WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

AUGUST 2014 MONTHLY REPORT

CONTINUOUS MONITORING
INTEGRATED MONITORING
September 29, 2014

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

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

AURORA
ATMOSPHERICS

September 29, 2014

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 August 2014
Wood Buffalo Environmental Association

Enclosed is the August 2014 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 501 - Statoil Leismer
AMS 502 - ConocoPhillips Surmont

WBEA commenced ambient air quality monitoring surveys at the Statoil Leismer and ConocoPhillips facilities on July 1, 2014. The survey at the Statoil Leismer facility will be conducted from July 1 to September 30, 2014 to fulfill EPEA approval number 241311-00-02. The survey at the ConocoPhillips Surmont facility will be conducted from July 1, 2014 to June 30, 2015 to fulfill EPEA approval number 48263-00-00.

These two stations are 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.

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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 and NH_3.

There were 16 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 13 concentrations in excess of the H_2S air quality objectives. Of these, there were 12 hourly average concentrations in exceedance of the 1-hour objective, and 1 daily average concentration in exceedance of the 24-hour air quality objective. There were 3 24-hour objective exceedences reported in real-time that were found not to be in exceedance after data processing.

There were 20 ambient ground level concentrations of O_3 in excess of the 1-hour O_3 air quality objective reported to Alberta Environment in real time. After data processing to account for valid analyzer response, there were 16 hourly average concentrations in exceedance of the 1-hour objective. There were 4 exceedences reported in real-time that were found not to be in exceedance after data processing.

There were 37 ambient ground level concentrations of $PM_{2.5}$ in excess of the 24-hour $PM_{2.5}$ air quality objective reported to Alberta Environment in real time. After data processing to account for valid analyzer response, all reported concentrations were in excess of the 24-hour $PM_{2.5}$ air quality objective.

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

					concentration (ppb or ug/m³ for $PM_{2.5}$)		
Site	parameter	date/time	reference	period	reported	final	status*
AMS 2 Mildred Lake	H_2S	26Aug14:05:00	288771	1-hour	11	11	exc
AMS 2 Mildred Lake	H_2S	26Aug14:06:00	288771	1-hour	12	12	exc
AMS 2 Mildred Lake	H_2S	26Aug14:24:00	288814	24-hour	3	3.3	nae
AMS 5 Mannix	H_2S	13Aug14:24:00	288202	1-hour	16	16	exc
AMS 5 Mannix	H_2S	16Aug14:01:00	288343	1-hour	11	11	exc
AMS 5 Mannix	H_2S	20Aug14:24:00	288578	24-hour	3	3.1	nae
AMS 5 Mannix	H_2S	21Aug14:23:00	288624	1-hour	17	17	exc
AMS 5 Mannix	H_2S	21Aug14:24:00	288624	24-hour	3	2.5	nae
AMS 5 Mannix	H_2S	24Aug14:02:00	288698	1-hour	12	12	exc
AMS 5 Mannix	H_2S	24Aug14:03:00	288698	1-hour	28	28	exc
AMS 5 Mannix	H_2S	24Aug14:04:00	288698	1-hour	28	27	exc
AMS 5 Mannix	H_2S	24Aug14:09:00	288704	1-hour	17	17	exc

Site	parameter	date/time	reference	period	concentration (ppb or ug/m^3 for $PM_{2.5}$) reported	final	status*
AMS 5 Mannix	H_2S	24Aug14:10:00	288704	1-hour	21	20	exc
AMS 5 Mannix	H_2S	24Aug14:11:00	288704	1-hour	11	11	exc
AMS 5 Mannix	H_2S	24Aug14:24:00	288704	24-hour	6	6.2	exc
AMS 12 Millennium	TRS	27Aug14:23:00	288859	1-hour	13	13	exc
AMS 1 Fort McKay	PM2.5	01Aug14:24:00	287663	24-hour	38	38	exc
AMS 1 Fort McKay	PM2.5	04Aug14:24:00	287757	24-hour	136	136	exc
AMS 1 Fort McKay	PM2.5	05Aug14:24:00	287827	24-hour	104	104	exc
AMS 6 Patricia McInnes	PM2.5	01Aug14:24:00	287664	24-hour	38	38	exc
AMS 6 Patricia McInnes	PM2.5	04Aug14:24:00	287751	24-hour	44	44	exc
AMS 6 Patricia McInnes	PM2.5	05Aug14:24:00	287824	24-hour	76	76	exc
AMS 7 Athabasca Valley	PM2.5	01Aug14:24:00	287665	24-hour	33	34	exc
AMS 7 Athabasca Valley	PM2.5	04Aug14:24:00	287752	24-hour	48	46	exc
AMS 7 Athabasca Valley	PM2.5	05Aug14:24:00	287825	24-hour	61	62	exc
AMS 8 Fort Chipewyan	PM2.5	01Aug14:24:00	287666	24-hour	60	60	exc
AMS 8 Fort Chipewyan	PM2.5	04Aug14:24:00	287749	24-hour	207	206	exc
AMS 8 Fort Chipewyan	PM2.5	05Aug14:24:00	287826	24-hour	86	86	exc
AMS 8 Fort Chipewyan	PM2.5	07Aug14:24:00	287399	24-hour	38	40	exc
AMS 8 Fort Chipewyan	PM2.5	14Aug14:24:00	288272	24-hour	90	90	exc
AMS 8 Fort Chipewyan	PM2.5	15Aug14:24:00	288342	24-hour	49	49	exc
AMS 8 Fort Chipewyan	PM2.5	16Aug14:24:00	288371	24-hour	41	40	exc
AMS 8 Fort Chipewyan	PM2.5	17Aug14:24:00	288403	24-hour	45	45	exc
AMS 8 Fort Chipewyan	PM2.5	18Aug14:24:00	288472	24-hour	36	36	exc
AMS 12 Millennium Mine	PM2.5	01Aug14:24:00	287667	24-hour	31	32	exc
AMS 12 Millennium Mine	PM2.5	04Aug14:24:00	287756	24-hour	67	67	exc
AMS 12 Millennium Mine	PM2.5	05Aug14:24:00	287828	24-hour	103	103	exc
AMS 12 Millennium Mine	PM2.5	14Aug14:24:00	288279	24-hour	31	31	exc
AMS 13 Fort McKay South	PM2.5	01Aug14:24:00	287668	24-hour	36	36	exc
AMS 13 Fort McKay South	PM2.5	04Aug14:24:00	287754	24-hour	137	137	exc
AMS 13 Fort McKay South	PM2.5	05Aug14:24:00	287829	24-hour	99	99	exc
AMS 14 Anzac	PM2.5	01Aug14:24:00	287669	24-hour	31	31	exc
AMS 14 Anzac	PM2.5	05Aug14:24:00	287894	24-hour	66	66	late

Site	parameter	date/time	reference	period	concentration (ppb or ug/m^3 for $PM_{2.5}$) reported	final	status*
AMS 15 CNRL Horizon	PM2.5	01Aug14:24:00	287670	24-hour	39	40	exc
AMS 15 CNRL Horizon	PM2.5	04Aug14:24:00	287755	24-hour	159	161	exc
AMS 15 CNRL Horizon	PM2.5	05Aug14:24:00	287822	24-hour	133	135	exc
AMS 15 CNRL Horizon	PM2.5	07Aug14:24:00	287938	24-hour	30	32	exc
AMS 15 CNRL Horizon	PM2.5	12Aug14:24:00	288145	24-hour	31	32	exc
AMS 16 Shell Muskeg River	PM2.5	04Aug14:24:00	287753	24-hour	138	139	exc
AMS 16 Shell Muskeg River	PM2.5	05Aug14:24:00	287823	24-hour	91	91	exc
AMS 17 Wapasu	PM2.5	04Aug14:24:00	287750	1-hour	107	108	exc
AMS 17 Wapasu	PM2.5	05Aug14:24:00	287821	24-hour	78	79	exc
AMS 17 Wapasu	PM2.5	16Aug14:24:00	288372	24-hour	67	67	exc
AMS 17 Wapasu	O3	02Aug14:19:00	287692	1-hour	83	87	exc
AMS 17 Wapasu	O3	02Aug14:20:00	287692	1-hour	93	91	exc
AMS 17 Wapasu	O3	02Aug14:21:00	287692	1-hour	89	87	exc
AMS 17 Wapasu	O3	02Aug14:22:00	287692	1-hour	87	87	exc
AMS 17 Wapasu	O3	02Aug14:23:00	287692	1-hour	91	89	exc
AMS 17 Wapasu	O3	02Aug14:24:00	287697	1-hour	92	90	exc
AMS 17 Wapasu	O3	03Aug14:01:00	287697	1-hour	88	86	exc
AMS 17 Wapasu	O3	03Aug14:02:00	287697	1-hour	83	81	nae
AMS 17 Wapasu	O3	03Aug14:09:00	287708	1-hour	86	83	exc
AMS 17 Wapasu	O3	03Aug14:10:00	287708	1-hour	96	96	exc
AMS 17 Wapasu	O3	03Aug14:11:00	287708	1-hour	102	100	exc
AMS 17 Wapasu	O3	03Aug14:12:00	287708	1-hour	111	109	exc
AMS 17 Wapasu	O3	03Aug14:13:00	287708	1-hour	111	-	nae
AMS 17 Wapasu	O3	04Aug14:13:00	287739	1-hour	83	81	nae
AMS 1 Bertha Ganter	O3	04Aug14:12:00	287737	1-hour	88	91	late
AMS 1 Bertha Ganter	O3	04Aug14:15:00	287737	1-hour	101	104	exc
AMS 1 Bertha Ganter	O3	04Aug14:16:00	287737	1-hour	87	90	exc
AMS 13 Fort McKay South	O3	04Aug14:12:00	287738	1-hour	106	105	late
AMS 13 Fort McKay South	O3	04Aug14:13:00	287738	1-hour	95	94	late
AMS 13 Fort McKay South	O3	04Aug14:15:00	287738	1-hour	100	-	nae

*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 estimates, and 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 August 2014, there were no incidents resulting in a compliance monitoring instrument operating less than 90 % of the time.

2.2 Intermittent Monitoring

The results for passive and integrated monitoring of PAH, VOC, RSC, $PM_{2.5}$ and PM_{10} samples from May to August 2014 are submitted with this report. The precipitation results were not available in time for submission with this report and 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.

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

Station 1, Fort McKay

The NH_3 analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily span period. Additional time for stabilization after spanning 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 31 hours this month.

Power failures at the station on August 9 and 19 interrupted the normal operations of all air quality analyzers for 4 hours. The NH_3 analyzer required extra time to stabilize following the power interruption on August 19, resulting in 1 additional hour of downtime.

An aborted calibration on August 6 interrupted the normal operation of the TRS analyzer for 1 hour.

Depletion and replacement of the fuel cylinder at the station on August 16 affected the normal operation of the THC analyzer for 2 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on August 19 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

The SO_2 analyzer experienced a single episode of unstable operation this reporting period, resulting in 1 hour of invalid data.

The NH_3 analyzer experienced two episodes of unstable operation due to baseline drift, resulting in 3 hours of invalid data.

Flat-line in the output signals of the wind sensor resulted in 1 hour 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

Maintenance and cleaning of the sample manifold on August 25 interrupted the normal operations of the H_2S analyzer for 1 hour.

The THC analyzer experienced multiple episodes of intermittent unstable operations due to baseline drift during this reporting period. This resulted in 28 hours of invalid data.

Calibration of the wind speed and direction sensors at the station on August 26 interrupted the normal operations of these parameters for 1 hour.

Station 3, Lower Camp B - Meteorology

A flat line in the output signals of the 45 m elevation wind sensor on August 30 resulted in 1 hour of downtime.

The meteorological sensors at the 167 m elevation failed following a lightning storm on July 30 resulting in invalid data for the month of August. All meteorological sensors were replaced on the tower on September 25, 2014 and data from these sensors will continue to be monitored.

Station 4, Buffalo Viewpoint

A power failure at the station on August 5 interrupted the normal operations of all air quality analyzers for 8 to 9 hours.

The data acquisition system failed to record data following the power failure on August 5 resulting in the absence of data for 1 hour for the temperature and wind sensors.

Calibration of the wind speed and direction sensors at the station on August 27 interrupted the normal operations of these parameters for 1 hour. The as-found wind direction sensor alignment indicated a 14 degree biased negative (alignment towards magnet north). A review of site documentation and comparisons to wind data from nearby meteorological towers failed to provide evidence to adjust data for a defined period. The wind direction sensor at the station was aligned to "true north" on August 27 and no additional adjustments were made to the wind data.

Station 5, Mannix

Maintenance and cleaning of the sample manifold on August 21 interrupted the normal operations of the SO_2, H_2S and THC analyzers for 1 hour.

Station operator activities on August 13 affected the normal operations of the SO_2 analyzer for 1 hour.

Station 6, Patricia McInnes

The NH_3 analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily span period. Additional time for stabilization after spanning 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 span have been reported as invalid for a total of 32 hours this month.

Maintenance on the auto daily zero and span systems and verification of analyzer response on August 1 interrupted the normal operations of the NH_3 analyzer for 3 hours.

Station operator activities on August 5 affected the normal operations of the NO_2 analyzer for 11 hours.

Maintenance and replacement of the $PM_{2.5}$ analyzer at the station on August 6 interrupted the continuous $PM_{2.5}$ data collection for 5 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on August 8 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

Maintenance and replacement of the fuel gas cylinder at the station on August 23 interrupted the normal operations of the THC analyzer for 2 hours.

Maintenance on the auto daily zero and span systems and verification of analyzer response on August 31 interrupted the normal operations of the NO_2 analyzer for 2 hours.

Station 7, Athabasca Valley

Maintenance and cleaning of the sample manifold on August 13 interrupted the normal operations of TRS, O_3, $PM_{2.5}$ and CO analyzers for 1 hour.

Maintenance and replacement of the fuel gas cylinder at the station on August 23 interrupted the normal operations of the THC analyzer for 2 hours.

Station 8, Fort Chipewyan

Power failures at the station on August 1 and 16 interrupted the normal operations of all air quality analyzers for 7 hours.

Maintenance to the sample inlet and flow and zero reference checks on August 7 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

Power spikes at the station on August 14 and 21 affected the normal operations of NO_2 and $PM_{2.5}$ analyzers for 1 hour.

Flat-line in the output signals of the wind sensor resulted in 1 hour of invalid data this reporting period.

Station 9, Barge Landing

A power failure at the station on August 19 interrupted the normal operations of all parameters for 3 hours.

Maintenance and cleaning of the sample manifold on August 22 affected the normal operations of TRS and THC analyzers for 1 hour.

The THC analyzer experienced multiple episodes of intermittent unstable operations due to baseline drift this reporting period. This resulted in 69 hours of invalid data.

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

Station 11, Lower Camp

Maintenance, replacement and calibration of the SO_2 flash lamp, socket and analyzer between August 18 and 20 affected data collection for the SO_2 parameter for 49 hours.

Station 12, Millennium Mine

The NO_2 analyzer experienced a single episode of unstable operations on August 7 resulting in 11 hours of invalid data.

There were two issues associated with operation of the $PM_{2.5}$ analyzer resulting in 26 hours of invalid data. The filter tape in the analyzer failed to advance on August 2 resulting in 25 hours of invalid data. Maintenance to the sample inlet, flow audits and zero reference checks on August 28 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 8 hours of invalid data this reporting period.

Station 13, Syncrude UE 1

Maintenance and cleaning of the sample manifold on August 22 affected the normal operations of all air quality analyzers for 2 hours.

A power failure at the station on August 19 interrupted the normal operations of all parameters for 5 hours.

A flat line in the output signals of the wind sensor resulted in 1 hour of invalid data this reporting period.

Station 14, Anzac

A power failure at the station on August 11 interrupted the normal operations of all air quality analyzers for 3 hours. The $PM_{2.5}$ analyzer required additional time to stabilize to ambient levels following the power failure resulting in 7 hours of invalid data.

Maintenance and replacement of the fuel gas cylinder at the station on August 14 interrupted the normal operations of the THC analyzer for 2 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on August 14 interrupted the normal operations of the $PM_{2.5}$ analyzer for 3 hours.

A flat line in the output signals of the wind sensor on August 16 resulted in 1 hour of invalid data.

Station 15, CNRL Horizon

A power spike at the station on August 8 affected the normal operations of the SO_2 analyzer for 1 hour.

A power failure at the station on August 19 interrupted the normal operations of all air quality analyzers for 7 hours. The THC analyzer required extra time to stabilize to ambient levels following the power failure resulting in 1 additional hour of invalid data.

Replacement of the sample inlet filters on August 13 and 26 due to the effects from forest fire resulted in 1 hour of invalid data for all air quality analyzers.

Maintenance to the sample inlet, flow audits and zero reference checks on August 27 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

Calibration of the meteorological sensors at the station on August 27 interrupted the normal operations of these parameters for 1 to 2 hours.

The THC analyzer experienced multiple episodes of intermittent unstable operations due to baseline drift this reporting period. This resulted in 10 hours of invalid data.

Station 16, Albian Muskeg River

The THC analyzer experienced four episodes of intermittent unstable operations this reporting period, resulting in 9 hours of invalid data.

Maintenance to the sample inlet, flow audits and zero reference checks on August 18 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

Replacement and calibration of the $PM_{2.5}$ analyzer on August 19 interrupted data collection for the $PM_{2.5}$ parameter for 4 hours.

A new data collection program and revision uploads to the data logger on July 31 interrupted the normal data collection for the relative humidity and barometric pressure sensor for 10 hours this reporting period.

A flat-line in the output signals of the wind sensor on August 23 resulted in 1 hour of invalid data.

Calibration of the meteorological sensors at the station on August 28 interrupted the normal operations of these parameters for 3 hours.

Station 17, Wapasu

A power failure at the station on August 28 interrupted the normal operations of all air quality analyzers for 3 hours.

Maintenance on the auto daily zero and span systems and verification of analyzer responses on August 1 interrupted the normal operations of O_3 analyzers for 1 hour.

Maintenance and cleaning of the sample manifold on August 6 interrupted the normal operations of the SO_2, H_2S, THC and O_3 analyzers for 1 hour.

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

Station 19, Firebag

The H_2S analyzer experienced a single episode of unstable operations due to excessive baseline drift resulting in 1 hour of invalid data.

Station 501, Statoil Leismer

In July 2014, WBEA commissioned an ambient air quality survey at the Statoil Leismer facility. The survey at this location will be conducted from July 1 to September 30, 2014 to fulfill Alberta Environment's Environmental Protection and Enhancement Act facility approval number 241311-00-02.

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.

Maintenance to the sample glass manifold on August 11 and 12 interrupted the normal operations of the air quality analyzers for 1 to 2 hours this reporting period.

A power failure at the station on August 1 interrupted the normal operations of all air quality analyzers for 8 hours.

The SO_2 analyzer experienced extended stabilization periods after the daily span checks this reporting month, resulting in 31 hours of invalid data.

Flat-lines in the output signals of the wind sensor resulted in 19 hours of invalid data this reporting period.

Station 502, ConocoPhillips Surmont

In July 2014, WBEA commissioned an ambient air quality survey at the ConocoPhillips facility. The survey at this location will be conducted from July 1, 2014 to June 30, 2015 to fulfill Alberta

Environment's Environmental Protection and Enhancement Act 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.

A revised data collection program upload to the data logger on August 1 interrupted the normal communication links with all parameters for 1 to 3 hours.

The NO_X analyzer experienced multiple episodes of intermittent unstable operations due to flow restrictions in the molybdenum converter and excessive baseline drift resulting in 22 hours of invalid data. A backup analyzer was installed on August 6 to minimize operational downtime and to conduct off-site repairs on the original NO_X analyzer.

The SO_2 analyzer experienced extended stabilization periods after the daily span checks this reporting month, resulting in 28 hours of invalid data.

Flat-lines in the output signals of the wind sensor resulted in 2 hours of invalid data this reporting period.

Station 101, Portable

Not in operation during 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

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

AUGUST 2014

prepared 28Sep14:19:01

APPROVAL NUMBERS	REPORT DATE MONTH	YEAR
289664-00-00	8	2014
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	99.46	0.034	0	0.005	0
SO2(ppm)	2	100.00	0.073	0	0.017	0
SO2(ppm)	4	98.92	0.012	0	0.001	0
SO2(ppm)	5	99.73	0.047	0	0.013	0
SO2(ppm)	6	100.00	0.025	0	0.006	0
SO2(ppm)	7	100.00	0.037	0	0.006	0
SO2(ppm)	8	99.06	0.006	0	0.001	0
SO2(ppm)	11	93.41	0.034	0	0.007	0
SO2(ppm)	12	100.00	0.037	0	0.006	0
SO2(ppm)	13	99.06	0.036	0	0.005	0
SO2(ppm)	14	99.60	0.012	0	0.002	0
SO2(ppm)	15	98.79	0.071	0	0.010	0
SO2(ppm)	16	100.00	0.031	0	0.006	0
SO2(ppm)	17	99.46	0.024	0	0.004	0
SO2(ppm)	19	100.00	0.044	0	0.006	0
SO2(ppm)	501	94.49	0.006	0	0.001	0
SO2(ppm)	502	95.83	0.012	0	0.004	0
H2S(ppm)	2	99.87	0.012	2	0.003	0
H2S(ppm)	4	98.79	0.004	0	0.001	0
H2S(ppm)	5	99.87	0.028	9	0.006	1
H2S(ppm)	11	100.00	0.004	0	0.001	0
H2S(ppm)	17	99.46	0.001	0	0.001	0
H2S(ppm)	19	99.87	0.003	0	0.001	0
H2S(ppm)	501	98.79	0.001	0	0.000	0
H2S(ppm)	502	99.87	0.003	0	0.002	0
TRS(ppm)	1	99.33	0.005	0	0.001	0
TRS(ppm)	6	100.00	0.003	0	0.001	0
TRS(ppm)	7	99.87	0.002	0	0.001	0
TRS(ppm)	9	99.46	0.004	0	0.001	0
TRS(ppm)	12	100.00	0.013	1	0.001	0
TRS(ppm)	13	99.19	0.004	0	0.001	0
TRS(ppm)	14	99.60	0.006	0	0.001	0
TRS(ppm)	15	98.79	0.002	0	0.001	0
THC(ppm)	1	99.19	3.5	-	2.3	-
THC(ppm)	2	96.24	4.6	-	2.8	-
THC(ppm)	4	98.92	4.3	-	2.7	-
THC(ppm)	5	99.87	4.7	-	2.7	-
THC(ppm)	6	99.73	2.9	-	2.2	-
THC(ppm)	7	99.73	2.3	-	2.1	-
THC(ppm)	9	90.19	3.1	-	2.4	-
THC(ppm)	11	100.00	3.9	-	2.7	-
THC(ppm)	12	100.00	6.3	-	2.8	-
THC(ppm)	13	99.19	7.9	-	2.7	-
THC(ppm)	14	99.33	5.8	-	2.6	-
THC(ppm)	15	97.58	5.0	-	2.9	-
THC(ppm)	16	98.79	4.9	-	3.1	-
THC(ppm)	17	99.46	3.0	-	2.4	-
THC(ppm)	19	100.00	3.1	-	2.5	-
O3(ppm)	1	99.33	0.104	3	0.043	-
O3(ppm)	6	100.00	0.075	0	0.035	-

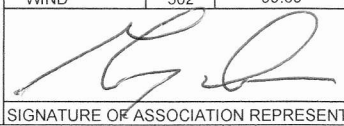
WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY
for AMD SECTION III.B.1(c)

prepared 28Sep14:19:01

APPROVAL NUMBERS	REPORT DATE MONTH	YEAR
289664-00-00	8	2014
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		
241311-00-02		
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
O3(ppm)	7	99.87	0.077	0	0.033	-
O3(ppm)	8	99.46	0.068	0	0.049	-
O3(ppm)	13	99.19	0.105	2	0.028	-
O3(ppm)	14	99.60	0.060	0	0.036	-
O3(ppm)	17	99.33	0.109	11	0.064	-
NO2(ppm)	1	99.60	0.033	0	0.008	-
NO2(ppm)	6	98.25	0.015	0	0.005	-
NO2(ppm)	7	100.00	0.022	0	0.008	-
NO2(ppm)	8	99.33	0.008	0	0.002	-
NO2(ppm)	12	98.52	0.037	0	0.013	-
NO2(ppm)	13	99.19	0.036	0	0.008	-
NO2(ppm)	14	99.60	0.011	0	0.003	-
NO2(ppm)	15	98.92	0.038	0	0.012	-
NO2(ppm)	16	100.00	0.039	0	0.016	-
NO2(ppm)	17	99.60	0.022	0	0.005	-
NO2(ppm)	19	100.00	0.032	0	0.006	-
NO2(ppm)	501	98.66	0.012	0	0.003	-
NO2(ppm)	502	96.91	0.026	0	0.007	-
CO(ppm)	7	99.87	1.4	0	0.6	-
NH3(ppm)	1	94.76	11	0	1	-
NH3(ppm)	6	95.30	20	0	12	-
PM2.5(ug/m^3)	1	99.33	530.1	-	135.8	3
PM2.5(ug/m^3)	6	99.06	191.6	-	76.2	3
PM2.5(ug/m^3)	7	99.87	213.1	-	62.2	3
PM2.5(ug/m^3)	8	99.60	354.5	-	206.4	9
PM2.5(ug/m^3)	12	96.51	275.6	-	103.4	4
PM2.5(ug/m^3)	13	99.19	617.3	-	137.3	3
PM2.5(ug/m^3)	14	98.25	186.8	-	66	2
PM2.5(ug/m^3)	15	98.92	479.2	-	160.9	5
PM2.5(ug/m^3)	16	99.19	491.2	-	139.3	2
PM2.5(ug/m^3)	17	99.46	347	-	107.9	3
WIND	1	99.87	-	-	-	-
WIND	2	99.87	-	-	-	-
WIND	4	99.73	-	-	-	-
WIND	5	100.00	-	-	-	-
WIND	6	100.00	-	-	-	-
WIND	7	100.00	-	-	-	-
WIND	8	99.87	-	-	-	-
WIND	9	99.19	-	-	-	-
WIND	11	100.00	-	-	-	-
WIND	12	98.92	-	-	-	-
WIND	13	99.87	-	-	-	-
WIND	14	99.87	-	-	-	-
WIND	15	99.87	-	-	-	-
WIND	16	99.46	-	-	-	-
WIND	17	100.00	-	-	-	-
WIND	19	100.00	-	-	-	-
WIND	501	97.45	-	-	-	-
WIND	502	99.60	-	-	-	-



SIGNATURE OF ASSOCIATION REPRESENTATIVE

FOR ALBERTA ENVIRONMENT USE ONLY

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 1
BERTHA GANTER FORT MCKAY
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY - BERTHA GANTER (AMS 1)
AUGUST 2014

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	704	36	40	99.46	34	0	5	0
TRS(ppb) Average	703	36	41	99.33	5	0	1	0
THC(ppm) Average	702	36	42	99.19	3.5	-	2.3	-
NMHC(ppm) Average	702	36	42	99.19	1.373	-	0.163	-
CH4(ppm) Average	702	36	42	99.19	2.5	-	2.1	-
O3 (ppb) Average	703	36	41	99.33	104	3	43	-
NO2 (ppb) Average	704	37	40	99.60	33	0	8	-
NO (ppb) Average	704	37	40	99.60	38	-	5	-
NOX (ppb) Average	704	37	40	99.60	55	-	13	-
NH3 (ppb) Average	661	44	83	94.76	11	0	1	-
PM2.5 (ug/m3) Average	739	0	5	99.33	530.1	-	135.8	3
Wind Speed 10 m (km/h) Average	743	0	1	99.87	16	-	-	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Temperature 2 m (C) Average	744	0	0	100.00	35.3	-	25.5	-
Temperature 10 m (C) Average	744	0	0	100.00	32.7	-	25.9	-
Relative Humidity (%) Average	744	0	0	100.00	100	-	-	-
Precipitation (mm) Total	744	0	0	100.00	7.4	-	-	-
Surface Wetness (% of range) Average	744	0	0	100.00	66	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	482	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT McKAY (AMS 1)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	704	1.9	4	-	0	0	1	1	1	4	34
TRS (ppb) Average	703	0.6	0	-	0	0	0	0	1	1	5
THC (ppm) Average	702	1.95	0.2	-	1.8	1.8	1.8	1.9	2	2.1	3.5
NMHC(ppm) Average	702	0.012	0.075	-	0	0	0	0	0	0	1.373
CH4(ppm) Average	702	1.93	0.1	-	1.8	1.8	1.8	1.9	2	2.1	2.5
O3 (ppb) Average	703	23.5	15	-	3	7	12	20	33	43	104
NO2 (ppb) Average	704	4	4	-	0	1	1	3	6	9	33
NO (ppb) Average	704	1.4	4	-	0	0	0	0	1	4	38
NOX (ppb) Average	704	5.4	7	-	0	1	1	3	7	13	55
NH3 (ppb) Average	661	0	1	-	0	0	0	0	0	0	11
PM2.5 (ug/m3) Average	739	18.24	40.2	-	0	2.6	4.9	9.4	15	25.3	530.1
Wind Speed 10 m (km/h) Average	743	5.1	3	-	0	2	3	4	7	9	16
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	744	18.68	7.2	-	2	10.2	13.6	17.9	23.7	29.1	35.3
Temperature 10 m (C) Average	744	18.97	6.4	-	3.3	11.5	14.5	18.4	23.2	28.3	32.7
Relative Humidity (%) Average	744	67.6	20	-	22	40	51	69	86	94	100
Precipitation (mm) Total	744	-	-	43.43	0	0	0	0	0	0	7.4
Surface Wetness (% of range) Average	744	5.5	12	-	0	0	0	0	0	25	66
Global Solar Radiation (W/m2) Average	744	123.5	148	-	0	0	0	35	229	363	482

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER Fort McKAY (AMS 1)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	09 Aug 2014 07:00	09 Aug 2014 07:00	1	Station Power failure
AIR QUALITY ANALYZERS	19 Aug 2014 14:00	19 Aug 2014 16:00	3	Station Power failure
TRS	06 Aug 2014 09:00	06 Aug 2014 09:00	1	Maintenance - aborted calibration
NMHC, CH4, THC	16 Aug 2014 11:00	16 Aug 2014 12:00	2	Maintenance - replaced fuel cylinder and relit FID
O3	09 Aug 2014 02:00	09 Aug 2014 02:00	1	Unstable operation - excessive noise in output signal
NH3	01 Aug 2014 03:00	31 Aug 2014 03:00	31	Stabilization after daily span
NH3	03 Aug 2014 08:00	03 Aug 2014 08:00	1	Intermittent unstable operation - baseline collapse
NH3	04 Aug 2014 12:00	04 Aug 2014 13:00	2	Intermittent unstable operation - baseline collapse
NH3	19 Aug 2014 17:00	19 Aug 2014 17:00	1	Stabilization period after power failure
PM2.5	13 Aug 2014 15:00	13 Aug 2014 16:00	2	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	24 Aug 2014 20:00	24 Aug 2014 20:00	1	Flatline in sensor output signal

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 34 ppb on Aug 29 12:00 Maximum Daily Average: 5.2 ppb on Aug 29

Minimum Value: 0 ppb on Aug 24 05:00 Minimum Daily Average: 0.4 ppb on Aug 21
Maximum Diurnal Average: 5.4 ppb at hour 12 Minimum Diurnal Average: 0.7 ppb at hour 5
Monthly Average: 1.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 19$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	Z	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	9	15	8	4	2	2	1	2.6	15
2-Aug	1	Z	1	1	1	1	1	1	10	15	8	10	6	1	1	1	1	1	1	1	1	1	1	1	2.8	15
3-Aug	1	Z	1	1	1	1	1	1	1	4	7	9	8	3	5	10	28	17	8	4	2	1	1	1	4.9	28
4-Aug	1	Z	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2
5-Aug	1	Z	1	1	1	0	0	2	2	2	21	14	15	3	9	7	4	3	2	1	2	1	1	1	4.1	21
6-Aug	1	Z	1	2	1	1	1	5	6	4	12	21	3	1	1	1	5	3	2	1	1	1	1	1	3.3	21
7-Aug	1	Z	1	1	1	1	1	1	1	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0.6	1
8-Aug	0	Z	1	0	0	0	0	1	1	4	1	1	3	6	3	1	1	1	0	0	1	1	1	0	1.2	6
9-Aug	0	Z	0	0	0	0	PF	1	1	1	1	2	3	2	1	0	0	0	0	0	0	0	0	0	0.8	3
10-Aug	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
11-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0.6	1
12-Aug	1	Z	1	0	0	1	1	1	6	19	32	10	2	5	5	6	5	3	3	2	1	1	1	3	4.7	32
13-Aug	5	Z	2	1	1	1	1	2	2	13	15	9	3	3	3	2	2	1	1	1	1	1	1	1	3.1	15
14-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	7	4	2	2	1	1	1	1.8	7
15-Aug	1	Z	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1.1	2
16-Aug	1	Z	1	1	1	1	1	1	1	1	2	2	1	3	14	2	1	1	1	1	1	1	1	1	1.6	14
17-Aug	1	Z	1	1	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
18-Aug	0	Z	1	1	1	1	1	1	1	2	1	7	8	2	2	2	3	1	1	1	1	1	1	1	1.6	8
19-Aug	1	Z	1	1	1	1	1	1	1	1	1	5	19	PF	PF	PF	1	1	1	1	1	1	1	1	2.0	19
20-Aug	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
21-Aug	0	Z	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Aug	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
23-Aug	1	Z	1	1	1	1	1	1	1	1	4	10	5	9	9	5	9	6	2	2	1	1	0	0	3.0	10
24-Aug	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	1	3	2	0	1	0	0	0	0	0	0.5	3
25-Aug	0	Z	0	0	1	1	1	1	1	4	8	10	4	3	2	1	1	1	2	2	1	11	4	4	2.8	11
26-Aug	5	Z	4	4	2	2	2	1	1	1	2	6	1	1	15	11	1	1	1	0	0	0	0	0	2.7	15
27-Aug	0	Z	0	0	0	0	0	1	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0.6	1
28-Aug	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
29-Aug	1	Z	1	1	1	1	1	1	4	16	23	34	20	4	2	2	2	2	2	1	1	1	1	1	5.2	34
30-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	0	1	0	1	0	0.6	1
31-Aug	1	Z	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0.6	1
	0.9	--	0.8	0.8	0.7	0.7	0.7	1.0	1.6	3.2	4.9	5.4	3.8	2.0	2.9	2.3	2.6	2.1	1.7	1.2	0.9	1.1	0.8	0.8	Diurnal Average	
	5	--	4	4	2	2	2	5	10	19	32	34	20	9	15	11	28	17	15	8	4	11	4	4	Diurnal Maximum	

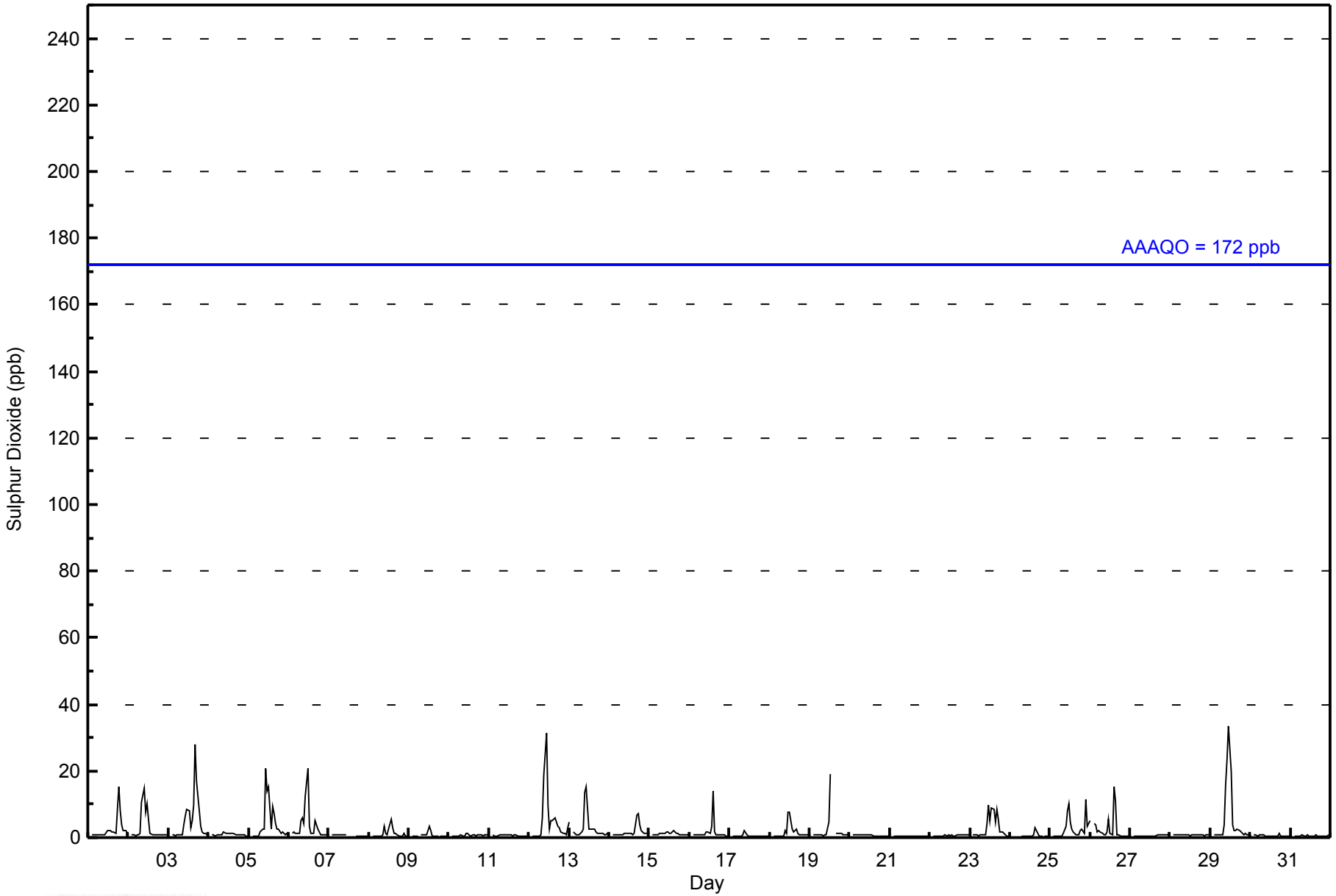
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	682	96.88	96.88
11 - 20	16	2.27	99.15
21 - 60	6	0.85	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	56	34	6	9	14	17	17	57	77	78	49	29	49	71	75	43	681
11 - 20	0	0	0	0	0	0	0	8	8	0	0	0	0	0	0	0	16
21 - 60	0	0	0	0	0	0	0	2	4	0	0	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	56	34	6	9	14	17	17	67	89	78	49	29	49	71	75	43	703

Total Number of Valid Hours: 703

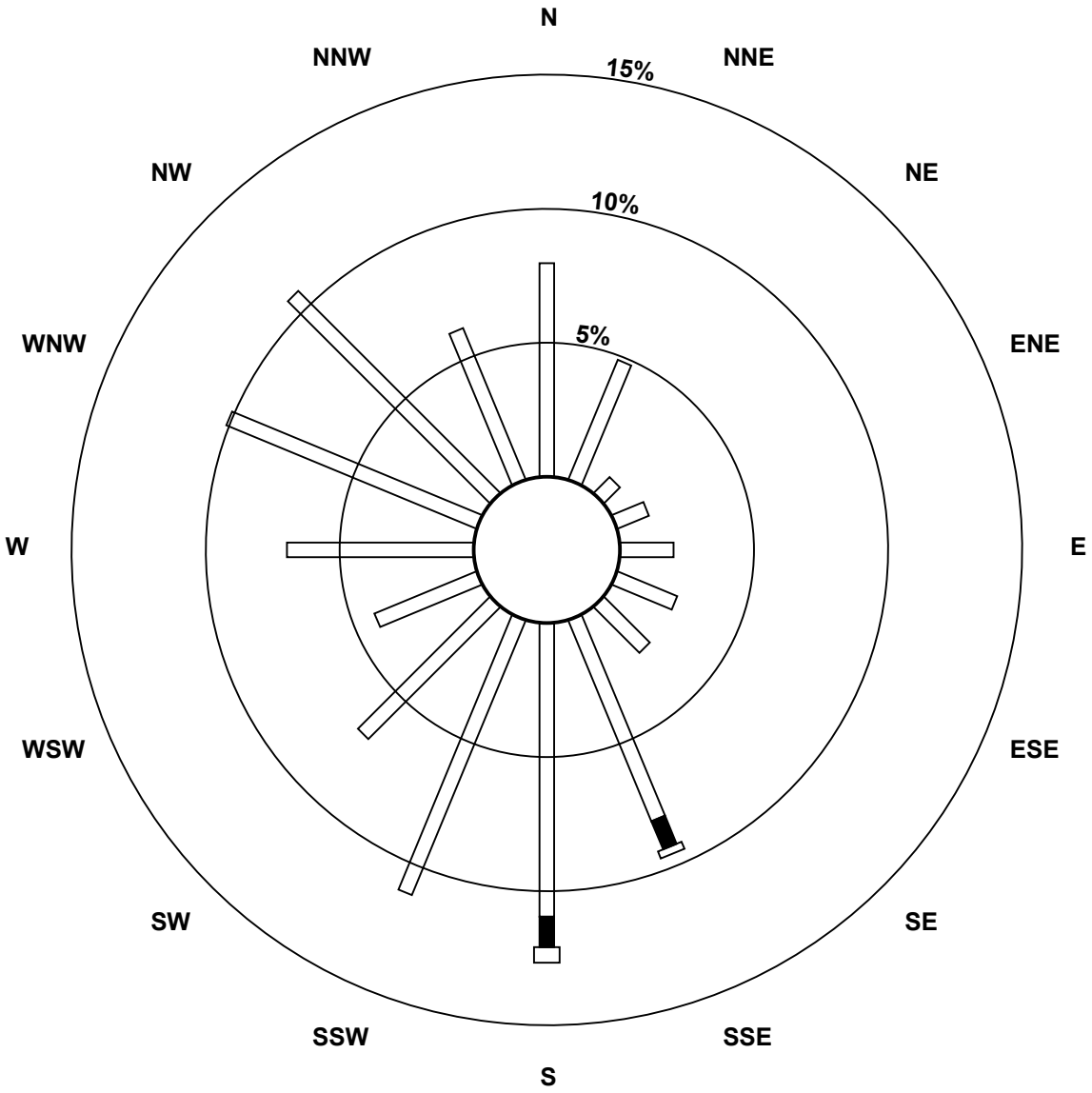
Total Number of Hours: 744

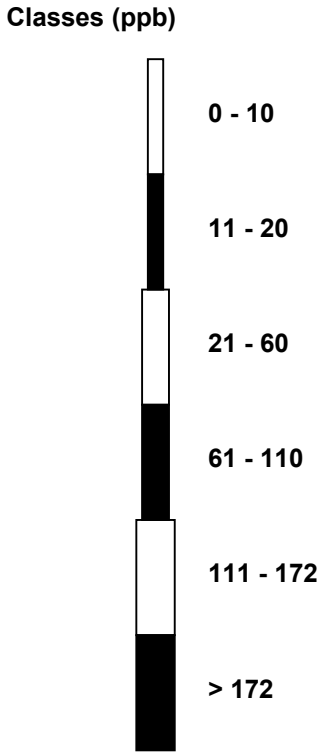
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter (AMS 1)





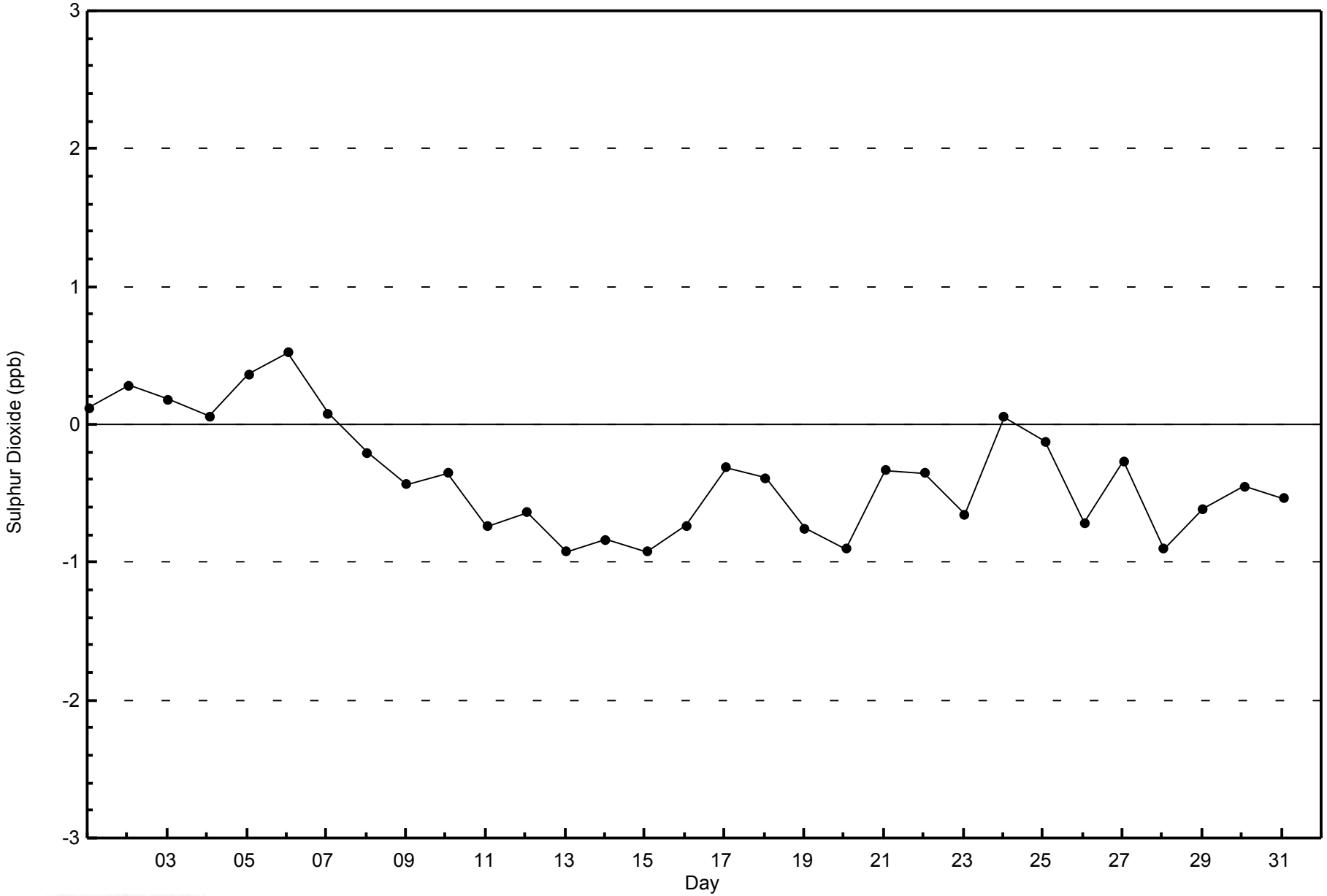
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - August 2014



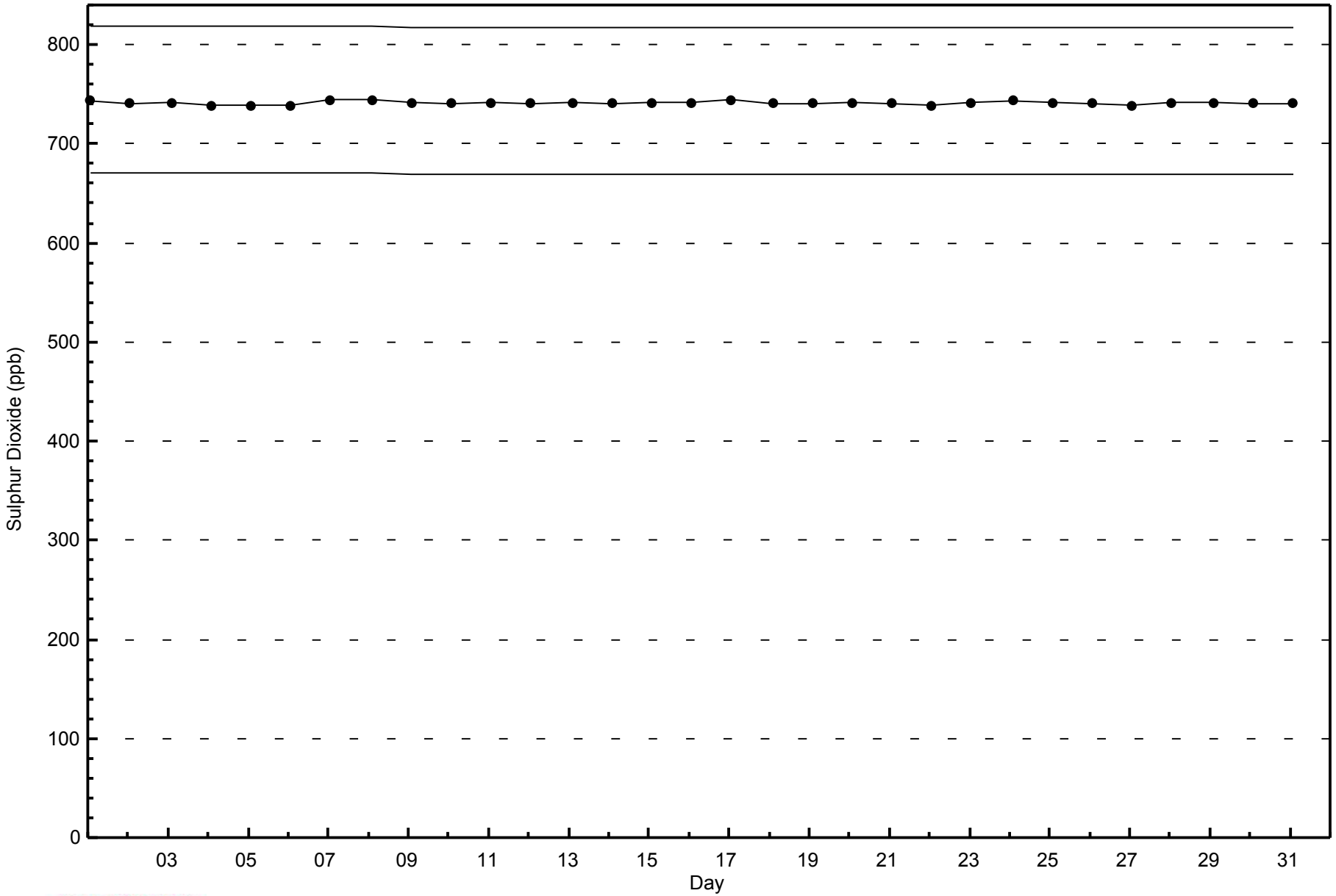
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 ppb on Aug 26 06:00 Maximum Daily Average: 1.2 ppb on Aug 25

Minimum Value: 0 ppb on Aug 29 05:00 Minimum Daily Average: 0.3 ppb on Aug 31
Maximum Diurnal Average: 0.9 ppb at hour 11 Minimum Diurnal Average: 0.4 ppb at hour 18
Monthly Average: 0.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	36
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.5	1
2-Aug	0	0	Z	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
3-Aug	0	0	Z	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Aug	0	0	Z	0	0	0	0	0	1	2	2	3	2	2	1	1	1	0	0	1	1	1	1	1	0.9	3
5-Aug	1	1	Z	1	1	0	0	1	1	1	2	2	1	0	0	0	0	0	0	0	0	1	1	1	0.7	2
6-Aug	1	1	Z	1	2	1	1	1	M	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
7-Aug	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
8-Aug	0	0	Z	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
9-Aug	0	0	Z	0	0	0	PF	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
10-Aug	0	0	Z	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Aug	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
12-Aug	0	0	Z	0	0	0	1	1	1	3	2	1	0	0	0	0	0	1	0	0	0	0	0	1	0.7	3
13-Aug	1	1	Z	1	1	2	1	2	2	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0.9	2
14-Aug	0	0	Z	0	1	1	1	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0.6	1
15-Aug	1	0	Z	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1
16-Aug	0	0	Z	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0.6	1
17-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
18-Aug	0	0	Z	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.6	1
19-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	1	PF	PF	PF	0	0	0	1	0	0	0	0	0.4	1
20-Aug	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.6	1
21-Aug	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
22-Aug	0	0	Z	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
23-Aug	0	0	Z	0	0	0	0	1	1	1	3	4	1	1	1	0	1	1	1	1	1	1	0	0	0.9	4
24-Aug	0	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.4	1
25-Aug	1	1	Z	2	3	2	2	2	4	1	2	1	0	1	0	0	0	0	0	0	1	1	1	1	1.2	4
26-Aug	2	2	Z	3	2	5	2	1	0	0	1	2	0	0	1	1	0	0	0	0	0	0	0	0	1.1	5
27-Aug	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.4	1
28-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.4	1
29-Aug	0	0	Z	0	0	0	1	1	2	2	3	2	1	1	0	1	1	1	1	0	1	1	0	0	0.8	3
30-Aug	0	0	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
31-Aug	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
	0.5	0.5	--	0.6	0.6	0.7	0.6	0.7	0.9	0.9	0.9	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	Diurnal Average	
	2	2	--	3	3	5	2	2	4	3	3	4	2	2	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

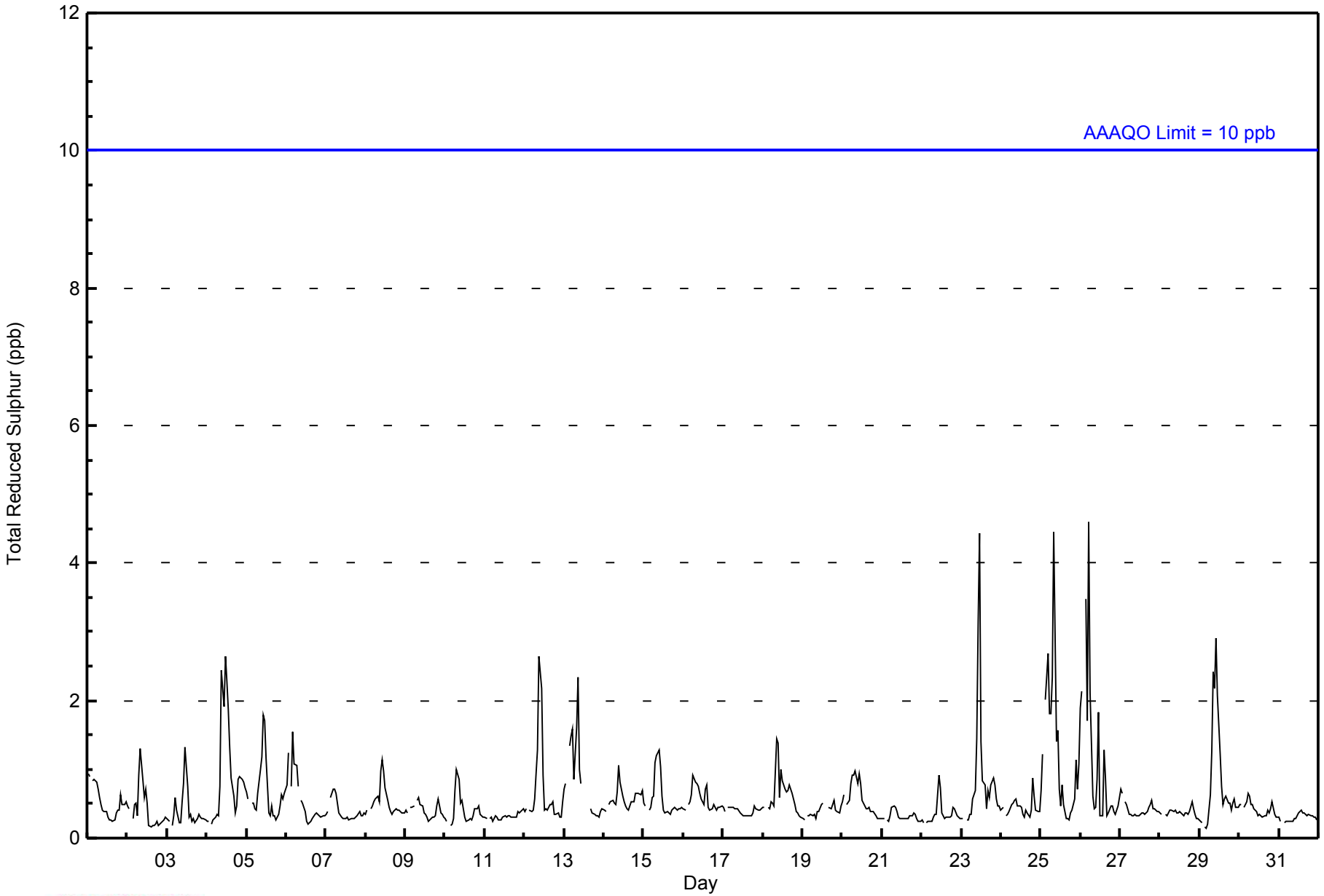
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	694	98.72	98.72
3 - 4	8	1.14	99.86
5 - 7	1	0.14	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	53	34	6	9	14	16	17	64	86	74	44	31	51	76	75	43	693
3 - 4	1	0	0	0	0	0	0	3	3	1	0	0	0	0	0	0	8
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	0	0	0	0	0	0	0	0	0	0
Totals	54	34	6	9	14	16	17	67	89	76	44	31	51	76	75	43	702

Total Number of Valid Hours: 702

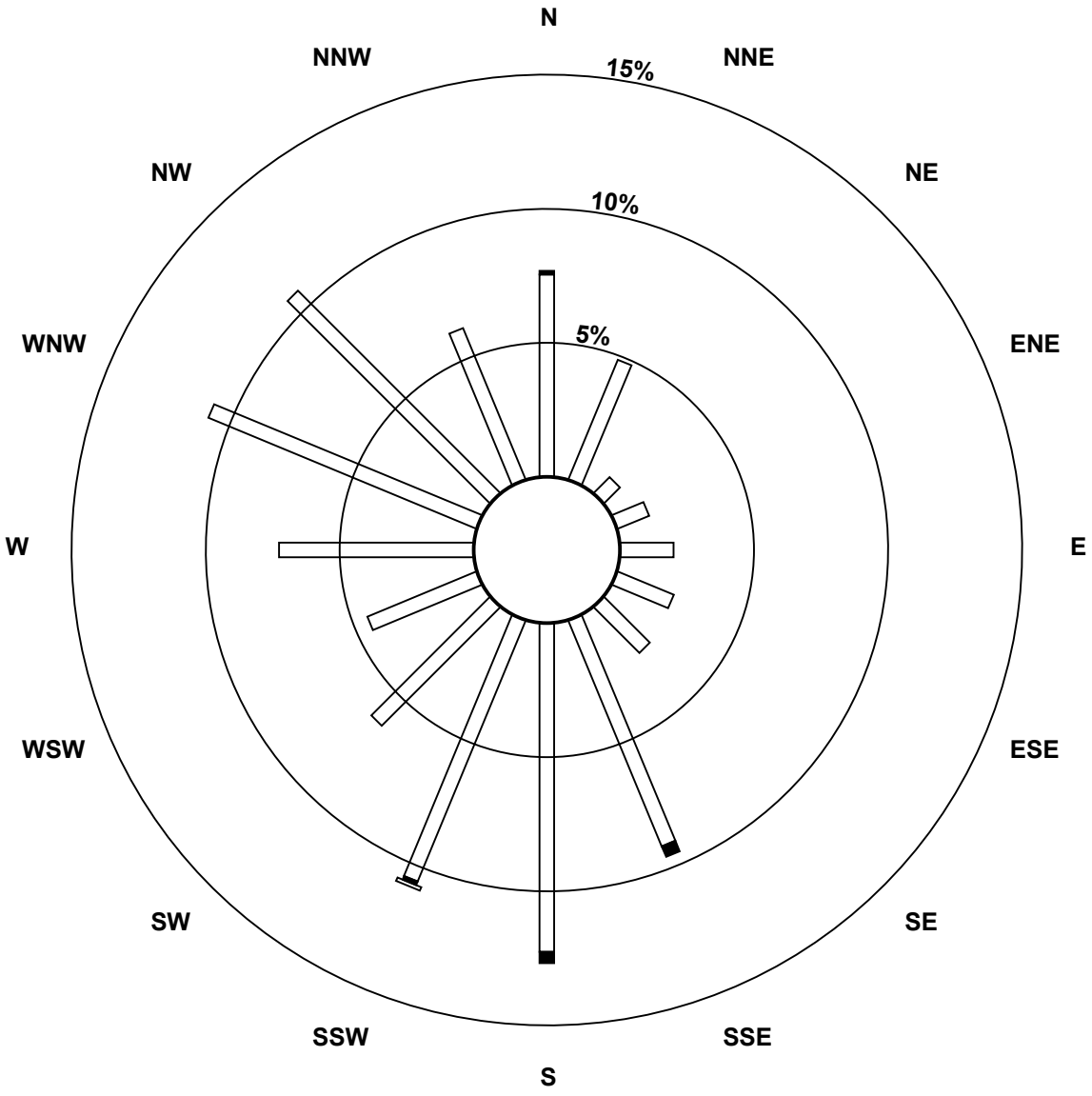
Total Number of Hours: 744

Wood Buffalo Environmental Association

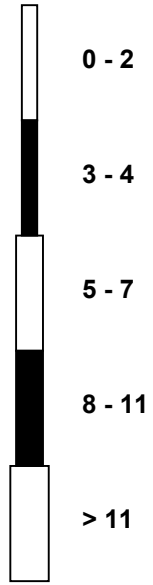
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



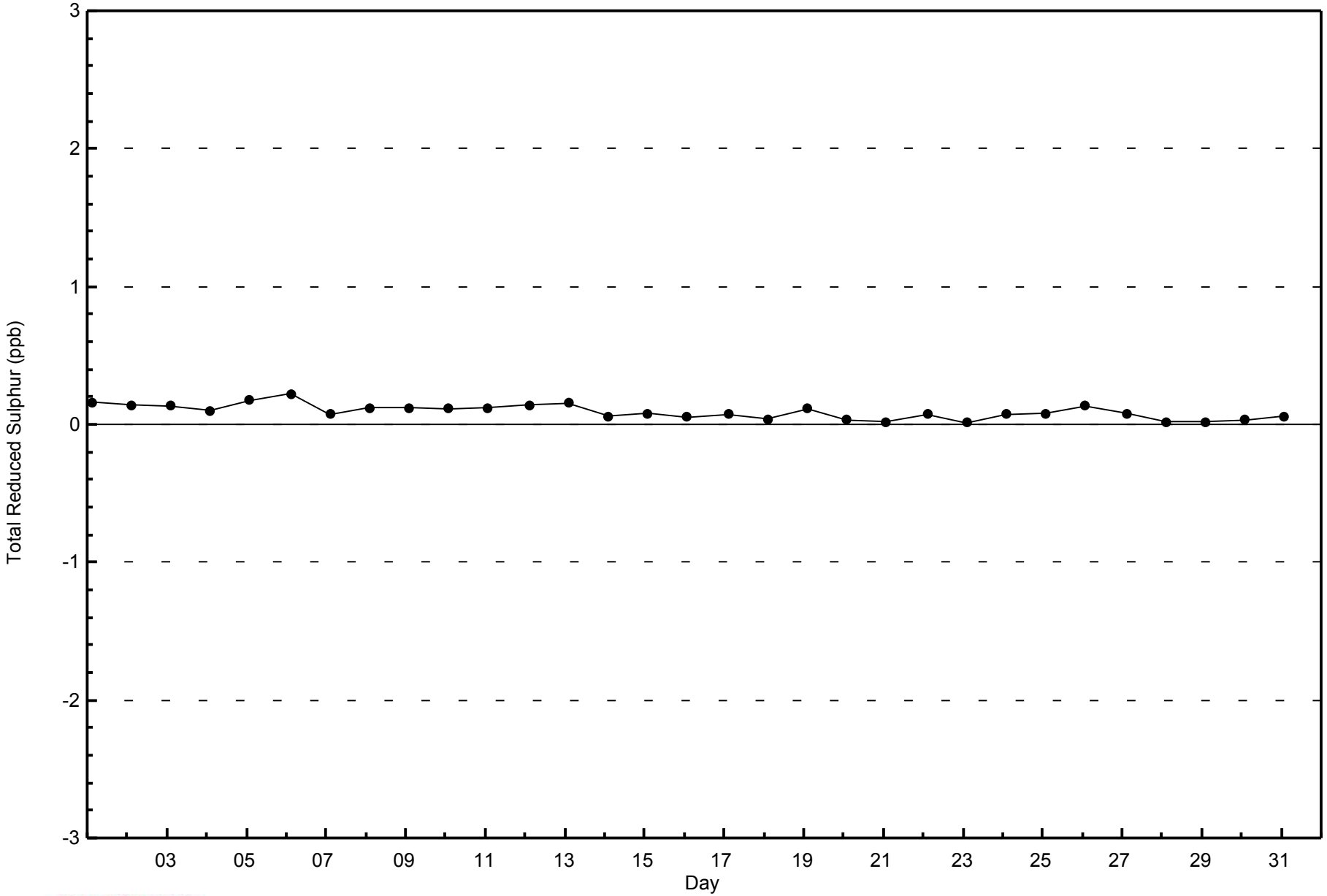
Total Number of Valid Hours: 702

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - August 2014



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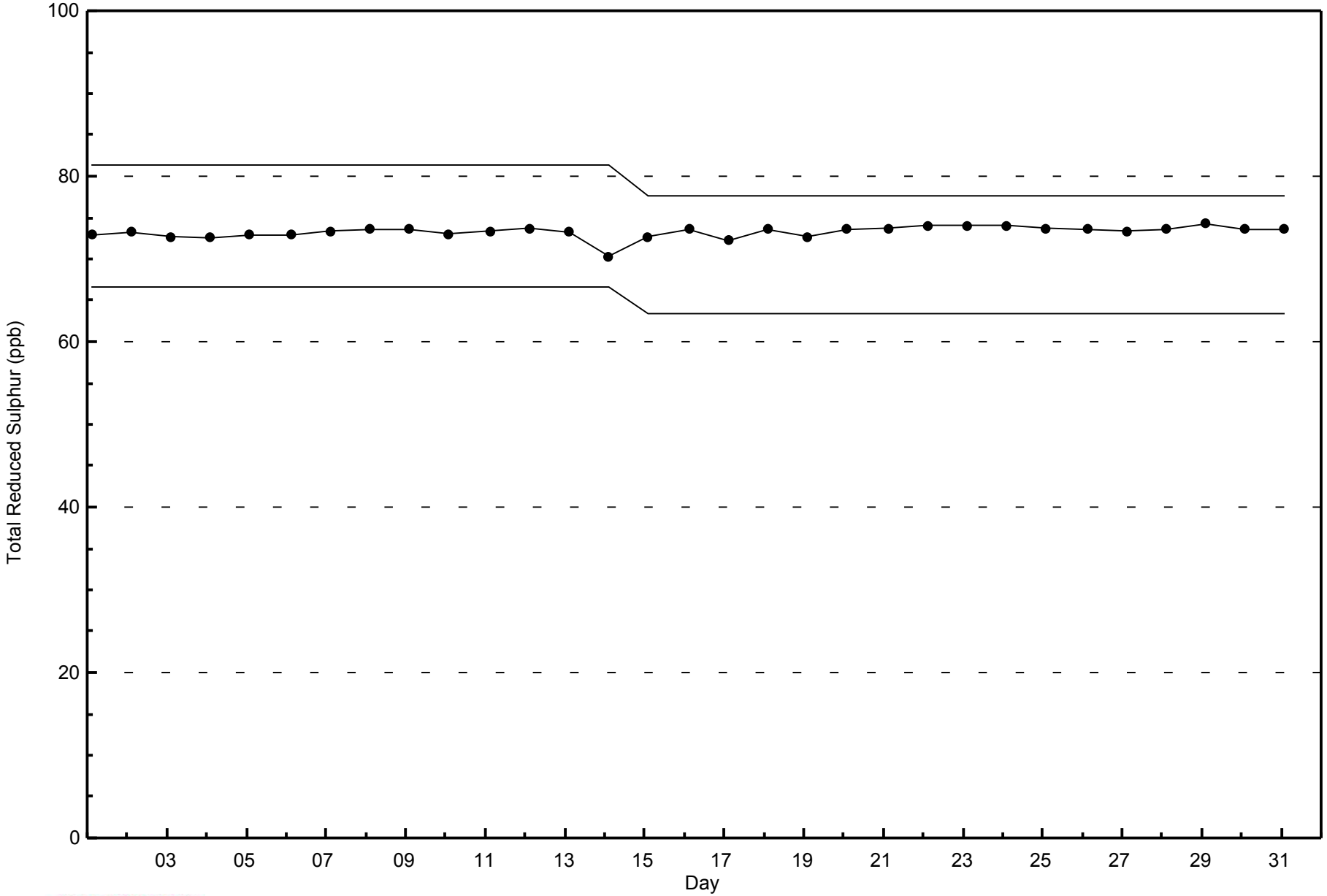
WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - August 2014

Maximum Value: 3.5 ppm on Aug 16 07:00

Maximum Daily Average: 2.3 ppm on Aug 4

Minimum Value: 1.8 ppm on Aug 7 11:00

Minimum Daily Average: 1.8 ppm on Aug 7

Maximum Diurnal Average: 2.1 ppm at hour 7

Minimum Diurnal Average: 1.8 ppm at hour 17

Monthly Average: 1.95 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	36
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-Aug	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0
2-Aug	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1
3-Aug	2.0	Z	1.9	2.0	2.2	2.5	2.5	2.0	2.1	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.5
4-Aug	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.7	2.6	2.7	2.5	2.4	2.3	2.1	2.1	1.9	2.0	2.3	2.5	2.7	2.5	2.3	2.3	2.7
5-Aug	2.3	Z	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.2	2.1	2.0	1.9	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.5
6-Aug	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.2	2.1	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	1.9	2.2
7-Aug	1.8	Z	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	C	C	C	C	C	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9
8-Aug	1.8	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
9-Aug	1.9	Z	1.9	1.9	1.9	1.9	PF	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0
10-Aug	1.9	Z	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.1	2.1	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9	1.9	1.9	2.2
11-Aug	1.9	Z	2.0	2.0	1.9	2.0	2.0	2.0	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	1.9	1.9	2.0
12-Aug	1.9	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.2
13-Aug	1.9	Z	2.0	2.0	2.1	2.1	2.0	2.1	2.2	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2
14-Aug	1.9	Z	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.0	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	1.9	2.1
15-Aug	2.0	Z	2.0	2.0	2.1	2.3	2.1	2.2	2.4	2.3	2.2	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.4
16-Aug	1.9	Z	1.9	2.0	2.0	2.2	3.5	2.8	2.6	2.3	M	M	1.9	1.9	1.9	1.8	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.1	2.1	3.5
17-Aug	2.0	Z	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	1.8	1.9	1.9	2.0	1.8	2.0
18-Aug	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.2	2.0	2.0	1.9	2.0	2.0	2.1	2.3
19-Aug	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	1.8	1.8	1.9	PF	PF	PF	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.1
20-Aug	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	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	1.9	1.9	1.8	1.9
21-Aug	1.9	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	1.9	1.9	1.9	1.9	1.9	1.8	1.9
22-Aug	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0
23-Aug	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	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	2.1
24-Aug	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
25-Aug	2.0	Z	2.0	2.0	2.0	2.0	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	1.9	2.1
26-Aug	2.0	Z	2.1	2.2	2.1	2.3	2.3	2.4	2.1	2.0	2.3	2.2	1.9	1.9	2.0	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.9	2.0	2.0	2.4
27-Aug	2.2	Z	2.1	2.0	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	1.9	1.9	1.8	1.8	1.9	2.2
28-Aug	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	1.9	1.9	1.9	1.9	1.9	1.8	1.9
29-Aug	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	1.9	2.1
30-Aug	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	2.0	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.1
31-Aug	2.0	Z	1.9	1.9	1.8	1.8	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	1.9	1.9	1.8	2.0
	2.0	--	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.3	--	2.5	2.5	2.4	2.5	3.5	2.8	2.6	2.7	2.6	2.7	2.5	2.4	2.3	2.1	2.1	2.1	2.2	2.3	2.5	2.7	2.5	2.3	Diurnal Maximum	

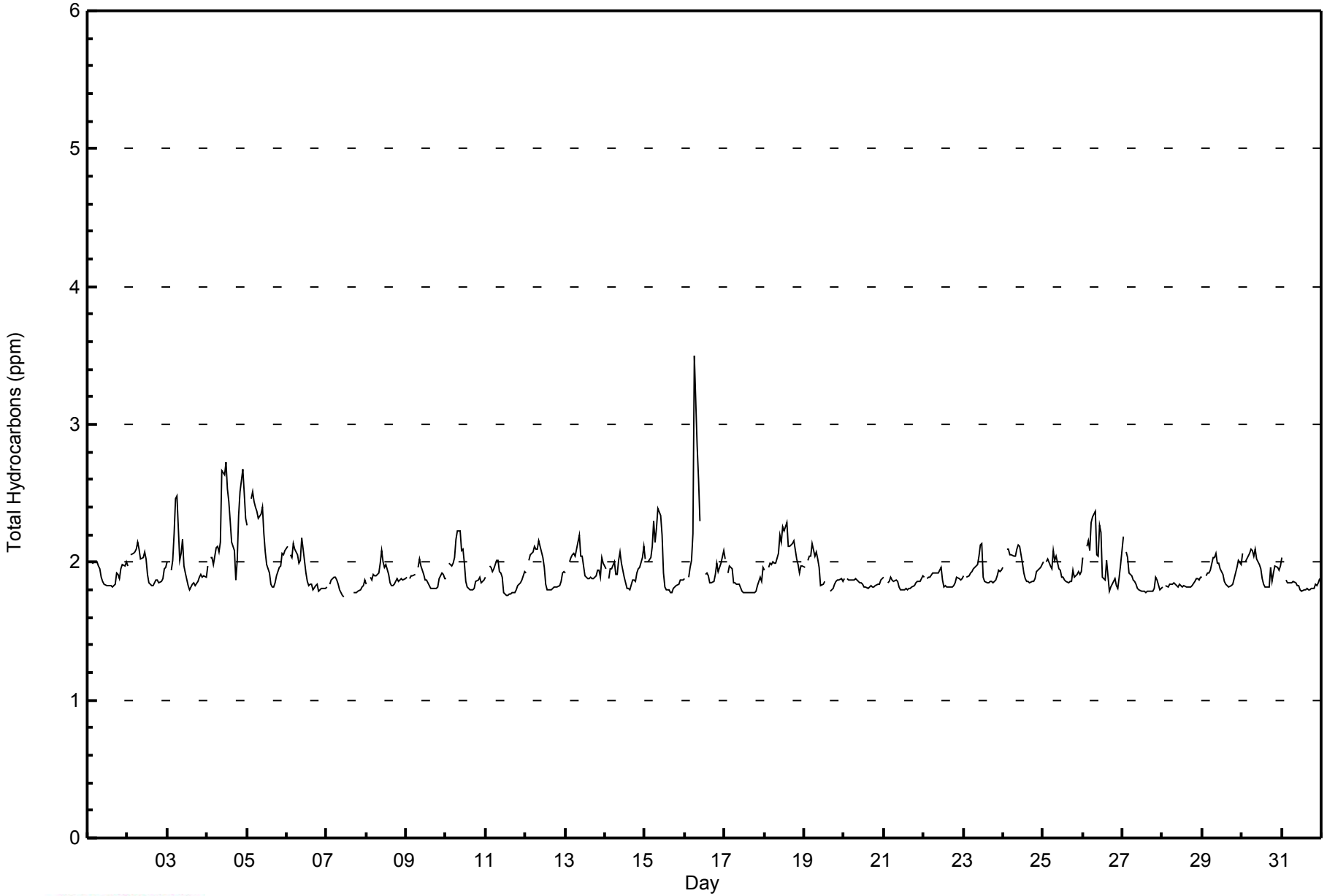
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - August 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	580	82.62	82.62
2.1 - 3.0	121	17.24	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - August 2014

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	31	5	6	10	15	13	49	74	52	43	27	43	57	64	40	579
2.1 - 3.0	6	3	1	3	3	2	4	18	15	25	6	2	6	13	11	3	121
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	34	6	9	13	17	17	67	89	77	49	29	49	71	75	43	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

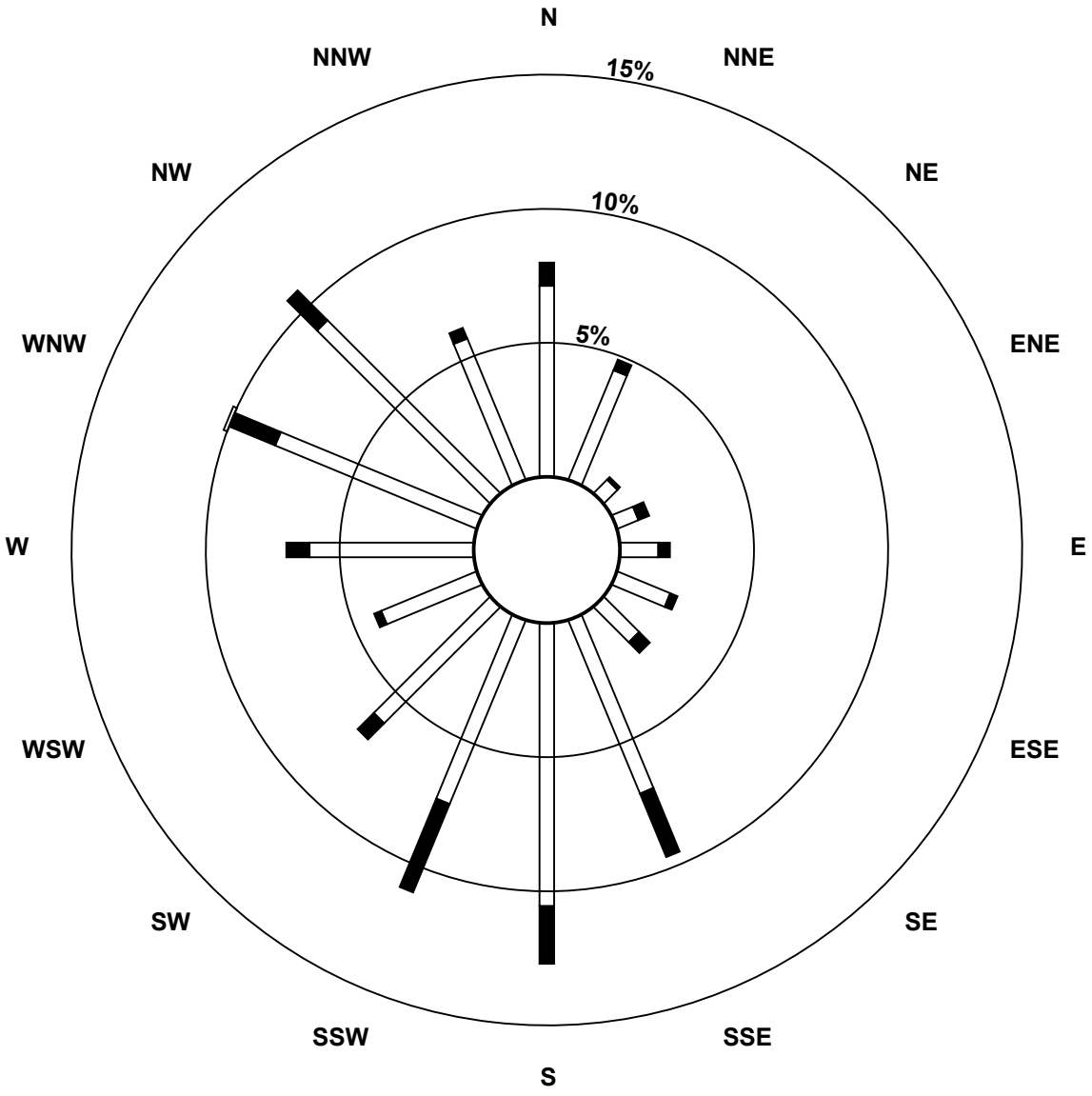
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

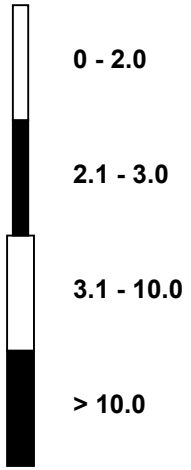
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)



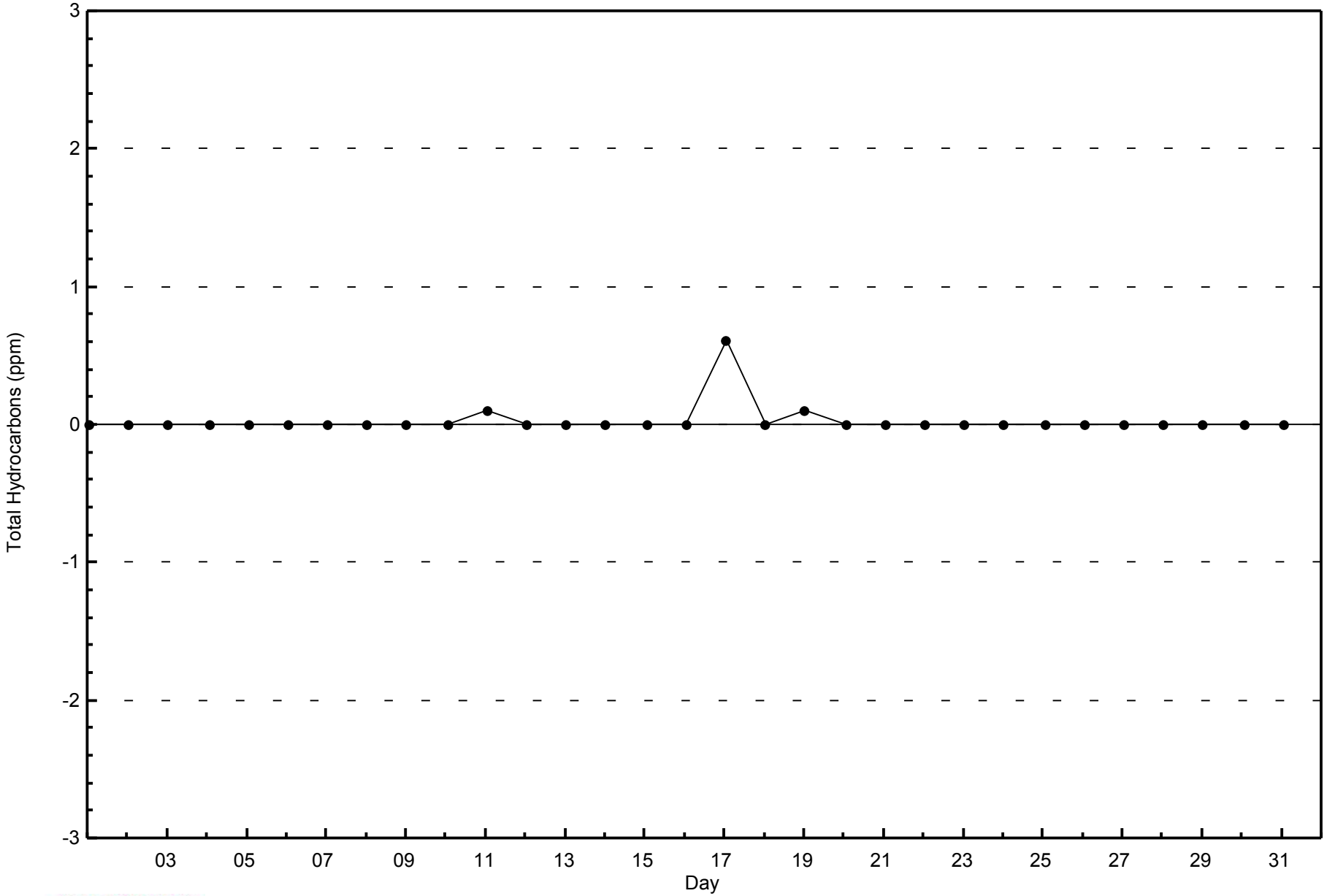
Total Number of Valid Hours: 701

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - August 2014



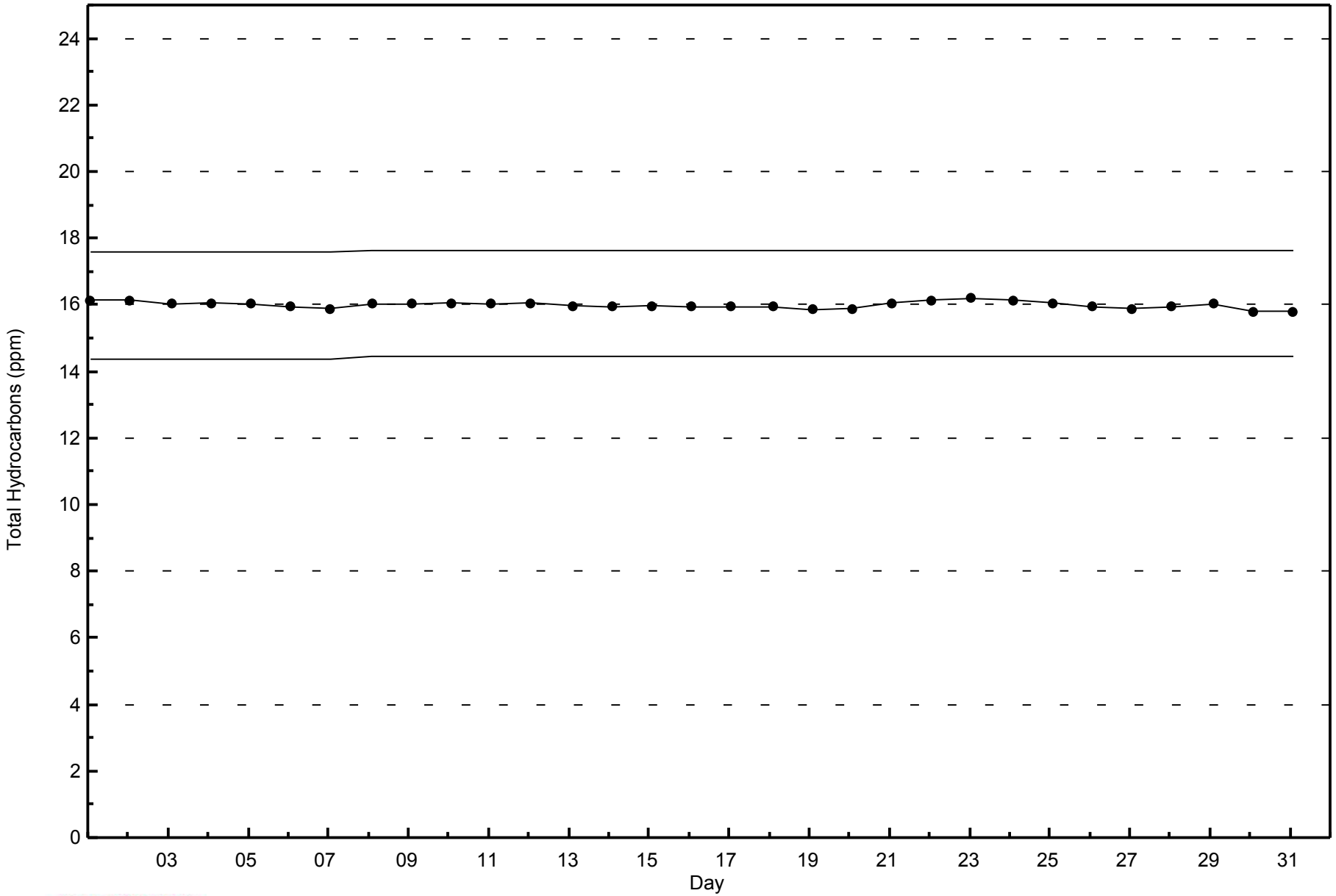
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 1.373 ppm on Aug 16 07:00

Maximum Daily Average: 0.163 ppm on Aug 4

Minimum Value: 0.000 ppm on Aug 1 01:00

Minimum Daily Average: 0.000 ppm on Aug 7

Maximum Diurnal Average: 0.047 ppm at hour 7

Minimum Diurnal Average: 0.002 ppm at hour 18

Monthly Average: 0.012 ppm

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

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	36
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-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.007	0.000	0.000	0.000	0.000	0.001	0.015
3-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.004	0.000	0.000	0.001	0.011
4-Aug	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.007	0.249	0.259	0.347	0.290	0.282	0.200	0.182	0.181	0.028	0.144	0.314	0.392	0.445	0.282	0.150	0.163	0.445
5-Aug	0.078	Z	0.137	0.129	0.073	0.037	0.044	0.048	0.010	0.034	0.018	0.031	0.022	0.015	0.000	0.000	0.000	0.016	0.049	0.103	0.042	0.014	0.005	0.000	0.039	0.137
6-Aug	0.000	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	0.000	0.001
7-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.091	0.158	0.064	0.048	0.082	0.038	0.006	0.000	0.000	0.007	0.022	0.000	0.000	0.000	0.000	0.000	0.022	0.158
9-Aug	0.000	Z	0.000	0.000	0.000	0.000	PF	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.008
10-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
11-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.013	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.017
12-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.009	0.000	0.030	0.003	0.002	0.030
14-Aug	0.000	Z	0.000	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	0.009	0.006	0.000	0.000	0.002	0.001	0.009
15-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.025
16-Aug	0.000	Z	0.000	0.000	0.000	0.150	1.373	0.787	0.534	0.254	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.085	0.010	0.008	0.003	0.000	0.154	1.373
17-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	PF	PF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
25-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.012
28-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.003	0.000	0.000	0.001	0.011
31-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.003	--	0.005	0.004	0.002	0.006	0.047	0.027	0.021	0.022	0.012	0.015	0.013	0.012	0.008	0.007	0.006	0.002	0.009	0.017	0.015	0.015	0.010	0.005	Diurnal Average	
	0.078	--	0.137	0.129	0.073	0.150	1.373	0.787	0.534	0.254	0.259	0.347	0.290	0.282	0.200	0.182	0.181	0.028	0.144	0.314	0.392	0.445	0.282	0.150	Diurnal Maximum	

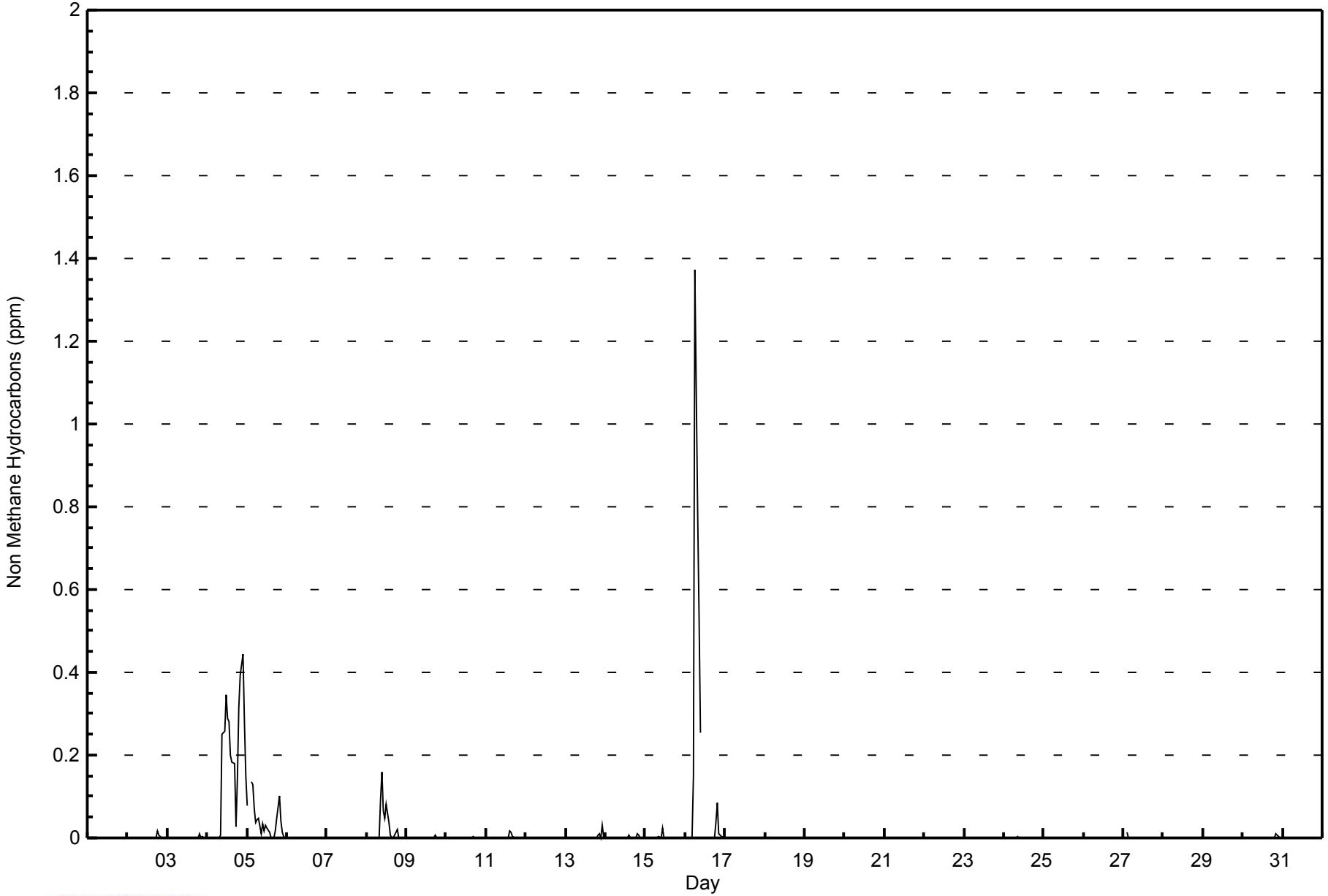
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	637	90.74	90.74
0.006 - 0.05	36	5.13	95.87
0.06 - 0.1	11	1.57	97.44
> 0.1	18	2.56	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - August 2014

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	52	29	5	7	7	12	15	62	85	74	43	27	47	64	66	41	636
0.006 - 0.05	0	2	1	1	3	2	0	4	4	3	5	2	1	0	7	1	36
0.06 - 0.1	0	1	0	0	1	2	1	0	0	0	1	0	1	3	1	0	11
> 0.1	4	2	0	1	2	1	1	1	0	0	0	0	0	4	1	1	18
Totals	56	34	6	9	13	17	17	67	89	77	49	29	49	71	75	43	701

Total Number of Valid Hours: 701

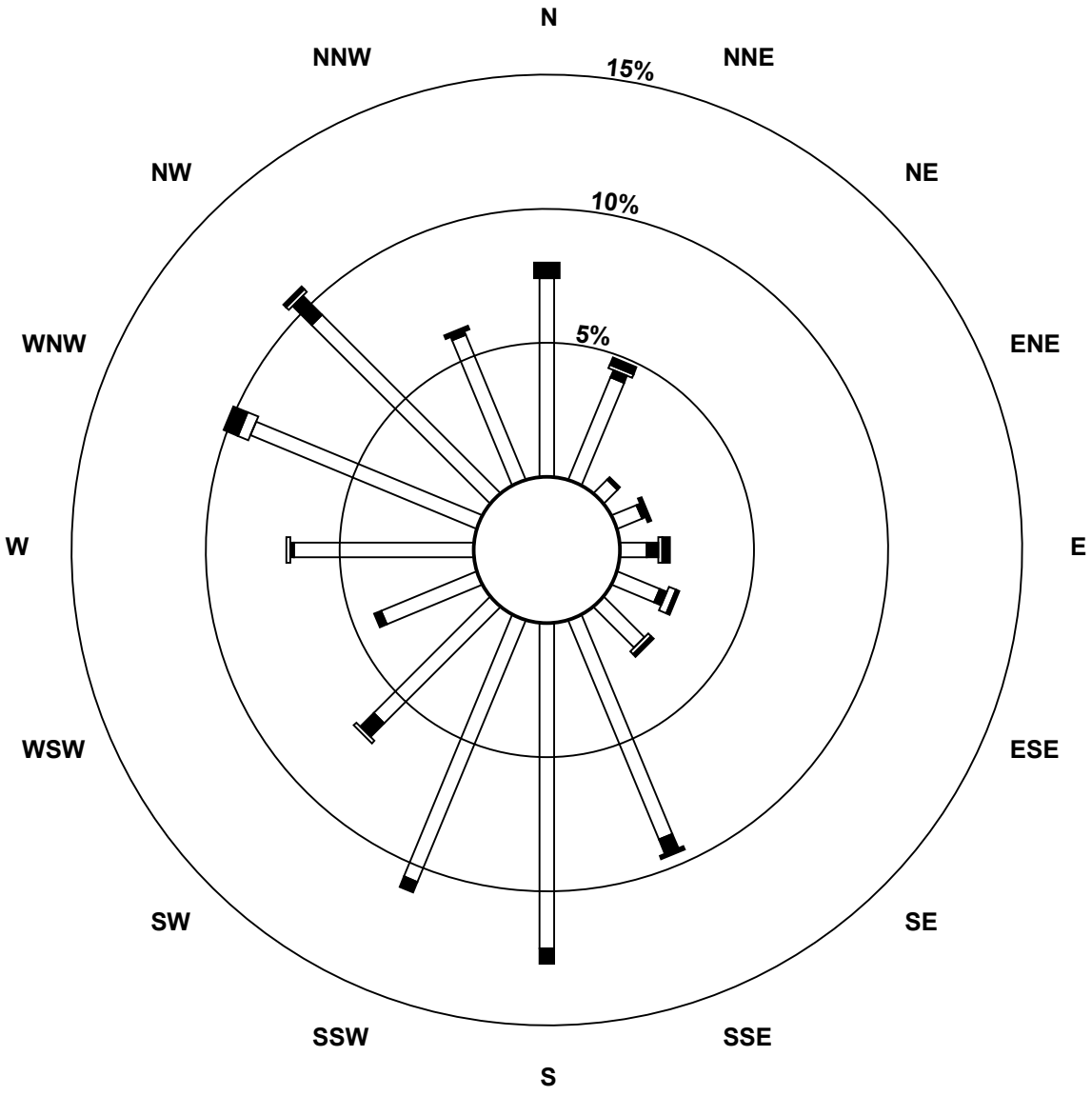
Total Number of Hours: 744

Wood Buffalo Environmental Association

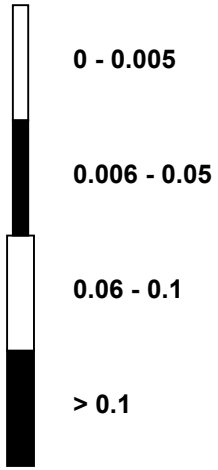
Wind Rose Aug 2014

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)



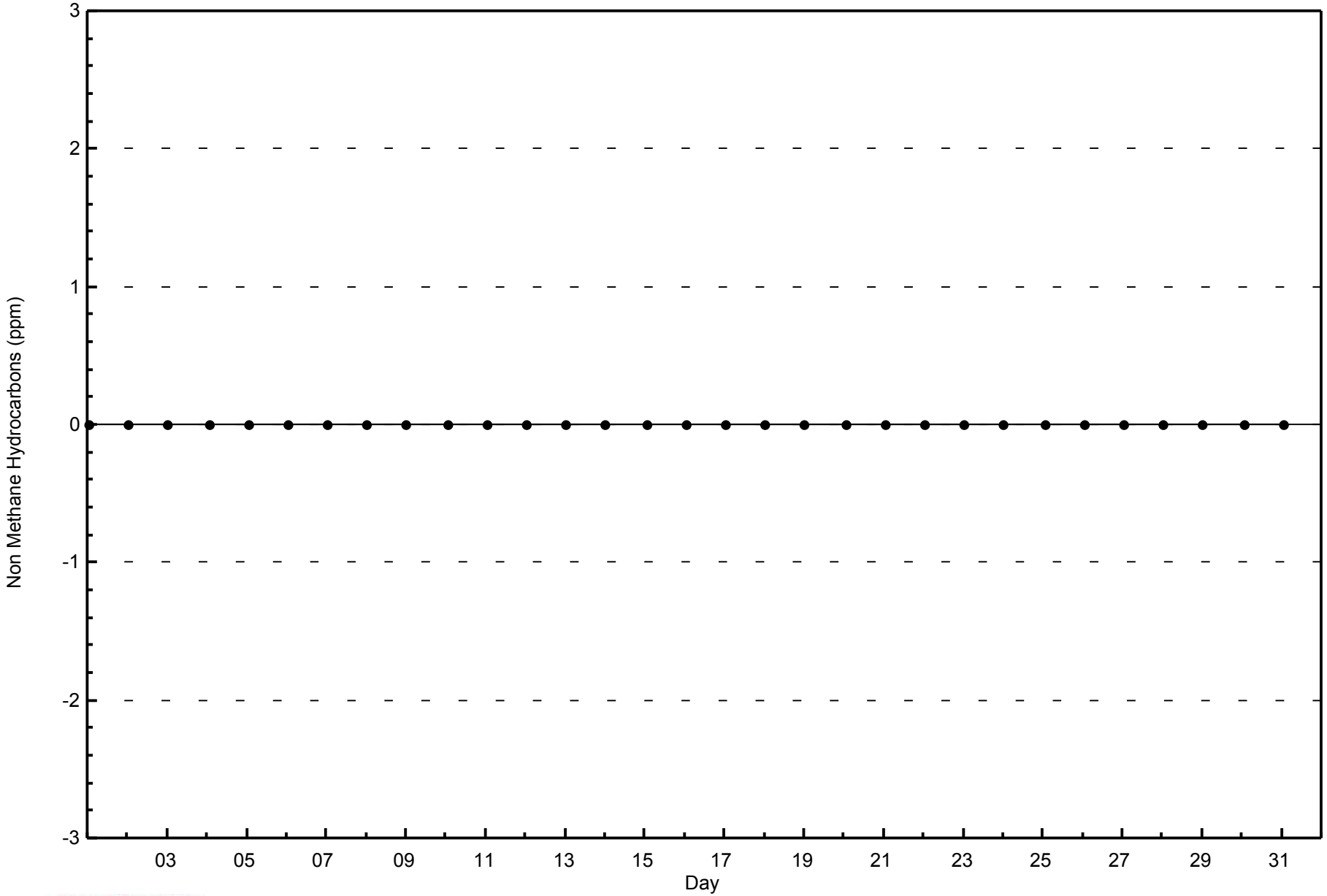
Total Number of Valid Hours: 701

WBEA NETWORK

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - August 2014



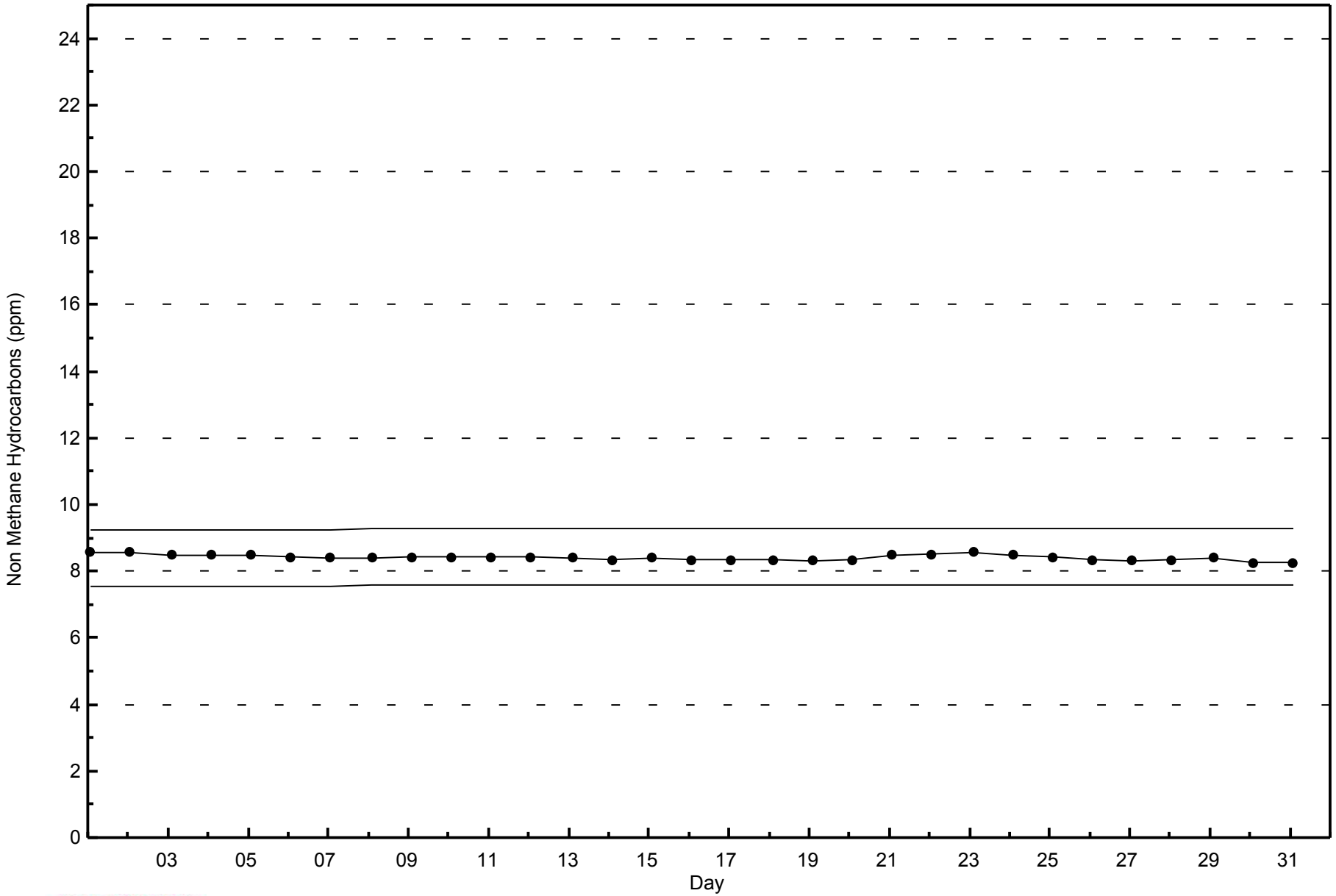
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.5 ppm on Aug 3 07:00 Maximum Daily Average: 2.1 ppm on Aug 4

Minimum Value: 1.8 ppm on Aug 7 11:00 Minimum Daily Average: 1.8 ppm on Aug 7
Maximum Diurnal Average: 2.0 ppm at hour 7 Minimum Diurnal Average: 1.8 ppm at hour 17
Monthly Average: 1.93 ppm Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	36
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-Aug	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0
2-Aug	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9	1.9	1.9	2.0	2.0	2.1
3-Aug	2.0	Z	1.9	2.0	2.2	2.5	2.5	2.0	2.1	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.5
4-Aug	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.4	2.4	2.4	2.2	2.2	2.1	2.0	1.9	1.8	1.9	2.0	2.1	2.2	2.2	2.2	2.1	2.4
5-Aug	2.2	Z	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.2	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.4
6-Aug	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.2	2.1	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	1.9	2.2
7-Aug	1.8	Z	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	C	C	C	C	C	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9
8-Aug	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	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
9-Aug	1.9	Z	1.9	1.9	1.9	1.9	PF	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0
10-Aug	1.9	Z	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.1	2.1	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9	1.9	1.9	2.2
11-Aug	1.9	Z	2.0	2.0	1.9	2.0	2.0	2.0	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	1.9	1.9	2.0
12-Aug	1.9	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.2
13-Aug	1.9	Z	2.0	2.0	2.1	2.1	2.0	2.1	2.2	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2
14-Aug	1.9	Z	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.0	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	1.9	2.1
15-Aug	2.0	Z	2.0	2.0	2.1	2.3	2.1	2.2	2.4	2.3	2.2	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.4
16-Aug	1.9	Z	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.0	M	M	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.1
17-Aug	2.0	Z	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	1.8	1.9	1.9	2.0	1.8	2.0
18-Aug	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.2	2.0	2.0	1.9	2.0	2.0	2.1	2.3
19-Aug	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	1.8	1.8	1.9	PF	PF	PF	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.1
20-Aug	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	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	1.9	1.9	1.8	1.9
21-Aug	1.9	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	1.9	1.9	1.9	1.9	1.9	1.8	1.9
22-Aug	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0
23-Aug	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	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	2.1
24-Aug	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
25-Aug	2.0	Z	2.0	2.0	2.0	2.0	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	1.9	2.1
26-Aug	2.0	Z	2.1	2.2	2.1	2.3	2.3	2.4	2.1	2.0	2.3	2.2	1.9	1.9	2.0	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.9	2.0	2.0	2.4
27-Aug	2.2	Z	2.1	2.0	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	1.9	1.9	1.8	1.8	1.9	2.2
28-Aug	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	1.9	1.9	1.9	1.9	1.9	1.8	1.9
29-Aug	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	1.9	2.1
30-Aug	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	2.0	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.1
31-Aug	2.0	Z	1.9	1.9	1.8	1.8	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	1.9	1.9	1.8	2.0
	2.0	--	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.2	--	2.3	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.2	2.3	2.1	2.1	2.1	2.1	2.2	2.0	2.1	2.2	2.2	2.2	Diurnal Maximum	

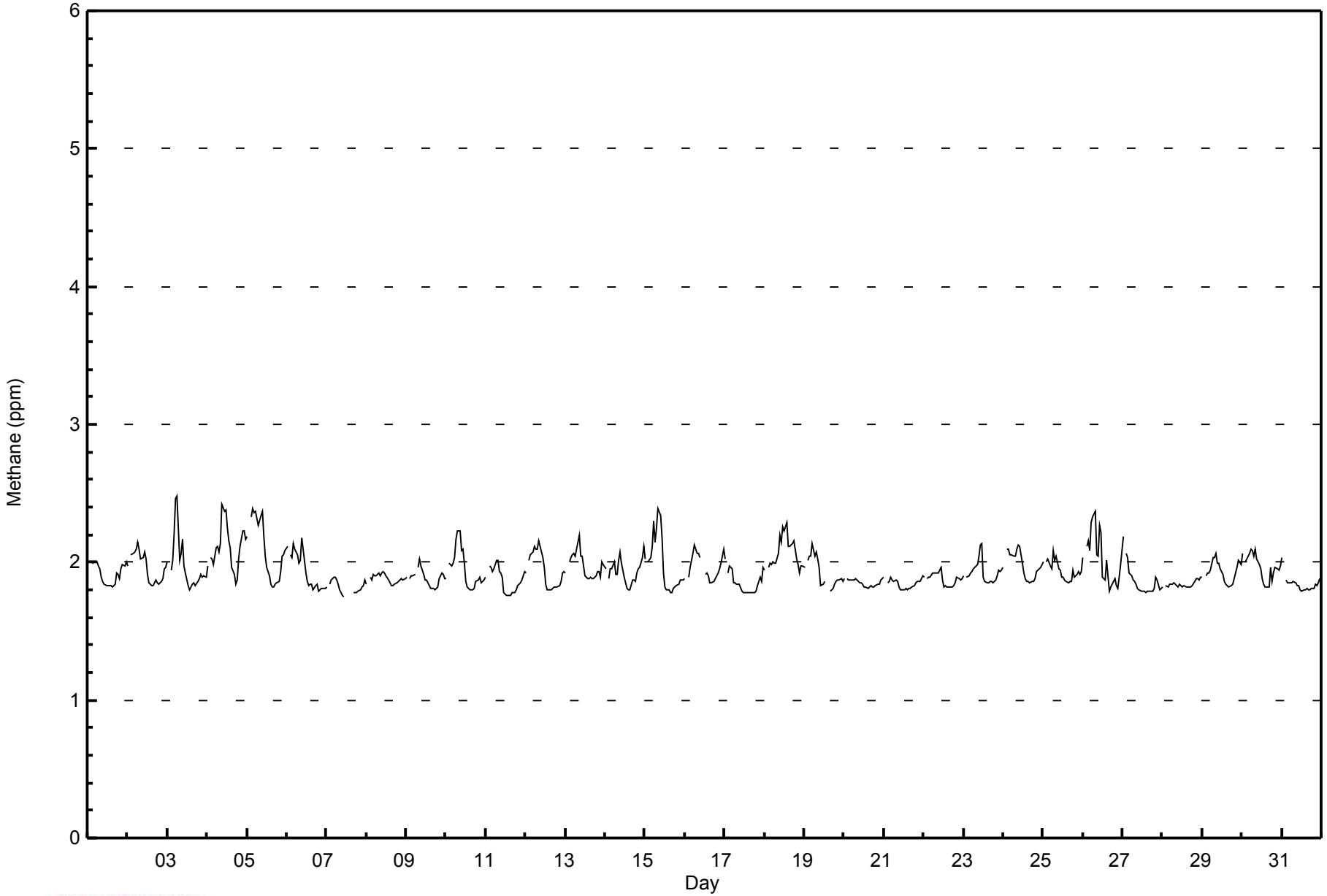
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	587	83.62	83.62
2.1 - 3.0	115	16.38	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

Methane (CH_4) - ppm
Fort McKay - Bertha Ganter - August 2014

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	32	5	7	11	16	13	50	75	53	43	27	43	57	64	40	586
2.1 - 3.0	6	2	1	2	2	1	4	17	14	24	6	2	6	14	11	3	115
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	56	34	6	9	13	17	17	67	89	77	49	29	49	71	75	43	701

Total Number of Valid Hours: 701

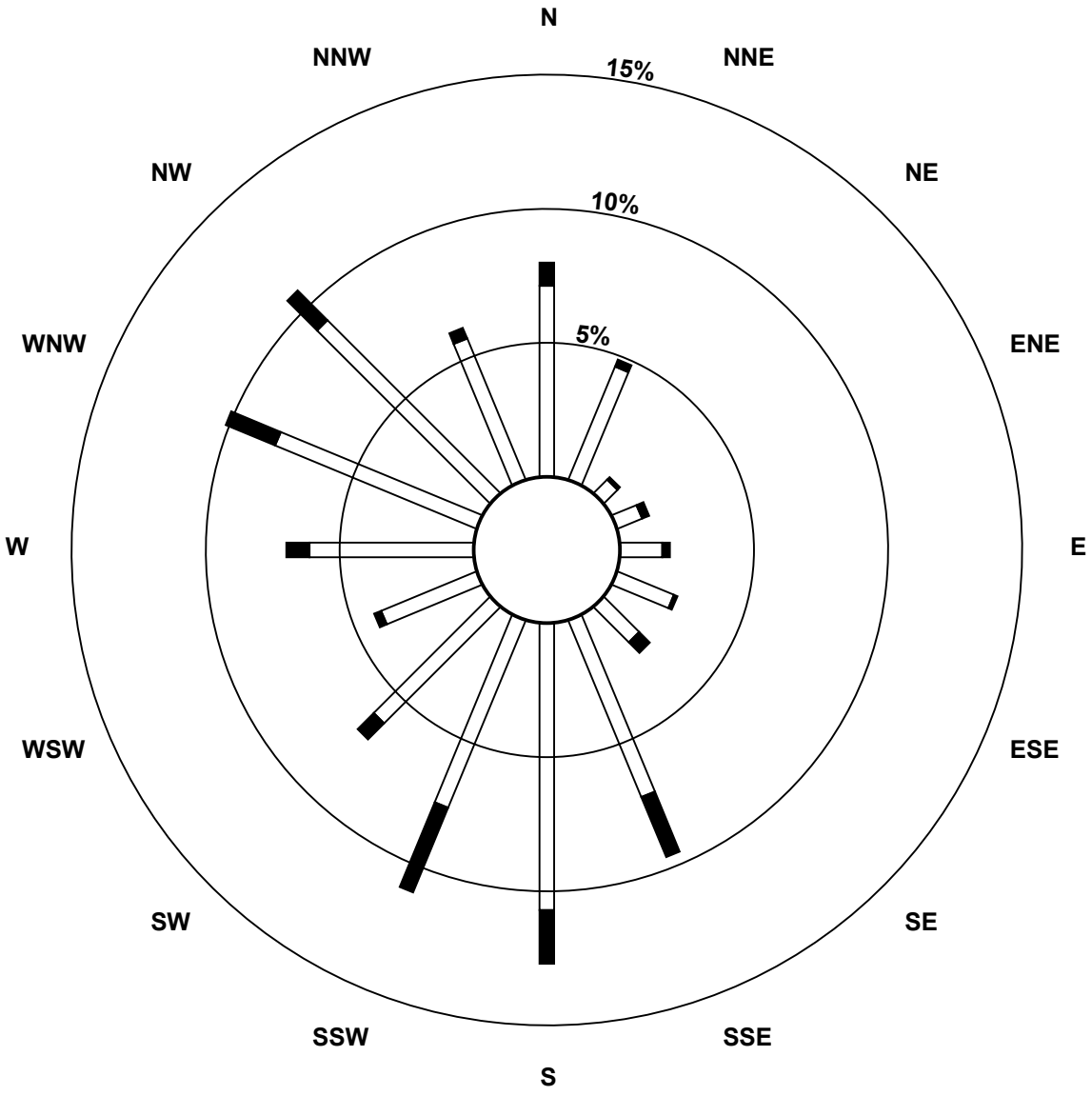
Total Number of Hours: 744

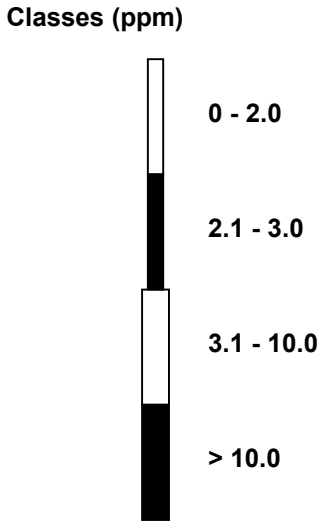
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter (AMS 1)





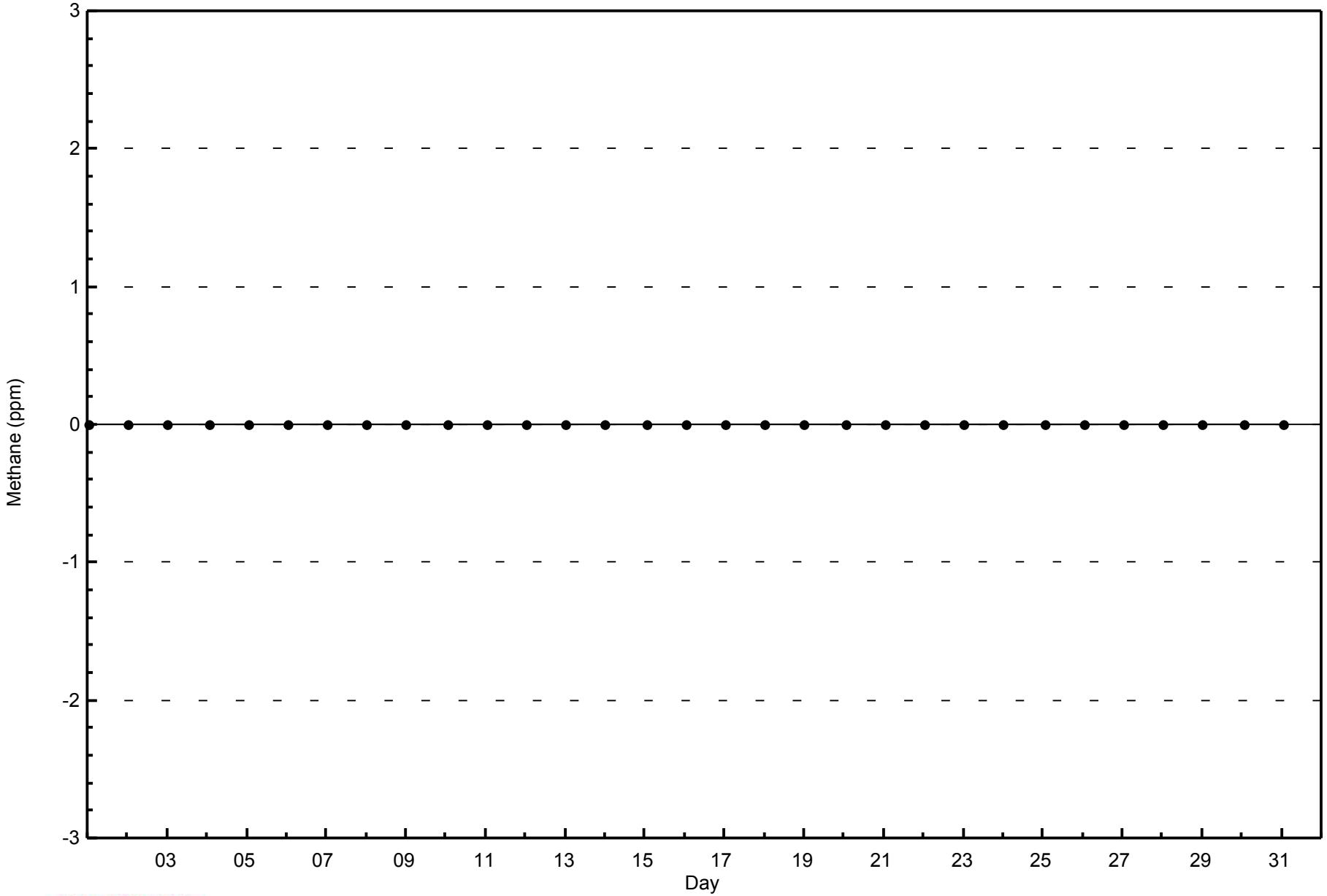
Total Number of Valid Hours: 701

WBEA NETWORK

Zero Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - August 2014



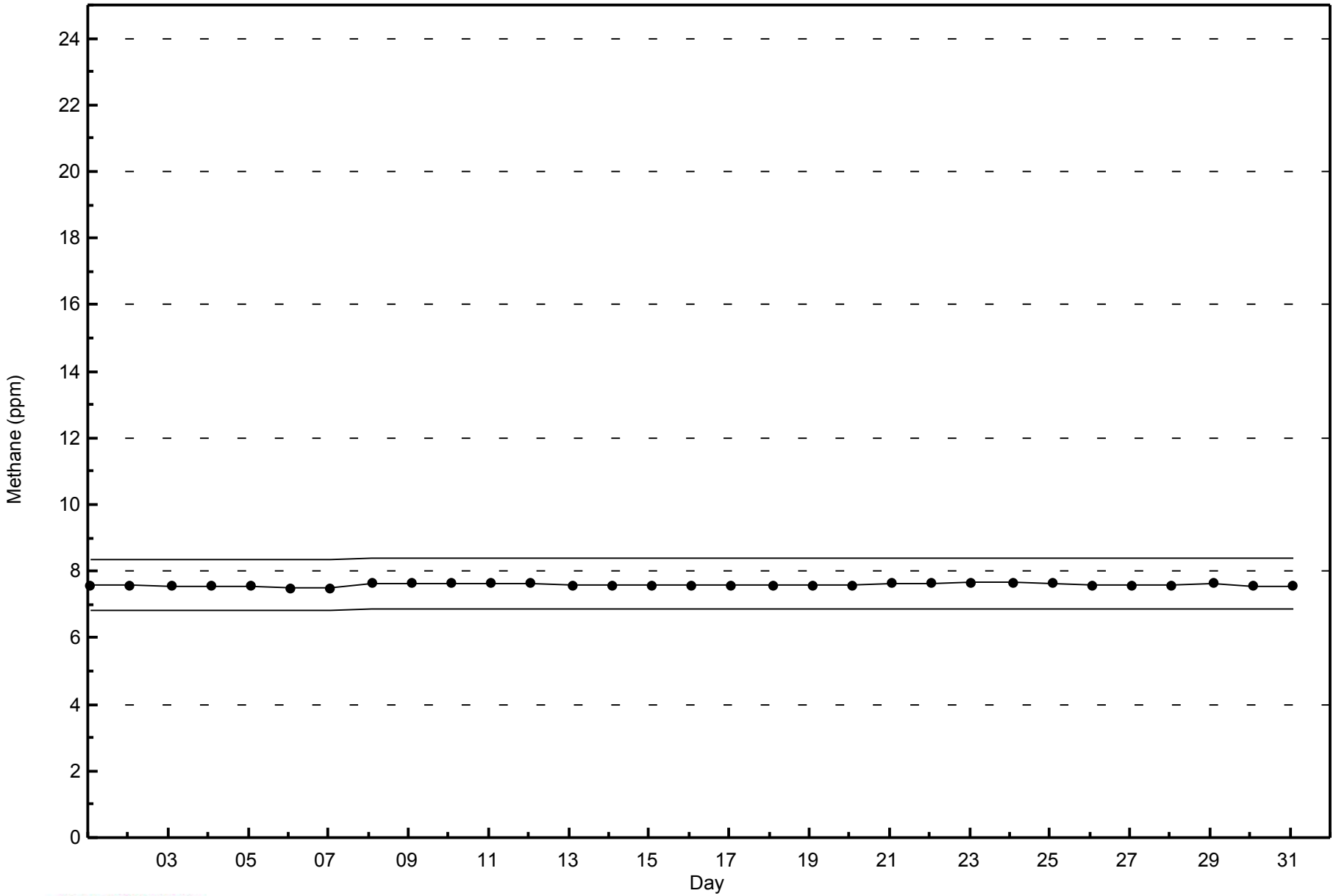
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Summary of Hour Averages

Fort McKay - Bertha Ganter - August 2014

Maximum Value: 38 ppb on Aug 3 07:00

Maximum Daily Average: 4.9 ppb on Aug 24

Minimum Value: 0 ppb on Aug 17 14:00

Minimum Daily Average: 0.1 ppb on Aug 7

Maximum Diurnal Average: 5.3 ppb at hour 9

Minimum Diurnal Average: 0.1 ppb at hour 21

Monthly Average: 1.4 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:	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-Aug	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
2-Aug	0	Z	0	0	1	5	11	6	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1.5	11
3-Aug	0	Z	0	0	14	26	38	3	8	2	1	1	0	0	0	0	1	0	0	0	0	0	0	0	4.2	38
4-Aug	0	Z	0	0	0	1	3	3	2	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	8
5-Aug	0	Z	1	1	1	1	2	3	4	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.9	4
6-Aug	0	Z	0	0	0	0	1	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	--	1
7-Aug	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
8-Aug	0	Z	0	0	0	0	0	4	4	6	6	4	3	3	1	0	0	0	0	0	0	0	0	0	1.5	6
9-Aug	0	Z	0	0	0	0	0	1	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	3
10-Aug	0	Z	0	0	1	1	15	30	28	18	8	4	0	0	0	0	0	0	1	0	0	0	0	0	4.6	30
11-Aug	0	Z	0	0	0	0	4	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	4
12-Aug	0	Z	0	0	0	2	5	11	22	13	10	3	1	1	1	1	0	0	0	0	0	0	0	0	3.1	22
13-Aug	0	Z	0	0	0	1	4	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	5
14-Aug	0	Z	0	0	0	1	0	1	6	9	5	2	0	0	0	0	0	0	0	0	0	0	1	2	1.3	9
15-Aug	0	Z	0	0	8	18	9	14	19	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3.5	19
16-Aug	0	Z	0	0	0	1	2	2	7	6	3	1	1	1	1	0	0	0	0	0	0	0	0	0	1.2	7
17-Aug	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
18-Aug	0	Z	0	0	0	0	0	0	2	14	8	7	4	1	0	0	0	0	0	0	0	0	0	0	1.7	14
19-Aug	0	Z	0	0	0	4	1	2	1	2	1	1	2	PF	PF	PF	1	1	1	1	0	0	0	0	0.9	4
20-Aug	0	Z	0	0	0	0	0	1	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0.3	1
21-Aug	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Aug	0	Z	0	0	0	0	0	1	2	4	9	3	1	1	0	0	0	0	0	0	0	0	0	0	1.0	9
23-Aug	0	Z	0	0	0	0	1	4	11	17	9	8	1	1	1	0	1	0	0	0	0	0	0	0	2.4	17
24-Aug	0	Z	4	7	4	4	5	11	17	18	19	10	6	2	1	1	0	0	0	0	0	0	0	1	4.9	19
25-Aug	0	Z	0	0	0	1	2	2	3	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	1.1	7
26-Aug	0	Z	0	0	0	1	10	18	2	4	6	3	0	1	1	1	0	0	0	0	0	0	0	0	2.1	18
27-Aug	11	Z	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	11
28-Aug	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
29-Aug	0	Z	1	1	1	1	12	13	7	5	5	5	3	1	1	0	0	0	0	0	0	0	0	0	2.4	13
30-Aug	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-Aug	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	--	0.4	0.4	1.1	2.3	4.1	4.6	5.3	5.2	3.6	2.0	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	Diurnal Average	
	11	--	4	7	14	26	38	30	28	18	19	10	6	3	1	1	1	1	1	1	0	0	1	2	Diurnal Maximum	

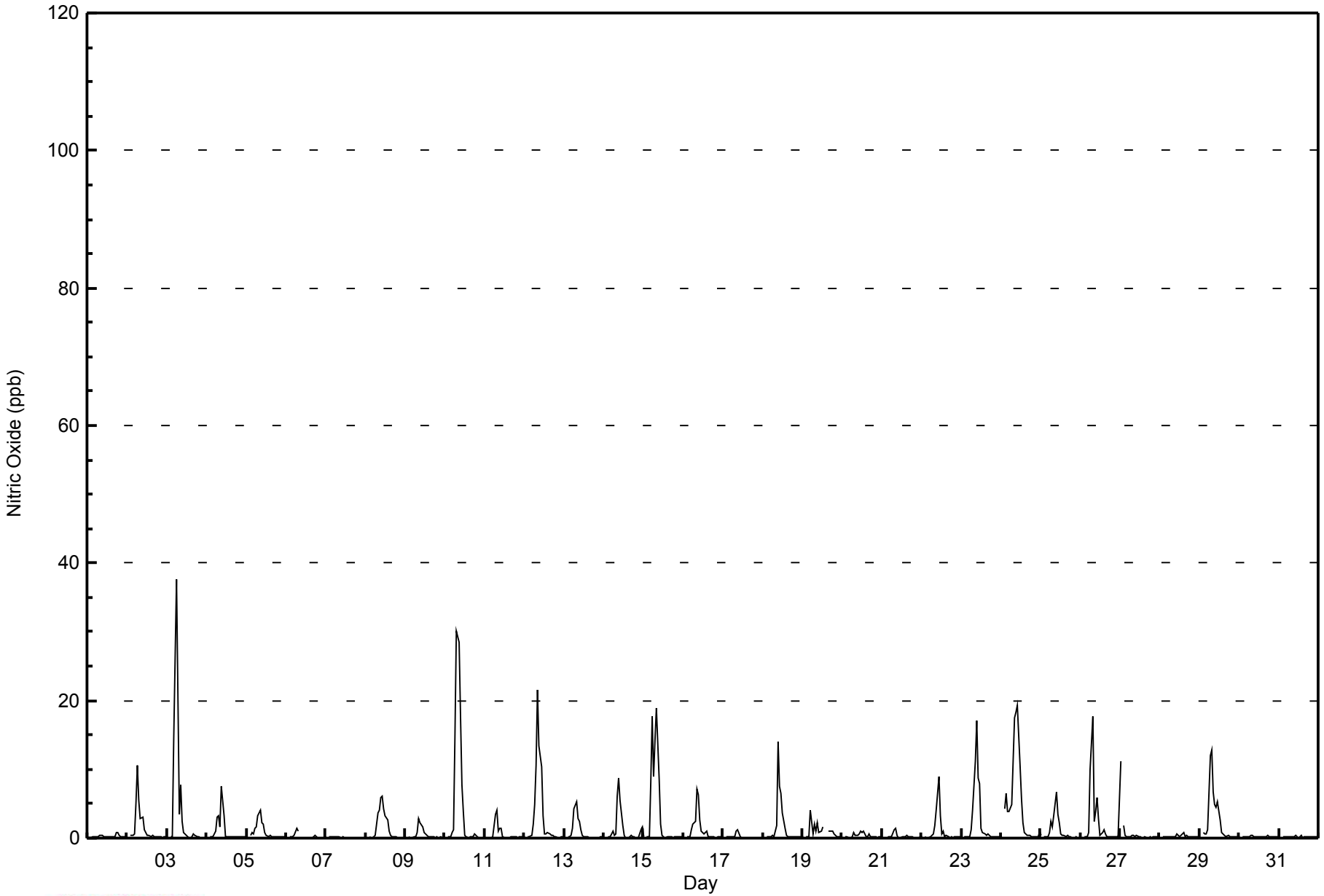
Z - zerospan C - Calibration PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	699	99.29	99.29
21 - 40	5	0.71	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

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	56	34	6	9	14	17	17	63	86	76	47	29	50	75	76	43	698
21 - 40	0	0	0	0	0	0	0	2	1	1	1	0	0	0	0	0	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	34	6	9	14	17	17	65	87	77	48	29	50	75	76	43	703

Total Number of Valid Hours: 703

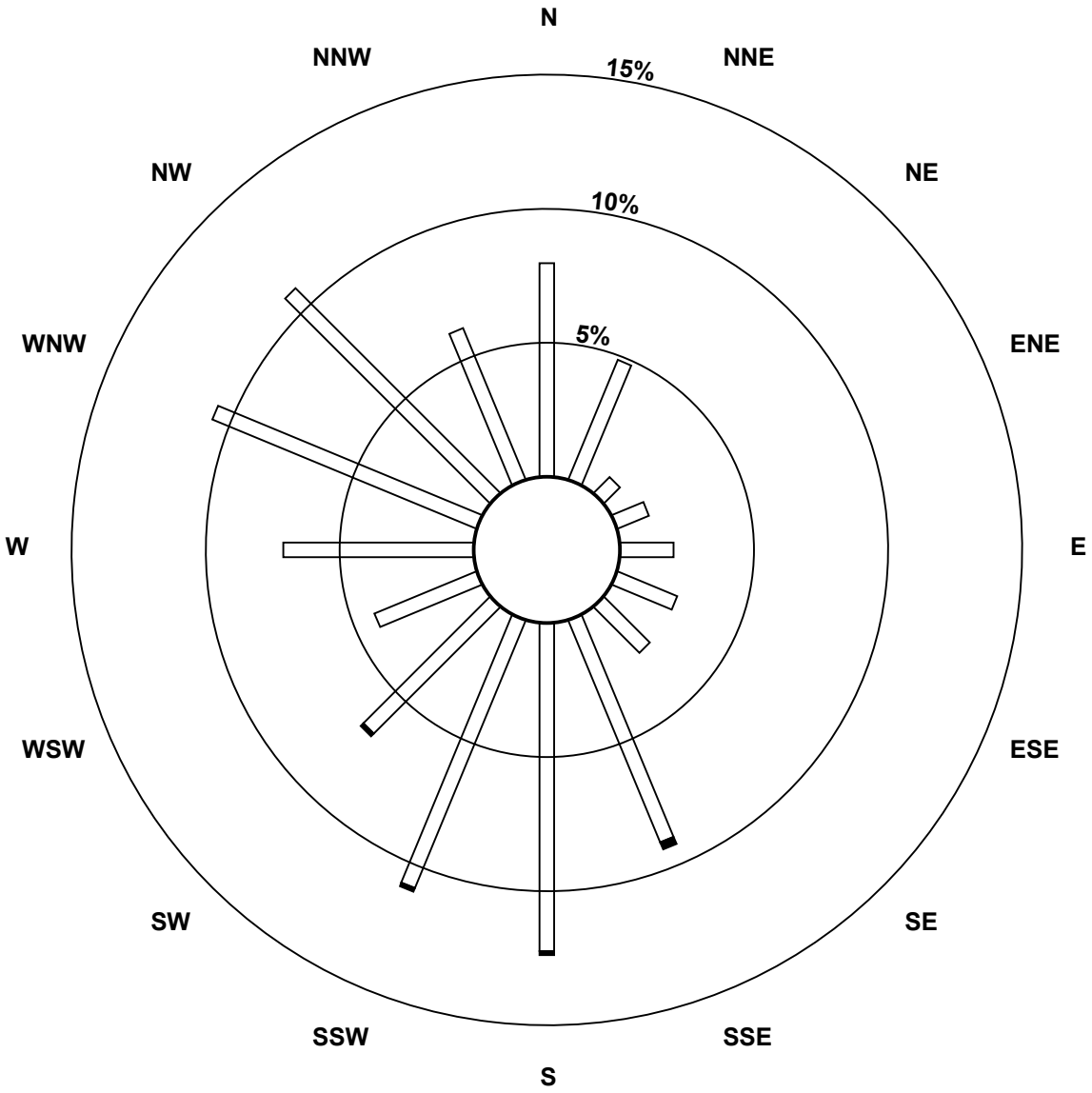
Total Number of Hours: 744

Wood Buffalo Environmental Association

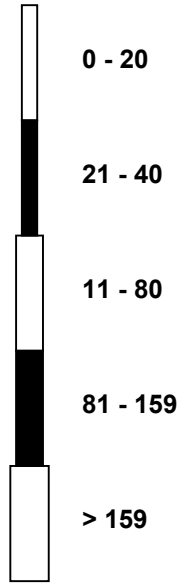
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



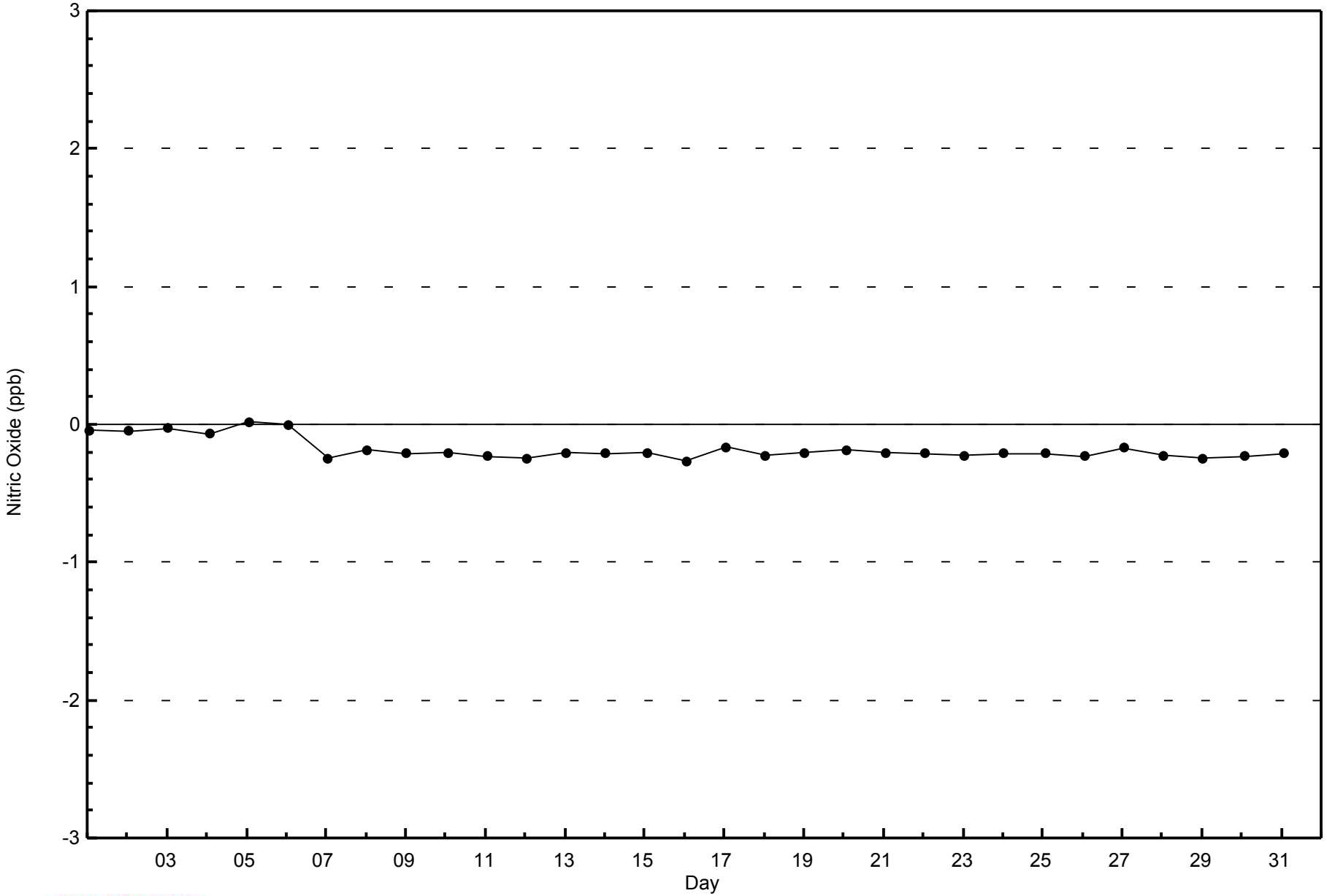
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - August 2014



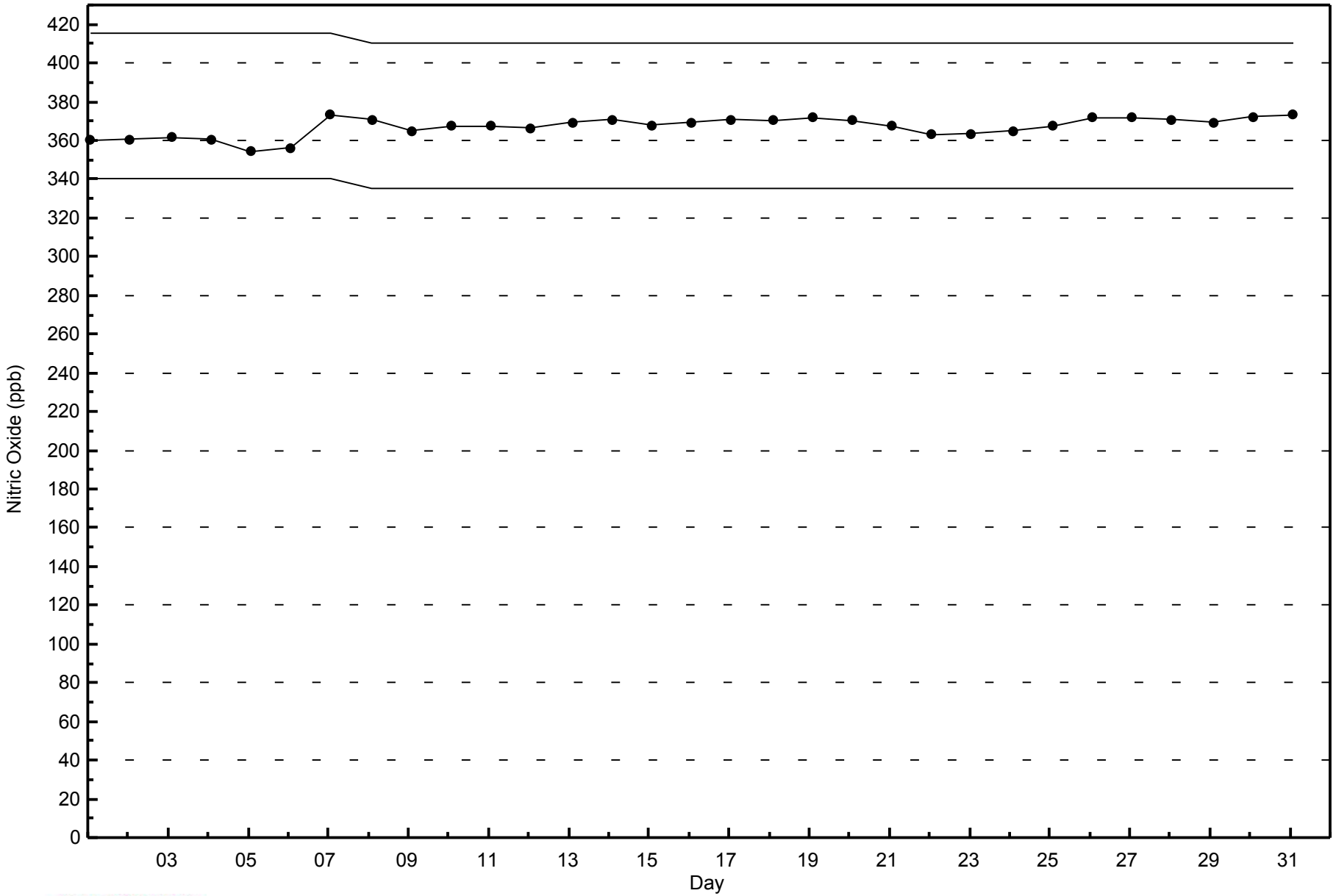
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 33 ppb on Aug 4 11:00 Maximum Daily Average: 7.8 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 12:00 Minimum Daily Average: 0.4 ppb on Aug 7
Maximum Diurnal Average: 8.4 ppb at hour 10 Minimum Diurnal Average: 2.1 ppb at hour 16
Monthly Average: 4.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 3 $Q_3 = 6$ $P_{90} = 9$ $P_{99} = 18$

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-Aug	1	Z	2	2	1	1	1	1	1	1	1	0	0	1	0	0	1	5	7	5	4	4	4	3	2.0	7
2-Aug	2	Z	4	3	3	6	7	5	6	6	4	4	3	1	1	1	1	2	4	4	3	2	2	3	3.3	7
3-Aug	3	Z	1	2	10	14	18	5	11	8	5	6	3	1	2	3	7	5	2	3	2	2	3	1	5.0	18
4-Aug	2	Z	2	1	1	2	4	5	6	32	33	16	10	10	10	7	6	2	2	4	5	8	7	4	7.7	33
5-Aug	4	Z	8	7	5	3	3	9	13	12	16	10	7	4	4	3	3	4	4	3	5	6	5	8	6.4	16
6-Aug	7	Z	4	3	2	4	5	6	C	C	C	C	C	C	1	1	1	5	4	1	1	1	0	0	--	7
7-Aug	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0.4	3
8-Aug	1	Z	1	1	1	1	1	5	6	9	10	9	9	9	6	4	3	3	4	3	1	2	1	1	3.9	10
9-Aug	3	Z	4	3	2	3	1	3	5	3	2	2	2	2	1	1	1	1	1	1	1	2	1	1	1.9	5
10-Aug	1	Z	1	1	1	1	5	8	10	9	8	7	2	1	1	1	1	2	4	3	3	1	1	1	3.2	10
11-Aug	1	Z	2	2	1	1	7	6	2	3	4	1	0	0	0	0	1	1	1	3	2	7	5	4	2.3	7
12-Aug	3	Z	6	5	5	4	5	8	17	21	21	12	4	4	5	4	3	3	3	3	4	4	8	10	7.0	21
13-Aug	10	Z	8	7	6	5	7	10	10	9	7	4	2	2	2	2	1	1	1	2	2	2	8	6	5.0	10
14-Aug	2	Z	3	7	7	8	3	3	13	18	17	10	5	2	1	1	6	7	5	5	6	4	14	12	6.9	18
15-Aug	5	Z	3	3	9	7	6	12	18	18	12	5	2	1	2	1	1	1	1	3	6	7	6	3	5.7	18
16-Aug	3	Z	1	3	5	7	13	11	18	17	10	7	6	7	7	3	2	2	2	2	2	2	3	3	5.9	18
17-Aug	2	Z	1	2	2	1	1	1	4	5	2	1	0	0	0	1	1	0	1	1	1	1	2	3	1.4	5
18-Aug	3	Z	2	2	3	2	2	1	6	16	12	14	13	10	6	5	7	8	5	6	9	2	2	1	6.0	16
19-Aug	1	Z	3	3	2	6	3	4	2	4	2	4	6	PF	PF	PF	3	4	6	5	3	3	4	2	3.5	6
20-Aug	3	Z	2	2	1	1	2	4	2	1	2	2	2	1	1	1	3	2	2	1	1	1	2	2	1.7	4
21-Aug	2	Z	1	0	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	1.3	7
22-Aug	3	Z	1	1	1	1	1	1	2	5	9	5	2	3	1	2	1	1	2	1	2	2	1	2	2.1	9
23-Aug	1	Z	1	1	1	2	2	4	8	13	12	12	5	5	4	3	5	3	3	3	4	8	8	8	5.0	13
24-Aug	6	Z	9	9	10	10	8	11	12	13	17	14	11	6	4	4	3	4	2	3	4	4	5	12	7.8	17
25-Aug	11	Z	5	4	5	8	10	7	7	9	7	6	3	3	2	2	2	3	3	3	3	9	4	4	5.0	11
26-Aug	4	Z	5	8	11	14	20	18	6	9	13	10	2	4	7	4	2	2	3	4	3	1	5	8	7.0	20
27-Aug	14	Z	6	4	2	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	4	3	1	1	2.0	14
28-Aug	1	Z	1	0	1	1	1	1	0	1	2	2	1	2	1	1	1	2	1	2	2	2	2	3	1.2	3
29-Aug	2	Z	1	1	1	2	6	7	7	6	7	9	6	3	2	2	2	3	4	7	9	11	15	11	5.4	15
30-Aug	14	Z	7	6	7	6	6	5	5	2	1	1	1	1	1	1	1	2	3	6	7	4	2	3	4.0	14
31-Aug	5	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	5
	3.8	--	3.0	3.0	3.4	4.1	4.8	5.3	6.7	8.4	7.9	5.8	3.6	2.9	2.5	2.1	2.3	2.6	2.7	2.8	3.2	3.4	4.0	4.2	Diurnal Average	
	14	--	9	9	11	14	20	18	18	32	33	16	13	10	10	7	7	8	7	7	9	11	15	12	Diurnal Maximum	

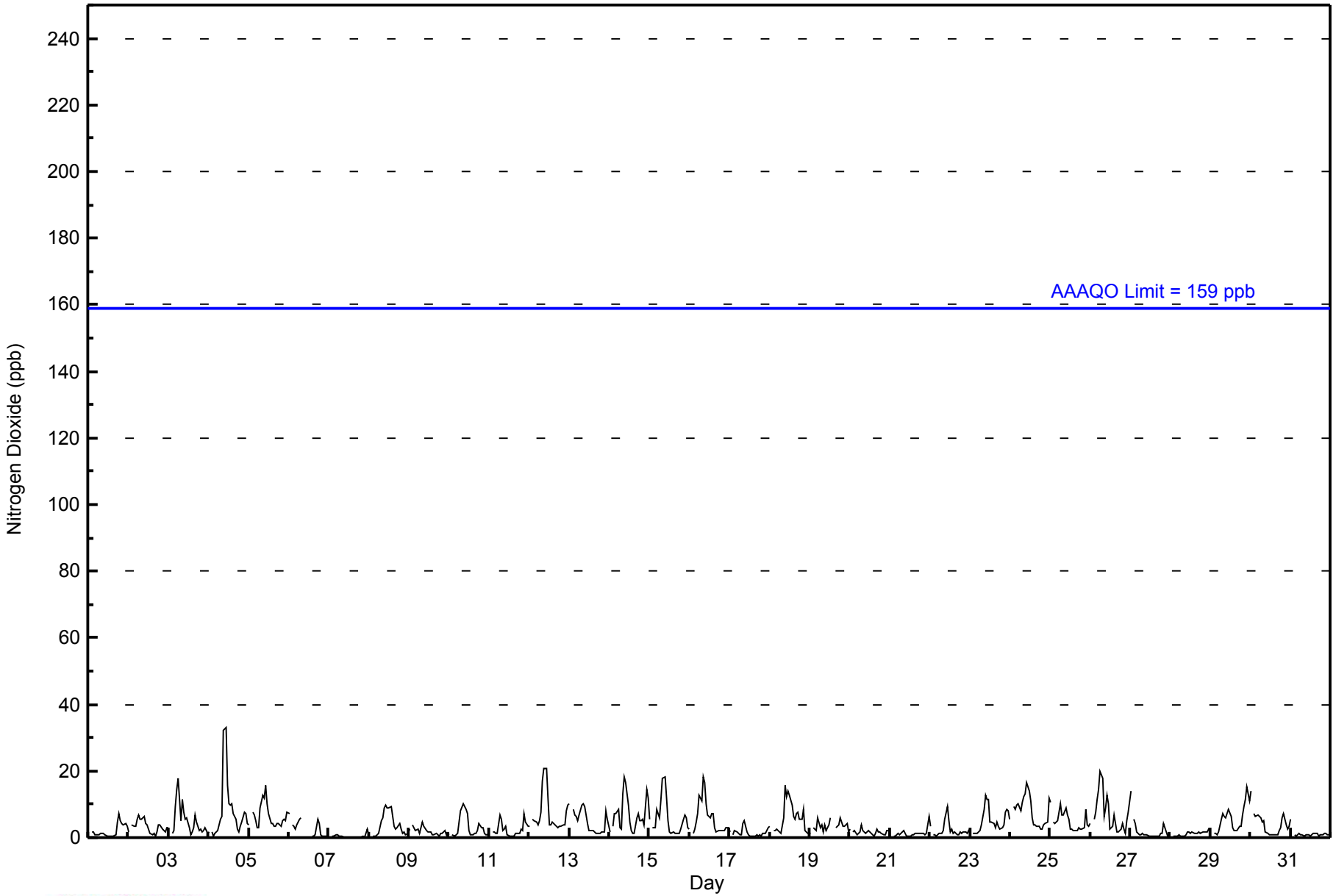
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	99.43	99.43
21 - 40	4	0.57	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	55	33	6	9	14	17	17	64	86	77	48	29	50	75	76	43	699
21 - 40	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	34	6	9	14	17	17	65	87	77	48	29	50	75	76	43	703

Total Number of Valid Hours: 703

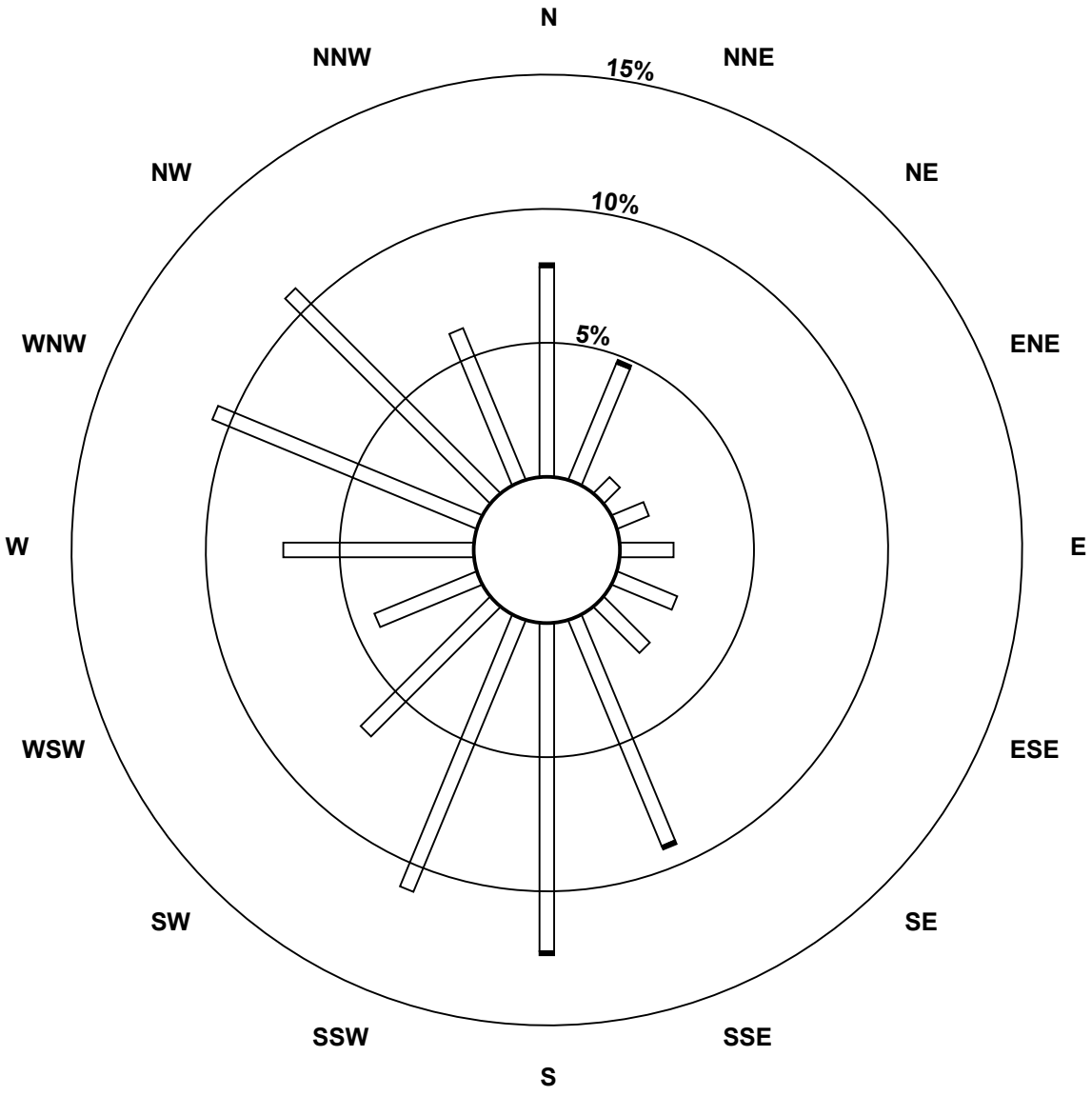
Total Number of Hours: 744

Wood Buffalo Environmental Association

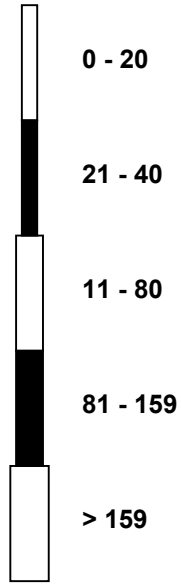
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



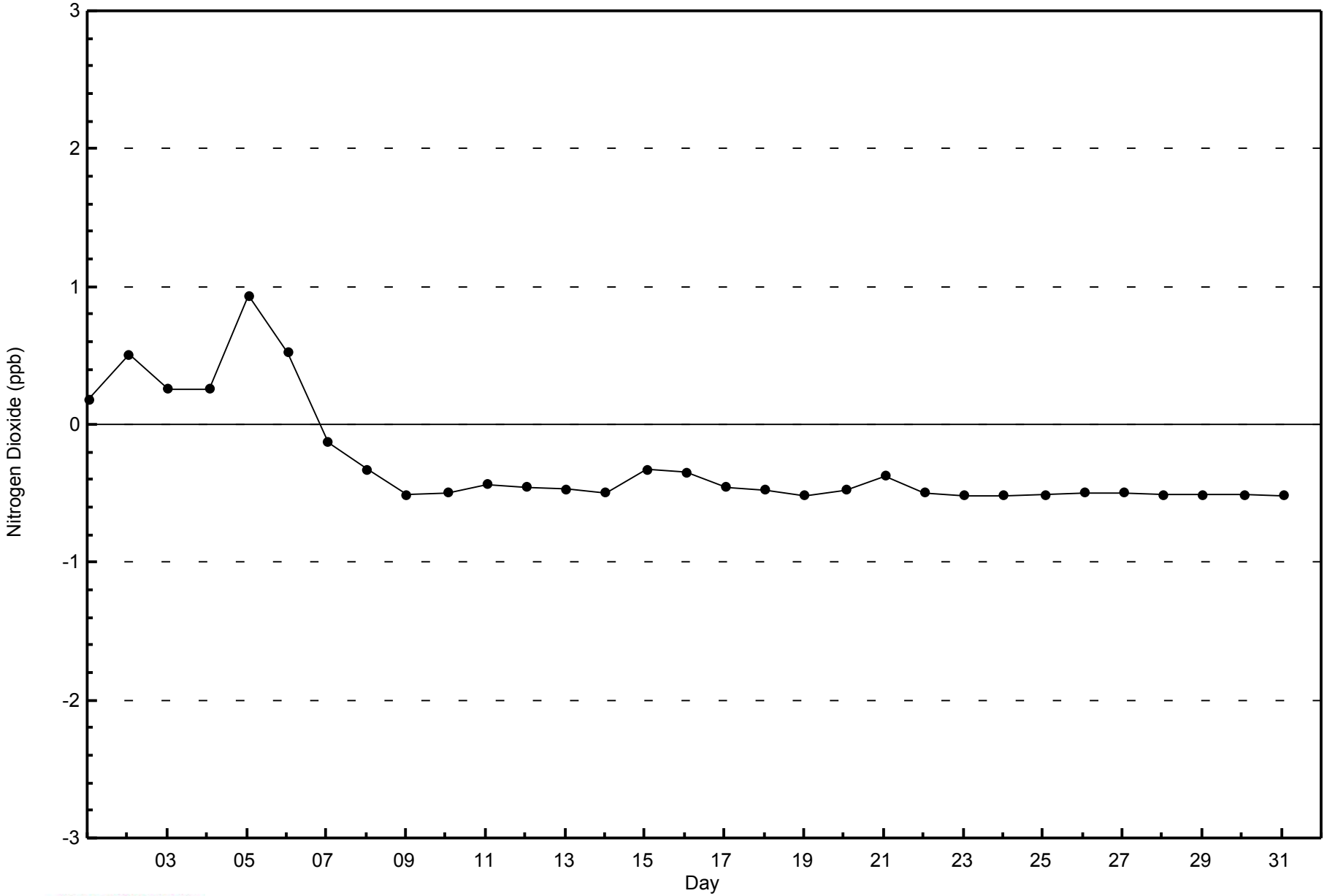
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - August 2014



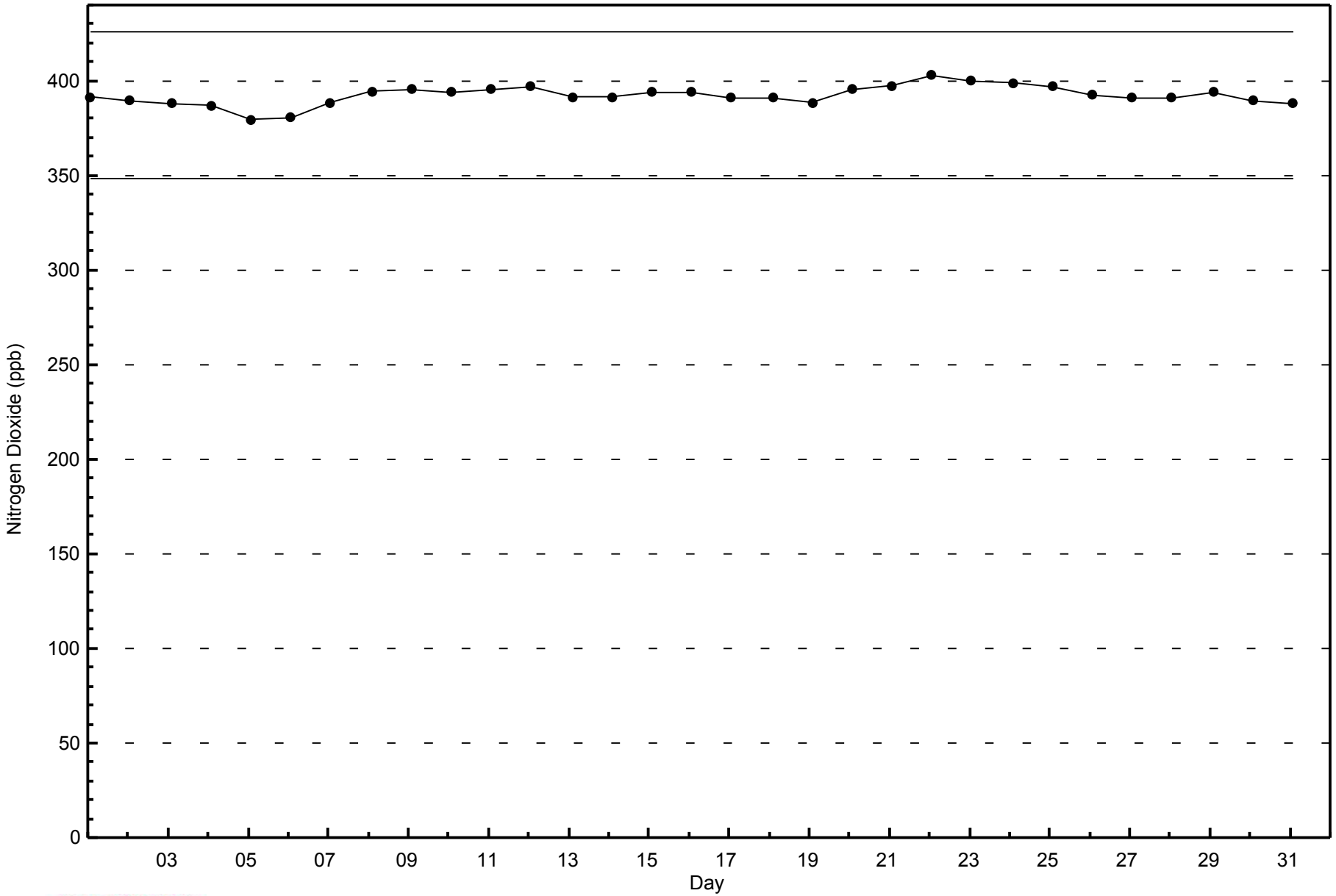
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - August 2014

Maximum Value: 55 ppb on Aug 3 07:00

Maximum Daily Average: 12.7 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 18:00

Minimum Daily Average: 0.5 ppb on Aug 7

Maximum Diurnal Average: 13.6 ppb at hour 10

Minimum Diurnal Average: 2.3 ppb at hour 16

Monthly Average: 5.4 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 3 $Q_3 = 7$ $P_{90} = 13$ $P_{99} = 36$

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-Aug	1	Z	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	6	8	6	5	4	5	4	2.3	8
2-Aug	2	Z	4	4	4	11	17	11	8	9	6	5	3	2	1	2	1	2	4	4	3	2	2	3	4.7	17
3-Aug	3	Z	1	2	24	41	55	9	19	10	6	7	3	1	2	3	8	5	2	3	2	2	3	1	9.2	55
4-Aug	2	Z	2	1	1	3	7	9	8	39	36	16	10	10	10	7	6	3	2	4	5	8	8	5	8.7	39
5-Aug	4	Z	8	8	6	5	4	12	17	14	17	11	8	4	5	4	4	4	5	3	5	6	5	8	7.3	17
6-Aug	8	Z	4	3	3	4	7	7	C	C	C	C	C	C	1	1	1	6	4	1	1	1	0	0	--	8
7-Aug	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0.5	3
8-Aug	1	Z	1	1	1	1	2	9	10	15	16	13	12	12	7	4	3	3	5	3	1	2	1	1	5.3	16
9-Aug	3	Z	4	3	2	3	1	4	7	6	4	3	2	2	1	1	2	1	1	1	1	2	1	1	2.4	7
10-Aug	1	Z	1	1	2	3	19	38	39	27	16	11	3	1	1	1	1	2	5	3	3	1	1	1	7.9	39
11-Aug	1	Z	2	2	1	1	10	10	3	4	5	1	0	0	1	1	2	1	2	3	2	7	5	4	2.9	10
12-Aug	4	Z	6	5	5	6	10	18	39	34	31	15	5	4	5	5	4	3	4	3	4	4	8	10	10.1	39
13-Aug	10	Z	9	7	7	6	11	15	13	12	8	5	2	2	2	2	2	1	2	2	2	2	8	6	5.9	15
14-Aug	2	Z	3	7	7	9	3	3	19	27	22	12	5	2	1	1	6	8	5	5	6	4	16	13	8.2	27
15-Aug	6	Z	3	3	17	25	15	26	37	27	14	6	2	2	2	1	1	1	1	3	6	7	6	3	9.2	37
16-Aug	3	Z	1	3	5	8	14	14	25	23	13	8	7	8	8	3	2	2	2	2	2	2	3	3	7.0	25
17-Aug	2	Z	1	2	2	1	1	1	5	6	2	1	0	0	0	0	1	0	1	1	1	2	2	3	1.6	6
18-Aug	3	Z	2	2	3	3	2	1	8	30	20	21	16	11	7	6	7	8	6	6	9	2	2	1	7.6	30
19-Aug	1	Z	3	3	2	10	4	6	3	6	3	5	8	PF	PF	PF	4	5	7	5	4	3	4	2	4.4	10
20-Aug	3	Z	2	2	1	1	2	5	3	2	2	3	2	2	1	1	3	2	2	1	1	1	2	2	2.0	5
21-Aug	2	Z	1	0	1	1	1	3	3	2	1	1	1	1	1	1	2	1	1	1	1	1	1	7	1.5	7
22-Aug	3	Z	1	1	1	1	2	2	4	9	18	8	3	4	1	2	1	1	2	1	2	2	1	2	3.2	18
23-Aug	2	Z	1	1	1	2	3	8	20	30	20	19	6	5	5	4	5	4	3	3	4	8	8	8	7.5	30
24-Aug	6	Z	14	15	13	14	13	22	30	31	36	24	17	8	5	5	4	4	3	3	4	5	5	13	12.7	36
25-Aug	11	Z	5	5	5	8	13	8	10	15	10	8	3	3	3	2	3	3	3	3	3	9	4	4	6.1	15
26-Aug	4	Z	5	8	11	15	30	35	9	13	18	13	3	4	8	5	2	2	3	4	3	2	5	8	9.1	35
27-Aug	25	Z	8	5	2	1	1	2	1	1	1	1	1	0	0	1	1	1	1	1	4	3	1	1	2.7	25
28-Aug	1	Z	1	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	1	2	2	2	2	3	1.4	3
29-Aug	2	Z	2	2	2	3	17	20	13	11	11	14	9	4	3	2	3	4	4	7	10	12	15	11	7.8	20
30-Aug	14	Z	8	6	7	6	6	5	6	2	1	1	1	1	1	1	1	3	3	6	7	4	3	4	4.3	14
31-Aug	6	Z	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1.2	6
	4.3	--	3.4	3.4	4.5	6.4	8.9	9.9	12.1	13.6	11.5	7.8	4.5	3.4	2.9	2.3	2.6	2.8	2.9	2.9	3.3	3.5	4.2	4.4	Diurnal Average	
	25	--	14	15	24	41	55	38	39	39	36	24	17	12	10	7	8	8	8	7	10	12	16	13	Diurnal Maximum	

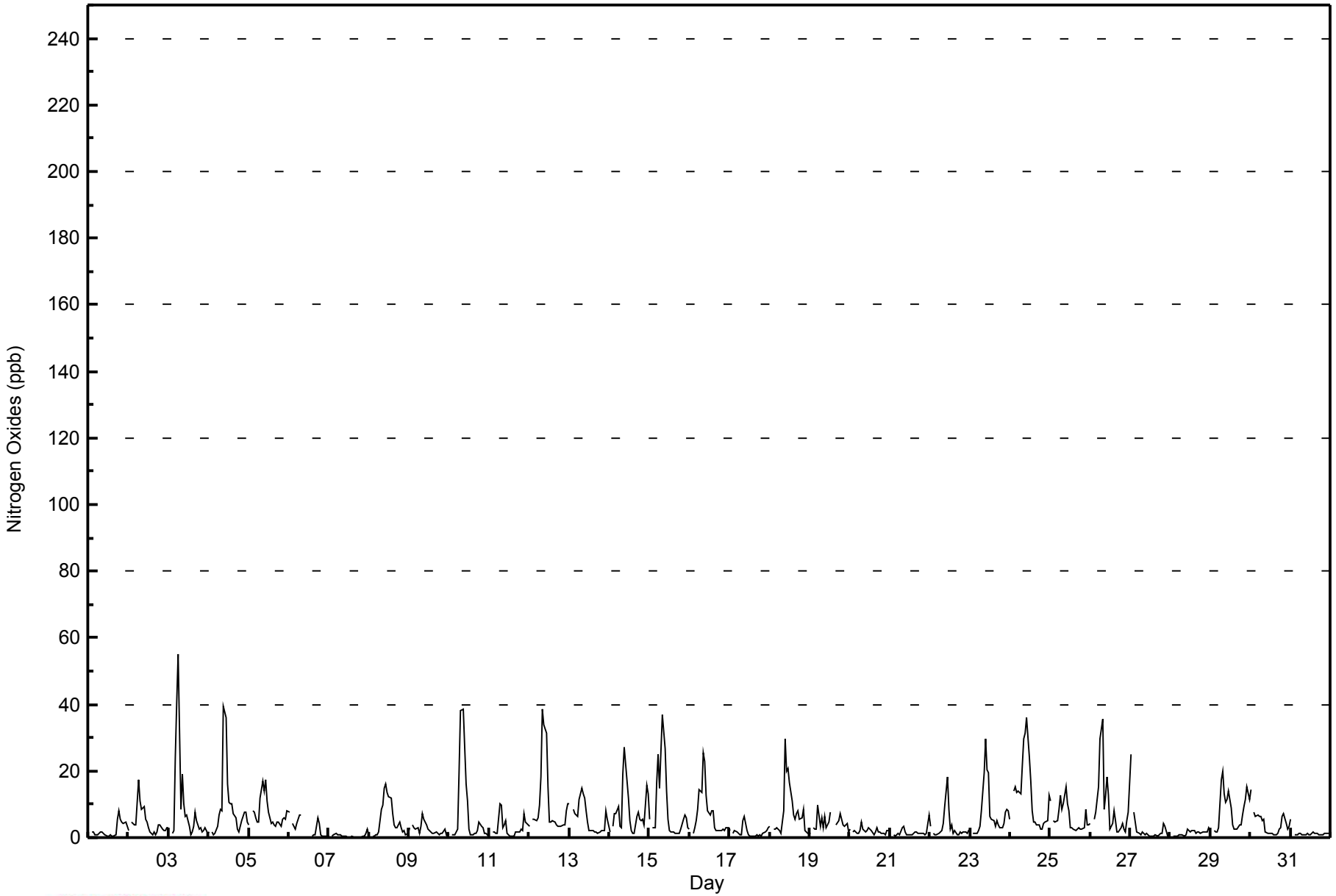
Z - zerospan C - Calibration PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	674	95.74	95.74
21 - 40	28	3.98	99.72
11 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	55	32	6	8	14	16	11	58	85	72	46	29	50	74	74	43	673
21 - 40	1	2	0	1	0	1	6	7	2	4	1	0	0	1	2	0	28
11 - 80	0	0	0	0	0	0	0	0	0	1	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	56	34	6	9	14	17	17	65	87	77	48	29	50	75	76	43	703

Total Number of Valid Hours: 703

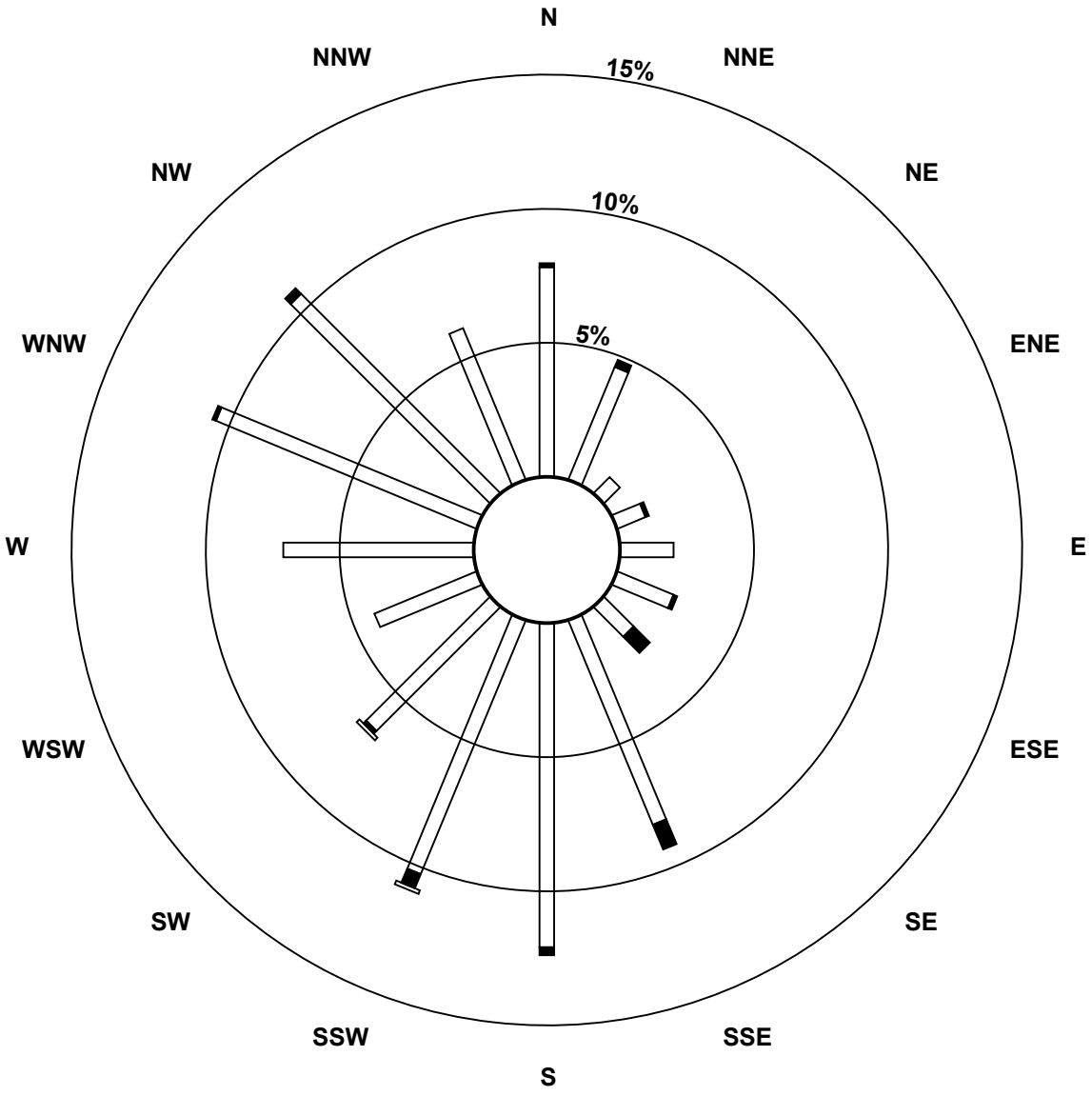
Total Number of Hours: 744

Wood Buffalo Environmental Association

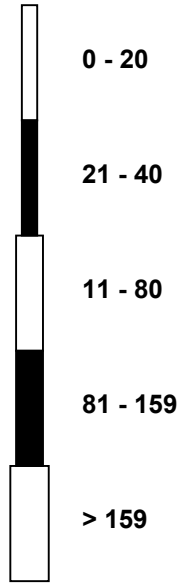
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



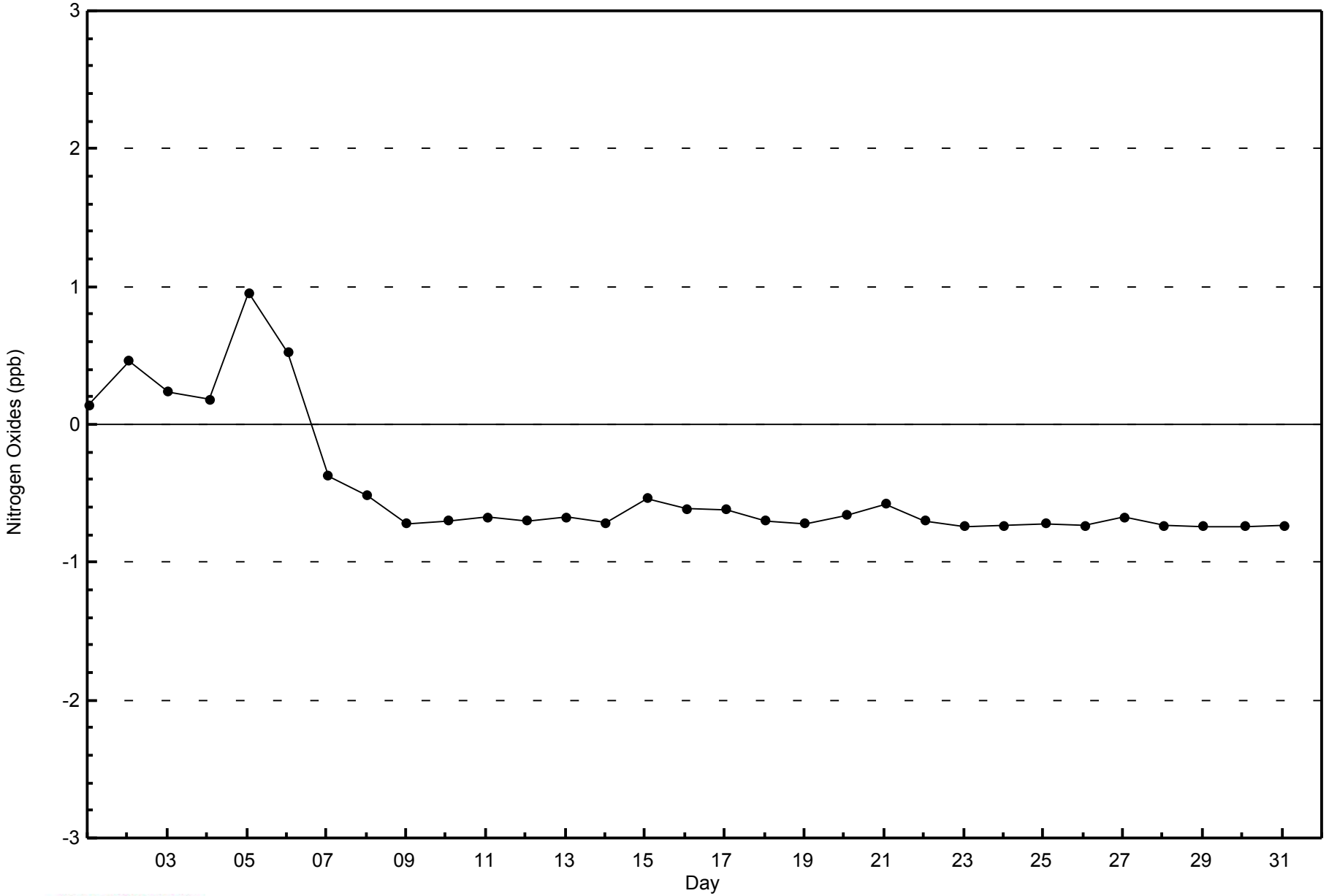
Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - August 2014



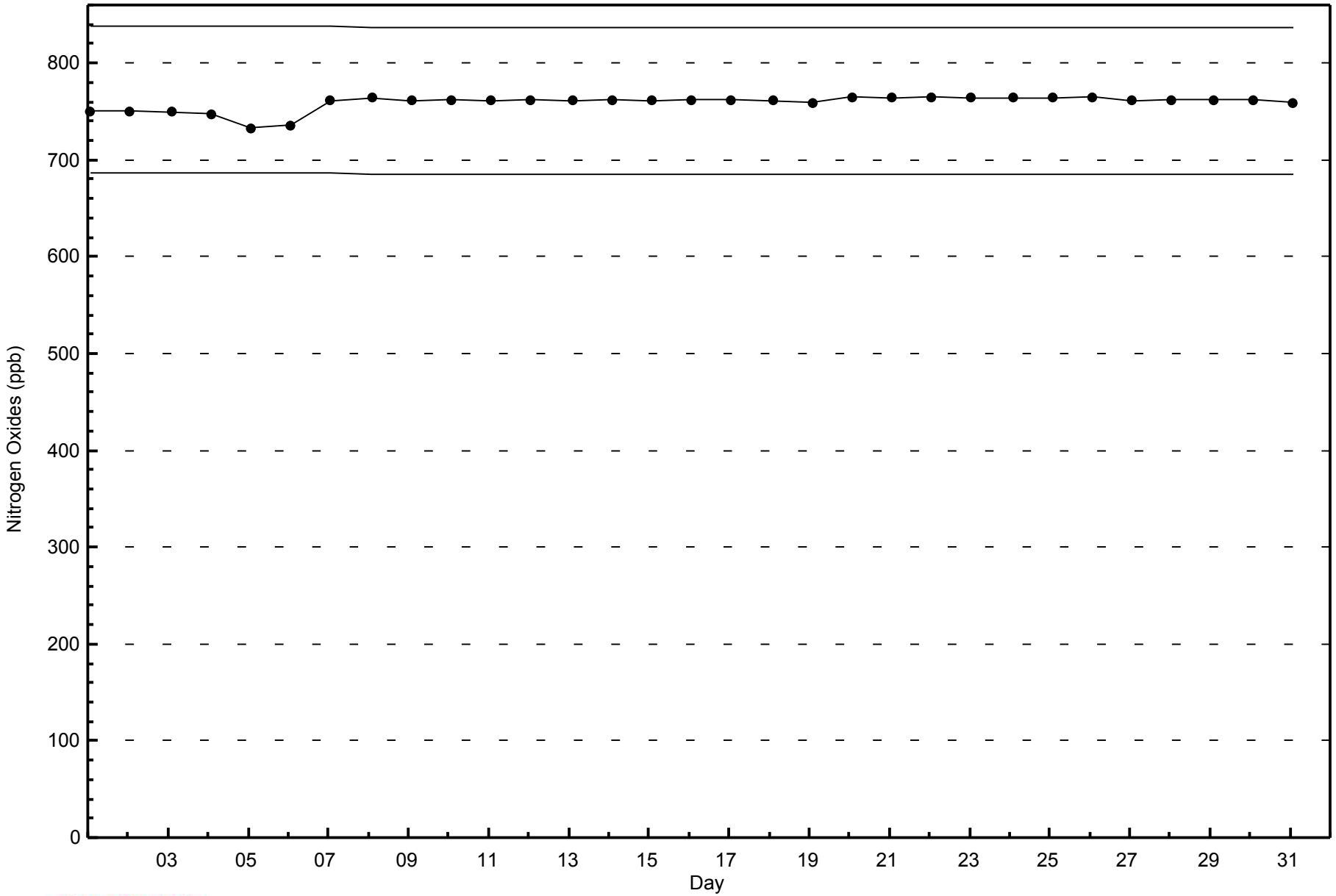
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - August 2014

Number of Exceedences (AAAQO): 1-hr: 3 24-hr: 0
Maximum Value: 104 ppb on Aug 4 15:00 Maximum Daily Average: 42.8 ppb on Aug 4

Minimum Value: 3 ppb on Aug 24 04:00 Minimum Daily Average: 14.6 ppb on Aug 20
Maximum Diurnal Average: 41.7 ppb at hour 15 Minimum Diurnal Average: 9.4 ppb at hour 6
Monthly Average: 23.5 ppb Percentiles: $P_1 = 4$ $P_{10} = 7$ $Q_1 = 12$ Median = 20 $Q_3 = 33$ $P_{90} = 43$ $P_{99} = 72$

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	36
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14	15	Z	15	16	15	17	21	25	28	28	28	30	32	32	33	35	40	37	29	18	12	11	8	23.4	40
2-Aug	6	5	Z	4	5	5	5	13	22	27	36	43	44	41	41	42	40	39	37	42	36	26	15	15	25.6	44
3-Aug	13	10	Z	9	4	5	7	23	22	40	56	66	62	51	61	64	65	46	40	30	22	19	16	17	32.5	66
4-Aug	11	8	Z	8	8	8	11	17	30	38	72	91	80	81	104	90	73	52	44	53	44	29	18	14	42.8	104
5-Aug	11	7	Z	5	6	5	6	13	19	33	49	63	75	69	65	62	55	53	47	32	28	20	16	16	32.9	75
6-Aug	17	18	Z	22	21	20	21	22	23	24	32	40	45	45	44	41	41	39	37	33	30	30	29	29	30.6	45
7-Aug	27	26	Z	24	22	21	21	21	22	24	25	26	27	27	28	29	28	27	25	23	21	18	18	14	23.6	29
8-Aug	16	13	Z	12	10	9	11	13	16	18	19	C	C	C	C	C	51	49	44	39	37	36	35	34	25.7	51
9-Aug	33	UO	Z	7	8	7	PF	7	7	8	13	17	21	25	25	25	22	22	21	16	9	6	6	9	15.0	33
10-Aug	7	5	Z	4	4	4	4	5	7	12	18	27	32	32	33	33	29	22	15	19	16	19	18	18	16.7	33
11-Aug	15	16	Z	14	16	15	11	12	17	21	27	26	24	24	23	23	24	24	22	18	13	9	11	8	17.9	27
12-Aug	7	6	Z	4	4	4	6	8	12	23	29	42	41	41	39	36	34	33	31	25	19	16	12	11	21.0	42
13-Aug	10	9	Z	5	5	5	8	12	21	28	38	41	45	52	54	50	48	46	43	34	25	27	17	17	27.9	54
14-Aug	16	17	Z	12	12	10	17	19	21	26	36	52	62	54	49	44	59	57	43	30	22	19	9	6	30.0	62
15-Aug	9	7	Z	7	4	4	9	11	13	29	52	55	44	41	43	41	40	33	28	26	20	14	12	17	24.2	55
16-Aug	16	15	Z	14	9	7	15	21	17	21	31	44	56	60	51	42	40	36	29	27	30	29	24	19	28.5	60
17-Aug	22	24	Z	16	15	19	21	25	33	41	45	45	43	43	43	42	41	40	37	31	25	21	23	17	30.8	45
18-Aug	14	16	Z	10	9	8	11	12	10	8	13	20	30	38	44	48	48	31	20	15	11	12	8	8	19.3	48
19-Aug	7	5	Z	6	8	6	9	9	12	21	32	39	39	PF	PF	PF	26	28	20	10	8	11	9	13	15.8	39
20-Aug	11	8	Z	12	14	15	14	12	13	14	15	15	17	17	19	20	23	23	20	15	10	10	8	8	14.6	23
21-Aug	7	11	Z	10	7	8	11	14	18	26	32	32	33	34	34	33	33	32	31	23	19	20	15	10	21.4	34
22-Aug	11	10	Z	10	10	7	8	10	10	14	16	27	36	34	36	34	36	34	31	24	15	11	9	8	19.2	36
23-Aug	8	8	Z	7	6	5	5	5	6	8	14	21	39	45	45	45	44	44	34	29	21	17	13	12	20.9	45
24-Aug	8	5	Z	3	3	3	6	7	6	6	10	20	30	35	39	41	39	38	30	19	15	13	10	5	16.9	41
25-Aug	5	11	Z	10	14	8	8	15	17	18	27	31	37	39	42	43	42	39	38	36	34	26	30	29	26.1	43
26-Aug	27	25	Z	20	17	12	8	10	22	20	22	31	33	39	47	43	33	37	28	24	26	23	20	14	25.3	47
27-Aug	4	4	Z	7	14	16	15	16	18	23	24	32	33	37	37	37	36	31	28	22	18	19	28	18	22.5	37
28-Aug	15	13	Z	16	13	13	13	14	16	20	29	31	30	30	31	32	33	32	29	17	10	10	6	7	20.1	33
29-Aug	5	4	Z	3	3	3	4	7	14	20	24	26	31	37	37	39	40	39	36	30	25	20	16	19	21.0	40
30-Aug	13	14	Z	15	9	10	13	17	17	17	19	19	33	39	38	32	31	29	26	18	10	10	9	8	19.4	39
31-Aug	5	7	Z	11	13	13	14	14	17	19	22	30	27	16	25	27	24	23	17	12	11	11	11	6	16.3	30
	12.6	11.4	--	10.4	10.0	9.4	10.9	13.7	16.9	21.9	29.1	35.9	39.3	39.9	41.7	40.4	39.1	36.0	31.3	25.9	20.9	18.2	15.6	14.0	Diurnal Average	
	33	26	--	24	22	21	21	25	33	41	72	91	80	81	104	90	73	57	47	53	44	36	35	34	Diurnal Maximum	

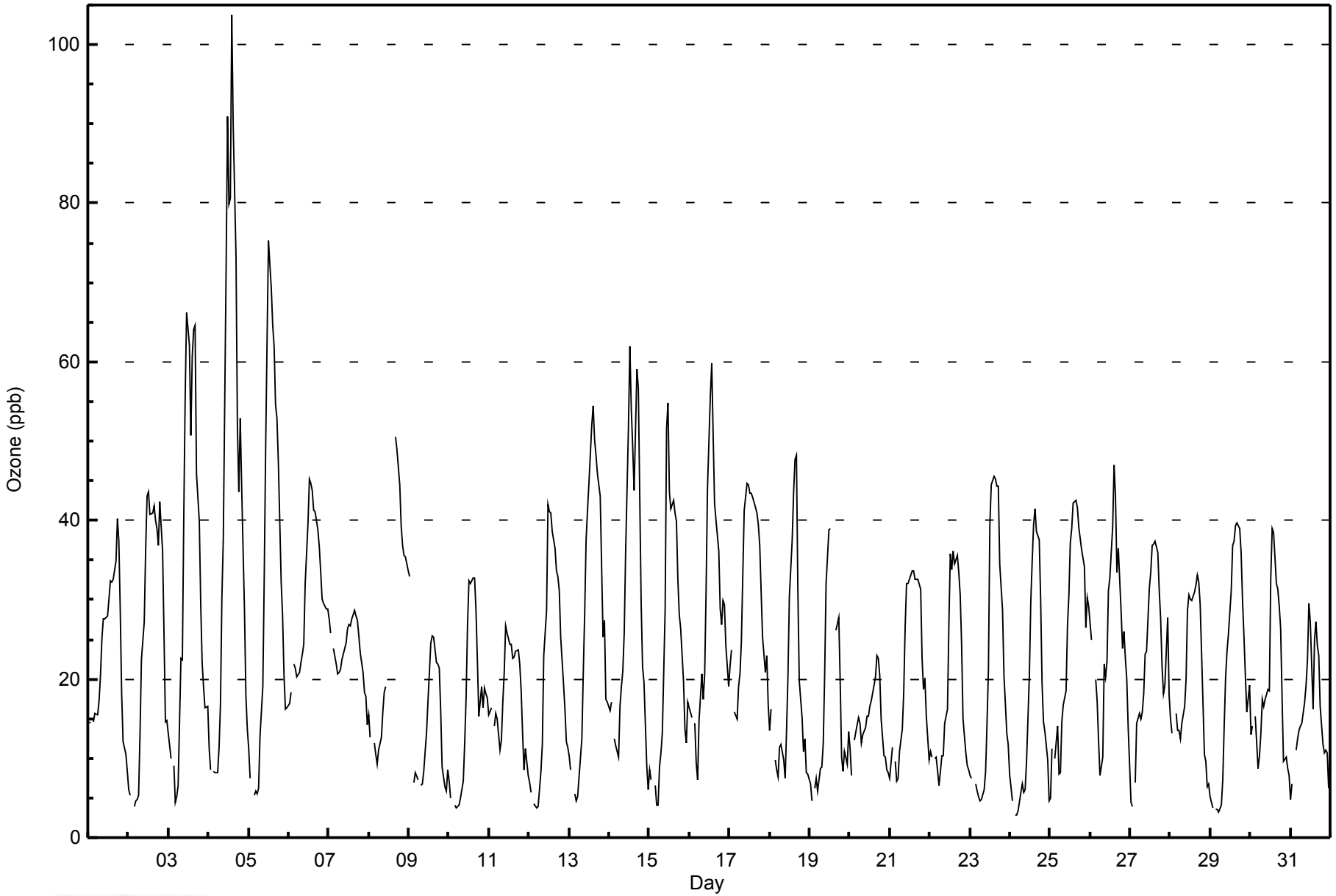
Z - zerospan C - Calibration UO - Unstable Operation PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	354	50.36	50.36
21 - 50	313	44.52	94.88
51 - 82	33	4.69	99.57
> 83	3	0.43	100.00

Total Number of Valid Hours: 703

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	26	12	1	3	0	6	4	14	32	49	25	21	37	46	55	22	353
21 - 50	25	21	5	3	8	9	11	44	46	27	20	11	14	30	20	19	313
51 - 82	2	1	0	2	1	0	2	9	12	1	2	0	0	0	0	1	33
> 83	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3
Totals	54	34	6	9	10	15	17	67	90	77	47	32	51	76	75	42	702

Total Number of Valid Hours: 702

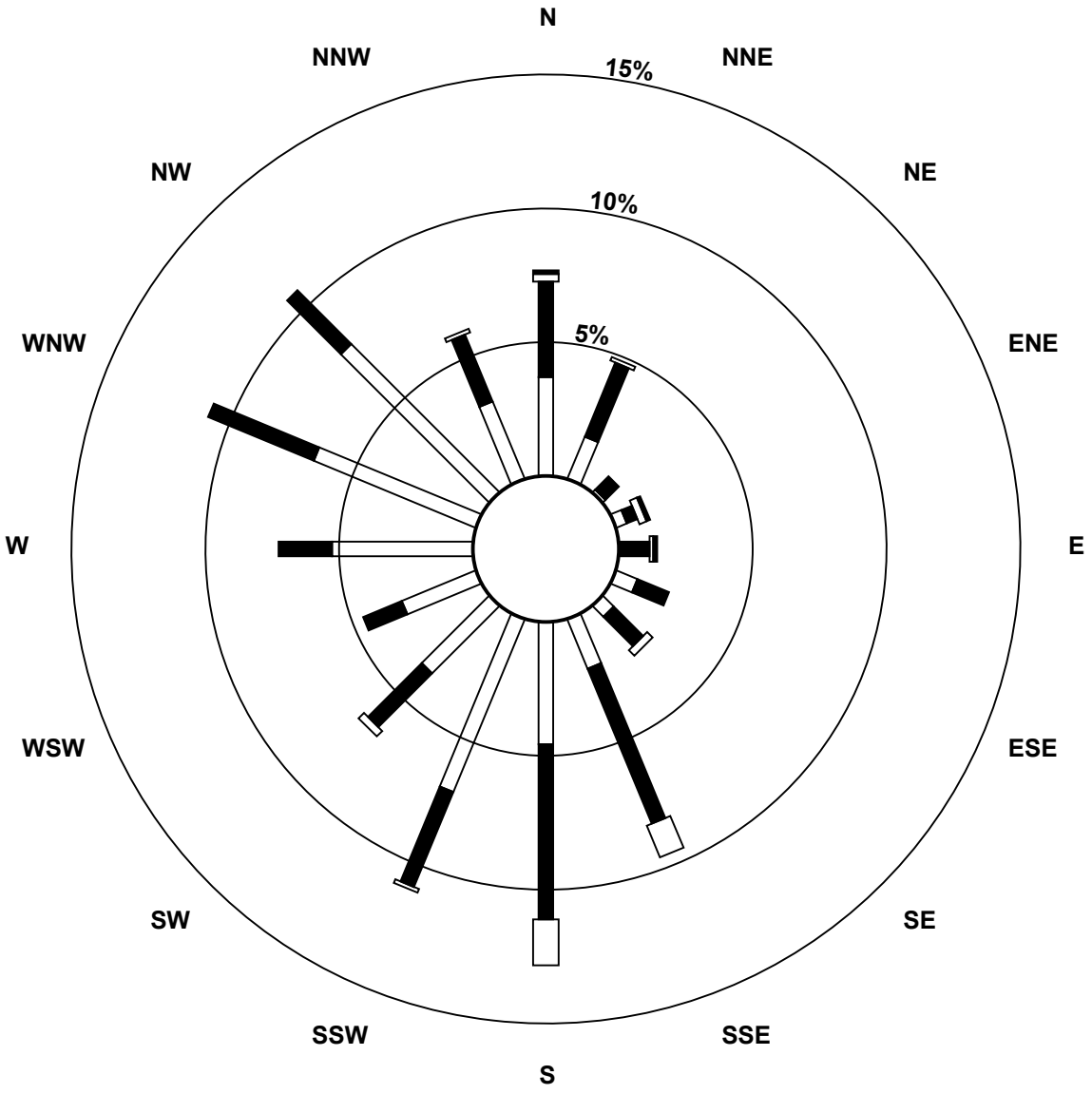
Total Number of Hours: 744

Wood Buffalo Environmental Association

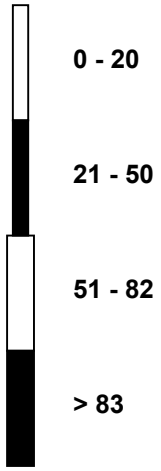
Wind Rose Aug 2014

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



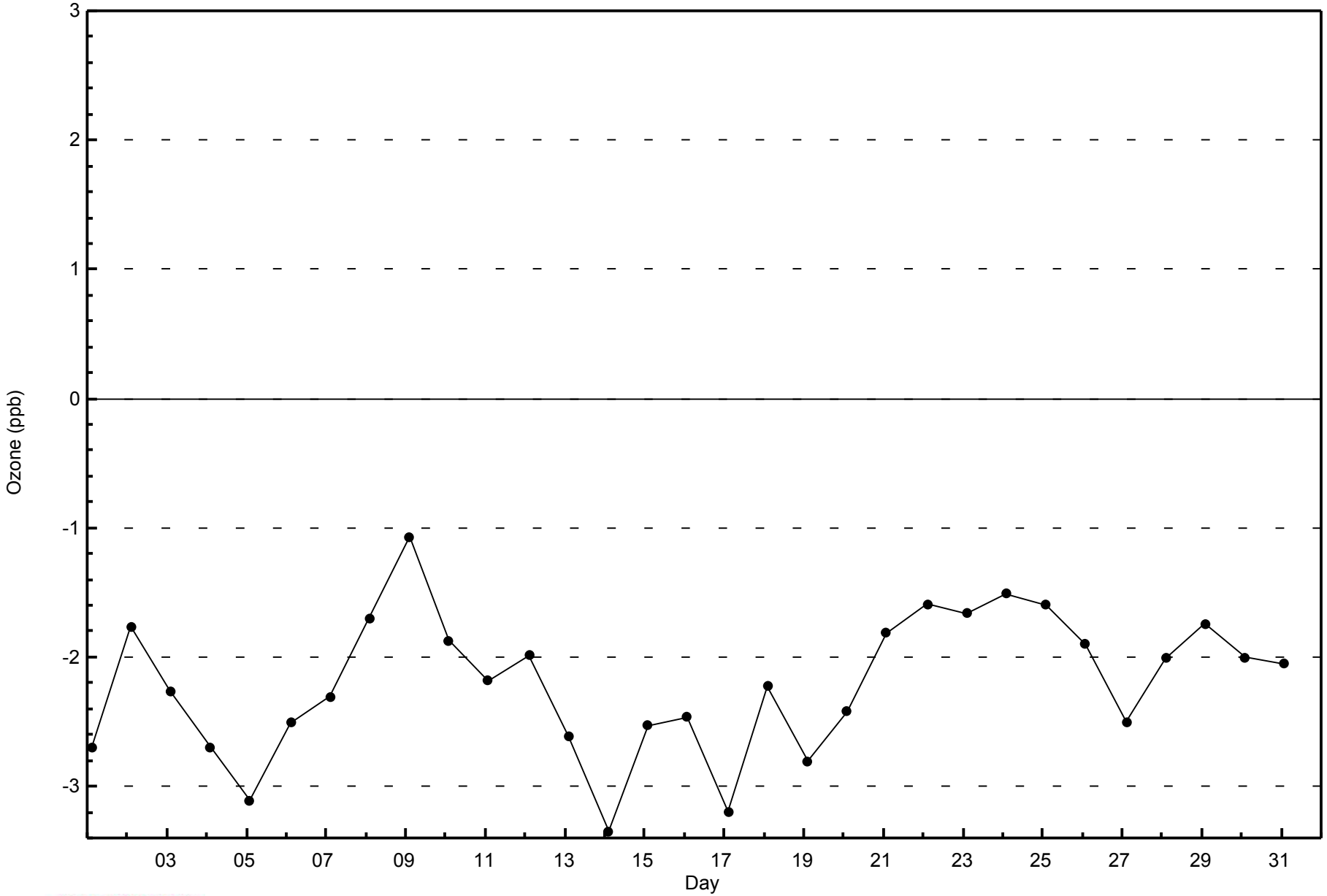
Total Number of Valid Hours: 702

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - August 2014



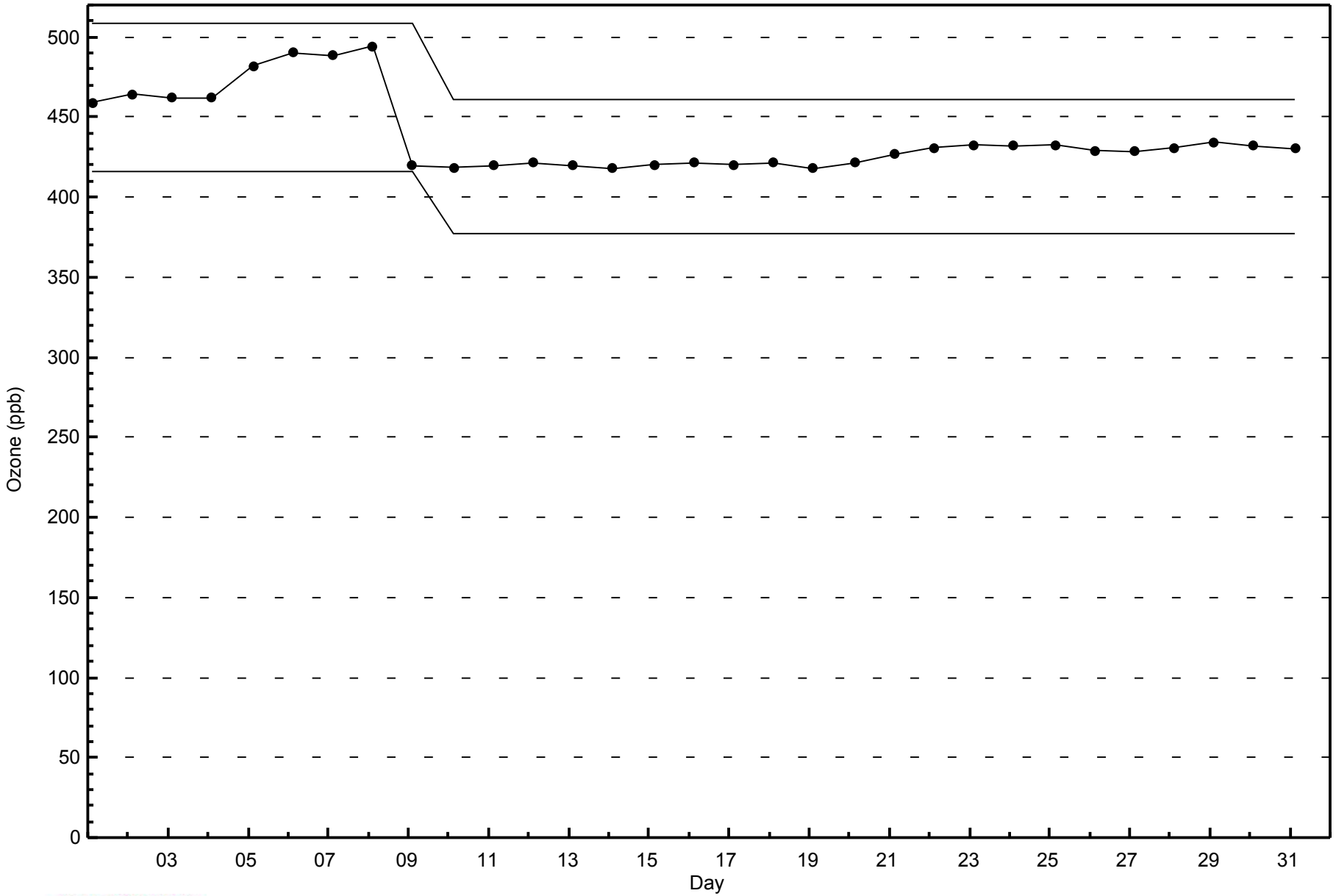
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 24-hr: 3

Maximum Value: 530.1 $\mu g/m^3$ on Aug 4 12:00

Maximum Daily Average: 135.8 $\mu g/m^3$ on Aug 4

Minimum Value: 0.0 $\mu g/m^3$ on Aug 11 13:00

Minimum Daily Average: 2.8 $\mu g/m^3$ on Aug 28

Maximum Diurnal Average: 33.6 $\mu g/m^3$ at hour 12

Minimum Diurnal Average: 12.4 $\mu g/m^3$ at hour 19

Monthly Average: 18.24 $\mu g/m^3$

Percentiles: P_1 = 1.2 P_{10} = 2.6 Q_1 = 4.9 Median = 9.4 Q_3 = 15.0 P_{90} = 25.3 P_{99} = 166.3

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Hours of Calibration:	0
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	70.7	79.3	93.0	82.0	75.8	64.9	49.5	41.5	35.2	30.5	27.5	23.4	18.6	17.2	16.9	15.8	15.7	20.7	23.6	18.7	16.2	18.4	23.2	25.0	37.6	93.0
2-Aug	25.1	24.9	24.5	25.2	25.1	18.5	14.5	14.5	21.6	27.7	22.4	25.6	22.5	19.6	21.0	21.3	21.0	19.1	10.2	12.0	15.3	12.4	13.1	15.1	19.7	27.7
3-Aug	13.3	13.0	13.4	10.7	13.8	15.5	9.3	6.5	9.8	17.0	12.5	9.7	11.0	11.9	14.8	22.2	24.8	14.9	11.5	8.5	7.8	11.9	11.6	11.8	12.8	24.8
4-Aug	12.3	13.2	15.6	13.9	11.6	14.2	14.4	12.6	19.8	174.4	315.0	530.1	449.5	369.2	236.8	139.7	103.7	56.1	70.5	143.0	139.5	131.0	132.0	140.3	135.8	530.1
5-Aug	149.0	143.0	145.6	153.3	157.5	144.2	142.3	142.8	130.5	139.9	170.1	167.8	149.4	117.1	71.6	61.6	45.2	60.8	61.8	50.5	35.1	24.4	24.8	15.7	104.3	170.1
6-Aug	13.8	11.0	7.1	5.7	5.8	5.7	5.5	7.0	7.3	6.1	6.8	6.7	4.1	6.6	7.2	7.7	13.2	19.2	17.3	16.2	19.1	18.7	15.1	13.3	10.3	19.2
7-Aug	11.0	11.9	20.3	70.4	99.9	91.9	76.9	46.8	17.5	5.1	1.8	1.3	1.4	1.4	1.4	1.6	1.5	1.7	1.8	2.0	2.3	2.5	2.6	2.2	19.9	99.9
8-Aug	1.9	2.5	3.6	4.0	5.0	5.3	4.2	5.0	5.7	10.3	7.7	5.8	7.8	11.1	12.5	13.4	8.1	8.1	7.7	7.4	4.5	3.2	4.5	6.1	6.5	13.4
9-Aug	5.5	4.8	6.0	4.1	3.5	5.0	5.0	5.3	4.5	4.0	4.0	5.3	6.6	7.5	17.1	19.7	18.3	13.8	10.5	10.0	11.5	14.1	10.9	14.3	8.8	19.7
10-Aug	15.5	12.9	11.0	11.9	10.3	8.8	6.8	4.7	5.5	7.9	8.2	4.8	4.0	4.1	4.9	5.8	5.2	4.3	5.9	2.8	4.5	9.4	17.1	17.9	8.1	17.9
11-Aug	18.4	17.2	18.0	16.0	12.1	9.3	5.8	6.4	5.8	3.5	2.8	0.8	0.0	0.3	0.7	0.9	2.4	1.0	2.2	4.1	3.2	4.1	13.3	18.4	6.9	18.4
12-Aug	15.1	16.4	18.5	23.4	26.6	27.0	26.4	21.2	29.8	46.8	49.1	33.6	14.9	11.4	9.2	8.1	6.2	4.5	5.1	5.1	6.2	8.3	11.3	10.1	18.1	49.1
13-Aug	9.8	10.2	9.0	11.2	11.1	9.1	9.9	10.4	10.3	16.8	10.2	6.4	4.4	4.9	M	M	7.0	7.3	9.0	10.3	11.3	14.6	21.1	22.0	10.7	22.0
14-Aug	15.2	14.2	15.0	14.6	13.7	10.5	12.6	16.5	18.9	21.5	25.3	31.6	32.0	22.0	18.9	17.1	26.7	23.7	18.0	19.8	17.4	16.2	21.9	18.1	19.2	32.0
15-Aug	10.5	9.2	8.6	6.4	7.9	10.5	11.0	16.3	16.2	15.8	15.3	11.2	8.0	8.3	9.3	6.0	7.3	16.9	15.8	10.1	11.7	14.5	10.2	8.9	11.1	16.9
16-Aug	11.1	11.4	15.7	19.5	16.0	16.4	20.6	18.4	22.5	27.5	32.7	42.8	40.4	32.9	25.6	14.5	11.3	8.9	8.3	9.5	13.4	16.6	18.3	14.1	19.5	42.8
17-Aug	11.5	12.6	15.5	13.7	11.9	11.4	10.5	6.7	5.6	6.7	5.3	3.9	3.5	3.6	3.7	4.3	4.8	5.4	6.2	4.5	3.7	6.2	7.4	10.0	7.4	15.5
18-Aug	7.9	8.7	6.1	6.6	9.2	11.4	8.7	7.7	10.7	11.2	11.7	22.5	26.7	23.9	20.8	25.4	25.2	25.6	22.5	11.8	7.4	9.6	8.4	6.9	14.0	26.7
19-Aug	7.8	9.9	10.3	7.5	7.1	10.4	10.3	8.7	11.0	10.4	4.6	8.2	17.1	PF	PF	PF	7.1	5.8	4.5	4.3	4.6	5.0	5.5	12.3	8.2	17.1
20-Aug	13.9	10.7	9.0	11.5	13.4	14.3	12.3	11.7	12.0	10.5	11.0	11.0	9.5	8.7	6.6	6.2	7.4	1.9	2.1	1.6	1.2	1.2	1.8	2.6	8.0	14.3
21-Aug	4.7	7.1	7.8	7.4	7.1	6.9	6.6	5.8	3.0	3.0	3.1	2.2	2.1	2.0	2.3	2.6	2.8	3.9	3.2	3.5	4.5	4.6	4.6	4.8	4.4	7.8
22-Aug	4.5	4.5	4.4	4.2	4.1	4.4	4.3	3.3	2.7	2.4	2.5	2.1	2.4	2.4	1.9	2.8	2.9	3.9	3.6	3.4	4.9	5.4	4.7	4.9	3.6	5.4
23-Aug	4.3	3.8	3.9	4.0	4.1	4.0	4.2	6.9	8.2	11.2	14.2	21.5	7.0	7.4	8.5	7.3	10.0	8.6	9.7	8.9	11.3	14.8	14.5	14.2	8.9	21.5
24-Aug	13.0	13.3	13.5	13.7	13.4	13.5	13.2	13.1	14.4	14.1	15.0	16.0	13.4	10.7	10.5	9.6	10.7	10.7	8.6	8.3	6.9	9.5	11.9	9.4	11.9	16.0
25-Aug	8.5	7.3	9.3	10.3	13.8	11.5	9.1	12.6	14.9	13.2	12.0	12.0	8.6	8.7	8.2	8.3	8.7	8.9	11.4	8.0	6.6	16.2	12.0	11.7	10.5	16.2
26-Aug	9.9	7.8	9.4	11.6	11.3	11.4	9.6	11.4	8.8	11.2	15.7	15.0	15.0	23.0	30.4	21.3	11.4	9.7	10.1	8.7	6.0	6.5	7.1	6.4	12.0	30.4
27-Aug	10.8	11.5	11.0	12.9	9.8	5.8	6.2	4.2	3.5	3.4	3.0	1.4	1.7	2.0	2.3	2.5	2.5	2.0	1.3	1.5	4.4	6.6	3.4	1.4	4.8	12.9
28-Aug	1.3	1.5	2.1	2.6	3.0	3.3	3.3	2.5	1.7	1.7	1.7	2.0	2.1	2.3	2.3	2.4	2.5	2.6	2.5	3.9	4.8	5.1	4.4	4.5	2.8	5.1
29-Aug	4.1	4.5	4.8	4.7	4.8	5.5	6.0	5.7	3.7	5.6	8.6	11.1	7.2	5.1	6.3	8.0	10.2	10.1	12.8	9.2	8.7	12.8	13.7	12.3	7.7	13.7
30-Aug	11.6	7.3	5.0	5.9	8.1	8.8	4.6	3.1	5.8	6.9	7.1	4.1	2.5	3.0	5.0	5.8	3.3	4.1	5.6	7.0	6.3	8.2	9.2	8.8	6.1	11.6
31-Aug	9.6	9.5	7.8	5.7	4.5	5.1	5.2	3.1	3.1	2.8	1.7	1.3	1.8	2.1	1.5	2.6	2.4	1.1	1.4	3.5	4.0	2.6	3.7	4.8	3.8	9.6
	16.8	16.6	17.6	19.2	20.0	18.9	17.1	15.6	15.2	21.6	26.7	33.6	28.9	25.0	19.9	16.0	13.9	12.4	12.4	13.5	13.0	14.0	14.9	15.1	Diurnal Average	
	149.0	143.0	145.6	153.3	157.5	144.2	142.3	142.8	130.5	174.4	315.0	530.1	449.5	369.2	236.8	139.7	103.7	60.8	70.5	143.0	139.5	131.0	132.0	140.3	Diurnal Maximum	

M - Maintenance PF - Power Failure

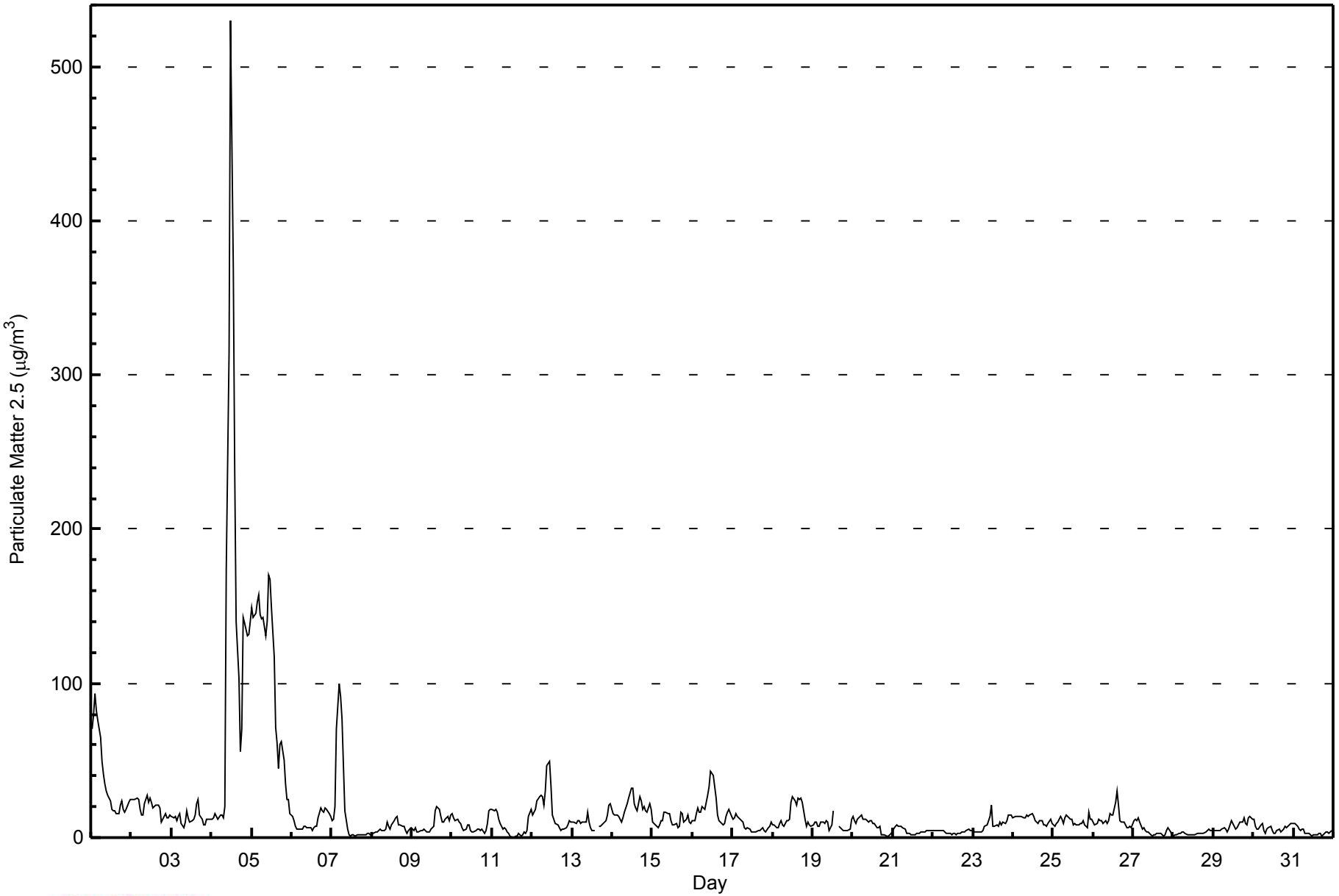
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	205	27.74	27.74
6 - 15	356	48.17	75.91
16 - 25	100	13.53	89.45
26 - 80	42	5.68	95.13
> 81.0	31	4.19	99.32

Total Number of Valid Hours: 739

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Fort McKay - Bertha Ganter - August 2014

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	19	15	3	2	2	3	2	6	10	12	11	7	24	33	31	25	205
6 - 15	21	14	3	5	8	9	7	35	57	55	31	17	18	29	31	15	355
16 - 25	5	0	0	0	1	5	5	14	16	9	8	8	9	10	8	2	100
26 - 80	7	3	0	1	1	0	3	10	6	4	0	0	2	4	0	1	42
> 81.0	6	2	0	1	2	0	0	2	3	1	0	1	3	5	4	1	31
Totals	58	34	6	9	14	17	17	67	92	81	50	33	56	81	74	44	733

Total Number of Valid Hours: 738

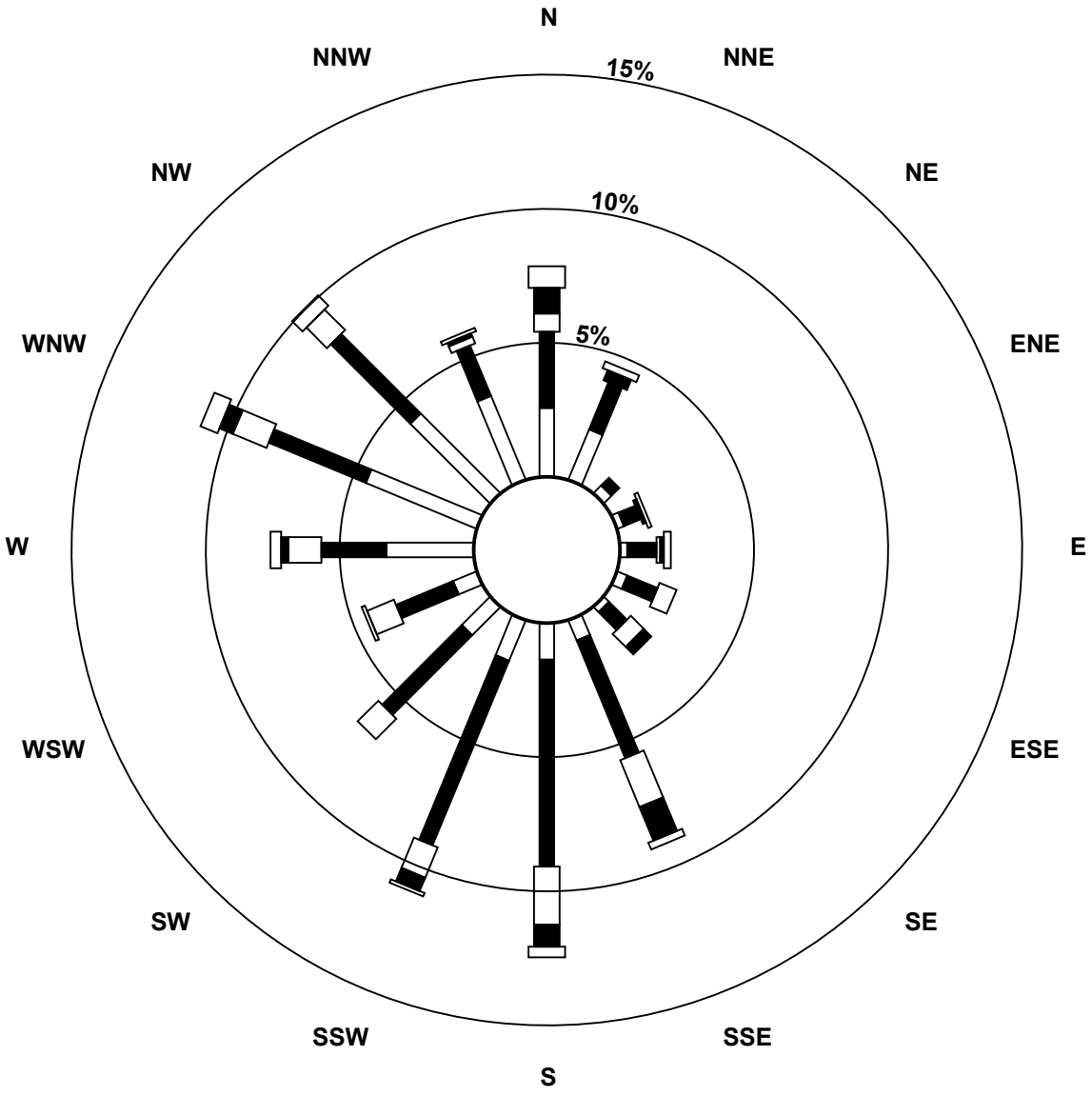
Total Number of Hours: 744

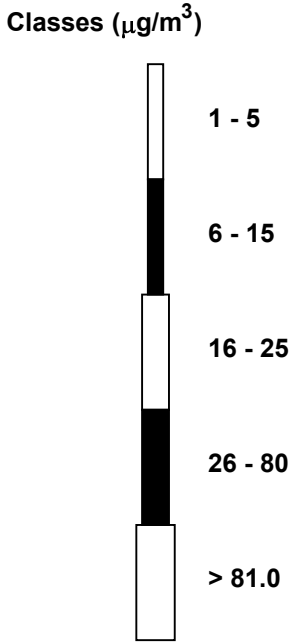
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Fort McKay - Bertha Ganter (AMS 1)





Total Number of Valid Hours: 738

Number of Exceedences (AAAQO): 1-hr: 0
Maximum Value: 11 ppb on Aug 1 04:00 Maximum Daily Average: 1.0 ppb on Aug 7

Minimum Value: 0 ppb on Aug 1 01:00 Minimum Daily Average: 0.0 ppb on Aug 2
Maximum Diurnal Average: 0.3 ppb at hour 4 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:	661
Hours of Missing Data:	83
Hours of Calibration:	44
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-Aug	0	Z	RE	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	11
2-Aug	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
3-Aug	0	Z	RE	0	0	0	0	UO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
4-Aug	0	Z	RE	0	0	0	0	0	0	0	0	UO	UO	0	0	0	0	0	0	0	0	0	0	0	0.0	0
5-Aug	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
6-Aug	0	Z	RE	0	0	0	0	0	0	C	C	C	C	C	C	C	C	C	C	C	C	C	0	0	--	0
7-Aug	0	Z	RE	0	11	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	11
8-Aug	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
9-Aug	0	Z	RE	0	0	0	PF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
10-Aug	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
11-Aug	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
12-Aug	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
13-Aug	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
14-Aug	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
15-Aug	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
16-Aug	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
17-Aug	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
18-Aug	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
19-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	0	0	0	0	0	0	0	0.0	0
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	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
24-Aug	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
25-Aug	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
26-Aug	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
27-Aug	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
28-Aug	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
29-Aug	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
30-Aug	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
31-Aug	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	--	--	0.3	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	Diurnal Average	
	0	--	--	11	11	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum	

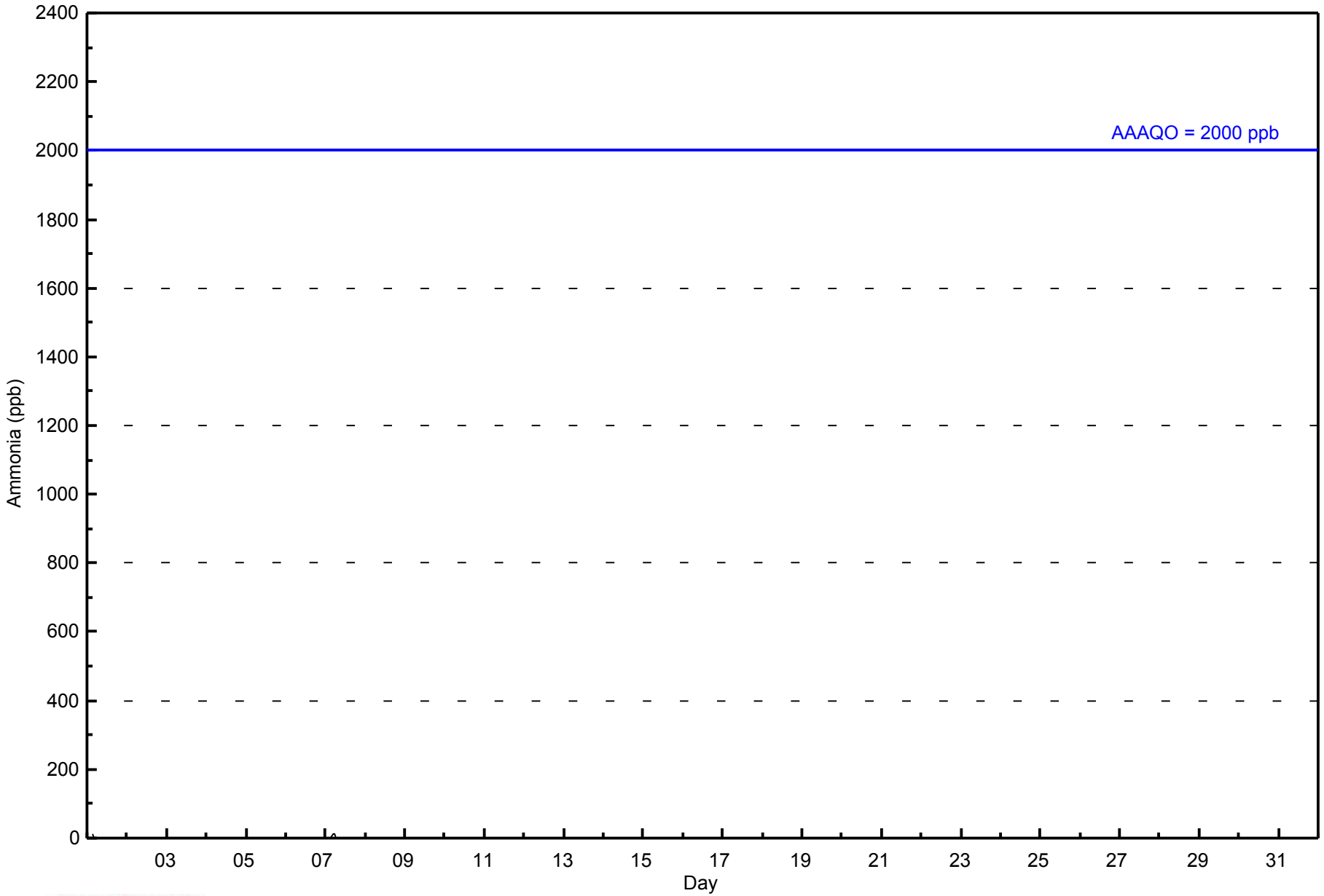
Z - zerospan C - Calibration UO - Unstable Operation PF - Power Failure RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb

WBEA NETWORK

Hourly Averages

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	658	99.55	99.55
6 - 10	1	0.15	99.70
11 - 15	2	0.30	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 661

Total Number of Hours: 744

Ammonia (NH_3) - ppb
Fort McKay - Bertha Ganter - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	50	34	5	9	14	15	17	64	85	72	41	25	44	69	73	40	657
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11 - 15	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
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	51	34	5	9	14	15	17	64	85	72	41	25	45	70	73	40	660

Total Number of Valid Hours: 660

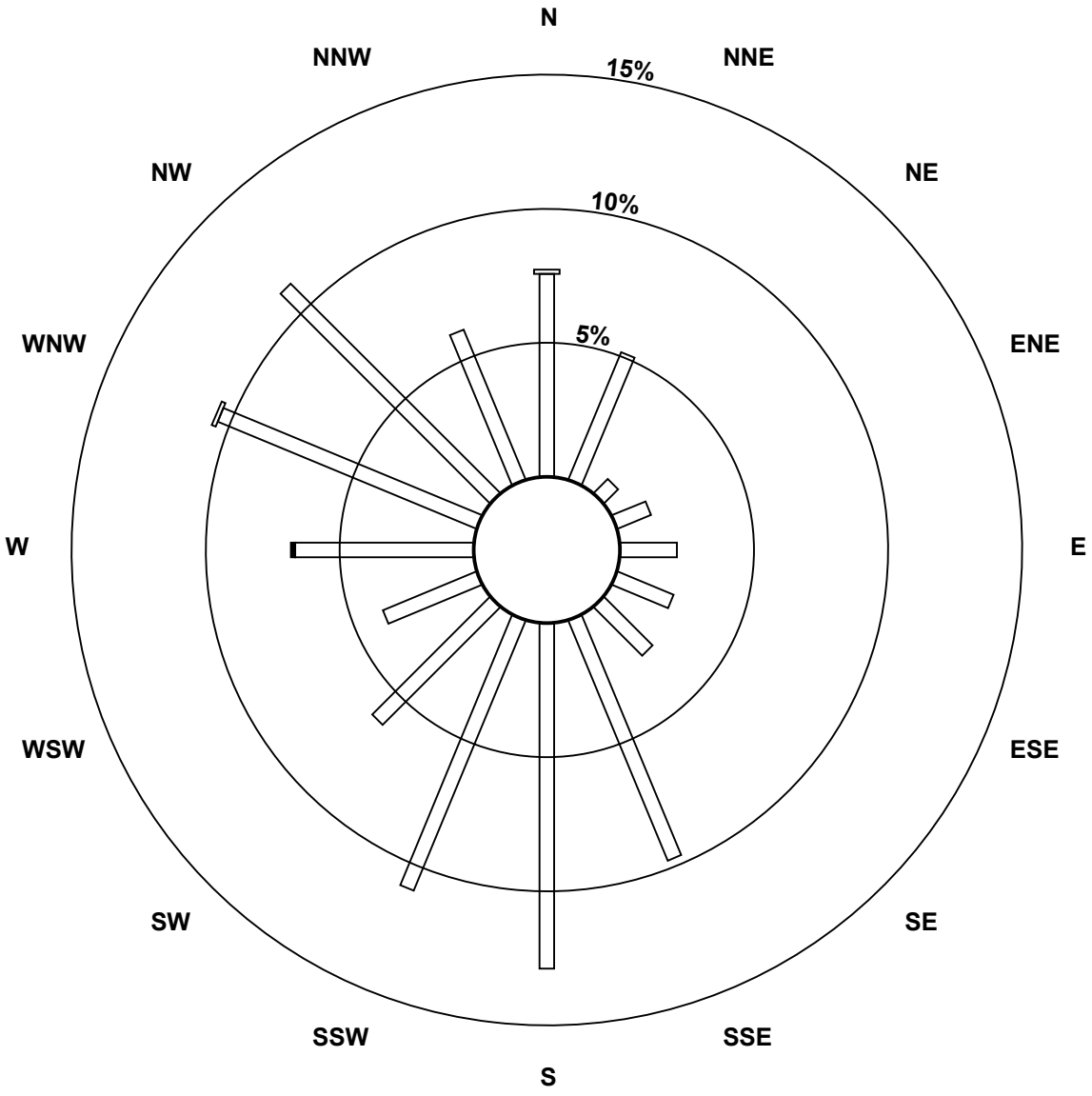
Total Number of Hours: 744

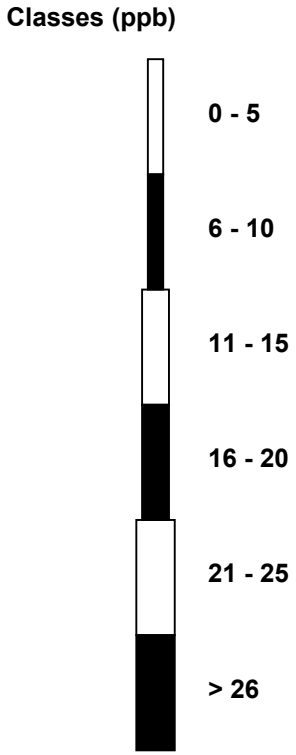
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter (AMS 1)





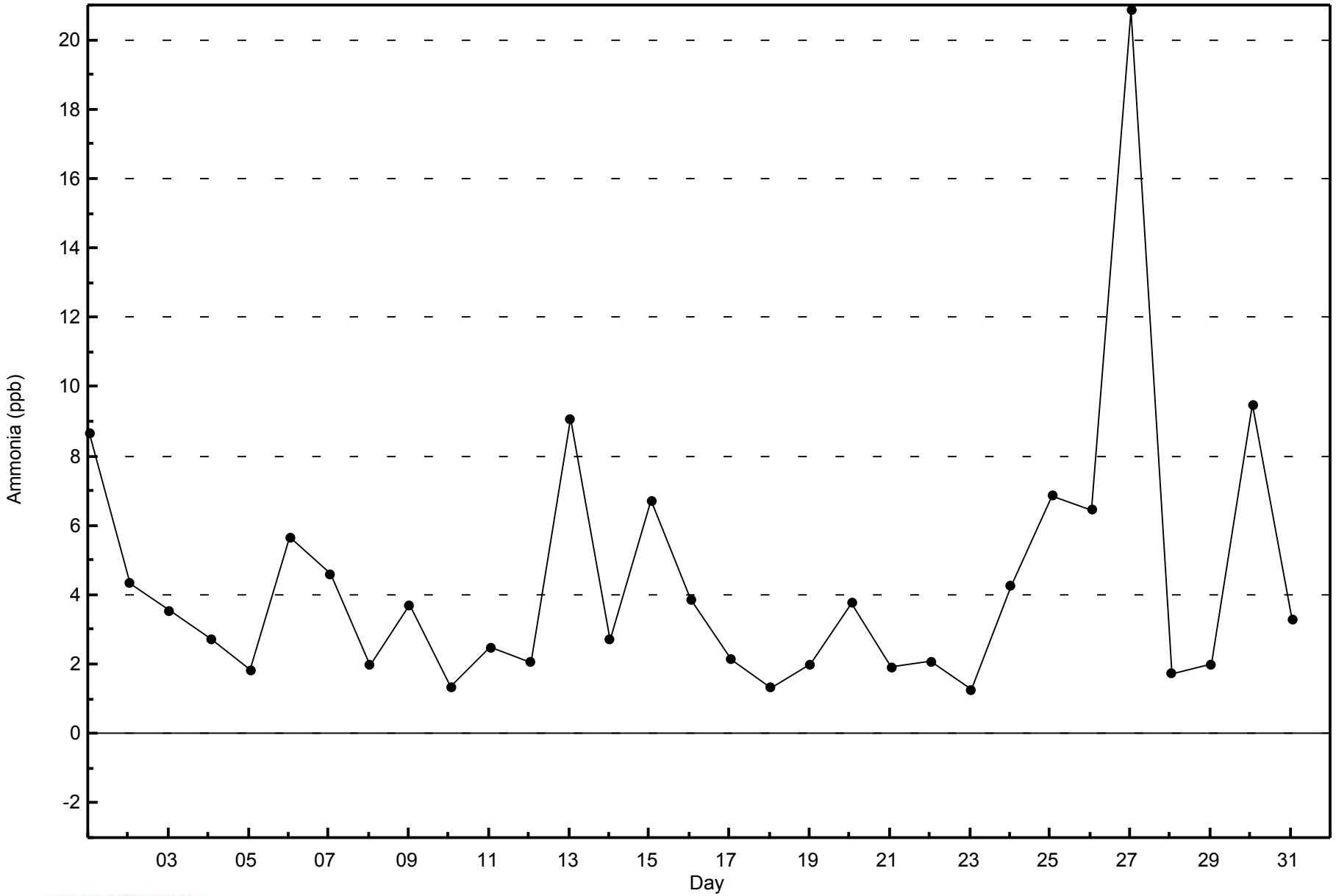
Total Number of Valid Hours: 660

WBEA NETWORK

Zero Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - August 2014



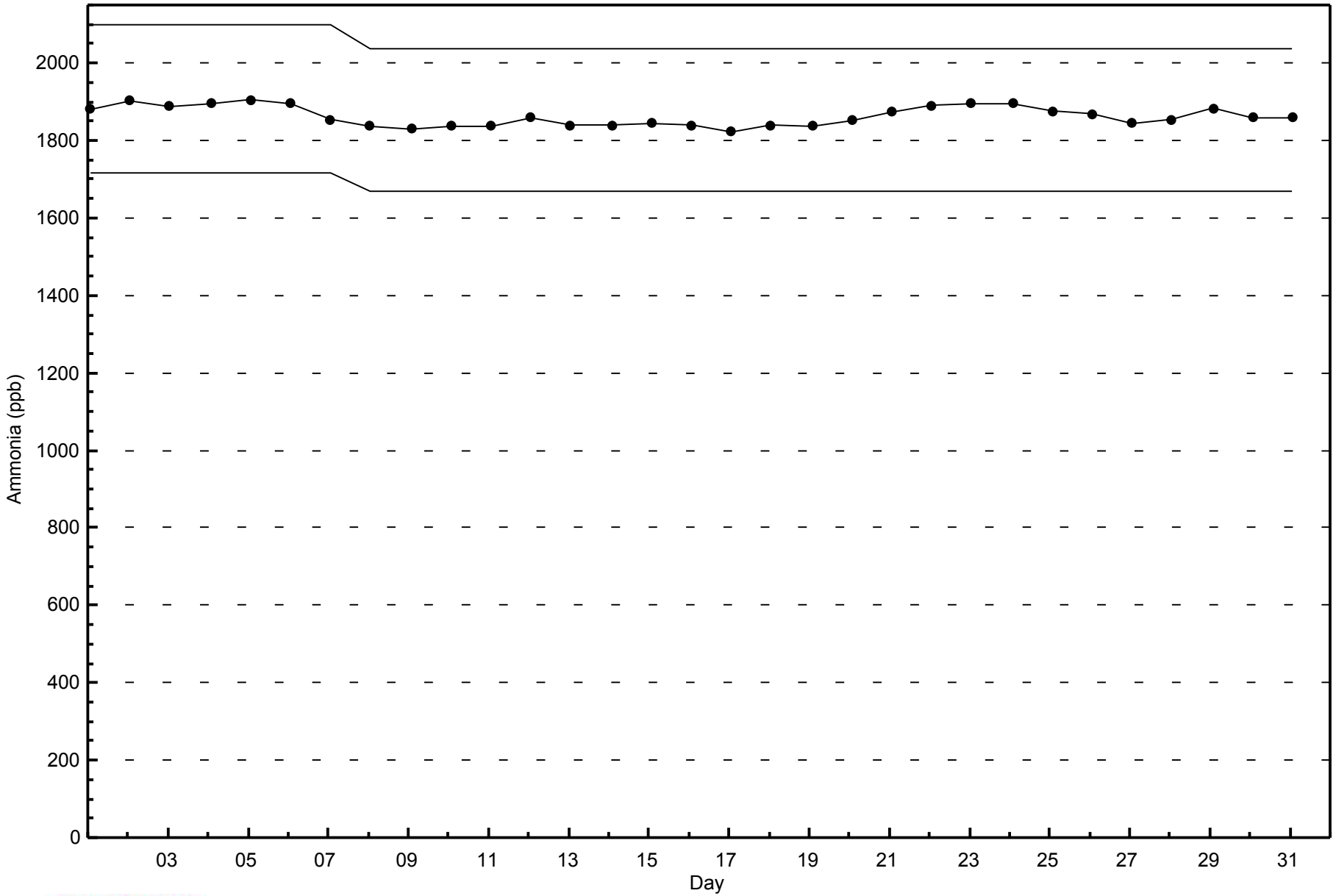
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 32.7 C on Aug 13 17:00

Maximum Daily Average: 25.9 C on Aug 13

Minimum Value: 3.3 C on Aug 22 06:00

Minimum Daily Average: 11.0 C on Aug 22

Maximum Diurnal Average: 24.7 C at hour 17

Minimum Diurnal Average: 12.9 C at hour 6

Monthly Average: 18.97 C

Percentiles: P_1 = 4.7 P_{10} = 11.5 Q_1 = 14.5 Median = 18.4 Q_3 = 23.2 P_{90} = 28.3 P_{99} = 32.0

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

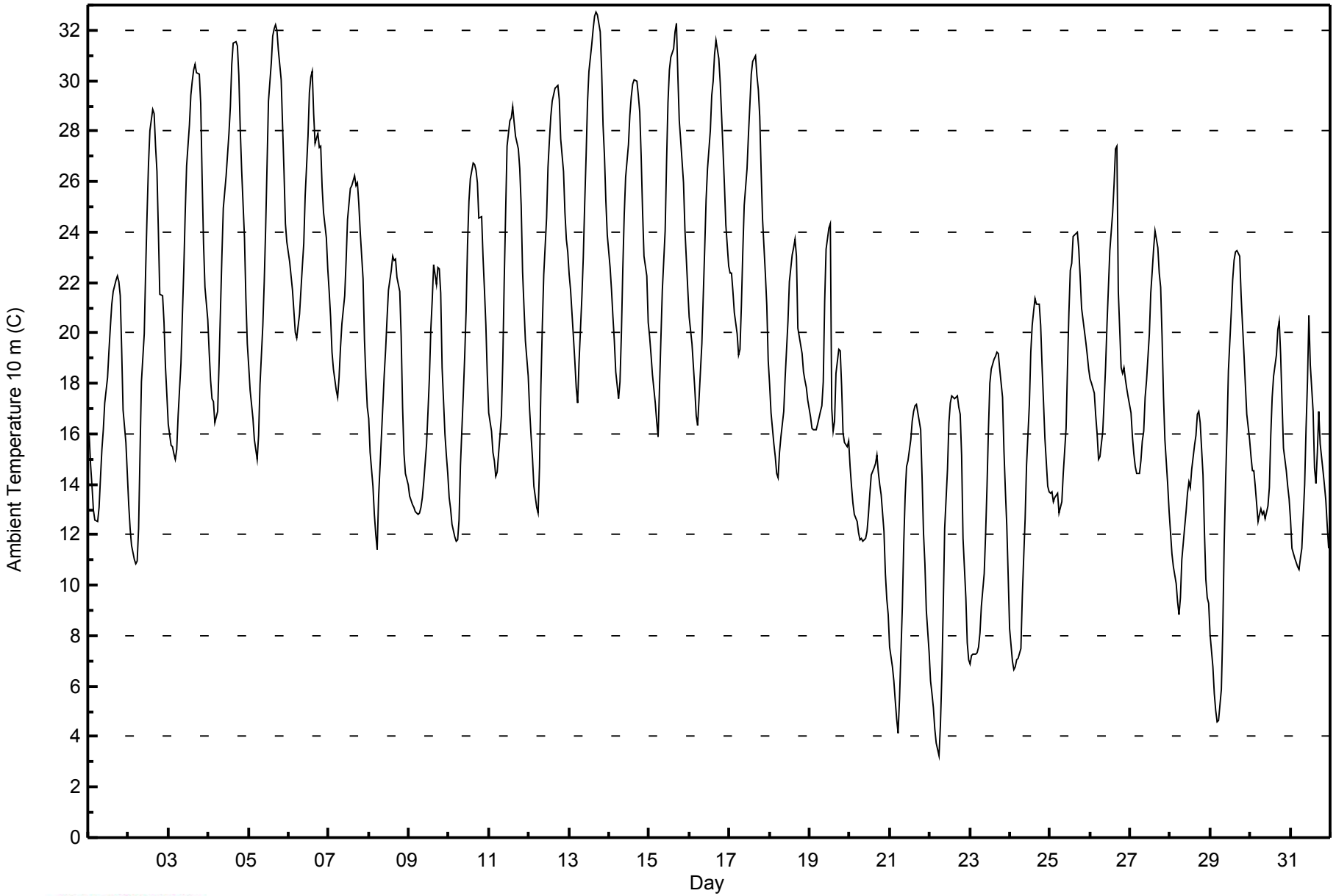
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	15.9	14.8	13.9	13.0	12.6	12.5	13.1	14.3	15.4	16.2	17.2	18.2	19.3	20.2	21.1	21.6	22.1	22.3	22.1	21.5	19.4	17.0	15.7	14.4	17.2	22.3
2-Aug	13.2	12.3	11.6	11.0	10.8	11.0	12.3	15.2	18.1	20.0	22.5	24.7	26.7	28.0	28.8	28.7	27.4	26.4	24.1	21.5	21.5	20.4	18.7	17.5	19.7	28.8
3-Aug	16.4	15.5	15.5	15.2	15.0	15.4	16.7	18.8	20.7	22.5	24.7	26.6	28.3	29.4	30.0	30.4	30.6	30.3	30.3	29.1	26.1	23.5	21.8	20.5	23.1	30.6
4-Aug	19.3	18.1	17.4	17.3	16.5	16.9	18.8	20.9	23.0	24.9	26.2	27.1	27.9	29.0	30.7	31.5	31.5	31.4	30.2	28.1	26.5	23.8	21.4	19.6	24.1	31.5
5-Aug	18.7	17.7	16.6	15.8	15.4	15.0	15.9	17.9	20.3	22.1	24.2	26.7	29.2	30.7	31.8	32.0	32.2	32.0	31.2	30.0	28.2	26.4	24.3	23.6	24.1	32.2
6-Aug	22.8	22.2	21.7	20.8	20.0	19.8	20.8	21.7	22.7	23.5	25.4	27.8	29.5	30.2	30.4	28.7	27.5	27.9	27.4	27.4	25.8	24.8	23.8	22.6	24.8	30.4
7-Aug	21.6	20.6	19.3	18.5	17.7	17.5	18.2	19.4	20.4	21.5	22.9	24.5	25.1	25.7	25.8	26.2	25.8	25.9	25.1	24.0	22.2	19.7	18.2	17.1	21.8	26.2
8-Aug	16.6	15.3	13.9	12.8	12.0	11.4	13.5	15.9	17.1	18.4	19.3	20.6	21.7	22.5	23.1	22.9	22.9	22.2	21.6	19.9	17.1	15.2	14.4	14.0	17.7	23.1
9-Aug	13.5	13.4	13.2	13.1	12.9	12.8	12.9	13.1	13.5	14.1	15.6	16.9	18.2	20.1	21.3	22.7	21.9	22.6	22.5	21.6	18.6	16.0	15.1	14.4	16.7	22.7
10-Aug	13.5	13.1	12.4	11.9	11.7	11.8	12.6	14.7	17.6	19.0	20.9	23.5	25.2	26.1	26.7	26.7	26.4	26.0	24.6	24.6	23.0	21.7	20.3	18.3	19.7	26.7
11-Aug	16.8	16.1	15.2	14.9	14.3	14.5	15.9	16.7	18.9	22.1	24.8	27.4	28.4	28.5	28.9	28.4	27.8	27.3	26.5	25.1	22.4	21.0	19.7	18.3	21.7	28.9
12-Aug	17.0	15.9	15.0	13.9	13.1	12.9	14.7	18.0	20.3	22.3	24.6	26.6	27.7	28.6	29.2	29.7	29.8	29.8	29.2	27.7	26.4	24.8	23.7	23.2	22.7	29.8
13-Aug	22.3	21.7	19.9	18.9	17.8	17.2	18.9	21.4	23.0	25.1	27.0	29.1	30.4	31.4	32.1	32.5	32.7	32.6	32.0	30.4	28.2	27.0	25.2	23.9	25.9	32.7
14-Aug	22.6	21.7	20.6	19.7	18.4	17.4	18.0	20.0	22.5	24.7	26.2	27.5	28.6	29.4	29.8	30.1	30.0	29.4	28.7	27.0	24.8	23.0	22.2	20.4	24.3	30.1
15-Aug	19.9	19.1	18.4	17.2	16.5	15.9	17.8	19.8	21.7	24.1	26.8	29.1	30.4	30.9	31.3	31.9	32.3	30.2	28.4	27.6	26.0	24.1	22.9	21.7	24.3	32.3
16-Aug	20.7	19.6	18.7	17.8	16.7	16.3	17.4	19.6	21.5	23.3	25.3	26.5	28.0	29.4	30.0	31.0	31.6	30.9	29.9	28.6	27.2	25.8	24.3	22.7	24.3	31.6
17-Aug	22.4	22.4	21.6	20.8	19.9	19.1	19.3	21.1	23.2	25.1	26.5	27.9	29.0	30.3	30.8	31.0	30.2	29.6	28.6	26.4	24.5	22.3	21.1	18.9	24.7	31.0
18-Aug	17.9	16.8	15.6	15.1	14.4	14.3	15.3	15.9	16.9	18.2	19.4	20.5	22.1	23.1	23.4	23.7	23.1	20.2	19.8	19.2	18.5	18.1	17.8	17.4	18.6	23.7
19-Aug	16.7	16.2	16.1	16.2	16.2	16.4	16.9	17.1	18.1	21.2	23.4	24.1	24.3	17.0	16.1	16.5	18.4	19.4	19.3	17.9	16.1	15.7	15.5	15.7	17.9	24.3
20-Aug	14.7	13.9	13.2	12.8	12.5	12.1	11.8	11.9	11.8	11.9	12.1	12.8	13.7	14.4	14.7	14.8	15.2	14.5	14.0	13.6	12.1	10.4	9.4	8.8	12.8	15.2
21-Aug	7.6	6.8	6.2	5.4	4.7	4.2	5.5	9.1	11.7	13.5	14.7	14.9	15.8	16.5	16.9	17.1	17.2	16.8	16.1	14.3	12.1	10.9	9.0	7.3	11.4	17.2
22-Aug	6.2	5.7	5.2	4.3	3.7	3.3	4.5	6.4	9.2	12.3	14.6	16.4	17.2	17.5	17.4	17.4	17.5	17.0	16.8	15.2	11.9	9.5	7.7	7.0	11.0	17.5
23-Aug	6.9	7.2	7.3	7.2	7.3	7.5	8.1	9.2	10.5	12.0	14.0	16.1	18.0	18.6	19.0	19.1	19.2	19.2	18.6	17.4	15.3	13.7	12.4	10.3	13.1	19.2
24-Aug	8.3	7.0	6.7	6.8	7.0	7.1	7.5	9.6	11.2	12.6	14.8	17.2	19.3	20.3	20.9	21.4	21.1	21.1	20.3	18.7	17.3	15.8	13.9	13.7	14.1	21.4
25-Aug	13.6	13.7	13.3	13.5	13.7	12.9	13.1	13.3	14.4	16.2	18.6	20.8	22.5	22.7	23.8	24.0	24.0	23.3	22.2	21.0	20.1	19.6	19.2	18.6	18.3	24.0
26-Aug	18.2	18.0	17.6	16.7	16.0	15.0	15.1	16.1	17.4	18.7	20.4	21.8	23.3	24.8	25.9	27.3	27.4	21.6	18.7	18.4	18.6	18.2	17.8	17.5	19.6	27.4
27-Aug	16.9	15.9	15.2	14.7	14.5	14.4	14.9	15.7	16.1	17.4	18.1	19.9	21.6	22.4	23.3	24.1	23.4	22.4	21.8	19.8	17.5	15.8	14.0	12.9	18.0	24.1
28-Aug	12.1	11.2	10.7	10.1	9.3	8.8	9.5	11.0	12.3	12.9	13.7	14.1	13.9	14.6	15.6	16.0	16.8	16.9	16.4	14.4	12.1	10.2	9.5	9.3	12.6	16.9
29-Aug	8.1	6.8	5.7	5.0	4.6	4.6	5.8	8.2	11.6	14.1	16.1	18.5	20.8	22.1	22.9	23.2	23.2	23.0	21.5	20.3	19.2	17.9	16.8	15.8	14.8	23.2
30-Aug	15.1	14.5	14.5	13.9	12.5	12.8	13.0	12.8	12.9	12.6	13.2	13.9	16.0	17.5	18.3	19.2	20.2	20.5	19.1	17.3	15.4	14.6	13.9	13.4	15.3	20.5
31-Aug	12.6	11.5	11.1	10.9	10.7	10.6	11.1	11.5	14.0	16.2	18.1	20.7	18.7	16.9	14.7	14.1	15.3	16.9	15.6	14.5	14.0	13.4	12.4	11.5	14.0	20.7
	15.7	15.0	14.3	13.7	13.2	12.9	13.8	15.4	17.0	18.7	20.4	22.0	23.3	23.8	24.3	24.6	24.7	24.2	23.3	22.0	20.3	18.7	17.5	16.5	Diurnal Average	
	22.8	22.4	21.7	20.8	20.0	19.8	20.8	21.7	23.2	25.1	27.0	29.1	30.4	31.4	32.1	32.5	32.7	32.6	32.0	30.4	28.2	27.0	25.2	23.9	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	53	7.12	7.12
10 - 20	385	51.75	58.87
> 20	306	41.13	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 35.3 C on Aug 15 16:00
Maximum Daily Average: 25.5 C on Aug 13

Minimum Value: 2.0 C on Aug 22 05:00
Minimum Daily Average: 10.5 C on Aug 22
Maximum Diurnal Average: 26.4 C at hour 16
Minimum Diurnal Average: 11.7 C at hour 5
Monthly Average: 18.68 C
Percentiles: P_1 = 3.5 P_{10} = 10.2 Q_1 = 13.6 Median = 17.9 Q_3 = 23.7 P_{90} = 29.1 P_{99} = 34.3

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

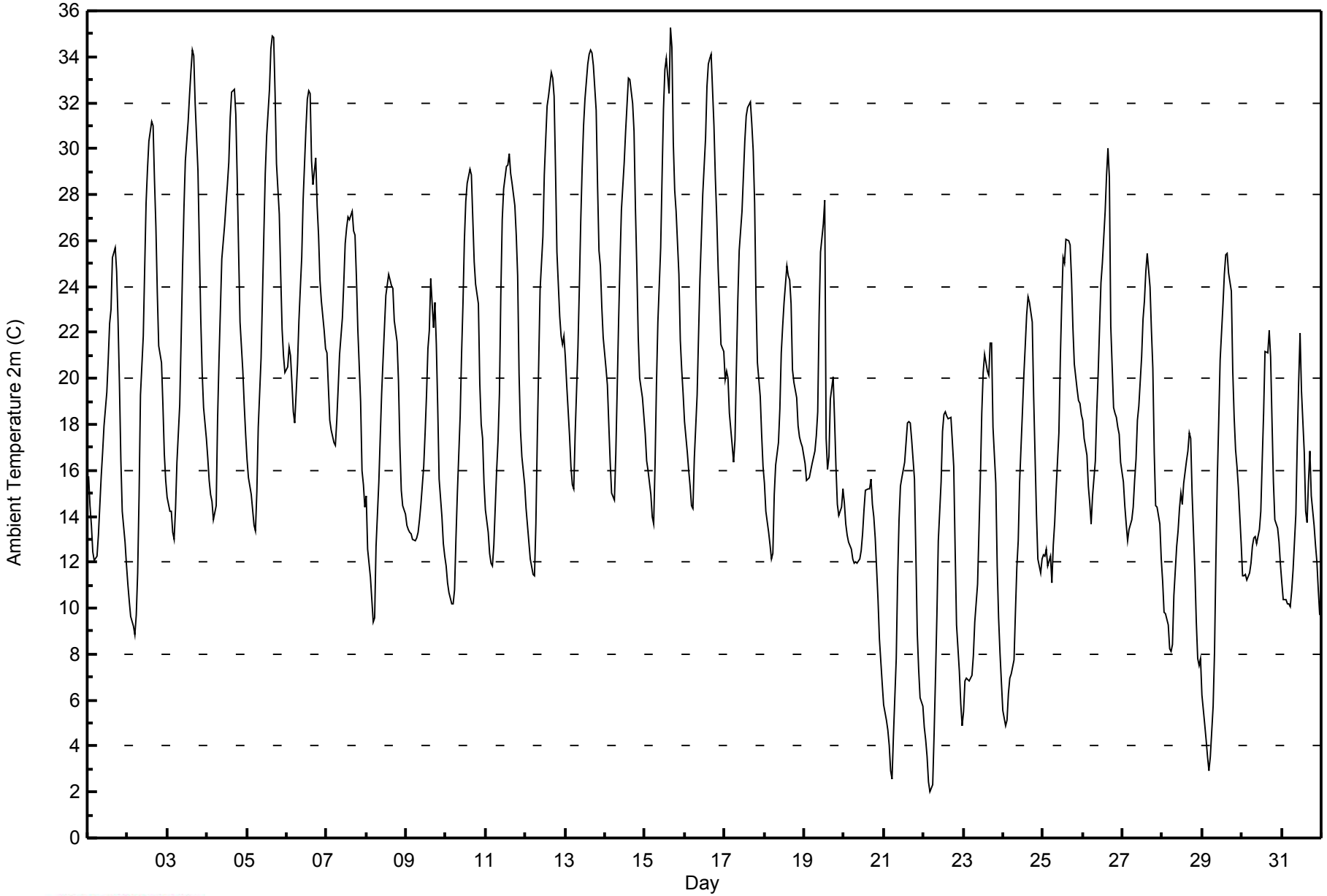
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	15.8	14.4	13.6	12.4	12.1	12.3	13.2	14.5	15.7	16.8	17.9	19.4	20.8	22.4	23.0	25.3	25.7	24.6	22.5	19.8	16.5	14.2	12.9	11.9	17.4	25.7
2-Aug	11.0	10.3	9.6	9.2	8.9	9.7	11.5	14.9	19.3	21.8	24.8	27.7	29.1	30.3	31.2	31.0	28.6	26.6	23.8	21.4	20.7	18.9	16.7	15.6	19.7	31.2
3-Aug	14.8	14.2	14.2	13.3	13.0	14.3	16.3	18.9	21.7	24.8	27.4	29.5	31.2	32.4	33.4	34.3	34.0	32.0	29.0	25.8	22.6	20.2	18.7	17.4	23.1	34.3
4-Aug	16.5	15.6	14.9	14.6	13.9	14.4	18.2	20.8	23.0	25.2	26.7	27.6	28.4	29.4	31.3	32.5	32.6	31.5	28.7	25.5	22.4	20.3	18.9	17.6	22.9	32.6
5-Aug	16.5	15.7	15.0	14.3	13.6	13.4	15.0	17.9	20.9	23.5	26.3	28.9	30.6	32.6	34.3	34.9	34.8	32.4	29.3	27.1	24.5	22.1	21.0	20.2	23.5	34.9
6-Aug	20.5	21.3	21.0	19.8	18.5	18.1	20.6	22.5	23.9	25.3	27.7	30.9	32.1	32.5	32.4	29.5	28.5	29.6	27.5	26.2	24.3	23.4	22.1	21.3	25.0	32.5
7-Aug	21.1	19.6	18.2	17.7	17.2	17.1	18.2	19.6	21.1	22.6	24.2	25.9	26.5	27.1	26.9	27.3	26.4	26.3	24.4	22.1	19.0	16.0	15.4	14.4	21.4	27.3
8-Aug	14.9	12.6	11.4	10.4	9.4	9.6	12.7	15.5	17.4	19.3	20.8	22.2	23.6	24.5	24.3	24.1	23.9	22.5	21.6	19.9	17.1	15.1	14.5	14.1	17.6	24.5
9-Aug	13.6	13.4	13.3	13.2	13.0	12.9	13.1	13.3	13.8	14.6	16.2	17.7	19.3	21.3	22.1	24.3	22.2	23.3	21.5	18.7	15.6	14.0	12.8	12.2	16.5	24.3
10-Aug	11.9	11.1	10.7	10.2	10.2	10.8	13.0	15.0	18.4	21.0	23.3	26.0	27.7	28.5	29.1	28.9	26.9	25.1	24.1	23.3	19.8	18.0	17.4	15.4	19.4	29.1
11-Aug	14.3	13.3	12.4	11.9	11.8	12.8	16.0	17.3	19.3	23.7	26.9	28.2	29.2	29.3	29.8	28.9	28.5	27.5	26.2	24.5	20.2	17.8	16.6	15.4	20.9	29.8
12-Aug	14.3	13.6	12.9	12.2	11.5	11.4	13.7	17.4	20.6	23.8	26.2	28.8	30.4	31.8	32.3	33.3	33.1	32.2	29.1	25.5	22.7	21.9	21.5	21.8	22.6	33.3
13-Aug	20.9	19.7	17.5	16.2	15.4	15.2	17.6	21.4	24.0	26.8	29.2	31.0	32.2	33.7	34.1	34.3	34.1	33.6	31.7	28.3	25.5	24.9	23.1	21.8	25.5	34.3
14-Aug	20.4	19.7	18.0	16.3	15.0	14.7	16.7	19.6	22.5	25.1	27.3	29.4	30.8	31.9	33.1	33.0	32.0	30.7	27.4	24.8	21.8	20.0	19.1	18.3	23.7	33.1
15-Aug	17.6	16.4	16.0	14.9	13.9	13.7	16.3	19.8	22.5	25.7	28.8	31.7	33.4	33.9	32.4	35.3	34.4	30.3	28.2	27.3	24.5	21.7	20.4	19.3	24.1	35.3
16-Aug	18.1	16.8	16.0	15.3	14.5	14.4	16.5	19.3	21.8	24.4	26.1	28.0	30.5	32.7	33.7	33.9	34.1	31.0	28.8	27.0	24.8	23.2	21.5	21.2	23.9	34.1
17-Aug	19.9	20.3	20.0	18.5	17.1	16.3	17.3	20.5	23.3	25.6	27.3	28.8	30.3	31.4	31.8	32.1	31.1	29.9	27.7	23.4	20.7	19.2	17.6	16.2	23.6	32.1
18-Aug	15.5	14.2	13.3	12.8	12.1	12.4	15.0	16.2	17.2	18.7	21.1	22.3	23.3	24.9	24.4	24.3	23.3	20.4	19.8	19.2	17.9	17.4	17.2	17.0	18.3	24.9
19-Aug	16.3	15.5	15.6	15.7	16.0	16.3	16.8	17.5	18.5	22.8	25.5	26.8	27.8	17.4	16.0	16.6	19.1	20.1	18.2	16.2	14.5	14.0	14.4	15.2	18.0	27.8
20-Aug	14.6	13.7	13.2	12.9	12.5	12.2	11.9	12.0	12.0	12.2	12.5	13.3	14.3	15.1	15.2	15.2	15.6	14.5	13.9	13.1	10.4	8.7	7.7	6.7	12.6	15.6
21-Aug	5.8	5.2	4.7	4.0	2.9	2.6	4.4	7.8	11.4	13.9	15.3	15.7	16.4	17.2	18.0	18.1	18.1	17.3	15.6	12.3	8.9	7.3	6.1	5.7	10.6	18.1
22-Aug	4.8	4.3	3.5	2.5	2.0	2.3	4.5	7.0	9.7	12.9	15.5	17.7	18.4	18.6	18.3	18.3	18.3	17.3	16.2	12.5	9.3	7.3	5.9	4.9	10.5	18.6
23-Aug	5.5	6.8	7.0	6.9	6.9	7.1	7.9	9.4	11.1	13.4	15.7	18.5	20.3	21.0	20.3	20.1	21.6	21.6	17.9	15.4	11.8	9.6	8.1	6.8	12.9	21.6
24-Aug	5.6	4.9	5.1	6.3	6.9	7.1	7.7	9.8	11.8	13.0	15.5	18.5	20.1	21.4	22.8	23.6	23.3	22.5	19.2	16.6	14.1	12.2	11.5	12.1	13.8	23.6
25-Aug	12.3	12.2	12.5	11.8	12.2	11.1	12.7	13.7	15.1	17.6	20.8	23.2	25.2	25.0	26.1	26.0	25.8	24.3	22.2	20.6	19.5	19.0	18.9	18.4	18.6	26.1
26-Aug	18.2	17.4	16.6	15.3	14.6	13.6	14.9	16.4	18.5	20.2	22.2	24.2	25.0	27.3	28.9	30.0	28.7	22.3	18.8	18.5	18.3	17.9	17.6	16.3	20.1	30.0
27-Aug	15.5	14.4	13.7	13.0	13.4	13.8	14.4	15.5	16.4	18.2	18.8	20.9	22.6	23.4	24.6	25.4	24.0	22.1	20.5	16.8	14.4	14.4	13.7	12.2	17.6	25.4
28-Aug	11.2	9.8	9.7	9.3	8.3	8.1	8.4	10.5	12.7	13.4	14.3	15.0	14.5	15.4	16.4	16.8	17.6	17.4	15.0	11.6	9.4	7.8	7.5	7.8	12.0	17.6
29-Aug	6.2	5.0	4.3	3.5	2.9	3.6	5.7	8.1	12.2	15.7	18.2	20.8	23.2	24.5	25.4	25.5	24.6	23.8	20.3	18.3	16.9	16.2	15.3	12.8	14.7	25.5
30-Aug	11.4	11.4	11.5	11.2	11.5	11.9	12.7	13.0	13.1	12.8	13.4	14.2	16.4	18.5	21.1	21.1	22.1	20.9	18.1	15.5	13.9	13.5	12.9	11.9	14.8	22.1
31-Aug	11.1	10.4	10.4	10.2	10.2	10.1	10.7	11.7	14.1	17.2	19.8	22.0	19.5	16.8	14.2	13.7	15.5	16.8	14.9	13.6	12.7	12.0	10.8	9.7	13.7	22.0
	14.1	13.3	12.8	12.1	11.7	11.7	13.4	15.4	17.5	19.7	21.8	23.7	24.9	25.6	26.0	26.4	26.1	24.8	22.6	20.3	17.9	16.4	15.4	14.6	Diurnal Average	
	21.1	21.3	21.0	19.8	18.5	18.1	20.6	22.5	24.0	26.8	29.2	31.7	33.4	33.9	34.3	35.3	34.8	33.6	31.7	28.3	25.5	24.9	23.1	21.8	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	72	9.68	9.68
10 - 20	377	50.67	60.35
> 20	295	39.65	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 100 % on Aug 29 07:00

Maximum Daily Average: 86.4 % on Aug 19

Minimum Value: 22 % on Aug 17 15:00

Minimum Daily Average: 48.3 % on Aug 17

Maximum Diurnal Average: 88.7 % at hour 6

Minimum Diurnal Average: 45.2 % at hour 16

Monthly Average: 67.6 %

Percentiles: P_1 = 27 P_{10} = 40 Q_1 = 51 Median = 69 Q_3 = 86 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

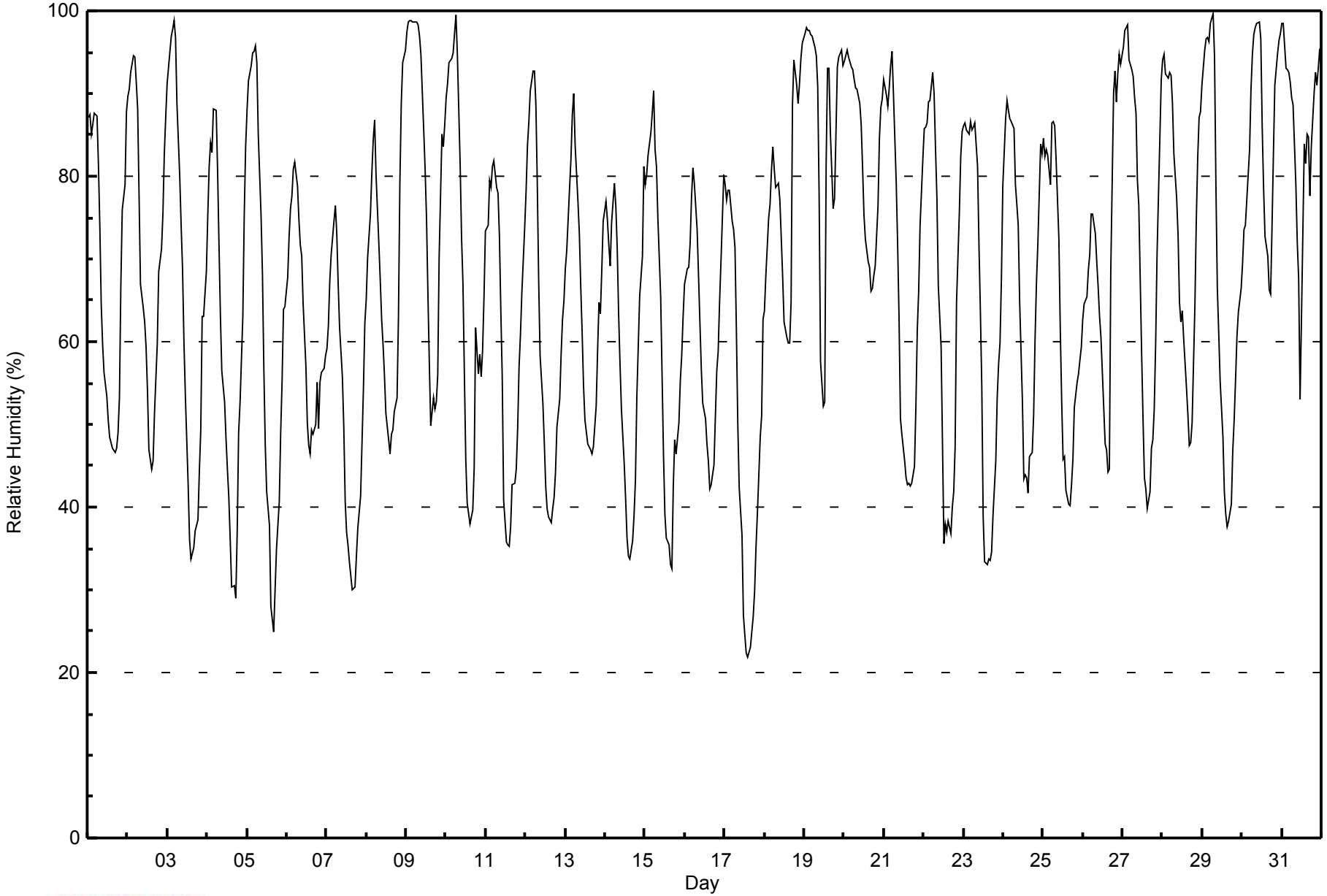
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	87	87	85	86	88	87	82	74	65	60	56	53	51	48	48	47	47	47	49	53	67	76	79	88	67.1	88
2-Aug	90	91	93	95	94	91	88	78	67	64	62	59	54	47	45	46	51	56	60	68	71	75	83	87	71.4	95
3-Aug	91	95	97	98	99	97	89	80	74	69	60	54	43	36	34	34	35	37	39	44	49	63	63	69	64.5	99
4-Aug	75	81	84	83	88	88	81	72	63	56	53	48	45	41	36	30	30	29	37	49	53	63	75	84	60.2	88
5-Aug	88	92	93	95	95	96	94	85	75	68	57	47	42	38	28	26	25	30	35	41	49	55	64	64	61.8	96
6-Aug	68	73	76	78	81	82	79	75	72	70	65	57	50	47	46	49	49	50	55	49	55	56	57	58	62.4	82
7-Aug	59	62	67	71	75	76	73	67	62	56	50	41	37	35	33	30	30	30	34	37	41	48	54	62	51.3	76
8-Aug	65	70	76	80	84	87	80	72	67	63	60	56	51	48	47	49	49	52	53	63	79	89	94	95	67.9	95
9-Aug	97	99	99	99	99	99	99	98	97	95	86	81	75	66	57	50	53	52	53	56	70	85	84	86	80.5	99
10-Aug	89	91	94	94	95	97	100	95	81	72	67	56	46	41	38	39	40	45	62	56	58	56	59	65	68.2	100
11-Aug	73	74	80	79	81	82	79	78	73	64	56	41	36	35	35	38	43	43	45	49	57	61	66	74	60.0	82
12-Aug	78	84	87	90	93	93	89	79	67	58	53	48	43	40	39	38	40	41	44	50	53	59	63	65	62.1	93
13-Aug	69	71	78	82	87	90	84	77	73	67	61	55	51	48	47	47	46	47	52	59	65	63	69	75	65.1	90
14-Aug	77	75	72	69	74	79	76	71	63	57	52	45	41	36	34	34	36	39	43	53	59	66	70	81	58.5	81
15-Aug	79	80	83	85	88	90	83	81	75	65	56	46	39	36	35	33	32	43	48	46	50	55	58	63	60.5	90
16-Aug	67	69	69	72	78	81	79	74	68	62	57	53	51	48	46	42	43	45	51	56	59	65	70	80	61.7	81
17-Aug	79	77	78	78	75	74	71	61	50	42	37	27	25	22	22	23	25	27	30	35	39	48	51	63	48.3	79
18-Aug	64	68	75	77	81	84	81	79	79	77	72	68	62	60	60	60	65	89	94	91	89	91	94	96	77.3	96
19-Aug	97	98	98	98	97	97	96	95	91	78	58	52	53	81	93	93	85	76	77	85	93	94	95	93	86.4	98
20-Aug	94	95	95	94	93	93	92	91	91	89	86	81	75	72	70	69	66	66	68	69	76	85	88	89	82.8	95
21-Aug	92	90	88	91	93	95	90	79	72	63	51	49	46	44	43	43	42	43	45	52	61	66	74	82	66.4	95
22-Aug	86	86	86	89	89	93	90	83	77	67	59	47	36	38	37	38	37	40	42	47	65	76	82	85	65.7	93
23-Aug	86	86	86	85	87	86	86	86	81	72	64	55	39	33	33	34	34	35	39	46	53	57	60	67	62.0	87
24-Aug	79	87	89	88	87	87	86	79	77	74	65	53	43	44	44	42	46	47	51	60	67	72	84	83	68.0	89
25-Aug	85	82	83	82	79	86	87	86	82	72	61	53	46	46	42	40	40	43	46	52	55	56	58	59	63.4	87
26-Aug	63	65	65	69	70	75	75	73	70	67	63	60	56	48	47	44	45	68	90	93	89	92	95	94	69.8	95
27-Aug	96	98	98	98	94	93	92	90	88	80	76	59	51	44	42	40	42	47	48	52	60	70	85	92	72.2	98
28-Aug	94	95	92	92	93	92	89	83	77	73	65	62	64	60	54	51	47	48	50	64	75	82	87	88	74.1	95
29-Aug	91	95	97	97	96	98	100	94	79	66	61	55	49	42	39	38	38	40	47	51	55	61	64	66	67.5	100
30-Aug	69	74	74	77	83	90	95	97	98	99	99	97	86	79	73	70	66	66	74	83	91	95	97	97	84.5	99
31-Aug	98	98	93	93	92	91	90	89	79	72	68	53	63	84	81	85	85	78	84	90	93	91	93	95	84.9	98
	81.5	83.4	84.8	85.9	87.3	88.7	86.2	81.3	75.2	68.9	62.3	55.2	49.8	48.0	46.1	45.2	45.6	48.3	53.0	58.1	64.5	70.1	74.6	78.9	Diurnal Average	
	98	99	99	99	99	99	100	98	98	99	99	97	86	84	93	93	85	89	94	93	93	95	97	97	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 7.4 mm on Aug 19 14:00

Maximum Daily Total: 16.0 mm on Aug 30

Minimum Value: 0.0 mm on Aug 1 01:00

Minimum Daily Total: 0.0 mm on Aug 1

Maximum Diurnal Total: 7.4 mm at hour 14

Minimum Diurnal Total: 0.0 mm at hour 12

Monthly Total: 43.43 mm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 1.0

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

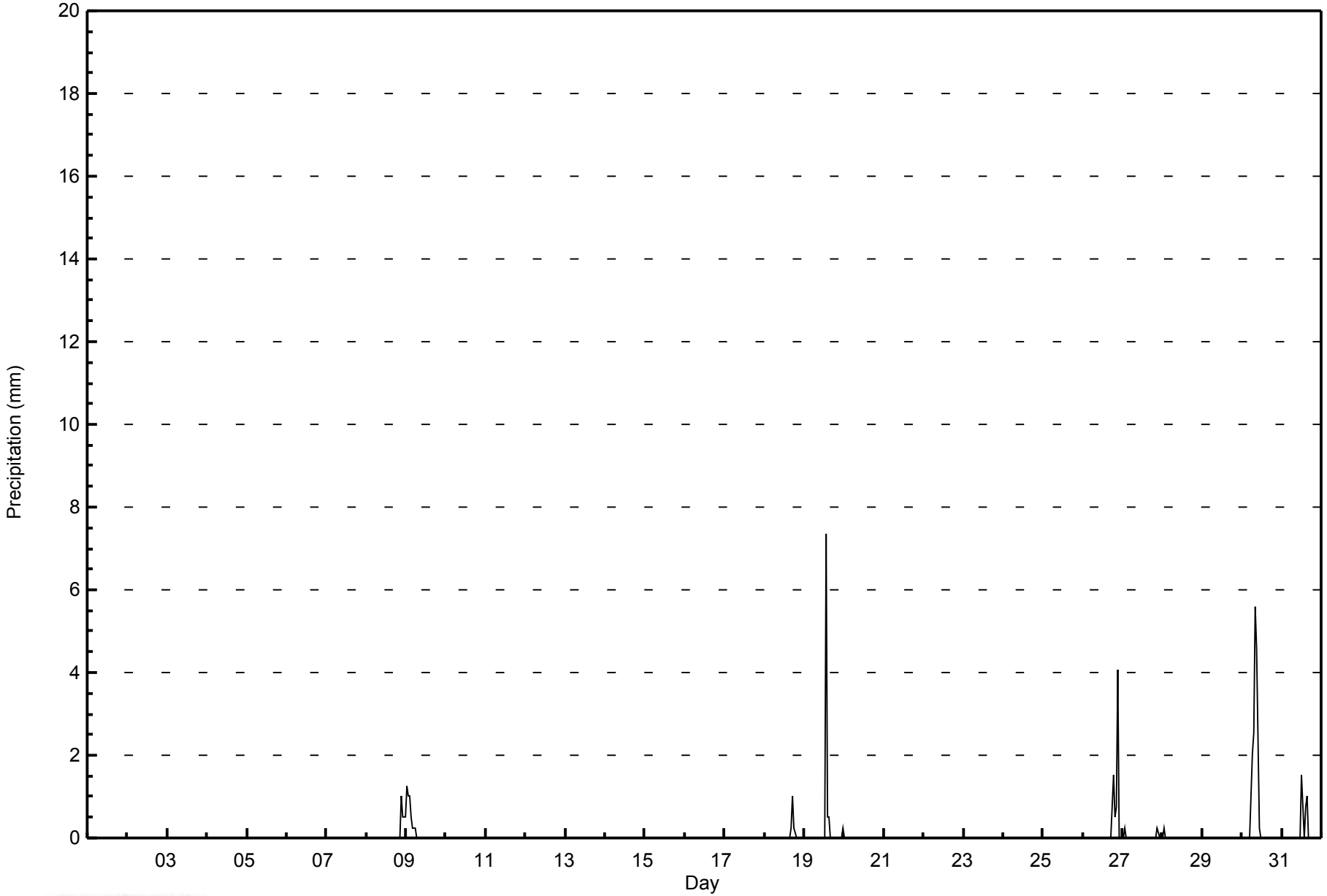
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	0.5	2.0	1.0
9-Aug	1.3	1.0	1.0	0.5	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	4.3	1.3
10-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	0.3	0.0	0.0	0.0	0.0	0.0	1.5	1.0
19-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	8.6	7.4
20-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.5	0.8	4.1	0.0	0.0	6.9	4.1
27-Aug	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	0.3	0.0	0.0	0.5	0.3
28-Aug	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
29-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	1.0	2.0	2.5	5.6	4.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	5.6
31-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.5
	1.3	1.5	1.0	0.5	0.3	1.3	2.0	2.5	5.6	4.6	0.3	0.0	1.5	7.4	1.3	1.5	0.3	1.0	1.8	0.5	0.8	5.3	0.5	0.8	Diurnal Average	
	1.3	1.0	1.0	0.5	0.3	1.0	2.0	2.5	5.6	4.6	0.3	0.0	1.5	7.4	0.8	1.0	0.3	1.0	1.5	0.5	0.8	4.1	0.5	0.5	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	721	96.91	96.91
0.4 - 0.5	6	0.81	97.72
0.6 - 0.7	0	0.00	97.72
0.8 - 1.4	9	1.21	98.92
1.5 - 10	8	1.08	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Summary of Hour Averages

Fort McKay - Bertha Ganter - August 2014

Maximum Value: 482 W/m2 on Aug 1 13:00

Maximum Daily Average: 179.0 W/m2 on Aug 1

Minimum Value: 0 W/m2 on Aug 13 22:00

Minimum Daily Average: 50.5 W/m2 on Aug 20

Maximum Diurnal Average: 368.3 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 23

Monthly Average: 123.5 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 35 $Q_3 = 229$ $P_{90} = 363$ $P_{99} = 450$

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

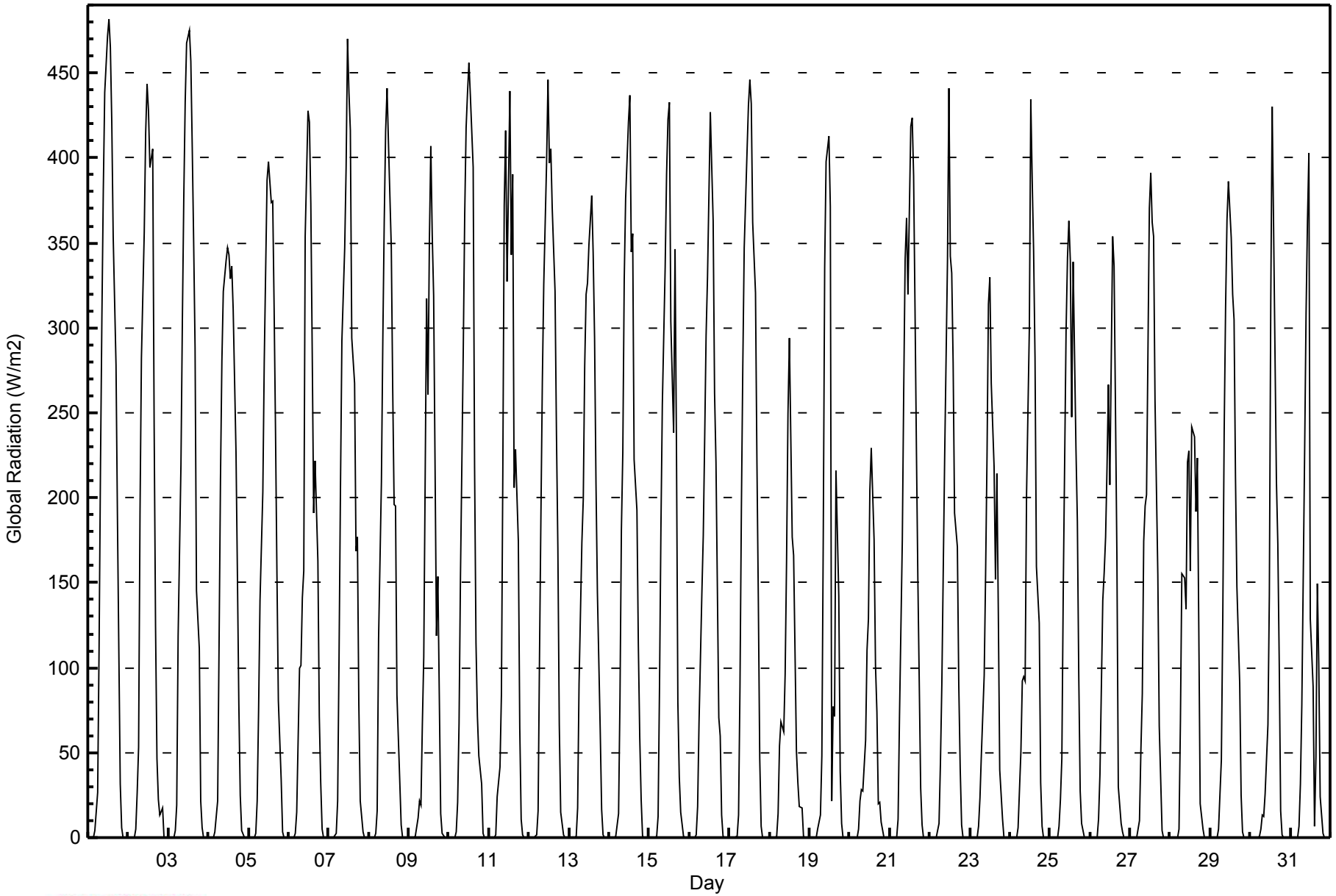
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	0	0	0	4	26	112	218	307	381	439	472	482	465	421	354	279	189	109	31	6	0	0	0	179.0	482
2-Aug	0	0	0	0	5	27	53	191	283	357	415	443	428	394	406	243	125	46	22	14	18	0	0	0	144.5	443
3-Aug	0	0	0	0	4	19	119	220	304	376	433	468	475	457	406	350	288	145	111	22	6	0	0	0	175.1	475
4-Aug	0	0	0	0	4	22	114	211	281	321	339	347	343	329	337	311	227	155	79	25	4	0	0	0	143.6	347
5-Aug	0	0	0	0	2	21	74	140	204	280	333	387	398	374	375	312	238	154	81	34	4	0	0	0	142.1	398
6-Aug	0	0	0	0	2	15	100	101	141	157	353	428	421	373	285	191	222	163	71	33	5	0	0	0	127.6	428
7-Aug	0	0	0	0	2	21	107	206	292	347	395	470	438	416	294	268	168	177	79	21	3	0	0	0	154.4	470
8-Aug	0	0	0	0	2	16	117	209	293	363	416	441	409	347	264	196	195	84	33	8	0	0	0	0	141.4	441
9-Aug	0	0	0	0	0	12	22	19	67	106	317	261	352	407	354	319	118	154	84	14	2	0	0	0	108.6	407
10-Aug	0	0	0	0	3	20	67	154	288	366	418	438	456	437	394	218	114	71	48	32	2	0	0	0	147.0	456
11-Aug	0	0	0	0	1	24	41	84	214	372	416	327	440	343	390	206	228	175	65	11	2	0	0	0	139.1	440
12-Aug	0	0	0	0	1	16	107	190	268	325	397	446	397	406	370	321	237	170	67	15	2	0	0	0	155.7	446
13-Aug	0	0	0	0	1	17	90	174	199	278	319	326	349	378	344	294	208	144	63	17	1	0	0	0	133.5	378
14-Aug	0	0	0	0	1	14	82	181	227	328	376	421	437	344	355	223	193	113	59	23	1	0	0	0	140.8	437
15-Aug	0	0	0	0	1	12	89	182	255	335	390	423	433	304	239	346	231	80	36	15	1	0	0	0	140.5	433
16-Aug	0	0	0	0	1	18	68	143	178	235	296	330	427	395	363	261	221	71	60	13	1	0	0	0	128.4	427
17-Aug	0	0	0	0	1	13	89	194	277	347	404	431	446	432	362	320	222	140	46	7	0	0	0	0	155.5	446
18-Aug	0	0	0	0	0	14	54	68	62	97	163	249	294	177	166	109	50	32	18	18	1	0	0	0	65.5	294
19-Aug	0	0	0	0	0	5	13	48	178	335	398	413	372	21	77	72	216	142	39	8	0	0	0	0	97.4	413
20-Aug	0	0	0	0	0	5	21	28	27	57	110	129	204	229	175	101	74	20	21	9	0	0	0	0	50.5	229
21-Aug	0	0	0	0	0	11	71	176	264	340	365	320	419	424	389	311	227	153	29	8	0	0	0	0	146.1	424
22-Aug	0	0	0	0	0	9	44	91	158	224	340	441	342	332	279	191	171	90	41	8	0	0	0	0	115.0	441
23-Aug	0	0	0	0	0	7	23	49	95	156	224	314	330	267	218	152	214	133	40	11	0	0	0	0	93.0	330
24-Aug	0	0	0	0	0	6	51	92	94	93	202	300	434	387	346	282	159	126	33	7	0	0	0	0	108.8	434
25-Aug	0	0	0	0	0	7	23	47	145	298	342	363	340	248	339	229	186	95	27	8	0	0	0	0	112.3	363
26-Aug	0	0	0	0	0	11	37	139	156	177	217	267	208	354	337	252	166	29	8	4	0	0	0	0	98.4	354
27-Aug	0	0	0	0	0	10	51	84	174	195	202	370	391	362	353	258	155	66	35	4	0	0	0	0	112.9	391
28-Aug	0	0	0	0	0	5	68	155	153	135	221	227	157	242	236	192	224	124	20	5	0	0	0	0	90.1	242
29-Aug	0	0	0	0	0	5	46	129	240	312	364	386	353	320	305	212	148	91	25	4	0	0	0	0	122.5	386
30-Aug	0	0	0	0	0	1	5	13	13	26	67	143	316	430	359	210	173	103	16	2	0	0	0	0	78.2	430
31-Aug	0	0	0	0	0	7	32	78	228	308	363	403	129	89	7	47	150	102	24	3	0	0	0	0	82.0	403
	0.0	0.0	0.0	0.0	1.2	13.4	64.2	129.6	195.6	258.9	323.7	360.8	368.3	338.1	307.9	237.1	188.0	114.1	48.0	13.9	1.9	0.0	0.0	0.0	Diurnal Average	
	0	0	0	0	5	27	119	220	307	381	439	472	482	465	421	354	288	189	111	34	18	0	0	0	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	338	45.43	45.43
21 - 100	100	13.44	58.87
101 - 300	163	21.91	80.78
301 - 600	143	19.22	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 - August 2014

Maximum Speed: 16 km/h on Aug 25 13:00

Maximum Daily Speed Average: 9.2 km/h on Aug 25

Minimum Speed Value: 0 km/h on Aug 8 01:00

Minimum Daily Speed Average: 0.4 km/h on Aug 24

Maximum Diurnal Speed Average: 2.7 km/h at hour 11

Minimum Diurnal Speed Average: 0.4 km/h at hour 19

Monthly Average Velocity: 1.4 km/h 236.3 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 3$ Median = 4 $Q_3 = 7$ $P_{90} = 9$ $P_{99} = 14$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	N10	N8	N9	N7	N8	N8	N8	N7	N8	NNE8	NNE7	NW3	ESE5	ESE6	ESE6	SSE6	SSE6	S7	S6	SE3	WSW3	W2	WSW2	W2	NNE2.4	N10
2-Aug	W3	W3	W4	W3	WNW4	NW3	SW2	S2	SSE8	SSE8	SSE8	SSE11	S9	SSW12	SSW11	SSW12	SSW13	SW6	NNE6	ESE4	W0	N1	WNW3	W3	SSW3.7	SSW13
3-Aug	W3	SW2	SSW4	SSW4	SSW5	SSW4	SW5	SSW4	SSE7	S8	S8	S8	S7	SSE6	SSE8	SSE12	S12	S8	SSE4	WSW3	W3	S1	WSW2	SW2	S4.7	SSE12
4-Aug	SW2	WSW3	SW3	SW3	W1	SSW3	S5	ENE2	E2	NNE4	N6	N6	NNW7	N5	E5	ENE5	E5	ENE3	NNE3	NNE3	N3	WNW4	WNW3	NW4	N1.3	NNW7
5-Aug	NW3	W3	W2	WNW1	WNW2	WSW2	NW2	NW2	SSW2	SSE5	S8	S6	SSE2	S5	S10	SSE8	S7	S5	SSE3	SE2	SSW4	SSW4	S4	SSW5	SSW3.2	S10
6-Aug	SSW7	SSW8	SSW8	SSW6	SSW5	SSW5	S6	S8	S8	SSE7	SSE8	S12	SSW12	SW11	SW11	WSW4	NE4	SSE5	S6	SW6	SW6	WSW6	W5	W5	SSW5.9	S12
7-Aug	WNW7	WNW6	WNW5	WNW7	WNW6	W6	WNW8	WNW10	WNW9	WSW9	WSW10	W11	WNW14	WNW13	WNW14	WNW13	WNW10	NW11	WNW6	WNW4	WNW3	NW6	NNW5	NW3	WNW7.8	WNW14
8-Aug	NW0	W2	WNW4	N3	WNW3	WNW4	NW3	ESE3	ESE4	ESE5	ESE6	E6	E6	ESE6	E3	E6	ENE7	NE5	NNE6	N9	NNW8	N6	N4	N3	NE2.1	N9
9-Aug	NNW5	NNW5	N5	N4	N5	NW5	NW5	NW4	NW4	NNW3	N4	NNW4	WNW4	W5	NNW5	NW6	WSW3	NW5	NW5	NW4	W4	SW2	NNW2	SW4	NW3.6	NW6
10-Aug	SSW3	WSW2	WSW2	W2	WSW3	SW3	SSW3	S5	SSE7	SSE9	SSE10	S9	S8	S7	SSW6	SSW7	SW4	SSW2	S3	SSW4	SW4	W4	WSW3	WSW2	SSW4.0	SSE10
11-Aug	S4	S4	S4	S5	SSW4	SSW5	SSW5	SSW5	S5	SSE8	SSE7	NNW9	NW14	NW14	NW14	NW11	NNE9	NNE8	NNE8	NNE6	NNW4	NNW3	NNW1	WNW3	NW2.1	NW14
12-Aug	NW4	NW3	NW4	WNW3	WNW3	W2	NNW2	ESE1	SSE4	SSE6	S5	SSE6	S8	S9	S10	S10	S9	S11	SSE7	SE4	SSE3	SSE5	S6	S7	S4.1	S11
13-Aug	S6	SSW6	N2	NW1	NW2	NNW3	NNW2	S4	S7	SSE8	S7	SSW8	SW10	SW10	SW10	WSW8	WSW7	SW7	SSW5	SW3	NW6	NW6	NW2	SW3	SW3.8	SW10
14-Aug	WNW5	NW6	NNW4	NNW4	NW3	WNW3	NW4	NW4	N3	SE1	SE4	SE6	SE6	SSE6	SSE8	SSE6	SSW6	S6	SSW3	SW2	W2	W2	WSW3	SSW3	SSW1.1	SSE8
15-Aug	SSW3	WSW3	SW2	WSW3	WSW1	SW3	SSW4	SSE5	SSE6	SE6	SSE6	SSE7	SSE8	SSE7	SE4	SSE7	E5	N7	N8	N7	N5	NW2	NNW5	NW3	SSE1.2	N8
16-Aug	NW3	NNW5	NNW2	W3	WNW3	WNW3	WNW3	WNW1	SE1	SSE2	E1	SSW2	S5	S10	SSE9	SSW6	SW5	SW4	SW3	SW4	SW3	SW2	WSW2	SSE2	SW2.1	S10
17-Aug	WNW2	WNW4	WNW5	W2	WNW5	WNW2	NW3	NNW6	NW7	WNW2	N2	NNW8	NW9	NW12	NW15	NNW15	NNW14	NNW12	NNW7	WNW4	WNW5	WNW2	WSW2	SW2	NW5.8	NW15
18-Aug	WNW2	W2	SW2	WSW2	SW2	WSW3	SSW2	N4	NE1	SE3	S6	SSW3	W1	SW3	WNW4	N3	N3	SSW2	NW2	N5	N5	NNW3	WNW3	WNW4	WNW1.1	S6
19-Aug	NW3	WNW3	SSW2	SSW4	SSW4	SW5	SSW3	S4	S5	S9	SSW11	S12	S12	NW14	NW8	NNW2	ESE4	E4	N3	NW4	NNW5	NNW5	NW4	N5	SW1.8	NW14
20-Aug	NNE5	N6	N8	N7	N9	NNE10	NNE7	NNE6	NNE7	NNE8	NNE7	NNE7	N8	N8	N9	NNE5	NNE4	N7	N4	NNW4	NW4	NW5	NW4	NW3	N6.1	NNE10
21-Aug	NW4	WNW4	NW3	WNW2	W2	WNW1	NW4	NNW1	NNE2	N7	NNE7	N6	NNE7	NNE8	NE6	NNE7	NNE7	NNE8	N6	N5	NNW5	NW3	WNW5	WNW4	N3.8	NNE8
22-Aug	WNW2	WNW2	W1	WNW1	NW3	W1	WNW1	W2	WNW1	N2	ENE2	E4	ENE6	NE5	N6	NNE5	NNE4	NNE3	NNE4	NNW3	W4	W3	W2	W2	N1.6	ENE6
23-Aug	WNW3	WSW2	W2	NW3	W2	WNW2	W2	SSW0	SE2	SE3	S4	SSE6	SE5	S6	S4	SSE4	SSE10	SSE8	ESE1	NNE2	N2	WSW2	WNW3	N4	S1.6	SSE10
24-Aug	WNW3	WNW3	WNW3	NW3	NW2	WNW3	NW3	NW3	NW1	N2	ENE1	ESE2	ENE5	E3	SSE3	SSE3	SE5	ESE4	E1	AF	SW3	SSW4	S3	S5	SSW0.4	ENE5
25-Aug	S4	S5	ESE2	S3	S5	SSE3	S7	SSW9	S10	S11	SSE11	SSE13	S16	S14	S15	SSW14	SSW15	SSW12	SSW10	S9	S9	S9	S11	S10	S9.2	S16
26-Aug	S9	SSW6	SSW5	SSW7	SSW6	SSW6	SSW5	SSW6	SSW7	SSW7	SSE7	S7	SW8	S8	SSE10	S10	SW13	N11	SSE0	S6	SW5	WNW4	SSW5	SSW3	SSW5.4	SW13
27-Aug	WNW2	WSW1	SW2	SSW2	SW5	W5	WNW6	W4	WNW7	W6	W6	WNW7	WNW6	WNW6	WSW7	W6	NW6	NW5	NNW5	NNW5	W3	NW8	W3	SSW3	WNW4.3	NW8
28-Aug	SW2	W3	WNW5	NW5	WNW6	NW7	NW4	WNW6	NW7	NNW7	NNW10	NNW9	N8	NNW8	NNW9	NW7	N5	NE3	ESE2	W1	W3	NW3	W3	SW3	NW4.4	NNW10
29-Aug	NW1	W3	WSW3	WSW3	W4	WSW3	SSW4	SSW5	SSE10	SSE11	SSE10	SSE9	S11	S12	SSE12	SSE11	SSE9	SSE9	S4	S5	S5	SSE6	SSE5	S3	S5.8	S12
30-Aug	SSW4	S4	S4	W3	NW1	SSW3	S3	S3	W3	NW4	NW4	WNW5	NNW2	E2	SSE8	SE4	SE4	ESE3	ENE3	NW2	NNW4	NNW4	NW4	WNW1	SW0.6	SSE8
31-Aug	SSW2	SW3	W4	SSW2	SSW4	SSW4	SW3	SW3	WSW2	S4	SSE7	SSW3	WNW4	N4	NNW7	SW4	W4	NW5	WNW3	SW0	SW1	SSW2	S3	SW1	WSW1.9	NNW7
	W1.7	W2.1	W1.9	W1.7	W2.2	W2.1	W1.9	WSW1.5	SSW1.6	SSE2.3	SSE2.7	S2.2	SSW2.0	SW2.0	SSW2.1	SSW2.2	SSW1.8	SW0.4	N0.4	WNW0.9	W2.1	W2.1	W1.9	WSW1.9	Diurnal Average	
	N10	SSW8	N9	N7	N9	NNE10	N8	WNW10	S10	S11	SSE11	SSE13	S16	NW14	NW15	NNW15	SSW15	SSW12	SSW10	S9	S9	S9	S11	S10	Diurnal Maximum	

AF - Analyzer Failure

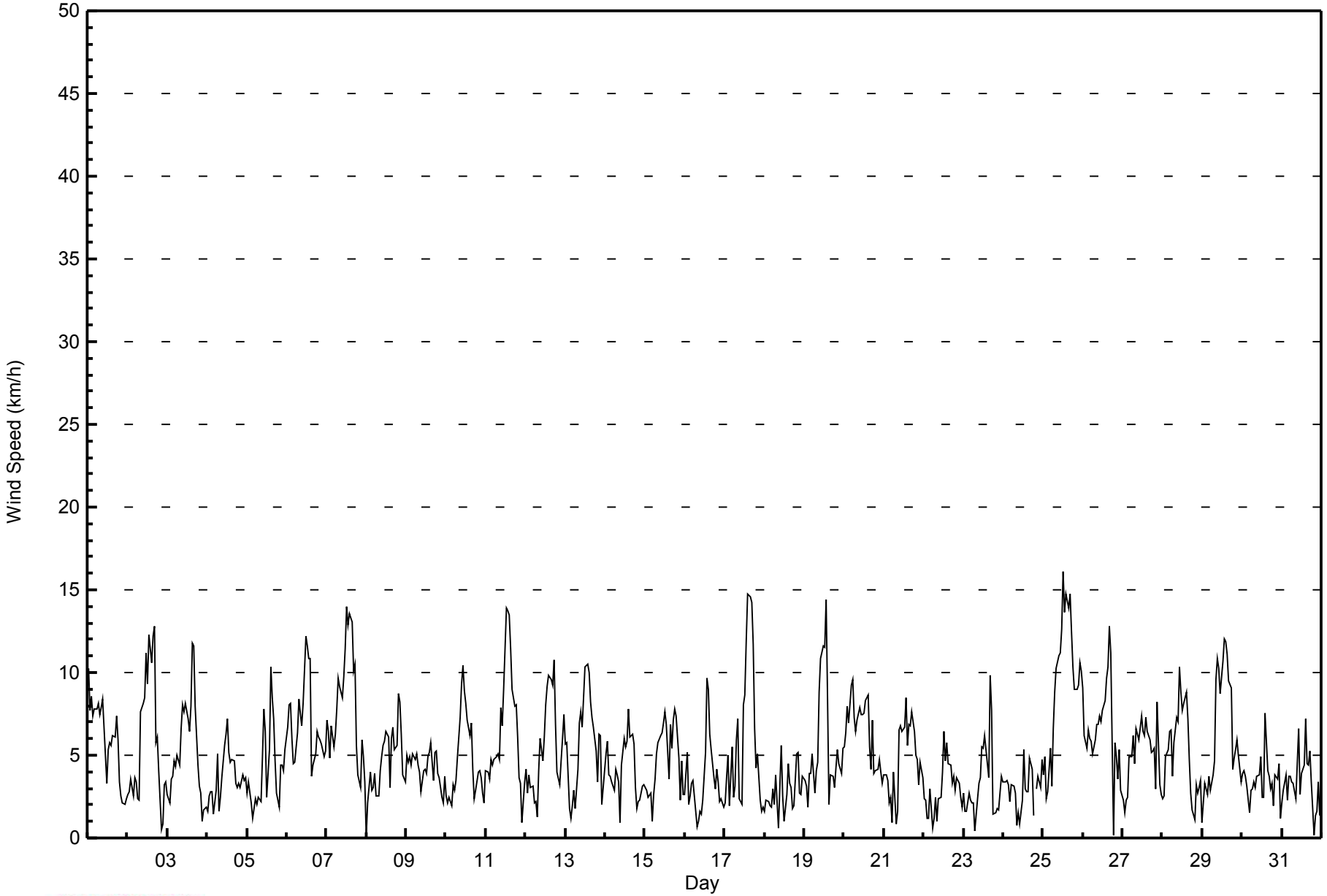
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	466	62.72	62.72
6 - 11	245	32.97	95.69
12 - 19	32	4.31	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - August 2014

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	13	5	7	11	13	14	17	35	53	40	28	51	61	59	31	466
6 - 11	30	21	1	2	3	4	3	47	49	21	10	6	5	16	15	12	245
12 - 19	0	0	0	0	0	0	0	3	8	7	1	0	0	4	6	3	32
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	58	34	6	9	14	17	17	67	92	81	51	34	56	81	80	46	743

Total Number of Valid Hours: 743

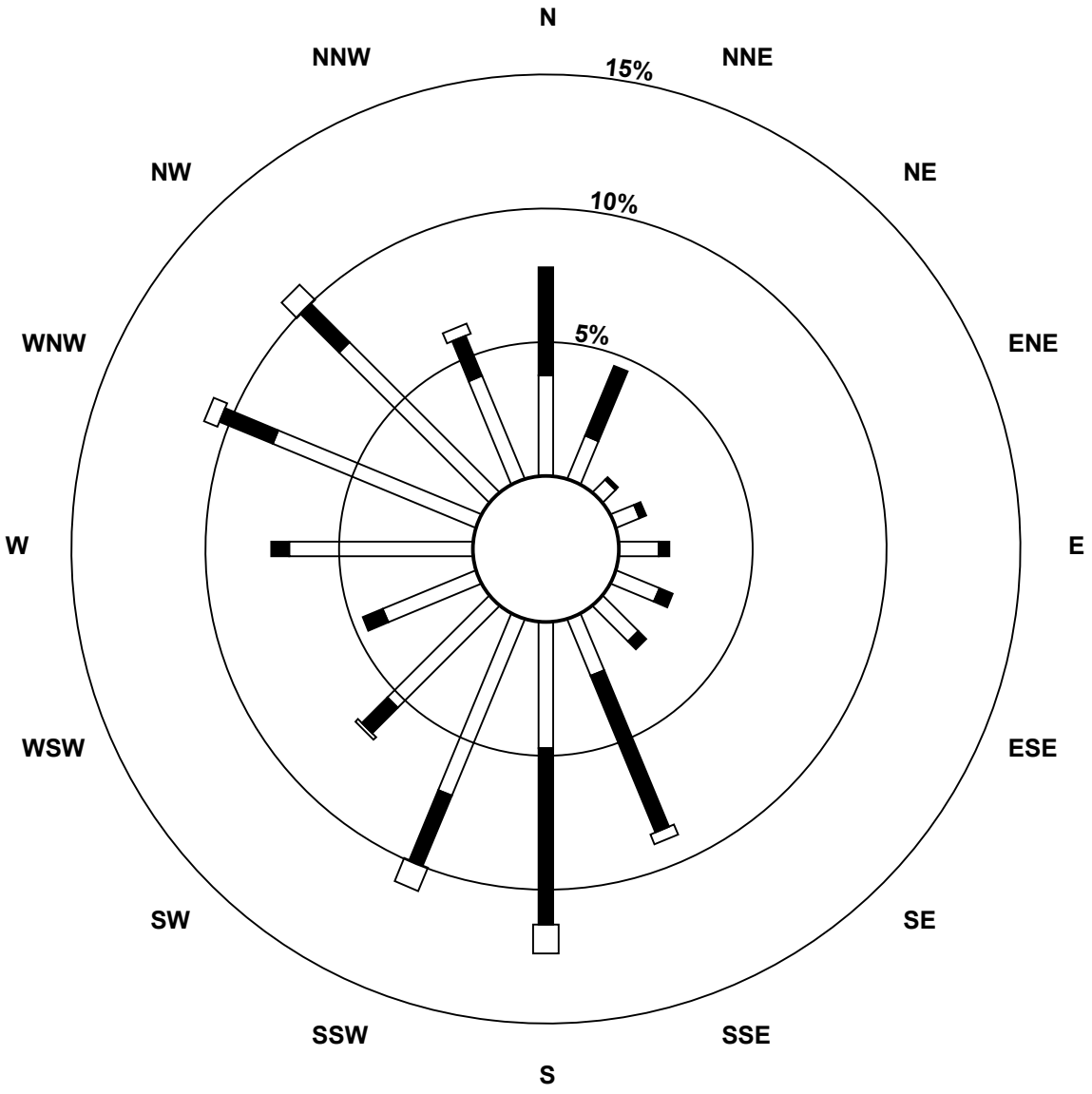
Total Number of Hours: 744

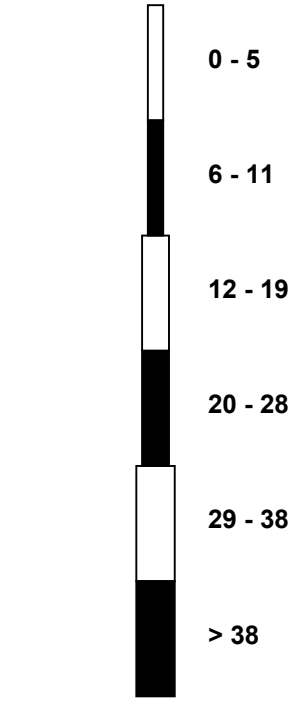
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter (AMS 1)





Total Number of Valid Hours: 743

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 10 19:00

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

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

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - August 2014

Direction of Maximum Speed: 172 deg on Aug 25 13:00
Direction of Maximum Daily Speed Average: 182.1 deg on Aug 25

Direction of Minimum Speed: 316 deg on Aug 8 01:00

Direction of Minimum Daily Speed Average: 0.4 deg on Aug 24

Monthly Average Direction: 267.3 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	2	3	5	356	360	3	2	2	10	12	25	326	108	117	111	158	160	175	172	135	253	263	253	261	21.0
2-Aug	280	279	274	273	297	305	225	170	167	149	157	167	184	192	200	196	210	219	31	110	276	352	296	272	197.8
3-Aug	259	233	195	199	207	212	221	201	148	174	179	182	189	150	147	158	170	177	149	241	270	177	243	232	182.2
4-Aug	235	241	226	221	262	206	186	74	89	28	10	3	345	356	79	72	87	70	21	29	6	294	288	308	8.3
5-Aug	317	276	278	287	284	252	309	307	200	154	178	175	164	189	188	168	175	176	155	127	196	213	191	204	192.8
6-Aug	195	194	196	198	200	195	180	179	190	165	168	173	206	220	229	253	36	166	174	224	230	238	269	260	200.7
7-Aug	290	302	288	299	283	278	282	284	285	255	257	279	296	294	302	299	296	306	302	295	287	304	331	310	290.9
8-Aug	316	279	292	355	291	299	313	106	122	120	107	100	98	105	89	94	73	56	32	355	328	354	351	349	43.2
9-Aug	344	348	355	359	351	326	310	310	305	328	2	333	291	277	337	307	252	308	310	319	278	229	331	228	317.2
10-Aug	202	250	246	266	249	215	198	185	165	155	154	173	187	182	199	202	228	210	180	203	234	277	246	246	195.0
11-Aug	178	188	179	187	205	199	201	211	177	150	160	328	320	321	323	323	13	19	14	18	333	340	330	285	312.8
12-Aug	307	314	304	290	284	279	343	121	166	167	182	164	176	173	185	176	169	169	167	146	164	168	182	177	180.7
13-Aug	176	201	2	326	306	334	344	183	181	163	171	207	221	220	221	244	250	229	203	223	313	324	307	235	222.8
14-Aug	297	308	330	333	320	287	310	309	359	136	127	134	129	147	151	148	192	184	195	218	270	276	237	213	209.2
15-Aug	213	240	234	239	237	235	209	161	150	142	156	155	155	159	126	153	98	1	4	10	356	318	330	324	151.7
16-Aug	304	329	329	280	286	293	295	285	127	154	86	196	177	179	162	195	220	229	222	227	235	222	253	167	218.1
17-Aug	289	288	303	276	300	301	313	328	315	289	5	332	311	316	325	330	330	327	330	299	300	288	252	219	316.7
18-Aug	301	267	236	242	226	240	204	2	46	124	173	212	269	228	303	6	360	210	317	7	352	346	284	295	293.3
19-Aug	307	293	208	197	212	220	192	190	181	175	193	176	175	309	311	329	123	85	8	305	340	338	306	8	233.4
20-Aug	12	8	5	1	3	12	15	33	17	12	24	15	7	0	10	14	15	359	358	338	310	307	321	322	4.3
21-Aug	312	303	313	292	267	282	313	339	31	3	12	353	31	16	52	23	26	20	10	352	347	319	303	301	355.9
22-Aug	290	302	277	301	317	273	290	281	285	3	65	99	72	44	354	32	29	19	17	336	262	278	280	277	353.7
23-Aug	296	254	277	309	269	282	270	213	135	143	171	162	140	169	180	151	168	162	118	27	353	253	282	350	181.1
24-Aug	303	293	287	305	308	298	306	318	319	11	60	118	73	84	151	164	145	104	89	AF	214	201	169	187	200.3
25-Aug	170	181	121	176	188	157	181	194	181	180	168	165	172	174	189	196	196	201	192	180	181	183	181	184	182.1
26-Aug	187	200	206	193	193	200	204	198	199	196	168	174	217	172	161	183	225	350	163	191	226	285	195	204	197.3
27-Aug	283	245	228	201	222	277	295	268	283	270	279	296	282	285	241	268	324	324	336	331	277	309	263	212	282.2
28-Aug	223	279	299	305	302	308	320	302	316	331	335	332	350	329	339	320	360	38	120	269	274	310	272	232	318.9
29-Aug	317	266	250	250	263	255	211	192	165	163	161	157	169	169	166	165	165	160	169	185	180	166	163	177	174.8
30-Aug	202	174	178	276	312	213	191	183	275	322	310	302	348	95	150	143	142	121	63	324	340	331	317	286	233.2
31-Aug	204	235	274	205	208	203	216	235	240	177	152	199	292	353	327	214	276	325	287	234	220	212	183	223	239.4
	270.2	270.5	278.3	273.1	274.1	269.0	260.7	236.4	195.0	165.1	162.8	186.8	199.3	216.3	213.7	203.2	196.0	227.5	4.0	301.3	280.3	279.4	258.9	244.7	
	Diurnal Average																								

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

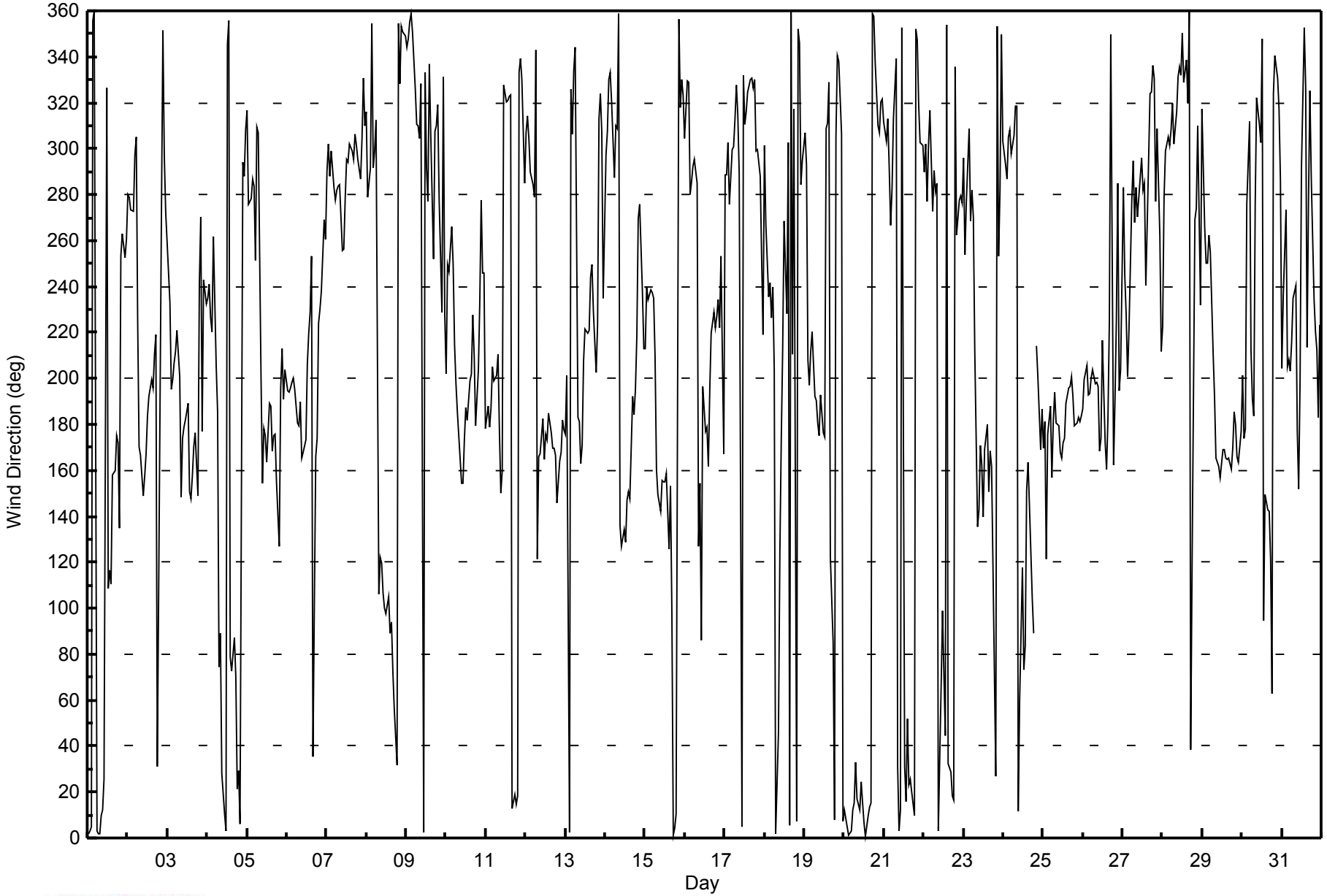
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 103 deg on Aug 18 13:00

Minimum Value: 9 deg on Aug 21 21:00

Percentiles: P_1 = 11 P_{10} = 17 Q_1 = 22 Median = 33 Q_3 = 48 P_{90} = 63 P_{99} = 95

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	26	26	27	22	25	25	29	34	39	46	58	97	59	49	51	42	38	22	21	20	28	32	32	45	97
2-Aug	27	26	17	27	34	46	45	95	21	20	20	18	40	24	33	25	24	55	50	63	90	91	37	22	95
3-Aug	45	73	36	28	17	17	25	33	18	19	24	22	39	29	21	18	19	20	55	38	48	63	34	44	73
4-Aug	32	39	49	52	48	33	22	77	79	57	40	33	28	59	65	43	33	37	28	27	41	36	35	33	79
5-Aug	27	28	40	43	59	37	26	39	59	22	25	30	76	48	20	22	17	17	18	38	23	11	23	17	76
6-Aug	17	14	16	16	15	14	22	22	21	21	23	22	29	37	42	78	62	23	22	23	27	34	41	51	78
7-Aug	38	30	44	27	44	41	46	46	50	49	50	49	41	46	33	37	36	27	35	29	15	13	19	47	50
8-Aug	97	74	21	39	35	17	52	92	58	48	57	59	49	43	75	35	42	45	42	29	26	28	31	27	97
9-Aug	19	24	24	27	22	20	18	24	35	35	53	44	54	61	57	54	41	48	20	21	19	25	58	32	61
10-Aug	44	63	30	48	13	30	20	19	24	21	16	26	43	46	58	36	33	33	15	14	19	28	43	42	63
11-Aug	21	13	16	13	15	17	16	21	38	32	26	71	26	26	29	27	40	40	36	34	24	11	60	20	71
12-Aug	25	55	26	32	19	32	26	80	33	26	41	32	26	25	23	24	18	19	15	19	15	14	14	15	80
13-Aug	16	15	58	57	30	13	22	54	21	22	28	33	32	41	38	49	50	36	15	21	15	27	66	39	66
14-Aug	17	20	37	29	26	17	15	26	45	102	51	40	55	40	19	19	21	19	38	50	61	54	46	37	102
15-Aug	21	31	26	22	66	20	27	25	20	29	21	24	24	29	78	23	36	39	28	28	23	63	10	60	78
16-Aug	25	12	39	16	15	13	21	66	89	82	94	84	51	24	24	39	49	55	33	14	21	55	44	75	94
17-Aug	76	33	18	64	11	54	35	30	25	85	96	54	46	34	27	29	25	23	17	12	12	73	59	32	96
18-Aug	50	56	47	55	33	19	59	24	81	59	31	69	103	72	50	38	47	69	49	25	22	53	33	24	103
19-Aug	23	18	50	24	23	22	61	26	28	26	25	27	44	26	20	87	49	45	39	15	16	19	35	42	87
20-Aug	39	30	31	31	29	35	41	46	38	35	41	41	40	33	34	42	48	27	32	21	11	16	37	27	48
21-Aug	22	19	28	31	22	66	16	83	90	44	54	50	56	46	63	52	50	44	34	25	9	33	9	17	90
22-Aug	40	28	65	59	17	60	50	45	88	81	81	73	51	72	56	58	51	40	40	36	26	47	48	56	88
23-Aug	43	56	64	44	45	35	39	87	42	30	44	31	40	35	51	80	23	17	58	64	60	71	36	26	87
24-Aug	27	25	26	27	23	20	28	48	100	80	91	85	53	88	75	80	58	29	42	AF	18	14	30	30	100
25-Aug	20	20	41	57	22	22	19	18	19	19	20	19	19	20	27	22	23	21	16	14	13	15	16	16	57
26-Aug	18	16	17	13	19	14	17	26	26	26	22	22	29	34	20	29	36	36	88	40	45	94	39	36	94
27-Aug	28	40	29	35	34	57	32	44	42	42	46	41	53	49	51	56	32	18	15	11	28	46	71	56	71
28-Aug	43	42	29	29	18	19	49	33	30	31	28	29	30	34	32	36	56	61	43	71	29	50	19	22	71
29-Aug	68	11	17	24	15	26	26	27	18	17	22	22	22	20	21	18	18	16	17	18	13	14	16	18	68
30-Aug	13	12	16	39	51	57	53	26	44	33	37	34	71	92	27	54	53	41	37	62	30	46	20	82	92
31-Aug	67	43	49	60	24	25	27	55	78	44	19	92	68	62	27	49	44	37	38	91	85	69	27	57	92
	97	74	65	64	66	66	61	95	100	102	96	97	103	92	78	87	62	69	88	91	90	94	71	82	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	11:15	End Time (MST)	15:35
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11571008
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		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	731	732
Calculated slope	1.002912	0.998650	Chamber temp.	43.0	42.9
Calculated intercept	0.820160	1.070742	Pressure (mmHg)	708.0	708.0
Analyzer Background	37.8	38.9	Flow (lpm)	0.495	0.495
Analyzer Coefficient	0.754	0.754	Intensity		

Analyzer make	Thermo 43C	Analyzer serial #	50911

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	752.4	1.004
calibrator zero	5500	0.0	0.0	-0.5	NA
high point	5500	81.5	755.7	756.0	1.000
second point	5500	45.7	423.8	423.0	1.002
third point	5500	22.8	211.4	210.0	1.007
calibrator zero	5500	0.0	0.0	-0.5	NA
as left zero	5500	0.0	0.0	-0.6	NA
as left span	5500	81.5	755.7	756.6	0.999
				Average Correction Factor	1.003

Corrected As found	752.4	Previous response	752.7	% change	0.05%

Notes:

zero adjustelight slightly.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

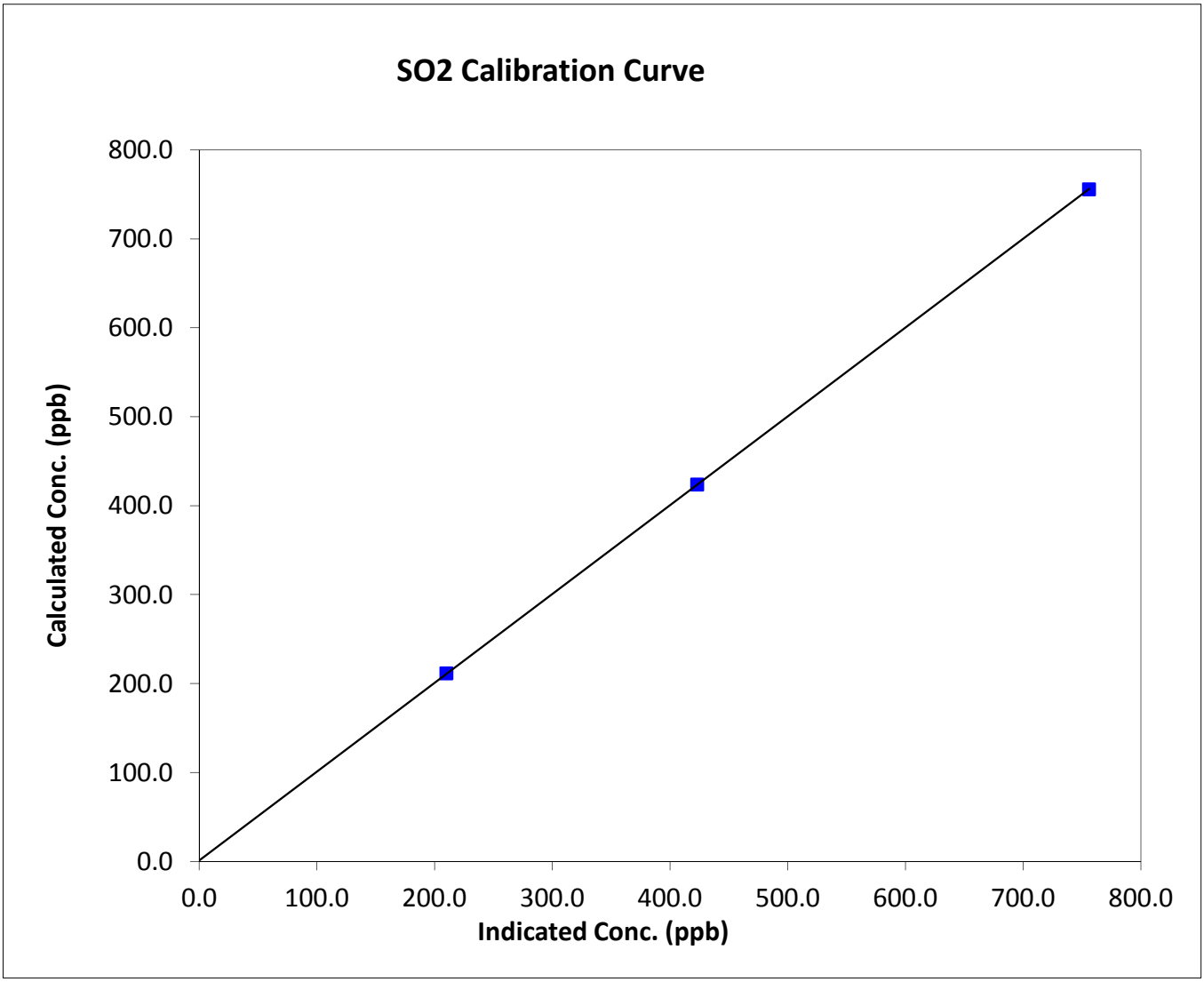
SO_2 Calibration Summary

Station Information

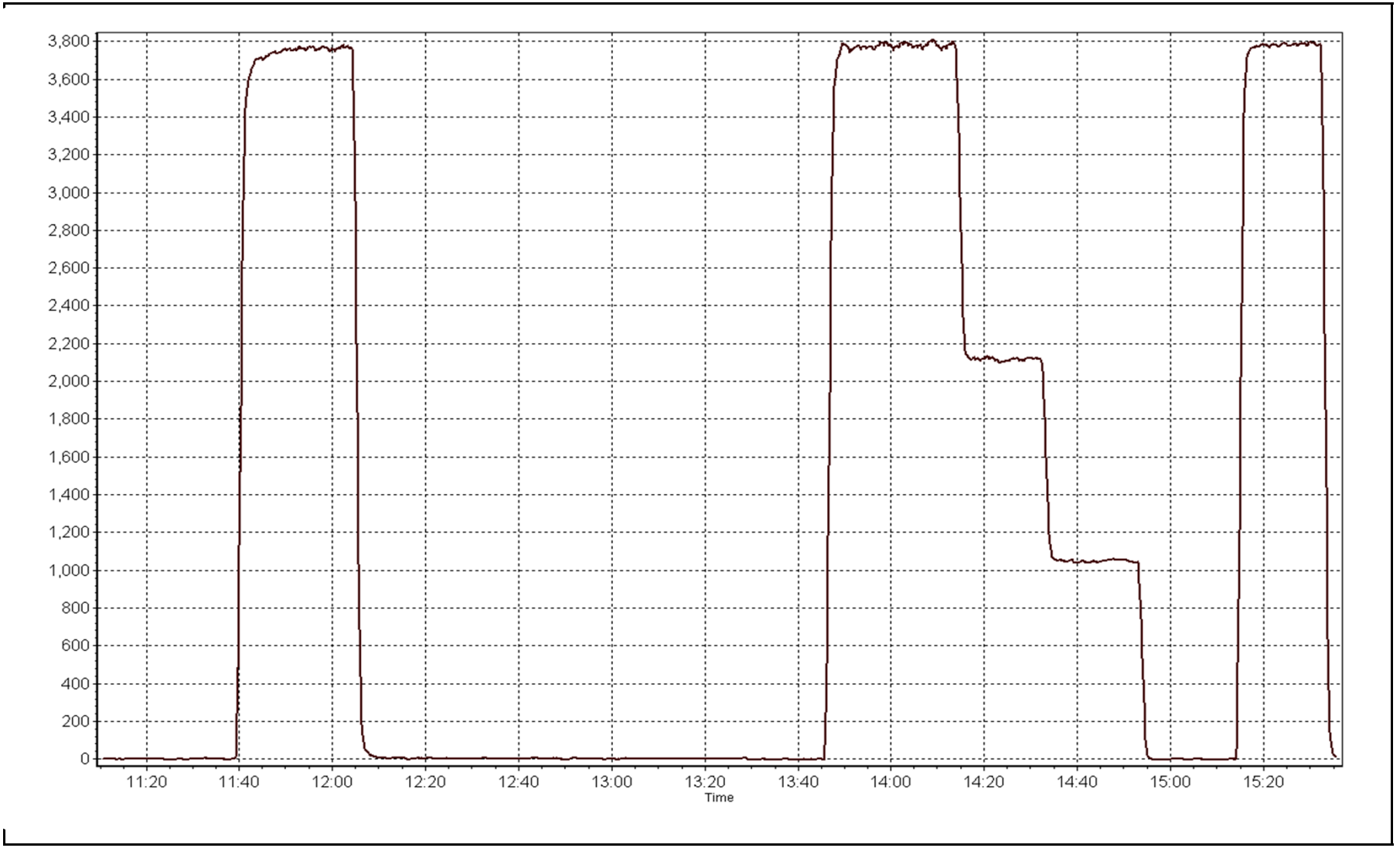
Calibration Date	August 7, 2014	Previous Calibration	July 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:15	End Time (MST)	15:35
Analyzer make	Thermo 43C	Analyzer serial #	50911

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999997
755.7	756.0	0.9996		
423.8	423.0	1.0018	Slope	0.998650
211.4	210.0	1.0068		
			Intercept	1.070742



SO2 Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	11:20	End Time (MST)	15:15
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11571008
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)	5000	5000	Lamp voltage	1126	1126
Calculated slope	0.991273	0.995069	Chamber temp.	45	45
Calculated intercept	-0.178044	0.022056	Pressure	582.2	664.5
Analyzer Background	1.78	1.60	Flow	0.387	0.417
Analyzer Coefficient	0.989	0.989	Intensity	81	81
			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	0.0	0.04	NA
as found span	6500	46.0	75.0	74.0	1.014
SO2 scrubber check	5500	22.8	211.4	0.41	NA
calibrator zero	6500	0.0	0.0	0.01	NA
high point	6500	46.0	75.0	75.4	0.994
second point	6500	24.6	40.1	40.1	1.000
third point	6500	12.3	20.1	20.2	0.993
calibrator zero	6500	0.0	0.0	0.01	NA
as left zero	6500	0.0	0.0	0.11	NA
as left span	6500	46.0	75.0	75.8	0.990
				Average Correction Factor	0.996

Corrected As found	73.9	Previous response	75.9	% change	2.6%

Notes:

Analog out cal performed for tighter zero adjustment. Sample inlet filter changed after as founds and Sox scrubber test. Zero adjusted. No span adjustment required.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

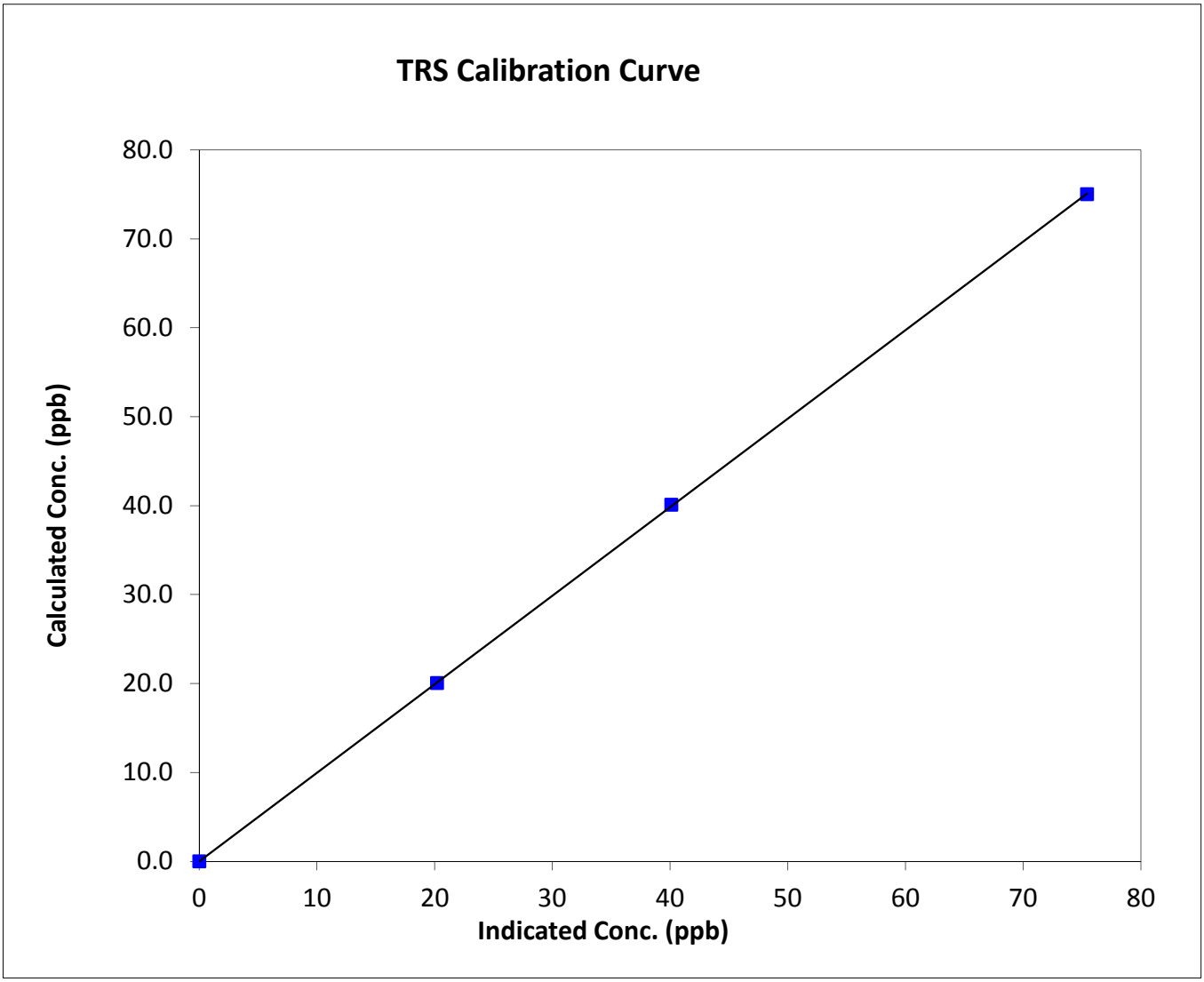
TRS Calibration Summary

Station Information

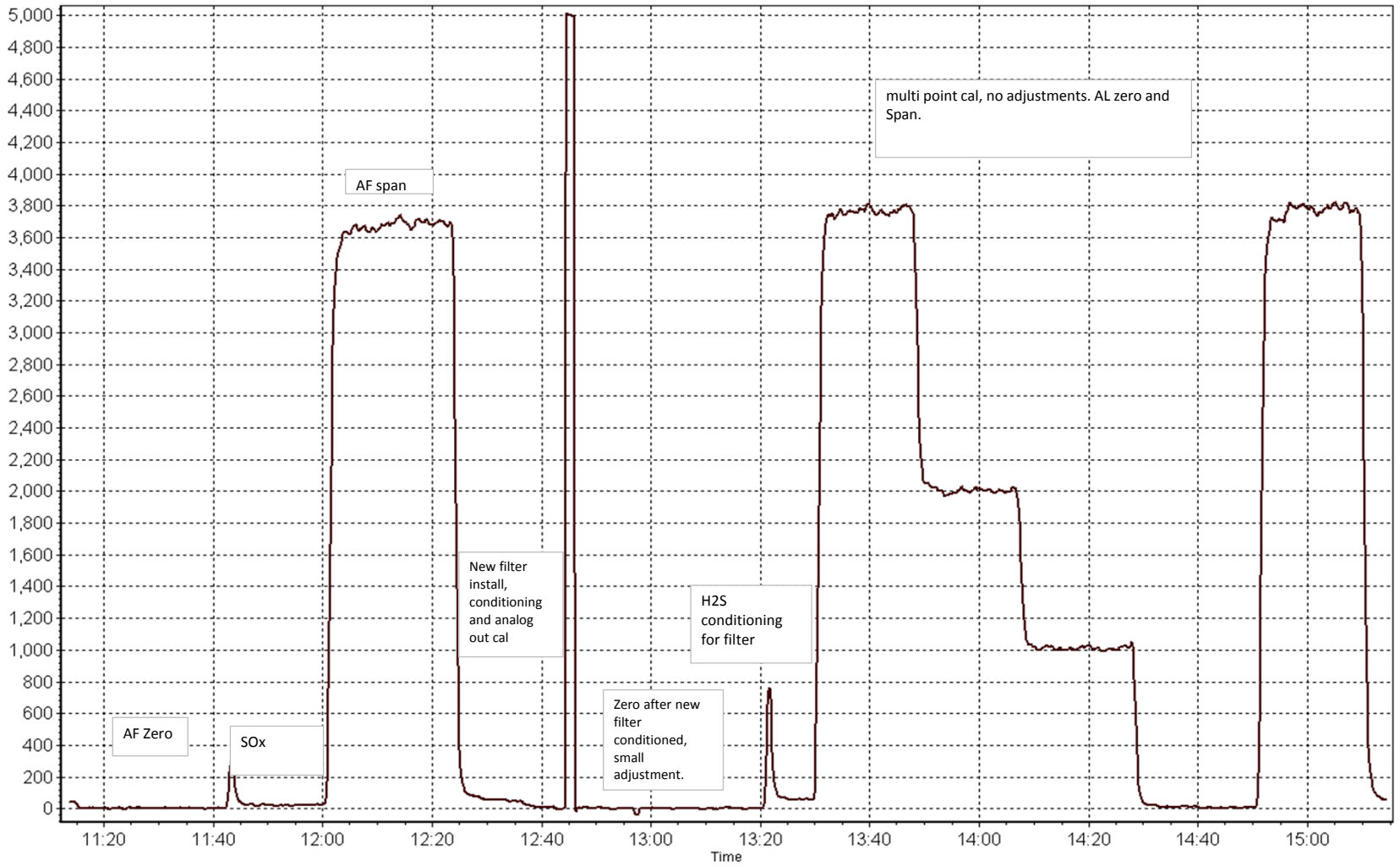
Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:20	End Time (MST)	15:15
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1218153461

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999987
75.0	75.4	0.9944		
40.1	40.1	0.9999	Slope	0.995069
20.1	20.2	0.9930		
			Intercept	0.022056



TRS Calibration Plot Date: August 13, 2014



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Thursday, August 07, 2014	Prev Calibration	Wednesday, July 09, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	11:15	End Time (MST)	15:35
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	11571108
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	33.8	32.9
THC Range (input)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Carrier Pressure	40.4	40.4
NMHC Range (input)	50	50	Fuel Pressure	42.2	42.2
THC Calc slope	0.999221	1.001202	Air Pressure	32.2	32.2
THC Calc intercept	0.027976	0.023487			
NMHC Calc slope	0.999390	1.002363			
NMHC Calc intercept	0.007353	0.000895			

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	13.08	1.220
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	15.95	15.93	1.001
second point	5500	45.7	8.94	8.88	1.007
third point	5500	22.8	4.46	4.42	1.010
calibrator zero	5500	0.0	0.00	0.00	N/A
as left zero	5500	0.0	0.00	0.00	N/A
as left span	5500	81.5	15.95	15.92	1.002
				Average Correction Factor	1.006

Corrected As found	13.08	Previous response	15.94	% change	21.8%

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	6.59	1.274
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	8.39	8.38	1.002
second point	5500	45.7	4.71	4.68	1.006
third point	5500	22.8	2.35	2.35	0.999
calibrator zero	5500	0.0	0.00	0.00	N/A
as left zero	5500	0.0	0.00	0.00	N/A
as left span	5500	81.5	8.39	8.37	1.003
				Average Correction Factor	1.002

Corrected As found	6.59	Previous response	8.39	% change	27.3%

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	5500	0	0.00	0.00	N/A
as found span	5500	81.5	7.56	6.49	1.164
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	7.56	7.56	1.000
second point	5500	45.7	4.24	4.20	1.009
third point	5500	22.8	2.11	2.09	1.012
calibrator zero	5500	0.0	0.00	0.00	N/A
as left zero	5500	0.0	0.00	0.00	N/A
as left span	5500	81.5	7.56	7.55	1.001
				Average Correction Factor	

Corrected As found	6.49	Previous response	7.54	% change	16.2%

Wood Buffalo Environmental Association

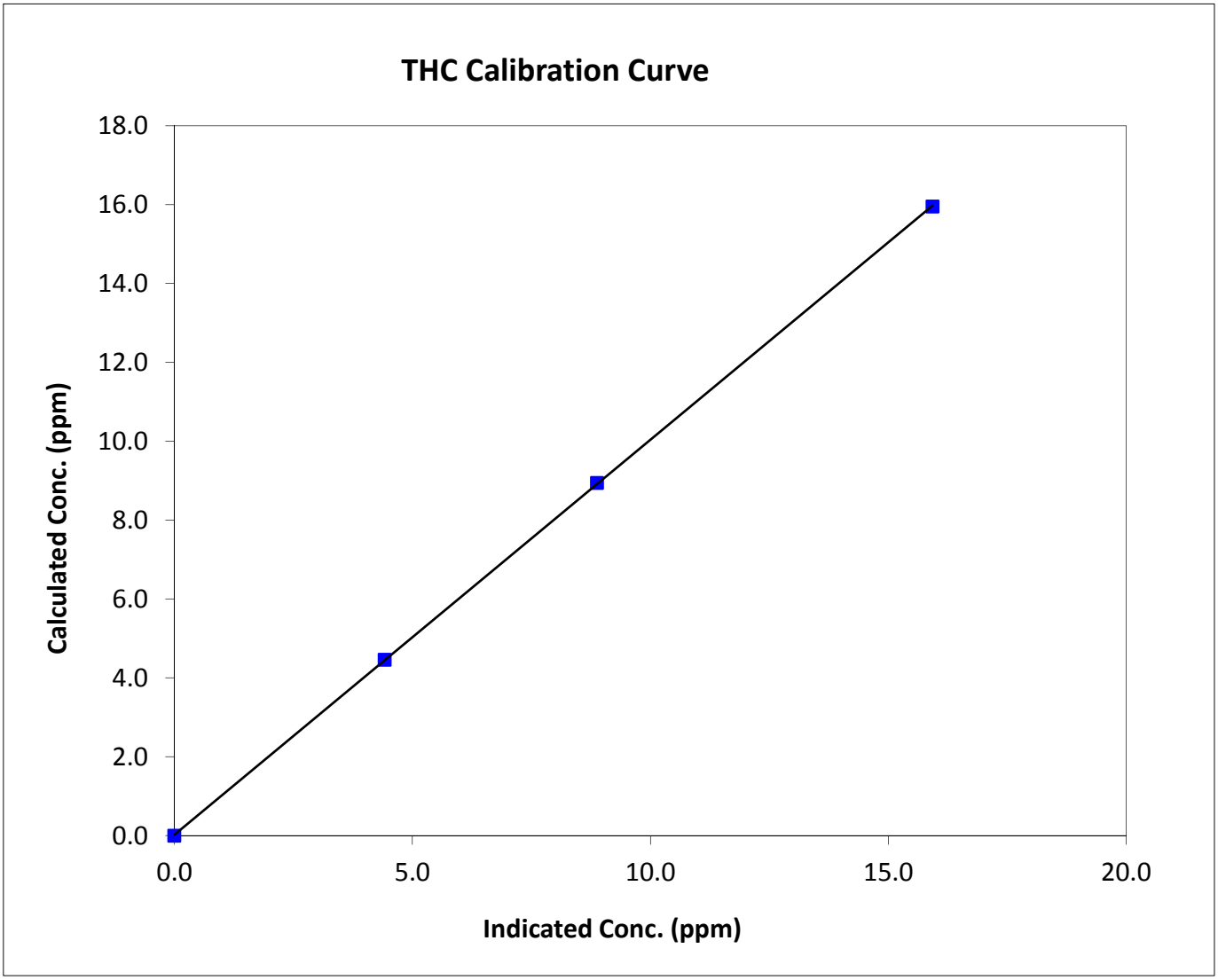
THC Calibration Summary

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:15	End Time (MST)	15:35
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	0.999985
15.95	15.93	1.0014		
8.94	8.88	1.0073	Slope	1.001202
4.46	4.42	1.0096		
			Intercept	0.023487



Wood Buffalo Environmental Association

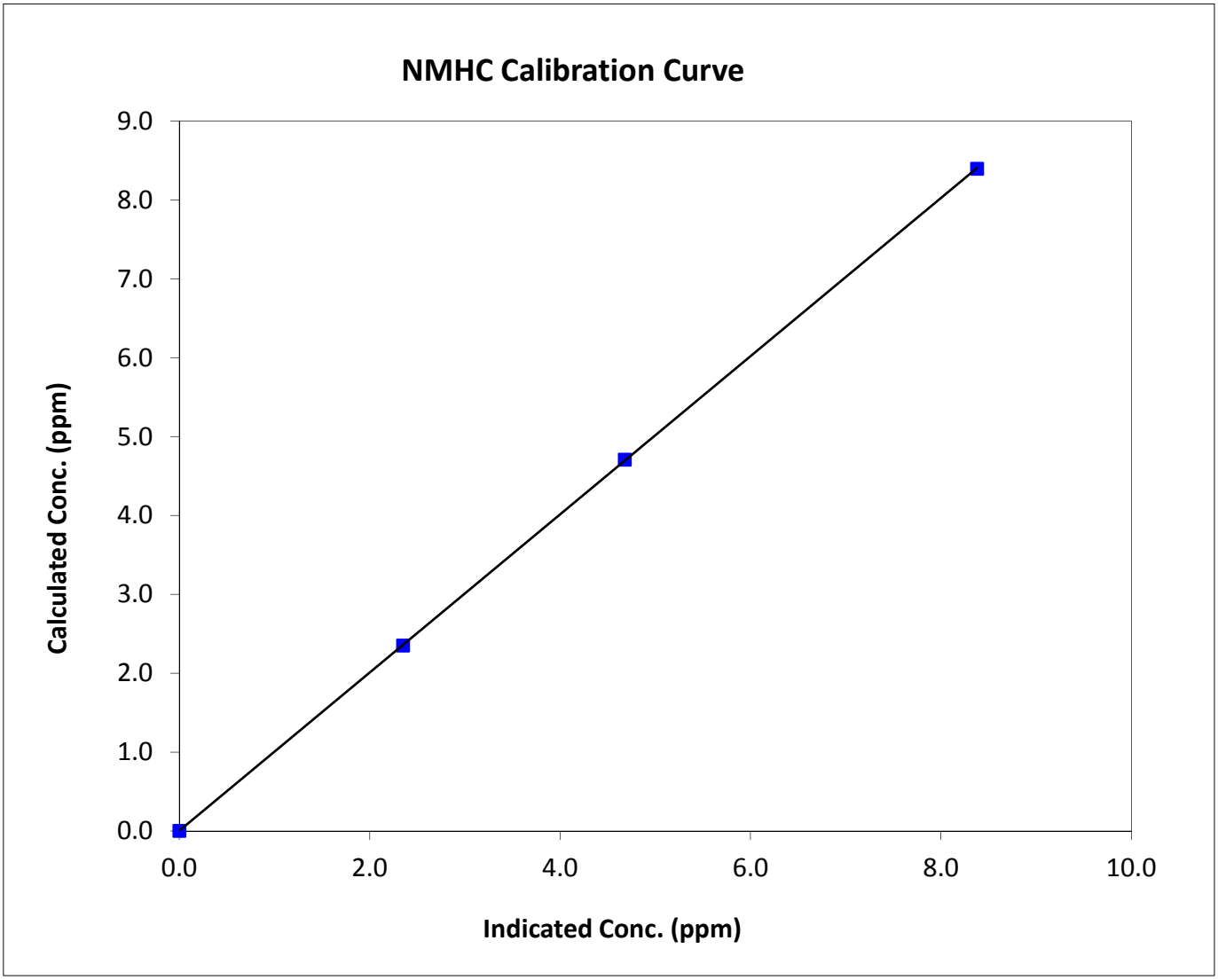
NMHC Calibration Summary

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:15	End Time (MST)	15:35
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	0.999991
8.39	8.38	1.0017		
4.71	4.68	1.0058	Slope	1.002363
2.35	2.35	0.9993		
			Intercept	0.000895



THC/NMHC Calibration Plot Date: August 7, 2014

Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 8, 2014	Previous Calibration	July 22, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	10:50	End Time (MST)	15:05
Barometric Pressure	N/A mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11571008
NO2 calibration used	Wednesday, August 06, 2014	Transfer Standard	na
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403
DACS voltage range	5000	DACS channel #	Diff 7

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	29.0	29.0
Analyzer Range (input)	5000	5000	Lamp temp.	54.0	54.0
Calculated slope	0.995414	0.999111	Pressure	555.4	676.0
Calculated intercept	-0.656690	-1.034195	Flow cell A	631	733
Analyzer Background	-1.3	-0.9	Flow cell B	631	734
Analyzer Coefficient	1.536	1.222	Cell A Intensity	847xxx	848xxx
			Cell B Intensity	831xxx	832xxx

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	-0.6	N/A
as found span	5000	1.10	402.0	330.2	1.217
calibrator zero	5500	0.00	0.0	0.2	N/A
high point	5000	1.10	402.0	402.7	0.998
second point	5000	0.60	208.6	210.9	0.989
third point	5000	0.35	108.3	109.9	0.985
calibrator zero	5500	0.00	0.0	0.2	N/A
as left zero	N/A	0.00	0.0	-0.3	N/A
as left span	N/A	1.10	NA	421.9	NA
				Average Correction Factor	0.991

Corrected As found	330.8	Previous response	404.5	% change	22.3%
				Average Correction	

Notes:

Flows and pressures low before filter change. Flows and pressures normal after change. Zero adjusted slightly with new filter, span required slight adjustment after new filter installed. Filter conditioned for about 40 mins prior to adjustments. Low span response associated with filter loaded with PM causing flow restriction.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

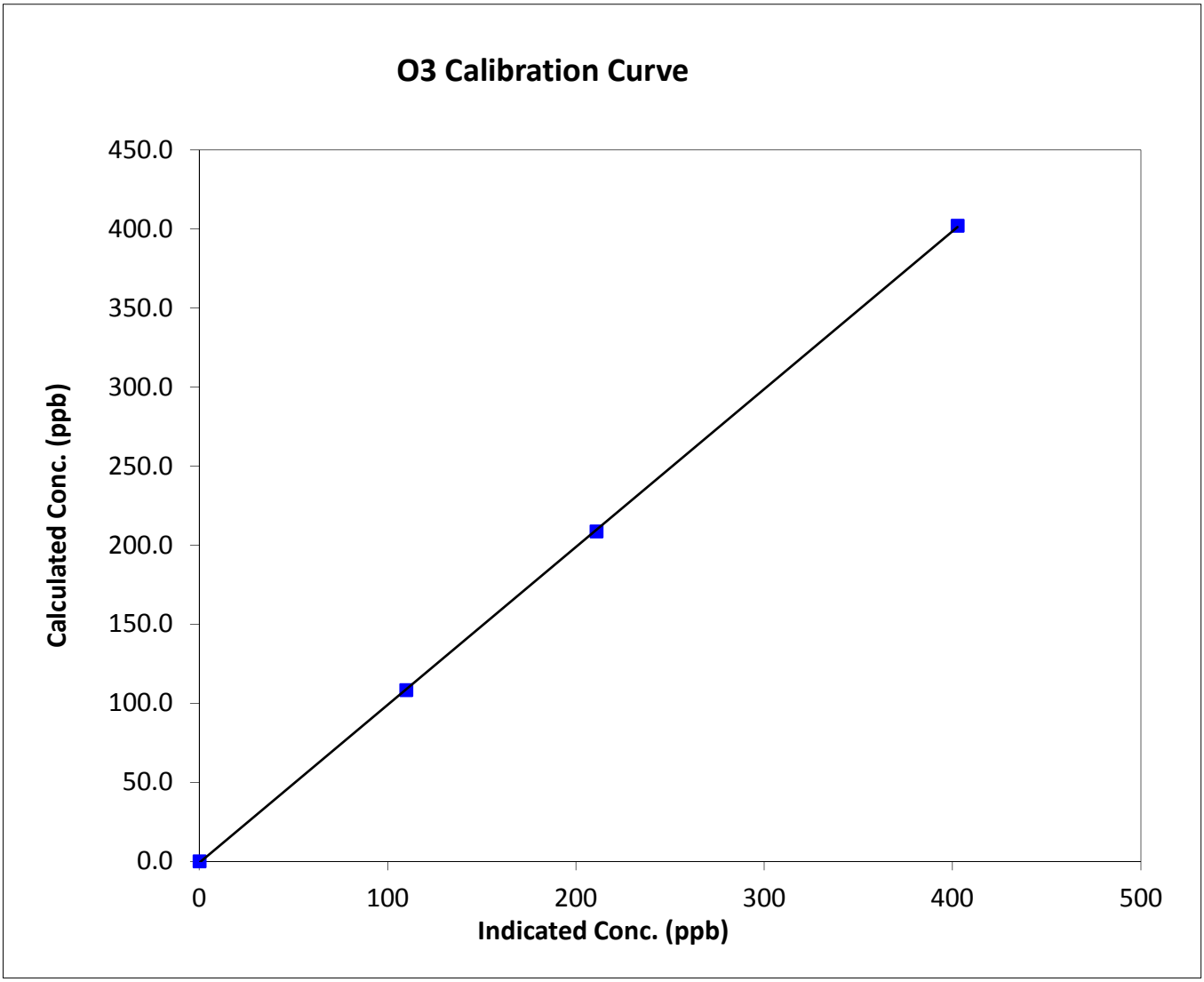
O_3 Calibration Summary

Station Information

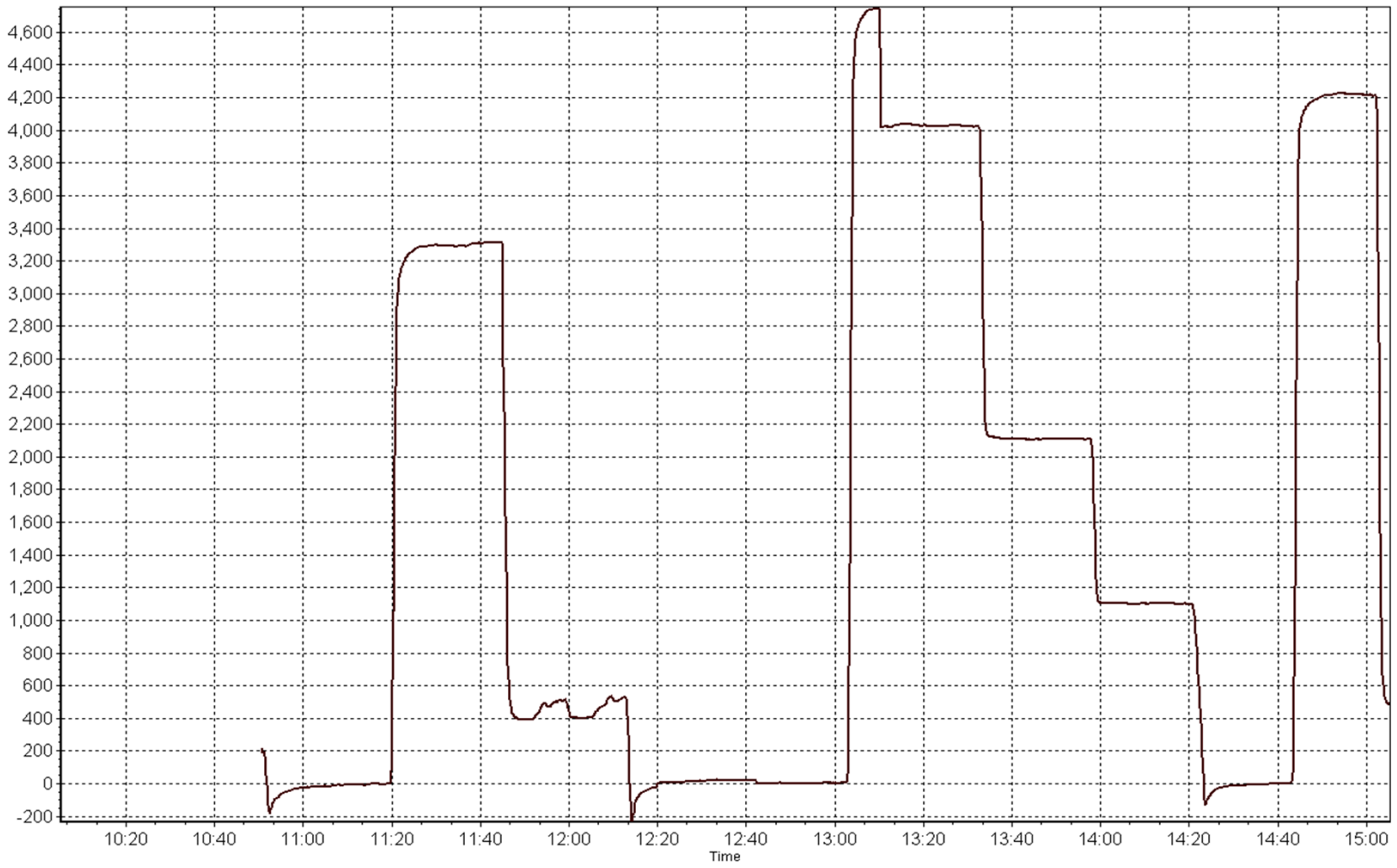
Calibration Date	Friday, August 08, 2014	Previous Calibration	July 22, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	10:50	End Time (MST)	15:05
Analyzer make	Thermo 49i	Analyzer serial #	1300156233

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999970
402.0	402.7	0.9983		
208.6	210.9	0.9891	Slope	0.999111
108.3	109.9	0.9854		
			Intercept	-1.034195



O3 Calibration Plot Date: August 8, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	8:50	End Time (MST)	13:30
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	SABIO 4010	Serial Number	11571108
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.	2403

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	5000	5000	5000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.997960	0.999577	0.999894
	Data Offset	0.451253	0.380743	0.031033
After	Data Slope	0.996168	0.996666	0.999091
	Data Offset	0.499880	0.421792	-0.635986
Channel #				
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	0.859	ppb	0.877	ppb
NOX coefficient	0.999	ppb	1.000	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	6.0		6.3	
NOX bkgrnd	6.2		7.0	
Nt coefficient				
Chamber Temp	50.6	Deg C	50.6	Deg C
Moly Temp	326.0	Deg C	326.0	Deg C
PMT Temp	-3.0	Deg C	-3.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	198.0	mmHg	203.0	mmHg
Sample Flow	477.0	ccm	502.0	ccm

Notes:

Zero and span adjusted after new inlet filter was installed and conditioned for 20mins.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 6, 2014 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	0.5	-0.1	0.5	N/A	N/A
as found span	5500	81.5	749.8	749.8	0.0	736.5	735.3	1.3	1.018	1.020
calibrator zero	5500	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	N/A	N/A
high point	5500	81.5	749.8	749.8	0.0	752.4	752.3	0.1	0.997	0.997
second point	5500	45.7	420.4	420.4	0.0	421.3	420.8	0.5	0.998	0.999
third point	5500	22.8	209.8	209.8	0.0	209.8	209.8	-0.1	1.000	1.000
calibrator zero	5500	0.0	0.0	0.0	0.0	-0.4	-0.2	-0.2	N/A	N/A
as left zero	5500	0.0	0.0	0.0	0.0	-0.4	-0.2	-0.2	N/A	N/A
as left span	5500	81.5	749.8	351.8	398.0	766.5	359.8	406.7	0.978	0.978
								Average Correction Factor	0.998	0.999

Corrcted As found NO_X= 736.0 NO= 735.4 Percent Change NO_X= 2.0% NO= 2.0%

Previous Response NO_X= 750.9 NO= 749.7

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	351.8	402.0	754.5	351.8	402.7	0.979	1.000	0.998	100.2%
2nd NO2 (200)	N/A	545.2	208.6	754.7	545.2	209.5	0.979	1.000	0.996	100.4%
3rd NO2 (100)	N/A	645.5	108.3	755.5	645.5	110.0	0.978	1.000	0.985	101.6%
4th NO2 (0)	753.8	N/A	0.5	754.3	753.8	0.5	0.980	1.000	N/A	N/A
					Average Correction Factor		0.979	1.000	0.993	100.7%

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

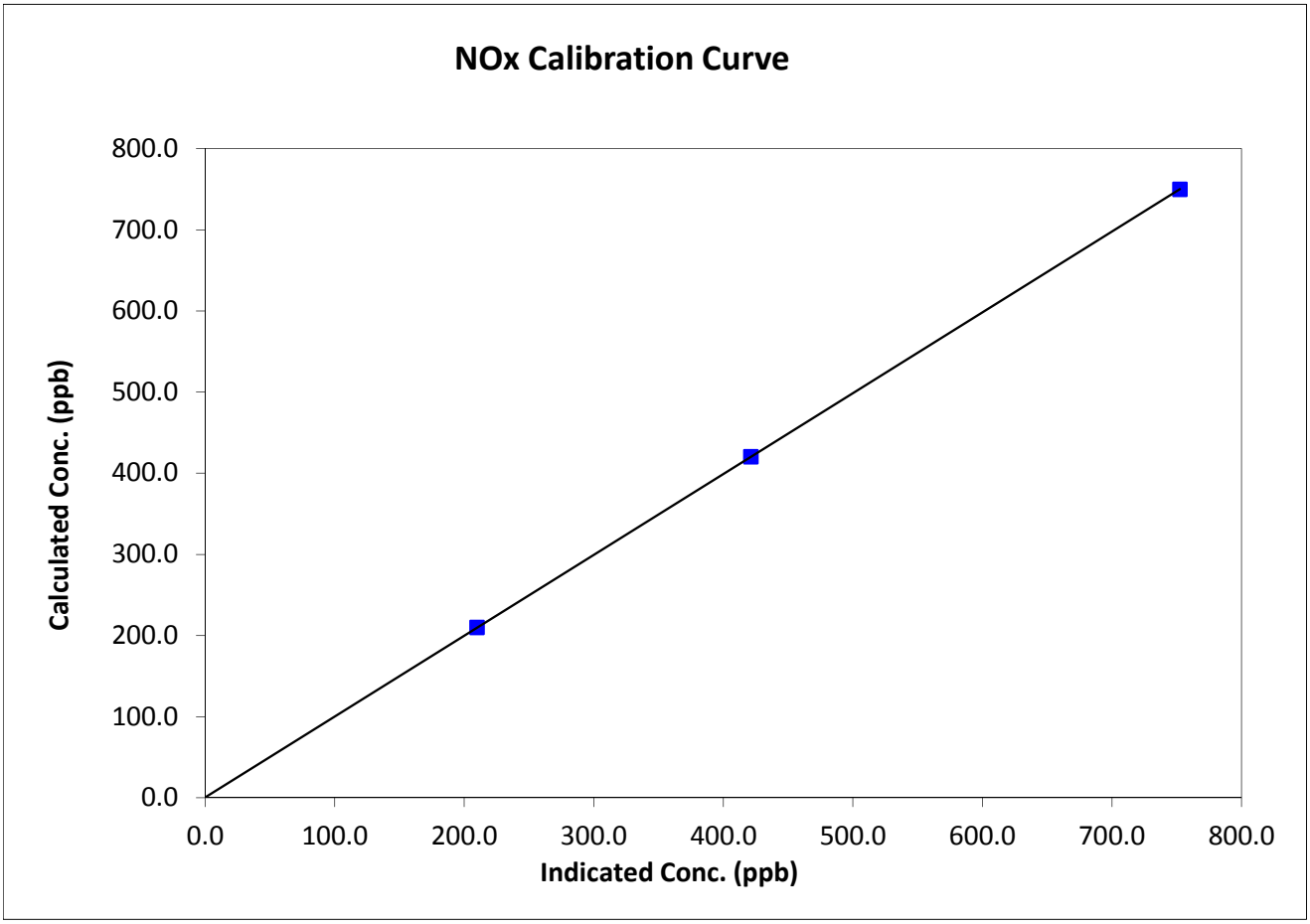
NO_X Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	8:50	End Time (MST)	13:30
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	-0.3	N/A	Correlation Coefficient	0.999999
749.8	752.4	0.9965		
420.4	421.3	0.9980	Slope	0.996168
209.8	209.8	0.9998		
0.0	-0.4	0.0000	Intercept	0.499880



Wood Buffalo Environmental Association

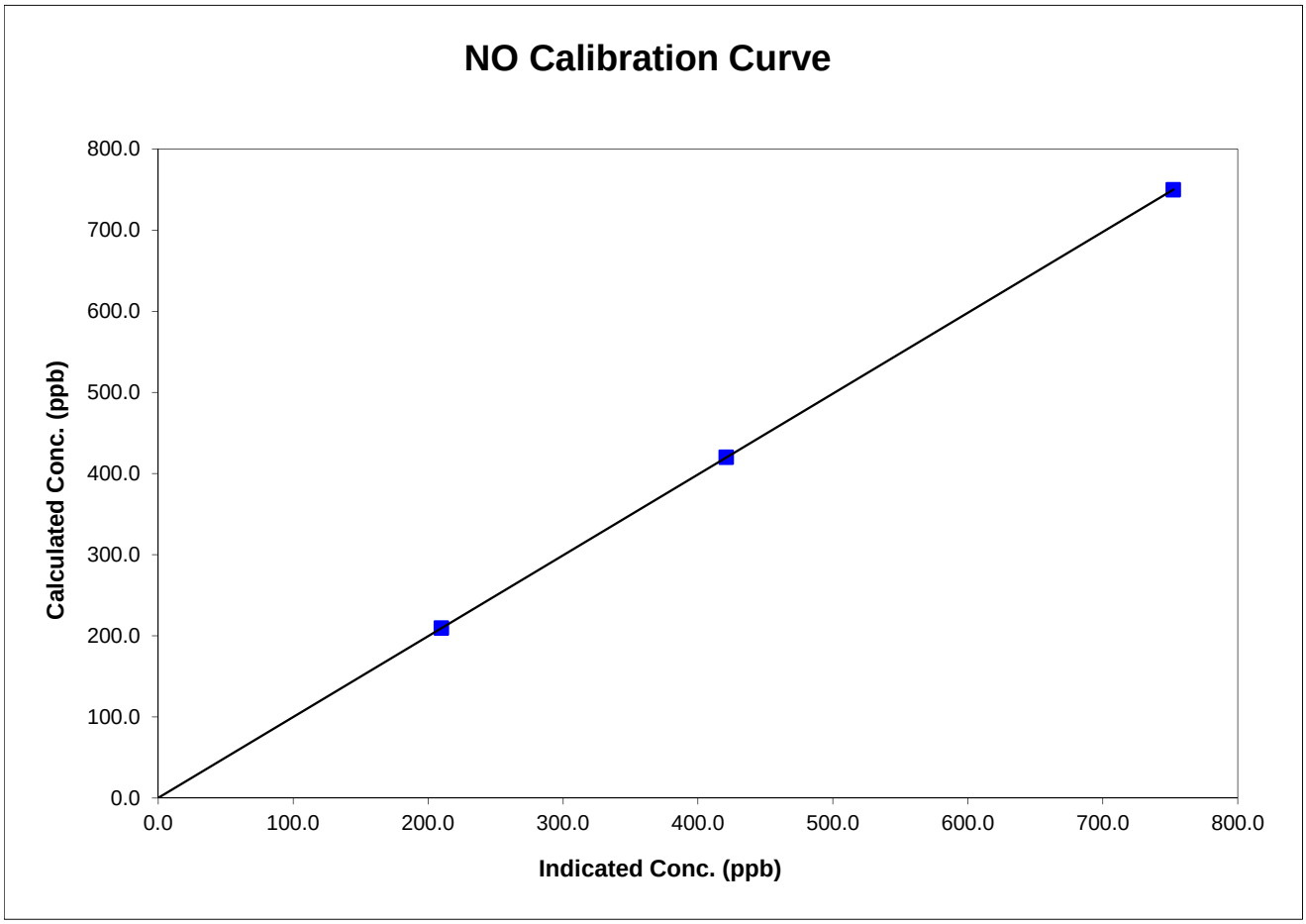
NO Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	8:50	End Time (MST)	13:30
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	-0.2	N/A	Correlation Coefficient	0.999998
749.8	752.3	0.9967		
420.4	420.8	0.9991	Slope	0.996666
209.8	209.8	0.9998		
0.0	-0.2	0.0000	Intercept	0.421792



Wood Buffalo Environmental Association

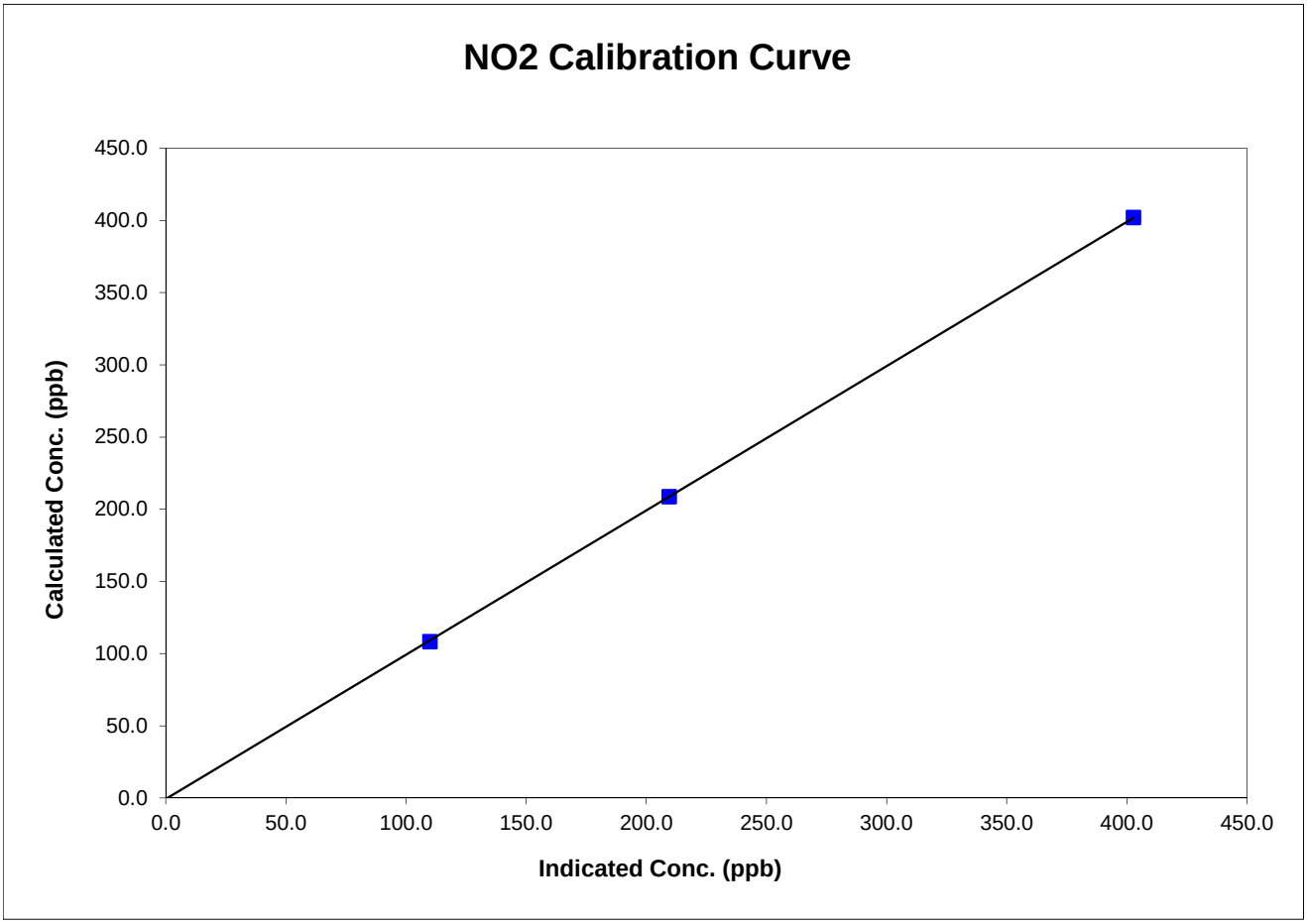
NO_2 Calibration Summary

Station Information

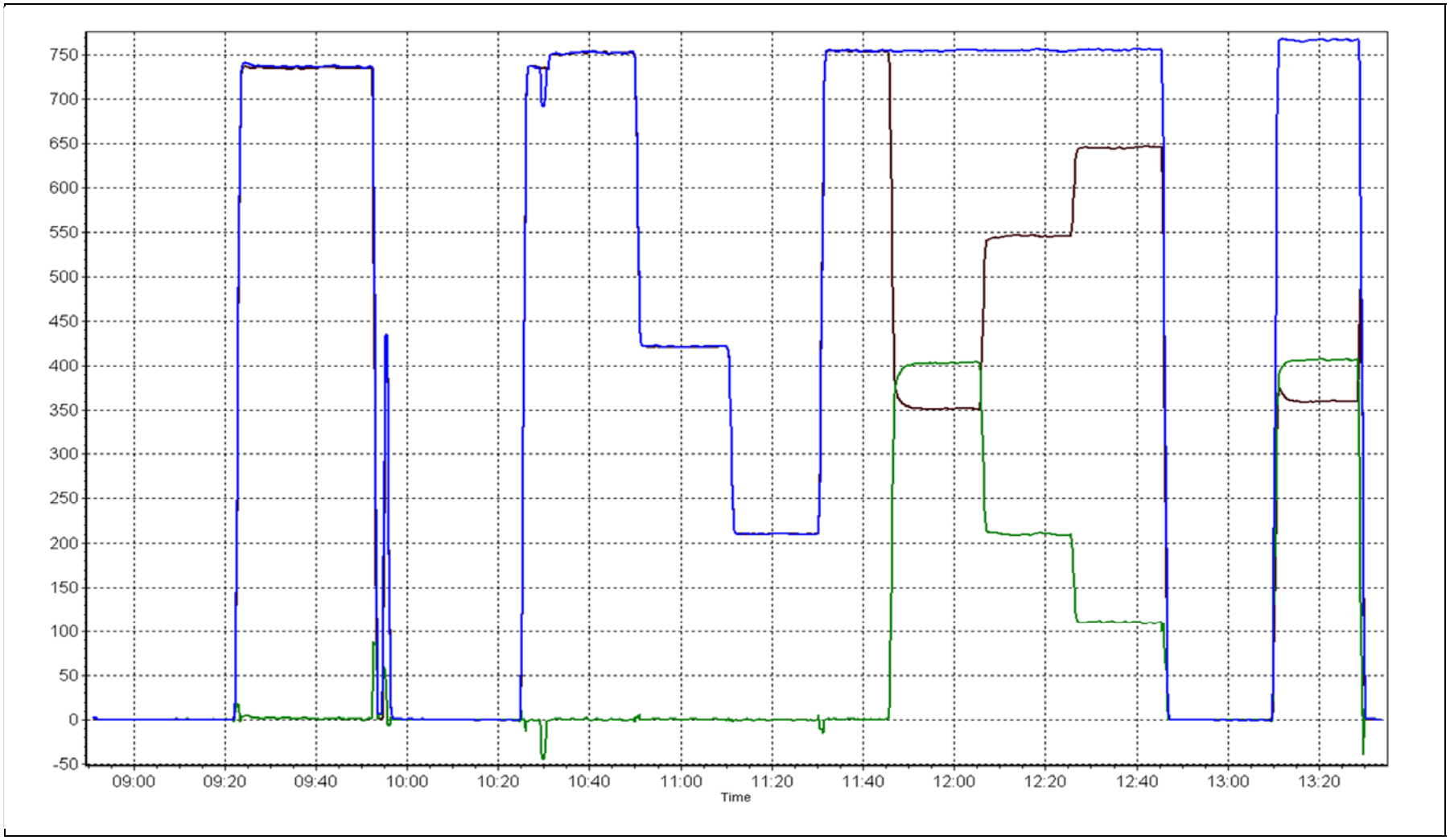
Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	8:50	End Time (MST)	13:30
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999982
402.0	402.7	0.9983		
208.6	209.5	0.9957	Slope	0.999091
108.3	110.0	0.9845		
			Intercept	-0.635986



NOx, NO & NO_2 Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

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

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	8:50	End Time (MST)	17:40
Barometric Pressure	N/A mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	224632
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.	2403

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.989129	1.006233	0.998923
	Data Offset	-7.797115	0.238222	-9.444577
After	Data Slope	1.004796	1.009016	1.015560
	Data Offset	-5.272499	-0.100902	-4.582480
Channel #		NA	6	7
Voltage Range		NA	0-5000mv	0-5000mv

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	1.208		1.198	
NOX Slope	1.183		1.183	
NH3_coeff	0.958		0.958	
NO slope	1.150		1.150	
No bkgrnd	0.0	mV	0.0	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	314.5	Deg C	314.5	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	85.0	ccm	85.0	ccm
R Cell Press	3.5	mmHg	4.1	mmHg
PMT Voltage		v		v
Sample Flow 1 NO	211.0	ccm	546.0	ccm
Sample Flow 2 Nox	211.0	ccm	516.0	ccm
Sample Flow 3 Nt	n/a	ccm	n/a	ccm

Notes:

Flow drop and vac increase associated with sample inlet filter restricted due to excess particulate most likely associated with fires. Filter changed after as founds.

Wood Buffalo Environmental Association

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

Station Information

Calibration Date: August 6, 2014 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	0.4	0.1	0.8	NA	NA
as found NO	5500	81.5	749.8	749.8	NA	509.2	495.0	35.6	1.472	NA
calibrator zero	5500	0.0	0.0	0.0	0.0	0.2	0.1	0.2	NA	NA
high NO point	5500	81.5	749.8	749.8	NA	744.0	743.2	2.0	1.008	NA
NO/O3 point	5500	81.5	749.8	749.8	NA	743.6	743.2	1.0	1.008	NA
as found NH3	6500	67.7	1999.8	NA	1999.8	1993.5	8.4	1972.5	1.003	1.014
first NH3	6500	67.7	1999.8	NA	1999.8	1993.5	8.4	1972.5	1.003	1.014
second NH3	6500	33.9	1001.4	NA	1001.4	1002.5	5.2	989.5	0.999	1.012
third NH3	6500	16.9	499.2	NA	499.2	508.4	2.4	502.5	0.982	0.993
as left zero						0.0				
as left span						0.0				
								Average Correction Factor	1.0081	1.0064

Corrected As found Nt = 508.8 ppb
NH3 = 1971.7 ppb

Previous response Nt = 765.8 ppb
NH3 = 2011.4 ppb

Nt percent change 50.5%
NH3 percent change 2.0%

Converter efficiency 95.8%

Calibration Performed By: Zach Eastman

Wood Buffalo Environmental Association

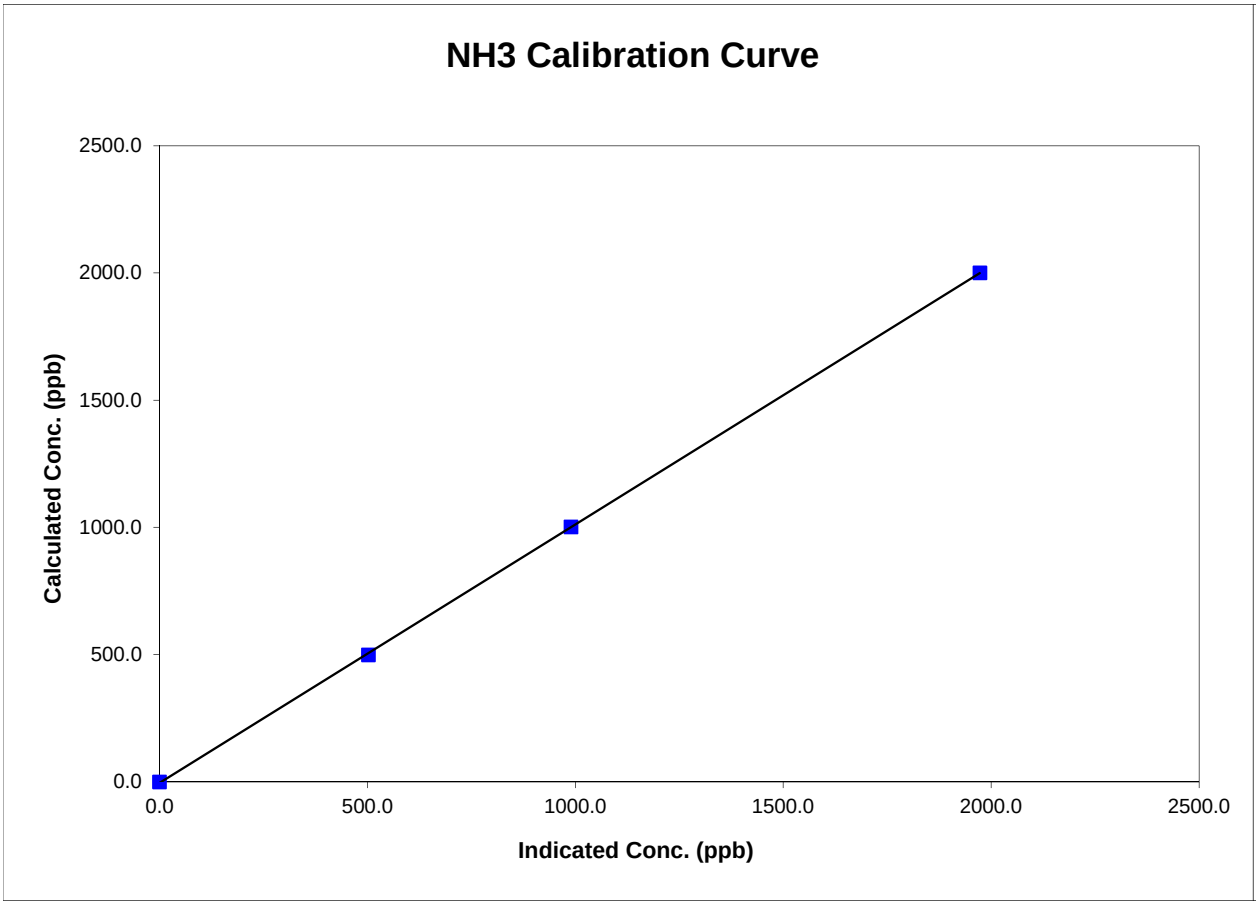
NH3 Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	8:50	End Time (MST)	17:40
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	0.2	N/A	Correlation Coefficient	0.999971
1999.8	1972.5	1.0138		
1001.4	989.5	1.0120	Slope	1.015560
499.2	502.5	0.9934		
			Intercept	-4.582480



Wood Buffalo Environmental Association

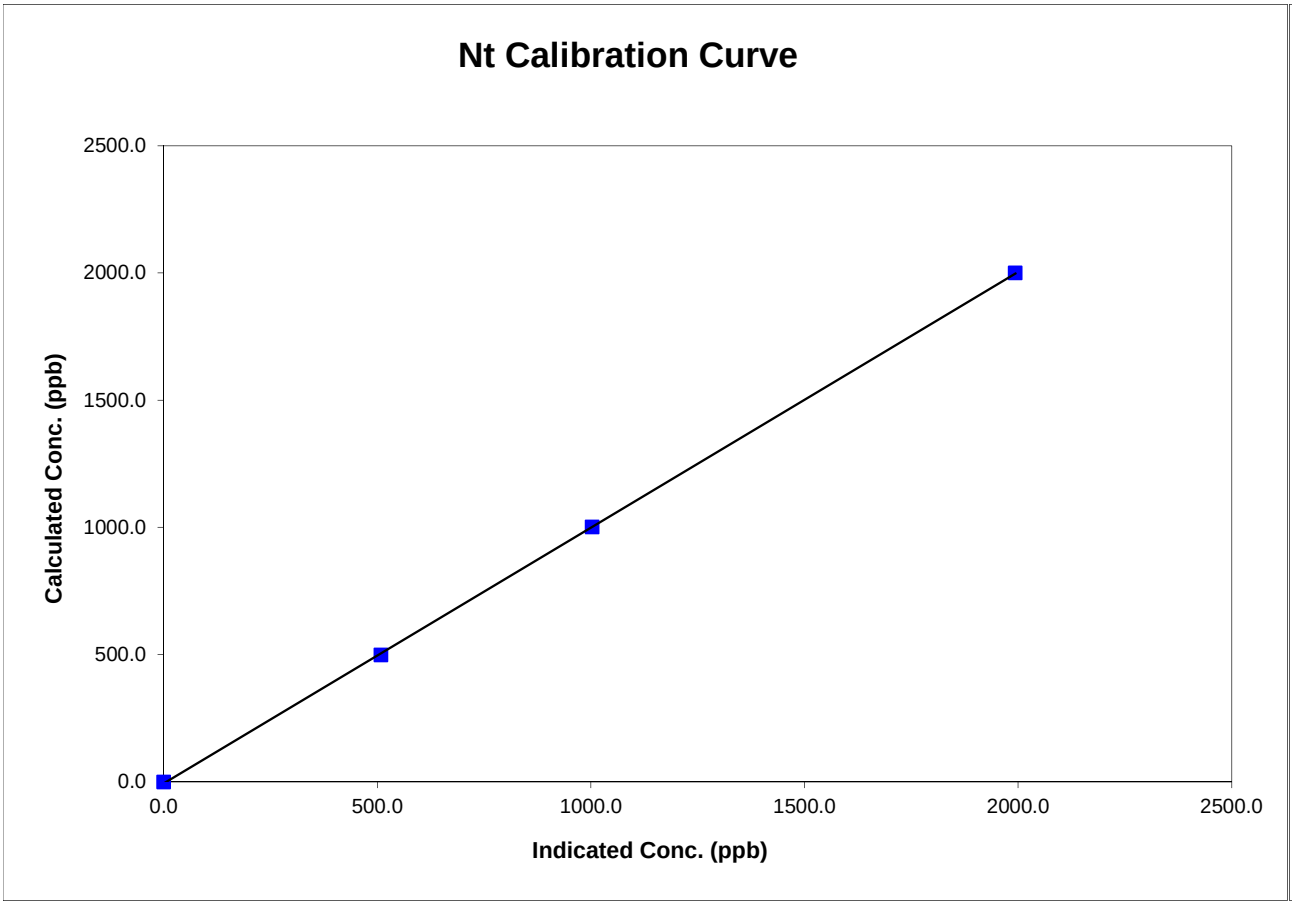
Nt Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	8:50	End Time (MST)	17:40
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	0.2	N/A	Correlation Coefficient	0.999968
1999.8	1993.5	1.0031		
1001.4	1002.5	0.9989	Slope	1.004796
499.2	508.4	0.9819		
	0.0		Intercept	-5.272499



Wood Buffalo Environmental Association

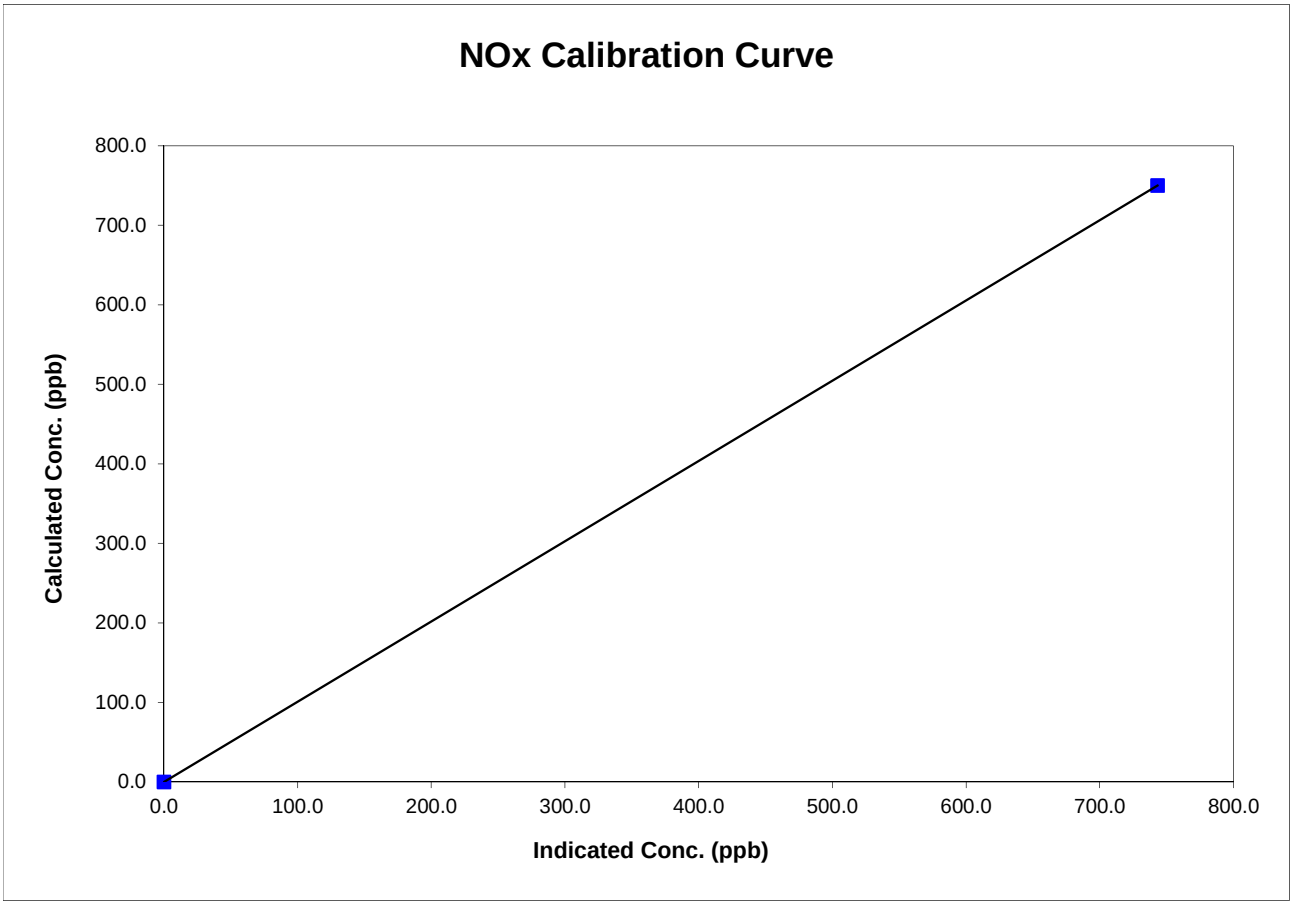
NOx Calibration Summary

Station Information

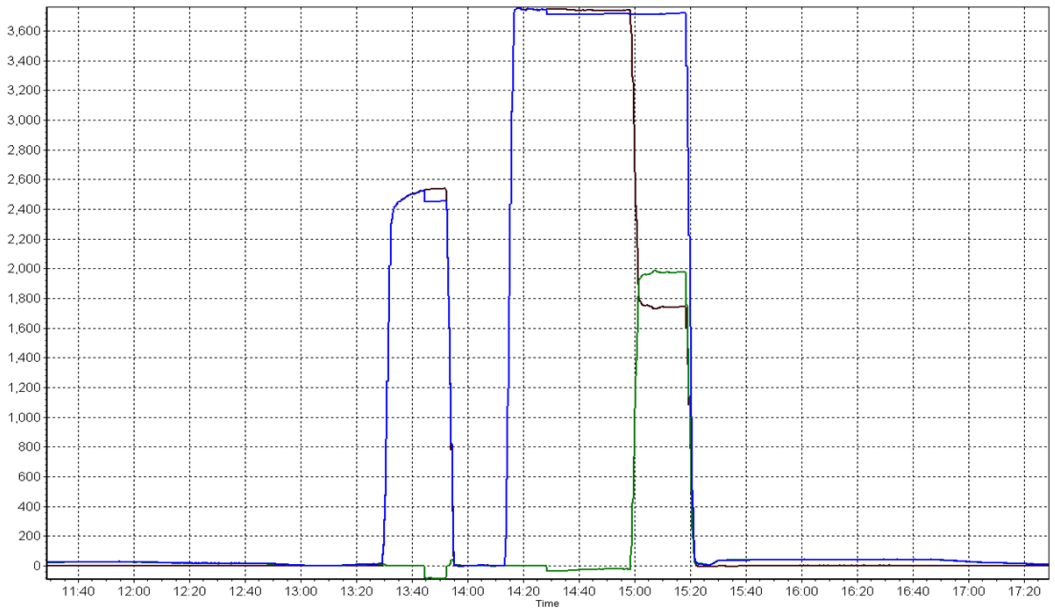
Calibration Date	August 6, 2014	Previous Calibration	July 11, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	8:50	End Time (MST)	17:40
Analyzer make	API T201	Analyzer serial #	152

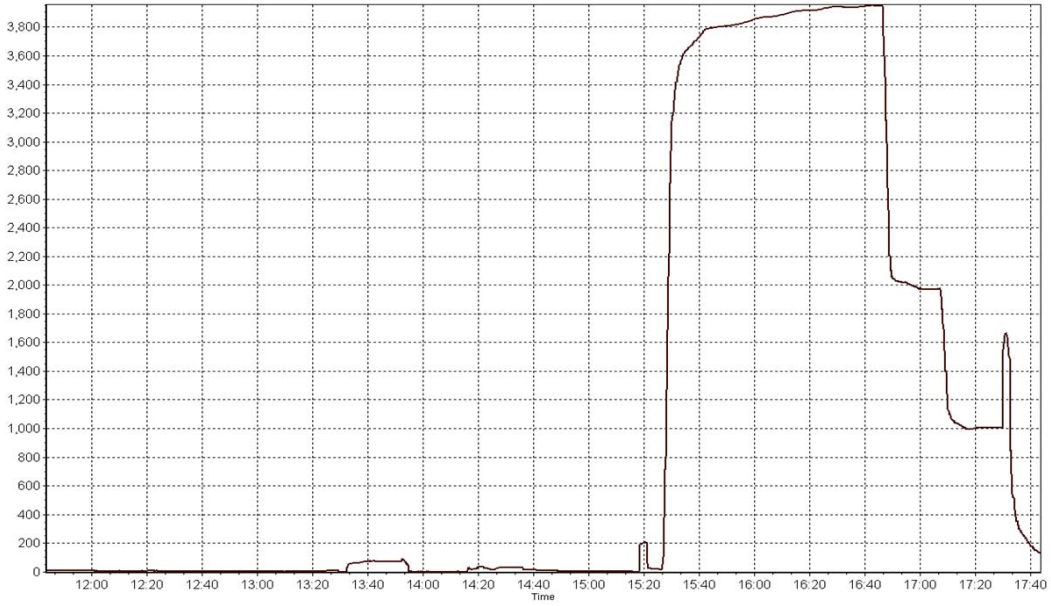
NO_X Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	1.000000
749.8	743.2	1.0089		
749.8	743.2	1.0089	Slope	1.009016
			Intercept	-0.100902



NH_3 Calibration Plot Date: August 6, 2014





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 2
MILDRED LAKE
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
AUGUST 2014

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	73	0	17	0
H2S (ppb) Average	708	35	36	99.87	12	2	3	0
THC (ppm) Average	681	35	63	96.24	4.6	-	2.8	-
Temperature (C) Average	744	0	0	100.00	31.7	-	25.5	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	19	-	13	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
AUGUST 2014

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	2.8	7	-	0	0	1	1	2	6	73
H2S (ppb) Average	708	0.9	1	-	0	0	0	0	1	2	12
THC (ppm) Average	681	2.39	0.4	-	1.8	2	2.1	2.3	2.5	2.9	4.6
Temperature 2 m (C) Average	744	18.37	6.2	-	2.7	10.8	14	17.9	22.7	27.8	31.7
Wind Speed 10 m (km/h) Average	743	7.6	4	-	0	3	5	7	10	13	19
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	25 Aug 2014 11:00	25 Aug 2014 11:00	1	Maintenance - manifold cleaning
THC	07 Aug 2014 09:00	07 Aug 2014 10:00	2	Intermittent unstable operation - baseline drift
THC	07 Aug 2014 12:00	07 Aug 2014 13:00	2	Intermittent unstable operation - baseline drift
THC	07 Aug 2014 15:00	07 Aug 2014 17:00	3	Intermittent unstable operation - baseline drift
THC	08 Aug 2014 17:00	08 Aug 2014 17:00	1	Intermittent unstable operation - baseline drift
THC	09 Aug 2014 13:00	09 Aug 2014 13:00	1	Intermittent unstable operation - baseline drift
THC	09 Aug 2014 18:00	09 Aug 2014 19:00	2	Intermittent unstable operation - baseline drift
THC	10 Aug 2014 09:00	10 Aug 2014 09:00	1	Intermittent unstable operation - baseline drift
THC	10 Aug 2014 11:00	10 Aug 2014 20:00	10	Intermittent unstable operation - baseline drift
THC	10 Aug 2014 22:00	10 Aug 2014 22:00	1	Intermittent unstable operation - baseline drift
THC	11 Aug 2014 01:00	11 Aug 2014 01:00	1	Intermittent unstable operation - baseline drift
THC	11 Aug 2014 08:00	11 Aug 2014 08:00	1	Intermittent unstable operation - baseline drift
THC	11 Aug 2014 13:00	11 Aug 2014 15:00	3	Intermittent unstable operation - baseline drift
Wind Speed, Wind Direction	26 Aug 2014 13:00	26 Aug 2014 13:00	1	Maintenance - sensor calibration

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 73 ppb on Aug 27 06:00 Maximum Daily Average: 16.7 ppb on Aug 7

Minimum Value: 0 ppb on Aug 25 23:00 Minimum Daily Average: 0.2 ppb on Aug 28
Maximum Diurnal Average: 6.6 ppb at hour 12 Minimum Diurnal Average: 1.3 ppb at hour 21
Monthly Average: 2.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 2$ $P_{90} = 6$ $P_{99} = 32$

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-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	8	31	17	18	13	6	5	5	6	5.3	31
2-Aug	3	Z	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	3
3-Aug	1	Z	1	1	1	1	1	1	1	3	16	27	7	11	39	30	2	2	1	1	1	1	1	1	6.4	39
4-Aug	1	Z	1	1	1	1	2	1	5	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3	5
5-Aug	1	Z	1	1	1	10	11	1	1	1	2	48	9	1	1	1	1	1	3	2	1	1	1	1	4.3	48
6-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	3	1	1	1	1	1	3	1.2	3
7-Aug	32	Z	15	10	8	33	33	27	20	14	23	27	17	32	31	27	23	6	1	1	1	1	1	1	16.7	33
8-Aug	1	Z	1	1	1	1	1	1	3	17	10	4	2	1	3	2	1	1	1	9	3	2	2	1	2.9	17
9-Aug	1	Z	1	1	1	1	1	1	3	17	9	3	1	2	2	1	5	2	1	1	1	1	1	1	2.4	17
10-Aug	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
11-Aug	1	Z	1	1	1	1	1	1	2	8	1	6	1	1	1	1	1	1	1	1	1	1	1	1	1.3	8
12-Aug	1	Z	1	1	1	1	1	5	4	3	20	6	9	2	1	1	1	1	2	1	5	3	1	2	3.1	20
13-Aug	4	Z	1	1	2	2	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1.3	4
14-Aug	1	Z	1	1	1	1	1	1	1	1	1	3	13	27	16	5	3	2	2	2	1	2	2	2	3.9	27
15-Aug	1	Z	1	1	1	1	1	1	1	1	4	3	1	13	17	13	9	4	2	1	1	1	1	1	3.5	17
16-Aug	1	Z	1	1	1	1	1	1	1	5	7	9	5	1	1	1	1	1	1	1	1	1	1	11	2.4	11
17-Aug	7	Z	1	1	1	1	1	1	3	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1.3	7
18-Aug	1	Z	1	1	1	1	1	1	1	3	5	1	1	10	2	1	1	1	1	3	1	1	1	1	1.7	10
19-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	0	1	1	0.8	2
20-Aug	1	Z	1	1	0	0	0	1	0	1	0	0	0	1	0	0	1	1	1	0	1	0	1	0	0.5	1
21-Aug	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
22-Aug	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
23-Aug	1	Z	1	1	1	1	1	1	2	2	2	2	12	6	1	1	1	1	1	1	1	1	1	1	1.7	12
24-Aug	1	Z	1	1	1	1	1	1	1	1	2	38	16	10	7	2	1	1	1	1	2	2	1	1	4.0	38
25-Aug	1	Z	1	1	2	1	2	2	2	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.7	2
26-Aug	0	Z	2	5	3	1	1	1	0	1	2	2	2	1	1	0	0	4	1	1	0	1	6	2	1.6	6
27-Aug	1	Z	0	29	32	73	8	1	1	1	0	1	1	1	2	3	1	0	0	0	0	0	0	0	6.8	73
28-Aug	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
29-Aug	0	Z	1	1	0	1	1	0	0	0	0	1	0	0	0	0	1	1	2	1	2	1	2	4	0.9	4
30-Aug	3	Z	3	3	1	0	2	1	0	1	1	0	0	2	4	20	7	1	1	0	0	0	0	0	2.2	20
31-Aug	0	Z	1	1	0	0	1	1	2	11	2	5	4	1	0	0	0	3	0	1	8	19	21	50	5.7	50
	2.2	--	1.4	2.2	2.1	4.4	2.5	1.8	2.0	3.4	3.9	6.6	3.7	4.3	4.5	4.2	3.3	1.9	1.6	1.5	1.3	1.6	1.8	3.0	Diurnal Average	
	32	--	15	29	32	73	33	27	20	17	23	48	17	32	39	30	31	17	18	13	8	19	21	50	Diurnal Maximum	

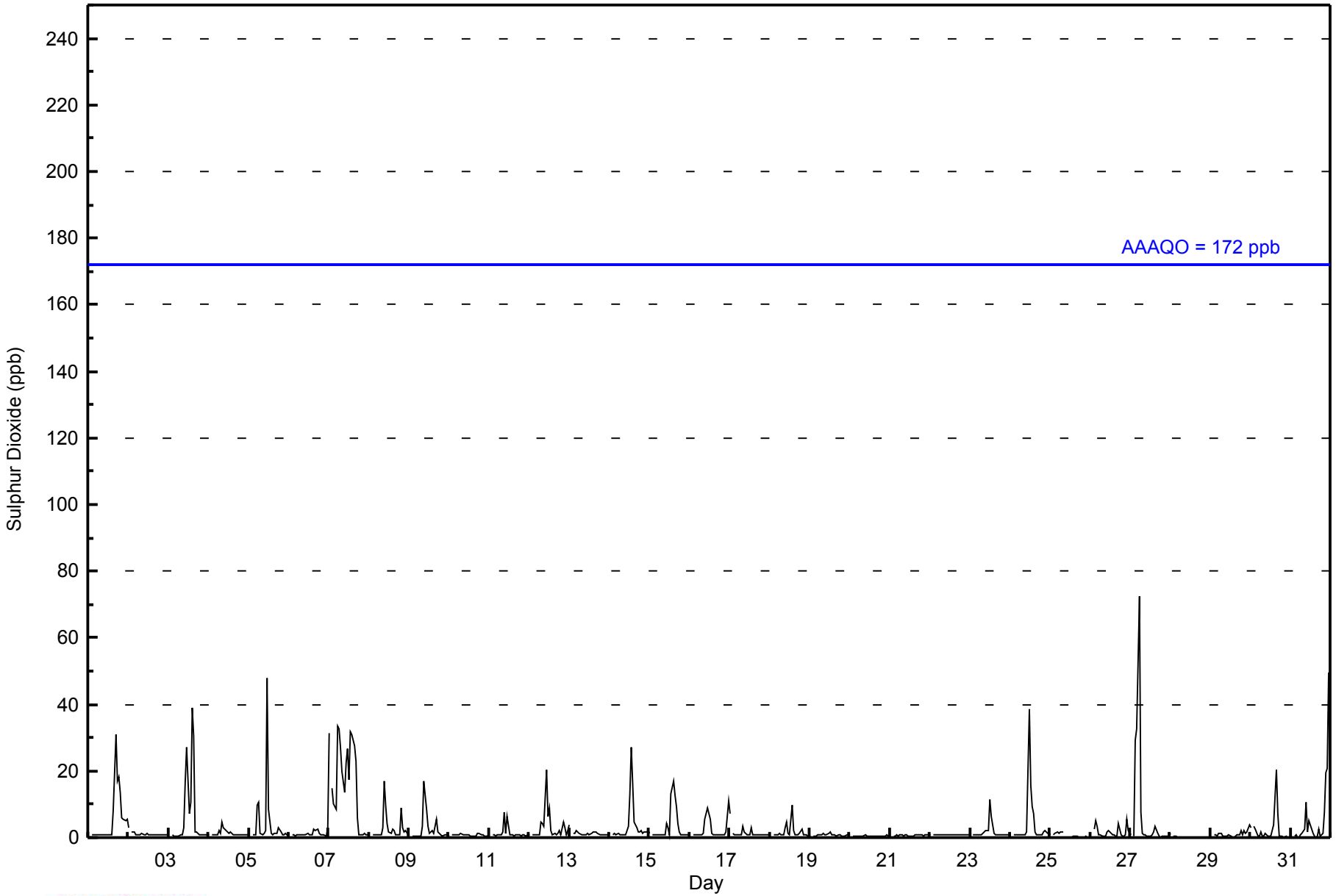
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	663	93.51	93.51
11 - 20	24	3.39	96.90
21 - 60	21	2.96	99.86
61 - 110	1	0.14	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - August 2014

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	69	23	15	16	18	25	69	79	80	34	30	13	26	42	45	662
11 - 20	1	0	0	1	0	2	5	0	4	1	1	1	1	6	0	1	24
21 - 60	0	1	0	0	0	0	1	1	2	2	0	3	9	2	0	0	21
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	1	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	79	70	23	16	16	20	31	70	85	83	35	34	24	34	42	46	708

Total Number of Valid Hours: 708

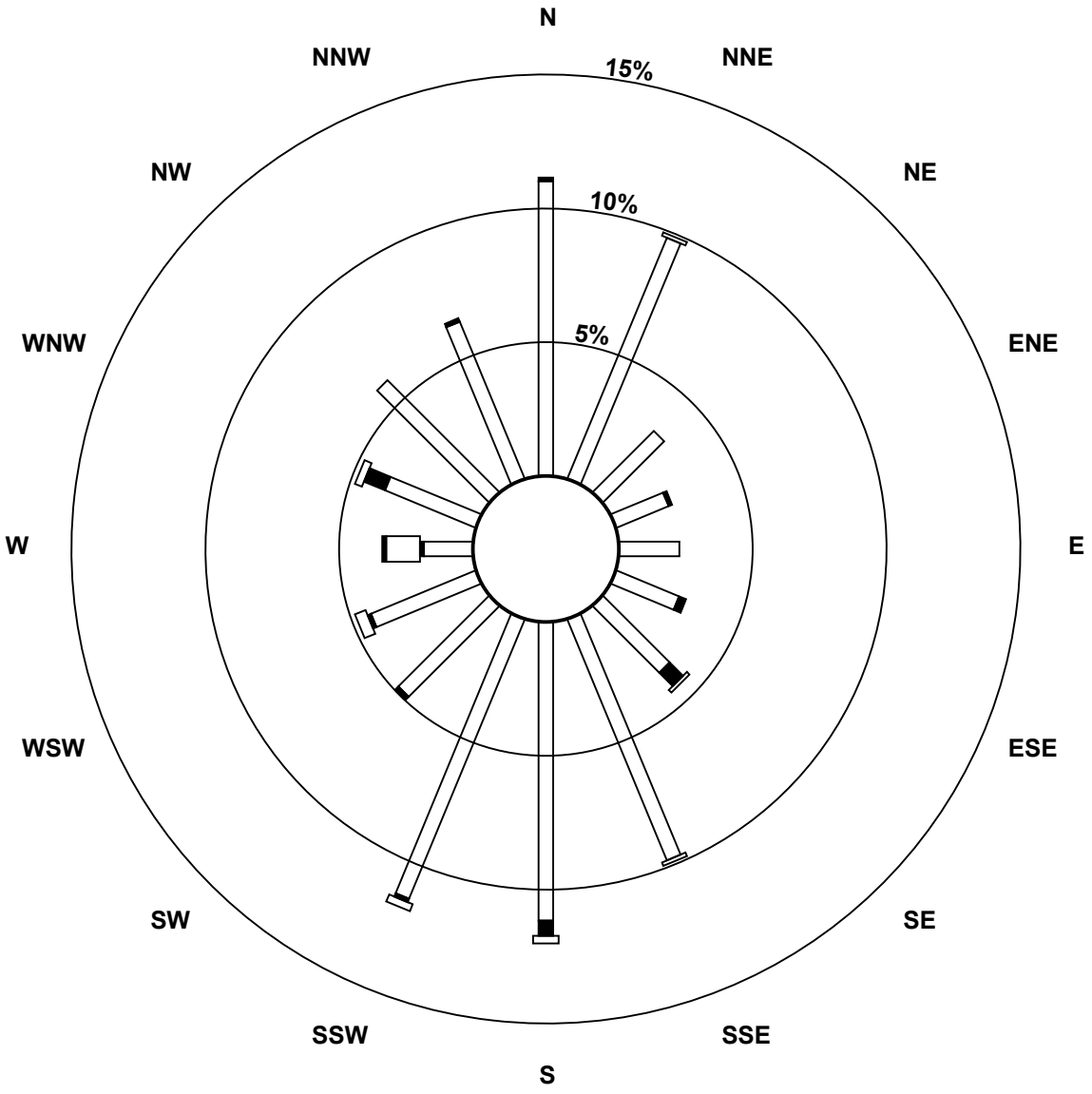
Total Number of Hours: 744

Wood Buffalo Environmental Association

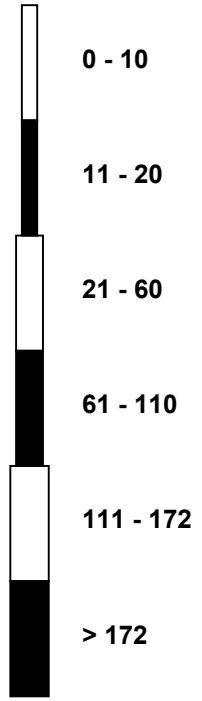
Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Mildred Lake (AMS 2)



Classes (ppb)



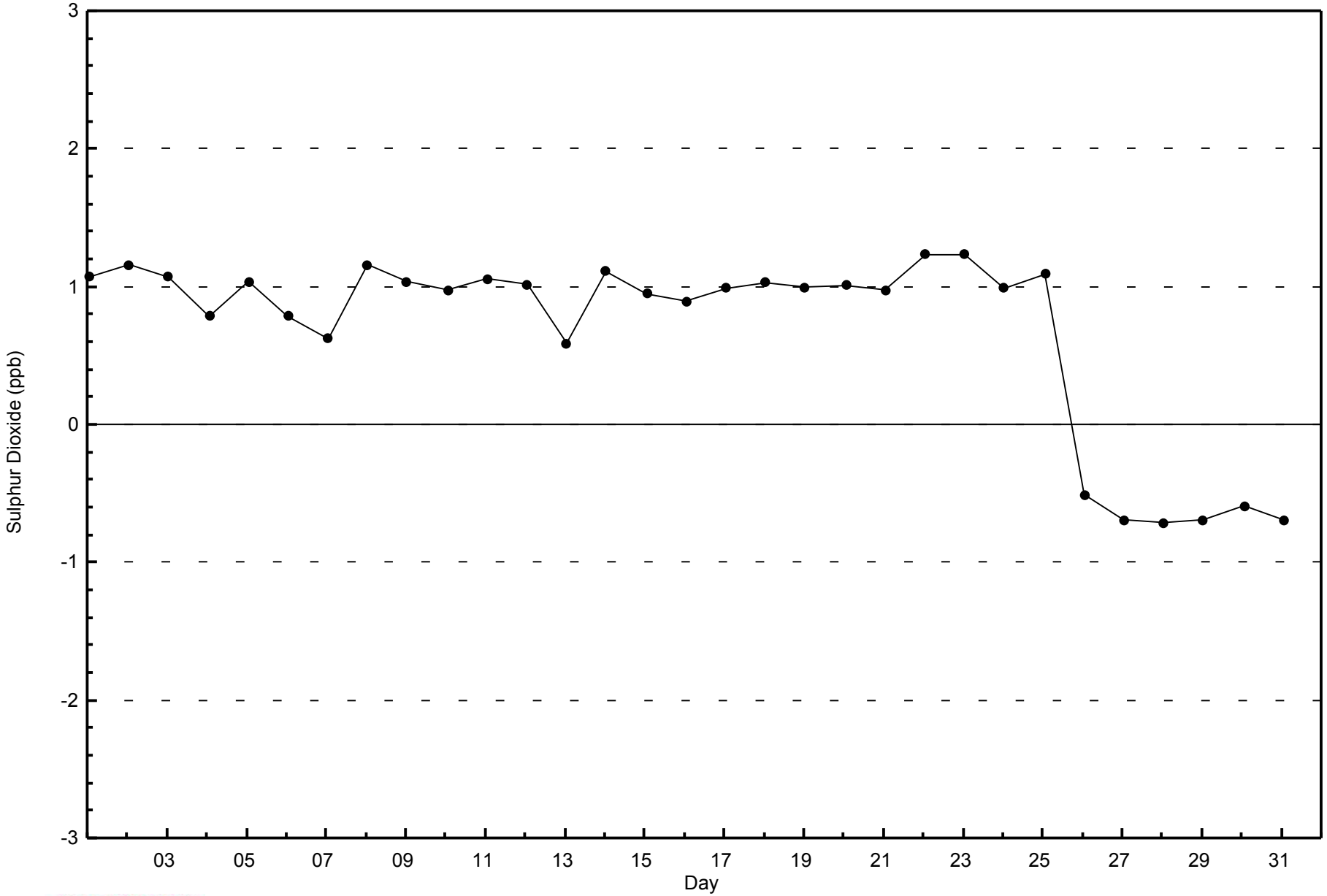
Total Number of Valid Hours: 708

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - August 2014



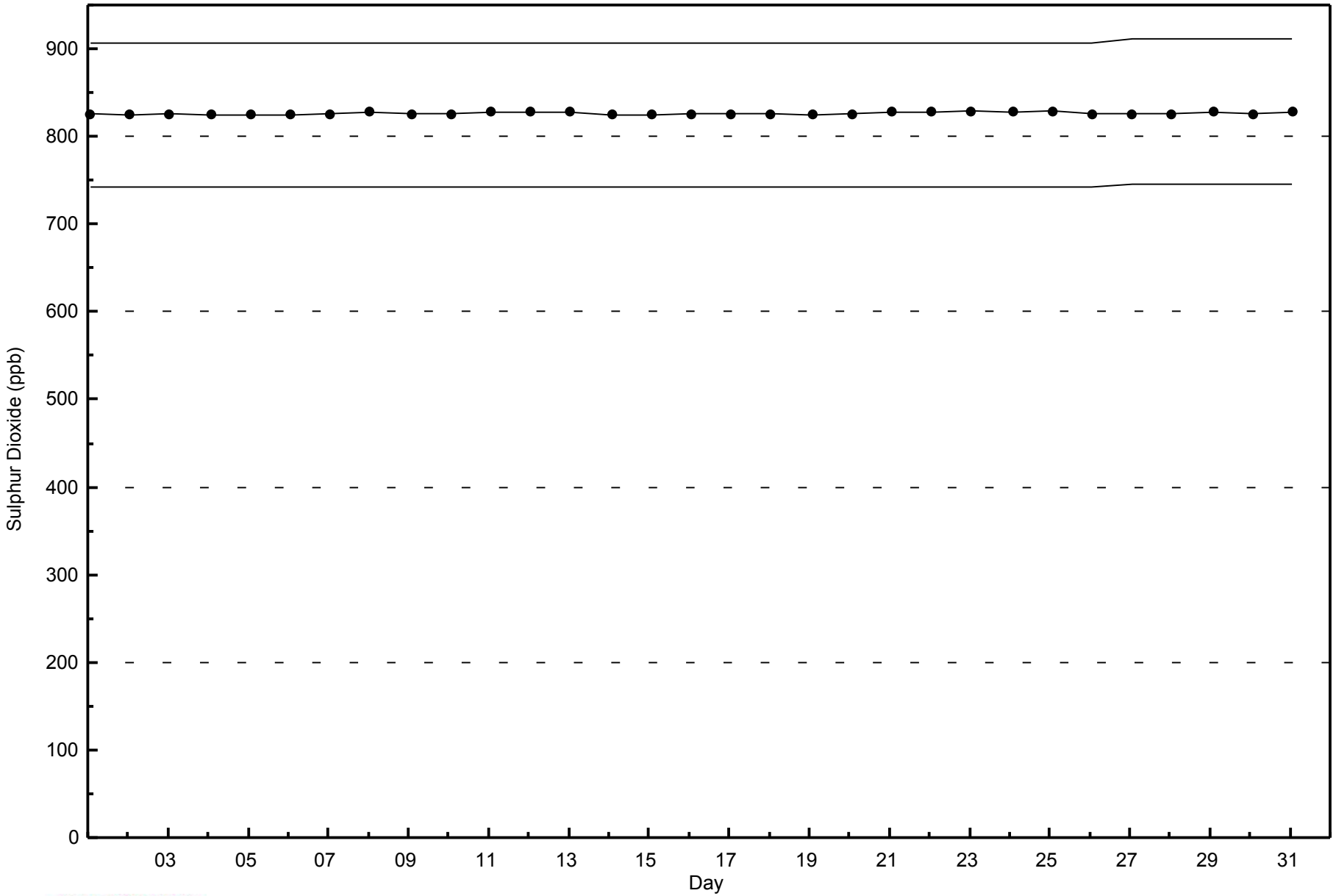
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 2 24-hr: 0
Maximum Value: 12 ppb on Aug 26 06:00 Maximum Daily Average: 3.3 ppb on Aug 26

Minimum Value: 0 ppb on Aug 17 21:00 Minimum Daily Average: 0.2 ppb on Aug 21
Maximum Diurnal Average: 7.7 ppb at hour 3 Minimum Diurnal Average: 0.3 ppb at hour 18
Monthly Average: 0.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 8$

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-Aug	1	1	Z	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	4	0.8	4
2-Aug	3	3	Z	4	2	2	1	2	1	1	2	2	0	0	0	0	0	0	0	0	0	1	1	0	1.2	4
3-Aug	1	1	Z	1	0	0	0	0	0	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0.7	3
4-Aug	1	0	Z	1	3	3	5	1	1	1	1	1	1	2	1	1	0	0	0	0	1	0	0	1	1.1	5
5-Aug	1	1	Z	1	2	2	1	1	1	1	2	2	0	0	0	0	0	0	1	2	0	0	2	0	1.0	2
6-Aug	2	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
7-Aug	1	1	Z	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0	0	1	1	1	1	0	0.6	1
8-Aug	1	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
9-Aug	0	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.4	1
10-Aug	0	0	Z	2	2	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.7	2
11-Aug	0	0	Z	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Aug	0	0	Z	0	0	1	1	2	3	4	1	1	1	0	0	0	0	0	0	0	0	2	2	5	1.2	5
13-Aug	3	2	Z	2	3	3	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.9	3
14-Aug	1	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	2
15-Aug	2	2	Z	1	1	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.7	2
16-Aug	0	0	Z	0	0	0	0	0	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0.4	2
17-Aug	1	2	Z	2	1	3	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0.6	3
18-Aug	1	1	Z	1	2	3	6	8	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	8
19-Aug	1	2	Z	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.4	2
20-Aug	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
21-Aug	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Aug	0	0	Z	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
23-Aug	1	1	Z	2	1	1	1	1	5	4	5	3	1	1	1	1	0	0	1	0	0	0	0	0	1.4	5
24-Aug	0	0	Z	0	1	1	1	1	1	0	0	1	0	0	1	0	0	0	0	0	2	3	5	4	1.0	5
25-Aug	2	3	Z	4	5	6	6	8	5	3	M	0	1	1	0	0	0	0	0	0	0	0	0	0	2.1	8
26-Aug	1	6	8	8	11	12	7	Z	1	C	C	C	C	1	1	1	0	0	0	0	0	1	2	1	3.3	12
27-Aug	1	0	Z	0	1	1	3	2	1	1	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0.7	3
28-Aug	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
29-Aug	0	1	Z	7	7	3	3	2	8	6	3	2	1	1	0	0	0	1	2	7	6	5	3	6	3.2	8
30-Aug	7	1	Z	2	1	0	0	2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.9	7
31-Aug	1	1	Z	1	1	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	2	0.6	2
	1.1	1.1	7.7	1.6	1.6	1.7	1.6	1.4	1.1	1.1	1.0	0.7	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.6	0.6	0.7	0.8	1.0	Diurnal Average	
	7	6	8	8	11	12	7	8	8	6	5	3	2	2	1	1	1	1	2	7	6	5	5	6	Diurnal Maximum	

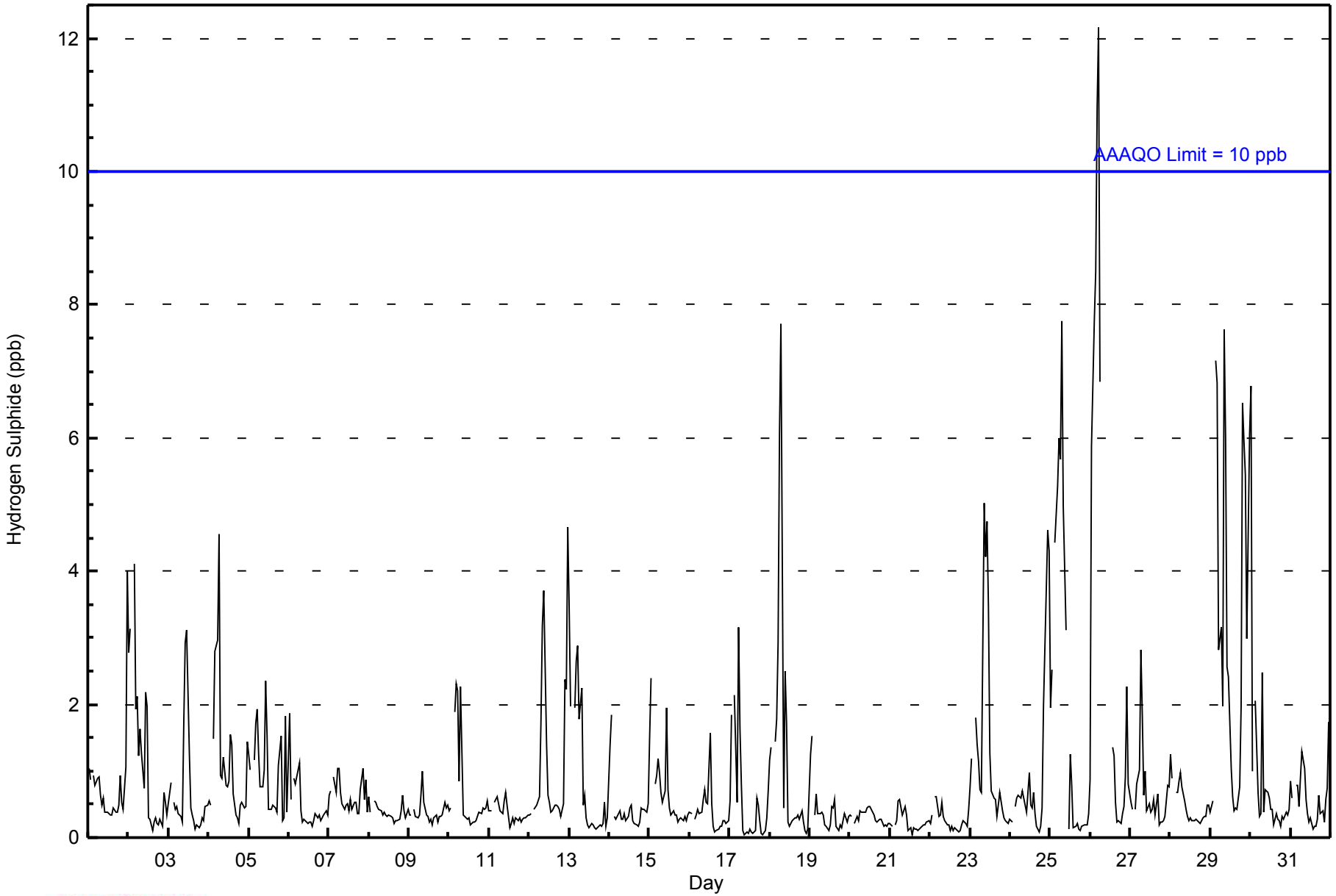
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	654	92.37	92.37
3 - 4	27	3.81	96.19
5 - 7	20	2.82	99.01
8 - 11	5	0.71	99.72
> 11	2	0.28	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	79	71	22	17	15	19	22	42	71	82	37	34	24	33	41	45	654
3 - 4	0	0	0	0	1	0	7	11	5	1	0	0	0	1	1	0	27
5 - 7	0	0	0	0	0	0	3	12	5	0	0	0	0	0	0	0	20
8 - 11	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	5
> 11	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Totals	79	71	22	17	16	19	32	70	83	83	37	34	24	34	42	45	708

Total Number of Valid Hours: 708

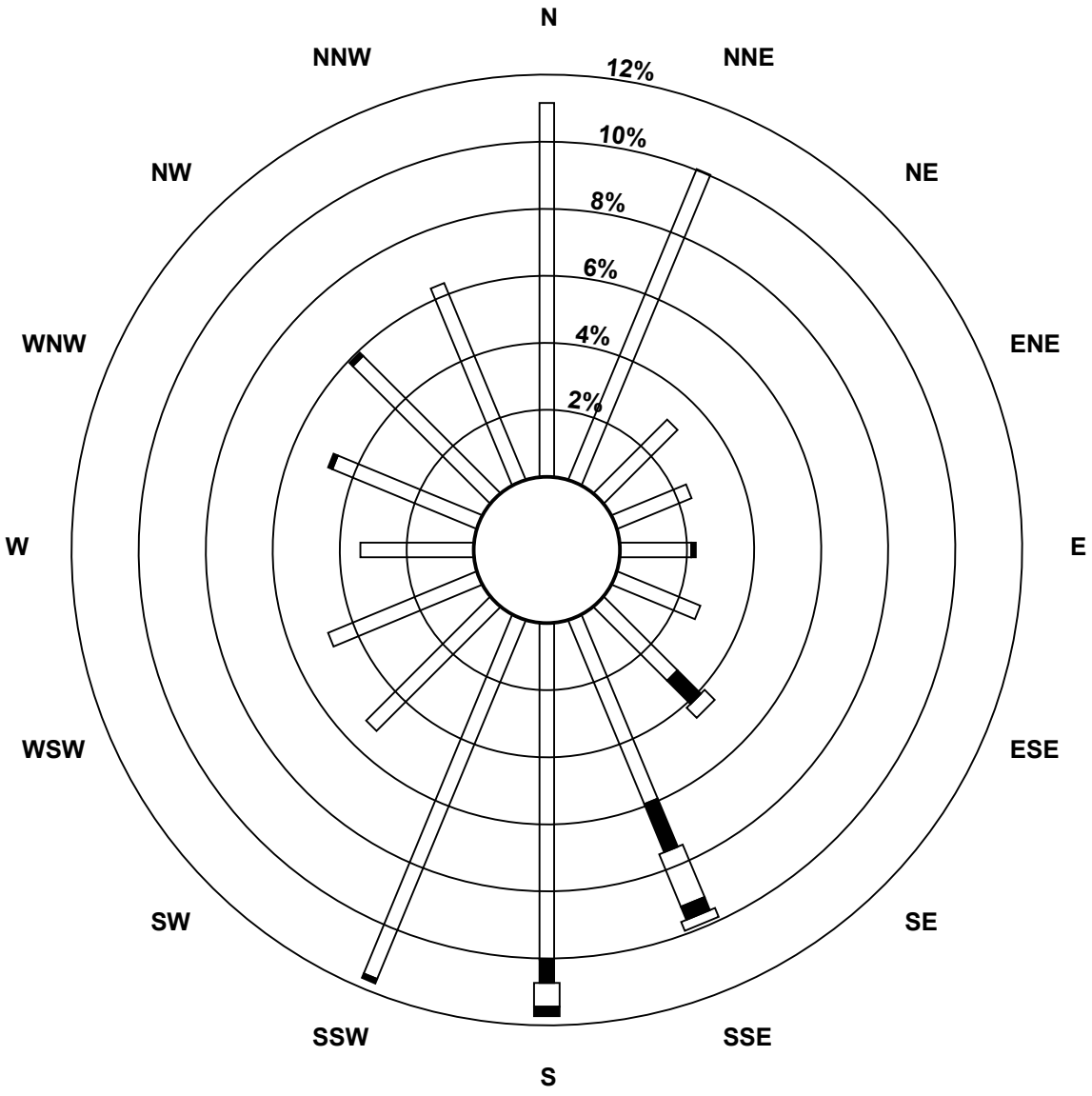
Total Number of Hours: 744

Wood Buffalo Environmental Association

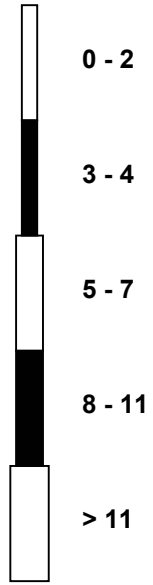
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake (AMS 2)



Classes (ppb)



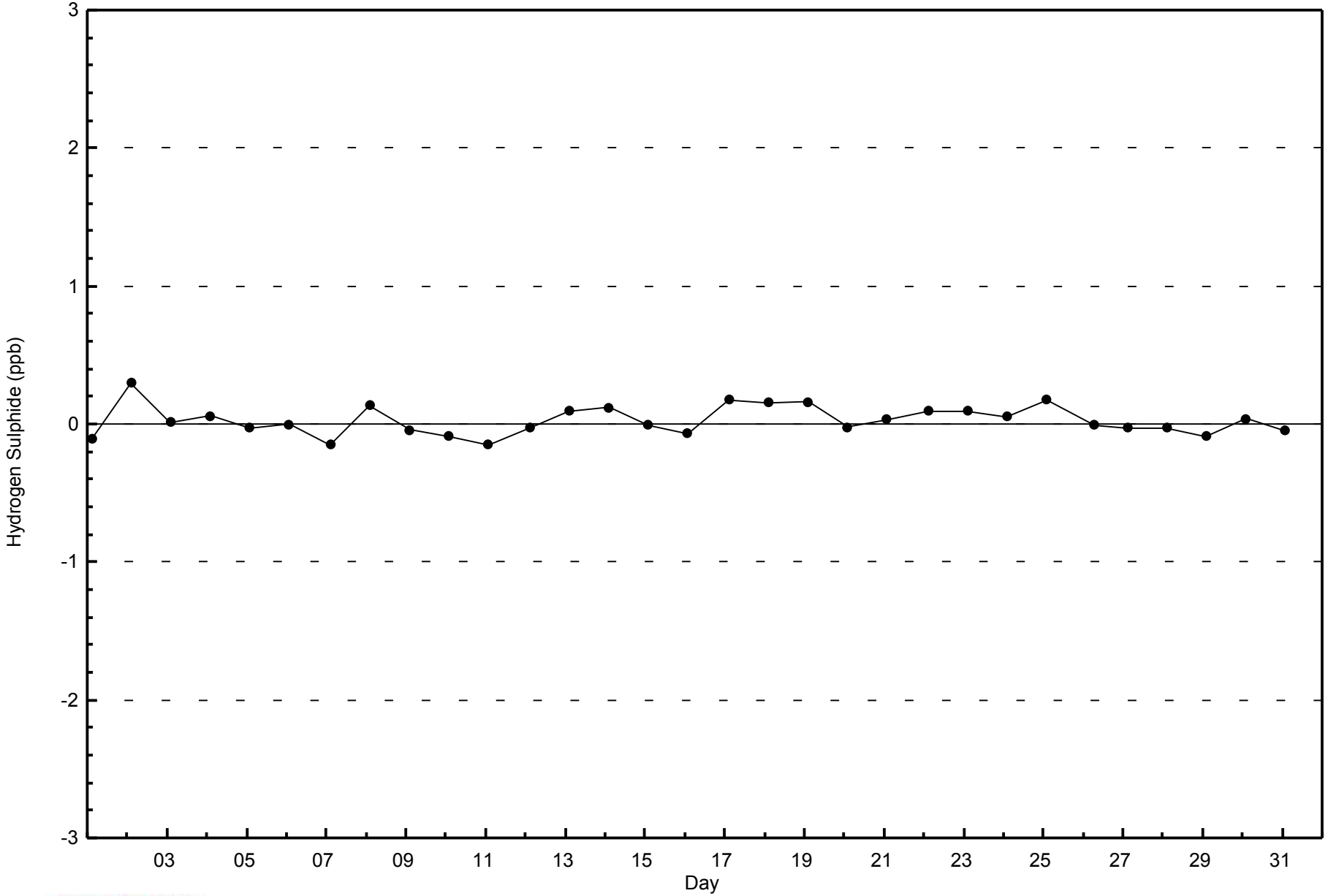
Total Number of Valid Hours: 708

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - August 2014



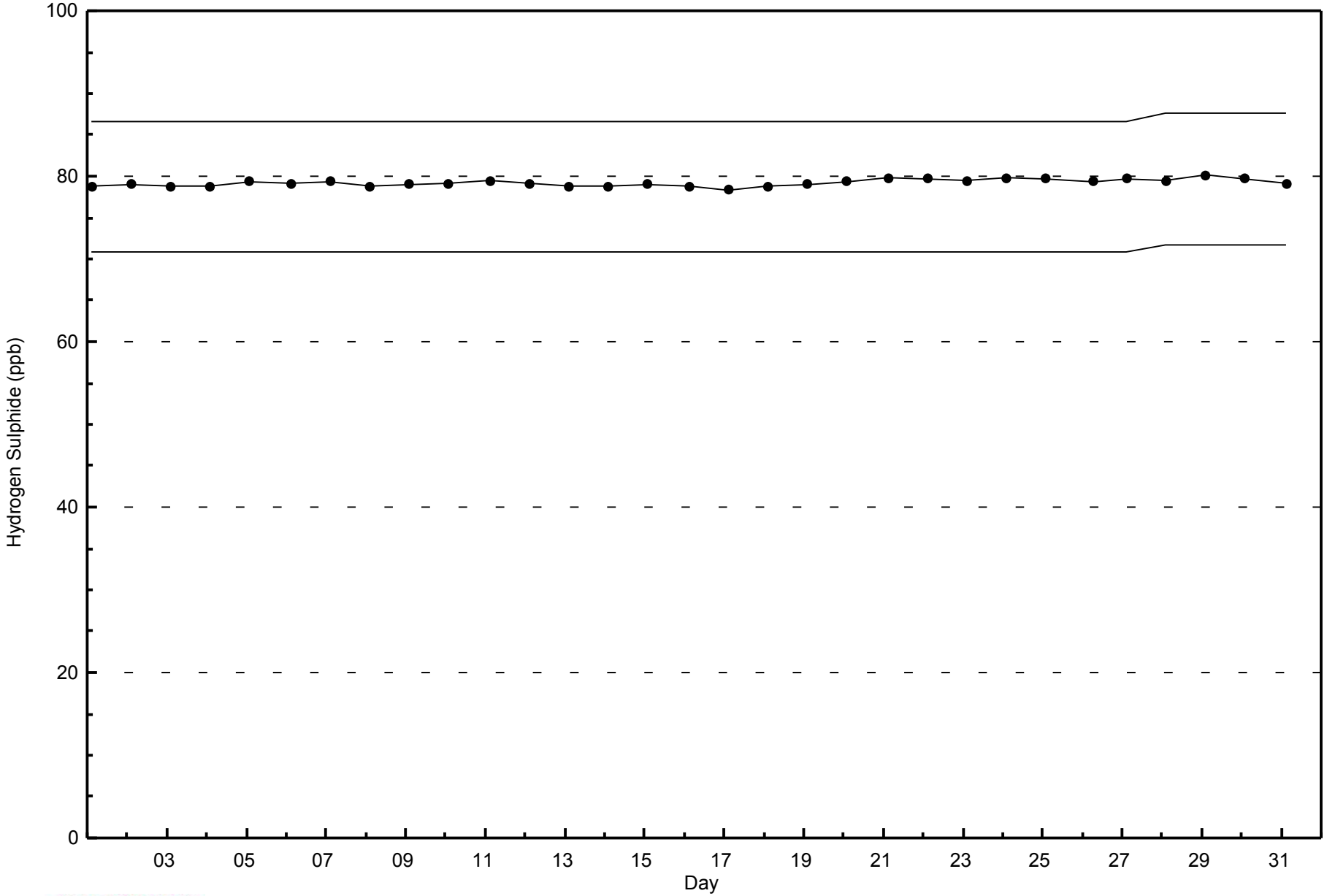
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - August 2014

Maximum Value: 4.6 ppm on Aug 17 06:00

Maximum Daily Average: 2.8 ppm on Aug 18

Minimum Value: 1.8 ppm on Aug 10 10:00

Minimum Daily Average: 1.9 ppm on Aug 8

Maximum Diurnal Average: 2.7 ppm at hour 3

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.39 ppm

Percentiles: P_1 = 1.8 P_{10} = 2.0 Q_1 = 2.1 Median = 2.3 Q_3 = 2.5 P_{90} = 2.9 P_{99} = 4.1

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	35
Percent Operational Time:	96.2

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-Aug	2.5	Z	2.5	2.5	2.5	2.4	2.4	2.4	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.5	3.2	2.3	3.2
2-Aug	2.8	Z	2.9	3.2	2.5	2.6	2.4	2.4	2.4	2.3	2.6	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.4	2.4	3.2
3-Aug	3.1	Z	2.9	2.7	2.5	2.5	2.3	2.3	2.2	2.6	2.8	2.8	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.4	2.3	2.6	2.7	2.8	2.5	3.1
4-Aug	3.1	Z	2.4	2.8	3.4	3.2	3.2	2.4	2.7	2.8	2.6	2.6	2.8	3.2	3.0	2.5	2.2	2.2	2.2	2.4	2.5	2.4	2.4	2.8	2.7	3.4
5-Aug	3.1	Z	3.2	3.2	3.3	2.9	2.8	2.4	2.4	2.5	3.1	2.4	2.4	2.2	2.1	2.1	2.1	2.2	2.4	2.4	2.3	2.5	2.7	2.3	2.6	3.3
6-Aug	2.7	Z	2.2	2.2	2.1	2.2	2.2	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.7	3.0	2.4	2.0	2.1	3.0
7-Aug	2.2	Z	2.0	2.1	2.2	2.2	2.3	2.0	UO	UO	1.9	UO	UO	1.9	UO	UO	UO	1.8	1.9	2.3	2.8	2.1	2.6	1.8	--	2.8
8-Aug	2.2	Z	1.9	2.2	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	UO	1.8	1.8	1.8	2.0	1.9	1.8	1.8	1.9	2.2
9-Aug	1.8	Z	1.9	1.9	1.9	1.8	1.8	2.1	2.5	2.0	1.8	1.8	UO	1.9	1.8	1.9	1.8	UO	UO	1.9	1.9	2.3	2.1	2.1	1.9	2.5
10-Aug	2.0	Z	2.2	2.4	2.3	2.2	1.8	2.0	UO	1.8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.9	UO	1.9	2.1	--	2.4
11-Aug	UO	Z	2.0	2.0	1.8	1.8	1.8	UO	1.9	1.9	2.0	2.0	UO	UO	UO	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.3	2.0	2.3
12-Aug	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.8	2.9	3.0	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.5	3.1	2.4	3.1
13-Aug	2.8	Z	2.4	2.7	2.7	2.7	2.6	2.7	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.3	2.2	3.2	3.4	2.3	2.5	2.5	3.4
14-Aug	4.2	Z	4.1	2.4	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.3	2.5	2.6	2.3	2.2	2.2	2.1	2.2	2.3	2.4	2.4	2.5	2.6	2.5	4.2
15-Aug	2.9	Z	2.8	2.7	2.9	2.9	2.4	2.3	2.2	2.3	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.3	2.4	2.9
16-Aug	2.3	Z	2.2	2.1	2.2	2.3	2.3	2.6	3.1	2.8	2.8	2.6	2.4	2.2	2.1	2.2	2.2	2.3	2.6	2.6	4.3	2.7	2.8	2.6	2.5	4.3
17-Aug	2.6	Z	3.9	4.2	3.2	4.6	3.8	2.6	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.3	2.2	2.2	2.1	2.3	2.9	3.5	2.7	4.6
18-Aug	4.1	Z	3.9	3.6	2.9	3.0	3.3	3.4	2.4	2.8	2.8	2.4	2.4	2.5	2.7	2.5	2.5	2.5	2.6	2.5	2.4	2.2	2.2	2.2	2.8	4.1
19-Aug	3.5	Z	2.8	2.5	2.6	2.4	2.5	2.5	2.4	2.3	2.1	2.1	2.1	2.3	2.4	2.4	2.0	2.0	2.0	2.1	2.1	2.3	2.2	2.2	2.3	3.5
20-Aug	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.3
21-Aug	2.2	Z	2.2	2.2	2.1	2.7	2.8	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	2.2	2.2	2.2	2.8
22-Aug	2.2	Z	3.9	3.5	3.0	2.4	2.3	2.7	2.4	2.3	2.3	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.3	2.4	3.9
23-Aug	2.3	Z	2.7	2.7	2.8	2.8	2.4	2.2	2.8	2.7	2.8	2.6	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.4	2.8
24-Aug	2.3	Z	2.3	2.4	2.5	2.5	2.5	2.6	2.5	2.4	2.4	2.3	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.4	2.8	2.7	2.3	2.8
25-Aug	2.4	Z	2.8	2.6	2.8	3.0	2.8	2.8	2.4	C	C	C	C	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	3.0
26-Aug	2.2	Z	3.2	3.0	3.6	4.1	3.3	3.0	2.2	2.4	2.7	3.0	2.8	2.4	2.4	2.2	2.1	2.1	2.2	2.2	2.2	2.6	3.3	2.6	2.7	4.1
27-Aug	2.3	Z	2.2	2.4	2.7	2.9	2.7	2.6	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.0	2.1	2.1	2.2	2.5	2.4	2.3	2.9
28-Aug	2.5	Z	2.9	3.1	3.2	3.3	3.4	2.9	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.5	3.4
29-Aug	2.2	Z	2.7	3.1	3.0	2.5	2.5	2.4	2.9	2.7	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.2	2.4	3.1	3.1	3.2	2.6	3.2	2.6	3.2
30-Aug	3.3	Z	2.4	2.5	2.1	2.2	2.2	2.7	2.3	3.6	3.9	3.0	3.0	2.5	2.2	2.4	2.3	2.3	2.3	2.3	2.2	2.4	2.4	2.7	2.6	3.9
31-Aug	3.5	Z	4.2	2.6	2.5	2.2	3.6	3.5	2.7	2.5	2.3	2.2	2.1	2.0	2.1	2.0	2.2	2.6	2.5	2.4	2.3	2.3	2.6	3.1	2.6	4.2
	2.7	--	2.7	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.5	Diurnal Average	
	4.2	--	4.2	4.2	3.6	4.6	3.8	3.5	3.1	3.6	3.9	3.0	3.0	3.2	3.0	2.5	2.5	2.6	2.6	3.1	4.3	3.4	3.3	3.5	Diurnal Maximum	

Z - zerospan C - Calibration UO - Unstable Operation

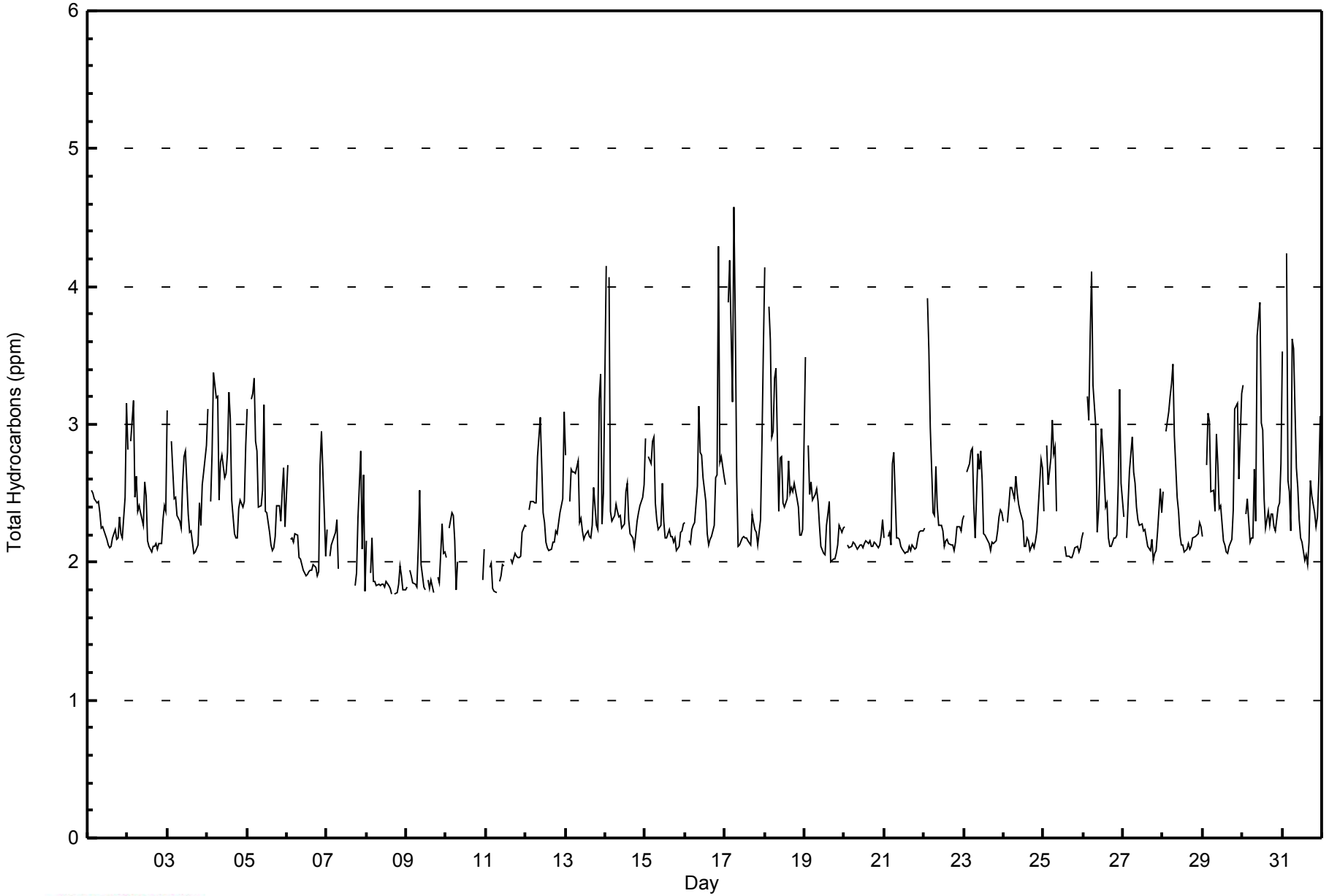
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	87	12.78	12.78
2.1 - 3.0	538	79.00	91.78
3.1 - 10.0	56	8.22	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mildred Lake - August 2014

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	11	12	8	2	1	0	1	1	3	15	6	4	7	6	3	7	87
2.1 - 3.0	66	57	12	14	12	17	28	57	76	60	26	20	11	21	26	34	537
3.1 - 10.0	2	0	1	0	2	3	2	12	6	2	1	6	1	4	10	4	56
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	79	69	21	16	15	20	31	70	85	77	33	30	19	31	39	45	680

Total Number of Valid Hours: 680

Total Number of Hours: 744

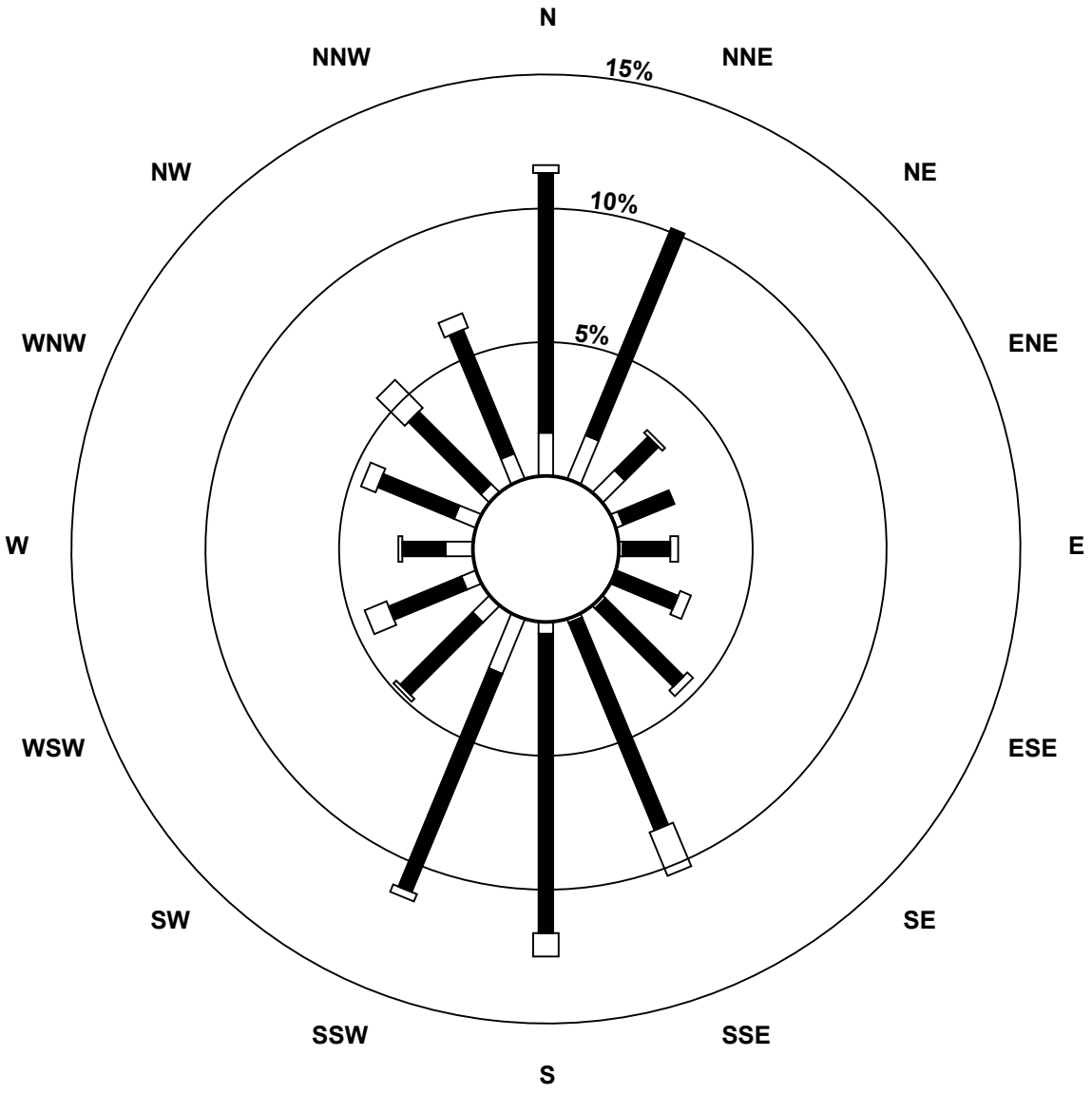
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

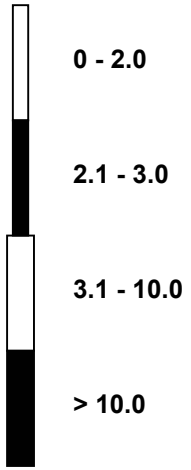
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Mildred Lake (AMS 2)



Classes (ppm)



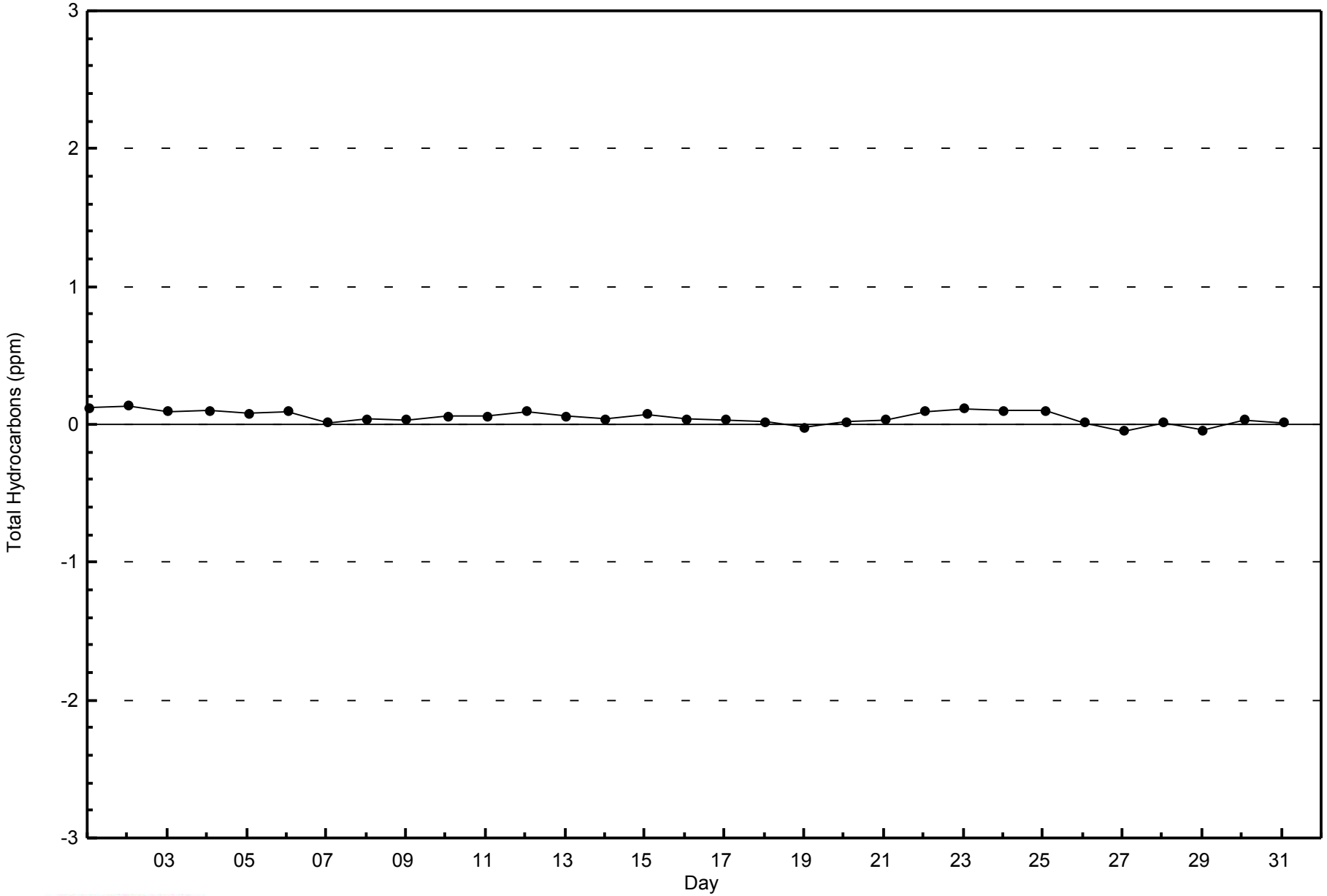
Total Number of Valid Hours: 680

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - August 2014



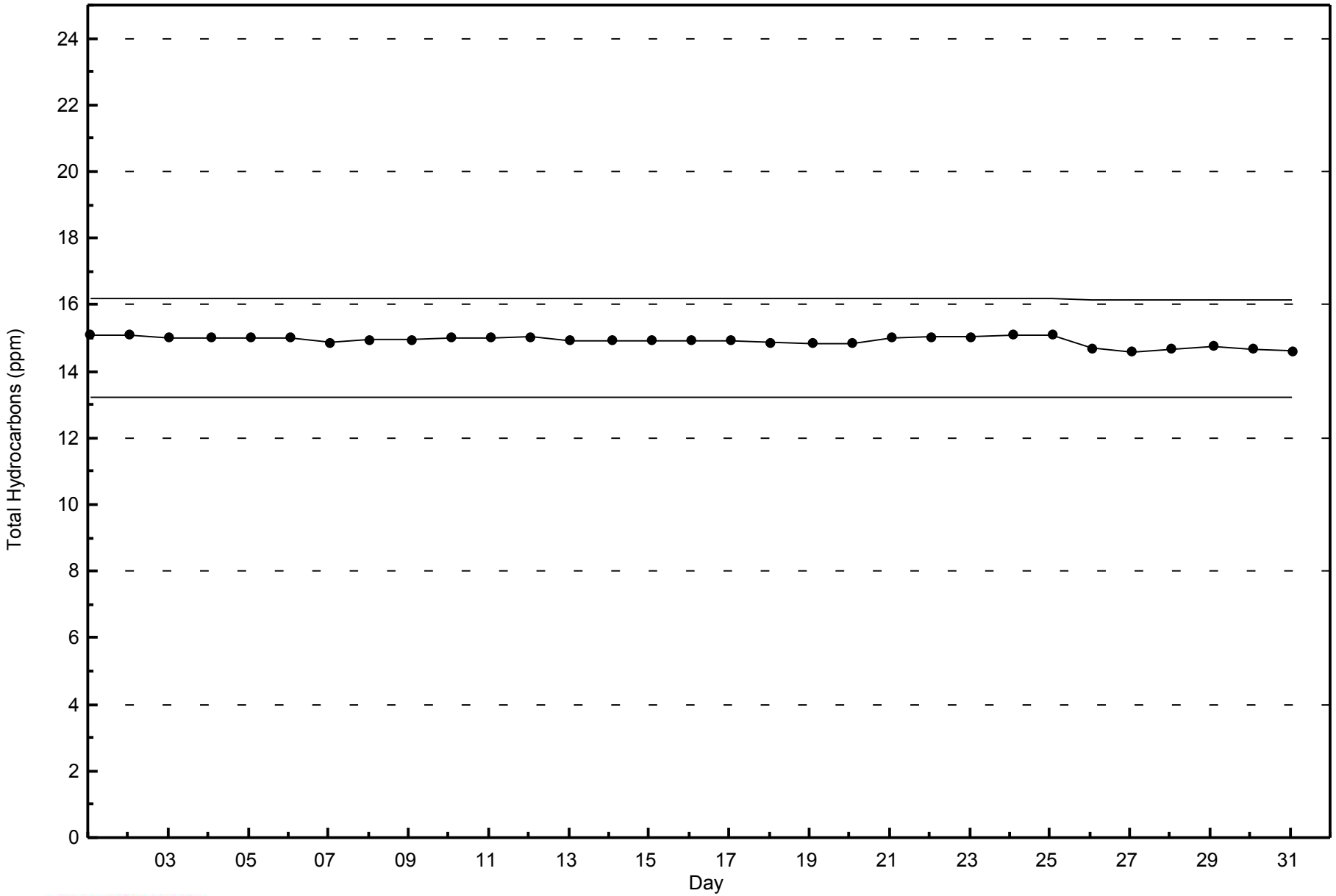
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 31.7 C on Aug 13 15:00

Maximum Daily Average: 25.5 C on Aug 13

Minimum Value: 2.7 C on Aug 22 05:00

Minimum Daily Average: 9.9 C on Aug 22

Maximum Diurnal Average: 23.7 C at hour 15

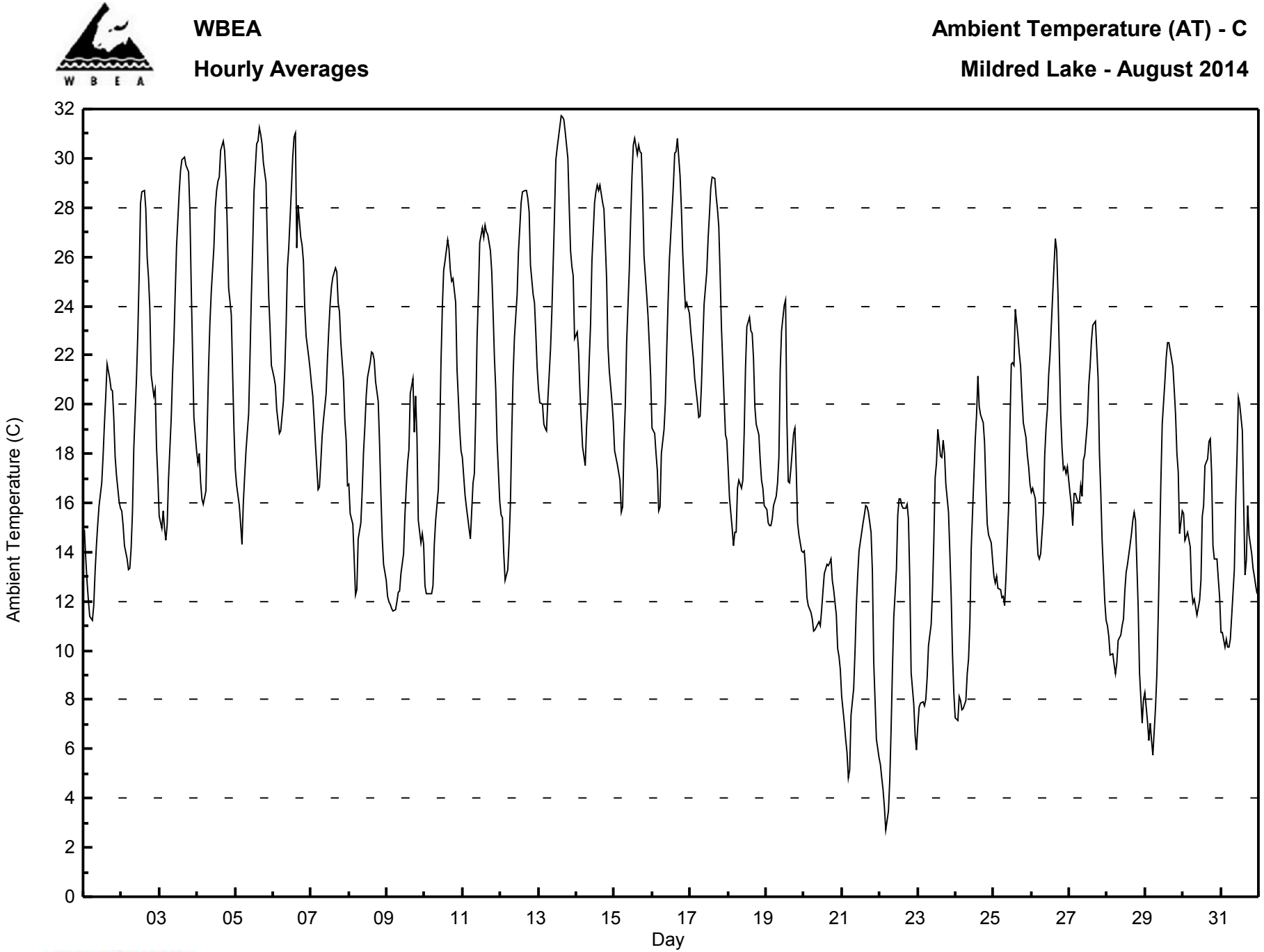
Minimum Diurnal Average: 13.1 C at hour 5

Monthly Average: 18.37 C

Percentiles: P_1 = 5.1 P_{10} = 10.8 Q_1 = 14.0 Median = 17.9 Q_3 = 22.7 P_{90} = 27.8 P_{99} = 31.0

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-Aug	14.9	13.8	12.8	12.0	11.4	11.2	11.8	13.2	14.2	15.1	15.9	16.8	17.9	19.2	20.4	21.6	21.0	20.6	20.6	19.5	17.9	17.1	16.0	15.8	16.3	21.6
2-Aug	15.7	15.1	14.3	13.7	13.3	13.4	14.1	15.6	18.2	21.0	22.9	25.2	28.1	28.6	28.7	27.9	26.0	25.2	23.9	21.2	20.3	20.6	18.3	17.1	20.4	28.7
3-Aug	15.5	15.0	15.7	15.0	14.5	15.1	17.0	19.4	21.2	22.5	24.5	26.4	28.7	29.5	29.9	30.0	30.0	29.7	29.5	27.8	24.8	22.1	19.5	18.1	22.6	30.0
4-Aug	17.6	18.0	16.9	16.2	15.9	16.5	19.1	21.5	23.3	24.6	26.4	28.0	28.7	29.1	29.2	30.3	30.7	30.3	29.2	27.1	24.7	23.7	21.3	19.0	23.6	30.7
5-Aug	17.4	16.7	15.9	15.1	14.3	16.0	17.1	18.1	19.6	21.9	24.4	26.3	28.7	30.6	30.7	31.2	31.0	30.6	29.8	29.0	26.6	24.4	23.1	21.6	23.3	31.2
6-Aug	21.1	20.8	19.8	19.3	18.8	18.9	20.1	21.3	23.1	25.6	26.3	28.8	30.1	30.8	31.0	26.3	28.1	26.8	26.5	25.8	23.9	22.8	21.9	21.4	24.1	31.0
7-Aug	20.8	20.3	19.4	18.4	16.5	16.7	17.6	18.7	19.4	20.4	21.9	23.1	24.1	24.8	25.2	25.5	25.4	24.1	23.8	22.5	21.0	19.4	18.6	16.7	21.0	25.5
8-Aug	16.7	15.6	15.1	13.7	12.2	12.5	14.6	15.2	16.5	18.1	19.1	20.3	21.1	21.7	22.1	22.1	21.8	20.9	20.1	18.4	16.4	14.6	13.5	12.9	17.3	22.1
9-Aug	12.2	12.0	11.9	11.7	11.6	11.6	12.0	12.4	12.4	13.1	14.0	15.5	16.6	17.6	18.2	20.5	21.0	18.9	20.4	18.7	15.3	14.4	14.7	14.3	15.0	21.0
10-Aug	12.6	12.3	12.3	12.3	12.3	12.6	14.3	15.3	16.5	18.6	21.7	23.9	25.4	25.8	26.7	26.3	25.4	25.0	25.1	24.1	21.4	20.3	19.0	18.1	19.5	26.7
11-Aug	17.9	16.3	15.8	15.4	15.0	14.5	16.8	17.2	19.6	22.7	24.5	26.6	27.2	26.8	27.3	27.0	26.9	26.3	25.4	23.7	21.9	20.6	18.5	16.1	21.2	27.3
12-Aug	15.5	15.4	14.0	12.9	13.3	14.5	16.0	18.9	21.2	22.7	24.5	26.2	27.2	28.2	28.6	28.7	28.7	28.4	27.8	25.7	24.4	24.2	22.9	21.5	22.1	28.7
13-Aug	20.6	20.1	20.0	19.2	19.0	18.9	20.2	22.2	23.7	25.7	27.7	30.0	30.4	31.3	31.7	31.7	31.6	31.1	30.0	28.0	26.2	25.6	25.2	22.7	25.5	31.7
14-Aug	22.9	22.2	20.6	19.4	18.3	17.5	19.1	20.1	21.8	23.3	25.8	28.2	28.6	28.9	28.7	28.9	28.2	27.9	26.6	25.1	22.4	21.4	20.1	19.3	23.6	28.9
15-Aug	18.1	17.8	17.6	16.9	15.6	15.8	18.3	20.0	22.5	25.5	27.5	29.3	30.5	30.8	30.2	30.5	30.3	30.2	28.5	26.0	24.5	23.6	22.4	21.1	23.9	30.8
16-Aug	19.1	18.8	18.0	17.3	15.7	15.9	18.0	19.0	20.1	22.2	24.1	25.9	27.9	28.9	30.2	30.3	30.8	29.3	27.9	26.1	25.0	24.0	24.1	23.7	23.4	30.8
17-Aug	23.0	22.4	21.9	21.0	20.1	19.5	19.5	20.8	22.5	24.1	25.4	26.8	27.7	28.8	29.2	29.2	28.5	28.0	27.2	25.3	23.1	20.2	18.8	18.5	23.8	29.2
18-Aug	17.4	16.2	15.0	14.3	14.8	14.8	16.6	16.9	16.6	16.9	18.8	21.5	23.2	23.5	23.0	22.9	21.9	19.9	19.2	18.7	17.7	16.9	16.6	15.9	18.3	23.5
19-Aug	15.7	15.2	15.1	15.1	15.4	15.9	16.3	16.8	17.8	21.4	23.0	24.0	24.2	19.4	16.9	16.8	17.4	18.8	19.0	17.3	15.2	14.7	14.0	14.0	17.5	24.2
20-Aug	14.1	13.3	12.1	11.8	11.6	11.3	10.8	10.9	10.9	11.2	11.0	11.7	12.4	13.1	13.5	13.4	13.6	13.7	12.9	12.5	11.5	10.1	9.8	9.2	11.9	14.1
21-Aug	8.2	7.0	6.4	5.9	4.8	5.1	7.4	8.5	10.0	11.8	13.1	14.0	14.8	15.2	15.5	15.9	15.8	15.6	14.8	13.2	9.6	8.0	6.4	5.7	10.5	15.9
22-Aug	5.4	4.9	4.3	3.6	2.7	3.5	4.7	6.8	9.2	11.3	13.3	15.5	16.2	16.2	15.9	15.8	15.8	16.0	15.3	12.9	9.1	7.8	6.5	6.0	9.9	16.2
23-Aug	6.9	7.7	7.9	7.9	7.7	8.0	8.9	10.2	11.1	12.4	14.5	17.1	17.6	19.0	17.9	17.8	18.5	18.0	16.8	15.6	14.0	12.2	9.8	8.2	12.7	19.0
24-Aug	7.3	7.2	8.1	8.0	7.6	7.7	8.0	9.1	9.6	11.1	14.2	17.1	18.6	19.6	21.2	19.9	19.6	19.3	18.4	16.6	15.1	14.7	14.4	13.7	13.6	21.2
25-Aug	13.0	12.7	13.0	12.5	12.5	12.1	12.2	11.8	12.9	15.8	19.1	21.6	21.7	21.6	23.9	22.8	22.1	21.5	20.3	19.2	18.7	18.0	17.5	16.7	17.2	23.9
26-Aug	16.4	16.6	16.2	14.8	13.9	13.7	13.9	15.6	17.9	19.0	19.8	21.2	22.0	24.5	25.7	26.7	26.3	24.4	19.6	18.2	17.4	17.5	17.2	17.5	19.0	26.7
27-Aug	16.4	15.9	15.1	16.4	16.4	16.0	16.1	16.7	16.2	17.8	17.9	19.2	20.8	21.5	22.6	23.2	23.4	22.2	21.1	18.0	16.4	14.5	12.0	11.2	17.8	23.4
28-Aug	11.0	10.6	9.8	9.9	9.4	9.0	9.5	10.4	10.6	11.0	11.3	12.4	13.2	13.5	14.3	14.7	15.3	15.6	15.3	11.8	9.1	8.1	7.1	8.0	11.3	15.6
29-Aug	8.3	7.1	6.3	7.0	6.3	5.8	7.7	9.1	11.4	14.1	16.9	19.2	21.0	21.9	22.5	22.5	22.2	21.5	20.6	19.6	18.0	17.2	14.8	15.7	14.9	22.5
30-Aug	15.5	14.5	14.7	14.8	14.2	12.5	11.9	12.1	11.8	11.5	12.0	12.9	15.5	15.9	17.5	17.8	18.5	18.6	17.2	14.2	13.7	13.7	12.9	12.2	14.4	18.6
31-Aug	10.8	10.7	10.2	10.5	10.1	10.2	10.5	11.4	13.3	16.0	17.9	20.3	20.0	18.9	16.0	13.1	13.7	15.9	14.7	14.0	13.3	13.0	12.7	12.3	13.7	20.3
	15.1	14.6	14.1	13.6	13.1	13.1	14.2	15.3	16.6	18.3	20.0	21.8	22.9	23.4	23.7	23.6	23.5	23.0	22.2	20.5	18.7	17.6	16.4	15.6	Diurnal Average	
	23.0	22.4	21.9	21.0	20.1	19.5	20.2	22.2	23.7	25.7	27.7	30.0	30.5	31.3	31.7	31.7	31.6	31.1	30.0	29.0	26.6	25.6	25.2	23.7	Diurnal Maximum	


WBEA
Hourly Averages
Ambient Temperature (AT) - C
Mildred Lake - August 2014
Ambient Temperature (C)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
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	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	62	8.33	8.33
10 - 20	400	53.76	62.10
> 20	282	37.90	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

Mildred Lake - August 2014

Maximum Speed: 19 km/h on Aug 17 16:00

Maximum Daily Speed Average: 12.0 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 10 19:00

Minimum Daily Speed Average: 0.5 km/h on Aug 18

Maximum Diurnal Speed Average: 2.7 km/h at hour 14

Minimum Diurnal Speed Average: 0.3 km/h at hour 21

Monthly Average Velocity: 1.0 km/h 240.7 deg

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 5$ Median = 7 $Q_3 = 10$ $P_{90} = 13$ $P_{99} = 17$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	N13	N13	NNE10	NNE10	N13	N12	N12	NNE11	NNE12	N15	N14	NNW10	NNW10	NNW6	NW6	SSW6	S7	SE6	ESE7	SE5	S7	S7	S7	S8	N4.6	N15
2-Aug	S12	S13	S11	SSE11	S13	SSW9	S10	S14	S11	S10	SSE12	SSE11	SW9	SSW11	SSW11	SSW16	SSW16	SSW11	SSW5	ENE8	ESE6	S2	ESE6	SE2	S8.7	SSW16
3-Aug	WSW3	SW1	SSW3	SSW3	SSW6	SSW8	SSW7	SSW7	SSW6	S7	S6	SSE7	SSW6	WNW4	SSW7	S7	S9	S10	SSW7	SW4	SSW4	S4	SE1	SE2	SSW5.0	S10
4-Aug	SSW2	SSW4	S4	SSE4	SE3	E3	SSE4	SSW5	N2	N7	NNE8	NNE7	N10	N11	NNE10	N9	NE8	NE8	NNE6	NE7	ENE7	E6	ESE3	SSW3	NE3.1	N11
5-Aug	SW3	SSW1	SSW2	SSE1	E4	SE7	S4	SW4	SW5	SW4	SSE9	SE8	SE10	SSE11	SSE11	SSE9	SE9	SSE9	SSE10	S13	S9	S7	S6	S6	SSE6.0	S13
6-Aug	SSE10	SSE9	SSE10	SSE11	SSE11	S11	S12	S12	SSW9	SSW7	S13	SSW13	SW13	SW12	SW13	WSW12	W6	E5	SW10	WSW11	SW7	WSW7	WSW8	WSW11	SSW8.3	S13
7-Aug	W13	WNW11	WNW11	W11	WSW9	W12	WSW10	W13	WNW18	WNW16	W16	W17	W17	W17	W15	W17	W16	WNW15	WNW14	WNW9	WNW8	W5	NNW9	N5	W12.0	WNW18
8-Aug	NNW6	NNE3	NW6	NNW7	N5	N5	NE5	NE7	NE4	N5	NNW8	N8	NNE6	NE8	NE7	ENE8	NE9	NE9	NNE5	WNW9	WNW14	NNW6	N6	NNE6	N5.1	WNW14
9-Aug	N8	NNE9	NNE10	NNE10	NNE7	N6	NNW6	NNW8	NW8	NNW8	N7	N7	NNE4	NE3	SSE6	W8	WNW8	WSW2	NW2	NNW3	NW4	SW4	WSW4	WSW4	NNW4.1	NNE10
10-Aug	SE2	ESE2	ESE4	SE4	SSE4	SSE6	SSW8	S6	SSW9	SSW8	SSW7	SW6	SSW8	SSW8	SSW8	SSW9	SW8	W4	NE0	E2	SSW3	WSW5	WSW4	WSW4	SSW4.5	SSW9
11-Aug	WSW6	SW4	SW5	SSW5	SSW6	SSW5	SSW7	WSW7	SW8	W6	W2	S3	NNW18	NW16	NW16	NW16	NNW16	N12	NNE10	NNE8	NNE6	NNE7	NNE4	NNE5	NW4.2	NNW18
12-Aug	NNE6	NNE7	N5	N2	NE2	ENE3	N3	SE2	SSE5	SSE6	SE7	SSE10	SE10	SSE10	SSE11	SSE12	SSE13	SSE12	SSE12	ESE10	SE10	SSE16	SSE15	SE8	SE6.1	SSE16
13-Aug	SE8	SSE11	SSE10	SSE8	SSE7	SE4	SW4	S7	S11	S12	S11	SSW12	SW11	SW10	SW10	SW10	SW10	SW9	SSW8	SW6	W3	NNW5	NNW8	NW5	SSW5.8	S12
14-Aug	NW8	NW10	NNW7	NNW8	NNW7	NNW5	N5	N6	NNE6	NNE7	NNW1	SSW6	SW5	SSW8	S7	S6	SSE7	S7	S2	SSE1	S4	S5	SSW4	S4	W1.3	NW10
15-Aug	SE3	SSW3	SSW6	S7	S5	S5	S7	S9	S7	SSW5	SSW5	SSW4	SW5	SSW4	WNW3	SE6	E8	E7	NNE11	N12	N10	NNE8	N9	N8	SSE0.9	N12
16-Aug	N5	N8	N9	N8	NNE3	N2	N3	NNE4	NE3	ESE5	ESE6	SE5	S9	SSW7	SSW7	SSW6	SW8	SW7	SSW6	SSW5	WSW2	WSW3	WSW5	WSW6	SW1.1	S9
17-Aug	W7	WNW8	WNW7	NW8	NW9	NW9	NW8	NNW11	NNW8	NNW7	WNW9	NW10	WNW10	WNW11	WNW15	NW19	NW17	NW17	NW13	NNW9	NNW7	WNW2	WSW2	WSW1	NW8.9	NW19
18-Aug	ESE3	ENE3	ESE3	ESE2	S3	SSE4	S7	S8	NE2	ENE5	S7	SW7	SW8	WSW5	N8	NNE8	NE4	N3	SSW6	N4	NNE8	NNE8	NNE3	NNW3	E0.5	S8
19-Aug	NNW3	NE2	ENE3	ESE3	S4	SSW5	SSW6	SW4	SSW8	SSW9	SSW11	S10	S12	WNW15	NNW15	N5	ENE6	NNE6	NE4	N4	NNW6	N8	NNE7	NNE8	WNW1.0	NNW15
20-Aug	NNE10	NNE13	NNE14	NNE11	NNE13	NNE11	NNE12	NNE12	NNE13	N14	N14	NNE12	N14	N16	N14	NNE9	N9	N9	N9	NNE5	N5	NNW6	NNW7	NNW9	NNE10.7	N16
21-Aug	NNW9	NNW7	NNW7	NNW7	NNW5	NW6	NNW3	NNE4	NNE9	N9	N11	N11	N11	N11	NNE9	NNE10	NNE10	NNE11	NNE9	NE6	NNE4	N5	N4	N4	N7.1	N11
22-Aug	NW2	NNW5	NNW5	N3	NE2	NE3	ENE2	E2	NNE3	N4	NNE5	N6	N5	N9	NNE7	NNE8	NE8	NNE6	NNE5	NE4	E3	ENE3	SE2	S3	NNE3.5	N9
23-Aug	S3	ENE3	NE2	E3	ENE2	ENE2	SSW5	S7	SE5	SSE5	SSE6	SSE6	ESE4	SSW5	WNW3	SSE6	SSW7	SSE7	SE4	ENE4	E5	ENE4	ENE5	E4	SE2.8	S7
24-Aug	NNE4	N6	N7	N7	N7	N6	N6	N4	N5	N5	N3	NNE5	ENE3	ESE6	SSW6	NNE2	ENE6	E7	E6	ESE6	ESE8	SE8	SE8	SE9	ENE3.1	SE9
25-Aug	S7	SSE7	S12	SSE10	SSE12	SSE10	SSE6	SSE8	SSE11	SSE14	S15	S15	SSE13	S14	SSW16	SSW17	SSW16	SSW14	S13	S11	S13	S17	S12	S9	S11.6	SSW17
26-Aug	S13	SSE11	SSE12	SSE9	SSE9	SSE10	S9	S9	SSW8	S8	SSE8	SSE7	M	SSE7	SSE8	SW13	SW13	NW8	NNE10	ESE4	NNE2	S2	S5	SSW9	S6.2	S13
27-Aug	SSW9	SSW6	SSW8	WSW8	WSW10	W9	WNW11	WNW13	WNW14	WNW12	WNW12	WNW10	NW10	NW11	NW11	WNW11	WNW10	NW11	N9	NNE5	NNE6	NW7	NW6	SW1	WNW7.2	WNW14
28-Aug	W5	WNW6	NE2	NW6	NW8	NW9	NW10	NW11	NW12	NW12	NNW12	NNW12	NW11	N12	N11	NW10	N8	NNW9	N6	E4	ESE4	ESE3	S4	SSW5	NNW6.1	NW12
29-Aug	SW5	S2	SSE6	S10	S7	SE7	SSW9	SSW9	S12	S13	S10	SSE12	S13	S14	S12	S13	SSE13	SSE13	SSE12	SSE12	SSE10	SSE11	SE7	SSE10	S9.7	S14
30-Aug	SSE10	SE10	SSE13	SSE13	SSW12	SSW9	SSW5	S5	WSW6	NW5	NW6	NW7	W5	WNW3	E4	SE4	SSW6	SSW4	SSE3	NNE2	ESE1	NNW4	N4	NNW4	SSW2.5	SSE13
31-Aug	WSW3	SW4	WNW5	W5	WSW5	WSW5	WSW4	WSW4	SSW4	S5	SSW6	SW5	NW7	NNW11	N16	NNE7	WSW6	NW5	NW6	W5	W7	WNW8	W8	WNW6	W4.1	N16
	WSW1.1	NW0.3	SSW0.4	S0.3	SSW1.1	SW1.2	SW1.9	SW2.0	WSW1.6	WSW1.2	SW1.5	SW1.9	W2.4	W2.7	W2.4	WSW2.4	SW2.0	WNW0.4	NNE0.5	ENE0.7	ESE0.3	SSW0.5	SSW0.5	SSW0.9	Diurnal Average	
	N13	N13	NNE14	SSE13	NNE13	W12	NNE12	S14	WNW18	WNW16	W16	W17	NNW18	W17	SSW16	NW19	NW17	NW17	WNW14	S13	WNW14	S17	SSE15	WSW11	Diurnal Maximum	

M - Maintenance

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 Aug 27 22:00

Minimum Value: 0 km/h on Aug 21 23:00

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

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

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

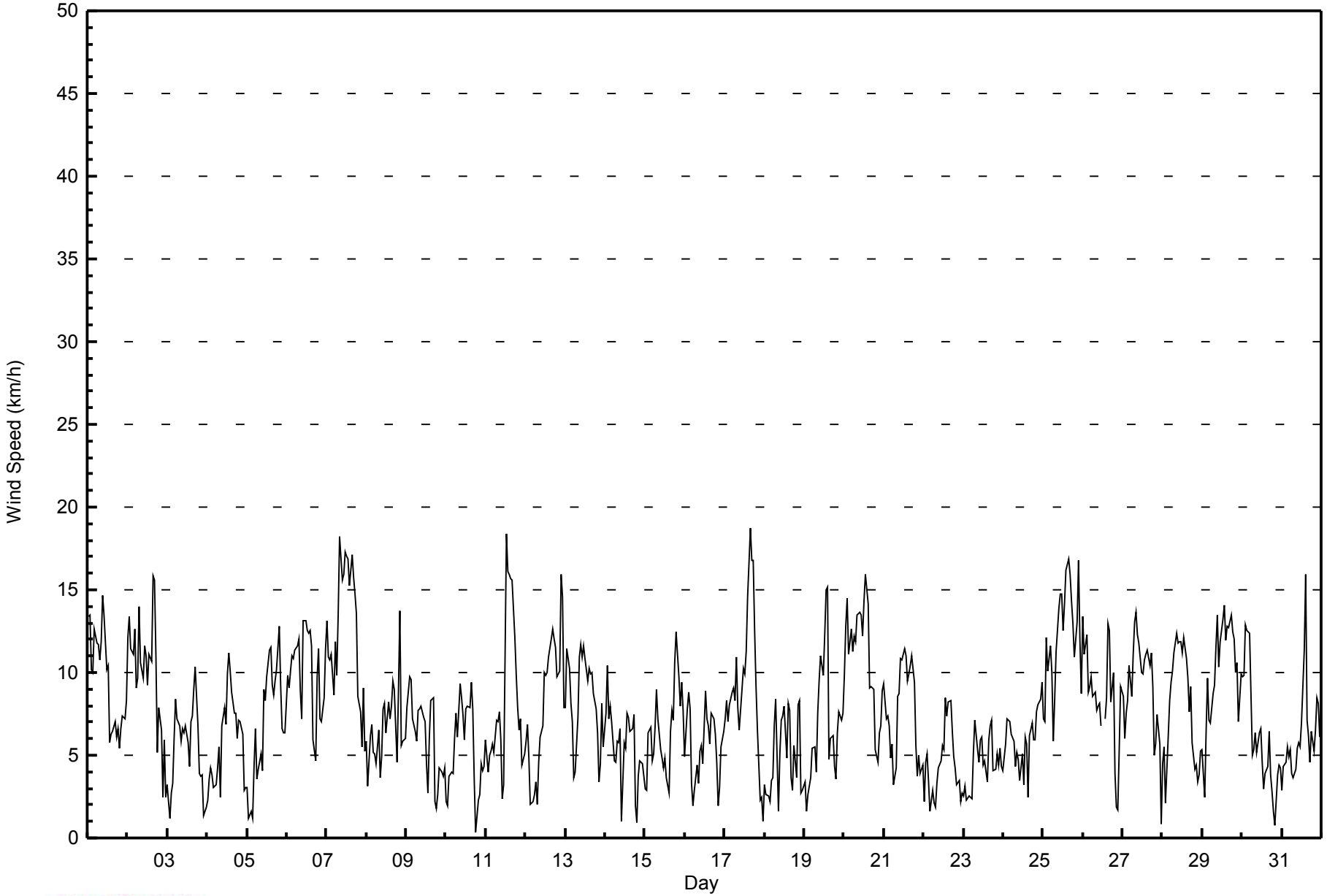
M - Maintenance

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Mildred Lake - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	239	32.17	32.17
6 - 11	387	52.09	84.25
12 - 19	117	15.75	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Mildred Lake - August 2014

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	20	15	13	11	13	15	9	20	28	17	18	8	6	6	12	239
6 - 11	39	46	9	5	5	8	17	49	44	50	16	15	7	19	28	30	387
12 - 19	15	8	0	0	0	0	0	18	25	9	5	1	9	12	9	6	117
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	82	74	24	18	16	21	32	76	89	87	38	34	24	37	43	48	743

Total Number of Valid Hours: 743

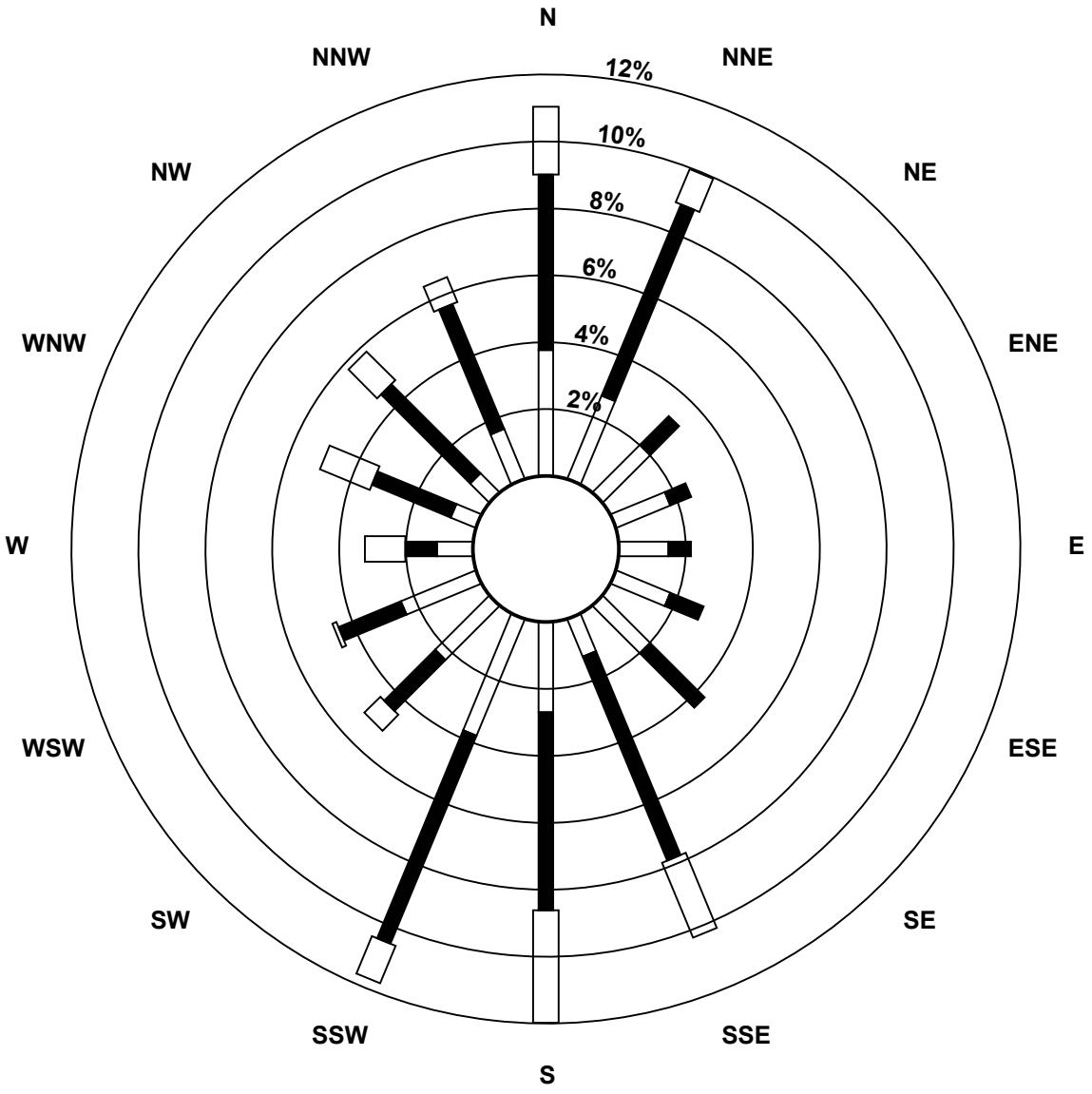
Total Number of Hours: 744

Wood Buffalo Environmental Association

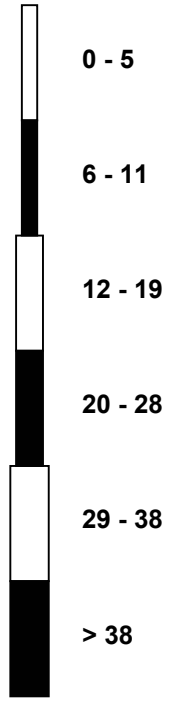
Wind Rose Aug 2014

Wind Speed (WS) - km/h

Mildred Lake (AMS 2)



Classes (km/h)



Total Number of Valid Hours: 743

Direction of Maximum Speed: 313 deg on Aug 17 16:00
Direction of Maximum Daily Speed Average: 281.0 deg on Aug 7

Direction of Minimum Speed: 35 deg on Aug 10 19:00

Direction of Minimum Daily Speed Average: 0.5 deg on Aug 18

Monthly Average Direction: 250.2 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	7	10	21	12	2	3	0	17	18	359	3	344	336	339	324	210	189	130	120	129	175	190	173	171	8.9
2-Aug	178	182	183	166	189	194	188	170	172	173	159	165	218	209	210	201	210	213	207	69	107	191	114	139	182.6
3-Aug	249	231	203	207	194	207	212	202	200	177	174	166	200	282	197	182	186	187	204	224	195	182	128	135	195.8
4-Aug	198	194	186	149	136	99	168	201	9	9	16	14	359	357	15	11	34	34	22	52	70	85	113	202	36.4
5-Aug	228	207	207	164	98	135	171	226	221	227	165	126	133	155	151	157	139	147	149	170	185	175	182	184	162.0
6-Aug	160	155	159	166	168	169	180	185	197	202	183	203	217	227	227	242	277	88	235	244	228	242	242	247	203.6
7-Aug	267	285	294	276	242	264	258	275	284	283	274	278	278	273	266	273	281	299	301	298	300	279	339	355	281.0
8-Aug	345	19	316	334	7	351	34	46	34	8	328	358	33	42	41	68	52	46	19	283	294	342	354	33	6.4
9-Aug	6	15	12	18	15	4	340	328	325	339	357	355	22	56	147	280	288	245	318	344	319	235	244	250	342.1
10-Aug	140	116	119	138	159	168	196	182	197	197	200	216	209	194	208	205	215	269	35	88	206	257	242	240	198.2
11-Aug	256	220	220	207	201	198	209	243	235	270	275	191	328	318	314	323	346	9	26	28	25	25	26	20	317.9
12-Aug	13	14	5	0	52	60	11	133	163	153	141	156	146	166	167	149	160	150	148	119	128	158	154	142	142.7
13-Aug	138	155	155	148	153	137	220	182	170	172	182	207	219	233	236	231	223	219	210	218	278	337	329	323	198.4
14-Aug	304	308	327	343	341	329	350	1	20	13	329	213	218	196	180	173	166	188	171	147	187	184	192	170	261.0
15-Aug	126	200	202	190	178	188	191	189	186	193	199	208	229	197	293	141	98	99	12	6	9	16	9	4	152.3
16-Aug	349	355	1	4	15	355	9	21	48	111	110	134	179	195	202	204	215	233	212	207	255	249	242	252	229.6
17-Aug	276	297	292	315	316	316	315	337	346	339	298	304	299	294	303	313	304	313	322	327	348	291	245	254	311.1
18-Aug	103	58	111	102	186	157	180	182	54	62	180	214	214	241	352	20	54	2	207	9	20	14	30	333	100.5
19-Aug	334	55	60	110	177	212	205	215	201	203	199	187	182	301	327	4	61	26	43	359	330	357	13	19	286.6
20-Aug	24	26	15	17	19	15	18	22	15	11	11	26	6	5	6	15	8	1	8	15	3	338	341	347	11.4
21-Aug	346	335	336	345	337	312	338	23	20	354	1	2	355	2	30	22	24	24	28	44	29	10	8	4	5.1
22-Aug	304	331	331	351	48	35	59	94	12	354	18	360	359	2	15	15	46	29	24	42	83	64	145	182	18.5
23-Aug	171	67	48	87	64	60	193	182	139	155	156	167	118	204	298	154	198	162	138	71	80	69	73	86	136.8
24-Aug	22	1	6	0	4	359	5	350	8	5	8	29	74	102	199	32	61	92	79	106	118	129	138	143	57.1
25-Aug	176	154	171	150	159	160	153	157	151	160	184	190	167	175	206	203	204	204	186	173	186	188	179	169	178.7
26-Aug	179	163	163	153	157	160	177	181	194	176	150	155	M	167	161	218	231	312	33	111	33	188	170	196	175.0
27-Aug	200	203	208	248	254	263	294	298	297	293	299	295	306	309	308	297	297	322	353	12	18	325	314	225	294.2
28-Aug	269	299	46	324	314	315	315	309	308	313	337	331	321	349	1	325	355	346	359	86	110	110	188	204	327.9
29-Aug	222	172	164	179	189	141	193	209	182	175	177	163	174	172	175	183	158	161	158	168	162	165	128	154	171.0
30-Aug	157	133	149	162	196	202	196	180	246	315	318	312	265	299	99	135	210	212	160	19	123	334	354	336	191.7
31-Aug	249	230	282	279	241	245	258	239	205	186	196	219	317	332	350	14	238	310	321	267	259	287	270	296	280.5
	241.8	324.7	194.9	190.4	202.6	221.3	234.3	226.6	241.2	253.1	221.9	227.1	260.3	272.4	275.5	245.4	232.8	286.6	28.8	74.2	101.4	212.5	193.9	205.7	
	Diurnal Average																								

M - Maintenance
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 Aug 14 11:00

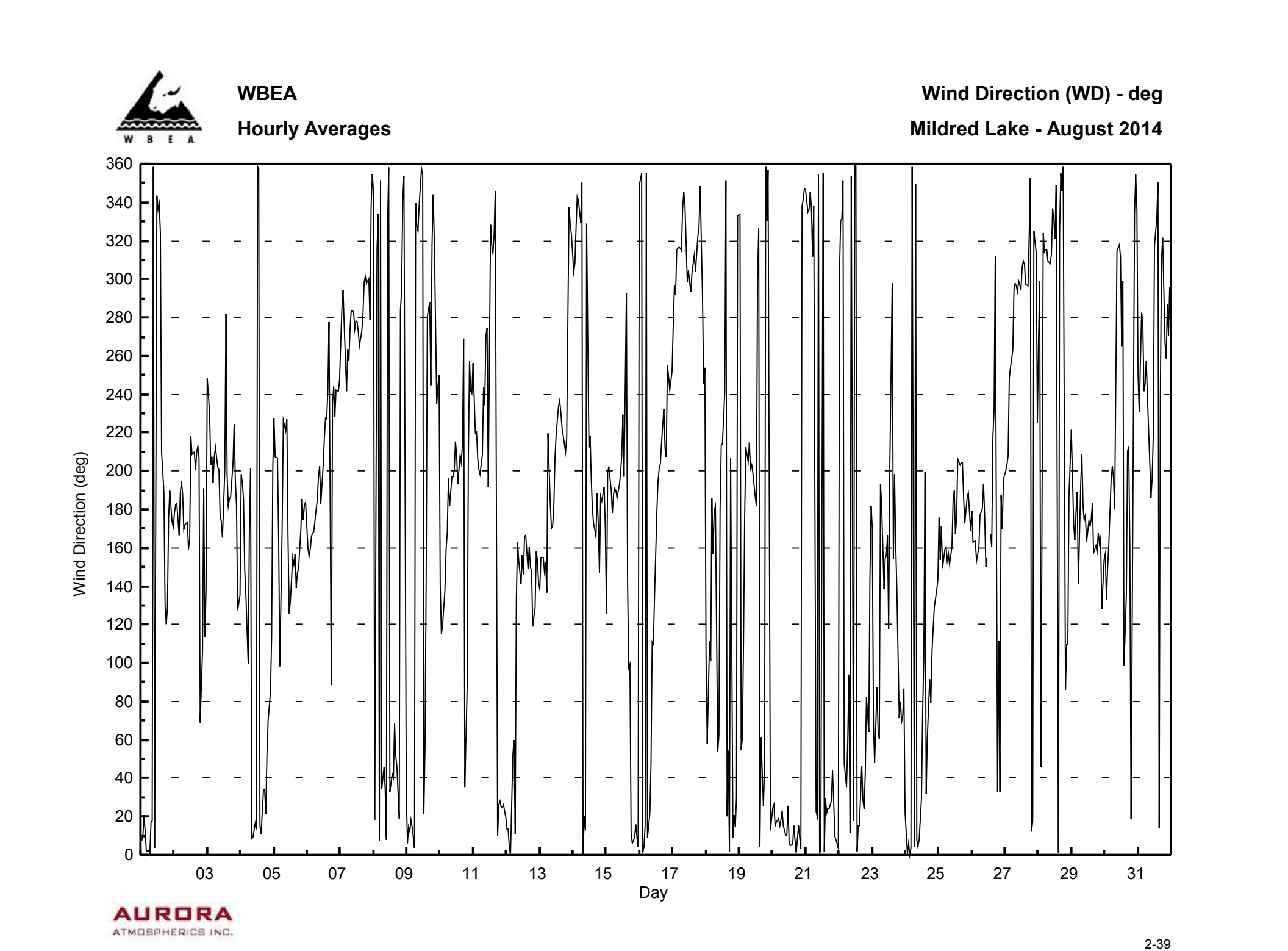
Minimum Value: 7 deg on Aug 20 22:00

Percentiles: P_1 = 9 P_{10} = 14 Q_1 = 18 Median = 25 Q_3 = 34 P_{90} = 52 P_{99} = 89

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	13	13	16	15	11	12	12	19	21	16	25	40	41	64	48	38	33	31	21	15	16	16	17	19	64
2-Aug	15	15	16	14	16	18	20	14	20	24	19	30	29	27	24	19	19	21	27	27	21	90	21	70	90
3-Aug	35	75	73	60	19	18	20	19	28	33	34	32	44	61	35	42	26	19	47	51	29	27	57	39	75
4-Aug	64	36	34	33	48	36	32	32	70	28	24	34	18	17	17	20	27	20	16	14	16	24	53	47	70
5-Aug	18	69	52	71	29	13	47	25	25	34	25	27	25	24	24	26	22	20	16	15	13	16	35	21	71
6-Aug	11	17	18	13	18	13	17	19	21	29	21	25	29	27	28	31	67	57	42	25	31	30	25	26	67
7-Aug	26	24	25	30	28	29	28	27	22	25	27	24	28	28	27	26	26	21	20	17	14	25	24	43	43
8-Aug	33	48	30	20	21	11	29	32	72	49	32	39	55	30	32	25	22	18	26	49	21	81	41	19	81
9-Aug	13	16	15	15	15	17	22	15	17	18	23	31	48	93	39	31	23	68	68	25	15	20	27	51	93
10-Aug	62	68	17	26	26	26	18	25	16	18	26	35	35	32	27	21	23	47	93	56	65	27	32	30	93
11-Aug	36	27	25	22	23	17	28	28	28	36	90	81	18	19	20	18	18	18	20	16	15	14	16	10	90
12-Aug	9	10	10	27	29	35	18	70	42	29	34	25	27	33	25	23	20	18	18	12	19	14	15	15	70
13-Aug	15	11	17	19	29	43	24	23	16	19	25	22	25	30	31	27	25	21	17	24	39	39	28	57	57
14-Aug	22	18	16	9	12	20	16	16	25	27	99	31	40	23	28	23	21	15	67	79	30	27	33	49	99
15-Aug	27	71	37	19	16	17	18	19	27	29	35	52	45	74	74	47	27	18	32	10	13	14	13	10	74
16-Aug	12	9	7	7	38	56	20	15	24	31	36	38	27	34	37	35	24	27	18	20	69	51	35	31	69
17-Aug	30	17	18	16	12	13	17	14	23	38	29	28	33	26	27	21	20	19	19	10	11	63	31	60	63
18-Aug	14	42	44	50	28	24	22	23	75	40	32	29	24	52	19	21	53	70	47	41	21	15	32	11	75
19-Aug	36	51	44	24	37	22	20	38	24	19	20	31	23	52	16	50	33	32	34	17	28	13	14	20	52
20-Aug	32	19	15	17	18	18	18	16	16	16	17	23	18	18	18	21	17	14	12	15	20	7	9	10	32
21-Aug	9	12	10	12	21	12	36	29	24	32	29	39	38	37	39	33	30	26	19	16	15	10	9	33	39
22-Aug	58	22	13	32	55	22	29	37	28	36	51	60	56	35	40	28	22	24	15	19	15	13	61	25	61
23-Aug	51	50	70	61	53	47	44	21	29	36	35	42	62	65	67	41	30	27	35	14	9	29	11	22	70
24-Aug	16	11	14	9	11	11	16	19	14	19	38	47	90	52	48	86	23	18	13	19	11	16	20	20	90
25-Aug	21	23	18	16	10	16	22	19	15	17	19	22	21	21	18	19	17	17	15	15	15	14	18	32	32
26-Aug	15	14	11	16	13	11	19	19	20	23	21	24	M	32	25	25	29	62	25	59	76	94	41	14	94
27-Aug	18	28	18	33	30	42	20	18	19	22	23	27	26	24	28	34	31	20	10	9	11	76	86	98	98
28-Aug	29	36	69	36	17	18	17	19	21	20	15	21	25	24	25	29	36	24	24	21	28	31	28	12	69
29-Aug	16	59	26	19	17	35	22	16	19	16	26	23	23	18	26	20	23	15	15	13	12	14	14	14	59
30-Aug	15	13	16	17	25	25	57	26	31	25	26	23	48	73	74	50	23	44	36	67	88	76	42	81	88
31-Aug	50	25	43	39	26	30	32	35	28	29	34	40	36	21	20	64	41	39	35	32	28	27	31	30	64
	64	75	73	71	55	56	57	70	75	49	99	81	90	93	74	86	67	70	93	79	88	94	86	98	
	Diurnal Maximum																								

M - Maintenance


WBEA
Hourly Averages
Wind Direction (WD) - deg
Mildred Lake - August 2014
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	August 25, 2014	Previous Calibration	July 17 2014
Station Name	Mildred Lake	Station Number	AMS 2

Reason: Routine

Start Time (MST)	9:05	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	-616
Analyzer Range (mv)	5000	5000	Lamp voltage	900	900
Calculated slope	1.001406	0.997219	Chamber temp.	44.4	44.4
Calculated intercept	0.012033	1.267389	Pressure (mmHg)	702.3	700.9
Analyzer Background	26.4	27.9	Flow (lpm)	0.532	0.518
Analyzer Coefficient	0.902	0.902	Intensity	29000	29000

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	1.2	NA
as found span	5000	69.9	830.4	833.5	0.996
calibrator zero	5000	0.0	0.0	-0.6	0.000
high point	5000	69.9	830.4	831.8	0.998
second point	5000	35.4	420.6	420.2	1.001
third point	5000	17.7	210.3	208.8	1.007
calibrator zero	5000	0.0	0.0	-0.6	NA
as left zero	5000	0.0	0.0	-0.2	NA
as left span	5000	69.9	830.4	834.7	0.995
				Average Correction Factor	1.002

Corrected As found	832.2	Previous response	829.2	% change	-0.4%

Notes:

Changed filter after as founds. Adjusted zero.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

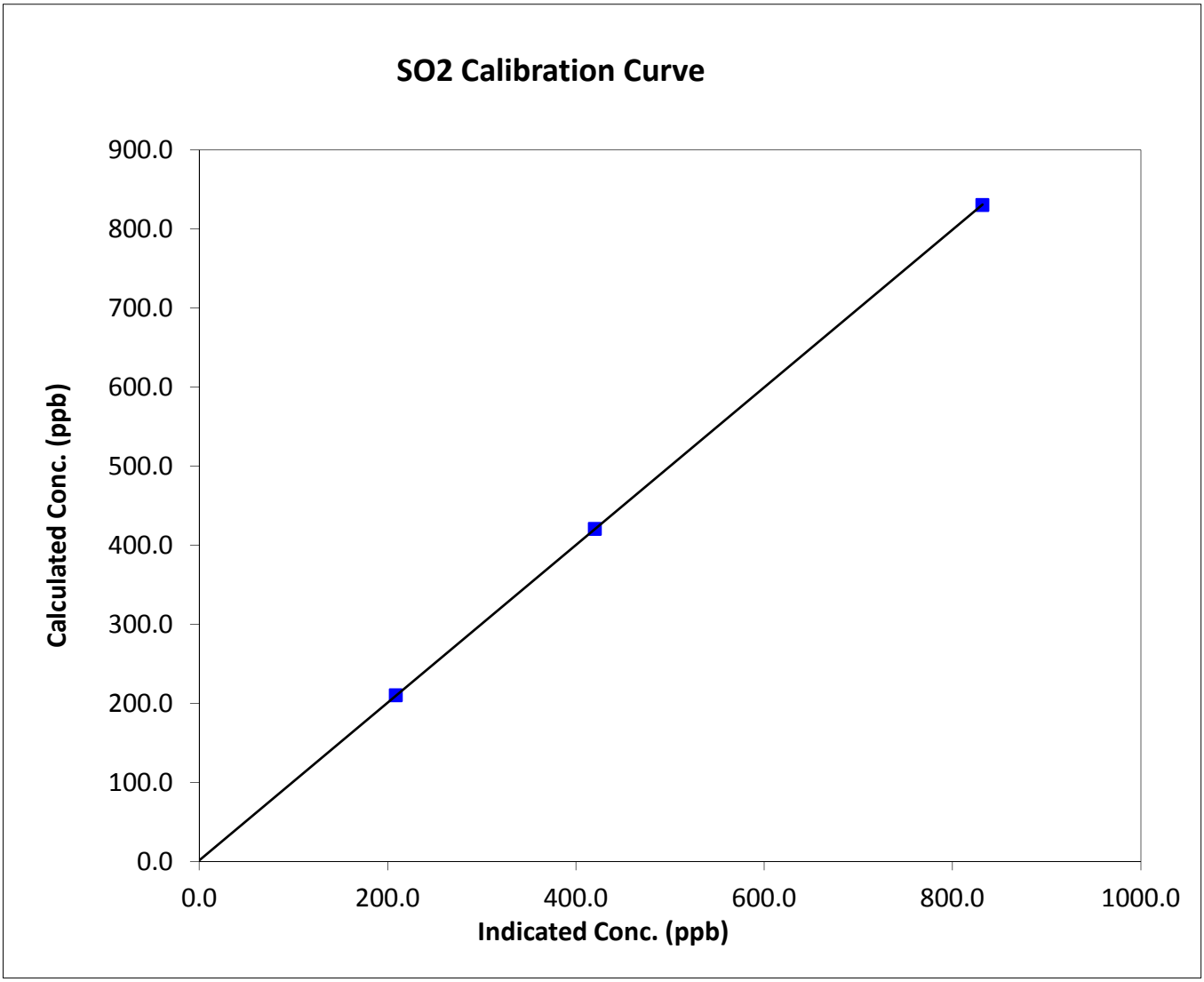
SO_2 Calibration Summary

Station Information

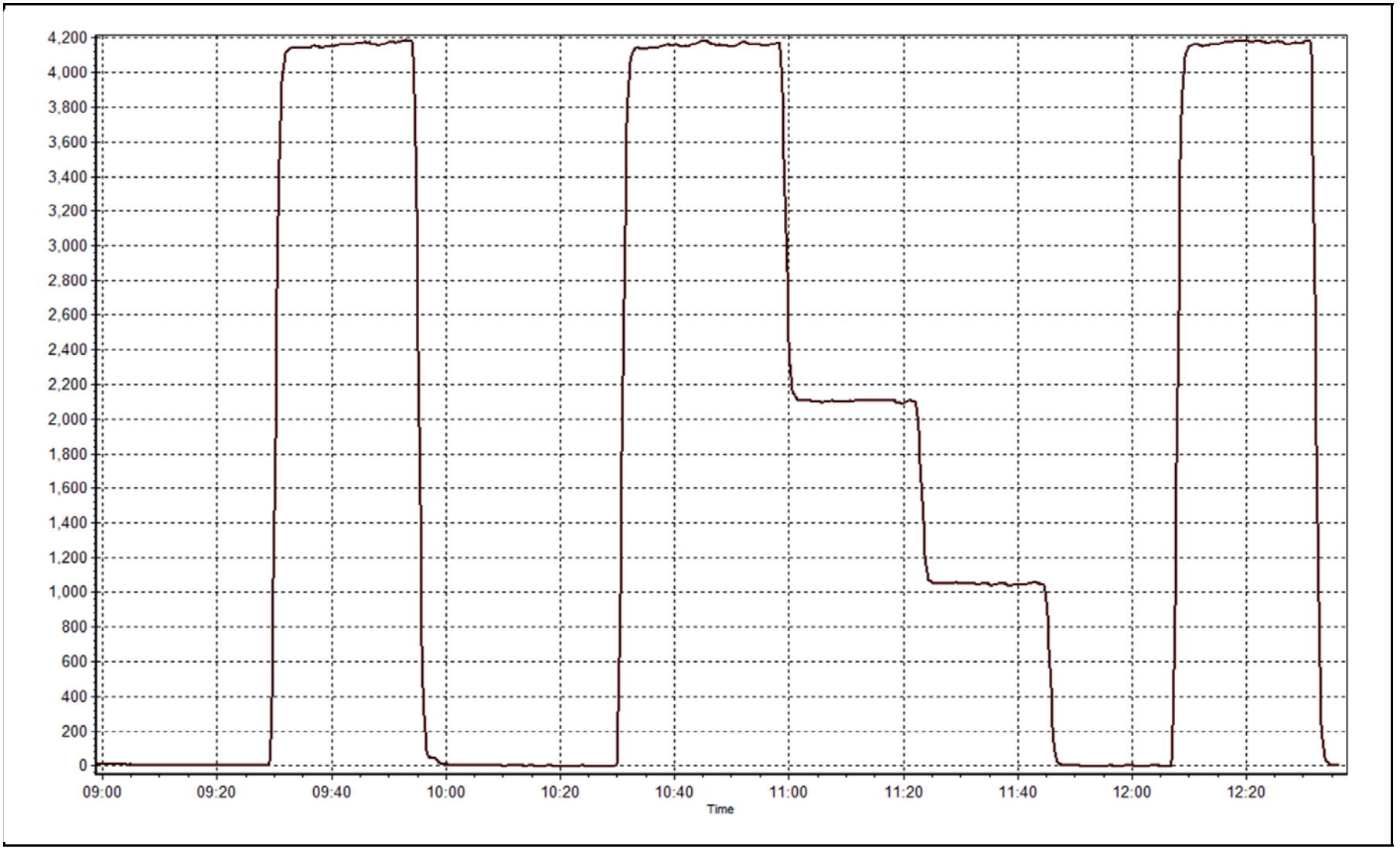
Calibration Date	August 25, 2014	Previous Calibration	July 17 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	9:05	End Time (MST)	12:35
Analyzer make	TEI 43c	Analyzer serial #	43c-77879-387

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999997
830.4	831.8	0.9983		
420.6	420.2	1.0009	Slope	0.997219
210.3	208.8	1.0069		
			Intercept	1.267389



SO2 Calibration Plot Date: August 25, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	9:00	End Time (MST)	11:55
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	3/11/2009
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	-601	-601
Analyzer Range (mv)	5000	5000	Lamp voltage	772	773
Calculated slope	0.994880	0.997554	Chamber temp.	45	45
Calculated intercept	0.085461	-0.102971	Pressure	545.1	543.6
Analyzer Background	12.8	12.9	Flow	1.007	1.006
Analyzer Coefficient	0.886	0.886	Intensity	88	87
			Converter temp.	325	324

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	4000	0.0	0.0	0.0	NA
as found span	4000	57.2	79.9	80.1	0.998
SO2 scrubber check	5000	17.7	210.3	0.0	NA
calibrator zero	4000	0.0	0.0	0.0	NA
high point	4000	57.2	79.9	80.1	0.997
second point	4000	28.6	40.0	40.3	0.991
third point	4000	14.3	20.0	20.2	0.988
calibrator zero	4000	0.0	0.0	0.0	NA
as left zero	5000	0.0	0.0	0.0	NA
as left span	4000	57.2	79.9	80.6	0.992
				Average Correction Factor	0.992

Corrected As found	80.2	Previous response	80.3	% change	0.1%

Notes:

Filter changed after as founds. No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

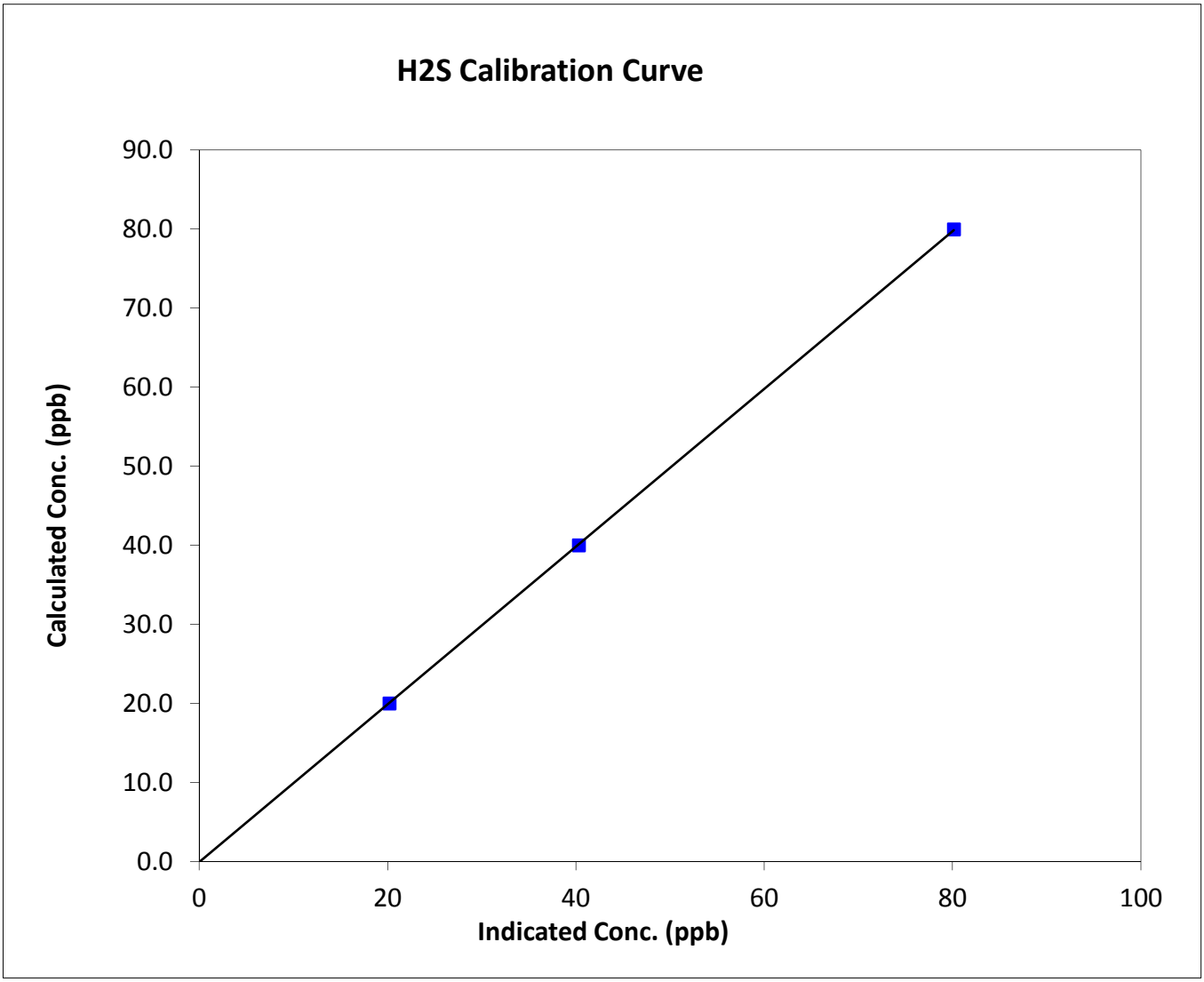
H2S Calibration Summary

Station Information

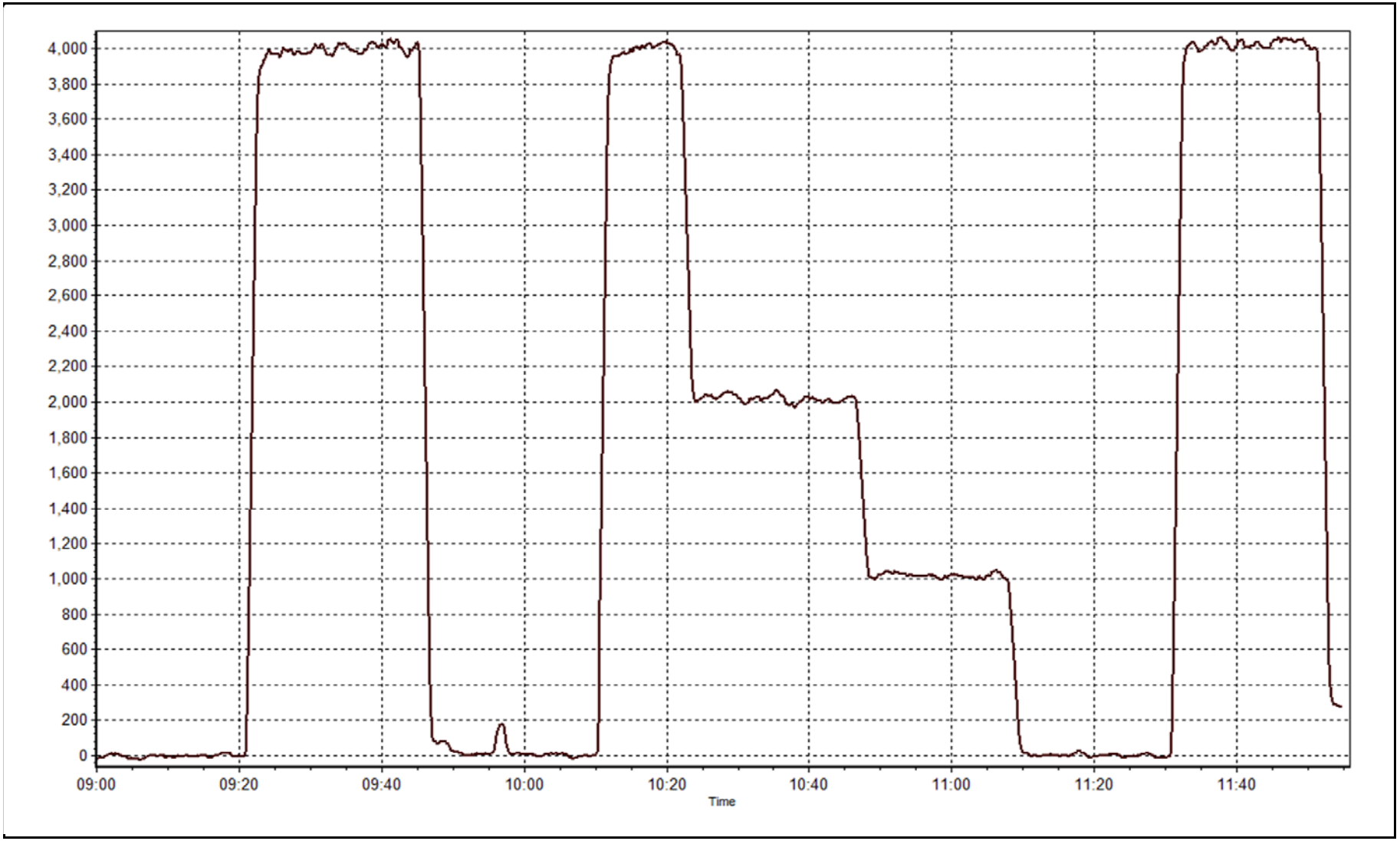
Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	9:00	End Time (MST)	11:55
Analyzer make	TEI 450i	Analyzer serial #	815129107

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999984
79.9	80.1	0.9975		
40.0	40.3	0.9913	Slope	0.997554
20.0	20.2	0.9884		
			Intercept	-0.102971



H2S Calibration Plot Date: August 26, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	August 25, 2014	Previous Calibration	July 17 2014
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	9:05	End Time (MST)	12:35
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	1.000394	1.002998	Fuel Pressure	25.7	25.7
Calculated intercept	-0.016436	0.006562			
BKG	2.62	2.62			
COEF	5.046	4.983			

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	0.04	N/A
as found span	5000	69.9	14.83	14.86	0.998
calibrator zero	5000	0.0	0.00	0.03	N/A
high point	5000	69.9	14.83	14.79	1.002
second point	5000	35.4	7.51	7.47	1.005
third point	5000	17.7	3.75	3.69	1.018
calibrator zero	5000	0.0	0.00	0.03	N/A
as left zero	5000	0.0	0.00	0.07	N/A
as left span	5000	69.9	14.83	14.67	1.010
				Average Correction Factor	1.008

Corrected As found	14.82	Previous response	14.84	% change	0.1%

Notes:

Filter changed after as founds. Adjusted zero and span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

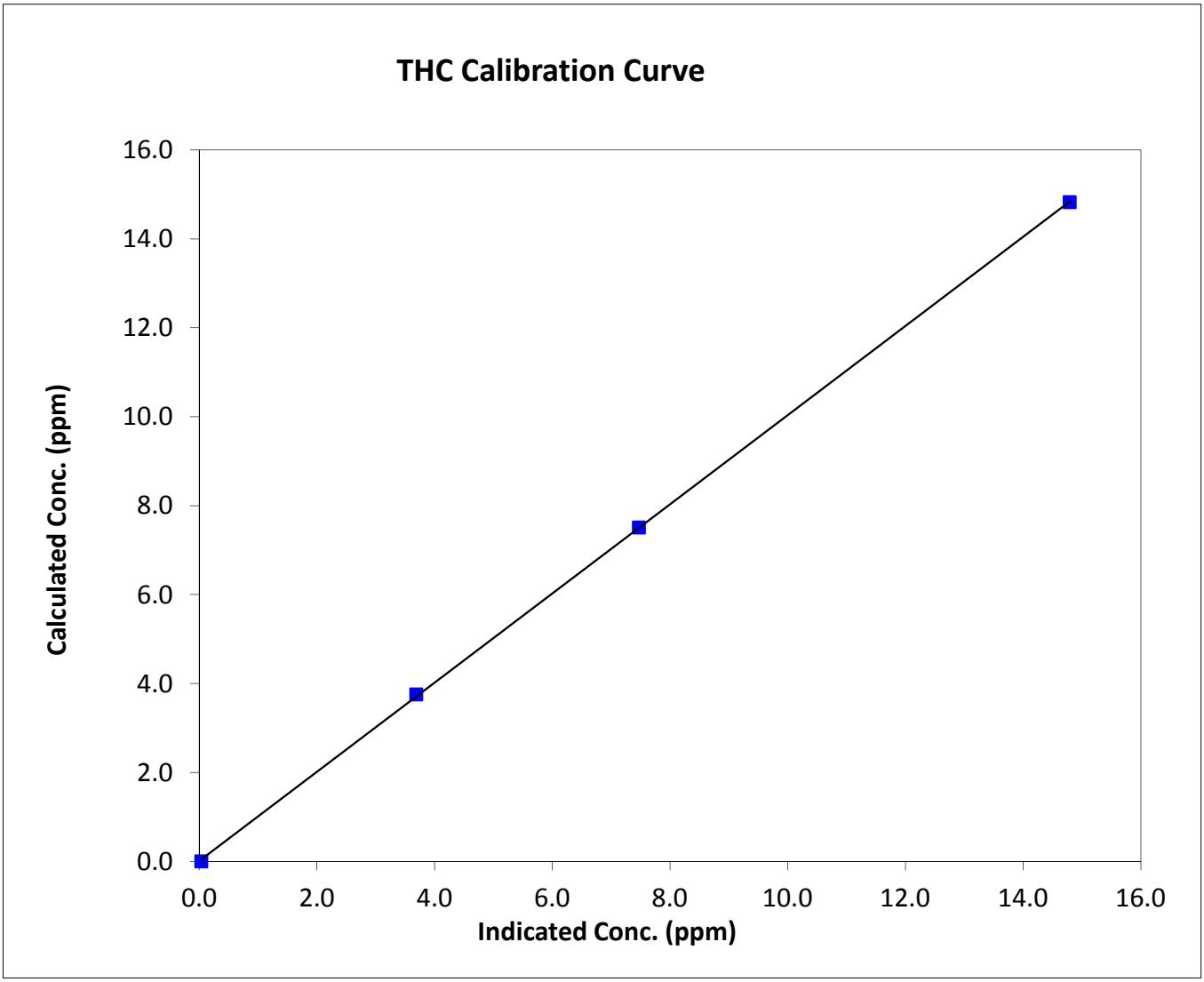
THC Calibration Summary

Station Information

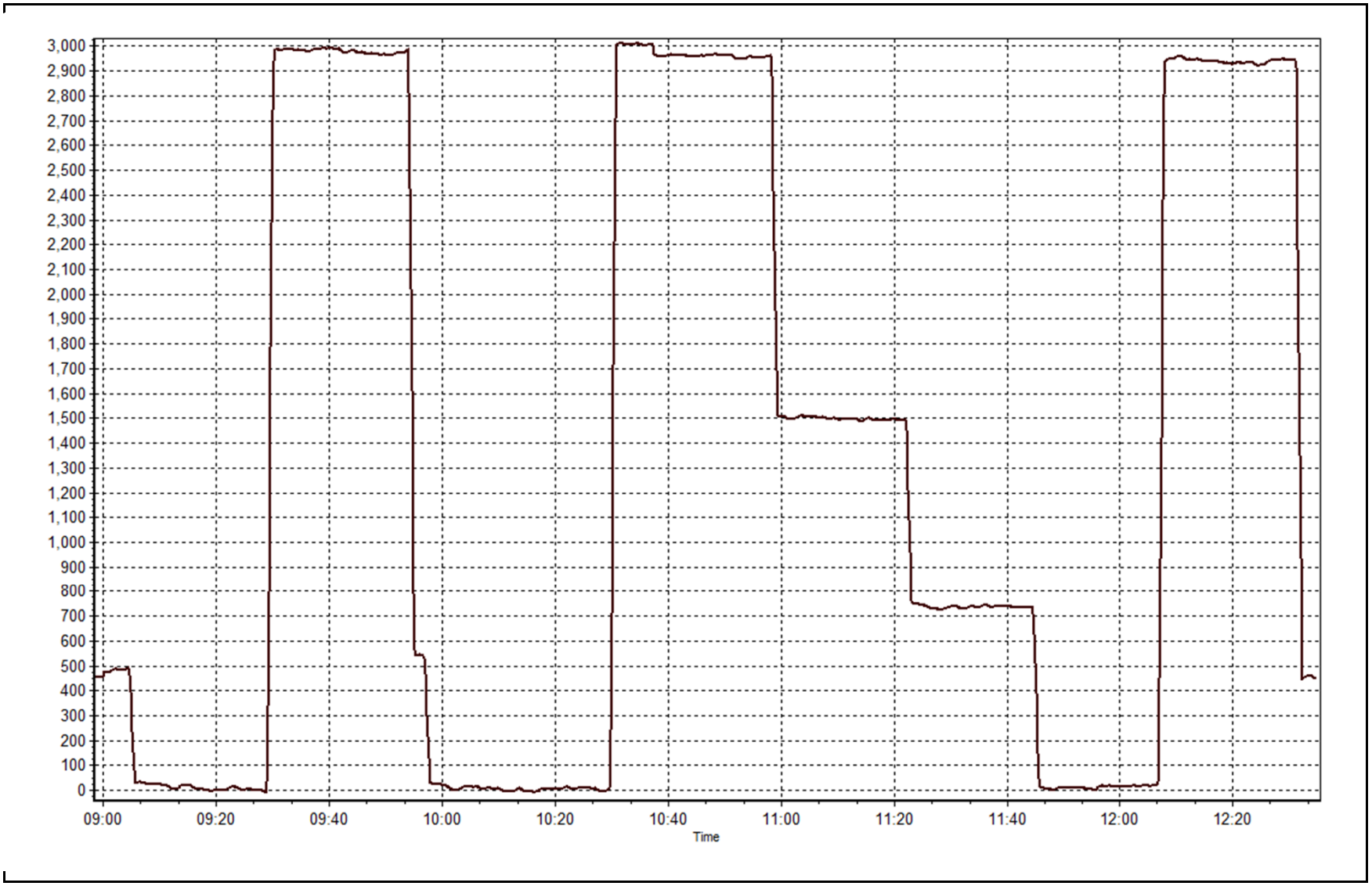
Calibration Date	August 25, 2014	Previous Calibration	July 17 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	9:05	End Time (MST)	12:35
Analyzer make	51i-LT	Analyzer serial #	1300156231

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.03	N/A	Correlation Coefficient	0.999965
14.83	14.79	1.0023		
7.51	7.47	1.0051	Slope	1.002998
3.75	3.69	1.0177		
			Intercept	0.006562



THC Calibration Plot Date: August 25, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 3
LOWER CAMP METEOROLOGY
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
AUGUST 2014

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
Temperature 20 m (C) Average	744	0	0	100.00	31.1	-	25.2	
Temperature 45 m (C) Average	744	0	0	100.00	30.9	-	25.2	
Temperature 100 m (C) Average	744	0	0	100.00	30.3	-	25.1	
Temperature 167 m (C) Average	0	0	744	0.00	-	-	-	
Relative Humidity 20 m (%) Average	744	0	0	100.00	98	-	84.0	
Relative Humidity 45 m (%) Average	744	0	0	100.00	98	-	82.0	
Relative Humidity 100 m (%) Average	744	0	0	100.00	97	-	80.0	
Relative Humidity 167 m (%) Average	0	0	744	0.00	-	-	-	
Wind Speed 20 m (km/h) Average	744	0	0	100.00	20	-	14.0	
Wind Speed 45 m (km/h) Average	743	0	1	99.87	28	-	19.0	
Wind Speed 100 m (km/h) Average	744	0	0	100.00	35	-	27.0	
Wind Speed 167 m (km/h) Average	0	0	744	0.00	-	-	-	
Wind Direction 20 m (deg) Average	744	0	0	100.00	-	-	0.0	
Wind Direction 45 m (deg) Average	743	0	1	99.87	-	-	0.0	
Wind Direction 100 m (deg) Average	744	0	0	100.00	-	-	0.0	
Wind Direction 167 m (deg) Average	0	0	744	0.00	-	-	0.0	
Vertical Wind Speed 20 m (km/h) Average	744	0	0	100.00	1.1	-	0.3	
Vertical Wind Speed 45 m (km/h) Average	743	0	1	99.87	1.7	-	0.5	
Vertical Wind Speed 100 m (km/h) Average	744	0	0	100.00	3.1	-	0.7	
Vertical Wind Speed 167 m (km/h) Average	0	0	744	0.00	-	-	-	

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
AUGUST 2014

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	744	18.32	6.1	-	3.6	11.3	14	17.9	22.3	26.9	31.1
Temperature 45 m (C) Average	744	18.3	6	-	3.6	11.1	14	17.9	22.4	26.8	30.9
Temperature 100 m (C) Average	744	18.26	5.8	-	4	11	14	18	22.2	26.7	30.3
Temperature 167 m (C) Average	0	-	-	-	-	-	-	-	-	-	-
Relative Humidity 20 m (%) Average	744	65.7	19	-	25	39	49	67	83	91	98
Relative Humidity 45 m (%) Average	744	64.9	19	-	25	39	48	66	82	90	98
Relative Humidity 100 m (%) Average	744	61	18	-	24	37	46	61	75	86	97
Relative Humidity 167 m (%) Average	0	-	-	-	-	-	-	-	-	-	-
Wind Speed 20 m (km/h) Average	744	6	4	-	0	2	3	5	8	12	20
Wind Speed 45 m (km/h) Average	743	8	5	-	0	2	4	7	11	16	28
Wind Speed 100 m (km/h) Average	744	11.7	7	-	0	4	6	10	16	21	35
Wind Speed 167 m (km/h) Average	0	-	-	-	-	-	-	-	-	-	-
Wind Direction 20 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 167 m (deg) Average	0	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	-0.21	0.4	-	-1.2	-0.7	-0.5	-0.2	0	0.2	1.1
Vertical Wind Speed 45 m (km/h) Average	743	-0.01	0.5	-	-1.3	-0.7	-0.3	0	0.3	0.6	1.7
Vertical Wind Speed 100 m (km/h) Average	744	0.15	0.5	-	-1.1	-0.3	-0.1	0.1	0.4	0.8	3.1
Vertical Wind Speed 167 m (km/h) Average	0	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Temperature, Relative Humidity 167 m	01 Aug 2014 01:00	01 Sep 2014 00:00	744	Analyzer Failure due to lightening strike
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	30 Aug 2014 12:00	30 Aug 2014 12:00	1	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	01 Aug 2014 01:00	01 Sep 2014 00:00	744	Analyzer Failure due to lightening strike

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - August 2014

Maximum Value: 31.1 C on Aug 15 18:00

Maximum Daily Average: 25.2 C on Aug 13

Minimum Value: 3.6 C on Aug 22 05:00

Minimum Daily Average: 10.3 C on Aug 22

Maximum Diurnal Average: 23.4 C at hour 17

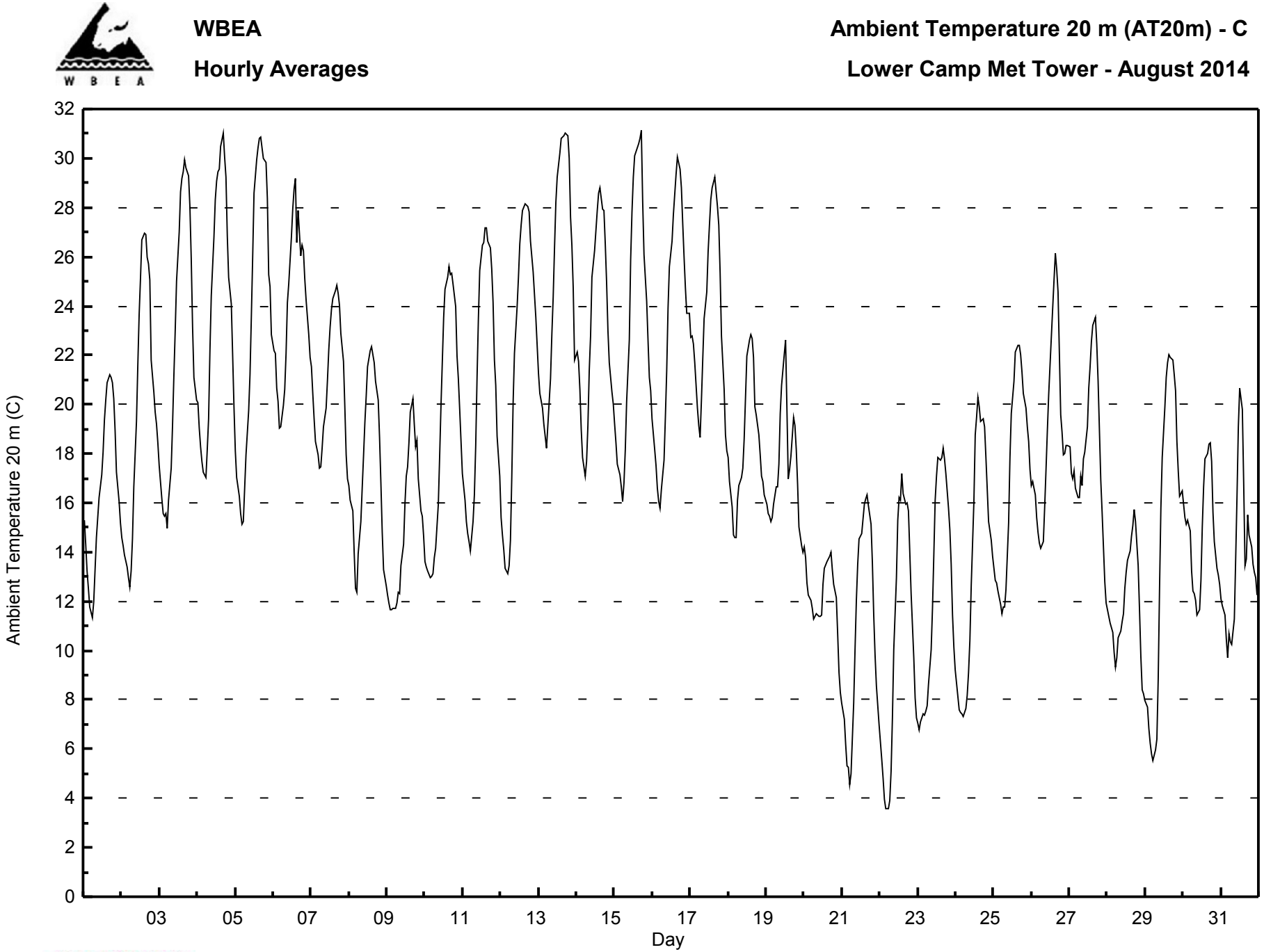
Minimum Diurnal Average: 13.1 C at hour 6

Monthly Average: 18.32 C

Percentiles: P_1 = 5.1 P_{10} = 11.3 Q_1 = 14.0 Median = 17.9 Q_3 = 22.3 P_{90} = 26.9 P_{99} = 30.8

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-Aug	15.3	14.3	13.2	12.5	11.8	11.4	12.0	13.3	14.6	15.4	16.2	17.1	18.1	19.3	20.2	20.9	21.2	21.1	20.9	20.2	18.9	17.3	16.1	15.2	16.5	21.2
2-Aug	14.6	14.3	13.9	13.4	13.0	12.6	13.2	14.5	16.6	19.3	21.6	23.7	25.1	26.7	27.0	26.9	26.0	25.7	25.1	21.8	20.5	19.7	19.2	18.4	19.7	27.0
3-Aug	17.5	16.2	15.6	15.5	15.6	15.0	16.1	17.4	19.2	21.2	23.0	25.0	27.0	28.6	29.2	29.5	29.9	29.6	29.3	28.1	25.9	23.2	21.1	20.2	22.4	29.9
4-Aug	20.1	19.1	18.3	17.7	17.3	17.0	18.2	19.4	22.2	24.4	26.8	28.3	29.1	29.5	29.6	30.5	31.0	30.1	29.2	26.8	25.2	24.1	22.0	19.9	24.0	31.0
5-Aug	18.1	17.0	16.3	15.6	15.1	15.2	16.6	17.9	19.7	21.2	23.5	26.0	28.6	29.9	30.4	30.8	30.8	30.4	30.0	29.8	28.4	25.3	24.8	22.8	23.5	30.8
6-Aug	22.2	22.1	20.6	20.1	19.1	19.1	19.9	20.6	22.1	24.1	24.9	26.8	27.9	28.7	29.2	26.6	27.9	26.0	26.4	26.3	25.1	24.3	22.8	21.9	23.9	29.2
7-Aug	21.5	20.4	19.4	18.5	17.9	17.4	17.5	18.2	19.1	19.9	21.0	22.2	23.2	23.8	24.3	24.6	24.8	24.5	24.0	22.9	21.8	19.9	18.0	17.0	20.9	24.8
8-Aug	16.7	16.1	15.7	14.0	12.5	12.4	13.9	15.3	16.6	17.9	19.2	20.4	21.5	22.2	22.4	22.0	21.7	20.9	20.2	18.6	16.8	14.8	13.3	12.7	17.4	22.4
9-Aug	12.2	11.9	11.7	11.6	11.7	11.7	11.9	12.4	12.3	13.4	14.3	15.9	17.1	17.5	18.4	19.7	20.2	19.2	18.3	18.5	17.0	15.7	15.4	14.6	15.1	20.2
10-Aug	13.6	13.4	13.2	13.0	13.0	13.2	13.8	14.1	15.9	17.9	20.0	21.7	23.6	24.7	25.2	25.6	25.3	25.3	24.9	24.0	22.0	21.1	19.8	18.5	19.3	25.6
11-Aug	17.2	16.1	15.3	14.8	14.4	14.1	15.3	16.3	18.3	21.1	23.5	25.4	26.5	26.6	27.2	27.2	26.7	26.3	25.5	24.1	21.8	20.8	18.7	17.1	20.8	27.2
12-Aug	15.4	14.7	14.1	13.3	13.1	13.4	14.5	17.0	20.0	22.1	24.0	25.2	26.5	27.3	27.9	28.2	28.1	28.1	27.8	26.6	25.4	24.5	23.5	22.4	21.8	28.2
13-Aug	21.2	20.4	19.8	19.2	18.7	18.2	19.1	21.0	22.8	24.4	26.3	28.2	29.2	30.2	30.8	30.9	30.9	31.0	30.9	30.0	27.6	26.4	24.7	21.8	25.2	31.0
14-Aug	22.1	21.8	20.6	19.0	17.9	17.1	17.7	19.1	21.4	22.8	25.1	26.2	27.0	27.9	28.6	28.8	27.9	27.9	26.5	24.9	23.0	21.7	20.5	20.0	23.1	28.8
15-Aug	19.2	18.4	17.6	17.2	16.7	16.1	16.8	18.2	20.1	22.6	25.9	27.8	29.2	30.1	30.4	30.6	30.8	31.1	28.2	26.1	24.2	22.6	21.1	20.5	23.4	31.1
16-Aug	19.4	18.2	17.5	16.6	16.1	15.8	16.5	17.7	19.5	21.4	23.9	25.6	26.6	27.7	28.5	29.3	30.0	29.6	28.8	27.4	26.0	24.8	23.7	23.7	23.1	30.0
17-Aug	22.7	22.8	22.5	21.7	19.9	19.2	18.7	20.2	21.9	23.5	24.6	26.2	27.3	28.3	28.8	29.2	28.7	28.0	27.3	25.3	22.8	20.6	18.7	18.1	23.6	29.2
18-Aug	17.8	16.9	15.8	14.7	14.6	14.6	16.1	16.7	17.0	17.4	18.6	20.3	22.0	22.6	22.8	22.7	21.9	19.9	19.6	18.8	18.0	17.1	16.9	16.3	18.3	22.8
19-Aug	16.0	15.6	15.5	15.2	15.4	16.0	16.7	16.6	17.6	19.6	20.8	22.0	22.6	19.8	17.0	17.3	17.9	19.5	19.2	18.1	16.8	15.0	14.3	14.0	17.4	22.6
20-Aug	14.2	13.8	12.8	12.2	12.0	11.7	11.3	11.4	11.5	11.4	11.4	11.4	12.7	13.3	13.6	13.7	13.8	14.0	13.3	12.7	12.2	10.7	9.1	8.3	12.2	14.2
21-Aug	7.8	7.2	6.2	5.3	5.3	4.6	5.0	7.8	10.0	12.1	13.5	14.5	14.8	15.3	16.0	16.2	16.3	15.9	15.1	13.6	11.5	9.8	8.6	7.0	10.8	16.3
22-Aug	6.3	5.6	4.8	4.0	3.6	3.6	3.9	5.1	7.3	10.0	13.0	15.3	16.2	16.1	17.2	16.4	16.0	16.0	15.7	14.0	12.3	9.7	8.1	7.3	10.3	17.2
23-Aug	7.0	6.8	7.1	7.5	7.4	7.5	7.8	8.6	10.0	11.7	13.9	16.1	17.1	17.9	17.7	17.8	18.2	17.8	17.2	15.8	14.9	13.5	11.4	10.1	12.5	18.2
24-Aug	9.2	8.1	7.6	7.5	7.4	7.3	7.7	8.2	9.1	10.4	12.6	16.0	18.8	19.4	20.3	19.9	19.3	19.4	19.1	17.9	16.5	15.3	14.5	13.8	13.6	20.3
25-Aug	13.4	12.9	12.7	12.4	11.9	11.5	11.8	11.7	12.4	15.2	17.9	19.6	20.3	20.9	22.1	22.4	22.4	22.0	21.3	20.4	19.9	19.1	18.5	17.3	17.1	22.4
26-Aug	16.7	16.9	16.3	15.4	14.8	14.4	14.2	14.4	15.8	17.4	19.0	20.4	21.6	23.9	25.0	26.1	25.5	24.6	19.6	18.9	17.9	18.0	18.4	18.3	18.9	26.1
27-Aug	18.3	17.2	17.0	17.3	16.6	16.2	16.2	17.1	16.7	17.8	18.1	19.1	20.7	21.5	22.6	23.2	23.5	22.5	20.9	18.9	16.9	15.6	12.8	11.9	18.3	23.5
28-Aug	11.7	11.4	11.1	10.7	9.9	9.3	9.7	10.5	10.8	11.2	11.5	12.5	13.2	13.7	14.0	14.6	15.1	15.7	15.2	13.5	11.7	9.8	8.4	8.3	11.8	15.7
29-Aug	8.0	7.7	6.8	6.2	5.8	5.5	6.0	6.4	8.8	12.5	15.8	17.9	19.9	21.1	21.7	22.0	21.9	21.8	21.2	20.5	18.5	17.3	16.3	16.5	14.4	22.0
30-Aug	16.0	15.4	15.1	15.3	14.8	13.2	12.4	12.3	12.0	11.5	11.7	12.9	15.1	16.6	17.8	18.0	18.4	18.4	17.7	15.6	14.4	13.3	13.1	12.7	14.7	18.4
31-Aug	12.1	11.8	11.5	10.5	9.7	10.7	10.4	10.3	11.3	13.7	16.3	19.1	20.6	19.8	16.8	13.5	13.7	15.5	14.7	14.2	13.5	13.2	13.0	12.3	13.7	20.6
	15.6	15.0	14.4	13.8	13.3	13.1	13.6	14.5	15.9	17.6	19.3	20.9	22.2	22.9	23.3	23.4	23.4	23.2	22.4	21.1	19.6	18.2	17.0	16.1	Diurnal Average	
	22.7	22.8	22.5	21.7	19.9	19.2	19.9	21.0	22.8	24.4	26.8	28.3	29.2	30.2	30.8	30.9	31.0	31.1	30.9	30.0	28.4	26.4	24.8	23.7	Diurnal Maximum	



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	58	7.80	7.80
10 - 20	413	55.51	63.31
> 20	273	36.69	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Ambient Temperature 45 m (AT45m) - C
Lower Camp Met Tower - August 2014

Maximum Value: 30.9 C on Aug 13 18:00

Maximum Daily Average: 25.2 C on Aug 13

Minimum Value: 3.6 C on Aug 22 06:00

Minimum Daily Average: 10.3 C on Aug 22

Maximum Diurnal Average: 23.2 C at hour 17

Minimum Diurnal Average: 13.2 C at hour 6

Monthly Average: 18.30 C

Percentiles: P_1 = 5.4 P_{10} = 11.1 Q_1 = 14.0 Median = 17.9 Q_3 = 22.4 P_{90} = 26.8 P_{99} = 30.6

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

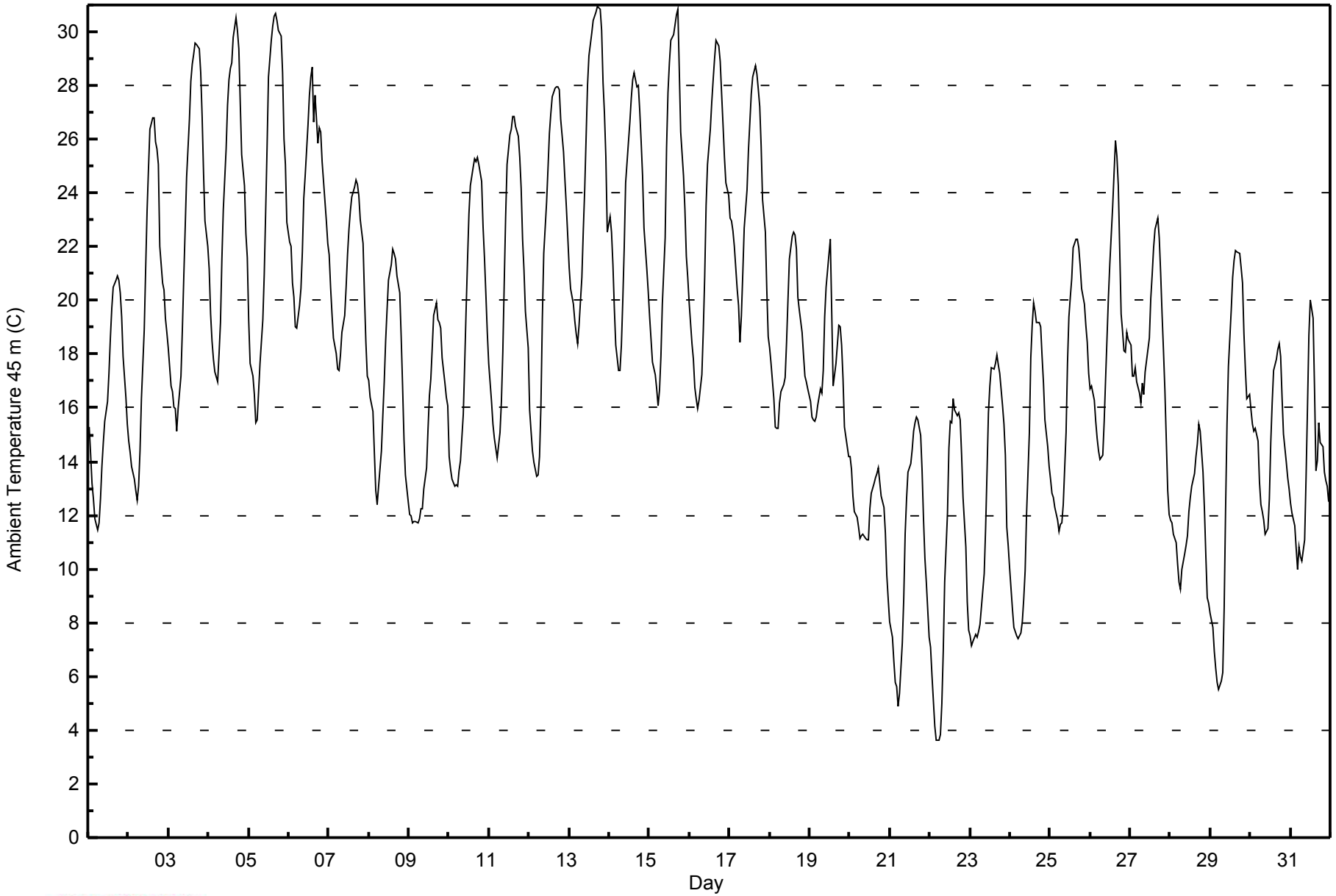
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	15.3	14.3	13.2	12.6	11.9	11.5	11.7	12.6	13.8	14.7	15.5	16.3	17.3	18.6	19.7	20.5	20.8	20.9	20.8	20.3	19.4	17.9	16.4	15.4	16.3	20.9
2-Aug	14.7	14.3	13.8	13.3	12.9	12.6	13.1	14.4	16.4	18.9	21.2	23.3	24.9	26.4	26.8	26.8	25.9	25.6	25.1	22.0	20.7	20.4	19.4	18.8	19.7	26.8
3-Aug	18.2	16.8	16.6	16.0	16.0	15.1	16.0	17.2	18.9	20.9	22.7	24.6	26.7	28.2	28.8	29.2	29.6	29.5	29.4	28.5	26.9	24.8	23.0	22.0	22.7	29.6
4-Aug	21.2	19.5	18.5	17.8	17.3	17.0	18.0	19.2	21.6	23.4	25.6	27.3	28.2	28.6	28.8	29.8	30.5	30.1	29.4	27.4	25.4	24.3	22.5	21.6	23.9	30.5
5-Aug	19.2	17.7	17.2	16.5	15.4	15.6	16.6	17.6	19.3	21.0	23.3	25.7	28.3	29.7	30.2	30.6	30.7	30.4	30.1	29.9	28.5	26.0	25.1	22.9	23.6	30.7
6-Aug	22.2	22.0	20.6	20.1	19.0	19.0	19.8	20.4	21.8	23.8	24.6	26.5	27.7	28.3	28.7	26.6	27.6	25.8	26.4	26.3	25.2	24.4	23.0	22.1	23.8	28.7
7-Aug	21.7	20.5	19.5	18.6	18.0	17.4	17.4	18.0	18.8	19.4	20.5	21.7	22.7	23.3	23.8	24.2	24.5	24.3	23.9	23.0	22.1	20.2	18.5	17.2	20.8	24.5
8-Aug	17.0	16.4	15.9	14.3	12.9	12.4	13.1	14.4	15.7	17.0	18.5	19.7	20.7	21.3	21.9	21.8	21.6	20.9	20.3	18.6	16.8	14.8	13.5	12.5	17.2	21.9
9-Aug	12.0	12.0	11.7	11.8	11.7	11.7	11.9	12.3	12.2	13.0	13.8	15.2	16.4	17.1	18.2	19.5	19.9	19.3	19.2	19.0	17.9	16.9	16.4	16.1	15.2	19.9
10-Aug	14.2	13.7	13.3	13.1	13.1	13.1	13.7	14.0	15.8	17.7	19.7	21.5	23.2	24.2	25.0	25.3	25.2	25.3	25.1	24.5	22.8	21.6	20.2	18.8	19.3	25.3
11-Aug	17.7	16.3	15.4	14.8	14.5	14.1	15.1	16.2	18.1	20.7	23.1	25.1	26.2	26.4	26.9	26.8	26.5	26.1	25.3	24.2	22.3	21.1	19.6	18.2	20.9	26.9
12-Aug	15.9	15.1	14.4	14.0	13.4	13.5	14.2	16.1	19.3	21.8	23.7	24.9	26.2	27.0	27.6	27.9	27.9	28.0	27.8	26.8	25.5	24.5	23.5	22.4	21.7	28.0
13-Aug	21.2	20.5	19.8	19.2	18.8	18.4	19.1	20.9	22.6	24.1	26.1	28.0	29.1	29.9	30.4	30.6	30.7	30.9	30.9	30.1	28.1	27.0	25.3	22.5	25.2	30.9
14-Aug	23.1	22.6	21.3	19.7	18.3	17.4	17.4	18.3	20.0	22.0	24.4	25.9	26.6	27.5	28.2	28.5	28.0	28.0	27.1	25.9	24.7	22.7	21.2	20.3	23.3	28.5
15-Aug	19.4	18.5	17.7	17.3	16.7	16.1	16.7	17.9	19.8	22.3	25.7	27.7	28.8	29.7	29.9	30.3	30.6	30.8	28.6	26.3	24.6	23.4	21.6	20.8	23.4	30.8
16-Aug	19.9	18.4	17.8	16.8	16.4	16.0	16.3	17.2	18.9	20.8	23.6	25.1	26.4	27.4	28.2	29.0	29.7	29.5	28.9	27.7	26.5	25.3	24.4	23.9	23.1	29.7
17-Aug	23.0	23.0	22.6	22.0	20.4	19.8	18.4	19.4	21.0	22.7	24.1	25.6	26.6	27.7	28.3	28.8	28.4	27.9	27.2	25.8	23.8	22.6	20.4	18.7	23.7	28.8
18-Aug	18.3	17.6	16.3	15.3	15.2	15.2	16.2	16.6	16.9	17.1	18.4	20.0	21.5	22.4	22.5	22.4	21.9	20.1	19.6	18.8	18.0	17.2	16.9	16.7	18.4	22.5
19-Aug	16.2	15.6	15.5	15.5	15.6	16.1	16.7	16.5	17.4	19.4	20.5	21.7	22.3	19.6	16.8	17.2	17.7	19.1	19.0	18.4	17.1	15.3	14.6	14.2	17.4	22.3
20-Aug	14.2	13.7	12.7	12.1	11.9	11.6	11.1	11.2	11.3	11.2	11.1	11.1	12.2	12.8	13.2	13.4	13.5	13.8	13.2	12.7	12.3	11.3	9.8	8.9	12.1	14.2
21-Aug	8.0	7.5	6.6	5.8	5.6	4.9	5.4	7.3	8.9	11.3	12.6	13.6	13.9	14.5	15.1	15.4	15.7	15.5	15.0	13.7	11.9	10.4	9.5	7.5	10.6	15.7
22-Aug	7.1	6.1	5.1	4.1	3.6	3.6	3.9	5.0	7.0	9.5	12.1	14.5	15.5	15.5	16.3	15.9	15.7	15.8	15.6	14.2	12.7	10.8	8.8	7.7	10.3	16.3
23-Aug	7.5	7.1	7.3	7.6	7.5	7.6	7.9	8.6	9.8	11.5	13.6	15.8	16.8	17.5	17.4	17.6	18.0	17.6	17.3	16.1	15.4	14.2	11.6	10.9	12.6	18.0
24-Aug	10.0	8.5	7.8	7.7	7.5	7.4	7.6	8.0	8.9	10.0	12.0	15.1	17.9	19.1	19.9	19.6	19.2	19.2	19.0	17.9	16.9	15.5	14.6	13.8	13.5	19.9
25-Aug	13.3	12.8	12.7	12.3	11.8	11.4	11.7	11.7	12.4	15.1	17.6	19.4	20.1	20.8	22.0	22.3	22.3	22.0	21.3	20.4	19.9	19.1	18.5	17.3	17.0	22.3
26-Aug	16.7	16.8	16.3	15.5	14.9	14.4	14.1	14.2	15.5	17.1	18.6	20.1	21.4	23.5	24.7	26.0	25.4	24.3	19.5	18.8	18.1	18.1	18.8	18.6	18.8	26.0
27-Aug	18.4	17.2	17.2	17.5	17.0	16.6	16.2	16.9	16.5	17.3	17.8	18.6	20.1	21.0	22.0	22.6	23.1	22.4	21.0	19.5	18.1	16.7	12.9	12.1	18.3	23.1
28-Aug	11.8	11.7	11.3	11.0	10.2	9.5	9.2	10.0	10.6	10.9	11.2	12.1	12.7	13.1	13.5	14.2	14.7	15.4	15.1	13.6	12.3	10.5	8.9	8.7	11.8	15.4
29-Aug	8.3	7.8	6.9	6.3	5.8	5.5	5.8	6.2	8.6	12.2	15.4	17.5	19.7	20.9	21.5	21.9	21.8	21.7	21.2	20.7	18.7	17.5	16.3	16.5	14.4	21.9
30-Aug	15.9	15.4	15.1	15.2	14.8	13.2	12.4	12.2	11.8	11.3	11.5	12.6	14.7	16.2	17.4	17.8	18.2	18.4	17.9	16.4	15.0	14.0	13.4	13.0	14.7	18.4
31-Aug	12.4	12.1	11.6	10.8	10.0	10.8	10.5	10.3	11.1	13.4	16.0	18.7	20.0	19.3	16.7	13.7	14.0	15.4	14.7	14.5	13.6	13.3	13.1	12.5	13.7	20.0
	15.9	15.2	14.6	14.0	13.5	13.2	13.5	14.2	15.5	17.1	18.9	20.5	21.8	22.5	22.9	23.1	23.2	23.0	22.4	21.4	20.0	18.8	17.5	16.5	Diurnal Average	
	23.1	23.0	22.6	22.0	20.4	19.8	19.8	20.9	22.6	24.1	26.1	28.0	29.1	29.9	30.4	30.6	30.7	30.9	30.9	30.1	28.5	27.0	25.3	23.9	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Lower Camp Met Tower - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	57	7.66	7.66
10 - 20	413	55.51	63.17
> 20	274	36.83	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 30.3 C on Aug 13 18:00

Maximum Daily Average: 25.1 C on Aug 13

Minimum Value: 4.0 C on Aug 22 06:00

Minimum Daily Average: 10.6 C on Aug 21

Maximum Diurnal Average: 22.6 C at hour 17

Minimum Diurnal Average: 13.5 C at hour 6

Monthly Average: 18.26 C

Percentiles: P_1 = 6.1 P_{10} = 11.0 Q_1 = 14.0 Median = 18.0 Q_3 = 22.2 P_{90} = 26.7 P_{99} = 30.1

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

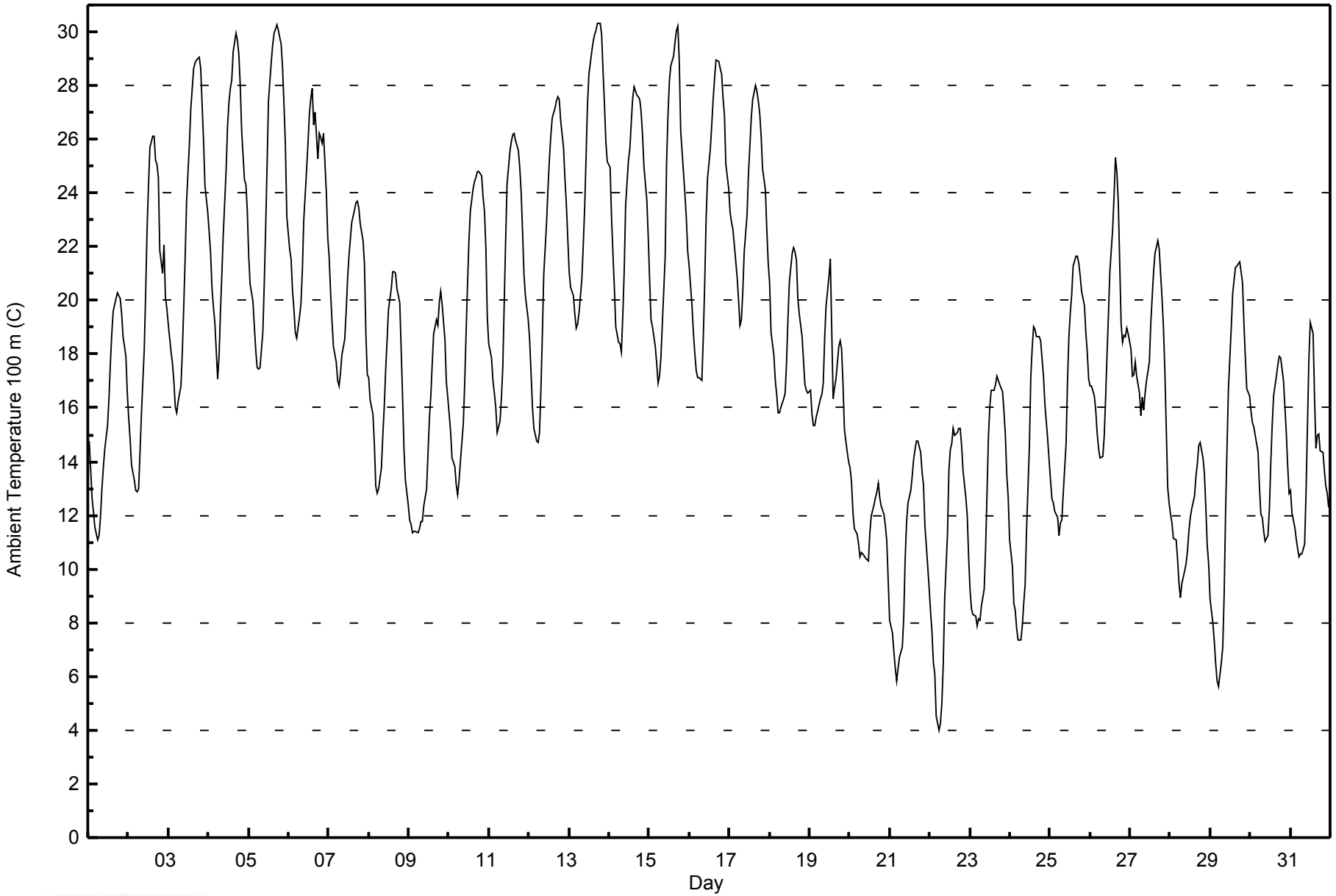
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.8	13.7	12.7	12.1	11.6	11.1	11.3	11.9	13.0	13.8	14.5	15.4	16.3	17.6	18.7	19.6	20.1	20.3	20.2	20.1	19.5	18.6	17.9	16.5	15.9	20.3
2-Aug	15.6	14.8	13.9	13.3	12.9	12.9	13.0	14.3	15.7	18.2	20.3	22.6	24.3	25.7	26.1	26.1	25.2	25.1	24.6	21.8	21.0	22.1	20.1	19.7	19.6	26.1
3-Aug	19.1	18.1	17.7	17.0	16.0	15.8	16.3	16.8	18.1	19.8	21.6	23.7	25.9	27.2	27.9	28.6	28.8	29.0	29.1	28.6	27.3	26.0	24.3	23.3	22.7	29.1
4-Aug	22.6	21.7	20.4	19.8	19.2	17.1	17.9	19.6	21.0	22.5	24.8	26.5	27.4	27.9	28.2	29.3	30.0	29.7	29.2	28.0	26.3	24.5	24.3	23.3	24.2	30.0
5-Aug	21.6	20.6	20.0	19.0	18.1	17.5	17.4	17.5	18.8	20.6	22.7	25.0	27.4	28.9	29.5	29.9	30.1	30.2	30.1	29.5	28.7	27.3	25.7	23.1	24.1	30.2
6-Aug	21.9	21.6	20.4	19.7	18.8	18.6	19.4	19.9	21.1	23.0	23.9	25.8	27.0	27.6	27.9	26.5	27.0	25.3	26.2	26.1	25.9	26.2	24.0	22.3	23.6	27.9
7-Aug	21.6	20.3	19.3	18.3	17.7	17.0	16.8	17.3	18.0	18.6	19.6	20.7	21.7	22.3	22.9	23.4	23.7	23.7	23.4	22.9	22.2	21.3	18.8	17.3	20.4	23.7
8-Aug	17.1	16.3	15.8	14.6	13.1	12.8	13.0	13.8	15.0	16.0	17.4	18.5	19.6	20.5	21.1	21.1	21.0	20.4	19.9	18.2	16.4	14.4	13.3	12.4	16.7	21.1
9-Aug	11.8	11.6	11.4	11.4	11.4	11.3	11.5	11.8	11.7	12.4	13.0	14.3	15.6	16.5	17.7	18.7	19.3	19.1	19.9	20.4	19.9	18.5	17.0	16.4	15.1	20.4
10-Aug	15.8	15.1	14.1	13.8	13.2	12.8	13.3	14.0	15.4	16.9	18.8	20.6	22.2	23.3	24.2	24.5	24.6	24.8	24.8	24.6	23.9	23.3	22.0	19.4	19.4	24.8
11-Aug	18.4	17.9	17.0	16.5	16.0	15.1	15.5	16.3	17.5	19.9	22.2	24.3	25.6	25.9	26.2	26.2	26.0	25.6	25.0	24.0	22.6	21.0	20.2	19.3	21.0	26.2
12-Aug	18.6	17.3	16.0	15.2	14.8	14.7	15.1	16.7	18.7	21.0	22.9	24.2	25.3	26.1	26.8	27.2	27.4	27.6	27.5	26.7	25.7	24.5	23.6	22.3	21.9	27.6
13-Aug	21.1	20.5	20.2	19.5	19.0	19.1	19.5	20.8	22.1	23.5	25.4	27.3	28.4	29.3	29.7	29.9	30.1	30.3	30.3	29.9	28.6	27.3	25.9	25.2	25.1	30.3
14-Aug	25.0	23.1	21.8	20.5	19.0	18.4	18.4	18.1	19.4	21.1	23.6	25.2	25.7	26.6	27.5	28.0	27.6	27.6	27.5	27.0	26.1	25.0	23.7	22.4	23.7	28.0
15-Aug	20.8	19.3	19.0	18.3	17.7	16.9	17.2	17.9	19.1	21.6	25.1	26.9	28.1	28.8	29.1	29.6	30.0	30.2	28.9	26.3	24.8	23.9	23.1	21.8	23.5	30.2
16-Aug	21.3	19.8	18.8	18.0	17.4	17.1	17.2	17.0	18.6	20.6	23.0	24.6	25.7	26.5	27.5	28.3	28.9	28.9	28.6	28.4	27.6	26.9	25.0	24.2	23.3	28.9
17-Aug	23.3	22.9	22.6	22.1	20.8	20.0	19.1	19.3	20.3	21.8	23.2	24.7	25.8	26.8	27.5	28.0	27.8	27.4	27.0	26.1	24.9	24.1	22.7	21.4	23.7	28.0
18-Aug	20.6	18.8	18.0	17.0	16.5	15.8	15.8	16.0	16.3	16.5	17.7	19.3	20.7	21.7	22.0	21.8	21.5	20.1	19.5	18.7	17.8	16.9	16.6	16.5	18.4	22.0
19-Aug	16.6	15.7	15.3	15.4	15.6	15.9	16.4	16.5	16.9	18.6	19.8	20.9	21.5	18.9	16.3	16.7	17.1	18.3	18.5	18.2	16.8	15.2	14.3	14.0	17.1	21.5
20-Aug	13.8	13.2	12.1	11.5	11.3	10.9	10.5	10.6	10.6	10.4	10.4	10.3	11.4	12.0	12.4	12.7	12.9	13.2	12.7	12.4	12.0	11.6	11.0	9.6	11.6	13.8
21-Aug	8.1	7.6	6.9	6.3	5.8	6.3	6.7	7.1	8.2	10.3	11.7	12.5	12.9	13.5	14.1	14.5	14.7	14.7	14.4	13.6	13.1	11.6	10.9	9.3	10.6	14.7
22-Aug	8.4	7.6	6.5	6.1	4.5	4.0	4.2	5.0	6.5	8.9	11.3	13.7	14.5	14.7	15.3	15.0	15.1	15.2	15.2	14.6	13.7	12.6	12.0	10.4	10.6	15.3
23-Aug	9.2	8.5	8.3	8.3	7.9	8.1	8.1	8.6	9.3	10.8	12.8	14.9	16.1	16.6	16.7	16.9	17.2	17.0	16.9	16.6	15.9	15.0	13.5	12.7	12.7	17.2
24-Aug	11.1	10.1	8.7	8.4	7.8	7.3	7.3	7.9	8.7	9.4	11.4	14.5	17.1	18.2	19.0	18.9	18.7	18.6	18.5	17.8	17.2	16.1	14.8	14.0	13.4	19.0
25-Aug	13.3	12.6	12.4	12.1	11.9	11.2	11.7	11.8	12.8	14.7	17.0	18.7	19.5	20.2	21.3	21.6	21.6	21.4	20.9	20.3	19.8	18.8	18.1	17.1	16.7	21.6
26-Aug	16.8	16.8	16.5	15.9	15.1	14.5	14.1	14.2	14.9	16.3	18.0	19.5	21.1	22.6	23.9	25.3	24.7	23.6	19.1	18.4	18.7	18.7	19.0	18.7	18.6	25.3
27-Aug	18.2	17.2	17.3	17.7	17.2	16.6	15.7	16.4	15.9	16.5	17.0	17.7	19.1	20.1	21.1	21.8	22.2	21.9	20.9	20.1	19.0	17.3	13.1	12.4	18.0	22.2
28-Aug	12.0	11.7	11.1	11.1	10.4	9.5	9.0	9.5	9.9	10.2	10.7	11.4	11.9	12.2	12.7	13.5	13.9	14.6	14.7	14.1	13.6	12.3	10.9	10.2	11.7	14.7
29-Aug	8.9	8.0	7.3	6.5	5.9	5.6	6.5	7.1	9.1	12.1	14.5	16.7	18.9	20.2	20.8	21.2	21.3	21.4	21.1	20.7	19.1	17.8	16.7	16.4	14.3	21.4
30-Aug	15.8	15.4	15.3	15.0	14.3	13.0	12.0	11.9	11.4	11.0	11.2	12.2	13.9	15.4	16.5	17.2	17.6	17.9	17.8	17.4	17.0	15.1	13.8	12.8	14.6	17.9
31-Aug	12.9	12.1	11.6	11.1	10.8	10.4	10.5	10.6	11.0	12.9	15.3	17.8	19.2	18.8	16.4	14.5	15.0	15.0	14.4	14.4	13.7	13.1	12.8	12.3	13.6	19.2
	16.6	15.8	15.1	14.6	13.9	13.5	13.6	14.1	15.0	16.5	18.1	19.7	21.0	21.7	22.2	22.5	22.6	22.5	22.2	21.5	20.6	19.6	18.4	17.3	Diurnal Average	
	25.0	23.1	22.6	22.1	20.8	20.0	19.5	20.8	22.1	23.5	25.4	27.3	28.4	29.3	29.7	29.9	30.1	30.3	30.3	29.9	28.7	27.3	25.9	25.2	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 100 m (AT100m) - C

Lower Camp Met Tower - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	51	6.85	6.85
10 - 20	419	56.32	63.17
> 20	274	36.83	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

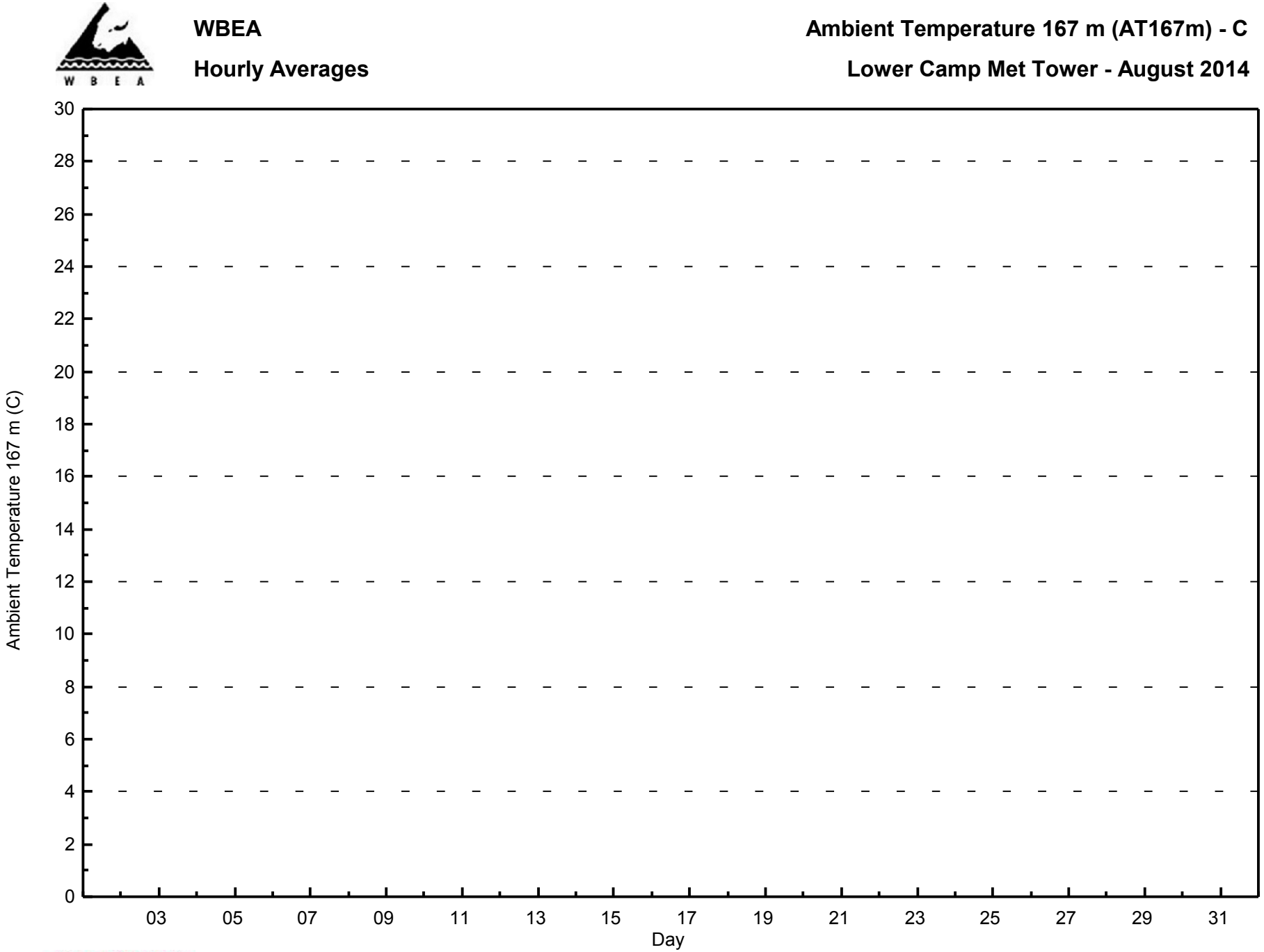
Maximum Value: -- C on Aug 1 00:00
Maximum Daily Average: -- C on Jul 31

Minimum Value: -- C on Aug 1 00:00
Minimum Daily Average: -- C on Jul 31
Maximum Diurnal Average: -- C at hour 0
Minimum Diurnal Average: -- C at hour 0
Monthly Average: -- C
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:	0
Hours of Missing Data:	744
Hours of Calibration:	0
Percent Operational Time:	0.0

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

AF - Analyzer Failure


WBEA
Hourly Averages
Ambient Temperature 167 m (AT167m) - C
Lower Camp Met Tower - August 2014
Ambient Temperature 167 m (C)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
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	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	0	0.00	0.00
10 - 20	0	0.00	0.00
> 20	0	0.00	0.00

Total Number of Valid Hours: 0

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 20m (RH20m) - %

Lower Camp Met Tower - August 2014

Maximum Value: 98 % on Aug 9 04:00

Maximum Daily Average: 84.3 % on Aug 9

Minimum Value: 25 % on Aug 5 16:00

Minimum Daily Average: 49.7 % on Aug 7

Maximum Diurnal Average: 86.2 % at hour 6

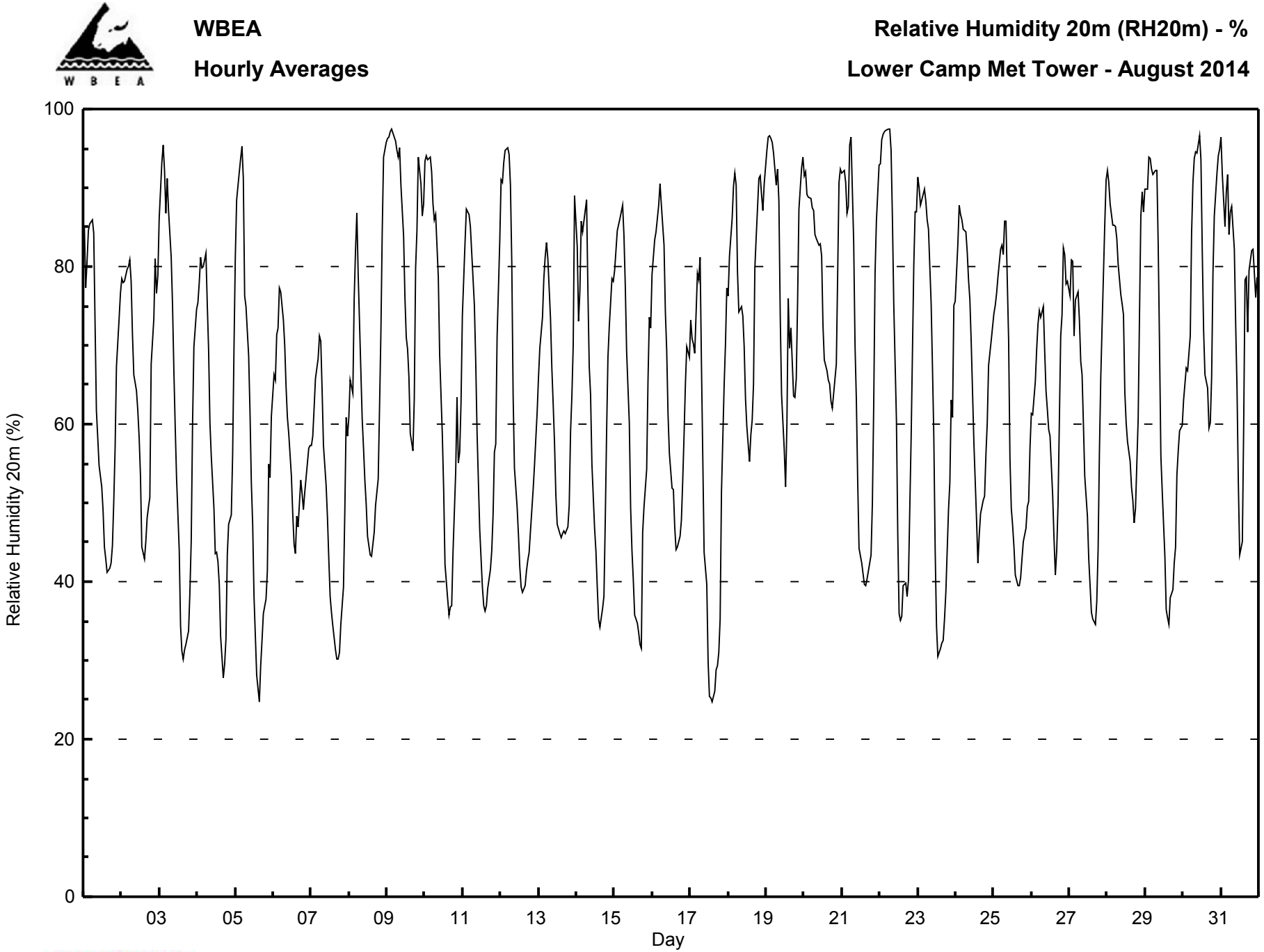
Minimum Diurnal Average: 43.6 % at hour 16

Monthly Average: 65.7 %

Percentiles: P_1 = 28 P_{10} = 39 Q_1 = 49 Median = 67 Q_3 = 83 P_{90} = 91 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-Aug	85	77	81	85	85	86	84	73	62	58	55	52	49	44	43	41	42	42	45	50	57	67	73	77	63.0	86
2-Aug	78	78	78	80	80	81	78	71	66	64	62	58	53	44	43	45	48	50	51	68	73	81	77	79	66.1	81
3-Aug	86	93	95	92	87	91	87	81	75	67	60	53	44	34	31	30	31	32	34	39	45	60	70	75	62.2	95
4-Aug	75	78	81	80	80	82	75	69	60	56	49	44	44	42	40	33	28	29	33	43	47	48	56	70	56.0	82
5-Aug	81	89	92	94	95	91	76	75	69	62	53	47	38	28	27	25	29	32	36	38	41	55	53	61	57.8	95
6-Aug	66	66	71	72	77	77	73	70	65	61	59	53	49	45	44	48	47	53	51	49	51	53	57	57	58.9	77
7-Aug	57	58	62	66	68	71	70	64	57	52	48	43	38	36	34	31	30	30	31	35	39	49	61	58	49.7	71
8-Aug	61	66	64	76	82	87	79	67	61	57	53	50	46	43	43	45	46	50	53	62	71	84	94	96	64.0	96
9-Aug	96	96	97	98	97	96	95	94	95	90	84	76	71	70	66	59	57	63	80	85	94	91	86	88	84.3	98
10-Aug	93	94	94	94	92	88	86	87	79	69	64	59	52	42	38	36	37	37	44	54	63	55	56	63	65.6	94
11-Aug	74	83	87	87	87	85	78	75	68	59	53	47	39	37	36	37	39	42	44	48	57	58	71	83	61.4	87
12-Aug	91	91	93	95	95	94	90	80	64	54	50	46	42	39	39	39	41	43	44	46	52	55	58	62	62.6	95
13-Aug	66	70	74	78	81	83	81	73	67	62	58	51	47	46	46	46	47	46	47	50	59	64	70	89	62.5	89
14-Aug	83	73	77	86	84	87	88	77	67	64	55	47	44	39	35	34	37	38	48	59	69	72	79	78	63.3	88
15-Aug	80	82	85	86	87	88	84	77	69	60	49	44	40	36	35	34	32	31	46	50	54	66	74	72	60.8	88
16-Aug	79	83	84	86	88	91	88	83	74	69	61	56	52	52	47	44	44	46	48	53	59	65	70	68	66.2	91
17-Aug	73	71	70	69	79	78	81	68	56	44	40	30	25	25	25	26	29	29	31	35	51	65	70	77	52.0	81
18-Aug	76	81	86	90	92	90	79	74	75	74	70	63	60	55	59	61	65	80	84	91	92	89	87	90	77.6	92
19-Aug	95	97	97	96	96	94	90	92	88	74	64	57	52	60	76	70	72	64	63	66	76	87	93	94	79.6	97
20-Aug	91	92	89	89	89	88	87	84	84	83	83	81	72	68	67	66	65	63	62	64	68	79	91	92	79.0	92
21-Aug	92	92	91	87	88	95	97	83	70	63	53	44	42	41	40	40	40	41	43	50	62	79	86	93	67.2	97
22-Aug	93	96	97	97	97	97	97	95	86	75	60	46	36	35	36	39	40	38	40	49	58	80	87	87	69.3	97
23-Aug	91	90	88	89	90	88	86	85	75	67	58	44	34	30	31	32	32	35	39	49	53	63	61	75	62.0	91
24-Aug	76	83	88	87	86	85	84	82	78	76	70	58	53	48	42	46	49	50	51	56	60	67	71	72	67.4	88
25-Aug	74	75	77	79	82	83	82	86	86	71	56	49	47	44	41	39	40	41	43	45	47	49	50	57	60.0	86
26-Aug	61	61	65	70	73	74	74	75	69	64	62	59	58	51	45	41	44	50	71	74	82	82	78	78	65.1	82
27-Aug	76	81	81	71	76	77	73	68	66	60	53	48	43	39	36	35	35	38	44	57	66	72	85	91	61.3	91
28-Aug	92	91	88	85	85	85	84	80	76	75	74	64	60	58	55	52	50	47	49	61	74	86	90	87	72.9	92
29-Aug	90	90	94	94	92	92	92	92	83	70	56	51	43	36	35	35	38	39	42	44	54	57	59	60	64.1	94
30-Aug	63	65	67	67	71	84	91	94	95	94	97	94	82	72	66	65	60	60	66	79	86	92	94	95	79.1	97
31-Aug	96	92	85	89	92	84	87	88	82	73	65	53	43	45	60	78	79	72	79	82	82	79	76	79	76.6	96
	80.4	81.7	83.1	84.3	85.6	86.2	83.8	79.4	73.1	66.7	60.3	53.8	48.4	44.8	43.9	43.6	44.3	45.5	49.7	55.8	62.7	69.4	73.6	77.5	Diurnal Average	
	96	97	97	98	97	97	97	95	95	94	97	94	82	72	76	78	79	80	84	91	94	92	94	96	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - August 2014
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	88	11.83	11.83
40 - 60	209	28.09	39.92
60 - 80	228	30.65	70.56
80 - 100	219	29.44	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 98 % on Aug 22 06:00

Maximum Daily Average: 81.6 % on Aug 9

Minimum Value: 25 % on Aug 5 16:00

Minimum Daily Average: 49.4 % on Aug 7

Maximum Diurnal Average: 85.4 % at hour 6

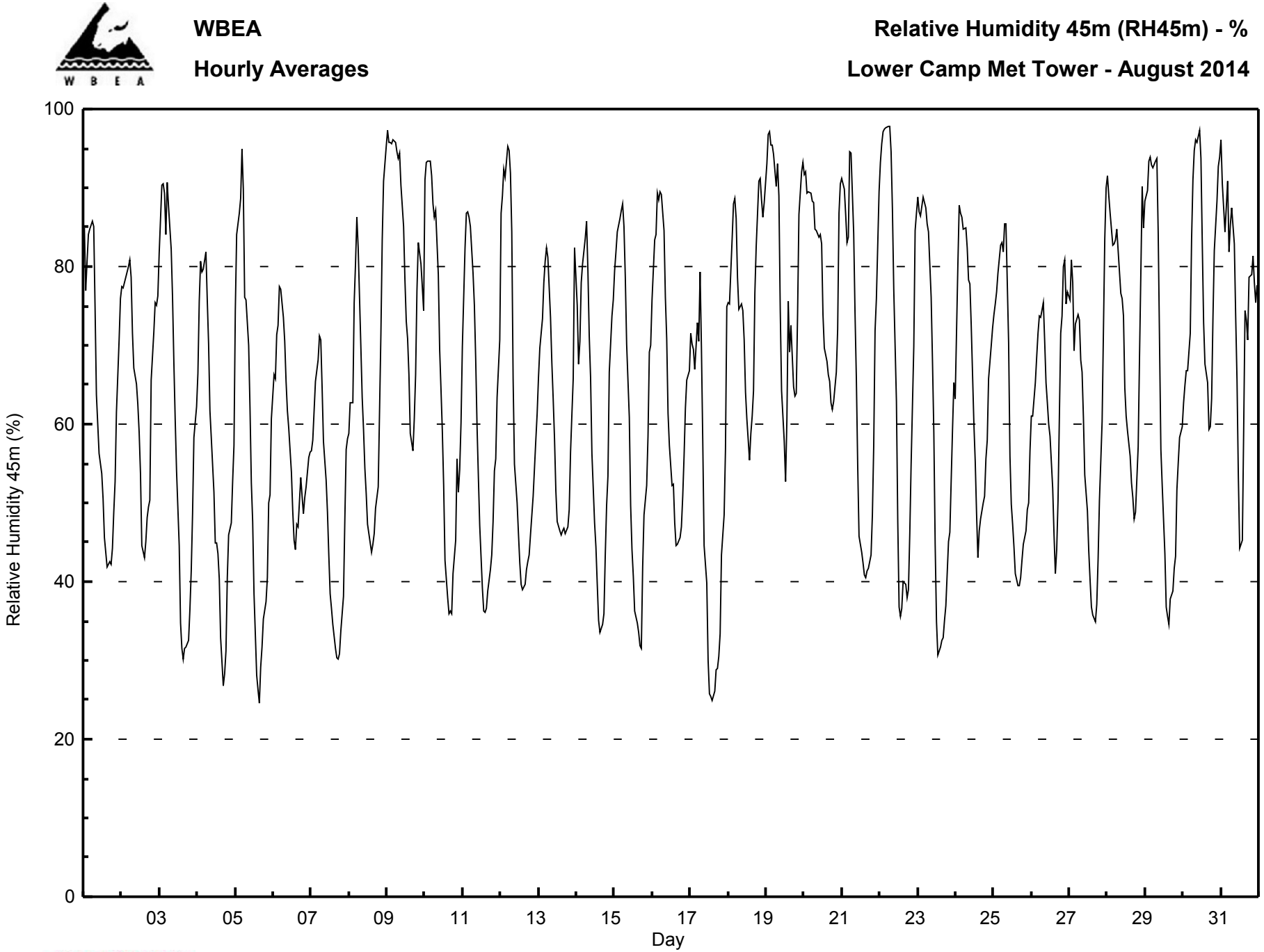
Minimum Diurnal Average: 43.6 % at hour 16

Monthly Average: 64.9 %

Percentiles: P_1 = 28 P_{10} = 39 Q_1 = 48 Median = 66 Q_3 = 82 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-Aug	85	77	81	84	85	86	85	75	64	60	56	54	50	46	44	42	43	42	44	49	53	62	71	76	63.0	86
2-Aug	77	77	78	79	80	81	79	72	67	65	63	59	54	45	43	45	48	50	50	66	72	75	75	76	65.7	81
3-Aug	82	90	91	89	84	91	88	82	76	68	61	54	45	35	32	30	32	32	33	36	41	49	58	62	60.0	91
4-Aug	67	76	81	79	80	82	76	70	62	58	51	45	45	44	40	33	27	28	31	40	46	47	53	57	54.9	82
5-Aug	74	84	87	89	95	90	76	76	70	62	53	48	38	28	26	25	29	32	35	37	41	50	51	61	56.5	95
6-Aug	66	66	71	72	77	77	74	71	65	62	60	54	49	45	44	47	47	53	51	49	51	52	56	56	59.0	77
7-Aug	57	58	62	65	68	71	71	65	58	53	49	43	38	37	35	31	30	30	31	34	38	48	57	58	49.4	71
8-Aug	59	63	63	75	80	86	82	70	63	59	54	51	47	45	44	45	46	49	52	62	71	83	91	95	64.1	95
9-Aug	97	96	96	96	96	96	94	94	94	90	85	78	73	71	66	59	57	61	66	77	83	80	77	74	81.6	97
10-Aug	91	93	93	93	92	88	86	87	79	69	64	59	52	43	38	36	36	36	41	45	56	51	54	60	64.4	93
11-Aug	70	82	87	87	86	85	79	75	68	60	53	47	39	36	36	37	39	41	43	48	54	56	63	71	60.1	87
12-Aug	87	89	92	91	95	95	92	84	66	55	50	46	42	40	39	40	41	42	43	46	51	54	58	61	62.6	95
13-Aug	66	70	73	78	81	82	81	73	68	63	58	51	48	46	46	46	47	46	47	49	57	61	66	82	61.9	82
14-Aug	75	68	70	78	80	84	86	80	71	66	56	47	44	40	35	34	35	36	43	50	53	67	74	76	60.3	86
15-Aug	79	82	84	86	87	88	85	79	70	61	50	44	41	36	35	34	32	32	42	48	52	58	69	70	60.2	88
16-Aug	76	83	84	89	88	90	89	85	76	71	61	57	52	52	47	45	45	46	47	51	56	62	66	67	66.0	90
17-Aug	71	70	69	67	73	70	79	70	58	45	40	30	26	25	25	26	29	29	30	33	43	49	57	75	49.6	79
18-Aug	75	75	84	88	89	86	79	75	75	74	71	64	61	55	59	61	64	77	83	91	91	88	86	88	76.6	91
19-Aug	93	97	97	95	95	94	90	93	89	75	64	58	53	61	76	69	73	65	64	64	74	87	92	93	79.6	97
20-Aug	92	92	89	89	89	88	88	85	85	84	84	83	74	70	68	66	65	63	62	63	67	72	87	91	79.0	92
21-Aug	91	90	87	83	84	95	94	84	74	66	55	46	44	42	41	41	41	42	43	48	57	72	76	89	66.0	95
22-Aug	93	96	97	97	98	98	98	95	87	77	63	48	37	36	37	40	40	38	39	46	55	70	85	87	68.9	98
23-Aug	89	87	86	89	88	87	85	84	76	68	59	45	35	31	32	32	33	35	37	45	46	53	59	65	60.3	89
24-Aug	63	80	88	87	86	85	85	82	78	78	72	60	55	49	43	46	48	50	51	56	58	66	70	72	67.0	88
25-Aug	74	75	77	79	83	83	82	85	85	70	56	50	47	44	41	40	40	40	43	45	46	49	50	57	60.1	85
26-Aug	61	61	65	68	72	74	74	75	71	65	63	60	59	52	46	41	44	50	72	74	80	81	75	77	64.9	81
27-Aug	76	81	78	69	73	74	73	68	67	61	54	49	44	40	37	36	35	37	43	50	55	60	84	90	59.7	90
28-Aug	92	89	87	83	83	83	85	82	77	76	74	65	61	59	56	53	51	48	49	57	69	79	90	85	72.1	92
29-Aug	88	90	93	94	93	93	93	94	84	70	57	52	44	37	36	35	38	39	42	43	52	55	58	60	64.1	94
30-Aug	63	65	67	67	71	84	91	95	96	96	97	94	83	73	68	65	59	60	63	74	82	88	93	94	78.6	97
31-Aug	96	90	84	88	91	82	85	87	83	74	66	53	44	45	59	74	73	71	79	79	81	78	75	78	75.7	96
	78.2	80.4	82.0	83.1	84.6	85.4	84.0	80.3	74.3	67.8	61.2	54.6	49.2	45.4	44.2	43.6	44.0	45.1	48.3	53.4	59.1	64.6	70.2	74.3	Diurnal Average	
	97	97	97	97	98	98	98	95	96	96	97	94	83	73	76	74	73	77	83	91	91	88	93	95	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - August 2014
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	84	11.29	11.29
40 - 60	226	30.38	41.67
60 - 80	229	30.78	72.45
80 - 100	205	27.55	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 100m (RH100m) - %

Lower Camp Met Tower - August 2014

Maximum Value: 97 % on Aug 19 04:00

Maximum Daily Average: 79.6 % on Aug 19

Minimum Value: 24 % on Aug 5 16:00

Minimum Daily Average: 45.0 % on Aug 17

Maximum Diurnal Average: 79.7 % at hour 6

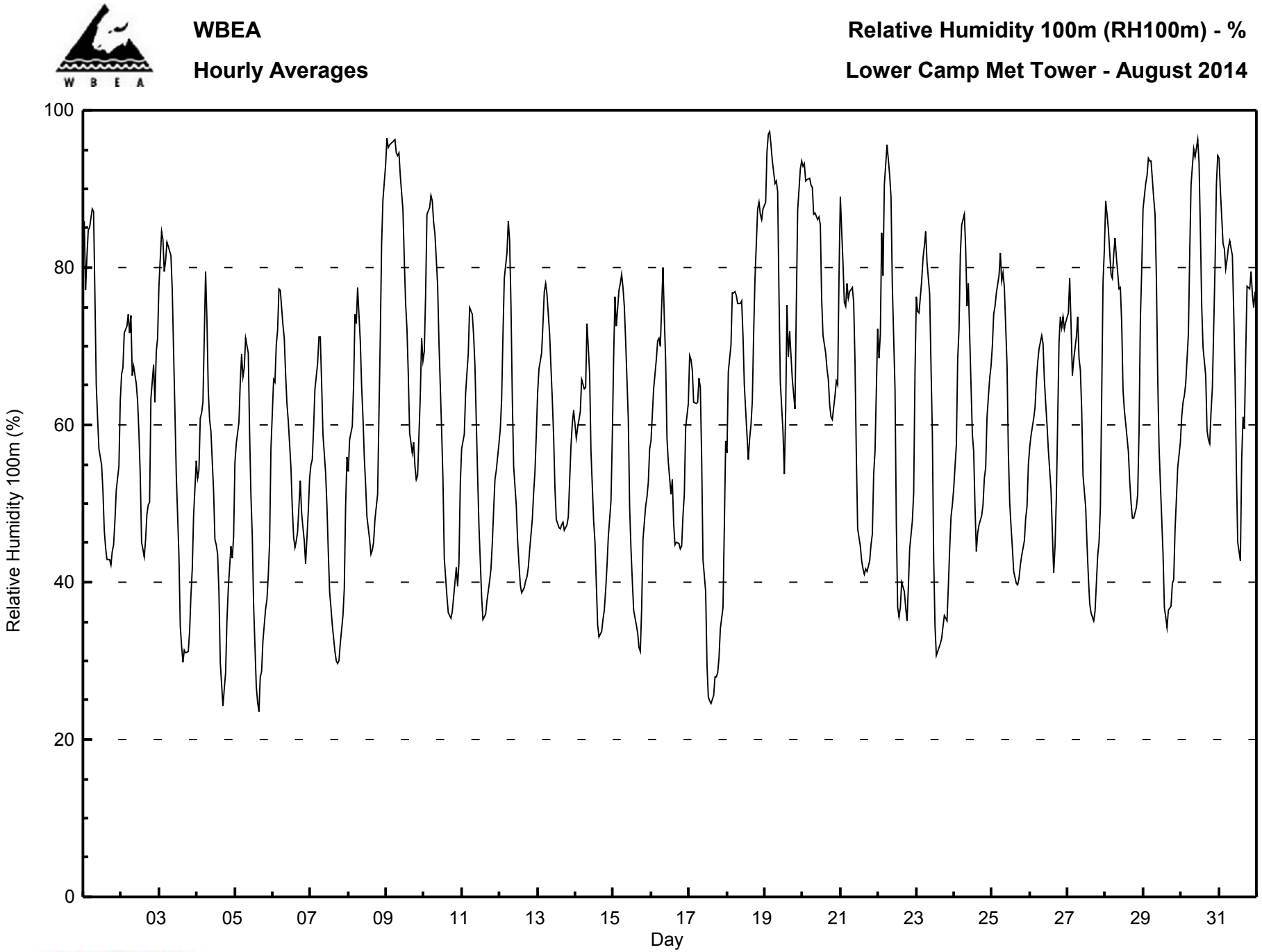
Minimum Diurnal Average: 43.0 % at hour 16

Monthly Average: 61.0 %

Percentiles: P_1 = 26 P_{10} = 37 Q_1 = 46 Median = 61 Q_3 = 75 P_{90} = 86 P_{99} = 95

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-Aug	86	77	81	85	85	87	87	76	65	61	57	55	52	47	44	43	43	42	44	45	48	52	55	63	61.7	87
2-Aug	66	67	72	73	74	72	74	66	68	65	63	59	54	45	43	45	49	50	50	63	68	63	69	71	62.0	74
3-Aug	78	85	83	80	81	83	83	82	77	69	62	54	43	34	32	30	31	31	31	34	38	42	48	55	56.9	85
4-Aug	53	54	61	62	63	79	73	64	61	59	51	45	45	44	39	30	24	26	28	35	39	45	43	46	48.8	79
5-Aug	55	58	60	65	69	66	67	71	69	59	51	46	37	27	25	24	28	29	33	37	38	41	45	57	48.1	71
6-Aug	66	65	70	72	77	77	73	71	67	63	60	55	50	46	44	45	46	53	49	47	45	42	49	53	57.7	77
7-Aug	55	56	60	65	68	71	71	65	59	54	50	44	39	37	35	31	30	30	30	32	36	39	50	56	48.4	71
8-Aug	54	58	60	65	74	73	77	71	65	61	56	52	48	45	44	44	45	48	51	61	71	83	89	93	62.1	93
9-Aug	96	95	96	96	96	96	95	94	95	92	87	81	75	72	66	59	56	58	55	53	53	64	71	68	77.9	96
10-Aug	69	77	87	88	89	88	86	84	78	70	65	59	53	43	38	36	36	35	36	40	42	39	42	53	59.8	89
11-Aug	57	59	64	67	69	75	74	71	67	60	54	47	38	35	36	36	38	40	42	45	49	53	54	58	53.6	75
12-Aug	60	63	71	79	82	86	83	75	64	55	50	45	42	40	39	39	40	41	42	44	48	51	54	59	56.3	86
13-Aug	64	67	69	73	77	78	77	72	67	63	58	52	48	47	47	47	48	47	47	48	53	57	60	62	59.5	78
14-Aug	58	60	61	62	66	65	65	73	70	67	57	48	45	40	35	33	34	35	36	39	42	46	50	58	51.8	73
15-Aug	69	76	73	77	78	79	77	75	71	61	50	44	40	36	35	34	32	31	37	45	50	51	53	57	55.4	79
16-Aug	58	65	66	68	71	71	70	80	74	68	58	55	51	53	47	45	45	45	44	45	49	51	60	63	58.4	80
17-Aug	69	68	67	63	63	63	66	65	56	43	39	29	25	25	25	26	28	28	28	30	34	37	47	58	45.0	69
18-Aug	56	67	70	77	77	77	76	75	75	76	71	65	62	56	58	60	63	72	79	87	88	87	86	87	72.9	88
19-Aug	88	95	97	97	96	94	91	91	90	77	65	59	54	62	75	69	72	66	64	62	75	87	92	94	79.6	97
20-Aug	93	93	91	91	91	90	90	87	87	86	86	86	76	71	69	67	66	63	61	61	64	66	65	79	78.3	93
21-Aug	89	81	76	75	78	76	77	77	76	68	56	47	45	43	42	41	42	41	43	45	46	54	57	72	60.2	89
22-Aug	68	72	84	79	90	96	94	92	89	78	65	47	37	36	37	40	39	37	35	39	44	48	51	67	60.9	96
23-Aug	76	74	74	78	81	83	85	81	77	68	59	43	34	31	32	32	33	34	36	35	39	44	48	50	55.3	85
24-Aug	52	57	68	72	82	85	87	82	75	78	71	59	57	49	44	46	47	49	50	53	55	61	66	67	63.1	87
25-Aug	70	74	75	77	79	82	78	79	77	68	56	50	47	44	41	40	40	40	42	43	45	48	50	55	58.4	82
26-Aug	57	59	61	62	66	68	70	71	70	66	63	60	57	52	46	41	45	51	70	74	72	74	72	73	62.4	74
27-Aug	74	79	73	66	68	71	74	68	67	62	54	49	45	41	37	36	35	36	40	43	45	49	78	82	57.3	82
28-Aug	88	87	85	79	79	82	84	81	77	77	73	64	62	60	57	53	50	48	48	50	51	59	73	80	68.7	88
29-Aug	88	91	92	94	94	94	89	87	79	66	57	53	44	37	36	34	36	37	40	40	47	51	55	58	62.3	94
30-Aug	61	63	64	65	72	82	91	93	95	94	96	93	85	75	70	66	59	58	58	62	65	80	90	94	76.3	96
31-Aug	94	90	83	82	80	81	83	83	82	74	66	54	45	43	56	61	59	69	78	77	80	77	75	77	72.8	94
	70.0	71.9	74.0	75.3	77.8	79.7	79.5	77.6	73.7	68.0	61.5	54.9	49.5	45.6	44.2	43.0	43.2	44.2	46.0	48.9	52.2	56.1	61.2	66.6	Diurnal Average	
	96	95	97	97	96	96	95	94	95	94	96	93	85	75	75	69	72	72	79	87	88	87	92	94	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - August 2014
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	104	13.98	13.98
40 - 60	252	33.87	47.85
60 - 80	272	36.56	84.41
80 - 100	116	15.59	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: -- % on Aug 1 00:00

Maximum Daily Average: -- % on Jul 31

Minimum Value: -- % on Aug 1 00:00

Minimum Daily Average: -- % on Jul 31

Maximum Diurnal Average: -- % at hour 0

Minimum Diurnal Average: -- % at hour 0

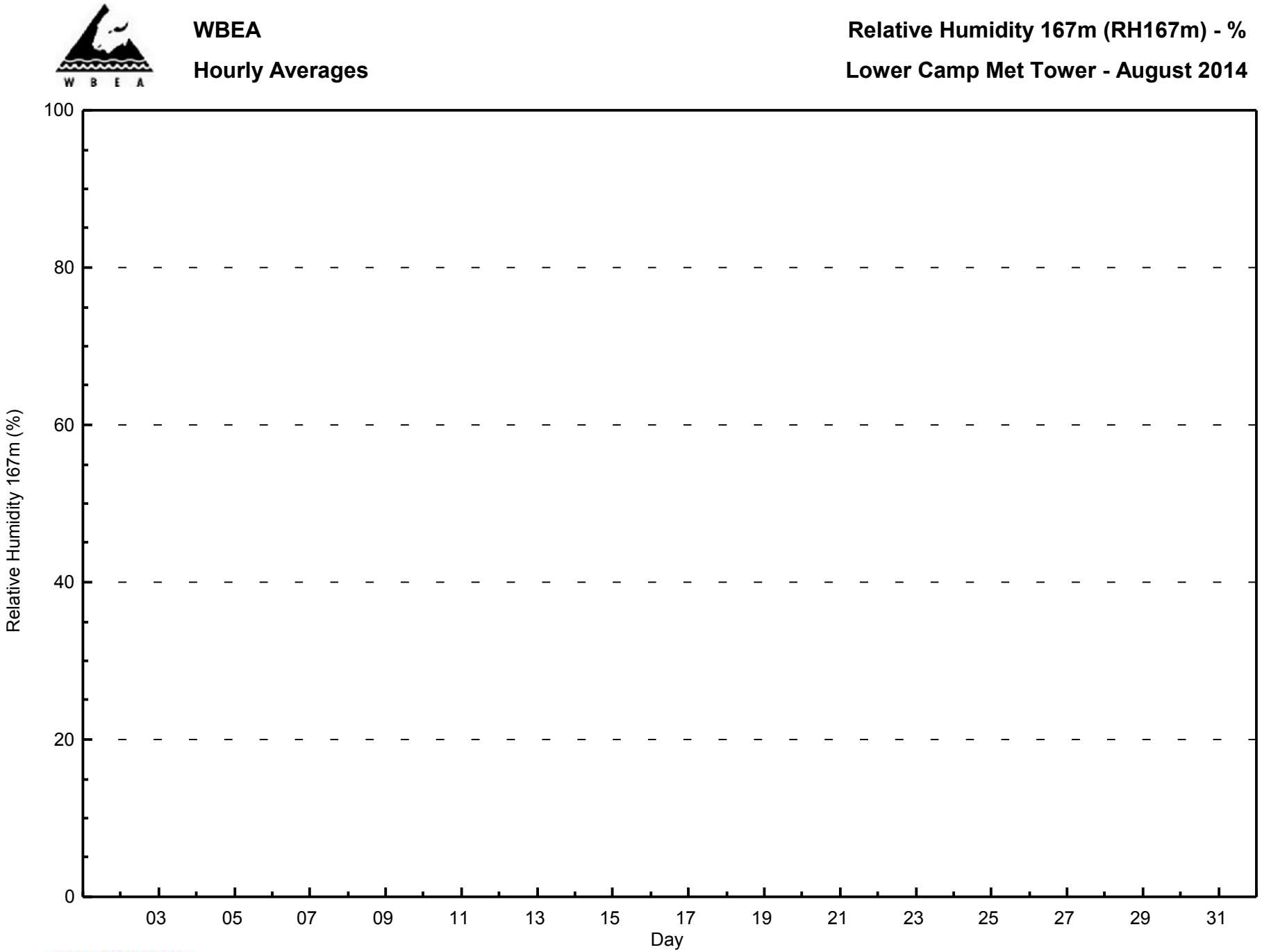
Monthly Average: -- %

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:	0
Hours of Missing Data:	744
Hours of Calibration:	0
Percent Operational Time:	0.0

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

AF - Analyzer Failure


WBEA
Hourly Averages
Relative Humidity 167m (RH167m) - %
Lower Camp Met Tower - August 2014
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	0	0.00	0.00
60 - 80	0	0.00	0.00
80 - 100	0	0.00	0.00

Total Number of Valid Hours: 0

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - August 2014

Maximum Speed: 20 km/h on Aug 7 13:00

Maximum Daily Speed Average: 13.4 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 22 05:00

Minimum Daily Speed Average: 0.2 km/h on Aug 14

Maximum Diurnal Speed Average: 3.1 km/h at hour 17

Minimum Diurnal Speed Average: 0.4 km/h at hour 10

Monthly Average Velocity: 0.9 km/h 194.5 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 3$ Median = 5 $Q_3 = 8$ $P_{90} = 12$ $P_{99} = 18$

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-Aug	NNW9	NNW12	N8	NNW8	NW7	NW4	NW4	N8	N9	N11	N10	NW10	NW7	NW5	N3	WSW2	W2	ENE2	ESE4	SE5	ESE5	E3	ESE4	ESE3	N4.0	NNW12
2-Aug	SE4	SE5	SSE8	S7	SSE5	SSE7	SE5	SE9	SE8	SE10	SE10	SE12	SSE15	SSW10	S12	S14	SSW15	SSW12	SSW6	N2	E3	ENE2	ESE4	ESE3	SSE6.5	SSE15
3-Aug	NW1	N1	SE3	ESE2	ESE4	SE6	ESE5	SE6	SE6	SE6	SE6	SE6	SE5	NNE2	SSW2	E1	S3	S7	SSE9	SE4	SE1	SE1	SSE2	SSE5	SE3.4	SSE9
4-Aug	SE8	SE6	ESE7	ESE6	SE8	SE7	SE8	SE7	NE2	NNW3	NNW5	NW6	NNW7	NNW8	NNW8	NNW5	N4	NE5	N3	NE3	SSE1	SE1	NNE2	NNW3	ENE1.7	SE8
5-Aug	N2	NNW2	NNW1	NNW2	N1	ESE3	ESE4	E0	NNE1	SE3	SE6	SE5	SE7	SE9	SSE9	SSE8	SSE5	SSE6	SSE8	SSE14	S11	SE9	SSE12	ESE6	SE4.6	SSE14
6-Aug	SE8	SSE13	ESE5	SE9	E5	SSE11	SE8	SSE10	SSE11	SSE8	S10	S12	SSW14	WSW14	WSW14	WSW15	WSW9	ESE4	SW7	SW14	SW14	SW17	WSW14	WSW10	SSW7.5	SW17
7-Aug	W13	W16	W11	W10	W12	W14	W15	W14	W18	W16	W19	W19	W20	W18	W18	W18	W18	W15	WNW13	WNW8	W7	W8	N4	W4	W13.4	W20
8-Aug	NNW2	WNW3	NW5	NNW2	NW3	N2	NNW3	N4	N3	N4	NNE5	N6	N5	NNW6	NNE4	NE5	ENE5	NE5	NW3	W11	WNW14	NW5	NNW5	N4	NNW3.6	WNW14
9-Aug	NNW5	NNW7	NNW8	N6	NNW3	NW4	WNW6	NW6	NW4	NNW5	NNW5	NNW6	N4	N2	ESE1	WSW7	WSW10	W2	ESE2	ESE1	SE3	ESE2	SE2	SE4	NW2.4	WSW10
10-Aug	E2	ESE2	ESE3	ESE4	SE5	SE8	SE8	SE7	SSE6	SSE5	SSE6	SE7	SE3	SSE1	SW4	WSW7	WSW6	SW5	NNW1	NNE1	WNW2	WSW8	WSW6	S3	S2.8	SE8
11-Aug	SE8	SE7	SE8	SE9	SE7	SE8	SE8	SE7	SW4	WSW8	WSW3	ESE3	NW7	NW11	NW12	NW11	NNW10	N8	N7	N7	NNW3	NNE2	NW3	NNW2	N0.8	NW12
12-Aug	NW2	NW2	NW1	N1	N1	N2	NNW3	NNW3	ENE1	SE5	SSE6	SE9	SE9	SE9	SSE9	SSE9	SSE10	SSE9	SE10	SE10	SE9	SE13	SSE15	SSE12	SE5.4	SSE15
13-Aug	SSE6	SE7	SSE5	SSE4	SSE2	SE5	SSE5	SSE5	SE8	SE10	SSE10	S12	SSW13	SW10	WSW13	WSW12	SW14	SW11	SSW8	SSW6	NNW3	WNW4	NW2	WNW3	SSW5.1	SW14
14-Aug	NW2	NNW5	NW2	NW2	WNW3	NW1	N3	NNW2	NNW3	NW3	NNW2	ESE2	WSW4	WSW3	WSW1	ENE2	SE4	SSE4	ESE3	SE1	ESE1	SE1	ESE2	SE6	NNW0.2	SE6
15-Aug	ESE5	ESE3	ESE4	SE7	SE7	ESE6	SE7	SE7	SE7	SE5	S2	SE2	ENE2	NE2	ENE4	NE4	NNE3	N2	N6	N7	NW5	NNW4	N5	NNW2	E2.3	SE7
16-Aug	NNW2	W2	NW2	NW3	WNW1	N1	WNW1	NNW2	NW2	NNW2	NNE3	NE1	SE7	SSE5	S6	SSW2	WSW3	WSW8	SW7	WSW4	S2	SW1	SSE3	S3	SW1.3	WSW8
17-Aug	WSW2	NNW2	NNW3	NW6	NNW2	NNW3	NNW3	N6	N4	N5	NNE5	WNW6	WNW10	WNW10	WNW14	NW14	WNW16	NW13	NW8	NW6	WNW0	SSE1	ENE1	S0	NW5.1	WNW16
18-Aug	ESE1	N3	NNE1	N1	N3	N2	SE2	SSE8	SE2	NNE1	SSE7	SSW6	WSW5	WNW6	N5	N6	NNE1	WNW2	SSW4	N2	N4	NNW6	WNW2	NW3	NW0.7	SSE8
19-Aug	N2	E1	N1	E3	ESE2	SSE2	SSE5	SE4	SSE6	S5	S7	SSE9	SSE11	WNW13	NNW9	NNW5	NNE1	NNE4	NE2	NW3	NW6	NNW4	NNW3	NNW4	WSW0.4	WNW13
20-Aug	N3	N6	NNW10	N10	N10	N12	N11	NNE8	N10	N11	N11	N11	N11	N11	N11	NNW7	NNW8	NNW7	N8	NNW3	NW3	NNW2	NNW2	NNW2	N7.7	N12
21-Aug	NNE0	N1	NNW3	NNW3	N3	N3	NNW2	NW2	NNW4	NNW1	N7	N8	NNW9	NNW8	NNW8	N9	N8	N8	NNE7	NE5	N2	NW1	N2	NW0	N4.1	NNW9
22-Aug	NNW2	NNW2	N2	NW2	NNE0	NE1	ENE2	E1	N1	NNW2	NW4	N5	NNW5	NNW6	NNW7	NNE6	N5	NE3	N4	NE2	SSW1	N2	N1	NNE1	N2.4	NNW7
23-Aug	N1	NNW3	N2	NNE2	NNW2	N2	NW3	N2	ENE2	ESE3	ESE4	SE6	SSE4	SSE1	SSW3	SSE4	SSE4	SE4	E4	N2	N2	N3	NE2	N2	E0.9	SE6
24-Aug	N3	NNW4	NW4	NW4	NW4	NW5	NW3	NW4	NW3	NNW4	N5	NNW5	N3	ENE3	ESE2	ENE3	E5	E5	E6	ESE5	SE7	SE7	SE8	SE11	NE1.4	SE11
25-Aug	SE6	SE6	SSE7	SSE6	SE5	SE5	SSE10	SSE11	SSE8	SSE11	SSE15	SSE15	SSE15	SSE18	S14	SSW14	SSW14	SSW13	S13	SSE14	SSE16	SSE16	SSE19	SE8	SSE11.0	SSE19
26-Aug	SE11	SE11	SE14	SE14	SSE15	SSE16	SSE11	SE11	SE9	SE7	SE7	SE6	ESE4	ESE5	SE8	SSW16	SW18	W11	N6	ESE3	NE2	SSW2	ESE4	SE8	SSE6.7	SW18
27-Aug	S6	ESE7	SE8	S5	SSE4	SSW3	W8	WNW12	WNW14	WNW13	WNW14	WNW9	W8	W9	W9	WNW9	W9	WNW8	NNW6	NNE1	NNW1	WNW5	WNW5	SE1	W5.0	WNW14
28-Aug	SW2	SE1	WSW3	NNW4	NNW5	NNW5	NNW5	NW7	NW10	WNW10	NW7	NW8	NW8	NNW8	N8	NNW6	N6	NNE2	ESE2	ESE3	SE1	N2	SE1	ENE1	NNW3.7	WNW10
29-Aug	E3	E3	E4	E5	ESE4	SE9	SE8	SE9	SE7	SSE9	SE10	SE11	SSE14	S12	SSE11	SSE14	SSE12	SSE11	SSE13	SSE14	SE12	SE10	SE8	SSE12	SE9.0	SSE14
30-Aug	SSE9	SE10	SE11	SE12	S14	SSE9	SSE6	SE5	SW7	WNW4	NW4	NNW3	W5	WNW2	ENE3	S2	WSW5	SSW3	SE4	NNW2	NNW0	NNE1	NNW1	NW2	SSE2.5	S14
31-Aug	SE3	S3	SW2	SE6	SE6	SSE5	SE8	SE8	SE8	SE6	SSE5	SW4	W6	NNW7	NNW12	NNW6	SSE3	NW3	WSW1	SSE4	SW3	W3	WNW8	NW5	S1.2	NNW12
	SE1.2	ESE0.8	ESE1.0	SE1.3	SE1.1	SE1.7	SSE1.6	SE1.5	S0.6	SSW0.4	S0.8	S1.2	SW1.9	W2.5	W2.3	WSW2.6	WSW3.1	WSW1.6	S0.6	S1.1	SSW1.1	SSW1.2	SSE1.3	SSE1.5	Diurnal Average	
	W13	W16	SE14	SE14	SSE15	SSE16	W15	W14	W18	W16	W19	W19	W20	W18	WSW18	W18	W18	W15	WNW13	SSE14	SSE16	SW17	SSE19	SSE12	Diurnal Maximum	

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 Aug 27 22:00

Minimum Value: 0 km/h on Aug 18 00:00

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

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

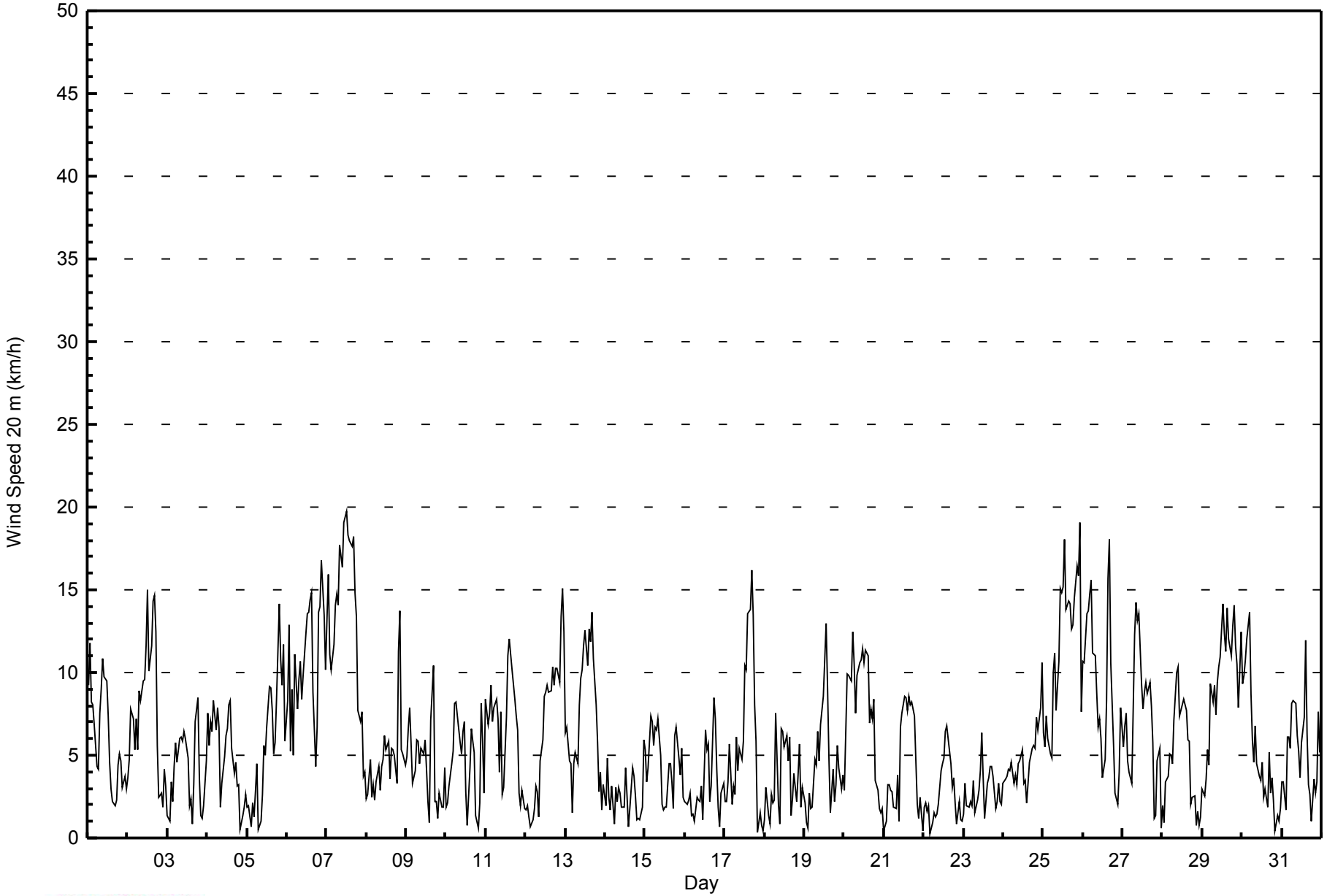
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	5	6	4	4	3	2	2	3	4	5	4	4	4	2	2	3	2	1	2	2	1	1	2	2	6
2-Aug	3	2	3	2	3	4	3	3	3	4	4	4	4	4	4	5	5	4	3	3	2	3	2	2	5
3-Aug	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	2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

WBEA

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	399	53.63	53.63
6 - 11	259	34.81	88.44
12 - 19	85	11.42	99.87
20 - 28	1	0.13	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

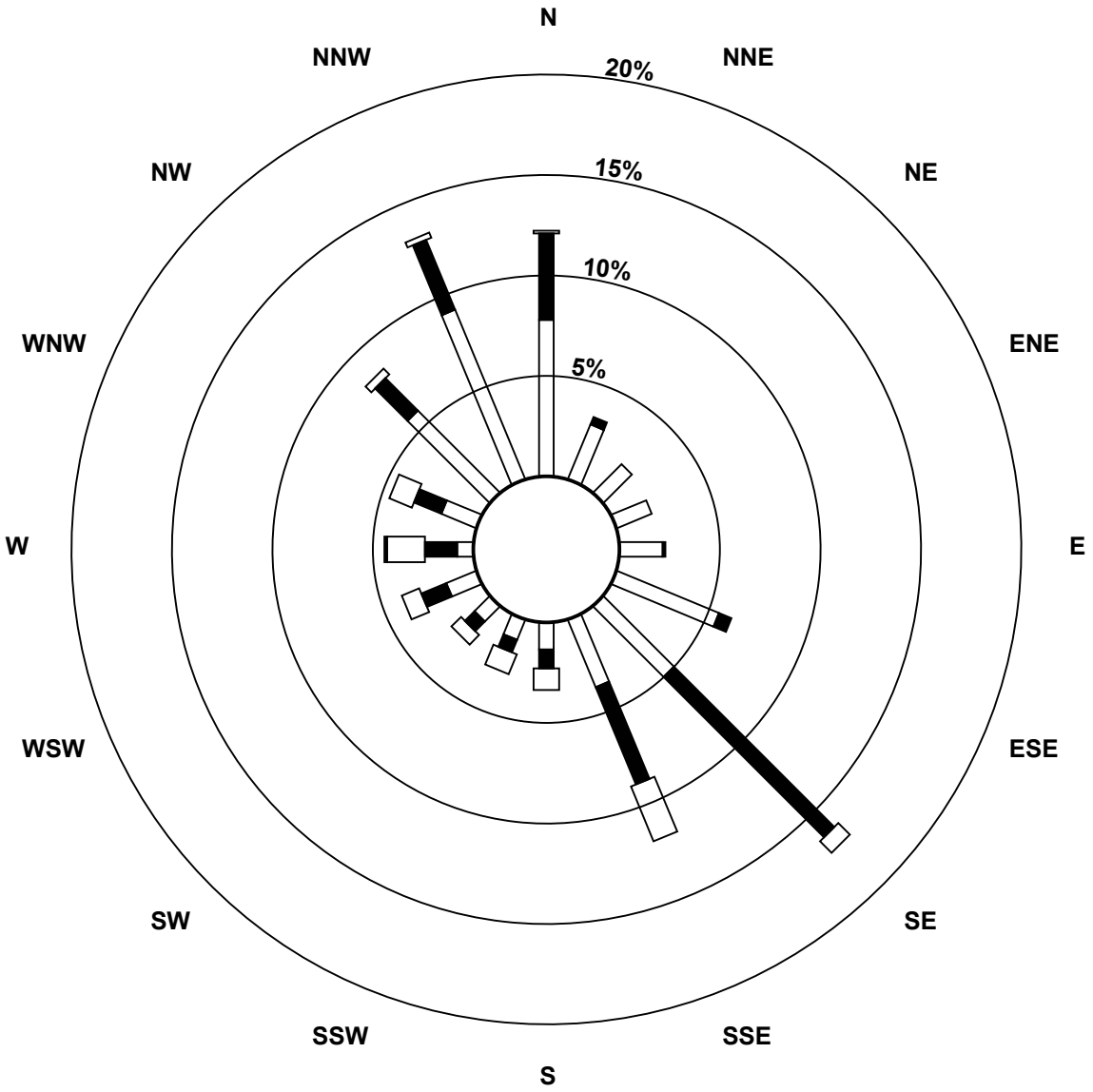
Total Number of Hours: 744

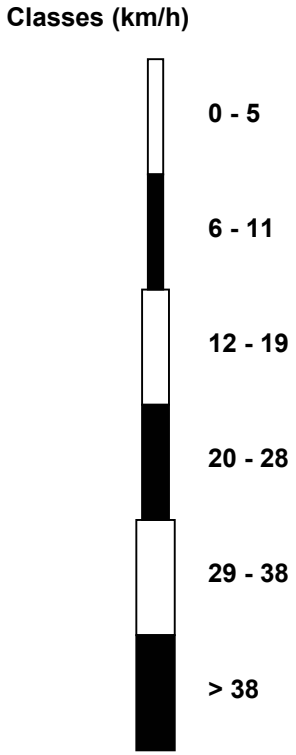
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - August 2014

Maximum Speed: 28 km/h on Aug 7 12:00

Maximum Daily Speed Average: 19.0 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 5 05:00

Minimum Daily Speed Average: 0.2 km/h on Aug 14

Maximum Diurnal Speed Average: 4.0 km/h at hour 17

Minimum Diurnal Speed Average: 0.3 km/h at hour 19

Monthly Average Velocity: 1.0 km/h 206.1 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 11$ $P_{90} = 16$ $P_{99} = 24$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNW14	NNW17	N11	NNW12	NW11	NW7	NW7	N11	N11	N15	N13	NW12	NW9	NW6	N4	WSW2	W2	ENE3	ESE6	SE7	ESE6	E5	ESE6	ESE5	N5.5	NNW17
2-Aug	SE6	SE7	SSE9	S8	SSE7	SSE8	SE6	SE11	SE10	SE12	SE12	SE14	SSE17	SSW12	S14	S17	SSW18	SSW16	SSW8	N3	E4	ENE3	ESE6	ESE6	SSE8.1	SSW18
3-Aug	NW2	N1	SE5	ESE3	ESE5	SE8	ESE6	SE7	SE7	SE7	SE7	SE7	SE5	NNE2	SSW3	E1	S4	S8	SSE10	SE6	SE3	SE3	SSE6	SSE7	SE4.3	SSE10
4-Aug	SE9	SE9	ESE10	ESE9	SE11	SE9	SE10	SE8	NE2	NNW4	NNW6	NW7	NNW8	NNW10	NNW11	NNW7	N6	NE8	N6	NE8	SSE3	SE3	NNE2	NNW3	ENE2.5	SE11
5-Aug	N4	NNW2	NNW1	NNW1	N0	ESE5	ESE7	E1	NNE1	SE3	SE7	SE6	SE8	SE11	SSE11	SSE9	SSE7	SSE8	SSE10	SSE15	S12	SE13	SSE14	ESE9	SE5.9	SSE15
6-Aug	SE11	SSE15	ESE8	SE11	E7	SSE13	SE10	SSE11	SSE12	SSE10	S12	S14	SSW17	WSW18	WSW20	WSW21	WSW11	ESE7	SW9	SW17	SW18	SW21	WSW19	WSW16	SSW9.6	SW21
7-Aug	W19	W24	W16	W15	W17	W20	W21	W20	W25	W23	W26	W28	W27	W26	W26	W25	W26	W20	WNW19	WNW11	W11	W12	N6	W4	W19.0	W28
8-Aug	NNW4	WNW4	NW7	NNW4	NW2	N3	NNW4	N6	N3	N5	NNE6	N8	N6	NNW7	NNE5	NE8	ENE9	NE8	NW5	W16	WNW19	NW7	NNW8	N6	NNW4.9	WNW19
9-Aug	NNW8	NNW10	NNW11	N8	NNW5	NW6	WNW8	NW8	NW7	NNW8	NNW7	NNW8	N5	N3	ESE1	WSW10	WSW15	W4	ESE2	ESE2	SE3	ESE2	SE2	SE5	NW3.6	WSW15
10-Aug	E4	ESE4	ESE6	ESE7	SE8	SE10	SE10	SE9	SSE7	SSE6	SSE7	SE8	SE4	SSE1	SW5	WSW8	WSW8	SW7	NNW2	NNE1	WNW4	WSW14	WSW11	S4	S3.6	WSW14
11-Aug	SE11	SE9	SE10	SE12	SE10	SE10	SE10	SE8	SW6	WSW10	WSW4	ESE3	NW10	NW16	NW16	NW16	NNW15	N12	N11	N10	NNW5	NNE3	NW5	NNW3	N1.6	NW16
12-Aug	NW3	NW3	NW1	N0	N1	N2	NNW4	NNW3	ENE2	SE6	SSE7	SE11	SE11	SE11	SSE10	SSE11	SSE13	SSE11	SE14	SE15	SE15	SE18	SSE19	SSE16	SE7.1	SSE19
13-Aug	SSE10	SE10	SSE8	SSE6	SSE4	SE6	SSE6	SSE6	SE10	SE12	SSE12	S13	SSW16	SW14	WSW17	WSW16	SW17	SW15	SSW11	SSW8	NNW3	WNW6	NW3	WNW5	SSW6.8	WSW17
14-Aug	NW5	NNW7	NW4	NW3	WNW4	NW1	N4	NNW3	NNW3	NW3	NNW2	ESE2	WSW5	WSW3	WSW1	ENE2	SE5	SSE5	ESE4	SE3	ESE4	SE4	ESE4	SE9	NNE0.2	SE9
15-Aug	ESE7	ESE5	ESE6	SE10	SE9	ESE7	SE8	SE8	SE8	SE6	S2	SE2	ENE2	NE2	ENE6	NE5	NNE4	N2	N9	N11	NW8	NNW6	N9	NNW5	E2.8	N11
16-Aug	NNW4	W0	NW2	NW1	WNW1	N1	WNW1	NNW3	NW3	NNW2	NNE4	NE2	SE8	SSE6	S7	SSW3	WSW4	WSW12	SW10	WSW7	S4	SW3	SSE4	S4	SW1.8	WSW12
17-Aug	WSW5	NNW4	NNW5	NW8	NNW4	NNW5	NNW4	N8	N5	N7	NNE5	WNW8	WNW13	WNW13	WNW18	NW19	WNW22	NW19	NW12	NW9	WNW3	SSE2	ENE0	S1	NW7.2	WNW22
18-Aug	ESE2	N3	NNE1	N0	N1	N2	SE4	SSE9	SE2	NNE1	SSE8	SSW8	WSW7	WNW8	N6	N8	NNE2	WNW3	SSW5	N3	N6	NNW9	WNW2	NW5	NW0.9	SSE9
19-Aug	N3	E2	N1	E3	ESE3	SSE3	SSE6	SE6	SSE7	S5	S8	SSE10	SSE13	WNW17	NNW13	NNW7	NNE3	NNE6	NE4	NW4	NW8	NNW8	NNW6	NNW7	NW0.7	WNW17
20-Aug	N5	N10	NNW14	N14	N13	N17	N15	NNE11	N14	N15	N14	N15	N15	N15	N15	NNW10	NNW10	NNW10	N12	NNW6	NW4	NNW3	NNW3	NNW4	N10.9	N17
21-Aug	NNE1	N2	NNW6	NNW6	N4	N4	NNW3	NW2	NNW4	NNW2	N8	N10	NNW11	NNW11	NNW10	N11	N11	N12	NNE11	NE8	N3	NW2	N3	NW2	N5.8	N12
22-Aug	NNW2	NNW3	N2	NW2	NNE1	NE1	ENE1	E2	N1	NNW2	NW5	N6	NNW6	NNW9	NNW9	NNE9	N6	NE4	N6	NE6	SSW1	N3	N1	NNE1	N3.1	NNW9
23-Aug	N1	NNW4	N2	NNE2	NNW3	N2	NW4	N2	ENE3	ESE3	ESE5	SE7	SSE4	SSE2	SSW4	SSE4	SSE5	SE6	E5	N4	N2	N4	NE4	N2	E1.1	SE7
24-Aug	N5	NNW6	NW5	NW6	NW6	NW7	NW5	NW5	NW5	NNW5	N5	NNW6	N3	ENE4	ESE2	ENE4	E7	E9	E9	ESE7	SE11	SE10	SE12	SE14	ENE1.9	SE14
25-Aug	SE9	SE9	SSE9	SSE8	SE7	SE7	SSE12	SSE14	SSE10	SSE13	SSE17	SSE17	SSE18	SSE20	S17	SSW18	SSW19	SSW16	S14	SSE16	SSE18	SSE17	SSE21	SE11	SSE13.1	SSE21
26-Aug	SE14	SE14	SE17	SE17	SSE18	SSE18	SSE13	SE13	SE11	SE8	SE9	SE7	ESE5	ESE6	SE10	SSW20	SW23	W15	N9	ESE4	NE3	SSW3	ESE5	SE10	SSE8.2	SW23
27-Aug	S8	ESE10	SE9	S7	SSE5	SSW6	W11	WNW17	WNW20	WNW18	WNW19	WNW13	W10	W11	W13	WNW11	W13	WNW12	NNW10	NNE3	NNW3	WNW6	WNW8	SE1	W6.9	WNW20
28-Aug	SW3	SE1	WSW5	NNW6	NNW8	NNW8	NNW6	NW10	NW13	WNW14	NW10	NW11	NW10	NNW11	N10	NNW8	N8	NNE3	ESE3	ESE5	SE2	N1	SE1	ENE3	NNW4.9	WNW14
29-Aug	E4	E4	E5	E7	ESE6	SE12	SE10	SE11	SE8	SSE11	SE13	SE13	SSE16	S14	SSE13	SSE16	SSE15	SSE13	SSE15	SSE16	SE15	SE14	SE12	SSE16	SE10.9	SSE16
30-Aug	SSE13	SE15	SE16	SE16	S16	SSE10	SSE7	SE6	SW10	WNW6	NW6	NNWAF	W6	WNW3	ENE3	S2	WSW7	SSW4	SE6	NNW2	NNW1	NNE2	NNW2	NW3	SSE3.6	SE16
31-Aug	SE3	S5	SW3	SE6	SE8	SSE6	SE8	SE10	SE9	SE7	SSE5	SW5	W7	NNW11	NNW18	NNW10	SSE4	NW5	WSW1	SSE4	SW5	W6	WNW11	NW8	SW1.2	NNW18
	SE1.4	ESE1.2	ESE1.2	SE1.5	SE1.4	SE1.9	SSE1.7	SE1.5	SSW0.6	WSW0.4	SSW0.7	SSW1.4	SW2.4	W3.5	W3.3	W3.6	WSW4.0	WSW2.1	S0.3	SSE0.9	SSW1.4	SSW1.6	S1.6	SSE1.9	Diurnal Average	
	W19	W24	SE17	SE17	SSE18	W20	W21	W20	W25	W23	W26	W28	W27	W26	WSW26	W25	W26	W20	WNW19	SW17	WNW19	SW21	SSE21	SSE16	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 Aug 27 22:00

Minimum Value: 0 km/h on Aug 16 07:00

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

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

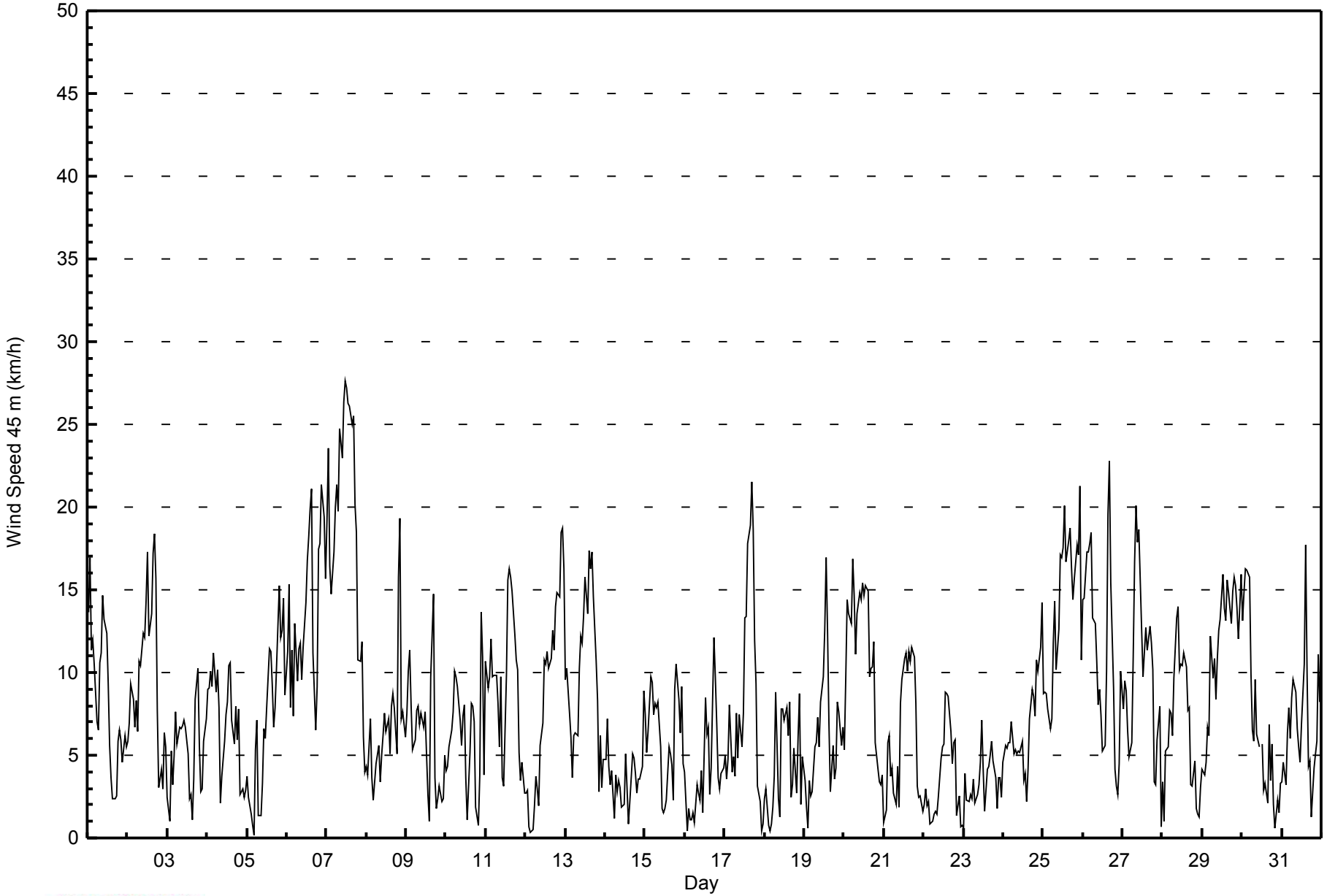
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	279	37.55	37.55
6 - 11	300	40.38	77.93
12 - 19	141	18.98	96.90
20 - 28	23	3.10	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

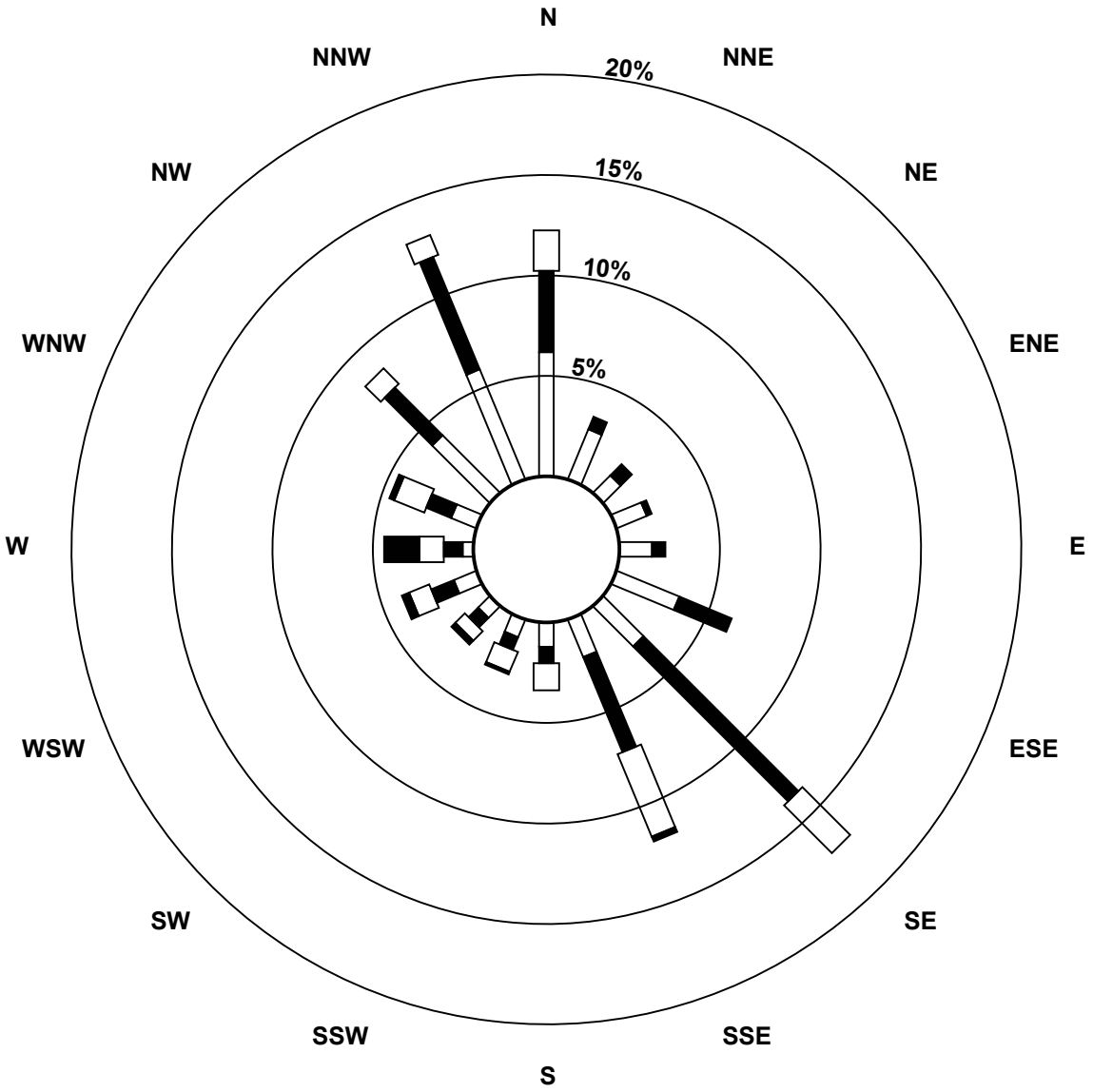
Total Number of Hours: 744

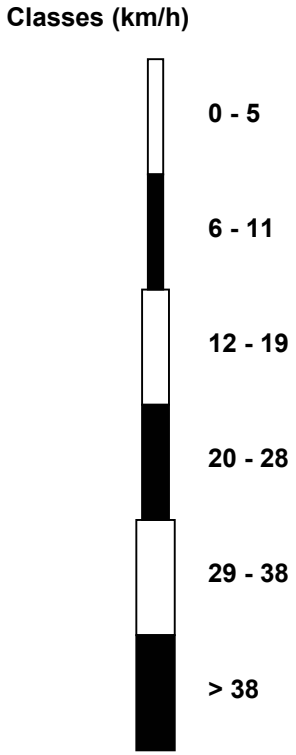
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - August 2014

Maximum Speed: 35 km/h on Aug 7 13:00

Maximum Daily Speed Average: 26.0 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 22 08:00

Minimum Daily Speed Average: 1.0 km/h on Aug 18

Maximum Diurnal Speed Average: 4.5 km/h at hour 14

Minimum Diurnal Speed Average: 0.4 km/h at hour 19

Monthly Average Velocity: 2.0 km/h 220.2 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 6 Median = 10 Q_3 = 16 P_{90} = 21 P_{99} = 33

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-Aug	N21	N24	N17	N18	N18	N11	N10	N13	N15	N19	N18	NNW15	NNW12	NW7	N5	W2	W3	ESE3	SE7	SSE8	SSE8	SSE8	SSE15	SSE14	N6.8	N24
2-Aug	SSE16	SSE14	SSE14	SSE15	SSE12	SSE10	SSE8	SSE13	SE13	SSE19	SE19	SSE19	SSE20	SSW13	SSW15	SSW18	SSW21	SSW18	SW12	ENE6	SE8	S11	SE12	SSE10	SSE12.3	SSW21
3-Aug	WSW7	WSW6	SW5	SW10	SSW6	S8	S6	SSE7	SE7	SE9	SE9	SE8	SE5	N4	SW3	S1	SSW5	S9	S11	SSW7	SSW4	SSW4	SW5	WSW6	S4.6	S11
4-Aug	SW8	SSW7	S5	S6	S10	SSE14	SSE11	S4	NNW2	NNW5	NNW7	NNW9	NNW10	NNW12	N13	N9	NNE8	ENE13	NE11	ENE20	ENE18	ESE9	SE9	SSE6	ENE2.7	ENE20
5-Aug	WSW5	WSW2	SSE4	SSE4	SE6	SE18	SE15	SSE6	ESE1	SSE6	SSE10	SE10	SE12	SE17	SE16	SSE12	SE11	SE17	SSE19	S20	S21	S18	S19	SSE13	SSE11.0	S21
6-Aug	SSE16	SSE17	SE14	SSE16	SE11	SSE15	SSE12	SSE15	SSE13	SSE11	S13	S16	SSW19	WSW20	WSW22	WSW29	WSW13	ESE10	SW13	WSW25	WSW28	WSW29	WSW28	WSW24	SSW13.1	WSW29
7-Aug	W30	W34	W24	W22	W25	W29	W30	W27	W34	W31	W34	W35	W35	W35	W32	W32	W33	W28	WNW25	WNW17	WNW16	W19	NNW10	N8	W26.0	W35
8-Aug	NW10	NNW10	NW13	NNW10	N7	NNW9	N6	NNE7	NNE4	N5	NNE8	N10	N8	N9	NE7	NE11	ENE13	NE13	N6	W17	WNW27	NW11	NNW12	NNE9	NNW7.4	WNW27
9-Aug	N12	N15	N17	NNE12	N9	N8	NNW10	NW11	NW11	NNW9	NNW8	NNW9	N7	N2	NW1	WSW11	WSW16	W7	W5	W3	W3	WSW11	WSW8	SW4	NW6.2	N17
10-Aug	S4	SSE7	SSE12	SSE11	SSE12	SSE14	SSE11	SSE10	S9	S6	SSE8	SSE9	SE5	SW2	SW6	WSW10	WSW10	WSW8	WSW7	SW6	SW14	WSW22	WSW21	SW11	SSW7.0	WSW22
11-Aug	SSW6	S5	SSW7	S8	S9	S7	S7	S5	SW7	WSW10	W5	SE2	NW14	NW23	NW22	NW23	NNW22	N17	NNE16	NNE16	NNE15	NNE6	NE8	ENE3	NNW4.3	NW23
12-Aug	NNE7	NE6	N5	N5	N2	ESE2	N1	ENE1	SE5	SE7	SE8	SE16	SE15	SE15	SE14	SSE15	SSE19	SE19	SE24	SE24	SE27	SSE33	SSE35	SSE30	SE12.1	SSE35
13-Aug	SE22	SE23	SE21	SE18	SE15	SSE15	SSE13	SSE11	SSE13	SSE16	SSE14	S15	SSW17	SW16	WSW20	WSW18	SW19	SW16	SW15	SW18	SW10	WNW9	NW9	NNW12	S10.4	SE23
14-Aug	WNW14	WNW17	NW9	NNW10	NNW11	NW6	NW7	NNW6	NW5	NNW4	N3	SE1	WSW6	W3	WSW2	ENE1	SSE4	S6	S5	SSE6	S6	S7	SSW6	SSE10	WNW2.7	WNW17
15-Aug	SSE11	SSE6	SSE9	S9	S9	S9	S9	SSE11	SE10	ESE7	SSE1	SSE1	E1	N2	NE6	ENE5	NNE5	NNW3	NNE13	NNE20	N11	N11	N14	N11	ENE2.4	NNE20
16-Aug	NNW8	NNW11	NNW11	NNW11	NNW7	NNW4	N4	N5	NNE3	E3	E7	ESE4	SE14	SSE7	S8	SW4	WSW6	WSW14	SW14	WSW12	SW11	WSW14	WSW12	WSW13	W3.2	WSW14
17-Aug	W16	WNW12	WNW12	NW15	NW11	NW13	WNW11	NNW9	NNW7	N9	NNE6	WNW11	WNW17	WNW17	WNW23	NW26	WNW30	NW27	NW20	NW18	NNW12	WNW5	W9	WSW5	NW13.2	WNW30
18-Aug	SSE7	SE6	SSE5	SSE9	SSE8	SSE10	SSE8	SSE11	SE2	ENE2	SSE10	SSW8	WSW9	WNW10	NNW9	N12	ENE5	NW5	SW8	N4	NNE10	N15	NNE4	NNW5	SE1.0	N15
19-Aug	NW7	N5	N2	SSE1	SSE4	SW8	SSW7	S5	S6	S6	S8	S11	SSE15	WNW23	NW19	NNW9	ENE6	NE8	ENE6	NNW5	NNW10	N12	NNE9	NNE12	NW2.0	WNW23
20-Aug	NNE10	NNE15	N21	N19	N19	N23	N21	NNE16	NNE19	NNE19	N21	N20	N20	N21	N20	N14	N15	N14	N18	N11	N8	NNW9	NNW12	NNW11	N16.2	N23
21-Aug	NNW6	NNW7	NNW10	NNW10	NW7	NW11	WNW7	NW3	N5	N3	N11	N13	NNW15	NNW14	N13	N15	N15	NNE16	NNE16	ENE16	ENE12	NNE6	N5	N5	N8.6	NNE16
22-Aug	NW4	NW5	NW3	NW3	NNW2	SE1	S1	W0	N2	NNW3	NNW6	NNE6	NNW8	N11	N11	NE12	NNE9	NE7	NNE10	ENE15	E10	E4	SE3	SSE3	NNE3.9	ENE15
23-Aug	SSE7	SE4	SE3	SE3	SE3	SSE2	SW1	NNE1	E3	ESE5	SE6	SE8	SE5	SSE2	SSW5	SSE5	SSE6	SSE8	SE5	E12	SE8	ESE5	ESE9	ESE7	SE4.7	E12
24-Aug	E2	N4	N6	N7	N8	N9	N7	N6	N6	NNW5	NNW5	N5	N3	E4	ESE2	E5	E10	E13	ESE14	SSE12	SSE19	SSE20	SSE19	SSE20	ESE3.8	SSE20
25-Aug	SSE16	SE16	SSE12	SSE17	SSE13	SSE13	SSE17	SSE23	SE19	SSE20	S19	S19	SSE20	SSE24	SSW18	SSW19	SSW22	SSW19	S19	S23	S26	S26	S24	SSE15	S18.1	S26
26-Aug	SSE21	SSE20	SSE21	SSE22	SSE21	SSE22	SSE16	SSE13	SSE13	SE11	SE12	SE11	SE7	SE7	SE12	SW23	SW27	W16	NNE14	E7	E7	SSE5	SSW4	SSE13	SSE10.8	SW27
27-Aug	S13	SSE13	SSW8	WSW15	WSW14	WSW13	W17	WNW23	WNW28	WNW22	WNW23	WNW16	W12	W13	W15	WNW15	W17	WNW17	NNW17	N10	N10	NW9	WNW15	ESE2	WNW11.2	WNW28
28-Aug	WSW9	W5	W10	WNW14	WNW18	WNW16	NW11	WNW15	NW18	WNW18	NW15	NNW14	NW13	NNW14	N14	NNW10	N10	NNE5	E2	ESE9	ESE8	SE7	SSE7	SSE8	NW6.9	NW18
29-Aug	SSE9	SSE9	SSE9	SSE9	SSE11	SSE15	SSE13	S11	S9	SSE14	SSE16	SE16	SSE19	S16	SSE16	SSE18	SSE22	SSE19	SSE21	SSE23	SSE19	SSE22	SE24	SSE27	SSE16.0	SSE27
30-Aug	SE24	SE29	SE30	SE28	S22	S10	S7	SSE7	WSW12	WNW10	NW9	NW8	W8	WNW5	NE2	S2	WSW9	SW5	SSE5	SSE1	SW2	WNW6	NW6	NW7	S5.3	SE30
31-Aug	WSW6	WSW7	W10	WSW5	SW7	SW8	SW7	SSW5	S5	SSE5	SSE4	WSW6	W8	NW16	N27	N20	SW7	W10	NNW4	SW8	WSW11	W12	W19	W14	W6.0	N27
	SSW3.1	S1.6	S1.6	S2.0	SSW2.3	SSW3.2	SSW2.8	SSW2.0	WSW1.4	SW0.9	SSW0.9	SSW1.6	WSW2.9	W4.5	WNW4.0	W4.3	WSW4.3	WSW1.9	S0.4	SSE1.7	S2.8	SSW4.0	SSW3.6	S3.4	Diurnal Average	
	W30	W34	SE30	SSE28	W25	W29	W30	W27	W34	W31	W34	W35	W35	W35	WSW32	W32	W33	W28	WNW25	WSW25	WSW28	SSE33	SSE35	SSE30	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 18 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 22 06:00

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

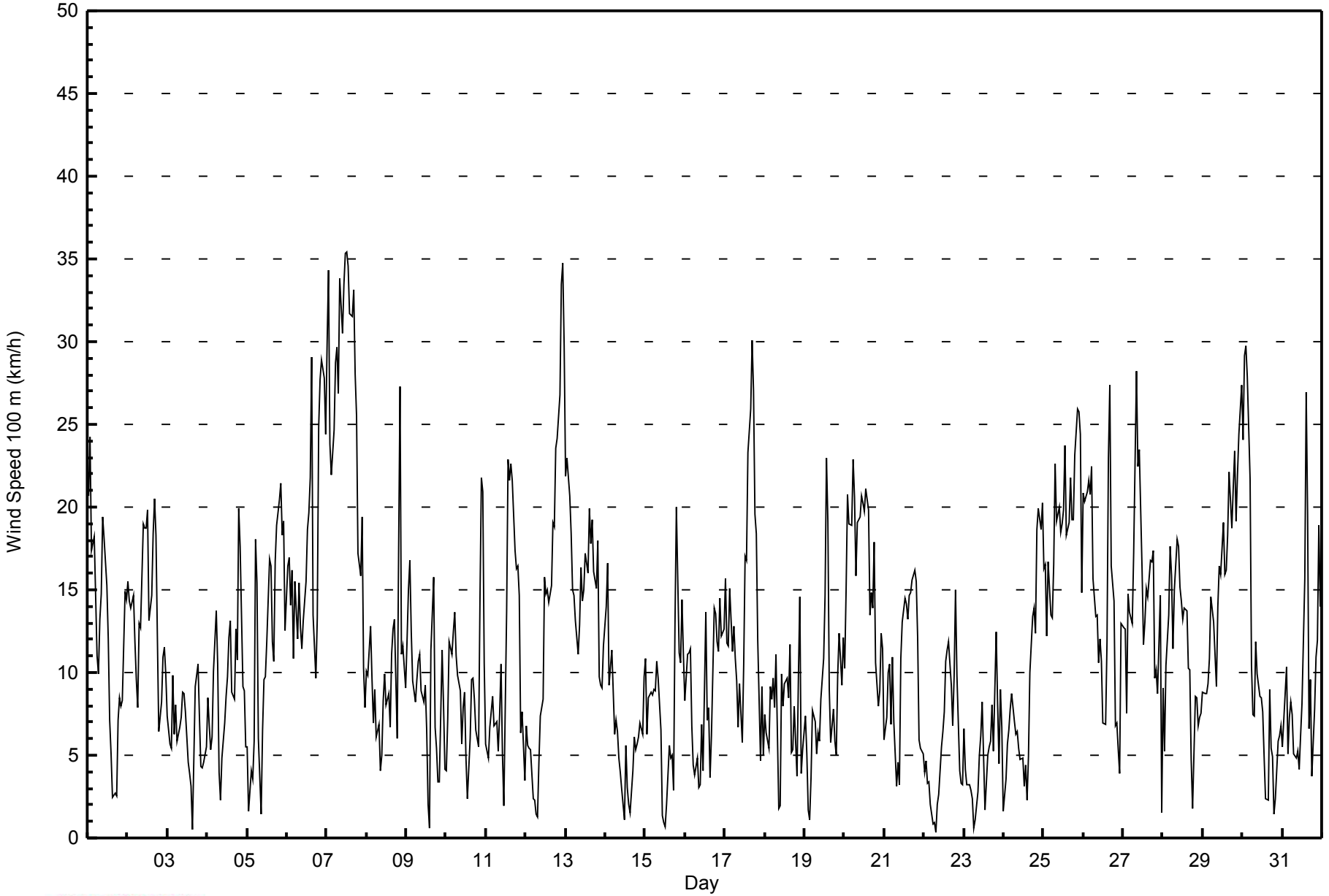
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	6	7	4	3	3	3	3	3	3	4	4	4	3	4	2	2	3	1	3	2	2	2	3	2	7
2-Aug	4	3	2	2	4	4	4	3	2	3	3	3	5	5	5	6	6	4	4	6	3	5	3	4	6
3-Aug	3	2	2	2	3	2	2	2	1	1	1	1	2	2	3	3	3	3	3	3	2	2	1	1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

WBEA

Hourly Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	145	19.49	19.49
6 - 11	276	37.10	56.59
12 - 19	221	29.70	86.29
20 - 28	81	10.89	97.18
29 - 38	21	2.82	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

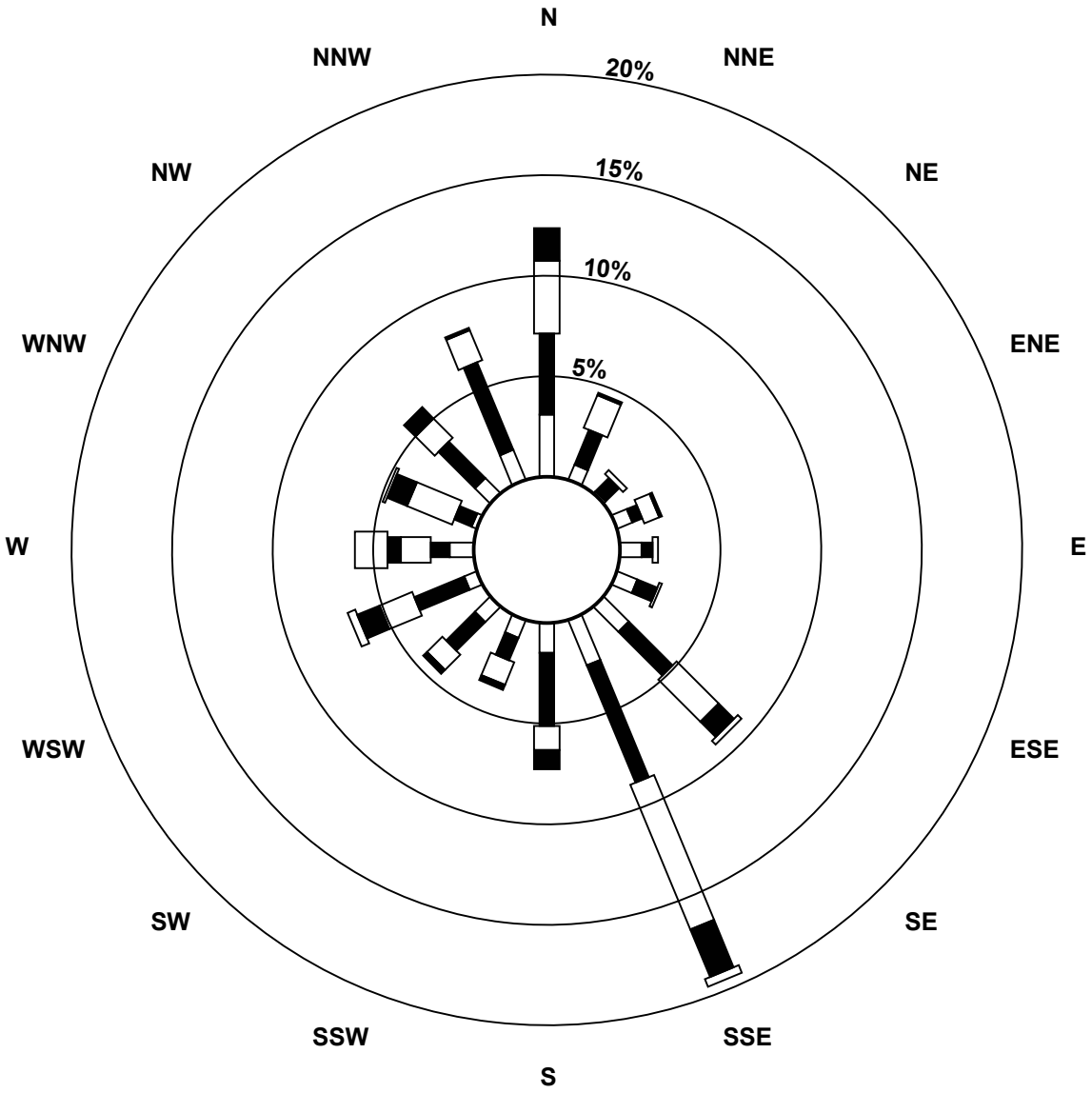
Total Number of Hours: 744

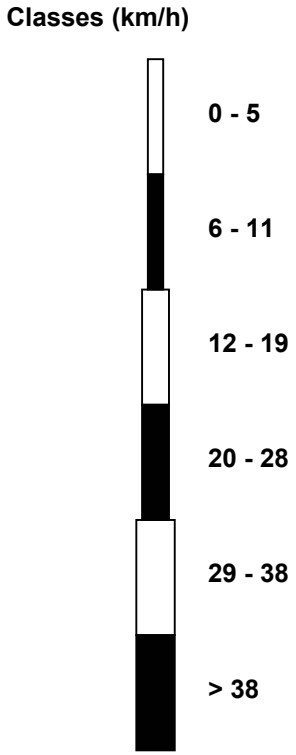
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 744

Maximum Speed: -- km/h on Aug 1 00:00

Maximum Daily Speed Average: 0.0 km/h on Jan 1

Minimum Speed Value: -- km/h on Aug 1 00:00

Minimum Daily Speed Average: 0.0 km/h on Jan 1

Maximum Diurnal Speed Average: -- km/h at hour 0

Minimum Diurnal Speed Average: -- km/h at hour 0

Monthly Average Velocity: -- km/h -- deg

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: 0

Hours of Missing Data: 744

Percent Operational Time: 0.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
21-Aug	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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
23-Aug	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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
25-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
26-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
27-Aug	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-Aug	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-Aug	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-Aug	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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
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	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	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 167 m (WS167m) - km/h

Lower Camp Met Tower - August 2014

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

Minimum Value: -- km/h on Aug 1 00:00

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:	0
Hours of Missing Data:	744
Hours of Calibration:	0
Percent Operational Time:	0.0

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

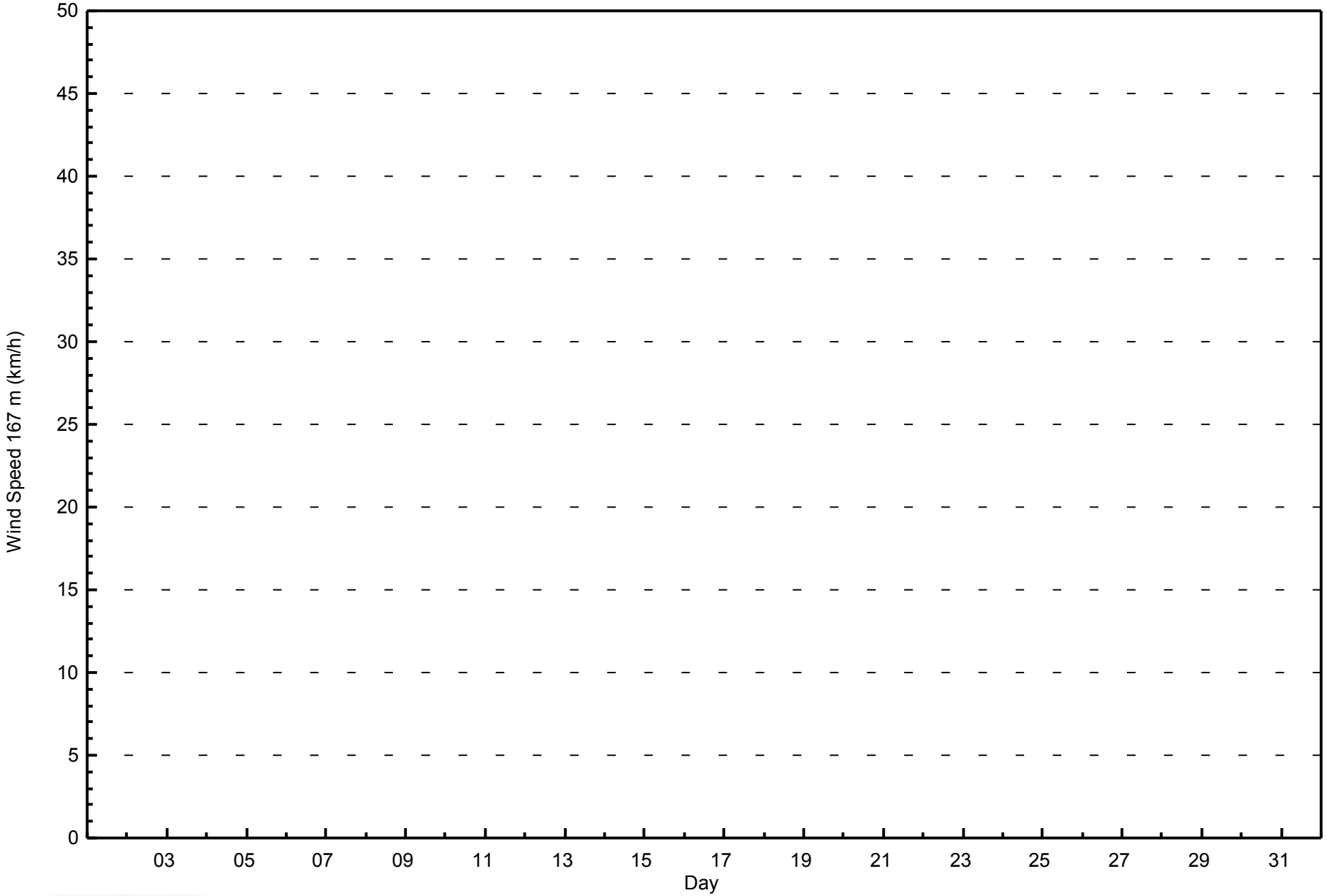
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	0	0.00	0.00
6 - 11	0	0.00	0.00
12 - 19	0	0.00	0.00
20 - 28	0	0.00	0.00
29 - 38	0	0.00	0.00
> 38	0	0.00	0.00

Total Number of Valid Hours: 0

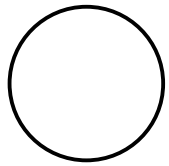
Total Number of Hours: 744

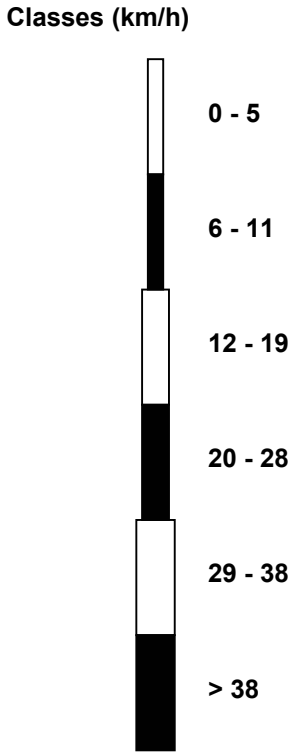
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 0

Direction of Maximum Speed: 265 deg on Aug 7 13:00
Direction of Maximum Daily Speed Average: 269.0 deg on Aug 7

Direction of Minimum Speed: 19 deg on Aug 22 05:00

Direction of Minimum Daily Speed Average: 0.2 deg on Aug 14

Monthly Average Direction: 313.7 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	342	348	0	344	325	321	317	354	350	357	358	326	326	320	0	256	269	71	123	133	112	96	116	111	351.9
2-Aug	135	139	161	174	167	156	137	146	125	140	137	145	153	197	188	191	202	205	209	349	83	61	114	120	163.7
3-Aug	307	349	130	112	120	129	122	130	138	135	132	128	139	15	208	84	187	176	157	138	126	139	150	149	139.7
4-Aug	144	124	119	123	126	128	137	127	35	340	333	323	344	337	345	344	357	44	7	38	167	145	17	339	58.1
5-Aug	1	328	330	342	357	108	114	92	12	126	133	130	144	141	149	150	149	153	164	167	170	139	149	116	145.1
6-Aug	137	153	112	142	91	153	145	151	156	157	173	174	209	240	243	245	244	106	223	234	231	232	237	245	198.6
7-Aug	263	266	262	267	267	268	267	267	272	271	265	262	265	267	259	265	264	276	294	300	279	261	349	281	269.0
8-Aug	331	297	319	328	306	350	332	354	355	1	14	4	0	345	25	36	67	35	322	265	283	312	333	2	337.5
9-Aug	342	342	345	356	341	312	302	314	325	334	328	330	356	357	112	240	250	262	123	104	132	121	134	137	320.8
10-Aug	99	108	118	122	132	146	143	125	151	151	147	137	140	166	222	255	247	234	327	30	296	244	247	173	169.8
11-Aug	133	135	129	124	128	124	126	137	216	243	239	112	326	313	306	316	334	353	356	3	345	17	326	347	5.8
12-Aug	325	323	310	6	357	350	330	341	70	128	158	140	135	145	150	151	156	156	136	125	139	142	149	149	142.6
13-Aug	153	137	149	164	162	137	168	153	140	143	147	183	205	222	245	239	232	234	210	209	333	299	311	287	196.9
14-Aug	315	332	321	314	299	326	1	329	345	309	328	104	238	239	245	66	130	163	119	133	121	143	110	130	333.9
15-Aug	119	115	121	129	127	119	128	124	134	141	173	138	76	46	62	54	31	350	2	350	323	348	355	335	88.4
16-Aug	335	267	316	306	298	4	298	332	312	332	25	37	141	152	173	196	254	247	229	240	177	227	168	170	230.2
17-Aug	246	337	336	309	330	340	331	357	8	2	29	297	298	284	297	310	301	310	314	320	283	163	59	187	313.7
18-Aug	111	351	28	8	352	2	135	165	129	21	155	195	256	290	351	359	28	298	194	350	353	343	298	319	314.0
19-Aug	4	88	6	81	106	158	149	129	154	190	191	166	164	288	328	347	28	25	44	309	313	331	330	335	250.8
20-Aug	357	352	346	354	354	355	354	12	1	10	358	355	349	350	354	348	347	339	356	337	320	341	345	342	353.2
21-Aug	24	353	341	338	351	353	327	318	341	340	352	349	344	342	348	354	353	8	22	50	355	325	352	320	353.2
22-Aug	346	346	356	316	19	49	75	82	10	345	323	358	332	346	345	21	11	52	351	50	199	357	352	14	358.8
23-Aug	0	345	352	16	335	353	325	3	78	111	108	144	153	150	194	164	160	144	90	10	10	1	39	355	84.1
24-Aug	357	336	319	314	310	316	310	305	325	343	355	346	355	73	121	76	84	79	96	114	124	138	139	143	54.5
25-Aug	140	129	151	150	144	137	153	152	147	151	168	159	153	160	188	199	206	201	176	162	163	166	157	141	164.5
26-Aug	136	128	144	143	148	148	156	146	140	133	134	138	121	111	135	209	219	278	355	115	47	199	121	143	152.6
27-Aug	180	123	144	188	168	210	276	294	295	294	295	284	267	268	276	283	265	295	339	19	330	294	297	128	277.2
28-Aug	218	145	256	329	330	336	347	309	305	300	314	324	324	342	352	331	1	30	108	117	125	2	135	71	327.7
29-Aug	100	89	91	94	102	126	136	130	135	148	140	134	158	172	166	159	156	161	156	159	144	142	140	147	145.3
30-Aug	147	128	132	143	174	158	161	140	232	300	316	334	270	294	60	169	238	200	139	343	334	19	336	323	165.2
31-Aug	132	189	235	134	126	161	143	138	143	140	149	230	277	331	339	339	155	306	249	149	224	268	286	306	183.1
	137.7	106.6	116.5	125.5	136.0	139.6	152.2	140.2	173.6	196.7	171.0	185.6	226.4	270.6	269.8	255.5	240.7	247.9	175.7	173.7	192.9	197.7	165.7	149.4	
	Diurnal Average																								

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 Aug 14 15:00

Minimum Value: 7 deg on Aug 26 05:00

Percentiles: P_1 = 9 P_{10} = 15 Q_1 = 21 Median = 29 Q_3 = 50 P_{90} = 72 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

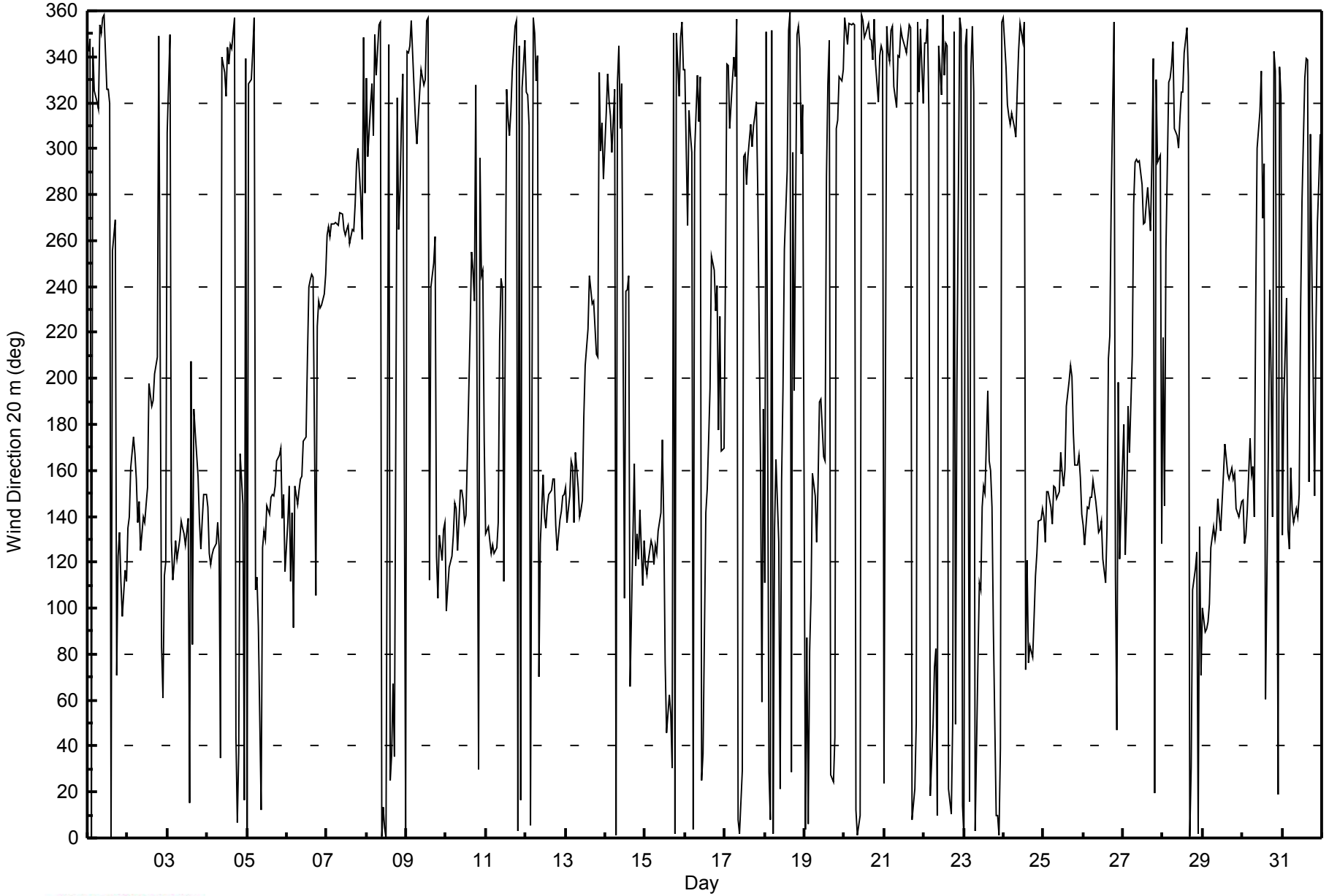
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	26	23	26	24	24	31	39	30	24	25	31	30	39	57	70	85	80	28	27	17	16	33	57	47	85
2-Aug	48	29	15	15	43	51	25	18	22	21	22	20	16	26	20	16	13	15	14	72	57	78	46	71	78
3-Aug	69	75	18	60	31	15	19	19	22	24	23	21	28	79	74	92	67	29	19	45	85	81	29	23	92
4-Aug	12	18	17	14	12	20	17	17	64	36	27	28	26	22	18	22	36	30	17	27	92	83	86	55	92
5-Aug	80	36	81	46	50	26	24	96	82	66	29	31	27	25	24	26	26	23	20	10	10	11	13	33	96
6-Aug	33	17	48	35	39	12	19	20	15	27	24	23	21	24	20	28	52	48	64	11	9	9	12	15	64
7-Aug	20	19	18	22	20	20	20	22	23	23	21	21	23	24	22	24	21	23	21	13	28	43	21	14	43
8-Aug	74	46	32	51	45	22	26	32	57	39	50	40	38	31	44	38	37	46	32	46	21	36	31	27	74
9-Aug	28	26	23	31	43	25	14	18	24	22	34	36	46	62	88	33	17	79	52	99	33	46	59	39	99
10-Aug	50	69	37	17	24	17	18	15	32	33	22	22	86	97	60	34	22	23	60	96	62	15	17	37	97
11-Aug	11	17	17	14	18	16	14	17	63	25	69	72	64	24	21	26	25	27	23	25	23	31	23	52	72
12-Aug	75	65	68	89	77	35	39	31	70	41	23	21	23	22	23	23	18	19	21	15	18	16	14	17	89
13-Aug	32	27	29	20	97	46	16	24	18	19	22	24	17	23	26	21	15	17	12	12	62	42	93	60	97
14-Aug	86	23	69	46	25	56	27	40	26	44	71	75	42	72	102	57	55	38	65	77	59	93	58	23	102
15-Aug	16	23	51	13	14	16	16	18	17	23	61	62	71	87	29	34	59	79	25	22	15	16	19	33	87
16-Aug	27	59	29	14	46	42	70	32	35	44	38	80	25	37	37	86	79	19	13	15	50	86	28	32	86
17-Aug	76	62	46	16	61	25	30	18	30	30	33	68	28	31	24	24	23	21	20	17	77	44	85	70	85
18-Aug	60	48	63	65	44	51	82	20	76	92	28	26	43	23	37	22	80	60	34	56	32	22	61	17	92
19-Aug	47	84	99	23	81	44	29	27	20	30	25	28	23	54	25	33	82	49	62	30	22	19	22	51	99
20-Aug	84	36	23	22	23	20	22	30	26	27	27	23	29	26	24	32	24	27	25	30	29	27	49	48	84
21-Aug	89	67	26	20	27	18	30	46	29	99	37	41	34	32	37	32	33	33	34	22	37	76	26	91	99
22-Aug	33	40	31	38	97	33	25	34	67	60	43	39	52	32	34	46	35	54	24	55	66	57	45	66	97
23-Aug	79	47	58	50	47	41	29	56	39	39	31	24	59	99	63	75	41	36	25	56	26	23	51	24	99
24-Aug	18	17	12	11	14	17	25	26	30	24	26	24	62	49	72	51	31	29	34	26	18	19	16	14	72
25-Aug	24	43	32	22	20	29	15	17	18	27	17	18	14	12	21	15	14	12	14	8	8	10	7	45	45
26-Aug	18	19	12	11	7	7	12	16	20	22	20	19	33	33	24	34	11	52	44	59	74	78	58	17	78
27-Aug	51	45	19	22	44	65	26	20	20	22	21	32	39	27	31	33	26	34	15	79	77	73	94	92	94
28-Aug	65	94	42	36	22	22	25	23	21	20	25	30	26	28	28	35	31	65	33	50	69	61	82	68	94
29-Aug	46	43	23	18	32	17	12	16	17	15	20	20	15	19	22	14	19	15	12	12	8	9	19	14	46
30-Aug	18	23	20	19	24	21	51	30	27	41	37	50	68	72	56	55	33	62	30	66	94	89	90	69	94
31-Aug	54	41	69	21	12	24	15	13	13	18	22	50	43	36	23	68	82	78	71	37	55	76	23	30	82
	89	94	99	89	97	65	82	96	82	99	71	80	86	99	102	92	82	79	71	99	94	93	94	92	
	Diurnal Maximum																								

WBEA

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Lower Camp Met Tower - August 2014



AURORA ATMOSPHERICS INC.

Direction of Maximum Speed: 264 deg on Aug 7 12:00
Direction of Maximum Daily Speed Average: 269.6 deg on Aug 7

Direction of Minimum Speed: 84 deg on Aug 5 05:00

Direction of Minimum Daily Speed Average: 0.1 deg on Aug 14

Monthly Average Direction: 299.1 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	349	354	6	352	336	331	335	2	358	4	5	328	327	322	8	254	274	77	124	137	133	128	136	130	358.3
2-Aug	140	142	158	168	165	157	142	147	129	141	140	145	154	197	188	189	200	206	210	12	103	113	121	133	163.0
3-Aug	226	319	147	160	142	141	132	130	137	136	136	133	137	8	213	98	195	179	164	160	137	142	151	154	149.3
4-Aug	156	138	133	134	135	135	140	132	41	342	338	326	344	339	352	352	8	52	27	50	97	138	71	317	72.6
5-Aug	344	349	291	38	84	127	119	117	32	132	141	131	145	141	146	150	145	146	160	170	175	149	155	124	146.5
6-Aug	138	154	121	144	102	153	148	151	157	156	173	175	209	241	245	247	243	106	220	236	231	233	236	246	201.3
7-Aug	262	266	262	267	267	267	266	267	273	272	265	264	266	267	259	266	266	278	295	300	278	258	352	309	269.6
8-Aug	329	310	321	351	321	360	348	8	5	11	18	8	3	353	32	42	68	42	338	265	285	315	337	10	344.9
9-Aug	348	349	350	3	354	327	310	318	329	340	335	335	2	15	99	245	253	265	157	107	157	190	202	156	322.7
10-Aug	136	135	130	134	141	147	146	130	154	157	147	141	136	145	220	257	249	237	282	116	248	244	244	189	178.1
11-Aug	142	143	139	135	139	134	132	142	221	245	247	120	326	313	308	319	336	1	6	15	10	17	344	337	354.5
12-Aug	1	342	307	303	311	8	349	351	74	131	154	139	136	143	147	148	153	150	136	128	138	143	143	145	139.3
13-Aug	144	137	142	151	138	143	165	156	142	141	149	184	205	224	246	240	233	236	212	208	306	294	313	296	196.9
14-Aug	311	327	319	323	309	305	8	341	345	313	338	113	246	253	253	71	135	168	135	151	141	151	138	134	268.8
15-Aug	133	130	135	138	136	130	133	129	133	138	172	133	72	42	61	53	31	350	10	4	332	345	355	345	85.0
16-Aug	342	288	327	325	255	352	343	347	324	338	41	58	141	151	174	204	265	248	231	235	199	215	198	200	225.1
17-Aug	246	320	327	310	322	325	342	359	13	15	32	300	300	286	298	312	302	311	320	323	342	239	50	160	314.3
18-Aug	151	19	39	53	21	90	142	164	128	42	154	196	255	289	360	13	45	307	202	8	2	349	331	322	332.2
19-Aug	351	62	31	84	139	185	160	135	157	188	189	166	165	291	329	350	42	33	54	319	315	338	346	349	311.9
20-Aug	12	359	351	360	1	0	1	19	10	18	5	2	356	359	3	353	354	346	5	348	347	334	353	6	0.8
21-Aug	5	332	347	343	338	9	22	349	349	346	359	352	350	346	352	360	358	15	29	50	30	6	335	338	0.8
22-Aug	340	355	2	354	52	30	76	88	14	354	330	5	339	351	348	27	18	52	3	59	174	2	303	205	7.8
23-Aug	69	360	18	29	359	19	341	26	81	106	116	144	152	156	196	163	160	146	104	71	77	22	67	352	97.7
24-Aug	17	353	338	335	332	330	328	319	339	348	1	352	358	77	118	81	90	88	101	128	136	140	138	142	65.3
25-Aug	145	134	150	146	145	136	153	151	145	151	169	162	156	163	189	198	206	199	178	167	167	170	161	144	165.7
26-Aug	139	132	143	145	149	149	157	146	140	136	139	138	125	120	137	211	220	277	4	111	55	178	132	149	154.3
27-Aug	175	131	150	206	196	227	274	294	294	295	296	285	275	269	278	286	265	294	342	15	3	302	300	99	280.8
28-Aug	227	222	256	315	322	329	346	308	307	303	316	329	326	345	356	334	7	25	112	118	146	29	169	124	326.7
29-Aug	124	116	108	112	115	128	139	136	139	148	140	137	159	171	165	162	152	159	159	162	145	143	134	143	146.4
30-Aug	139	128	136	143	176	163	166	143	234	304	321	AF	273	305	63	169	240	205	142	4	12	4	334	312	163.8
31-Aug	156	192	252	149	140	178	154	144	142	141	149	237	277	331	345	347	175	301	304	176	228	267	281	298	225.2
	148.0	113.6	125.8	130.1	146.7	145.8	151.5	138.8	188.6	222.9	172.5	192.0	234.3	277.9	278.9	263.6	244.3	255.5	149.1	157.0	191.4	204.0	173.2	154.1	
	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: 100 deg on Aug 5 05:00

Minimum Value: 5 deg on Aug 26 06:00

Percentiles: P_1 = 6 P_{10} = 11 Q_1 = 15 Median = 22 Q_3 = 39 P_{90} = 66 P_{99} = 93

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	17	16	19	15	16	20	25	23	20	20	24	23	30	54	63	87	80	26	23	16	14	16	27	25	87
2-Aug	29	18	12	11	28	40	22	15	17	15	17	14	15	24	18	14	14	15	13	79	44	67	37	30	79
3-Aug	44	90	11	39	36	12	15	15	19	18	18	17	24	73	70	87	68	25	15	33	43	39	7	17	90
4-Aug	11	11	10	9	8	14	12	13	58	31	20	22	21	16	12	16	27	18	11	13	79	65	88	47	88
5-Aug	35	33	47	89	100	13	13	80	64	68	23	22	20	21	19	22	21	19	18	7	6	12	13	25	100
6-Aug	26	14	35	28	28	10	15	16	14	24	22	20	21	20	13	26	53	35	57	7	6	5	6	9	57
7-Aug	16	10	11	15	13	13	12	15	13	15	14	15	16	17	14	17	14	17	18	10	25	40	16	19	40
8-Aug	56	27	29	67	72	21	18	27	50	31	39	31	31	24	37	27	25	32	27	54	14	31	23	21	72
9-Aug	19	18	15	24	28	24	9	12	15	17	23	28	40	70	92	27	10	73	60	39	19	31	53	21	92
10-Aug	23	27	18	12	20	14	14	12	28	29	19	17	78	98	59	30	18	14	55	73	36	7	9	38	98
11-Aug	7	8	11	9	13	11	9	17	44	14	66	70	64	21	17	18	20	21	20	17	15	19	10	21	70
12-Aug	36	36	71	88	80	44	30	27	58	29	18	16	17	18	21	19	15	15	15	9	12	12	13	13	88
13-Aug	23	18	18	19	69	40	10	17	11	15	19	21	17	21	21	16	11	11	11	11	75	33	96	54	96
14-Aug	41	19	41	29	19	57	16	32	26	44	70	74	40	79	95	53	56	33	40	45	21	41	29	14	95
15-Aug	9	12	29	8	10	11	12	14	13	20	62	66	72	83	20	32	55	76	28	18	10	10	11	26	83
16-Aug	14	83	32	62	31	47	53	21	29	46	31	76	20	31	33	83	74	13	11	9	43	40	29	27	83
17-Aug	58	47	50	12	33	22	24	17	25	21	25	64	22	26	18	20	17	17	17	13	33	47	79	42	79
18-Aug	35	62	78	87	85	62	57	17	69	84	26	23	35	17	36	15	72	64	25	56	27	16	84	6	87
19-Aug	37	54	99	19	37	24	24	18	20	25	25	25	19	54	20	28	73	38	54	32	21	12	15	30	99
20-Aug	66	28	16	17	17	15	18	23	21	19	22	18	25	20	18	28	19	21	18	19	22	20	22	27	66
21-Aug	88	50	29	12	17	11	20	41	26	88	32	37	31	25	29	24	26	28	22	15	37	46	24	78	88
22-Aug	29	20	22	36	41	42	31	30	60	45	35	35	54	26	25	38	29	43	17	16	49	43	61	58	61
23-Aug	80	43	53	43	36	34	31	43	29	32	28	17	55	93	59	57	38	29	23	40	37	22	39	37	93
24-Aug	17	9	7	9	15	11	16	20	19	17	21	20	59	43	69	46	18	13	22	20	12	13	10	12	69
25-Aug	18	27	28	18	15	19	11	12	13	22	13	15	12	9	18	14	15	12	10	7	7	8	6	31	31
26-Aug	13	12	8	7	5	5	11	13	15	16	14	14	23	29	17	31	9	51	35	48	71	81	60	14	81
27-Aug	41	24	15	23	41	58	18	15	12	14	13	24	32	21	25	31	20	32	10	42	71	87	89	94	94
28-Aug	49	83	29	33	19	19	24	20	16	15	19	22	21	21	24	33	26	44	28	15	50	56	48	25	83
29-Aug	24	33	21	15	25	12	10	12	14	14	16	15	13	18	21	12	17	14	9	10	5	8	13	12	33
30-Aug	13	14	12	15	24	19	52	26	23	39	32	AF	58	69	52	53	29	60	15	91	92	87	87	56	92
31-Aug	54	37	54	29	8	19	14	12	9	14	18	47	36	30	20	70	73	67	78	30	26	61	15	20	78
	88	90	99	89	100	62	57	80	69	88	70	76	78	98	95	87	80	76	78	91	92	87	96	94	
	Diurnal Maximum																								

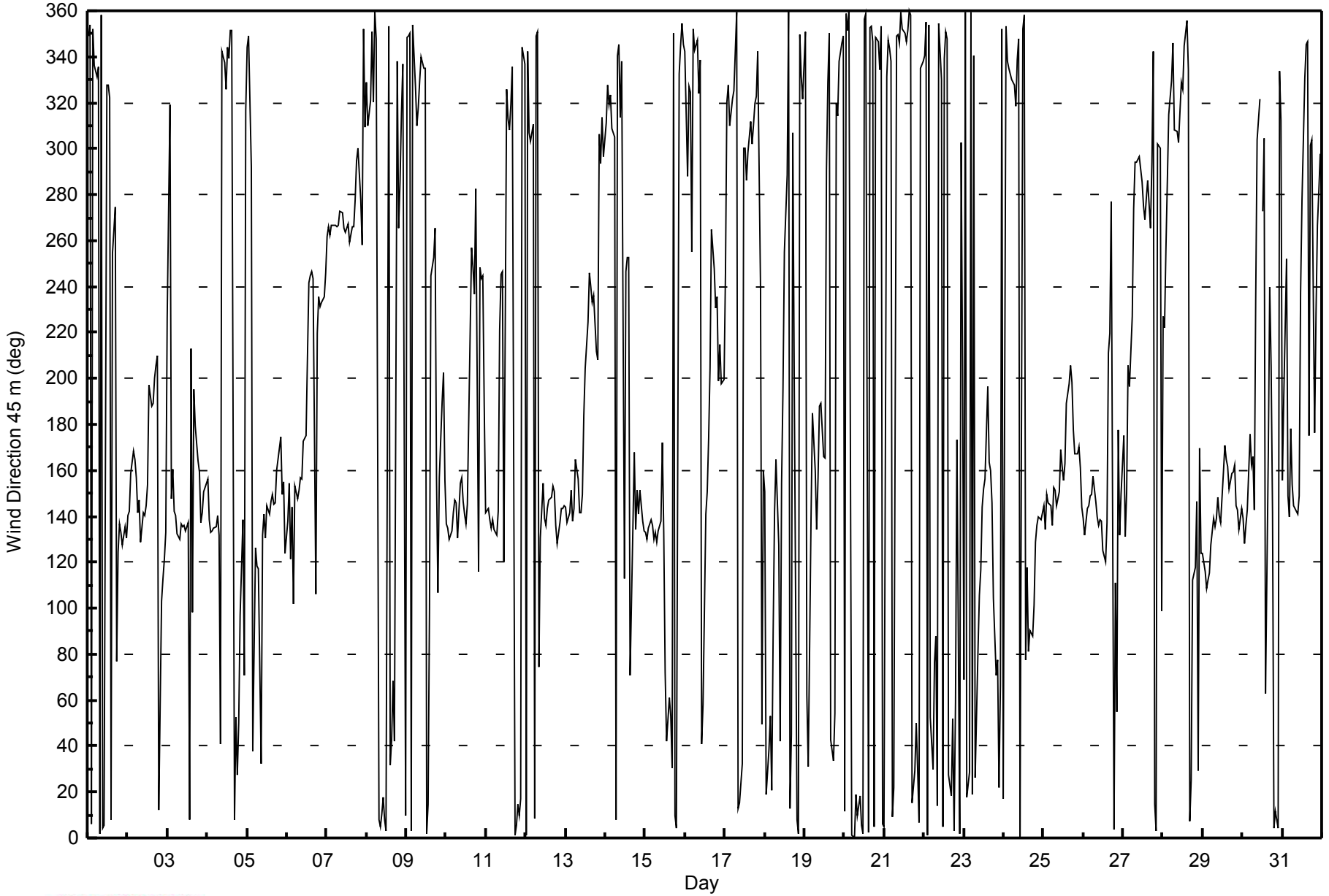
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - August 2014



AURORA ATMOSPHERICS INC.

Direction of Maximum Speed: 265 deg on Aug 7 13:00
Direction of Maximum Daily Speed Average: 269.3 deg on Aug 7

Direction of Minimum Speed: 278 deg on Aug 22 08:00

Direction of Minimum Daily Speed Average: 1.0 deg on Aug 18

Monthly Average Direction: 262.6 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-Aug	357	0	9	4	352	355	356	7	3	4	6	331	329	325	8	273	274	102	133	148	168	163	155	156	3.9
2-Aug	157	153	155	153	154	166	168	156	143	149	144	151	160	200	195	196	205	212	219	64	132	178	140	155	166.6
3-Aug	238	255	220	222	192	181	185	151	136	134	131	125	135	355	230	187	208	189	184	202	208	205	225	245	187.8
4-Aug	224	207	183	180	169	152	152	172	331	339	346	330	340	339	359	4	27	61	45	57	73	114	139	158	67.1
5-Aug	246	238	164	162	142	142	145	151	108	154	152	128	143	143	146	153	143	140	149	173	184	173	177	155	156.2
6-Aug	152	166	145	154	138	160	161	156	166	162	176	180	212	239	244	247	250	106	221	241	242	250	245	249	208.5
7-Aug	261	266	268	265	262	262	263	266	271	271	264	263	265	267	259	265	264	275	292	298	284	267	336	349	269.3
8-Aug	326	335	316	333	353	336	2	23	13	7	13	3	6	3	36	47	67	50	7	267	286	321	345	15	348.1
9-Aug	2	3	3	13	11	355	331	314	323	334	334	331	356	355	324	252	258	271	259	275	277	255	256	215	321.3
10-Aug	183	163	153	156	159	155	156	157	175	174	153	147	138	217	227	256	248	239	241	225	233	254	251	230	200.0
11-Aug	198	175	195	179	176	180	173	181	232	247	261	125	323	314	308	319	338	9	14	24	31	29	37	57	329.0
12-Aug	13	37	4	350	8	104	360	64	131	144	138	139	139	144	144	148	147	145	138	135	144	148	150	150	139.9
13-Aug	144	144	145	144	144	149	151	159	154	151	159	187	208	227	243	239	234	234	218	222	229	289	321	328	188.8
14-Aug	302	302	313	331	332	315	322	327	323	330	353	128	246	264	245	77	152	189	169	158	189	186	194	155	284.0
15-Aug	156	160	168	169	169	170	169	157	132	116	148	153	89	2	56	58	14	337	13	24	10	11	0	353	77.2
16-Aug	341	342	345	346	347	341	350	6	22	83	101	121	143	153	177	214	253	247	236	248	233	238	239	240	258.8
17-Aug	261	293	292	307	315	305	302	328	339	6	15	303	299	291	299	312	303	310	319	321	337	289	263	251	306.4
18-Aug	152	144	149	148	154	153	157	160	131	61	157	204	256	282	348	8	60	326	218	350	19	6	29	327	143.0
19-Aug	307	355	1	147	166	223	208	178	181	190	180	170	167	295	325	347	59	46	58	335	327	354	12	12	318.3
20-Aug	24	13	0	7	8	7	8	20	16	19	11	8	360	2	6	357	1	358	10	4	1	333	330	346	5.2
21-Aug	348	328	333	332	310	310	294	324	357	354	355	353	347	346	353	358	4	17	31	57	68	19	4	353	357.6
22-Aug	321	309	321	321	335	139	190	278	352	327	338	15	343	351	353	34	21	56	16	66	91	83	146	156	18.9
23-Aug	148	141	134	141	136	156	231	33	81	120	132	141	139	154	200	163	160	148	141	99	125	122	113	118	133.6
24-Aug	89	5	6	8	360	358	6	352	349	343	329	358	359	95	118	89	94	98	114	151	150	149	151	154	102.2
25-Aug	162	146	153	149	151	148	151	151	140	154	174	169	162	165	195	203	212	204	184	178	179	180	172	159	169.7
26-Aug	157	148	155	160	160	160	165	161	150	144	143	145	145	136	144	215	223	281	17	101	101	152	196	166	163.2
27-Aug	171	150	205	242	242	250	276	296	293	293	295	287	280	271	280	286	264	294	343	358	3	317	300	114	283.3
28-Aug	250	269	261	286	293	296	310	303	306	303	318	329	326	343	351	335	3	12	92	108	120	136	148	160	311.4
29-Aug	154	148	151	151	149	149	166	169	172	161	147	144	162	171	164	164	149	154	160	165	160	154	146	149	156.3
30-Aug	141	137	142	146	179	181	184	163	238	293	310	311	276	296	45	172	239	226	163	160	220	291	322	316	178.4
31-Aug	238	240	263	238	219	217	223	199	173	159	161	253	277	325	350	355	217	278	346	232	250	269	271	278	271.9
Diurnal Average	197.2	182.6	189.1	187.7	194.9	192.9	205.3	193.9	242.3	215.1	192.7	212.5	240.7	280.7	287.3	274.3	249.7	255.4	182.8	153.8	187.5	213.3	203.9	180.6	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 98 deg on Aug 9 15:00

Minimum Value: 2 deg on Aug 6 21:00

Percentiles: P_1 = 3 P_{10} = 7 Q_1 = 9 Median = 15 Q_3 = 24 P_{90} = 46 P_{99} = 91

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

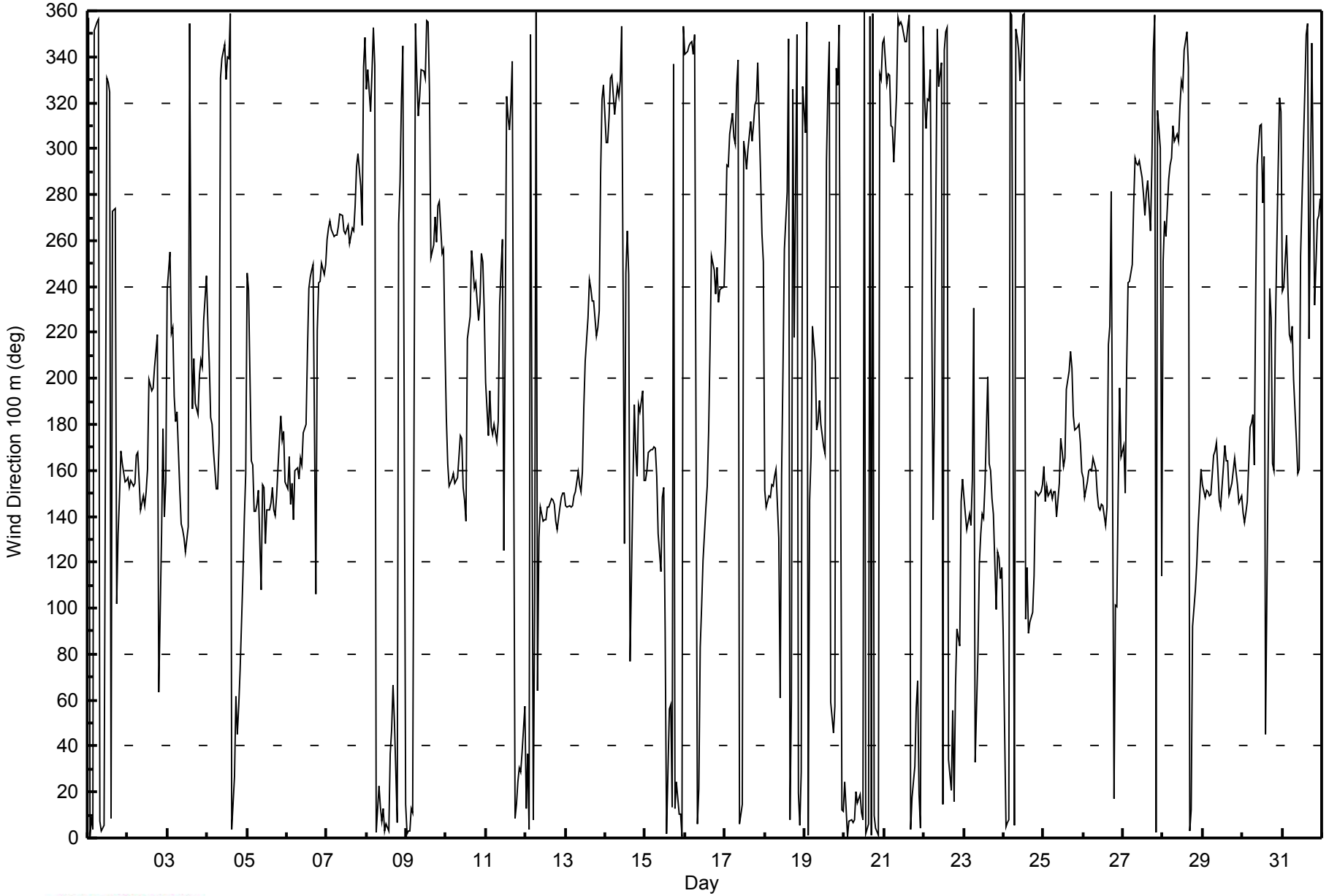
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	10	9	10	8	9	14	17	13	13	13	16	18	21	42	45	74	77	27	24	17	15	12	8	6	77
2-Aug	7	8	6	5	9	16	22	13	10	8	7	11	14	22	16	13	13	13	7	74	30	44	16	16	74
3-Aug	26	20	13	8	23	15	19	18	9	8	6	8	21	53	59	91	52	22	17	18	31	21	14	8	91
4-Aug	11	16	18	8	9	5	9	44	61	24	15	16	13	9	10	15	24	9	8	6	10	36	29	46	61
5-Aug	24	84	36	22	11	3	4	28	79	27	19	12	9	15	13	19	17	7	14	6	4	15	14	21	84
6-Aug	17	12	18	14	23	11	14	10	15	19	21	20	17	15	11	21	50	26	45	4	2	3	3	5	50
7-Aug	9	4	6	8	7	7	6	11	8	10	9	9	10	13	10	13	11	12	14	8	13	7	35	13	35
8-Aug	21	12	18	13	16	4	17	18	43	22	26	19	17	20	31	18	15	14	29	61	10	22	20	12	61
9-Aug	14	10	8	13	15	17	13	9	7	15	17	23	31	95	98	17	8	43	25	20	31	8	14	23	98
10-Aug	16	17	8	8	13	7	11	17	21	28	16	11	84	80	46	23	14	11	11	16	12	4	4	27	84
11-Aug	20	17	17	12	10	16	18	29	18	14	58	89	68	14	12	13	18	15	12	9	7	14	13	32	89
12-Aug	10	19	20	8	42	32	94	68	18	20	11	7	10	16	17	16	10	7	6	4	4	4	4	5	94
13-Aug	5	4	3	3	22	12	8	10	11	11	17	18	15	15	15	13	8	7	6	7	30	40	18	14	40
14-Aug	20	14	11	9	8	27	11	21	20	31	44	93	32	71	90	90	34	33	44	18	14	22	15	11	93
15-Aug	6	10	8	7	8	8	8	10	16	9	71	78	85	92	19	46	64	49	34	9	14	10	9	9	92
16-Aug	8	5	5	3	6	11	15	14	30	68	20	71	10	25	29	76	65	10	9	4	14	10	12	8	76
17-Aug	13	16	15	11	8	11	12	15	22	10	18	42	16	23	14	14	13	12	13	6	8	42	12	8	42
18-Aug	25	14	9	4	9	10	18	14	71	69	21	20	25	13	27	6	47	68	27	56	20	10	56	11	71
19-Aug	15	27	82	58	21	9	16	28	21	27	26	23	18	52	17	30	66	28	31	32	17	11	10	22	82
20-Aug	46	19	10	10	8	7	9	12	10	9	13	9	16	13	11	18	10	16	10	13	14	6	5	8	46
21-Aug	22	13	7	3	23	7	15	39	22	75	28	25	21	19	22	17	19	20	14	11	4	18	9	10	75
22-Aug	18	17	21	20	84	37	35	85	39	49	24	25	43	19	20	29	22	32	13	7	7	16	27	21	85
23-Aug	11	72	75	42	43	42	82	83	22	16	15	17	39	94	50	41	38	23	29	9	10	47	16	36	94
24-Aug	68	29	17	9	7	6	10	19	9	16	20	26	61	44	66	43	10	5	13	9	5	6	6	9	68
25-Aug	9	10	17	5	5	6	7	5	6	11	13	14	9	8	18	13	12	11	8	4	5	5	7	16	18
26-Aug	9	8	6	5	5	4	9	9	9	8	6	6	13	19	13	28	7	54	25	38	54	85	52	9	85
27-Aug	18	23	18	12	13	16	15	10	6	11	7	18	29	17	20	26	17	27	10	10	13	69	81	89	89
28-Aug	22	35	12	12	9	10	17	11	11	9	11	16	18	16	16	26	24	27	61	12	14	10	5	10	61
29-Aug	10	9	8	8	10	6	8	13	11	7	8	13	9	19	17	10	12	13	9	5	7	9	4	4	19
30-Aug	5	3	3	8	26	20	44	19	20	31	25	22	32	51	62	56	14	64	21	69	68	59	21	33	69
31-Aug	27	27	17	36	13	11	16	34	20	20	32	43	34	25	17	46	45	33	91	17	15	27	9	10	91
	68	84	82	58	84	42	94	85	79	75	71	93	85	95	98	91	77	68	91	74	68	85	81	89	
	Diurnal Maximum																								

WBEA

Hourly Averages

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 1.1 km/h on Aug 25 23:00

Maximum Daily Average: 0.3 km/h on Aug 25

Minimum Value: -1.2 km/h on Aug 20 06:00

Minimum Daily Average: -0.8 km/h on Aug 7

Maximum Diurnal Average: -0.1 km/h at hour 23

Minimum Diurnal Average: -0.3 km/h at hour 16

Monthly Average: -0.21 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.7 Q_1 = -0.5 Median = -0.2 Q_3 = 0.0 P_{90} = 0.2 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-Aug	-0.8	-1.0	-0.8	-0.7	-0.6	-0.4	-0.3	-0.8	-1.1	-1.0	-0.8	-0.7	-0.6	-0.6	-0.2	-0.3	0.1	-0.3	-0.3	0.0	-0.1	-0.1	0.0	-0.1	-0.5	0.1
2-Aug	0.1	-0.1	0.1	0.2	0.3	0.2	0.2	0.1	-0.3	0.3	0.8	0.3	0.5	0.1	0.3	0.1	-0.3	-0.3	-0.1	-0.5	-0.2	-0.4	-0.1	0.0	0.1	0.8
3-Aug	-0.1	-0.2	0.0	-0.1	0.0	0.1	-0.1	-0.1	0.2	0.5	0.5	0.7	0.6	-0.3	-0.1	-0.3	0.0	0.3	0.5	0.1	-0.1	0.0	0.0	0.1	0.1	0.7
4-Aug	0.3	0.0	0.3	0.2	0.0	0.0	0.0	-0.1	-0.3	-0.3	-0.4	-0.7	-0.7	-0.8	-1.0	-0.7	-0.4	-0.6	-0.3	-0.3	-0.1	-0.1	-0.3	-0.3	-0.3	0.3
5-Aug	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.3	-0.2	-0.1	0.0	0.1	0.0	0.2	0.1	0.4	0.1	0.1	0.2	0.4	0.9	0.6	0.3	0.5	-0.4	0.1	0.9
6-Aug	-0.1	0.4	-0.4	0.0	-0.5	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.0	-0.4	-0.4	-0.6	-0.5	-0.4	-0.3	-0.3	-0.2	-0.3	-0.2	-0.4	-0.1	0.4
7-Aug	-0.8	-0.9	-0.7	-0.7	-0.8	-0.9	-0.9	-0.9	-1.0	-1.0	-0.9	-0.8	-0.9	-0.7	-0.7	-0.9	-0.9	-0.9	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.8	-0.4
8-Aug	-0.4	-0.3	-0.5	-0.3	-0.4	-0.2	-0.4	-0.6	-0.3	-0.3	-0.3	-0.4	-0.6	-0.8	-0.3	-0.5	-0.6	-0.6	-0.5	-0.5	-0.9	-0.5	-0.5	-0.5	-0.5	-0.2
9-Aug	-0.5	-0.5	-0.7	-0.6	-0.4	-0.5	-0.5	-0.5	-0.3	-0.5	-0.3	-0.5	-0.5	-0.1	0.0	-0.2	-0.5	-0.3	-0.1	-0.1	0.0	0.0	0.0	0.1	-0.3	0.1
10-Aug	-0.1	-0.2	-0.1	0.1	0.0	0.2	0.2	0.0	0.1	0.0	0.4	0.1	0.4	-0.1	-0.1	-0.3	-0.4	-0.2	-0.2	-0.1	-0.2	-0.3	-0.2	0.0	0.0	0.4
11-Aug	0.3	0.2	0.2	0.2	0.3	0.2	0.0	0.2	0.0	-0.4	0.0	0.2	-0.7	-1.0	-0.9	-0.8	-0.7	-0.8	-0.8	-0.7	-0.2	-0.1	-0.3	-0.1	-0.2	0.3
12-Aug	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.4	-0.3	-0.2	-0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.2	0.2	-0.3	0.1	0.4	1.1	0.4	0.1	1.1
13-Aug	0.2	-0.2	-0.2	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.2	0.3	-0.2	-0.2	-0.6	-0.3	-0.4	-0.4	-0.2	-0.1	-0.2	-0.4	-0.5	-0.4	-0.1	0.3
14-Aug	-0.3	-0.6	-0.3	-0.2	-0.3	-0.1	-0.4	-0.3	-0.5	-0.2	0.1	0.1	0.2	0.2	0.0	-0.1	0.0	0.1	-0.1	0.0	0.0	-0.1	-0.1	0.1	-0.1	0.2
15-Aug	0.0	-0.2	0.0	0.1	0.0	0.0	0.0	0.0	-0.1	0.1	0.2	-0.2	0.1	-0.2	-0.2	-0.6	-0.3	-0.3	-0.5	-0.7	-0.6	-0.5	-0.5	-0.3	-0.2	0.2
16-Aug	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	-0.4	-0.2	-0.2	-0.4	-0.2	0.2	0.3	0.3	0.1	-0.3	-0.3	-0.2	-0.2	0.0	-0.1	0.0	0.0	-0.1	0.3
17-Aug	-0.3	-0.3	-0.6	-0.6	-0.2	-0.3	-0.4	-0.8	-0.5	-0.3	-0.4	-0.4	-0.8	-0.6	-0.9	-1.0	-1.1	-0.9	-0.6	-0.6	-0.1	0.0	-0.1	-0.1	-0.5	0.0
18-Aug	-0.1	-0.3	-0.1	-0.1	-0.3	-0.1	-0.1	0.3	0.0	-0.2	0.0	0.1	-0.2	-0.5	-0.6	-0.6	-0.4	-0.3	0.1	-0.4	-0.4	-0.5	-0.3	-0.4	-0.2	0.3
19-Aug	-0.3	-0.2	-0.2	-0.2	-0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.5	0.5	-1.0	-0.9	-0.5	-0.2	-0.6	-0.4	-0.4	-0.6	-0.5	-0.4	-0.4	-0.2	0.5
20-Aug	-0.5	-0.6	-0.8	-0.8	-0.8	-1.2	-1.0	-0.6	-0.9	-1.0	-1.0	-1.1	-0.9	-1.1	-1.0	-0.6	-0.7	-0.7	-0.7	-0.4	-0.3	-0.2	-0.2	-0.2	-0.7	-0.2
21-Aug	-0.2	-0.2	-0.4	-0.5	-0.3	-0.3	-0.3	-0.3	-0.6	0.1	-0.8	-0.5	-0.8	-0.6	-0.8	-0.8	-0.7	-0.8	-0.8	-0.6	-0.2	-0.2	-0.1	-0.1	-0.4	0.1
22-Aug	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.3	-0.3	-0.4	-0.5	-0.4	-0.2	-0.8	-0.6	-0.6	-0.5	-0.4	-0.4	-0.2	-0.1	-0.1	-0.1	0.0	-0.3	0.0
23-Aug	-0.2	-0.5	-0.3	-0.3	-0.3	-0.3	-0.5	-0.4	-0.3	-0.2	-0.2	0.3	0.0	0.1	0.1	0.2	0.2	0.1	-0.3	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	0.3
24-Aug	-0.3	-0.4	-0.5	-0.6	-0.5	-0.5	-0.3	-0.4	-0.3	-0.7	-0.7	-0.9	-0.5	-0.5	0.2	-0.3	-0.4	-0.4	-0.6	-0.1	0.0	0.0	-0.2	0.0	-0.4	0.2
25-Aug	0.1	-0.1	0.0	0.1	-0.1	-0.1	0.2	0.4	0.0	0.3	0.7	0.6	0.4	0.9	0.2	-0.1	-0.2	-0.1	0.5	0.8	1.1	0.9	1.1	0.1	0.3	1.1
26-Aug	-0.1	-0.2	0.2	0.2	0.3	0.4	0.5	0.3	0.1	0.2	0.2	0.2	-0.1	0.1	0.1	-0.4	-0.4	-0.9	-0.5	-0.2	-0.5	-0.4	0.0	0.1	0.0	0.5
27-Aug	-0.1	-0.2	0.3	0.1	0.1	-0.2	-0.6	-0.9	-0.7	-0.9	-0.9	-0.5	-0.4	-0.6	-0.4	-0.5	-0.6	-0.5	-0.4	-0.2	-0.3	-0.4	-0.8	-0.2	-0.4	0.3
28-Aug	-0.2	-0.1	-0.3	-0.4	-0.5	-0.6	-0.6	-0.5	-0.8	-0.6	-0.5	-0.6	-0.6	-0.9	-0.7	-0.4	-0.6	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.4	-0.1
29-Aug	-0.1	-0.1	-0.2	-0.5	-0.3	-0.3	0.0	-0.1	-0.1	0.3	0.1	0.0	0.4	0.3	0.4	0.5	0.6	0.4	0.4	0.8	0.2	0.1	-0.2	0.3	0.1	0.8
30-Aug	0.2	-0.3	-0.2	0.2	0.3	0.4	0.2	0.0	-0.2	-0.5	-0.4	-0.4	-0.5	-0.3	-0.2	-0.2	-0.2	-0.1	0.0	-0.3	-0.3	-0.3	-0.2	-0.3	-0.1	0.4
31-Aug	0.1	-0.1	-0.1	0.1	0.0	0.4	0.2	0.3	0.2	0.2	0.1	-0.2	-0.4	-0.5	-0.7	-0.3	-0.1	-0.2	-0.2	0.0	-0.1	-0.4	-0.6	-0.5	-0.1	0.4
	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	Diurnal Average	
	0.3	0.4	0.3	0.2	0.3	0.4	0.5	0.4	0.3	0.5	0.8	0.7	0.6	0.9	0.4	0.5	0.6	0.4	0.5	0.9	1.1	0.9	1.1	0.4	Diurnal Maximum	

Summary of Hour Standard Deviations

Lower Camp Met Tower - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.9 km/h on Aug 7 13:00

Minimum Value: 0.1 km/h on Aug 18 00:00

Percentiles: P_1 = 0.2 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:	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-Aug	2.3	2.8	1.9	1.9	1.5	1.0	1.3	2.0	2.2	2.6	2.6	2.4	2.1	1.8	1.7	1.5	1.2	0.7	0.8	0.8	0.4	0.4	0.7	0.8	2.8
2-Aug	1.0	1.1	1.2	1.1	0.9	0.9	1.0	1.4	1.8	2.3	2.4	2.3	2.5	1.7	1.7	2.0	1.8	1.6	0.9	1.2	0.6	1.2	0.8	0.5	2.5
3-Aug	0.3	0.3	0.4	0.5	0.5	0.7	0.8	1.2	1.4	1.7	1.8	1.8	1.7	1.4	1.5	1.2	1.3	1.3	1.2	0.8	0.4	0.2	0.2	0.4	1.8
4-Aug	0.9	0.8	1.0	0.8	1.2	1.3	1.5	1.2	1.1	1.3	1.4	1.5	1.6	1.8	1.6	1.1	1.0	1.2	0.5	0.6	0.6	0.8	0.6	0.4	1.8
5-Aug	0.2	0.2	0.2	0.2	0.2	0.6	0.9	0.6	0.8	1.0	1.4	1.4	1.7	2.1	1.9	1.5	1.1	1.2	1.3	1.4	1.0	1.1	1.5	1.4	2.1
6-Aug	1.8	1.9	1.6	1.8	1.2	1.4	1.4	1.7	1.7	1.8	1.7	1.9	2.1	2.5	2.7	2.7	2.1	1.4	1.4	1.7	1.6	1.7	1.8	1.6	2.7
7-Aug	2.5	3.1	2.0	2.1	2.2	2.8	3.1	3.0	3.6	3.4	3.8	3.7	3.9	3.8	3.5	3.6	3.8	3.0	2.8	1.1	0.9	1.2	0.5	0.3	3.9
8-Aug	0.7	0.4	0.8	0.4	0.4	0.4	0.8	1.2	1.4	1.6	1.9	2.0	1.8	1.7	1.3	1.6	1.6	1.5	0.6	2.4	2.8	1.3	1.1	1.0	2.8
9-Aug	1.2	1.6	1.7	1.6	0.9	0.8	0.9	1.1	1.1	1.4	1.6	1.8	1.6	1.1	1.0	1.7	1.9	0.7	0.5	0.3	0.4	0.3	0.4	0.4	1.9
10-Aug	0.3	0.4	0.6	0.6	0.9	1.2	1.4	1.2	1.3	1.3	1.7	1.8	1.5	1.4	1.5	1.7	1.1	0.8	0.5	0.2	0.4	1.2	1.1	0.7	1.8
11-Aug	1.0	0.7	1.1	1.4	1.3	1.0	1.3	1.1	1.1	1.6	1.4	1.6	2.3	2.4	2.5	2.5	2.3	1.9	1.6	1.5	0.5	0.3	0.3	0.2	2.5
12-Aug	0.2	0.2	0.2	0.1	0.2	0.2	0.6	0.9	0.9	1.3	1.4	1.8	2.1	2.1	1.8	1.8	1.8	1.6	2.2	1.8	2.0	2.6	2.8	2.3	2.8
13-Aug	1.9	1.8	1.1	0.9	0.9	0.8	0.7	1.0	1.7	2.0	2.0	1.7	1.7	1.9	2.3	2.0	1.8	1.5	1.1	0.8	0.7	0.7	0.7	0.7	2.3
14-Aug	0.5	0.8	0.4	0.2	0.3	0.1	0.5	0.7	0.9	1.2	1.3	1.3	1.5	1.3	1.0	0.8	0.5	0.6	0.4	0.2	0.2	0.3	0.4	0.7	1.5
15-Aug	0.7	0.5	0.6	0.9	1.0	0.8	1.2	1.3	1.7	1.4	1.3	1.3	1.4	1.6	1.5	1.4	1.2	0.9	1.2	1.5	0.7	0.5	0.9	0.6	1.7
16-Aug	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.7	0.9	1.0	1.0	1.2	1.7	1.6	1.4	1.2	1.5	1.5	0.7	0.4	0.4	0.5	0.6	0.7	1.7
17-Aug	1.1	0.8	0.9	0.7	0.3	0.6	0.4	1.2	1.2	1.7	1.5	2.0	2.4	2.4	3.0	3.1	3.4	2.8	1.6	0.7	0.3	0.2	0.3	0.1	3.4
18-Aug	0.2	0.4	0.2	0.1	0.3	0.4	0.8	1.3	0.8	0.8	1.5	1.3	1.6	1.3	1.2	1.4	0.7	0.6	0.7	0.7	1.0	1.2	0.5	0.3	1.6
19-Aug	0.3	0.3	0.2	0.4	0.3	0.5	0.8	0.8	1.0	1.1	1.4	1.8	1.9	3.8	2.2	1.2	1.2	1.4	0.9	0.3	0.7	0.8	0.5	1.0	3.8
20-Aug	1.4	1.8	2.2	2.3	2.3	2.7	2.5	2.1	2.5	2.7	2.4	2.6	2.6	2.6	2.6	1.8	1.7	1.7	2.0	0.8	0.5	0.2	0.2	0.3	2.7
21-Aug	0.4	0.4	0.6	0.6	0.3	0.4	0.3	0.7	1.3	1.5	2.0	2.5	2.4	2.3	2.3	2.3	2.0	2.2	2.0	1.1	0.3	0.3	0.2	0.1	2.5
22-Aug	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.6	1.0	1.2	1.6	1.7	1.9	1.7	2.0	2.0	1.4	1.0	0.7	0.6	0.3	0.2	0.1	0.2	2.0
23-Aug	0.2	0.5	0.5	0.3	0.3	0.3	0.5	0.5	0.8	1.1	1.4	1.6	1.5	1.4	1.4	1.2	1.3	1.0	0.5	0.5	0.3	0.4	0.6	0.2	1.6
24-Aug	0.4	0.4	0.4	0.4	0.6	0.7	0.7	0.8	0.9	1.1	1.4	1.6	1.8	1.6	1.6	1.2	1.2	1.5	1.5	0.9	1.1	1.2	1.3	1.7	1.8
25-Aug	1.3	1.7	1.2	1.4	1.0	1.2	1.6	1.7	1.4	1.9	2.0	2.1	2.1	1.9	1.8	1.8	1.7	1.7	1.3	1.4	1.5	1.5	1.8	1.5	2.1
26-Aug	1.9	2.0	1.9	1.7	1.4	1.6	1.6	1.9	2.0	1.7	1.8	1.5	1.1	1.8	1.9	2.2	2.0	3.1	1.6	0.8	0.9	1.8	0.5	1.0	3.1
27-Aug	1.1	1.3	1.0	0.8	0.8	1.3	1.8	2.5	3.0	2.8	2.7	2.4	2.1	2.1	2.4	2.2	2.2	1.9	1.0	0.3	0.4	2.0	2.5	1.0	3.0
28-Aug	0.6	0.6	0.8	0.8	1.1	0.9	0.8	1.7	2.2	2.2	1.7	1.8	1.9	2.1	1.9	1.6	1.6	1.0	0.6	0.4	0.2	0.2	0.2	0.2	2.2
29-Aug	0.4	0.4	0.5	0.9	0.9	1.5	1.2	1.7	1.4	1.6	2.4	2.2	2.1	1.8	1.8	1.9	2.2	1.6	1.4	1.2	1.0	1.2	1.6	2.2	2.4
30-Aug	1.8	2.4	2.3	2.4	2.0	1.1	1.0	0.8	1.2	1.0	0.9	1.0	1.6	1.7	1.7	1.0	1.0	0.7	0.5	0.4	0.6	0.6	0.3	0.4	2.4
31-Aug	0.4	0.6	0.9	0.6	0.7	0.9	0.9	1.3	1.2	1.6	1.6	1.6	1.8	1.8	2.7	1.8	0.9	1.1	0.7	0.6	0.7	1.1	1.6	1.1	2.7
	2.5	3.1	2.3	2.4	2.3	2.8	3.1	3.0	3.6	3.4	3.8	3.7	3.9	3.8	3.5	3.6	3.8	3.1	2.8	2.4	2.8	2.6	2.8	2.3	
	Diurnal Maximum																								

Maximum Value: 1.7 km/h on Aug 12 23:00

Maximum Daily Average: 0.5 km/h on Aug 25

Minimum Value: -1.3 km/h on Aug 17 16:00

Minimum Daily Average: -0.8 km/h on Aug 7

Maximum Diurnal Average: 0.1 km/h at hour 12

Minimum Diurnal Average: -0.2 km/h at hour 16

Monthly Average: -0.01 km/h

Percentiles: P_1 = -1.2 P_{10} = -0.7 Q_1 = -0.3 Median = 0.0 Q_3 = 0.3 P_{90} = 0.6 P_{99} = 1.1

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

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

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 1 24-hr: 1
Maximum Value: 4082.0 km/h on Aug 4 11:00

Minimum Value: 0.1 km/h on Aug 22 23:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.7 Median = 1.3 Q_3 = 1.9 P_{90} = 2.4 P_{99} = 3.8

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	2.5	2.8	2.1	2.0	1.8	1.3	1.4	1.9	2.2	2.7	2.8	2.7	2.3	2.1	2.0	1.7	1.5	0.7	0.9	0.8	0.6	0.6	0.9	1.0	2.8
2-Aug	1.1	1.3	1.3	1.3	1.1	1.0	1.1	1.4	1.8	2.5	2.5	2.6	2.5	2.0	2.0	2.2	2.2	1.7	0.9	1.4	0.7	1.5	0.9	0.6	2.6
3-Aug	0.4	0.3	0.6	0.7	0.7	0.8	0.8	1.2	1.5	1.8	1.9	1.8	1.8	1.6	1.6	1.3	1.4	1.5	1.4	0.8	0.6	0.4	0.4	0.6	1.9
4-Aug	1.0	0.9	1.1	0.8	1.1	1.2	1.5	1.2	1.2	1.4	4082.0	1.7	1.7	1.7	1.5	1.1	1.2	1.3	0.5	0.7	0.9	1.1	0.8	0.4	4082.0
5-Aug	0.3	0.3	0.2	0.3	0.2	0.6	0.8	0.7	0.9	1.0	1.6	1.4	1.7	2.2	2.0	1.4	1.1	1.5	1.6	1.6	1.2	1.3	1.7	1.7	2.2
6-Aug	1.9	2.0	1.8	2.1	1.4	1.6	1.6	2.0	1.9	2.0	1.9	2.2	2.5	2.3	2.6	2.8	2.3	1.5	1.6	1.7	1.6	1.5	1.5	1.6	2.8
7-Aug	2.6	2.9	2.0	2.2	2.4	3.0	3.2	3.3	3.9	3.5	3.8	4.0	4.2	3.9	3.6	3.4	3.7	3.2	2.8	1.2	0.9	0.9	0.6	0.4	4.2
8-Aug	0.8	0.6	0.8	0.4	0.4	0.5	0.8	1.3	1.5	1.8	2.0	2.2	2.0	1.7	1.5	1.8	1.8	1.6	0.8	2.4	2.9	1.4	1.2	1.2	2.9
9-Aug	1.4	1.8	1.8	1.6	1.2	0.9	0.7	1.0	1.1	1.3	1.7	2.0	1.7	1.2	1.0	1.5	1.7	0.9	0.5	0.4	0.5	0.5	0.5	0.6	2.0
10-Aug	0.4	0.6	0.7	0.7	1.1	1.4	1.4	1.3	1.4	1.5	1.8	2.0	1.8	1.5	1.7	1.9	1.2	0.9	0.7	0.4	0.6	1.0	1.0	1.0	2.0
11-Aug	1.1	0.8	1.2	1.3	1.6	1.1	1.2	1.2	1.3	1.6	1.5	1.8	2.5	2.6	2.6	2.7	2.6	2.1	1.8	1.6	0.7	0.3	0.3	0.3	2.7
12-Aug	0.2	0.2	0.2	0.1	0.2	0.2	0.7	0.9	1.0	1.3	1.5	2.0	2.3	2.1	1.9	2.0	2.1	1.9	2.3	1.7	2.0	3.0	3.3	3.0	3.3
13-Aug	2.2	1.9	1.4	1.2	1.1	0.8	0.8	1.0	1.6	2.1	2.1	2.0	2.0	2.0	2.4	2.0	2.0	1.6	1.2	1.0	0.9	0.9	0.7	0.7	2.4
14-Aug	0.6	1.1	0.5	0.3	0.4	0.2	0.4	0.7	0.8	1.3	1.6	1.5	1.6	1.5	1.0	0.7	0.4	0.7	0.5	0.4	0.4	0.5	0.6	0.7	1.6
15-Aug	0.6	0.5	0.7	0.9	1.1	0.8	1.2	1.3	1.6	1.5	1.3	1.3	1.5	1.7	1.3	1.3	1.1	1.1	1.4	1.7	0.8	0.4	0.9	0.6	1.7
16-Aug	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.7	0.8	1.1	1.1	1.3	1.7	1.8	1.5	1.3	1.7	1.4	0.8	0.4	0.6	0.6	0.7	0.9	1.8
17-Aug	1.3	1.1	1.1	0.8	0.5	0.9	0.6	1.2	1.3	1.8	1.6	2.2	2.5	2.7	3.0	3.2	3.3	3.1	1.7	0.7	0.3	0.2	0.3	0.1	3.3
18-Aug	0.2	0.4	0.2	0.1	0.3	0.6	1.0	1.5	0.9	0.9	1.6	1.5	1.8	1.3	1.3	1.5	0.7	0.7	0.8	0.9	1.2	1.4	0.6	0.2	1.8
19-Aug	0.3	0.3	0.3	0.3	0.3	0.6	1.0	0.9	1.2	1.2	1.5	2.0	2.2	4.0	2.3	1.2	1.3	1.5	1.0	0.4	0.7	0.9	0.6	1.1	4.0
20-Aug	1.7	2.0	2.4	2.2	2.4	2.7	2.8	2.3	2.5	2.6	2.7	2.7	2.6	2.8	2.6	1.9	1.8	1.7	2.0	1.1	0.6	0.2	0.2	0.4	2.8
21-Aug	0.5	0.5	0.8	0.6	0.4	0.4	0.4	0.8	1.3	1.7	2.1	2.4	2.7	2.3	2.4	2.3	2.2	2.2	2.1	1.1	0.5	0.3	0.2	0.2	2.7
22-Aug	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.5	0.9	1.2	1.9	1.7	1.9	1.6	2.1	2.2	1.5	1.3	0.9	0.6	0.4	0.3	0.1	0.1	2.2
23-Aug	0.2	0.6	0.4	0.3	0.4	0.3	0.4	0.5	0.9	1.2	1.4	1.7	1.8	1.7	1.5	1.4	1.4	1.2	0.7	0.7	0.4	0.5	0.6	0.2	1.8
24-Aug	0.3	0.4	0.4	0.5	0.7	0.8	0.7	0.6	1.0	1.1	1.5	1.6	1.8	1.7	1.6	1.3	1.1	1.3	1.5	1.0	1.2	1.4	1.4	1.8	1.8
25-Aug	1.6	1.9	1.3	1.7	1.0	1.4	1.7	2.0	1.5	2.1	2.3	2.5	2.1	2.0	2.4	2.3	2.2	2.1	1.7	1.5	1.9	2.1	2.1	1.6	2.5
26-Aug	2.0	2.0	1.8	1.4	1.2	1.3	1.6	2.0	2.0	1.7	1.8	1.5	1.0	1.8	1.9	2.5	2.3	2.7	1.8	0.9	0.9	1.8	0.6	1.1	2.7
27-Aug	1.4	1.6	1.3	1.0	1.1	1.4	2.0	2.6	2.9	2.9	2.6	2.5	2.3	2.3	2.4	2.6	2.3	2.0	1.3	0.3	0.4	2.4	2.7	0.9	2.9
28-Aug	0.8	0.7	1.0	1.1	1.2	1.1	1.0	1.8	2.2	2.4	1.9	2.0	1.9	2.2	2.1	1.9	1.6	1.1	0.7	0.5	0.3	0.3	0.2	0.3	2.4
29-Aug	0.4	0.6	0.6	0.8	0.9	1.3	1.2	1.6	1.4	1.5	2.4	2.2	2.2	2.1	2.1	2.1	2.5	1.8	1.5	1.4	0.9	1.2	1.7	2.5	2.5
30-Aug	2.0	2.4	2.2	2.6	2.4	1.2	1.1	0.9	1.3	1.1	0.8	AF	1.6	1.8	1.8	1.1	1.0	0.8	0.5	0.5	0.6	0.7	0.4	0.5	2.6
31-Aug	0.5	0.9	1.1	0.7	0.8	1.1	1.1	1.3	1.2	1.5	1.6	1.8	2.1	2.0	2.9	1.9	1.1	1.4	0.7	0.7	0.8	1.3	1.7	1.2	2.9
	2.6	2.9	2.4	2.6	2.4	3.0	3.2	3.3	3.9	3.5	4082.0	4.0	4.2	4.0	3.6	3.4	3.7	3.2	2.8	2.4	2.9	3.0	3.3	3.0	
	Diurnal Maximum																								

AF - Analyzer Failure

Maximum Value: 3.1 km/h on Aug 12 23:00

Maximum Daily Average: 0.7 km/h on Aug 12

Minimum Value: -1.1 km/h on Aug 22 14:00

Minimum Daily Average: -0.3 km/h on Aug 17

Maximum Diurnal Average: 0.3 km/h at hour 1

Minimum Diurnal Average: 0.0 km/h at hour 9

Monthly Average: 0.15 km/h

Percentiles: P_1 = -0.9 P_{10} = -0.3 Q_1 = -0.1 Median = 0.1 Q_3 = 0.4 P_{90} = 0.8 P_{99} = 1.6

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-Aug	0.4	0.2	-0.1	0.1	0.3	0.4	0.8	-0.5	-0.6	-0.6	-0.2	1.1	0.2	0.9	0.1	-0.4	0.5	-0.6	0.1	0.2	0.2	0.0	0.7	1.2	0.2	1.2
2-Aug	1.3	0.6	0.5	0.2	0.4	0.4	0.6	-0.1	-0.1	0.9	0.9	0.8	1.1	0.7	-0.1	0.2	-0.1	0.0	0.4	0.5	0.2	-0.1	0.3	0.3	0.4	1.3
3-Aug	0.0	-0.1	0.1	0.5	0.2	0.0	-0.3	-0.1	0.0	0.5	0.2	-0.1	0.5	0.1	0.0	-0.6	0.3	0.3	0.5	0.4	-0.1	-0.1	-0.1	-0.1	0.1	0.5
4-Aug	-0.4	-0.3	0.1	-0.2	0.3	0.6	0.0	0.0	-0.1	-0.5	-0.3	0.0	0.1	-0.1	-0.2	-0.3	0.1	-0.2	0.0	0.2	0.6	-0.1	0.1	0.2	0.0	0.6
5-Aug	0.0	0.0	-0.1	0.0	0.2	0.7	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.5	1.3	0.6	0.6	1.3	1.8	0.0	-0.5	0.7	0.9	0.3	0.4	1.8
6-Aug	0.8	1.1	0.3	0.9	-0.1	-0.1	0.8	0.8	0.3	1.0	0.6	0.0	0.2	0.6	0.8	0.6	0.9	0.2	1.1	0.5	0.9	0.7	0.8	0.4	0.6	1.1
7-Aug	0.3	-0.1	-0.3	0.0	0.4	0.3	0.2	0.5	-0.5	-0.4	-0.7	0.0	0.1	-0.2	0.5	-0.2	0.4	0.0	-0.4	-0.6	-0.3	0.1	-0.2	-0.2	-0.1	0.5
8-Aug	-0.3	-0.1	-0.3	-0.1	-0.2	-0.3	-0.2	0.2	0.3	-0.3	-0.2	0.4	-0.4	-0.2	0.2	0.2	-0.2	-0.2	0.0	0.2	-0.4	-0.4	0.0	0.3	-0.1	0.4
9-Aug	0.3	0.6	0.3	0.5	0.5	0.4	-0.2	-0.6	-0.1	-0.5	-0.1	0.2	0.2	0.1	-0.4	0.2	0.1	-0.2	-0.1	0.0	0.0	0.1	-0.1	0.1	0.1	0.6
10-Aug	0.0	0.3	0.6	0.5	0.0	0.3	0.1	0.0	0.2	-0.2	0.1	0.4	1.3	0.2	0.4	0.2	0.0	0.1	0.4	-0.1	0.9	1.2	1.8	0.6	0.4	1.8
11-Aug	0.0	-0.1	-0.3	-0.3	0.4	0.1	-0.1	0.1	0.2	-0.2	0.4	-0.1	-0.3	-0.1	-0.1	-0.6	-0.2	0.2	0.3	0.2	0.2	-0.1	-0.2	0.0	0.0	0.4
12-Aug	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.4	0.3	0.4	0.2	1.3	1.1	1.7	1.8	0.9	0.5	1.1	0.9	3.1	2.4	0.7	3.1
13-Aug	2.1	1.5	0.9	0.9	1.2	0.1	0.7	0.3	0.1	0.7	0.5	0.1	-0.2	1.4	0.2	1.0	0.3	0.5	0.4	0.7	0.4	-0.4	-0.2	-0.2	0.5	2.1
14-Aug	-0.4	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	0.2	0.4	0.7	0.8	0.7	0.9	-0.3	0.0	0.2	0.4	0.1	-0.1	0.1	0.2	0.4	0.1	0.9
15-Aug	0.4	0.2	0.2	-0.1	-0.1	-0.1	0.1	0.1	-0.1	-0.1	0.4	0.2	1.1	0.6	-0.5	-0.9	-0.9	-0.7	0.2	0.5	-0.1	-0.2	-0.1	-0.1	0.0	1.1
16-Aug	-0.1	0.0	0.1	0.1	0.0	0.0	0.1	-0.1	0.1	0.0	0.3	0.4	0.8	0.9	0.3	0.1	0.2	0.3	0.5	0.5	0.2	0.7	0.4	0.3	0.3	0.9
17-Aug	1.0	-0.5	-1.0	-0.4	-0.3	-0.3	-0.6	-0.4	-0.3	-0.4	-0.2	0.0	-0.6	-0.2	-0.7	-0.4	-1.0	-0.4	-0.2	-0.1	-0.1	0.1	-0.1	0.0	-0.3	1.0
18-Aug	0.4	0.3	0.2	0.3	0.3	0.2	0.6	0.9	0.4	0.4	0.5	0.3	0.1	-0.3	-0.2	-0.3	0.0	0.0	0.5	-0.2	0.1	0.2	-0.1	-0.1	0.2	0.9
19-Aug	-0.2	0.0	-0.1	0.0	0.0	-0.1	-0.2	0.0	0.0	0.4	1.0	1.1	0.3	-0.4	0.1	-0.3	-0.1	0.5	0.1	0.0	-0.2	0.2	0.0	0.0	0.1	1.1
20-Aug	0.2	0.5	0.3	-0.2	0.4	-0.2	0.0	0.5	0.9	-0.7	0.6	0.1	-0.6	0.3	-0.1	0.1	0.2	0.4	0.0	0.0	-0.1	-0.2	-0.2	-0.1	0.1	0.9
21-Aug	0.0	-0.2	0.0	0.0	-0.4	-0.4	-0.3	0.0	-0.5	0.4	0.2	0.7	-0.6	-1.0	-0.7	-0.6	0.5	0.3	0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.7
22-Aug	0.0	-0.1	0.2	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.7	-0.3	0.0	-1.1	1.1	0.5	0.6	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	1.1
23-Aug	0.3	0.0	0.0	0.1	0.0	0.0	-0.1	0.0	-0.2	0.0	-0.1	0.5	-0.3	-0.3	0.5	0.3	0.8	0.2	0.1	0.5	0.2	0.0	0.6	0.1	0.1	0.8
24-Aug	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.3	-0.1	-0.1	-0.2	-0.2	-0.2	-0.4	0.1	0.2	0.0	-0.4	-0.2	0.3	0.4	0.4	1.0	0.3	0.6	0.0	1.0
25-Aug	1.1	0.7	0.1	0.9	0.4	0.5	0.5	1.2	0.4	0.8	0.2	0.5	0.5	0.0	-0.1	0.1	0.4	-0.3	-0.3	-0.1	-0.2	-0.1	0.5	0.5	0.3	1.2
26-Aug	0.5	0.3	0.0	0.3	0.3	0.8	1.5	0.6	0.5	0.3	0.2	0.1	-0.1	0.2	0.2	0.5	0.3	0.1	0.0	-0.3	0.0	-0.1	-0.1	0.0	0.3	1.5
27-Aug	-0.1	-0.8	-0.3	0.3	0.5	0.5	0.0	-1.0	-0.5	-0.3	-1.0	0.1	0.4	-0.5	-0.1	0.4	0.4	-0.1	-0.1	0.1	-0.1	-0.3	-0.4	0.0	-0.1	0.5
28-Aug	0.1	-0.2	0.2	-0.2	-0.1	-0.7	-0.6	-0.3	-0.3	-0.5	-0.5	-0.1	-0.1	-0.4	-0.1	0.2	-0.2	0.3	-0.1	0.0	0.1	0.2	0.3	0.3	-0.1	0.3
29-Aug	0.2	0.2	-0.1	-0.5	-0.2	-0.2	-0.1	0.1	-0.2	0.9	0.2	0.3	0.2	0.6	0.8	0.6	1.5	1.4	0.7	0.2	0.7	0.5	0.8	1.3	0.4	1.5
30-Aug	1.6	1.7	1.2	1.4	0.4	0.1	0.2	-0.1	0.6	-0.3	-0.3	0.1	0.1	-0.2	0.3	0.0	0.5	0.2	0.0	0.0	0.0	-0.1	-0.3	-0.2	0.3	1.7
31-Aug	0.0	0.1	-0.6	-0.2	-0.2	-0.3	0.0	-0.2	0.1	-0.1	0.2	0.0	-0.2	-0.2	0.1	-0.3	0.5	0.9	0.0	0.1	0.6	-0.2	-0.3	-0.2	0.0	0.9
	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.3	0.3	Diurnal Average	
	2.1	1.7	1.2	1.4	1.2	0.8	1.5	1.2	0.9	1.0	1.0	1.1	1.3	1.4	1.3	1.1	1.7	1.8	1.8	0.7	1.1	1.2	3.1	2.4	Diurnal Maximum	

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.9 km/h on Aug 19 14:00

Minimum Value: 0.2 km/h on Aug 22 07:00

Percentiles: P_1 = 0.2 P_{10} = 0.5 Q_1 = 0.8 Median = 1.4 Q_3 = 2.0 P_{90} = 2.6 P_{99} = 3.3

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

Maximum Value: -- km/h on Aug 1 00:00

Maximum Daily Average: -- km/h on Jul 31

Minimum Value: -- km/h on Aug 1 00:00

Minimum Daily Average: -- km/h on Jul 31

Maximum Diurnal Average: -- km/h at hour 0

Minimum Diurnal Average: -- km/h at hour 0

Monthly Average: -- km/h

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:	0
Hours of Missing Data:	744
Hours of Calibration:	0
Percent Operational Time:	0.0

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

AF - Analyzer Failure

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

Minimum Value: -- km/h on Aug 1 00:00

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:	0
Hours of Missing Data:	744
Hours of Calibration:	0
Percent Operational Time:	0.0

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

AF - Analyzer Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 4
BUFFALO VIEWPOINT
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
AUGUST 2014

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	36	44	98.92	12	0	1	0
H2S (ppb) Average	698	37	46	98.79	4	0	1	0
THC (ppm) Average	699	37	45	98.92	4.3	-	2.7	-
Temperature (C) Average	743	0	1	99.87	31.4	-	24.2	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	27	-	17	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
AUGUST 2014

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	0.4	1	-	0	0	0	0	0	1	12
H2S (ppb) Average	698	0.4	0	-	0	0	0	0	0	1	4
THC (ppm) Average	699	2.39	0.3	-	2.1	2.2	2.2	2.3	2.4	2.7	4.3
Temperature 2 m (C) Average	743	17.75	6.1	-	2.1	10.5	13.1	17.3	22.1	26.7	31.4
Wind Speed 10 m (km/h) Average	742	8.9	4	-	1	4	6	8	11	15	27
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	05 Aug 2014 03:00	05 Aug 2014 10:00	8	Station Power failure
H2S	05 Aug 2014 02:00	05 Aug 2014 10:00	9	Station Power failure
THC	05 Aug 2014 03:00	05 Aug 2014 10:00	8	Station Power failure
Temperature 2 m	05 Aug 2014 02:00	05 Aug 2014 02:00	1	DAS collection error - power interruption
Wind Speed, Wind Direction	05 Aug 2014 02:00	05 Aug 2014 02:00	1	DAS collection error - power interruption
Wind Speed, Wind Direction	27 Aug 2014 14:00	27 Aug 2014 14:00	1	Maintenance - sensor calibration

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 ppb on Aug 14 13:00 Maximum Daily Average: 1.4 ppb on Aug 14

Minimum Value: 0 ppb on Aug 31 11:00 Minimum Daily Average: 0.1 ppb on Aug 30
Maximum Diurnal Average: 1.0 ppb at hour 14 Minimum Diurnal Average: 0.2 ppb at hour 7
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	36
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	3	2	4	6	2	1	1	1	1	1	0	0	1.1	6
2-Aug	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
3-Aug	0	Z	0	0	0	0	0	0	0	0	0	1	1	7	7	1	1	1	0	0	0	0	0	0	1.0	7
4-Aug	0	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0.4	1
5-Aug	0	Z	PF	PF	PF	PF	PF	PF	PF	PF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	0
6-Aug	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
7-Aug	0	Z	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.2	0
8-Aug	0	Z	0	0	0	0	0	0	0	5	5	4	2	3	2	1	1	1	1	1	1	0	0	0	1.3	5
9-Aug	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0.4	1
10-Aug	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
11-Aug	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
12-Aug	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
13-Aug	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
14-Aug	0	Z	0	0	0	0	0	0	0	0	0	5	12	3	1	1	1	1	1	1	0	0	0	0	1.4	12
15-Aug	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
16-Aug	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
17-Aug	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
18-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	2	9	1	1	0	0	0	0	0	0	0.7	9
19-Aug	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
20-Aug	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
21-Aug	0	Z	0	0	0	0	0	1	1	0	0	3	3	5	1	1	0	0	0	0	0	1	0	0	0.9	5
22-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0.3	2
23-Aug	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
24-Aug	0	Z	0	0	0	0	0	0	1	1	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0.5	2
25-Aug	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
26-Aug	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
27-Aug	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
28-Aug	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
29-Aug	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
30-Aug	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
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0.3	2
	0.2	--	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.7	1.0	1.0	0.8	0.8	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	Diurnal Average	
	0	--	1	0	0	0	0	1	1	5	5	5	12	7	7	9	2	1	1	1	1	1	0	0	Diurnal Maximum	

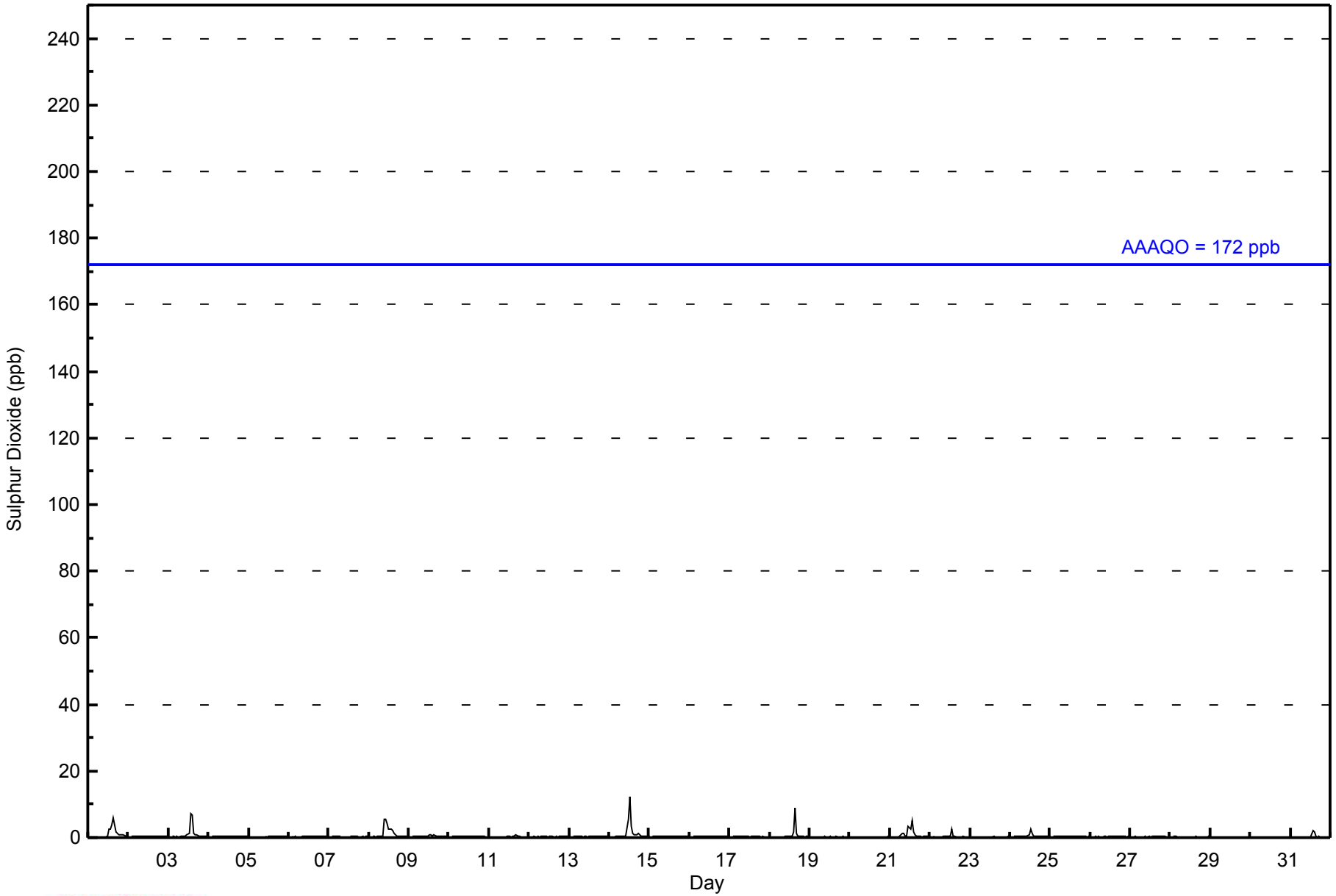
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	699	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: 700

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - August 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	58	19	8	6	7	44	124	96	59	38	24	34	41	51	36	53	698
11 - 20	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	19	8	6	7	44	124	96	59	38	25	34	41	51	36	53	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

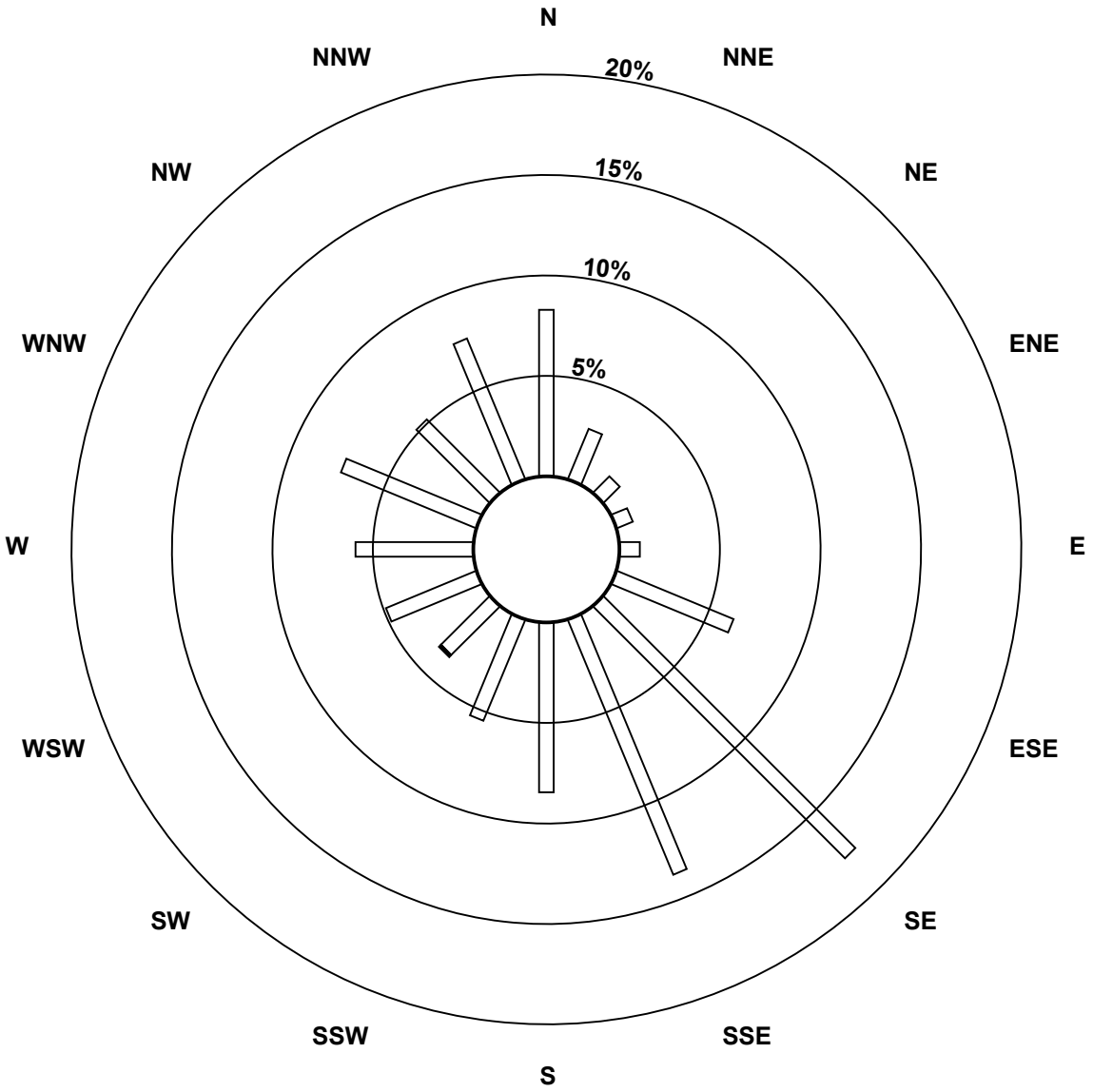
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

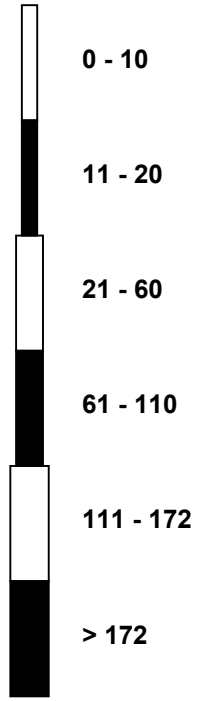
Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint (AMS 4)



Classes (ppb)



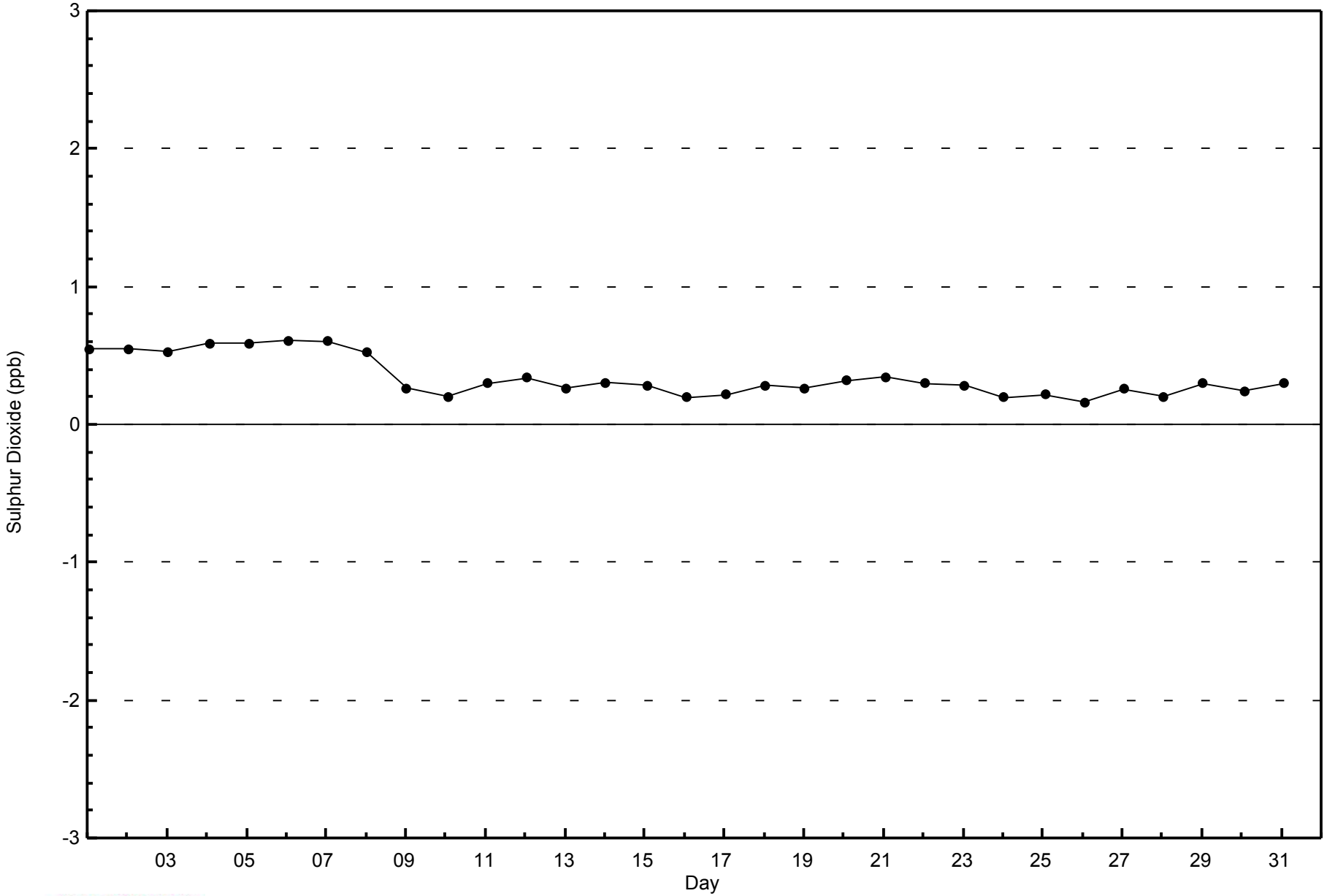
Total Number of Valid Hours: 699

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - August 2014



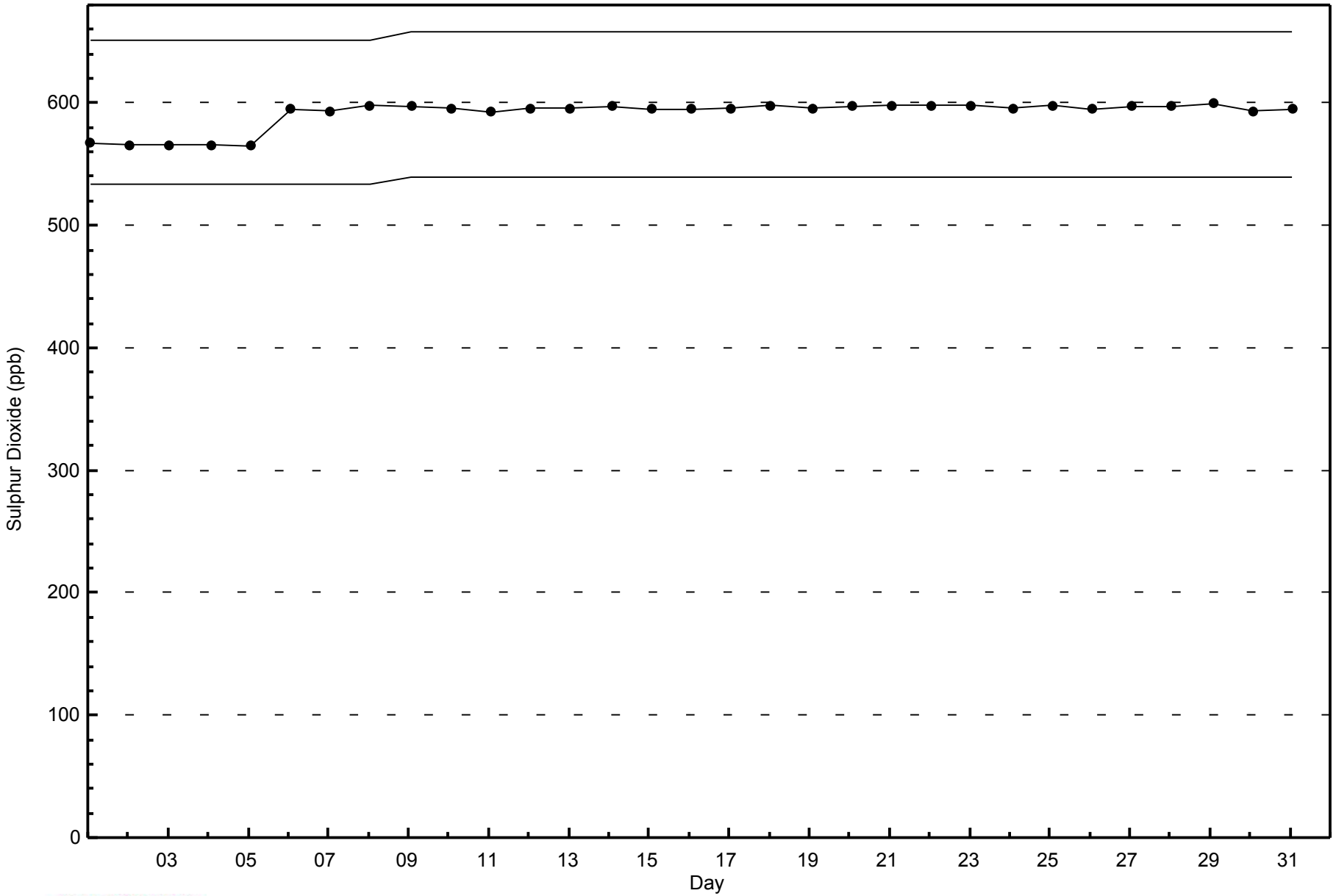
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 ppb on Aug 18 05:00 Maximum Daily Average: 0.8 ppb on Aug 4

Minimum Value: 0 ppb on Aug 21 16:00 Minimum Daily Average: 0.2 ppb on Aug 25
Maximum Diurnal Average: 0.7 ppb at hour 5 Minimum Diurnal Average: 0.2 ppb at hour 19
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	698
Hours of Missing Data:	46
Hours of Calibration:	37
Percent Operational Time:	98.8

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	0	Z	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
2-Aug	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-Aug	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
4-Aug	0	1	Z	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
5-Aug	1	PF	PF	PF	PF	PF	PF	PF	PF	PF	1	1	1	1	1	0	0	0	0	0	0	0	0	0	--	1
6-Aug	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
7-Aug	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
8-Aug	0	0	Z	0	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Aug	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
10-Aug	1	1	Z	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.6	3
11-Aug	0	0	Z	1	2	1	1	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	2
12-Aug	1	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
13-Aug	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
14-Aug	1	1	Z	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1
15-Aug	1	1	Z	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
16-Aug	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
17-Aug	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
18-Aug	0	0	Z	1	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	4
19-Aug	0	1	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.3	1
20-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
21-Aug	1	0	Z	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
22-Aug	0	0	Z	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0.4	1
23-Aug	0	1	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.3	1
24-Aug	1	2	Z	1	0	0	1	1	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.7	2
25-Aug	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-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1
27-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.3	1
28-Aug	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
29-Aug	1	1	Z	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
31-Aug	1	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	1
	0.5	0.5	--	0.6	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	Diurnal Average	
	1	2	--	3	4	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

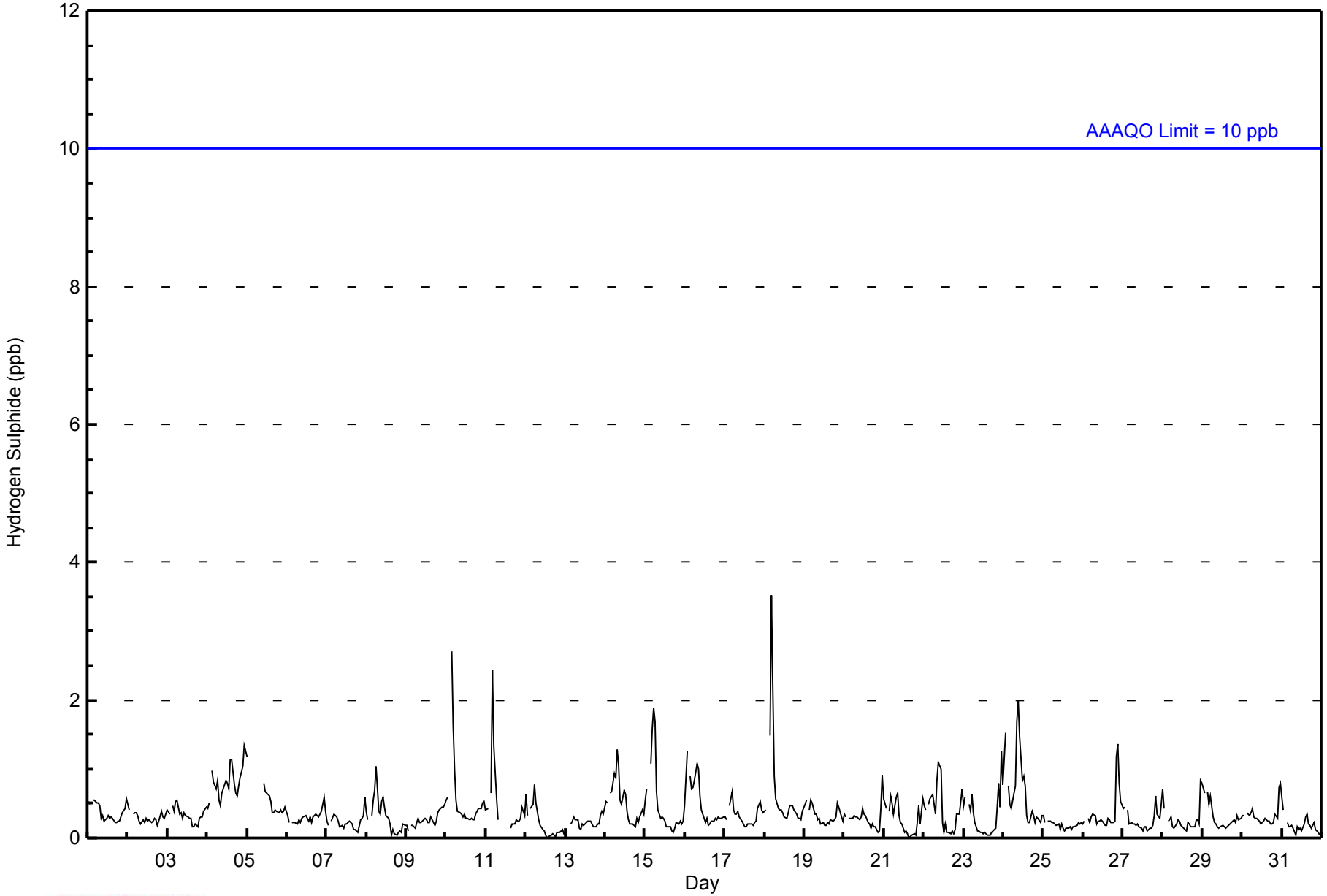
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	696	99.71	99.71
3 - 4	2	0.29	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: 698

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	58	19	8	6	7	45	122	93	59	38	24	38	41	49	34	54	695
3 - 4	0	0	0	0	0	0	1	1	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	58	19	8	6	7	45	123	94	59	38	24	38	41	49	34	54	697

Total Number of Valid Hours: 697

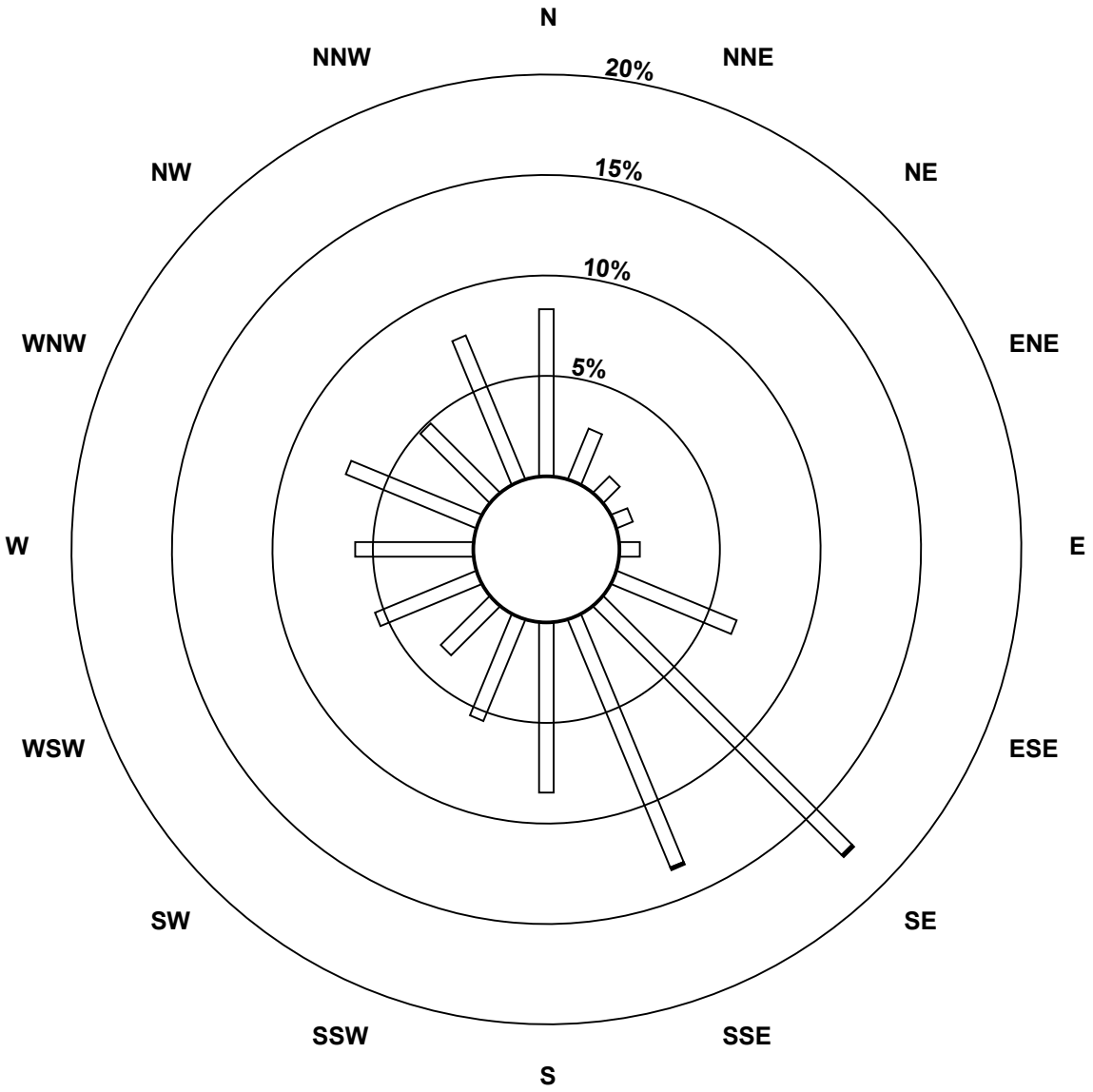
Total Number of Hours: 744

Wood Buffalo Environmental Association

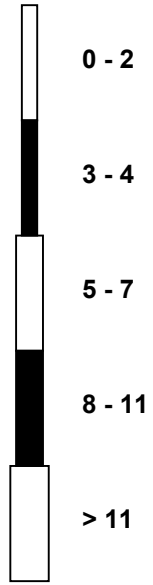
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint (AMS 4)



Classes (ppb)



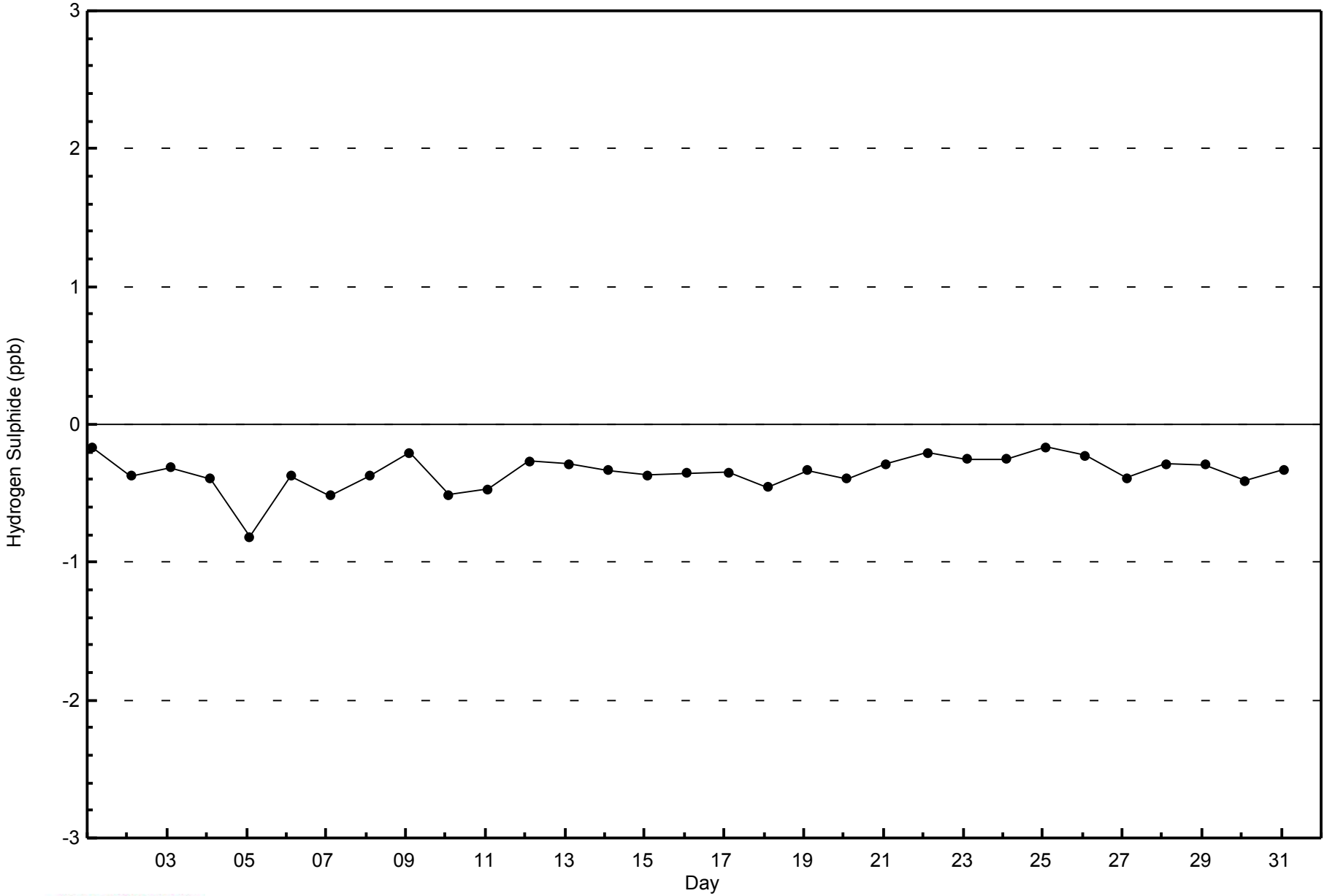
Total Number of Valid Hours: 697

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - August 2014



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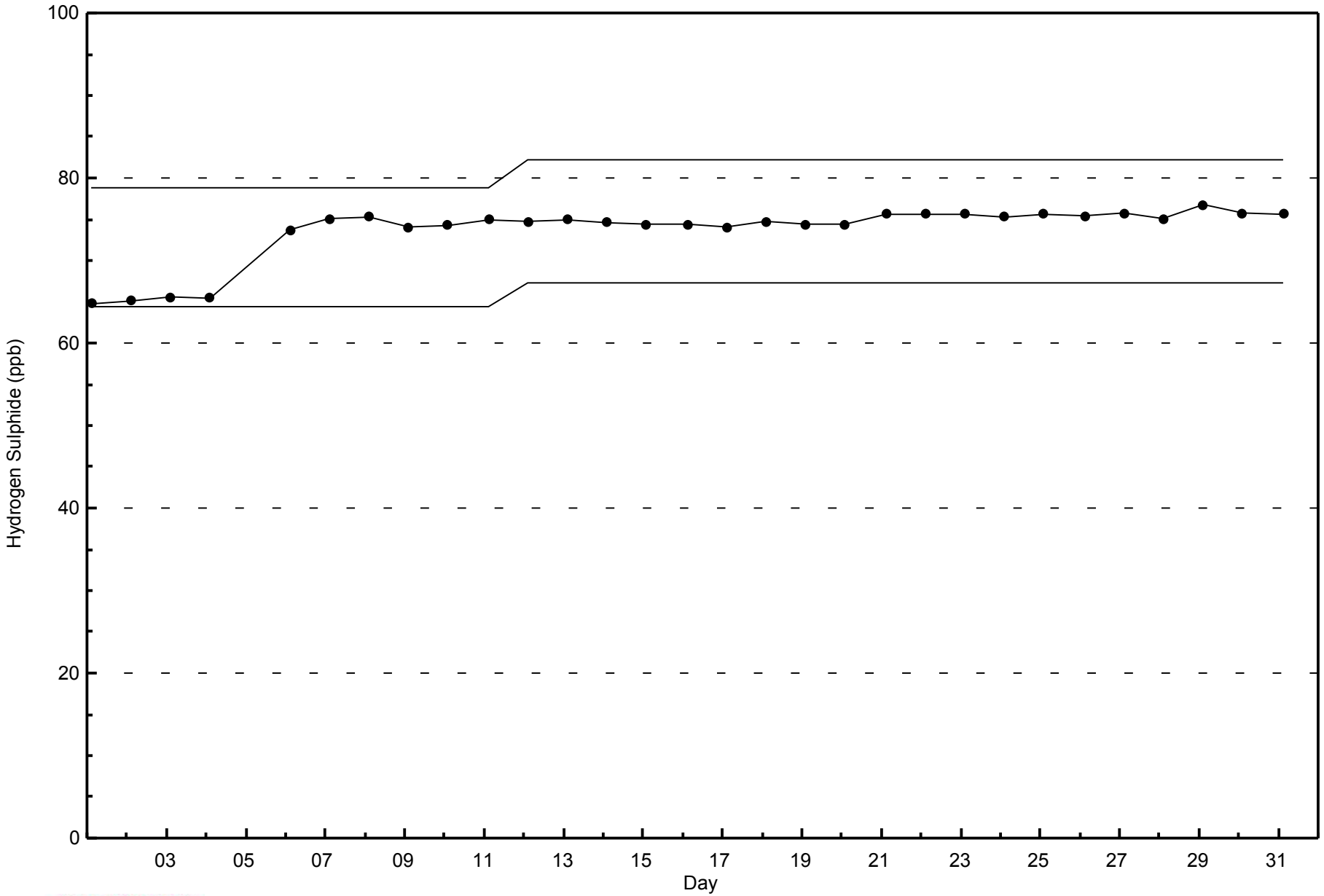
WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - August 2014

Maximum Value: 4.3 ppm on Aug 24 10:00

Maximum Daily Average: 2.7 ppm on Aug 16

Minimum Value: 2.1 ppm on Aug 7 07:00

Minimum Daily Average: 2.2 ppm on Aug 25

Maximum Diurnal Average: 2.5 ppm at hour 9

Minimum Diurnal Average: 2.3 ppm at hour 18

Monthly Average: 2.39 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.2 Median = 2.3 Q_3 = 2.4 P_{90} = 2.7 P_{99} = 3.7

Hours in Service:	744
Hours of Data:	699
Hours of Missing Data:	45
Hours of Calibration:	37
Percent Operational Time:	98.9

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-Aug	2.5	Z	2.5	2.5	2.5	2.4	2.4	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	2.2	2.3	2.4	2.4	2.3	2.5
2-Aug	2.4	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.2	2.1	2.2	2.2	2.4
3-Aug	2.5	Z	2.5	2.5	2.4	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.2	2.5
4-Aug	2.5	Z	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.6	2.6	2.5	2.5	2.4	2.7	2.6	2.3	2.2	2.2	2.5	2.4	2.4	2.7	2.8	2.4	2.8
5-Aug	2.6	Z	PF	PF	PF	PF	PF	PF	PF	PF	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.3	2.3	2.3	2.3	--	2.6
6-Aug	2.4	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.2	2.3	2.2	2.2	2.2	2.1	2.2	2.4
7-Aug	2.1	Z	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	C	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.7	--	2.7
8-Aug	2.5	Z	2.4	2.3	2.5	2.6	2.8	2.4	2.3	2.5	2.6	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.4	2.8
9-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4
10-Aug	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.4	2.3	2.5
11-Aug	2.3	Z	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.5	2.6	2.5	2.6	2.5	2.4	2.5	2.5	2.4	2.4	2.6
12-Aug	2.4	Z	2.7	3.0	3.0	3.0	2.9	2.7	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	3.0
13-Aug	2.3	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.7	2.6	2.8	2.6	2.4	2.8
14-Aug	2.6	Z	2.6	2.9	3.2	3.7	3.4	3.7	3.5	2.5	2.7	3.0	2.7	2.4	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.6	2.6	2.7	3.7
15-Aug	2.5	Z	2.5	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6
16-Aug	2.7	Z	3.8	2.9	3.2	3.3	3.5	3.7	3.1	2.7	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.7	2.6	2.6	2.8	2.7	3.8
17-Aug	2.6	Z	2.6	2.5	2.5	2.4	2.4	2.4	2.6	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.8	2.7	2.8	2.6	2.5	2.8
18-Aug	2.8	Z	2.5	2.9	2.7	2.6	2.6	2.5	2.5	2.7	2.8	2.6	2.5	2.5	2.8	3.0	2.7	2.7	2.7	2.4	2.5	2.4	2.3	2.4	2.6	3.0
19-Aug	2.6	Z	2.8	2.8	2.8	2.6	2.7	2.7	2.6	2.5	2.4	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.5	2.7	2.5	2.4	2.5	2.8
20-Aug	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	3.0	2.3	3.0
21-Aug	2.7	Z	2.5	2.6	2.6	2.6	2.4	2.6	2.8	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.8
22-Aug	2.6	Z	2.6	2.7	2.9	2.8	2.7	2.6	3.0	3.3	3.1	2.4	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.5	2.6	3.3
23-Aug	2.5	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.3	2.5
24-Aug	2.4	Z	2.6	2.5	2.4	2.5	2.8	2.8	4.2	4.3	3.7	2.7	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.6	4.3
25-Aug	2.2	Z	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	2.2	2.2	2.2	2.2	2.2	2.3
26-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.4	2.6	2.6	2.5	2.3	2.6
27-Aug	2.4	Z	2.4	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.7	2.4	2.5	2.3	2.2	2.3	2.7
28-Aug	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.5	2.3	2.5
29-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.3	2.3	2.5
30-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.6	3.2	3.2	2.4	3.2
31-Aug	2.8	Z	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.3	2.8
	2.5	--	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	Diurnal Average	
	2.8	--	3.8	3.0	3.2	3.7	3.5	3.7	4.2	4.3	3.7	3.0	2.7	2.5	2.8	3.0	2.7	2.7	2.7	2.7	2.8	2.7	3.2	3.2	Diurnal Maximum	

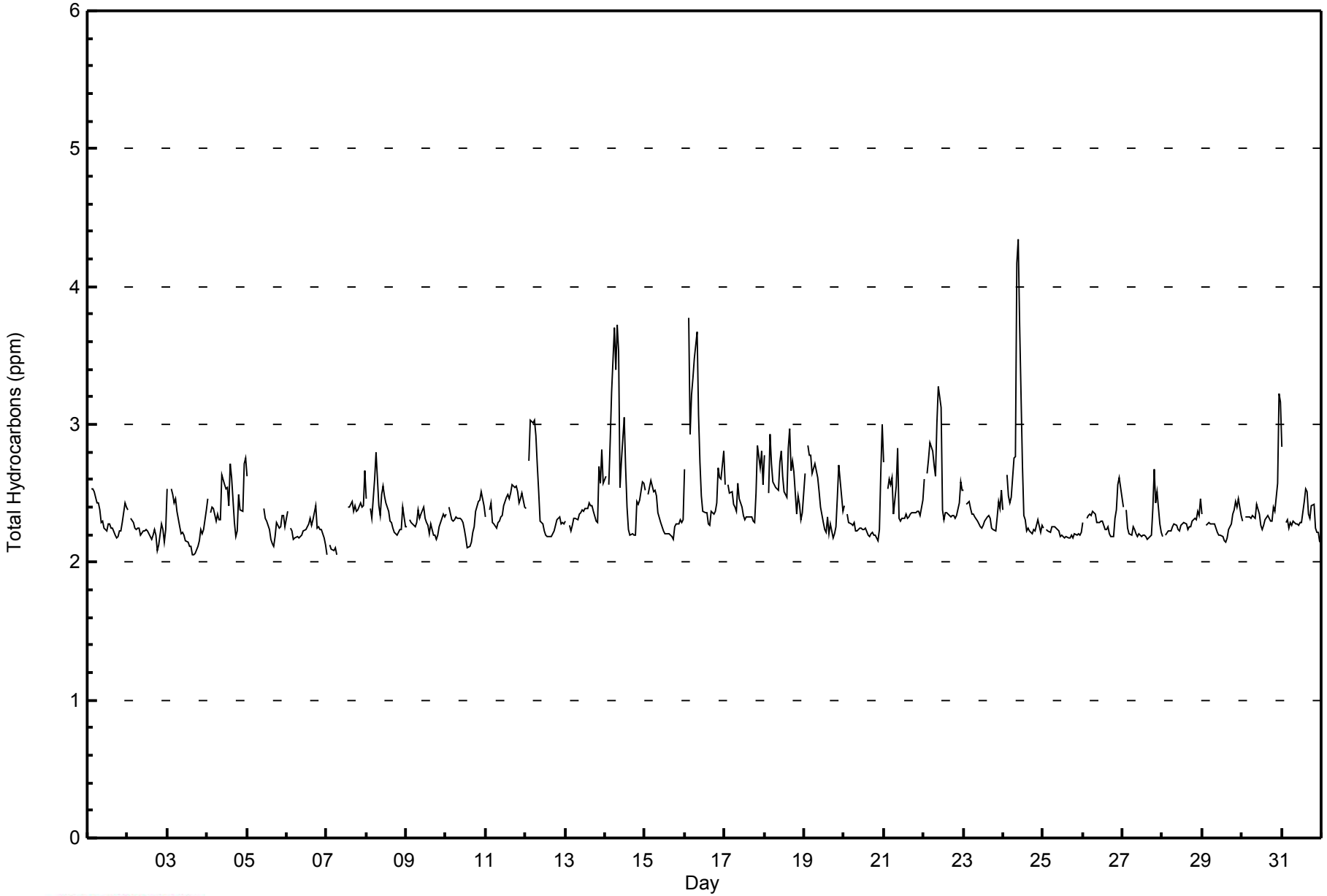
Z - zerospan C - Calibration PF - Power Failure

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	681	97.42	97.42
3.1 - 10.0	18	2.58	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - August 2014

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	58	19	7	6	6	44	124	94	58	38	25	33	40	48	31	49	680
3.1 - 10.0	0	0	1	0	1	0	0	2	1	0	0	0	1	3	5	4	18
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	19	8	6	7	44	124	96	59	38	25	33	41	51	36	53	698

Total Number of Valid Hours: 698

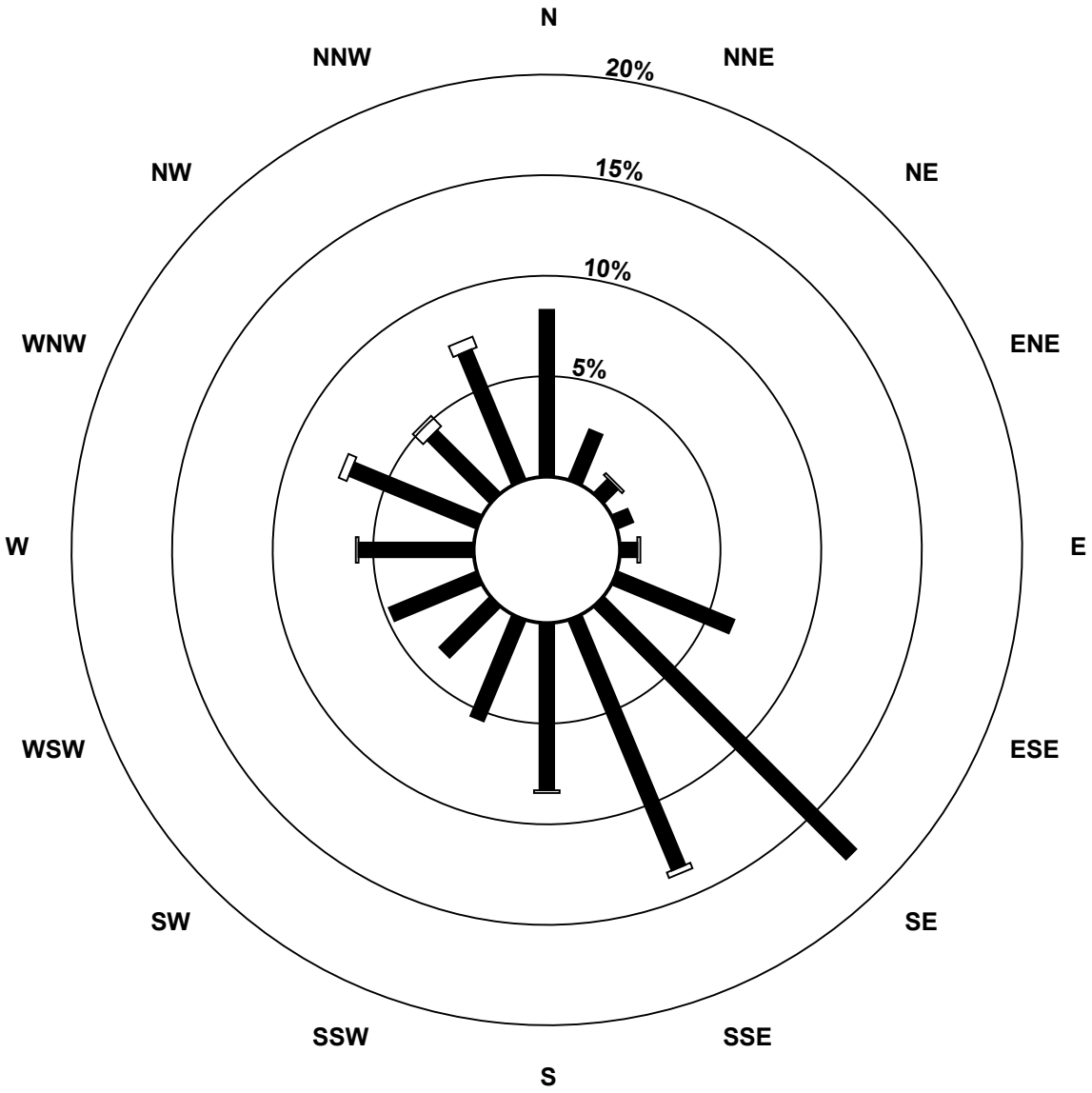
Total Number of Hours: 744

Wood Buffalo Environmental Association

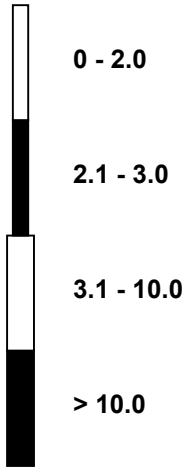
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint (AMS 4)



Classes (ppm)



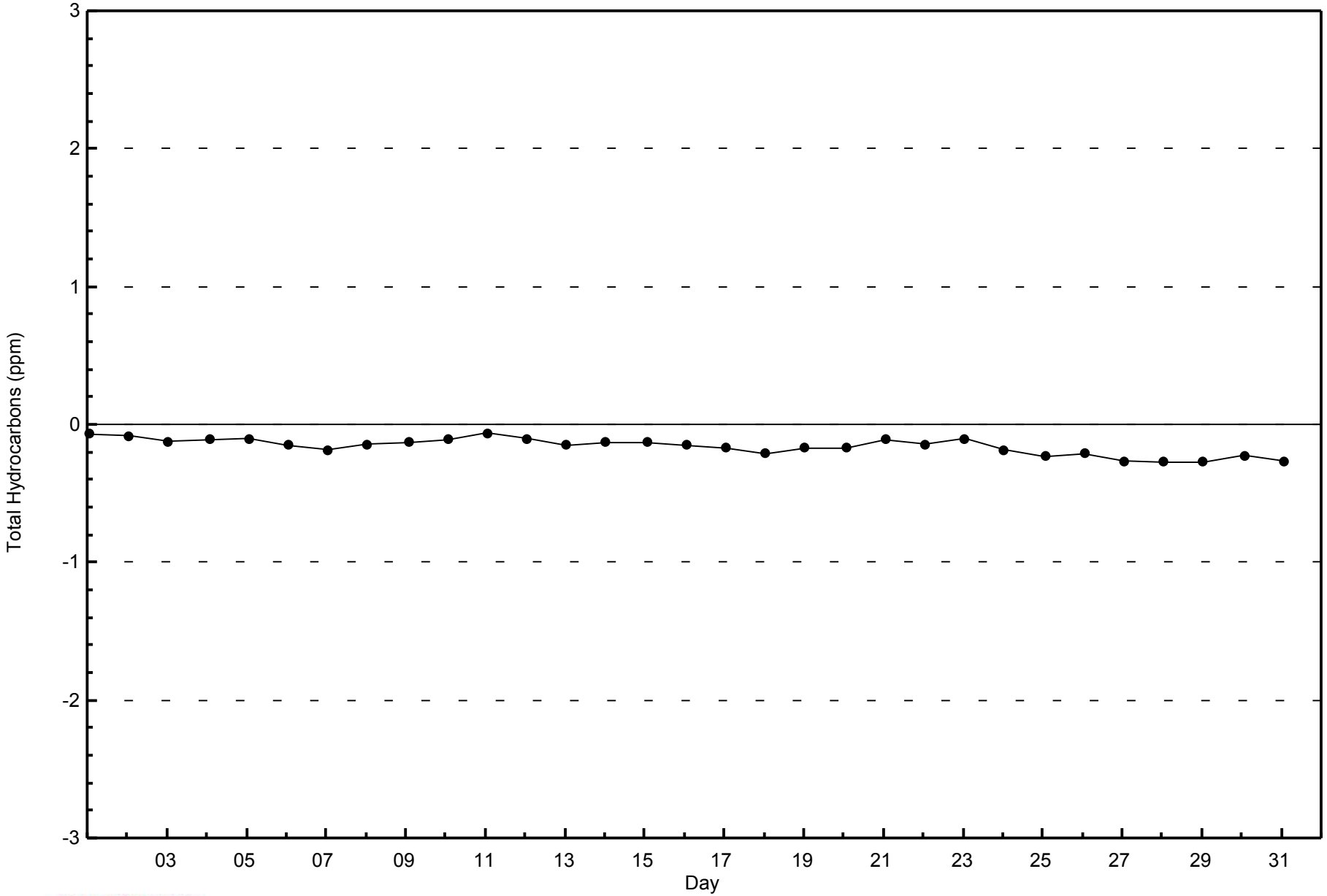
Total Number of Valid Hours: 698

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - August 2014



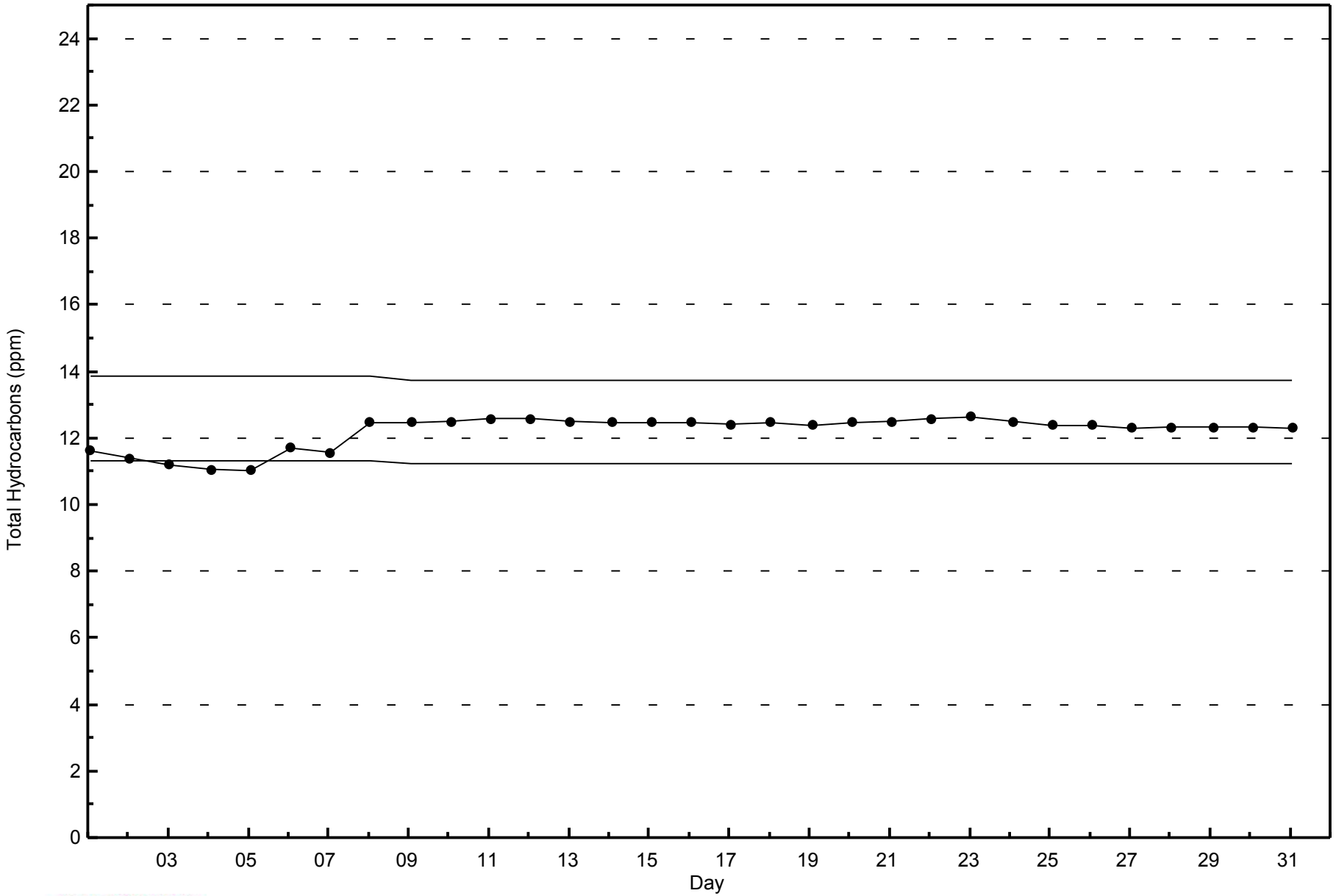
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 31.4 C on Aug 4 17:00

Maximum Daily Average: 24.2 C on Aug 13

Minimum Value: 2.1 C on Aug 22 06:00

Minimum Daily Average: 10.3 C on Aug 22

Maximum Diurnal Average: 23.4 C at hour 15

Minimum Diurnal Average: 11.9 C at hour 6

Monthly Average: 17.75 C

Percentiles: P_1 = 4.3 P_{10} = 10.5 Q_1 = 13.1 Median = 17.3 Q_3 = 22.1 P_{90} = 26.7 P_{99} = 30.8

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-Aug	14.7	13.7	12.5	11.7	11.5	11.2	11.8	13.1	14.5	15.6	16.4	17.5	18.4	19.5	19.6	20.0	20.9	20.7	20.2	18.7	16.7	14.6	13.2	12.4	15.8	20.9
2-Aug	12.0	11.9	11.0	10.5	10.5	10.9	12.1	14.2	17.3	20.0	22.6	24.9	26.1	26.8	27.2	26.6	25.5	24.6	23.1	22.1	20.7	20.2	19.4	17.8	19.1	27.2
3-Aug	16.3	15.6	13.8	12.9	12.4	12.2	14.4	17.1	19.1	21.2	23.3	25.8	27.0	28.2	29.2	29.4	29.6	28.6	28.4	26.3	24.3	22.1	21.3	20.2	21.6	29.6
4-Aug	17.6	17.2	16.8	16.0	15.0	15.3	16.8	19.6	21.5	23.9	26.5	28.1	29.9	31.2	31.1	30.9	31.4	30.7	28.6	26.7	25.0	23.2	20.3	18.0	23.4	31.4
5-Aug	18.1	MS	15.4	14.5	14.5	12.8	13.4	15.3	17.4	20.2	23.1	25.9	28.5	30.0	30.7	30.9	30.8	29.8	28.6	27.7	25.0	22.8	21.4	20.2	22.5	30.9
6-Aug	19.1	19.0	18.0	17.1	16.8	17.1	18.0	20.0	22.5	24.0	25.4	27.3	27.8	28.1	28.6	25.1	26.7	27.6	25.9	24.4	22.8	21.6	21.0	20.9	22.7	28.6
7-Aug	20.9	19.6	18.4	17.5	16.8	16.4	16.5	17.4	18.7	19.7	21.0	22.2	23.2	23.7	24.1	24.5	24.4	24.2	23.7	22.1	19.7	17.4	17.3	16.3	20.2	24.5
8-Aug	16.6	15.6	15.4	13.9	12.7	12.5	14.0	15.7	16.5	17.7	19.6	20.3	21.6	22.6	22.7	22.5	22.1	20.9	19.9	17.1	15.5	14.1	13.2	12.5	17.3	22.7
9-Aug	11.9	11.7	11.6	11.5	11.3	11.4	11.7	12.0	12.2	13.2	14.1	15.2	16.6	18.3	20.5	19.3	20.4	20.7	20.6	19.9	17.8	15.7	14.2	13.4	15.2	20.7
10-Aug	12.3	12.4	12.0	11.6	11.1	10.9	12.2	13.9	15.6	18.0	21.2	22.7	23.8	24.6	25.3	25.9	25.0	24.4	23.9	23.6	20.7	18.6	16.9	15.7	18.4	25.9
11-Aug	15.4	15.0	14.1	13.0	12.1	12.0	13.9	15.6	17.4	21.4	23.4	25.6	26.4	27.3	27.5	27.9	26.6	25.8	24.7	23.1	20.5	19.6	18.7	17.8	20.2	27.9
12-Aug	16.7	16.2	14.4	13.2	12.4	13.0	15.6	18.0	20.0	22.3	24.2	25.3	26.7	27.7	28.2	28.4	28.3	27.9	26.9	24.4	23.1	22.3	21.4	20.0	21.5	28.4
13-Aug	19.1	18.3	17.5	16.9	16.4	16.5	17.8	20.5	23.0	25.3	27.1	28.4	29.0	29.7	30.2	30.3	30.3	30.0	29.1	27.7	24.6	25.7	24.7	21.5	24.2	30.3
14-Aug	21.4	20.4	20.0	18.9	17.5	17.4	18.6	19.8	21.0	22.8	24.0	25.5	26.8	28.0	28.2	28.0	27.8	27.4	26.4	23.7	22.4	20.7	19.0	18.4	22.7	28.2
15-Aug	17.9	17.4	16.2	14.7	14.1	13.9	15.2	17.7	21.0	24.0	26.4	28.2	29.5	30.4	30.6	31.1	31.1	30.8	28.0	25.8	23.6	22.6	20.6	20.3	23.0	31.1
16-Aug	19.1	18.9	17.8	16.8	16.0	14.7	15.9	17.8	20.3	22.1	23.5	25.0	26.1	27.4	28.6	29.5	29.6	28.1	26.6	25.2	23.2	22.5	21.6	20.4	22.4	29.6
17-Aug	21.9	21.5	20.5	20.1	19.6	18.9	18.8	19.8	21.7	22.9	24.5	25.8	27.1	28.1	28.8	28.7	28.2	27.7	26.7	24.5	22.7	20.0	18.6	19.3	23.2	28.8
18-Aug	18.0	17.3	16.7	14.5	13.5	13.1	13.7	14.6	15.4	17.1	18.5	20.1	22.2	22.8	23.4	23.6	21.5	18.8	18.4	18.0	17.4	16.4	16.1	15.8	17.8	23.6
19-Aug	15.8	15.5	15.3	15.1	14.6	14.9	14.7	15.4	16.1	18.8	21.0	22.4	22.8	18.4	15.5	15.6	16.9	19.0	18.9	16.5	15.2	14.7	13.7	13.4	16.7	22.8
20-Aug	13.7	13.0	12.0	11.6	11.3	11.0	10.7	10.6	10.9	11.0	10.8	11.6	12.6	13.1	13.4	12.7	12.9	13.1	12.7	12.2	11.1	10.0	10.1	9.7	11.7	13.7
21-Aug	8.5	7.9	7.2	7.0	6.2	5.6	7.2	8.9	10.9	12.1	13.3	14.3	15.4	16.2	16.2	16.7	16.5	15.7	14.7	12.9	11.5	10.3	9.8	8.1	11.4	16.7
22-Aug	6.7	5.9	5.3	4.3	2.6	2.1	3.1	5.1	8.1	11.5	13.5	15.7	16.3	17.2	16.7	15.9	16.2	16.0	15.5	13.3	12.1	10.4	7.1	6.4	10.3	17.2
23-Aug	5.9	6.7	6.9	6.9	6.9	7.2	7.3	8.4	10.2	11.9	14.2	16.3	17.6	17.5	17.5	17.5	17.9	17.2	16.1	15.4	15.1	13.0	11.8	11.3	12.4	17.9
24-Aug	10.0	9.5	8.8	8.3	8.3	7.9	8.8	9.7	10.7	12.8	14.8	17.5	19.2	19.5	19.3	20.3	20.6	20.3	19.1	16.0	13.9	12.4	12.0	11.5	13.8	20.6
25-Aug	10.9	10.7	10.9	10.7	10.3	9.9	10.5	10.4	11.7	15.2	18.3	20.2	20.5	21.2	22.3	22.1	21.5	21.0	19.3	17.6	16.8	16.1	15.8	15.6	15.8	22.3
26-Aug	15.2	15.2	14.3	13.3	12.0	11.5	11.7	13.7	16.2	18.3	19.7	21.2	21.7	24.1	25.7	25.8	25.0	24.9	19.5	18.4	17.5	17.3	17.5	16.1	18.1	25.8
27-Aug	15.6	14.5	14.2	16.6	16.8	16.4	15.7	16.5	16.4	17.5	17.9	19.2	20.7	22.1	22.9	23.3	23.0	22.4	20.8	18.4	17.5	15.2	11.8	11.1	17.8	23.3
28-Aug	10.4	10.6	10.0	9.7	9.1	8.5	8.7	9.7	9.9	11.1	11.0	11.6	13.0	14.1	14.9	15.3	15.7	15.6	15.7	13.5	11.6	9.4	7.7	6.0	11.4	15.7
29-Aug	5.5	5.5	4.9	4.0	3.3	3.5	4.2	6.2	9.6	13.1	16.5	19.2	20.5	21.4	22.2	22.2	21.9	20.7	18.9	17.4	15.2	14.1	13.2	13.3	13.2	22.2
30-Aug	12.7	11.9	12.2	12.8	12.2	11.4	11.1	11.3	11.2	11.3	11.6	12.7	14.8	16.5	18.6	18.1	17.3	17.4	17.1	14.8	14.4	13.8	13.2	12.3	13.8	18.6
31-Aug	11.2	9.8	9.9	8.8	8.0	9.0	9.5	9.5	11.6	15.3	17.6	19.4	20.6	21.6	16.3	13.0	13.3	15.5	14.7	13.2	12.3	12.0	12.2	11.4	13.2	21.6
	14.6	13.9	13.4	12.7	12.1	11.9	12.7	14.1	15.8	17.8	19.5	21.1	22.3	23.1	23.4	23.3	23.2	22.8	21.7	20.0	18.4	17.1	16.0	15.1	Diurnal Average	
	21.9	21.5	20.5	20.1	19.6	18.9	18.8	20.5	23.0	25.3	27.1	28.4	29.9	31.2	31.1	31.1	31.4	30.8	29.1	27.7	25.0	25.7	24.7	21.5	Diurnal Maximum	

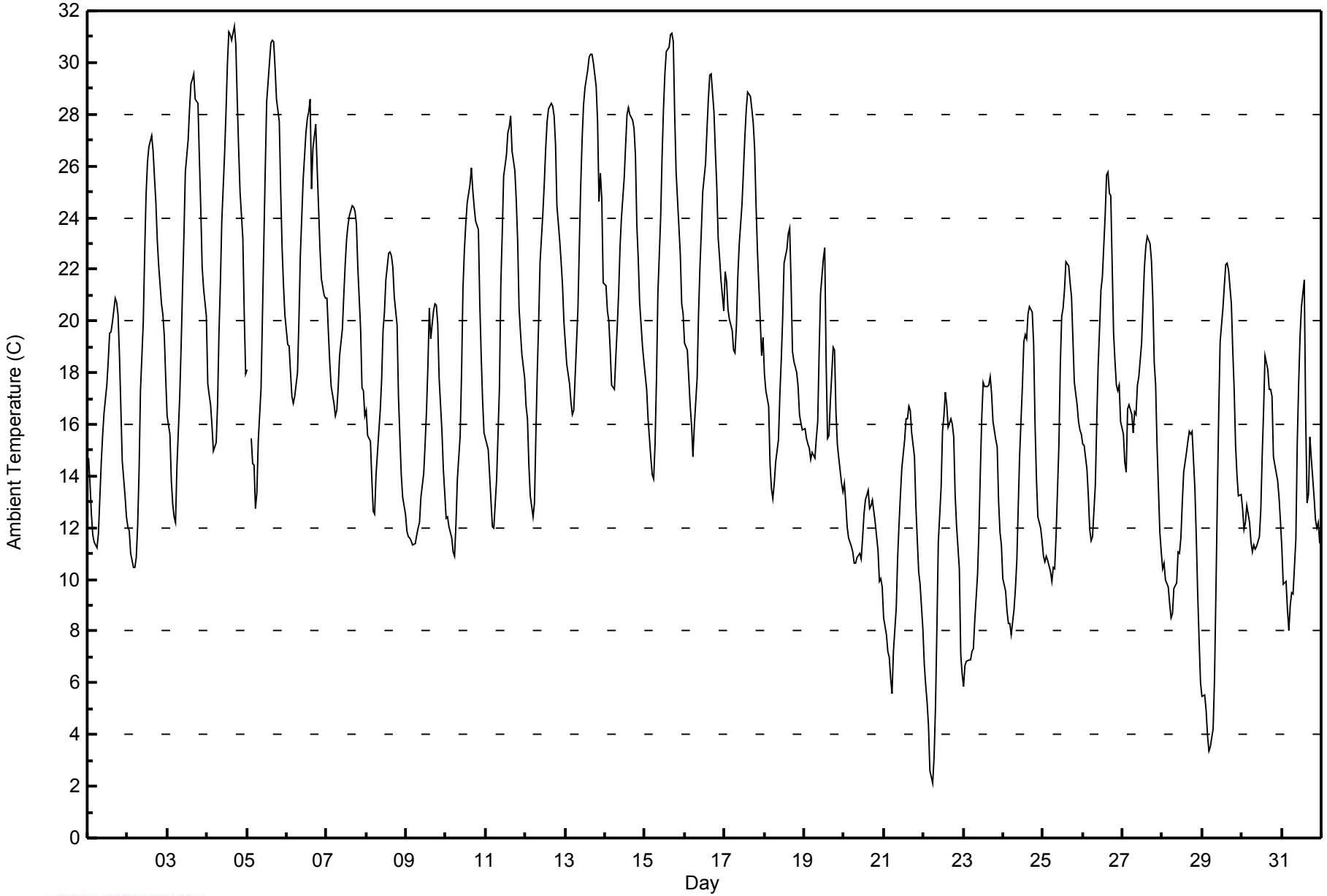
MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	65	8.75	8.75
10 - 20	418	56.26	65.01
> 20	260	34.99	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - August 2014

Maximum Speed: 27 km/h on Aug 31 15:00

Maximum Daily Speed Average: 16.3 km/h on Aug 7

Minimum Speed Value: 1 km/h on Aug 24 01:00

Minimum Daily Speed Average: 0.7 km/h on Aug 15

Maximum Diurnal Speed Average: 3.5 km/h at hour 14

Minimum Diurnal Speed Average: 0.6 km/h at hour 20

Monthly Average Velocity: 1.3 km/h 216.4 deg

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 6 Median = 8 Q_3 = 11 P_{90} = 15 P_{99} = 22

Hours in Service: 744

Hours of Data: 742

Hours of Missing Data: 2

Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNW24	NNW25	N18	NNW16	NNW21	NNW21	NNW20	N15	N14	NNW16	NNW19	NNW14	NNW10	NNW6	SSW5	SSW6	SSE4	ESE6	ESE7	SE7	SE7	SE7	SE7	SE8	NNW7.8	NNW25
2-Aug	SE10	SE11	SE9	SE11	SE13	SE11	SE8	SE11	SE9	ESE9	ESE10	S9	S11	S13	S11	S15	S14	S11	SSE4	ENE5	ESE5	S7	ESE4	S5	SSE8.5	S15
3-Aug	S6	S5	SE8	SE9	SE9	SE8	SSE7	SSE5	S5	S4	S5	SE5	SSW6	WSW4	SSW3	SE5	SE6	SSE5	S6	SSE6	S8	SSE6	SW3	SW7	SSE5.1	SE9
4-Aug	SE8	ESE9	SE7	SE7	SSE8	SE5	SE6	SSE3	WSW3	NNW5	N5	NNW7	NNW8	NNW10	N11	NNE11	N10	N11	N10	NNE8	NE10	ENE3	SSE6	SSE4	NE2.8	NNW11
5-Aug	SSW4	MS	SSE5	SSE4	ESE6	SSE7	SSE6	SSE5	SSE6	ESE6	ESE8	ESE9	ESE9	ESE10	ESE10	ESE9	ESE7	ESE7	ESE7	SE9	SE7	SE7	SE9	SE9	SE6.9	ESE10
6-Aug	SE11	SE12	SE10	SE11	SE12	SE12	SE9	SE10	S9	SSE9	SSE12	S12	S13	SSW13	SW14	SSW12	SSW7	WSW8	SW11	SSW11	S11	S12	SSW13	SSW13	S9.3	SW14
7-Aug	SW17	WSW18	WSW17	WSW16	SW16	WSW17	WSW18	WSW20	WSW22	WSW21	WSW20	WSW22	WSW24	WSW21	WSW21	WSW22	WSW18	WSW18	W14	W10	SW7	SSW6	W8	NW8	WSW16.3	WSW24
8-Aug	NW8	NW8	NW10	WNW11	WNW8	WNW5	WNW5	NNE7	N6	NW4	N5	NE4	NE6	NNE8	N8	NNE11	NNE9	NNE11	NNE7	SW13	W15	WSW11	NW11	N11	NNW5.6	W15
9-Aug	N15	N15	N16	N14	N11	N10	NNW7	WNW10	WNW8	WNW9	NW9	NW10	WNW8	WNW7	NW8	WNW7	WSW7	S7	SSW6	W5	SW5	S7	S6	SSE6	NW5.1	N16
10-Aug	SE7	SE7	SE7	SSE8	SE10	SE10	SE8	SE5	SSE7	S6	SE4	SW4	S5	SSW5	SSW6	SSW3	SW7	SW6	S5	S5	S8	S9	SSE9	SSE8	SSE5.7	SE10
11-Aug	SSE7	SSE5	SSE6	SE8	SSE7	SSE8	SE7	SSE4	S6	SW8	W6	WSW6	WNW16	WNW16	WNW17	NW18	NW18	N18	N16	N14	N10	NNE7	N4	N6	NW3.6	N18
12-Aug	NNW4	N5	WSW2	SSW2	SE4	SE4	ESE3	SE4	SE5	ESE6	E8	ESE11	ESE11	ESE10	ESE10	ESE10	ESE11	ESE11	ESE10	ESE8	ESE11	SE11	SE12	SE12	ESE6.7	SE12
13-Aug	SE12	SE11	SE8	SE7	SSE9	SSE9	SSE7	SE7	SE9	SE10	SSE10	SSE12	SSW12	SSW12	SSW12	SSW11	SSW11	SSW7	S6	SSE7	SSE7	W9	WNW8	WNW7	S6.8	SSW12
14-Aug	W11	W13	W11	WNW11	NW12	WNW9	NW6	WNW7	NW6	NNW6	W4	WSW2	SW3	WSW3	S5	S5	S4	SSE4	SSE5	SE6	SSE6	SSE7	SE9	SE10	WSW2.9	W13
15-Aug	SE8	SE8	SE9	SE10	SE10	SE9	SE9	SE8	SSE5	ENE2	NNW4	NNW2	NNW6	WNW6	SW6	W7	W7	S4	NNW9	N20	N15	N8	NNW8	NNW6	NE0.7	N20
16-Aug	NW6	W4	NW6	NNW6	S3	SSE4	SSE2	NE2	E4	ESE8	SE8	SE8	SE8	S7	S5	SSW5	SSW9	SW7	S6	S6	SE8	SSE8	S8	SSE8	SSE3.6	SSW9
17-Aug	WSW10	WSW9	W10	W9	W10	W10	W10	W8	WNW11	WNW11	WNW11	W10	W12	W15	WNW20	WNW26	WNW21	WNW21	WNW16	NW12	WSW6	SSE5	S5	SSW4	W10.5	WNW26
18-Aug	SE6	SE7	SE5	SSE8	SE9	SE9	SE7	SSE8	SE4	E1	SSE8	SSE7	SW8	WNW6	NW9	NNW9	ENE3	W4	SSW6	WNW7	NNW12	N14	NNE2	WNW4	SSE1.1	N14
19-Aug	WSW5	WSW2	SE1	SSE5	SSE6	SSE6	SE7	SE5	SSE7	SSE8	SSE9	SSE9	SSE10	WNW19	WNW18	N5	NE5	N6	S1	SW6	WNW8	NNW12	N10	N10	WSW1.3	WNW19
20-Aug	N11	N18	N18	N17	N20	N19	N20	N17	NNW17	NNW19	NNW20	N17	NNW20	NNW20	N17	N13	N15	NNW14	NNW18	N12	N10	NW8	NW9	WNW9	N15.3	NNW20
21-Aug	NW10	WNW11	NW13	NW10	WNW7	WNW10	WNW8	NW6	N7	N8	NNW10	NNW12	NNW13	NNW11	N11	N9	N14	N15	N17	NNE11	NE7	NNE7	NNE5	W4	NNW8.4	N17
22-Aug	W4	WSW4	WSW5	W5	SW3	S4	SE4	SE3	NW3	NNW5	NNW5	N8	NW5	NW8	NNW8	N11	NNE9	NNE7	N8	NNE7	ENE6	SSE4	SSE8	SSE8	N2.0	N11
23-Aug	SE8	SE5	SSE5	SSE7	SE6	SSE4	SE6	ESE4	SE5	SE7	SE7	SE9	ESE6	ESE6	E5	SE2	SSE4	ESE5	ESE5	E4	ENE6	ESE6	ESE3	NE3	SE5.0	SE9
24-Aug	NNW1	N5	N6	N6	NNW5	NNW6	NNW5	NW5	NW6	NNW5	NNW5	N7	N8	E5	SE5	SSE5	ESE7	E5	SE5	ESE7	ESE7	SE8	SE10	SE11	ENE1.9	SE11
25-Aug	SE10	SE9	SE9	SE10	SE9	SE10	SE9	SE8	SE9	SE14	SSE16	SSE14	SE11	S12	S14	S16	S15	S12	SSE10	SE11	SE12	SE13	SE13	SE8	SSE10.9	S16
26-Aug	SE11	SE11	SE12	SE10	SE7	ESE8	SE6	SE7	SE6	ESE6	ESE6	ESE5	ESE5	ESE4	SSE7	SSW15	SSW13	SW9	N17	NE5	SE3	SSW2	SE5	SSE7	SE5.3	N17
27-Aug	SSE9	SSE10	SSE9	SW9	SW14	WSW19	W15	W14	WNW19	WNW15	WNW15	W11	W12	M	WNW10	W10	WSW13	WNW11	NW11	NNW8	NNE4	WNW8	WNW7	SSW7	W8.1	WNW19
28-Aug	SW6	W9	WSW10	WSW7	W6	W8	W10	WNW14	WNW14	WNW16	NW14	NW14	NW13	NW13	NW12	NW10	NW9	WNW7	WSW2	S5	SE4	S6	S8	S8	WNW6.7	WNW16
29-Aug	SSE8	SSE10	SSE8	S9	SSE9	SSE11	SSE11	SSE9	SSE10	SSE11	SSE10	SSE11	SE12	SSE13	SE10	SSE11	SE11	SE11	SE9	SSE9	SE8	SSE7	SSE8	SSE9	SSE9.6	SSE13
30-Aug	SSE8	SSE7	SSE7	SSE9	S10	SSE7	SSE5	SSE6	WSW7	W8	W9	W8	W8	NW6	N6	NW2	SW5	SSW2	S4	SE6	S4	WNW7	W3	WNW5	SW3.0	S10
31-Aug	SSW7	SW7	SW6	SSE6	SSE7	SSW6	S4	S4	SSW4	WSW4	SSW4	W9	W11	NNW16	NNW27	N19	SW7	WSW8	WNW7	SW7	SSW8	W7	WSW11	W6	W4.0	NNW27
	S2.1	S1.2	SSW1.4	S1.8	S2.4	S2.6	S1.8	SSW1.4	SW1.5	W1.2	WSW1.0	WSW1.4	W2.6	W3.5	WNW3.3	W2.4	SW2.4	W1.4	NNW1.0	SE0.6	SE1.8	S2.0	S2.4	S2.6	Diurnal Average	
	NNW24	NNW25	N18	N17	NNW21	NNW21	NNW20	WSW20	WSW22	WSW21	WSW20	WSW22	WSW24	WSW21	NNW27	WNW26	WNW21	WNW21	NNW18	N20	W15	N14	SE13	SSW13	Diurnal Maximum	

M - Maintenance MS - Missing

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 15 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 23 19:00

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

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

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

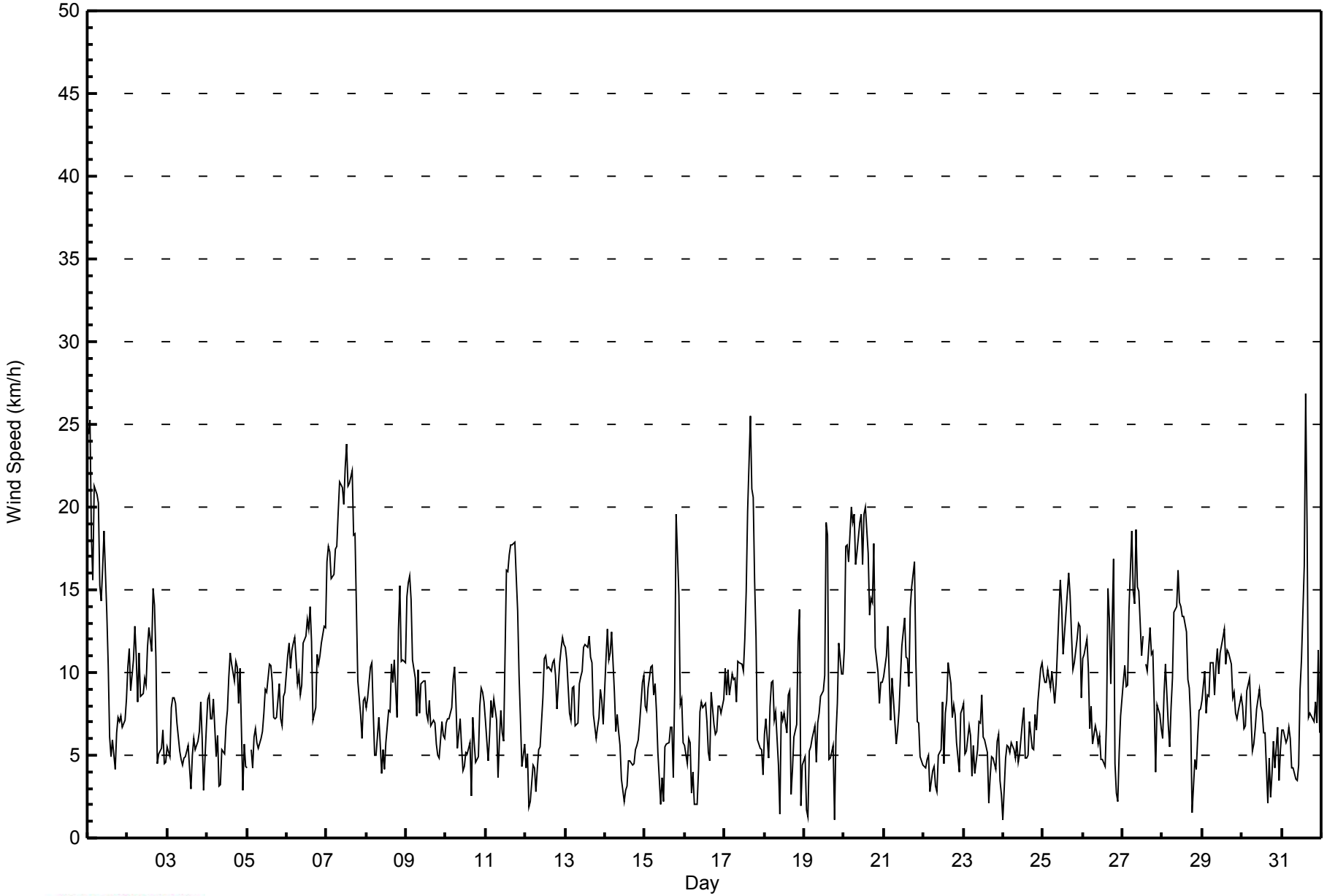
M - Maintenance MS - Missing

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	160	21.56	21.56
6 - 11	435	58.63	80.19
12 - 19	122	16.44	96.63
20 - 28	25	3.37	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Buffalo Viewpoint - August 2014

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	5	4	5	4	6	10	22	25	22	12	6	12	7	4	4	12	160
6 - 11	27	15	3	2	1	37	98	76	27	17	16	12	29	32	23	20	435
12 - 19	27	0	0	0	0	0	13	5	11	9	4	10	8	12	10	13	122
20 - 28	3	0	0	0	0	0	0	0	0	0	0	9	0	4	0	9	25
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	62	19	8	6	7	47	133	106	60	38	26	43	44	52	37	54	742

Total Number of Valid Hours: 742

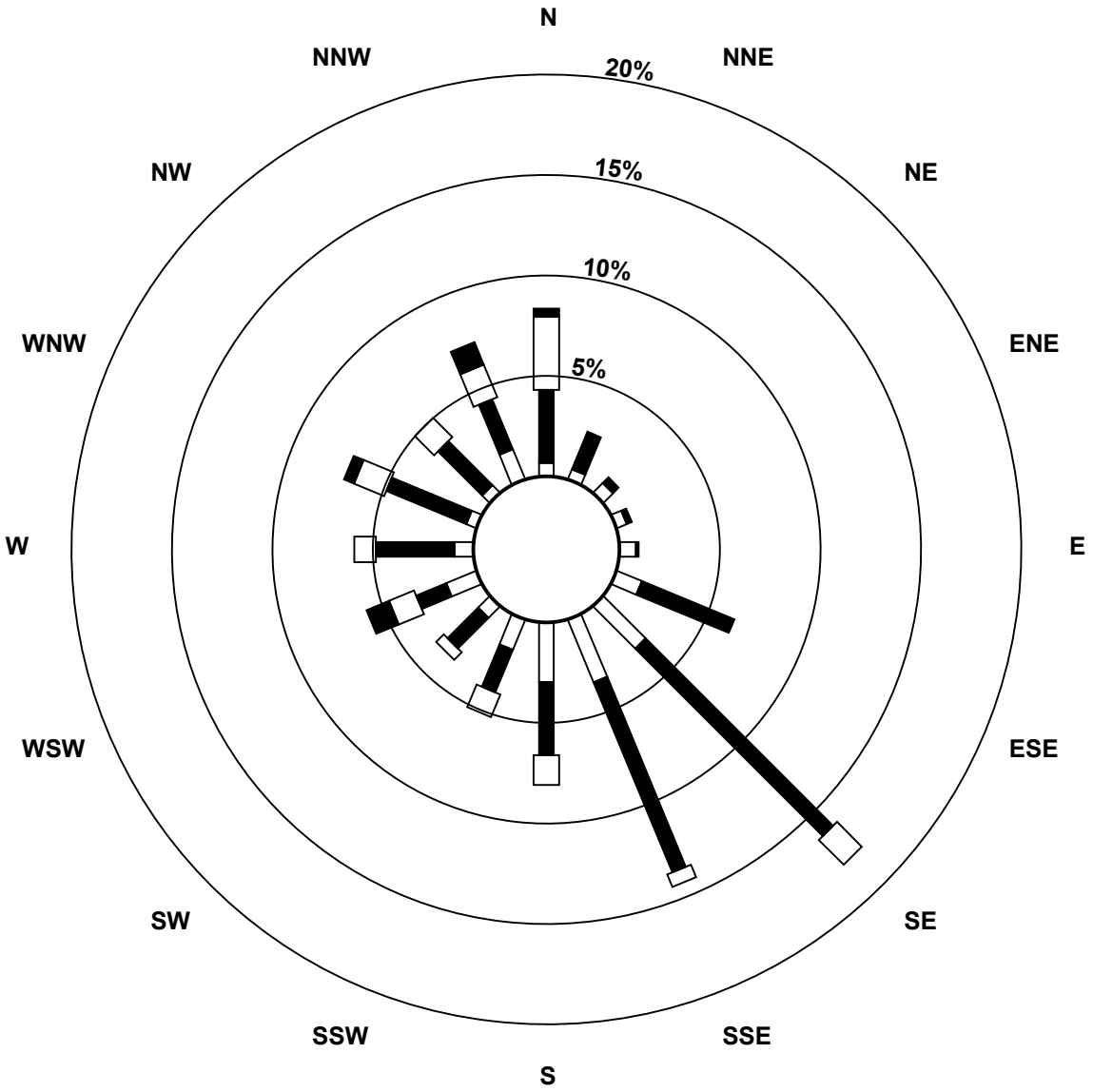
Total Number of Hours: 744

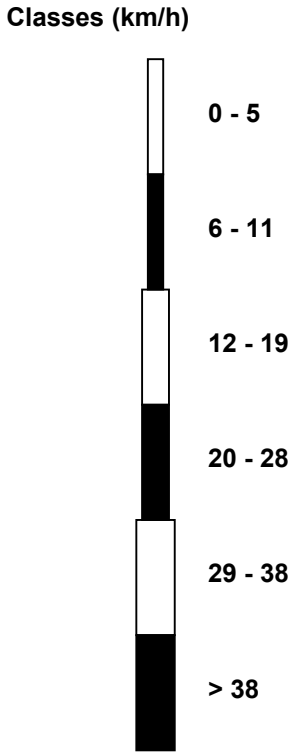
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Buffalo Viewpoint (AMS 4)





Total Number of Valid Hours: 742

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - August 2014

Direction of Maximum Speed: 346 deg on Aug 31 15:00
Direction of Maximum Daily Speed Average: 248.0 deg on Aug 7

Direction of Minimum Speed: 329 deg on Aug 24 01:00

Direction of Minimum Daily Speed Average: 0.7 deg on Aug 15

Monthly Average Direction: 250.1 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	344	343	353	343	335	337	340	349	350	345	343	343	332	329	213	213	155	117	123	132	144	140	134	132	347.9
2-Aug	136	140	142	138	142	139	135	136	134	114	108	170	178	183	178	175	177	186	163	61	121	170	116	177	151.2
3-Aug	191	171	144	138	142	143	168	166	180	190	181	130	197	254	213	142	146	154	185	160	170	149	233	215	167.1
4-Aug	145	123	129	131	150	128	137	151	250	343	9	334	339	339	349	12	11	8	5	33	53	62	168	168	42.8
5-Aug	192	MS	154	151	122	154	152	159	155	121	112	108	115	121	114	108	108	109	113	141	144	144	141	141	130.2
6-Aug	132	136	133	128	135	136	139	146	179	166	158	175	190	207	217	207	206	258	215	202	190	185	194	206	176.3
7-Aug	229	240	243	243	236	237	237	244	255	254	245	251	250	254	255	248	253	250	261	265	221	200	273	308	248.0
8-Aug	306	314	305	293	301	293	298	14	6	326	4	47	39	18	5	12	24	27	13	234	275	258	322	7	331.5
9-Aug	355	358	358	2	2	351	335	285	291	295	314	312	292	293	308	297	237	181	198	270	224	191	179	166	314.0
10-Aug	128	126	136	150	141	138	138	140	156	177	143	219	189	212	196	205	221	228	171	178	189	187	159	149	165.0
11-Aug	155	157	153	125	149	147	137	153	190	234	261	251	300	287	303	312	314	349	358	3	7	16	11	11	317.9
12-Aug	342	352	245	198	146	133	113	134	131	102	101	104	107	102	112	121	121	118	113	115	123	132	140	142	118.7
13-Aug	138	135	143	146	147	149	156	141	137	143	160	166	192	200	203	209	202	202	171	163	149	271	289	298	173.1
14-Aug	265	276	273	289	307	294	305	299	311	342	268	238	234	258	190	179	169	156	162	141	154	153	133	135	250.6
15-Aug	135	146	146	136	139	145	140	146	148	62	337	343	345	301	229	266	268	188	328	356	2	5	346	331	51.4
16-Aug	317	273	318	347	178	167	166	44	90	116	126	126	138	176	171	193	196	216	188	171	138	149	174	155	162.2
17-Aug	248	251	259	278	280	259	268	279	295	287	282	267	272	269	287	293	286	282	291	310	254	148	169	204	276.1
18-Aug	141	136	140	147	144	142	145	155	129	87	148	157	236	291	326	345	67	269	192	283	338	352	17	289	162.7
19-Aug	255	253	141	149	158	167	136	144	150	163	158	158	159	285	293	352	42	8	178	220	288	329	354	356	245.1
20-Aug	5	4	353	350	351	353	356	355	347	347	348	351	345	348	352	359	351	348	347	359	359	319	309	293	349.4
21-Aug	305	300	304	304	292	298	294	306	357	4	340	333	338	344	355	0	1	3	358	16	45	12	18	267	338.4
22-Aug	259	257	255	266	220	171	141	141	317	347	328	355	305	326	343	357	19	26	5	33	63	151	156	147	352.4
23-Aug	128	130	157	147	136	150	130	118	126	133	142	133	105	123	99	132	160	119	120	90	76	122	123	54	125.3
24-Aug	329	3	4	355	344	344	345	313	314	339	346	356	355	83	136	164	115	87	126	123	121	141	138	140	62.1
25-Aug	142	138	127	130	131	133	136	132	132	137	155	154	145	173	182	180	177	173	149	139	137	139	136	137	148.6
26-Aug	129	130	133	128	135	123	137	128	130	119	122	112	114	122	149	195	192	229	358	52	132	205	142	152	139.5
27-Aug	162	149	150	217	223	238	261	280	285	282	282	280	279	M	288	275	249	286	322	335	17	287	302	203	265.2
28-Aug	227	261	258	252	263	274	278	287	289	303	310	311	309	321	316	326	309	302	253	185	132	175	171	170	285.5
29-Aug	166	157	166	170	162	149	159	161	151	150	151	147	146	164	146	158	146	136	136	150	142	154	152	160	153.1
30-Aug	163	159	156	163	171	162	156	167	239	278	274	275	272	318	8	315	219	194	177	142	191	288	267	292	215.0
31-Aug	194	220	223	161	156	206	170	176	195	244	209	265	273	338	346	4	214	247	300	214	213	267	256	275	263.4
	182.7	185.2	193.3	173.3	173.0	180.8	184.0	201.3	235.7	272.3	252.3	240.5	259.7	278.2	285.7	271.0	229.0	259.7	331.7	126.4	139.1	177.9	173.2	174.6	
	Diurnal Average																								

M - Maintenance MS - Missing

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 - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Aug 14 12:00

Minimum Value: 6 deg on Aug 23 01:00

Percentiles: P_1 = 7 P_{10} = 12 Q_1 = 15 Median = 20 Q_3 = 30 P_{90} = 48 P_{99} = 86

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	12	11	12	13	11	10	10	14	15	15	14	23	30	65	70	40	50	26	19	13	15	14	17	13	70
2-Aug	16	18	18	17	17	18	19	19	23	28	29	33	24	23	23	22	20	20	35	43	35	36	37	35	43
3-Aug	25	36	11	11	9	14	16	22	35	54	45	47	46	65	82	43	44	22	16	17	19	16	70	20	82
4-Aug	13	6	18	15	16	48	15	45	50	32	47	31	22	19	18	18	18	14	12	14	12	88	22	37	88
5-Aug	26	MS	13	23	22	21	20	20	26	22	24	22	24	24	24	22	21	18	18	18	15	12	12	11	26
6-Aug	14	17	12	12	16	16	19	20	28	29	25	26	22	21	19	33	45	37	18	13	11	10	12	13	45
7-Aug	17	14	13	13	15	15	15	15	17	18	22	19	18	21	22	20	19	20	17	16	24	29	16	14	29
8-Aug	17	13	12	10	15	14	26	22	33	65	45	75	52	40	24	19	19	18	28	26	16	34	22	15	75
9-Aug	13	12	12	14	12	14	28	15	19	18	19	22	24	38	37	43	34	21	19	34	28	15	13	20	43
10-Aug	11	12	18	11	12	11	12	20	22	42	69	63	52	52	53	78	27	20	15	11	12	15	18	21	78
11-Aug	21	27	15	19	17	14	12	63	21	29	27	43	18	20	20	20	19	13	12	11	11	7	12	6	63
12-Aug	24	22	58	56	24	25	26	33	31	31	25	21	22	27	26	30	25	20	18	14	17	19	19	17	58
13-Aug	17	18	18	17	17	20	21	24	21	25	26	24	22	25	21	19	17	14	17	8	41	21	19	79	79
14-Aug	9	8	10	9	11	13	17	12	26	18	51	94	77	81	39	31	27	17	25	26	31	23	12	11	94
15-Aug	11	15	12	7	7	8	10	18	35	84	58	87	48	50	45	42	37	63	63	11	11	17	13	14	87
16-Aug	19	21	15	11	60	13	43	57	45	23	23	24	27	34	44	52	22	17	15	11	12	19	26	23	60
17-Aug	15	10	10	14	13	10	11	21	17	19	20	24	21	19	17	16	17	16	13	8	48	23	19	25	48
18-Aug	30	8	45	14	8	10	17	16	35	87	25	37	42	28	17	21	70	49	36	28	24	11	84	18	87
19-Aug	14	86	82	19	22	18	10	57	15	24	33	34	32	49	13	62	47	25	93	18	24	15	10	16	93
20-Aug	29	15	13	12	13	12	14	13	13	15	12	14	13	14	14	16	14	13	13	13	12	16	15	15	29
21-Aug	19	13	12	10	14	11	14	29	37	23	31	31	25	30	26	37	18	15	14	20	7	14	7	43	43
22-Aug	22	18	13	15	45	18	14	17	79	30	37	38	76	41	28	19	19	24	14	17	44	25	11	8	79
23-Aug	6	42	23	24	16	28	18	37	27	22	31	31	59	57	52	88	57	25	10	26	29	6	51	42	88
24-Aug	77	30	18	11	16	15	21	22	15	26	31	29	31	60	41	48	39	38	18	16	11	16	16	17	77
25-Aug	17	18	16	15	18	18	21	22	20	21	23	24	25	26	23	21	19	21	18	16	18	17	17	22	26
26-Aug	13	15	12	11	37	18	23	23	24	27	25	27	20	63	44	18	22	45	17	51	84	80	41	23	84
27-Aug	19	16	17	27	16	14	18	18	15	17	17	22	22	M	32	32	24	22	15	15	56	56	83	38	83
28-Aug	19	21	18	28	23	19	15	16	17	18	19	15	19	23	23	30	24	26	66	8	40	8	17	13	66
29-Aug	14	10	12	12	12	13	17	22	20	22	28	25	24	26	30	25	26	18	16	14	15	16	15	17	30
30-Aug	19	18	19	23	33	25	53	25	23	17	17	19	33	34	31	74	36	73	22	47	69	36	33	54	74
31-Aug	33	29	22	33	18	22	43	48	54	64	55	32	31	40	13	43	37	23	35	30	19	52	17	32	64
	77	86	82	56	60	48	53	63	79	87	69	94	77	81	82	88	70	73	93	51	84	88	84	79	
	Diurnal Maximum																								

M - Maintenance MS - Missing

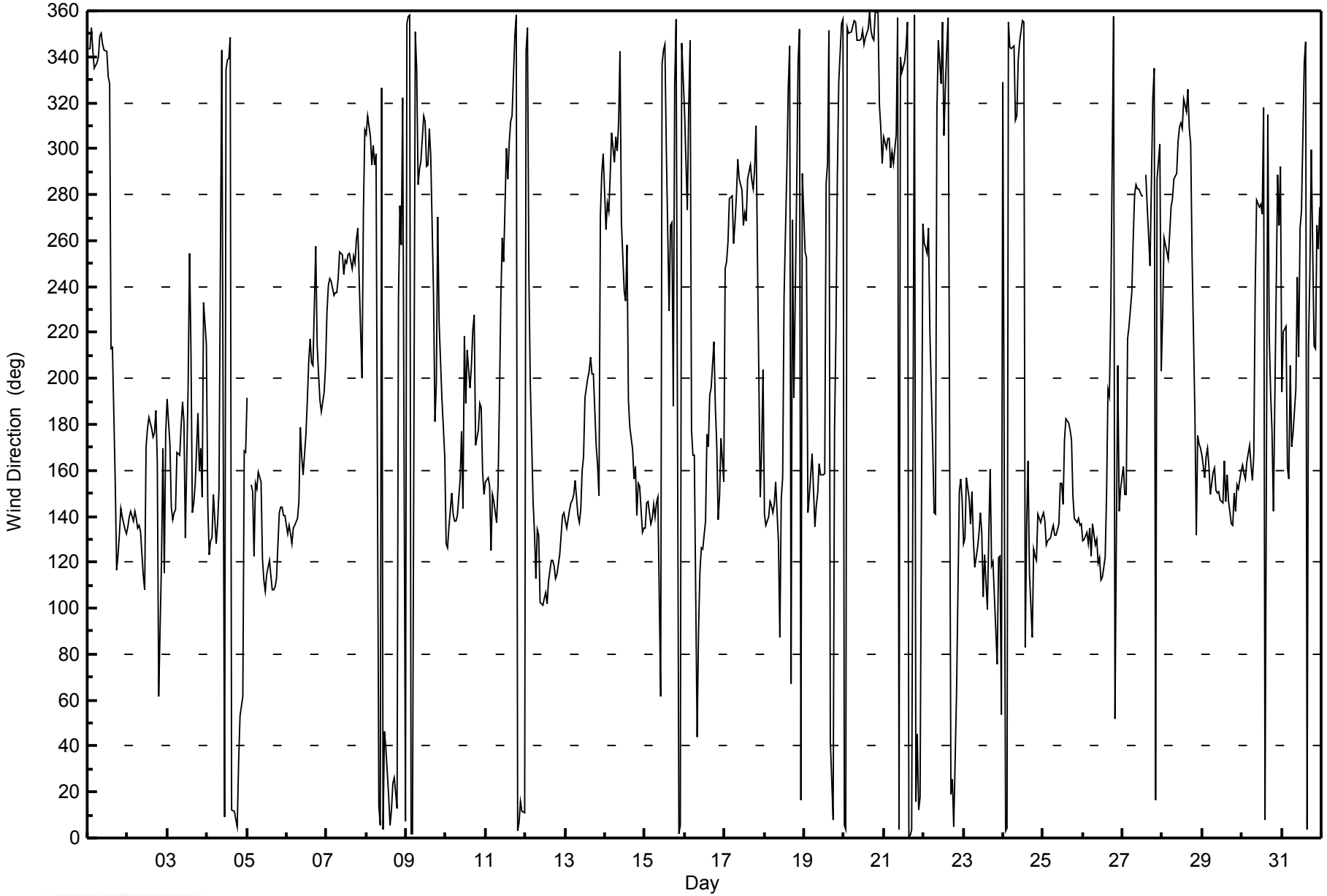
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 3, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4

Reason: Routine

Start Time (MST)	8:00	End Time (MST)	12:45
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	-592	-592
Analyzer Range (mv)	5000	5000	Lamp voltage	823	817
Calculated slope	0.999299	0.999005	Chamber temp.	45.0	45.3
Calculated intercept	-0.967258	-0.761006	Pressure (mmHg)	688.0	687.7
Analyzer Background	9.1	9.4	Flow (lpm)	0.492	0.488
Analyzer Coefficient	0.910	0.907	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	0.8	NA
as found span	5000	58.8	599.8	605.6	0.990
calibrator zero	5000	0.0	0.0	0.3	NA
high point	5000	58.8	599.8	600.5	0.999
second point	5000	29.4	299.9	302.4	0.992
third point	5000	14.7	149.9	150.5	0.996
calibrator zero	5000	0.0	0.0	0.3	NA
as left zero	5000	0.0	0.0	0.4	NA
as left span	5000	58.8	599.8	598.3	1.002
				Average Correction Factor	0.996

Corrected As found	604.8	Previous response	601.1	% change	-0.6%

Notes:

Filter changed after as founds. Adjusted zero and span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

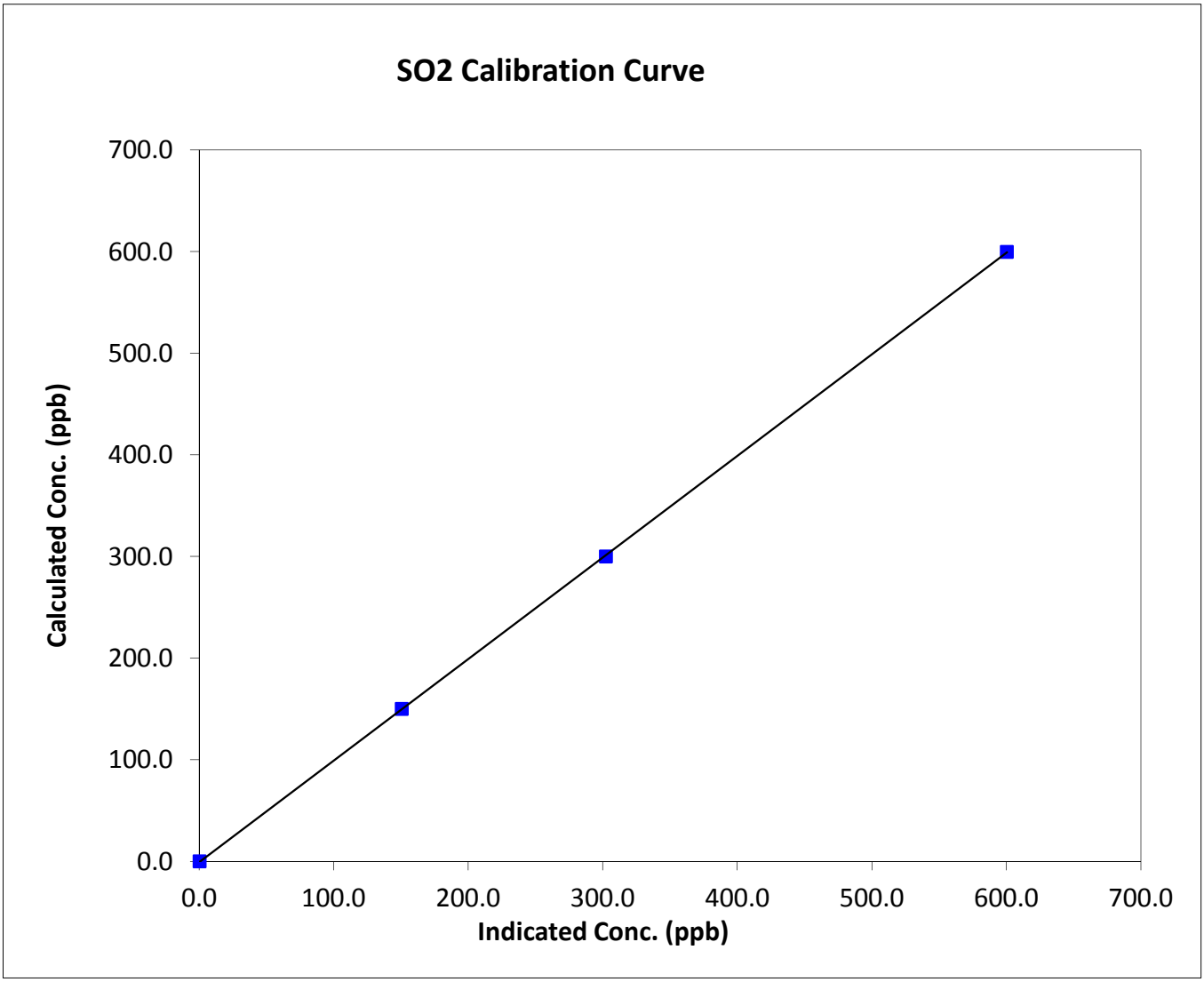
SO_2 Calibration Summary

Station Information

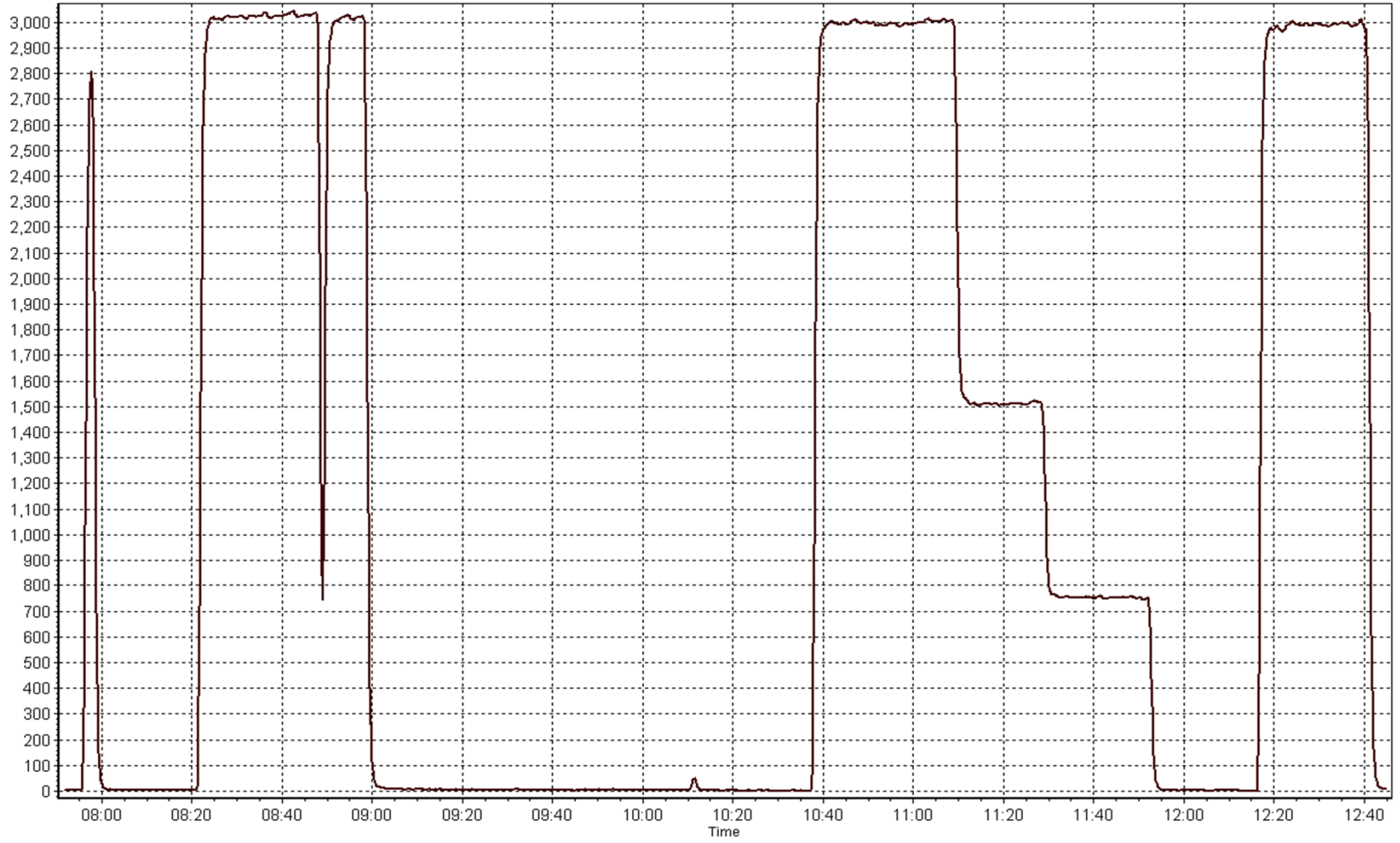
Calibration Date	August 7, 2014	Previous Calibration	July 3, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	8:00	End Time (MST)	12:45
Analyzer make	TEI 43i	Analyzer serial #	JC1327300932

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999985
599.8	600.5	0.9988		
299.9	302.4	0.9917	Slope	0.999005
149.9	150.5	0.9963		
			Intercept	-0.761006



SO2 Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 11, 2014	Previous Calibration	July 3, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	8:25	End Time (MST)	14:35
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 #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-616	-616
Analyzer Range (mv)	5000	5000	Lamp voltage	874	867
Calculated slope	0.979951	0.982956	Chamber temp.	45	45
Calculated intercept	0.045022	0.022843	Pressure	550.8	547.8
Analyzer Background	16.3	16.1	Flow	1.056	1.043
Analyzer Coefficient	1.000	1	Intensity	95	94
			Converter temp.	329	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	-0.6	NA
as found span	6000	46.2	75.1	77.2	0.973
SO2 scrubber check	5000	29.4	299.9	2.7	NA
calibrator zero	6000	0.0	0.0	-0.6	NA
high point	6000	46.2	75.1	75.9	0.989
second point	6000	25.9	42.1	43.3	0.972
third point	6000	15.4	25.0	25.9	0.965
calibrator zero	6000	0.0	0.0	-0.6	NA
as left zero	5000	0.0	0.0	-0.5	NA
as left span	6000	46.2	75.1	80.0	0.938
				Average Correction Factor	0.975

Corrected As found	77.7	Previous response	76.6	% change	-1.5%

Notes:

Changed filter after as founds.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

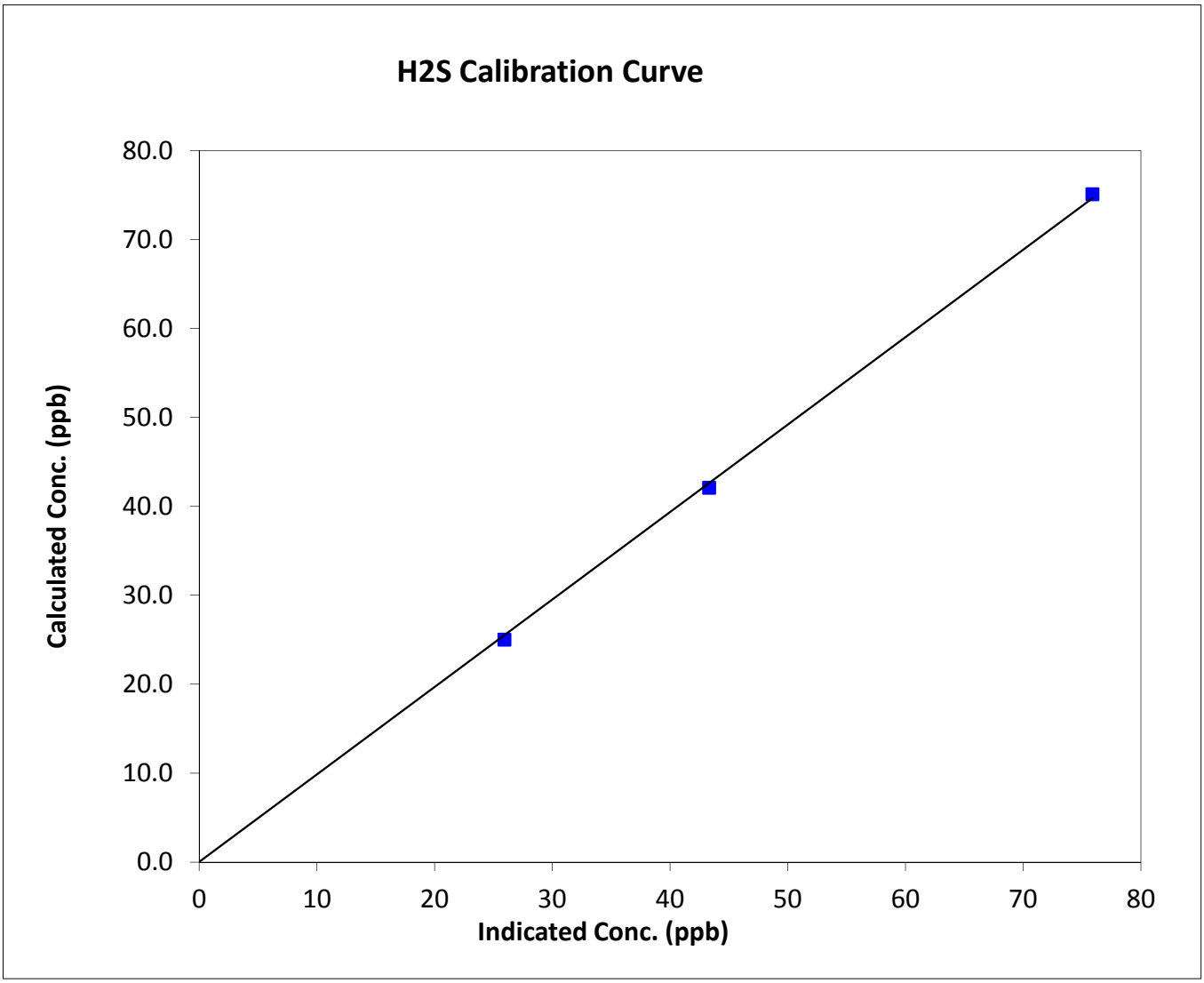
H2S Calibration Summary

Station Information

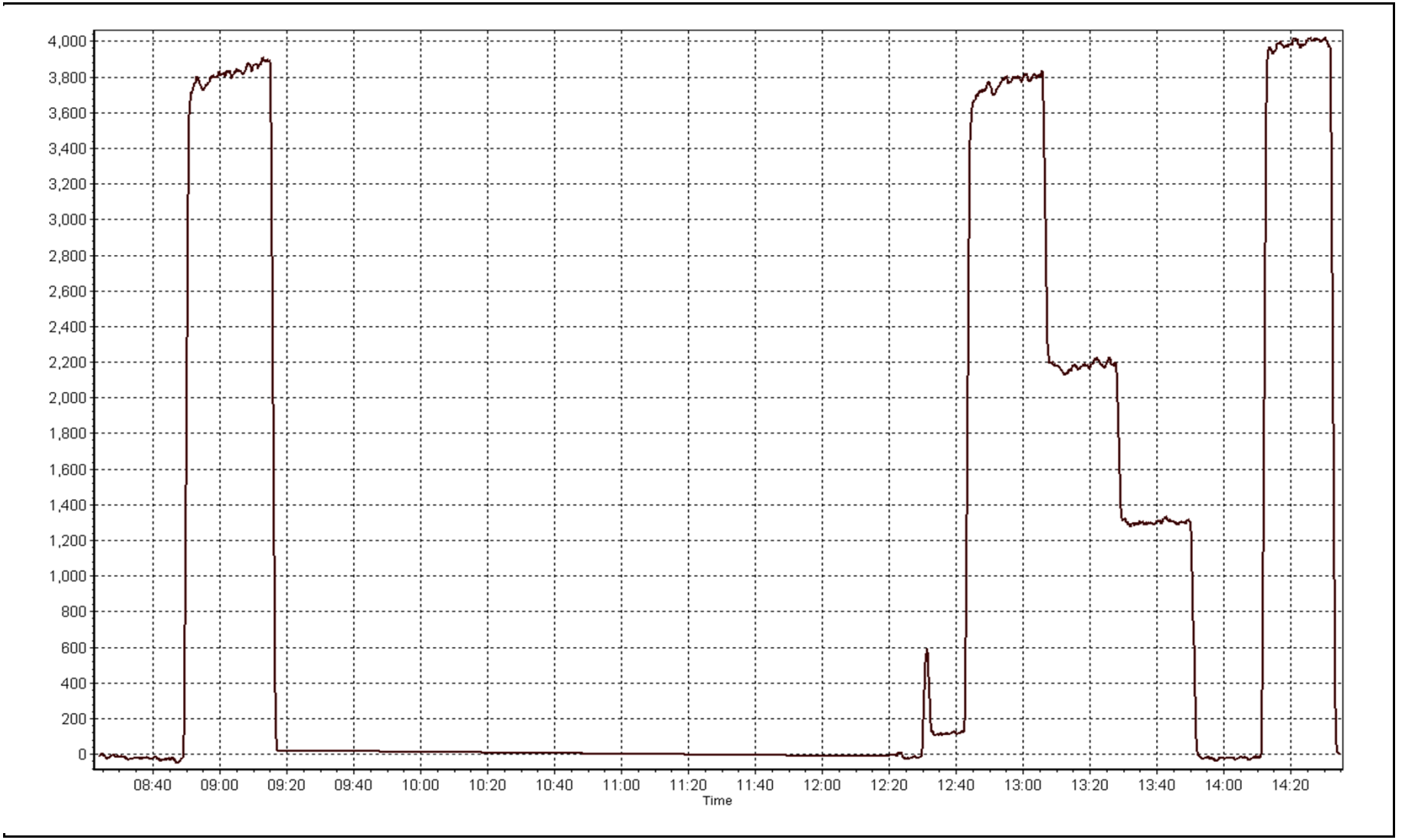
Calibration Date	August 11, 2014	Previous Calibration	July 3, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	8:25	End Time (MST)	14:35
Analyzer make	TEI 450i	Analyzer serial #	1336160094

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999662
75.1	75.9	0.9894		
42.1	43.3	0.9716	Slope	0.982956
25.0	25.9	0.9650		
			Intercept	0.022843



H2S Calibration Plot Date: Monday, August 11, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, August 07, 2014	Previous Calibration	Thursday, July 03, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	8:00	End Time (MST)	12:42
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	0.995514	0.999668	Fuel Pressure	19.9	18.7
Calculated intercept	0.031813	-0.068162			
BKG	1.7	1.7			
COEF	4.269	4.108			

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	-0.20	N/A
as found span	5000	58.8	12.56	11.55	1.087
calibrator zero	5000	0.0	0.00	0.02	N/A
high point	5000	58.8	12.56	12.59	0.997
second point	5000	29.4	6.28	6.41	0.979
third point	5005	14.7	3.14	3.23	0.970
calibrator zero					
as left zero	5000	0.0	0.00	0.06	N/A
as left span	5000	58.8	12.56	12.68	0.990
				Average Correction Factor	0.982

Corrected As found	11.75	Previous response	12.58	% change	7.1%

Notes:

Filter changed after as founds. Pump replaced. Adjusted zero and span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

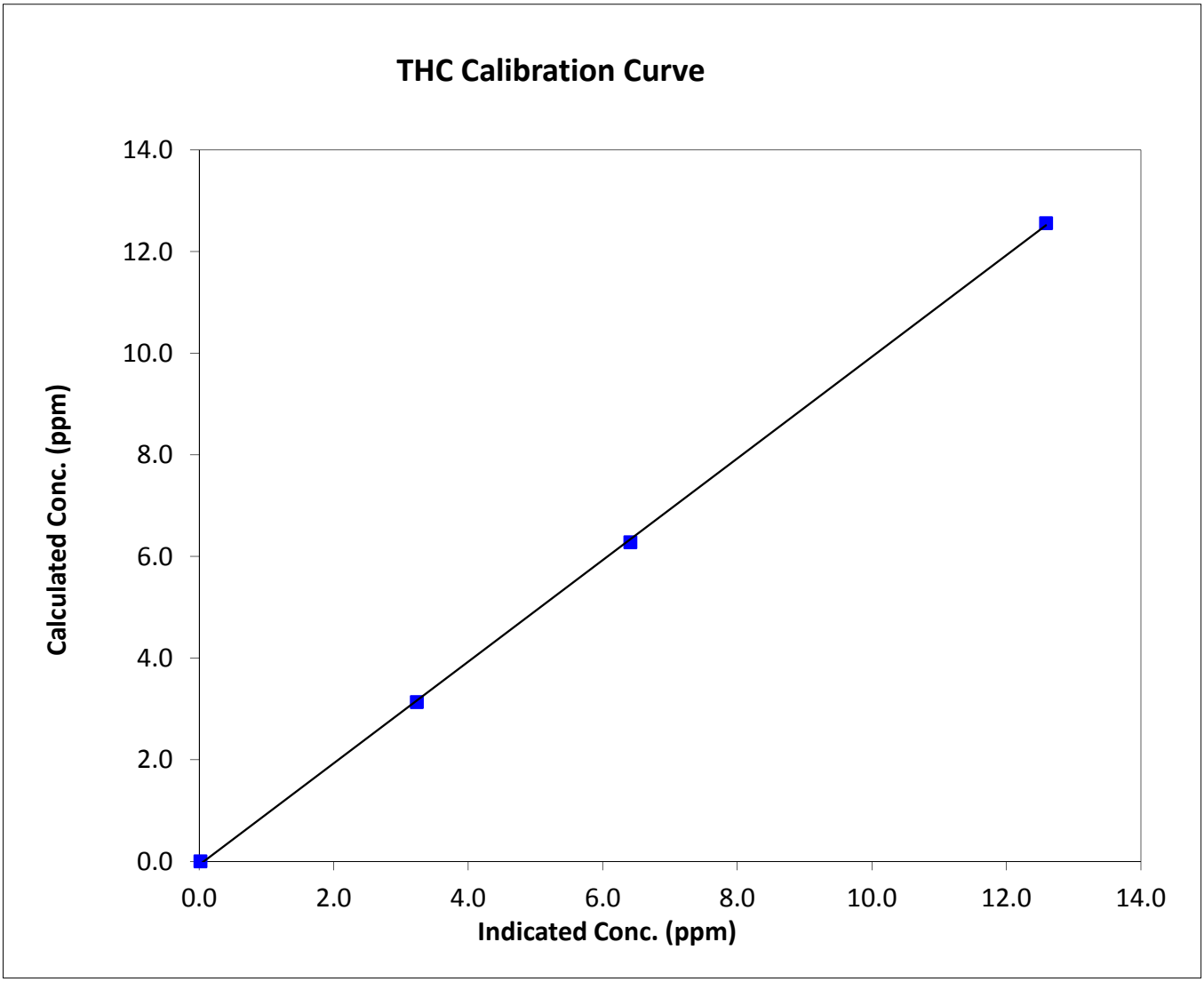
THC Calibration Summary

Station Information

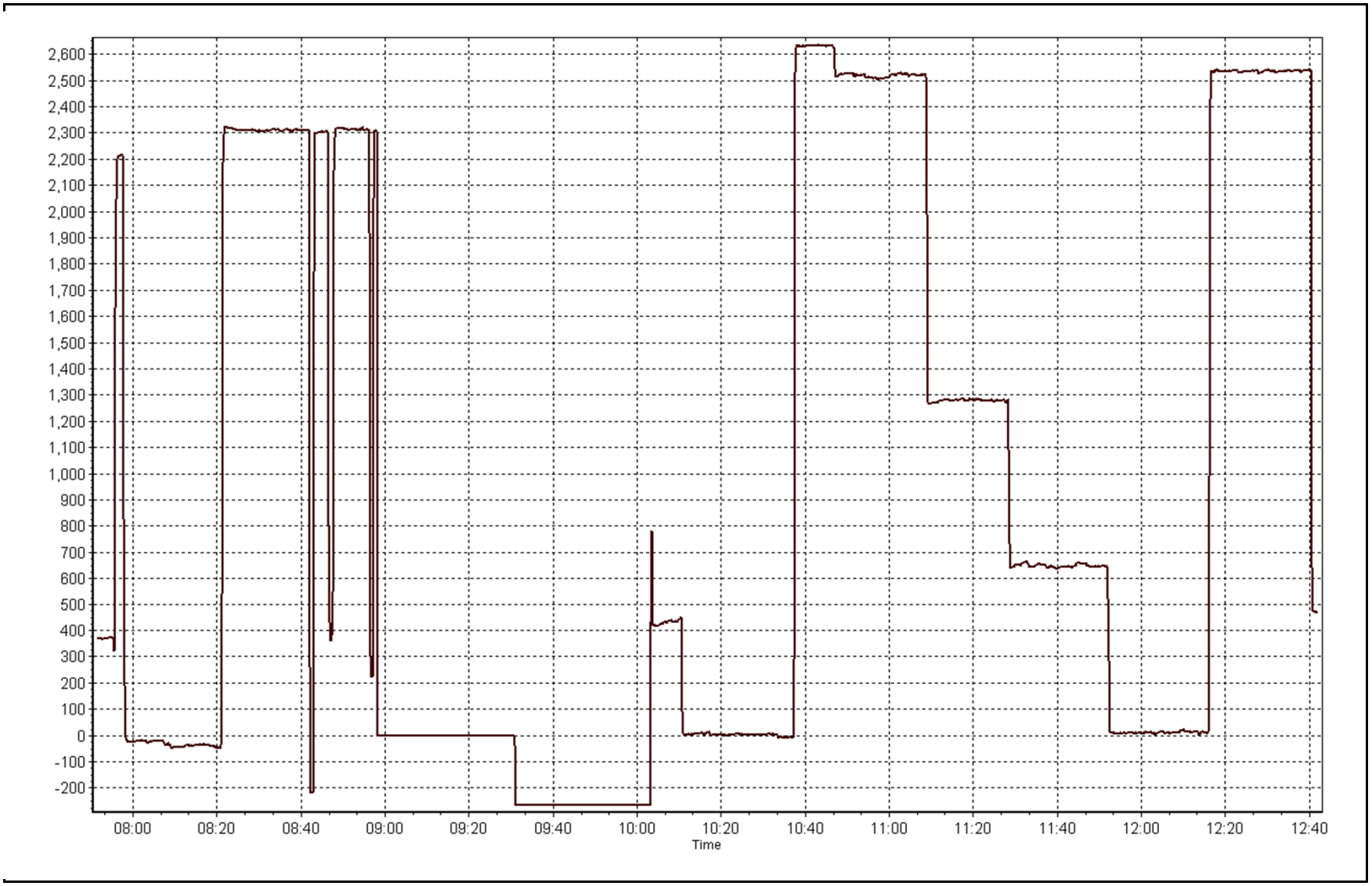
Calibration Date	August 7, 2014	Previous Calibration	July 3, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	8:00	End Time (MST)	12:42
Analyzer make	TEI 51i-LT	Analyzer serial #	1201650671

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.02	N/A	Correlation Coefficient	0.999897
12.56	12.59	0.9973		
6.28	6.41	0.9793	Slope	0.999668
3.14	3.23	0.9698		
			Intercept	-0.068162



THC Calibration Plot Date: August 7, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 5
MANNIX
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
AUGUST 2014

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	704	38	40	99.73	47	0	13	0
H2S (ppb) Average	708	35	36	99.87	28	9	6	1
THC (ppm) Average	708	35	36	99.87	4.7	-	2.7	-
Temperature 2 m (C) Average	744	0	0	100.00	30.6	-	24.7	-
Temperature 20 m (C) Average	744	0	0	100.00	30.6	-	24.9	-
Temperature 45 m (C) Average	744	0	0	100.00	30.2	-	24.8	-
Temperature 75 m (C) Average	744	0	0	100.00	29.9	-	24.8	-
Temperature 90 m (C) Average	744	0	0	100.00	29.8	-	24.8	-
Relative Humidity 2 m (%) Average	744	0	0	100.00	97	-	-	-
Relative Humidity 20 m (%) Average	744	0	0	100.00	97	-	-	-
Relative Humidity 45 m (%) Average	744	0	0	100.00	97	-	-	-
Relative Humidity 75 m (%) Average	744	0	0	100.00	97	-	-	-
Relative Humidity 90 m (%) Average	744	0	0	100.00	98	-	-	-
Wind Speed 20 m (km/h) Average	744	0	0	100.00	29	-	-	-
Wind Speed 45 m (km/h) Average	744	0	0	100.00	33	-	-	-
Wind Speed 75 m (km/h) Average	744	0	0	100.00	35	-	-	-
Wind Speed 90 m (km/h) Average	744	0	0	100.00	37	-	-	-
Wind Direction 20 m (deg) Average	744	0	0	100.00	-	-	-	-
Wind Direction 45 m (deg) Average	744	0	0	100.00	-	-	-	-
Wind Direction 75 m (deg) Average	744	0	0	100.00	-	-	-	-
Wind Direction 90 m (deg) Average	744	0	0	100.00	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	0	0	100.00	0.7	-	-	-
Vertical Wind Speed 45 m (km/h) Average	744	0	0	100.00	1.3	-	-	-
Vertical Wind Speed 75 m (km/h) Average	744	0	0	100.00	1.4	-	-	-
Vertical Wind Speed 90 m (km/h) Average	744	0	0	100.00	4.1	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	704	2.6	6	-	0	0	0	0	1	8	47
H2S (ppb) Average	708	1.2	2	-	0	0	0	0	1	3	28
THC (ppm) Average	708	2.36	0.3	-	2	2.1	2.2	2.3	2.4	2.7	4.7
Temperature 2 m (C) Average	744	17.81	6	-	3	10.3	13.4	17.4	21.8	26.5	30.6
Temperature 20 m (C) Average	744	18.16	5.8	-	4.5	10.9	14	17.8	22.2	26.6	30.6
Temperature 45 m (C) Average	744	18.13	5.7	-	4.9	11	13.8	17.9	22.2	26.5	30.2
Temperature 75 m (C) Average	744	18.15	5.7	-	5.6	11	13.7	18	22.2	26.4	29.9
Temperature 90 m (C) Average	744	18.15	5.6	-	5.9	11	13.7	18	22.3	26.3	29.8
Relative Humidity 2 m (%) Average	744	65.5	19	-	26	40	50	66	81	91	97
Relative Humidity 20 m (%) Average	744	61	18	-	23	36	46	61	75	86	97
Relative Humidity 45 m (%) Average	744	59.4	18	-	22	36	45	59	72	85	97
Relative Humidity 75 m (%) Average	744	58.3	17	-	23	36	45	58	71	83	97
Relative Humidity 90 m (%) Average	744	58.1	17	-	23	36	45	57	70	83	98
Wind Speed 20 m (km/h) Average	744	8.3	4	-	1	4	5	8	11	13	29
Wind Speed 45 m (km/h) Average	744	12.6	6	-	0	5	8	12	16	20	33
Wind Speed 75 m (km/h) Average	744	14.4	7	-	1	5	8	13	20	24	35
Wind Speed 90 m (km/h) Average	744	15.4	8	-	1	6	9	14	21	27	37
Wind Direction 20 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	0.02	0.2	-	-0.9	-0.3	-0.1	0	0.2	0.3	0.7
Vertical Wind Speed 45 m (km/h) Average	744	0.24	0.4	-	-0.8	-0.2	0	0.2	0.5	0.7	1.3
Vertical Wind Speed 75 m (km/h) Average	744	0.15	0.3	-	-0.8	-0.2	-0.1	0.1	0.3	0.6	1.4
Vertical Wind Speed 90 m (km/h) Average	744	0.78	0.8	-	-1	-0.1	0.2	0.6	1.2	1.8	4.1

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	13 Aug 2014 10:00	13 Aug 2014 10:00	1	Maintenance - Station operator on site
SO2	21 Aug 2014 09:00	21 Aug 2014 09:00	1	Maintenance - sample manifold cleaned
H2S	21 Aug 2014 09:00	21 Aug 2014 09:00	1	Maintenance - sample manifold cleaned
THC	21 Aug 2014 09:00	21 Aug 2014 09:00	1	Maintenance - sample manifold cleaned

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 47 ppb on Aug 8 10:00 Maximum Daily Average: 13.3 ppb on Aug 1

Minimum Value: 0 ppb on Aug 12 23:00 Minimum Daily Average: 0.2 ppb on Aug 25
Maximum Diurnal Average: 6.1 ppb at hour 10 Minimum Diurnal Average: 1.0 ppb at hour 22
Monthly Average: 2.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 8$ $P_{99} = 29$

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	38
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-Aug	33	Z	15	31	25	15	16	45	6	8	4	1	2	2	7	5	22	16	14	12	9	7	5	5	13.3	45
2-Aug	2	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0.8	2
3-Aug	0	Z	1	0	0	0	0	1	0	1	4	3	1	4	10	25	8	8	4	2	1	1	1	0	3.2	25
4-Aug	1	Z	0	0	0	0	0	0	1	15	14	38	11	4	9	2	1	1	1	1	1	1	1	1	4.6	38
5-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	2	1	1	1	0	0	0.8	2
6-Aug	0	Z	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0.6	1
7-Aug	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0.5	3
8-Aug	22	Z	2	3	1	2	1	1	21	47	27	19	11	20	4	2	1	1	1	1	1	1	3	2	8.4	47
9-Aug	2	Z	6	12	1	2	4	13	19	22	23	9	18	14	1	6	1	0	26	14	6	2	1	0	8.8	26
10-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	1	0.4	1
11-Aug	1	Z	0	0	0	1	1	0	0	1	16	40	8	11	17	13	4	2	1	1	1	0	1	1	5.2	40
12-Aug	1	Z	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
13-Aug	0	Z	0	0	0	0	0	0	0	M	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0.4	1
14-Aug	1	Z	1	0	1	1	2	2	7	C	C	C	C	C	C	C	2	2	1	1	2	2	2	2	--	7
15-Aug	1	Z	1	0	0	0	1	1	1	0	0	0	0	0	0	3	0	0	0	1	0	0	0	3	0.7	3
16-Aug	3	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3
17-Aug	0	Z	0	0	0	0	0	3	5	16	25	1	0	0	1	0	0	0	1	21	8	1	0	0	3.7	25
18-Aug	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	11	3	1	0	0	0	4	2	1	1.1	11
19-Aug	0	Z	0	0	0	0	0	0	0	1	1	1	2	1	13	17	6	1	1	1	9	3	4	3	2.9	17
20-Aug	8	Z	27	28	22	18	11	11	10	7	4	5	9	3	1	1	0	1	2	1	0	2	0	0	7.4	28
21-Aug	0	Z	1	1	1	1	6	3	M	6	1	0	1	0	0	2	3	2	0	0	0	0	1	0	1.4	6
22-Aug	0	Z	0	0	0	0	0	0	1	20	36	13	4	2	1	1	3	0	0	0	0	0	0	0	3.6	36
23-Aug	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Aug	0	Z	0	2	1	1	2	1	4	24	11	14	4	0	0	0	0	0	0	0	0	0	0	0	2.9	24
25-Aug	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-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	1	5	3	0.8	5
27-Aug	1	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	1	1	0	8	0.8	8
28-Aug	0	Z	0	0	0	0	0	0	0	3	7	6	26	13	6	8	11	2	1	0	1	1	1	0	3.8	26
29-Aug	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
30-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	0	0	0	0.3	2
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	5	1	1	2	4	1	0	0	0	0	0.6	5
	2.7	--	2.0	2.7	1.9	1.6	1.6	2.9	2.6	6.1	6.0	5.2	3.5	2.6	2.7	3.4	2.4	1.4	2.2	2.1	1.4	1.0	1.0	1.2	Diurnal Average	
	33	--	27	31	25	18	16	45	21	47	36	40	26	20	17	25	22	16	26	21	9	7	5	8	Diurnal Maximum	

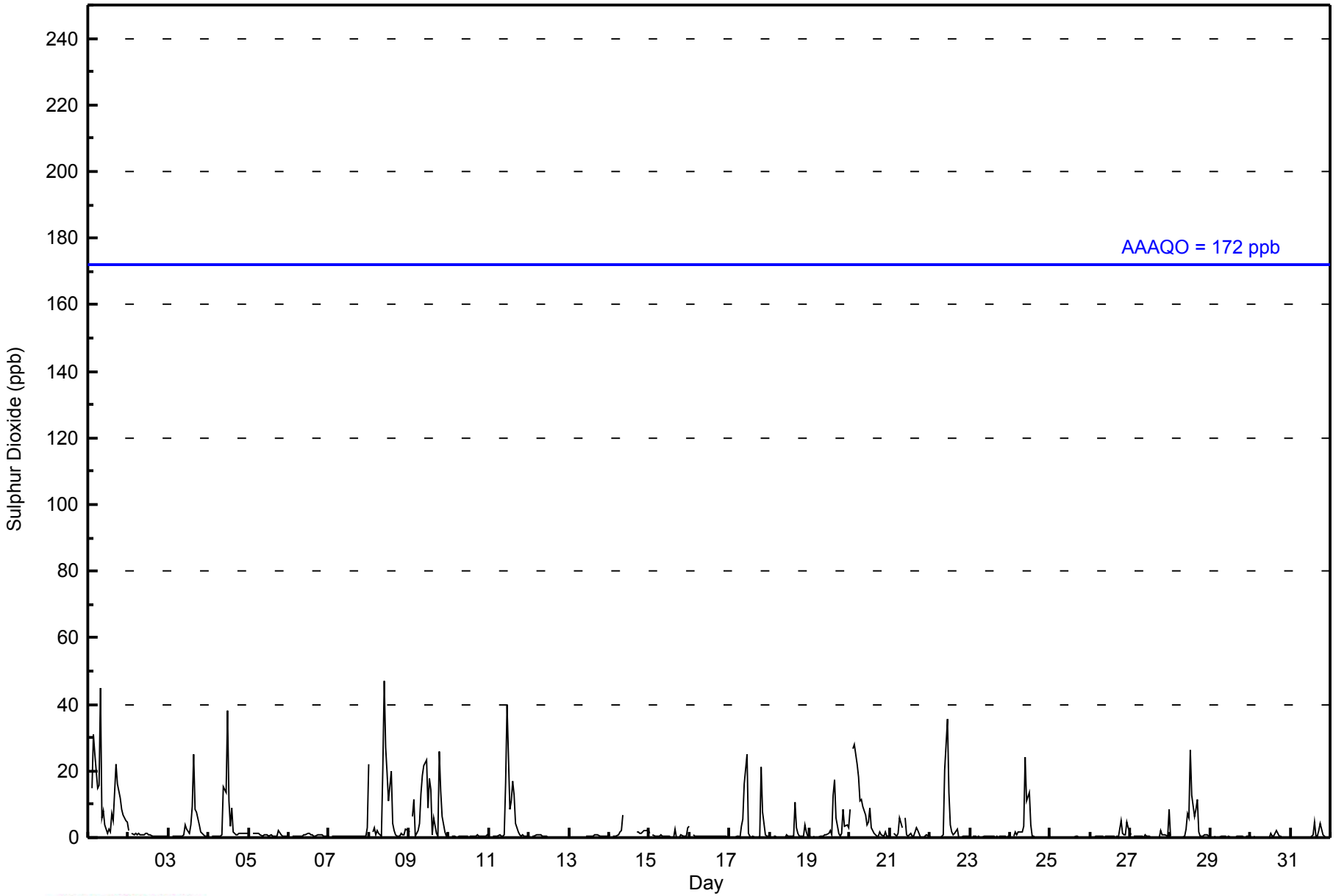
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	646	91.76	91.76
11 - 20	35	4.97	96.73
21 - 60	23	3.27	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mannix - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	24	38	8	6	4	13	81	140	52	40	41	44	76	35	18	26	646
11 - 20	6	4	3	0	1	0	0	3	0	1	0	0	2	10	2	3	35
21 - 60	8	2	0	1	0	0	0	0	0	0	0	1	3	2	5	1	23
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	44	11	7	5	13	81	143	52	41	41	45	81	47	25	30	704

Total Number of Valid Hours: 704

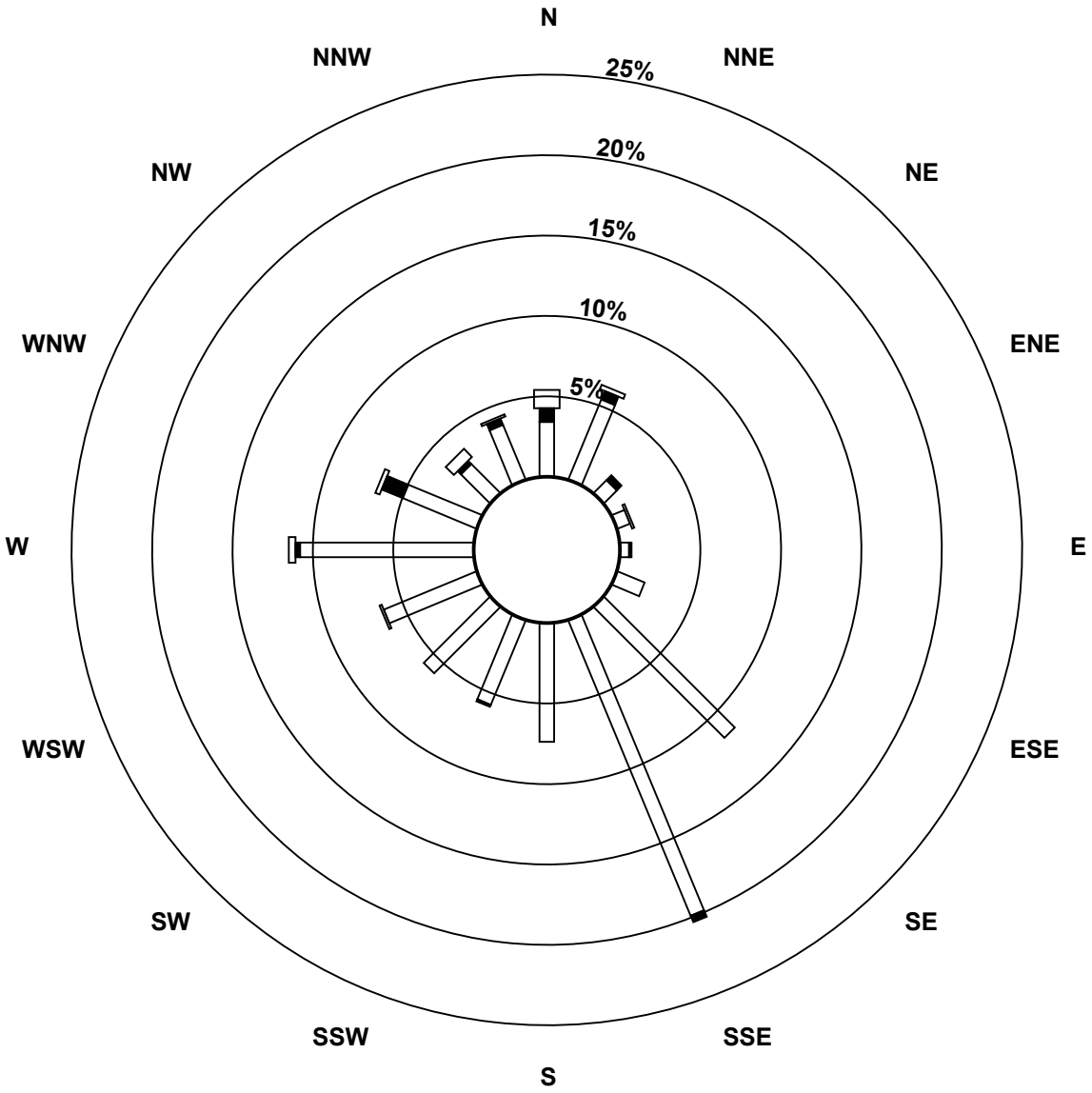
Total Number of Hours: 744

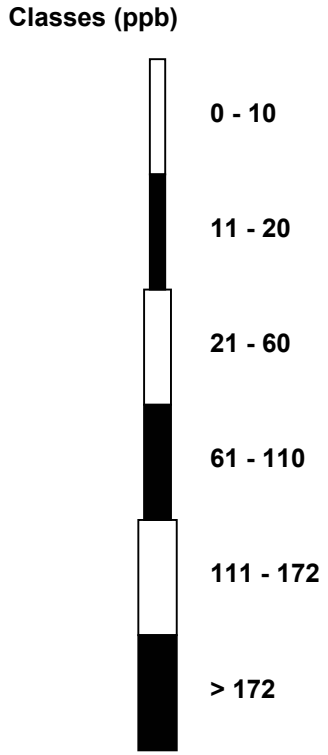
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Mannix (AMS 5)





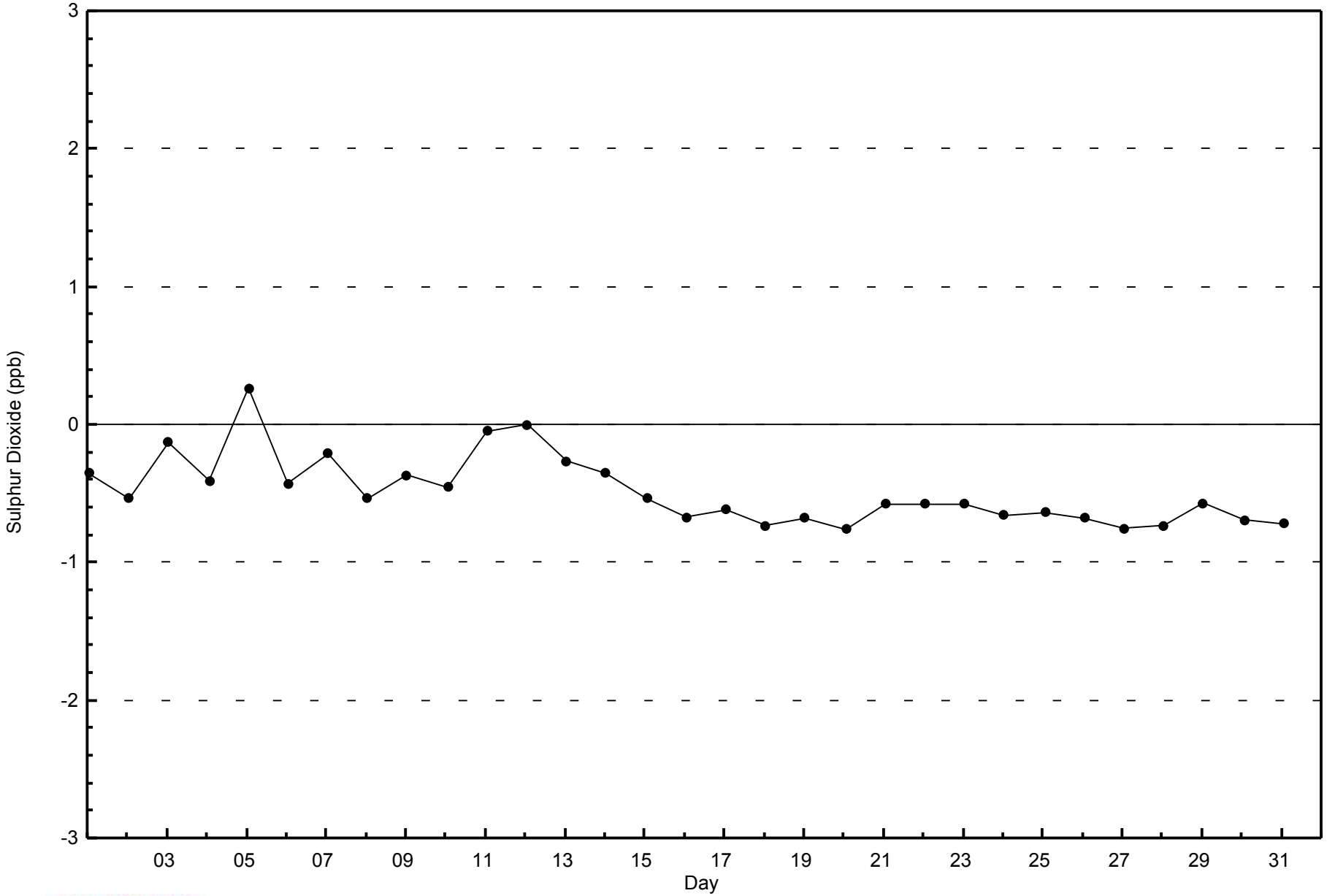
Total Number of Valid Hours: 704

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - August 2014



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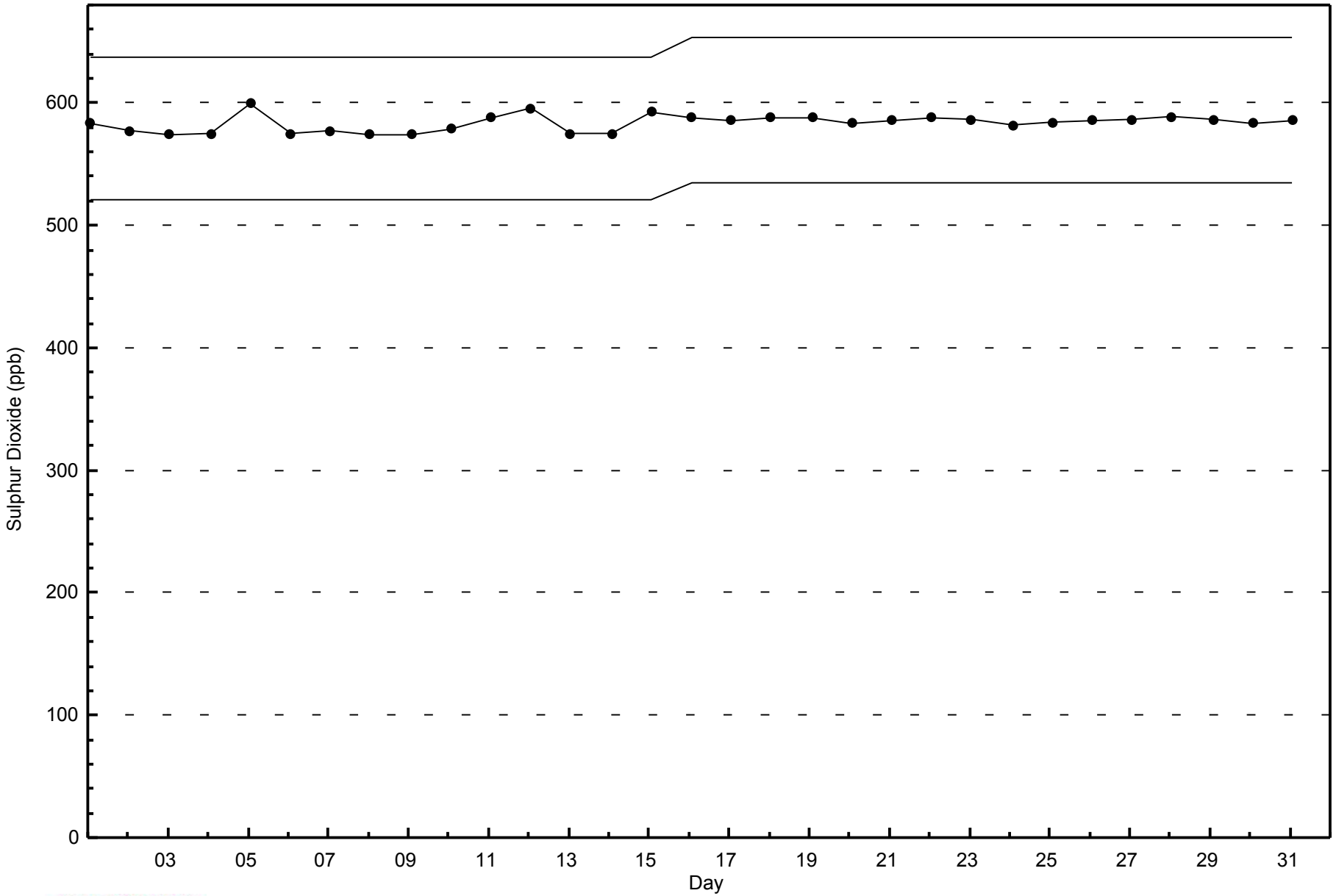
ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - August 2014

Number of Exceedences (AAAQO): 1-hr: 9 24-hr: 1
Maximum Value: 28 ppb on Aug 24 03:00 Maximum Daily Average: 6.2 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 18:00
Maximum Diurnal Average: 16.7 ppb at hour 3
Monthly Average: 1.2 ppb

Minimum Daily Average: 0.2 ppb on Aug 25
Minimum Diurnal Average: 0.5 ppb at hour 18
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 9$

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

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Aug	4	5	6	6	3	Z	3	4	2	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1.9	6
2-Aug	1	0	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
3-Aug	1	1	Z	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.5	1
4-Aug	1	0	Z	1	1	1	0	0	1	3	1	2	2	1	4	1	1	1	1	2	2	1	1	1	1.2	4
5-Aug	1	1	Z	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
6-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1
7-Aug	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3	2
8-Aug	3	2	Z	2	2	3	2	1	2	3	2	1	1	1	0	1	1	1	2	0	0	1	4	2	1.6	4
9-Aug	4	1	Z	4	2	3	3	2	1	1	3	2	2	1	0	1	0	0	1	1	1	1	0	1	1.4	4
10-Aug	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
11-Aug	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	3	4	1	2	2	2	2	5	8	1.5	8
12-Aug	8	3	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	8
13-Aug	0	0	Z	0	0	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	1	6	16	1.5	16
14-Aug	3	0	Z	1	5	6	4	7	8	5	5	1	1	1	0	0	0	0	0	0	0	0	0	0	2.2	8
15-Aug	0	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	3	5	4	4	9	1.4	9
16-Aug	11	3	Z	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	11
17-Aug	0	0	Z	0	1	0	0	2	4	2	0	0	0	0	0	0	0	0	1	9	6	0	0	0	1.3	9
18-Aug	0	0	Z	0	0	0	0	0	0	0	1	0	0	1	6	3	1	1	1	0	1	6	2	3	1.3	6
19-Aug	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	2	5	1	1	0	1	0	6	7	5	1.4	7
20-Aug	3	4	Z	4	5	3	3	2	4	3	4	5	3	2	2	2	2	2	4	2	3	5	2	2	3.1	5
21-Aug	1	1	Z	4	2	1	1	2	M	4	1	1	1	1	1	1	1	1	2	2	2	3	17	5	2.5	17
22-Aug	1	1	Z	1	0	0	1	1	2	5	4	1	1	1	1	1	1	1	1	2	1	0	0	0	1.2	5
23-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
24-Aug	2	12	28	27	8	Z	5	4	17	20	11	7	1	0	0	0	0	0	0	0	0	0	0	0	6.2	28
25-Aug	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-Aug	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	1	3	2	0.6	3
27-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	9	7	2	4	1.3	9
28-Aug	1	0	Z	0	0	0	0	0	0	0	1	2	1	1	2	1	0	1	0	0	0	1	0	0	0.7	2
29-Aug	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
30-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	0.4	2
31-Aug	1	0	Z	0	0	0	0	0	0	0	0	0	0	1	3	3	2	0	1	0	0	0	0	0	0.6	3
	1.6	1.3	16.7	1.9	1.2	0.9	1.0	1.1	1.6	1.8	1.4	1.0	0.6	0.5	0.9	0.9	0.6	0.5	0.8	1.0	1.2	1.3	1.9	2.2	Diurnal Average	
	11	12	28	27	8	6	5	7	17	20	11	7	3	2	6	5	4	2	4	9	9	7	17	16	Diurnal Maximum	

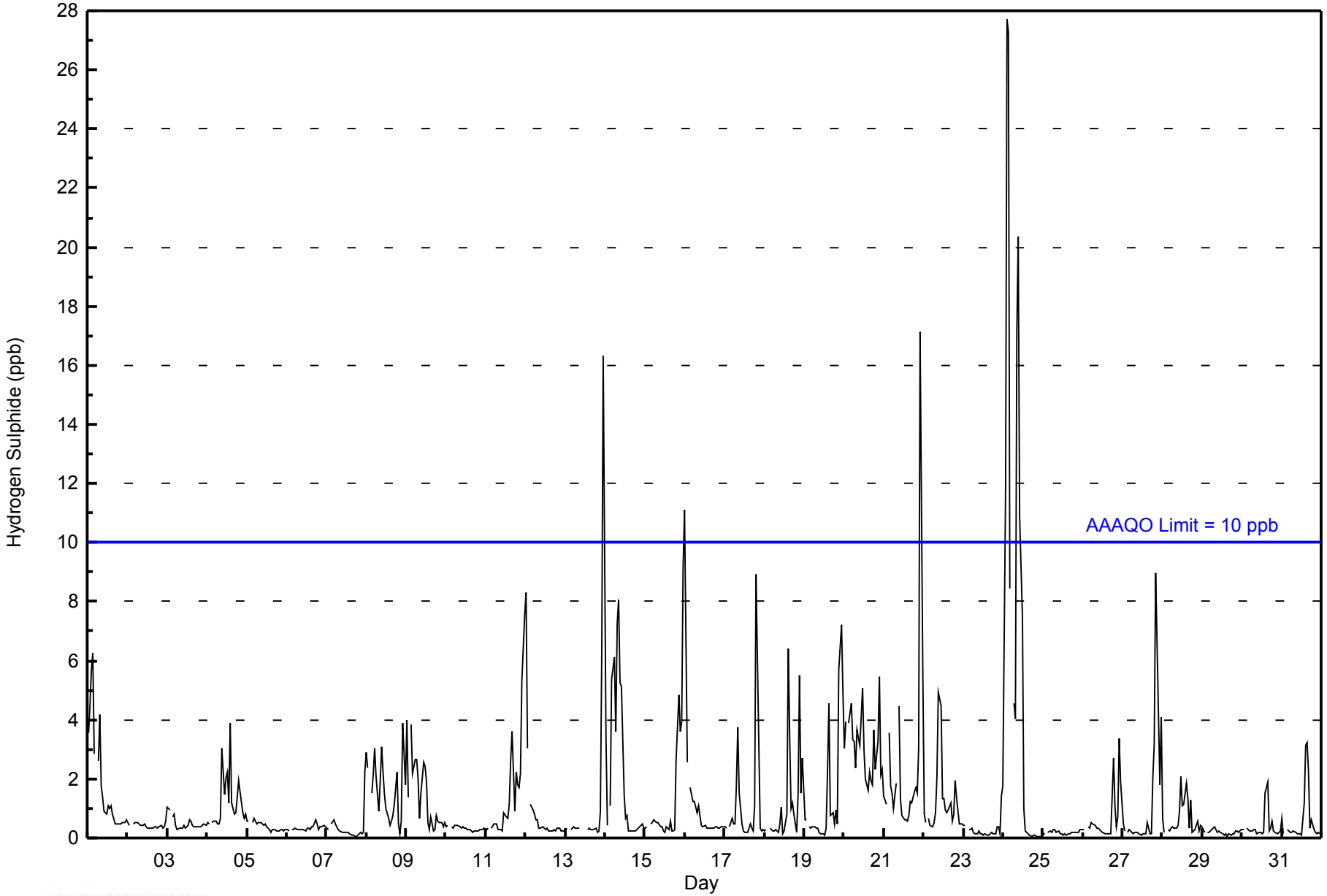
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	617	87.15	87.15
3 - 4	49	6.92	94.07
5 - 7	26	3.67	97.74
8 - 11	7	0.99	98.73
> 11	9	1.27	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mannix - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	13	25	8	7	5	13	80	145	49	38	41	45	78	42	11	17	617
3 - 4	16	10	1	0	0	0	0	0	1	1	0	0	3	3	8	6	49
5 - 7	6	5	1	0	0	0	0	0	0	0	0	0	3	3	4	4	26
8 - 11	3	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	7
> 11	2	3	1	0	0	0	0	0	0	0	0	0	0	0	1	2	9
Totals	40	45	11	7	5	13	80	145	50	39	41	45	84	48	26	29	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

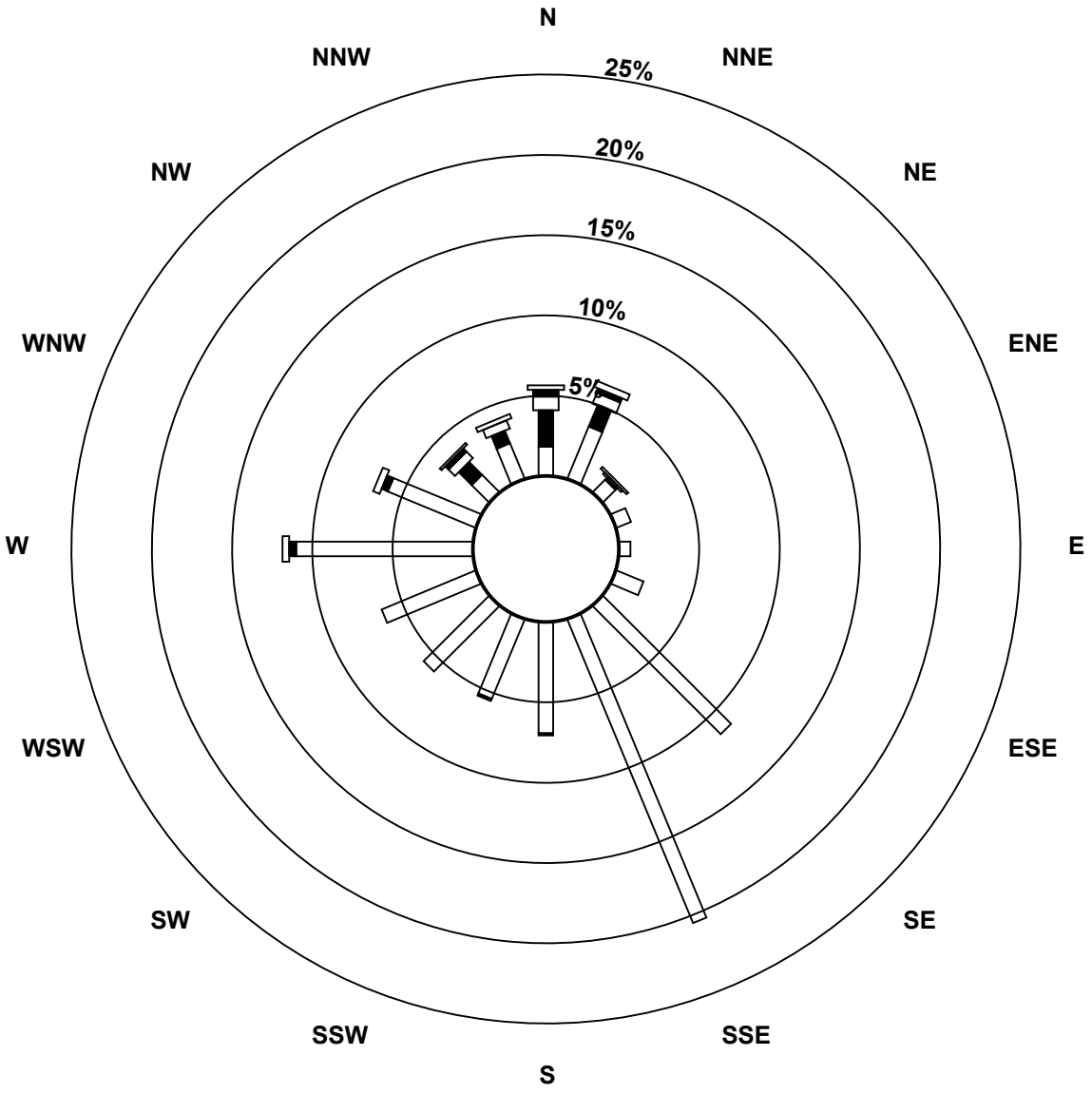
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

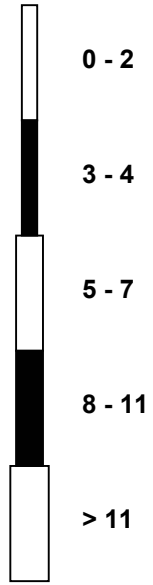
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Mannix (AMS 5)



Classes (ppb)



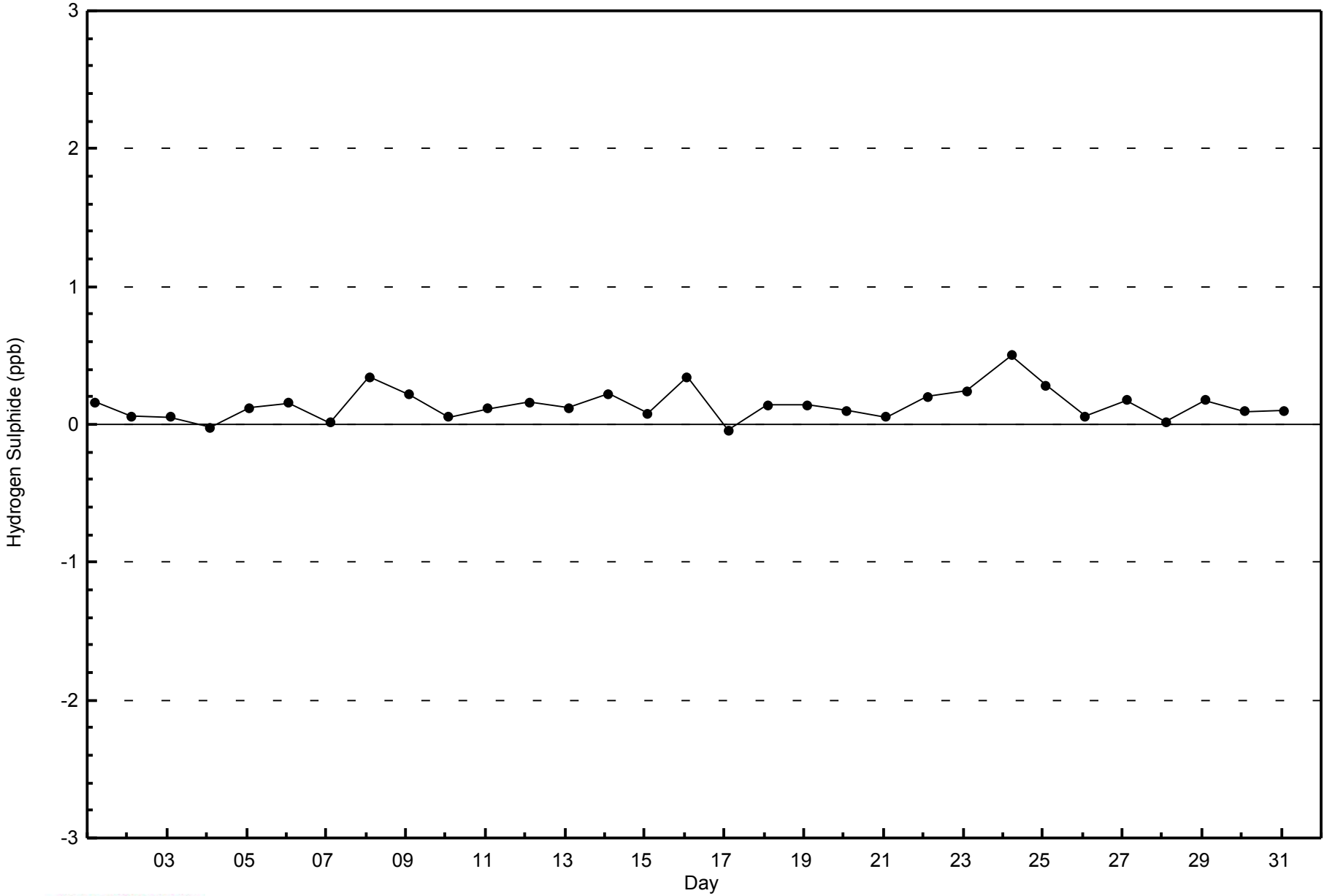
Total Number of Valid Hours: 708

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - August 2014



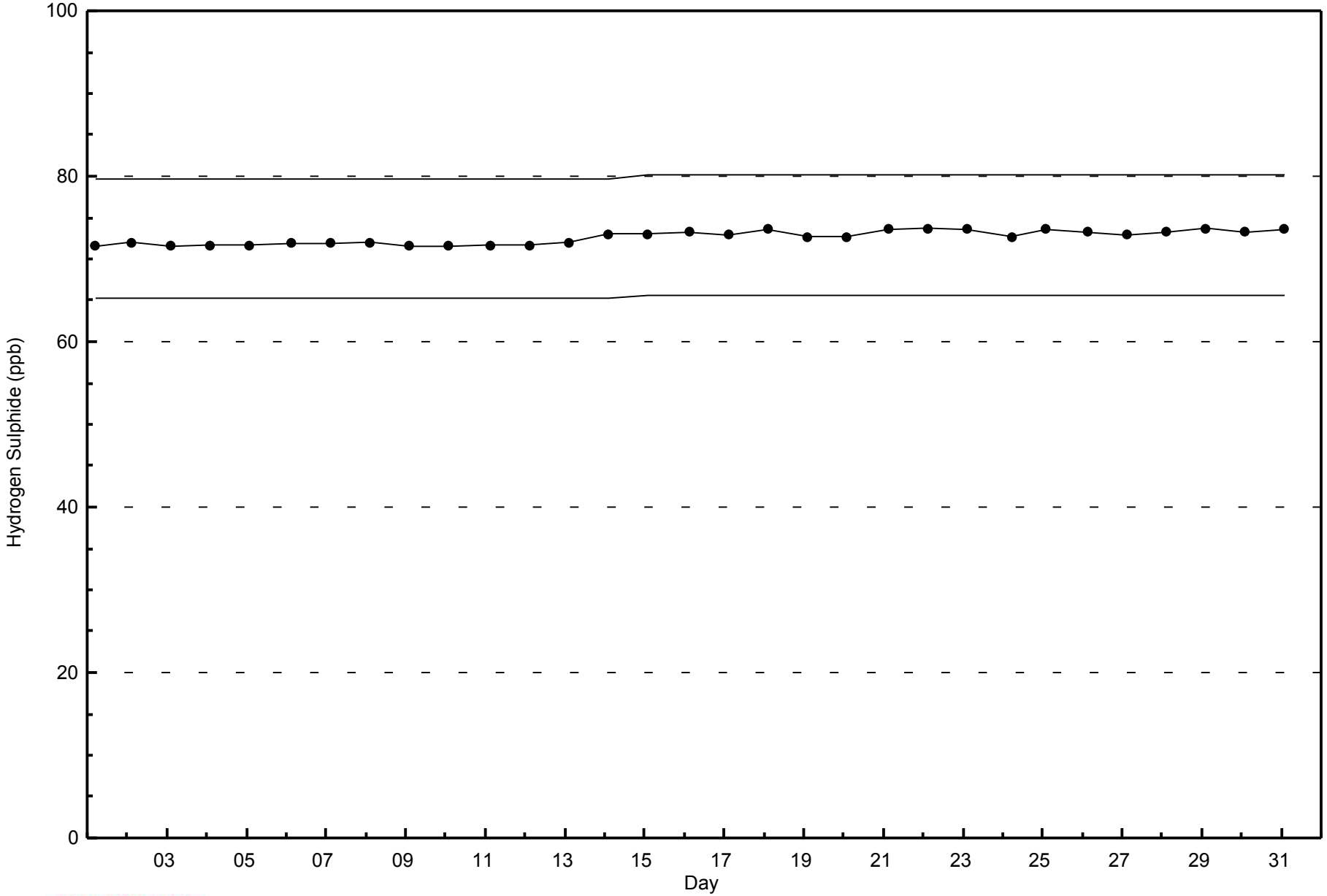
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - August 2014

Maximum Value: 4.7 ppm on Aug 24 10:00

Maximum Daily Average: 2.7 ppm on Aug 14

Minimum Value: 2.0 ppm on Aug 26 18:00

Minimum Daily Average: 2.1 ppm on Aug 29

Maximum Diurnal Average: 2.5 ppm at hour 3

Minimum Diurnal Average: 2.2 ppm at hour 18

Monthly Average: 2.36 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:	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-Aug	2.5	Z	2.7	2.7	2.6	2.7	2.6	2.5	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.7
2-Aug	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.2	2.2	2.8	2.3	2.8
3-Aug	2.7	Z	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.7
4-Aug	2.4	Z	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.9	2.9	2.9	3.2	2.5	2.8	2.5	2.3	2.4	2.4	2.7	2.9	3.0	3.0	2.7	2.6	3.2
5-Aug	2.5	Z	2.9	2.6	2.6	2.6	2.5	2.5	2.5	2.6	2.5	2.6	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.9
6-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4
7-Aug	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.6	2.2	2.6
8-Aug	2.9	Z	2.7	2.7	3.0	3.2	2.5	2.4	2.4	3.1	3.1	2.8	2.5	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.2	2.2	2.7	2.3	2.6	3.2
9-Aug	2.5	Z	2.4	2.4	2.4	2.4	2.4	2.8	2.4	2.7	3.3	3.0	2.8	2.3	2.2	2.3	2.1	2.1	2.4	2.3	2.3	2.2	2.2	2.2	2.4	3.3
10-Aug	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.4
11-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.5	2.3	2.2	2.3	2.5	2.6	2.2	2.3	2.4	2.4	2.6	2.4	2.6	2.3	2.6
12-Aug	3.1	Z	2.6	2.7	2.8	2.7	2.6	2.6	2.3	2.3	2.4	2.2	2.2	2.4	2.2	2.2	2.1	2.2	2.2	2.4	2.2	2.2	2.2	2.2	2.4	3.1
13-Aug	2.2	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	3.9	3.7	2.4	3.9
14-Aug	2.8	Z	2.4	2.8	4.0	4.1	3.9	3.6	3.4	C	C	C	C	2.6	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.4	2.7	4.1
15-Aug	2.3	Z	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.2	2.1	2.2	2.1	2.3	2.1	2.1	2.1	2.3	2.4	2.5	2.5	2.5	2.3	2.5
16-Aug	2.8	Z	3.1	3.0	3.1	3.0	3.0	2.7	2.9	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	3.1
17-Aug	2.3	Z	2.3	2.3	2.5	2.4	2.3	2.4	2.8	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	3.5	3.2	2.3	2.2	2.2	2.4	3.5
18-Aug	2.2	Z	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.7	2.4	2.3	2.4	3.3	2.9	2.6	2.5	2.6	2.2	2.4	2.4	2.3	2.4	2.5	3.3
19-Aug	2.4	Z	2.6	2.6	2.4	2.4	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.3	2.7	2.2	2.2	2.1	2.1	2.3	2.7	2.4	2.4	2.3	2.7
20-Aug	2.4	Z	2.4	2.3	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.3	2.6
21-Aug	2.6	Z	2.7	3.1	2.8	2.6	2.4	2.4	M	2.5	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.5	2.4	2.4	3.1
22-Aug	2.4	Z	2.6	2.5	2.4	2.3	2.4	2.6	3.2	3.4	2.7	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.3	2.5	3.4
23-Aug	2.3	Z	3.4	2.4	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	2.4	2.5	2.3	2.5	2.3	3.4
24-Aug	2.7	Z	3.5	3.0	2.9	2.9	3.2	3.0	4.0	4.7	3.5	2.9	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.7	4.7
25-Aug	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3
26-Aug	2.2	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.2	2.5	2.5	2.7	3.2	2.8	2.4	3.2
27-Aug	2.4	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.3	2.5	2.2	2.5	2.2	2.5
28-Aug	2.1	Z	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	2.4	2.2	2.3	2.2	2.2	2.7	2.5	2.2	2.3	2.3	2.7
29-Aug	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.3
30-Aug	2.2	Z	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.4	2.6	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.6
31-Aug	2.6	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.6
	2.4	--	2.5	2.4	2.5	2.5	2.4	2.4	2.5	2.5	2.4	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	Diurnal Average	
	3.1	--	3.5	3.1	4.0	4.1	3.9	3.6	4.0	4.7	3.5	3.0	3.2	2.6	3.3	2.9	2.6	2.5	2.6	3.5	3.2	3.0	3.9	3.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

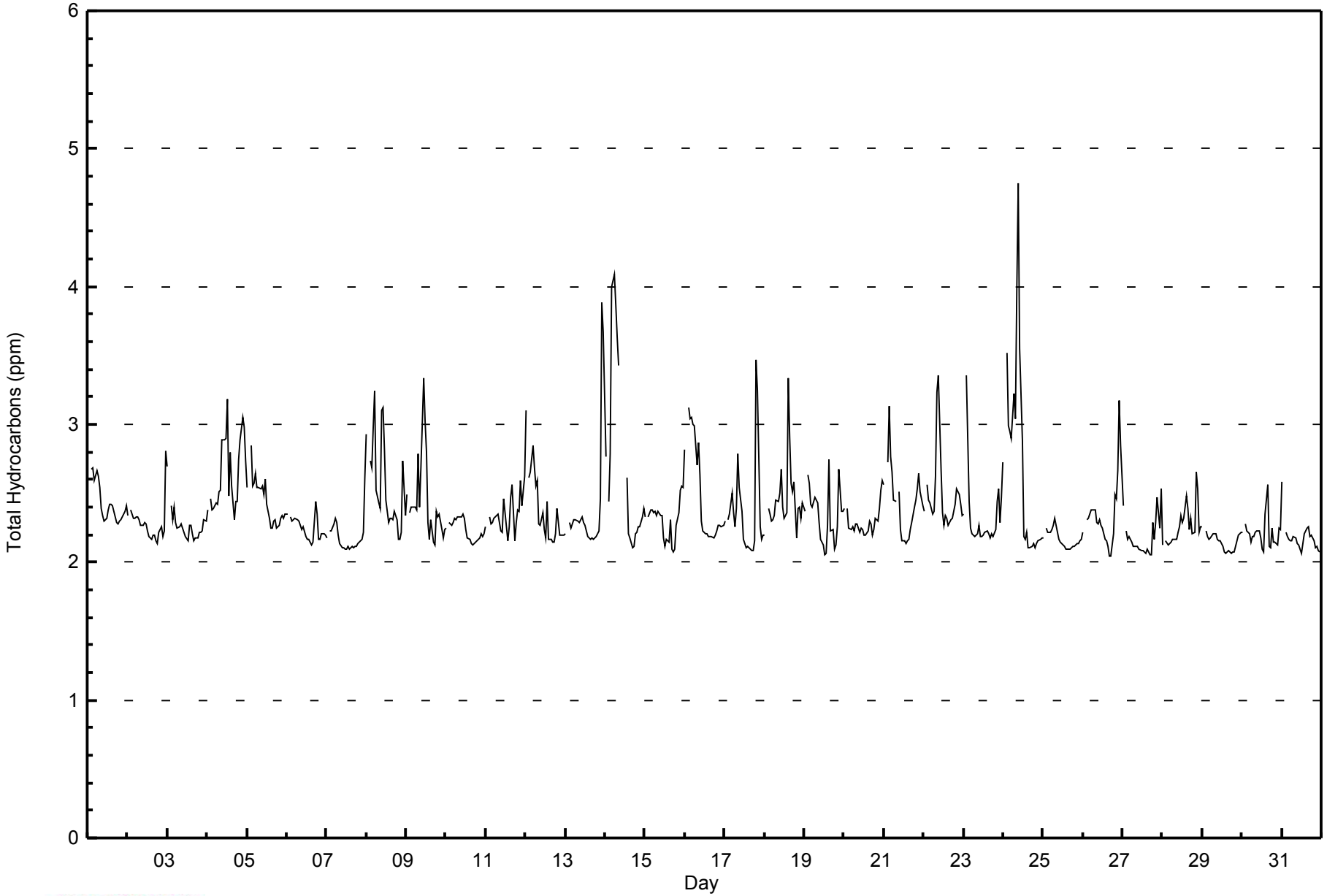
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	2	0.28	0.28
2.1 - 3.0	678	95.76	96.05
3.1 - 10.0	28	3.95	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 - August 2014

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	1	0	1	0	0	0	0	2
2.1 - 3.0	37	42	10	7	5	13	80	144	51	40	41	43	80	42	16	27	678
3.1 - 10.0	1	2	1	0	0	0	1	0	1	0	0	1	4	5	9	3	28
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	44	11	7	5	13	81	144	52	41	41	45	84	47	25	30	708

Total Number of Valid Hours: 708

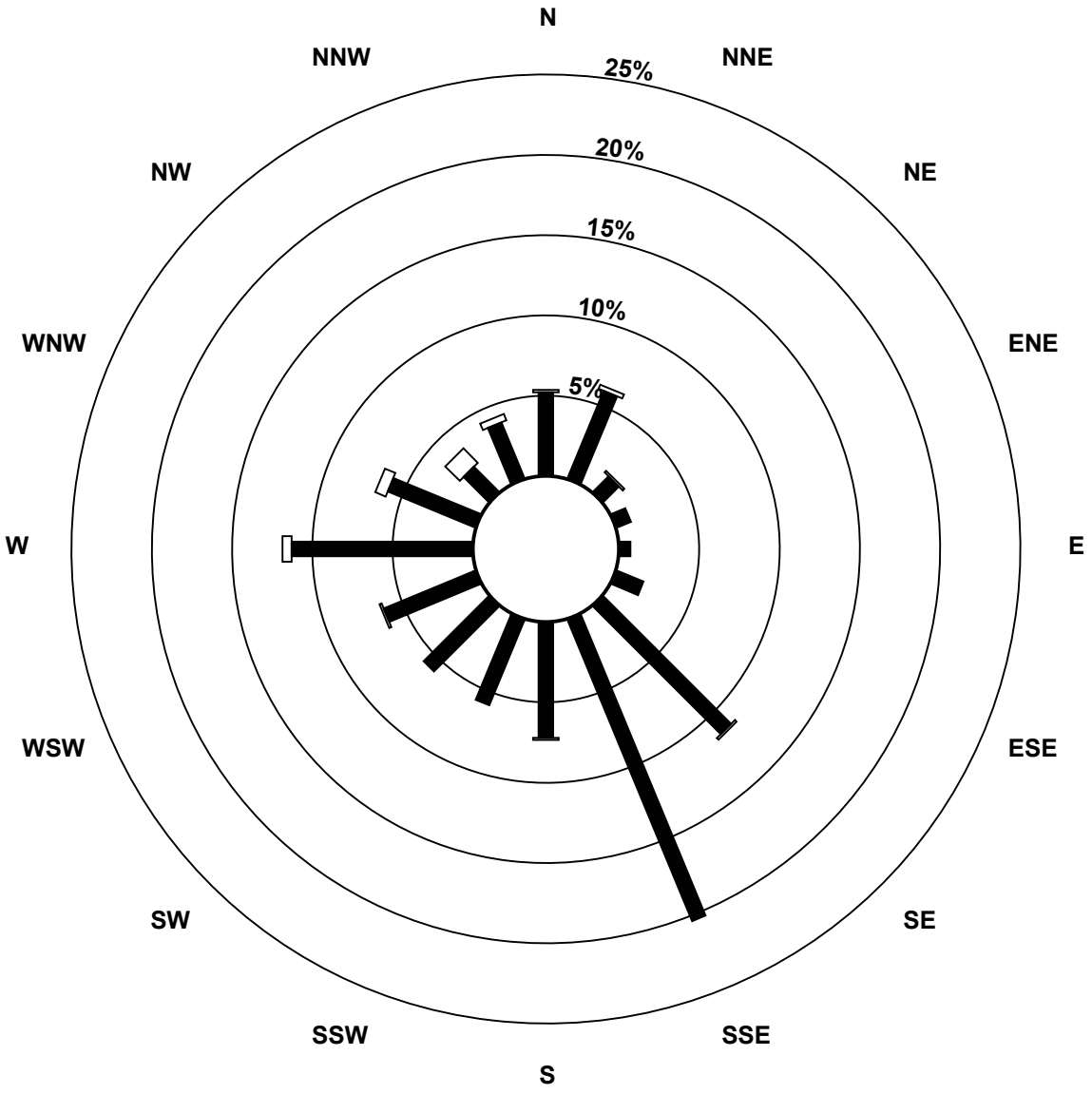
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Mannix (AMS 5)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

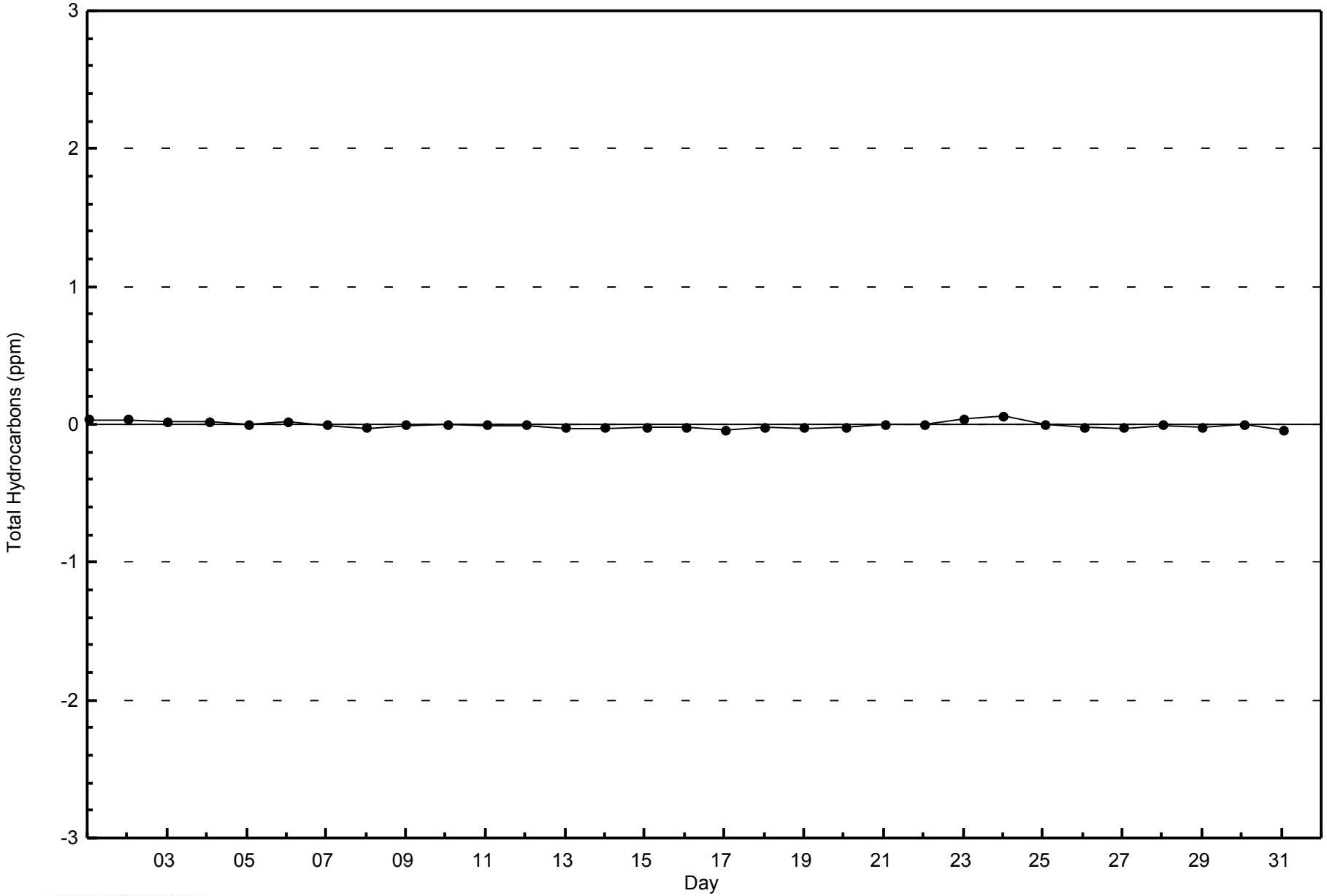
Total Number of Valid Hours: 708

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Mannix - August 2014



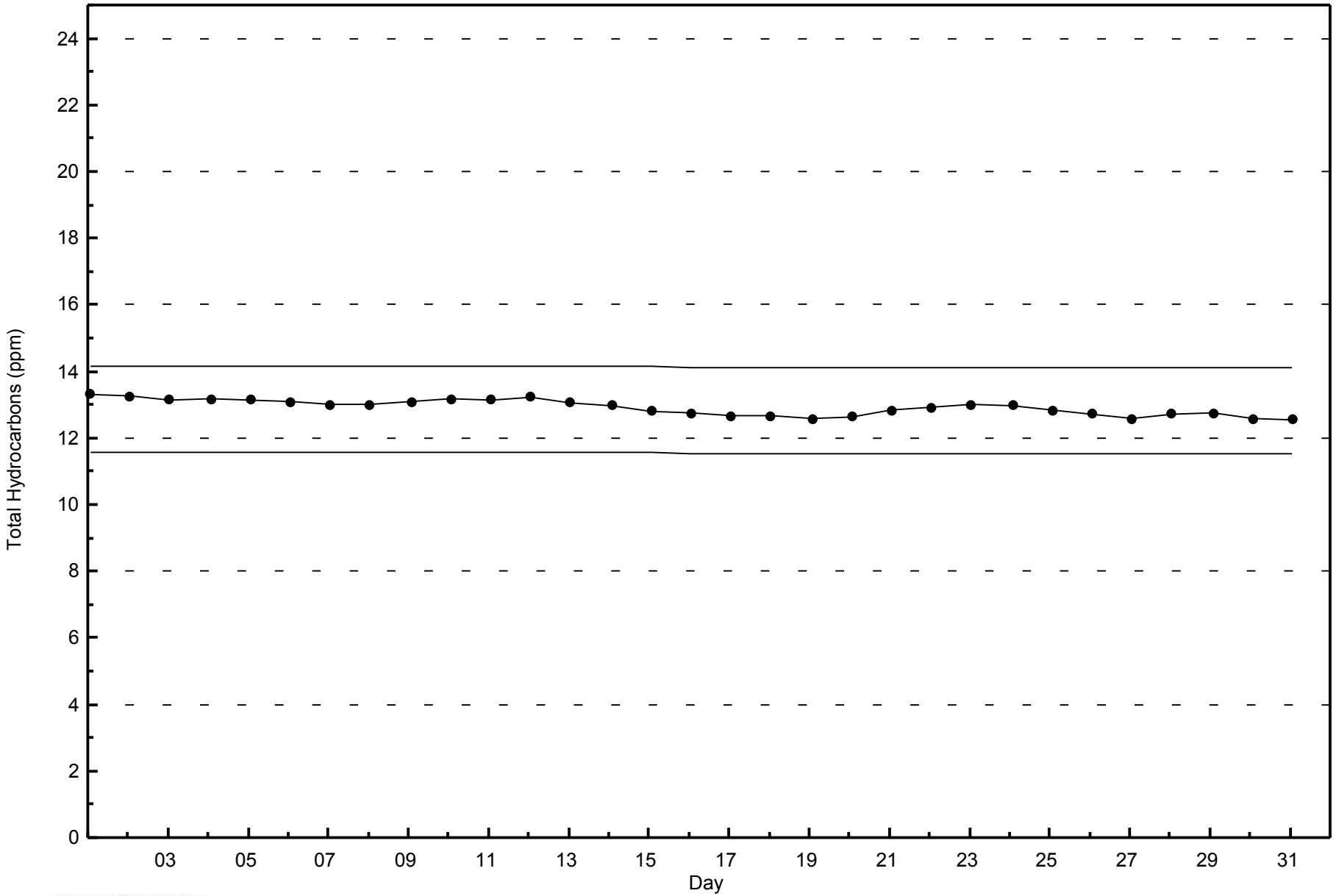
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 30.6 C on Aug 13 15:00

Maximum Daily Average: 24.7 C on Aug 13

Minimum Value: 3.0 C on Aug 22 06:00

Minimum Daily Average: 10.3 C on Aug 22

Maximum Diurnal Average: 23.2 C at hour 15

Minimum Diurnal Average: 12.1 C at hour 5

Monthly Average: 17.81 C

Percentiles: P_1 = 4.9 P_{10} = 10.3 Q_1 = 13.4 Median = 17.4 Q_3 = 21.8 P_{90} = 26.5 P_{99} = 30.2

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

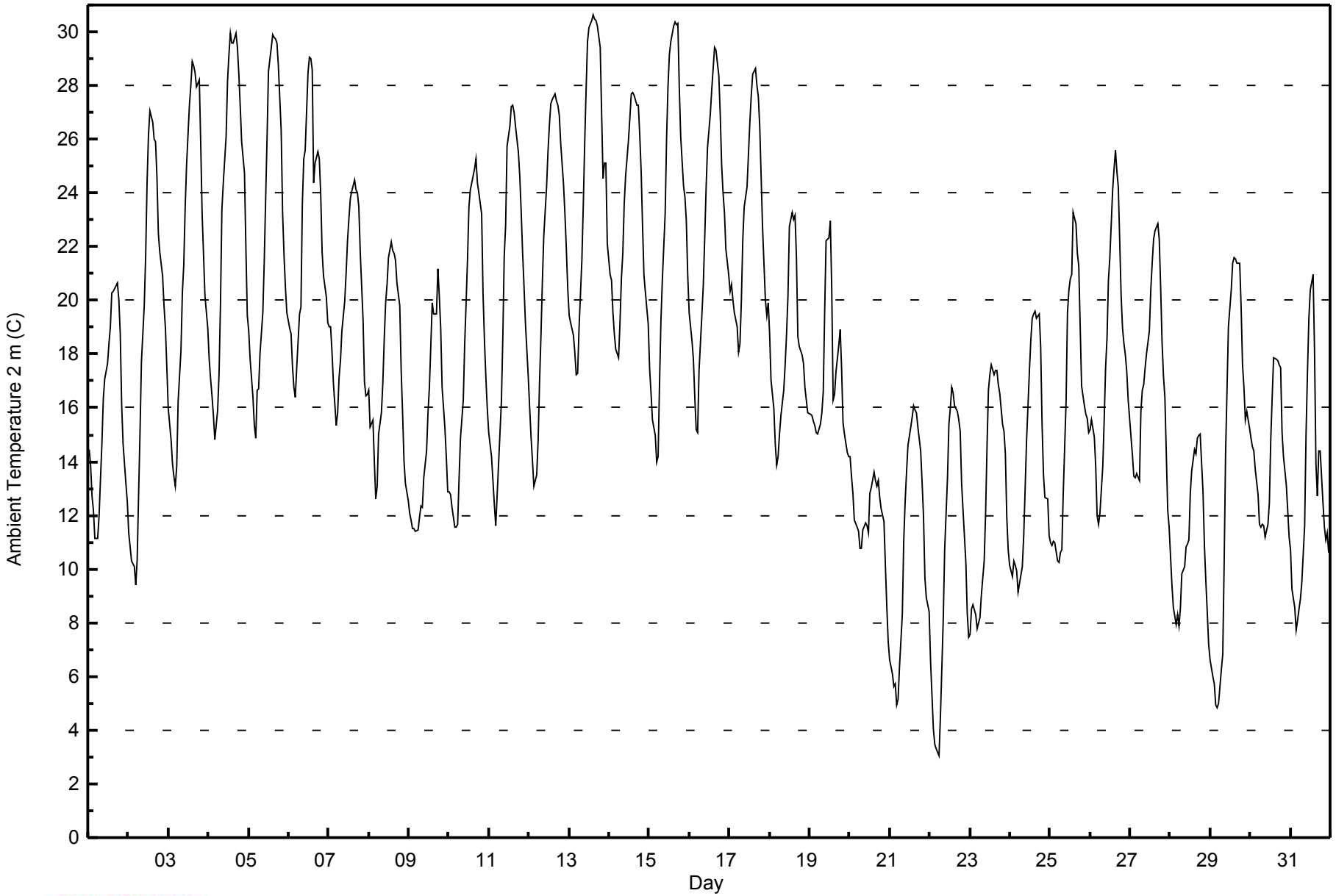
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.5	13.9	12.7	12.2	11.2	11.1	12.0	13.4	14.7	16.3	17.1	17.7	18.4	19.0	20.3	20.3	20.5	20.7	20.0	18.8	16.1	14.7	13.2	12.5	15.9	20.7
2-Aug	11.3	10.8	10.3	10.1	9.4	10.4	12.8	15.1	17.7	19.8	21.6	24.4	26.1	27.0	26.6	26.0	25.9	24.6	22.5	21.8	20.9	19.8	19.0	17.5	18.8	27.0
3-Aug	16.0	14.8	14.0	13.5	13.1	13.8	16.2	18.1	20.3	21.3	23.5	25.1	27.3	28.0	28.9	28.7	28.5	28.0	28.2	25.9	23.2	21.7	20.2	19.0	21.5	28.9
4-Aug	17.8	17.1	16.5	15.7	14.8	15.9	17.3	19.8	23.4	24.4	26.1	28.1	29.1	29.9	29.6	29.6	30.0	29.4	28.4	27.2	25.9	24.7	22.0	19.4	23.4	30.0
5-Aug	18.9	17.8	16.4	15.3	14.9	16.7	16.7	18.0	19.5	21.4	23.8	26.1	28.6	29.4	29.9	29.8	29.7	29.6	28.8	26.3	23.3	21.7	20.5	19.5	22.6	29.9
6-Aug	19.0	18.8	17.6	16.7	16.4	17.5	19.5	19.7	23.6	25.3	25.6	28.5	29.1	29.0	28.6	24.4	25.1	25.5	25.3	24.0	21.8	20.9	20.1	19.2	22.5	29.1
7-Aug	19.0	19.0	18.1	16.9	15.4	15.8	17.1	17.8	18.9	20.0	21.0	22.2	23.1	23.8	24.1	24.5	24.1	24.0	23.5	21.8	19.3	17.0	16.4	16.5	20.0	24.5
8-Aug	16.6	15.3	15.6	14.0	12.6	13.1	15.0	15.8	16.9	18.5	19.9	20.6	21.6	22.1	21.9	21.7	21.5	20.7	19.8	17.4	15.8	14.0	13.2	12.6	17.3	22.1
9-Aug	12.1	11.8	11.5	11.5	11.4	11.4	11.9	12.4	12.3	13.4	14.4	15.8	16.8	18.3	19.9	19.5	19.5	21.2	20.2	18.9	16.7	15.2	14.2	12.9	15.1	21.2
10-Aug	12.9	12.8	12.3	11.6	11.5	11.6	13.4	14.9	16.3	18.4	19.9	21.6	23.5	24.1	24.6	24.9	25.3	24.4	24.0	23.2	20.2	18.5	17.1	16.0	18.5	25.3
11-Aug	15.1	14.2	13.3	12.4	11.6	12.8	15.1	16.2	18.6	21.7	22.8	25.7	26.5	27.2	27.2	27.0	26.5	25.5	24.6	23.3	21.8	20.6	19.2	17.2	20.2	27.2
12-Aug	16.0	14.9	14.0	13.1	13.5	14.8	16.9	18.6	20.6	22.4	24.2	25.5	26.5	27.3	27.5	27.7	27.4	27.3	26.9	25.8	24.3	23.2	21.9	20.5	21.7	27.7
13-Aug	19.5	19.2	18.7	18.1	17.2	17.3	19.0	21.5	23.5	25.8	27.8	29.6	30.2	30.4	30.6	30.5	30.4	30.2	29.4	27.0	24.5	25.1	25.1	22.1	24.7	30.6
14-Aug	21.0	20.8	19.5	18.8	18.2	17.9	19.2	20.8	21.8	23.6	24.7	26.0	26.8	27.7	27.7	27.6	27.3	27.3	26.1	24.8	22.7	20.9	19.7	19.2	22.9	27.7
15-Aug	17.4	16.6	15.5	15.0	14.0	14.2	16.8	19.2	20.7	23.2	26.0	28.0	29.2	29.6	30.2	30.4	30.3	30.3	28.0	26.1	24.3	23.8	23.0	20.9	23.0	30.4
16-Aug	19.5	18.5	17.8	16.4	15.2	15.1	17.4	19.5	20.6	22.3	24.2	25.7	27.0	27.8	28.7	29.4	29.3	28.4	27.0	25.1	24.0	23.3	21.9	20.9	22.7	29.4
17-Aug	20.3	20.6	20.0	19.6	19.0	18.1	18.4	20.0	22.3	23.5	24.2	25.4	26.6	27.7	28.4	28.6	28.0	27.6	26.5	24.6	22.7	20.0	19.5	19.9	23.0	28.6
18-Aug	18.8	17.0	16.0	14.7	13.9	14.2	15.0	15.7	16.6	17.6	18.8	20.2	22.8	23.3	23.0	23.2	21.6	18.6	18.3	18.0	17.6	16.8	16.3	15.8	18.1	23.3
19-Aug	15.8	15.7	15.5	15.4	15.1	15.0	15.4	15.8	16.6	19.6	22.2	22.3	23.0	20.5	16.3	16.5	17.3	18.3	18.9	17.4	15.4	15.0	14.3	14.2	17.2	23.0
20-Aug	14.2	13.5	12.8	11.8	11.6	11.4	10.8	10.7	11.5	11.7	11.6	11.3	12.8	13.0	13.6	13.3	13.1	13.3	12.7	12.3	11.8	10.1	8.6	7.3	11.9	14.2
21-Aug	6.6	6.1	5.6	5.7	5.0	5.2	6.3	8.3	11.1	12.5	13.6	14.6	15.3	15.7	16.1	15.9	15.8	15.3	14.4	13.2	12.0	9.7	8.9	8.4	10.9	16.1
22-Aug	6.5	5.3	4.1	3.5	3.3	3.0	4.5	6.3	8.1	10.7	13.4	15.4	16.0	16.8	16.6	16.1	15.9	15.5	15.1	13.2	12.2	10.2	8.4	7.5	10.3	16.8
23-Aug	7.6	8.5	8.7	8.3	7.8	8.0	8.2	9.1	10.3	12.1	14.5	16.6	17.2	17.6	17.3	17.4	17.4	16.9	16.6	15.4	15.1	14.3	12.0	10.7	12.8	17.6
24-Aug	10.2	9.7	10.3	10.1	9.9	9.1	9.8	10.1	11.3	13.0	14.8	17.3	18.5	19.3	19.5	19.6	19.3	19.5	18.3	15.4	13.5	12.7	12.6	11.2	14.0	19.6
25-Aug	11.0	10.9	11.1	11.0	10.3	10.2	10.6	10.7	12.8	16.2	19.6	20.4	20.8	20.9	23.3	22.9	21.8	21.3	19.0	16.8	16.1	15.8	15.6	15.1	16.0	23.3
26-Aug	15.2	15.6	14.9	13.8	12.0	11.7	12.1	13.8	15.6	17.5	18.6	20.8	21.6	24.1	24.9	25.6	24.8	24.2	20.2	19.0	18.4	18.0	17.3	16.3	18.2	25.6
27-Aug	14.9	14.3	13.5	13.4	13.6	13.3	15.9	16.6	16.9	17.5	18.0	18.9	20.4	21.4	22.3	22.6	22.9	22.3	20.5	18.4	17.2	16.4	12.2	11.5	17.3	22.9
28-Aug	10.5	9.4	8.6	8.0	8.3	7.9	8.6	9.8	10.1	10.8	10.9	11.1	12.8	13.7	14.4	14.3	14.9	15.0	15.0	12.9	10.9	9.6	8.4	7.2	11.0	15.0
29-Aug	6.6	6.0	5.7	4.9	4.8	5.0	6.3	6.8	10.3	14.3	16.7	19.0	20.4	21.4	21.6	21.6	21.4	21.4	19.8	17.6	16.8	15.6	15.9	15.2	14.0	21.6
30-Aug	14.8	14.6	14.4	13.7	12.8	11.7	11.6	11.7	11.6	11.2	11.7	12.4	14.8	16.4	17.8	17.8	17.7	17.6	17.5	15.1	14.2	13.1	12.2	11.2	14.1	17.8
31-Aug	10.7	9.2	8.6	7.7	8.1	8.5	8.9	9.5	11.6	15.0	17.3	19.3	20.4	20.9	18.1	13.9	12.7	14.4	14.4	12.4	11.5	11.1	11.4	10.6	12.8	20.9
	14.5	14.0	13.3	12.7	12.1	12.3	13.5	14.7	16.3	18.1	19.6	21.1	22.4	23.0	23.2	22.9	22.8	22.5	21.6	20.0	18.4	17.2	16.1	15.1	Diurnal Average	
	21.0	20.8	20.0	19.6	19.0	18.1	19.5	21.5	23.6	25.8	27.8	29.6	30.2	30.4	30.6	30.5	30.4	30.3	29.4	27.2	25.9	25.1	25.1	22.1	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 2 m (AT2m) - C

Mannix - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	62	8.33	8.33
10 - 20	426	57.26	65.59
> 20	256	34.41	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 30.6 C on Aug 13 18:00 — Maximum Daily Average: 24.9 C on Aug 13

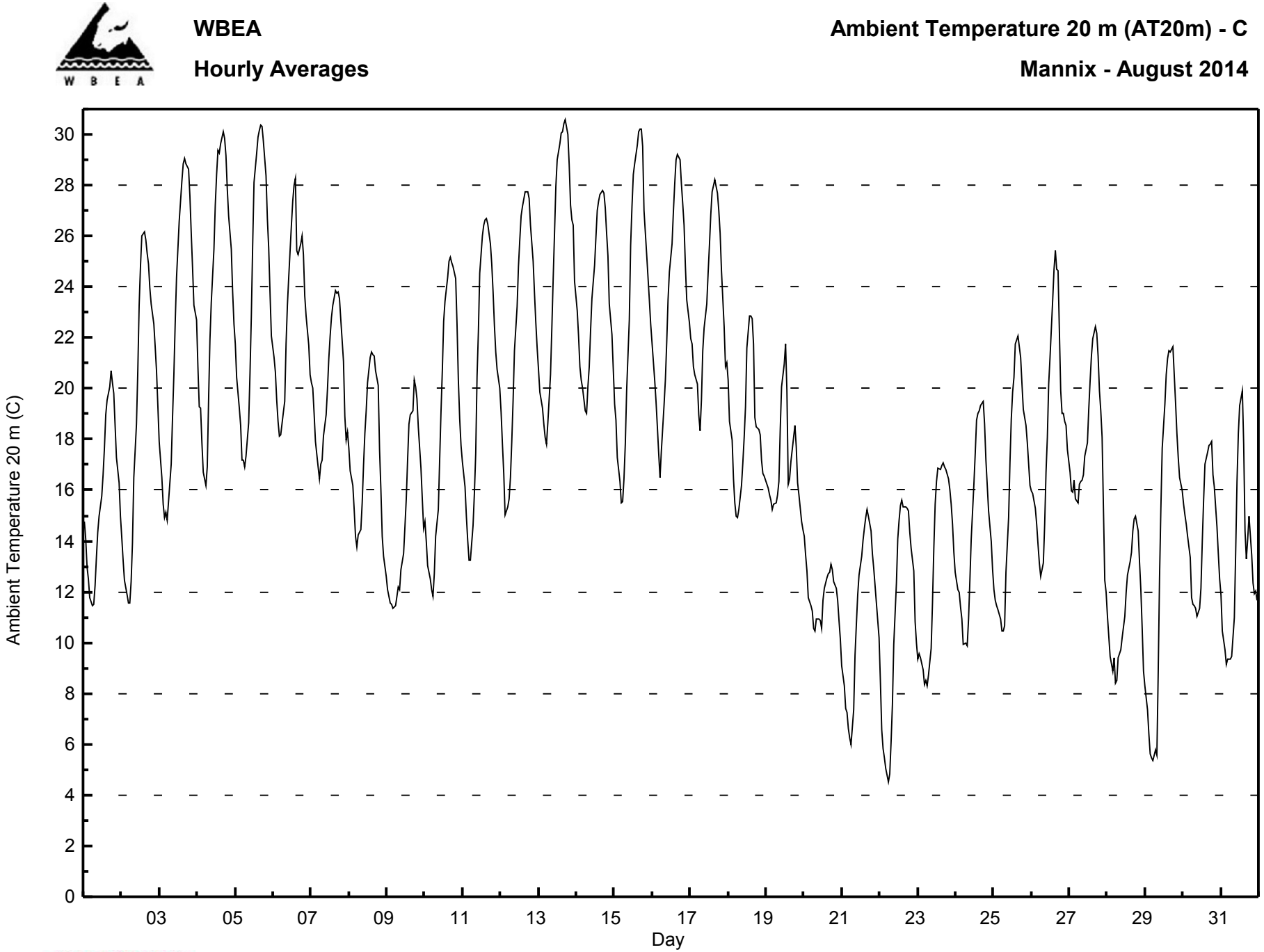
Minimum Value: 4.5 C on Aug 22 06:00 — Minimum Daily Average: 10.8 C on Aug 22

Maximum Diurnal Average: 22.7 C at hour 17 — Minimum Diurnal Average: 13.0 C at hour 6

Monthly Average: 18.16 C — Percentiles: P_1 = 5.6 P_{10} = 10.9 Q_1 = 14.0 Median = 17.8 Q_3 = 22.2 P_{90} = 26.6 P_{99} = 30.1

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-Aug	14.8	14.1	13.0	12.5	11.8	11.5	11.5	12.2	13.3	14.4	15.0	15.8	16.6	17.6	18.9	19.5	20.1	20.7	20.2	19.8	18.6	17.3	16.3	15.0	15.8	20.7
2-Aug	14.1	13.3	12.5	11.9	11.6	11.5	12.4	13.9	16.5	18.6	20.7	23.3	24.8	26.0	26.2	25.8	25.3	24.9	24.0	23.3	22.5	21.6	20.7	19.4	19.4	26.2
3-Aug	17.9	16.5	15.4	14.9	15.1	14.8	15.6	17.0	18.9	20.5	22.6	24.4	26.6	27.4	28.2	28.8	29.0	28.9	28.7	27.6	26.1	24.8	23.3	22.7	22.3	29.0
4-Aug	20.9	19.3	19.2	17.8	16.7	16.2	16.9	19.6	21.9	23.4	25.5	27.2	28.4	29.4	29.3	29.6	30.1	29.8	29.2	27.9	26.8	25.5	23.8	22.6	24.0	30.1
5-Aug	21.8	20.4	19.3	18.5	17.2	17.2	16.9	17.3	18.7	20.6	22.8	25.6	28.1	29.2	29.9	30.2	30.4	30.3	29.7	28.4	26.7	25.5	23.8	22.1	23.8	30.4
6-Aug	21.2	20.6	19.5	18.7	18.1	18.2	19.1	19.5	21.7	23.3	24.4	26.4	27.4	28.0	28.3	25.4	25.3	25.7	26.0	25.3	23.6	22.9	21.7	20.6	23.0	28.3
7-Aug	20.2	20.0	19.0	17.9	16.9	16.5	17.0	17.2	18.1	19.0	20.0	21.2	22.1	22.8	23.3	23.8	23.8	23.8	23.5	22.7	21.1	18.9	18.0	18.3	20.2	23.8
8-Aug	17.7	16.7	16.2	15.2	14.2	13.8	14.2	14.5	15.5	17.0	18.2	19.1	20.2	21.2	21.4	21.3	21.3	20.7	20.1	17.6	16.0	14.2	13.4	12.6	17.2	21.4
9-Aug	12.1	11.8	11.6	11.5	11.4	11.4	11.8	12.2	12.1	12.9	13.5	14.5	15.7	17.2	18.6	19.0	19.1	20.3	20.1	19.6	18.5	16.8	15.6	14.5	15.1	20.3
10-Aug	14.8	14.0	13.0	12.5	12.1	11.8	12.7	14.2	15.2	17.2	19.1	20.7	22.6	23.4	24.4	25.0	25.2	24.9	24.8	24.3	22.6	20.3	18.8	17.8	18.8	25.2
11-Aug	17.2	16.1	15.0	14.0	13.2	13.2	14.6	15.9	17.4	20.5	22.2	24.5	26.0	26.4	26.6	26.7	26.5	25.7	24.9	23.8	22.5	21.5	20.7	20.0	20.6	26.7
12-Aug	19.1	17.8	16.7	15.1	15.3	15.7	16.5	17.9	19.6	21.5	23.2	24.8	25.8	26.8	27.2	27.7	27.8	27.7	27.5	26.4	25.0	23.7	22.6	21.6	22.2	27.8
13-Aug	20.7	19.9	19.2	18.6	18.1	17.8	18.7	20.5	22.4	24.3	26.1	27.9	29.0	29.6	30.0	30.1	30.4	30.6	30.0	28.8	27.2	26.7	26.4	24.2	24.9	30.6
14-Aug	23.1	22.1	20.9	20.3	20.0	19.1	19.0	20.1	20.9	22.3	23.6	24.9	26.0	27.0	27.4	27.6	27.8	27.7	27.1	26.1	25.2	23.4	22.1	20.7	23.5	27.8
15-Aug	19.4	18.8	17.3	16.3	15.5	15.6	16.4	17.8	19.9	22.7	25.6	27.2	28.4	28.8	29.6	30.1	30.2	30.2	29.5	27.0	25.3	24.4	23.5	22.5	23.4	30.2
16-Aug	21.8	20.3	19.5	18.5	17.5	16.5	17.5	19.3	20.3	21.8	23.5	24.6	25.7	27.0	28.1	29.0	29.2	29.0	28.1	27.2	26.4	24.8	23.5	22.6	23.4	29.2
17-Aug	22.0	21.7	20.8	20.5	20.2	19.0	18.3	19.6	21.5	22.4	23.3	24.5	25.6	26.9	27.7	28.2	28.0	27.7	27.0	26.1	24.6	22.5	20.9	21.0	23.3	28.2
18-Aug	20.3	18.7	18.0	16.5	15.5	15.0	14.9	15.2	16.2	17.1	18.1	19.3	21.6	22.9	22.8	22.8	21.8	18.9	18.5	18.4	18.2	17.2	16.7	16.5	18.4	22.9
19-Aug	16.2	16.1	15.8	15.6	15.3	15.4	15.5	15.8	16.4	18.4	20.1	20.9	21.8	19.9	16.3	16.5	17.1	18.1	18.6	17.7	16.3	15.8	14.8	14.4	17.0	21.8
20-Aug	14.2	13.5	12.8	11.8	11.5	11.3	10.6	10.5	10.9	10.9	10.9	10.6	11.7	12.1	12.6	12.7	12.8	13.1	12.9	12.4	12.1	11.7	10.9	10.1	11.8	14.2
21-Aug	9.1	8.3	7.4	7.3	6.6	6.2	6.0	7.4	9.5	10.7	11.9	12.7	13.4	14.0	14.5	14.9	15.2	15.0	14.4	13.5	12.9	12.3	11.5	10.2	11.0	15.2
22-Aug	8.5	6.6	5.8	5.5	5.0	4.5	4.8	6.1	7.6	9.9	12.3	14.1	14.8	15.4	15.6	15.3	15.3	15.3	15.2	14.4	13.7	12.8	10.8	10.0	10.8	15.6
23-Aug	9.4	9.6	9.4	8.9	8.4	8.5	8.3	8.7	9.8	11.6	13.7	15.5	16.4	16.9	16.8	17.0	17.1	16.9	16.8	16.5	16.0	15.5	14.6	13.5	13.2	17.1
24-Aug	12.8	12.1	12.0	11.4	10.9	9.9	10.0	9.9	10.9	12.5	14.1	16.2	17.5	18.7	19.0	19.1	19.3	19.5	18.6	17.2	16.2	15.2	14.0	12.9	14.6	19.5
25-Aug	12.1	11.7	11.4	11.3	10.9	10.4	10.5	10.6	12.8	14.9	17.1	18.8	19.8	20.4	21.8	22.0	21.7	21.2	20.2	19.2	18.5	17.9	17.0	16.2	16.2	22.0
26-Aug	16.0	15.8	15.3	14.6	13.9	13.1	12.6	13.1	14.7	16.7	18.1	20.2	21.2	23.5	24.7	25.4	24.7	24.7	19.9	19.0	19.0	18.7	18.6	17.6	18.4	25.4
27-Aug	16.7	16.0	15.9	16.4	15.7	15.5	16.2	16.4	16.4	16.6	17.3	17.9	19.2	20.3	21.3	22.0	22.5	22.2	21.3	19.9	19.1	18.1	12.4	12.0	17.8	22.5
28-Aug	11.0	10.2	9.4	8.9	9.4	8.4	8.5	9.4	9.7	10.2	10.6	11.0	12.0	12.7	13.2	13.6	14.4	14.9	15.0	14.4	13.2	12.1	10.6	8.9	11.3	15.0
29-Aug	8.3	7.4	6.4	5.6	5.4	5.3	5.8	5.6	8.8	12.6	15.3	17.7	19.4	20.6	21.2	21.5	21.4	21.7	20.5	19.4	18.2	17.3	16.5	16.0	14.1	21.7
30-Aug	15.5	15.0	14.7	14.2	13.3	11.8	11.5	11.5	11.3	11.0	11.3	12.2	14.0	15.6	17.0	17.5	17.7	17.8	17.9	16.6	16.1	14.6	13.5	12.5	14.3	17.9
31-Aug	11.9	10.5	9.7	9.1	9.4	9.3	9.3	9.5	11.0	13.5	16.3	18.3	19.3	19.9	17.8	14.4	13.3	14.1	14.9	13.5	12.3	11.9	12.0	11.7	13.0	19.9
	16.1	15.3	14.6	13.9	13.4	13.0	13.3	14.1	15.5	17.1	18.6	20.1	21.3	22.2	22.6	22.7	22.7	22.6	22.1	21.1	20.0	18.9	17.7	16.8	Diurnal Average	
	23.1	22.1	20.9	20.5	20.2	19.1	19.1	20.5	22.4	24.3	26.1	27.9	29.0	29.6	30.0	30.2	30.4	30.6	30.0	28.8	27.2	26.7	26.4	24.2	Diurnal Maximum	


WBEA
Hourly Averages
Ambient Temperature 20 m (AT20m) - C
Mannix - August 2014
Ambient Temperature 20 m (C)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
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	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	54	7.26	7.26
10 - 20	418	56.18	63.44
> 20	272	36.56	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 30.2 C on Aug 13 18:00
Maximum Daily Average: 24.8 C on Aug 13

Minimum Value: 4.9 C on Aug 22 06:00
Minimum Daily Average: 10.9 C on Aug 21
Maximum Diurnal Average: 22.3 C at hour 18
Minimum Diurnal Average: 13.3 C at hour 7
Monthly Average: 18.13 C
Percentiles: P_1 = 5.9 P_{10} = 11.0 Q_1 = 13.8 Median = 17.9 Q_3 = 22.2 P_{90} = 26.5 P_{99} = 29.7

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

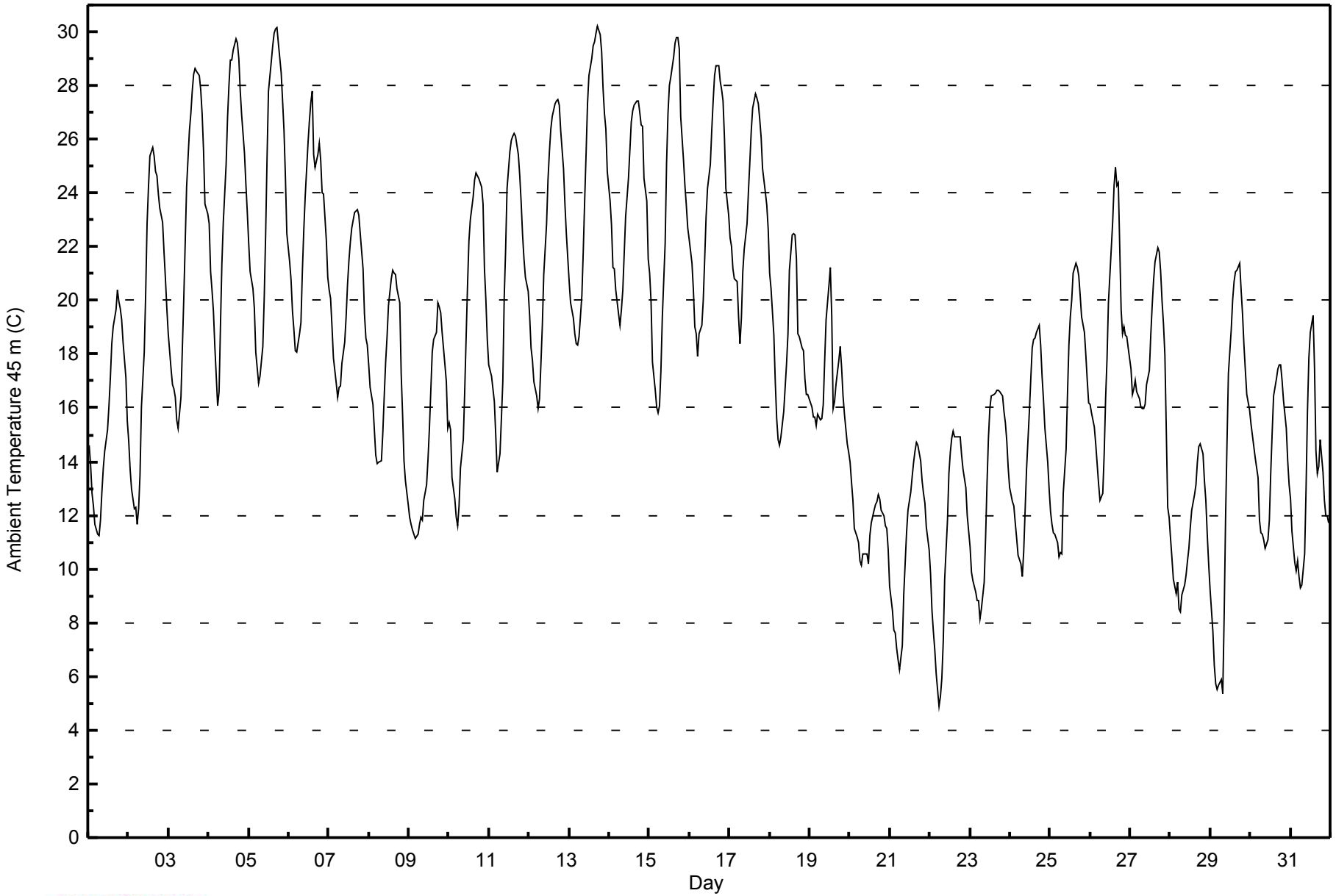
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.6	13.9	12.8	12.4	11.6	11.3	11.2	11.8	12.9	13.8	14.4	15.2	16.1	17.1	18.4	19.0	19.6	20.4	20.0	19.7	19.3	18.4	17.1	15.5	15.7	20.4
2-Aug	14.8	13.7	13.0	12.2	12.3	11.7	12.2	13.5	16.0	18.1	20.2	22.8	24.2	25.4	25.7	25.4	24.8	24.6	24.0	23.4	22.9	21.8	20.8	19.7	19.3	25.7
3-Aug	18.8	17.4	16.9	16.7	16.4	15.5	15.2	16.4	18.2	20.1	22.1	24.2	26.3	26.9	27.8	28.4	28.7	28.6	28.4	27.8	27.0	25.6	23.6	23.2	22.5	28.7
4-Aug	22.9	21.1	20.4	19.6	18.3	16.1	16.6	19.1	21.4	22.9	25.1	26.8	28.0	28.9	29.0	29.3	29.8	29.6	29.0	27.8	26.9	25.5	24.3	23.3	24.2	29.8
5-Aug	22.1	21.1	20.4	19.7	18.1	17.5	16.9	17.2	18.3	20.1	22.5	25.3	27.8	28.9	29.5	29.9	30.1	30.2	29.6	28.5	27.4	26.3	24.6	22.5	23.9	30.2
6-Aug	21.4	20.7	19.6	18.9	18.1	18.1	18.8	19.2	21.1	22.6	23.9	25.9	26.7	27.4	27.8	25.4	25.0	25.4	25.8	25.2	24.0	24.0	22.2	20.9	22.8	27.8
7-Aug	20.4	20.1	19.0	17.9	16.9	16.4	16.8	16.8	17.7	18.5	19.4	20.6	21.5	22.2	22.7	23.3	23.3	23.4	23.2	22.5	21.2	19.5	18.6	18.3	20.0	23.4
8-Aug	17.6	16.7	16.1	15.2	14.3	13.9	14.0	14.0	15.1	16.5	17.7	18.7	19.8	20.8	21.1	21.0	21.0	20.5	19.9	17.3	15.8	14.0	13.3	12.4	16.9	21.1
9-Aug	11.9	11.7	11.4	11.3	11.1	11.3	11.7	11.9	11.8	12.6	13.1	14.1	15.2	16.6	18.1	18.6	18.8	19.9	19.7	19.6	18.8	17.6	17.0	15.3	15.0	19.9
10-Aug	15.4	15.2	13.4	12.6	11.9	11.6	12.3	13.8	14.8	16.6	18.6	20.6	22.2	23.0	23.9	24.5	24.8	24.6	24.6	24.2	23.6	21.2	20.0	18.6	18.8	24.8
11-Aug	17.6	17.2	16.7	16.2	15.0	13.6	14.3	15.6	17.0	20.1	21.9	24.2	25.6	26.0	26.1	26.2	26.1	25.4	24.7	23.6	22.4	21.5	20.9	20.3	20.8	26.2
12-Aug	19.4	18.3	17.8	17.0	16.5	16.0	16.4	17.7	19.1	20.9	22.8	24.5	25.5	26.4	26.8	27.3	27.4	27.5	27.3	26.3	24.9	23.6	22.5	21.6	22.2	27.5
13-Aug	20.7	19.9	19.4	18.8	18.4	18.3	18.7	20.2	21.9	23.7	25.5	27.3	28.4	29.0	29.5	29.6	30.0	30.2	29.9	29.3	27.9	27.0	26.4	24.8	24.8	30.2
14-Aug	23.7	22.8	21.2	21.2	20.4	19.5	19.1	19.7	20.4	21.7	23.1	24.6	25.6	26.6	27.0	27.3	27.4	27.4	27.0	26.5	26.5	24.5	23.7	21.5	23.7	27.4
15-Aug	21.0	20.0	17.7	16.7	16.0	15.8	16.1	17.4	19.4	22.1	25.1	26.9	28.0	28.3	29.1	29.6	29.8	29.8	29.4	26.9	25.2	24.3	23.5	22.7	23.4	29.8
16-Aug	22.3	21.4	20.4	19.0	18.8	17.9	18.8	19.1	20.0	21.5	23.1	24.2	25.1	26.3	27.4	28.4	28.7	28.7	28.2	27.9	27.4	26.1	24.2	23.2	23.7	28.7
17-Aug	22.4	22.0	21.2	20.8	20.7	19.4	18.4	19.3	21.1	21.9	22.9	24.0	25.2	26.3	27.2	27.7	27.6	27.3	26.8	26.0	24.9	24.0	23.6	22.6	23.5	27.7
18-Aug	21.0	20.4	18.7	17.0	15.6	14.8	14.6	14.9	15.8	16.8	17.6	18.8	21.1	22.4	22.5	22.5	21.6	18.8	18.7	18.2	18.1	17.1	16.5	16.5	18.3	22.5
19-Aug	16.2	16.0	15.7	15.7	15.3	15.7	15.6	15.6	16.1	17.7	19.3	20.5	21.2	19.5	16.0	16.3	16.8	17.8	18.3	17.5	16.5	15.8	14.7	14.3	16.8	21.2
20-Aug	14.0	13.2	12.6	11.5	11.2	11.0	10.3	10.2	10.6	10.5	10.5	10.2	11.2	11.7	12.2	12.4	12.5	12.8	12.6	12.2	12.0	11.6	11.5	10.7	11.6	14.0
21-Aug	9.3	8.5	7.7	7.6	7.0	6.6	6.3	7.2	9.0	10.2	11.3	12.2	12.9	13.5	14.0	14.4	14.7	14.6	14.0	13.3	12.8	12.4	11.6	10.7	10.9	14.7
22-Aug	9.8	8.4	7.7	7.0	6.1	4.9	5.3	5.9	7.3	9.6	11.8	13.5	14.4	14.9	15.1	14.9	14.9	14.9	14.9	14.3	13.7	13.1	12.0	11.4	11.1	15.1
23-Aug	10.8	9.9	9.5	9.1	8.8	8.8	8.2	8.5	9.5	11.2	13.2	14.9	16.0	16.4	16.5	16.6	16.6	16.6	16.6	16.4	15.9	15.5	14.8	13.7	13.1	16.6
24-Aug	13.0	12.5	12.3	11.7	11.2	10.5	10.2	9.7	10.7	12.2	13.7	15.9	17.1	18.2	18.6	18.6	18.8	19.1	18.3	17.2	16.3	15.2	14.0	13.0	14.5	19.1
25-Aug	12.1	11.6	11.4	11.3	11.0	10.4	10.6	10.6	12.8	14.5	16.5	18.4	19.4	20.0	21.0	21.4	21.2	20.9	20.2	19.4	18.8	18.0	17.0	16.2	16.0	21.4
26-Aug	16.2	15.8	15.3	14.6	13.9	13.2	12.5	12.8	14.3	16.3	17.8	19.9	20.9	22.9	24.3	25.0	24.3	24.4	19.6	18.8	19.0	18.7	18.6	18.2	18.2	25.0
27-Aug	17.4	16.5	16.7	17.0	16.6	16.4	16.0	16.0	16.0	16.1	16.9	17.4	18.7	19.8	20.8	21.5	22.0	21.8	21.1	20.0	19.1	18.0	12.3	11.9	17.7	22.0
28-Aug	11.2	10.4	9.6	9.1	9.5	8.5	8.4	9.0	9.4	9.8	10.3	10.8	11.6	12.2	12.7	13.1	14.0	14.5	14.7	14.3	13.3	12.6	11.3	10.2	11.3	14.7
29-Aug	9.3	7.7	6.4	5.7	5.5	5.7	5.9	5.3	8.3	11.9	14.7	17.3	18.9	20.0	20.7	21.0	21.1	21.4	20.4	19.5	18.3	17.4	16.5	15.9	14.0	21.4
30-Aug	15.4	15.0	14.6	14.1	13.4	11.8	11.4	11.3	11.1	10.8	11.1	11.8	13.6	15.1	16.5	17.1	17.5	17.6	17.6	17.0	16.3	15.2	14.1	13.1	14.3	17.6
31-Aug	12.6	11.4	10.3	9.9	10.3	9.7	9.3	9.4	10.6	13.0	15.9	17.9	18.8	19.4	17.5	14.4	13.6	13.8	14.8	13.6	12.6	12.0	12.0	11.7	13.1	19.4
	16.6	15.8	15.0	14.4	13.9	13.3	13.3	13.8	15.1	16.6	18.1	19.7	20.9	21.7	22.1	22.3	22.3	22.3	21.9	21.1	20.3	19.3	18.2	17.2	Diurnal Average	
	23.7	22.8	21.2	21.2	20.7	19.5	19.1	20.2	21.9	23.7	25.5	27.3	28.4	29.0	29.5	29.9	30.1	30.2	29.9	29.3	27.9	27.0	26.4	24.8	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Mannix - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	49	6.59	6.59
10 - 20	425	57.12	63.71
> 20	270	36.29	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 29.9 C on Aug 13 18:00

Maximum Daily Average: 24.8 C on Aug 13

Minimum Value: 5.6 C on Aug 22 07:00

Minimum Daily Average: 10.8 C on Aug 21

Maximum Diurnal Average: 22.1 C at hour 18

Minimum Diurnal Average: 13.5 C at hour 7

Monthly Average: 18.15 C

Percentiles: P_1 = 6.5 P_{10} = 11.0 Q_1 = 13.7 Median = 18.0 Q_3 = 22.2 P_{90} = 26.4 P_{99} = 29.4

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

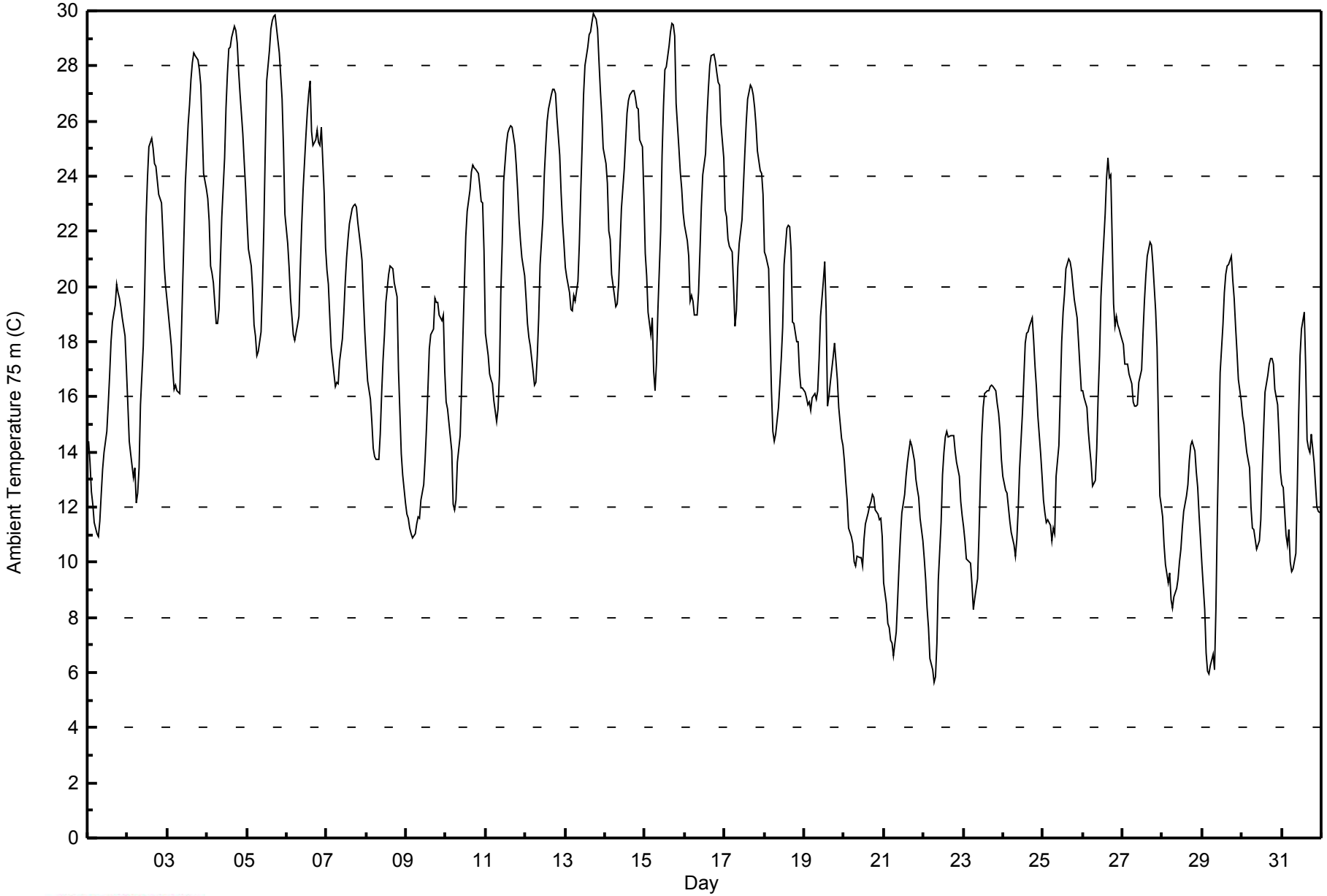
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.4	13.6	12.6	12.1	11.5	11.1	11.0	11.5	12.5	13.4	14.0	14.8	15.7	16.8	18.0	18.7	19.3	20.1	19.8	19.6	19.3	18.9	18.2	17.0	15.6	20.1
2-Aug	15.7	14.4	14.0	13.1	13.4	12.2	12.5	13.4	15.7	17.8	19.9	22.5	23.9	25.0	25.4	25.0	24.4	24.4	23.8	23.3	23.0	21.9	20.7	20.0	19.4	25.4
3-Aug	19.4	18.4	17.8	17.0	16.3	16.4	16.2	16.1	17.9	19.9	21.8	23.7	25.9	26.6	27.5	28.1	28.5	28.4	28.2	27.8	27.3	25.8	24.1	23.5	22.6	28.5
4-Aug	23.2	22.4	20.7	20.5	20.1	18.7	18.7	19.2	20.9	22.5	24.7	26.5	27.7	28.6	28.7	29.0	29.5	29.3	28.8	27.8	27.0	25.5	24.5	23.6	24.5	29.5
5-Aug	22.4	21.3	20.7	19.9	18.6	18.2	17.5	17.7	18.4	20.0	22.2	25.0	27.5	28.6	29.3	29.6	29.8	29.8	29.4	28.5	27.7	26.8	25.0	22.6	24.0	29.8
6-Aug	21.6	20.7	19.6	18.9	18.3	18.0	18.6	18.9	20.7	22.3	23.5	25.5	26.3	27.0	27.4	25.6	25.1	25.3	25.7	25.2	25.1	25.8	23.4	21.4	22.9	27.4
7-Aug	20.6	20.1	18.9	17.8	16.8	16.4	16.5	16.5	17.3	18.1	19.0	20.2	21.0	21.7	22.3	22.8	22.9	23.0	22.9	22.3	21.5	21.0	19.6	18.3	19.9	23.0
8-Aug	17.4	16.6	15.9	15.1	14.2	13.8	13.8	13.8	14.6	16.1	17.3	18.2	19.4	20.4	20.7	20.7	20.6	20.1	19.6	17.0	15.5	13.9	13.1	12.2	16.7	20.7
9-Aug	11.7	11.6	11.2	11.0	10.9	11.0	11.4	11.6	11.6	12.3	12.8	13.7	14.9	16.3	17.7	18.3	18.5	19.6	19.4	19.4	19.0	18.8	19.0	17.0	14.9	19.6
10-Aug	15.8	15.6	15.1	14.0	12.1	11.9	12.2	13.7	14.6	16.3	18.2	20.1	21.8	22.7	23.5	24.2	24.4	24.3	24.3	24.1	23.7	23.1	23.0	21.3	19.2	24.4
11-Aug	18.3	17.5	16.8	16.6	16.5	15.8	15.1	15.6	16.8	19.8	21.5	23.8	25.2	25.6	25.7	25.8	25.8	25.1	24.4	23.5	22.4	21.7	21.1	20.4	20.9	25.8
12-Aug	19.6	18.7	18.2	17.9	17.0	16.4	16.5	17.5	18.9	20.8	22.5	24.1	25.1	26.0	26.4	27.0	27.1	27.1	27.0	26.1	24.7	23.4	22.3	21.5	22.2	27.1
13-Aug	20.7	20.3	19.8	19.2	19.1	19.7	19.5	20.2	21.6	23.4	25.1	26.9	28.0	28.7	29.1	29.3	29.6	29.9	29.7	29.3	28.2	27.1	26.2	25.0	24.8	29.9
14-Aug	24.5	23.8	22.0	21.7	20.5	19.7	19.2	19.4	20.1	21.5	22.8	24.2	25.3	26.3	26.7	27.0	27.1	27.1	26.9	26.5	26.4	25.3	25.1	23.3	23.8	27.1
15-Aug	21.2	20.4	19.1	18.3	18.9	16.9	16.2	17.2	19.1	22.0	24.7	26.5	27.9	28.0	28.7	29.3	29.5	29.5	29.1	26.7	25.0	24.2	23.6	22.7	23.5	29.5
16-Aug	22.2	21.6	21.1	19.5	19.7	19.5	19.0	19.0	19.8	21.3	22.9	24.0	24.8	26.1	27.1	28.0	28.4	28.4	28.2	27.8	27.4	27.3	25.9	24.7	23.9	28.4
17-Aug	22.8	22.5	21.7	21.5	21.3	20.0	18.6	19.1	20.7	21.6	22.4	23.7	24.8	25.9	26.8	27.3	27.2	27.0	26.5	25.8	24.9	24.2	24.1	23.4	23.5	27.3
18-Aug	21.3	21.1	20.7	18.3	16.2	14.8	14.4	14.6	15.6	16.5	17.4	18.5	20.8	22.1	22.2	22.2	21.3	18.7	18.7	18.0	18.0	16.9	16.3	16.3	18.4	22.2
19-Aug	16.2	16.0	15.7	15.8	15.5	16.0	16.1	15.9	16.2	17.4	18.9	20.2	20.9	19.1	15.7	16.0	16.5	17.4	18.0	17.3	16.6	15.6	14.5	14.3	16.7	20.9
20-Aug	13.7	12.9	12.3	11.2	10.9	10.7	10.0	9.8	10.2	10.2	10.2	9.8	10.8	11.4	11.8	12.1	12.2	12.5	12.3	11.9	11.8	11.6	11.6	10.9	11.4	13.7
21-Aug	9.3	8.5	7.8	7.6	7.2	7.1	6.6	7.5	8.6	9.8	10.9	11.8	12.5	13.1	13.6	14.1	14.4	14.3	13.7	13.0	12.7	12.3	11.6	10.8	10.8	14.4
22-Aug	10.1	9.4	8.4	7.6	6.5	6.1	5.6	5.9	7.1	9.3	11.4	13.2	14.0	14.6	14.8	14.5	14.6	14.6	14.6	14.1	13.6	13.1	12.2	11.7	11.1	14.8
23-Aug	11.3	10.8	10.1	10.0	10.0	9.2	8.3	8.7	9.4	11.0	12.9	14.6	15.6	16.1	16.2	16.2	16.4	16.4	16.4	16.2	15.8	15.4	14.8	13.7	13.2	16.4
24-Aug	13.1	12.6	12.5	12.0	11.5	11.1	10.6	10.2	10.8	12.0	13.4	15.4	16.7	17.9	18.3	18.3	18.6	18.9	18.1	17.1	16.3	15.3	13.9	13.1	14.5	18.9
25-Aug	12.2	11.8	11.4	11.5	11.3	10.8	11.3	11.0	13.1	14.2	16.1	18.0	19.1	19.7	20.6	21.0	20.9	20.6	20.1	19.5	18.9	18.0	17.1	16.2	16.0	21.0
26-Aug	16.2	16.0	15.6	14.8	14.1	13.6	12.8	13.0	14.1	16.0	17.5	19.6	20.7	22.6	23.9	24.7	24.0	24.1	19.4	18.5	18.9	18.6	18.5	18.3	18.1	24.7
27-Aug	17.9	17.2	17.2	17.2	16.8	16.5	15.8	15.7	15.6	15.7	16.5	17.0	18.3	19.5	20.4	21.1	21.6	21.5	20.8	20.0	19.1	17.8	12.4	12.0	17.6	21.6
28-Aug	11.7	10.6	9.9	9.3	9.6	8.7	8.4	8.7	9.0	9.4	10.0	10.5	11.2	11.9	12.4	12.8	13.7	14.2	14.4	14.0	13.2	12.7	11.7	10.8	11.2	14.4
29-Aug	9.9	8.3	6.7	6.1	6.0	6.2	6.6	6.1	8.3	11.7	14.3	16.9	18.6	19.8	20.4	20.8	20.8	21.1	20.3	19.6	18.6	17.6	16.7	15.8	14.1	21.1
30-Aug	15.3	15.0	14.5	14.0	13.4	12.0	11.2	11.2	10.8	10.5	10.8	11.6	13.3	14.8	16.2	16.8	17.2	17.4	17.4	17.2	16.3	15.7	14.6	13.3	14.2	17.4
31-Aug	12.8	12.7	11.0	10.6	11.2	10.0	9.6	9.7	10.3	12.5	15.3	17.5	18.5	19.1	17.1	14.4	14.1	14.0	14.7	13.6	12.8	12.0	11.9	11.8	13.2	19.1
	16.9	16.2	15.5	14.8	14.4	13.8	13.5	13.8	14.9	16.3	17.8	19.3	20.5	21.4	21.8	22.0	22.1	22.1	21.7	21.0	20.3	19.6	18.6	17.6	Diurnal Average	
	24.5	23.8	22.0	21.7	21.3	20.0	19.5	20.2	21.6	23.4	25.1	26.9	28.0	28.7	29.3	29.6	29.8	29.9	29.7	29.3	28.2	27.3	26.2	25.0	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 75 m (AT75m) - C

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	45	6.05	6.05
10 - 20	428	57.53	63.58
> 20	271	36.42	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 29.8 C on Aug 5 18:00 | Maximum Daily Average: 24.8 C on Aug 13

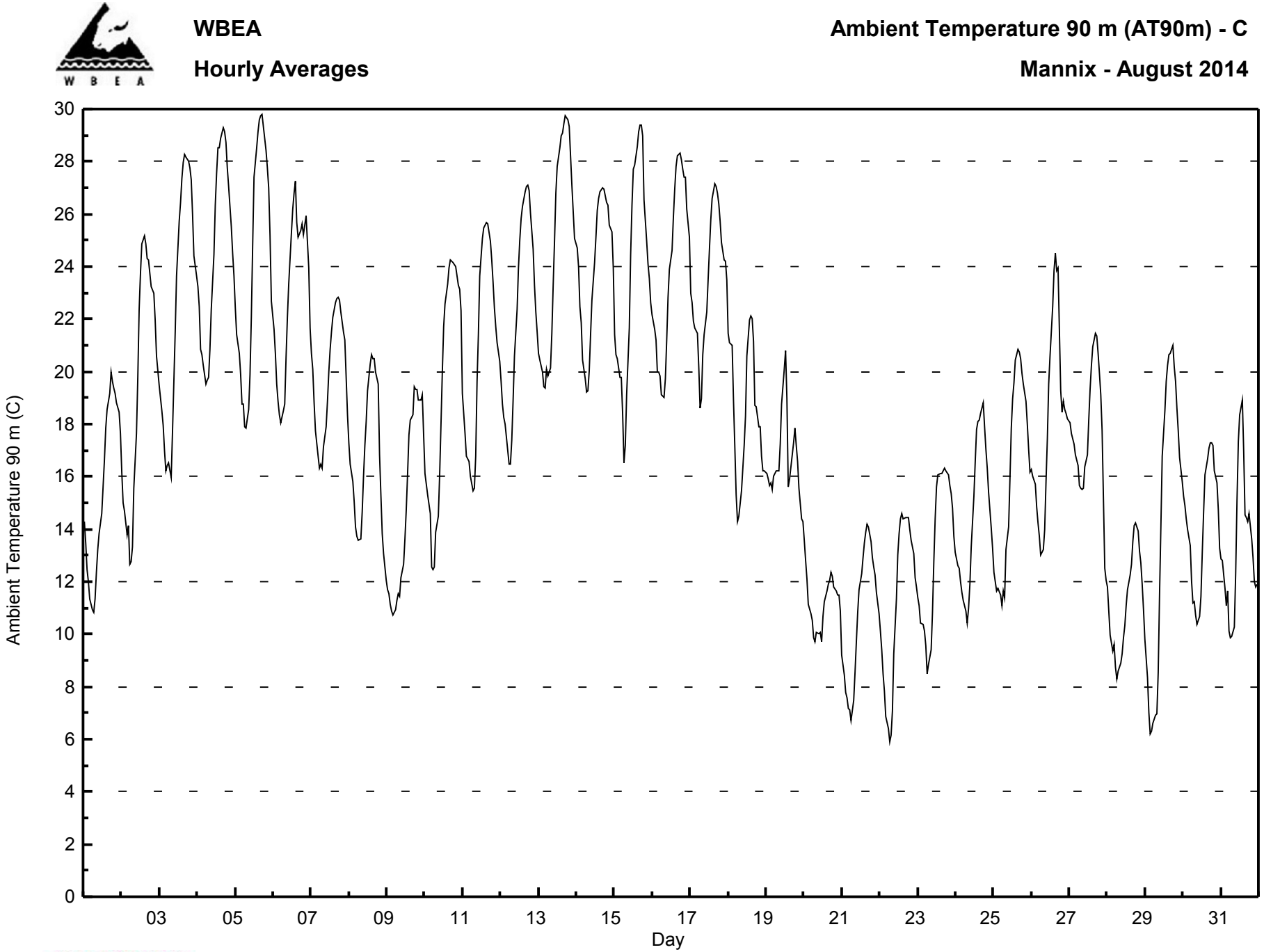
Minimum Value: 5.9 C on Aug 22 07:00 | Minimum Daily Average: 10.7 C on Aug 21

Maximum Diurnal Average: 22.0 C at hour 18 | Minimum Diurnal Average: 13.7 C at hour 7

Monthly Average: 18.15 C | Percentiles: P_1 = 6.9 P_{10} = 11.0 Q_1 = 13.7 Median = 18.0 Q_3 = 22.3 P_{90} = 26.3 P_{99} = 29.3

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-Aug	14.3	13.5	12.5	12.0	11.4	11.0	10.8	11.3	12.3	13.2	13.8	14.6	15.6	16.6	17.9	18.6	19.2	20.0	19.6	19.4	19.2	18.8	18.4	17.6	15.5	20.0
2-Aug	16.2	15.0	14.7	13.8	14.1	12.6	12.8	13.3	15.6	17.6	19.8	22.4	23.7	24.9	25.2	24.9	24.3	24.2	23.7	23.3	23.0	22.0	20.6	20.0	19.5	25.2
3-Aug	19.5	18.5	17.9	17.0	16.2	16.4	16.5	16.0	17.7	19.6	21.5	23.7	25.7	26.5	27.4	28.0	28.3	28.2	28.0	27.8	27.3	26.0	24.4	23.7	22.6	28.3
4-Aug	23.2	22.5	20.9	20.6	20.3	19.5	19.7	19.8	20.9	22.4	24.5	26.4	27.6	28.5	28.5	28.9	29.3	29.1	28.7	27.8	27.0	25.5	24.5	23.6	24.6	29.3
5-Aug	22.4	21.4	20.7	19.9	18.8	18.7	17.9	17.9	18.6	19.9	22.0	24.8	27.4	28.5	29.1	29.6	29.8	29.8	29.4	28.4	27.8	27.0	25.2	22.7	24.1	29.8
6-Aug	21.6	20.7	19.5	18.9	18.4	18.0	18.5	18.8	20.6	22.1	23.3	25.3	26.2	26.8	27.3	25.7	25.1	25.4	25.6	25.2	25.6	25.9	24.0	21.7	22.9	27.3
7-Aug	20.7	20.1	18.8	17.7	16.8	16.3	16.5	16.3	17.1	17.9	18.8	20.0	20.9	21.5	22.1	22.6	22.8	22.9	22.7	22.3	21.5	21.2	19.8	18.3	19.8	22.9
8-Aug	17.3	16.5	15.8	15.0	14.1	13.7	13.6	13.6	14.6	16.0	17.2	18.1	19.3	20.3	20.6	20.5	20.5	20.0	19.5	16.9	15.3	13.8	13.1	12.1	16.6	20.6
9-Aug	11.7	11.6	11.1	10.9	10.7	10.9	11.3	11.5	11.5	12.1	12.7	13.6	14.8	16.1	17.6	18.1	18.4	19.4	19.3	19.3	18.9	18.9	19.1	17.6	14.9	19.4
10-Aug	16.1	15.7	15.3	14.6	12.6	12.4	12.6	13.9	14.5	16.1	18.0	20.0	21.7	22.6	23.4	23.9	24.3	24.2	24.1	24.0	23.6	23.3	23.1	22.3	19.3	24.3
11-Aug	19.2	17.7	16.8	16.7	16.6	16.0	15.5	15.6	16.8	19.6	21.4	23.6	25.0	25.5	25.6	25.7	25.6	25.0	24.3	23.4	22.4	21.7	21.1	20.4	20.9	25.7
12-Aug	19.6	18.8	18.3	18.0	17.0	16.5	16.5	17.4	18.9	20.6	22.4	24.0	25.0	25.8	26.3	26.9	27.0	27.1	26.9	26.0	24.7	23.3	22.3	21.5	22.1	27.1
13-Aug	20.7	20.5	20.0	19.4	19.4	20.1	19.8	20.2	21.5	23.3	25.0	26.8	27.8	28.5	29.0	29.1	29.4	29.7	29.6	29.3	28.2	27.1	26.1	25.1	24.8	29.7
14-Aug	24.7	24.0	22.5	21.9	20.5	19.7	19.2	19.2	20.0	21.4	22.7	24.1	25.1	26.2	26.6	26.8	27.0	27.0	26.7	26.4	26.4	25.6	25.3	24.0	23.9	27.0
15-Aug	21.4	20.6	20.5	19.8	19.8	18.4	16.5	17.2	19.1	21.7	24.5	26.3	27.7	27.8	28.6	29.1	29.4	29.4	29.0	26.6	25.0	24.1	23.5	22.6	23.7	29.4
16-Aug	22.2	21.6	21.2	20.0	20.0	19.8	19.1	19.0	19.7	21.2	22.8	23.9	24.6	25.9	27.0	27.8	28.2	28.3	28.1	27.7	27.4	27.4	26.2	25.1	23.9	28.3
17-Aug	23.0	22.6	21.9	21.7	21.4	20.2	18.6	19.0	20.6	21.4	22.3	23.5	24.7	25.8	26.6	27.2	27.0	26.8	26.4	25.7	24.9	24.2	24.2	23.5	23.5	27.2
18-Aug	21.5	21.1	21.0	18.9	17.2	15.3	14.3	14.5	15.5	16.3	17.2	18.3	20.6	22.0	22.1	22.0	21.2	18.7	18.6	17.9	17.9	16.8	16.2	16.2	18.4	22.1
19-Aug	16.1	15.9	15.7	15.8	15.5	16.0	16.2	16.2	16.2	17.2	18.8	20.1	20.8	19.0	15.6	15.9	16.4	17.3	17.8	17.2	16.6	15.6	14.4	14.3	16.7	20.8
20-Aug	13.6	12.8	12.1	11.1	10.8	10.5	9.9	9.7	10.0	10.0	10.0	9.7	10.7	11.2	11.6	11.9	12.1	12.3	12.2	11.8	11.6	11.5	11.5	10.9	11.2	13.6
21-Aug	9.2	8.4	7.8	7.6	7.2	7.1	6.7	7.5	8.6	9.7	10.8	11.7	12.3	12.9	13.5	13.9	14.2	14.1	13.5	12.9	12.6	12.3	11.6	10.8	10.7	14.2
22-Aug	10.1	9.4	8.5	7.8	6.9	6.4	5.9	6.2	7.1	9.3	11.3	13.0	13.8	14.4	14.6	14.4	14.4	14.5	14.4	14.0	13.6	13.1	12.2	11.8	11.1	14.6
23-Aug	11.4	11.1	10.4	10.4	10.1	9.6	8.5	8.9	9.4	10.8	12.8	14.4	15.6	16.0	16.1	16.1	16.2	16.3	16.2	16.1	15.7	15.3	14.8	13.7	13.2	16.3
24-Aug	13.1	12.6	12.5	12.0	11.6	11.3	10.9	10.4	11.0	11.9	13.3	15.3	16.6	17.8	18.1	18.1	18.4	18.8	17.9	17.0	16.3	15.4	14.0	13.3	14.5	18.8
25-Aug	12.4	12.0	11.6	11.8	11.5	11.1	11.6	11.4	13.2	14.1	15.9	17.8	19.0	19.6	20.5	20.8	20.8	20.5	20.0	19.5	18.9	18.0	17.1	16.2	16.0	20.8
26-Aug	16.3	16.0	15.7	14.8	14.2	13.7	13.0	13.2	14.0	15.8	17.4	19.5	20.6	22.5	23.9	24.5	23.8	23.9	19.3	18.5	18.8	18.5	18.4	18.2	18.1	24.5
27-Aug	18.1	17.7	17.4	17.2	16.8	16.4	15.6	15.5	15.5	15.6	16.4	16.8	18.1	19.3	20.3	20.9	21.5	21.4	20.7	19.9	19.1	17.7	12.5	12.1	17.6	21.5
28-Aug	11.8	10.9	10.0	9.4	9.6	8.7	8.3	8.6	8.9	9.3	9.9	10.3	11.1	11.7	12.3	12.7	13.5	14.1	14.3	13.9	13.2	12.7	11.9	10.9	11.2	14.3
29-Aug	9.8	8.3	7.0	6.2	6.3	6.6	6.9	6.9	8.5	11.5	14.1	16.8	18.5	19.6	20.3	20.6	20.7	21.0	20.2	19.6	18.6	17.8	16.7	15.8	14.1	21.0
30-Aug	15.3	14.9	14.4	14.0	13.4	12.0	11.2	11.2	10.7	10.3	10.7	11.4	13.1	14.6	16.1	16.7	17.1	17.3	17.3	17.2	16.2	15.8	14.8	13.3	14.1	17.3
31-Aug	12.9	12.8	11.8	11.1	11.6	10.1	9.9	9.9	10.3	12.3	15.1	17.3	18.3	18.9	17.0	14.5	14.4	14.3	14.6	13.6	12.9	12.0	11.8	11.9	13.3	18.9
	16.9	16.3	15.6	15.0	14.5	14.0	13.7	13.9	14.8	16.1	17.6	19.1	20.4	21.2	21.6	21.8	21.9	22.0	21.6	20.9	20.3	19.6	18.7	17.8	Diurnal Average	
	24.7	24.0	22.5	21.9	21.4	20.2	19.8	20.2	21.5	23.3	25.0	26.8	27.8	28.5	29.1	29.6	29.8	29.8	29.6	29.3	28.2	27.4	26.2	25.1	Diurnal Maximum	


WBEA
Hourly Averages
Ambient Temperature 90 m (AT90m) - C
Mannix - August 2014
Ambient Temperature 90 m (C)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
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	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	46	6.18	6.18
10 - 20	429	57.66	63.84
> 20	269	36.16	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 97 % on Aug 19 07:00

Maximum Daily Average: 82.0 % on Aug 19

Minimum Value: 26 % on Aug 17 15:00

Minimum Daily Average: 50.9 % on Aug 17

Maximum Diurnal Average: 86.4 % at hour 5

Minimum Diurnal Average: 44.8 % at hour 15

Monthly Average: 65.5 %

Percentiles: P_1 = 30 P_{10} = 40 Q_1 = 50 Median = 66 Q_3 = 81 P_{90} = 91 P_{99} = 96

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

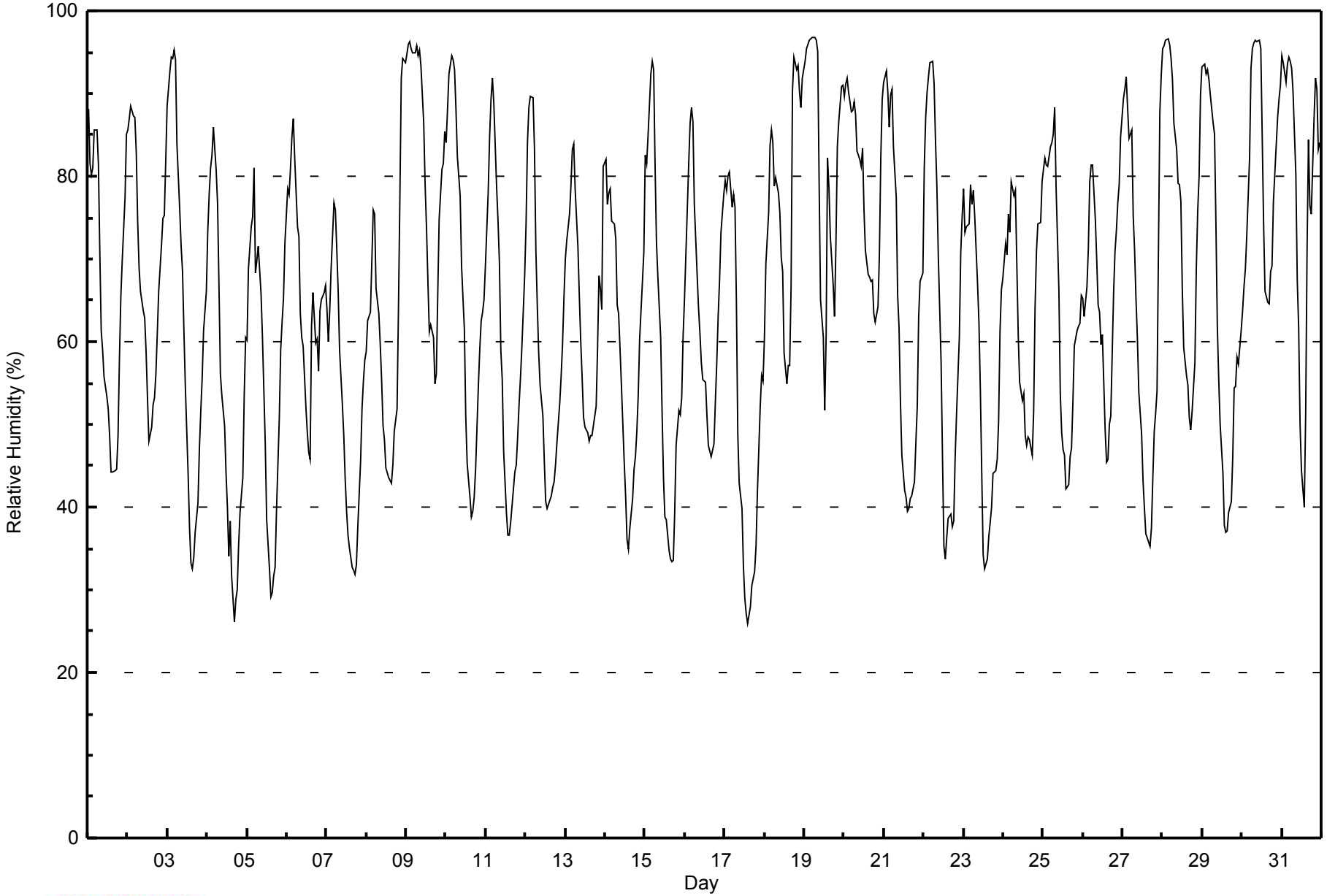
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	88	81	80	81	86	86	81	71	61	59	56	53	52	49	44	44	44	45	49	58	65	70	77	85	65.3	88
2-Aug	86	87	89	87	87	83	75	69	66	64	63	59	53	48	50	52	53	56	61	66	72	75	75	82	69.0	89
3-Aug	88	93	94	94	95	94	84	76	72	69	61	55	44	37	33	33	34	37	41	47	52	56	61	66	63.1	95
4-Aug	73	78	81	83	86	81	77	67	56	54	50	44	40	34	38	32	26	29	30	35	39	44	54	61	53.8	86
5-Aug	60	69	74	75	81	68	70	72	66	60	54	48	39	33	29	30	32	33	40	51	59	62	65	72	55.8	81
6-Aug	79	78	81	85	87	82	74	73	63	61	60	52	49	47	46	62	66	60	60	56	64	65	66	67	65.9	87
7-Aug	64	60	64	69	77	76	71	66	59	52	49	43	39	37	35	33	32	32	33	38	46	52	55	58	51.7	77
8-Aug	59	63	63	70	76	75	66	63	60	55	50	48	45	44	43	43	45	49	52	64	77	92	94	94	62.1	94
9-Aug	95	96	96	95	95	95	96	95	95	93	87	79	74	67	61	62	61	55	56	66	75	81	82	85	80.9	96
10-Aug	84	88	92	95	94	93	88	82	78	69	65	62	51	45	41	39	40	41	45	55	59	63	64	65	66.5	95
11-Aug	69	78	85	89	92	89	79	75	70	59	55	47	39	37	37	38	40	44	45	48	52	56	59	68	60.4	92
12-Aug	74	84	88	90	89	83	71	64	59	55	51	46	41	40	40	41	42	43	45	48	53	56	60	65	59.5	90
13-Aug	70	72	75	79	83	84	78	71	65	60	56	51	50	49	48	49	49	50	52	59	68	66	64	81	63.8	84
14-Aug	82	77	78	79	75	74	72	64	63	59	55	45	41	36	35	37	41	45	46	49	54	60	67	71	58.6	82
15-Aug	83	82	85	92	94	93	81	72	68	60	52	44	39	38	35	34	33	34	39	47	52	51	53	61	59.2	94
16-Aug	65	76	82	86	88	87	77	68	64	61	57	55	55	51	47	47	46	48	53	57	63	68	73	78	64.7	88
17-Aug	79	78	80	80	76	78	76	65	49	43	40	33	29	27	26	28	31	31	32	35	42	52	56	55	50.9	80
18-Aug	61	69	76	84	86	84	79	80	78	76	70	68	59	55	57	57	67	90	94	93	93	90	88	92	76.9	94
19-Aug	94	95	96	96	97	97	97	96	95	79	65	60	52	61	82	79	73	67	63	72	84	87	91	91	82.0	97
20-Aug	90	91	92	90	88	88	89	87	83	82	81	83	76	71	68	68	67	67	63	62	64	71	82	89	78.9	92
21-Aug	91	93	90	86	90	91	84	78	66	62	53	46	42	41	39	40	41	41	43	48	52	63	67	68	63.1	93
22-Aug	81	87	90	92	94	94	91	84	79	70	57	46	35	34	36	39	39	38	38	46	51	61	71	75	63.7	94
23-Aug	78	73	74	74	79	77	78	75	67	62	54	44	34	33	34	36	38	40	44	44	46	50	61	66	56.8	79
24-Aug	68	72	71	75	73	79	78	78	69	61	55	53	54	49	47	49	48	46	52	64	71	74	74	79	64.1	79
25-Aug	81	82	81	81	84	84	85	88	79	66	54	49	47	46	42	43	46	47	53	59	61	62	62	66	64.5	88
26-Aug	65	63	67	71	79	81	81	75	70	64	64	60	61	49	45	46	50	51	66	71	73	77	79	85	66.4	85
27-Aug	89	90	92	88	85	86	75	71	65	60	54	49	43	40	37	36	35	37	44	49	51	54	88	92	63.0	92
28-Aug	95	96	96	97	96	94	92	87	83	79	79	77	66	59	56	55	51	49	52	57	69	76	80	90	76.3	97
29-Aug	93	94	92	93	92	90	87	85	74	62	55	50	44	38	37	37	39	41	46	54	55	58	57	61	63.9	94
30-Aug	64	67	69	73	82	93	95	96	97	96	96	95	85	74	66	65	65	69	69	77	80	87	89	91	80.9	97
31-Aug	95	94	91	94	94	94	93	90	80	67	62	50	44	40	51	71	84	76	75	87	92	90	83	84	78.5	95
	78.8	80.8	82.7	84.6	86.4	85.5	81.3	76.9	70.9	65.2	59.9	54.7	49.1	45.4	44.8	45.9	47.0	48.1	51.0	57.0	62.4	66.7	71.0	75.6	Diurnal Average	
	95	96	96	97	97	97	97	96	97	96	96	95	85	74	82	79	84	90	94	93	93	92	94	94	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Mannix - August 2014



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ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	78	10.48	10.48
40 - 60	215	28.90	39.38
60 - 80	251	33.74	73.12
80 - 100	200	26.88	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 97 % on Aug 30 09:00

Maximum Daily Average: 80.2 % on Aug 19

Minimum Value: 23 % on Aug 4 17:00

Minimum Daily Average: 46.6 % on Aug 17

Maximum Diurnal Average: 80.2 % at hour 6

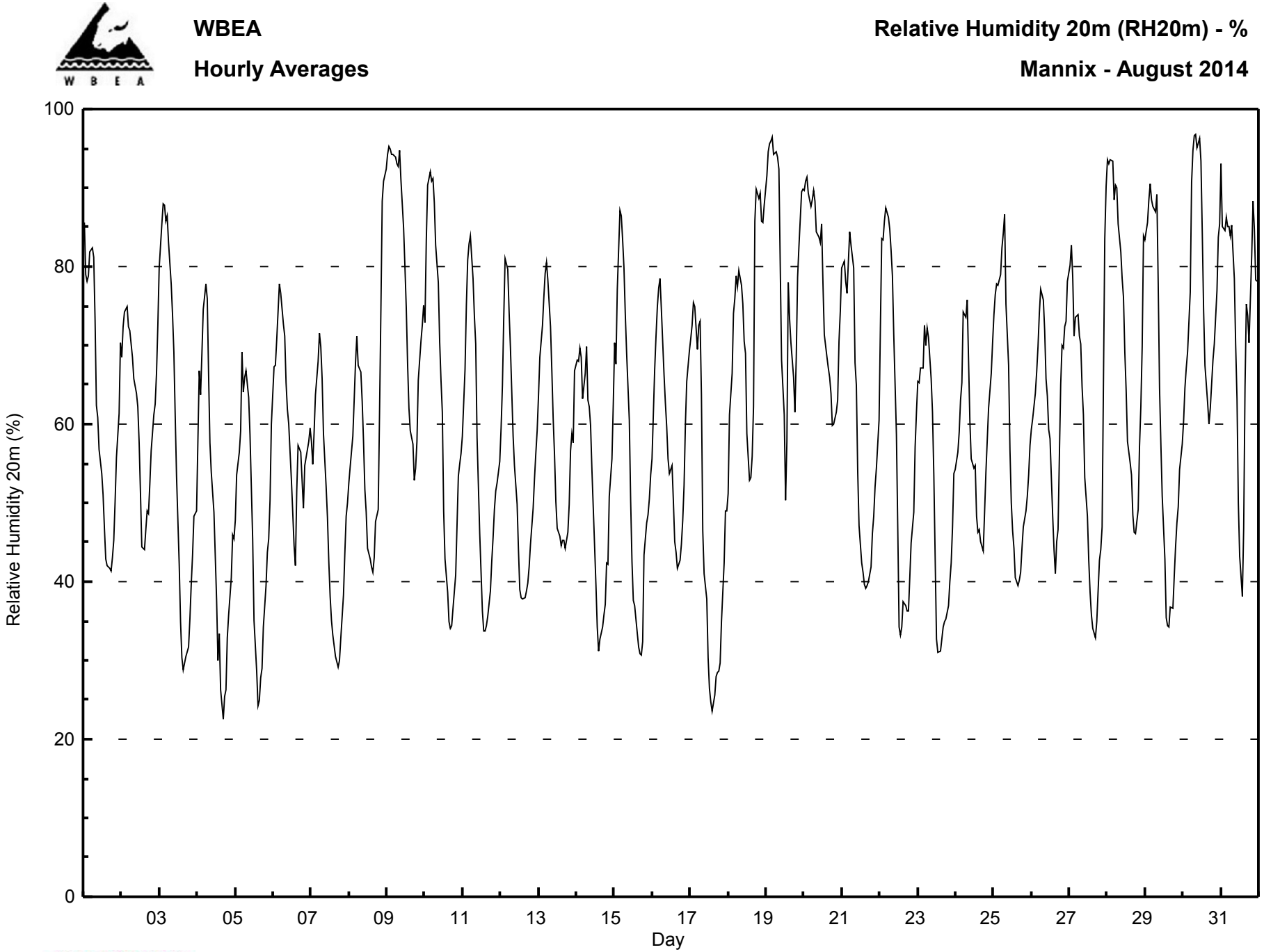
Minimum Diurnal Average: 42.5 % at hour 15

Monthly Average: 61.0 %

Percentiles: P_1 = 26 P_{10} = 36 Q_1 = 46 Median = 61 Q_3 = 75 P_{90} = 86 P_{99} = 95

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-Aug	86	79	78	79	82	82	81	73	62	61	57	54	51	47	43	42	42	41	43	45	50	56	61	70	61.1	86
2-Aug	69	72	74	75	72	72	70	68	66	64	62	58	51	44	44	47	49	49	52	57	61	63	66	73	61.6	75
3-Aug	80	85	88	88	86	87	83	78	74	69	61	53	42	35	30	29	30	30	32	35	40	43	48	49	57.3	88
4-Aug	58	67	64	69	75	78	76	66	58	54	49	43	38	30	33	26	23	25	26	33	36	40	46	45	48.2	78
5-Aug	48	54	56	59	69	64	66	67	63	59	52	45	35	29	24	25	28	29	34	40	44	45	50	60	47.7	69
6-Aug	67	67	71	74	78	77	73	71	65	62	60	53	49	45	42	51	57	56	53	49	55	56	58	60	60.4	78
7-Aug	58	55	59	64	68	72	70	66	59	52	48	43	38	35	33	30	30	29	30	33	38	44	48	50	48.0	72
8-Aug	53	55	58	63	68	71	67	67	63	58	52	49	44	43	42	41	43	48	49	62	74	88	91	92	60.0	92
9-Aug	94	95	95	94	94	94	93	93	95	91	85	80	75	68	62	59	57	53	54	58	66	70	72	75	78.1	95
10-Aug	73	83	90	92	91	91	88	83	78	71	66	62	49	43	39	35	34	34	37	41	47	53	55	56	62.1	92
11-Aug	59	67	75	81	83	84	78	74	70	58	52	46	36	34	34	34	36	39	42	46	49	51	53	55	55.7	84
12-Aug	59	65	74	81	80	74	70	64	58	55	50	44	39	38	38	38	39	40	42	45	49	53	56	59	54.6	81
13-Aug	63	68	72	76	79	81	78	72	67	61	56	50	47	46	45	45	45	44	46	50	57	59	58	67	59.7	81
14-Aug	68	68	70	69	63	66	70	63	62	60	54	45	40	34	31	33	34	36	37	42	42	51	56	63	52.3	70
15-Aug	70	68	77	87	86	83	80	74	69	60	50	43	38	37	33	32	31	31	32	43	47	49	50	54	55.2	87
16-Aug	56	67	71	75	77	78	75	66	63	60	56	54	55	50	45	44	42	43	45	48	52	60	65	69	58.9	78
17-Aug	71	73	75	75	69	73	73	64	46	41	38	30	26	25	24	26	28	28	29	30	35	42	49	49	46.6	75
18-Aug	51	61	66	74	76	79	77	80	78	75	70	69	59	53	53	56	62	86	90	89	89	86	86	88	73.0	90
19-Aug	92	95	96	96	96	94	95	94	92	80	68	61	50	58	78	73	70	66	61	69	79	83	90	90	80.2	96
20-Aug	90	91	91	89	88	88	90	88	84	84	83	85	78	71	68	67	66	64	60	60	61	63	70	74	77.3	91
21-Aug	80	81	78	77	81	84	83	80	68	65	54	47	42	41	40	39	39	40	42	46	48	52	54	60	59.2	84
22-Aug	72	84	83	86	88	86	85	82	79	71	59	47	34	33	34	37	37	36	36	40	45	49	57	61	59.3	88
23-Aug	65	65	67	67	73	70	72	71	66	61	54	43	33	31	31	33	34	35	35	37	40	42	47	54	51.1	73
24-Aug	54	56	59	63	65	74	74	76	68	60	56	54	55	48	46	47	45	44	49	54	58	62	66	70	58.5	76
25-Aug	74	77	78	78	79	82	84	87	75	67	57	50	46	44	41	40	40	41	44	47	49	51	54	57	60.1	87
26-Aug	59	61	64	67	70	74	77	76	72	66	64	59	58	48	44	41	45	47	65	70	70	72	73	78	63.3	78
27-Aug	80	83	79	71	74	74	71	70	65	61	53	48	43	39	36	34	33	35	39	43	44	47	84	90	58.1	90
28-Aug	94	93	94	93	88	90	90	85	82	79	76	69	64	58	55	54	49	46	46	49	57	62	70	84	72.0	94
29-Aug	83	86	88	90	88	88	87	89	78	65	57	51	43	35	34	34	37	37	41	44	47	50	54	57	61.0	90
30-Aug	60	65	67	69	77	91	95	97	97	95	96	93	84	74	67	63	60	62	65	68	70	77	84	85	77.6	97
31-Aug	93	85	85	86	85	85	84	85	78	70	63	50	43	38	47	65	75	74	70	81	88	85	78	78	73.9	93
	70.3	73.2	75.6	77.6	79.0	80.2	79.2	76.4	71.0	65.6	59.9	54.2	47.9	43.7	42.5	42.6	43.2	44.1	46.1	50.1	54.5	58.2	62.9	66.9	Diurnal Average	
	94	95	96	96	96	94	95	97	97	95	96	93	84	74	78	73	75	86	90	89	89	88	91	92	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 20m (RH20m) - %
Mannix - August 2014
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	108	14.52	14.52
40 - 60	252	33.87	48.39
60 - 80	256	34.41	82.80
80 - 100	128	17.20	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 97 % on Aug 19 05:00

Maximum Daily Average: 79.8 % on Aug 19

Minimum Value: 22 % on Aug 4 17:00

Minimum Daily Average: 44.4 % on Aug 17

Maximum Diurnal Average: 78.0 % at hour 7

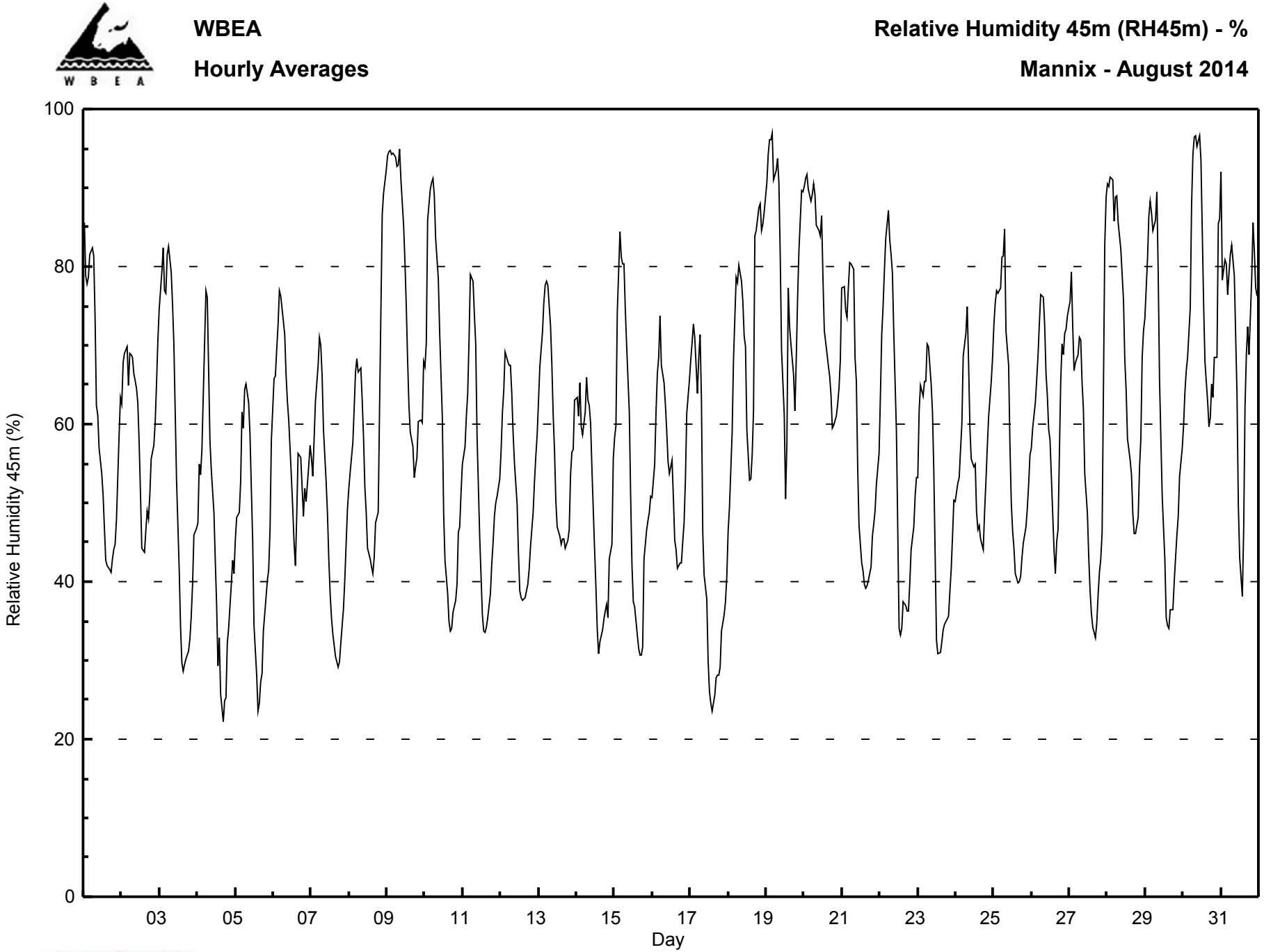
Minimum Diurnal Average: 42.3 % at hour 16

Monthly Average: 59.4 %

Percentiles: P_1 = 26 P_{10} = 36 Q_1 = 45 Median = 59 Q_3 = 72 P_{90} = 85 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-Aug	86	79	78	79	82	82	81	74	62	61	57	54	51	47	43	42	42	41	43	44	45	48	59	63	60.0	86
2-Aug	63	68	69	70	65	69	69	68	66	65	63	58	51	44	44	46	49	48	51	56	57	60	65	70	59.7	70
3-Aug	75	79	82	77	77	81	83	79	75	70	62	53	42	34	30	29	30	30	31	33	36	40	46	47	54.9	83
4-Aug	47	55	54	57	64	77	76	67	58	54	49	43	37	29	33	26	22	25	25	32	34	40	43	41	45.3	77
5-Aug	45	48	49	53	62	60	64	65	63	59	52	45	34	28	24	25	27	28	34	38	40	42	47	58	45.3	65
6-Aug	66	66	69	73	77	76	73	71	66	63	60	53	49	45	42	49	56	56	52	48	52	50	55	57	59.4	77
7-Aug	56	53	58	63	67	71	70	66	59	53	49	43	38	35	33	31	30	29	30	32	37	40	45	49	47.4	71
8-Aug	52	54	58	62	67	68	67	67	63	58	52	49	44	43	42	41	43	47	49	62	74	87	89	92	59.6	92
9-Aug	94	95	95	94	94	94	93	93	95	91	85	81	75	68	62	59	57	53	55	56	60	61	60	68	76.6	95
10-Aug	67	70	86	90	91	91	89	84	78	72	66	61	49	43	38	35	34	34	36	38	40	46	47	51	59.8	91
11-Aug	55	57	61	64	71	79	78	74	70	58	52	46	36	34	34	34	35	38	42	45	48	50	51	53	52.7	79
12-Aug	57	62	64	69	68	67	68	64	59	55	50	44	39	38	38	38	39	40	42	44	49	53	56	59	52.4	69
13-Aug	63	67	72	75	78	78	78	73	68	61	57	50	47	46	45	45	45	44	45	47	54	56	57	63	58.9	78
14-Aug	63	61	65	60	59	61	66	63	62	60	54	44	39	34	31	32	34	35	36	37	35	43	45	56	49.1	66
15-Aug	58	60	74	84	81	80	80	75	70	61	51	42	37	37	33	32	31	31	32	43	47	48	49	51	53.6	84
16-Aug	51	55	62	67	68	74	68	65	63	59	55	54	55	51	45	44	42	42	42	45	47	53	61	66	55.6	74
17-Aug	68	70	73	71	64	69	71	63	46	41	38	30	26	25	24	26	28	28	28	29	34	36	37	41	44.4	73
18-Aug	47	50	59	68	73	79	78	80	78	76	71	70	59	53	53	56	62	84	85	87	88	85	85	87	71.3	88
19-Aug	91	94	96	96	97	91	92	94	91	81	69	61	50	58	77	72	70	66	62	68	76	82	90	89	79.8	97
20-Aug	90	91	92	90	88	89	91	89	85	85	84	86	79	72	69	67	66	64	60	60	61	62	65	68	77.2	92
21-Aug	77	77	74	74	77	80	80	80	68	66	54	47	42	41	40	39	40	40	42	46	47	49	52	56	57.9	80
22-Aug	64	71	75	80	84	87	83	81	79	72	59	47	34	33	34	37	37	36	36	40	44	47	51	53	56.9	87
23-Aug	53	62	65	63	65	65	70	70	65	62	54	43	32	31	31	32	34	35	35	36	39	41	46	50	49.2	70
24-Aug	50	53	53	57	60	69	71	75	68	60	56	55	55	49	47	47	45	44	49	53	57	61	65	69	56.9	75
25-Aug	73	75	77	77	77	81	81	85	72	68	57	50	46	44	41	40	40	41	43	45	47	49	52	56	59.1	85
26-Aug	57	59	63	66	69	73	76	76	73	66	64	59	58	49	44	41	45	47	65	70	69	72	72	74	62.7	76
27-Aug	76	79	72	67	68	69	71	71	65	62	54	49	43	39	36	34	33	35	38	41	43	46	83	89	56.8	89
28-Aug	91	90	91	91	86	89	89	86	82	79	76	68	64	58	55	54	49	46	46	48	54	58	69	72	70.4	91
29-Aug	73	81	86	88	87	84	86	90	79	66	58	51	43	35	34	34	37	36	40	43	46	48	53	57	59.9	90
30-Aug	60	64	67	68	75	88	94	97	97	95	97	94	84	75	68	63	60	61	65	63	68	68	85	86	76.8	97
31-Aug	92	78	81	80	76	79	82	83	79	71	64	50	43	38	47	62	69	72	69	78	86	82	77	76	71.4	92
	66.4	68.6	71.6	73.3	74.7	77.5	78.0	76.3	71.1	66.1	60.2	54.1	47.9	43.7	42.4	42.3	42.9	43.8	45.4	48.6	52.1	54.9	59.9	63.5	Diurnal Average	
	94	95	96	96	97	94	94	97	97	95	97	94	84	75	77	72	70	84	85	87	88	87	90	92	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 45m (RH45m) - %
Mannix - August 2014
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	117	15.73	15.73
40 - 60	266	35.75	51.48
60 - 80	252	33.87	85.35
80 - 100	109	14.65	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 75m (RH75m) - %

Mannix - August 2014

Maximum Value: 97 % on Aug 30 11:00

Maximum Daily Average: 79.3 % on Aug 19

Minimum Value: 23 % on Aug 4 17:00

Minimum Daily Average: 42.5 % on Aug 4

Maximum Diurnal Average: 75.2 % at hour 7

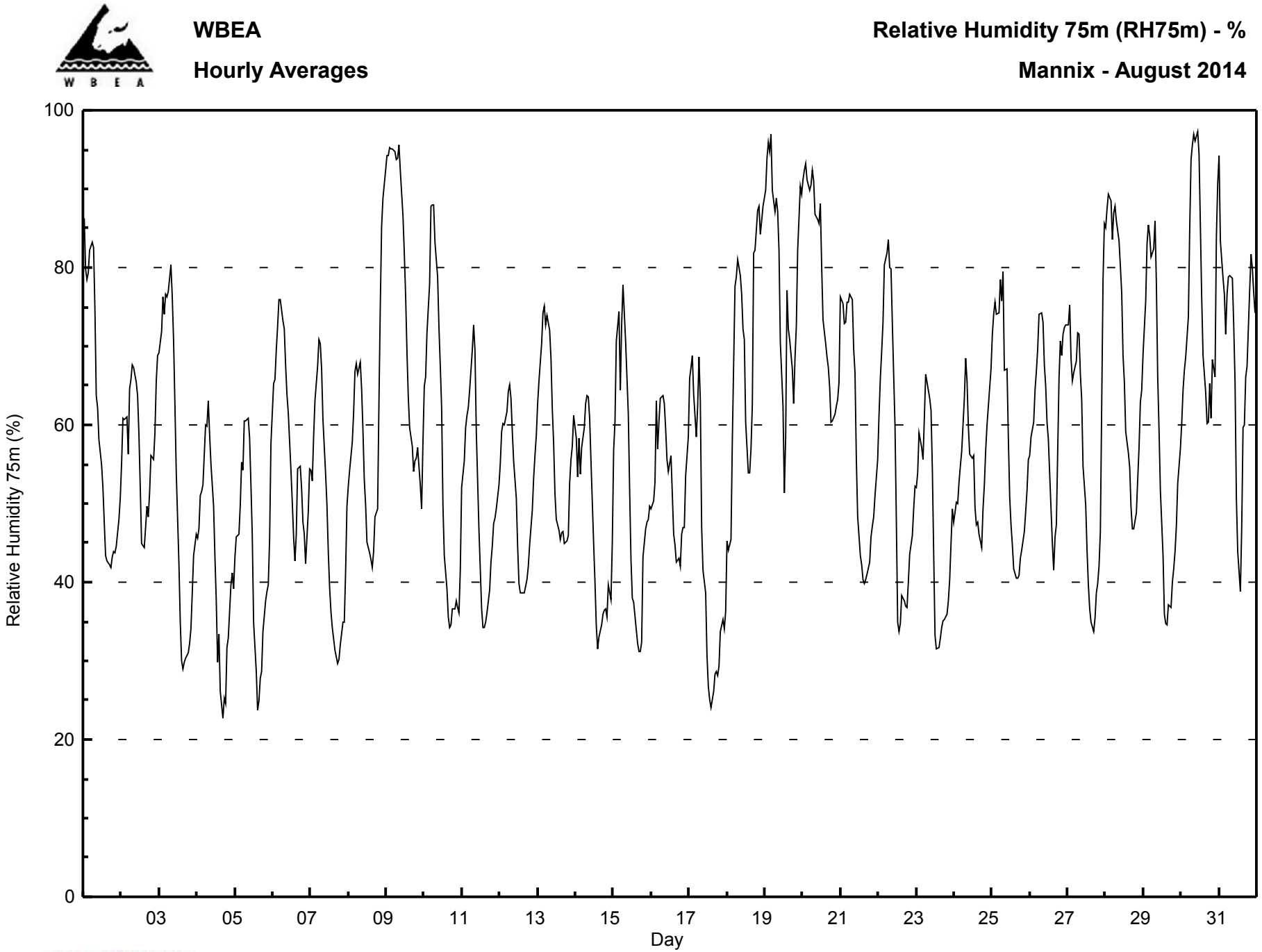
Minimum Diurnal Average: 42.8 % at hour 16

Monthly Average: 58.3 %

Percentiles: P_1 = 26 P_{10} = 36 Q_1 = 45 Median = 58 Q_3 = 71 P_{90} = 83 P_{99} = 96

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	86	80	79	79	82	83	83	75	64	62	58	55	52	48	43	43	42	42	43	44	44	45	48	51	59.6	86
2-Aug	55	61	61	61	56	65	66	68	67	65	64	59	52	45	44	47	50	48	51	56	56	59	66	69	57.9	69
3-Aug	69	72	76	74	77	76	77	80	76	71	62	54	42	35	30	29	30	30	31	32	34	39	43	46	53.6	80
4-Aug	46	47	51	52	52	60	60	63	59	55	50	43	38	30	33	26	23	25	25	32	33	40	41	39	42.5	63
5-Aug	43	46	46	50	55	54	61	60	61	58	52	46	35	29	24	25	28	29	34	38	39	40	45	58	43.9	61
6-Aug	65	66	70	73	76	76	73	72	68	64	61	54	50	46	43	46	54	55	52	48	46	42	49	54	58.5	76
7-Aug	54	53	58	63	68	71	70	67	61	54	50	44	39	36	34	31	30	30	30	32	35	35	41	50	47.4	71
8-Aug	52	54	58	62	67	68	67	68	65	59	53	50	45	44	43	42	44	48	49	63	75	85	89	92	60.0	92
9-Aug	94	94	95	95	95	95	94	94	96	92	87	82	76	69	64	60	57	54	55	56	57	52	49	58	75.9	96
10-Aug	65	66	72	78	88	88	88	83	79	72	68	62	50	43	39	36	34	35	37	37	38	37	36	42	57.1	88
11-Aug	52	55	60	61	62	64	69	73	69	59	53	47	37	34	34	35	36	39	43	45	48	48	49	52	51.0	73
12-Aug	55	59	60	60	62	64	65	63	59	55	51	45	40	39	39	39	39	40	42	45	49	53	56	59	51.6	65
13-Aug	63	66	70	74	75	73	74	72	68	62	58	51	48	47	45	46	46	45	45	46	52	56	57	61	58.4	75
14-Aug	58	53	58	54	57	60	63	64	64	61	55	45	40	34	31	33	34	36	36	37	36	40	38	45	47.2	64
15-Aug	57	60	71	74	64	73	78	74	71	61	52	43	38	37	34	32	31	31	32	43	47	48	48	50	52.0	78
16-Aug	49	50	53	63	57	61	63	64	63	59	56	54	56	51	46	45	43	43	42	46	47	47	54	58	52.9	64
17-Aug	66	67	69	64	58	62	69	63	47	42	39	31	27	25	24	26	28	29	28	29	34	35	34	36	43.0	69
18-Aug	45	44	45	58	68	78	79	81	79	77	72	71	60	54	54	57	63	82	82	87	88	84	86	88	70.1	88
19-Aug	90	94	96	95	97	90	87	89	87	82	71	62	51	59	77	72	71	67	63	68	73	82	90	89	79.3	97
20-Aug	91	92	93	91	90	91	92	91	87	86	86	88	80	73	70	69	67	65	60	61	61	62	63	65	78.2	93
21-Aug	76	75	73	73	76	76	77	76	70	67	56	48	43	42	40	40	40	41	43	46	47	48	51	56	57.5	77
22-Aug	61	66	69	73	80	82	84	80	80	73	60	48	35	34	35	38	38	37	37	40	44	46	49	52	55.8	84
23-Aug	52	54	59	57	56	61	66	65	63	62	54	44	33	31	32	33	34	35	35	36	38	40	45	49	47.3	66
24-Aug	48	50	50	53	55	57	63	68	66	60	56	56	56	50	47	48	46	44	49	52	57	60	65	67	55.1	68
25-Aug	71	74	76	74	74	78	76	79	67	67	58	51	47	45	42	40	41	41	43	44	46	49	52	56	58.0	79
26-Aug	56	58	60	64	67	70	74	74	73	68	65	60	58	49	45	42	46	47	66	71	69	72	72	73	62.5	74
27-Aug	73	75	68	66	67	68	72	72	67	63	55	50	44	40	37	35	34	35	39	40	42	46	79	86	56.2	86
28-Aug	85	87	89	89	84	87	88	86	83	80	77	69	65	59	56	55	50	47	47	49	53	57	63	64	69.5	89
29-Aug	69	76	83	85	84	81	82	86	78	66	59	52	43	36	35	35	37	37	40	42	44	47	53	57	58.6	86
30-Aug	60	64	67	69	74	85	94	96	97	96	97	94	85	76	69	64	60	60	65	61	68	66	84	91	76.8	97
31-Aug	94	83	79	77	72	77	79	79	79	73	65	51	44	39	47	60	60	66	68	77	82	80	77	74	70.0	94
	64.6	65.9	68.2	69.7	70.8	73.3	75.2	75.0	71.3	66.8	61.3	55.1	48.8	44.5	43.1	42.8	43.1	44.0	45.6	48.4	50.9	52.9	57.2	60.9	Diurnal Average	
	94	94	96	95	97	95	94	96	97	96	97	94	85	76	77	72	71	82	82	87	88	85	90	92	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 75m (RH75m) - %
Mannix - August 2014
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	121	16.26	16.26
40 - 60	283	38.04	54.30
60 - 80	248	33.33	87.63
80 - 100	92	12.37	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 98 % on Aug 30 11:00

Maximum Daily Average: 79.3 % on Aug 19

Minimum Value: 23 % on Aug 4 17:00

Minimum Daily Average: 41.9 % on Aug 4

Maximum Diurnal Average: 74.3 % at hour 8

Minimum Diurnal Average: 43.2 % at hour 16

Monthly Average: 58.1 %

Percentiles: P_1 = 26 P_{10} = 36 Q_1 = 45 Median = 57 Q_3 = 70 P_{90} = 83 P_{99} = 96

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

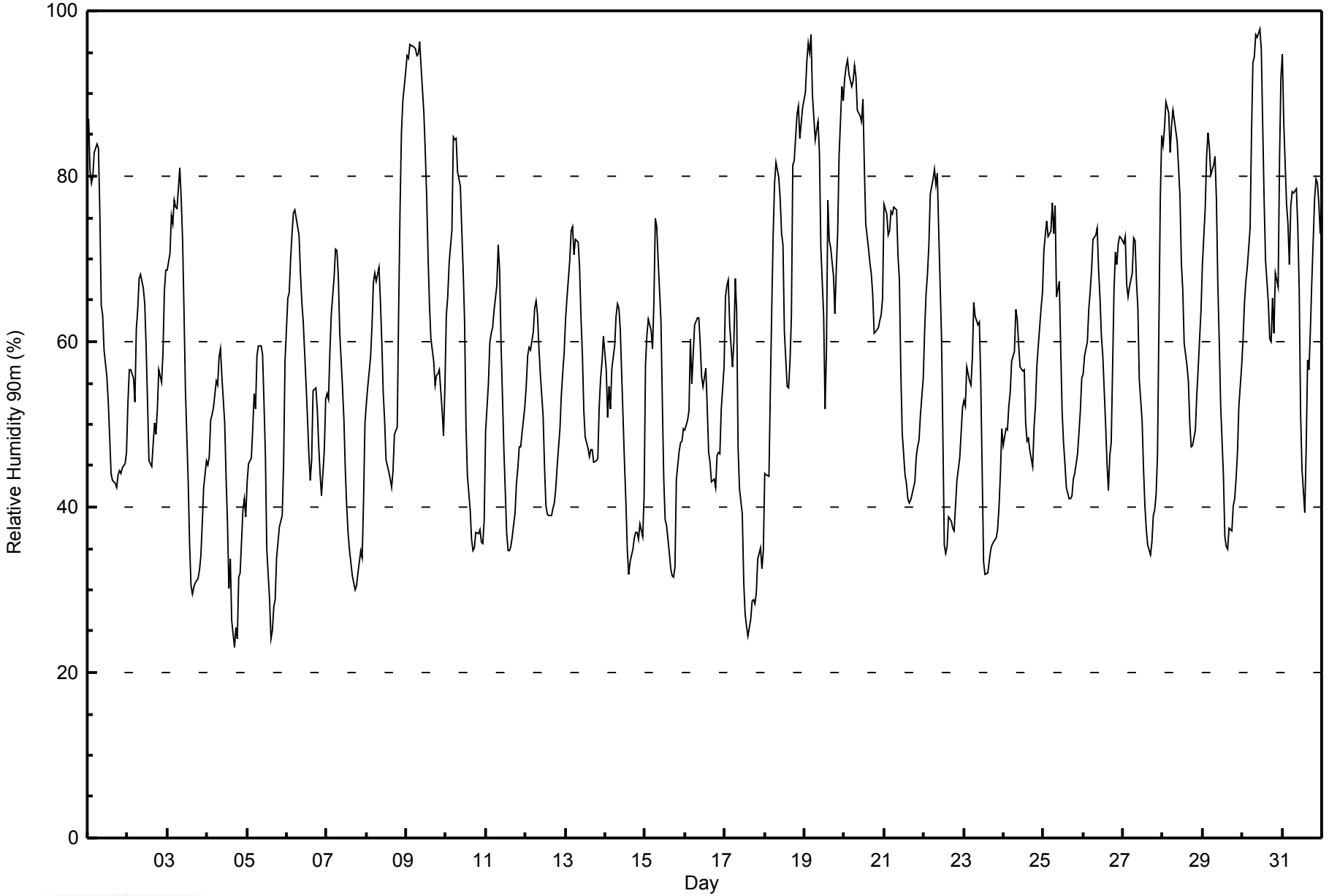
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	87	81	79	80	83	84	83	76	64	63	59	56	53	48	44	43	43	42	44	44	44	45	45	47	59.9	87
2-Aug	53	57	57	56	53	62	64	68	68	66	65	59	53	46	45	48	50	49	52	57	55	59	66	69	57.2	69
3-Aug	69	71	75	74	77	76	76	81	77	72	64	54	43	35	31	29	30	31	31	32	34	38	42	46	53.7	81
4-Aug	45	46	50	51	52	55	55	58	59	56	50	44	38	30	34	26	23	25	24	32	32	40	41	39	41.9	59
5-Aug	43	45	46	49	54	52	58	59	59	58	53	46	35	29	24	25	28	29	34	38	38	39	45	58	43.6	59
6-Aug	65	66	70	73	76	76	74	73	68	65	62	55	51	46	43	46	54	54	52	47	44	41	47	53	58.4	76
7-Aug	54	53	59	63	68	71	71	68	61	54	51	44	40	37	35	32	31	30	30	32	35	34	41	50	47.7	71
8-Aug	53	55	58	62	67	68	67	69	65	60	54	50	46	44	43	42	44	49	50	64	76	85	89	93	60.6	93
9-Aug	95	94	96	96	96	95	95	95	96	93	88	83	77	70	64	60	58	55	56	56	57	52	49	55	76.2	96
10-Aug	63	65	69	74	85	84	85	81	79	74	69	63	50	44	40	36	35	35	37	37	37	36	36	38	56.2	85
11-Aug	49	55	60	61	62	64	67	72	69	60	53	47	37	35	35	35	36	39	43	45	47	47	49	52	50.8	72
12-Aug	55	58	59	59	61	64	65	63	59	56	51	45	40	39	39	39	40	40	42	45	49	54	56	59	51.6	65
13-Aug	63	65	70	73	74	71	72	72	69	63	58	52	48	47	46	47	47	45	46	46	52	56	58	61	58.4	74
14-Aug	57	51	55	52	57	59	63	65	64	62	56	45	41	35	32	33	35	36	37	37	36	38	36	41	46.8	65
15-Aug	57	61	63	61	59	65	75	74	70	63	53	43	38	38	34	33	32	32	33	43	47	48	48	50	50.8	75
16-Aug	49	50	52	60	55	58	62	63	63	60	56	55	57	52	47	45	43	43	42	46	47	46	52	57	52.5	63
17-Aug	65	67	67	62	57	60	68	63	47	42	39	31	27	26	24	26	29	29	28	30	34	35	33	35	42.7	68
18-Aug	44	44	44	54	64	73	79	82	80	77	73	72	61	55	54	58	63	81	82	87	88	85	86	88	69.8	88
19-Aug	90	94	96	95	97	90	84	86	87	83	71	63	52	59	77	72	71	68	63	69	73	83	91	89	79.3	97
20-Aug	92	93	94	92	91	92	93	92	88	87	87	89	81	74	71	70	68	66	61	61	62	63	63	65	79.0	94
21-Aug	77	75	73	73	76	75	76	76	70	67	56	49	44	43	41	41	41	42	43	46	47	48	51	56	57.8	77
22-Aug	61	66	68	72	78	80	81	79	80	74	61	48	35	34	35	39	38	38	37	40	43	46	49	52	55.6	81
23-Aug	53	52	57	55	55	58	65	63	62	62	55	44	33	32	32	33	35	35	36	36	37	40	44	49	46.9	65
24-Aug	47	50	49	52	54	58	59	64	63	60	57	57	57	50	48	48	47	45	50	52	57	60	64	66	54.7	66
25-Aug	71	73	75	73	73	77	73	76	65	67	59	52	48	45	42	41	41	41	43	44	46	49	52	56	57.6	77
26-Aug	56	58	60	64	66	69	72	73	74	69	65	61	58	50	45	42	46	48	66	71	69	72	73	73	62.5	74
27-Aug	72	73	67	65	67	68	73	72	67	64	55	50	45	40	37	35	34	36	39	40	42	46	77	85	56.3	85
28-Aug	84	86	89	88	83	86	88	87	84	81	78	69	66	60	57	55	50	47	47	49	54	57	60	64	69.6	89
29-Aug	69	76	82	85	83	80	81	82	77	67	60	52	44	36	35	35	37	37	40	41	43	47	52	57	58.4	85
30-Aug	60	65	67	69	74	85	94	94	97	97	98	95	86	77	70	65	60	60	65	61	68	67	82	92	77.0	98
31-Aug	95	86	77	74	69	77	78	78	78	74	67	51	45	39	47	58	57	61	67	77	80	79	77	73	69.3	95
	64.3	65.5	67.2	68.4	69.8	72.0	74.1	74.3	71.4	67.6	62.0	55.7	49.3	45.1	43.6	43.2	43.4	44.2	45.9	48.6	50.8	52.6	56.6	60.2	Diurnal Average	
	95	94	96	96	97	95	95	95	97	97	98	95	86	77	77	72	71	81	82	87	88	85	91	93	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity 90m (RH90m) - %

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	120	16.13	16.13
40 - 60	297	39.92	56.05
60 - 80	237	31.85	87.90
80 - 100	90	12.10	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Speed: 29 km/h on Aug 7 14:00

Maximum Daily Speed Average: 18.2 km/h on Aug 7

Minimum Speed Value: 1 km/h on Aug 26 23:00

Minimum Daily Speed Average: 0.5 km/h on Aug 15

Maximum Diurnal Speed Average: 4.4 km/h at hour 14

Minimum Diurnal Speed Average: 0.4 km/h at hour 19

Monthly Average Velocity: 2.2 km/h 222.1 deg

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 5 Median = 8 Q_3 = 11 P_{90} = 13 P_{99} = 26

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-Aug	N20	N19	NNE17	N19	NNW12	NNW11	N11	N12	NNE13	NNW10	NNW13	NW11	NW10	WNW9	NW7	W8	W8	SSW1	SSE6	SSE6	S6	S7	SSE8	SSE7	NNW6.0	N20
2-Aug	SSE9	SSE10	SSE11	SSE10	SSE10	SSE9	SSE8	SSE8	SSE10	SE9	SE10	SSE11	SSE13	S11	S12	S15	S12	SSW10	SSW7	SSE5	S7	S8	SE4	ESE2	SSE8.9	S15
3-Aug	SW6	SW6	SW6	SW5	SSW6	S6	S5	S5	SSE4	SE5	SE4	SE4	S1	W6	W4	W3	SSE4	SSE7	SSE7	S9	S7	SSW6	S3	S6	S4.0	S9
4-Aug	S8	SSE6	SSE6	SSE7	SSE8	SE6	SE7	ESE2	WSW2	NE4	E3	N4	NNW5	NNW5	N9	NNE10	NNE9	NNE11	NNE10	NE11	ENE10	E9	SSE4	SSE7	ENE2.8	NNE11
5-Aug	SSE7	SSE5	S5	SSE6	SE5	SE8	SE7	SSE6	S4	S5	SSE8	ESE6	SE9	SE9	SSE9	SE7	SE8	SE9	SE11	SSE11	SSE8	SSE8	SSE11	SSE9	SSE7.2	SSE11
6-Aug	SSE12	SSE12	SSE10	SSE9	SSE12	SSE11	SSE8	SSE8	S9	S8	SSE9	S12	SSW11	SW14	SW14	WSW16	S6	E4	SW7	SW12	SW9	SW12	SW12	SW13	SSW8.7	WSW16
7-Aug	WSW14	W16	W14	WSW12	WSW7	WSW13	WSW19	WSW20	W28	W27	W27	WSW28	WSW28	W29	WSW27	W26	W24	W24	W17	W13	WSW9	WSW9	W9	NNW9	W18.2	W29
8-Aug	NW5	NNW8	WNW7	WNW6	WNW4	WNW3	N4	N6	N3	NW3	NW4	WNW6	N5	NE5	ENE8	NNE10	NNE10	NNE10	NNE6	WSW16	W12	WNW14	NNW8	NNE10	NNW4.6	WSW16
9-Aug	N11	N12	N12	NNE12	NNE10	NNE6	NNW6	WNW8	WNW9	NW7	NW7	WNW8	WNW6	WNW9	W8	WNW9	W11	WSW7	ENE3	SSE5	SW4	SW8	WSW8	SSW3	NW4.8	NNE12
10-Aug	SSE4	SSE5	SSE6	SSE6	SSE7	SSE6	SSE6	SSE6	S7	SSE6	SE6	SE7	SE5	S4	ESE4	SSW3	WSW7	W9	WSW4	SSW5	SSW8	SW9	WSW9	SW7	S4.4	SW9
11-Aug	S5	SE4	SSE6	SSE7	SSE8	SSE7	SSE6	SSE4	SSW5	WSW10	W8	WSW4	WNW14	WNW18	WNW16	NW14	NW12	N12	NNE10	NNE10	NNE10	NNE8	NNE6	NNE4	NW2.5	WNW18
12-Aug	NNE2	N2	WSW2	WSW2	SE3	SE3	SE2	SE4	SSE6	SE5	SE7	SE8	ESE10	ESE11	SE11	SE9	SE12	SE13	SE11	SE10	SE13	SE16	SE14	SSE11	SE7.2	SE16
13-Aug	SE10	SE13	SE11	SE11	SE11	SSE12	SE10	SSE8	SSE6	SSE10	SSE12	S11	SSW11	SSW11	SSW13	SW14	WSW14	SW10	SSW8	SSW7	S6	W9	NW7	NW6	S7.1	WSW14
14-Aug	W12	WNW11	W10	W9	WNW6	WNW5	WNW3	NW4	NW5	NW4	WNW5	WSW5	WNW7	W6	W7	W6	W4	SSW4	SSE5	S5	S6	SSW5	SSW4	SE5	W4.4	W12
15-Aug	SSE7	SSE6	SSE7	SSE5	SSE7	SSE6	SSE5	SSE7	SE4	ESE3	ESE3	SE3	SW3	WNW5	W4	WNW5	W6	W8	WNW4	N12	NNE13	NNE10	NNE11	N7	E0.5	NNE13
16-Aug	NNW3	W3	NNW3	NW2	WSW2	SW3	WSW2	ESE2	ESE5	SE8	SSE8	SSE7	S8	SSE8	S6	SSW9	SW11	WSW11	SW5	SW6	SW8	SW7	SW5	WSW6	SSW4.0	SW11
17-Aug	SW5	W12	W10	W9	W9	WSW10	SW6	W7	NW9	WNW9	W12	W14	W14	W18	WNW21	WNW24	WNW23	WNW19	WNW13	NW9	W7	WSW8	W9	W4	W11.3	WNW24
18-Aug	S6	SSE6	SE3	SSE6	SSE6	SSE8	SSE8	SSE10	S4	SSW3	SSE5	SSE8	SW6	WSW3	NW6	NNE8	NNE6	W10	SW6	W7	NNW5	N12	NNE6	NW3	S1.5	N12
19-Aug	W6	W3	W2	S3	SW5	SW5	S4	S4	SSW4	S5	S8	SSE8	SSE9	WNW13	WNW18	NNW6	NE8	NE9	NNE4	W5	W8	NNW8	N10	NNE11	WNW1.8	WNW18
20-Aug	NNE11	NNE16	N11	N15	NNE17	N13	N17	NNE15	NNE13	N14	N15	N11	N11	NNW12	NNW11	N10	N10	NNW8	N12	NNE9	NNE8	N4	WNW4	WNW4	N10.9	N17
21-Aug	W3	W5	W6	WNW4	WSW4	W6	WSW6	W2	NW5	NW6	NNW9	NNW9	NW10	NNW10	NNW10	N10	N8	NNE11	NNE14	NE11	NE7	NNE5	NNE5	NNW3	NNW5.0	NNE14
22-Aug	WNW5	W7	W5	W4	W3	SW1	SSW2	WSW2	W4	W3	N4	N5	NNW5	N5	NNW6	NNE13	NNE9	NE10	NE7	NNE6	ENE6	ESE2	SW5	SW5	NNW2.3	NNE13
23-Aug	S4	SE3	SE2	S4	SSE4	S4	S5	S5	SE6	SE4	SSE5	SSE7	SE6	SE6	SE5	SSE5	SSE5	SE5	SSE4	SSE4	E4	SE6	SE6	ENE4	SSE4.3	SSE7
24-Aug	E2	N3	NE3	NNE3	N2	WNW2	W2	W5	NNW2	NNE3	N2	NE5	ENE5	SE5	SE3	S5	SSE4	SE6	SE9	SSE10	SSE9	SSE11	SSE11	SSE10	SE2.8	SSE11
25-Aug	SSE8	SSE8	SSE7	SSE9	SSE9	SE9	SSE9	SE7	SE10	SSE12	SSE15	SSE14	SSE14	SSE13	S14	SSW13	SSW13	SSW12	S10	SSE11	SSE12	S14	SSE13	SSE8	SSE10.5	SSE15
26-Aug	SE8	SE11	SE11	SE9	SSE9	SSE9	SSE10	SSE8	SE7	SE5	SE6	SE6	SSE5	SSE5	SE5	SSW12	SSW13	WSW11	N13	ENE7	ESE3	SSE4	S1	SSE8	SSE5.5	N13
27-Aug	S9	SSE7	SSW6	SSW6	SSE6	S6	W13	W18	WNW22	W23	W19	W15	W14	W11	W13	WNW11	W16	W15	WNW9	NNW6	N7	NNW6	WNW13	SSW3	W8.8	W23
28-Aug	WSW7	SW7	SW7	SSW4	W10	WSW11	W12	W15	W18	WNW16	WNW10	WNW10	WNW11	NW11	NW9	NW7	WNW9	NW4	W6	SW2	ESE4	SSE5	SSE6	SSE7	W6.6	W18
29-Aug	SSE8	SSE8	SE11	SSE10	SE11	SE10	SSE9	SSE8	SSE7	SSE10	SE8	SE9	SE12	SSE13	SSE12	SE12	SE11	SE10	SSE12	SSE10	SE12	SE12	SE14	SSE13	SSE10.4	SE14
30-Aug	SE11	SE8	SE11	SSE9	SSE9	S6	SSE8	S6	SW8	W9	W11	W13	W11	W7	NW4	NNW4	W6	SW6	SSE2	SSE4	SW4	WSW8	WSW6	W6	SW4.1	W13
31-Aug	WSW6	WSW8	WSW8	SSW5	SSW5	SSW5	SSW5	S4	SSW3	SSW3	S3	W8	W12	WNW11	NNW18	NNW15	SW5	WSW10	W4	SW6	SW10	WSW9	W10	WSW6	WSW5.1	NNW18
	SSW2.5	SSW1.8	SSW2.2	S2.1	S2.8	S3.1	S2.7	SSW2.2	SW2.4	WSW2.6	SW2.2	SW2.5	WSW3.7	WSW4.4	W4.1	W3.7	WSW3.6	WSW2.9	SW0.4	S1.6	S2.0	SSW2.5	SW2.2	S2.0	Diurnal Average	
	N20	N19	NNE17	N19	NNE17	N13	WSW19	WSW20	W28	W27	W27	WSW28	WSW28	W29	WSW27	W26	W24	W24	W17	WSW16	SE13	SE16	SE14	SW13	Diurnal Maximum	

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

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

Maximum Value: 13 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 28 20:00

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

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

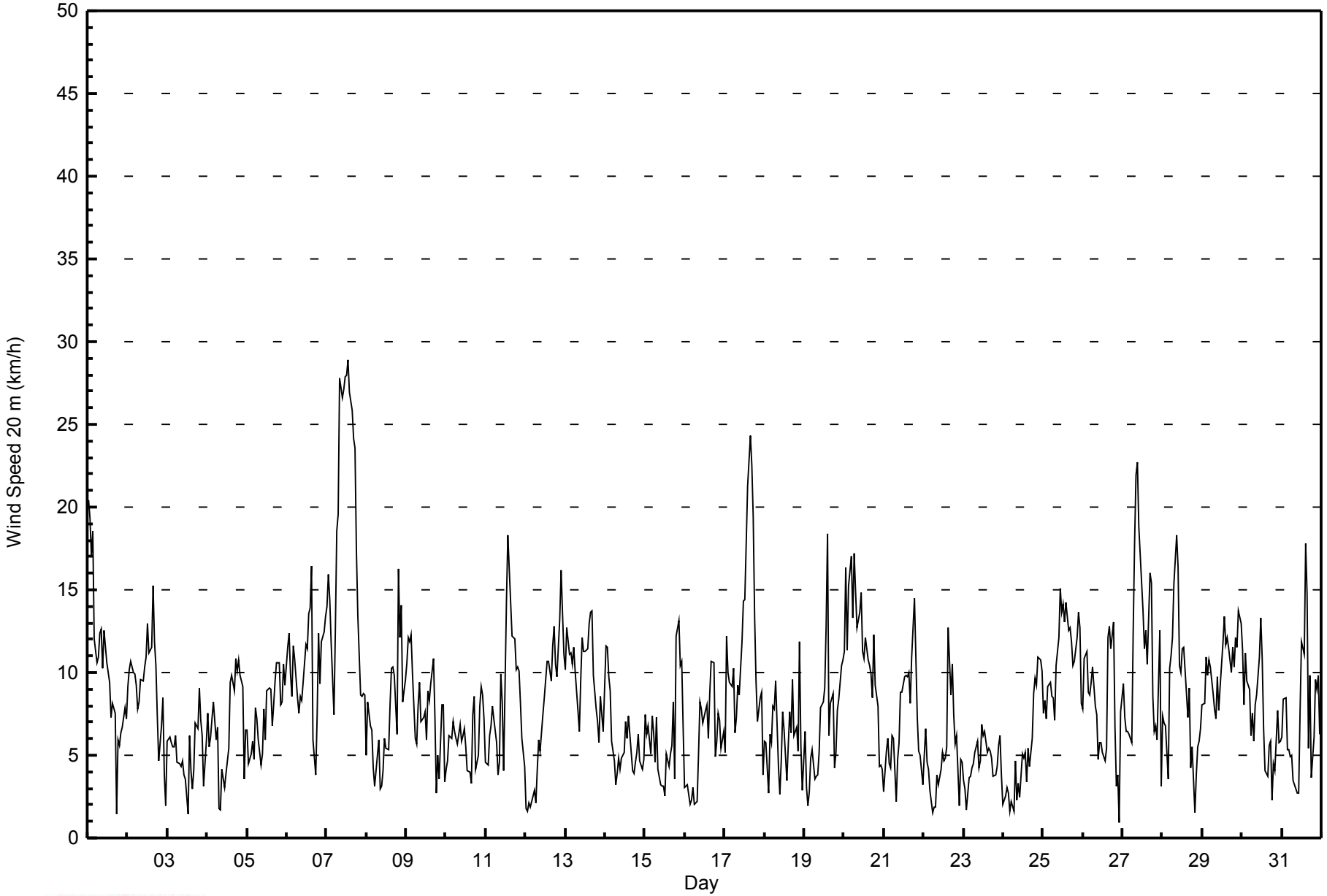
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	7	7	5	6	5	4	5	5	5	5	6	5	4	4	4	4	3	3	3	2	2	2	2	2	7
2-Aug	3	3	3	3	3	3	3	3	4	4	4	5	5	5	6	7	6	5	3	1	3	4	2	1	7
3-Aug	1	2	2	2	2	2	3	3	2	2	2	2	2	3	3	3	3	3	3	3	2	1	1	2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

WBEA

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	213	28.63	28.63
6 - 11	395	53.09	81.72
12 - 19	119	15.99	97.72
20 - 28	16	2.15	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 20 m (WS20m) - km/h

Mannix - August 2014

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	12	7	4	3	4	10	24	28	23	20	14	11	20	13	11	9	213
6 - 11	14	28	7	4	1	3	52	109	24	14	22	25	38	23	14	17	395
12 - 19	15	10	0	0	0	0	10	17	5	7	7	7	24	10	2	5	119
20 - 28	1	0	0	0	0	0	0	0	0	0	0	4	7	4	0	0	16
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	42	45	11	7	5	13	86	154	52	41	43	47	90	50	27	31	744

Total Number of Valid Hours: 744

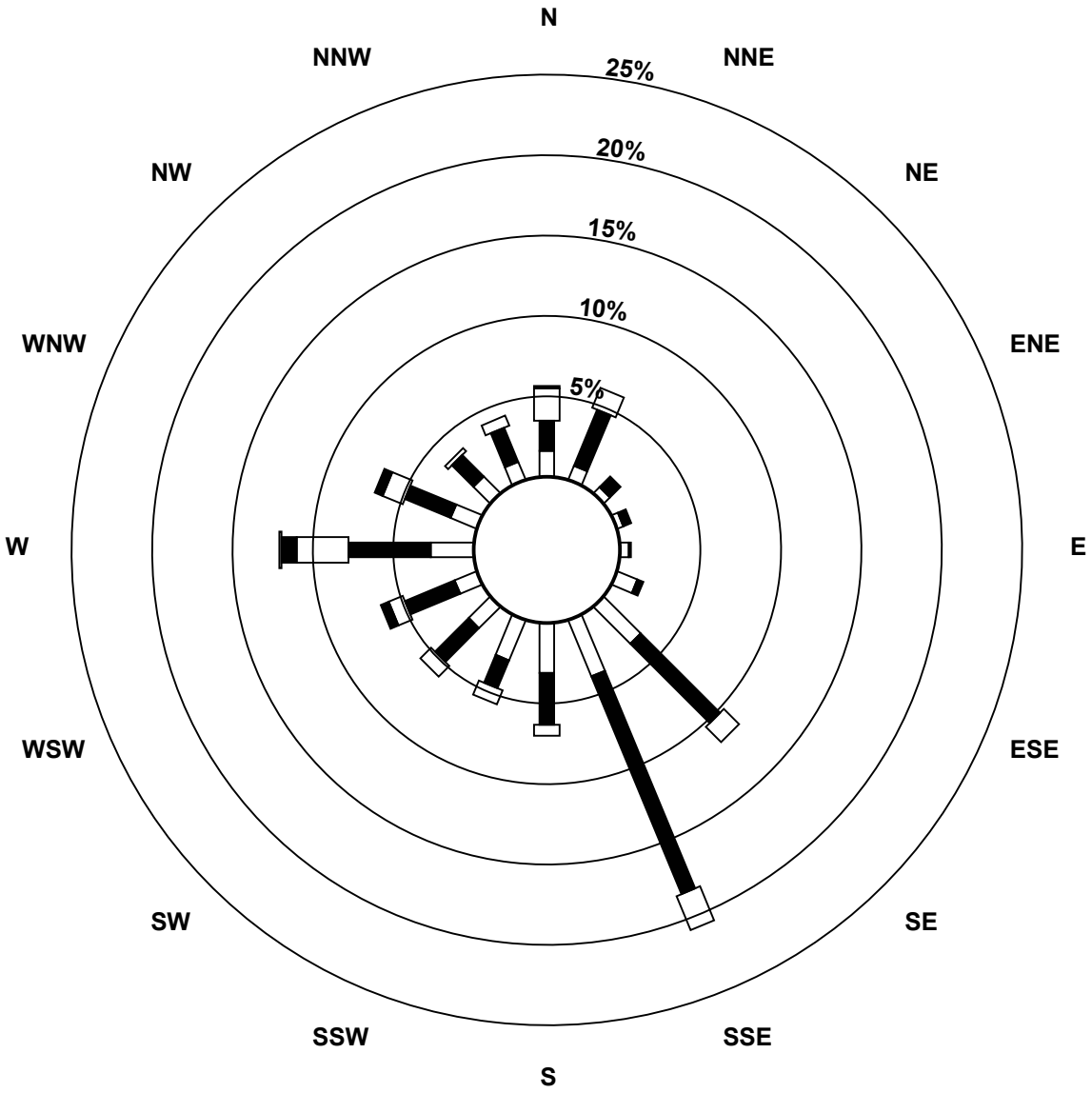
Total Number of Hours: 744

Wood Buffalo Environmental Association

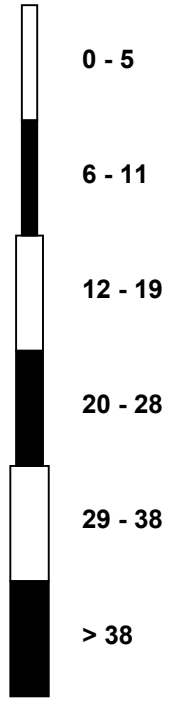
Wind Rose Aug 2014

Wind Speed 20 m (WS20m) - km/h

Mannix (AMS 5)



Classes (km/h)



Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - August 2014

Maximum Speed: 33 km/h on Aug 7 14:00

Maximum Daily Speed Average: 22.3 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 22 07:00

Minimum Daily Speed Average: 1.5 km/h on Aug 15

Maximum Diurnal Speed Average: 5.4 km/h at hour 14

Minimum Diurnal Speed Average: 1.1 km/h at hour 19

Monthly Average Velocity: 3.2 km/h 211.7 deg

Percentiles: P_1 = 2 P_{10} = 5 Q_1 = 8 Median = 12 Q_3 = 16 P_{90} = 20 P_{99} = 30

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-Aug	N30	N28	NNE24	N26	N20	N17	N16	N17	NNE17	NNW15	NNW18	NNW16	NW15	WNW12	NW11	WNW10	W9	SW2	SSE8	SSE10	S16	S17	SSE17	SSE15	N7.9	N30
2-Aug	SSE19	SSE21	SSE21	SSE20	SSE22	SSE18	SSE14	SSE13	SSE14	SSE13	SE14	SSE15	SSE20	S19	S20	S27	S23	SSW21	SSW15	SSE10	S16	S18	SSE7	SSE5	SSE16.4	S27
3-Aug	SSW13	WSW10	SW12	SW12	SSW13	S16	S11	S7	SSE7	SE6	SE5	SE4	S3	W7	W6	W4	SSE6	SSE10	SSE11	S18	S15	SW12	WSW4	SSW3	SSW7.2	S18
4-Aug	S8	S10	SSW10	S11	SSE15	SE11	SSE10	SE2	W3	NNE5	E3	N5	NNW7	NNW8	N12	NNE12	NNE11	NNE14	NNE15	NE17	NE15	E13	SE8	SSE13	ENE3.3	NE17
5-Aug	SSE12	SSE11	SSE12	SSE12	SE9	SE12	SE12	SSE10	SSE8	SSE7	SSE11	ESE7	SE12	SE13	SSE13	SE9	SE11	SE13	SE15	SSE21	S19	SSE17	SSE23	S20	SSE12.3	SSE23
6-Aug	SSE24	S23	SSE19	SSE18	SSE22	SSE19	SSE14	SSE12	S15	S14	SSE14	S20	SSW21	SW20	SW19	SW24	S10	E4	SW11	SW20	SW19	SW25	SW24	SW24	SSW15.3	SW25
7-Aug	WSW21	W21	W19	WSW17	WSW12	WSW18	WSW23	WSW23	W32	W30	W31	WSW32	WSW32	W33	WSW32	WSW30	W28	W27	W20	W17	W13	WSW13	WNW14	NNW16	W22.3	W33
8-Aug	NNW9	NNW14	NW11	WNW10	NW8	NNW7	NNE6	NNE7	NNE4	NW4	NW5	NW8	N8	NE6	ENE9	NNE12	NNE13	NNE12	NNE9	WSW20	W14	WNW21	NNW14	NNE12	NNW7.0	WNW21
9-Aug	N16	N20	N18	NNE17	NNE14	NNE9	NNW9	WNW11	WNW13	NW11	NW11	WNW10	WNW8	WNW11	W10	WNW12	W12	WSW9	ENE4	SSE7	SW7	WSW13	WSW14	SW7	NW7.0	N20
10-Aug	S6	SSE6	SSE12	SSE12	SSE12	SSE11	SSE9	SSE8	S11	SSE8	SE7	SE7	SE7	S5	ESE5	SSW5	WSW9	W10	WSW5	SSW10	SW15	WSW18	SW19	SW16	S7.4	SW19
11-Aug	SSW10	S6	S8	S10	SSE15	SSE13	SSE8	SSE4	SSW7	WSW11	W9	WSW4	WNW19	WNW23	WNW23	NW22	NW19	N18	NNE14	NNE15	NNE16	NNE14	NNE11	NE7	NW3.6	WNW23
12-Aug	ENE4	NE4	SSE4	SE4	SSE7	SE6	SE4	SE5	SSE8	SE7	SE9	SE11	ESE12	ESE13	SE13	SE13	SE15	SE17	SE15	SE14	SE20	SE24	SE20	SSE18	SE10.7	SE24
13-Aug	SSE16	SE19	SE17	SE17	SE18	SE20	SE17	SSE12	SSE9	S15	SSE19	S21	SSW20	SSW19	SSW21	SW20	SW18	SW15	SSW16	SSW16	SSW16	WNW14	NW14	NNW13	S11.5	SSW21
14-Aug	W16	WNW22	WNW15	NW14	NW11	NW10	NNW6	NW6	NNW7	NW6	WNW5	WSW5	WNW8	W7	W9	WNW8	WSW6	SSW6	SSE7	S11	S14	SSW11	SSW11	SSE8	W5.8	WNW22
15-Aug	SE14	SSE14	SSE14	SSE10	SSE16	SSE13	SSE7	SSE11	SSE6	SE3	ESE3	SE3	SW3	WNW7	W6	WNW7	W7	W11	WNW5	NNE18	NNE19	NNE15	NE16	NNE11	ESE1.5	NNE19
16-Aug	NNE6	NNE4	N5	N5	NNE3	ESE2	SE3	ESE3	ESE6	SE11	SE11	SSE10	S12	SSE11	S10	SSW13	SW16	WSW15	SW10	SW11	SW15	SW15	SW13	SW15	SSW5.7	SW16
17-Aug	WSW11	W17	W15	WNW16	WNW15	W14	WSW9	WNW9	NW14	WNW12	W13	W17	W17	W21	WNW26	WNW33	WNW29	WNW26	WNW20	NW17	WNW12	W11	W14	WNW10	WNW16.0	WNW33
18-Aug	S4	SSE9	SSE4	SSE13	SSE11	SSE12	SSE11	SSE15	S7	SW4	SSE7	SSE11	SW8	WSW5	NW9	NNE10	NNE8	W12	SW9	W9	NNW9	N18	NNE8	NNW4	S2.2	N18
19-Aug	W9	WNW5	W3	S2	SSW6	SW9	S8	S6	SSW7	S8	S12	SSE12	SSE13	WNW18	WNW27	NNW10	NE10	NNE11	NNE5	W6	WNW12	N14	N16	NNE17	WNW2.8	WNW27
20-Aug	NNE16	NNE23	N16	N22	NNE24	N19	N24	NNE20	NNE17	N20	N21	N16	N16	NNW19	N16	N15	N13	NNW14	N18	NNE13	NNE12	NNW7	NW11	NW10	N16.1	N24
21-Aug	NW4	WNW6	WNW9	NW10	WNW6	WNW10	WNW9	NW3	NNW7	NW8	NNW13	NNW12	NW13	NNW14	NNW13	N13	N12	NNE14	NNE19	NE15	NE12	NE8	NNE8	NNE6	NNW8.2	NNE19
22-Aug	NW5	WNW12	WNW7	NNW3	NNW2	NE1	ESE0	WSW2	W4	WNW3	N5	N7	NNW6	NNW6	NNW8	NNE16	NNE11	NE12	NE9	NE8	ENE9	E5	S3	SSE7	N3.8	NNE16
23-Aug	SSE11	SE6	SE3	SSE8	SSE9	SSE8	S9	S9	SE9	SSE6	SSE7	SSE10	SE8	SE8	SE7	SSE8	SSE8	SE7	SSE6	SE7	ESE7	SE9	SE10	E5	SSE7.2	SSE11
24-Aug	ESE5	NE2	ENE5	NE4	NE4	N6	NNE2	WNW4	NNW3	N4	N3	NE5	E5	SE6	SE5	S8	SSE7	SE8	SE13	SSE16	SSE16	SSE19	SSE18	SSE18	SE5.0	SSE19
25-Aug	SSE15	SSE15	SSE13	SSE15	SSE16	SSE15	SSE15	SE12	SE17	SSE17	SSE22	SSE19	SSE19	SSE19	S25	S24	SSW25	S24	S20	SSE22	SSE24	S25	SSE24	SSE15	SSE18.3	S25
26-Aug	SE13	SE18	SSE18	SSE15	SSE16	SSE17	SSE18	SSE11	SE9	SE6	SE7	SE8	SSE8	SSE6	SE7	SSW22	SSW23	SW17	N20	ENE9	ESE6	SE6	S1	SSE13	SSE8.8	SSW23
27-Aug	SSE20	S17	SSW16	SW12	SSW11	SSW11	W16	W22	WNW28	W26	W22	W17	W16	W14	W15	WNW14	W19	W18	NW14	N13	N11	NNW7	WNW20	S3	W11.4	WNW28
28-Aug	WSW10	WSW11	WSW12	WSW7	W15	W15	W15	WNW19	W21	WNW21	WNW15	NW15	WNW15	NW16	NNW13	NNW10	WNW12	WNW6	W6	SW2	ESE8	SSE10	SSE11	SSE14	W8.7	WNW21
29-Aug	SSE16	SSE15	SE17	SE16	SE18	SE18	SSE15	SSE12	SSE10	SSE14	SE10	SSE13	SSE16	SSE19	SSE17	SE17	SE15	SE14	SSE17	SSE17	SE19	SE19	SE22	SE20	SSE16.1	SE22
30-Aug	SE18	SE15	SE17	SE16	S17	S14	SSE12	S11	SW13	W10	W13	W15	W12	W8	NW5	NNW5	W7	SW9	S4	S10	SSW8	WSW13	WNW8	W11	SSW6.1	SE18
31-Aug	W9	WSW14	WSW14	SW9	SW10	SW10	SSW9	SSW7	SSW4	SSW4	S4	W9	W14	NW15	NNW28	N24	SSW9	WSW12	W5	SW11	WSW17	WSW14	W13	WSW10	W8.1	NNW28
	S4.2	SSW3.0	SSW3.6	S3.5	S4.9	S4.9	S4.0	SSW3.2	SW3.1	WSW3.0	SW2.6	SW3.1	SW4.6	WSW5.4	W5.2	W4.8	WSW4.7	WSW3.9	SSW1.1	S3.4	S4.3	SSW4.6	SSW3.5	S3.5	Diurnal Average	
	N30	N28	NNE24	N26	NNE24	SE20	N24	WSW23	W32	W30	W31	WSW32	WSW32	W33	WSW32	WNW33	WNW29	W27	WNW20	SSE22	SSE24	S25	SW24	SW24	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 16 km/h on Aug 27 22:00

Minimum Value: 0 km/h on Aug 22 06:00

Percentiles: P_1 = 1 P_{10} = 2 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

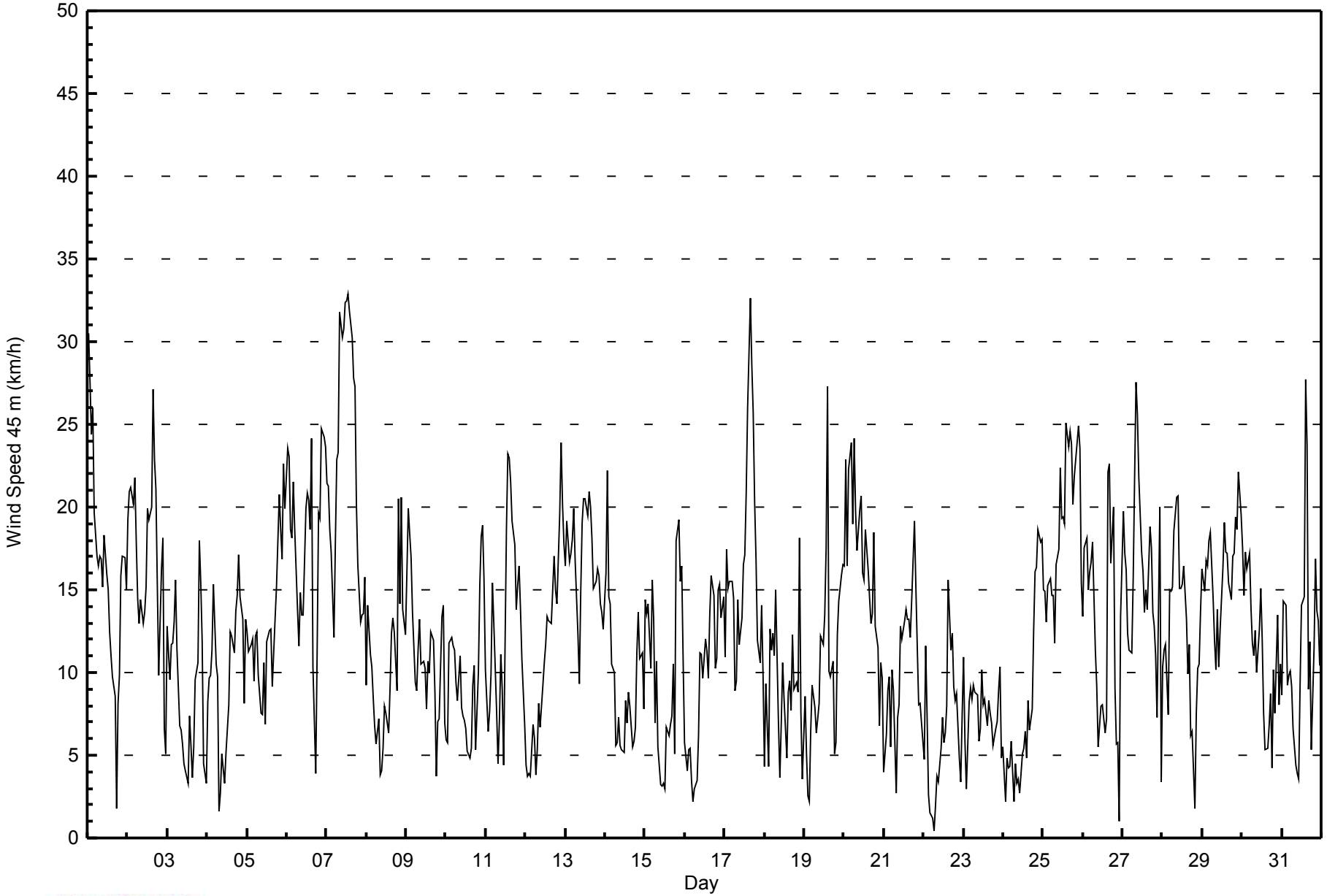
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	5	7	4	6	5	3	4	5	4	5	5	4	4	4	4	3	3	3	2	3	2	2	2	3	7
2-Aug	3	2	3	3	2	2	4	3	3	4	3	4	5	5	5	6	5	4	4	2	2	6	4	2	6
3-Aug	2	2	2	2	1	2	4	2	2	2	2	2	2	3	3	3	4	3	3	2	2	2	2	3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

WBEA

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	91	12.23	12.23
6 - 11	255	34.27	46.51
12 - 19	301	40.46	86.96
20 - 28	86	11.56	98.52
29 - 38	11	1.48	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 45 m (WS45m) - km/h

Mannix - August 2014

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	6	6	6	3	5	6	11	4	9	4	4	6	5	5	6	5	91
6 - 11	4	15	6	3	0	5	33	55	22	15	13	11	22	20	15	16	255
12 - 19	19	26	6	0	1	2	37	77	17	9	17	16	29	19	11	15	301
20 - 28	10	4	0	0	0	0	6	14	11	8	7	4	9	11	1	1	86
29 - 38	1	0	0	0	0	0	0	0	0	0	0	4	4	2	0	0	11
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	40	51	18	6	6	13	87	150	59	36	41	41	69	57	33	37	744

Total Number of Valid Hours: 744

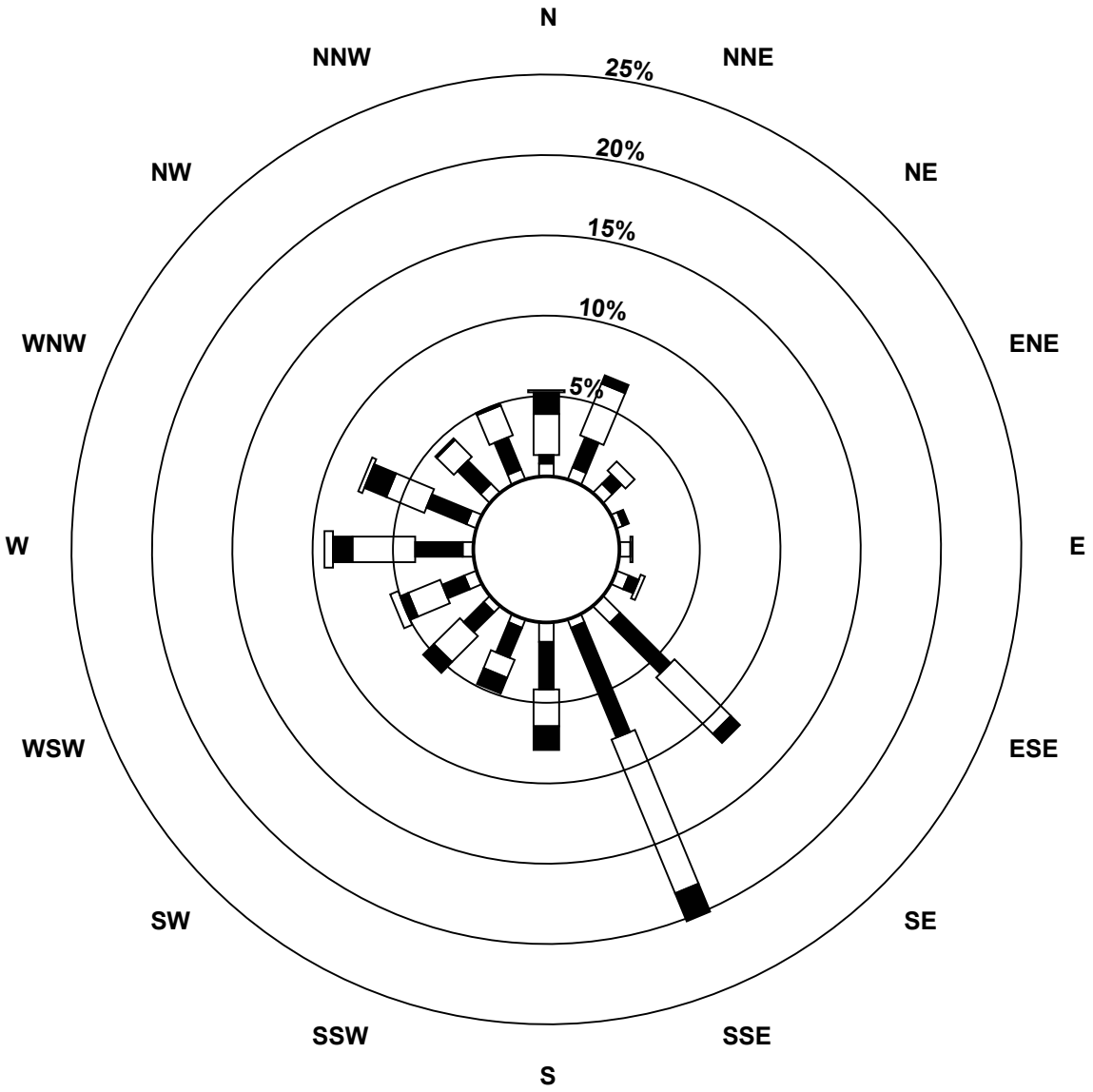
Total Number of Hours: 744

Wood Buffalo Environmental Association

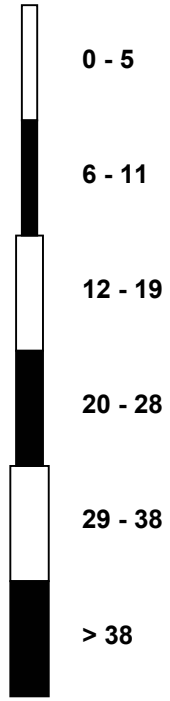
Wind Rose Aug 2014

Wind Speed 45 m (WS45m) - km/h

Mannix (AMS 5)



Classes (km/h)



Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - August 2014

Maximum Speed: 35 km/h on Aug 7 14:00

Maximum Daily Speed Average: 25.4 km/h on Aug 7

Minimum Speed Value: 1 km/h on Aug 19 04:00

Minimum Daily Speed Average: 2.5 km/h on Aug 18

Maximum Diurnal Speed Average: 5.9 km/h at hour 6

Minimum Diurnal Speed Average: 1.2 km/h at hour 19

Monthly Average Velocity: 3.6 km/h 211.7 deg

Percentiles: P_1 = 2 P_{10} = 5 Q_1 = 8 Median = 13 Q_3 = 20 P_{90} = 24 P_{99} = 33

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-Aug	N35	N31	NNE29	N30	N23	N19	N18	N18	NNE19	N16	NNW19	NNW16	NW15	NW12	NW11	WNW10	W8	SW2	SSE8	SSE11	SSE17	S20	SSE22	SSE23	N8.3	N35
2-Aug	SSE25	SSE27	SSE29	SSE27	SSE29	SSE25	SSE20	SSE17	SSE16	SSE14	SE14	SSE16	SSE21	S21	S21	S30	S25	SSW23	SSW18	S12	S20	S24	SSE8	SSE9	SSE19.8	S30
3-Aug	SSW15	WSW12	WSW10	SW13	SSW13	S16	S15	S7	SSE7	SE5	SE4	SE4	S4	W7	W5	W4	SSE5	SSE10	SSE12	S20	SSW16	SW14	W9	W5	SSW7.8	S20
4-Aug	SW7	SW11	SW11	SSW7	S9	SSE13	SSE10	S2	W3	NNE6	E4	N5	NNW7	NNW8	N13	NNE13	NNE12	NNE15	NNE18	NE22	ENE19	E16	ESE9	SE13	ENE3.5	NE22
5-Aug	SE12	SE13	SSE15	SSE12	SE9	SE11	SE11	SE10	SSE10	SSE8	SSE10	ESE6	SE11	SE12	SSE13	SE9	SE10	SE12	SE19	SSE26	S24	SSE23	S28	S25	SSE13.5	S28
6-Aug	SSE30	S28	S24	S23	SSE27	SSE24	SSE17	SSE14	S16	S14	SSE14	S22	SSW23	SW22	SW20	SW28	SSW12	ENE3	SW14	SW25	SW29	WSW32	SW33	SW31	SSW18.3	SW33
7-Aug	WSW28	W26	W22	W22	WSW17	WSW23	W27	WSW26	W33	W31	W32	WSW35	WSW35	W35	WSW34	WSW32	W29	WSW30	W22	W19	W18	WSW21	WNW19	N21	W25.4	W35
8-Aug	NNW11	NNW16	NW13	NW13	NW10	N8	NNE6	NNE7	NNE4	NW4	NW5	NW8	N8	NE7	ENE9	NNE13	NNE14	NNE14	NNE10	WSW23	W15	WNW22	NNW16	NNE14	NNW7.7	WSW23
9-Aug	N19	N24	N21	NNE19	NNE16	NNE12	NNW10	NW12	WNW14	NW11	NW10	NW10	WNW8	WNW11	W10	WNW13	W12	WSW9	NE4	S6	WSW9	WSW16	W18	WSW13	NW8.2	N24
10-Aug	SSW9	SSW7	SSE10	SSE16	SSE17	SSE15	S11	S9	S11	SSE8	SE7	SE6	SE6	S5	SE5	SSW6	SW10	W11	WSW6	SSW11	SW17	WSW25	WSW26	WSW26	SSW8.8	WSW26
11-Aug	SW17	SW9	SSW8	SSW9	SSW11	SSW10	S8	S4	SSW8	WSW11	W9	W4	WNW19	WNW24	NW24	NW22	NNW21	N20	NNE16	NNE20	NNE22	NE20	NE16	ENE9	NW5.4	WNW24
12-Aug	E6	E3	SSE7	SSE8	SE9	SE6	SE5	SE5	SE8	SE7	SE8	SE9	ESE10	ESE11	SE11	SE13	SE15	SE16	SE14	SE12	SE20	SE26	SE25	SSE24	SE11.2	SE26
13-Aug	SSE23	SE23	SE19	SE17	SE21	SE27	SE24	SSE16	SSE10	S16	SSE20	S22	SSW22	SSW21	SSW22	SW21	SW19	SW17	SSW18	SSW19	SSW20	WNW17	NNW16	NNW16	S13.2	SE27
14-Aug	WNW21	WNW29	NW21	NNW18	NNW14	NNW12	NNW8	NW6	NNW7	NNW5	WNW5	WSW5	WNW8	W7	W9	W8	WSW6	SSW6	SSE7	S12	S13	S15	SSW16	S10	W6.0	WNW29
15-Aug	SE16	SSE18	SSE20	S15	SSE17	SSE20	SSE11	SSE12	SSE6	SE3	ESE3	SSE3	SSW3	WNW7	W7	WNW6	W8	W10	WNW5	NNE22	NNE23	NE19	NE20	NNE11	SE2.8	NNE23
16-Aug	NE5	NE5	NNE6	N8	ENE5	ESE4	SE7	SE4	ESE5	SE10	SE11	SSE10	SSE12	SSE12	S10	SSW15	SW17	WSW16	SW13	SW12	SW13	WSW14	WSW20	WSW23	SSW6.1	WSW23
17-Aug	WSW18	WNW23	W20	WNW22	NW21	WNW19	W12	WNW11	NW15	WNW12	W13	W16	W18	W21	WNW27	WNW33	WNW30	WNW27	WNW22	NW19	NW14	WNW9	WNW11	WNW10	WNW17.9	WNW33
18-Aug	SW3	S6	S6	SSE15	SSE18	SSE17	SSE14	SSE16	S7	SW4	SSE7	SSE11	SW9	WSW5	NW9	NNE10	NE8	WNW13	WSW10	W11	NNW10	N21	NE9	NNW3	S2.5	N21
19-Aug	WNW9	WNW7	WNW4	WSW1	S6	SW11	S11	SSW7	SW9	S9	S13	SSE12	SSE14	WNW18	NW30	NNW11	NE11	NE11	NNE5	W6	WNW13	N17	NNE19	NNE21	WNW3.1	WNW30
20-Aug	NNE20	NNE26	N19	N26	NNE27	N22	NNE26	NNE21	NNE20	N22	N23	N18	N17	N20	N17	N16	NNE14	NNW15	N21	NNE15	NNE13	NNW9	NNW14	NNW13	N18.4	NNE27
21-Aug	NNW6	NW6	NW12	NW13	NW6	NW12	WNW12	NNW5	NNW7	NW8	NNW13	NNW12	NNW14	NNW14	NNW14	N14	N13	NNE15	NNE21	NE19	NE13	NE9	NNE12	NNE8	N9.7	NNE21
22-Aug	NNW5	NNW10	NNW8	NNW6	NW2	NW4	NW2	WNW3	WNW3	WNW3	N6	N8	NNW6	N6	NNW8	NNE16	NNE12	NE13	NE10	NE10	ENE12	E6	SE5	SSE8	NNE4.9	NNE16
23-Aug	SSE11	SE8	SSE6	SSE11	SSE13	SSE10	SSE12	S12	SE11	SSE6	SSE7	SSE11	SE8	SE8	SE6	SSE8	SSE8	SE7	SSE6	SE7	ESE6	SE8	SE10	ESE5	SSE8.3	SSE13
24-Aug	ESE5	ENE3	E6	ENE6	ENE6	NE7	NE5	NNW3	N4	N3	NNW3	NE5	E6	SE6	SE5	SSE9	SSE7	SE7	SE14	SE21	SE21	SSE26	SSE24	SSE25	SE6.9	SSE26
25-Aug	SSE21	SSE21	SSE19	SSE22	SSE21	SSE21	SSE21	SE17	SE22	SSE19	SSE24	SSE21	SSE20	SSE21	S27	S26	SSW27	S27	S24	SSE28	S30	S31	SSE30	S19	SSE22.5	S31
26-Aug	SSE16	SSE22	SSE24	SSE21	SSE23	SSE23	SSE23	SSE14	SSE9	SE6	SE6	SE8	SSE9	SSE6	SE7	SSW24	SSW24	SW18	N23	ENE11	E6	SE5	SE1	SSE15	SSE10.6	SSW24
27-Aug	SSE25	S24	SW22	SW17	SW15	SW13	W18	WNW23	WNW28	W26	W22	W17	W16	W14	WNW16	WNW15	W20	W19	NW15	N16	N15	NNW7	WNW24	SSE2	W12.7	WNW28
28-Aug	W12	WSW14	WSW13	W12	WNW18	WNW18	WNW18	WNW19	W21	WNW21	WNW16	NW16	WNW16	NW16	NNW14	NNW10	WNW12	WNW7	W7	SW2	ESE5	SSE10	SSE11	SSE16	WNW9.8	WNW21
29-Aug	SE18	SE21	SE22	SE21	SE23	SE23	SE19	SE16	SSE12	SSE15	SSE11	SSE13	SSE17	SSE20	SSE18	SE18	SE16	SE15	SSE21	SSE23	SE25	SE26	SE28	SE25	SE19.5	SE28
30-Aug	SE22	SE17	SE18	SE19	S21	S17	SSE14	S14	SW14	W11	W14	W16	W12	W7	NW5	NNW6	WSW7	SW10	S5	S13	SW10	WSW17	NW8	WNW11	SSW7.2	SE22
31-Aug	W7	WSW14	W20	W13	WSW13	WSW12	WSW11	WSW7	SW5	SSW4	S4	W9	W14	NW15	NNW31	N28	SSW9	WSW15	WNW7	WSW13	WSW22	WSW19	W17	WSW14	W10.3	NNW31
	S4.8	SSW3.5	SSW4.0	S3.6	S5.3	S5.9	S5.0	S3.6	SW3.3	WSW3.2	SW2.5	SW3.1	SW4.8	WSW5.5	W5.4	W4.9	WSW4.9	WSW4.3	SSW1.2	S3.7	S4.6	SSW5.1	SSW4.0	S4.3	Diurnal Average	
	N35	N31	SSE29	N30	SSE29	SE27	WSW27	WSW26	W33	W31	W32	WSW35	WSW35	W35	WSW34	WNW33	WNW30	WSW30	S24	SSE28	S30	WSW32	SW33	SW31	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 17 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 22 07:00

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

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

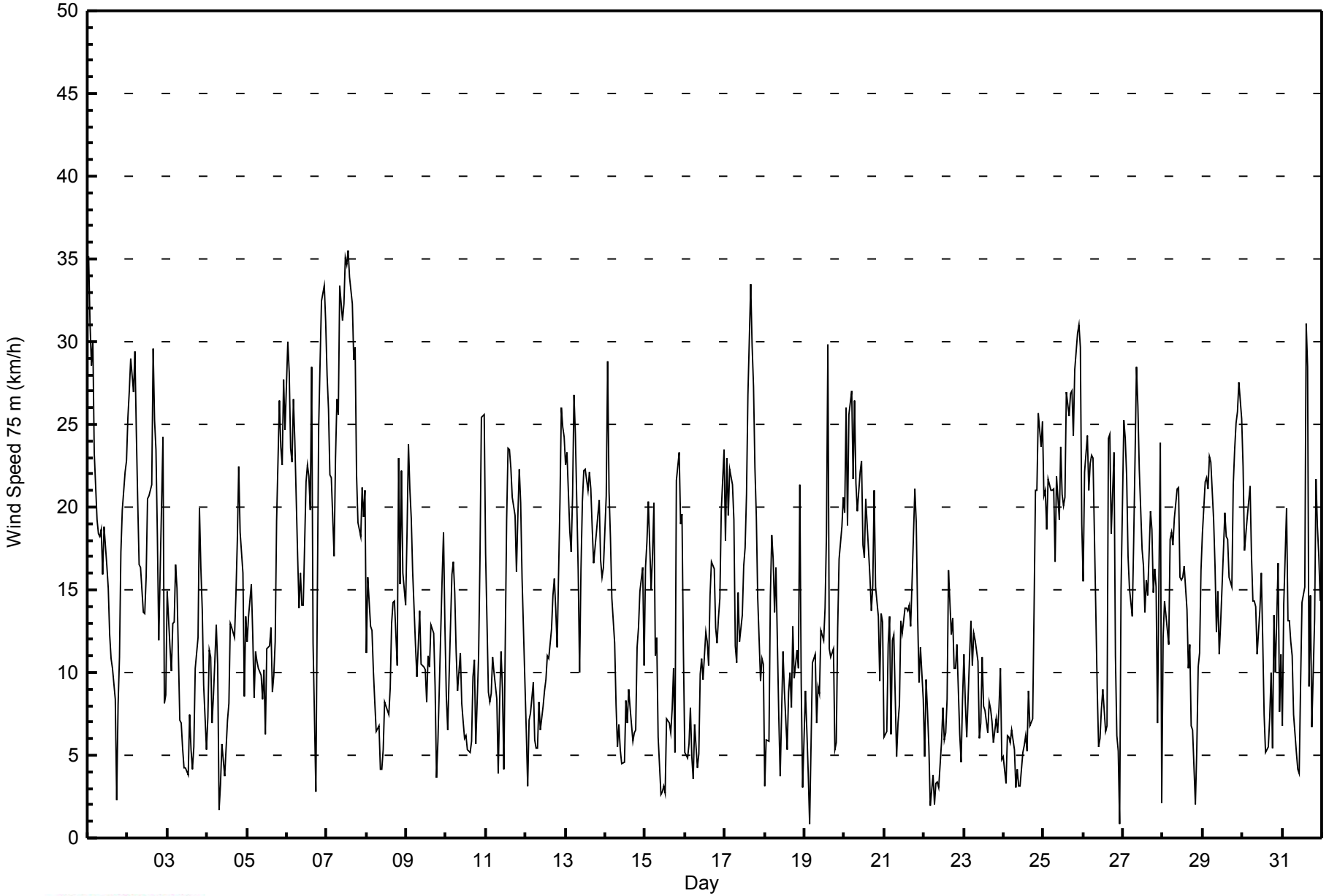
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	4	7	4	6	5	3	4	5	4	5	5	4	4	4	4	3	3	3	3	3	2	2	1	2	7
2-Aug	3	2	2	3	2	3	4	3	3	4	4	5	5	5	5	5	4	4	4	2	3	6	4	2	6
3-Aug	2	2	2	1	1	1	3	2	2	2	2	2	2	3	3	3	4	3	3	2	2	1	3	2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

WBEA

Hourly Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	75	10.08	10.08
6 - 11	226	30.38	40.46
12 - 19	247	33.20	73.66
20 - 28	166	22.31	95.97
29 - 38	30	4.03	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 75 m (WS75m) - km/h

Mannix - August 2014

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	5	3	2	6	12	3	6	2	5	3	5	6	6	6	75
6 - 11	5	8	9	5	5	5	35	40	14	14	10	10	19	15	11	21	226
12 - 19	16	21	5	2	1	0	26	43	16	9	15	18	22	20	15	18	247
20 - 28	14	12	3	0	0	0	19	42	21	9	6	12	11	13	3	1	166
29 - 38	3	1	0	0	0	0	0	4	3	0	3	6	5	4	0	1	30
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	44	22	10	8	11	92	132	60	34	39	49	62	58	35	47	744

Total Number of Valid Hours: 744

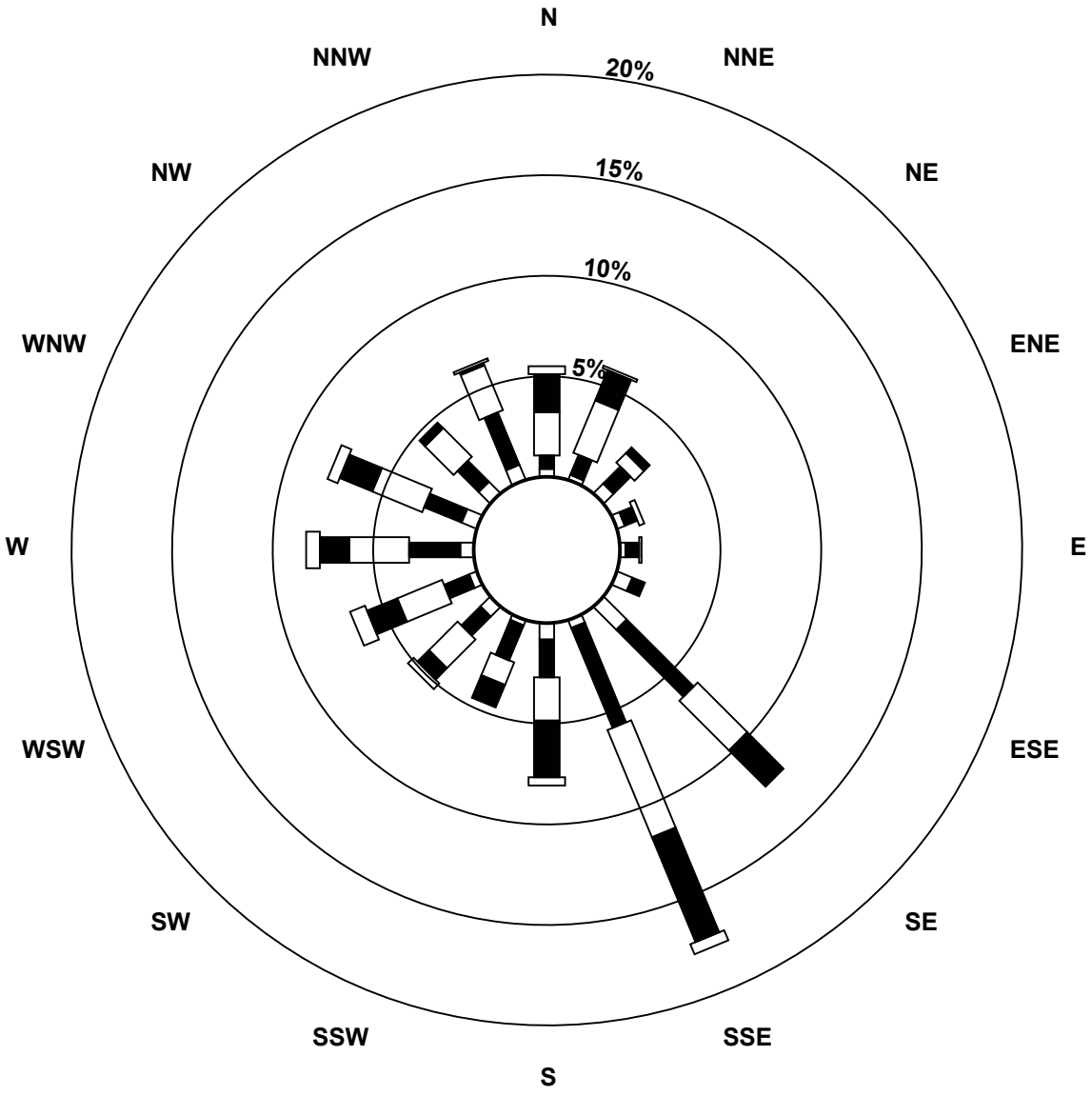
Total Number of Hours: 744

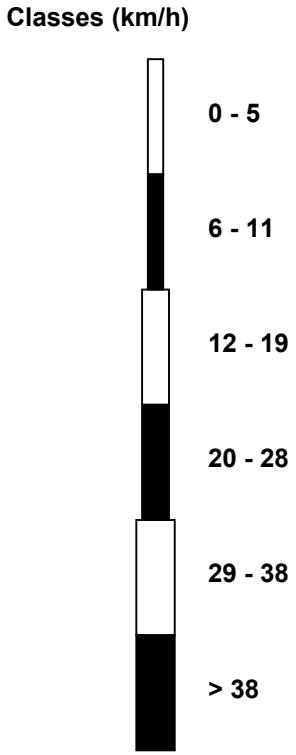
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed 75 m (WS75m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - August 2014

Maximum Speed: 37 km/h on Aug 6 23:00

Maximum Daily Speed Average: 25.9 km/h on Aug 7

Minimum Speed Value: 1 km/h on Aug 26 23:00

Minimum Daily Speed Average: 2.4 km/h on Aug 18

Maximum Diurnal Speed Average: 6.2 km/h at hour 6

Minimum Diurnal Speed Average: 1.3 km/h at hour 19

Monthly Average Velocity: 3.7 km/h 205.4 deg

Percentiles: P_1 = 3 P_{10} = 6 Q_1 = 9 Median = 14 Q_3 = 21 P_{90} = 27 P_{99} = 34

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-Aug	N37	N33	N30	N32	N25	N20	N20	N19	NNE19	NNW16	NNW19	NNW17	NW15	WNW12	NW11	WNW10	W8	SSW2	SSE8	SSE12	SSE18	SSE20	SSE24	SSE26	N8.5	N37
2-Aug	SSE28	SSE30	SSE33	SE32	SE34	SE29	SSE24	SSE19	SSE17	SSE15	SE15	SE17	SSE21	S21	S22	S31	S26	S24	SSW20	S13	S22	S27	SSE9	SSE9	SSE21.7	SE34
3-Aug	SSW15	WSW12	WSW9	SW13	SSW13	S16	S16	S8	SSE7	SE6	SE4	SE5	S4	WSW8	W5	W4	SSE6	SSE11	SSE13	S20	SSW16	SW16	W12	W8	SSW8.0	S20
4-Aug	SW9	SW13	SW12	SW8	S8	SSE10	SSE6	SW1	W4	NNE6	ENE4	N5	NNW7	NNW8	N13	N13	NNE12	NNE15	NNE19	NNE24	NE21	ENE20	ESE10	SE13	NE3.7	NNE24
5-Aug	SE13	SE14	SE16	SE13	SE11	SE17	ESE15	SE12	SE11	SSE9	SE11	ESE7	SE13	SE13	SE14	SE10	ESE11	ESE14	SE21	SSE29	S26	SSE24	S30	S27	SE15.1	S30
6-Aug	SSE32	S31	SSE26	SSE25	SSE28	SSE27	SSE19	SSE15	S16	S15	SE15	SSE22	S23	SSW23	SW20	SW29	SSW12	NE2	SW16	SW27	SW32	WSW33	SW37	SW35	SSW19.3	SW37
7-Aug	WSW31	WSW27	W23	WSW23	WSW19	WSW25	WSW27	WSW26	WSW33	W31	WSW32	WSW35	WSW34	WSW35	WSW34	WSW32	W28	WSW30	WSW22	W19	W19	WSW22	WNW21	N23	WSW25.9	WSW35
8-Aug	NW12	NNW17	NW13	WNW13	NW11	N9	NNE7	NNE7	NNE4	WNW4	NW5	NW8	NNW8	NE8	NE10	NNE13	NNE15	NNE15	NNE11	WSW24	W15	WNW22	NNW17	NNE15	NNW8.0	WSW24
9-Aug	N19	N25	N22	N20	NNE17	N13	NNW10	WNW12	WNW14	NW11	NW10	WNW10	WNW8	W11	W10	WNW13	WSW13	WSW9	NE4	S6	WSW9	WSW15	W17	WSW14	NW8.7	N25
10-Aug	SSW11	SSW9	SSE7	SSE13	SSE18	SSE14	S12	S9	SSE11	SSE9	SE8	ESE7	SE7	S6	ESE5	SSW6	SW10	WSW11	WSW6	SSW11	SW18	WSW25	WSW24	WSW27	SSW9.0	WSW27
11-Aug	SW23	SW12	SW9	SW10	SSW12	SSW10	SSW9	SSW4	SW9	WSW11	W9	W4	WNW19	WNW23	WNW23	NW23	NW21	NNW20	NNE17	NNE21	NNE25	NNE23	NE18	ENE11	NW6.6	NNE25
12-Aug	E8	ESE4	SE8	SSE8	SE10	ESE8	ESE7	SE7	SE9	SE7	SE9	ESE11	ESE12	ESE14	ESE14	SE14	SE16	SE18	ESE16	ESE16	SE22	SE29	SE28	SE28	SE13.2	SE29
13-Aug	SE26	SE27	SE24	SE23	SE25	SE30	SE28	SSE19	SSE11	SSE17	SSE21	S23	SSW23	SSW22	SSW23	SW22	SW19	SW17	SSW20	SSW21	SSW22	W18	NW17	NNW18	S14.5	SE30
14-Aug	WNW21	WNW28	NW22	NW20	NNW17	NNW13	NNW9	NW6	NNW7	NW5	WNW4	WSW5	W8	W7	W9	W8	WSW6	SSW7	SSE6	SSE11	S12	S16	S17	S14	W6.0	WNW28
15-Aug	SE17	SSE17	SSE18	S14	SSE13	SSE20	SSE16	SSE14	SSE7	SSE3	ESE2	SSE3	SSW3	WNW7	W7	WNW7	W8	W10	WNW5	N23	NNE25	NNE21	NE21	NNE11	SE2.5	NNE25
16-Aug	NE5	NE5	NNE5	N8	ENE4	ESE5	SE8	ESE7	ESE7	ESE12	SE12	SE10	SSE13	SSE12	S11	SSW15	SW17	SW17	SW13	SW12	SW13	WSW15	WSW21	WSW26	SSW6.3	WSW26
17-Aug	WSW21	WNW24	W21	WNW23	WNW23	WNW21	W14	WNW11	NW15	WNW12	W13	W16	W18	W20	W26	WNW33	WNW30	WNW27	WNW23	NW20	NW16	WNW9	WNW10	WNW10	WNW18.4	WNW33
18-Aug	WSW4	S4	SSE4	SSE12	SSE19	SSE20	SSE15	SSE17	S8	SW4	SSE8	SSE12	SW9	SW6	NW9	N10	NNE8	WNW13	WSW10	W12	NNW11	N22	NNE11	N3	S2.4	N22
19-Aug	WNW9	WNW7	WNW5	W2	S5	SW11	SSW11	SSW7	SW10	S9	S13	SE12	SSE15	W18	WNW30	NNW12	NE12	NNE12	NNE5	W6	W12	NNW18	N20	N23	WNW3.5	WNW30
20-Aug	NNE21	NNE28	N20	N27	N28	N23	N27	NNE22	N21	N23	N23	N18	NNW18	NNW21	NNW18	N16	N14	NNW16	N22	NNE16	N14	NNW11	NW15	NNW14	N19.3	N28
21-Aug	NNW7	NW7	NW13	NW15	NW8	NW12	WNW13	NNW6	NNW7	NW8	NNW13	NW13	NW14	NNW14	NNW14	N15	N13	NNE16	NNE22	NE20	NE14	NNE10	NNE13	NNE9	NNW10.4	NNE22
22-Aug	NNW5	NNW10	NNW9	NW8	NW4	NW5	WNW4	WNW5	NW4	WNW3	N6	N8	NNW6	NNW6	NNW9	NNE16	N13	NNE13	NE11	NE11	NE14	ENE8	ESE6	SSE9	N5.4	NNE16
23-Aug	SSE11	SE10	SE8	SSE12	SSE13	SE12	SSE13	SSE14	SE13	SSE6	SSE7	SSE11	SE9	ESE8	SE7	SSE9	SSE8	SE7	SE6	SE8	ESE11	ESE10	SE11	ESE7	SE9.3	SSE14
24-Aug	ESE8	ENE4	E8	ENE7	ENE6	NE7	NE6	N4	N4	NNW3	NNW3	NNE5	ENE6	SE7	SE5	SSE9	SSE7	SE8	SE16	SE23	SE23	SE29	SSE28	SSE29	SE8.0	SSE29
25-Aug	SSE24	SSE25	SSE22	SE26	SE24	SSE24	SSE25	SE20	SE24	SSE21	SSE24	SSE22	SE21	SSE22	S28	S27	S28	S28	S26	SSE31	SSE33	SSE34	SSE32	S21	SSE24.7	SSE34
26-Aug	SSE16	SSE24	SSE26	SSE23	SSE25	SSE25	SSE24	SSE14	SE9	SE6	SE7	SE9	SSE10	SSE7	SE8	SSW25	SSW25	SW19	N25	NE12	E9	ESE7	ESE1	SE16	SSE11.4	SSE26
27-Aug	SSE27	S27	SW25	SW19	SW17	SW15	W19	W23	W28	W26	W22	W17	W16	W14	W16	WNW15	WSW20	W18	NW15	NNW17	N17	N8	WNW27	ESE3	W13.2	W28
28-Aug	W12	WSW15	W14	W14	WNW19	WNW20	WNW19	W19	W21	WNW21	WNW16	WNW16	WNW16	NW17	NW14	NW10	WNW12	WNW7	W7	SW2	ESE8	SE10	SSE12	SSE16	W10.1	W21
29-Aug	SE20	SE23	SE24	SE24	SE24	SE24	SE22	SE20	SE15	SSE16	SE12	SE14	SE18	SE21	SE19	SE20	SE18	SE17	SE24	SSE26	SE27	SE29	SE31	SE29	SE21.5	SE31
30-Aug	SE26	SE20	SE21	SE22	S23	S17	SSE15	S15	SW15	WSW12	W14	W17	W12	W8	NW5	NNW5	WSW8	SW11	S6	SSE14	SW11	WSW17	WNW8	WNW11	SSW7.5	SE26
31-Aug	W6	WSW12	W21	W16	WSW15	WSW13	WSW13	WSW9	SW6	SSW4	S4	W10	W14	NW15	NNW32	NNW31	SSW8	WSW16	W7	WSW13	WSW23	WSW21	W19	WSW16	W11.4	NNW32
	S5.2	S3.8	SSW4.1	S3.6	S5.3	S6.2	S5.4	S4.0	SSW3.5	SW3.3	SSW2.6	SSW3.3	SW4.8	WSW5.4	W5.4	W5.0	SW5.0	WSW4.3	SSW1.3	S3.7	S4.5	SSW4.8	SSW4.0	S4.5	Diurnal Average	
	N37	N33	SSE33	SSE32	SE34	SE30	SE28	WSW26	WSW33	W31	WSW32	WSW35	WSW34	WSW35	WSW34	WNW33	WNW30	WSW30	S26	SSE31	SSE33	SSE34	SW37	SW35	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 17 km/h on Aug 27 23:00

Minimum Value: 1 km/h on Aug 16 05:00

Percentiles: P_1 = 1 P_{10} = 2 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

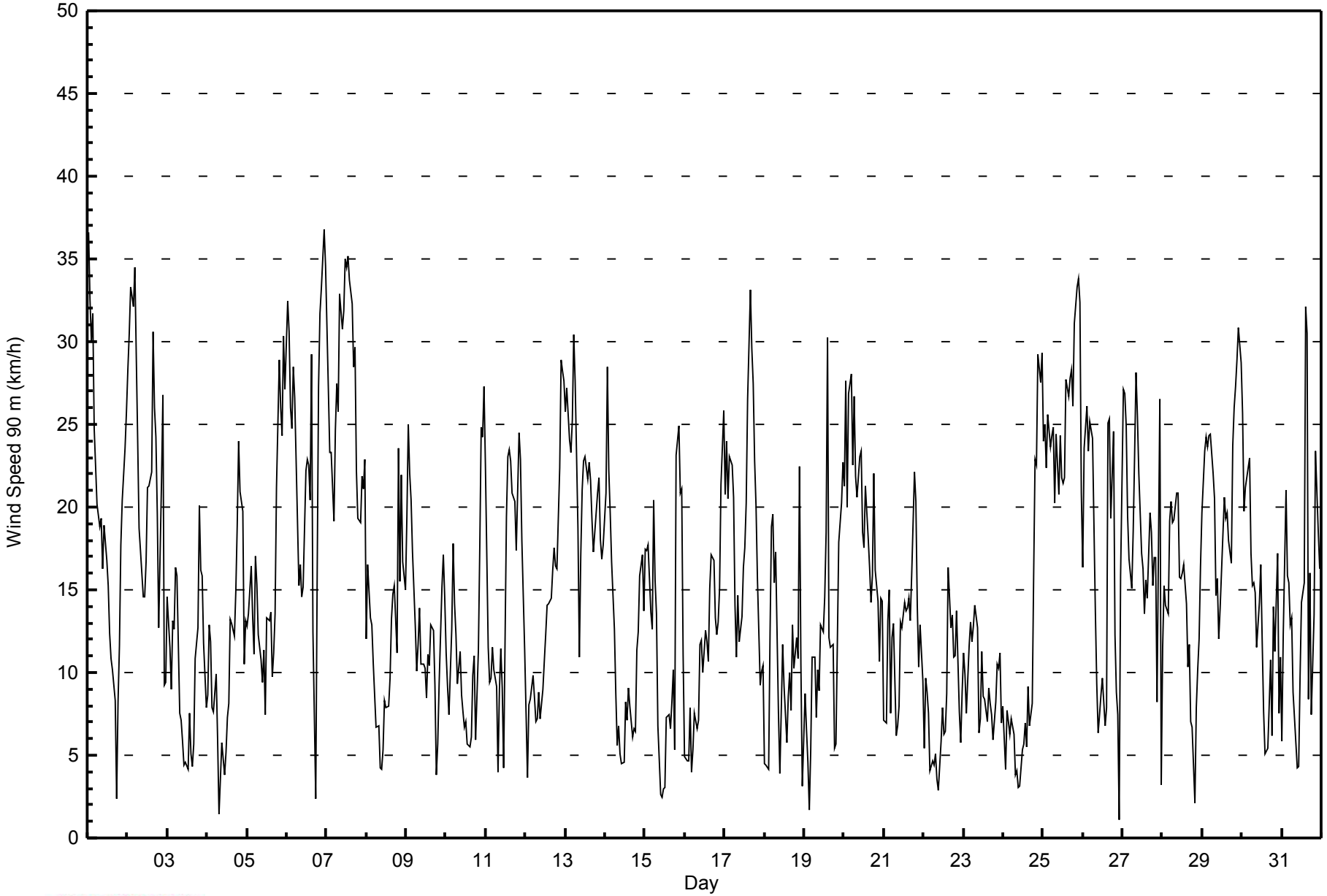
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	4	6	4	6	4	3	4	5	4	5	5	5	4	4	4	3	3	3	2	2	2	1	1	2	6
2-Aug	3	2	1	3	2	3	4	3	3	3	3	4	5	5	5	5	4	4	5	2	4	7	4	2	7
3-Aug	2	2	2	1	1	2	2	2	2	2	2	2	2	3	3	3	4	3	3	2	2	3	3	2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

WBEA

Hourly Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	62	8.33	8.33
6 - 11	209	28.09	36.42
12 - 19	243	32.66	69.09
20 - 28	185	24.87	93.95
29 - 38	45	6.05	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 90 m (WS90m) - km/h

Mannix - August 2014

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	4	4	4	3	0	6	3	3	4	4	3	2	5	7	6	4	62
6 - 11	6	9	6	5	3	17	30	30	9	11	12	11	18	14	12	16	209
12 - 19	13	16	5	0	0	8	29	38	14	6	19	17	27	17	16	18	243
20 - 28	21	10	3	1	0	0	33	33	19	10	5	17	11	15	5	2	185
29 - 38	4	0	0	0	0	0	7	11	3	0	4	10	1	3	0	2	45
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	39	18	9	3	31	102	115	49	31	43	57	62	56	39	42	744

Total Number of Valid Hours: 744

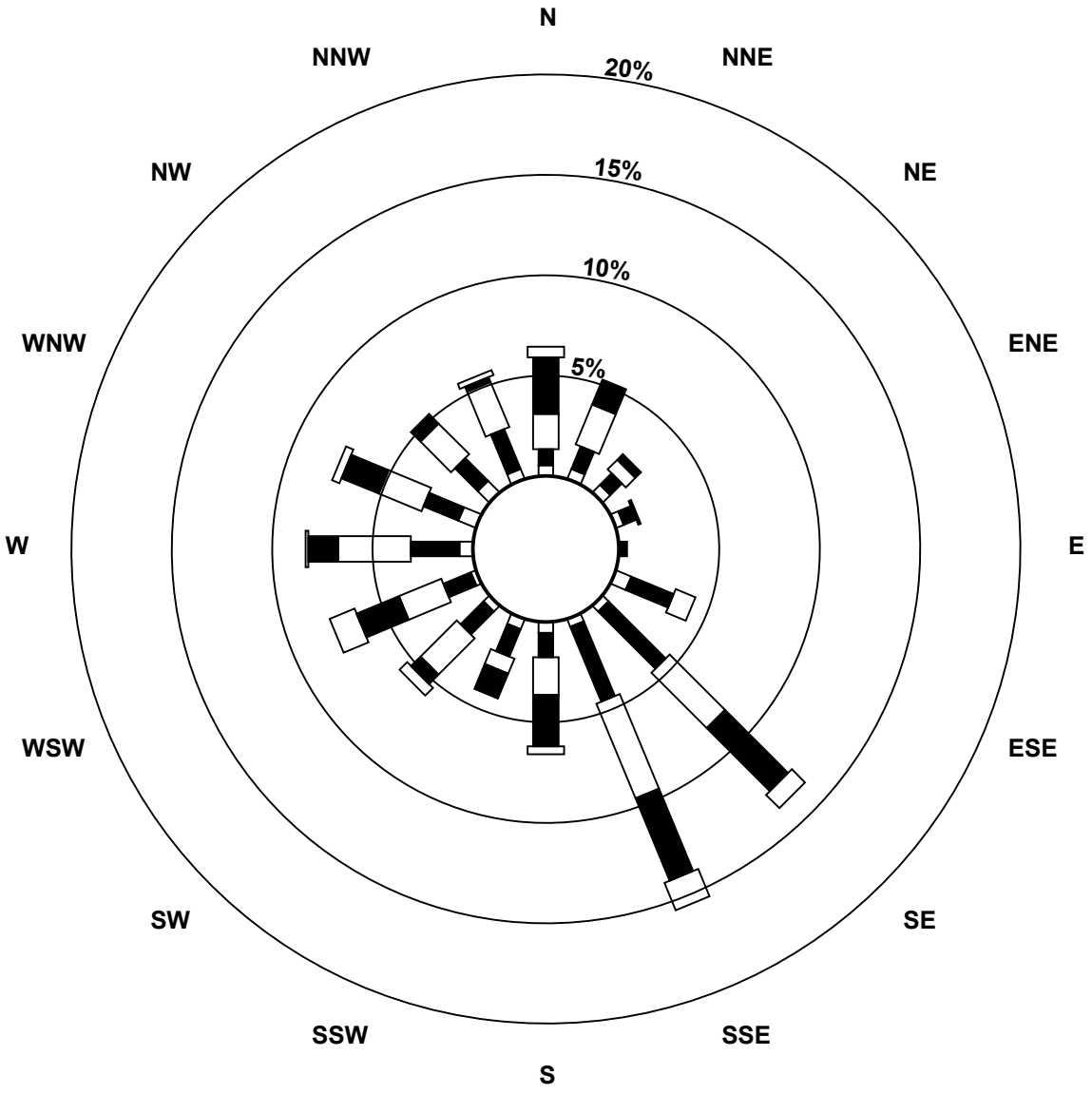
Total Number of Hours: 744

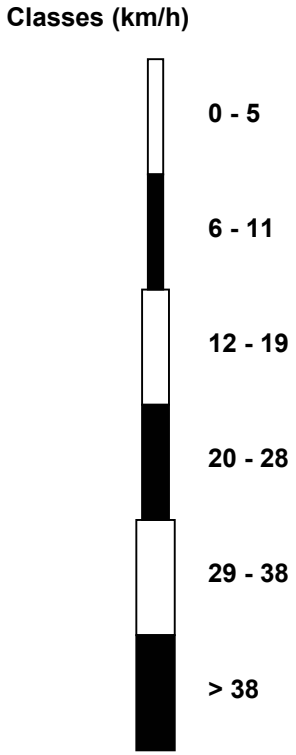
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed 90 m (WS90m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 259 deg on Aug 7 14:00
Direction of Maximum Daily Speed Average: 260.9 deg on Aug 7

Direction of Minimum Speed: 178 deg on Aug 26 23:00

Direction of Minimum Daily Speed Average: 0.5 deg on Aug 15

Monthly Average Direction: 238.2 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-Aug	354	5	14	6	347	345	355	8	16	345	332	326	312	295	308	281	266	210	152	159	169	173	164	156	345.4
2-Aug	162	165	163	161	163	161	160	157	157	146	138	147	166	178	175	181	187	196	201	155	170	176	136	123	166.1
3-Aug	227	236	226	227	196	177	183	169	161	130	136	127	173	270	279	267	157	151	163	170	188	204	187	170	189.0
4-Aug	171	152	160	157	156	138	144	116	254	34	81	355	327	337	5	15	24	20	20	38	57	87	162	161	68.1
5-Aug	159	166	189	161	139	129	138	164	172	171	148	105	141	139	150	137	131	135	146	161	165	157	164	168	150.7
6-Aug	164	168	161	162	159	157	152	152	179	185	152	173	199	221	236	237	181	94	230	232	219	224	224	231	194.1
7-Aug	249	262	266	252	247	256	258	256	263	268	263	257	256	259	254	259	269	259	260	266	258	245	276	343	260.9
8-Aug	320	342	291	288	300	298	7	7	355	305	317	299	2	43	64	28	28	25	16	250	261	290	338	26	334.7
9-Aug	5	350	357	20	26	14	331	292	289	304	310	297	293	282	279	285	260	251	63	163	230	234	250	197	307.5
10-Aug	167	149	151	153	149	152	167	158	172	163	126	128	126	188	108	193	246	263	255	200	212	234	240	229	183.6
11-Aug	183	140	151	150	161	156	154	148	193	248	260	248	285	287	299	312	323	349	26	29	27	32	28	31	310.3
12-Aug	19	8	256	247	146	139	125	136	151	137	141	129	120	114	128	141	141	137	133	129	137	139	142	147	135.7
13-Aug	146	142	140	142	145	147	146	156	150	168	166	179	206	208	212	224	237	225	209	200	191	279	318	317	184.4
14-Aug	264	288	270	279	292	285	292	320	318	312	286	253	284	278	274	281	261	206	153	179	191	207	211	140	265.0
15-Aug	161	162	154	153	159	160	162	165	138	107	111	143	216	290	273	287	273	280	302	9	12	29	30	1	92.3
16-Aug	340	276	336	313	238	234	241	111	106	138	148	160	169	168	190	207	225	241	214	219	216	230	230	237	204.1
17-Aug	227	266	262	278	276	257	225	275	309	296	267	275	268	271	283	292	286	285	295	313	278	245	259	266	277.0
18-Aug	173	162	140	155	156	150	148	163	169	210	158	162	236	244	315	20	31	271	221	269	327	7	15	307	189.2
19-Aug	267	265	260	188	214	226	189	178	199	178	177	150	163	282	296	342	42	36	17	272	281	346	10	16	287.7
20-Aug	20	24	6	360	13	5	10	18	17	355	7	360	352	343	345	0	8	343	359	20	14	351	292	296	3.5
21-Aug	270	272	269	287	251	273	256	278	321	320	333	328	320	329	337	357	355	22	32	40	48	28	13	345	340.1
22-Aug	283	269	268	277	263	216	202	240	260	276	359	356	328	352	341	19	17	41	44	31	65	111	231	214	343.6
23-Aug	180	134	140	171	157	170	177	174	146	145	156	155	137	129	134	162	165	146	164	151	100	136	146	57	148.6
24-Aug	100	9	38	20	10	288	265	267	332	13	356	49	77	127	142	169	165	133	139	151	149	153	154	156	136.7
25-Aug	168	157	157	154	156	146	152	133	141	148	164	151	147	158	191	193	196	194	172	166	166	169	162	164	164.0
26-Aug	139	141	143	146	148	149	156	155	140	126	124	133	157	156	127	204	208	237	7	71	109	156	178	165	152.6
27-Aug	169	167	197	201	163	190	264	277	282	275	276	275	272	271	277	290	262	267	296	345	6	327	298	210	269.6
28-Aug	255	226	225	211	263	257	265	277	275	283	294	301	297	309	322	321	288	306	276	220	117	158	163	166	272.9
29-Aug	161	153	145	150	146	144	159	165	155	155	143	146	146	151	150	143	137	145	147	148	142	145	139	147	147.8
30-Aug	143	134	134	148	166	180	152	180	225	260	263	272	269	275	311	329	265	236	157	166	214	246	249	262	216.2
31-Aug	243	244	240	194	209	194	201	179	205	205	183	273	275	297	343	348	222	254	271	217	234	253	264	256	257.9
	196.3	202.5	194.3	181.6	175.5	182.2	190.6	207.0	231.7	241.3	225.8	227.3	240.3	256.1	272.1	275.3	253.5	254.1	220.4	185.0	180.2	203.1	213.9	187.0	
	Diurnal Average																								

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

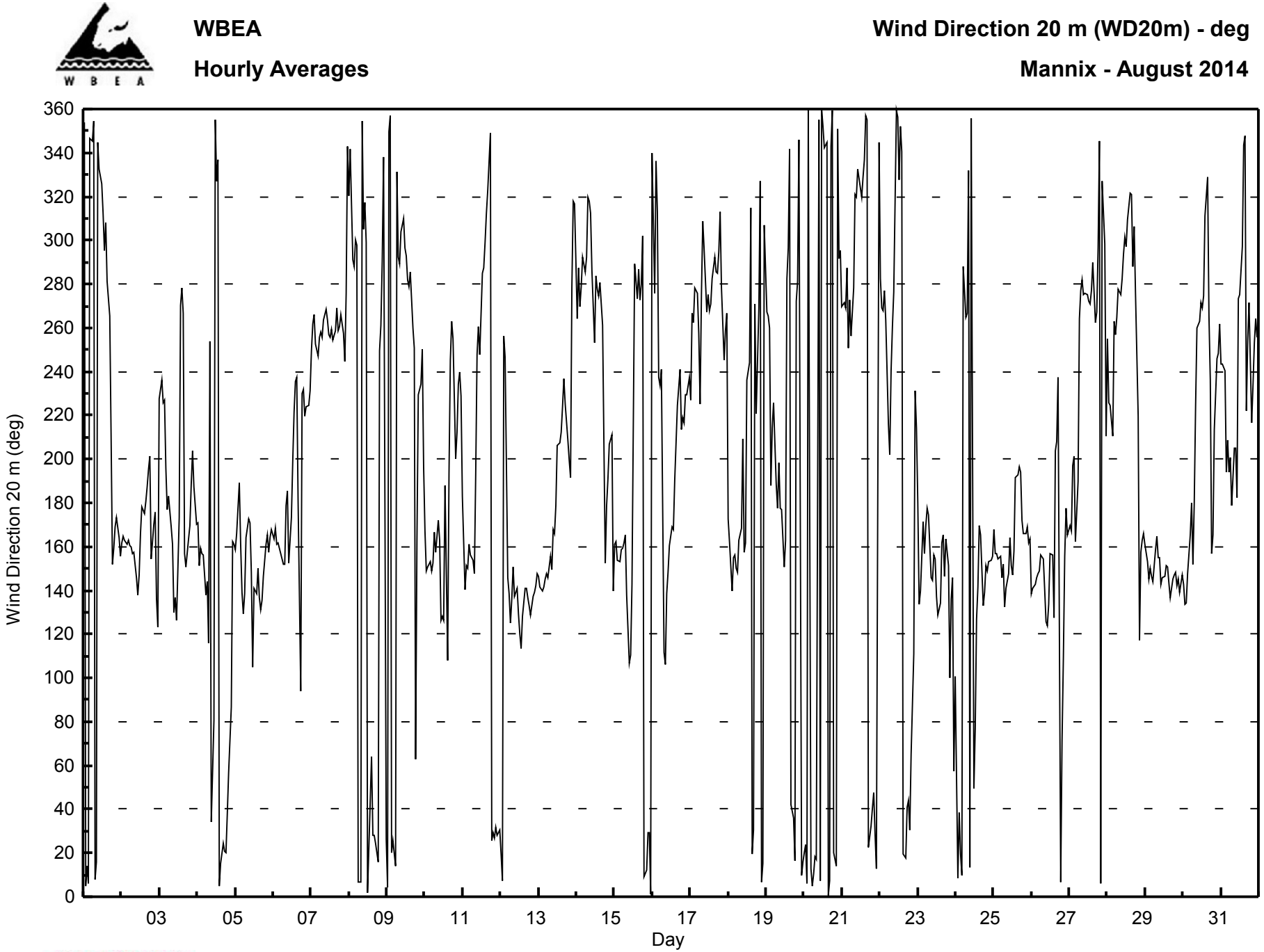
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Aug 26 23:00

Minimum Value: 5 deg on Aug 22 02:00

Percentiles: P_1 = 8 P_{10} = 12 Q_1 = 14 Median = 20 Q_3 = 30 P_{90} = 49 P_{99} = 75

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	15	17	11	16	18	17	19	20	23	25	24	27	25	28	35	32	27	81	21	18	14	14	12	13	81
2-Aug	13	13	14	14	13	14	17	18	18	20	15	21	24	26	23	20	22	22	18	15	15	32	45	49	49
3-Aug	14	15	16	23	13	16	26	31	34	29	42	53	84	43	63	77	76	20	29	15	15	15	29	12	84
4-Aug	11	15	18	12	13	17	14	50	81	47	61	58	55	42	23	21	19	14	12	11	13	14	50	23	81
5-Aug	18	41	25	13	18	13	16	17	33	30	23	31	29	22	20	19	20	14	13	15	13	13	13	14	41
6-Aug	15	14	14	13	15	16	17	20	27	27	23	26	27	24	22	22	35	67	37	12	13	11	13	11	67
7-Aug	12	8	9	12	16	12	10	11	10	12	13	13	13	14	16	14	11	13	11	9	12	8	19	17	19
8-Aug	27	19	26	22	21	29	41	21	66	62	53	38	47	64	33	18	17	14	54	16	13	20	18	18	66
9-Aug	19	15	16	15	13	39	21	22	13	21	23	25	40	32	30	32	14	27	64	26	30	13	9	43	64
10-Aug	25	16	15	15	15	18	21	22	20	35	28	23	54	65	61	71	36	19	25	14	15	11	8	17	71
11-Aug	18	16	8	9	10	14	18	31	33	17	18	65	23	17	19	20	22	18	16	13	11	11	10	12	65
12-Aug	64	70	46	73	32	19	36	30	20	25	17	24	22	23	20	25	16	13	16	16	12	12	12	13	73
13-Aug	12	9	10	11	12	11	13	19	22	26	21	25	25	26	22	20	17	19	17	15	18	37	25	41	41
14-Aug	11	12	12	10	17	26	38	30	25	38	32	37	25	35	22	30	28	40	11	13	13	23	34	22	40
15-Aug	12	11	13	15	13	13	18	19	26	40	45	51	70	54	76	55	53	17	45	18	12	13	12	10	76
16-Aug	43	23	37	41	63	32	35	79	20	19	18	20	26	29	35	31	20	16	16	14	14	14	17	15	79
17-Aug	37	6	11	8	12	10	19	23	22	30	18	14	22	14	13	14	13	12	15	16	22	11	7	68	68
18-Aug	10	20	34	10	17	14	16	16	24	71	41	29	41	59	26	19	27	29	23	18	36	15	20	36	71
19-Aug	14	64	47	18	20	14	33	42	21	35	25	33	30	53	14	38	24	18	30	38	17	26	16	19	64
20-Aug	22	21	20	18	16	20	15	15	19	21	19	21	24	21	23	23	20	21	21	18	15	47	17	40	47
21-Aug	46	11	16	35	27	17	26	64	34	40	35	48	36	34	35	31	38	25	13	11	11	29	12	53	64
22-Aug	22	5	8	9	15	31	19	31	25	66	51	51	63	65	51	19	34	19	19	19	14	26	24	17	66
23-Aug	32	49	67	54	62	33	22	23	20	26	37	26	35	44	58	36	39	20	21	22	15	16	10	24	67
24-Aug	68	23	24	18	63	34	69	34	44	25	56	51	53	50	70	39	38	28	22	12	11	13	15	15	70
25-Aug	15	14	17	14	12	13	17	21	12	16	16	18	19	22	25	25	20	20	17	15	14	14	15	16	25
26-Aug	19	11	11	13	14	13	14	17	15	24	20	17	24	46	49	22	21	31	29	26	62	60	94	14	94
27-Aug	18	17	15	14	13	28	12	10	11	9	10	11	19	25	23	27	18	11	26	15	14	42	62	67	67
28-Aug	23	21	26	40	10	10	10	11	10	12	24	20	26	25	27	40	19	65	14	65	11	18	14	14	65
29-Aug	13	13	12	14	13	14	15	19	19	19	21	23	19	18	24	18	15	17	13	12	10	12	12	13	24
30-Aug	12	13	12	17	23	37	17	23	18	15	14	9	14	23	50	46	26	29	53	18	41	21	22	30	53
31-Aug	17	21	18	31	30	16	18	25	44	51	64	34	20	34	18	18	67	14	37	18	10	12	11	32	67
	68	70	67	73	63	39	69	79	81	71	64	65	84	65	76	77	76	81	64	65	62	60	94	68	
	Diurnal Maximum																								



AURORA
ATMOSPHERICS INC.

Direction of Maximum Speed: 260 deg on Aug 7 14:00
Direction of Maximum Daily Speed Average: 262.2 deg on Aug 7

Direction of Minimum Speed: 117 deg on Aug 22 07:00

Direction of Minimum Daily Speed Average: 1.5 deg on Aug 15

Monthly Average Direction: 241.9 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-Aug	358	7	14	7	351	351	357	9	17	347	336	331	319	303	315	290	265	216	153	160	170	176	163	156	350.6
2-Aug	162	163	160	160	161	160	157	157	159	148	139	148	165	176	175	180	185	193	202	165	174	178	149	158	167.7
3-Aug	209	242	232	234	205	182	183	169	167	134	145	141	180	266	273	273	157	152	162	173	189	214	241	204	195.6
4-Aug	188	183	192	173	166	144	150	143	267	27	88	356	334	341	7	15	24	21	22	36	55	86	139	147	76.9
5-Aug	149	152	164	163	131	125	133	154	164	168	148	106	138	139	150	137	129	132	145	163	171	160	168	172	151.2
6-Aug	165	171	168	167	161	158	155	155	180	185	152	173	196	218	233	234	188	91	228	233	224	227	228	233	194.8
7-Aug	247	263	269	257	254	258	258	256	263	269	264	256	256	260	255	258	270	259	260	268	260	249	290	348	262.2
8-Aug	327	342	304	300	311	337	13	15	14	311	321	309	1	42	64	27	29	28	18	247	265	295	339	26	337.7
9-Aug	6	352	1	18	23	15	338	301	295	308	315	302	301	284	279	291	260	249	61	166	231	240	251	225	311.7
10-Aug	176	163	155	155	152	155	168	162	171	164	134	124	131	179	122	201	237	264	249	201	224	238	236	229	189.9
11-Aug	211	180	183	173	166	160	156	155	197	246	262	254	291	291	303	317	326	351	25	28	26	32	33	51	312.3
12-Aug	64	50	157	143	155	137	132	134	148	139	136	128	119	115	125	141	138	134	131	127	135	138	142	148	133.5
13-Aug	148	140	134	134	137	141	143	157	153	169	167	179	202	203	211	222	235	223	209	202	195	284	326	335	182.5
14-Aug	279	294	291	309	320	316	331	324	327	320	294	250	287	280	276	282	257	204	159	176	184	195	205	149	271.0
15-Aug	143	153	158	166	162	165	166	165	147	126	116	145	221	298	276	295	273	281	297	12	16	31	34	13	121.2
16-Aug	13	23	3	352	22	111	128	123	107	136	145	156	170	168	188	206	223	238	218	222	215	232	229	234	200.3
17-Aug	244	277	271	288	295	276	255	284	313	301	273	279	269	273	286	296	289	287	300	317	302	269	274	286	285.2
18-Aug	177	167	168	152	154	151	149	163	171	221	158	161	229	244	320	19	31	274	230	272	331	8	26	328	183.0
19-Aug	279	284	279	172	206	232	189	179	204	177	180	151	164	282	301	342	42	33	19	273	289	349	11	16	290.3
20-Aug	20	22	6	3	12	6	10	19	17	357	9	2	353	347	349	3	10	345	1	21	14	339	317	324	3.7
21-Aug	311	298	299	317	297	295	285	307	330	324	333	331	325	332	339	356	358	20	31	40	51	35	16	18	346.6
22-Aug	325	296	303	332	347	46	117	252	274	287	357	356	332	348	342	19	16	38	42	36	64	99	182	163	3.7
23-Aug	168	131	136	164	161	164	176	175	146	147	158	155	134	134	132	164	163	145	159	145	102	132	139	91	149.3
24-Aug	110	43	60	52	41	11	13	284	344	7	350	38	82	134	138	170	166	133	140	149	147	153	153	153	133.1
25-Aug	167	157	156	154	155	151	159	137	139	149	165	152	147	160	190	190	195	191	174	168	168	171	163	168	166.1
26-Aug	146	141	148	151	152	154	158	156	141	127	127	136	160	158	129	201	206	236	6	67	104	141	177	154	155.6
27-Aug	166	173	208	225	203	213	268	281	286	278	279	278	276	273	281	297	262	269	306	349	2	332	301	188	269.0
28-Aug	256	237	238	241	275	273	278	283	279	288	300	306	303	314	328	328	292	303	279	216	111	153	161	163	277.6
29-Aug	153	149	144	146	145	140	150	158	154	154	144	148	148	152	151	145	137	144	148	149	142	145	138	146	146.7
30-Aug	142	133	132	145	171	181	154	179	222	260	264	273	268	279	320	334	261	231	172	171	212	247	282	281	206.4
31-Aug	265	249	256	234	235	216	212	198	208	192	179	271	278	307	346	349	210	252	279	226	237	256	267	257	262.0
	182.9	193.9	192.7	179.9	172.2	174.9	179.7	195.1	223.3	237.4	219.9	220.5	234.2	253.8	273.0	269.3	242.9	246.1	208.9	181.8	182.5	202.5	210.9	182.7	
	Diurnal Average																								

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

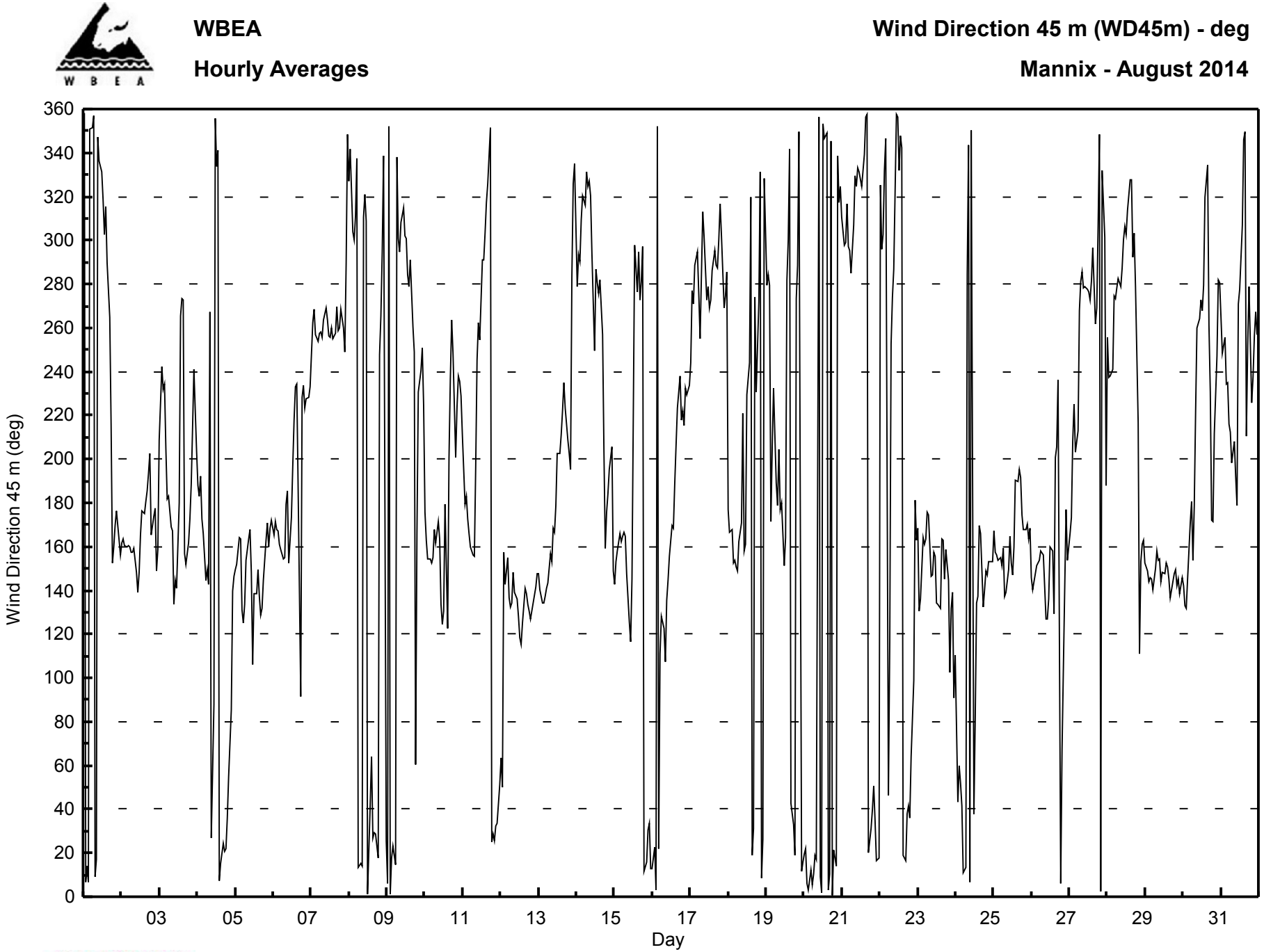
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 89 deg on Aug 26 23:00

Minimum Value: 3 deg on Aug 10 23:00

Percentiles: P_1 = 4 P_{10} = 6 Q_1 = 9 Median = 14 Q_3 = 22 P_{90} = 36 P_{99} = 68

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	8	12	7	10	10	9	12	13	17	18	16	19	18	21	24	29	22	77	16	13	6	6	5	6	77
2-Aug	6	4	5	4	3	6	9	9	9	16	10	17	14	17	13	10	12	12	8	9	7	17	33	32	33
3-Aug	10	10	8	10	6	7	11	17	22	23	34	49	58	39	42	78	72	18	17	6	8	8	18	37	78
4-Aug	14	18	15	7	8	9	9	72	57	39	57	59	48	36	16	16	16	9	7	7	11	13	31	14	72
5-Aug	13	17	9	15	8	7	9	11	21	19	20	26	20	16	14	14	15	10	9	6	5	8	6	5	26
6-Aug	5	5	7	5	5	8	11	13	12	20	16	15	17	18	18	18	27	69	33	6	5	3	5	4	69
7-Aug	9	5	8	8	10	8	8	9	9	10	12	12	11	13	13	13	11	11	9	7	11	6	21	9	21
8-Aug	23	12	21	20	11	16	29	13	48	44	47	35	34	58	28	12	12	10	49	15	11	16	12	13	58
9-Aug	13	7	9	11	9	25	12	18	7	15	16	20	35	29	25	30	14	23	54	24	16	8	6	32	54
10-Aug	23	22	8	8	9	11	12	15	10	22	25	18	51	62	55	63	34	19	26	6	14	3	3	8	63
11-Aug	8	18	13	7	4	7	12	32	21	15	17	61	22	14	14	15	18	13	13	9	7	7	8	10	61
12-Aug	16	35	28	16	16	10	23	23	14	19	11	18	17	19	15	22	12	8	11	11	7	7	7	8	35
13-Aug	7	5	4	4	5	5	7	13	17	19	12	13	17	19	15	15	12	13	10	8	11	36	18	26	36
14-Aug	12	6	8	10	11	11	21	20	14	33	25	37	19	30	20	27	28	35	6	4	6	10	13	24	37
15-Aug	3	3	7	4	5	4	11	11	19	36	43	51	67	45	50	56	43	13	38	13	7	9	8	6	67
16-Aug	10	11	13	12	38	17	15	40	14	13	11	13	16	22	21	22	13	11	9	12	9	6	8	9	40
17-Aug	16	5	10	6	6	6	14	19	13	26	16	12	19	13	10	11	10	9	10	8	12	8	4	29	29
18-Aug	23	11	28	6	8	8	10	8	15	67	28	19	34	53	17	14	22	14	28	15	32	8	16	37	67
19-Aug	15	35	27	57	27	10	21	34	14	18	13	27	22	56	8	34	20	13	25	42	18	20	9	12	57
20-Aug	16	15	15	11	9	14	10	10	14	15	12	14	17	14	17	17	17	12	16	13	10	33	9	26	33
21-Aug	41	12	15	15	24	10	20	55	30	33	27	42	29	26	24	23	28	21	9	8	6	26	8	24	55
22-Aug	26	4	19	16	31	26	66	42	24	66	43	38	60	60	41	13	27	15	13	14	9	15	38	15	66
23-Aug	16	29	58	28	30	18	10	17	12	16	25	18	26	35	40	31	29	14	13	16	11	12	5	19	58
24-Aug	26	28	14	13	18	14	56	28	34	19	52	53	48	38	57	21	23	22	20	6	5	7	8	8	57
25-Aug	7	8	11	7	6	7	10	14	7	12	10	13	14	17	15	14	10	10	8	5	5	5	6	13	17
26-Aug	16	6	7	8	7	6	6	11	10	17	13	11	16	35	36	17	14	27	23	20	42	63	89	11	89
27-Aug	9	8	10	8	10	21	10	9	8	8	7	10	17	23	19	23	16	10	22	7	11	47	52	66	66
28-Aug	22	15	16	27	6	7	9	8	8	9	18	14	22	21	19	35	16	53	11	58	10	11	6	6	58
29-Aug	9	6	7	7	7	6	8	11	11	10	17	17	13	13	17	13	12	11	8	7	6	6	6	9	17
30-Aug	8	7	6	12	17	31	15	16	16	16	11	8	10	20	45	33	25	26	26	7	35	17	20	31	45
31-Aug	20	11	11	20	19	10	11	17	31	35	54	25	17	33	12	13	69	11	26	13	5	9	8	11	69
	41	35	58	57	38	31	66	72	57	67	57	61	67	62	57	78	72	77	54	58	42	63	89	66	
	Diurnal Maximum																								


WBEA
Hourly Averages
Wind Direction 45 m (WD45m) - deg
Mannix - August 2014
Wind Direction 45 m (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 Averages

Wind Direction 75 m (WD75m) - deg

Mannix - August 2014

Direction of Maximum Speed: 259 deg on Aug 7 14:00
Direction of Maximum Daily Speed Average: 263.0 deg on Aug 7

Direction of Minimum Speed: 243 deg on Aug 19 04:00

Direction of Minimum Daily Speed Average: 2.5 deg on Aug 18

Monthly Average Direction: 247.7 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	1	8	15	9	355	357	359	10	19	349	339	334	320	306	315	289	264	222	155	157	166	173	166	156	356.4
2-Aug	160	159	156	154	152	155	155	160	163	153	143	149	164	176	176	180	185	192	204	175	176	179	157	165	166.6
3-Aug	199	244	240	236	206	188	185	176	166	141	138	145	186	262	272	273	156	152	162	176	198	229	266	266	201.3
4-Aug	226	222	215	206	179	156	160	180	270	24	85	4	337	345	11	19	25	26	24	38	57	83	121	140	57.7
5-Aug	139	142	155	151	132	131	130	138	147	160	148	110	137	139	148	137	128	132	145	164	174	163	173	179	151.7
6-Aug	167	174	172	171	165	160	159	157	179	184	152	174	195	217	233	235	200	75	232	235	231	238	235	236	198.9
7-Aug	248	262	270	260	255	258	259	255	263	269	263	256	255	259	255	257	270	258	260	270	266	258	297	355	263.0
8-Aug	331	339	311	306	316	354	25	24	26	306	321	313	354	44	63	28	32	32	23	246	265	295	342	24	340.3
9-Aug	7	356	4	18	24	17	341	305	298	311	318	305	303	284	277	291	262	249	55	175	243	255	260	242	314.4
10-Aug	203	201	153	162	156	162	172	169	170	167	143	127	140	179	127	203	232	262	245	205	232	250	246	238	200.4
11-Aug	227	226	212	208	197	198	191	180	211	245	265	262	293	292	304	318	327	354	25	29	28	34	41	65	313.5
12-Aug	82	88	152	164	143	132	127	133	145	143	132	129	121	117	127	142	138	134	132	126	135	138	143	148	135.4
13-Aug	148	139	136	135	137	140	141	156	160	170	166	177	200	201	210	221	233	222	210	207	203	284	329	342	180.7
14-Aug	291	299	305	327	336	334	347	326	334	329	301	251	287	277	271	278	254	205	164	171	179	184	193	184	278.6
15-Aug	145	153	163	177	165	166	165	162	162	144	115	154	212	297	277	297	265	281	291	16	22	37	43	27	132.3
16-Aug	39	50	19	1	64	119	144	131	113	133	140	150	167	165	187	206	222	237	222	230	216	239	239	244	201.9
17-Aug	252	287	281	297	304	289	281	294	314	301	274	279	268	272	286	296	289	288	302	318	314	292	282	299	290.1
18-Aug	231	170	173	157	159	153	151	165	175	227	157	163	227	238	322	18	34	282	240	275	336	11	35	347	182.4
19-Aug	286	293	299	243	184	217	190	194	222	181	179	154	164	282	304	343	45	35	23	270	288	353	13	17	297.9
20-Aug	23	22	9	7	14	7	12	21	18	358	10	4	355	350	352	5	13	347	3	21	16	335	327	337	5.7
21-Aug	333	318	313	326	322	308	301	335	335	325	335	331	327	337	339	358	1	20	32	41	56	40	25	28	352.2
22-Aug	337	329	339	333	323	309	306	302	298	298	1	2	341	349	347	22	17	39	44	42	63	86	138	162	11.5
23-Aug	162	139	149	156	161	152	168	169	146	154	157	153	134	131	131	162	160	144	153	142	106	131	135	108	148.8
24-Aug	113	78	84	77	67	46	36	346	356	355	347	34	81	134	136	167	164	133	141	145	145	152	153	153	131.4
25-Aug	163	158	155	151	151	155	165	146	141	151	164	153	148	160	189	188	195	190	174	168	170	172	166	173	165.9
26-Aug	158	148	157	158	160	161	164	164	148	138	131	142	163	160	134	199	205	235	8	62	97	130	139	147	160.2
27-Aug	161	178	220	236	222	232	270	283	286	280	279	278	277	271	282	297	261	269	310	352	1	342	301	164	269.3
28-Aug	260	254	257	261	285	285	287	286	280	289	301	307	303	315	330	331	293	303	280	226	113	152	165	154	282.2
29-Aug	144	143	144	143	144	142	142	143	150	154	148	150	149	152	150	146	139	146	147	152	144	146	141	146	145.8
30-Aug	143	136	135	146	175	186	158	177	221	261	267	274	267	280	324	336	254	229	182	170	217	256	308	293	203.8
31-Aug	278	254	265	260	257	239	243	239	222	193	184	269	278	310	348	351	205	251	284	238	241	257	266	256	269.0
	184.3	195.5	195.9	188.2	172.6	177.4	180.3	190.6	219.5	237.4	222.2	221.2	234.2	253.4	274.0	269.0	241.2	247.3	209.5	181.1	187.1	207.2	213.5	187.6	
	Diurnal Average																								

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

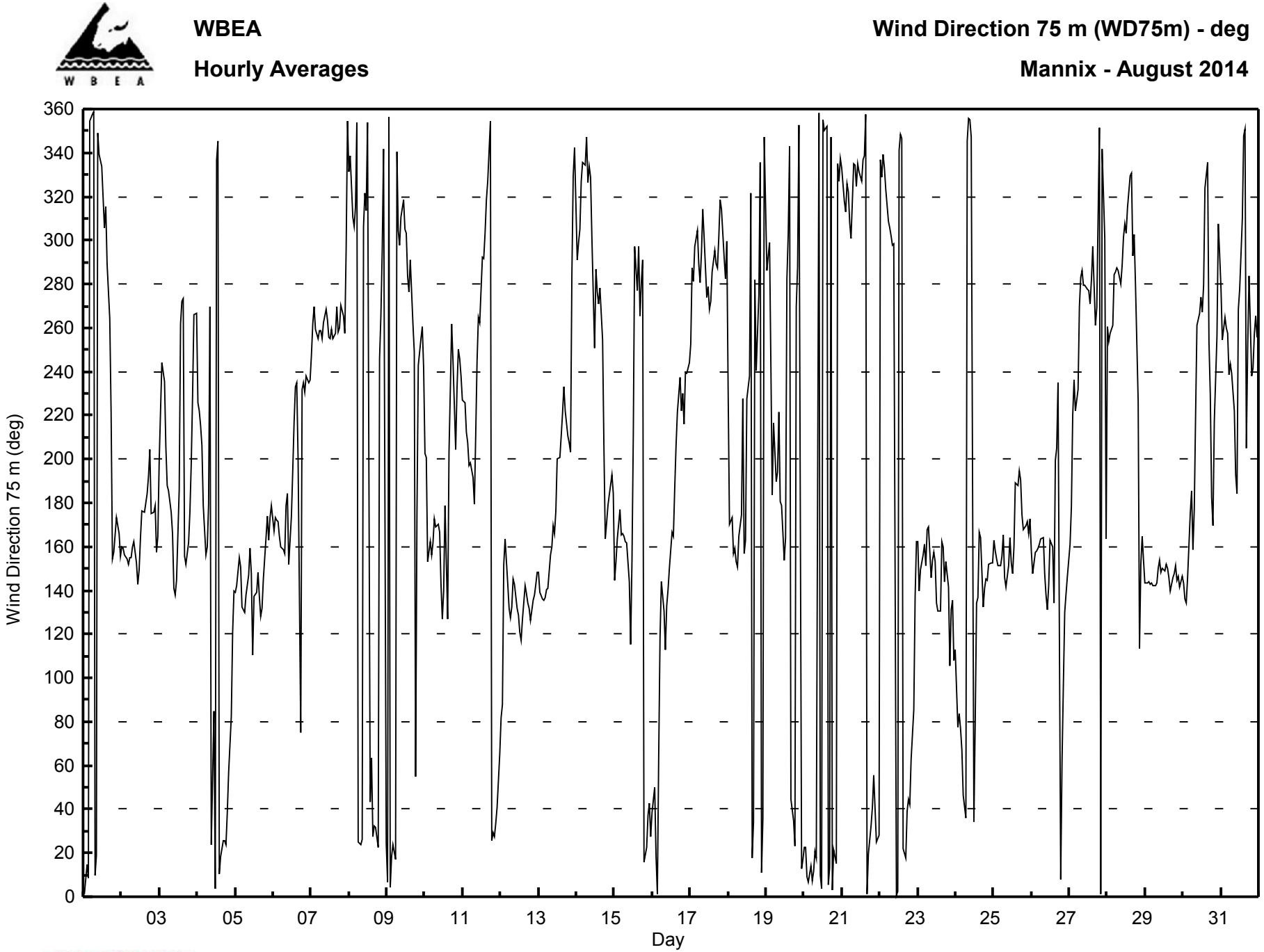
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 97 deg on Aug 4 08:00

Minimum Value: 3 deg on Aug 13 06:00

Percentiles: P_1 = 3 P_{10} = 5 Q_1 = 8 Median = 12 Q_3 = 19 P_{90} = 33 P_{99} = 69

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-Aug	6	10	5	7	9	8	11	11	14	16	15	17	18	20	21	26	22	67	15	9	5	5	3	3	67
2-Aug	3	3	3	4	3	4	6	7	9	14	10	15	15	16	10	8	11	10	5	7	8	9	25	17	25
3-Aug	12	15	11	14	6	4	8	17	17	21	28	33	58	36	46	53	78	15	12	6	10	10	12	24	78
4-Aug	20	13	12	11	9	6	6	97	51	32	52	58	44	36	14	13	13	8	4	6	8	12	24	10	97
5-Aug	11	9	8	12	10	7	10	11	13	16	21	20	17	15	13	13	13	10	8	5	4	8	7	5	21
6-Aug	4	4	6	4	4	6	10	11	10	19	14	13	15	17	16	14	26	76	28	5	3	3	3	3	76
7-Aug	8	5	8	6	8	7	6	8	8	10	11	10	10	12	12	11	10	10	8	6	8	5	23	6	23
8-Aug	21	10	17	18	11	14	18	14	40	45	49	30	39	46	25	11	9	8	52	13	11	16	13	10	52
9-Aug	10	5	7	8	7	17	12	16	7	14	16	19	33	27	22	28	14	21	51	27	13	6	6	21	51
10-Aug	15	24	13	4	6	8	10	12	10	20	19	18	49	59	54	62	32	18	24	6	14	4	3	8	62
11-Aug	5	15	13	13	11	10	16	53	21	15	18	63	22	14	13	14	17	12	13	7	5	3	8	11	63
12-Aug	10	34	15	7	8	11	18	17	13	18	13	16	16	18	15	20	11	8	10	12	6	5	5	5	34
13-Aug	4	4	4	4	4	3	3	11	15	15	11	11	14	16	15	13	11	11	9	8	10	38	16	20	38
14-Aug	10	6	8	7	8	9	11	20	15	32	31	39	20	26	18	24	25	29	9	3	4	4	3	26	39
15-Aug	3	4	5	4	3	3	7	9	15	45	52	51	62	39	39	67	36	13	34	12	7	7	6	9	67
16-Aug	18	13	9	12	24	16	7	23	17	12	11	12	13	18	18	21	11	10	7	11	11	4	6	5	24
17-Aug	10	5	8	5	5	5	9	17	11	24	15	11	18	11	10	10	10	8	11	7	7	11	8	10	24
18-Aug	48	11	10	8	6	6	8	9	16	52	21	15	31	50	16	14	22	23	39	14	29	6	15	41	52
19-Aug	17	23	15	73	28	12	11	28	14	17	12	23	19	57	7	33	16	11	19	45	20	18	7	9	73
20-Aug	14	13	13	10	8	12	8	9	11	13	10	13	16	12	15	17	16	11	15	11	8	26	8	19	26
21-Aug	27	15	10	9	21	9	7	39	26	32	23	34	26	26	21	22	26	20	8	6	4	23	5	14	39
22-Aug	20	5	8	6	28	8	19	23	28	65	38	34	57	65	37	12	23	12	10	13	7	13	27	12	65
23-Aug	15	19	35	13	10	12	9	13	10	13	18	15	19	34	31	30	28	12	11	14	15	12	6	17	35
24-Aug	17	12	9	12	12	7	15	31	20	20	45	50	40	39	51	17	21	19	18	4	3	4	6	6	51
25-Aug	6	6	7	6	7	4	7	13	4	11	9	11	13	15	12	13	9	10	6	4	4	4	5	12	15
26-Aug	15	5	4	5	4	4	5	8	10	18	13	12	15	28	32	16	13	25	19	16	33	57	90	6	90
27-Aug	11	12	8	6	7	15	10	8	6	7	6	10	15	21	17	18	15	9	22	5	11	56	45	70	70
28-Aug	31	10	11	18	5	6	8	8	7	8	17	14	21	21	16	34	17	37	11	55	16	11	5	4	55
29-Aug	5	4	4	5	5	5	5	6	10	9	15	15	11	11	14	11	10	10	6	5	4	5	4	6	15
30-Aug	6	6	6	10	15	29	17	14	17	16	11	8	9	21	46	29	24	25	15	4	29	19	15	32	46
31-Aug	26	17	6	13	11	9	13	17	27	32	50	27	17	32	12	11	70	10	25	12	3	8	7	6	70
	48	34	35	73	28	29	19	97	51	65	52	63	62	65	54	67	78	76	52	55	33	57	90	70	
	Diurnal Maximum																								


WBEA
Hourly Averages
Wind Direction 75 m (WD75m) - deg
Mannix - August 2014
Wind Direction 75 m (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 90 m (WD90m) - deg

Mannix - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 88 deg on Aug 26 23:00

Minimum Value: 2 deg on Aug 2 03:00

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 7 Median = 11 Q_3 = 18 P_{90} = 31 P_{99} = 66

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

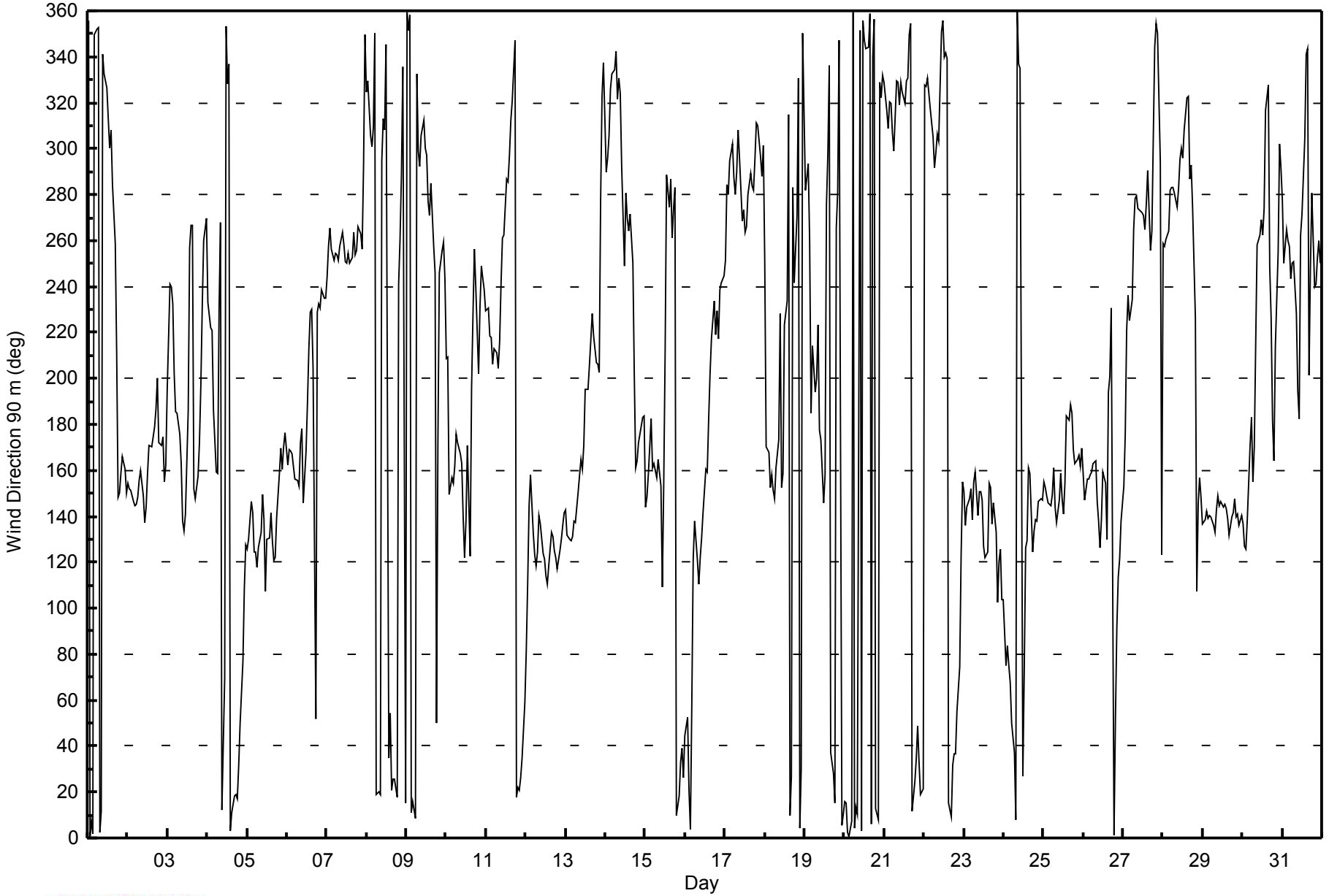
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	5	9	5	6	8	8	10	11	13	16	15	15	16	19	20	26	19	67	16	8	5	5	2	3	67
2-Aug	3	2	2	3	2	3	5	7	9	14	10	15	15	16	10	8	10	11	5	7	8	10	20	15	20
3-Aug	13	16	10	13	6	4	8	18	18	23	33	38	49	30	46	50	77	14	10	6	11	10	11	14	77
4-Aug	17	10	10	11	15	7	13	74	46	36	55	63	41	34	14	11	12	8	4	6	8	12	21	11	74
5-Aug	11	8	8	10	7	3	5	8	11	16	21	25	17	15	14	12	15	9	9	4	3	8	8	5	25
6-Aug	3	4	5	4	3	6	9	10	9	18	14	14	16	17	17	12	25	82	26	4	2	4	3	2	82
7-Aug	7	4	8	6	7	6	6	8	8	9	10	10	9	11	12	10	10	9	8	5	7	4	22	5	22
8-Aug	19	9	17	16	10	14	17	16	41	44	53	25	40	43	25	10	9	7	53	12	11	15	13	8	53
9-Aug	9	4	7	8	6	15	12	14	7	13	16	17	32	24	21	26	14	21	50	31	12	5	5	16	50
10-Aug	13	14	20	8	5	9	11	18	9	20	22	22	50	59	56	63	30	16	23	5	14	3	3	6	63
11-Aug	4	11	11	13	10	9	13	45	19	13	18	63	20	13	12	14	17	12	12	7	4	3	8	11	63
12-Aug	8	26	17	10	8	7	13	14	13	21	15	17	17	18	15	20	11	7	10	10	6	5	5	4	26
13-Aug	3	4	3	3	4	3	2	10	15	14	10	11	14	16	15	14	10	10	8	8	10	37	16	18	37
14-Aug	8	7	10	7	7	7	9	22	17	31	29	37	20	22	18	22	21	28	9	4	4	4	4	21	37
15-Aug	4	3	6	11	10	4	6	9	14	58	60	54	58	33	34	66	26	11	31	12	6	7	5	10	66
16-Aug	22	14	10	11	32	8	6	18	17	13	10	12	12	16	18	22	11	9	6	9	12	5	5	3	32
17-Aug	8	5	7	5	4	4	7	15	10	23	13	10	16	10	9	10	9	7	11	6	6	11	9	10	23
18-Aug	30	16	16	14	4	4	6	9	17	42	19	16	30	46	14	14	25	22	38	13	28	5	15	40	46
19-Aug	15	19	10	67	24	11	8	17	12	18	11	23	19	56	6	32	15	10	20	44	19	17	6	9	67
20-Aug	14	12	12	9	7	11	7	9	11	12	10	13	16	12	15	16	16	10	14	10	8	22	7	17	22
21-Aug	24	14	8	7	14	10	8	31	27	31	23	32	23	26	20	22	25	19	7	5	4	21	5	11	32
22-Aug	18	5	8	5	13	5	7	8	28	68	34	34	53	59	37	11	22	11	10	13	6	10	27	15	68
23-Aug	11	15	29	8	8	8	11	10	9	13	19	15	19	37	32	29	27	12	11	14	11	9	5	14	37
24-Aug	13	13	6	11	8	7	6	22	18	23	45	45	41	40	50	17	22	20	19	3	2	3	5	4	50
25-Aug	5	5	6	5	6	4	6	12	4	11	9	11	13	16	12	13	9	10	6	3	4	3	4	10	16
26-Aug	16	5	4	4	3	3	5	8	11	18	12	12	15	29	33	16	13	24	17	15	28	54	88	7	88
27-Aug	12	15	7	5	6	13	9	8	6	6	6	9	13	20	15	18	13	8	21	5	12	48	43	71	71
28-Aug	37	8	8	14	4	4	6	7	6	7	16	14	20	20	15	33	16	34	9	53	11	13	4	3	53
29-Aug	5	4	3	6	7	8	5	4	10	9	16	14	11	12	13	11	9	10	6	5	4	5	4	6	16
30-Aug	6	4	4	10	15	30	20	13	18	15	10	7	9	18	42	29	21	23	15	4	27	19	16	29	42
31-Aug	25	17	5	11	9	7	8	15	26	34	46	25	16	32	12	11	62	7	22	10	3	6	7	6	62
	37	26	29	67	32	30	20	74	46	68	60	63	58	59	56	66	77	82	53	53	28	54	88	71	
	Diurnal Maximum																								

WBEA

Hourly Averages

Wind Direction 90 m (WD90m) - deg

Mannix - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 0.7 km/h on Aug 10 13:00

Maximum Daily Average: 0.2 km/h on Aug 25

Minimum Value: -0.9 km/h on Aug 19 15:00

Minimum Daily Average: -0.2 km/h on Aug 20

Maximum Diurnal Average: 0.1 km/h at hour 12

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

Monthly Average: 0.02 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.3 Q_1 = -0.1 Median = 0.0 Q_3 = 0.2 P_{90} = 0.3 P_{99} = 0.5

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

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.5 km/h on Aug 1 01:00

Minimum Value: 0.2 km/h on Aug 24 02:00

Percentiles: P_1 = 0.3 P_{10} = 0.6 Q_1 = 0.9 Median = 1.5 Q_3 = 1.9 P_{90} = 2.4 P_{99} = 3.2

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

Maximum Value: 1.3 km/h on Aug 10 13:00

Maximum Daily Average: 0.8 km/h on Aug 29

Minimum Value: -0.8 km/h on Aug 1 01:00

Minimum Daily Average: -0.2 km/h on Aug 7

Maximum Diurnal Average: 0.4 km/h at hour 12

Minimum Diurnal Average: 0.1 km/h at hour 22

Monthly Average: 0.24 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.2 Q_1 = 0.0 Median = 0.2 Q_3 = 0.5 P_{90} = 0.7 P_{99} = 1.2

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-Aug	-0.8	-0.3	-0.3	-0.4	-0.3	-0.4	-0.3	-0.1	0.4	0.3	-0.3	0.0	0.4	-0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.3	0.5	0.6	0.0	0.6
2-Aug	0.8	0.7	0.8	0.7	0.8	0.7	0.6	0.6	0.7	0.6	0.3	0.5	1.0	1.0	1.1	0.6	0.8	0.4	-0.2	0.5	0.5	0.5	0.3	0.2	0.6	1.1
3-Aug	0.0	0.0	0.0	-0.1	-0.2	0.2	0.4	0.5	0.7	0.6	0.8	0.0	0.6	0.4	1.0	0.3	0.0	0.5	0.5	0.5	0.0	-0.2	0.0	0.0	0.3	1.0
4-Aug	-0.1	0.0	-0.1	0.0	0.3	0.6	0.4	0.2	0.7	0.2	0.4	0.6	0.6	0.6	0.5	-0.1	0.0	0.1	0.0	0.3	0.3	0.6	0.5	0.8	0.3	0.8
5-Aug	0.6	0.4	0.3	0.4	0.6	0.6	0.5	0.5	0.4	0.3	0.4	1.0	0.6	0.4	0.4	0.1	0.8	0.4	0.6	0.9	0.5	0.6	0.7	0.5	0.5	1.0
6-Aug	0.9	0.7	0.7	0.6	0.9	0.7	0.9	0.6	0.5	0.1	0.7	1.3	0.5	-0.1	0.4	-0.4	0.4	0.5	0.1	-0.3	-0.6	-0.8	-0.6	-0.4	0.3	1.3
7-Aug	-0.3	-0.2	-0.1	-0.3	-0.1	-0.2	-0.3	-0.5	-0.2	-0.1	-0.3	-0.2	-0.6	-0.1	-0.4	-0.1	-0.1	0.0	0.3	0.0	-0.1	-0.3	-0.3	-0.3	-0.2	0.3
8-Aug	0.1	-0.3	0.0	0.1	0.1	0.4	0.5	-0.1	0.5	0.3	0.6	0.3	0.3	0.3	0.6	0.3	0.3	0.8	0.2	-0.2	0.2	-0.1	-0.4	0.1	0.2	0.8
9-Aug	-0.2	-0.4	0.0	-0.1	0.1	0.1	-0.1	0.0	0.0	0.2	0.2	0.2	-0.2	0.1	0.0	0.3	-0.1	0.1	0.5	0.2	-0.1	-0.2	-0.3	0.1	0.0	0.5
10-Aug	0.1	0.1	0.4	0.5	0.7	0.5	0.4	0.5	0.6	0.8	0.9	0.5	1.3	0.4	1.2	0.3	0.6	-0.1	0.3	-0.1	-0.3	-0.4	-0.5	-0.4	0.4	1.3
11-Aug	-0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	-0.3	0.1	0.2	-0.1	-0.3	-0.2	-0.3	0.1	-0.5	0.5	0.2	0.0	0.2	0.0	0.2	0.0	0.5
12-Aug	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.2	0.1	0.8	0.4	1.2	0.7	0.7	0.5	0.5	0.8	1.2	0.8	0.8	0.9	0.6	0.5	1.2
13-Aug	0.7	0.7	0.6	0.8	0.8	1.1	0.7	0.5	0.6	0.4	0.6	1.1	0.7	0.2	-0.1	-0.2	-0.2	0.2	-0.1	-0.2	0.1	-0.3	-0.1	-0.2	0.4	1.1
14-Aug	-0.4	-0.4	-0.4	-0.4	-0.3	-0.1	0.1	0.2	0.2	0.5	0.0	0.2	-0.1	-0.4	0.1	0.0	0.6	0.2	0.3	0.2	0.1	0.0	0.0	0.3	0.0	0.6
15-Aug	0.7	0.5	0.5	0.3	0.5	0.4	0.3	0.5	0.5	0.6	0.6	0.3	0.9	-0.2	0.0	0.4	0.5	0.3	0.2	-0.2	-0.2	0.1	-0.1	0.0	0.3	0.9
16-Aug	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.5	0.4	0.2	0.2	0.2	0.4	0.3	0.2	0.1	-0.2	-0.1	0.0	-0.2	-0.2	-0.4	0.1	0.7
17-Aug	-0.3	-0.1	-0.1	-0.4	-0.3	-0.4	-0.6	0.1	0.1	0.2	0.3	-0.1	0.4	0.6	-0.1	-0.3	-0.3	-0.1	-0.2	-0.3	-0.2	0.1	0.2	-0.1	-0.1	0.6
18-Aug	0.0	0.1	0.2	0.5	0.6	0.7	0.5	0.6	0.4	0.6	0.7	0.3	0.1	0.4	0.1	0.5	0.4	0.0	-0.2	0.2	0.0	-0.1	0.0	0.0	0.3	0.7
19-Aug	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.3	0.1	0.7	0.1	0.8	0.2	-0.1	-0.4	-0.1	0.6	0.4	0.0	0.1	-0.1	-0.2	-0.2	-0.1	0.1	0.8
20-Aug	0.0	0.2	-0.1	-0.6	-0.1	0.0	0.0	-0.1	0.6	-0.1	0.0	0.2	0.5	-0.2	0.2	-0.2	0.1	-0.3	0.0	0.3	0.0	0.0	0.2	0.1	0.0	0.6
21-Aug	0.1	0.0	0.0	0.3	-0.1	-0.4	-0.1	0.0	0.4	0.6	0.2	0.2	-0.1	0.0	-0.3	0.3	0.7	0.4	-0.1	0.3	0.3	0.3	-0.1	0.0	0.1	0.7
22-Aug	-0.2	-0.1	-0.2	0.0	0.1	0.2	0.2	0.2	0.1	0.5	1.0	0.5	0.5	0.2	0.7	0.2	0.4	0.2	0.5	0.2	0.7	0.2	0.2	0.3	0.3	1.0
23-Aug	0.3	0.3	0.3	0.5	0.4	0.5	0.2	0.3	0.6	0.6	0.6	0.7	0.1	0.8	0.4	0.4	0.0	0.2	0.2	0.4	0.5	0.4	0.6	0.3	0.4	0.8
24-Aug	0.3	0.1	0.2	0.3	0.2	0.0	0.2	0.1	-0.1	0.2	0.6	0.9	0.5	0.8	0.5	0.6	0.6	0.6	0.8	0.6	0.5	0.7	0.6	0.8	0.4	0.9
25-Aug	0.3	0.6	0.6	0.4	0.4	0.5	0.6	0.5	0.6	0.7	0.7	1.3	1.1	0.9	0.5	0.5	0.2	0.3	0.5	0.7	0.8	0.6	1.0	0.5	0.6	1.3
26-Aug	0.7	0.9	1.1	0.9	0.8	0.8	0.9	0.5	0.2	0.3	0.4	0.3	0.5	0.6	0.4	0.3	-0.1	0.0	-0.4	0.6	0.3	0.4	0.1	0.7	0.5	1.1
27-Aug	0.6	0.4	-0.2	-0.4	-0.2	-0.1	0.2	0.0	-0.1	0.0	0.0	0.1	-0.2	-0.5	-0.2	0.1	-0.2	-0.2	0.1	-0.3	-0.1	0.1	-0.1	0.3	0.0	0.6
28-Aug	0.0	-0.2	-0.1	0.0	-0.2	-0.1	0.0	0.4	0.2	-0.2	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.3	0.2	0.2	0.2	0.5	0.3	0.5	0.1	0.5
29-Aug	0.7	0.4	0.5	0.6	0.7	0.9	0.8	0.5	0.5	1.3	0.9	1.0	0.7	0.7	0.9	1.0	0.6	0.8	0.8	0.8	0.7	0.8	1.0	0.8	0.8	1.3
30-Aug	0.7	0.7	0.8	0.8	0.5	0.5	0.7	0.3	-0.1	0.1	0.1	-0.1	0.1	0.5	0.4	0.1	0.1	0.2	0.1	0.1	0.0	-0.3	0.0	-0.1	0.3	0.8
31-Aug	0.0	-0.2	-0.1	-0.1	-0.1	-0.2	-0.1	0.2	0.1	0.4	0.8	0.3	-0.1	-0.1	-0.7	-0.5	0.1	-0.3	0.1	-0.2	-0.4	-0.3	0.0	-0.1	-0.1	0.8
	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	Diurnal Average	
	0.9	0.9	1.1	0.9	0.9	1.1	0.9	0.6	0.7	1.3	1.0	1.3	1.3	1.2	1.2	1.0	0.8	0.8	0.8	1.2	0.8	0.8	1.0	0.8	Diurnal Maximum	

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

Maximum Value: 3.7 km/h on Aug 7 14:00

Minimum Value: 0.2 km/h on Aug 22 06:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.8 Median = 1.5 Q_3 = 2.1 P_{90} = 2.5 P_{99} = 3.1

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

Maximum Value: 1.4 km/h on Aug 3 15:00

Maximum Daily Average: 0.3 km/h on Aug 2

Minimum Value: -0.8 km/h on Aug 6 23:00

Minimum Daily Average: -0.1 km/h on Aug 7

Maximum Diurnal Average: 0.3 km/h at hour 12

Minimum Diurnal Average: 0.0 km/h at hour 1

Monthly Average: 0.15 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.2 Q_1 = -0.1 Median = 0.1 Q_3 = 0.3 P_{90} = 0.6 P_{99} = 0.9

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

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4.0 km/h on Aug 7 14:00

Minimum Value: 0.2 km/h on Aug 14 21:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.7 Median = 1.4 Q_3 = 2.2 P_{90} = 2.7 P_{99} = 3.5

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

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

Maximum Value: 4.1 km/h on Aug 17 16:00

Maximum Daily Average: 2.5 km/h on Aug 7

Minimum Value: -1.0 km/h on Aug 12 21:00

Minimum Daily Average: -0.3 km/h on Aug 12

Maximum Diurnal Average: 1.0 km/h at hour 15

Minimum Diurnal Average: 0.6 km/h at hour 19

Monthly Average: 0.78 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.1 Q_1 = 0.2 Median = 0.6 Q_3 = 1.2 P_{90} = 1.8 P_{99} = 3.3

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-Aug	0.5	0.8	0.1	0.5	1.2	0.9	0.3	0.3	0.6	0.9	1.1	1.1	2.0	1.0	0.8	1.3	0.8	0.4	0.3	0.4	0.9	1.0	1.4	1.2	0.8	2.0
2-Aug	1.6	1.6	1.5	1.1	1.1	1.0	1.0	0.9	1.0	0.5	-0.4	0.1	1.4	1.2	1.3	1.3	1.7	1.3	0.3	0.6	1.2	1.5	0.3	0.4	1.0	1.7
3-Aug	0.7	0.8	0.6	0.6	0.2	0.7	0.7	0.4	0.7	0.5	0.5	-0.6	0.0	1.1	1.8	0.1	-0.2	0.4	0.6	0.8	0.5	0.6	1.2	0.7	0.6	1.8
4-Aug	0.4	0.6	0.3	0.2	0.2	0.5	0.1	0.0	1.6	0.3	0.0	0.9	1.5	1.5	0.9	0.1	-0.1	0.1	-0.1	-0.2	-0.3	-0.4	-0.1	0.1	0.3	1.6
5-Aug	-0.1	0.1	0.6	0.2	-0.3	-0.5	-0.6	-0.2	0.1	0.2	0.0	0.2	-0.3	-0.4	-0.1	-0.9	-0.4	-0.8	0.2	1.7	1.3	1.2	1.6	1.3	0.2	1.7
6-Aug	2.0	1.6	1.3	1.1	1.8	1.4	1.2	0.8	0.3	0.1	0.4	1.9	1.4	0.6	2.0	1.2	0.5	0.0	1.0	1.4	1.4	2.0	2.1	2.1	1.2	2.1
7-Aug	2.1	2.5	2.3	2.2	1.7	2.3	2.7	1.9	3.1	3.2	2.7	3.2	2.5	3.8	2.7	3.4	3.1	3.0	2.4	2.2	2.1	1.9	2.1	1.0	2.5	3.8
8-Aug	1.1	0.8	1.3	1.8	1.3	0.9	0.6	-0.3	0.7	1.0	1.2	0.9	0.2	0.0	0.2	0.1	-0.1	0.2	0.3	1.7	1.9	2.6	0.9	-0.1	0.8	2.6
9-Aug	0.1	1.2	0.8	0.0	-0.1	0.1	0.6	1.2	1.8	1.5	1.4	1.2	0.1	0.9	0.7	1.7	1.0	0.5	0.2	0.0	0.8	1.3	1.6	1.4	0.8	1.8
10-Aug	0.3	0.2	0.1	0.7	1.1	0.5	0.4	0.5	0.6	0.6	0.4	-0.2	0.6	0.6	1.0	0.3	1.6	0.9	0.7	0.2	0.8	2.1	1.5	1.5	0.7	2.1
11-Aug	1.1	0.6	0.2	0.3	0.2	0.2	0.2	0.1	0.3	0.5	0.7	0.6	2.1	2.6	2.5	2.1	2.5	0.4	0.6	0.0	-0.1	-0.1	-0.2	-0.2	0.7	2.6
12-Aug	-0.2	0.0	0.2	0.4	-0.1	-0.5	-0.2	-0.2	-0.1	-0.3	-0.6	-0.2	-0.5	-0.3	-0.6	-0.3	-0.4	-0.9	-0.5	-0.3	-1.0	-0.4	0.4	0.5	-0.3	0.5
13-Aug	0.6	-0.1	-0.5	-0.3	0.0	1.0	0.9	0.7	0.6	0.6	0.6	1.7	1.7	0.8	0.6	0.8	0.8	0.8	0.4	0.4	0.7	1.7	1.6	1.0	0.7	1.7
14-Aug	2.1	3.7	2.3	0.9	0.7	0.9	0.6	0.4	0.6	1.2	0.0	0.2	0.7	-0.1	0.4	0.6	1.0	0.4	0.2	0.5	0.3	0.8	0.9	0.5	0.8	3.7
15-Aug	0.5	0.7	1.0	0.7	0.6	1.2	0.6	0.7	0.4	0.4	0.1	-0.6	1.1	0.2	0.3	1.3	1.5	1.3	0.8	0.0	-0.4	-0.6	-0.9	-0.2	0.4	1.5
16-Aug	0.0	0.1	0.0	0.2	-0.1	-0.2	0.0	0.1	0.2	-0.4	-0.5	-0.1	0.1	0.1	0.6	0.7	0.8	1.0	0.3	0.5	0.3	1.0	1.4	1.7	0.3	1.7
17-Aug	1.6	2.9	2.4	2.7	2.7	2.1	0.5	1.3	1.6	1.2	1.8	1.4	1.7	2.9	2.9	4.1	3.6	3.2	2.6	2.1	1.4	1.0	1.3	1.3	2.1	4.1
18-Aug	0.4	0.2	0.2	0.5	1.3	1.3	0.5	0.7	0.4	0.6	0.5	0.2	0.5	0.7	0.9	0.6	0.2	1.2	0.6	1.5	1.0	0.4	-0.2	0.1	0.6	1.5
19-Aug	1.0	0.9	0.6	0.4	0.1	0.3	0.5	0.1	0.2	0.7	-0.1	0.6	-0.1	2.5	3.5	0.7	0.2	-0.1	-0.2	0.6	1.4	0.7	0.2	0.2	0.6	3.5
20-Aug	-0.2	0.1	0.5	0.2	0.2	0.6	0.4	-0.5	0.9	1.2	0.9	1.1	1.6	1.0	1.3	0.6	0.9	0.6	1.4	0.4	0.0	1.1	1.7	1.3	0.7	1.7
21-Aug	0.5	0.3	1.1	1.8	0.5	0.9	1.4	0.1	0.9	1.4	1.3	1.1	0.7	1.1	0.6	0.8	1.7	0.7	-0.5	-0.2	-0.2	0.1	0.0	0.0	0.7	1.8
22-Aug	0.2	0.8	0.6	0.4	0.3	0.4	0.5	0.5	0.3	0.9	1.5	0.8	0.9	0.8	1.3	0.4	0.5	-0.4	0.0	0.0	0.1	-0.1	0.1	0.3	0.5	1.5
23-Aug	0.4	0.0	0.4	0.6	0.8	0.4	0.3	0.5	0.5	0.5	0.5	0.2	-0.7	-0.3	-0.1	0.3	-0.4	-0.2	-0.2	0.1	-0.1	-0.4	-0.5	-0.3	0.1	0.8
24-Aug	-0.2	-0.2	-0.3	-0.1	-0.2	-0.1	0.0	0.0	-0.1	0.1	0.7	0.8	0.0	0.7	0.1	0.7	1.0	0.0	0.5	0.3	0.4	1.0	0.9	0.9	0.3	1.0
25-Aug	1.0	1.0	0.7	0.4	0.5	0.7	1.2	0.4	0.5	0.6	1.0	0.9	0.7	0.7	1.7	1.5	1.3	1.1	1.3	1.8	1.8	1.7	1.9	1.1	1.1	1.9
26-Aug	0.7	1.1	1.7	1.4	1.6	1.5	1.3	0.4	0.0	-0.3	-0.2	-0.1	0.5	0.2	-0.3	1.3	0.7	1.4	0.7	0.0	-0.3	0.1	0.2	0.4	0.6	1.7
27-Aug	1.2	1.6	0.9	0.8	0.6	0.9	2.4	2.7	3.3	2.8	2.4	1.6	1.1	0.5	1.1	1.5	1.4	1.6	1.6	0.7	0.8	0.5	3.5	0.1	1.5	3.5
28-Aug	1.4	1.3	1.6	1.5	2.1	2.3	2.2	2.6	2.6	2.2	1.8	1.8	1.8	1.8	0.9	0.8	1.0	1.0	0.7	0.2	-0.3	0.3	0.6	0.7	1.4	2.6
29-Aug	0.3	0.4	0.5	0.4	0.7	0.9	0.4	0.2	0.1	0.9	0.6	1.2	0.4	0.0	0.6	0.4	-0.1	0.4	0.4	1.0	0.6	0.8	0.6	0.6	0.5	1.2
30-Aug	0.3	-0.5	-0.6	0.3	1.2	1.0	0.8	0.7	0.5	1.0	1.6	1.7	0.9	1.1	1.0	0.3	0.6	0.8	0.3	0.6	0.5	1.4	0.9	1.3	0.7	1.7
31-Aug	0.7	1.2	2.4	1.7	1.5	0.7	0.9	0.8	0.3	0.2	0.6	0.9	1.1	1.3	1.2	1.2	0.5	1.2	0.9	0.8	1.4	1.6	1.7	1.4	1.1	2.4
	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.6	0.8	0.8	0.7	0.8	0.8	0.9	1.0	0.9	0.9	0.7	0.6	0.6	0.6	0.8	0.9	0.7	Diurnal Average	
	2.1	3.7	2.4	2.7	2.7	2.3	2.7	2.7	3.3	3.2	2.7	3.2	2.5	3.8	3.5	4.1	3.6	3.2	2.6	2.2	2.1	2.6	3.5	2.1	Diurnal Maximum	

Summary of Hour Standard Deviations

Mannix - August 2014

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

Maximum Value: 7.1 km/h on Aug 27 23:00

Minimum Value: 0.2 km/h on Aug 28 23:00

Percentiles: P_1 = 0.2 P_{10} = 0.5 Q_1 = 0.8 Median = 1.4 Q_3 = 2.3 P_{90} = 2.8 P_{99} = 3.8

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
	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-Aug	3.1	3.5	2.1	3.0	2.7	2.1	2.5	2.9	3.0	3.3	3.5	3.7	3.6	3.1	3.1	2.8	2.6	2.1	1.4	0.6	0.3	0.3	0.3	0.4	3.7
2-Aug	0.5	0.6	0.8	0.8	0.8	1.1	1.2	1.3	1.9	1.9	1.6	2.4	2.8	2.9	2.7	2.5	2.6	2.1	0.9	0.4	0.4	1.1	1.1	0.5	2.9
3-Aug	0.5	0.5	0.5	0.6	0.3	0.4	0.6	1.3	1.7	1.9	2.1	1.8	2.6	2.7	2.5	2.4	2.4	1.8	1.2	1.0	1.1	0.7	0.6	0.9	2.7
4-Aug	0.9	0.7	0.5	0.5	0.3	0.5	0.4	0.6	1.5	2.2	1.8	2.5	2.8	2.9	2.6	2.4	2.5	2.1	0.8	0.6	1.0	1.8	1.5	1.2	2.9
5-Aug	1.2	0.7	0.7	0.5	0.6	0.9	1.1	1.0	1.2	1.6	1.9	1.9	2.2	2.5	2.3	2.0	1.9	1.6	1.5	1.2	0.7	0.6	0.9	0.9	2.5
6-Aug	1.0	1.4	1.4	1.1	0.8	1.4	1.5	1.5	2.3	1.9	2.6	3.4	3.2	3.2	3.1	2.2	1.6	1.7	1.9	1.7	0.5	0.6	0.6	1.0	3.4
7-Aug	1.7	1.7	2.0	1.7	1.5	1.6	2.4	3.2	3.4	3.4	3.5	3.9	4.0	4.2	4.0	3.7	3.1	3.2	2.3	1.2	0.4	0.5	1.2	1.2	4.2
8-Aug	1.5	1.3	1.4	0.8	0.9	0.8	1.8	1.6	2.3	2.6	2.7	2.9	3.4	2.7	2.5	2.4	2.0	1.7	1.2	2.4	1.9	1.3	1.2	1.1	3.4
9-Aug	1.2	1.3	2.1	1.8	1.5	1.4	1.1	1.1	0.9	1.5	2.3	2.5	2.0	2.7	2.9	2.4	1.6	2.1	1.4	0.7	0.7	0.4	0.3	0.9	2.9
10-Aug	0.9	0.7	0.5	0.7	0.7	0.7	0.8	1.2	1.1	2.1	1.8	1.7	2.5	2.6	2.4	2.3	2.4	1.5	1.3	0.4	0.6	0.3	0.3	0.3	2.6
11-Aug	0.5	1.2	1.0	0.7	0.6	0.6	0.7	0.7	1.4	1.8	1.8	2.4	2.8	3.1	2.6	3.0	3.0	2.2	1.9	0.8	0.7	0.6	0.6	0.7	3.1
12-Aug	0.5	0.4	0.6	0.3	0.6	0.7	0.8	1.2	1.5	1.7	2.0	2.3	2.5	2.6	2.5	2.5	2.2	1.9	1.8	2.2	2.1	2.4	1.8	1.5	2.6
13-Aug	1.1	0.8	0.5	0.7	0.9	0.6	0.6	1.8	1.8	2.4	2.5	2.9	3.1	2.5	2.6	2.6	2.4	1.9	1.0	0.4	0.7	1.9	2.0	1.6	3.1
14-Aug	1.0	0.6	1.3	1.0	1.3	1.0	0.6	1.2	1.6	2.2	1.9	2.3	2.7	2.5	2.6	2.1	1.8	1.5	0.5	0.2	0.3	0.4	0.3	0.5	2.7
15-Aug	0.4	0.3	0.4	0.5	0.6	0.5	1.1	1.2	0.9	1.1	1.6	1.9	2.6	2.6	3.3	3.2	2.8	2.1	1.2	2.1	1.8	1.6	1.0	0.8	3.3
16-Aug	0.7	0.6	0.2	0.3	0.2	0.5	0.4	1.0	1.2	1.8	1.9	1.7	2.0	2.7	2.6	2.7	2.4	1.7	0.4	0.3	0.3	0.4	0.4	0.5	2.7
17-Aug	0.9	0.7	0.5	0.6	0.7	0.6	1.1	1.5	2.3	2.6	2.6	2.9	3.4	3.2	2.9	3.2	2.8	2.2	1.5	1.5	1.3	0.5	0.5	0.4	3.4
18-Aug	0.5	0.3	0.4	0.5	0.6	0.9	1.2	1.2	1.1	1.2	1.6	2.2	2.6	2.4	1.8	2.0	1.3	1.4	1.2	1.1	1.2	1.6	1.1	0.5	2.6
19-Aug	0.4	0.6	0.4	0.4	0.2	0.2	0.4	0.4	0.6	1.9	2.5	2.8	2.4	3.5	1.9	1.6	1.6	2.0	1.5	0.8	0.6	1.2	1.4	1.7	3.5
20-Aug	1.9	2.6	2.3	2.5	2.6	2.6	2.2	1.8	2.5	2.3	2.2	2.6	3.2	2.8	2.8	2.2	2.2	2.1	2.2	1.6	1.3	1.3	1.2	1.3	3.2
21-Aug	1.3	0.8	1.3	1.3	1.0	0.8	0.7	0.8	2.1	2.6	3.3	4.0	3.7	3.9	3.5	3.4	3.2	2.7	1.7	1.0	0.5	0.8	0.3	0.3	4.0
22-Aug	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.6	1.0	1.4	2.7	3.0	3.1	3.1	2.8	3.1	2.6	2.2	1.5	0.9	0.8	0.5	0.3	0.4	3.1
23-Aug	0.4	0.6	0.8	0.9	0.9	0.8	0.7	1.0	1.2	1.4	2.0	2.6	2.2	2.7	2.1	1.8	1.7	1.4	1.0	0.8	0.7	1.0	0.8	0.7	2.7
24-Aug	0.7	0.4	0.4	0.5	0.5	0.3	0.4	0.4	0.5	0.9	1.7	2.7	2.4	2.8	2.1	2.4	2.2	1.8	1.5	0.8	0.6	1.0	1.4	1.3	2.8
25-Aug	0.8	0.9	1.4	1.0	0.6	0.9	0.8	1.1	0.9	2.3	2.6	2.9	3.0	2.7	3.3	3.1	2.6	2.3	1.8	1.0	1.3	1.5	1.4	1.2	3.3
26-Aug	1.0	1.1	1.1	1.0	0.8	0.8	0.9	0.8	1.1	1.2	1.0	1.2	1.3	1.9	2.3	2.7	2.3	1.9	2.2	1.1	0.8	1.9	1.0	0.8	2.7
27-Aug	1.2	1.2	0.7	1.3	0.9	1.4	2.0	2.0	2.3	2.5	2.1	2.8	2.8	2.7	2.9	2.9	2.6	1.9	1.4	0.6	1.1	2.8	7.1	1.0	7.1
28-Aug	0.8	0.7	0.7	1.0	0.8	1.0	1.3	1.8	1.9	1.9	1.8	2.1	2.3	3.1	2.7	2.7	2.3	2.1	1.0	0.4	0.6	0.5	0.2	0.2	3.1
29-Aug	0.6	0.6	0.8	0.6	0.8	0.7	0.9	1.2	1.7	2.2	2.3	2.7	2.7	2.7	2.7	2.4	1.9	2.1	1.5	0.9	0.6	0.8	1.4	1.9	2.7
30-Aug	1.5	1.1	1.3	1.3	1.4	0.9	0.9	0.7	1.0	1.2	1.3	1.3	2.1	2.5	2.4	1.9	1.7	1.8	0.7	0.3	1.0	0.7	0.5	0.6	2.5
31-Aug	0.5	1.0	0.6	0.8	0.9	0.6	0.7	0.8	1.1	1.8	2.1	2.4	2.8	3.2	2.9	2.4	1.0	1.0	0.9	0.7	0.6	1.4	1.5	1.0	3.2
	3.1	3.5	2.3	3.0	2.7	2.6	2.5	3.2	3.4	3.4	3.5	4.0	4.0	4.2	4.0	3.7	3.2	3.2	2.3	2.4	2.1	2.8	7.1	1.9	
	Diurnal Maximum																								

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	July 10, 2014	Previous Calibration	July 10, 2014
Station Name	Mannix	Station Number	AMS 5
Reason:	Removal		
Start Time (MST)	9:40	End Time (MST)	11:40
Barometric Pressure	729 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	-645	-645
Analyzer Range (mv)	5000	5000	Lamp voltage	804	802
Calculated slope	0.999130	1.024749	Chamber temp.	44.5	44.5
Calculated intercept	1.091578	0.708027	Pressure (mmHg)	695.9	689.8
Analyzer Background	15.9	16.0	Flow (lpm)	0.500	0.497
Analyzer Coefficient	0.763	0.763	Intensity	25xxx	25xxx

Analyzer make	TEI 43C	Analyzer serial #	613516797

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	58.8	599.8	584.0	1.027
calibrator zero	5000	0.0	0.0	-0.6	0.000
high point	5000	58.8	599.8	584.0	1.027
second point	5000	29.4	299.9	293.8	1.021
third point	5000	14.7	149.9	144.3	1.039
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.029

Corrected As found	584.6	Previous response	599.2	% change	2.5%

Notes:

Removal cal, no adjustments

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

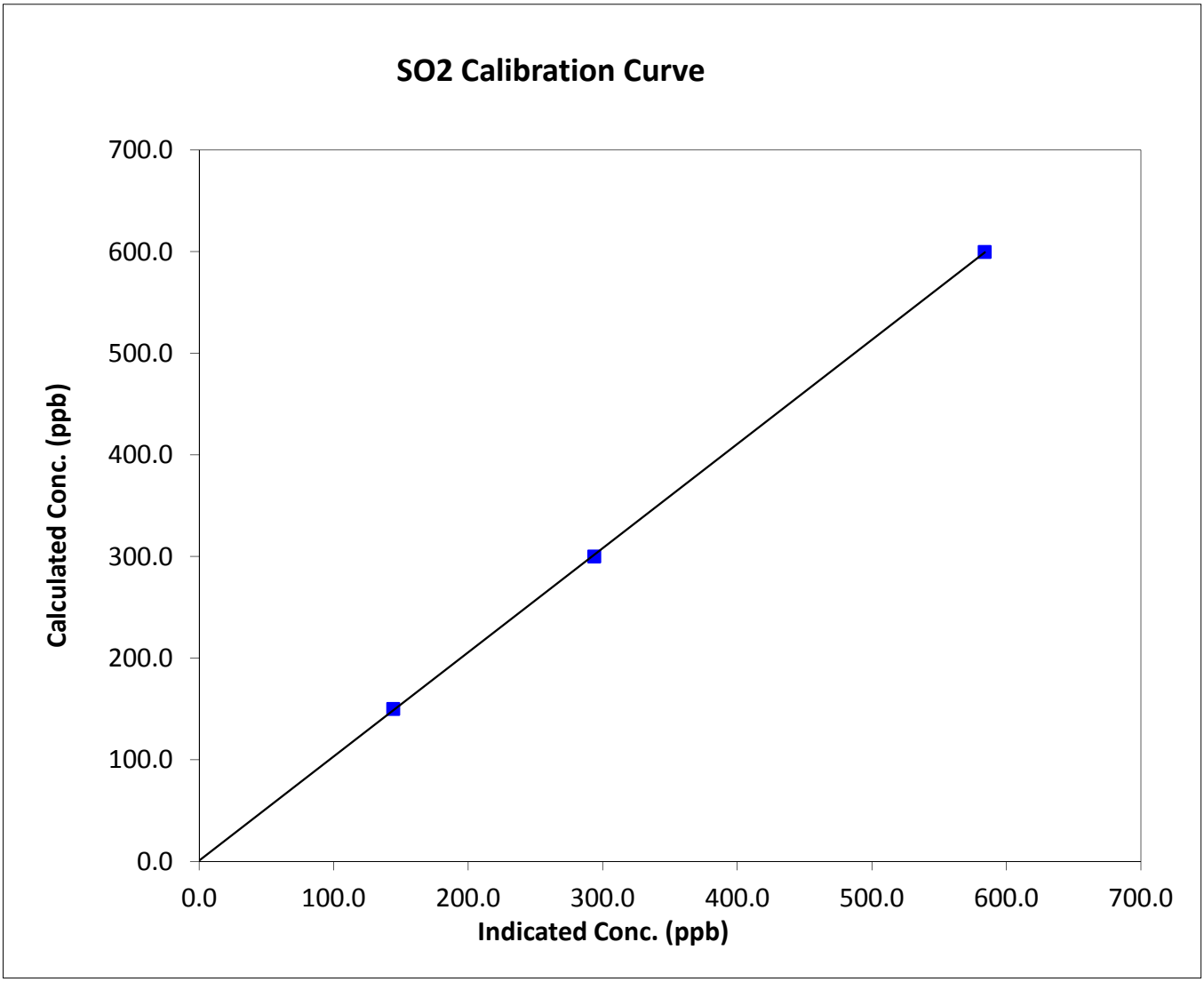
SO_2 Calibration Summary

Station Information

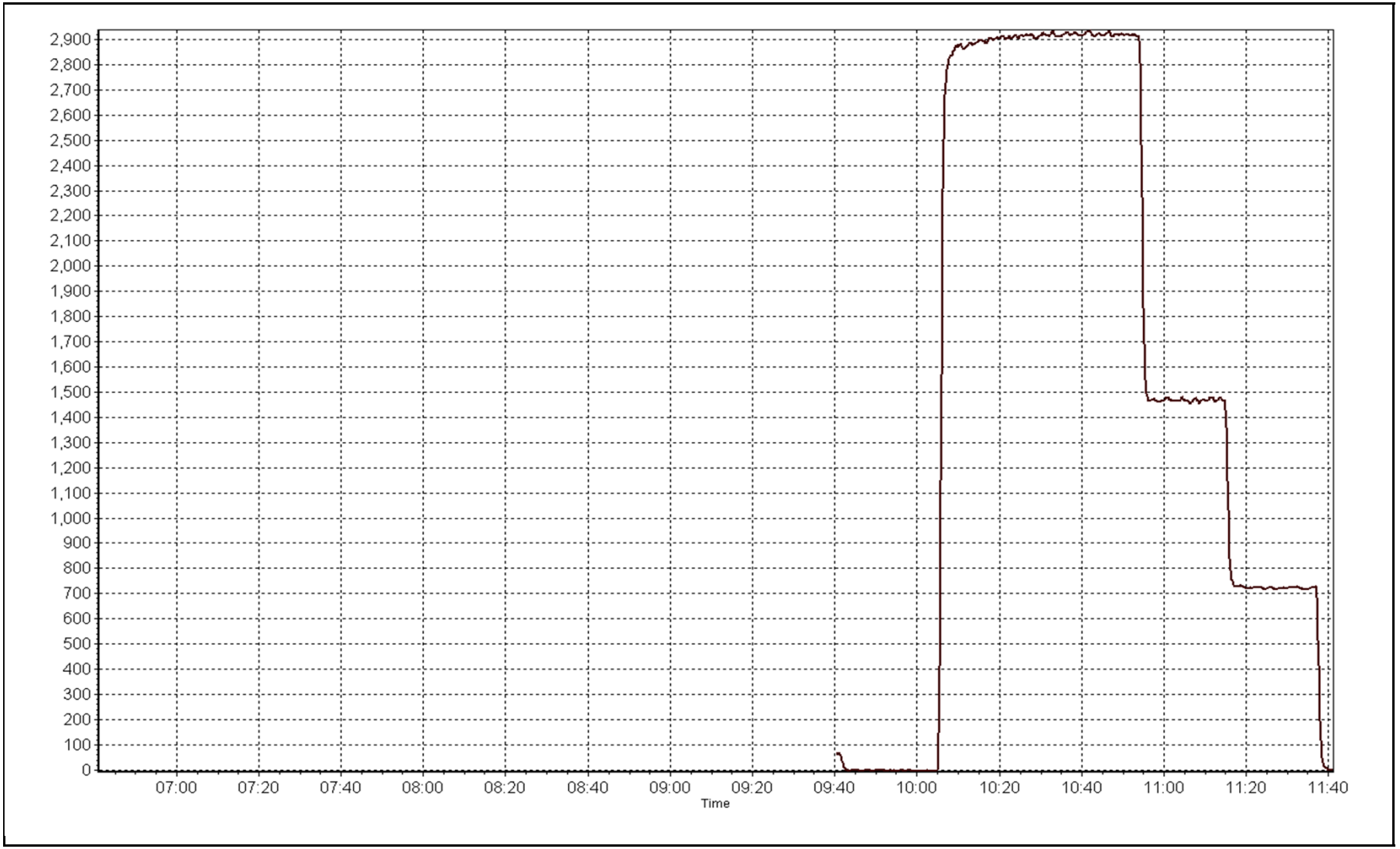
Calibration Date	July 10, 2014	Previous Calibration	July 10, 2014
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	9:40	End Time (MST)	11:40
Analyzer make	TEI 43C	Analyzer serial #	613516797

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999971
599.8	584.0	1.0270		
299.9	293.8	1.0208	Slope	1.024749
149.9	144.3	1.0390		
			Intercept	0.708027



SO2 Calibration Plot Date: July 10, 2014



Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 14, 2014	Previous Calibration	N/A
Station Name	Mannix	Station Number	AMS 5

Reason: Install

Start Time (MST)	12:30	End Time (MST)	15:30
Barometric Pressure	724 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	NA	-635
Analyzer Range (mv)	5000	5000	Lamp voltage	NA	860
Calculated slope	NA	0.994072	Chamber temp.	NA	45.2
Calculated intercept	NA	0.480358	Pressure (mmHg)	NA	694.0
Analyzer Background	NA	16.0	Flow (lpm)	NA	0.478
Analyzer Coefficient	NA	0.763	Intensity	NA	91

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					
as found span					
calibrator zero	5000	0.0	0.0	-0.2	0.000
high point	5000	58.8	599.8	602.4	0.996
second point	5000	29.4	299.9	302.8	0.991
third point	5000	14.7	149.9	149.0	1.006
calibrator zero					
as left zero	5000	0.0	0.0	-0.5	0.000
as left span	5000	58.8	599.8	603.6	0.994
				Average Correction Factor	0.997

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Install cal. Looking good

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

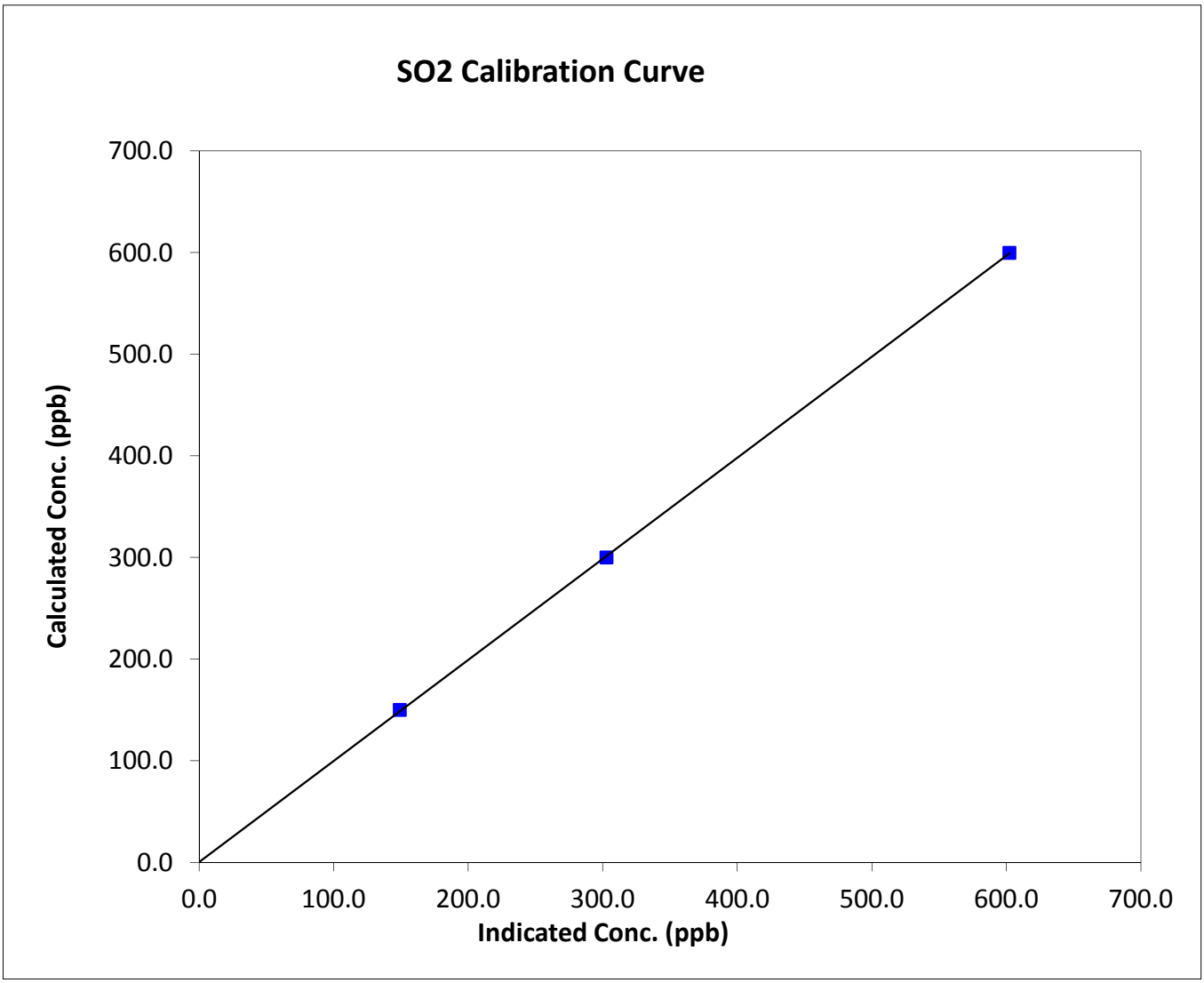
SO_2 Calibration Summary

Station Information

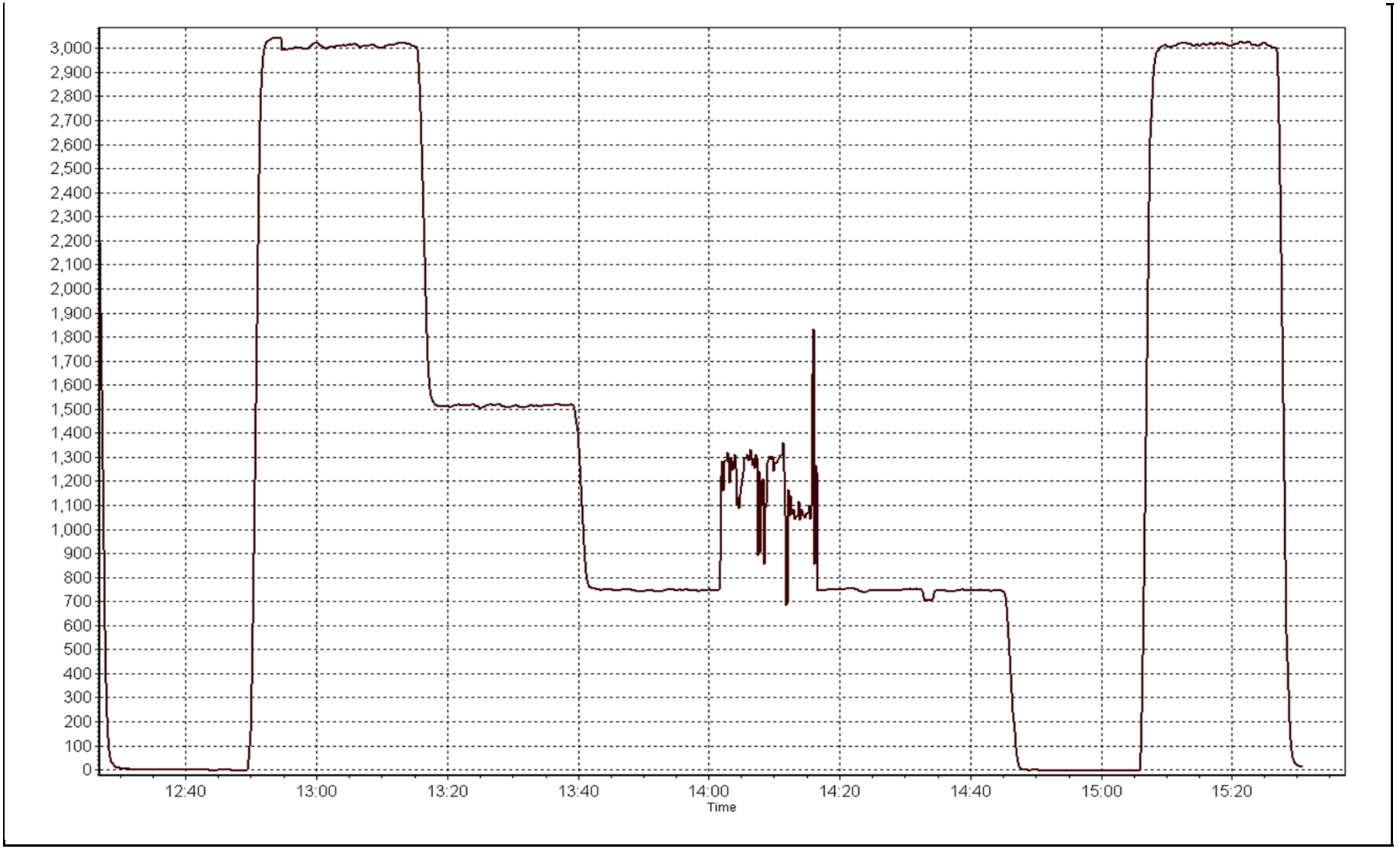
Calibration Date	August 14, 2014	Previous Calibration	N/A
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	12:30	End Time (MST)	15:30
Analyzer make	TEI 43i	Analyzer serial #	1008841399

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999977
599.8	602.4	0.9956		
299.9	302.8	0.9905	Slope	0.994072
149.9	149.0	1.0063		
			Intercept	0.480358



SO2 Calibration Plot Date: August 14, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 11, 2014
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	9:45	End Time (MST)	12:45
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	-624	-624
Analyzer Range (mv)	5000	5000	Lamp voltage	875	876
Calculated slope	1.005846	0.993591	Chamber temp.	45	45
Calculated intercept	0.184921	0.101448	Pressure	505.6	508.3
Analyzer Background	14.3	14.5	Flow	1.047	1.050
Analyzer Coefficient	1.110	1.135	Intensity (%)	115	115
			Converter temp.	328	327

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	0.05	NA
as found span	5000	36.8	75.1	73.2	1.025
SO2 scrubber check	5000	29.4	299.9	1.5	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	36.8	75.1	75.5	0.994
second point	5000	20.6	42.0	42.2	0.995
third point	5000	12.3	25.1	24.9	1.007
calibrator zero					
as left zero	5000	0.0	0.0	0.2	NA
as left span	5000	36.8	75.1	75.7	0.992
				Average Correction Factor	0.999

Corrected As found	73.2	Previous response	74.5	% change	1.8%

Notes:

As found zero used as calibrator zero, Span with a small adjustment. Scrubber check before As Founds. Filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

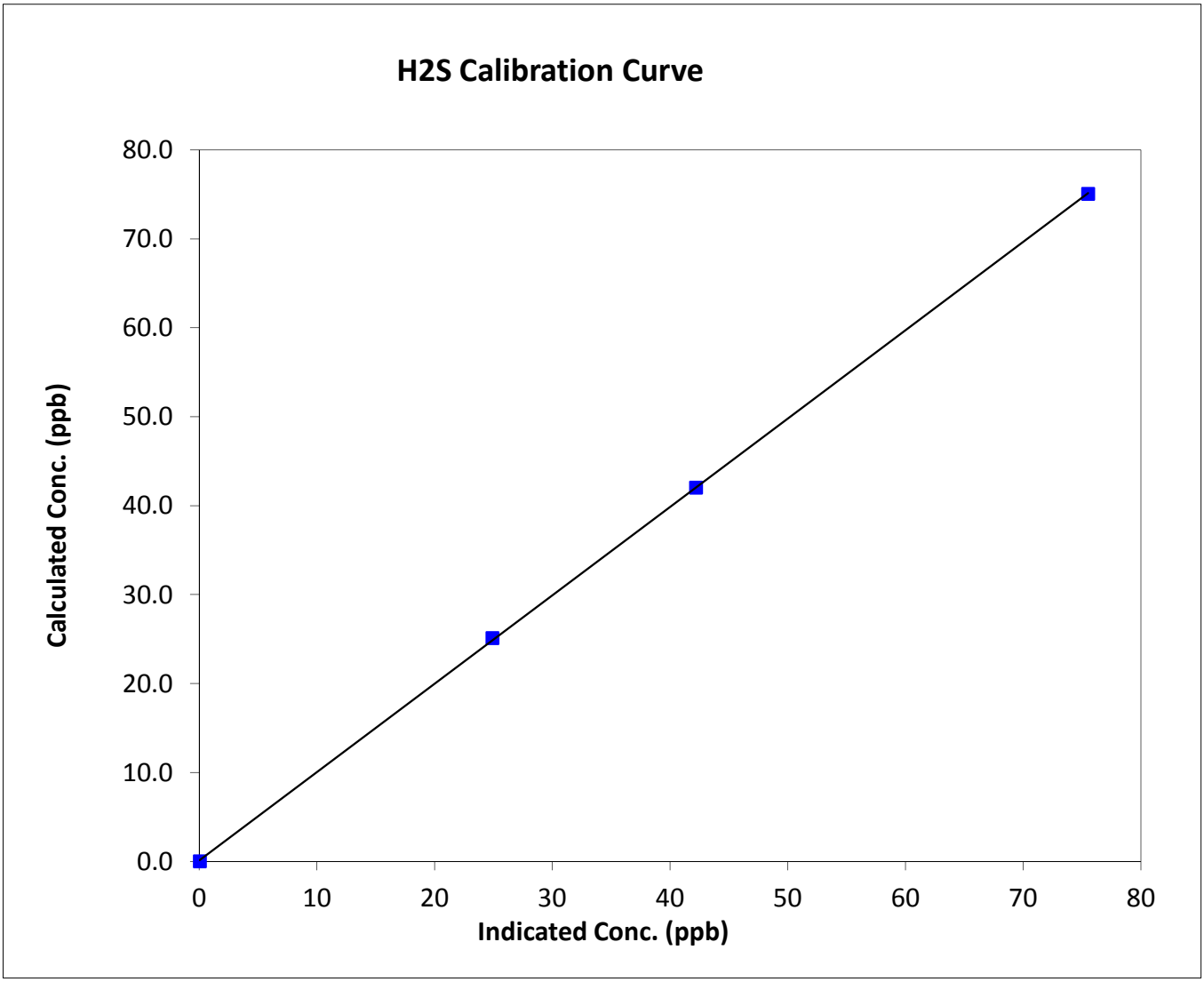
H2S Calibration Summary

Station Information

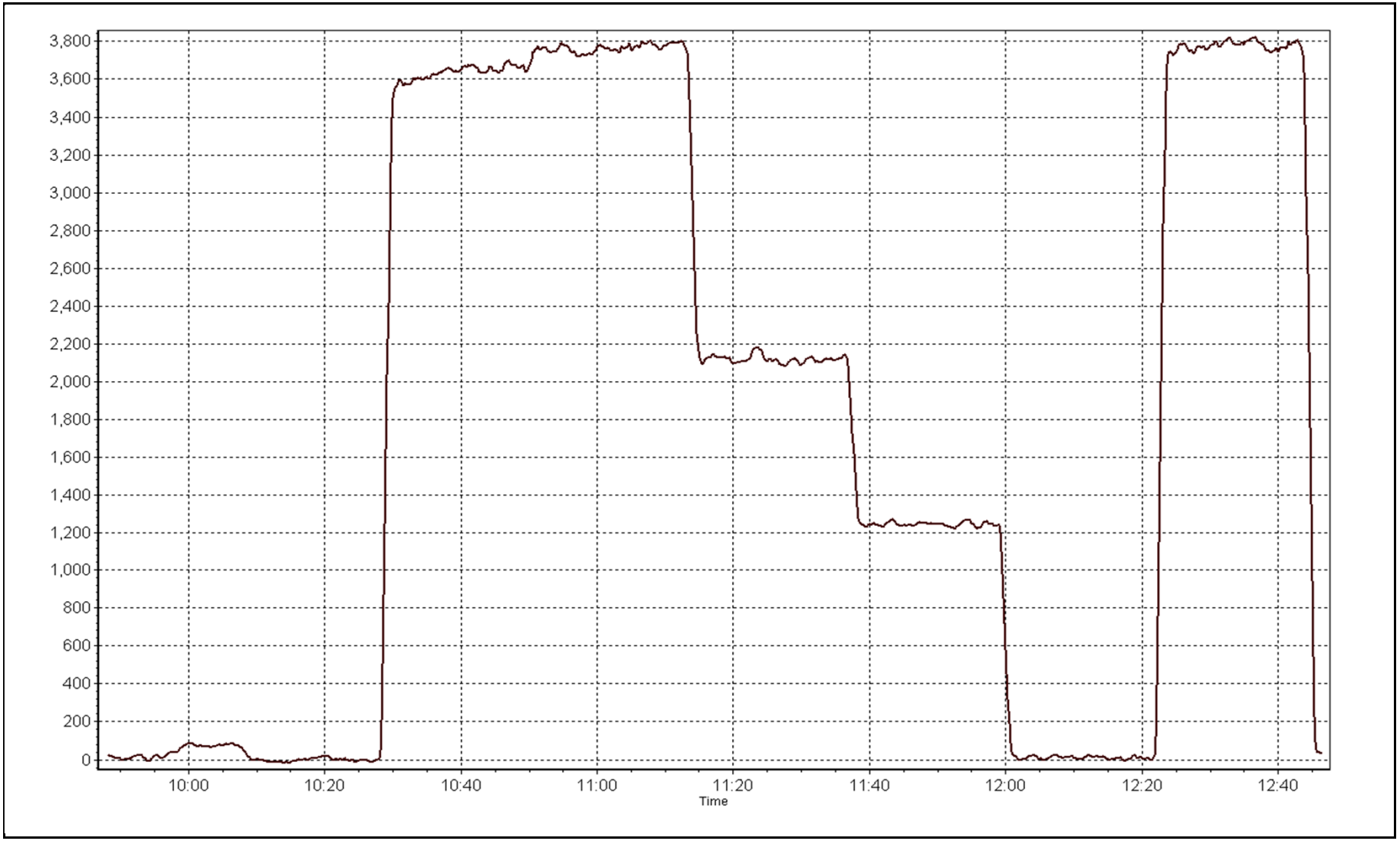
Calibration Date	August 13, 2014	Previous Calibration	July 11, 2014
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	9:45	End Time (MST)	12:45
Analyzer make	TEI 450i	Analyzer serial #	815129108

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999972
75.1	75.5	0.9941		
42.0	42.2	0.9954	Slope	0.993591
25.1	24.9	1.0072		
			Intercept	0.101448



H2S Calibration Plot Date: Wednesday, August 13, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, August 14, 2014	Previous Calibration	Thursday, July 10, 2014
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	9:40	End Time (MST)	12:27
Barometric Pressure	729 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 (mv)	5000	5000	Air	41.1	40.0
Calculated slope	0.998136	0.997498	Fuel Pressure	20.2	20.2
Calculated intercept	0.006800	0.032857	Detector Temp	125.0	124.9
Bkg	2.08	2.03	Flame Temp	162.8	162.1
Slope	1.749	1.712			

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	-0.02	N/A
as found span	5000	58.8	12.72	13.00	0.978
calibrator zero	5000	0.0	0.00	-0.02	N/A
high point	5000	58.8	12.72	12.70	1.001
second point	5000	29.0	6.27	6.32	0.993
third point	5000	14.7	3.18	3.10	1.025
calibrator zero	5000	0.0	0.00		N/A
as left zero	5000	0.0	0.00	-0.04	N/A
as left span	5000	58.8	12.72	12.81	0.993
				Average Correction Factor	1.006

Corrected As found	13.02	Previous response	12.74	% change	-2.2%

Notes:

As found zero used as calibrator zero. Small adjustment to span, filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

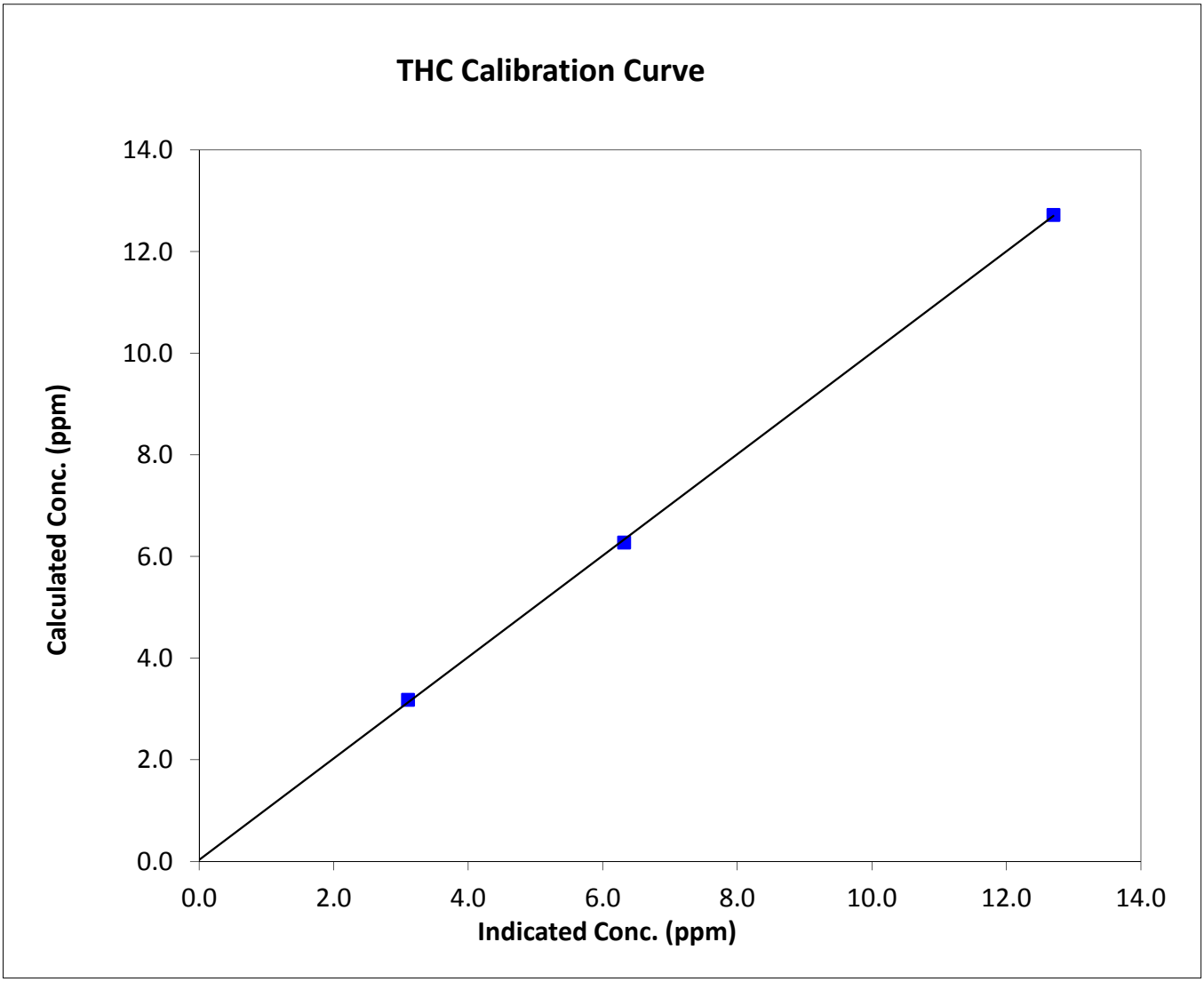
THC Calibration Summary

Station Information

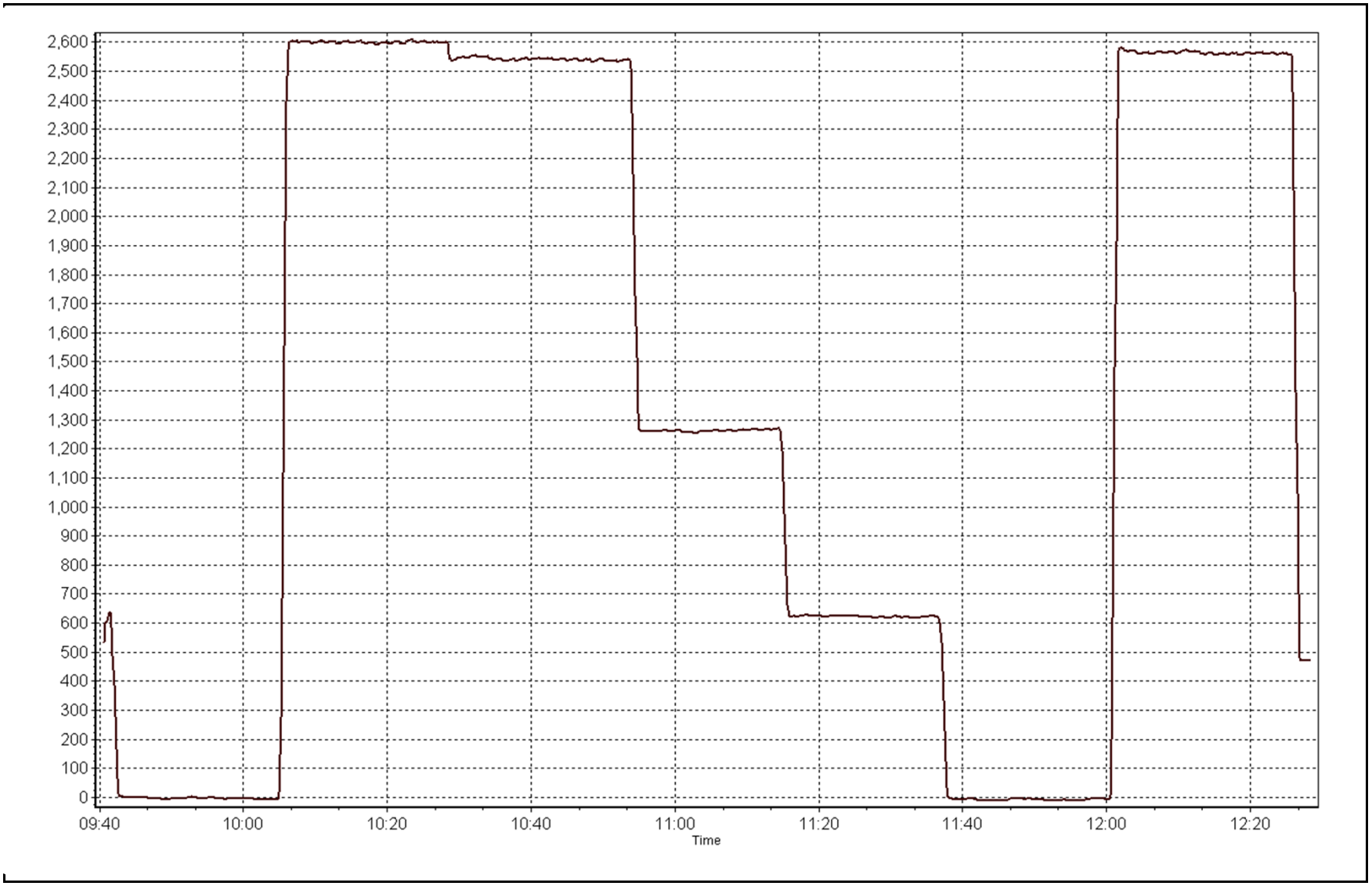
Calibration Date	August 14, 2014	Previous Calibration	July 10, 2014
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	9:40	End Time (MST)	12:27
Analyzer make	TEI 51i-LT	Analyzer serial #	1317958295

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.02	N/A	Correlation Coefficient	0.999923
12.72	12.70	1.0015		
6.27	6.32	0.9931	Slope	0.997498
3.18	3.10	1.0249		
			Intercept	0.032857



THC Calibration Plot Date: August 14, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 6
PATRICIA MCINNES
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
AUGUST 2014

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	25	0	6	0
TRS (ppb) Average	709	35	35	100.00	3	0	1	0
THC (ppm) Average	704	38	40	99.73	2.9	-	2.2	-
NMHC(ppm) Average	704	38	40	99.73	0.27	-	0.013	-
CH4(ppm) Average	704	38	40	99.73	2.7	-	2.2	-
O3 (ppb) Average	710	34	34	100.00	75	0	35	-
NO2 (ppb) Average	693	38	51	98.25	15	0	5	-
NO (ppb) Average	693	38	51	98.25	19	-	3	-
NOX (ppb) Average	693	38	51	98.25	34	-	8	-
NH3 (ppb) Average	669	40	75	95.30	20	0	12	-
PM2.5 (ug/m3) Average	737	0	7	99.06	191.6	-	76.2	-
Temperature 2 m (C) Average	744	0	0	100.00	31.1	-	24.2	-
Relative Humidity (%) Average	744	0	0	100.00	98	-	-	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	27	-	-	-
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 - PATRICIA McINNES (AMS 6)
AUGUST 2014

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	1.1	2	-	0	0	0	0	1	4	25
TRS (ppb) Average	709	0.5	0	-	0	0	0	0	1	1	3
THC (ppm) Average	704	2.01	0.1	-	1.9	1.9	1.9	2	2.1	2.1	2.9
NMHC(ppm) Average	704	0.001	0.01	-	0	0	0	0	0	0	0.27
CH4(ppm) Average	704	2.01	0.1	-	1.9	1.9	1.9	2	2.1	2.1	2.7
O3 (ppb) Average	710	23	12	-	2	9	14	21	30	38	75
NO2 (ppb) Average	693	2.5	2	-	0	0	1	2	4	6	15
NO (ppb) Average	693	0.9	2	-	0	0	0	0	1	2	19
NOX (ppb) Average	693	3.5	4	-	0	1	1	2	4	8	34
NH3 (ppb) Average	669	0.5	3	-	0	0	0	0	0	0	20
PM2.5 (ug/m3) Average	737	13.79	20.7	-	0.5	2.2	4.6	7.9	14.9	25.2	191.6
Temperature 2 m (C) Average	744	17.4	6.5	-	0	9.1	12.8	16.9	22.1	26.8	31.1
Relative Humidity (%) Average	744	65.4	20	-	24	37	48	67	84	92	98
Wind Speed 10 m (km/h) Average	744	8.2	4	-	0	3	5	8	11	14	27
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NMHC, CH4, THC	23 Aug 2014 14:00	23 Aug 2014 15:00	2	Maintenance - replaced fuel and carrier gas
NO2, NO, NOX	05 Aug 2014 06:00	05 Aug 2014 16:00	11	Maintenance - stn operator on site
NO2, NO, NOX	31 Aug 2014 12:00	31 Aug 2014 13:00	2	Maintenance - investigate daily span drift and analyzer response
NH3	01 Aug 2014 01:00	01 Aug 2014 23:00	32	Stabilization after daily span
NH3	01 Aug 2014 11:00	01 Aug 2014 13:00	3	Maintenance - verify daily zero and span cycle response
PM2.5	06 Aug 2014 13:00	06 Aug 2014 17:00	5	Maintenance - replaced analyzer
PM2.5	08 Aug 2014 12:00	08 Aug 2014 13:00	2	Flow and zero reference checks, sample head cleaning

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 25 ppb on Aug 8 14:00 Maximum Daily Average: 6.1 ppb on Aug 1

Minimum Value: 0 ppb on Aug 7 13:00 Minimum Daily Average: 0.1 ppb on Aug 7
Maximum Diurnal Average: 2.6 ppb at hour 12 Minimum Diurnal Average: 0.4 ppb at hour 5
Monthly Average: 1.1 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 12$

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-Aug	9	6	2	1	Z	6	3	2	0	6	12	9	5	8	14	13	11	9	7	7	4	2	2	1	6.1	14
2-Aug	1	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
3-Aug	Z	0	0	0	0	0	0	0	0	0	1	1	2	1	3	2	2	1	1	1	1	0	0	0	0.8	3
4-Aug	0	Z	0	0	0	0	0	0	0	0	3	22	9	5	7	4	3	1	1	0	0	0	0	0	2.5	22
5-Aug	0	0	Z	0	0	0	0	0	0	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0.4	1
6-Aug	0	0	0	Z	0	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	0
7-Aug	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
8-Aug	1	2	0	0	0	Z	0	1	2	3	4	11	19	25	16	7	4	2	1	0	0	0	0	2	4.4	25
9-Aug	Z	5	4	4	1	0	1	2	7	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1.3	7
10-Aug	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
11-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.2	1
12-Aug	0	0	0	Z	0	0	0	0	1	1	0	1	2	1	1	1	1	0	0	0	0	0	0	0	0.5	2
13-Aug	0	0	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0.7	1
14-Aug	2	0	0	0	1	Z	4	6	4	5	10	11	4	5	8	7	10	8	5	3	3	2	2	1	4.3	11
15-Aug	Z	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0.5	1
16-Aug	0	Z	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	0.5	1
17-Aug	0	0	Z	0	0	0	0	0	1	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	5
18-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0.3	1
19-Aug	0	0	1	1	Z	3	2	2	1	2	1	1	0	0	0	0	2	3	4	5	4	4	5	3	2.0	5
20-Aug	1	1	1	1	3	Z	0	0	0	2	9	8	4	3	4	4	2	1	0	1	1	0	0	0	2.1	9
21-Aug	Z	0	0	0	0	0	0	9	10	4	4	5	5	4	5	7	5	5	3	0	0	0	0	0	3.0	10
22-Aug	0	Z	0	0	0	0	0	0	2	9	6	1	0	2	4	4	3	4	4	2	1	0	0	0	1.8	9
23-Aug	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
24-Aug	0	0	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
25-Aug	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
26-Aug	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	1	0	0.5	4
27-Aug	Z	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
28-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.1	1
29-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.2	1
30-Aug	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
31-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	4	3	1	1	0	0	0	0	0	0.5	4
	0.7	0.7	0.5	0.5	0.4	0.5	0.5	0.9	1.1	1.4	2.0	2.6	1.8	2.0	2.3	1.9	1.6	1.3	1.1	0.9	0.6	0.5	0.5	0.5	Diurnal Average	
	9	6	4	4	3	6	4	9	10	9	12	22	19	25	16	13	11	9	7	7	4	4	5	3	Diurnal Maximum	

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

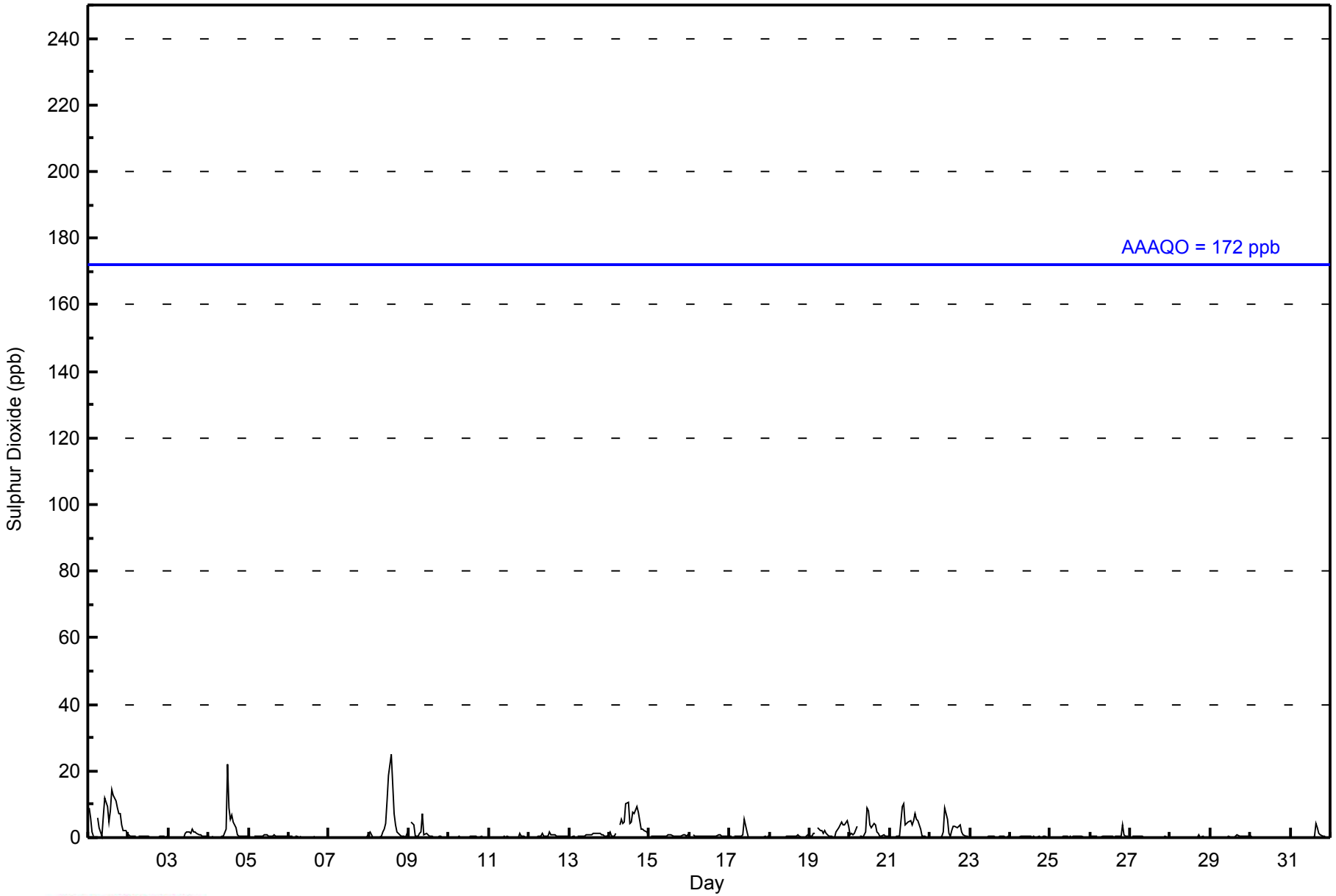
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	696	98.58	98.58
11 - 20	8	1.13	99.72
21 - 60	2	0.28	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	40	24	8	4	15	55	31	35	64	77	60	51	50	55	57	70	696
11 - 20	1	2	2	0	0	0	0	0	0	0	0	1	0	0	0	2	8
21 - 60	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	26	11	4	15	55	31	35	64	77	60	52	50	55	57	72	706

Total Number of Valid Hours: 706

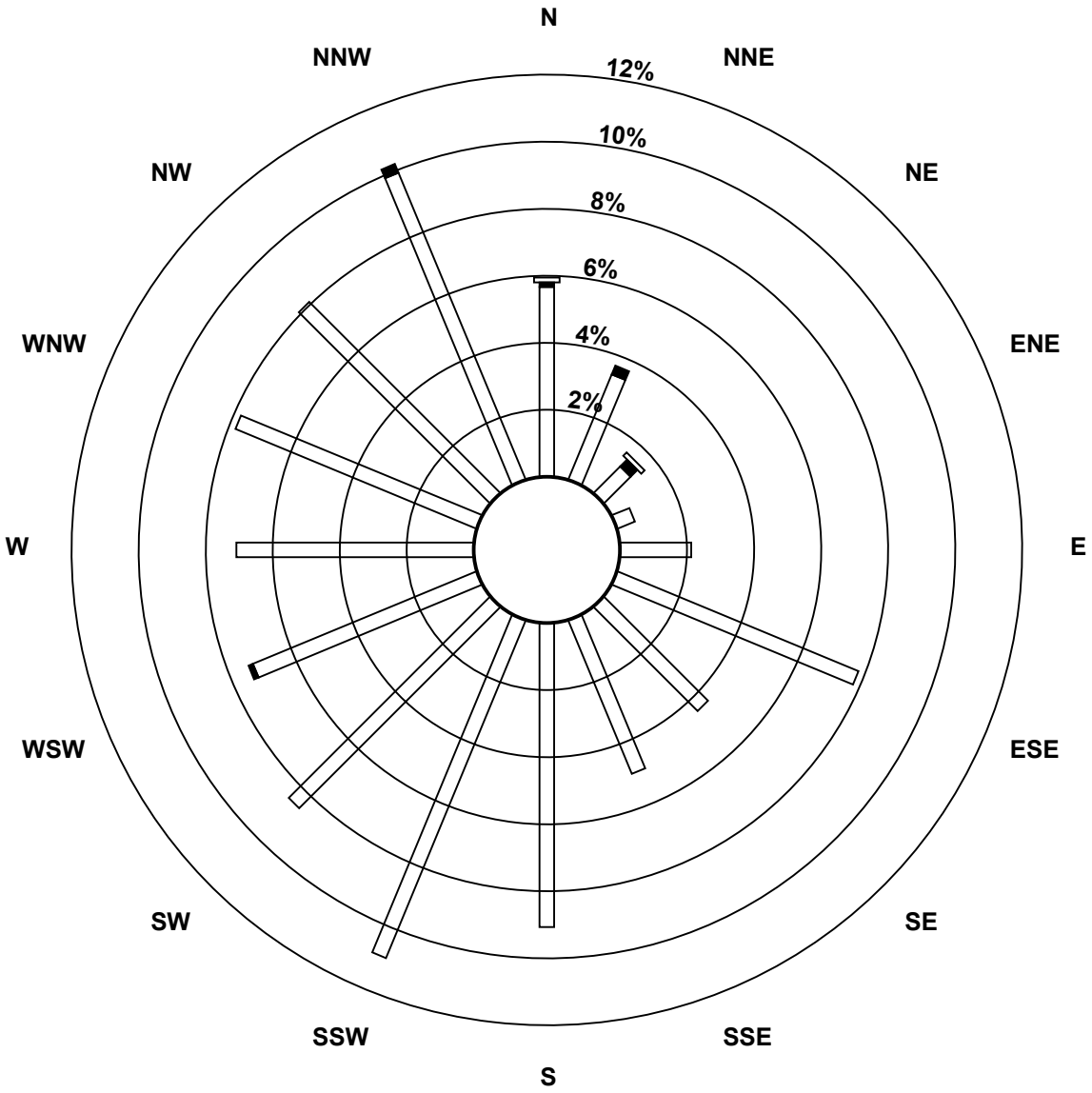
Total Number of Hours: 744

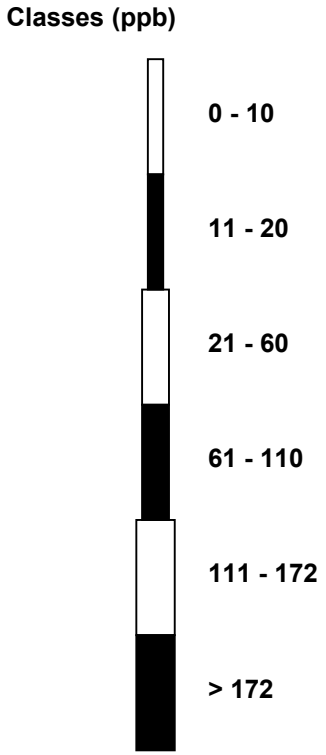
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes (AMS 6)





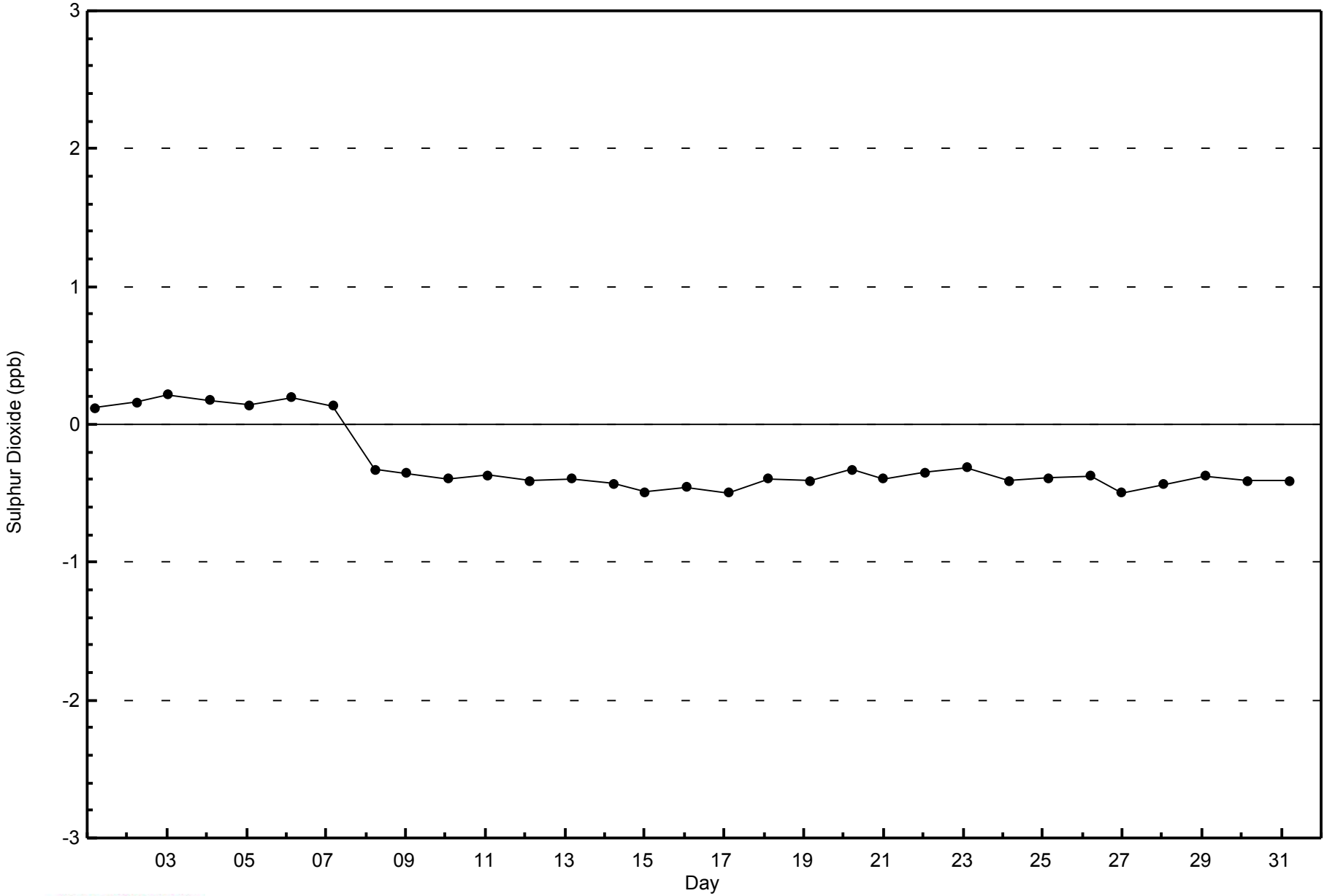
Total Number of Valid Hours: 706

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - August 2014



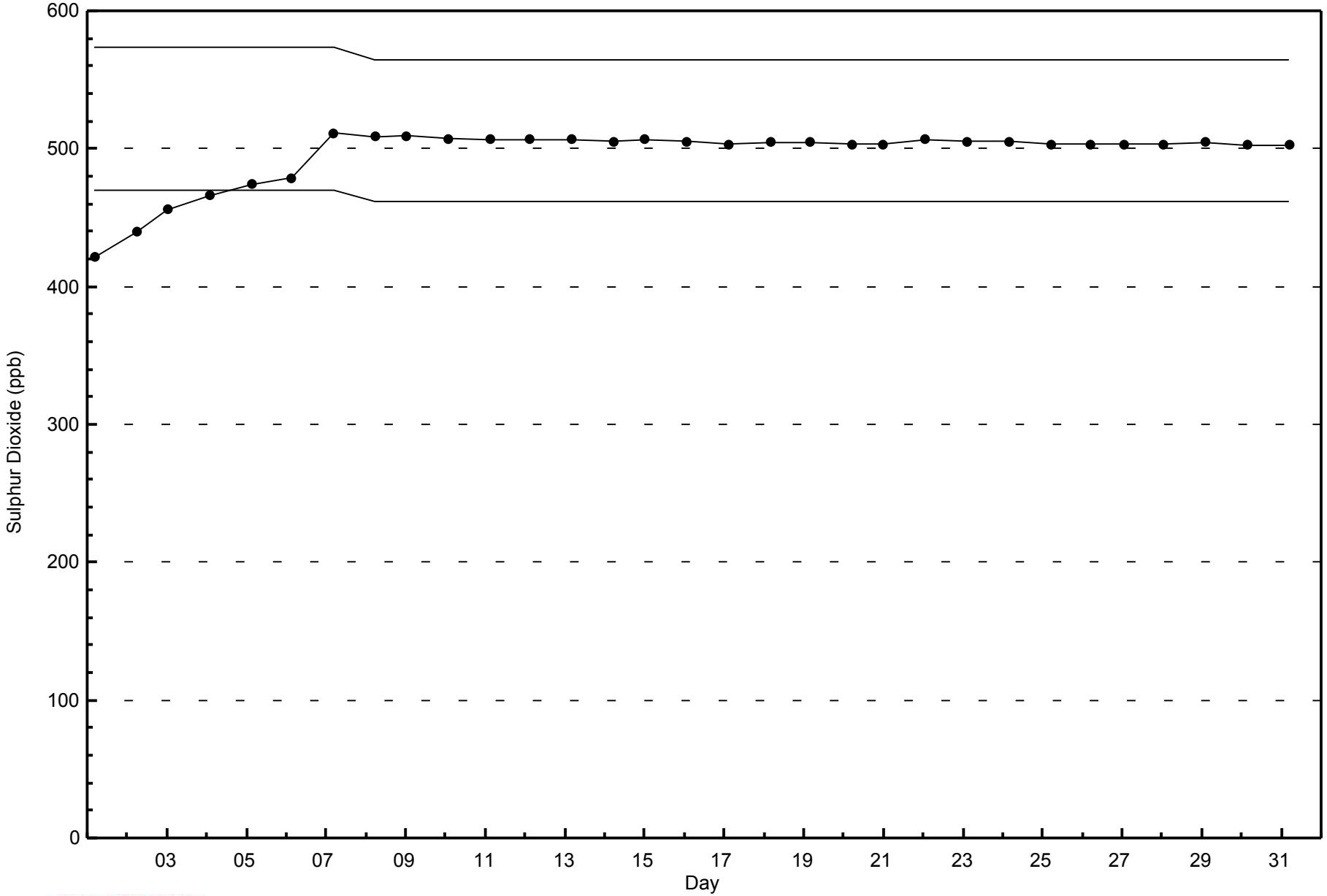
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

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

Maximum Value: 3 ppb on Aug 1 01:00 Maximum Daily Average: 1.0 ppb on Aug 20

Minimum Value: 0 ppb on Aug 8 05:00 Minimum Daily Average: 0.2 ppb on Aug 7

Maximum Diurnal Average: 0.6 ppb at hour 7 Minimum Diurnal Average: 0.4 ppb at hour 21

Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 1$

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

Z - zerospan C - Calibration

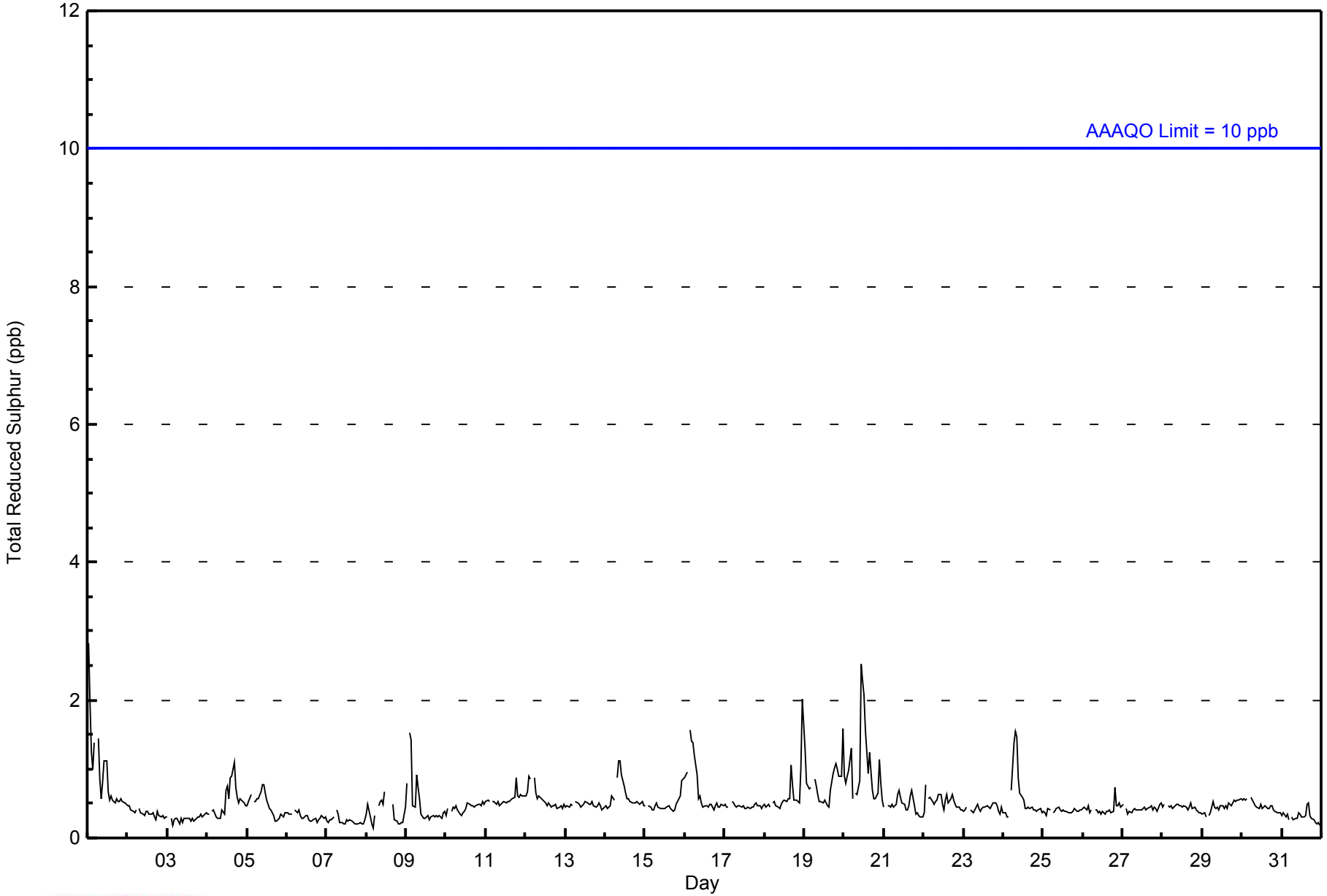
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	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: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - August 2014

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	25	8	5	15	55	33	33	69	75	65	52	50	57	56	69	707
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	25	8	5	15	55	33	33	69	75	65	52	50	57	56	71	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

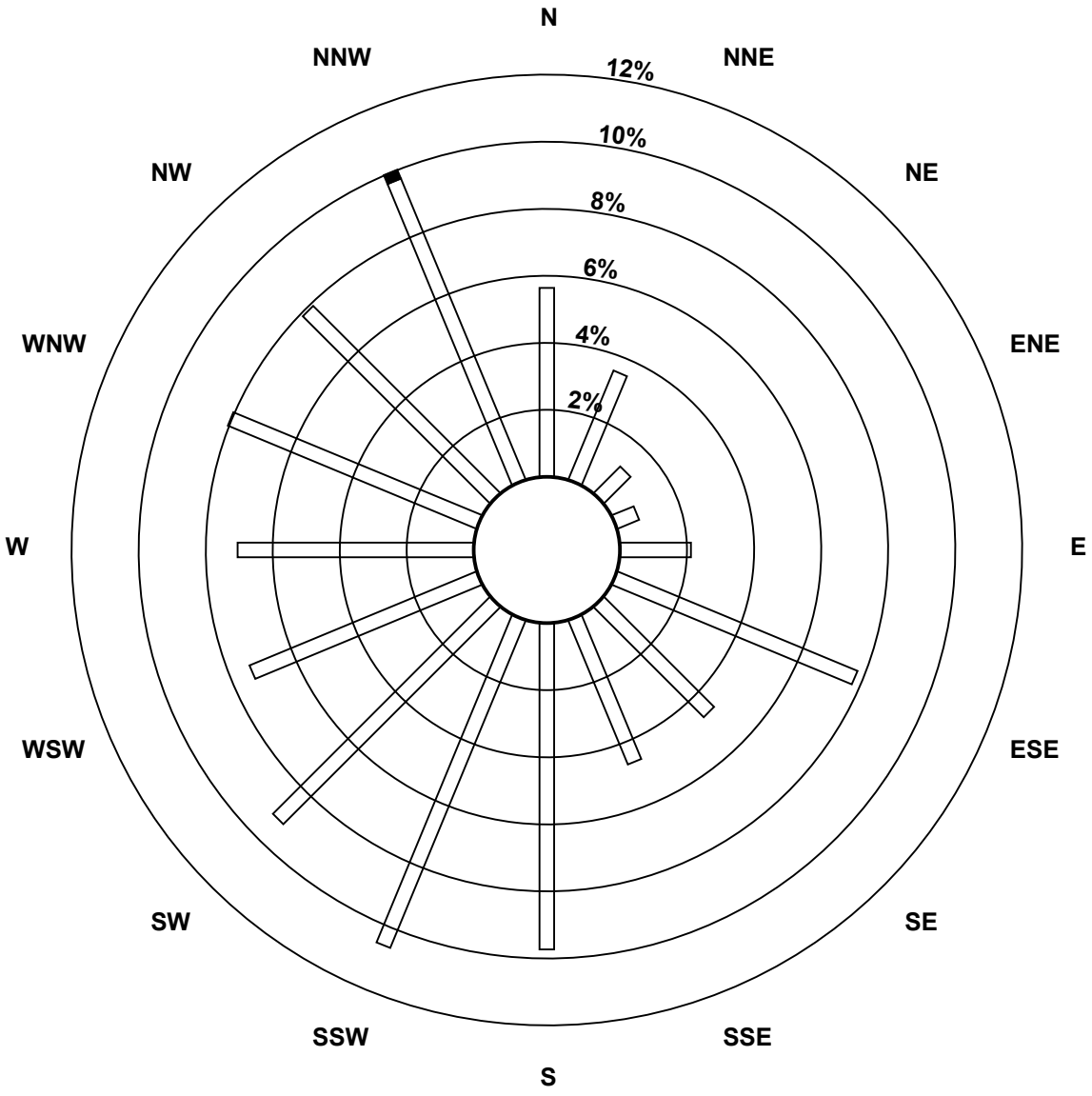
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

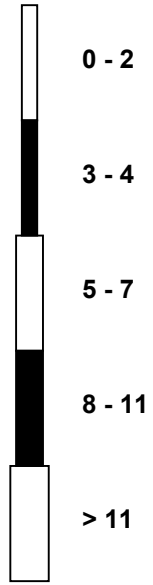
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



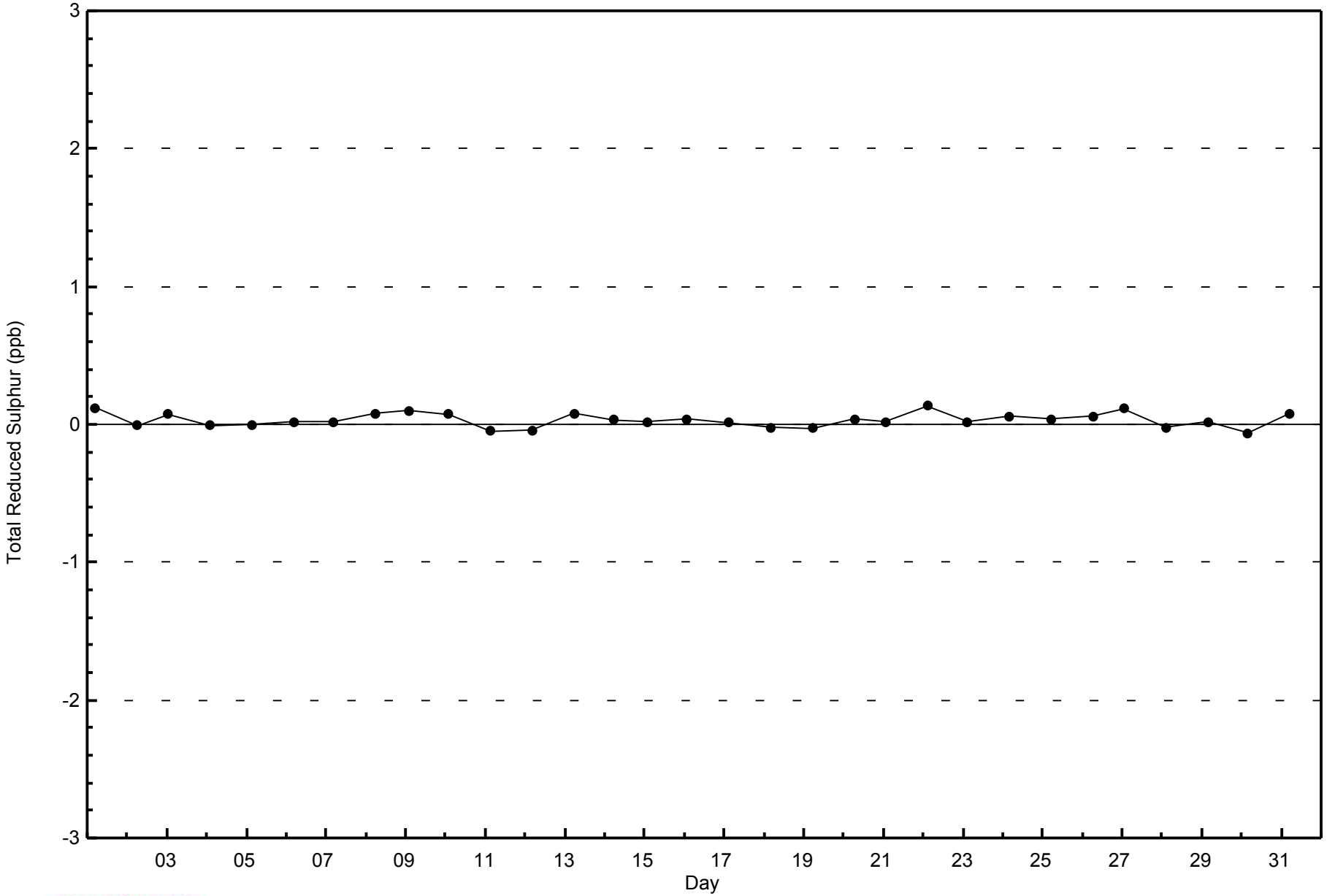
Total Number of Valid Hours: 709

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - August 2014



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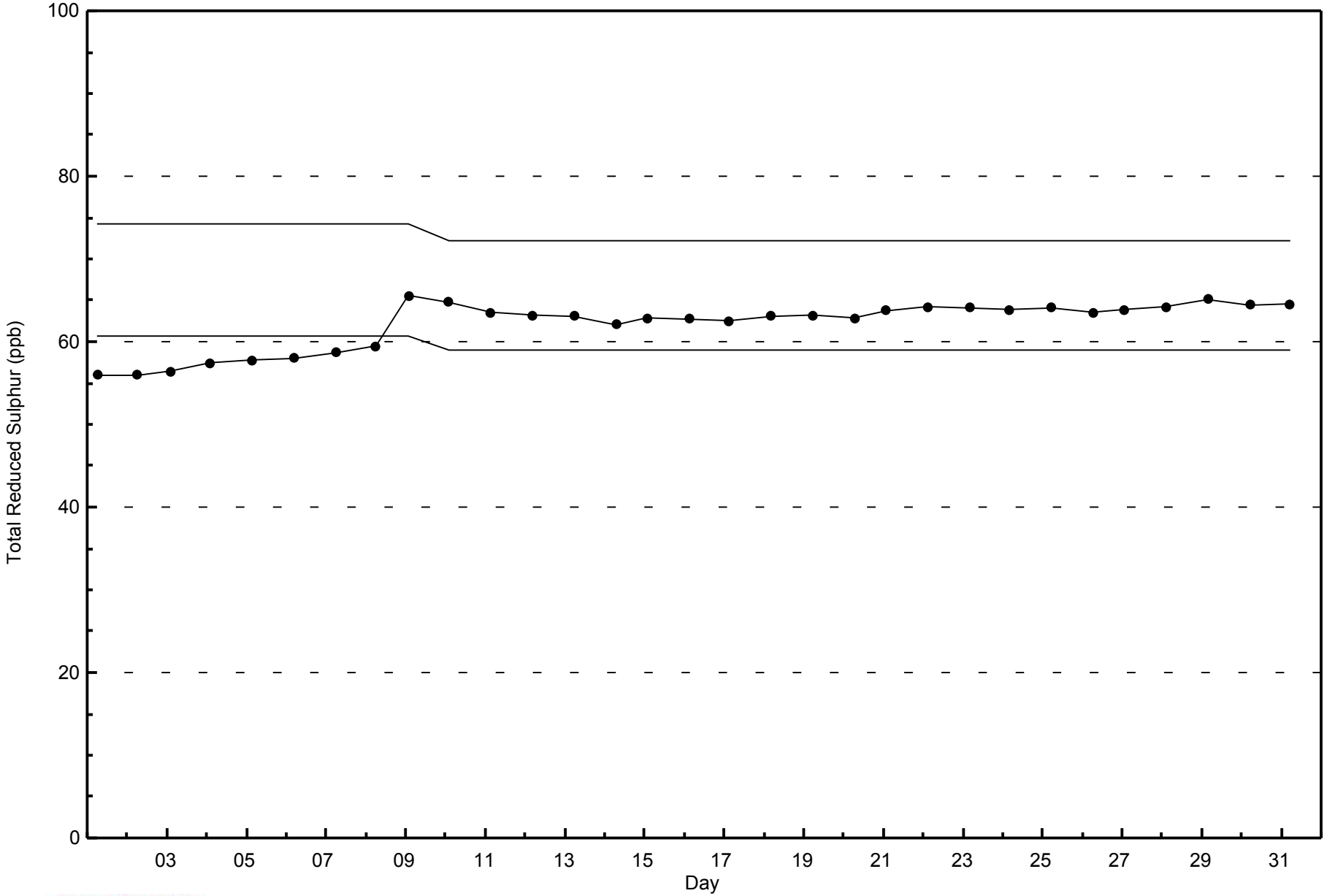
WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - August 2014



AURORA
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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - August 2014

Maximum Value: 2.9 ppm on Aug 16 04:00

Maximum Daily Average: 2.2 ppm on Aug 16

Minimum Value: 1.9 ppm on Aug 11 15:00

Minimum Daily Average: 1.9 ppm on Aug 27

Maximum Diurnal Average: 2.1 ppm at hour 5

Minimum Diurnal Average: 1.9 ppm at hour 16

Monthly Average: 2.01 ppm

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

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	38
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-Aug	2.1	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.2
2-Aug	2.2	2.2	2.2	2.1	2.2	Z	2.2	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2
3-Aug	Z	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.2
4-Aug	2.0	Z	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.3	2.3	2.1	2.3
5-Aug	2.3	2.3	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.4
6-Aug	2.0	2.1	2.0	Z	2.1	2.1	2.1	2.1	C	C	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	--	2.1
7-Aug	1.9	1.9	1.9	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0
8-Aug	2.1	2.2	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	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.2
9-Aug	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1
10-Aug	1.9	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.1
11-Aug	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.1	2.1	2.0	2.2
12-Aug	2.1	2.2	2.3	Z	2.4	2.3	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	2.0	2.4
13-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
14-Aug	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.1	2.2	2.0	2.2
15-Aug	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2	2.1	2.0	2.2
16-Aug	2.3	Z	2.2	2.9	2.6	2.7	2.5	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.9
17-Aug	2.1	2.1	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.1
18-Aug	2.0	2.1	2.2	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.2	2.1	2.2
19-Aug	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.2
20-Aug	2.0	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
21-Aug	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.1
22-Aug	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2
23-Aug	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	M	M	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
24-Aug	2.0	2.1	2.1	Z	2.1	2.1	2.3	2.5	2.3	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.5
25-Aug	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
26-Aug	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	2.1
27-Aug	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0
28-Aug	1.9	Z	1.9	2.0	2.0	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
29-Aug	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.0	2.1
30-Aug	2.1	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1
31-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.3	2.3	2.3	2.9	2.6	2.7	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	Diurnal Maximum	

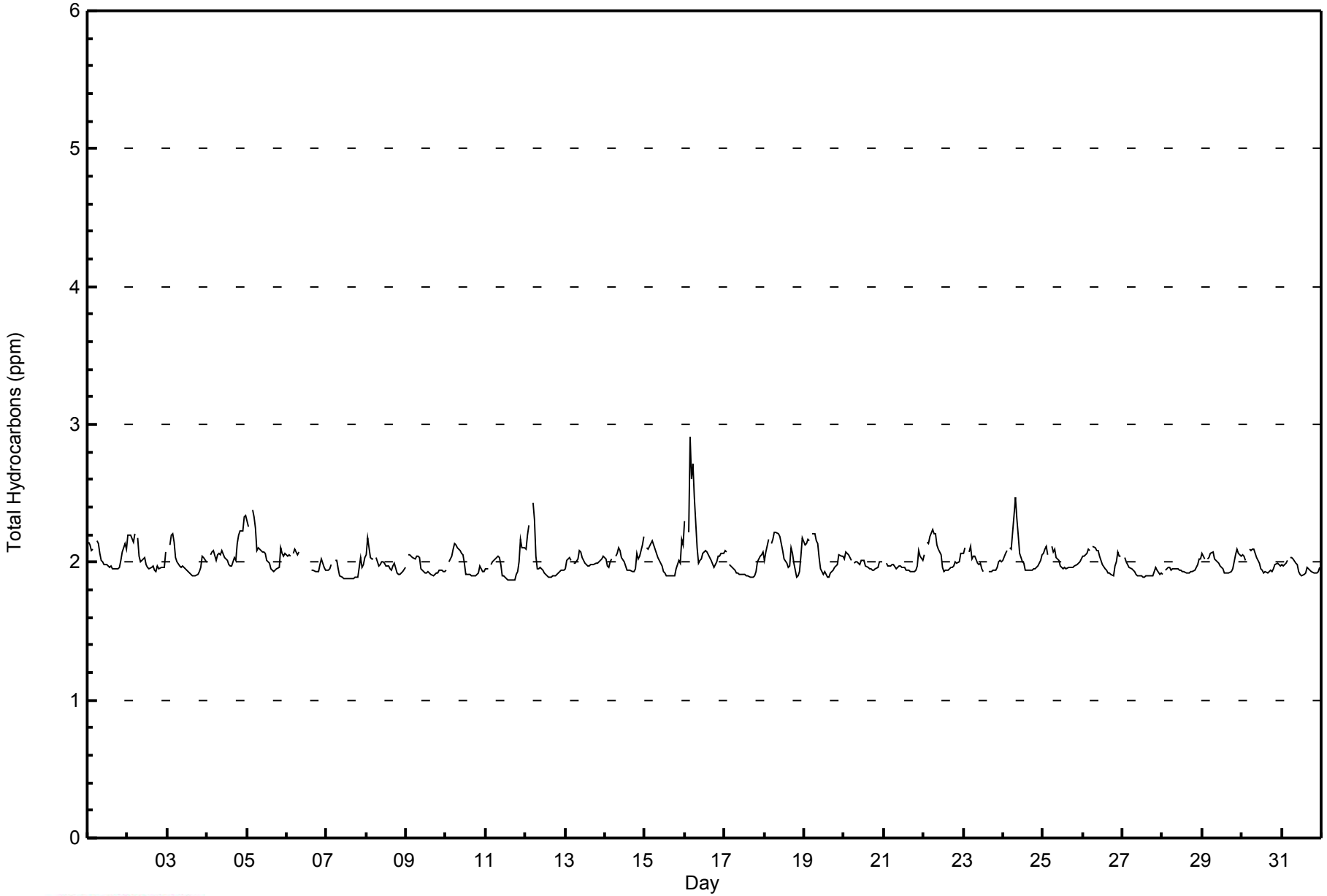
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	519	73.72	73.72
2.1 - 3.0	185	26.28	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Patricia McInnes - August 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2.0	33	23	8	2	12	50	18	21	30	52	46	45	43	46	40	50	519
2.1 - 3.0	9	3	3	2	3	4	12	14	34	25	14	7	7	9	17	22	185
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	42	26	11	4	15	54	30	35	64	77	60	52	50	55	57	72	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

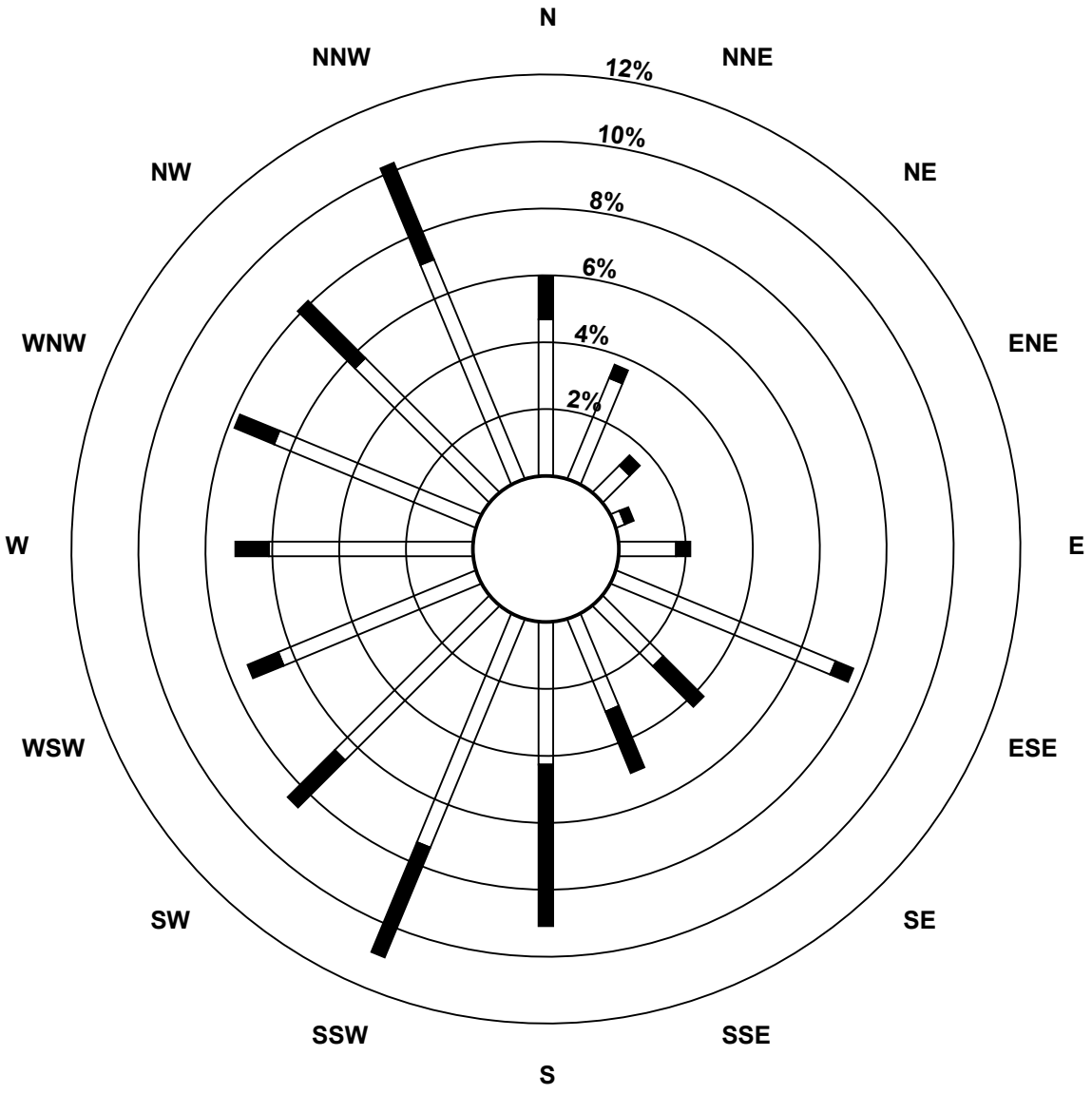
AURORA ATMOSPHERICS INC.

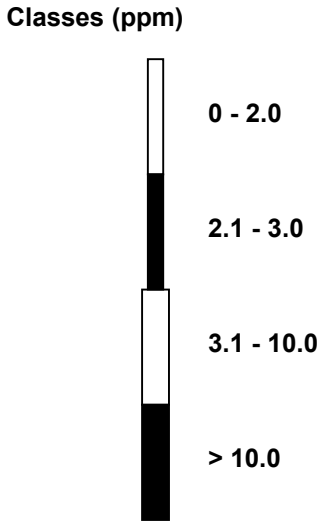
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Patricia McInnes (AMS 6)





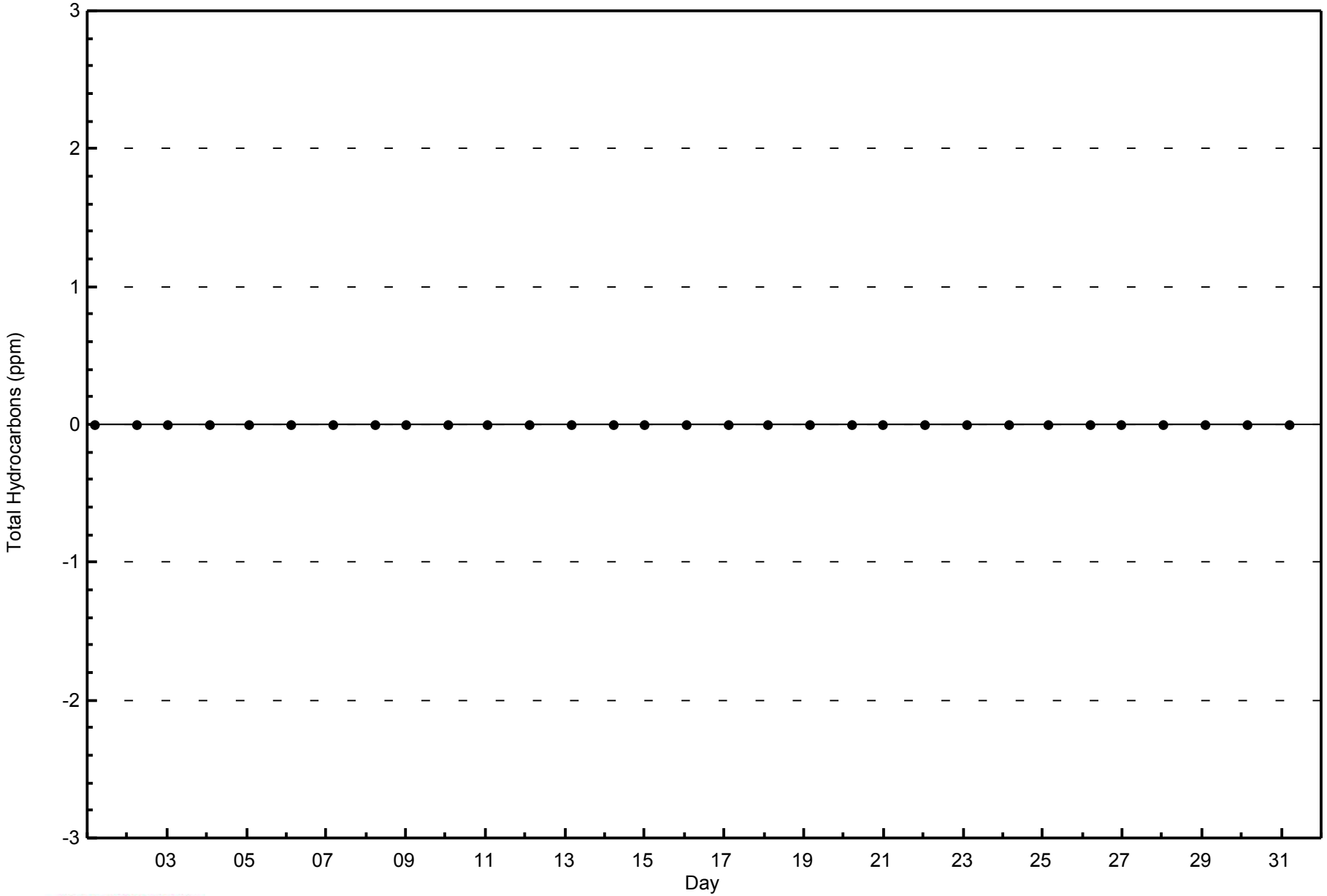
Total Number of Valid Hours: 704

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - August 2014



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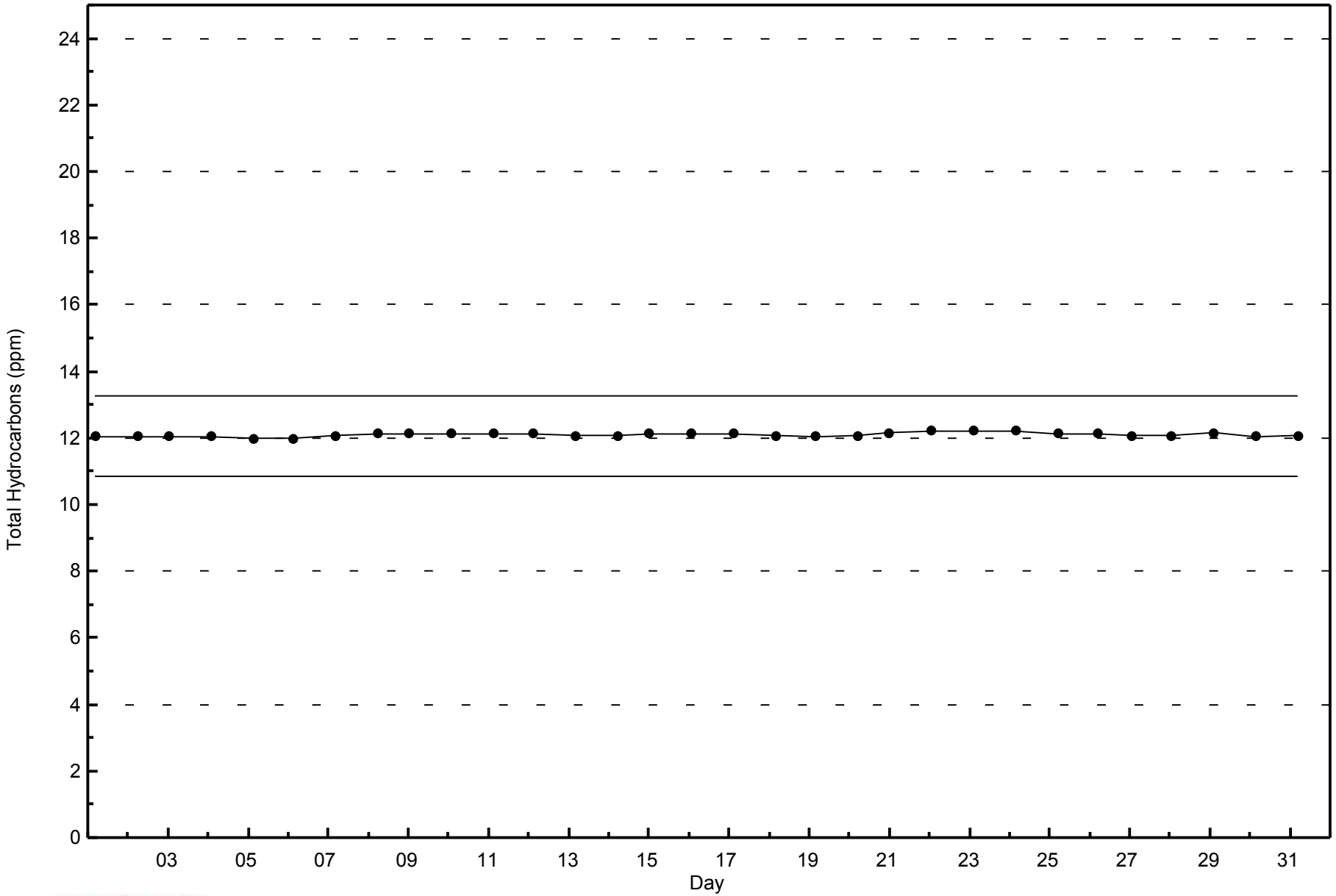
WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 0.270 ppm on Aug 16 04:00

Maximum Daily Average: 0.013 ppm on Aug 16

Minimum Value: 0.000 ppm on Aug 1 01:00

Minimum Daily Average: 0.000 ppm on Aug 9

Maximum Diurnal Average: 0.011 ppm at hour 4

Minimum Diurnal Average: 0.000 ppm at hour 9

Monthly Average: 0.001 ppm

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

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	38
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-Aug	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
2-Aug	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	0.004	0.000	0.004
3-Aug	Z	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.003	0.000	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.005	0.000	0.005	0.001	0.006
4-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.007	0.005	0.000	0.001	0.015
5-Aug	0.000	0.000	Z	0.003	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.007	0.000	0.001	0.002	0.000	0.000	0.000	0.015	0.018	0.003	0.000	0.003	0.018
6-Aug	0.000	0.000	0.000	Z	0.000	0.003	0.000	0.000	C	C	C	C	C	C	C	0.000	0.003	0.000	0.000	0.000	0.005	0.000	0.000	0.000	--	0.005
7-Aug	0.000	0.000	0.000	0.003	Z	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.001	0.007
8-Aug	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
9-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
11-Aug	0.000	0.000	Z	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.001	0.009
12-Aug	0.000	0.000	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
13-Aug	0.000	0.005	0.000	0.000	Z	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	0.005	0.000	0.001	0.005
14-Aug	0.000	0.000	0.000	0.000	0.000	Z	0.003	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.008	0.000	0.008	0.000	0.001	0.008
15-Aug	Z	0.003	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.003	0.000	0.004	0.000	0.000	0.002	0.000	0.001	0.004
16-Aug	0.003	Z	0.000	0.270	0.000	0.007	0.003	0.002	0.000	0.004	0.000	0.000	0.000	0.000	0.005	0.000	0.004	0.000	0.000	0.006	0.000	0.000	0.002	0.000	0.013	0.270
17-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.001	0.027
18-Aug	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
19-Aug	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	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
20-Aug	0.000	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	0.000	0.000	0.000	0.000	0.000	0.000	0.002
21-Aug	Z	0.001	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	0.001	0.003	0.000	0.000	0.002	0.003	0.002	0.000	0.000	0.001	0.003
22-Aug	0.000	Z	0.000	0.000	0.000	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	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.003
23-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Aug	0.000	0.000	0.002	Z	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	0.003	0.000	0.003
25-Aug	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002
26-Aug	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.006
27-Aug	Z	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.005
28-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.003
29-Aug	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	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.004
30-Aug	0.000	0.000	0.000	Z	0.003	0.000	0.000	0.000	0.000	0.001	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
31-Aug	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.001	0.000	0.011	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.001	0.002	0.001	0.001	Diurnal Average	
	0.003	0.005	0.002	0.270	0.006	0.007	0.003	0.004	0.003	0.004	0.003	0.003	0.004	0.015	0.005	0.003	0.004	0.003	0.006	0.006	0.015	0.018	0.008	0.027	Diurnal Maximum	

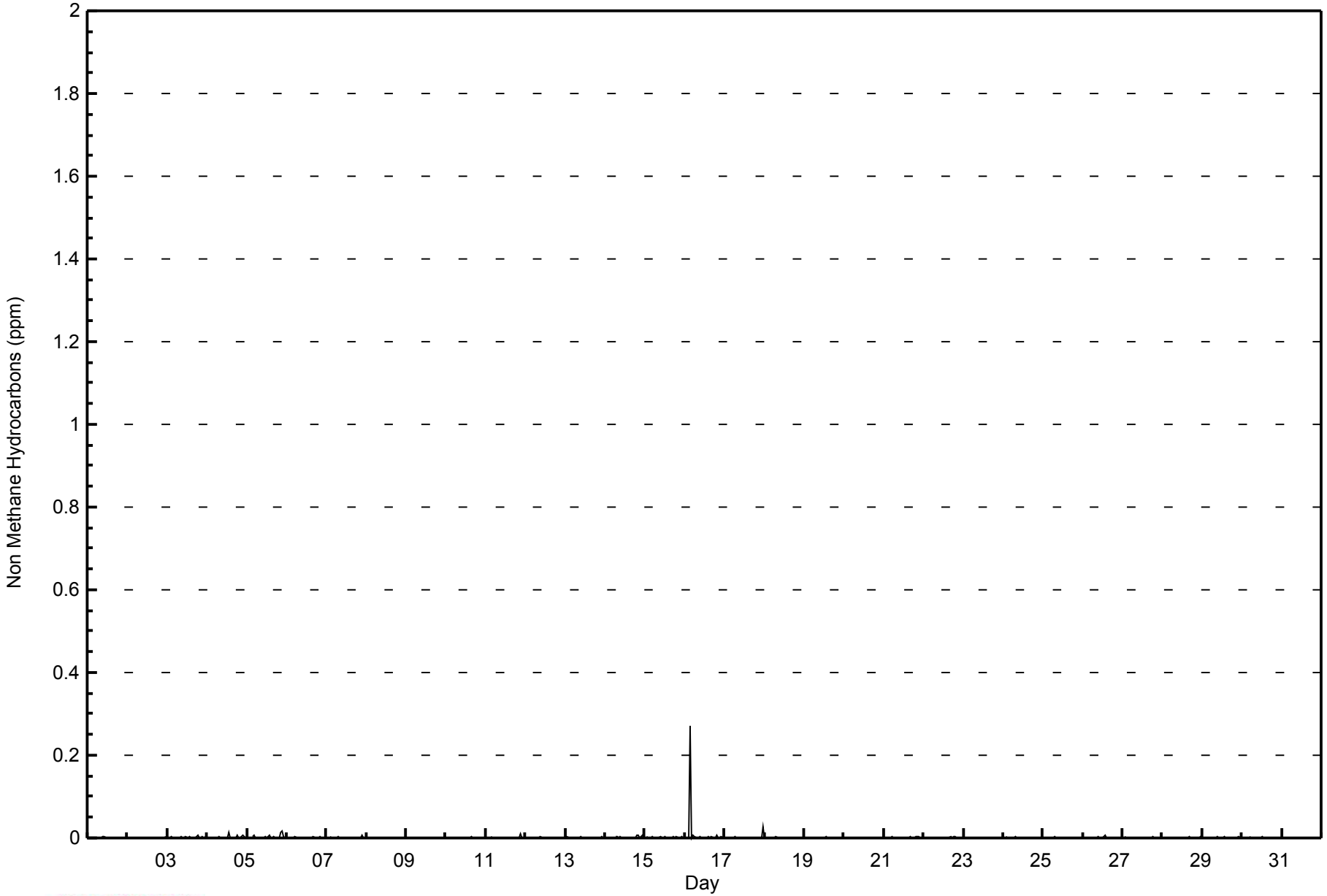
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	686	97.44	97.44
0.006 - 0.05	17	2.41	99.86
0.06 - 0.1	0	0.00	99.86
> 0.1	1	0.14	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - August 2014

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	42	25	11	3	15	53	30	35	59	75	59	50	49	55	56	69	686
0.006 - 0.05	0	1	0	1	0	1	0	0	5	2	1	2	1	0	1	2	17
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Totals	42	26	11	4	15	54	30	35	64	77	60	52	50	55	57	72	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

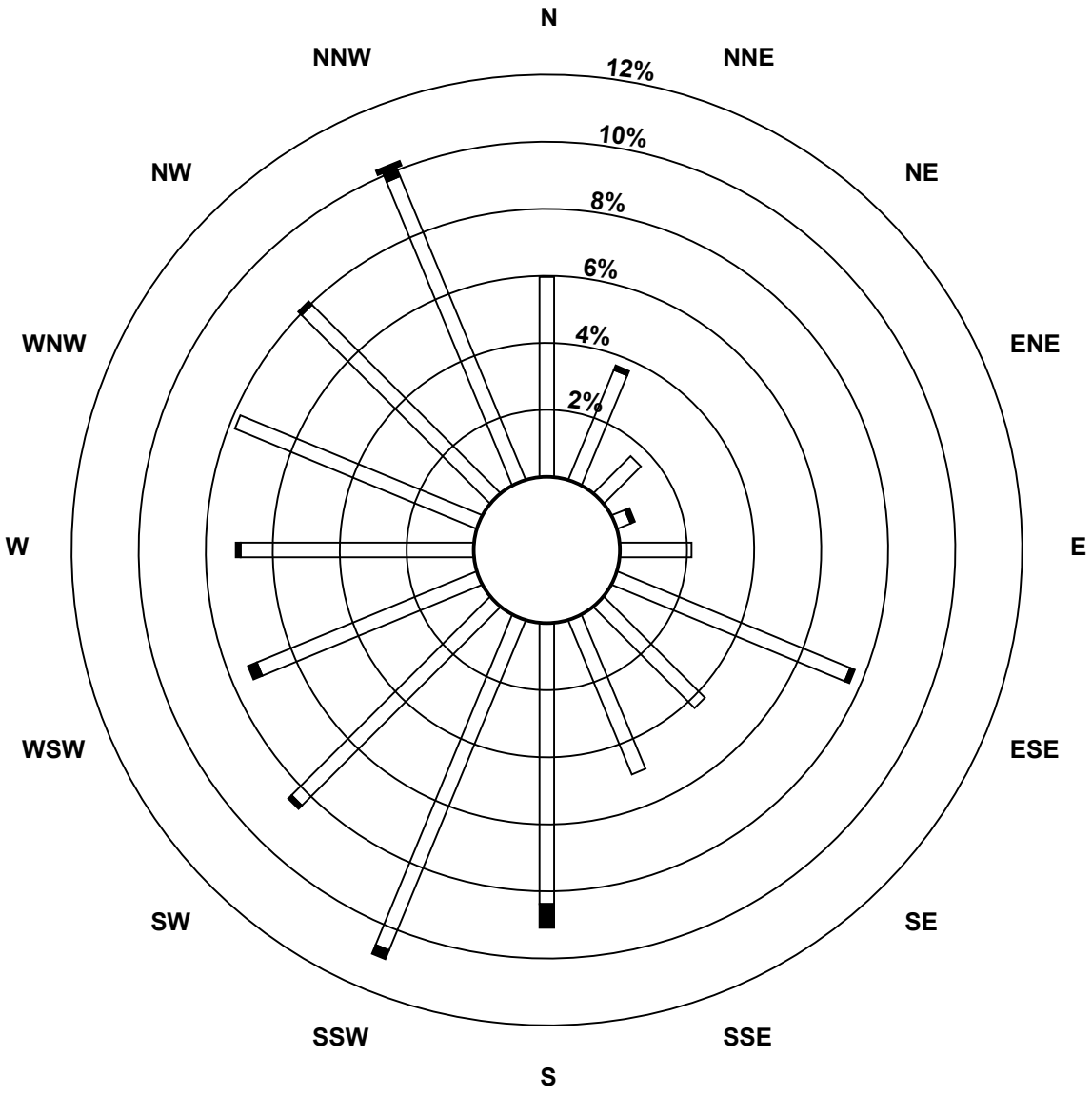
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Aug 2014

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes (AMS 6)



Classes (ppm)

0 - 0.005

0.006 - 0.05

0.06 - 0.1

> 0.1

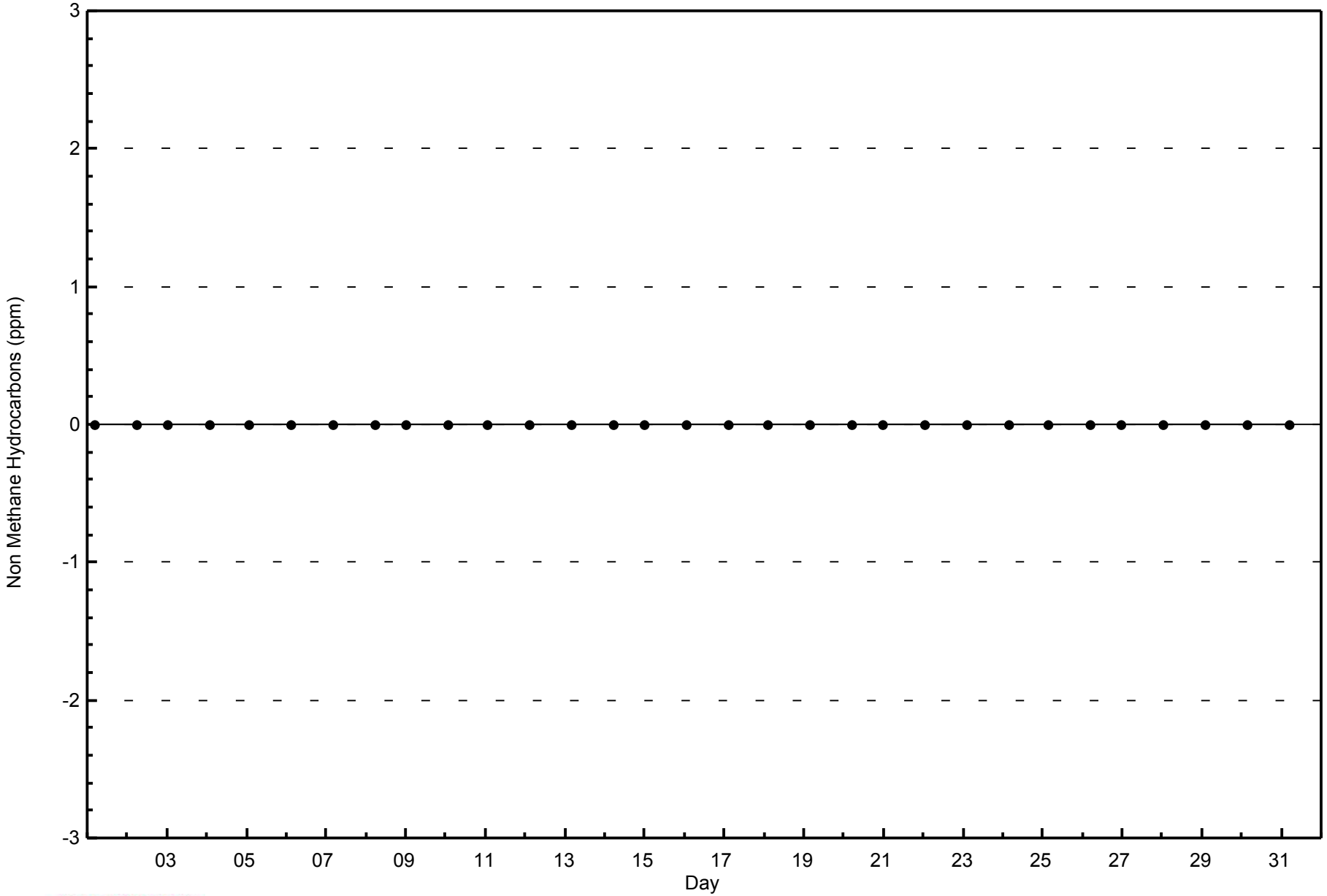
Total Number of Valid Hours: 704

WBEA NETWORK

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - August 2014



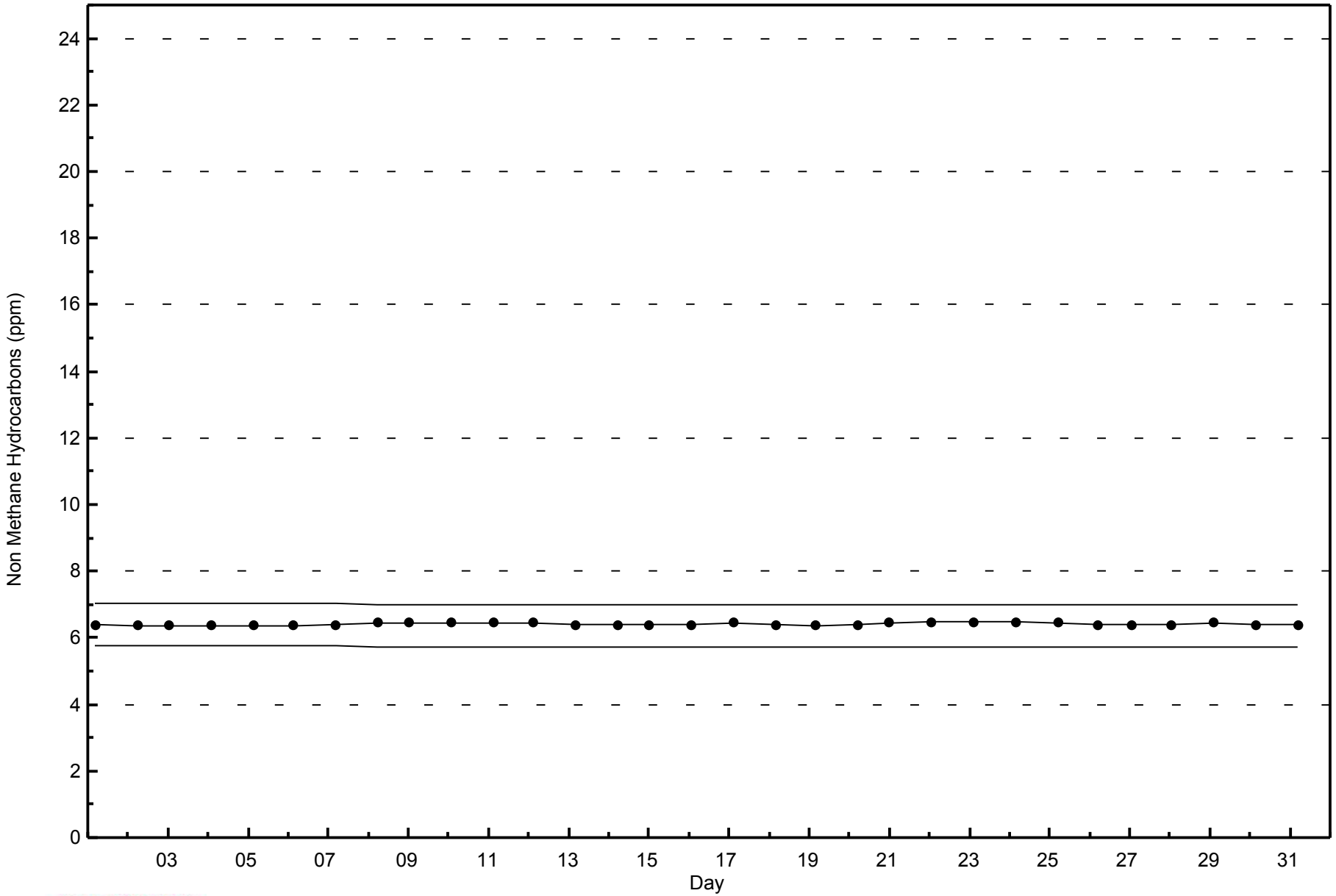
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Patricia McInnes - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.7 ppm on Aug 16 06:00 Maximum Daily Average: 2.2 ppm on Aug 16

Minimum Value: 1.9 ppm on Aug 11 15:00 Minimum Daily Average: 1.9 ppm on Aug 27
Maximum Diurnal Average: 2.1 ppm at hour 5 Minimum Diurnal Average: 1.9 ppm at hour 16
Monthly Average: 2.01 ppm Percentiles: P_1 = 1.9 P_{10} = 1.9 Q_1 = 1.9 Median = 2.0 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	38
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-Aug	2.1	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.2
2-Aug	2.2	2.2	2.2	2.1	2.2	Z	2.2	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2
3-Aug	Z	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.2
4-Aug	2.0	Z	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.3	2.3	2.1	2.3
5-Aug	2.3	2.3	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.4
6-Aug	2.0	2.1	2.0	Z	2.1	2.1	2.1	2.1	C	C	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	--	2.1
7-Aug	1.9	1.9	1.9	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0
8-Aug	2.1	2.2	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	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.2
9-Aug	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1
10-Aug	1.9	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.1
11-Aug	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.1	2.1	2.0	2.2
12-Aug	2.1	2.2	2.3	Z	2.4	2.3	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	2.0	2.4
13-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
14-Aug	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.1	2.2	2.0	2.2
15-Aug	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2	2.1	2.0	2.2
16-Aug	2.3	Z	2.2	2.6	2.6	2.7	2.5	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.7
17-Aug	2.1	2.1	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.1
18-Aug	2.0	2.1	2.2	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.2	2.1	2.2
19-Aug	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.2
20-Aug	2.0	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
21-Aug	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.1
22-Aug	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2
23-Aug	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	M	M	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
24-Aug	2.0	2.1	2.1	Z	2.1	2.1	2.3	2.5	2.3	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.5
25-Aug	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
26-Aug	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	2.1
27-Aug	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0
28-Aug	1.9	Z	1.9	2.0	2.0	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
29-Aug	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.0	2.1
30-Aug	2.1	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1
31-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.3	2.3	2.3	2.6	2.6	2.7	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	Diurnal Maximum	

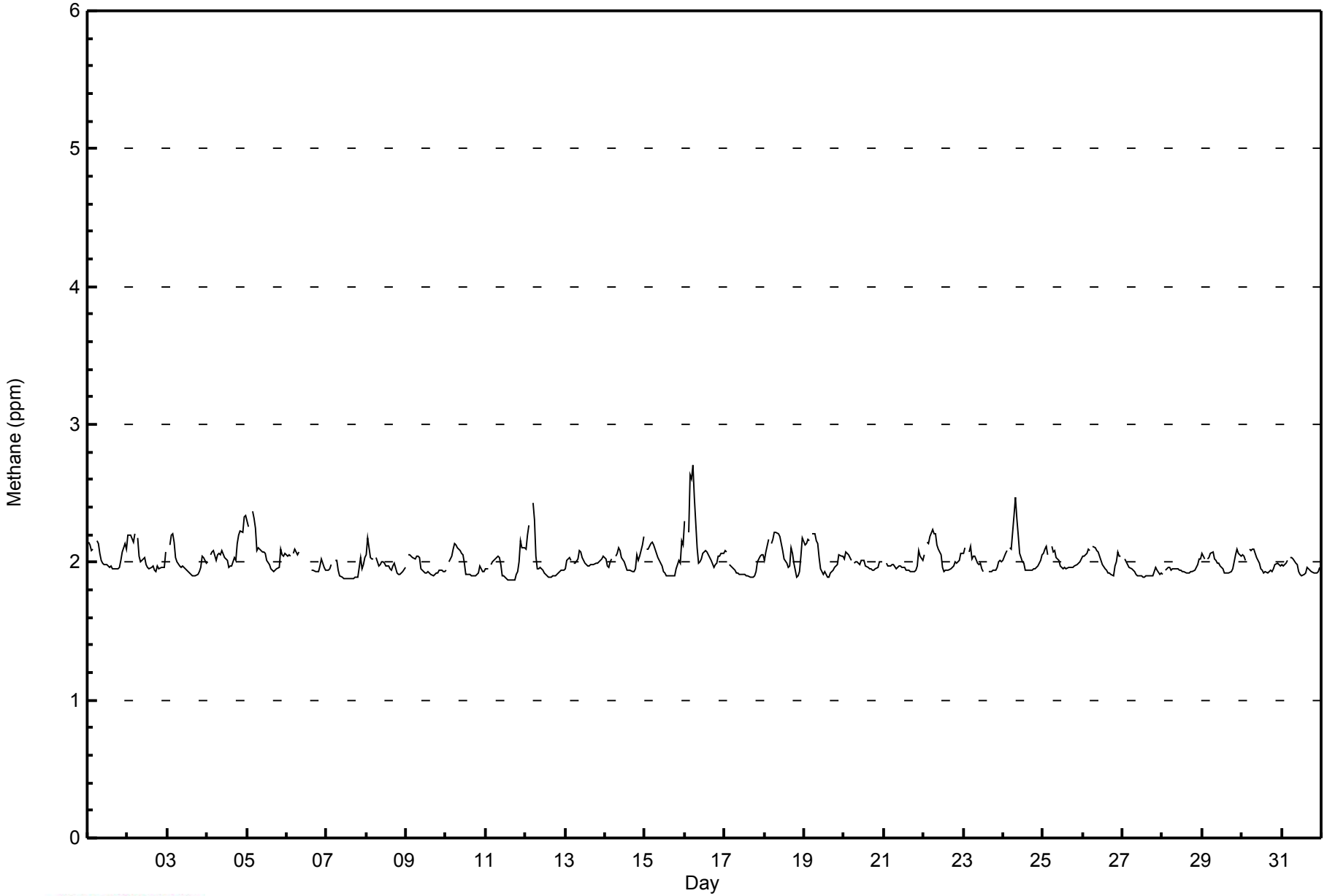
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Methane (CH_4) - ppm

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	520	73.86	73.86
2.1 - 3.0	184	26.14	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2.0	33	23	8	2	12	50	19	21	30	52	46	45	43	46	40	50	520
2.1 - 3.0	9	3	3	2	3	4	11	14	34	25	14	7	7	9	17	22	184
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	42	26	11	4	15	54	30	35	64	77	60	52	50	55	57	72	704

Total Number of Valid Hours: 704

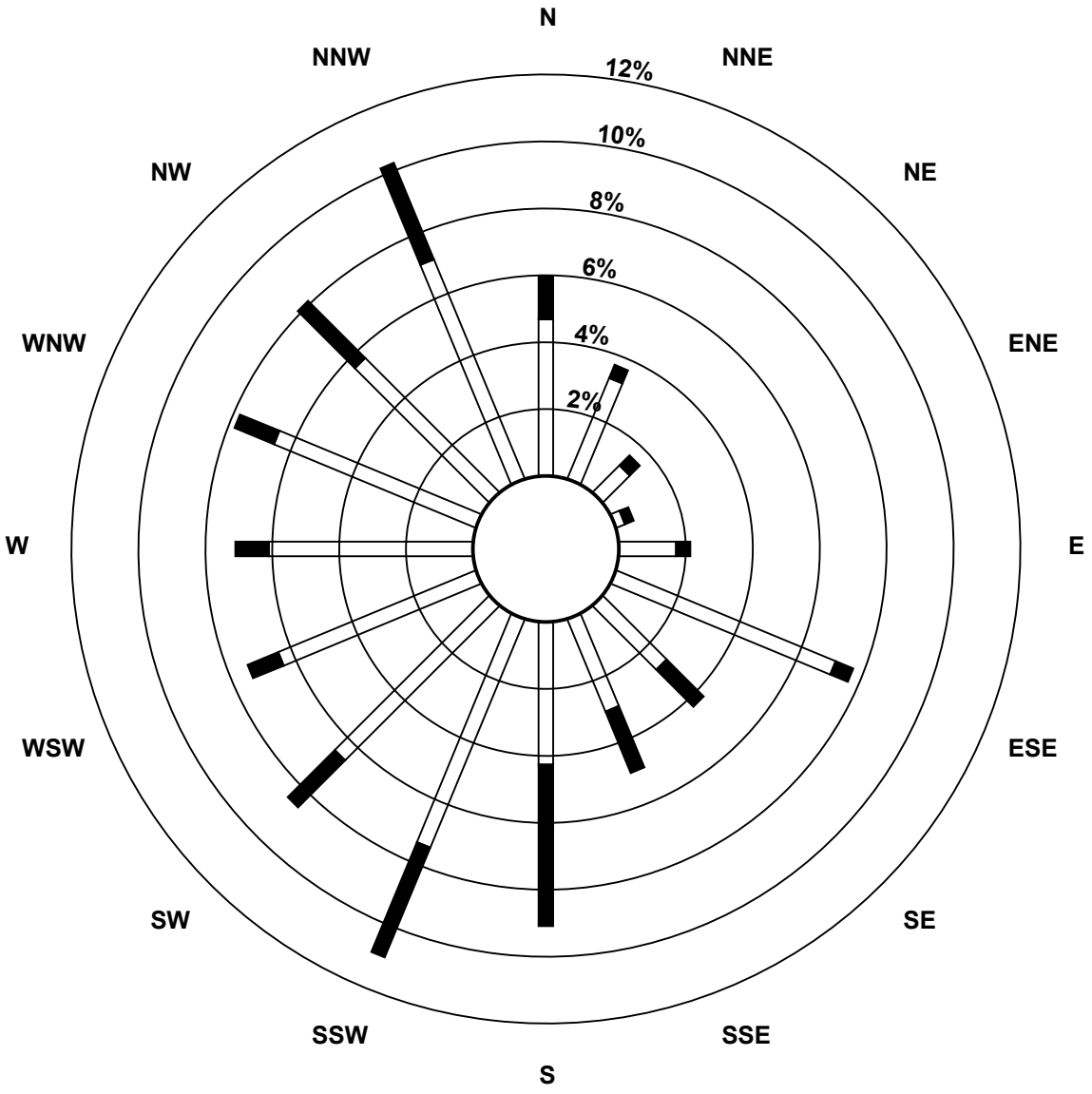
Total Number of Hours: 744

Wood Buffalo Environmental Association

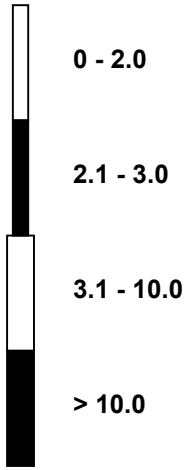
Wind Rose Aug 2014

Methane (CH_4) - ppm

Patricia McInnes (AMS 6)



Classes (ppm)



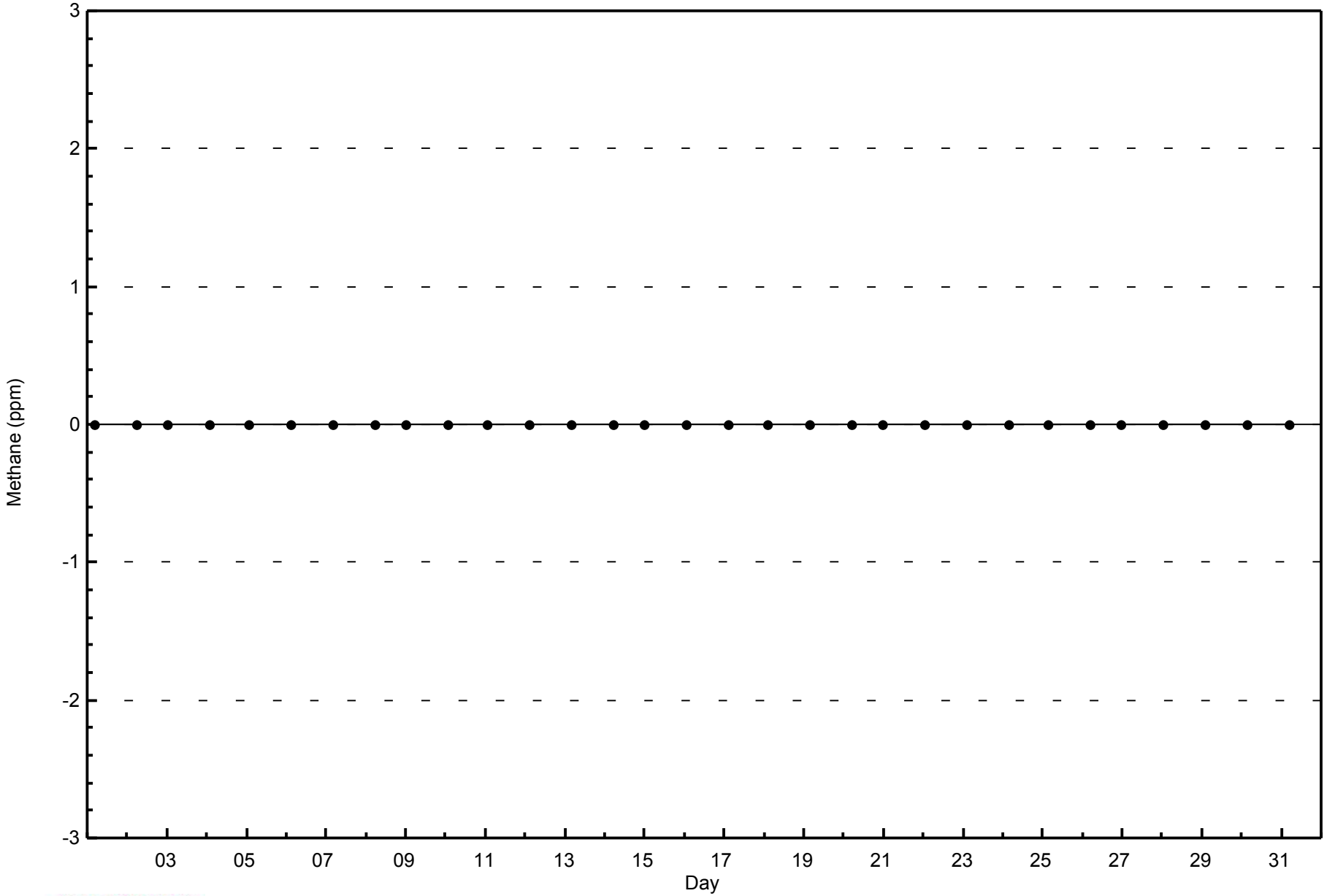
Total Number of Valid Hours: 704

WBEA NETWORK

Zero Responses

Methane (CH_4) - ppm

Patricia McInnes - August 2014



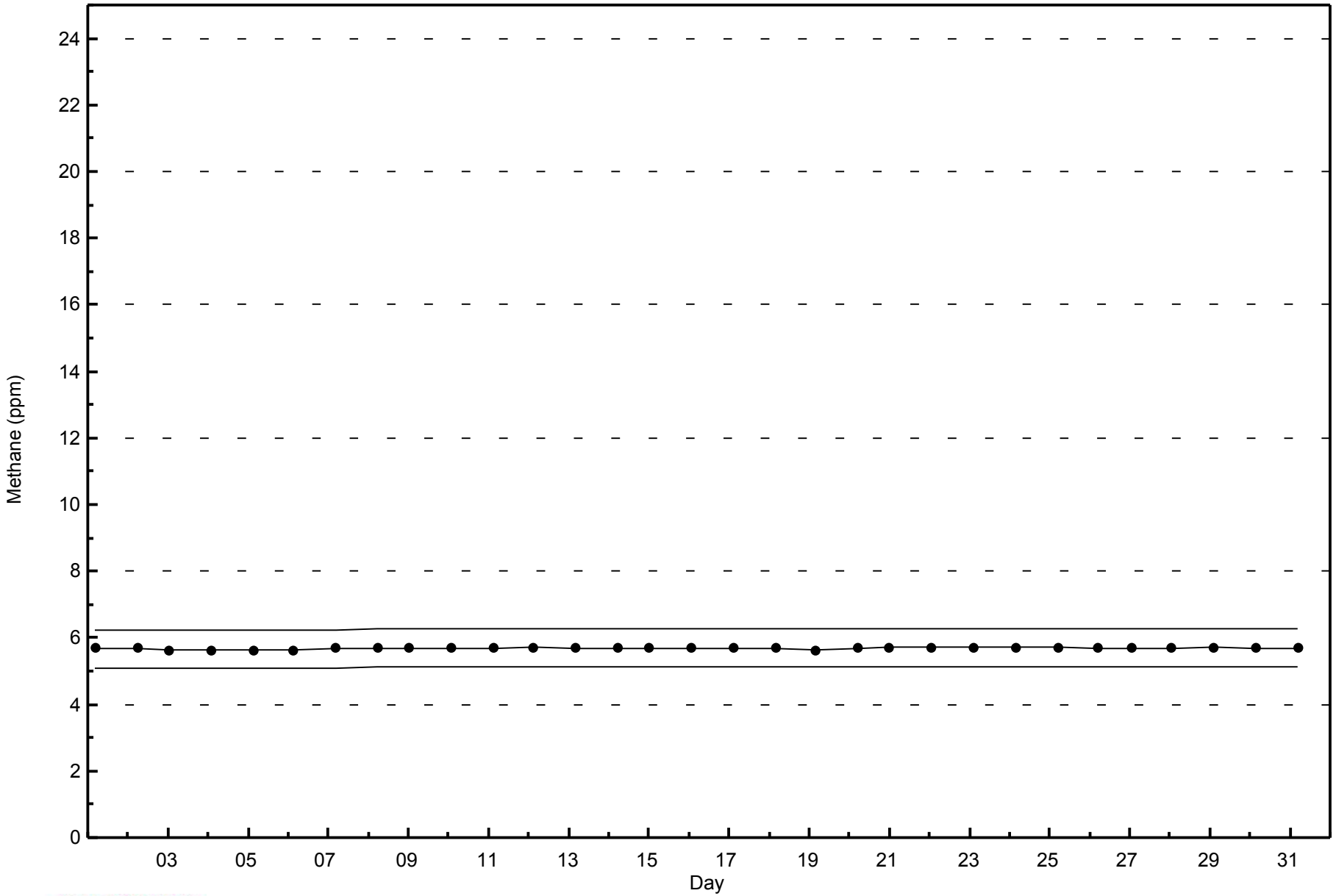
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Methane (CH_4) - ppm

Patricia McInnes - August 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Patricia McInnes - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 75 ppb on Aug 4 17:00 Maximum Daily Average: 34.6 ppb on Aug 14

Minimum Value: 2 ppb on Aug 12 05:00 Minimum Daily Average: 12.9 ppb on Aug 20
Maximum Diurnal Average: 35.9 ppb at hour 15 Minimum Diurnal Average: 10.6 ppb at hour 6
Monthly Average: 23.0 ppb Percentiles: $P_1 = 3$ $P_{10} = 9$ $Q_1 = 14$ Median = 21 $Q_3 = 30$ $P_{90} = 38$ $P_{99} = 62$

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-Aug	8	8	13	14	12	10	Z	16	20	24	27	32	36	37	39	37	36	37	35	32	22	17	16	14	23.6	39
2-Aug	11	11	9	8	7	8	9	Z	17	19	26	32	34	36	35	37	46	52	43	39	37	36	32	21	26.3	52
3-Aug	14	13	Z	11	16	17	16	22	28	29	32	37	38	39	45	42	42	40	37	31	24	18	18	19	27.3	45
4-Aug	17	14	12	Z	9	10	15	16	15	26	40	59	67	61	64	63	75	66	45	31	25	18	16	15	33.9	75
5-Aug	17	17	14	12	Z	9	19	25	30	35	40	43	54	52	55	55	45	37	38	38	23	23	33	32	32.4	55
6-Aug	30	32	31	27	22	Z	25	27	33	38	46	51	48	45	43	44	40	36	35	32	21	24	25	27	34.0	51
7-Aug	27	27	26	20	21	21	Z	25	27	28	27	28	29	30	30	30	29	29	28	27	24	23	21	21	26.0	30
8-Aug	18	13	15	13	12	10	12	Z	23	25	C	C	C	44	45	40	36	26	31	26	22	21	21	14	23.4	45
9-Aug	8	7	Z	8	9	10	9	10	8	16	21	24	23	24	25	25	23	23	22	18	16	15	15	14	16.2	25
10-Aug	13	10	10	Z	3	3	7	9	11	11	13	18	26	26	26	26	28	28	24	20	14	17	19	19	16.5	28
11-Aug	18	18	18	16	Z	15	15	16	16	19	23	23	21	22	22	21	20	20	22	16	10	7	6	4	16.9	23
12-Aug	3	2	2	2	2	Z	8	16	20	23	24	24	27	24	25	25	25	24	21	17	18	19	18	16	16.6	27
13-Aug	13	8	8	10	10	10	Z	15	21	27	34	37	40	42	46	48	48	49	46	44	42	39	37	31	30.7	49
14-Aug	22	18	17	15	16	14	15	Z	30	39	50	64	62	60	63	60	56	53	38	24	25	23	18	14	34.6	64
15-Aug	15	13	Z	5	4	4	5	11	13	22	29	35	47	44	43	45	41	40	38	24	21	20	13	12	23.7	47
16-Aug	9	11	9	Z	2	2	4	11	18	21	27	29	29	26	33	38	37	43	39	29	26	27	26	26	22.6	43
17-Aug	23	23	23	21	Z	20	20	21	26	34	37	36	38	38	36	34	32	31	28	20	17	16	16	15	26.4	38
18-Aug	16	12	9	8	7	Z	10	13	15	18	22	24	26	26	26	26	24	23	23	19	14	12	13	11	17.3	26
19-Aug	10	9	7	5	4	4	Z	5	9	21	31	31	35	32	32	35	30	29	28	24	21	17	15	13	19.5	35
20-Aug	11	7	7	7	8	12	12	Z	11	13	10	11	14	15	14	17	18	16	17	18	19	15	13	13	12.9	19
21-Aug	13	14	Z	16	16	15	16	17	19	22	24	28	32	38	37	36	34	31	27	24	19	14	13	11	22.4	38
22-Aug	7	8	5	Z	4	3	3	5	10	12	18	26	34	34	36	37	31	29	24	17	13	11	9	8	16.7	37
23-Aug	9	8	7	6	Z	8	9	8	11	17	21	31	39	37	38	37	37	36	34	30	24	13	12	16	21.3	39
24-Aug	12	13	11	12	11	Z	4	5	10	14	20	24	26	27	29	29	27	28	23	18	17	18	16	12	17.6	29
25-Aug	11	8	8	10	8	7	Z	9	13	19	28	30	32	35	36	37	37	36	33	29	29	30	28	24	23.3	37
26-Aug	26	27	26	22	20	16	18	Z	22	23	26	29	32	34	35	33	30	28	28	22	19	14	15	13	24.3	35
27-Aug	12	13	Z	20	18	16	16	19	30	32	34	37	36	36	37	37	36	34	33	27	20	19	30	24	26.7	37
28-Aug	19	16	18	Z	17	16	15	15	16	16	17	18	19	23	25	26	27	27	26	15	9	8	5	6	17.3	27
29-Aug	6	7	7	4	Z	3	4	9	11	14	19	25	29	32	34	38	42	39	37	31	32	33	30	30	22.5	42
30-Aug	27	25	24	21	21	Z	16	15	17	16	24	29	29	30	29	30	29	28	25	14	13	15	15	16	22.1	30
31-Aug	14	15	16	14	13	13	Z	15	20	23	28	30	32	30	29	24	18	18	16	14	16	15	18	14	19.3	32
	14.7	13.7	13.4	12.6	11.2	10.6	12.1	14.3	18.4	22.5	27.3	31.5	34.4	34.8	35.9	35.9	34.8	33.4	30.5	24.9	21.1	19.3	18.8	16.9	Diurnal Average	
	30	32	31	27	22	21	25	27	33	39	50	64	67	61	64	63	75	66	46	44	42	39	37	32	Diurnal Maximum	

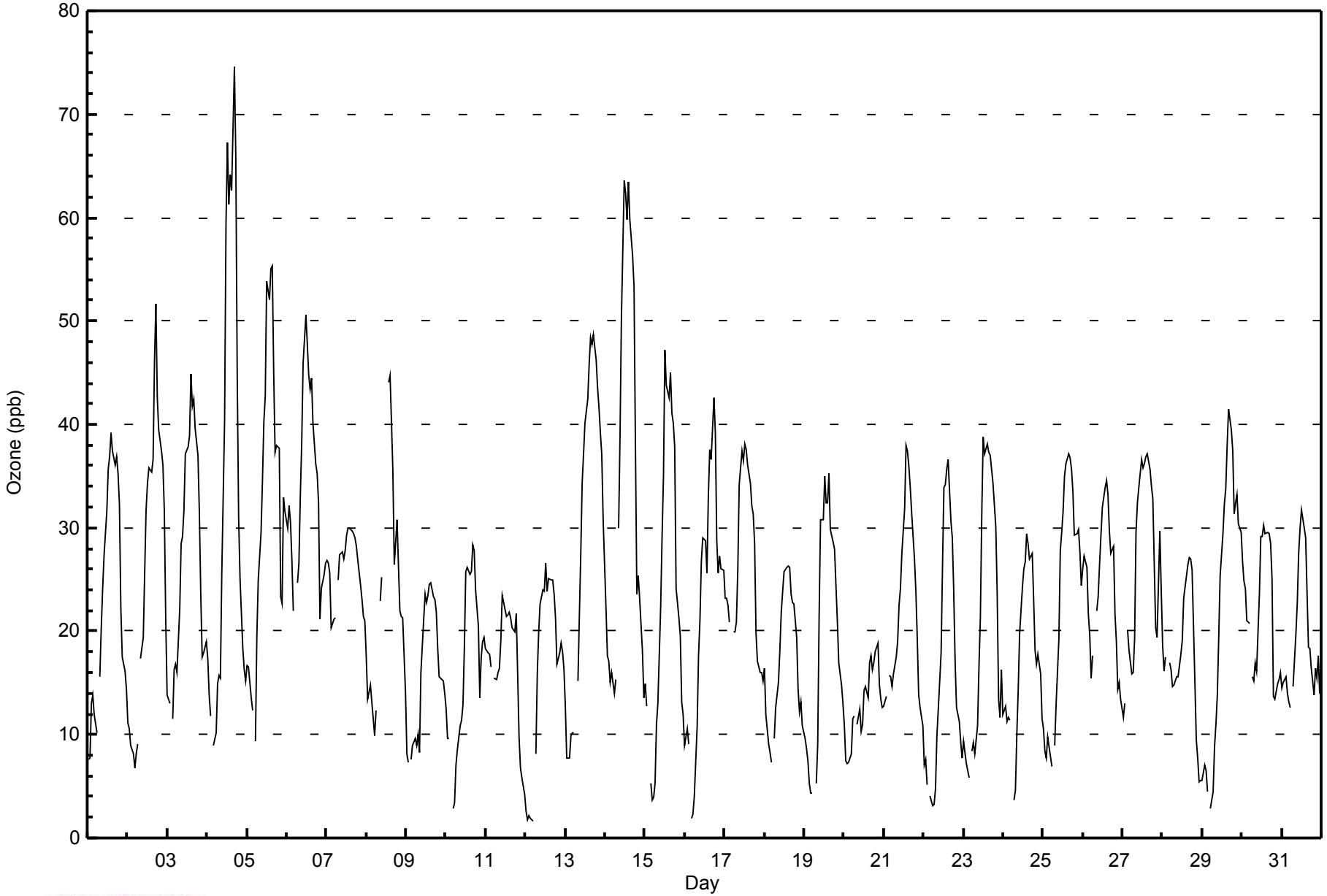
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	334	47.04	47.04
21 - 50	356	50.14	97.18
51 - 82	20	2.82	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Ozone (O_3) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	24	5	4	2	2	15	21	12	29	40	40	21	18	40	30	31	334
21 - 50	13	15	4	3	13	33	11	23	37	36	26	28	32	18	28	36	356
51 - 82	5	4	1	0	0	5	0	0	1	1	0	1	0	0	0	2	20
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	24	9	5	15	53	32	35	67	77	66	50	50	58	58	69	710

Total Number of Valid Hours: 710

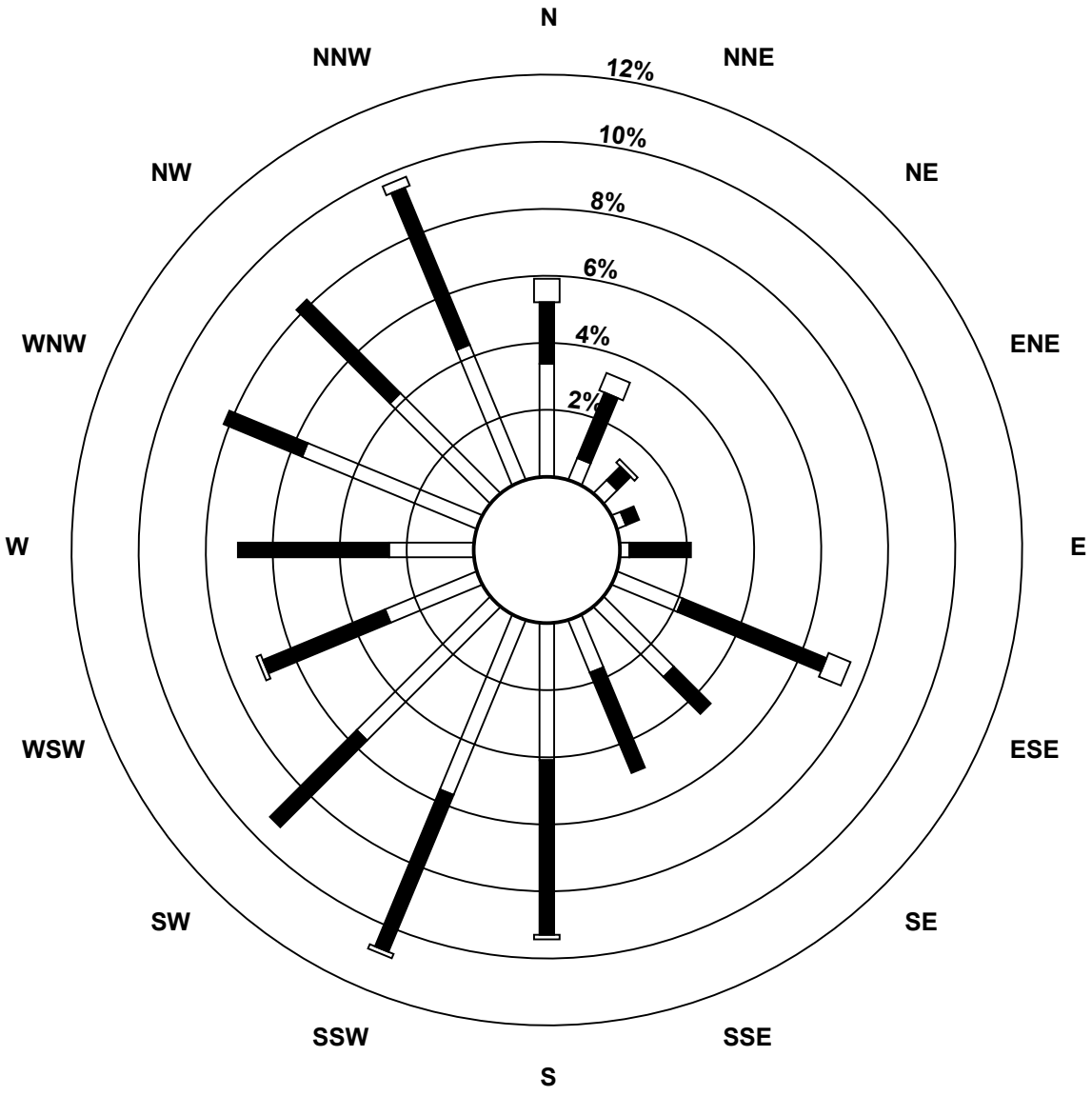
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Aug 2014

Ozone (O_3) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)

0 - 20

21 - 50

51 - 82

> 83

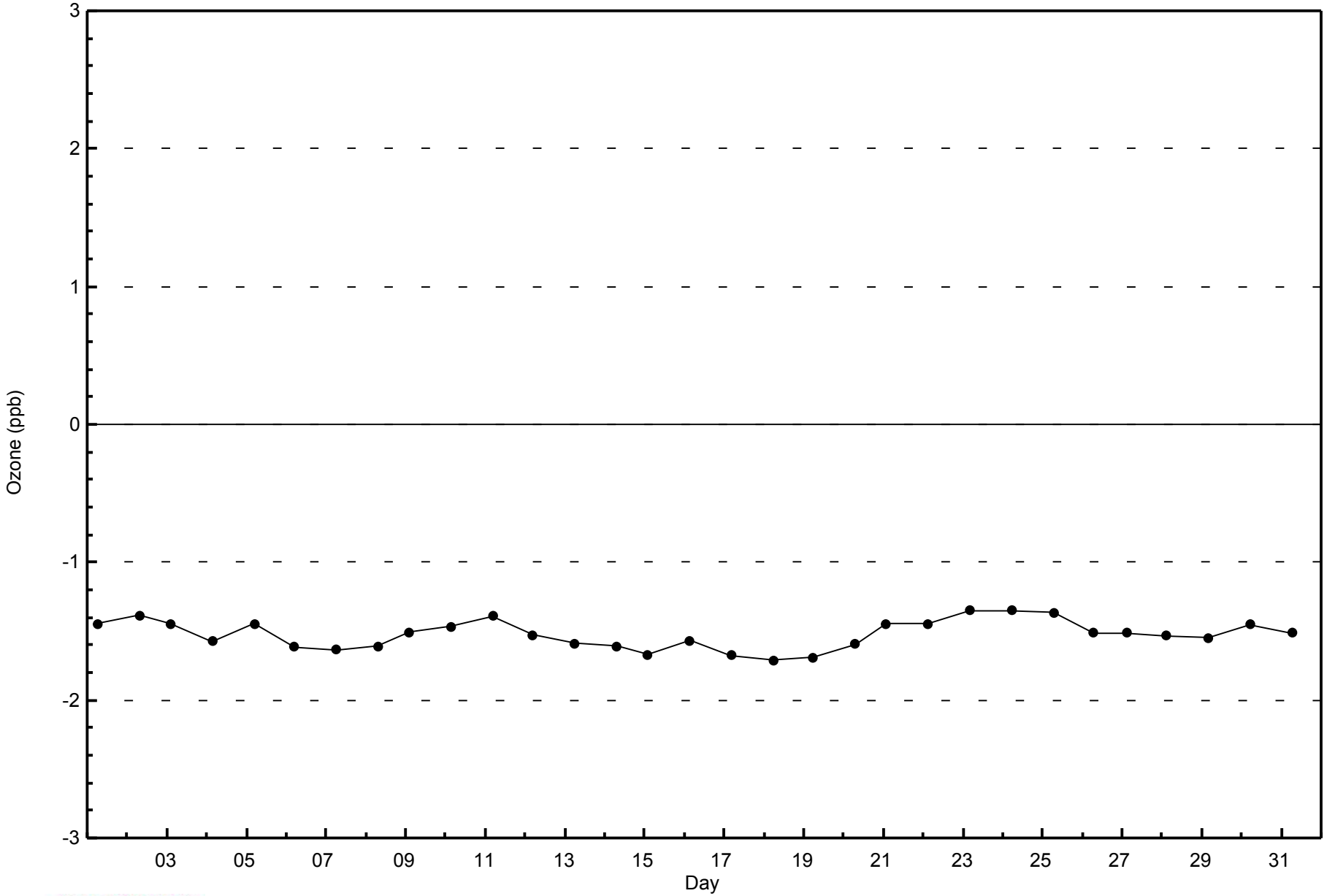
Total Number of Valid Hours: 710

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Patricia McInnes - August 2014



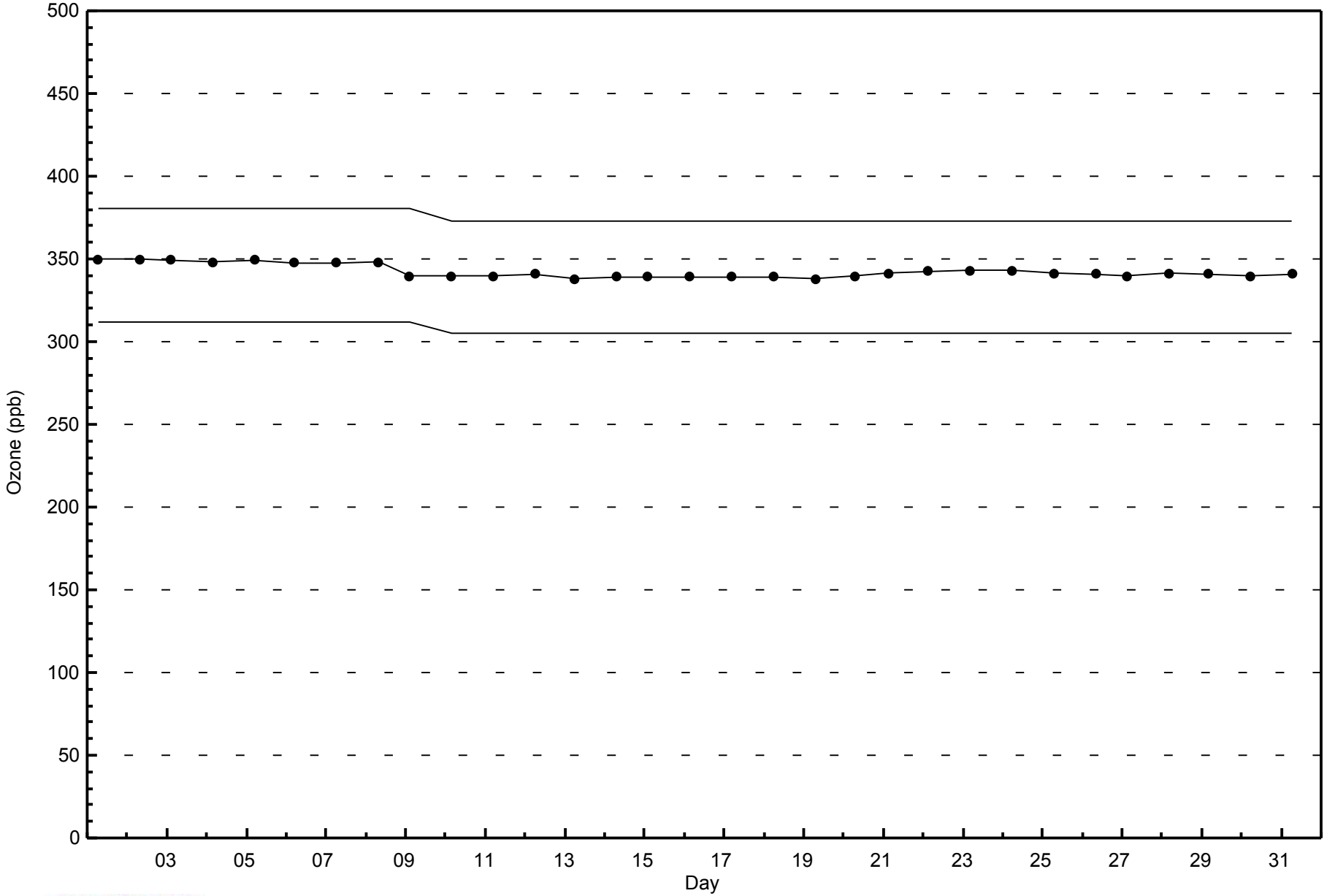
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 19 ppb on Aug 24 08:00

Maximum Daily Average: 3.2 ppb on Aug 24

Minimum Value: 0 ppb on Aug 27 16:00

Minimum Daily Average: 0.2 ppb on Aug 27

Maximum Diurnal Average: 2.7 ppb at hour 7

Minimum Diurnal Average: 0.3 ppb at hour 3

Monthly Average: 0.9 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 11$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	38
Percent Operational Time:	98.3

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-Aug	0	0	0	0	Z	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.6	2
2-Aug	0	0	0	0	1	Z	2	2	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.4	2
3-Aug	Z	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
4-Aug	0	Z	1	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
5-Aug	0	0	Z	2	0	M	M	M	M	M	M	M	M	M	M	M	1	1	0	0	1	1	0	0	--	2
6-Aug	0	0	0	Z	1	1	1	1	C	C	C	C	C	C	C	0	0	0	0	0	1	0	0	0	--	1
7-Aug	0	0	0	0	Z	0	0	1	1	3	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0.5	3
8-Aug	0	0	0	0	0	Z	3	1	1	2	4	4	3	2	1	1	1	1	0	0	0	0	0	0	1.1	4
9-Aug	Z	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
10-Aug	0	Z	0	1	3	4	1	1	1	1	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0.7	4
11-Aug	0	0	Z	0	0	1	0	1	0	0	0	0	1	1	0	0	1	1	0	1	2	2	1	1	0.7	2
12-Aug	1	2	1	Z	4	6	6	3	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	0	1.8	6
13-Aug	0	1	0	1	Z	2	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
14-Aug	0	1	1	1	0	Z	3	4	2	1	1	1	0	1	0	0	1	1	1	0	0	1	2	0	1.0	4
15-Aug	Z	0	0	1	2	3	3	1	1	1	1	0	0	0	0	0	0	1	2	1	0	0	1	2	1.0	3
16-Aug	3	Z	1	2	7	15	19	7	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2.6	19
17-Aug	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.2	1
18-Aug	0	0	0	Z	1	2	1	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.5	2
19-Aug	0	0	0	1	Z	2	2	5	3	1	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0.9	5
20-Aug	0	0	0	0	0	Z	1	1	1	1	4	3	2	1	2	2	1	1	1	0	0	0	0	0	1.0	4
21-Aug	Z	0	0	0	0	0	0	2	3	3	2	1	1	1	1	1	2	1	1	1	1	0	0	0	0.9	3
22-Aug	0	Z	0	0	1	3	9	12	6	11	5	2	0	1	1	1	2	2	1	0	1	0	1	0	2.6	12
23-Aug	0	0	Z	1	2	1	1	4	4	2	2	1	1	1	1	1	1	1	1	2	1	0	0	0	1.3	4
24-Aug	1	0	0	Z	0	2	10	19	11	11	5	2	1	1	1	1	1	1	1	3	1	1	0	0	3.2	19
25-Aug	0	0	0	0	Z	4	1	3	5	1	1	1	1	0	0	1	0	0	0	1	0	0	0	0	0.9	5
26-Aug	0	0	0	0	0	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.4	1
27-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
28-Aug	0	Z	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	1	0	1	2	0	0	0	0.5	2
29-Aug	0	0	Z	2	2	8	8	4	3	3	2	1	1	0	0	1	0	1	0	2	1	0	0	0	1.7	8
30-Aug	0	0	0	Z	0	1	1	0	0	0	0	0	0	0	0	1	1	1	3	1	1	1	0	1	0.5	3
31-Aug	0	0	0	0	Z	1	1	1	0	0	0	M	M	0	0	0	1	1	1	0	0	0	0	0	0.4	1
	0.4	0.3	0.3	0.6	1.1	2.3	2.7	2.6	1.9	1.8	1.2	0.8	0.5	0.5	0.5	0.5	0.7	0.6	0.6	0.6	0.6	0.4	0.3	0.3	Diurnal Average	
	3	2	1	2	7	15	19	19	11	11	5	4	3	2	2	2	2	2	3	3	2	2	2	2	Diurnal Maximum	

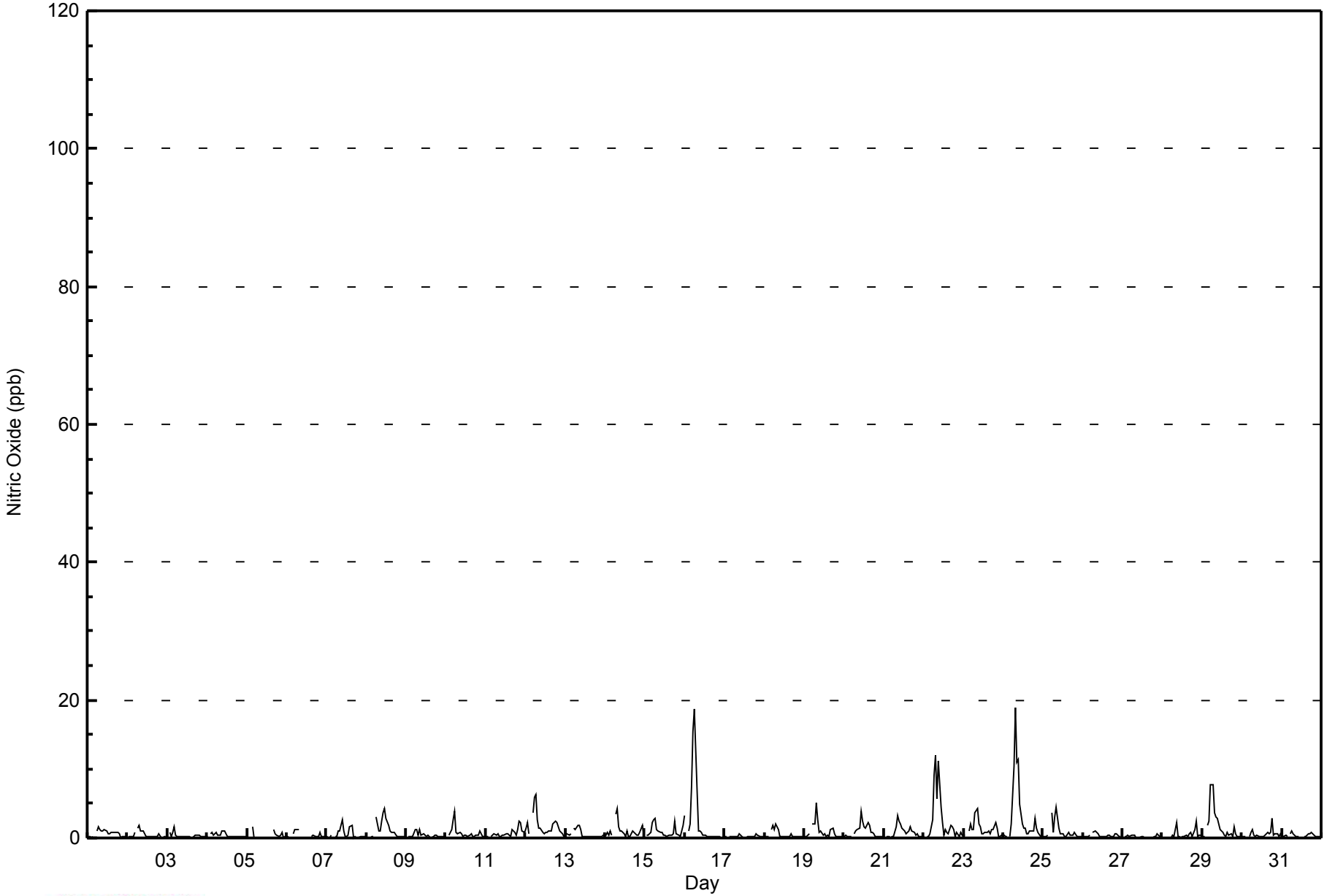
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	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: 693

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitric Oxide (NO) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	42	26	11	4	13	50	29	34	63	77	60	50	50	55	57	72	693
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	26	11	4	13	50	29	34	63	77	60	50	50	55	57	72	693

Total Number of Valid Hours: 693

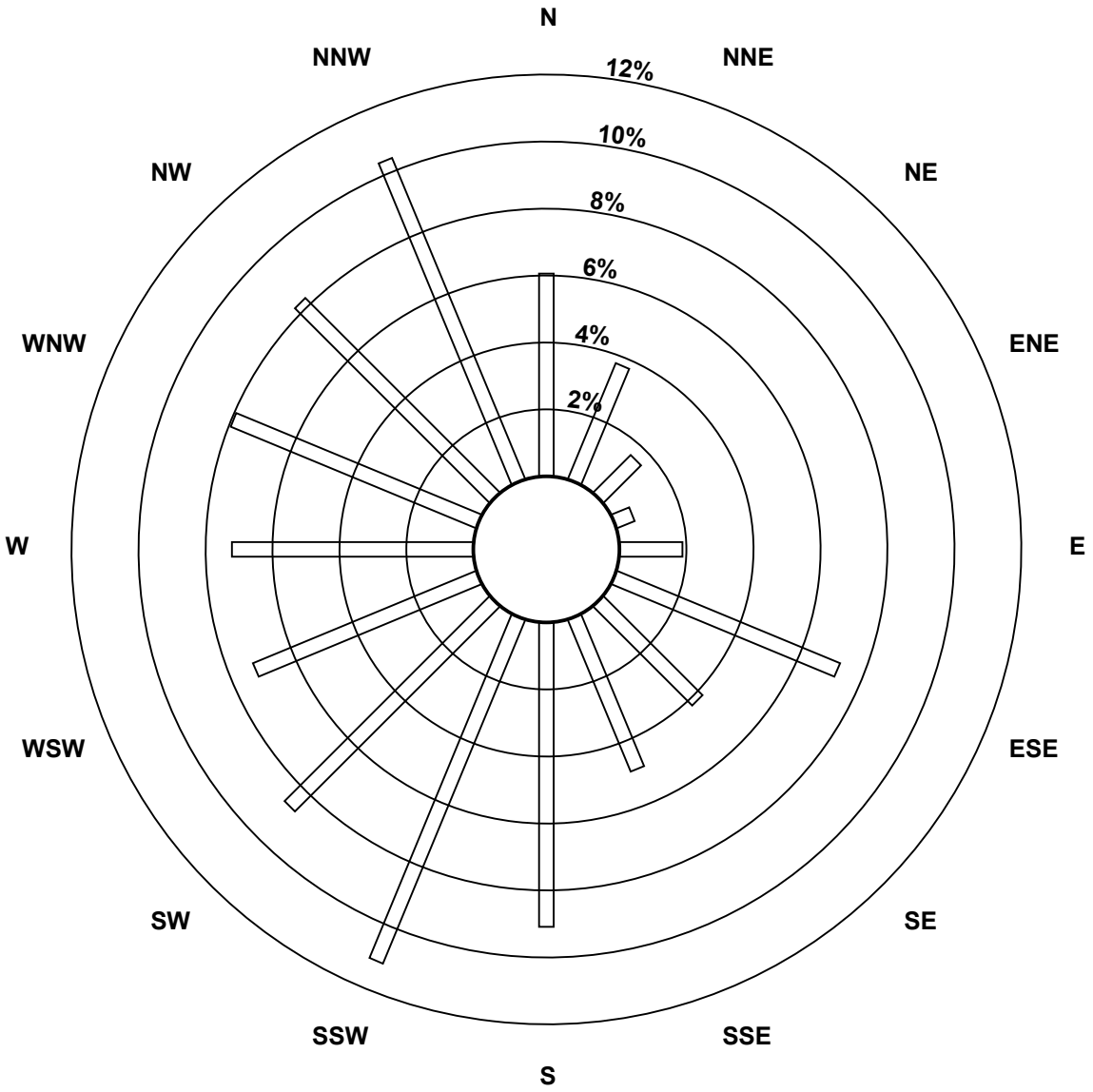
Total Number of Hours: 744

Wood Buffalo Environmental Association

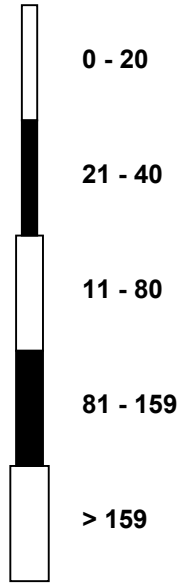
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



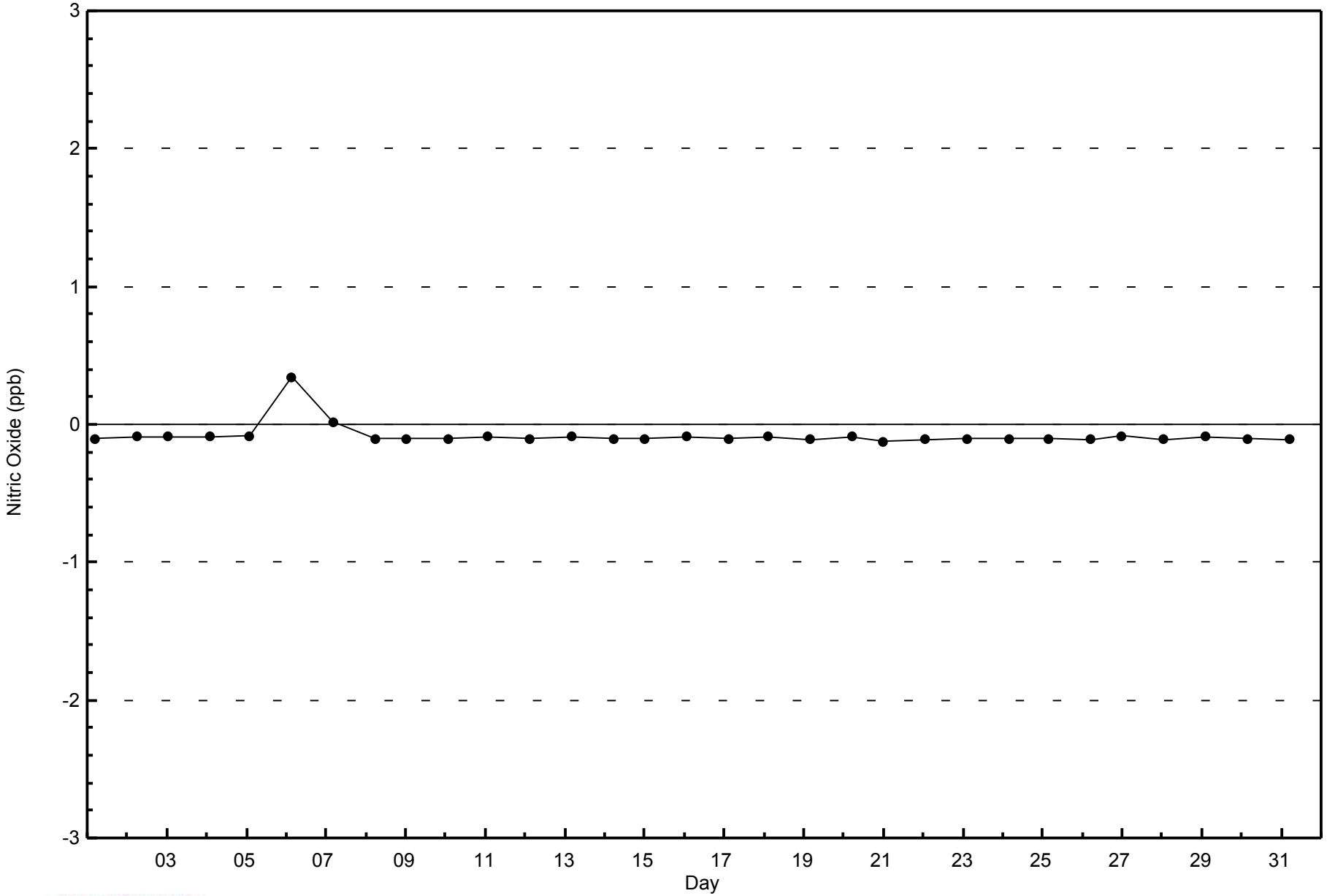
Total Number of Valid Hours: 693

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - August 2014



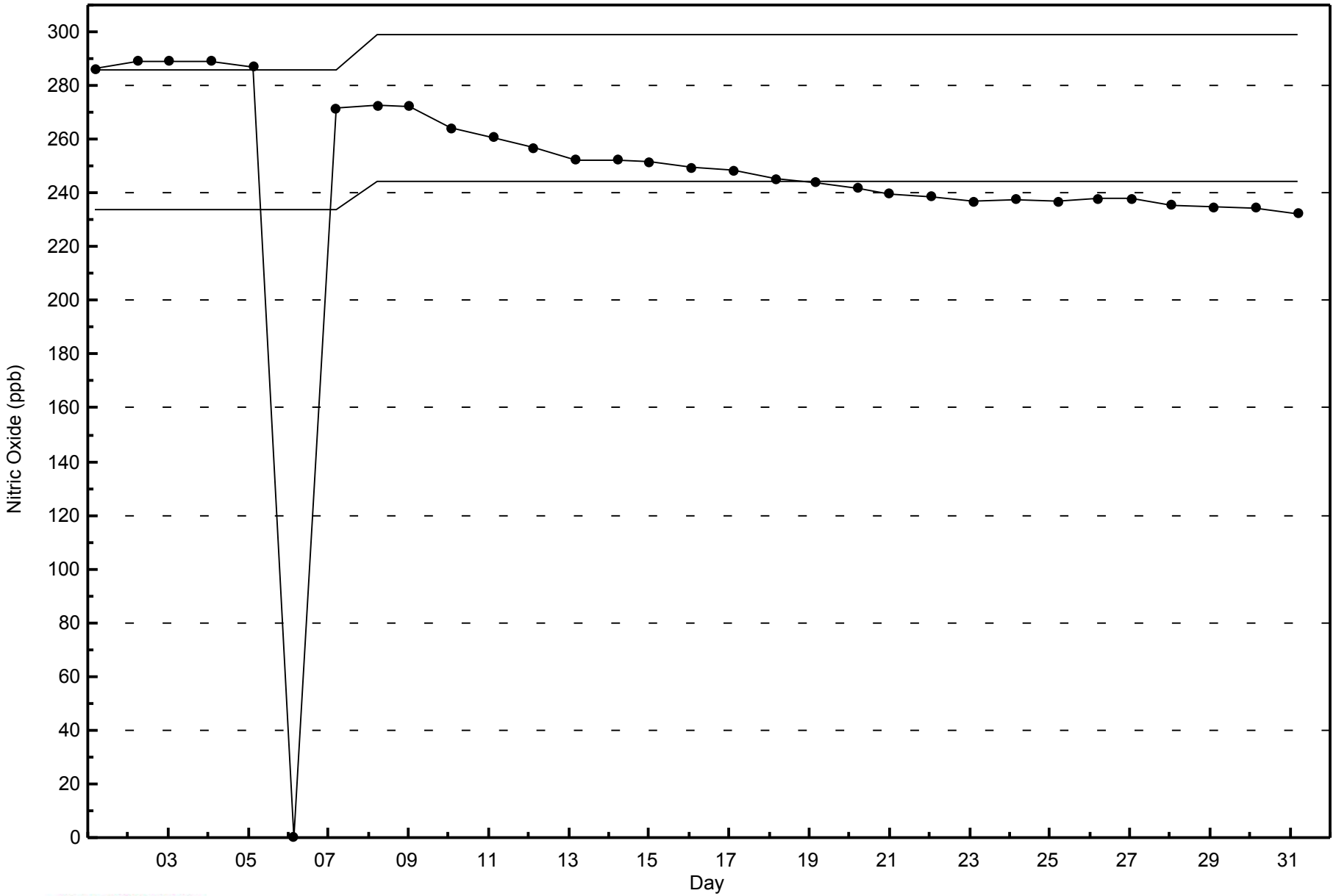
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 15 ppb on Aug 24 08:00 Maximum Daily Average: 4.6 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 17:00 Minimum Daily Average: 0.6 ppb on Aug 7
Maximum Diurnal Average: 3.8 ppb at hour 21 Minimum Diurnal Average: 1.3 ppb at hour 14
Monthly Average: 2.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 2 $Q_3 = 4$ $P_{90} = 6$ $P_{99} = 11$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	38
Percent Operational Time:	98.3

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-Aug	4	4	2	1	Z	4	5	3	2	2	3	3	3	3	3	3	3	4	4	5	3	2	3	2	3.0	5
2-Aug	2	1	2	1	3	Z	3	2	2	2	2	0	0	0	0	1	1	1	1	3	3	1	2	5	1.6	5
3-Aug	Z	2	1	3	3	2	1	0	1	1	1	1	1	1	1	0	1	1	2	4	3	3	2	1	1.4	4
4-Aug	1	Z	3	3	2	1	1	1	1	3	6	7	5	4	4	3	5	6	3	3	3	6	4	3	3.3	7
5-Aug	3	2	Z	5	1	M	M	M	M	M	M	M	M	M	M	M	4	3	3	3	5	8	2	2	--	8
6-Aug	2	1	2	Z	7	8	5	4	C	C	C	C	C	C	C	1	2	0	0	2	7	2	1	1	--	8
7-Aug	0	0	0	3	Z	1	1	1	1	1	1	0	0	0	1	1	0	0	0	0	1	0	1	1	0.6	3
8-Aug	3	4	1	2	2	Z	3	2	2	4	6	10	9	9	8	7	9	8	2	1	1	1	1	3	4.2	10
9-Aug	Z	6	4	5	3	3	3	2	4	1	1	1	1	1	0	0	0	1	2	1	1	1	1	1	1.7	6
10-Aug	1	Z	1	3	5	5	1	1	1	1	0	0	0	0	1	1	0	0	1	3	4	2	1	1	1.4	5
11-Aug	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	2	6	8	6	8	6	1.8	8
12-Aug	8	7	6	Z	5	4	5	3	2	3	2	1	1	1	1	1	2	2	3	4	2	1	1	1	2.8	8
13-Aug	2	3	2	3	Z	4	3	3	4	3	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2.0	4
14-Aug	2	1	0	1	1	Z	4	8	6	5	7	7	3	3	4	5	8	7	7	6	5	5	7	4	4.6	8
15-Aug	Z	2	1	1	2	2	2	2	1	2	2	1	2	1	2	2	2	3	4	4	3	5	6	7	2.6	7
16-Aug	7	Z	5	8	10	12	13	9	2	2	3	2	2	1	1	1	1	1	3	3	3	2	2	1	4.0	13
17-Aug	1	1	Z	1	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3	2	1	1	2	0.7	3
18-Aug	1	1	1	Z	3	4	3	3	2	1	1	1	0	1	0	1	4	3	2	0	1	0	2	3	1.6	4
19-Aug	3	2	3	4	Z	5	5	7	3	2	2	1	2	1	1	1	6	5	5	5	5	5	8	8	3.7	8
20-Aug	9	9	4	3	4	Z	3	3	3	2	4	4	2	2	4	4	3	3	3	3	2	2	2	2	3.4	9
21-Aug	Z	1	0	0	1	1	0	2	4	3	3	3	3	2	3	3	4	4	5	6	8	2	2	2	2.7	8
22-Aug	6	Z	6	5	5	4	4	6	6	9	5	3	1	2	3	3	4	6	8	4	4	3	3	3	4.5	9
23-Aug	4	4	Z	5	4	5	3	5	5	3	2	1	1	1	1	1	1	3	5	7	9	4	4	5	3.6	9
24-Aug	3	1	1	Z	2	6	13	15	14	11	5	3	3	2	1	1	2	2	2	5	5	4	3	3	4.6	15
25-Aug	3	2	2	3	Z	5	3	6	4	2	1	1	1	1	1	2	1	2	2	5	2	1	2	3	2.3	6
26-Aug	1	1	1	4	5	Z	4	3	2	2	1	1	1	1	1	1	1	1	1	10	11	8	6	5	2.9	11
27-Aug	Z	3	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	0	0.6	3
28-Aug	0	Z	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	2	1	4	4	2	1	2	0.8	4
29-Aug	2	2	Z	3	2	5	6	3	2	2	2	2	2	1	1	2	2	2	3	10	7	5	4	2	3.0	10
30-Aug	2	1	1	Z	2	4	3	2	1	1	0	0	0	0	1	1	2	3	5	4	3	4	1	1	1.9	5
31-Aug	1	1	1	1	Z	2	1	1	0	0	0	M	M	0	0	5	6	2	3	2	1	1	1	3	1.3	6
	2.6	2.3	1.9	2.6	3.0	3.5	3.3	3.2	2.5	2.4	2.2	1.9	1.5	1.3	1.5	1.8	2.4	2.4	2.6	3.8	3.8	2.9	2.6	2.6	Diurnal Average	
	9	9	6	8	10	12	13	15	14	11	7	10	9	9	8	7	9	8	8	10	11	8	8	8	Diurnal Maximum	

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

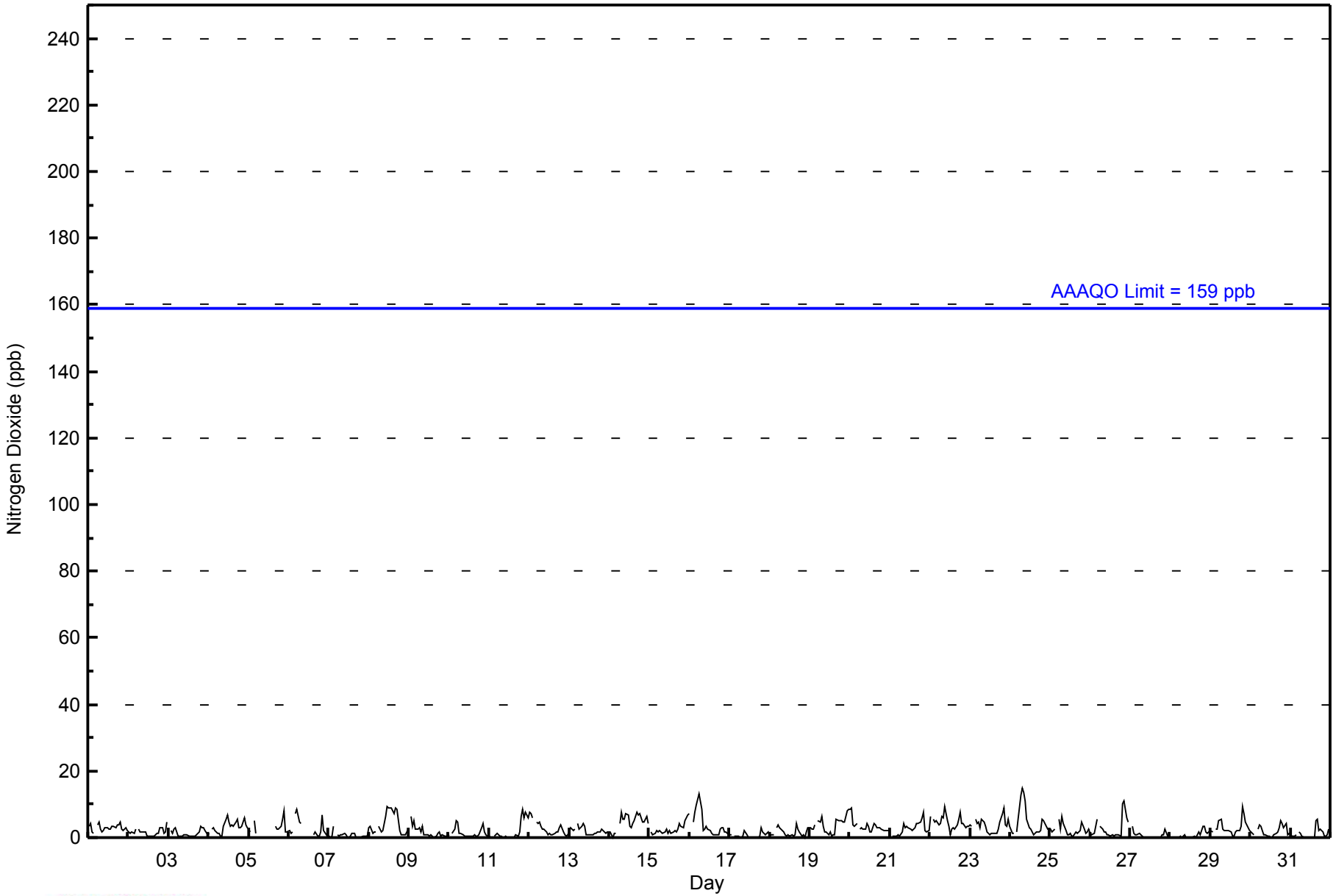
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	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: 693

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	42	26	11	4	13	50	29	34	63	77	60	50	50	55	57	72	693
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	26	11	4	13	50	29	34	63	77	60	50	50	55	57	72	693

Total Number of Valid Hours: 693

Total Number of Hours: 744

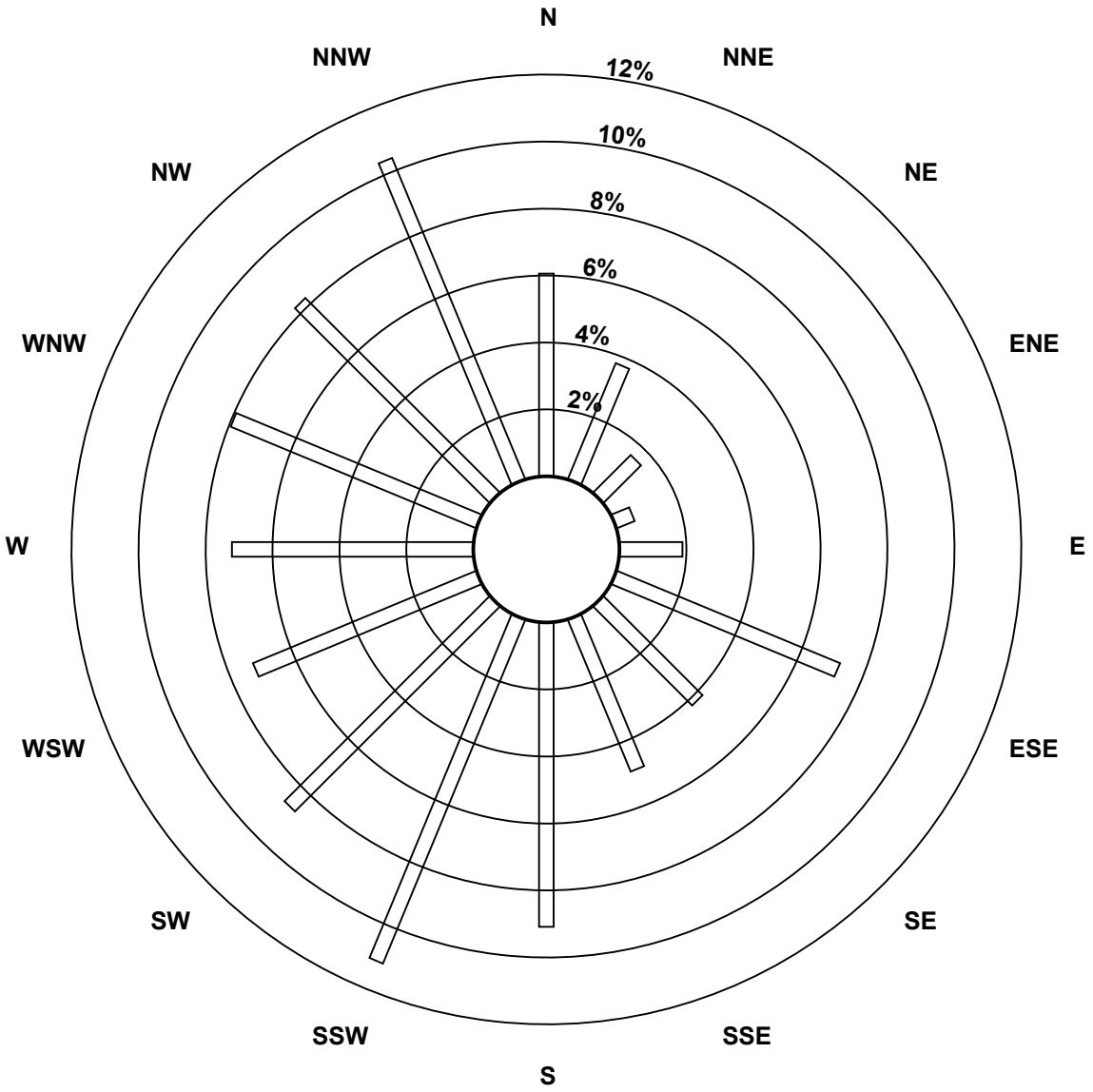
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

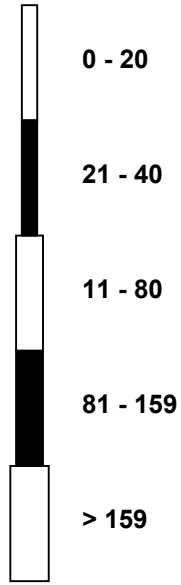
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



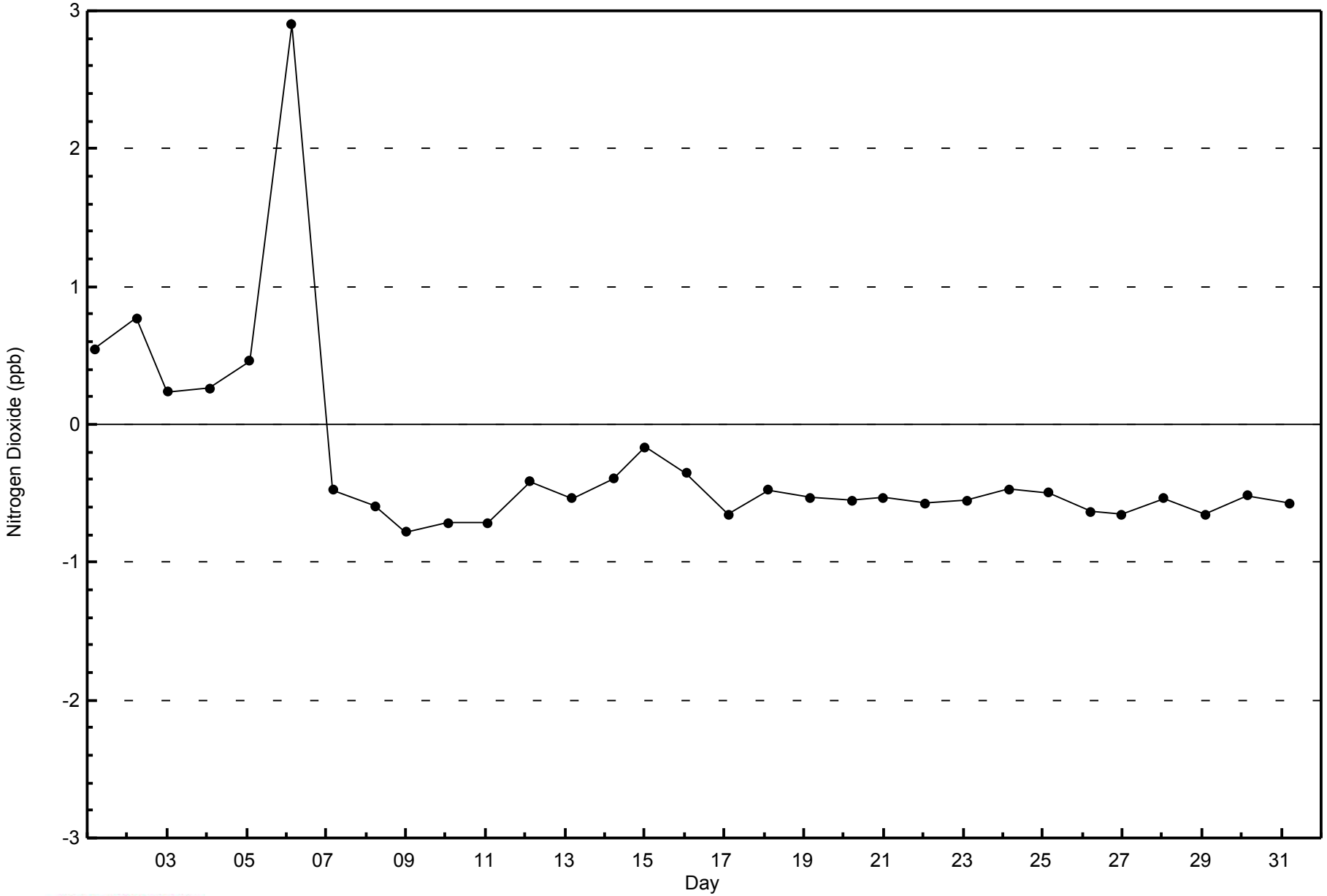
Total Number of Valid Hours: 693

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - August 2014



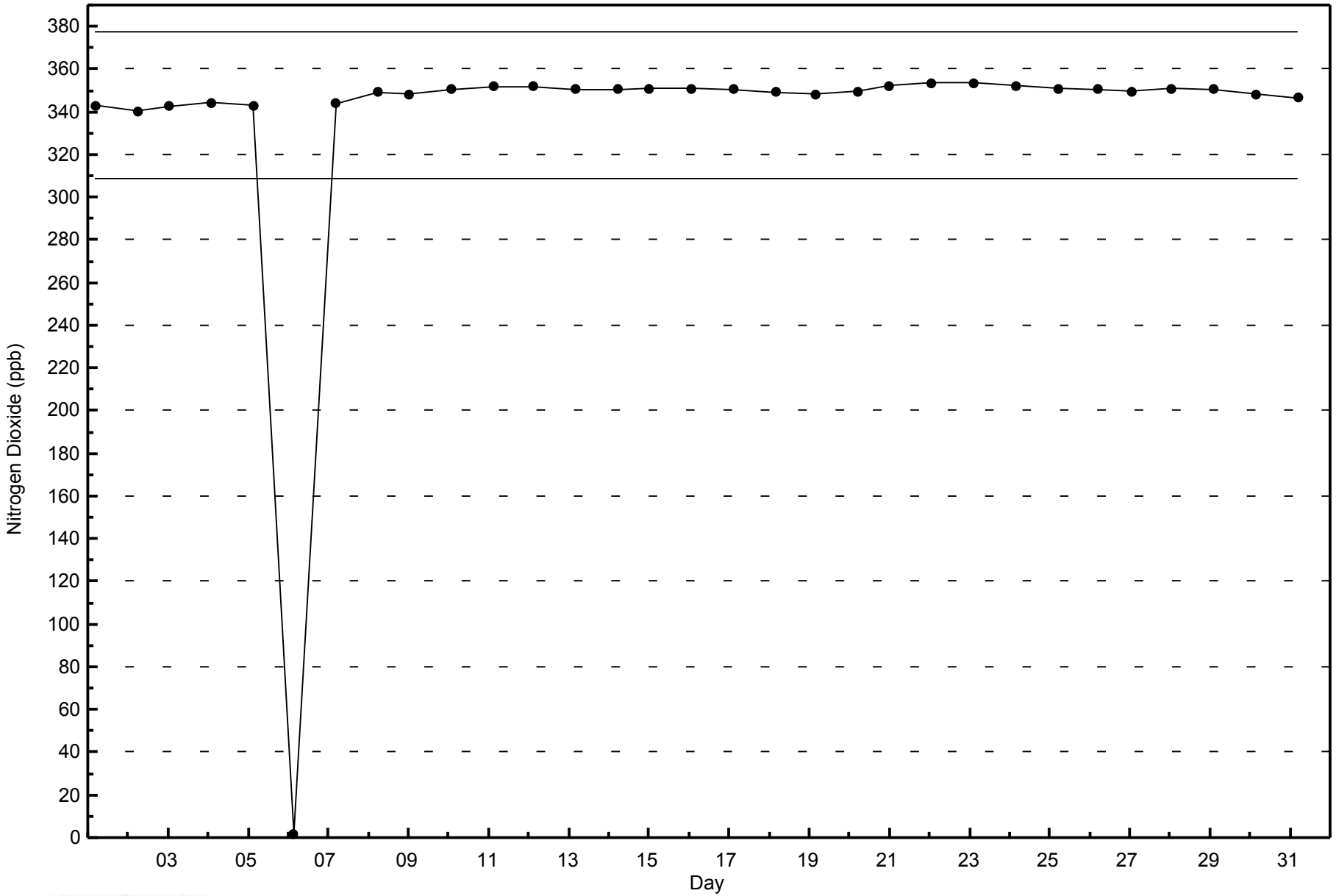
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 34 ppb on Aug 24 08:00

Maximum Daily Average: 7.8 ppb on Aug 24

Minimum Value: 0 ppb on Aug 27 16:00

Minimum Daily Average: 0.8 ppb on Aug 27

Maximum Diurnal Average: 5.9 ppb at hour 7

Minimum Diurnal Average: 1.8 ppb at hour 14

Monthly Average: 3.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 4$ $P_{90} = 8$ $P_{99} = 20$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	38
Percent Operational Time:	98.3

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-Aug	4	4	2	1	Z	5	6	4	3	3	4	4	3	3	4	4	4	5	5	5	3	2	3	2	3.6	6
2-Aug	2	1	2	2	4	Z	4	4	2	3	2	1	0	0	0	1	1	1	1	4	3	1	2	5	2.0	5
3-Aug	Z	3	1	3	5	2	1	1	1	1	1	1	1	1	1	1	1	1	2	4	3	3	3	1	1.7	5
4-Aug	1	Z	3	4	2	2	2	1	1	4	7	8	5	4	4	4	5	6	3	3	3	6	4	3	3.7	8
5-Aug	3	2	Z	7	1	M	M	M	M	M	M	M	M	M	M	M	5	3	3	4	6	9	2	2	--	9
6-Aug	2	1	2	Z	8	10	6	5	C	C	C	C	C	C	C	1	2	1	0	2	8	2	1	1	--	10
7-Aug	0	0	0	4	Z	1	1	2	2	4	2	0	0	1	3	3	0	1	0	0	1	0	1	1	1.2	4
8-Aug	3	4	1	2	2	Z	6	3	3	7	10	14	12	11	9	8	10	9	3	1	1	1	1	3	5.3	14
9-Aug	Z	7	4	5	3	4	4	2	5	1	1	1	1	1	1	0	1	2	2	1	1	1	1	1	2.1	7
10-Aug	1	Z	1	4	8	9	2	2	2	1	1	1	1	0	1	2	0	0	1	4	5	2	1	1	2.1	9
11-Aug	1	0	Z	1	1	2	1	1	0	0	1	1	1	1	0	0	2	1	2	8	11	8	9	7	2.5	11
12-Aug	9	9	7	Z	8	10	11	6	4	4	2	1	2	2	2	2	4	4	6	6	3	2	1	1	4.6	11
13-Aug	2	3	3	3	Z	6	4	5	6	5	1	1	1	1	1	2	2	2	2	3	2	2	1	2	2.6	6
14-Aug	2	2	1	2	2	Z	8	12	7	6	8	7	4	4	5	5	9	8	8	6	5	6	8	5	5.6	12
15-Aug	Z	2	1	2	4	4	5	3	2	3	3	2	3	2	2	2	2	3	6	4	3	5	7	9	3.5	9
16-Aug	11	Z	5	10	17	27	32	15	3	3	4	3	2	1	1	1	1	1	3	3	3	2	2	1	6.6	32
17-Aug	1	1	Z	1	1	0	0	0	0	3	1	0	0	0	0	0	0	0	0	3	2	1	1	2	0.9	3
18-Aug	1	1	1	Z	4	6	4	5	3	1	1	1	1	1	1	1	5	3	2	0	1	0	2	3	2.1	6
19-Aug	3	3	3	4	Z	7	7	12	6	3	3	1	2	1	1	1	7	6	6	5	5	5	8	9	4.6	12
20-Aug	9	9	4	3	4	Z	3	4	4	4	8	6	3	3	6	6	4	4	3	3	2	2	2	2	4.4	9
21-Aug	Z	1	1	0	1	1	1	3	7	5	5	4	3	3	3	4	6	5	6	6	8	2	2	2	3.5	8
22-Aug	6	Z	6	5	6	7	13	18	11	20	10	5	1	4	4	3	6	7	9	5	5	3	4	4	7.1	20
23-Aug	4	4	Z	6	6	6	4	9	9	5	3	2	1	2	2	2	2	4	6	9	11	4	4	6	4.9	11
24-Aug	4	1	1	Z	2	8	23	34	25	22	10	5	4	3	1	2	3	3	3	8	6	5	3	3	7.8	34
25-Aug	3	2	2	3	Z	9	4	9	9	4	1	1	2	1	1	2	2	2	3	5	3	1	2	3	3.1	9
26-Aug	1	1	1	4	6	Z	4	4	2	2	1	1	1	1	1	1	1	1	1	11	12	9	6	5	3.3	12
27-Aug	Z	3	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	1	0.8	3
28-Aug	0	Z	0	0	0	0	1	0	3	0	0	0	0	0	1	0	1	3	1	5	6	2	2	2	1.3	6
29-Aug	2	2	Z	4	5	13	13	6	5	5	4	3	3	1	1	2	3	3	4	11	8	5	4	2	4.8	13
30-Aug	2	1	1	Z	3	5	4	2	1	1	1	1	0	0	1	2	2	4	8	5	3	5	1	2	2.4	8
31-Aug	1	1	1	1	Z	2	2	1	0	0	0	M	M	0	0	5	6	3	3	2	1	1	1	3	1.7	6
	3.0	2.6	2.2	3.2	4.1	5.8	5.9	5.8	4.4	4.2	3.3	2.7	2.1	1.8	2.0	2.3	3.1	3.1	3.3	4.4	4.4	3.3	2.9	2.9	Diurnal Average	
	11	9	7	10	17	27	32	34	25	22	10	14	12	11	9	8	10	9	9	11	12	9	9	9	Diurnal Maximum	

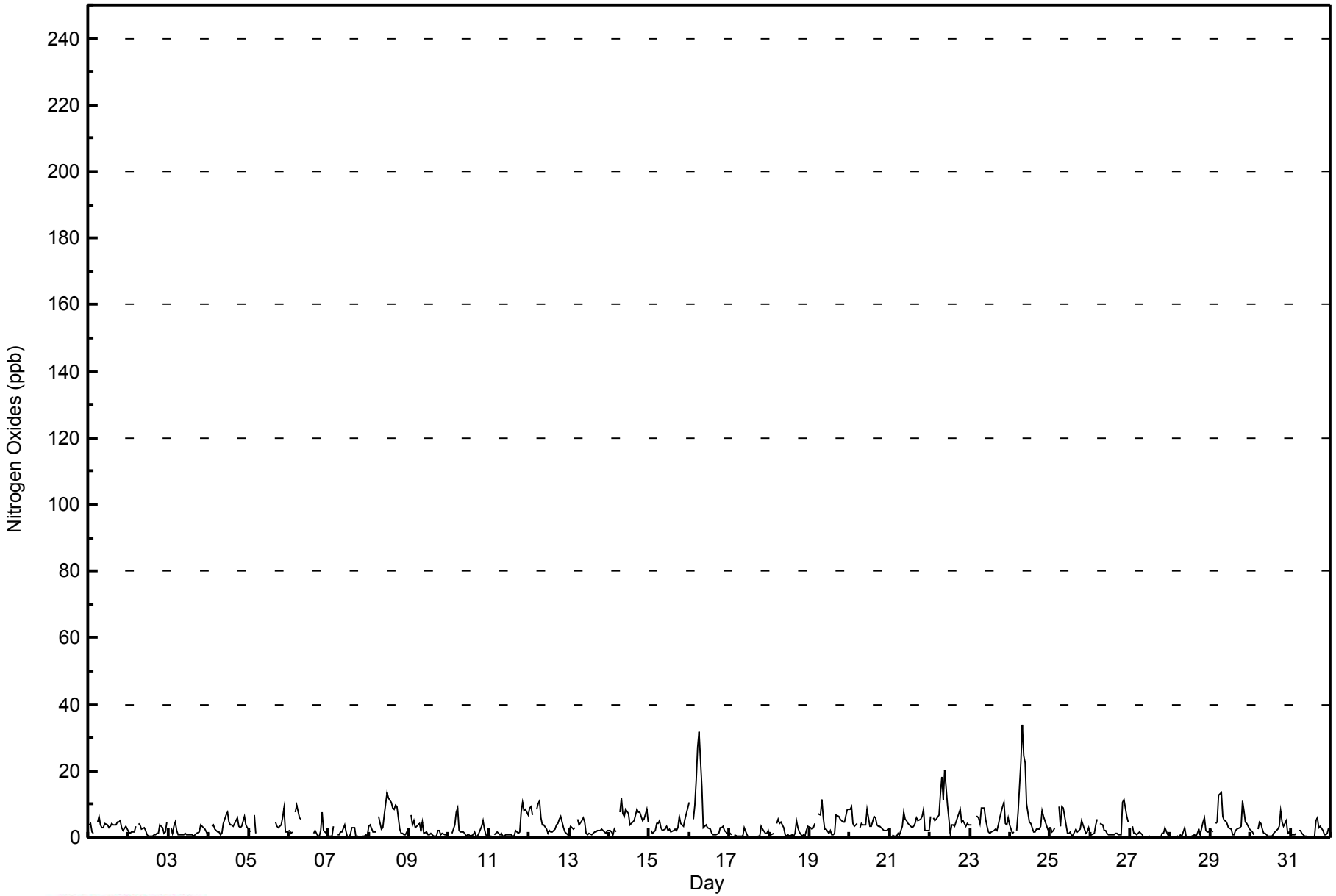
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	687	99.13	99.13
21 - 40	6	0.87	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: 693

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	41	25	10	4	13	50	29	34	63	77	60	50	50	55	56	70	687
21 - 40	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	2	6
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	26	11	4	13	50	29	34	63	77	60	50	50	55	57	72	693

Total Number of Valid Hours: 693

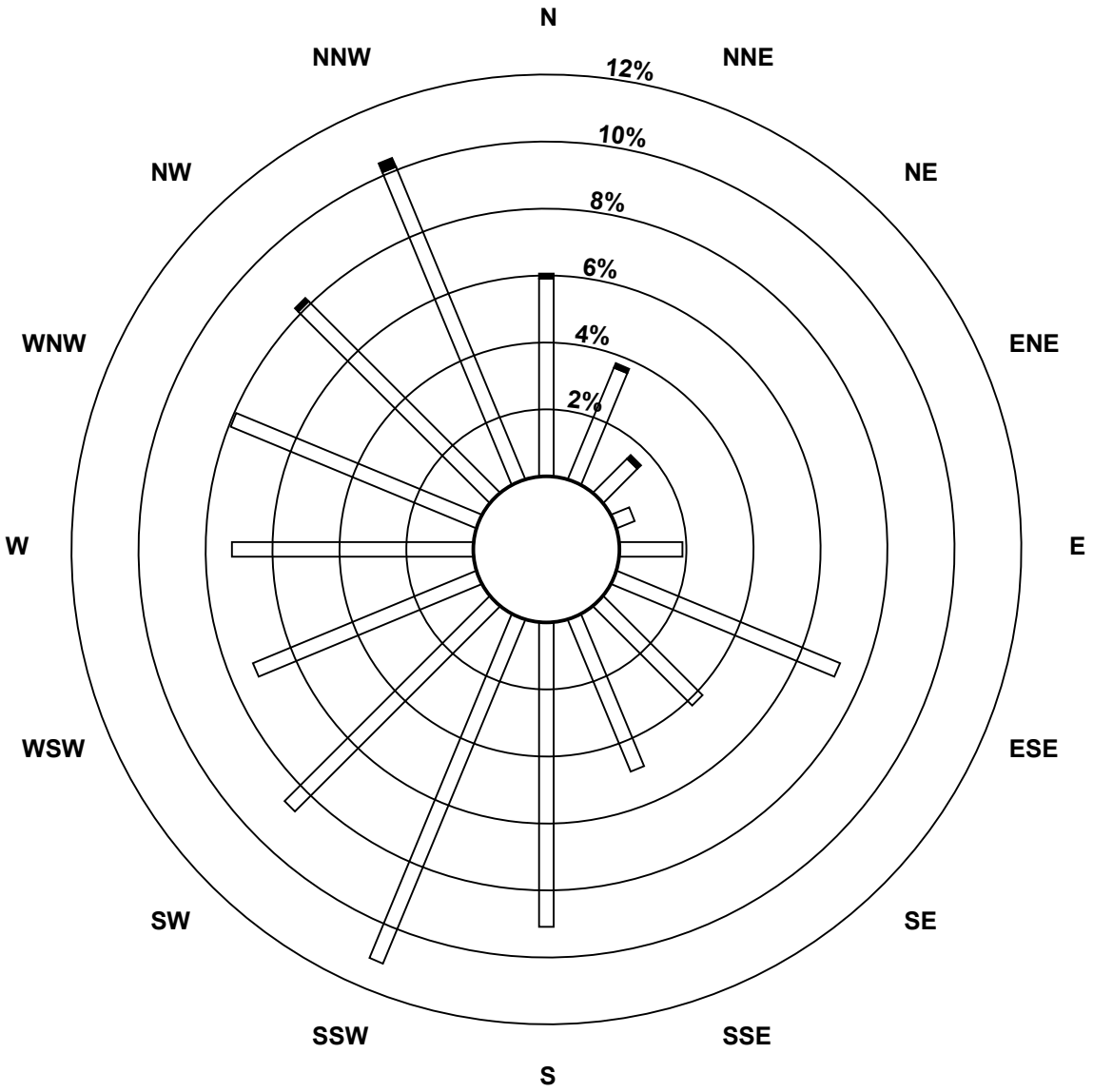
Total Number of Hours: 744

Wood Buffalo Environmental Association

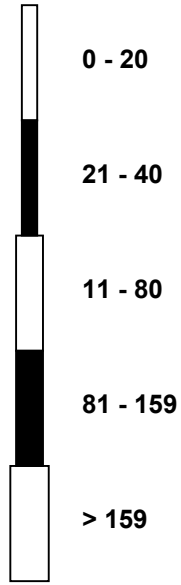
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes (AMS 6)



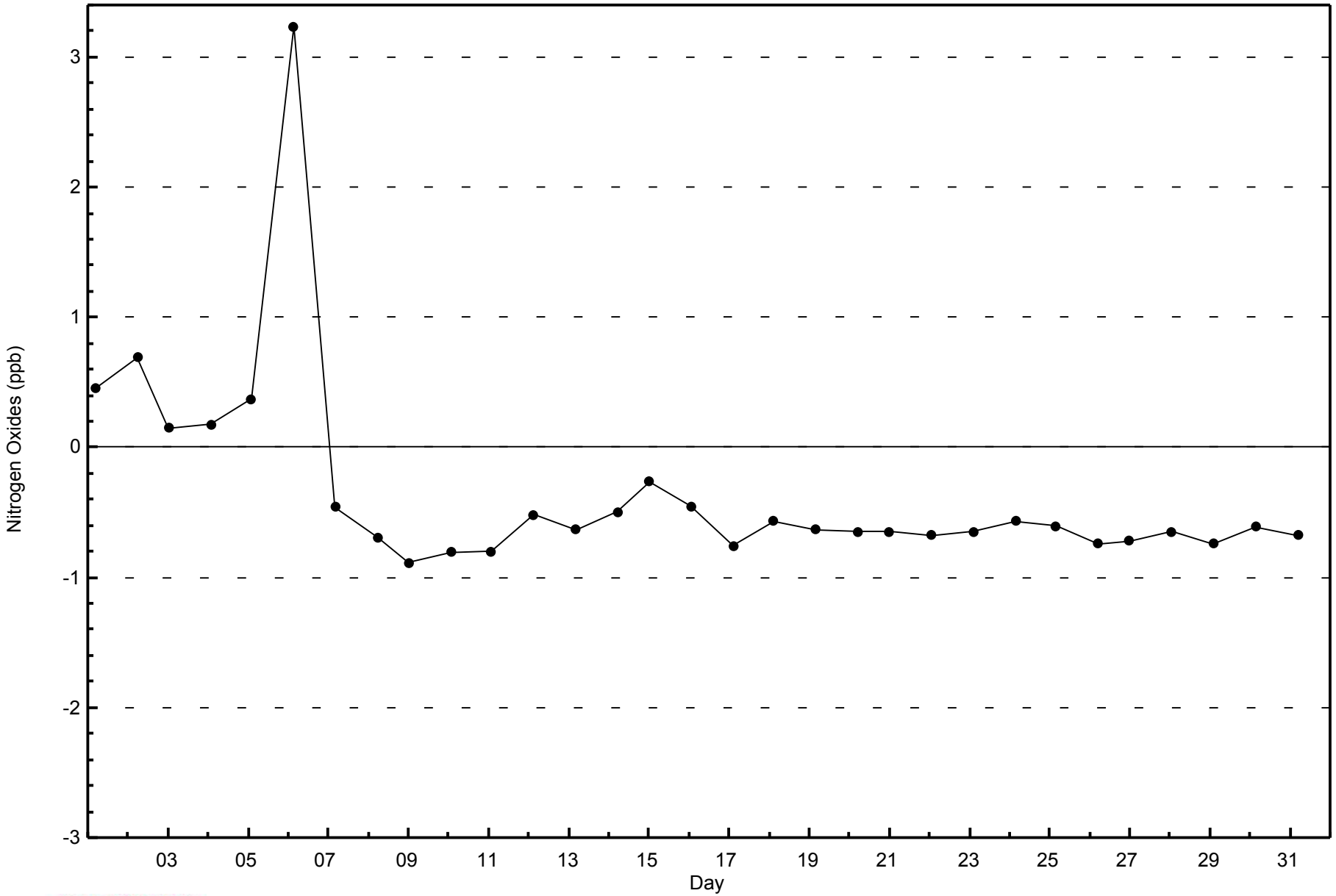
Classes (ppb)



Total Number of Valid Hours: 693

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Patricia McInnes - August 2014



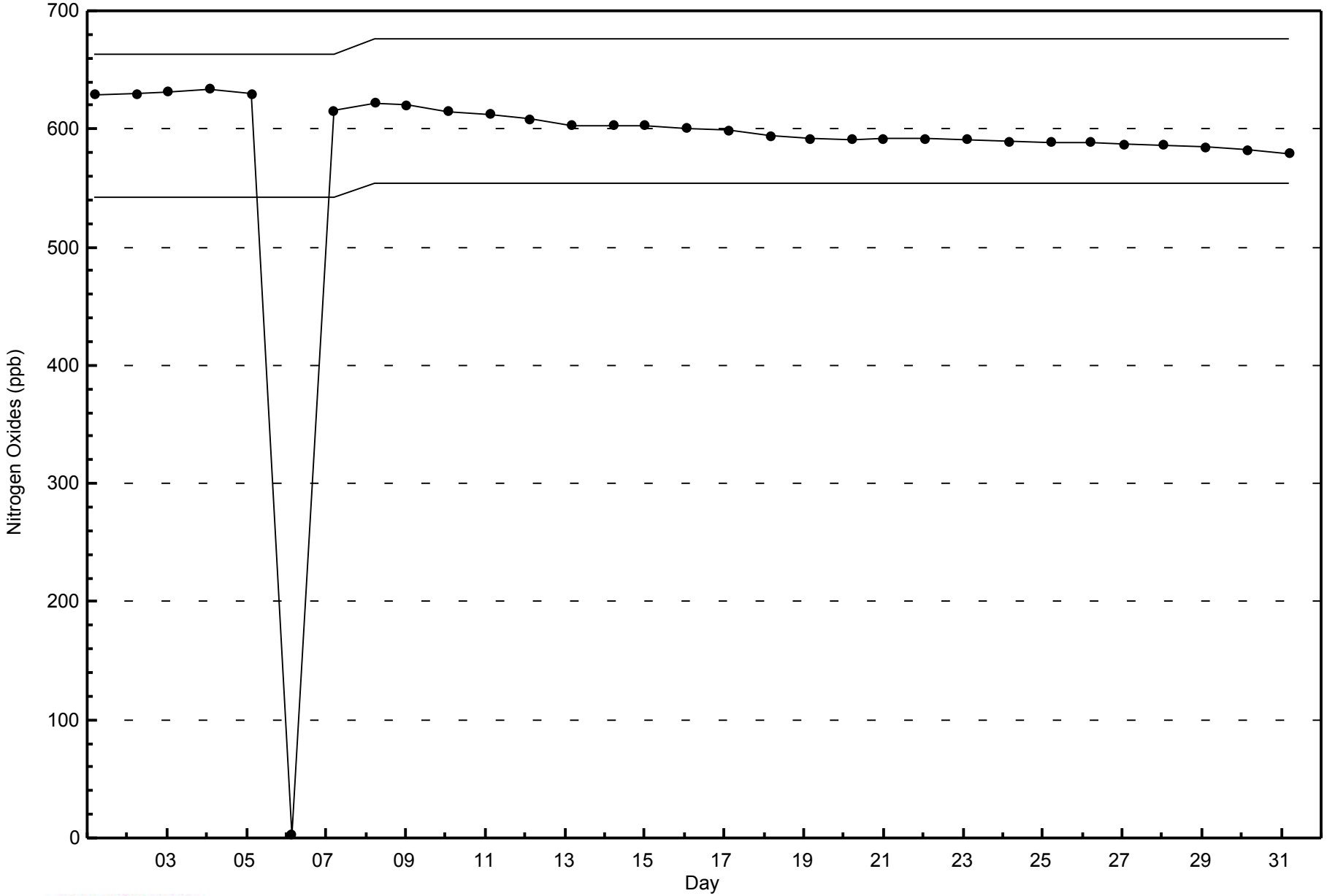
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0
Maximum Value: 20 ppb on Aug 1 14:00 Maximum Daily Average: 11.8 ppb on Aug 1

Minimum Value: 0 ppb on Aug 1 01:00 Minimum Daily Average: 0.0 ppb on Aug 3
Maximum Diurnal Average: 1.5 ppb at hour 6 Minimum Diurnal Average: 0.0 ppb at hour 12
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 15$

Hours in Service:	744
Hours of Data:	669
Hours of Missing Data:	75
Hours of Calibration:	40
Percent Operational Time:	95.3

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-Aug	0	0	10	15	18	18	17	Z	RE	15	M	M	M	20	19	17	16	14	12	10	0	0	11	11	11.8	20
2-Aug	11	12	12	12	12	14	14	11	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.5	14
3-Aug	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
4-Aug	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
5-Aug	0	0	0	0	0	Z	0	0	11	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	12
6-Aug	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
7-Aug	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
8-Aug	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
9-Aug	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
10-Aug	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
11-Aug	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
12-Aug	0	0	0	0	0	0	Z	RE	RE	C	C	C	C	C	C	C	C	C	0	0	0	0	0	0	--	0
13-Aug	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
14-Aug	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
15-Aug	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
16-Aug	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
17-Aug	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
18-Aug	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
19-Aug	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
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	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
24-Aug	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
25-Aug	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
26-Aug	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
27-Aug	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
28-Aug	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
29-Aug	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
30-Aug	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
31-Aug	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
	0.4	0.4	0.7	1.1	1.4	1.5	1.4	0.6	0.6	1.1	0.4	0.0	0.0	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.0	0.0	0.3	0.4	Diurnal Average	
	11	12	12	15	18	18	17	11	11	15	12	0	0	20	19	17	16	14	12	10	0	0	11	11	Diurnal Maximum	

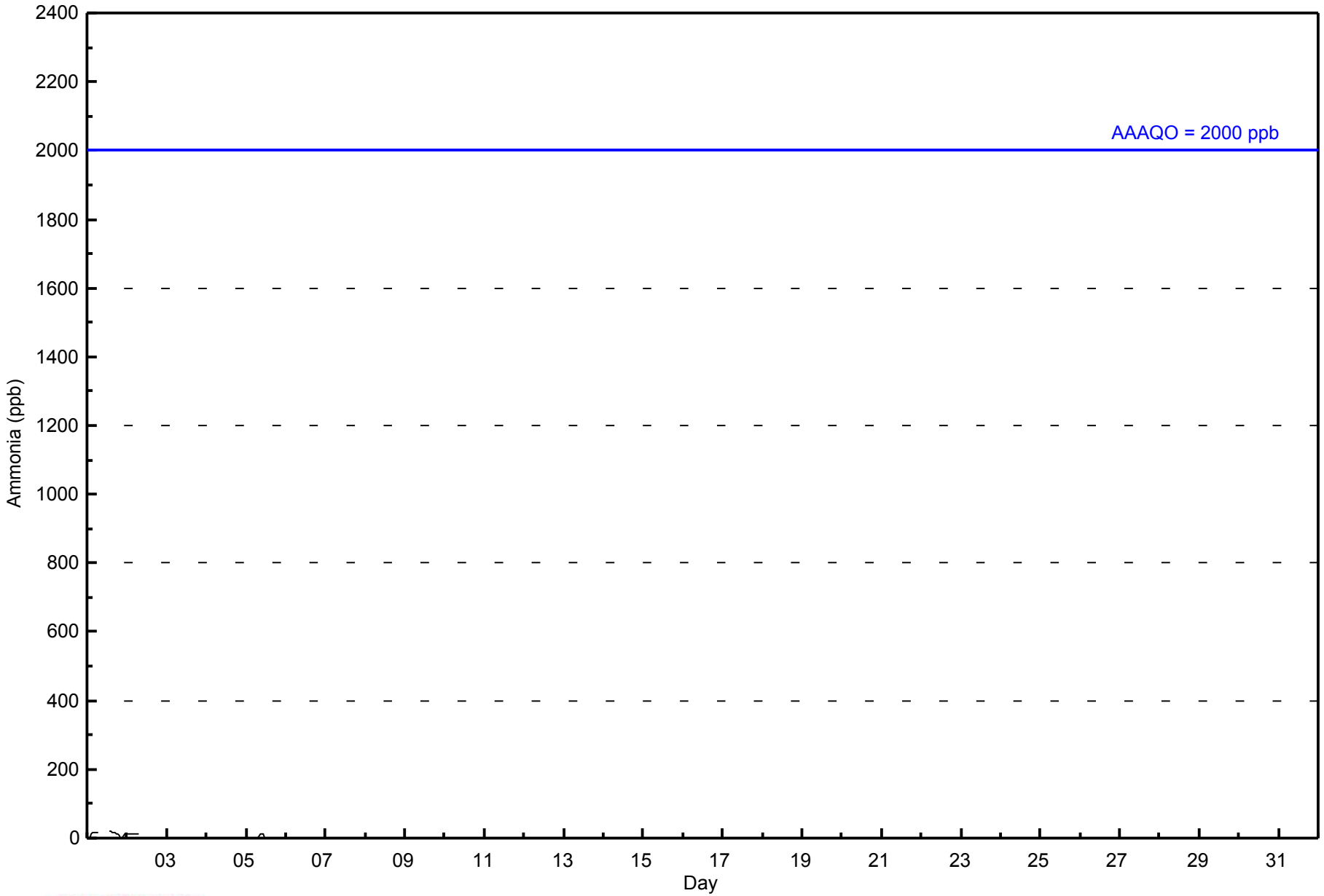
Z - zerospan C - Calibration M - Maintenance RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb

WBEA NETWORK

Hourly Averages

Ammonia (NH_3) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	643	96.11	96.11
6 - 10	2	0.30	96.41
11 - 15	17	2.54	98.95
16 - 20	7	1.05	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 669

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Ammonia (NH_3) - ppb

Patricia McInnes - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	32	24	10	5	13	39	27	28	62	70	59	51	49	56	56	62	643
6 - 10	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
11 - 15	2	0	1	0	1	3	0	1	3	6	0	0	0	0	0	0	17
16 - 20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	7
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	36	24	11	5	14	42	27	30	65	76	59	51	49	56	56	68	669

Total Number of Valid Hours: 669

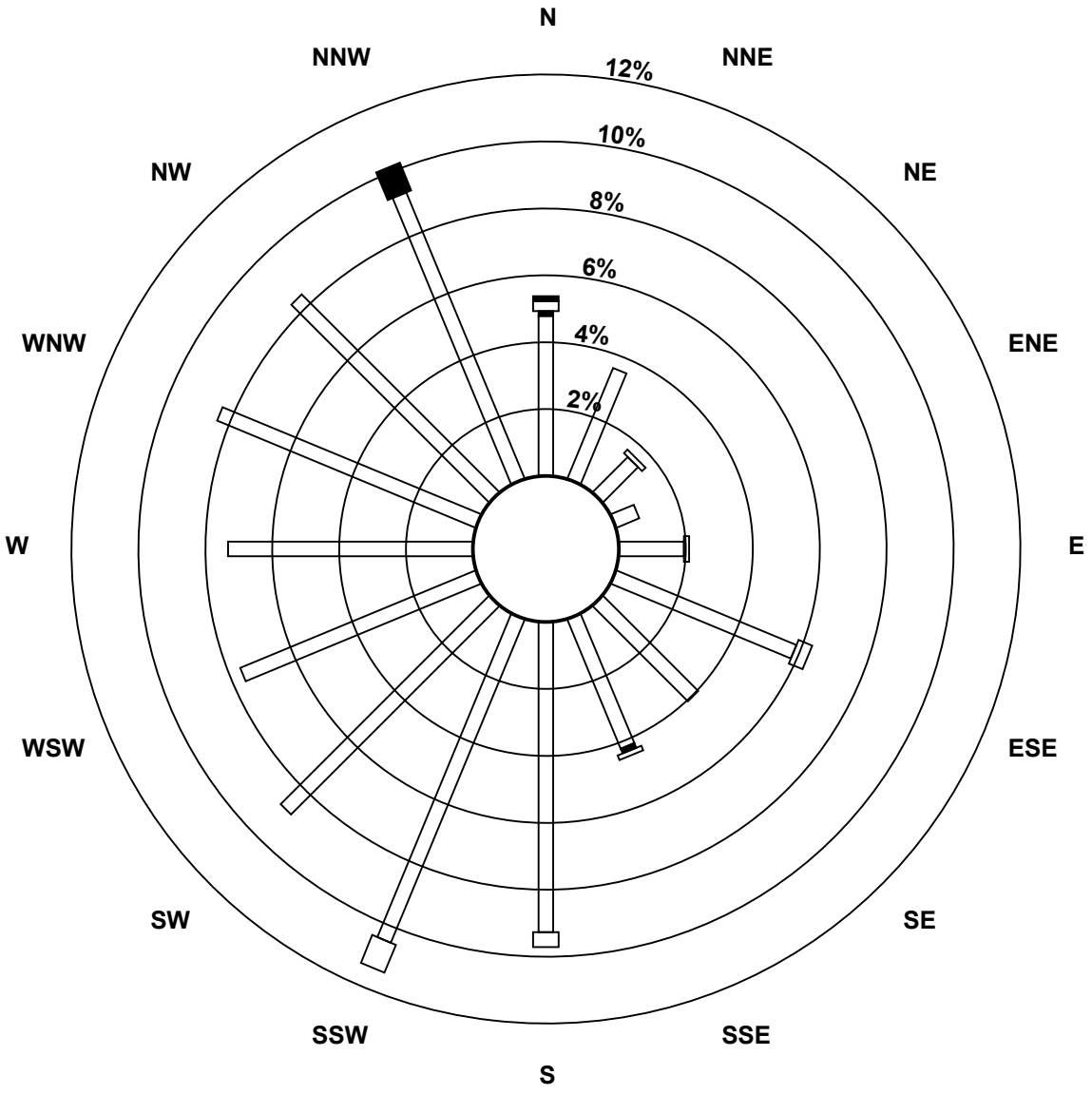
Total Number of Hours: 744

Wood Buffalo Environmental Association

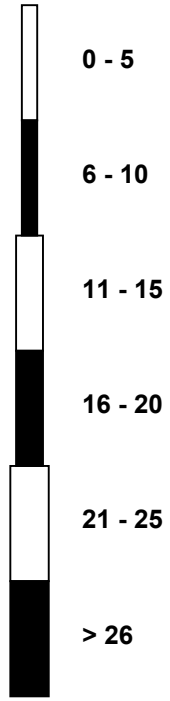
Wind Rose Aug 2014

Ammonia (NH_3) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



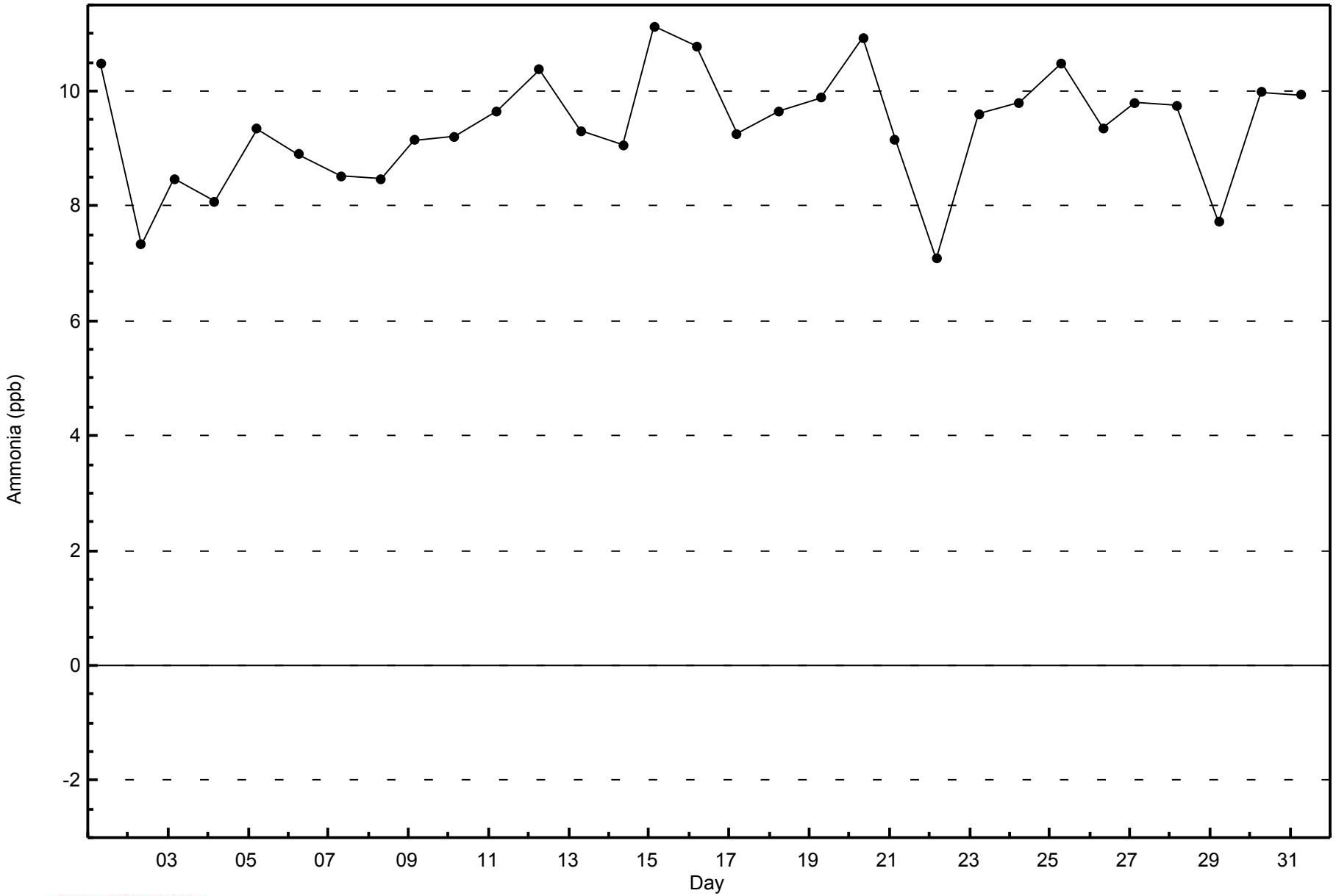
Total Number of Valid Hours: 669

WBEA NETWORK

Zero Responses

Ammonia (NH_3) - ppb

Patricia McInnes - August 2014



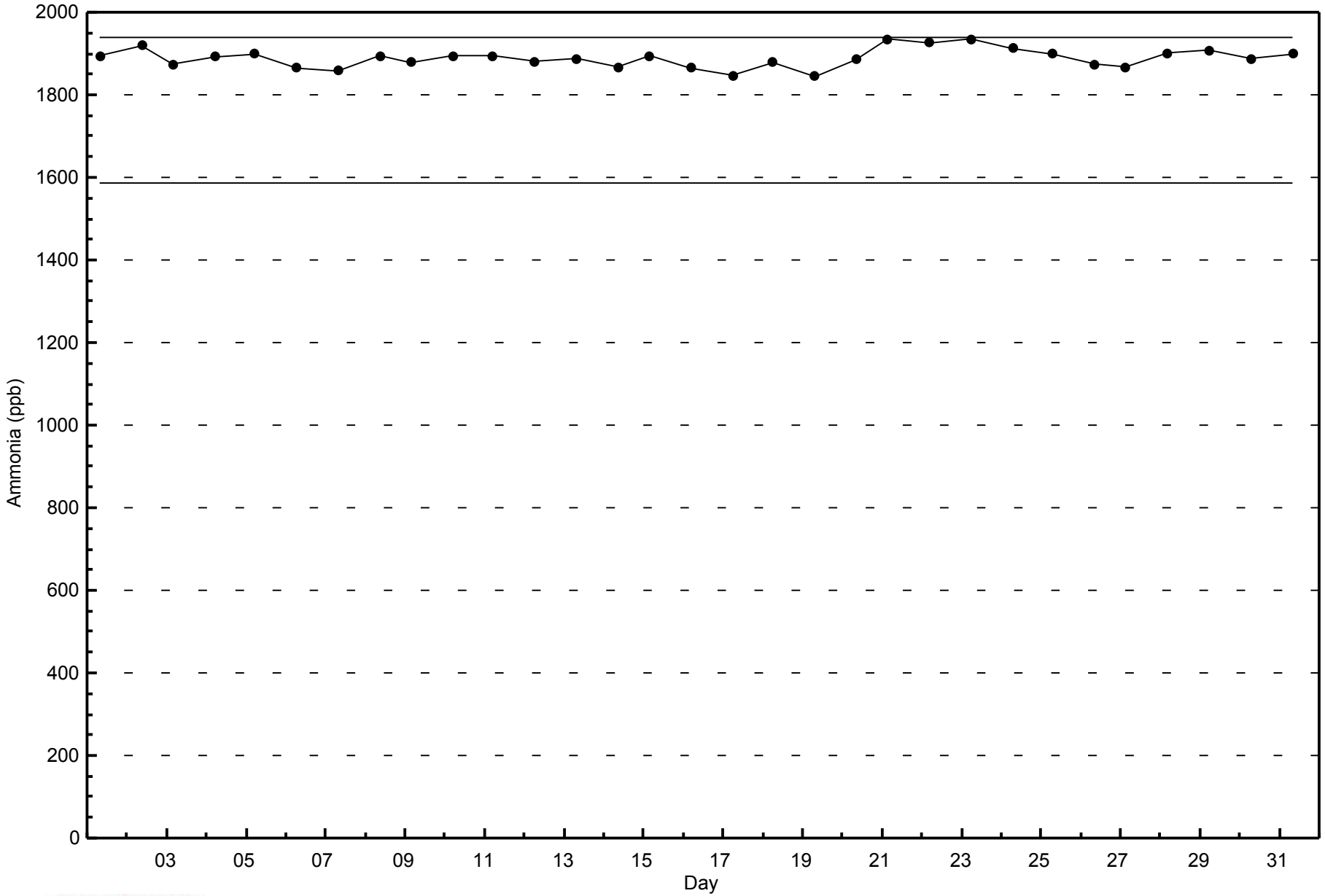
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ammonia (NH_3) - ppb

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Patricia McInnes - August 2014

Number of Exceedences (AAAQO): 24-hr: 3

Maximum Value: 191.6 $\mu g/m^3$ on Aug 5 10:00

Maximum Daily Average: 76.2 $\mu g/m^3$ on Aug 5

Minimum Value: 0.5 $\mu g/m^3$ on Aug 7 17:00

Minimum Daily Average: 3.0 $\mu g/m^3$ on Aug 28

Maximum Diurnal Average: 16.9 $\mu g/m^3$ at hour 6

Minimum Diurnal Average: 10.9 $\mu g/m^3$ at hour 15

Monthly Average: 13.79 $\mu g/m^3$

Percentiles: P_1 = 0.8 P_{10} = 2.2 Q_1 = 4.6 Median = 7.9 Q_3 = 14.9 P_{90} = 25.2 P_{99} = 122.0

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-Aug	94.2	78.3	78.6	80.6	71.7	63.6	55.3	34.4	26.4	22.9	21.1	22.6	25.5	25.2	19.9	17.8	17.6	16.9	16.7	17.4	21.9	26.1	27.3	25.9	37.8	94.2
2-Aug	25.5	22.8	22.5	21.5	19.9	19.4	16.0	13.0	17.1	22.6	31.3	55.4	42.3	31.2	31.0	28.6	16.2	9.1	13.2	10.1	10.9	11.1	15.6	19.5	21.9	55.4
3-Aug	17.8	16.1	13.9	12.1	10.5	10.7	7.7	7.1	7.7	7.5	7.4	7.5	7.7	6.7	5.6	5.5	6.1	6.5	7.3	10.1	18.5	22.6	25.3	16.7	11.0	25.3
4-Aug	15.8	16.9	16.4	17.0	16.6	16.0	14.2	12.3	11.0	12.0	12.6	21.8	23.0	17.8	32.0	63.2	165.4	124.0	90.4	70.3	71.4	70.0	66.0	68.8	43.5	165.4
5-Aug	75.0	74.6	72.2	72.1	76.4	87.9	102.5	123.0	168.2	191.6	177.8	149.5	118.4	84.2	66.4	55.8	32.7	16.2	11.6	13.6	18.9	17.8	12.0	9.9	76.2	191.6
6-Aug	9.9	7.2	7.1	7.6	7.9	7.7	6.7	6.4	5.2	4.9	5.2	5.4	M	M	M	M	M	37.5	40.9	44.0	50.1	48.2	43.4	31.1	19.8	50.1
7-Aug	23.7	21.3	18.9	22.3	60.4	107.6	14.6	7.4	2.4	2.8	0.9	0.7	0.6	0.6	0.8	0.6	0.5	0.6	1.0	1.7	2.2	2.5	3.1	2.8	12.5	107.6
8-Aug	2.8	3.4	3.1	3.2	3.8	6.1	3.9	3.2	3.6	4.2	5.1	M	M	19.7	18.2	15.0	12.7	11.9	7.0	5.6	5.4	5.5	6.4	6.6	7.1	19.7
9-Aug	6.8	9.8	12.2	7.7	5.4	5.0	6.7	9.4	12.4	1.4	1.2	1.6	2.0	1.7	1.9	2.9	5.1	5.0	3.3	3.0	4.7	4.1	4.6	6.1	5.2	12.4
10-Aug	5.8	5.6	6.9	6.8	5.9	6.7	6.0	4.6	6.8	5.8	3.2	2.4	2.6	3.3	3.5	4.0	3.4	3.4	4.1	2.9	2.7	3.8	9.2	14.0	5.1	14.0
11-Aug	15.0	13.6	11.1	7.1	6.4	6.4	4.3	2.4	3.5	2.0	1.5	1.9	2.1	2.0	1.8	1.9	1.9	1.7	2.3	2.9	6.6	7.1	3.4	5.2	4.7	15.0
12-Aug	7.8	9.8	12.1	13.4	13.4	7.6	7.4	24.4	33.2	25.6	16.4	9.4	9.5	7.9	5.8	5.2	3.5	3.9	5.8	5.8	9.0	9.1	10.6	11.5	11.2	33.2
13-Aug	9.3	9.8	10.9	7.6	7.1	9.6	8.0	6.5	7.2	5.5	4.6	6.8	9.3	8.8	7.7	10.2	10.2	8.5	10.5	11.7	9.7	8.5	8.4	9.2	8.6	11.7
14-Aug	12.2	12.0	9.5	10.1	12.3	15.5	14.8	13.3	20.4	31.6	32.2	34.9	33.9	30.3	32.9	30.9	27.5	24.7	24.1	20.1	17.4	18.0	22.9	27.4	22.0	34.9
15-Aug	30.2	24.3	15.2	15.1	14.7	13.0	10.9	7.9	6.7	7.0	7.4	6.3	8.2	7.9	8.4	9.8	9.9	9.6	9.8	13.3	9.5	10.0	15.1	23.0	12.2	30.2
16-Aug	22.5	17.9	20.4	22.3	19.5	16.7	17.4	23.6	33.4	32.6	20.2	16.7	15.4	12.6	10.6	12.8	15.4	12.4	12.4	11.7	10.7	9.5	12.1	12.8	17.2	33.4
17-Aug	11.9	10.8	14.9	17.9	15.3	10.9	7.9	7.3	5.2	3.9	2.6	2.1	1.7	1.7	2.3	3.3	5.0	7.3	12.0	4.1	2.4	4.6	9.2	11.3	7.3	17.9
18-Aug	11.7	13.4	9.1	9.6	11.2	10.3	13.2	18.4	26.0	25.1	19.7	19.4	17.2	13.6	15.1	18.8	16.7	16.6	16.1	19.2	18.5	19.2	16.3	14.9	16.2	26.0
19-Aug	12.8	9.2	10.4	13.1	13.5	22.4	26.2	20.7	20.6	15.9	12.3	8.1	9.7	6.4	2.8	3.3	3.2	2.7	4.4	7.5	7.0	7.2	12.4	7.5	10.8	26.2
20-Aug	4.8	7.4	20.1	18.1	9.8	12.1	13.7	15.2	13.1	7.9	7.8	7.9	9.1	7.6	8.2	5.1	4.1	4.2	3.7	3.4	3.1	1.8	2.2	2.4	8.0	20.1
21-Aug	2.3	2.2	3.8	5.5	7.2	8.0	5.2	7.4	5.2	6.0	10.0	10.6	13.0	18.9	8.5	4.6	3.9	4.0	3.4	4.0	9.2	5.0	5.3	4.9	6.6	18.9
22-Aug	5.3	4.6	5.4	5.7	7.2	7.9	5.5	7.4	4.9	4.0	2.2	1.4	0.9	1.5	2.3	3.4	4.9	5.1	13.5	11.3	10.7	10.2	12.8	16.2	6.4	16.2
23-Aug	15.8	15.9	14.4	13.6	12.3	10.1	10.4	9.0	7.5	5.7	4.1	3.3	2.9	2.8	2.9	3.3	3.3	5.1	11.6	7.1	11.2	14.9	12.4	18.4	9.1	18.4
24-Aug	11.7	11.6	11.5	10.3	10.2	11.7	12.9	13.6	11.4	9.1	5.3	2.4	3.4	3.5	3.7	4.1	4.8	4.4	5.4	5.0	5.3	8.2	9.5	9.0	7.8	13.6
25-Aug	10.3	10.0	9.8	10.3	7.2	10.3	13.6	14.6	10.8	8.4	6.2	4.9	4.9	4.5	4.7	5.3	6.3	7.0	8.6	9.0	8.6	9.3	7.0	6.1	8.2	14.6
26-Aug	4.7	5.2	5.4	5.1	3.8	5.7	6.6	7.0	2.9	3.4	8.6	9.0	13.4	17.1	16.3	15.0	9.4	4.7	4.9	8.3	13.0	14.9	13.3	16.0	8.9	17.1
27-Aug	14.9	13.2	9.9	6.8	5.7	4.3	3.2	4.2	2.6	2.1	1.8	1.3	1.1	0.8	0.8	0.9	1.3	1.5	2.2	2.9	2.2	4.6	4.2	1.3	3.9	14.9
28-Aug	1.0	1.3	2.2	2.4	2.4	2.0	1.6	1.6	2.0	1.7	1.5	1.5	1.6	1.5	1.6	1.8	1.8	2.5	2.0	5.7	6.1	7.4	9.6	10.3	3.0	10.3
29-Aug	7.1	6.7	2.0	2.3	1.8	3.4	3.9	1.9	2.1	2.5	2.4	2.5	2.1	2.7	4.1	5.3	7.7	7.4	7.3	12.1	10.5	9.9	10.4	8.7	5.3	12.1
30-Aug	6.6	4.7	5.1	5.8	4.0	2.0	4.4	6.6	7.4	8.0	6.0	4.6	4.8	4.5	5.5	5.1	5.7	6.7	7.4	10.7	6.4	8.0	7.0	7.3	6.0	10.7
31-Aug	6.8	6.2	6.0	5.0	4.9	4.8	4.9	4.4	2.1	1.3	1.6	2.2	2.3	2.5	3.0	6.4	4.2	2.4	3.4	4.7	5.3	4.8	9.3	4.8	4.3	9.3
	16.2	15.0	14.9	14.8	15.1	16.9	13.9	14.1	15.8	15.7	14.2	14.1	13.4	11.7	10.9	11.7	13.7	12.1	11.8	11.6	12.6	13.0	13.8	13.9	Diurnal Average	
	94.2	78.3	78.6	80.6	76.4	107.6	102.5	123.0	168.2	191.6	177.8	149.5	118.4	84.2	66.4	63.2	165.4	124.0	90.4	70.3	71.4	70.0	66.0	68.8	Diurnal Maximum	

M - Maintenance

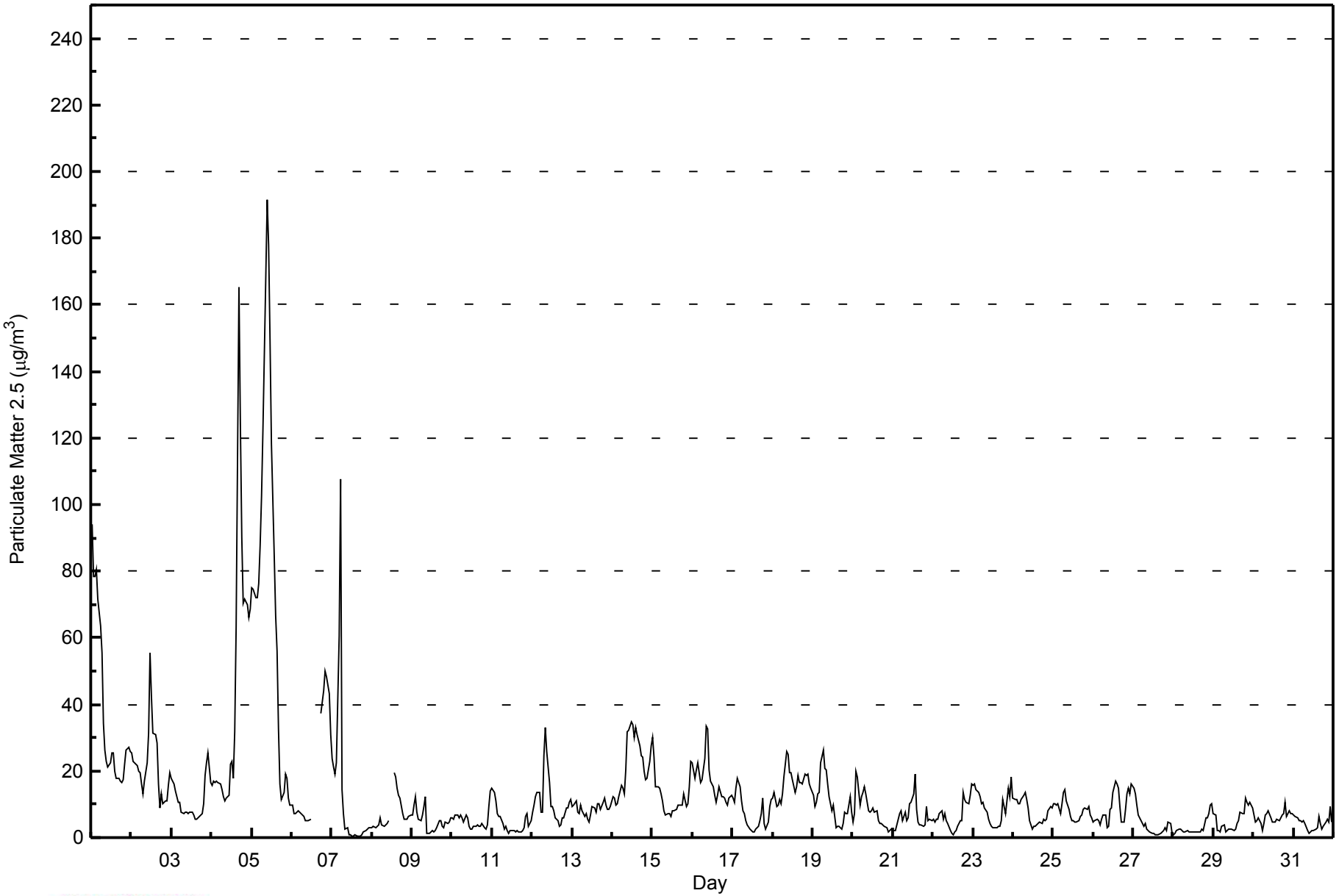
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	234	31.75	31.75
6 - 15	321	43.55	75.31
16 - 25	98	13.30	88.60
26 - 80	55	7.46	96.07
> 81.0	15	2.04	98.10

Total Number of Valid Hours: 737

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Patricia McInnes - August 2014

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	14	8	1	2	4	21	6	8	16	14	13	23	18	34	28	24	234
6 - 15	17	9	4	2	7	19	21	21	41	39	43	18	16	16	23	25	321
16 - 25	4	3	3	0	2	5	4	6	9	20	6	6	5	5	5	15	98
26 - 80	5	4	2	1	0	7	1	0	5	7	3	5	2	3	2	8	55
> 81.0	2	1	0	0	2	3	2	1	1	0	0	1	0	0	1	1	15
Totals	42	25	10	5	15	55	34	36	72	80	65	53	41	58	59	73	723

Total Number of Valid Hours: 737

Total Number of Hours: 744

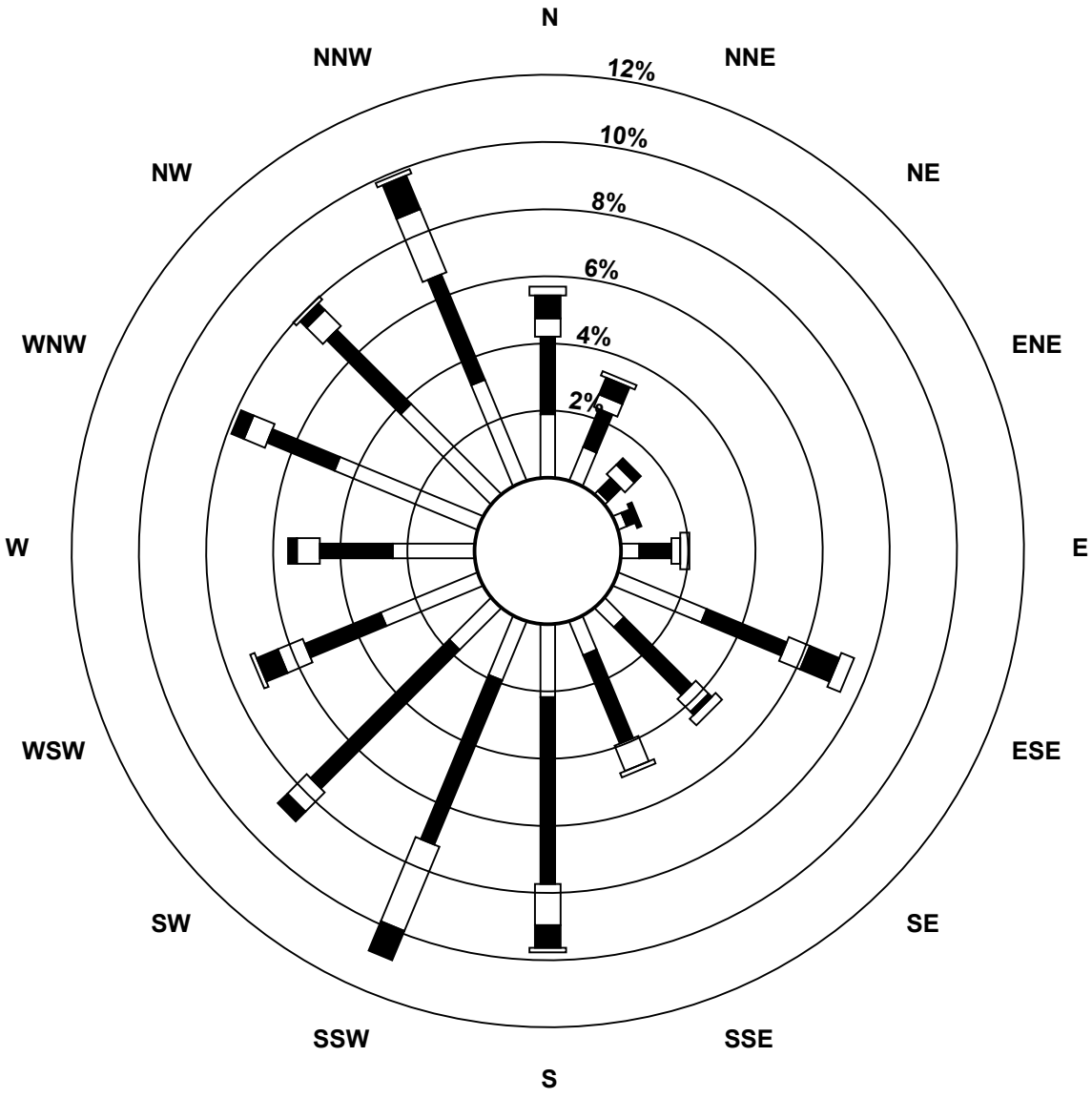
AURORA ATMOSPHERICS INC.

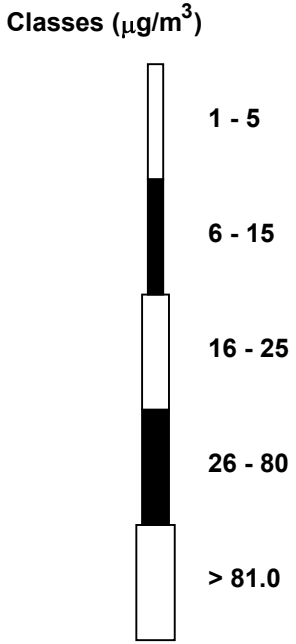
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Patricia McInnes (AMS 6)





Total Number of Valid Hours: 737

Maximum Value: 31.1 C on Aug 5 16:00

Maximum Daily Average: 24.2 C on Aug 13

Minimum Value: 0.0 C on Aug 22 06:00

Minimum Daily Average: 8.6 C on Aug 22

Maximum Diurnal Average: 23.4 C at hour 15

Minimum Diurnal Average: 11.3 C at hour 6

Monthly Average: 17.40 C

Percentiles: P_1 = 3.1 P_{10} = 9.1 Q_1 = 12.8 Median = 16.9 Q_3 = 22.1 P_{90} = 26.8 P_{99} = 30.4

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

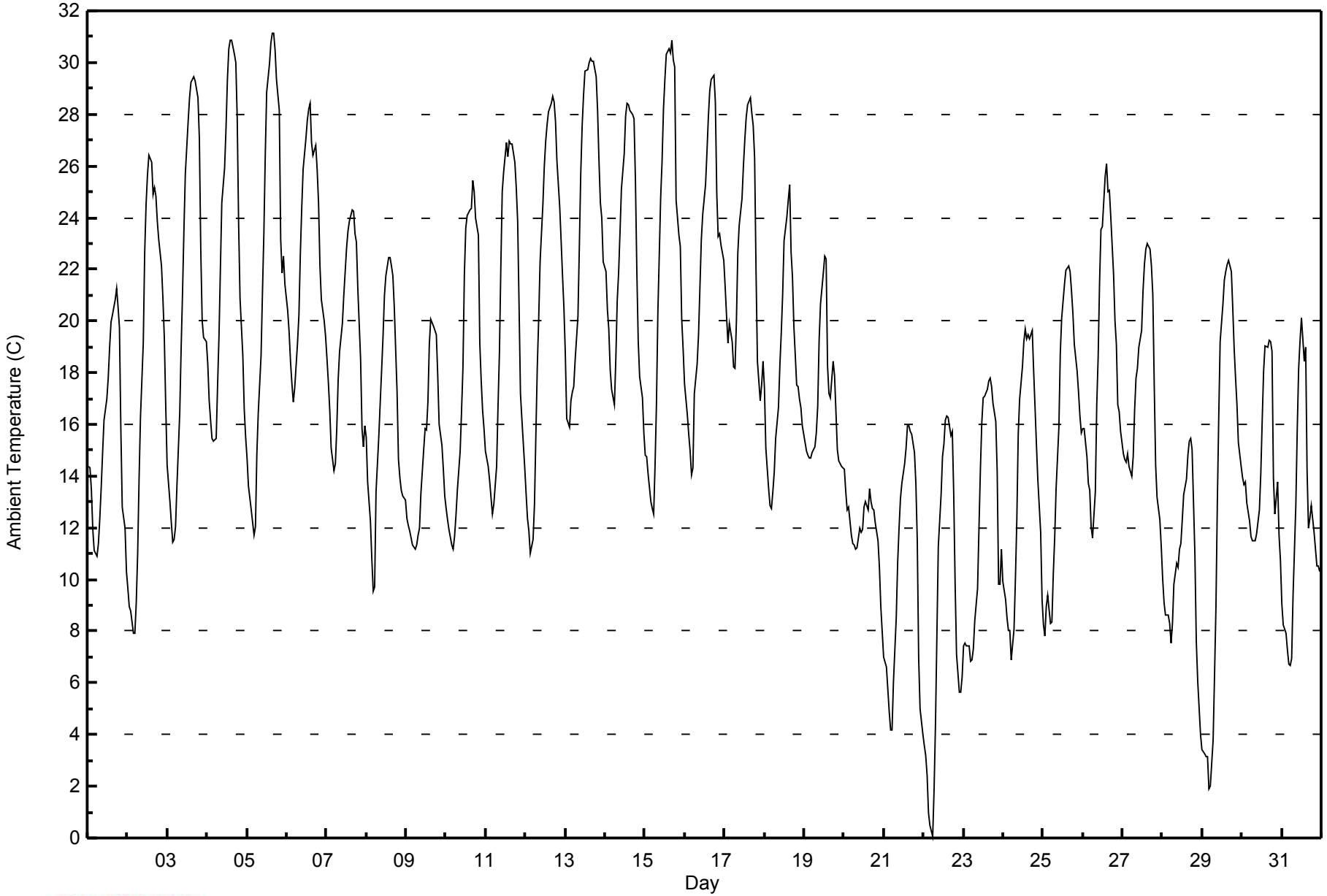
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.4	14.3	13.4	12.0	11.1	10.9	11.4	12.4	13.6	14.9	16.2	17.0	17.8	19.0	19.9	20.3	20.8	21.3	20.5	19.8	15.8	12.8	12.0	10.3	15.5	21.3
2-Aug	9.7	8.9	8.8	7.9	7.9	9.1	11.0	13.9	16.3	19.2	22.6	24.5	25.6	26.4	26.2	24.9	25.2	24.8	23.8	23.1	22.1	20.9	19.4	16.8	18.3	26.4
3-Aug	14.4	13.0	12.2	11.5	11.5	12.1	13.6	16.4	18.9	21.1	23.5	25.7	27.7	28.6	29.3	29.4	29.5	29.3	28.7	27.1	22.8	20.0	19.4	19.2	21.0	29.5
4-Aug	18.3	16.9	16.2	15.4	15.3	15.5	17.5	19.4	22.0	24.6	25.9	27.4	29.3	30.6	30.8	30.9	30.3	30.0	27.8	23.8	20.9	18.6	16.6	15.5	22.5	30.9
5-Aug	14.7	13.6	12.7	12.2	11.7	12.1	14.9	16.4	18.7	21.1	23.4	26.4	28.8	29.9	30.7	31.1	31.1	30.5	29.4	28.1	23.2	21.9	22.5	21.4	21.9	31.1
6-Aug	20.4	19.6	18.5	17.6	16.9	17.4	19.1	20.2	22.6	24.4	25.9	27.1	27.8	28.2	28.4	26.9	26.4	26.8	25.9	24.5	22.2	20.9	20.0	19.4	22.8	28.4
7-Aug	18.5	17.6	16.5	15.1	14.2	14.5	15.8	17.7	18.8	19.9	21.0	21.9	22.8	23.5	23.9	24.3	24.3	23.4	23.0	21.3	18.5	15.9	15.2	16.0	19.3	24.3
8-Aug	15.5	13.8	12.3	10.8	9.6	9.7	13.4	15.6	16.8	18.1	19.4	21.0	21.7	22.4	22.5	22.1	21.7	20.5	17.2	14.6	13.9	13.5	13.2	13.1	16.4	22.5
9-Aug	12.4	12.1	11.9	11.6	11.3	11.2	11.3	11.7	12.0	13.4	15.0	15.8	15.8	16.9	19.1	20.1	19.8	19.6	19.5	17.9	16.0	15.2	14.3	13.2	14.9	20.1
10-Aug	12.8	12.3	12.0	11.3	11.2	11.6	12.5	13.5	15.0	16.6	18.2	21.8	23.6	24.1	24.3	24.3	25.4	25.0	24.0	23.3	19.2	17.7	16.6	15.8	18.0	25.4
11-Aug	15.0	14.4	13.8	13.2	12.5	12.9	14.3	16.7	18.7	22.1	25.0	25.8	26.9	26.4	26.9	26.9	26.8	26.1	25.2	23.9	20.6	17.2	16.2	14.4	20.1	26.9
12-Aug	13.4	12.4	11.9	11.0	11.6	12.9	15.6	18.2	20.1	22.3	24.5	26.0	27.0	27.6	28.1	28.4	28.7	28.4	27.7	26.2	24.4	23.1	21.8	20.5	21.3	28.7
13-Aug	18.7	16.2	15.9	16.9	17.3	17.5	18.5	20.2	22.9	25.7	27.5	28.7	29.7	29.7	30.0	30.2	30.1	30.0	29.5	28.1	26.2	24.6	24.0	22.3	24.2	30.2
14-Aug	21.9	20.5	19.7	18.1	17.3	16.8	18.5	20.8	21.9	23.5	25.1	26.5	27.9	28.4	28.4	28.2	28.0	27.8	25.4	21.9	19.2	17.8	17.0	15.7	22.3	28.4
15-Aug	14.8	14.7	14.1	13.0	12.8	12.5	14.4	16.8	20.3	24.8	26.2	28.2	29.4	30.3	30.5	30.4	30.9	30.1	29.8	24.7	23.3	22.9	20.1	18.9	22.3	30.9
16-Aug	17.6	16.4	15.6	15.0	14.0	14.3	17.2	18.3	19.5	21.3	23.2	24.1	25.3	26.5	27.9	28.9	29.3	29.5	28.5	24.9	23.3	23.4	22.9	22.4	22.1	29.5
17-Aug	21.3	20.2	19.2	19.9	19.2	18.2	18.2	20.0	22.6	23.7	24.7	26.0	27.0	27.9	28.3	28.7	28.1	27.5	26.3	22.0	18.4	16.9	17.5	18.5	22.5	28.7
18-Aug	17.4	15.1	13.5	12.9	12.7	13.4	14.2	15.4	16.6	18.3	19.5	21.0	23.1	24.0	24.7	25.3	22.7	21.7	19.8	17.5	17.5	17.0	16.6	15.9	18.2	25.3
19-Aug	15.3	14.9	14.8	14.7	14.7	14.9	15.1	15.7	16.7	19.2	20.7	21.9	22.5	22.4	18.3	17.2	17.0	18.4	17.9	16.5	15.0	14.6	14.4	14.3	17.0	22.5
20-Aug	14.2	13.4	12.7	12.8	11.7	11.4	11.3	11.2	11.2	12.0	11.8	11.9	12.8	13.0	12.7	13.5	13.0	12.8	12.7	12.2	11.5	10.4	9.0	8.0	12.0	14.2
21-Aug	7.0	6.6	5.7	4.9	4.2	4.2	6.0	8.5	10.6	12.0	13.1	13.7	14.5	15.1	16.0	16.0	15.7	15.6	14.9	13.7	11.5	6.9	5.0	4.0	10.2	16.0
22-Aug	3.6	3.2	2.4	1.0	0.5	0.0	1.9	4.4	7.9	11.3	13.3	14.7	15.2	16.2	16.3	16.3	15.5	15.7	13.3	9.8	7.1	5.6	5.6	6.3	8.6	16.3
23-Aug	7.4	7.5	7.4	7.4	6.8	6.9	7.3	8.4	9.7	12.0	14.2	16.0	17.0	17.1	17.4	17.7	17.8	17.4	16.8	16.1	14.1	9.8	9.8	11.2	12.2	17.8
24-Aug	9.9	9.2	8.5	8.1	8.0	6.9	8.1	10.0	12.3	15.6	17.0	18.2	19.2	19.7	19.3	19.5	19.3	19.6	18.1	16.7	15.2	13.8	11.8	9.2	13.9	19.7
25-Aug	8.2	7.8	9.0	9.4	8.3	8.4	10.2	11.6	13.5	15.9	18.7	20.1	20.8	21.4	21.9	22.2	21.9	21.1	20.3	19.1	18.1	17.3	16.3	15.6	15.7	22.2
26-Aug	15.9	15.8	14.8	13.7	13.4	12.1	11.6	13.4	16.7	18.6	21.5	23.5	23.7	25.6	26.1	25.0	25.1	24.1	21.8	20.0	19.1	16.7	16.5	15.7	18.8	26.1
27-Aug	14.9	14.7	14.5	14.9	14.4	14.0	14.8	16.5	17.8	18.2	19.0	19.6	21.2	22.2	22.8	23.0	22.8	22.1	21.0	17.5	14.4	13.2	12.3	11.3	17.4	23.0
28-Aug	10.0	9.1	8.6	8.6	8.3	7.5	8.3	9.8	10.6	10.5	11.2	11.4	12.3	13.3	13.9	14.8	15.3	15.5	15.0	11.0	7.6	6.1	5.0	4.0	10.3	15.5
29-Aug	3.4	3.2	3.2	3.1	1.9	2.0	3.8	6.3	8.9	13.0	16.3	19.2	20.7	21.6	21.9	22.2	22.3	21.9	20.5	19.0	17.8	16.7	15.3	14.4	13.3	22.3
30-Aug	14.0	13.7	13.8	12.9	12.2	11.7	11.5	11.5	11.5	11.8	12.7	14.1	16.2	18.0	19.0	19.0	19.2	19.2	18.8	13.9	12.5	13.8	11.7	10.7	14.3	19.2
31-Aug	9.1	8.2	7.9	7.2	6.7	6.7	7.0	9.4	12.9	15.9	18.2	19.2	20.1	18.5	19.0	14.2	12.0	12.3	12.8	11.9	11.2	10.5	10.5	10.3	12.2	20.1
	13.7	12.9	12.3	11.7	11.3	11.3	12.5	14.2	16.1	18.1	19.8	21.2	22.4	23.0	23.4	23.3	23.1	22.8	21.8	19.7	17.5	16.0	15.1	14.3	Diurnal Average	
	21.9	20.5	19.7	19.9	19.2	18.2	19.1	20.8	22.9	25.7	27.5	28.7	29.7	30.6	30.8	31.1	31.1	30.5	29.8	28.1	26.2	24.6	24.0	22.4	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	88	11.83	11.83
10 - 20	407	54.70	66.53
> 20	249	33.47	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 98 % on Aug 29 05:00

Maximum Daily Average: 80.4 % on Aug 9

Minimum Value: 24 % on Aug 4 16:00

Minimum Daily Average: 51.9 % on Aug 17

Maximum Diurnal Average: 87.4 % at hour 5

Minimum Diurnal Average: 41.0 % at hour 15

Monthly Average: 65.4 %

Percentiles: P_1 = 26 P_{10} = 37 Q_1 = 48 Median = 67 Q_3 = 84 P_{90} = 92 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

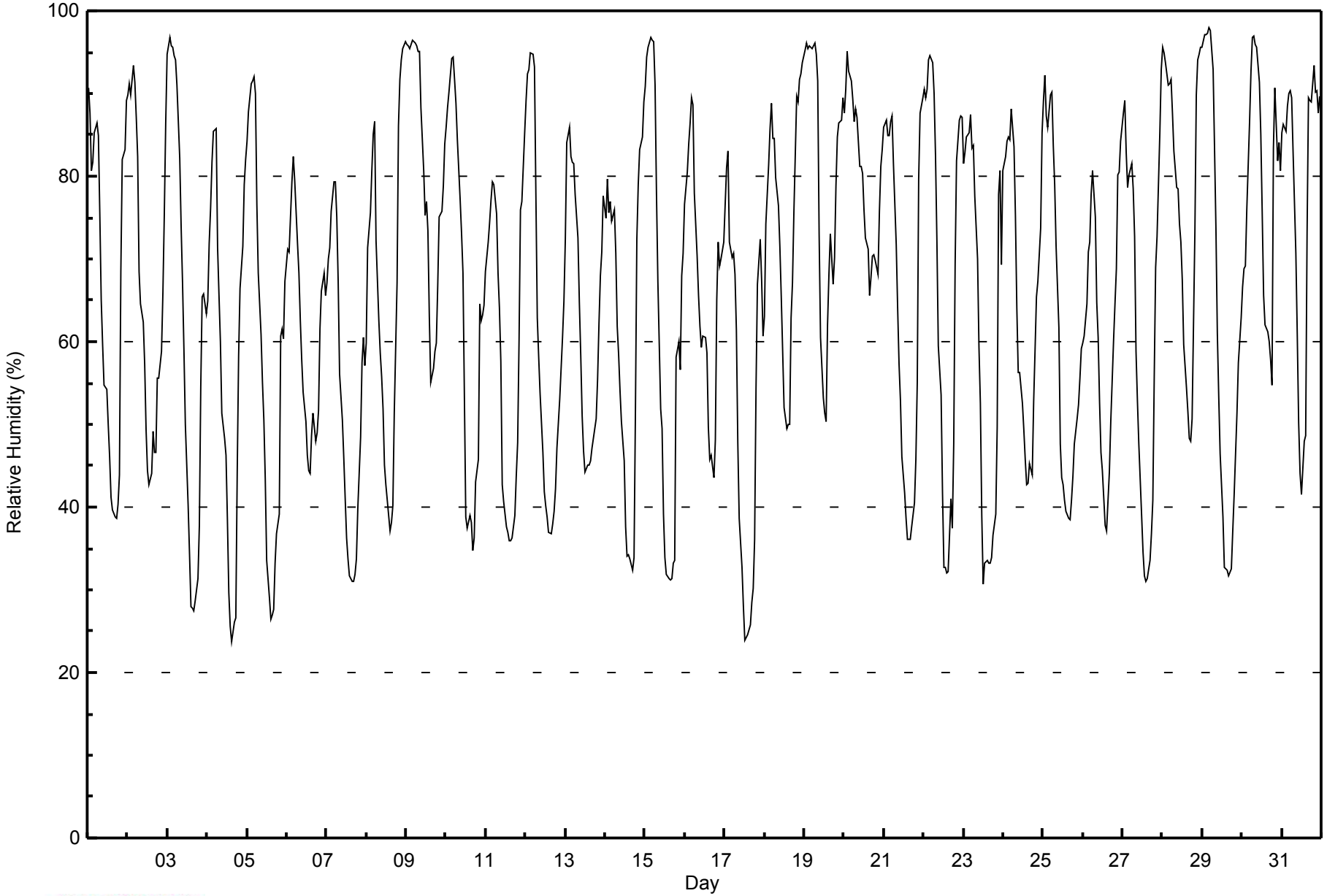
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	91	88	81	82	85	86	85	75	65	60	55	54	50	46	41	40	39	39	40	44	68	82	83	89	65.4	91
2-Aug	90	91	90	93	91	87	82	69	65	62	57	49	44	43	44	49	47	47	56	56	59	66	75	86	66.6	93
3-Aug	95	97	96	96	95	94	91	82	74	67	59	50	40	34	28	28	27	29	31	38	54	65	66	63	62.5	97
4-Aug	65	72	76	82	85	86	71	66	60	51	48	46	38	30	26	24	26	27	44	58	66	71	79	82	57.5	86
5-Aug	84	88	91	91	92	90	77	68	61	55	51	43	34	29	26	27	28	33	37	39	61	62	60	67	58.1	92
6-Aug	71	71	75	79	82	79	72	68	63	58	54	50	46	44	44	49	51	48	49	52	62	66	68	66	61.2	82
7-Aug	67	70	71	76	79	79	75	67	56	50	46	41	36	34	32	31	31	32	34	40	48	57	61	57	53.0	79
8-Aug	60	71	76	81	85	87	72	63	59	56	52	45	43	39	37	38	40	51	67	86	92	94	95	96	66.0	96
9-Aug	96	96	96	96	96	96	96	95	95	88	81	75	77	73	63	55	57	59	60	67	75	76	79	84	80.4	96
10-Aug	86	88	90	94	94	92	89	84	77	73	68	54	39	37	39	38	35	36	43	46	65	62	63	64	64.9	94
11-Aug	68	72	74	77	79	79	75	68	64	58	43	41	38	37	36	36	36	39	44	48	60	76	77	85	58.8	85
12-Aug	89	92	93	95	95	93	78	63	58	54	47	42	40	39	37	37	38	39	42	47	53	57	61	65	60.5	95
13-Aug	72	84	86	82	82	81	78	72	65	58	51	47	44	45	45	46	47	48	51	55	62	68	71	78	63.3	86
14-Aug	75	80	76	77	75	76	71	62	59	54	50	46	38	34	34	34	32	34	52	72	79	83	85	89	61.0	89
15-Aug	91	94	96	97	96	96	91	78	67	52	50	39	34	32	31	31	31	33	34	58	60	57	68	71	61.9	97
16-Aug	77	81	84	86	90	89	78	70	66	62	59	61	61	59	50	46	46	44	48	65	72	69	70	72	66.8	90
17-Aug	77	81	83	72	70	71	68	61	48	39	33	28	24	24	25	26	29	30	36	54	67	72	67	61	51.9	83
18-Aug	63	74	81	86	89	85	85	80	76	71	65	59	52	49	50	50	63	67	76	90	89	92	92	94	74.1	94
19-Aug	95	96	95	96	96	95	96	95	92	73	60	53	51	50	62	68	73	67	70	79	85	86	87	90	79.6	96
20-Aug	88	91	95	93	92	89	87	88	87	81	81	80	76	73	71	66	68	70	71	70	68	76	81	83	80.2	95
21-Aug	86	87	85	85	87	87	82	72	64	57	53	46	42	39	36	36	36	38	41	46	55	80	88	89	63.1	89
22-Aug	90	89	90	94	95	94	90	82	72	60	54	42	33	33	32	32	41	37	48	69	82	87	87	87	67.5	95
23-Aug	82	83	85	85	87	83	84	78	70	59	52	39	31	33	34	33	33	34	37	39	50	78	81	69	60.0	87
24-Aug	81	82	84	85	84	88	84	75	64	56	56	53	49	46	43	43	45	44	53	59	65	67	74	85	65.2	88
25-Aug	89	92	87	86	90	90	84	79	71	62	48	44	43	41	40	39	39	41	44	48	51	52	56	59	61.3	92
26-Aug	60	61	65	71	72	78	81	75	65	61	53	47	44	38	37	41	44	50	60	65	69	80	81	84	61.6	84
27-Aug	88	89	83	79	80	81	78	73	59	53	48	39	35	32	31	31	34	37	41	56	69	73	85	93	61.0	93
28-Aug	96	95	94	91	91	92	88	83	79	78	74	72	67	60	54	52	48	48	51	73	90	94	95	96	77.5	96
29-Aug	96	97	97	97	98	98	93	83	74	61	53	46	39	33	33	32	32	33	37	41	46	51	57	63	62.1	98
30-Aug	67	69	69	76	87	93	97	97	96	96	91	85	76	66	62	61	60	58	55	83	91	82	84	81	78.3	97
31-Aug	85	86	85	88	90	90	90	83	71	61	50	44	41	48	49	73	89	89	89	93	90	90	88	90	77.2	93
	81.2	84.1	84.8	86.1	87.4	87.3	82.7	76.0	69.0	62.1	56.2	50.3	45.3	42.5	41.0	41.6	43.4	44.5	49.6	59.2	67.8	73.3	76.2	78.7	Diurnal Average	
	96	97	97	97	98	98	97	97	96	96	91	85	77	73	71	73	89	89	89	93	92	94	95	96	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Patricia McInnes - August 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - August 2014

Maximum Speed: 27 km/h on Aug 7 12:00

Maximum Daily Speed Average: 15.1 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 5 04:00

Minimum Daily Speed Average: 0.7 km/h on Aug 15

Maximum Diurnal Speed Average: 3.7 km/h at hour 16

Minimum Diurnal Speed Average: 1.0 km/h at hour 10

Monthly Average Velocity: 2.3 km/h 256.8 deg

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 5$ Median = 8 $Q_3 = 11$ $P_{90} = 14$ $P_{99} = 21$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNW17	NNW17	N19	N15	NNW10	NNW7	NNW10	N14	NNE17	N13	NNE10	NNW15	N13	NNW9	NNW10	NNW10	N6	NE3	ESE6	SSE5	SSW4	SSW4	SSW2	SSW3	N7.9	N19
2-Aug	S3	S3	S3	SW3	SSW4	SSW4	SSW2	ESE5	SE7	SE6	ESE7	S13	SSW14	S17	S18	SSW16	SSW13	SSW15	SSW9	SSE7	S5	SSW9	SE3	S1	S7.1	S18
3-Aug	W3	W4	WSW4	WSW5	SW4	SSW4	SSW7	SSW9	SSW9	S7	SSE6	S2	W1	NNE3	NNW6	WSW8	SW4	S7	S9	S7	SSW5	SSW5	SSW5	SSW8	SSW4.1	SSW9
4-Aug	SSW4	SSE4	SSE4	S5	SSW7	SSW8	S6	SSW9	SSE3	ENE4	NNE7	N7	NNW7	NNE7	NNE9	NNE11	NNE12	N10	NW7	NW6	NNW5	ENE1	NW2	NNW1	N1.5	NNE12
5-Aug	WNW2	WNW3	WNW3	NNE0	WSW1	S2	SE6	SE7	SSE6	ESE7	E7	E8	ESE12	ESE13	ESE11	ESE11	ESE12	SSE13	SSE12	S9	SSW3	S5	SSW9	S8	SE5.4	ESE13
6-Aug	SSE7	S6	SSE8	SE7	SSE5	SE6	SE9	SSE8	S12	S11	S13	S15	SSW19	SW17	SW16	W12	NNW7	W13	WSW13	WSW8	SSW5	SW7	SW10	WSW15	SSW7.8	SSW19
7-Aug	SW15	WSW15	WSW10	SSW6	SW7	WSW11	WSW15	W20	W21	W21	W23	W27	W26	W25	W24	W22	WNW19	WNW16	W12	W8	W8	W7	W8	NW10	W15.1	W27
8-Aug	NW8	NW5	WNW5	SW5	WSW4	W3	NW4	NNW7	N6	N3	NNE5	NNE4	NE8	NE8	NE9	N9	NNE10	NNW6	WSW16	WSW14	WSW8	NW8	NNW9	N14	NNW4.1	WSW16
9-Aug	NNW15	NNW14	NNW12	N14	N11	NNW11	NW11	NW9	WNW8	WNW6	NNW11	NNW12	N10	NNW7	NW9	WNW10	N10	NNW2	SSW6	WSW7	WSW9	WSW9	WSW9	SW7	NW7.2	NNW15
10-Aug	SW6	S5	S5	SSE5	SSE3	S4	S4	S5	S8	SSW10	SSW8	SSE9	S11	W7	W6	S7	WSW6	WSW11	WSW7	SSW5	SW7	SW9	SW10	SW10	SSW6.0	WSW11
11-Aug	SW11	SW13	SW13	SW12	SSW9	SW10	SW10	SSW8	SW9	WSW6	NW9	WNW3	WNW12	NW14	NW14	NW16	NW15	NW13	NNW11	N10	NNW6	NNW6	NNW3	WNW5	W6.3	NW16
12-Aug	W3	NW5	NW3	WNW2	NW2	W2	ESE4	ESE6	ESE8	ESE8	ESE11	E12	ESE13	ESE14	ESE14	ESE14	ESE14	ESE14	ESE13	ESE11	ESE14	ESE17	ESE12	SE8	ESE7.8	ESE17
13-Aug	SE5	SE5	SE4	SE6	SE7	SE8	SE10	SE8	SSE6	SE7	S13	SSW16	SSW17	SW17	SW17	SW17	SW16	SSW14	SSW10	SSW10	SW10	SW10	WSW12	WSW8	SSW8.5	SW17
14-Aug	WNW10	WNW12	WNW12	WNW7	NW8	WNW5	NW5	NNW9	NNW9	NNW5	W3	WSW3	NNW6	N8	N9	N6	NE6	E4	SSE2	SW3	WSW3	SW4	S2	S2	NW4.1	WNW12
15-Aug	SSW3	SSW4	S2	SSW3	S2	SSW3	SSW4	S5	S5	E4	E6	E4	ESE4	WSW4	E1	NNE3	NNW3	N7	NE7	NW3	NNW10	NNW10	NW6	NW7	NNW0.7	NNW10
16-Aug	NNW5	NW5	WNW4	NNW6	NW5	NNW2	NNE4	E5	SE8	ESE7	E5	S6	SSW6	S8	SSW10	SW11	W7	WSW8	SSW8	SSW4	SW6	SW7	SW8	WSW9	SW3.0	SW11
17-Aug	SW10	WSW10	WSW7	WNW10	WNW11	WNW12	WNW10	W6	NNW8	NNW12	NW11	NW13	WNW16	WNW16	NW19	NW19	NW20	NW17	NW8	WNW6	WNW7	W5	SW3	S4	WNW9.4	NW20
18-Aug	SW5	SSW3	S3	S4	S4	S5	S6	SSE7	S7	WSW3	SW8	SSW12	SW14	SSW12	WSW8	NW8	NNW6	WNW9	NW13	W8	WSW8	W6	NNW10	W4	WSW4.5	SW14
19-Aug	W4	WNW4	WNW3	SW3	SW3	SSW5	NE1	SE6	WSW4	SSW3	SSE9	SSE8	SSE8	WNW7	NW24	NNW13	NNE10	NNW8	WNW7	W6	W4	NW5	NNW9	NNW12	NW3.0	NW24
20-Aug	N10	N6	NNW10	NNW15	N16	N16	N17	N15	N14	N15	NNW14	NNW17	N17	NNW17	N15	N14	N14	NNW12	NNW9	NNW9	NNW7	NW5	WNW7	WNW7	NNW12.0	N17
21-Aug	WNW7	WNW9	WNW9	WNW11	NW7	WNW7	WNW5	NNW8	NNW8	N11	NNW13	NNW11	NNW12	NNW12	NNW12	N11	NNE13	NNE11	NNE13	NNE11	NNE7	NNW5	WNW4	WNW5	NNW8.1	NNE13
22-Aug	WNW3	NW4	N1	SW3	SW3	SW3	SW2	S3	NW1	N5	NNE6	NNE9	N5	NNW7	NNW5	NW7	NW7	N12	NNW8	NW5	NW4	W3	W3	WNW3	NNW3.4	N12
23-Aug	W0	N1	ENE1	SSW2	S1	S3	SW3	ESE3	ESE4	E6	ESE9	ESE10	ESE10	SE10	ESE10	ESE10	ESE9	E8	ESE8	E7	E4	NE1	NW2	ESE3	ESE4.6	ESE10
24-Aug	NW2	NW4	NW4	WNW5	NNW4	NW4	NW3	NNW5	N4	NE4	NE7	ENE9	ESE9	E11	SE6	E8	ESE9	ESE11	ESE11	ESE7	ESE6	SE7	SSE4	SE3	E3.2	ESE11
25-Aug	SW4	SSW2	SE2	SSE4	SW4	SW5	SSW5	SE6	SE7	SSE10	S14	SSE15	S11	SSW17	SSW16	SSW17	SSW17	S14	S12	S9	S10	S10	SSE7	SSE5	S8.6	SSW17
26-Aug	SSW7	SSW9	S7	SSE6	SSE6	S6	SSW5	S7	S6	S10	SSW9	SSW11	SW7	S10	SSW15	SW20	SSW15	SW13	WSW6	NNE11	NE4	N2	N1	SW2	SSW6.1	SW20
27-Aug	SSW5	SW8	SW11	SW11	SW12	SW11	WSW7	W7	WNW15	NW18	WNW15	WNW13	W9	W9	W10	W15	W14	W11	W9	WNW7	WNW6	SW3	NW17	WNW4	W8.7	NW18
28-Aug	SW8	SW7	W10	W10	WNW4	W8	W8	WNW11	WNW14	WNW15	WNW14	WNW12	NW13	NW14	NW12	NNW10	NNW11	N7	NNW3	S1	WNW3	W2	WNW3	WSW2	WNW7.2	WNW15
29-Aug	S2	SSW4	S3	S3	SSW3	SSE4	SSE5	SE8	SE7	SE5	SE8	ESE8	ESE10	S10	S10	SSE10	S10	SSE14	S10	SSE7	SE9	SE8	ESE9	ESE10	SSE6.6	SSE14
30-Aug	SE8	ESE10	ESE11	SE8	SSE6	ESE3	ESE6	SSW7	SW8	WSW7	W9	WNW9	NW7	NNW4	NNE6	ENE9	NNE9	NNE7	E4	SSW3	WSW6	WSW2	WSW7	SW7	S0.9	ESE11
31-Aug	W3	SW8	SSW6	SSW5	SW6	SSW7	SSW9	SSW7	SW10	SW10	WSW11	WSW10	WSW9	WSW13	WSW11	NW17	WSW5	WSW8	SW7	WSW9	WSW8	WSW8	SSW4	E4	WSW6.9	NW17
	W2.9	W3.1	W2.4	WSW2.3	WSW2.2	WSW2.7	WSW2.0	SW1.5	WSW1.6	W1.0	W1.2	WSW2.0	WSW2.3	W3.2	W3.7	WNW3.7	NW2.6	W2.4	SW2.3	SW2.0	WSW2.6	SW2.9	WSW2.9	WSW2.6	Diurnal Average	
	NNW17	NNW17	N19	NNW15	N16	N16	N17	W20	W21	W21	W23	W27	W26	W25	NW24	W22	NW20	NW17	WSW16	WSW14	ESE14	ESE17	NW17	WSW15	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 10 km/h on Aug 19 14:00

Minimum Value: 0 km/h on Aug 28 21:00

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

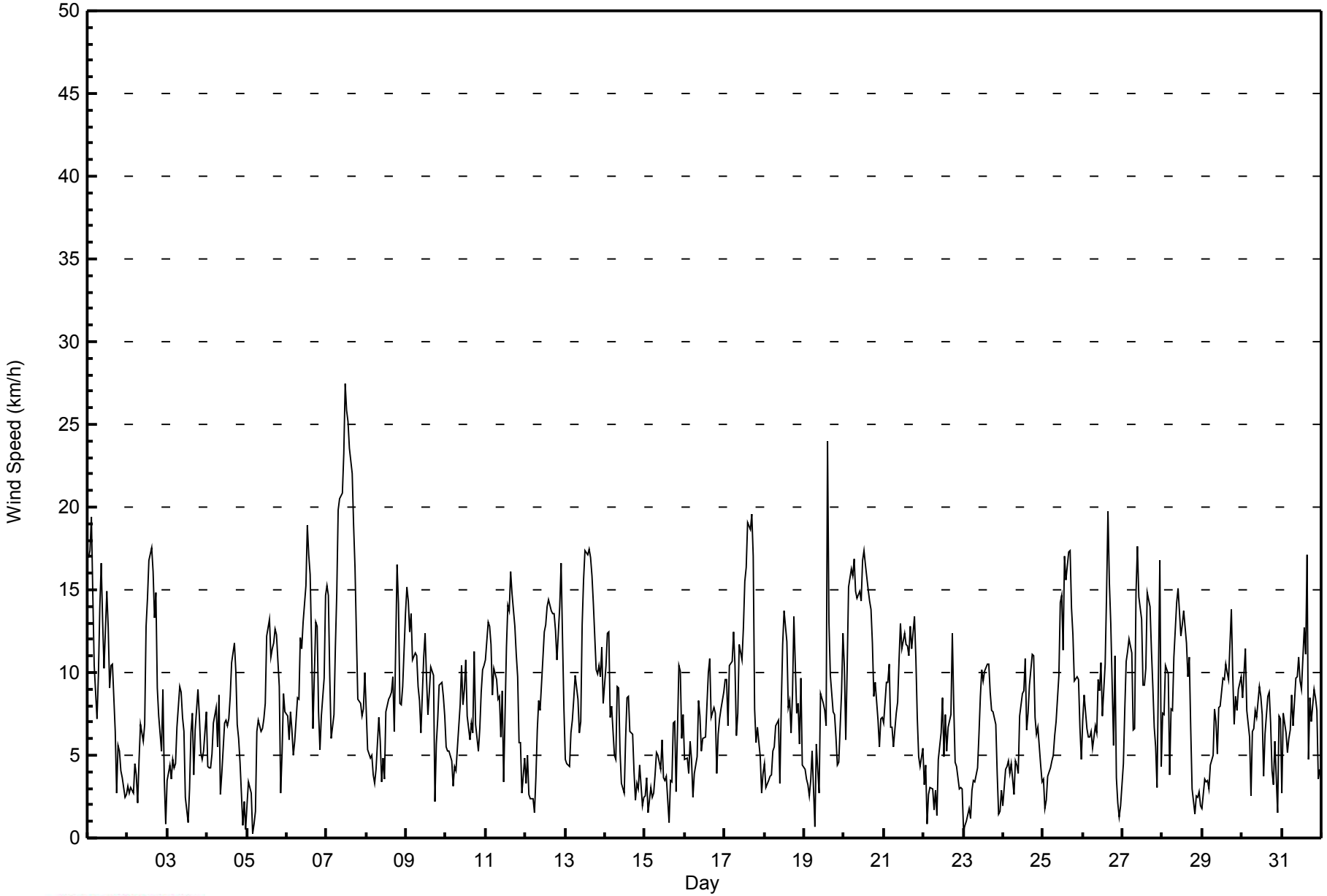
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	3	4	5	4	3	1	2	4	4	4	4	5	4	3	4	4	3	2	2	1	1	2	1	1	5
2-Aug	1	1	1	1	1	1	2	2	2	2	3	4	4	4	4	4	4	4	2	2	1	2	3	2	4
3-Aug	1	2	1	1	1	1	2	2	2	2	2	2	2	3	3	3	2	2	2	2	1	1	1	1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

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Patricia McInnes - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	229	30.78	30.78
6 - 11	361	48.52	79.30
12 - 19	142	19.09	98.39
20 - 28	12	1.61	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Patricia McInnes - August 2014

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	6	5	3	8	9	6	13	32	35	19	12	16	21	22	14	229
6 - 11	18	16	6	2	6	33	28	19	30	30	35	33	22	24	19	40	361
12 - 19	17	4	0	0	1	13	0	4	10	16	13	8	5	15	16	20	142
20 - 28	0	0	0	0	0	0	0	0	0	0	1	0	9	0	2	0	12
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	26	11	5	15	55	34	36	72	81	68	53	52	60	59	74	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

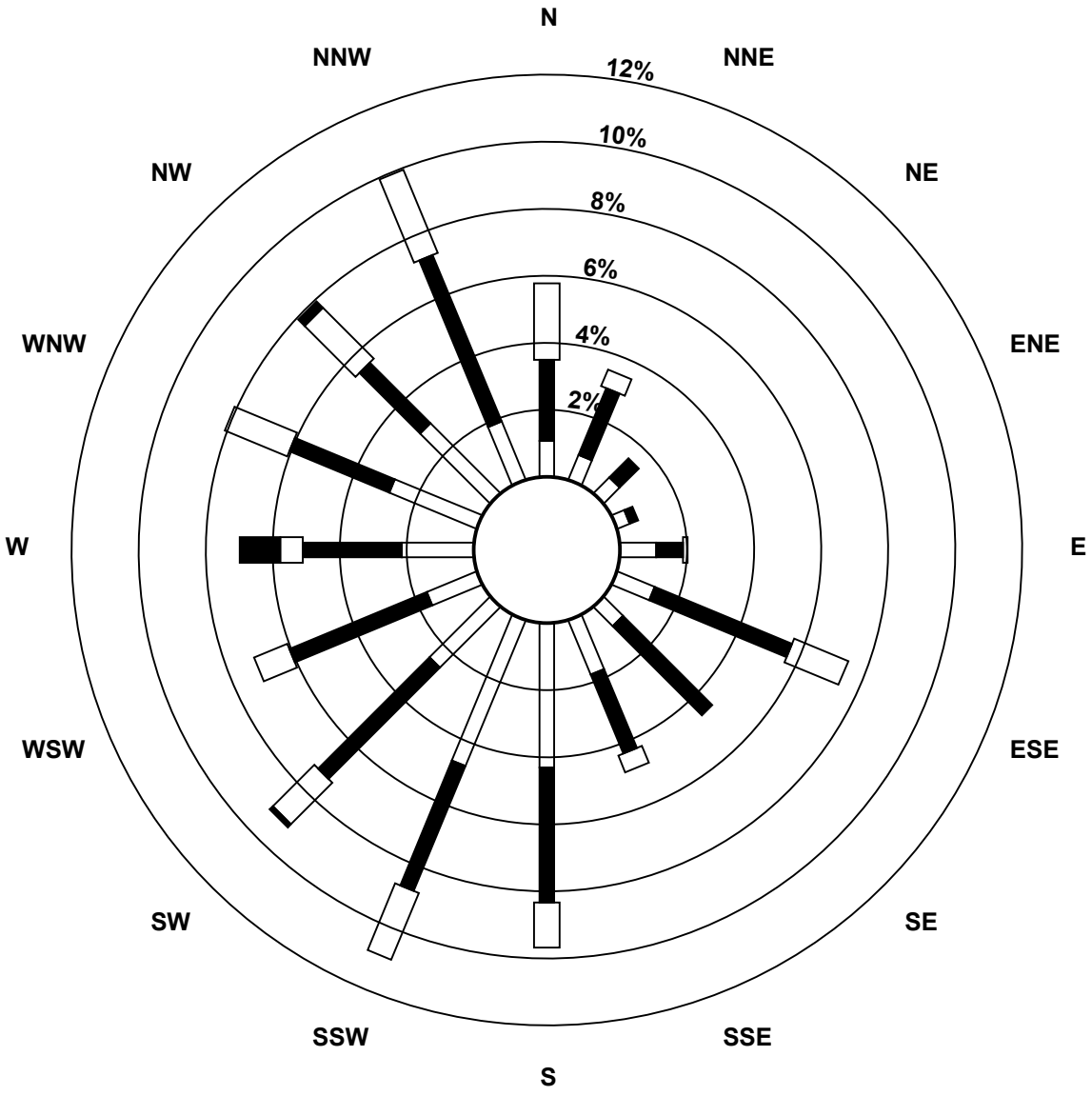
AURORA ATMOSPHERICS INC.

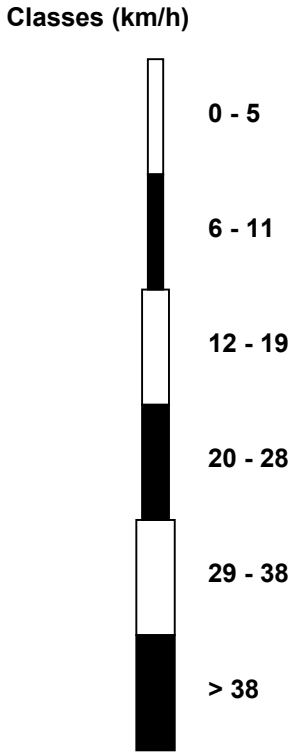
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Patricia McInnes (AMS 6)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 262 deg on Aug 7 12:00
Direction of Maximum Daily Speed Average: 264.2 deg on Aug 7

Direction of Minimum Speed: 29 deg on Aug 5 04:00

Direction of Minimum Daily Speed Average: 0.7 deg on Aug 15

Monthly Average Direction: 269.7 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	338	346	354	355	346	343	342	3	12	3	19	340	349	347	327	334	355	44	123	161	202	212	192	201	350.8
2-Aug	182	175	169	214	193	194	193	120	146	137	115	172	197	180	183	195	197	200	212	160	187	201	145	170	181.9
3-Aug	265	277	243	250	216	195	206	208	195	170	154	184	280	14	343	257	218	183	171	181	211	212	201	207	207.7
4-Aug	200	154	164	181	192	196	171	205	163	67	29	352	327	18	29	28	16	358	321	325	339	72	310	341	2.9
5-Aug	288	286	288	29	247	173	128	138	147	121	92	101	116	104	114	112	110	149	156	173	198	170	208	185	136.5
6-Aug	164	180	147	146	150	139	137	151	181	172	176	187	199	222	215	262	327	268	253	241	200	223	229	239	203.6
7-Aug	233	242	241	194	233	246	255	262	266	271	268	262	265	264	275	277	283	282	276	261	263	262	270	307	264.2
8-Aug	317	315	286	225	248	275	313	338	11	353	15	29	42	36	42	11	13	330	239	237	242	313	340	354	327.0
9-Aug	346	344	346	350	355	337	322	321	301	292	330	329	349	348	316	294	349	348	196	246	242	242	237	231	318.6
10-Aug	219	178	180	164	165	181	178	180	174	209	212	157	181	261	278	170	252	243	244	194	223	232	231	228	208.8
11-Aug	226	228	229	221	208	219	216	208	216	255	314	297	301	311	304	318	313	326	339	7	342	328	335	293	279.7
12-Aug	272	309	325	292	320	280	112	107	118	103	106	101	106	104	102	105	116	118	103	103	116	119	123	131	109.5
13-Aug	138	124	143	137	134	137	131	142	152	135	184	194	199	220	222	219	219	205	209	198	215	236	247	255	195.6
14-Aug	294	291	299	301	306	295	307	339	340	332	262	239	340	0	1	360	37	101	149	233	254	223	183	181	314.9
15-Aug	207	204	182	206	188	212	196	173	169	95	100	85	113	251	90	16	345	11	40	321	327	342	316	310	341.3
16-Aug	338	312	299	343	323	329	25	99	130	115	101	183	192	186	203	230	262	247	192	206	227	231	233	237	219.9
17-Aug	219	244	249	303	298	293	294	278	342	344	324	306	303	299	305	309	313	309	306	292	298	263	230	176	298.6
18-Aug	217	197	186	183	186	187	181	161	169	249	234	202	232	209	258	310	343	297	309	268	247	278	327	279	243.1
19-Aug	275	300	298	231	217	204	40	141	239	194	158	160	164	294	326	340	19	338	302	273	275	320	328	344	304.9
20-Aug	357	354	334	335	349	352	5	4	357	1	343	340	350	347	351	355	352	333	334	337	327	307	295	293	345.6
21-Aug	303	302	302	303	306	300	303	333	345	350	345	345	338	337	338	5	27	14	20	21	18	331	295	297	340.6
22-Aug	283	310	353	234	229	227	227	189	313	5	29	12	355	328	347	319	307	358	342	320	305	273	271	290	326.4
23-Aug	260	9	65	192	189	171	219	123	117	101	121	118	109	128	117	112	122	99	103	101	101	36	316	122	116.1
24-Aug	325	313	326	303	340	307	307	333	4	43	45	68	108	97	139	97	112	111	116	117	114	144	157	130	90.9
25-Aug	229	192	134	150	214	215	209	125	142	148	169	160	170	204	193	194	193	189	173	171	182	184	162	154	179.3
26-Aug	195	203	183	158	165	179	205	182	189	181	197	195	236	190	213	219	208	233	256	20	46	352	360	221	202.7
27-Aug	207	216	222	226	230	227	250	278	302	308	300	289	275	272	270	278	265	260	261	296	300	219	321	294	271.2
28-Aug	235	231	261	271	301	272	272	291	292	297	294	290	326	310	317	330	339	360	338	169	283	278	298	250	295.4
29-Aug	191	195	190	171	197	153	166	138	129	129	135	109	113	172	178	155	177	157	180	153	136	133	115	121	149.4
30-Aug	129	121	118	143	150	107	118	207	234	238	278	287	317	338	28	57	22	29	99	210	250	258	254	222	174.1
31-Aug	259	215	205	205	221	203	208	203	221	229	247	242	252	248	249	309	255	243	217	244	249	237	204	99	236.7
	260.2	260.4	260.4	255.5	252.0	240.6	236.5	216.7	237.5	276.7	267.9	240.4	256.6	262.3	278.1	291.5	309.1	273.1	235.3	229.0	241.4	236.0	257.0	248.6	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 107 deg on Aug 3 13:00

Minimum Value: 5 deg on Aug 27 21:00

Percentiles: P_1 = 7 P_{10} = 12 Q_1 = 15 Median = 20 Q_3 = 32 P_{90} = 52 P_{99} = 96

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

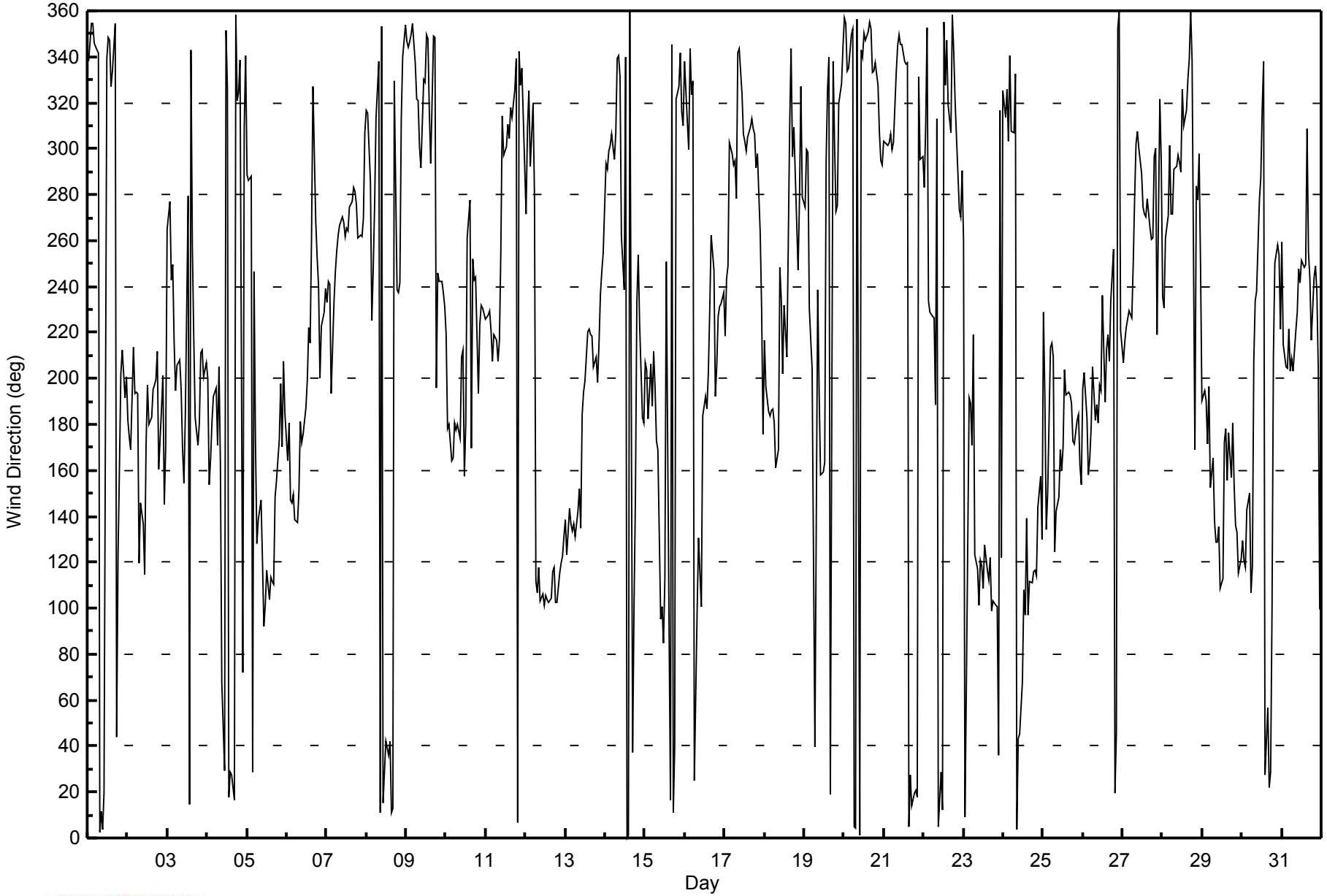
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	11	13	16	14	13	18	13	15	16	22	33	22	29	38	26	27	50	80	63	31	16	18	36	24	80
2-Aug	15	27	19	24	12	20	82	40	21	28	38	24	23	19	21	18	24	19	17	19	16	17	70	86	86
3-Aug	25	30	36	17	27	20	18	19	24	33	35	82	107	83	55	32	72	47	16	14	12	13	12	13	107
4-Aug	43	16	13	18	22	16	31	17	88	54	40	35	37	40	35	24	17	16	12	11	14	96	54	86	96
5-Aug	63	33	45	92	74	62	19	15	23	28	28	22	20	19	26	23	21	17	18	12	36	32	16	25	92
6-Aug	16	15	12	11	17	12	13	24	20	22	24	26	21	25	22	51	28	18	11	12	9	8	7	9	51
7-Aug	16	12	17	25	20	12	11	13	15	17	17	17	18	19	17	19	15	16	11	7	22	8	9	15	25
8-Aug	17	22	53	19	26	33	20	19	37	82	97	92	55	44	31	23	14	40	25	11	19	30	15	14	97
9-Aug	13	14	14	14	14	10	10	11	14	26	17	22	18	34	43	21	18	87	26	13	7	7	10	9	87
10-Aug	19	15	19	24	30	22	24	18	14	20	24	32	31	42	33	42	74	20	23	19	14	6	6	7	74
11-Aug	7	7	8	10	16	13	14	16	18	25	43	79	33	16	30	15	15	13	14	15	12	9	31	20	79
12-Aug	40	8	35	40	43	41	64	22	26	24	18	20	21	21	18	18	17	15	14	13	13	12	15	15	64
13-Aug	12	10	19	16	15	12	13	14	19	32	23	21	19	21	20	18	14	17	14	16	11	26	16	12	32
14-Aug	13	8	7	9	8	15	16	15	18	45	66	72	54	47	29	40	33	43	56	17	17	22	46	32	72
15-Aug	46	23	57	18	47	21	20	25	23	38	34	65	85	66	100	86	73	45	19	42	13	12	14	11	100
16-Aug	11	23	23	12	9	53	39	36	18	24	38	37	33	26	28	21	25	24	18	16	13	14	18	12	53
17-Aug	20	12	18	13	10	6	7	25	22	21	24	20	20	18	18	18	14	13	17	5	10	22	47	37	47
18-Aug	24	30	32	23	22	15	19	14	17	65	26	31	23	23	29	33	56	41	17	18	11	24	13	26	65
19-Aug	21	23	22	34	46	28	98	26	44	67	31	35	40	76	12	19	34	36	15	16	20	31	13	13	98
20-Aug	14	42	11	11	16	15	15	15	17	17	15	13	17	23	23	18	16	13	12	14	10	12	5	8	42
21-Aug	12	7	7	6	9	7	15	21	18	21	23	41	31	34	33	32	26	22	14	12	20	10	29	8	41
22-Aug	27	21	77	38	17	15	36	30	84	33	33	31	69	60	60	51	21	23	13	13	19	43	47	49	84
23-Aug	85	94	97	76	86	53	38	44	24	21	22	23	33	26	29	27	30	21	14	10	52	40	70	33	97
24-Aug	54	16	12	16	16	7	34	20	28	60	34	38	45	26	42	30	16	18	12	11	13	16	24	29	60
25-Aug	32	51	41	38	17	18	29	17	27	18	24	21	36	22	22	21	20	17	13	13	13	15	18	22	51
26-Aug	17	13	12	15	13	18	15	20	32	19	26	27	54	32	26	15	19	17	31	14	59	99	95	66	99
27-Aug	11	12	8	10	11	11	38	30	13	13	19	23	37	35	36	25	17	15	10	10	5	34	38	43	43
28-Aug	15	17	15	18	27	9	15	19	13	15	17	17	16	18	20	32	33	32	55	83	21	31	19	36	83
29-Aug	41	17	48	23	19	18	17	17	18	30	27	29	31	37	27	25	17	15	14	18	10	12	13	13	48
30-Aug	14	15	14	18	30	80	15	28	12	17	13	22	34	73	43	28	68	18	37	30	35	87	23	24	87
31-Aug	60	20	24	18	13	21	16	29	16	26	18	28	26	11	32	29	58	15	19	14	18	14	51	54	60
	85	94	97	92	86	80	98	44	88	82	97	92	107	83	100	86	74	87	63	83	59	99	95	86	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Patricia McInnes - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	8:20	End Time (MST)	14:45
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	-670	-678
Analyzer Range (mv)	1000	1000	Lamp voltage	753	773
Calculated slope	0.993129	1.000674	Chamber temp.	45.1	45.3
Calculated intercept	-0.257209	0.917151	Pressure (mmHg)	697.0	692.2
Analyzer Background	4.7	5.4	Flow (lpm)	0.438	0.434
Analyzer Coefficient	1.144	1.010	Intensity	93	90

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	0.2	NA
as found span	5000	55.3	519.8	520.2	0.999
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	55.3	519.8	518.8	1.002
second point	5000	27.7	260.4	259.5	1.003
third point	5000	13.9	130.7	128.3	1.018
calibrator zero	5000	0.0	0.0	0.0	NA
as left zero	5000	0.0	0.0	-0.1	NA
as left span	5000	55.3	519.8	516.6	1.006
				Average Correction Factor	1.008

Corrected As found	520.1	Previous response	523.7	% change	0.7%

Notes:

Updated firmware. Adjusted flash lamp voltage, initial flash reference, and PMT voltage - to address lamp voltage alarm. Adjusted zero and span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

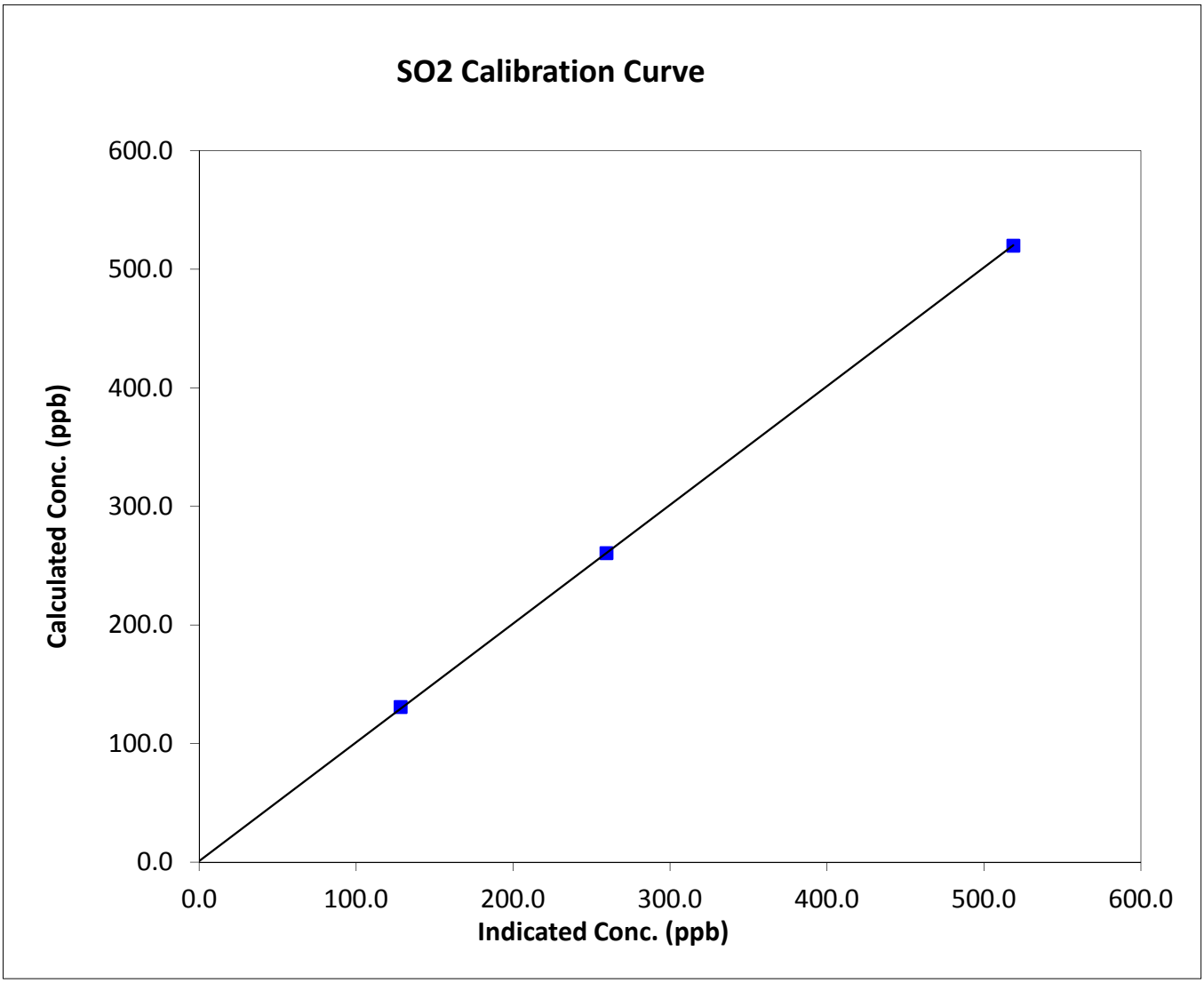
SO_2 Calibration Summary

Station Information

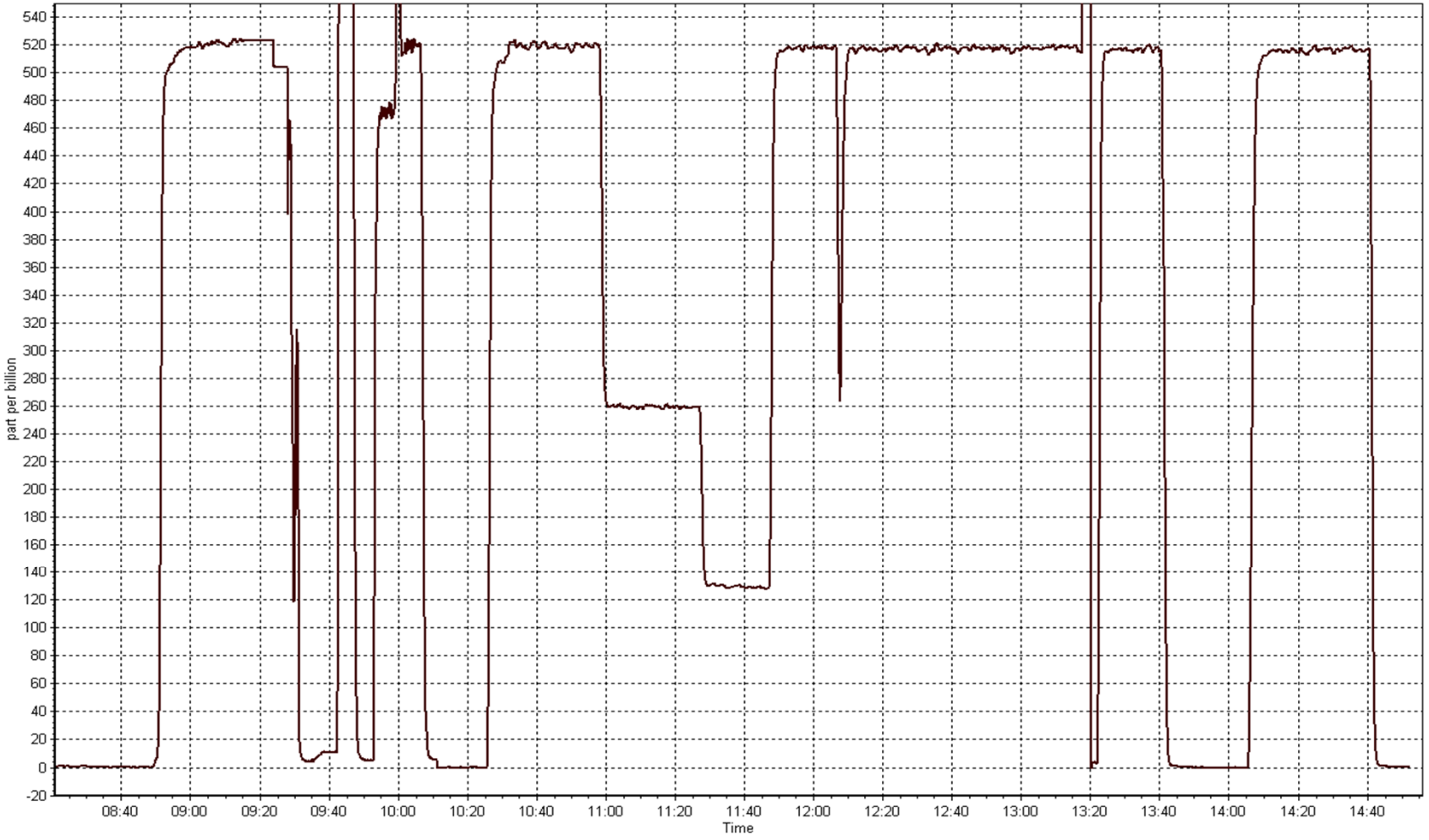
Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	14:45
Analyzer make	Thermo 43i	Analyzer serial #	1008841397

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999982
519.8	518.8	1.0020		
260.4	259.5	1.0034	Slope	1.000674
130.7	128.3	1.0182		
			Intercept	0.917151



SO2 Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 8, 2014	Previous Calibration	July 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	12:45	End Time (MST)	15:15
Barometric Pressure	727.5 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	-657	-657
Analyzer Range (input)	100	100	Lamp voltage	846	850
Calculated slope	0.989662	1.010074	Chamber temp.	45	45
Calculated intercept	0.145132	-0.046107	Pressure	689.7	694.0
Analyzer Background	14	14	Flow	0.470	0.473
Analyzer Coefficient	1.208	1.208	Intensity	114	114
			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	0.1	NA
as found span	5000	72.3	70.0	69.4	1.009
SO2 scrubber check	5000	21.3	200.2	0.1	NA
calibrator zero	5000	0.0	0.0	0.1	NA
high point	5000	72.3	70.0	69.4	1.009
second point	5000	36.3	35.1	34.7	1.011
third point	5000	18.7	18.1	18.0	1.007
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	72.3	70.0	70.2	0.997
				Average Correction Factor	1.009

Corrected As found	69.3	Previous response	70.6	% change	1.9%

Notes:

No adjustments or maintenance performed.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

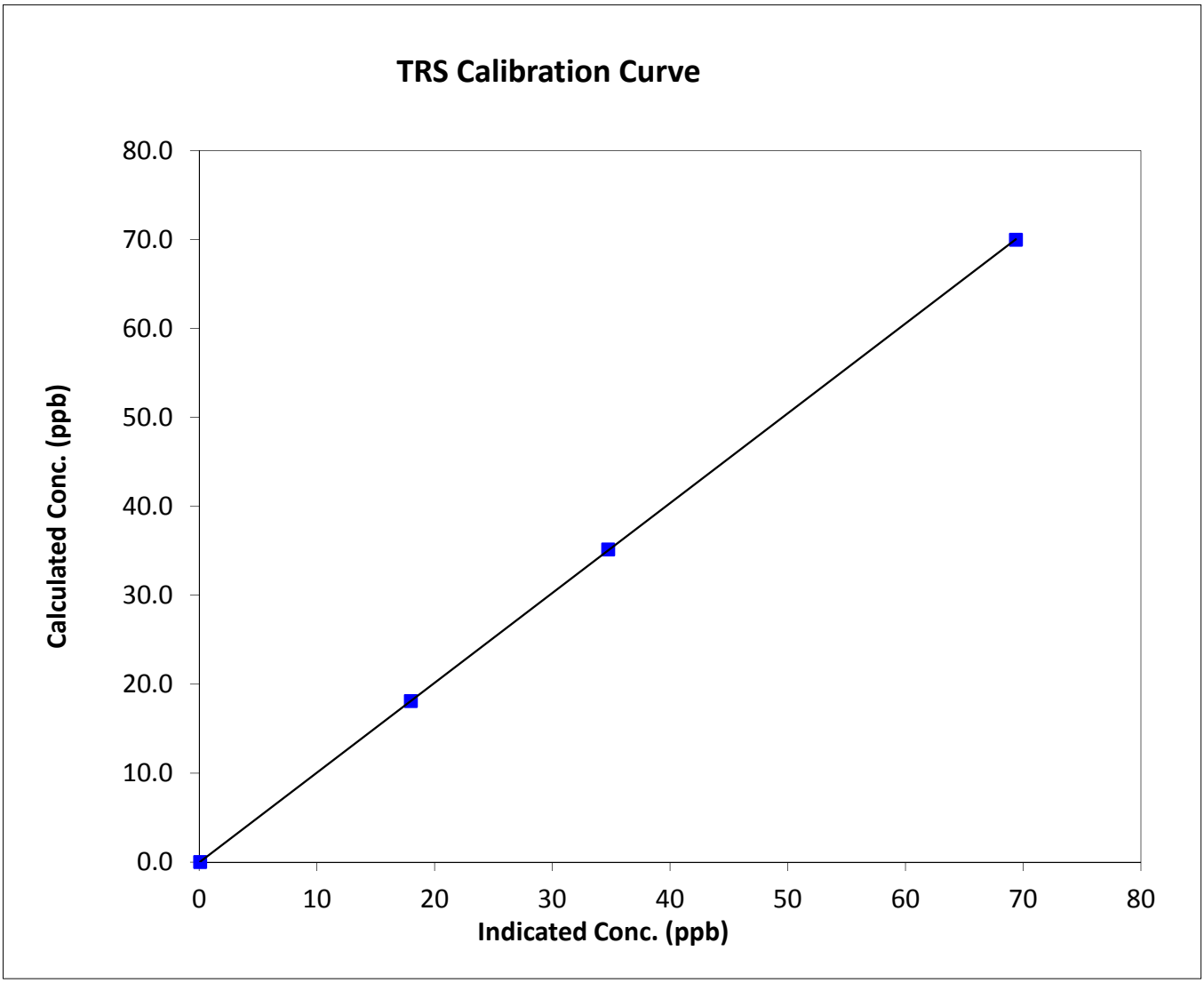
TRS Calibration Summary

Station Information

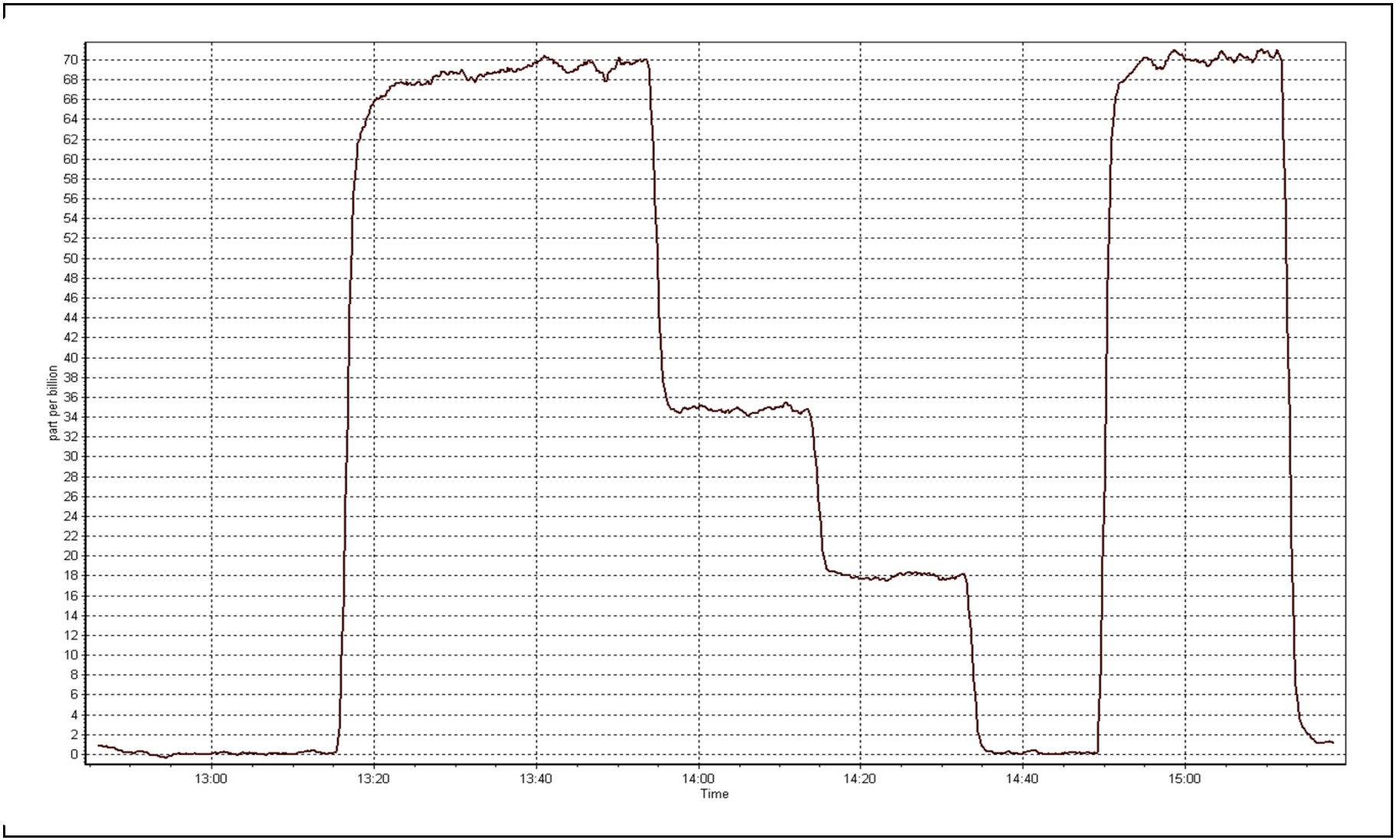
Calibration Date	August 8, 2014	Previous Calibration	July 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	12:45	End Time (MST)	15:15
Analyzer make	TEI 43i	Analyzer serial #	1008841398

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999995
70.0	69.4	1.0087		
35.1	34.7	1.0115	Slope	1.010074
18.1	18.0	1.0073		
			Intercept	-0.046107



TRS Calibration Plot Date: August 8, 2014



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Wednesday, August 06, 2014	Prev Calibration	Wednesday, July 02, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	8:20	End Time (MST)	14:45
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	Monday, December 12, 2016
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*
THC Range (ppm)	50	50	Internal Temp	36.5	37.7
THC Range (input)	50	50	Flame Temp	405.0	405.0
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	0.998954	1.003126	Air Pressure	32.4	32.4
THC Calc intercept	0.012011	-0.010016			
NMHC Calc slope	0.998708	1.007118			
NMHC Calc intercept	0.012029	-0.014039			

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	11.96	1.010
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	55.3	12.08	12.05	1.003
second point	5000	27.7	6.05	6.04	1.002
third point	5000	13.8	3.01	3.03	0.995
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	55.3	12.08	12.01	1.006
				Average Correction Factor	1.000

Corrected As found	11.96	Previous response	12.08	% change	1.0%

Notes:

no adjustments required.

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	6.34	1.012
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	55.3	6.42	6.38	1.006
second point	5000	27.7	3.21	3.21	1.001
third point	5000	13.8	1.60	1.62	0.989
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	55.3	6.42	6.35	1.011
				Average Correction Factor	0.999

Corrected As found	6.34	Previous response	6.41	% change	1.2%

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	5.62	1.008
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	55.3	5.66	5.67	0.999
second point	5000	27.7	2.84	2.83	1.002
third point	5000	13.8	1.41	1.41	1.002
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	55.3	5.66	5.67	0.999
				Average Correction Factor	

Corrected As found	5.62	Previous response	5.67	% change	0.8%

Wood Buffalo Environmental Association

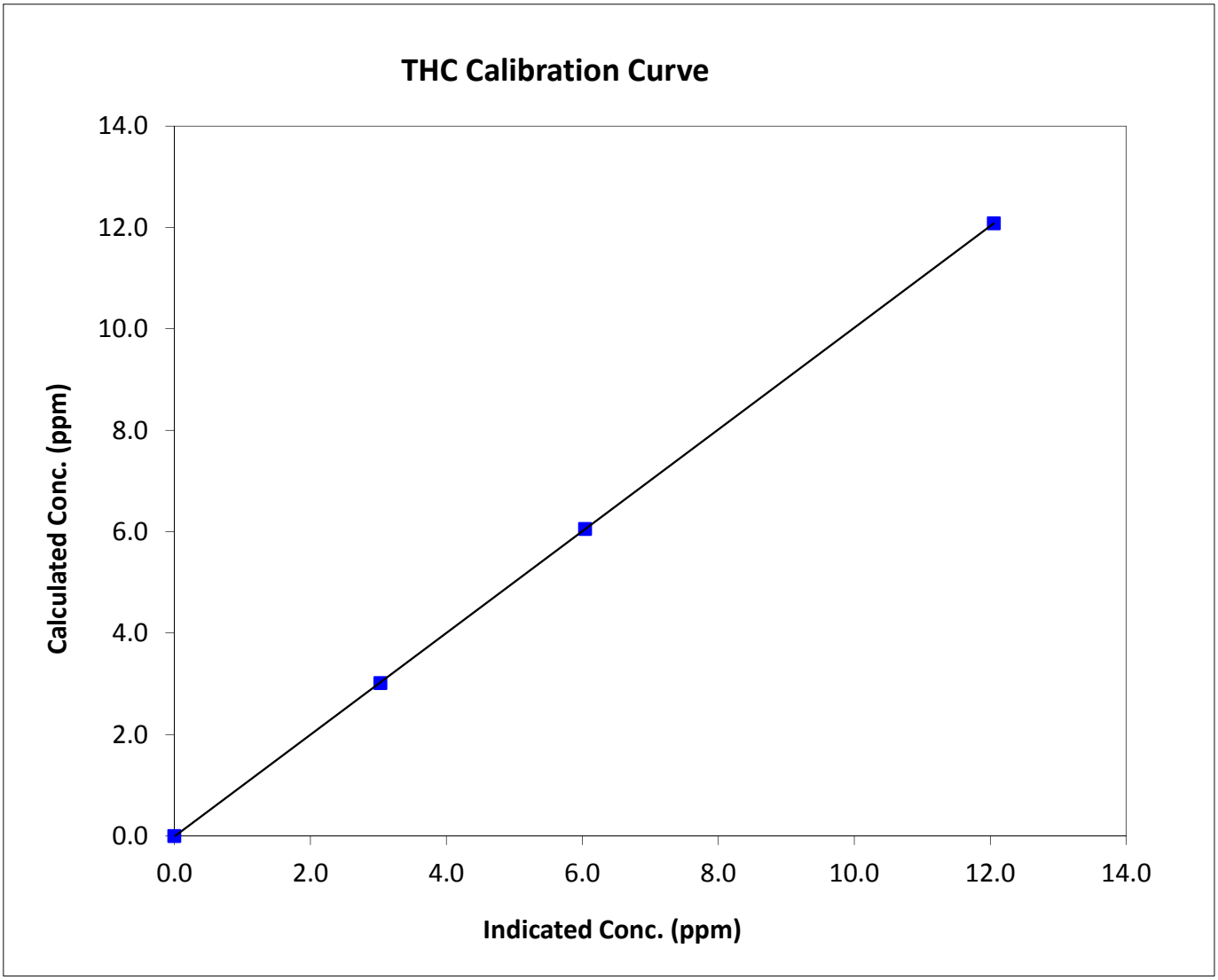
THC Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	14:45
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	0.999996
12.08	12.05	1.0025		
6.05	6.04	1.0018	Slope	1.003126
3.01	3.03	0.9949		
			Intercept	-0.010016



Wood Buffalo Environmental Association

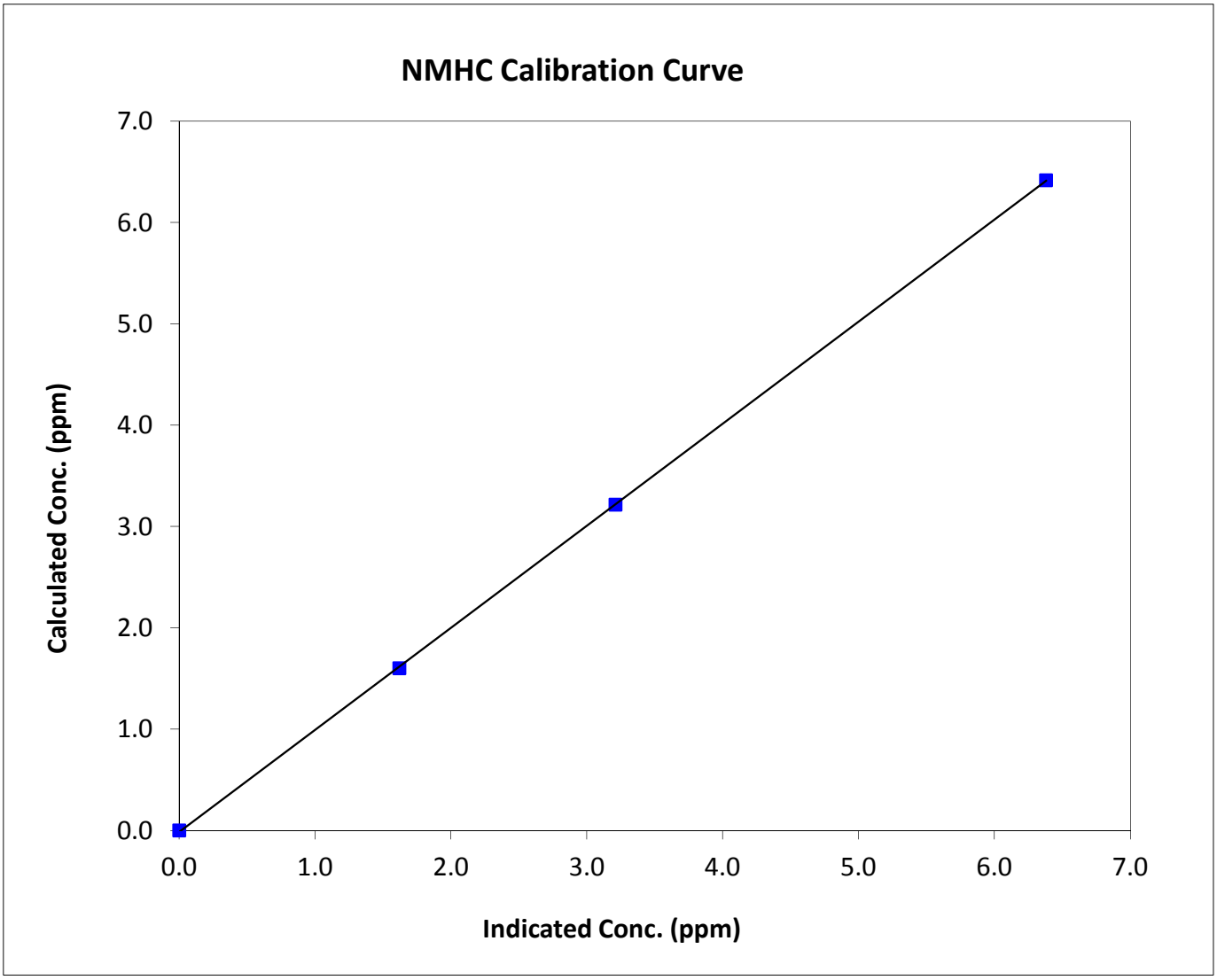
NMHC Calibration Summary

Station Information

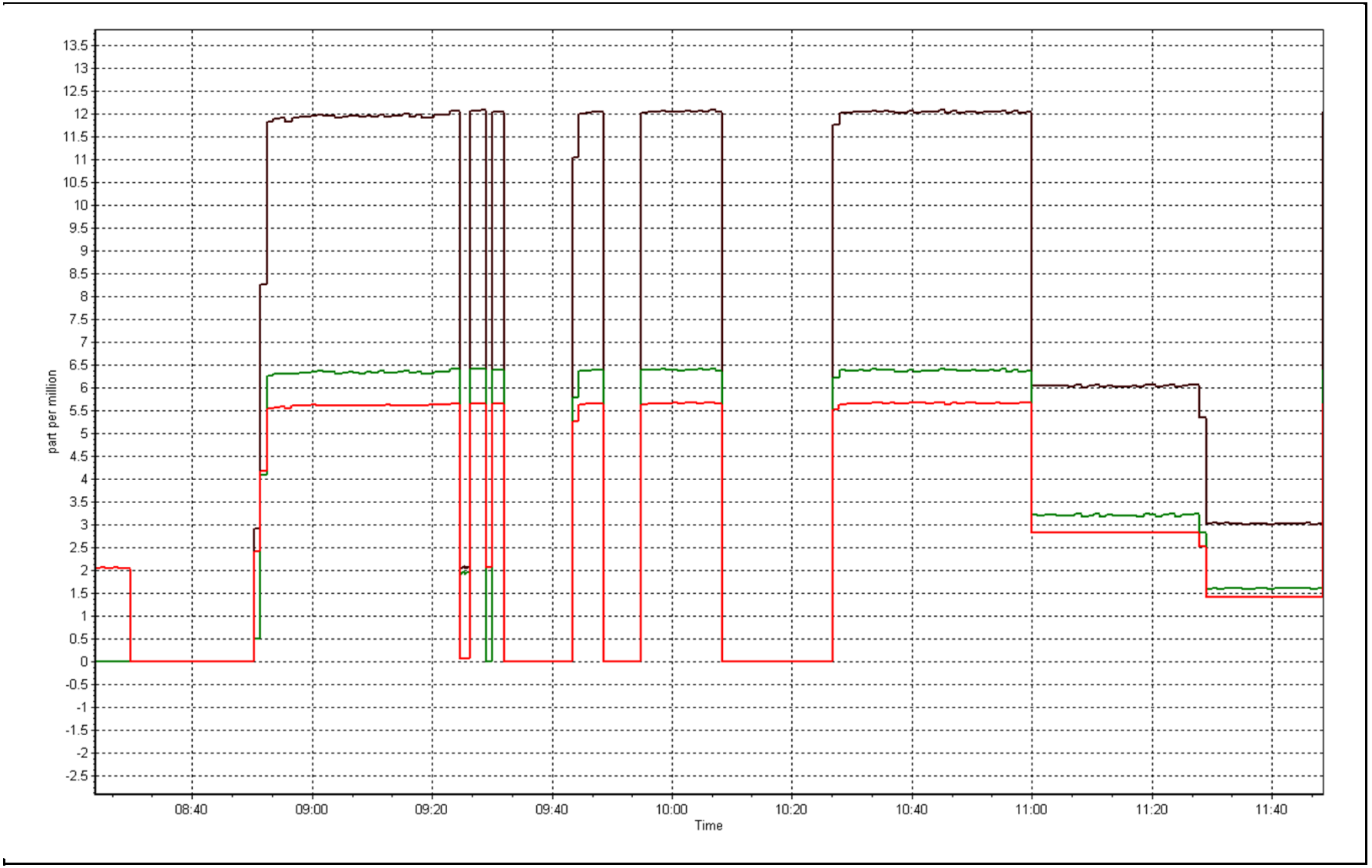
Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	14:45
Analyzer make	Thermo 55i	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999977
6.42	6.38	1.0059		
3.21	3.21	1.0014	Slope	1.007118
1.60	1.62	0.9886		
			Intercept	-0.014039



THC/NMHC Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 8, 2014	Previous Calibration	July 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	9:50	End Time (MST)	12:40
Barometric Pressure	727.5 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	1220
NO2 calibration used	Wednesday, July 02, 2014	Transfer Standard	SA130110A
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE4

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	29.9	31.0
Analyzer Range (input)	500	500	Lamp temp.	53.5	53.6
Calculated slope	0.984700	0.993482	Pressure	668.2	675.4
Calculated intercept	1.649080	1.650616	Flow cell A	0.610	0.608
Analyzer Background	0.0	0.0	Flow cell B	0.630	0.638
Analyzer Coefficient	0.984	0.956	Cell A Intensity	92300	90750
			Cell B Intensity	86000	84500

Analyzer make	Thermo 49i	Analyzer serial #	1300156234

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	0.000	0.0	-1.0	N/A
as found span	5000	0.950	336.8	346.0	0.973
calibrator zero	5000	0.000	0.0	-1.0	N/A
high point	5000	0.953	336.8	337.7	0.997
second point	5000	0.542	230.8	230.7	1.001
third point	5000	0.324	119.2	117.3	1.016
calibrator zero	5000	0.000	0.0	-1.0	N/A
as left zero	5000	0.000	0.0	-1.0	N/A
as left span	5000	0.950	336.8	338.5	0.995
				Average Correction Factor	1.005

Corrected As found	347.0	Previous response	340.3	% change	-1.9%

Notes:

changed inlet filter. Adjusted span

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

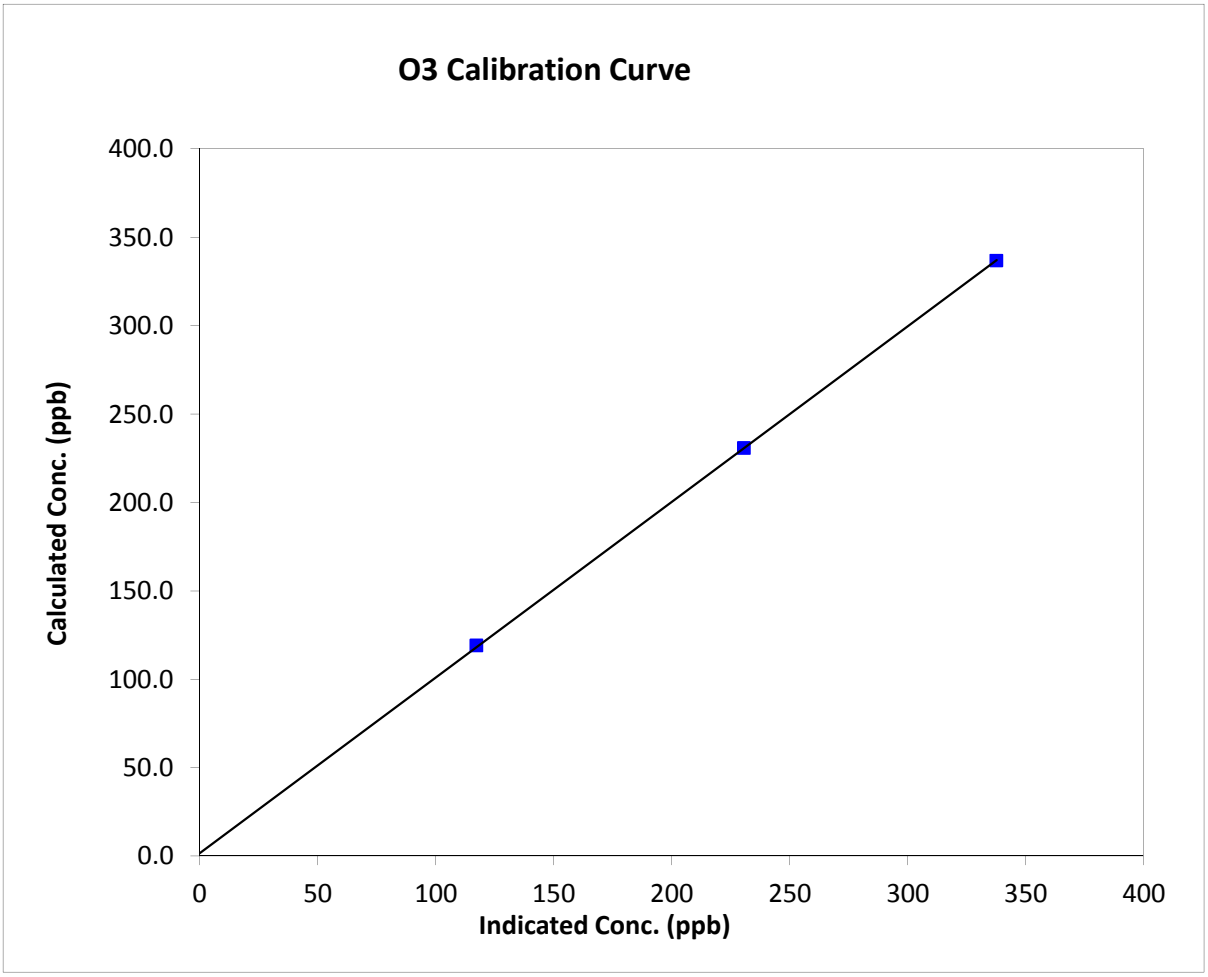
O_3 Calibration Summary

Station Information

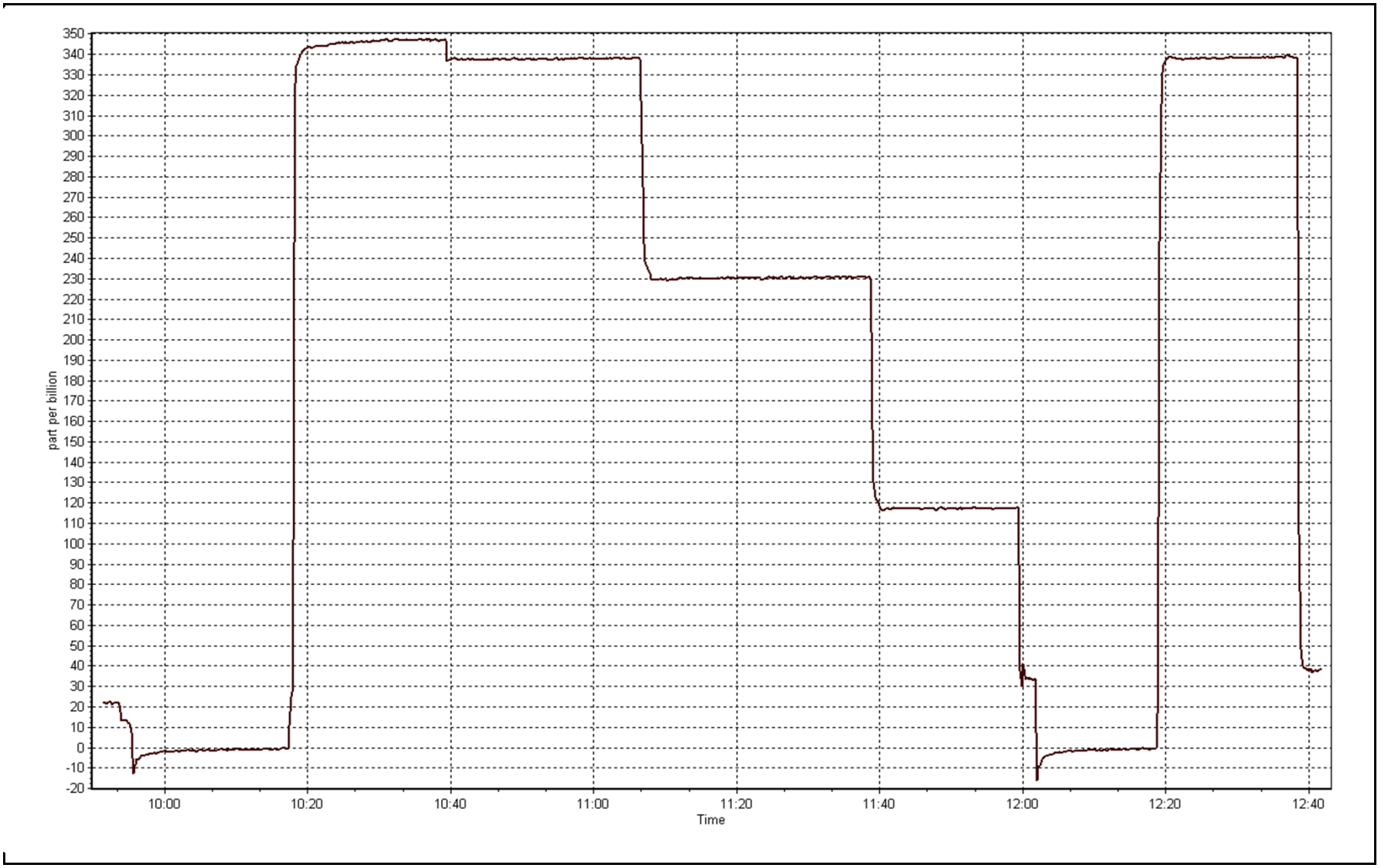
Calibration Date	Friday, August 08, 2014	Previous Calibration	July 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:50	End Time (MST)	12:40
Analyzer make	Thermo 49i	Analyzer serial #	1300156234

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.0	N/A	Correlation Coefficient	0.999975
336.8	337.7	0.9973		
230.8	230.7	1.0008	Slope	0.993482
119.2	117.3	1.0160		
			Intercept	1.650616



O3 Calibration Plot Date: August 8, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 6, 2014		Previous Calibration	July 2, 2014	
Station Name	Patricia McInnes		Station Number	AMS 6	
Reason:	Routine				
Start Time (MST)	8:20		End Time (MST)	14:45	
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	0.991787	0.994157	1.003812
	Data Offset	-0.013348	0.377500	1.745075
After	Data Slope	1.002824	1.003477	1.001496
	Data Offset	0.457940	0.668100	1.095152
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	0.988		1.043	
NOX coefficient	0.993		0.997	
NO2 coefficient	1		1.000	
NO bkgrnd	2.7		2.7	
NOX bkgrnd	3.2		4.0	
Chamber Temp	50.6	Deg C	50.6	Deg C
Moly Temp	325	Deg C	325.0	Deg C
PMT Temp	-3	Deg C	-3.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	178.3	mmHg	178.3	mmHg
Sample Flow	800	ccm	802	ccm

Notes:

updated firmware and adjusted zero and span.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 6, 2014 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	0.0	-0.1	0.1	N/A	N/A
as found span	5000	55.3	601.7	601.7	0.0	598.5	598.8	-0.3	1.0053	1.0047
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.2	-0.4	N/A	N/A
high point	5000	55.3	601.7	601.7	0.0	599.3	599.2	0.0	1.0039	1.0040
second point	5000	27.7	301.4	301.4	0.0	300.4	299.7	0.8	1.0032	1.0058
third point	5000	13.9	151.2	151.2	0.0	150.5	148.8	1.7	1.0050	1.0166
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.2	-0.4	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	-0.4	0.0	-0.4	N/A	N/A
as left span	5000	55.3	601.7	260.8	340.8	593.9	258.8	335.1	1.0131	1.0078
								Average Correction Factor	1.0040	1.0088

Corrcted As found NO_X= 598.5 NO= 599.0 Percent Change NO_X= 1.4% NO= 1.0%

Previous Response NO_X= 606.7 NO= 604.8

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			-0.4			N/A	
1st NO2 (300)	N/A	260.8	336.8	596.5	260.8	335.7	0.9977	1.0000	1.0032	99.7%
2nd NO2 (200)	N/A	366.7	230.8	595.8	366.7	229.1	0.9987	1.0000	1.0076	99.3%
3rd NO2 (100)	N/A	478.4	119.2	595.4	478.4	117.0	0.9995	1.0000	1.0186	98.2%
4th NO2 (0)	597.6	N/A	-0.3	597.2	597.6	-0.3	0.9964	1.0000	N/A	N/A
					Average Correction Factor		0.9981	1.0000	1.0098	99.0%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

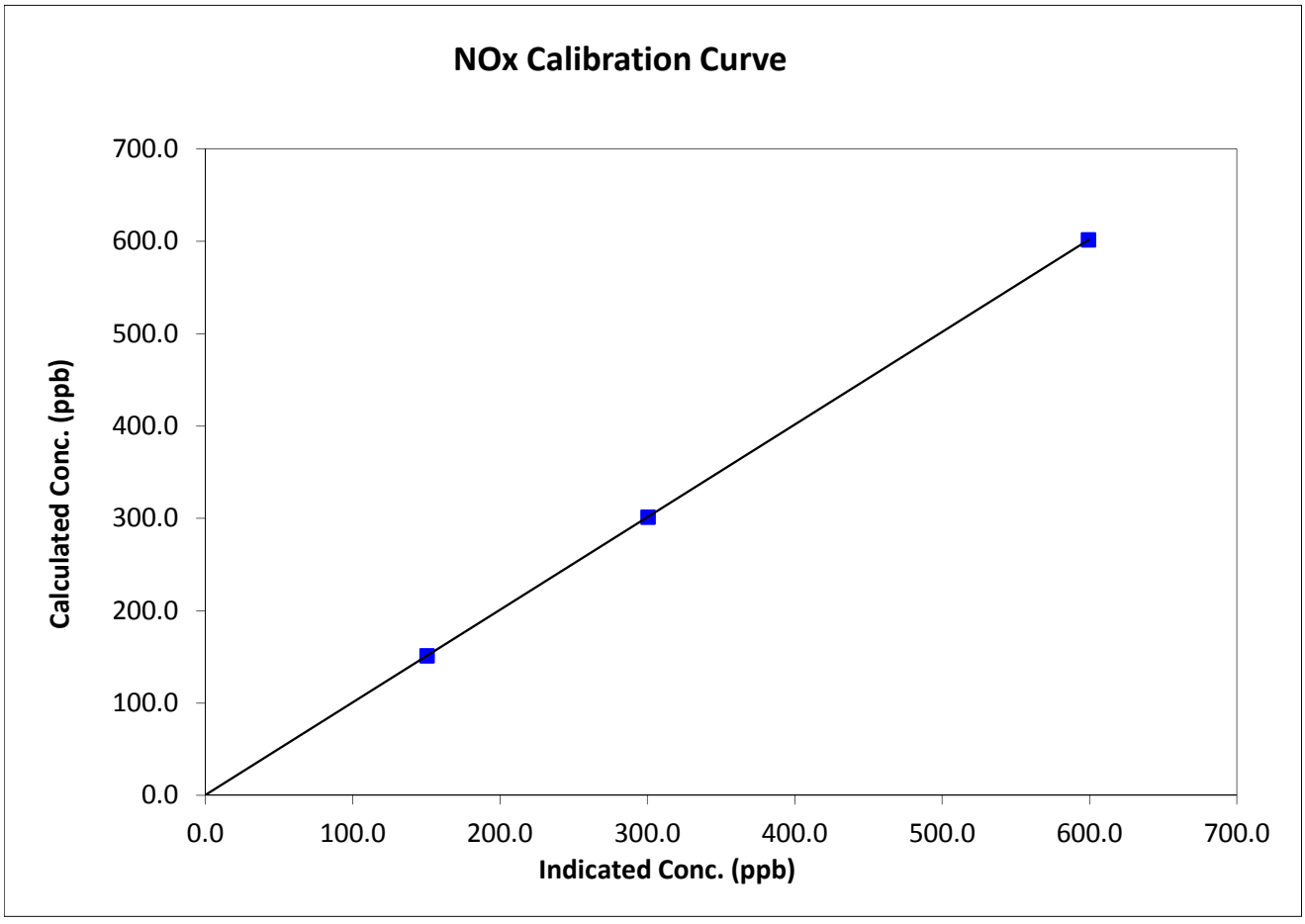
NO_X Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	14:45
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	-0.6	N/A	Correlation Coefficient	0.999999
601.7	599.3	1.0039		
301.4	300.4	1.0032	Slope	1.002824
151.2	150.5	1.0050		
0.0	-0.6	0.0000	Intercept	0.457940



Wood Buffalo Environmental Association

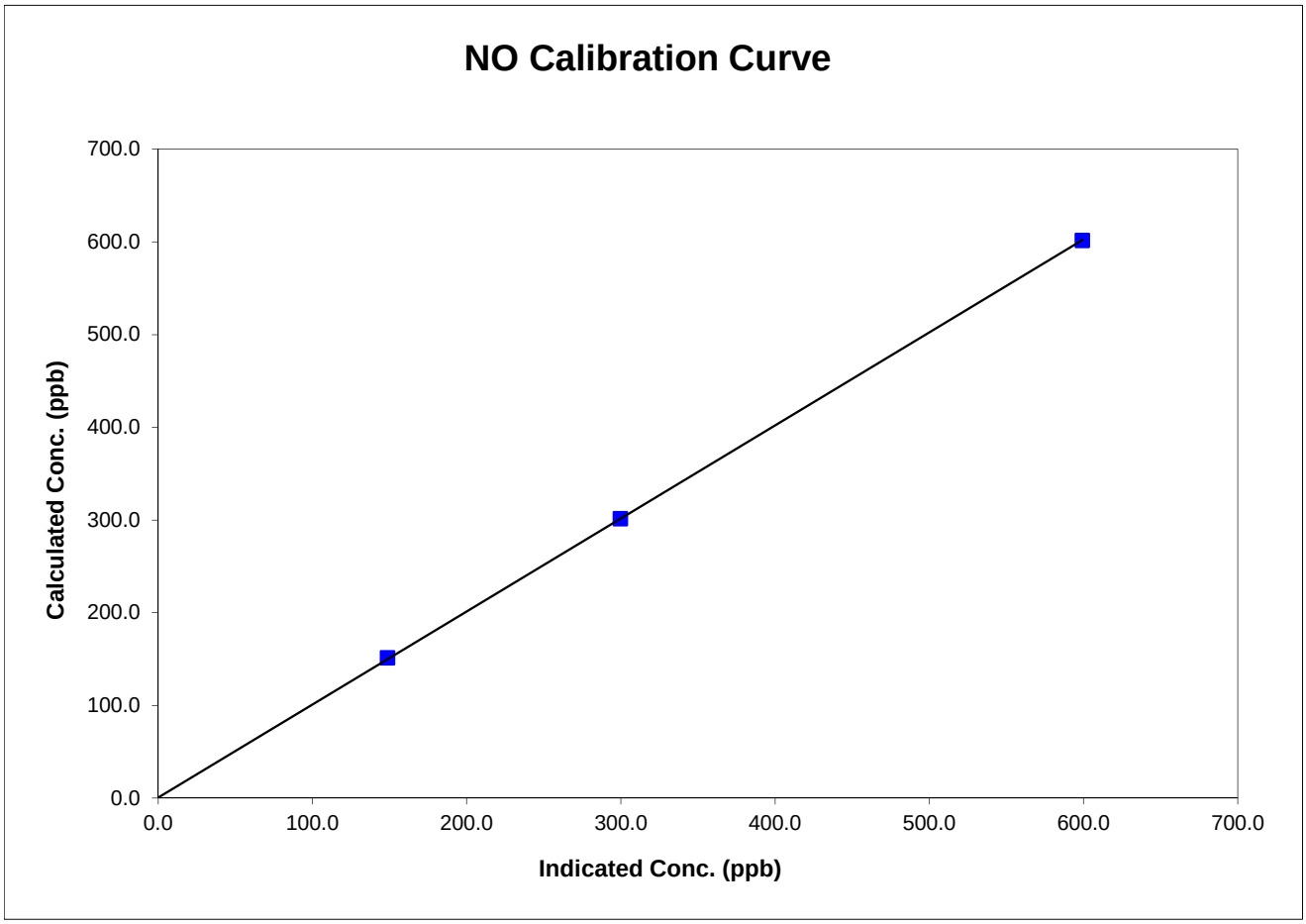
NO Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	14:45
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	0.999991
601.7	599.2	1.0040		
301.4	299.7	1.0058	Slope	1.003477
151.2	148.8	1.0166		
0.0	-0.2	0.0000	Intercept	0.668100



Wood Buffalo Environmental Association

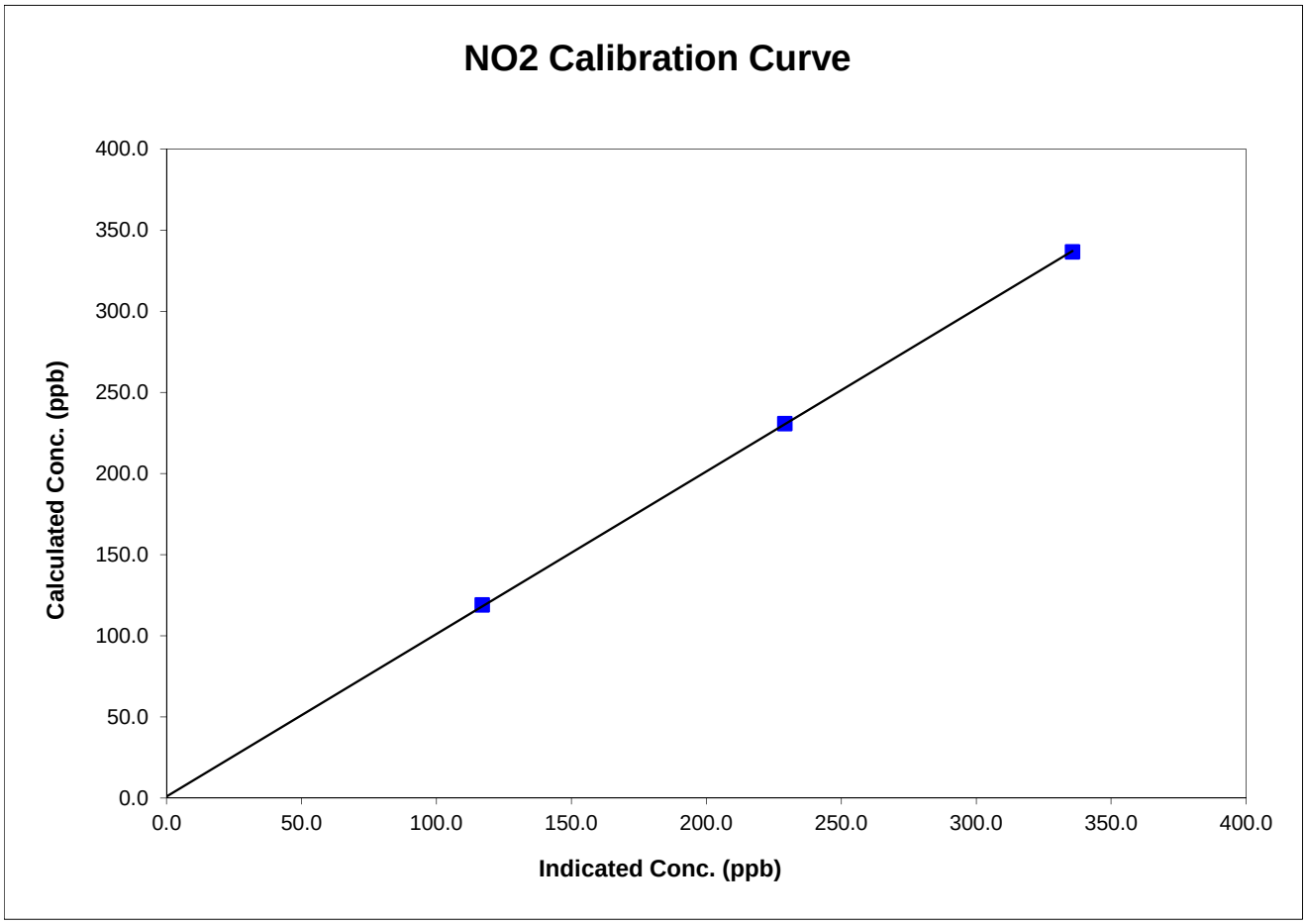
NO_2 Calibration Summary

Station Information

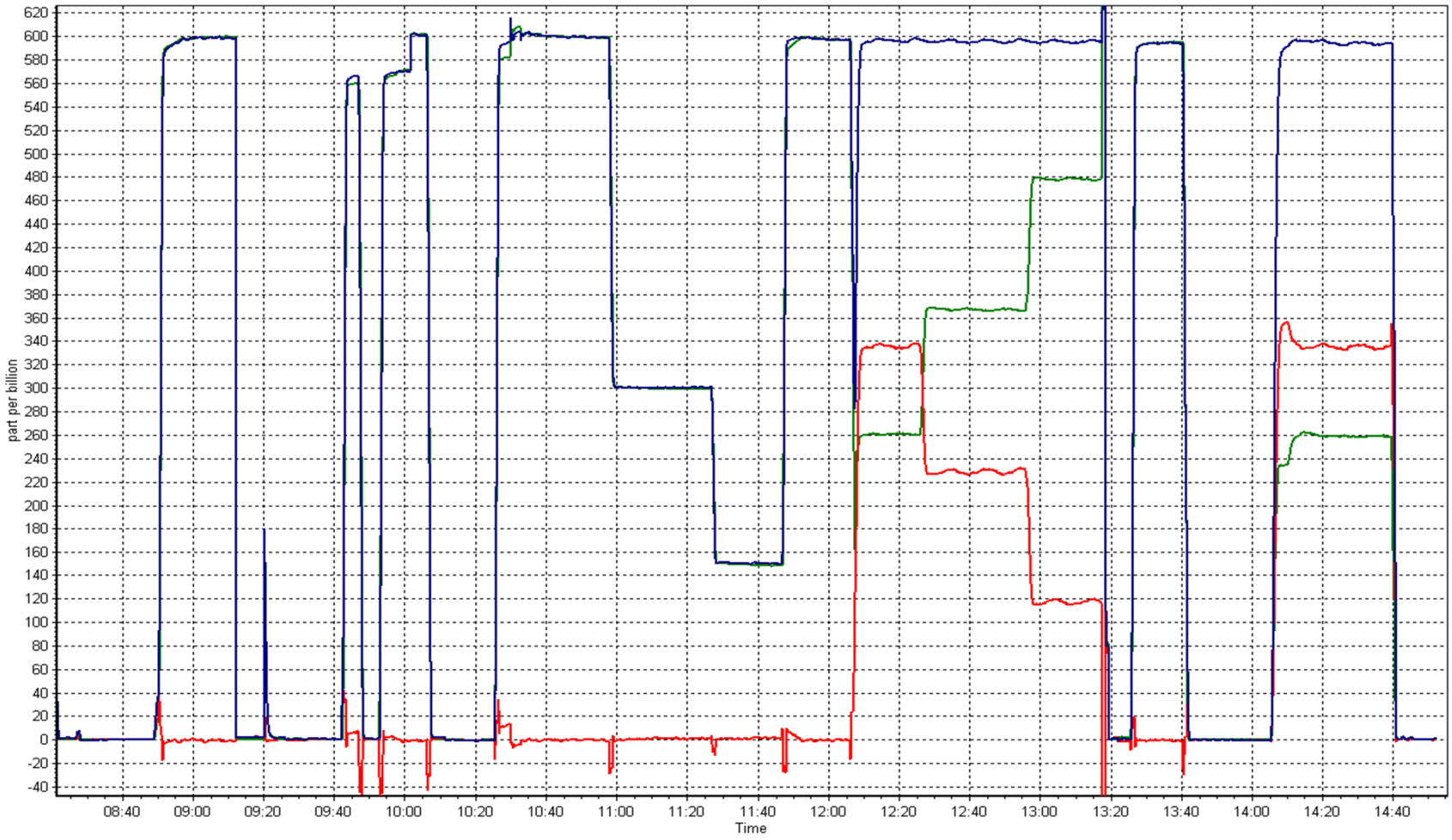
Calibration Date	August 6, 2014	Previous Calibration	July 2, 2014
Station Number	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	14:45
Analyzer make	Thermo Scientific 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	0.999974
336.8	335.7	1.0032		
230.8	229.1	1.0076	Slope	1.001496
119.2	117.0	1.0186		
			Intercept	1.095152



NOx, NO & NO_2 Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

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

Station Information

Calibration Date	August 12, 2014	Previous Calibration	July 11, 2014
Station Name	Patricia McInnis	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	9:00	End Time (MST)	13:00
Barometric Pressure	n/a 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	1.007204	1.003725	1.008733
	Data Offset	4.802732	0.047010	3.102652
After	Data Slope	1.003466	1.005957	1.003847
	Data Offset	0.988919	0.130392	0.972563
Channel #				
Voltage Range		0-5	0-5	0-5

Analyzer Information

Analyzer make/model	Thermo 17c	Analyzer serial #	622817829
		Converter serial #	617817369

Test Point	before		after	
Concentration range	0-2500	ppb	0-2500	ppb
Nt coefficient	0.887	ppb	0.887	ppb
NOX coefficient	0.905	ppb	0.905	ppb
NH3 coefficient	0.910		0.910	
NO coefficient	0.899		0.899	
NO2 coefficient	1.000	ppb	1.000	ppb
No bkgrnd	5.9		5.9	
Nt bkgrnd	8.7		8.8	
NOX bkgrnd	5.1		5.2	
NH3 conv temp	776	DegC	779	Deg C
Chamber Temp	50.0	Deg C	50.2	Deg C
Moly Temp	322.0	Deg C	322.0	Deg C
PMT Temp	-8.7	Deg C	-8.7	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	119.8	mmHg	120.1	mmHg
PMT Voltage	-839.0	v	-838.0	v
Sample Flow 1 NO	445.0	ccm	446.0	ccm
Sample Flow 2 Nox	491.0	ccm	492.0	ccm
Sample Flow 3 Nt	495.0	ccm	497.0	ccm

Notes:

No adjustments or maintenance performed.

Wood Buffalo Environmental Association

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

Station Information

Calibration Date: August 12, 2014 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	0.3	-0.1	0.4	NA	NA
as found NO	5000	55.2	600.6	600.6	NA	598.0	599.3	-1.3	1.004	NA
calibrator zero	5000	0.0	0.0	0.0	0.0	0.3	-0.1	0.4	NA	NA
high NO point	5000	55.2	600.6	600.6	NA	598.0	599.3	-1.3	1.004	NA
NO/O3 point	5000	55.2	600.6	600.6	NA	590.0	594.5	-4.4	1.018	NA
as found NH3	5000	52.8	2006.4	NA	2006.4	1998.4	1.0	1997.4	1.004	1.004
first NH3	5000	52.8	2006.4	NA	2006.4	1998.4	1.0	1997.4	1.004	1.004
second NH3	5000	26.3	999.4	NA	999.4	996.6	0.0	996.6	1.003	1.003
third NH3	5000	13.3	505.4	NA	505.4	499.9	0.0	499.9	1.011	1.011
as left zero						0.0				
as left span						0.0				
								Average Correction Factor	1.0111	1.0061

Corrected As found Nt = 597.7 ppb
NH3 = 1997.0 ppb

Previous response Nt = 591.5 ppb
NH3 = 1985.9 ppb

Nt percent change -1.0%
NH3 percent change -0.6%

Converter efficiency 91.0%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

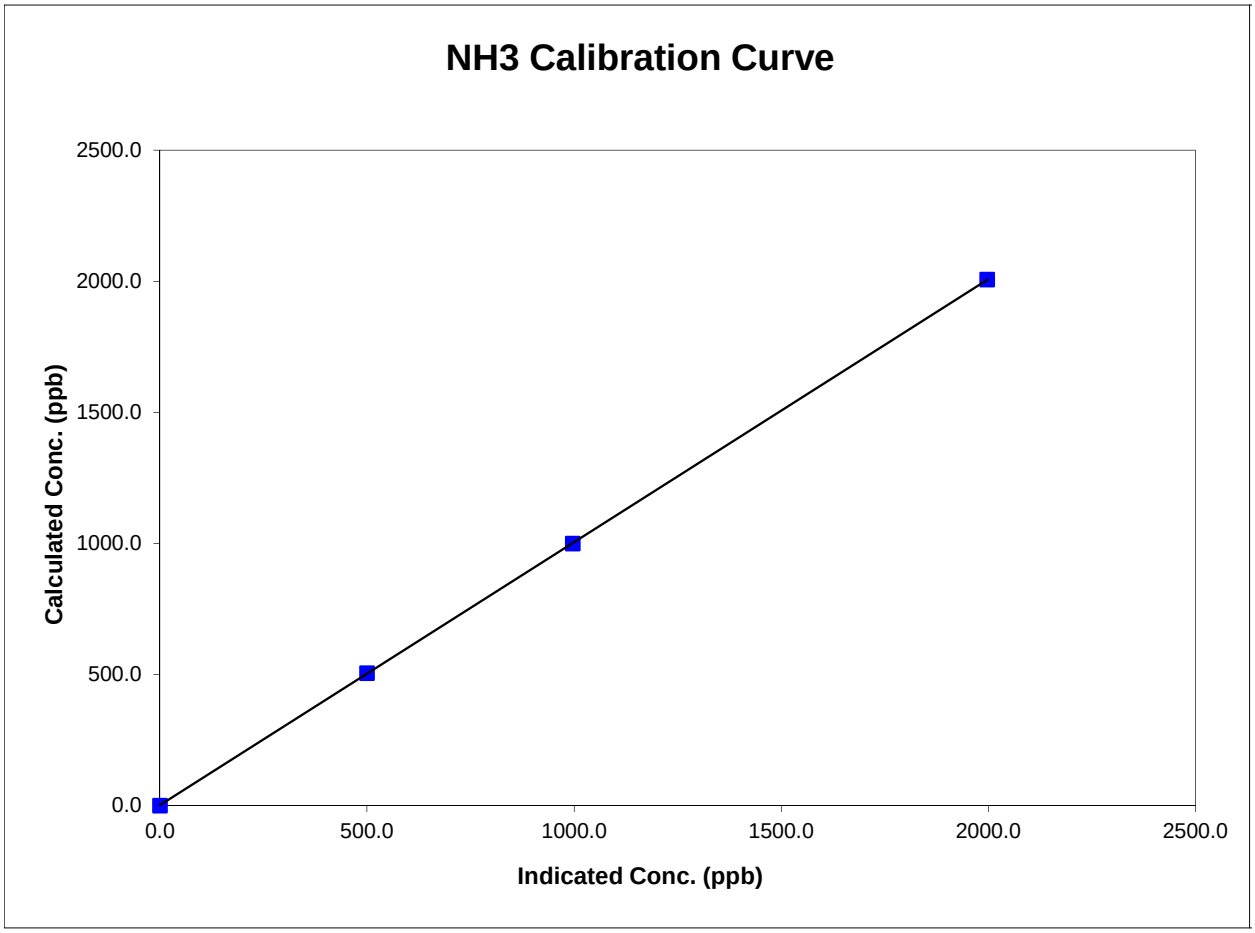
NH3 Calibration Summary

Station Information

Calibration Date	August 12, 2014	Previous Calibration	July 11, 2014
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	9:00	End Time (MST)	13:00
Analyzer make	Thermo 17c	Analyzer serial #	622817829

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	0.999995
2006.4	1997.4	1.0045		
999.4	996.6	1.0029	Slope	1.003847
505.4	499.9	1.0110		
			Intercept	0.972563



Wood Buffalo Environmental Association

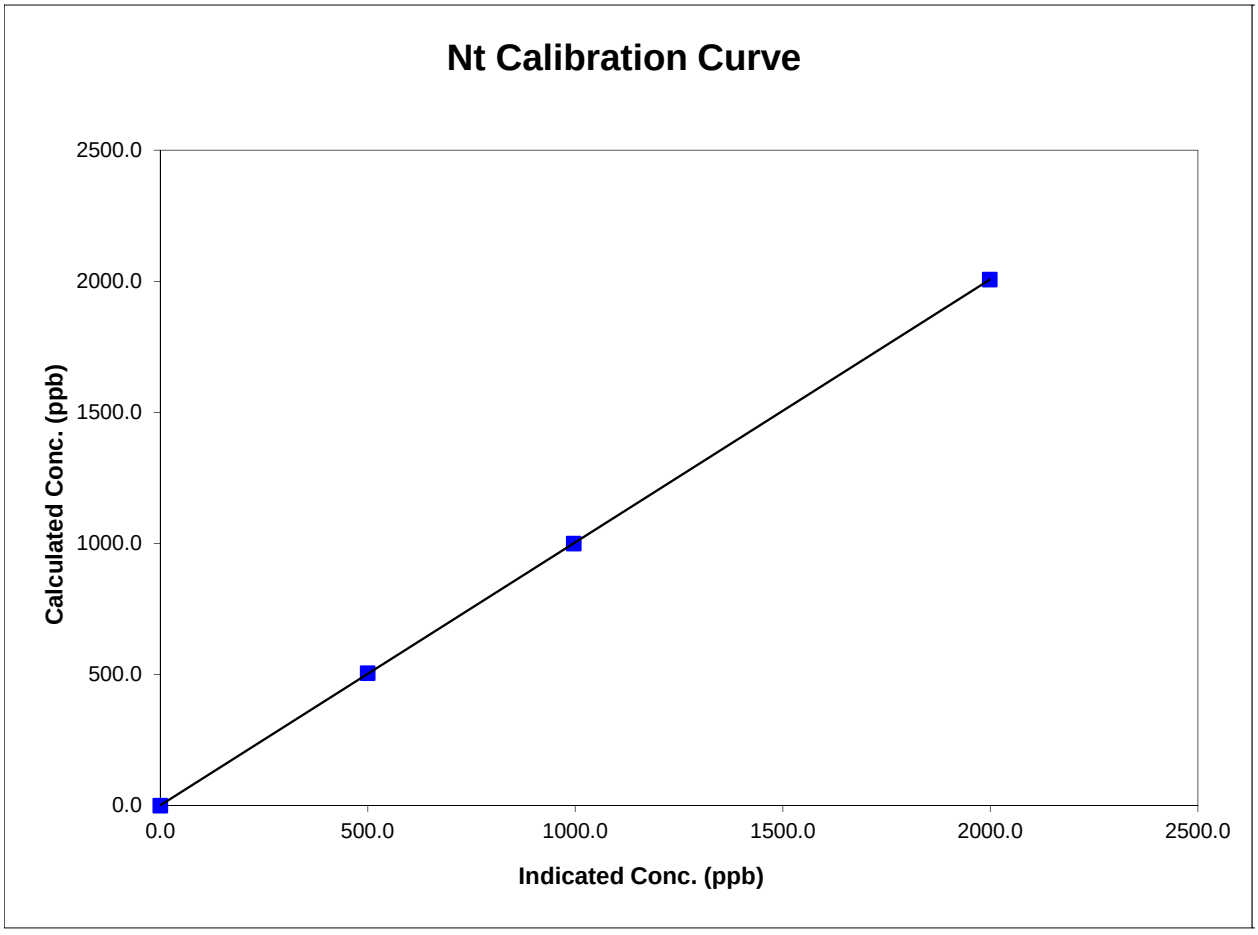
Nt Calibration Summary

Station Information

Calibration Date	August 12, 2014	Previous Calibration	July 11, 2014
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	9:00	End Time (MST)	13:00
Analyzer make	Thermo 17c	Analyzer serial #	622817829

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	0.999995
2006.4	1998.4	1.0040		
999.4	996.6	1.0028	Slope	1.003466
505.4	499.9	1.0110		
	0.0		Intercept	0.988919



Wood Buffalo Environmental Association

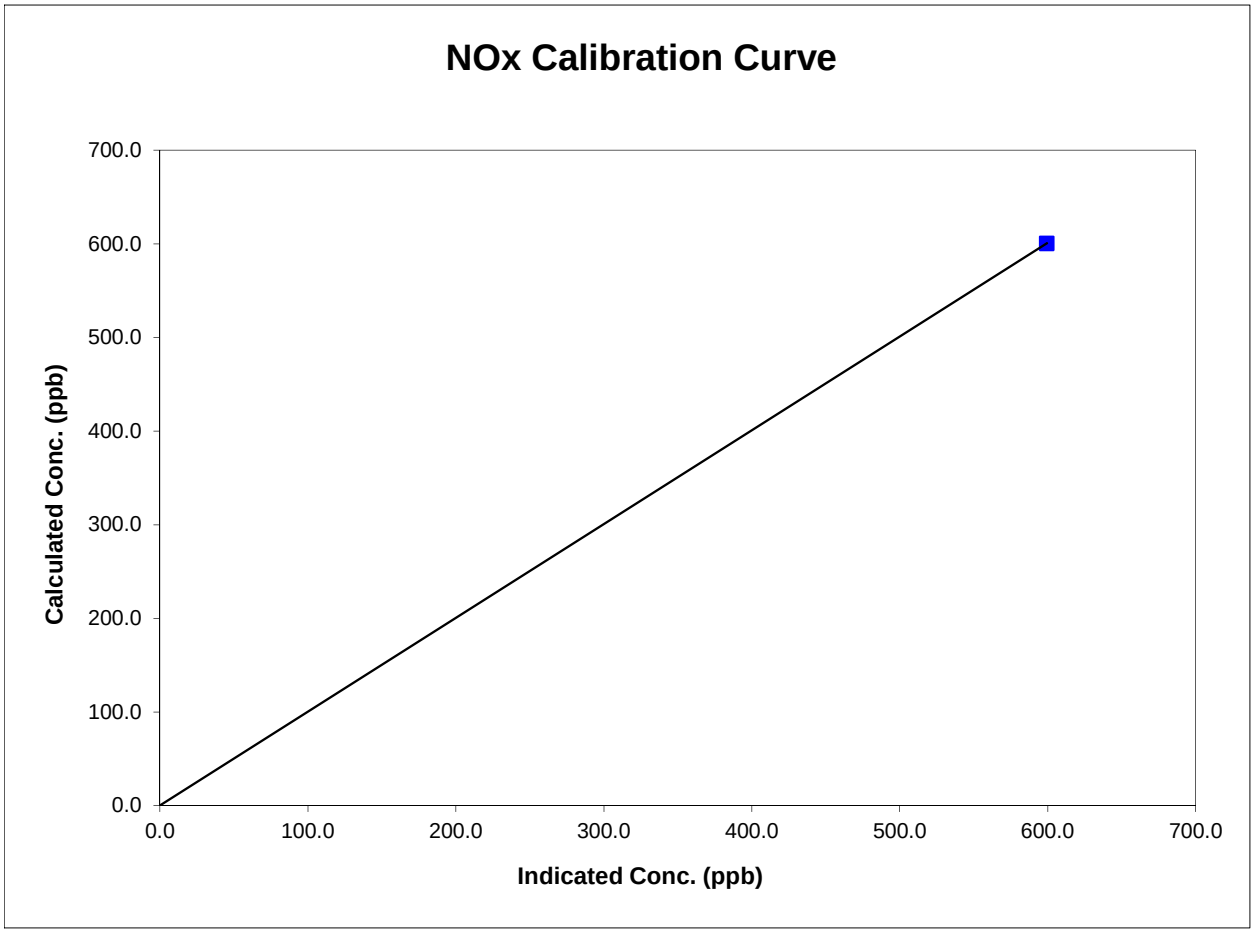
NOx Calibration Summary

Station Information

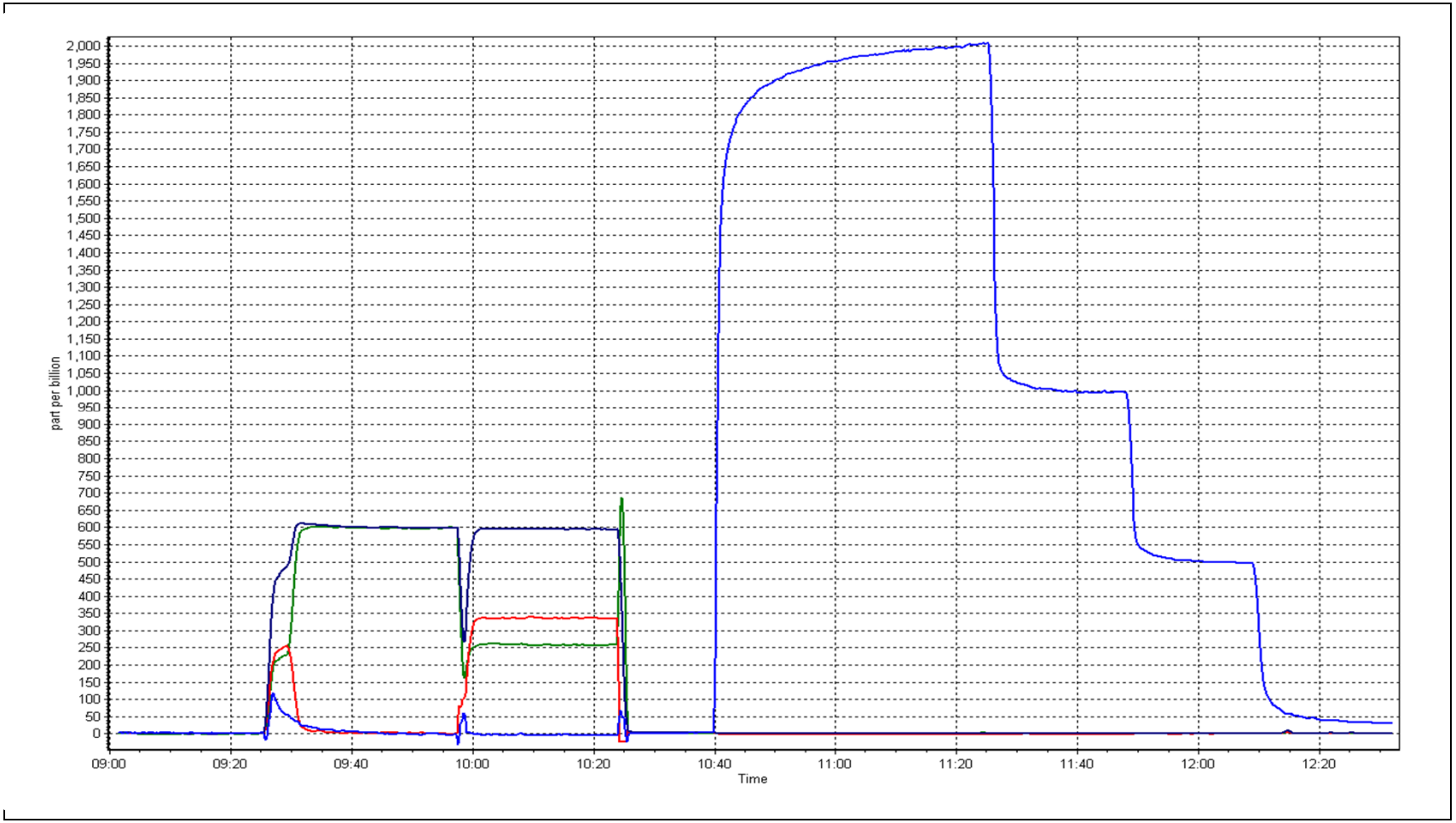
Calibration Date	August 12, 2014	Previous Calibration	July 11, 2014
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	9:00	End Time (MST)	13:00
Analyzer make	Thermo 17c	Analyzer serial #	622817829

NO_X Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999951
600.6	599.3	1.0021		
600.6	594.5	1.0103	Slope	1.005957
			Intercept	0.130392



NH_3 Calibration Plot Date: August 12, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 7
ATHABASCA VALLEY
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
AUGUST 2014

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	708	36	36	100.00	37	0	6	0
TRS (ppb) Average	708	35	36	99.87	2	0	1	0
THC (ppm) Average	706	36	38	99.73	2.3	-	2.1	-
NMHC (ppm) Average	706	36	38	99.73	0.363	-	0.085	-
CH4(ppm) Average	706	36	38	99.73	2.2	-	2	-
O3 (ppb) Average	708	35	36	99.87	77	0	33	-
NO2 (ppb) Average	708	36	36	100.00	22	0	8	-
NO (ppb) Average	708	36	36	100.00	94	-	9	-
NOX (ppb) Average	708	36	36	100.00	110	-	16	-
PM2.5 (ug/m3) Average	743	0	1	99.87	213.1	0	62.2	3
CO(ppm) Average	709	34	35	99.87	1.4	0	0.6	-
Temperature 2 m (C) Average	744	0	0	100.00	32	-	25.2	-
Barometric Pressure (inHg) Average	744	0	0	100.00	29.4	-	-	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	32	-	-	-
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 - ATHABASCA VALLEY (AMS 7)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	1.3	3	-	0	0	0	1	1	2	37
TRS (ppb) Average	708	0.4	0	-	0	0	0	0	0	1	2
THC (ppm) Average	706	1.96	0.1	-	1.8	1.9	1.9	1.9	2	2.1	2.3
NMHC (ppm) Average	706	0.034	0.04	-	0	0	0	0	0	0.1	0.363
CH4(ppm) Average	706	1.93	0.1	-	1.8	1.8	1.9	1.9	2	2	2.2
O3 (ppb) Average	708	19.3	13	-	1	4	9	17	27	36	77
NO2 (ppb) Average	708	5.4	3	-	0	2	3	5	7	10	22
NO (ppb) Average	708	2.6	6	-	0	0	0	1	3	8	94
NOX (ppb) Average	708	8	8	-	0	2	3	6	10	16	110
PM2.5 (ug/m3) Average	743	15.44	17.7	-	2	4.1	7.7	11.3	16.5	24.9	213.1
CO(ppm) Average	709	0.2	0.1	-	0	0.1	0.1	0.2	0.2	0.3	1.4
Temperature 2 m (C) Average	744	18.52	6.1	-	2.6	11.1	14	18	22.9	27.3	32
Barometric Pressure (inHg) Average	744	28.96	0.2	-	28.6	28.7	28.8	29	29.1	29.3	29.4
Relative Humidity (%) Average	744	66	19	-	26	38	49	69	82	89	99
Wind Speed 10 m (km/h) Average	744	7.2	5	-	1	2	4	6	10	13	32
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	13 Aug 2014 14:00	13 Aug 2014 14:00	1	Maintenance - sample manifold cleaned
NMHC, CH4, THC	23 Aug 2014 13:00	23 Aug 2014 14:00	2	Maintenance - replaced fuel and carrier gas
O3	13 Aug 2014 14:00	13 Aug 2014 14:00	1	Maintenance - sample manifold cleaned
PM2.5	13 Aug 2014 13:00	13 Aug 2014 13:00	1	Maintenance - sample manifold cleaned
CO	13 Aug 2014 14:00	13 Aug 2014 14:00	1	Maintenance - sample manifold cleaned

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 37 ppb on Aug 4 12:00 Maximum Daily Average: 5.7 ppb on Aug 1

Minimum Value: 0 ppb on Aug 28 03:00 Minimum Daily Average: 0.3 ppb on Aug 7
Maximum Diurnal Average: 3.2 ppb at hour 12 Minimum Diurnal Average: 0.4 ppb at hour 6
Monthly Average: 1.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 13$

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-Aug	3	3	1	Z	1	1	1	1	1	1	2	10	14	11	11	13	12	11	13	9	5	2	2	1	5.7	14
2-Aug	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
3-Aug	1	0	1	Z	0	1	0	1	1	0	1	1	2	1	2	4	3	2	1	1	1	1	1	0	1.1	4
4-Aug	0	0	0	Z	0	0	0	0	0	0	6	37	10	5	4	3	3	1	1	1	1	1	1	0	3.3	37
5-Aug	1	0	0	Z	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
6-Aug	1	1	1	Z	1	0	1	1	1	1	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0.8	2
7-Aug	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
8-Aug	0	0	0	Z	0	0	0	1	1	4	11	12	16	22	16	7	4	3	1	1	1	0	0	1	4.5	22
9-Aug	1	1	2	Z	1	1	0	1	7	2	2	6	8	11	5	2	1	1	1	1	1	1	1	1	2.4	11
10-Aug	0	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Aug	0	0	0	Z	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2	1	0	0	0	0	0.4	2
12-Aug	0	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.5	1
13-Aug	0	0	0	Z	0	0	0	0	1	C	C	C	C	C	1	2	2	2	1	1	1	1	1	1	0.8	2
14-Aug	1	1	1	Z	0	0	1	1	2	1	2	4	7	4	5	7	6	6	4	3	2	2	1	1	2.7	7
15-Aug	1	1	1	Z	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0.7	1
16-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0.4	1
17-Aug	0	0	0	Z	0	0	0	0	1	8	11	2	0	0	0	0	0	0	0	0	0	0	0	0	1.1	11
18-Aug	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	1	0	0	0	0	0.5	2
19-Aug	1	1	1	Z	1	1	2	1	1	1	1	1	1	1	0	0	4	3	1	2	3	1	4	2	1.4	4
20-Aug	1	0	0	Z	2	0	0	0	0	0	0	0	7	11	4	2	1	1	1	1	0	1	0	1	1.6	11
21-Aug	1	1	1	Z	1	1	1	1	19	15	8	8	7	7	7	7	6	5	1	1	0	1	0	1	4.2	19
22-Aug	0	0	0	Z	0	0	0	0	0	6	4	2	1	1	2	4	4	2	2	1	1	1	0	0	1.4	6
23-Aug	1	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0.5	1
24-Aug	0	0	0	Z	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
25-Aug	0	0	0	Z	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0.6	1
26-Aug	0	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0	0	0	0.6	1
27-Aug	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-Aug	0	0	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
29-Aug	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	0	0	0.4	1
30-Aug	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
31-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	1	1	1	0	0.7	2
	0.6	0.5	0.5	--	0.5	0.4	0.5	0.5	1.3	1.6	2.0	3.2	2.8	2.8	2.2	2.0	1.9	1.6	1.4	1.0	0.8	0.6	0.6	0.5	Diurnal Average	
	3	3	2	--	2	1	2	1	19	15	11	37	16	22	16	13	12	11	13	9	5	2	4	2	Diurnal Maximum	

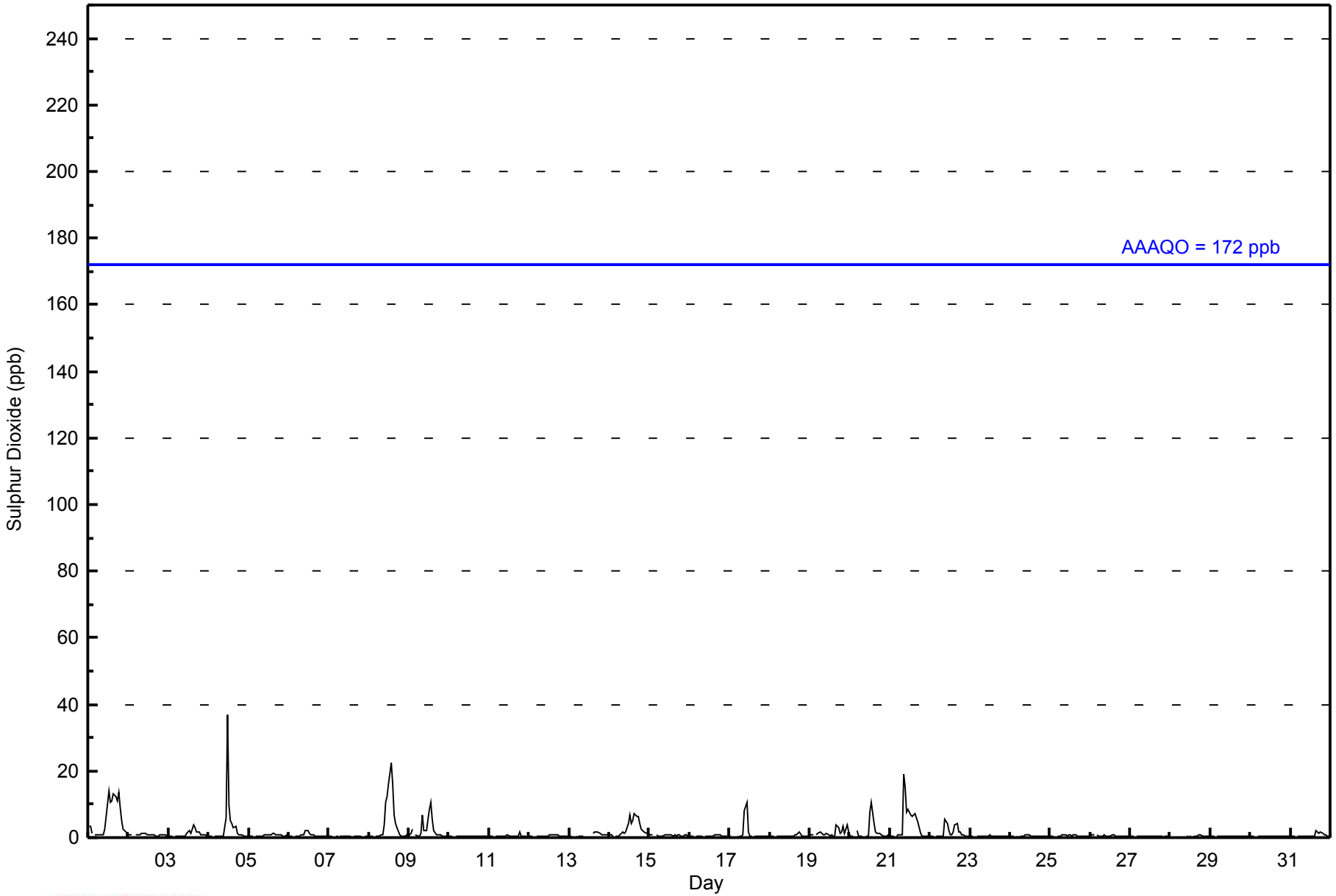
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	690	97.46	97.46
11 - 20	16	2.26	99.72
21 - 60	2	0.28	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	53	12	5	10	34	57	175	34	27	22	67	39	18	23	43	71	690
11 - 20	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	9	16
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	59	12	5	11	34	57	175	34	27	22	67	39	18	23	43	82	708

Total Number of Valid Hours: 708

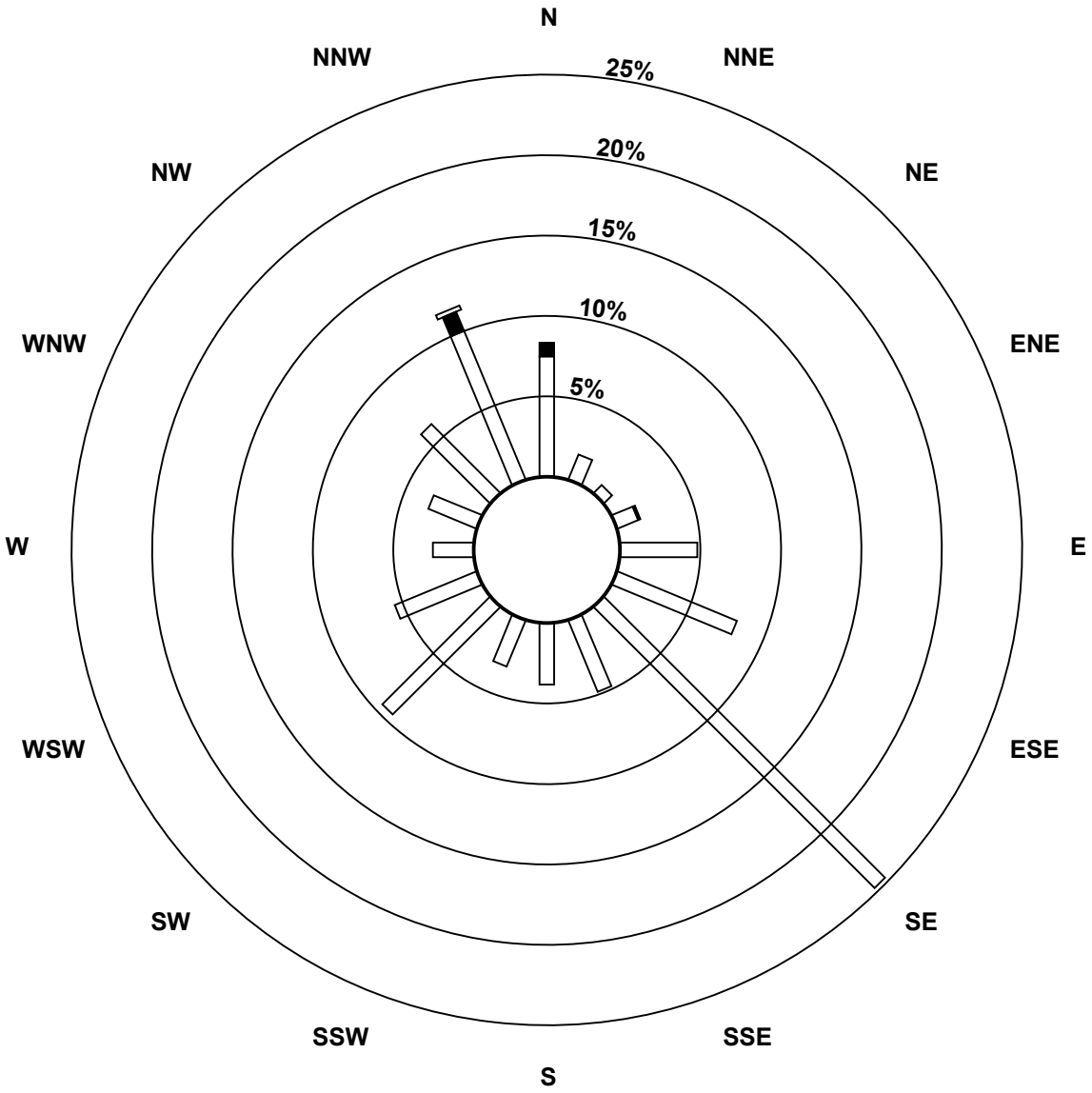
Total Number of Hours: 744

Wood Buffalo Environmental Association

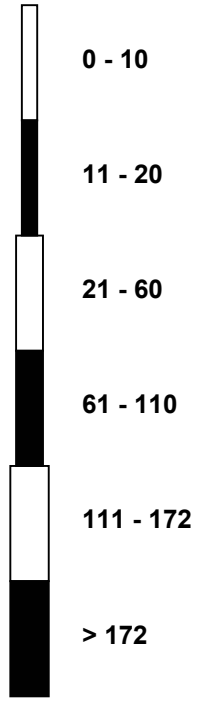
Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley (AMS 7)



Classes (ppb)



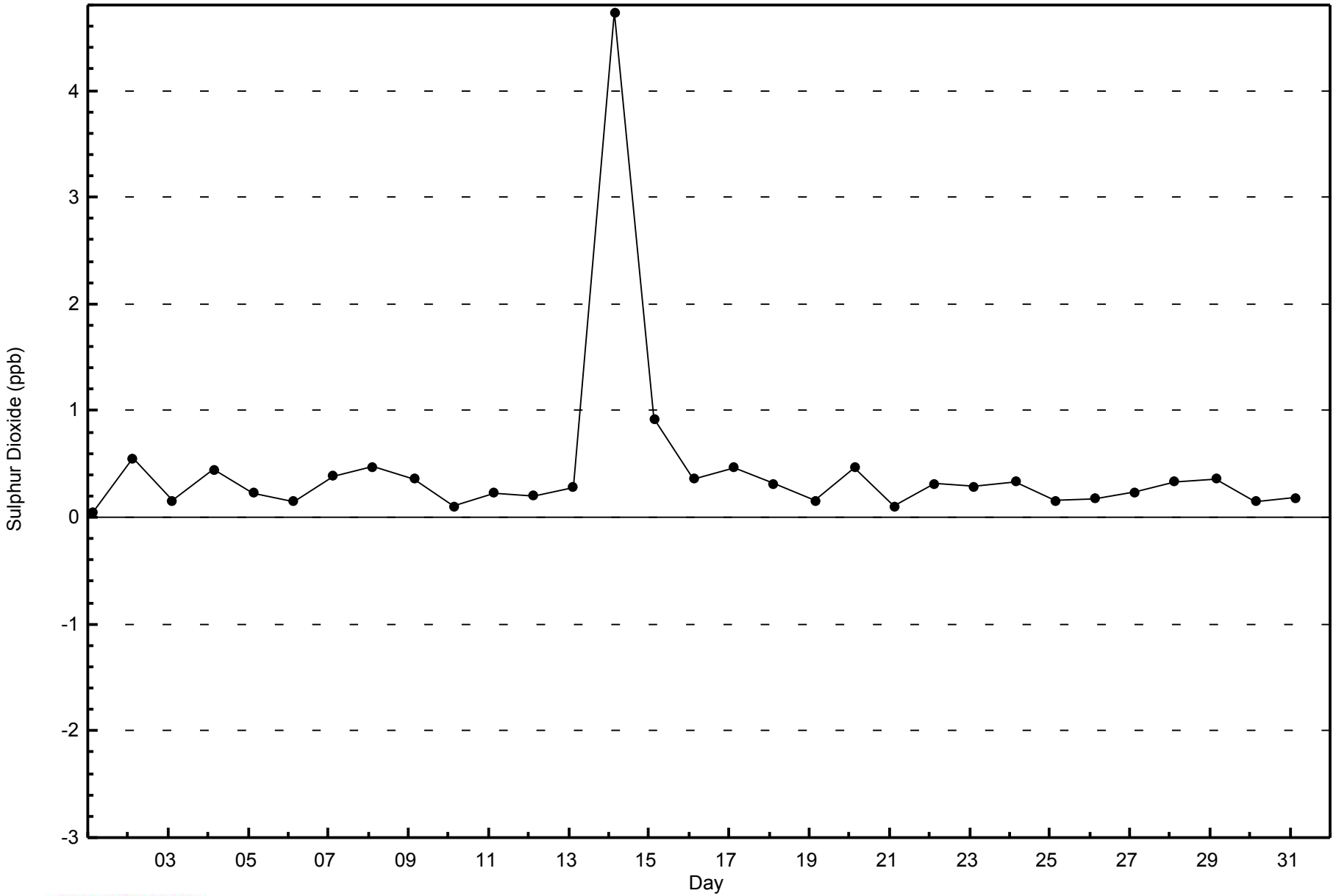
Total Number of Valid Hours: 708

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - August 2014



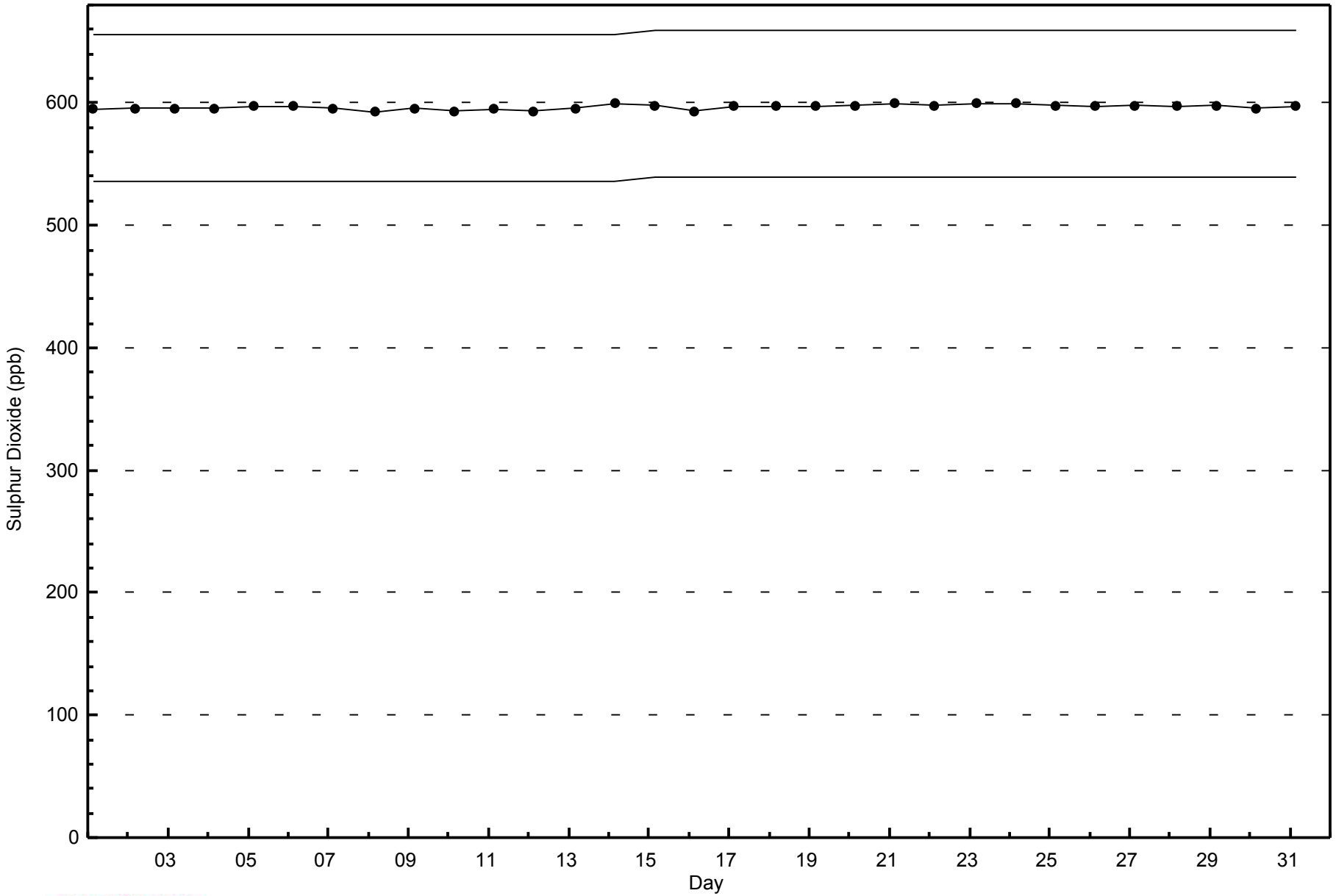
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2 ppb on Aug 1 01:00 Maximum Daily Average: 0.7 ppb on Aug 1

Minimum Value: 0 ppb on Aug 30 17:00 Minimum Daily Average: 0.2 ppb on Aug 31
Maximum Diurnal Average: 0.4 ppb at hour 1 Minimum Diurnal Average: 0.3 ppb at hour 16
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:	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-Aug	2	1	1	1	Z	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0.7	2
2-Aug	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
3-Aug	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-Aug	0	0	0	0	Z	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0.5	1
5-Aug	0	0	0	0	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
6-Aug	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
7-Aug	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
8-Aug	1	0	1	0	Z	0	0	0	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0.5	1
9-Aug	1	1	1	0	Z	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
10-Aug	0	0	0	0	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
12-Aug	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
13-Aug	0	0	0	0	Z	1	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0.4	1
14-Aug	0	0	0	0	Z	0	0	1	1	1	1	C	C	C	C	0	0	0	0	0	0	0	0	0	0.5	1
15-Aug	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Aug	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-Aug	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
18-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0.4	1
19-Aug	1	1	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	1	1	0	0	1	0	1	1	0.6	1
20-Aug	1	1	1	1	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	1	1	0	0	0	1	0.5	1
21-Aug	1	1	1	1	Z	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0.5	1
22-Aug	0	0	0	0	Z	0	0	0	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0.5	1
23-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
24-Aug	0	0	0	0	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1
25-Aug	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
26-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.3	1
27-Aug	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-Aug	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-Aug	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
30-Aug	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
31-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.2	1
	0.4	0.4	0.4	0.4	--	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	Diurnal Average	
	2	1	1	1	--	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

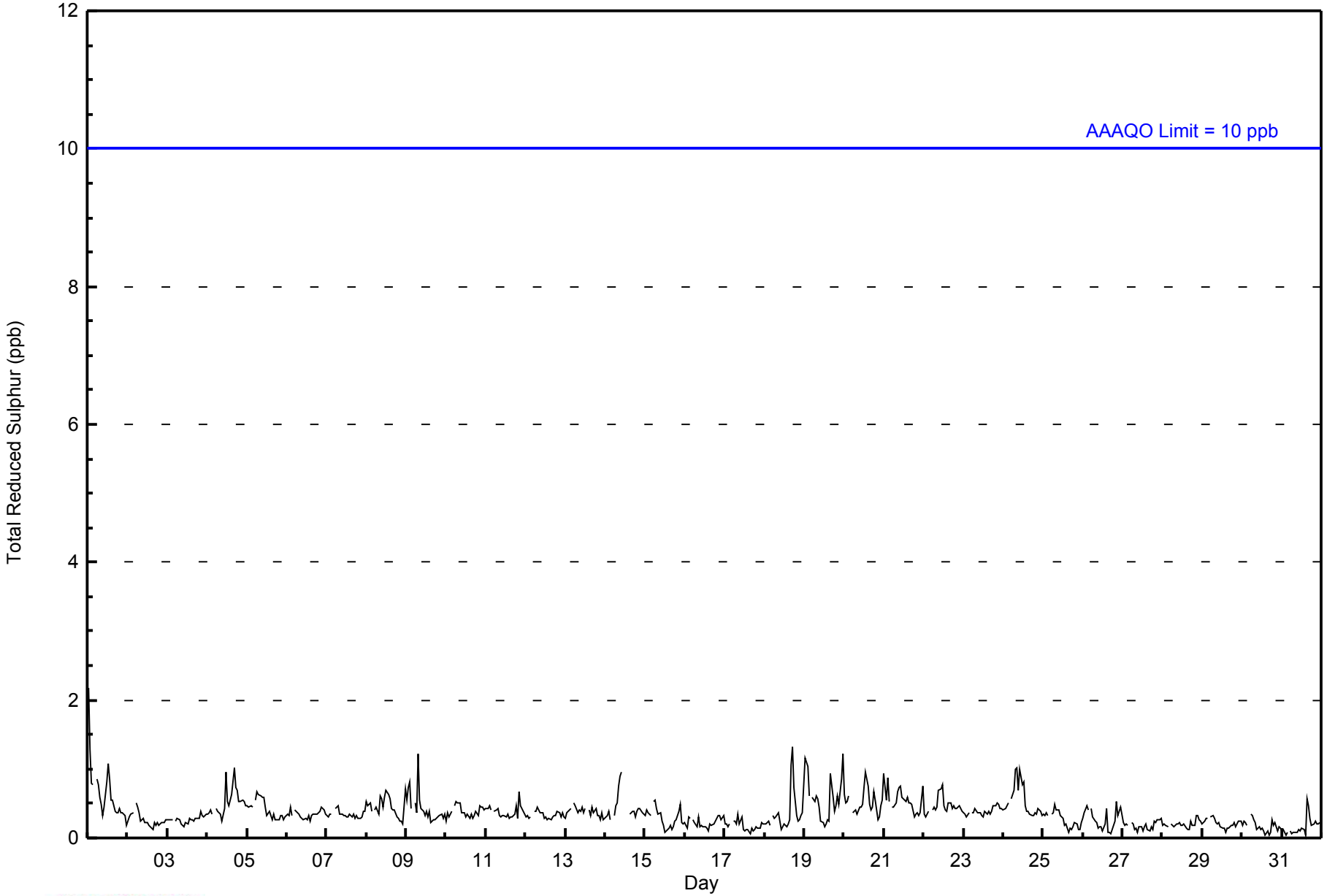
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - August 2014

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	11	5	11	32	58	177	32	28	22	68	42	18	23	43	81	708
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	11	5	11	32	58	177	32	28	22	68	42	18	23	43	81	708

Total Number of Valid Hours: 708

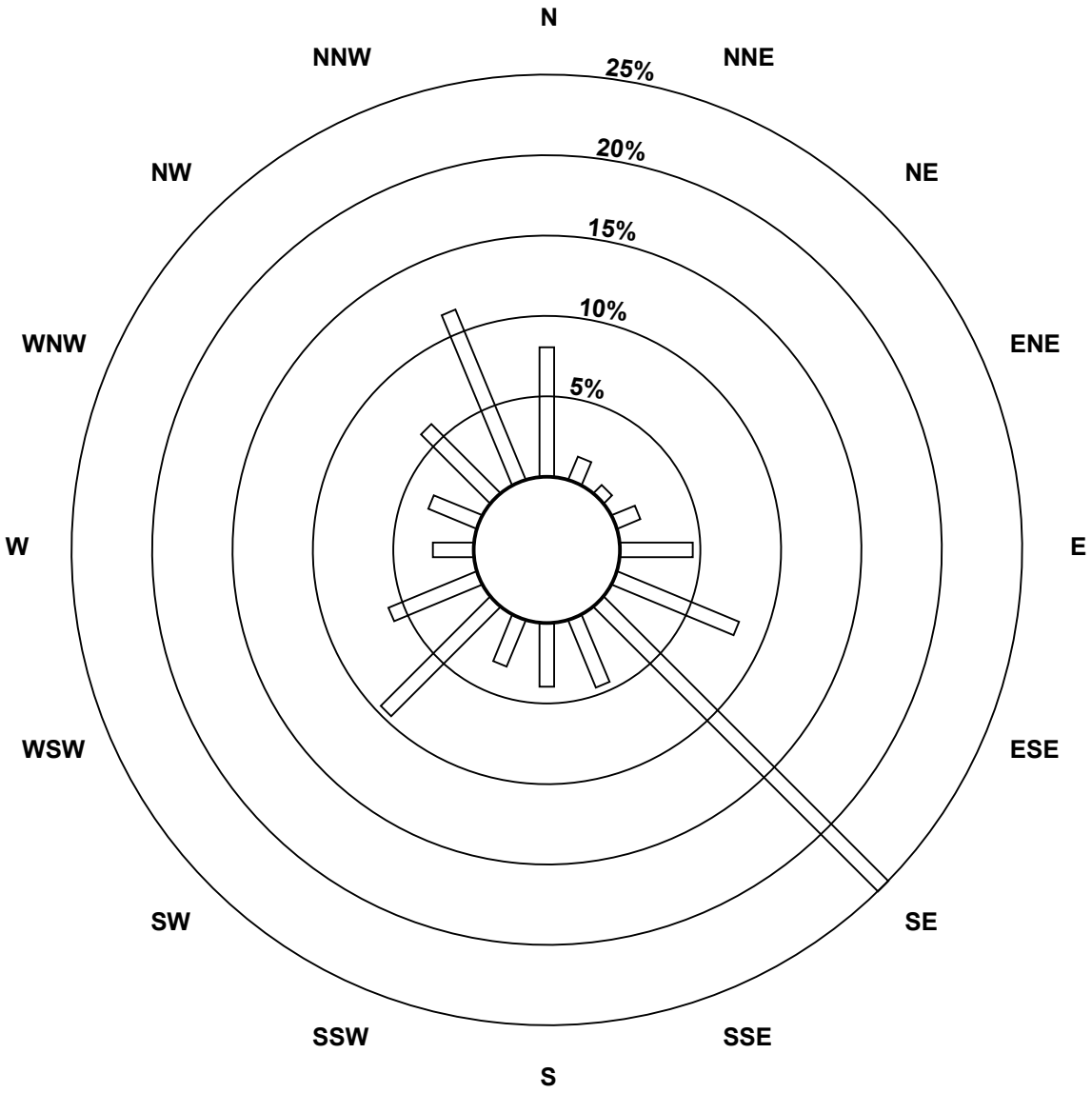
Total Number of Hours: 744

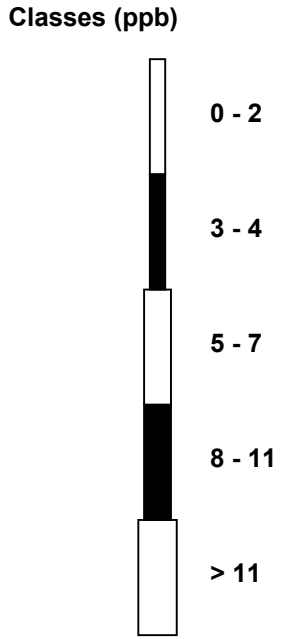
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley (AMS 7)





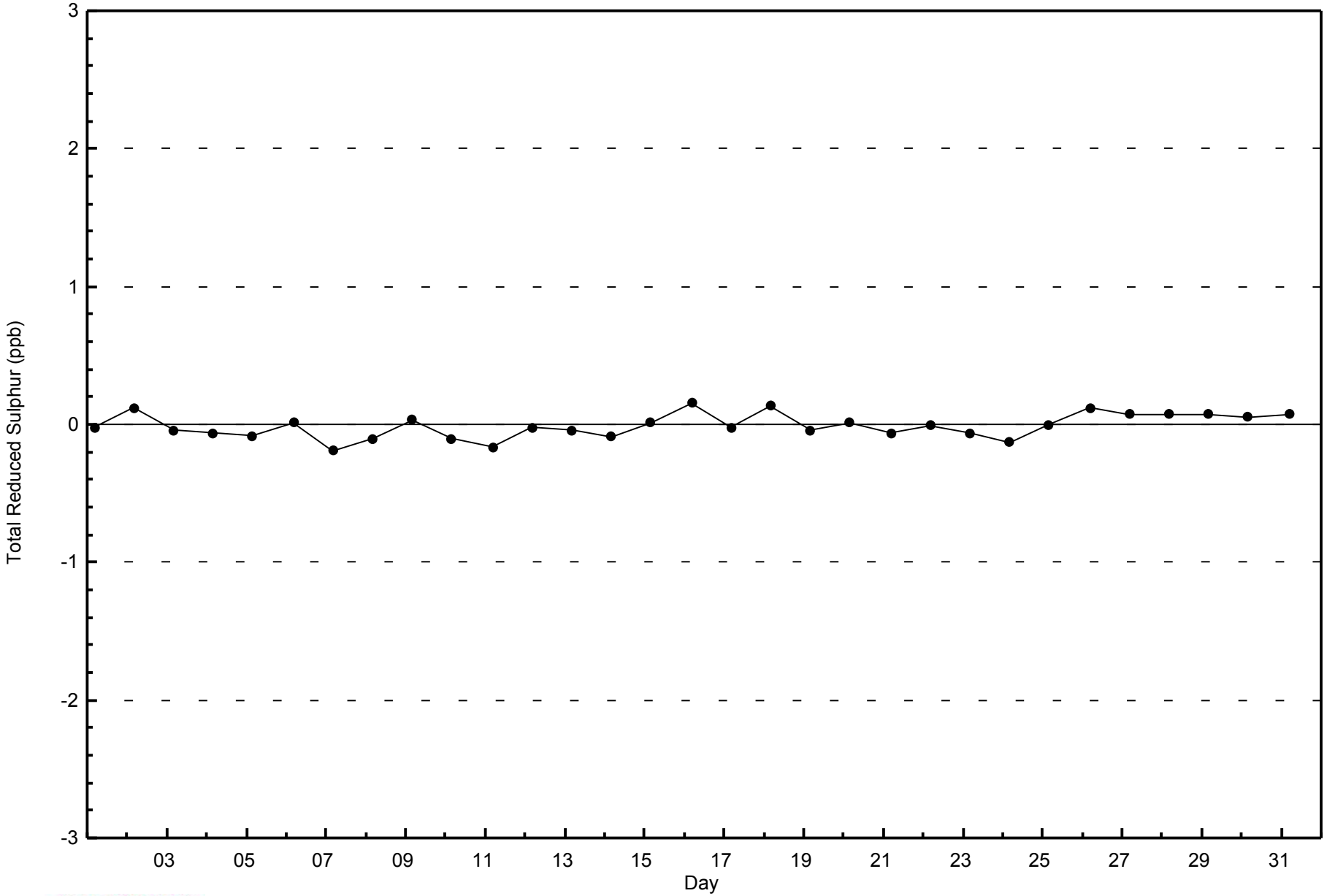
Total Number of Valid Hours: 708

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - August 2014



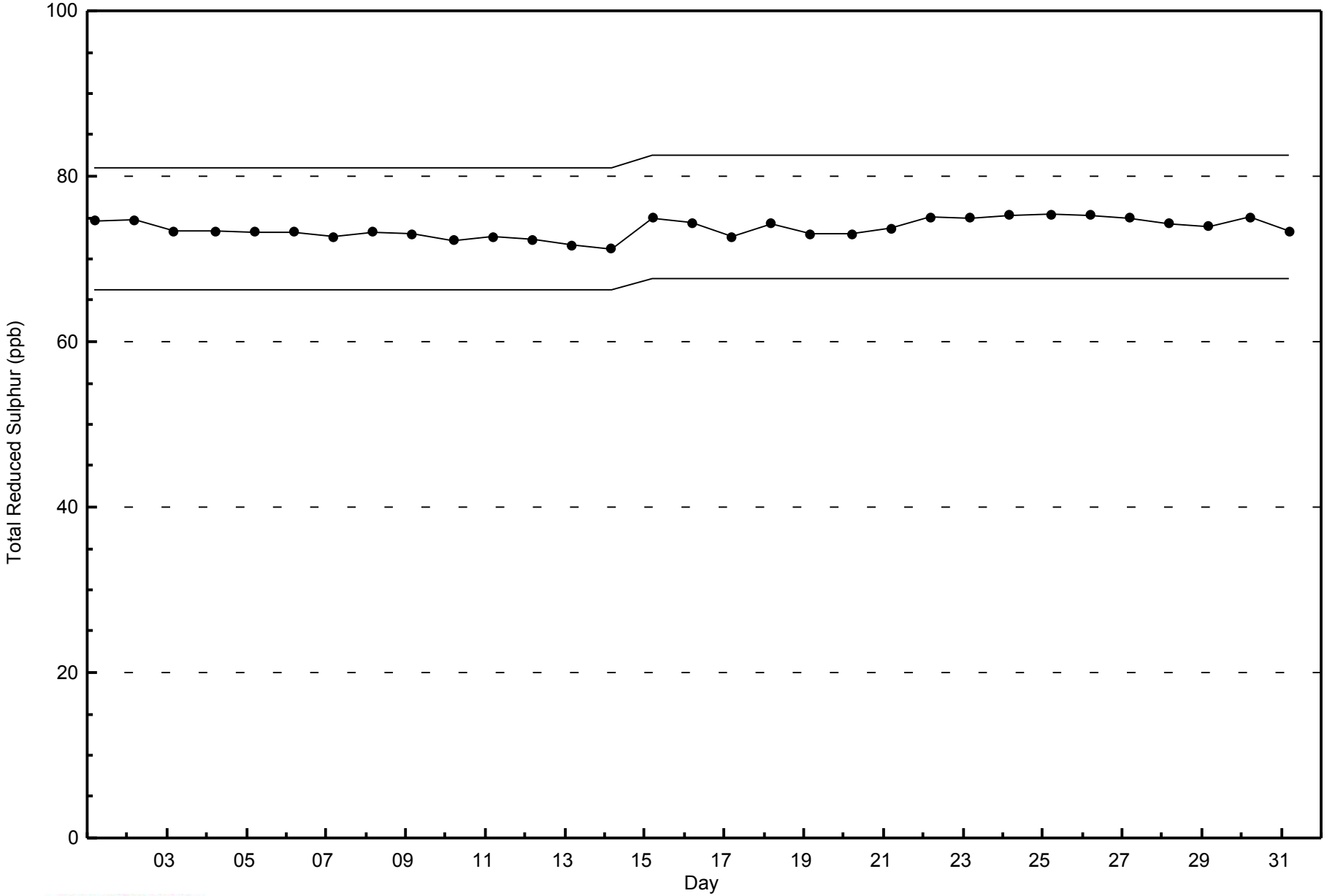
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - August 2014



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ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - August 2014

Maximum Value: 2.3 ppm on Aug 16 22:00

Maximum Daily Average: 2.1 ppm on Aug 4

Minimum Value: 1.8 ppm on Aug 11 17:00

Minimum Daily Average: 1.9 ppm on Aug 7

Maximum Diurnal Average: 2.0 ppm at hour 5

Minimum Diurnal Average: 1.9 ppm at hour 15

Monthly Average: 1.96 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.9 Q_1 = 1.9 Median = 1.9 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	2.2	2.2	2.2	Z	2.2	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	2.0	2.0	2.0	2.0	2.2
2-Aug	2.0	2.0	2.0	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	2.0	2.0	1.9	2.0
3-Aug	2.0	2.0	2.0	Z	2.0	2.2	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	2.2	2.1	2.1	2.2	2.0	2.2
4-Aug	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2
5-Aug	2.2	2.2	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2
6-Aug	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	1.9	2.0	2.1
7-Aug	1.9	1.9	1.9	Z	1.9	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	1.9	1.9	1.9	1.9	2.0
8-Aug	1.9	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	2.0
9-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0
10-Aug	2.0	2.0	2.0	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.1	2.0	1.9	2.1
11-Aug	2.0	2.0	2.0	Z	2.1	2.0	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	1.8	2.0	1.9	1.9	1.9	1.9	2.1
12-Aug	2.0	1.9	2.0	Z	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	2.0	1.9	1.9	1.9	1.9	2.0
13-Aug	1.9	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
14-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.1	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.3
15-Aug	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.1	2.0	2.0	2.0	2.0	2.1
16-Aug	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.2	2.3	2.2	2.2	2.1	2.3
17-Aug	2.1	2.1	2.1	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.1	1.9	2.1
18-Aug	2.1	2.1	2.2	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.2	2.3	2.2	2.0	1.9	1.9	2.0	2.1	2.1	2.3
19-Aug	2.1	2.1	2.2	Z	2.2	2.1	2.1	2.2	2.2	2.1	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.0	2.2
20-Aug	2.0	2.0	2.0	Z	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	1.9	1.9	2.0
21-Aug	2.0	2.0	2.0	Z	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	2.0	1.9	2.0
22-Aug	1.9	1.9	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
23-Aug	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
24-Aug	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.2	2.3	2.2	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.3	1.9	2.0	2.0	2.3
25-Aug	1.9	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	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	2.0
26-Aug	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.0	2.1
27-Aug	1.9	2.0	2.0	Z	2.0	2.1	2.0	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	1.9	1.9	1.9	1.8	1.9	2.1
28-Aug	1.8	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
29-Aug	2.0	1.9	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	2.0
30-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.1	1.9	2.1
31-Aug	2.0	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	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	2.0	1.9	1.9	2.0
	2.0	2.0	2.0	--	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	Diurnal Average	
	2.2	2.2	2.2	--	2.3	2.2	2.1	2.2	2.3	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.2	Diurnal Maximum	

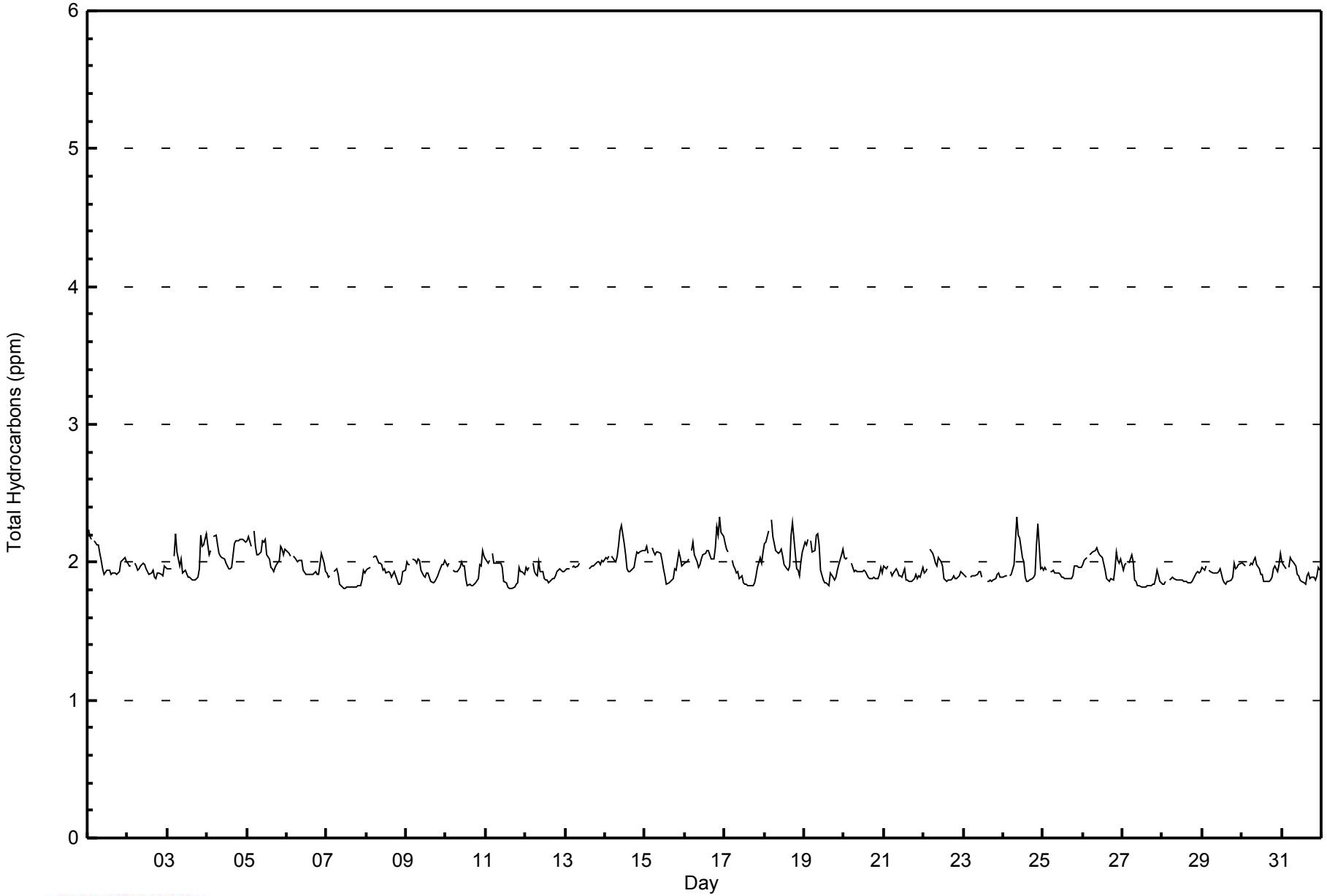
Z - zerospan C - Calibration M - Maintenance

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - August 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	577	81.73	81.73
2.1 - 3.0	129	18.27	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Athabasca Valley - August 2014

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	51	9	5	10	25	45	122	26	21	21	61	37	17	22	36	69	577
2.1 - 3.0	8	3	0	1	9	11	52	8	6	1	6	2	1	1	7	13	129
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	59	12	5	11	34	56	174	34	27	22	67	39	18	23	43	82	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

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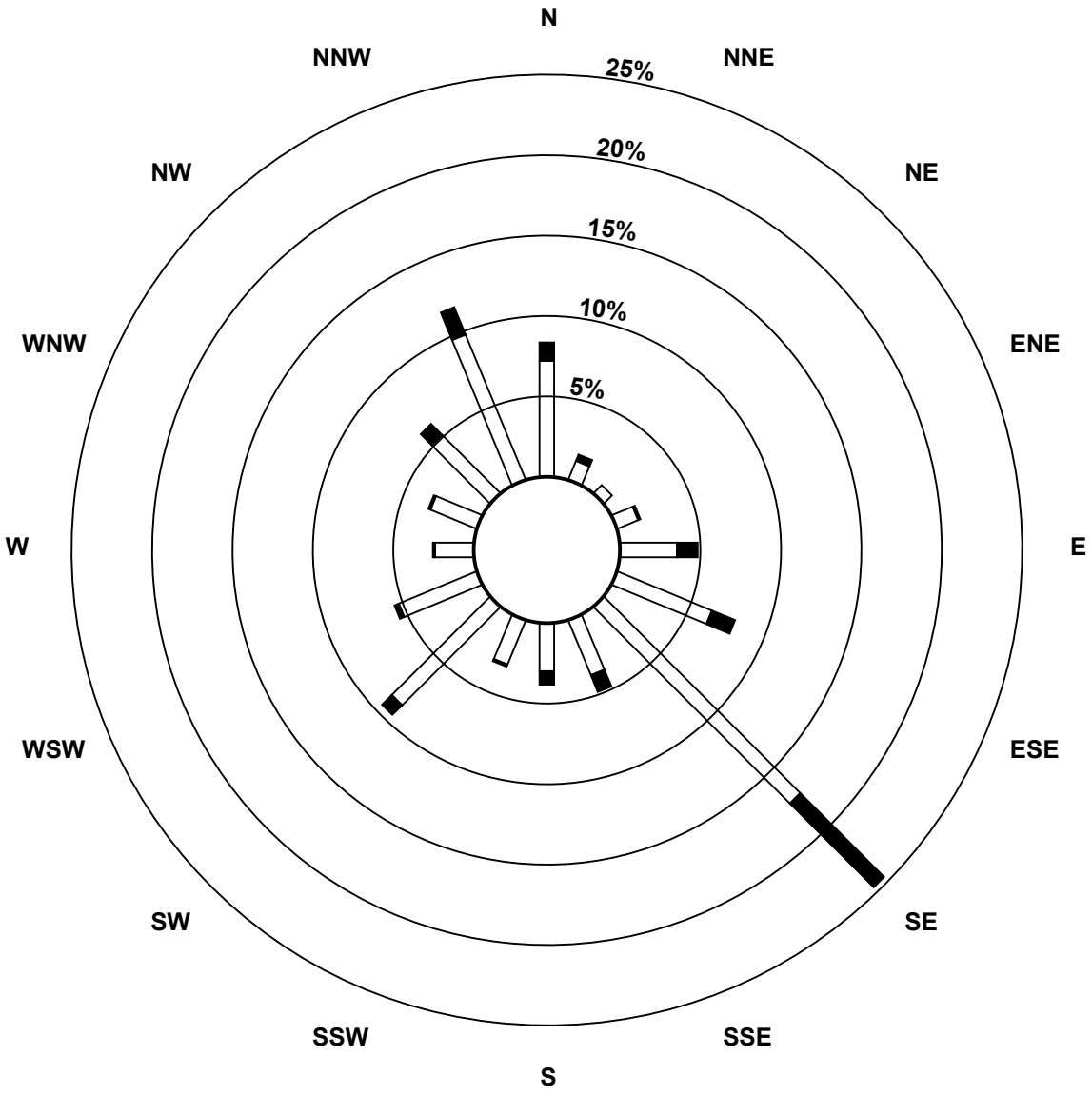
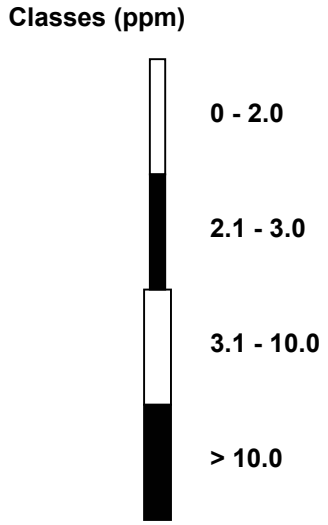
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Athabasca Valley (AMS 7)





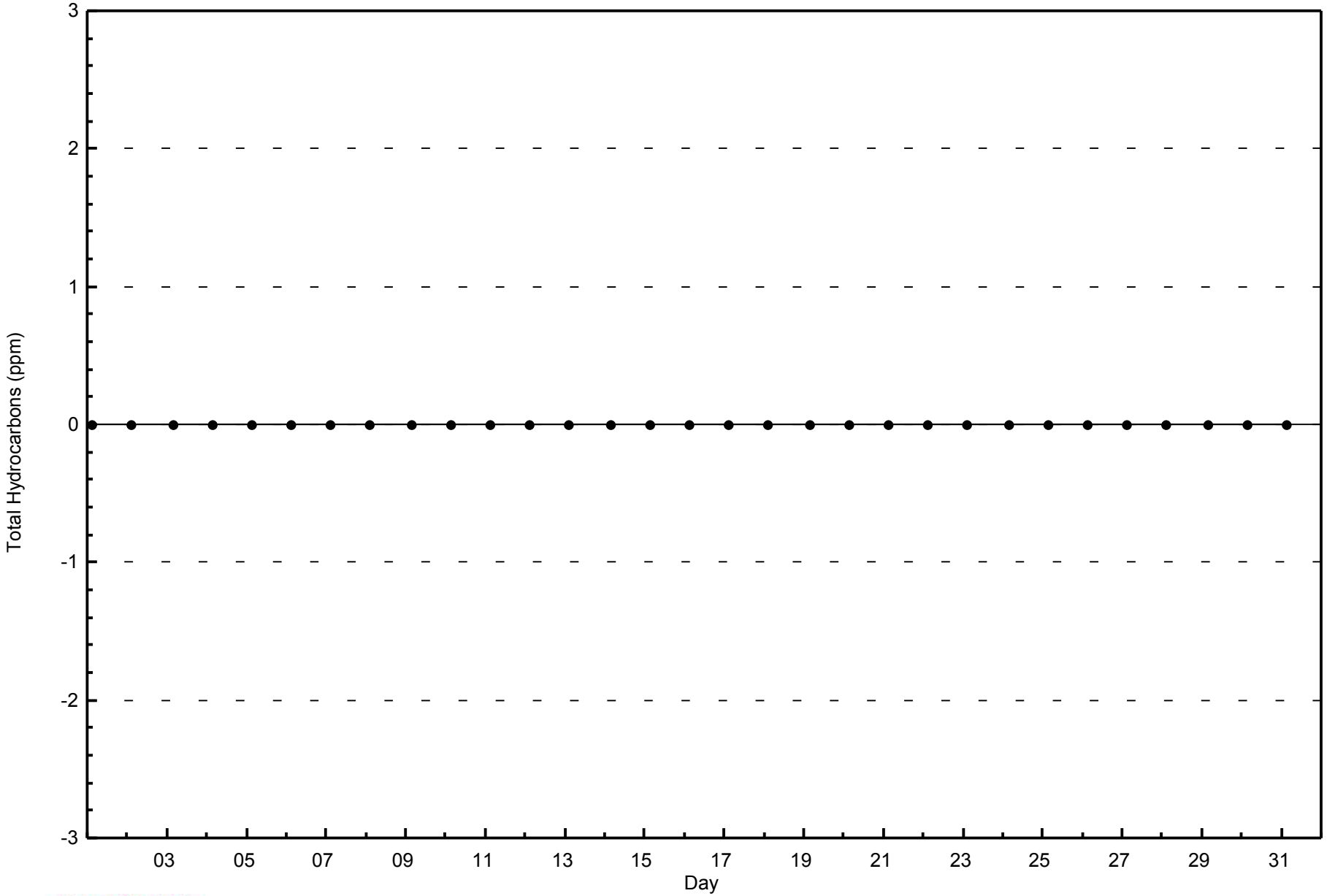
Total Number of Valid Hours: 706

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - August 2014



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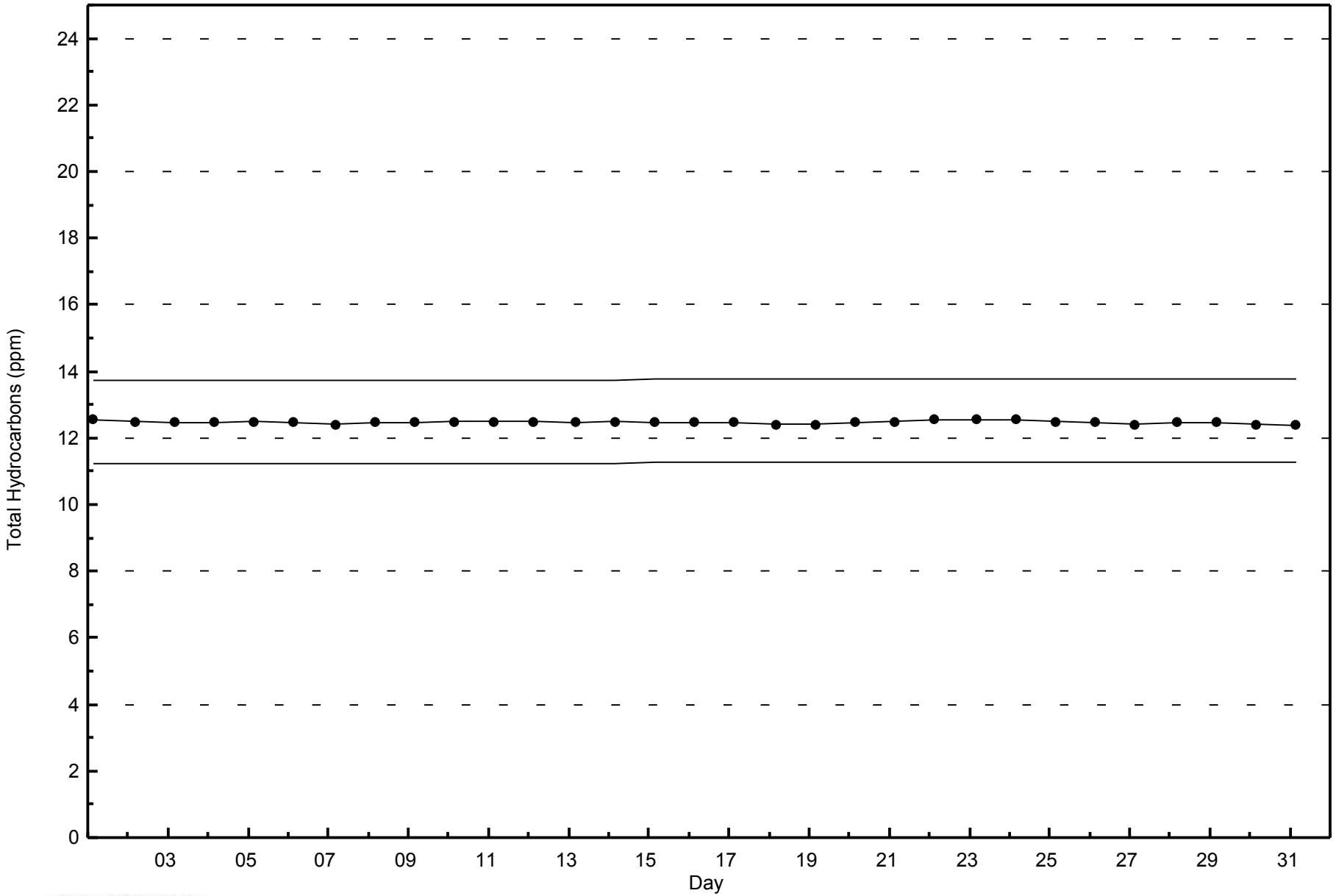
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - August 2014

Maximum Value: 0.363 ppm on Aug 24 22:00

Maximum Daily Average: 0.085 ppm on Aug 14

Minimum Value: 0.000 ppm on Aug 7 12:00

Minimum Daily Average: 0.003 ppm on Aug 23

Maximum Diurnal Average: 0.070 ppm at hour 22

Minimum Diurnal Average: 0.015 ppm at hour 16

Monthly Average: 0.034 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:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0.148	0.117	0.129	Z	0.118	0.090	0.073	0.060	0.039	0.022	0.004	0.012	0.019	0.023	0.006	0.006	0.009	0.004	0.009	0.026	0.055	0.059	0.056	0.044	0.049	0.148
2-Aug	0.036	0.028	0.021	Z	0.017	0.010	0.004	0.009	0.032	0.042	0.032	0.032	0.018	0.015	0.019	0.029	0.009	0.002	0.015	0.017	0.017	0.015	0.037	0.031	0.021	0.042
3-Aug	0.022	0.019	0.014	Z	0.028	0.026	0.016	0.009	0.011	0.009	0.011	0.023	0.006	0.014	0.009	0.002	0.004	0.006	0.032	0.083	0.238	0.200	0.126	0.116	0.044	0.238
4-Aug	0.089	0.072	0.082	Z	0.049	0.046	0.039	0.041	0.037	0.034	0.034	0.043	0.036	0.031	0.040	0.050	0.133	0.132	0.148	0.182	0.172	0.144	0.172	0.149	0.085	0.182
5-Aug	0.129	0.118	0.095	Z	0.099	0.067	0.056	0.062	0.079	0.148	0.124	0.129	0.096	0.084	0.055	0.045	0.044	0.055	0.052	0.059	0.118	0.105	0.067	0.070	0.085	0.148
6-Aug	0.056	0.050	0.039	Z	0.034	0.029	0.025	0.044	0.039	0.039	0.022	0.015	0.022	0.027	0.024	0.029	0.033	0.042	0.041	0.046	0.074	0.098	0.079	0.051	0.042	0.098
7-Aug	0.033	0.010	0.010	Z	0.018	0.026	0.033	0.019	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.007	0.035	0.042	0.010	0.042
8-Aug	0.027	0.027	0.026	Z	0.034	0.027	0.025	0.025	0.033	0.038	0.024	0.030	0.029	0.032	0.029	0.015	0.017	0.035	0.007	0.003	0.003	0.002	0.003	0.016	0.022	0.038
9-Aug	0.014	0.010	0.009	Z	0.021	0.012	0.018	0.040	0.028	0.012	0.005	0.007	0.019	0.016	0.008	0.002	0.003	0.012	0.020	0.030	0.043	0.077	0.065	0.064	0.023	0.077
10-Aug	0.054	0.027	0.024	Z	0.008	0.004	0.008	0.008	0.044	0.064	0.014	0.020	0.007	0.000	0.001	0.001	0.001	0.006	0.010	0.040	0.060	0.075	0.161	0.117	0.033	0.161
11-Aug	0.065	0.046	0.041	Z	0.098	0.027	0.028	0.020	0.018	0.020	0.027	0.009	0.008	0.005	0.001	0.002	0.003	0.004	0.019	0.014	0.032	0.033	0.037	0.029	0.025	0.098
12-Aug	0.043	0.031	0.031	Z	0.025	0.016	0.015	0.011	0.109	0.035	0.032	0.021	0.012	0.022	0.015	0.026	0.033	0.041	0.054	0.067	0.071	0.049	0.037	0.030	0.036	0.109
13-Aug	0.036	0.030	0.034	Z	0.030	0.036	0.032	0.033	0.039	C	C	C	C	C	0.052	0.048	0.052	0.054	0.071	0.087	0.075	0.062	0.060	0.059	0.049	0.087
14-Aug	0.066	0.069	0.070	Z	0.100	0.071	0.054	0.063	0.089	0.109	0.125	0.097	0.062	0.037	0.036	0.039	0.049	0.070	0.130	0.126	0.135	0.134	0.125	0.107	0.085	0.135
15-Aug	0.099	0.091	0.074	Z	0.065	0.057	0.056	0.061	0.065	0.069	0.054	0.045	0.018	0.001	0.009	0.011	0.014	0.030	0.053	0.084	0.100	0.080	0.073	0.062	0.055	0.100
16-Aug	0.062	0.054	0.054	Z	0.047	0.054	0.034	0.043	0.037	0.049	0.053	0.062	0.073	0.074	0.079	0.059	0.055	0.064	0.122	0.195	0.167	0.228	0.166	0.134	0.085	0.228
17-Aug	0.095	0.068	0.055	Z	0.046	0.040	0.038	0.035	0.036	0.019	0.020	0.003	0.001	0.001	0.002	0.003	0.006	0.006	0.011	0.058	0.084	0.073	0.075	0.079	0.037	0.095
18-Aug	0.070	0.070	0.080	Z	0.056	0.052	0.048	0.052	0.048	0.055	0.044	0.034	0.034	0.033	0.043	0.056	0.091	0.111	0.092	0.051	0.054	0.041	0.052	0.089	0.059	0.111
19-Aug	0.089	0.059	0.058	Z	0.053	0.049	0.056	0.072	0.066	0.057	0.022	0.011	0.010	0.006	0.003	0.002	0.030	0.014	0.009	0.020	0.038	0.053	0.068	0.073	0.040	0.089
20-Aug	0.058	0.046	0.043	Z	0.026	0.031	0.016	0.003	0.001	0.000	0.004	0.002	0.001	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.005	0.027	0.000	0.013	0.058
21-Aug	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.001	0.072	0.000	0.003	0.001	0.000	0.007	0.021	0.038	0.005	0.026	0.008	0.032	0.010	0.072
22-Aug	0.006	0.006	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.010	0.003	0.000	0.003	0.000	0.003	0.003	0.021	0.003	0.000	0.010	0.027	0.011	0.005	0.027
23-Aug	0.011	0.001	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	M	M	0.000	0.000	0.011	0.000	0.000	0.002	0.017	0.019	0.006	0.002	0.003	0.019
24-Aug	0.001	0.000	0.002	Z	0.000	0.000	0.002	0.023	0.085	0.098	0.055	0.030	0.031	0.006	0.001	0.000	0.000	0.000	0.004	0.016	0.212	0.363	0.030	0.019	0.043	0.363
25-Aug	0.007	0.004	0.003	Z	0.005	0.003	0.004	0.005	0.010	0.007	0.006	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.008	0.035	0.032	0.023	0.012	0.012	0.008	0.035
26-Aug	0.009	0.014	0.014	Z	0.016	0.019	0.019	0.017	0.039	0.026	0.027	0.044	0.086	0.035	0.019	0.009	0.011	0.014	0.025	0.047	0.078	0.069	0.046	0.050	0.032	0.086
27-Aug	0.034	0.034	0.046	Z	0.042	0.066	0.042	0.004	0.003	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.019	0.030	0.010	0.001	0.015	0.066
28-Aug	0.001	0.001	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	0.002	0.025	0.021	0.029	0.013	0.006	0.004	0.029
29-Aug	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.038	0.000	0.000	0.000	0.000	0.001	0.002	0.003	0.037	0.023	0.022	0.022	0.012	0.007	0.038
30-Aug	0.009	0.006	0.005	Z	0.006	0.013	0.006	0.013	0.016	0.005	0.002	0.003	0.009	0.003	0.000	0.002	0.003	0.007	0.008	0.043	0.033	0.029	0.031	0.046	0.013	0.046
31-Aug	0.024	0.015	0.007	Z	0.010	0.025	0.012	0.004	0.003	0.000	0.001	0.001	0.000	0.000	0.000	0.017	0.018	0.009	0.021	0.018	0.005	0.020	0.036	0.014	0.011	0.036
	0.045	0.036	0.034	--	0.034	0.029	0.025	0.025	0.033	0.032	0.025	0.024	0.023	0.017	0.015	0.015	0.020	0.024	0.032	0.047	0.064	0.070	0.057	0.051	Diurnal Average	
	0.148	0.118	0.129	--	0.118	0.090	0.073	0.072	0.109	0.148	0.125	0.129	0.096	0.084	0.079	0.059	0.133	0.132	0.148	0.195	0.238	0.363	0.172	0.149	Diurnal Maximum	

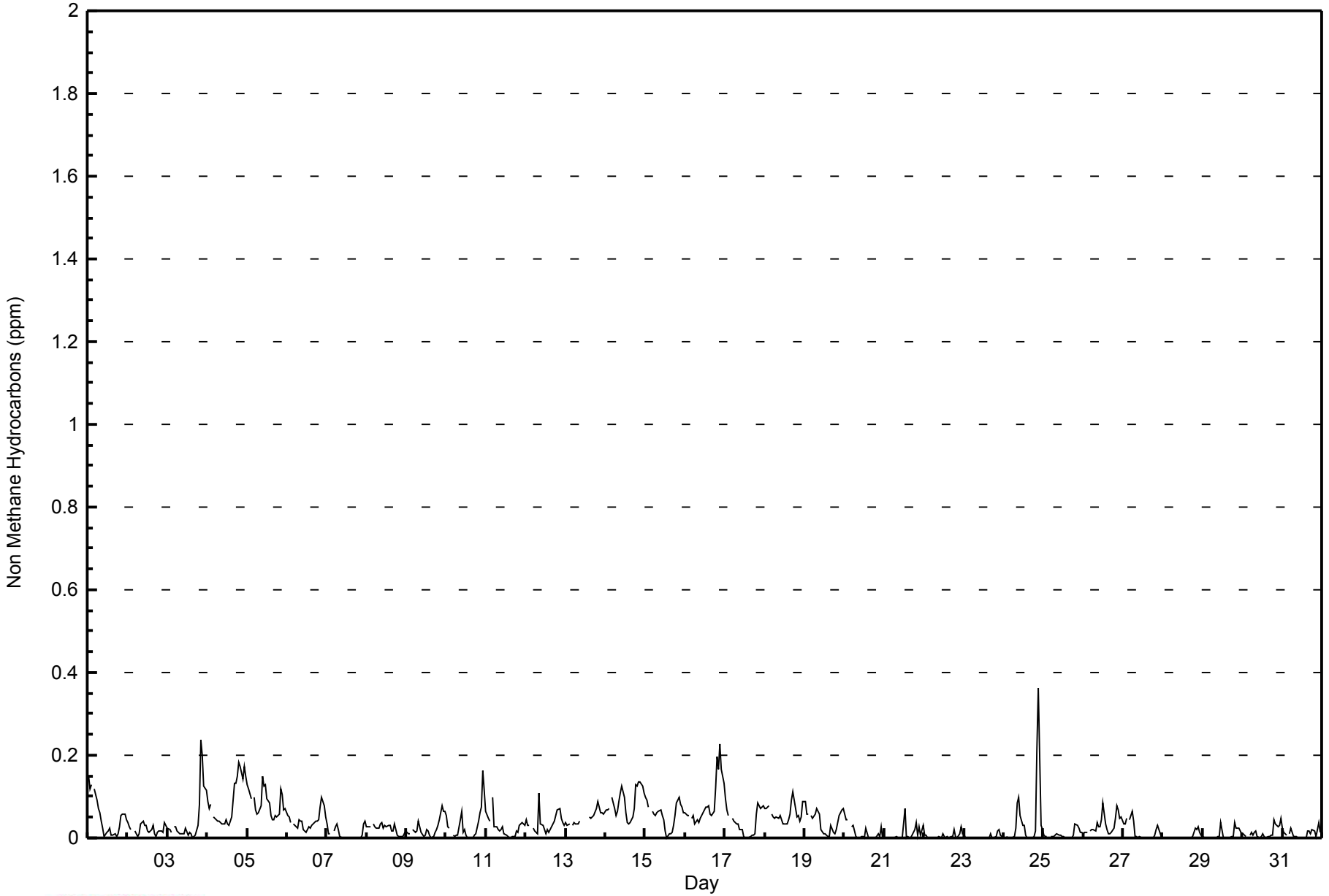
Z - zerospan C - Calibration M - Maintenance

WBEA

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - August 2014

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	199	28.19	28.19
0.006 - 0.05	360	50.99	79.18
0.06 - 0.1	135	19.12	98.30
> 0.1	12	1.70	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - August 2014

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	17	1	1	4	8	11	36	5	2	7	20	10	11	14	21	31	199
0.006 - 0.05	33	7	4	5	17	35	93	19	19	10	36	18	6	7	14	37	360
0.06 - 0.1	9	4	0	2	9	9	40	7	5	5	10	10	1	2	8	14	135
> 0.1	0	0	0	0	0	1	5	3	1	0	1	1	0	0	0	0	12
Totals	59	12	5	11	34	56	174	34	27	22	67	39	18	23	43	82	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

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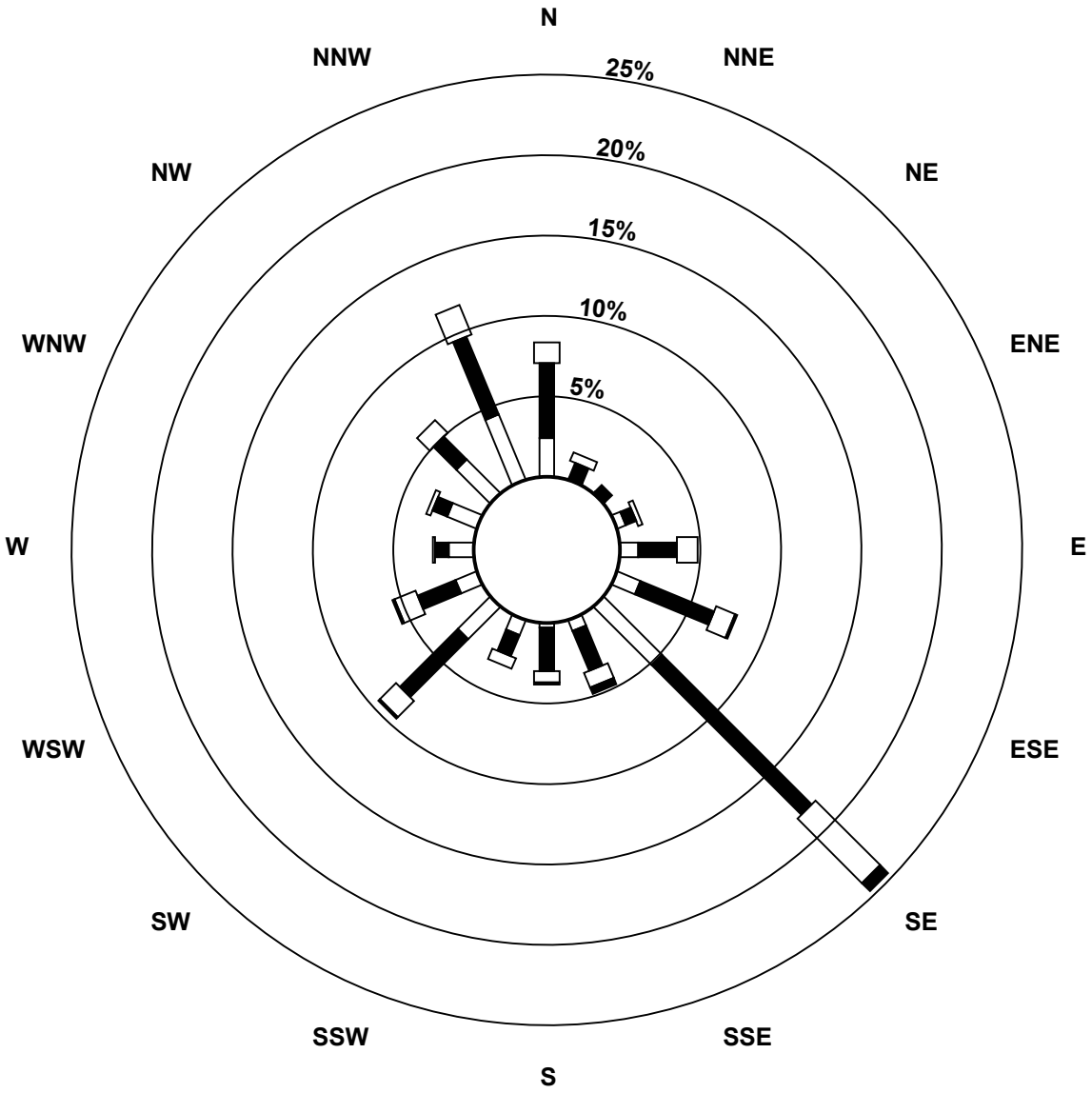
ATMOSPHERICS INC.

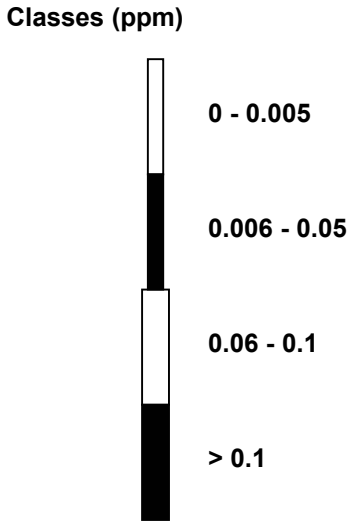
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley (AMS 7)





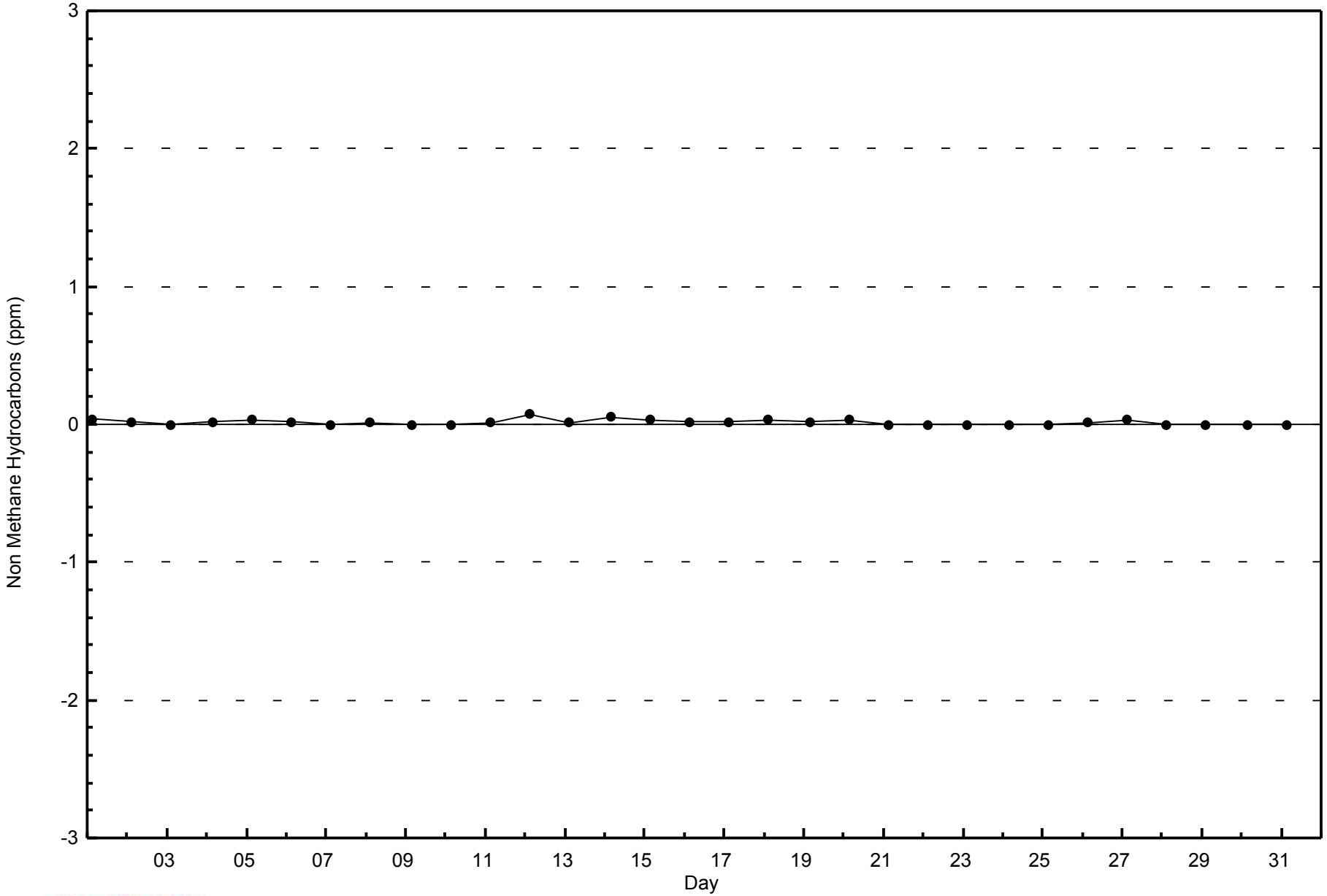
Total Number of Valid Hours: 706

WBEA

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - August 2014



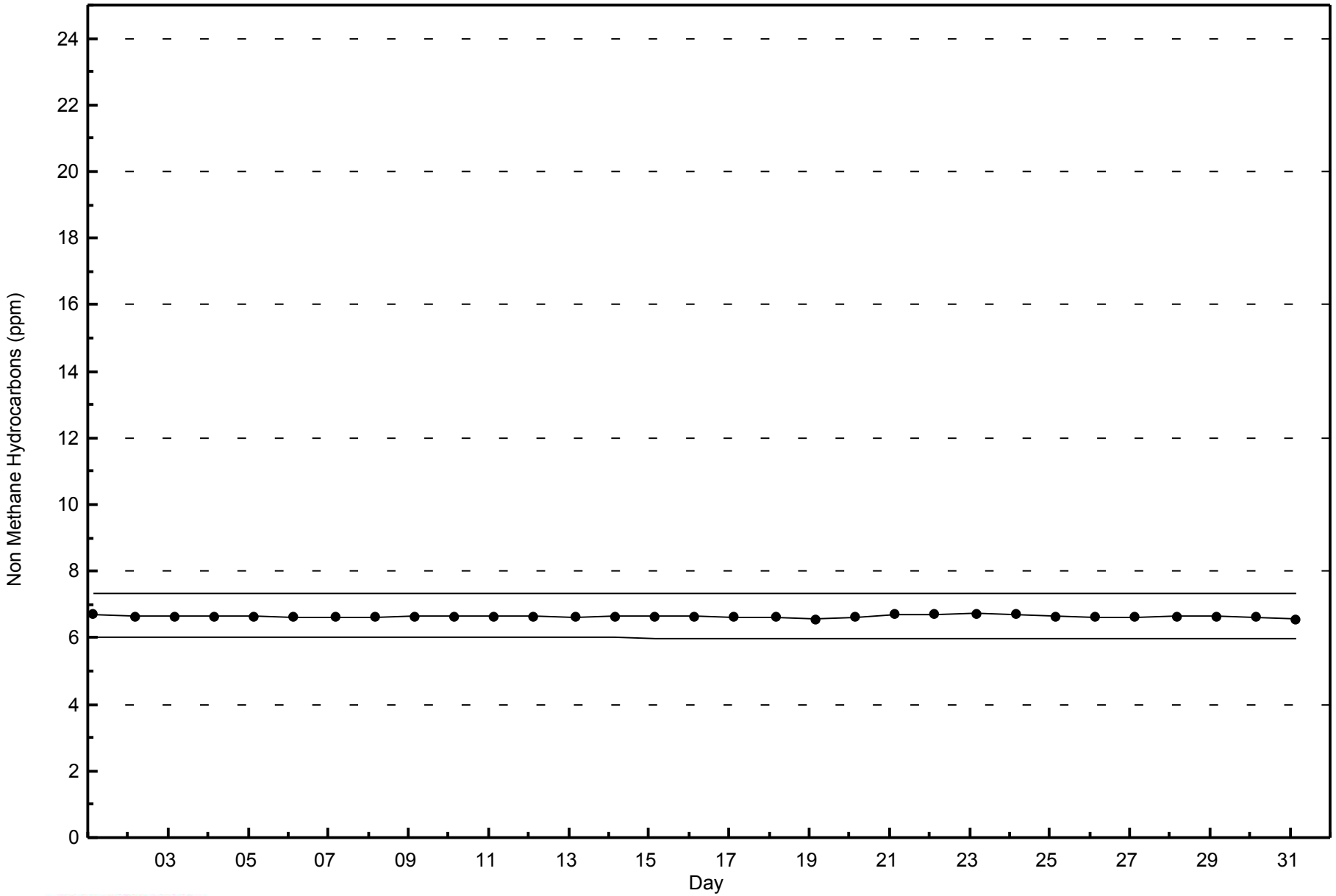
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Athabasca Valley - August 2014

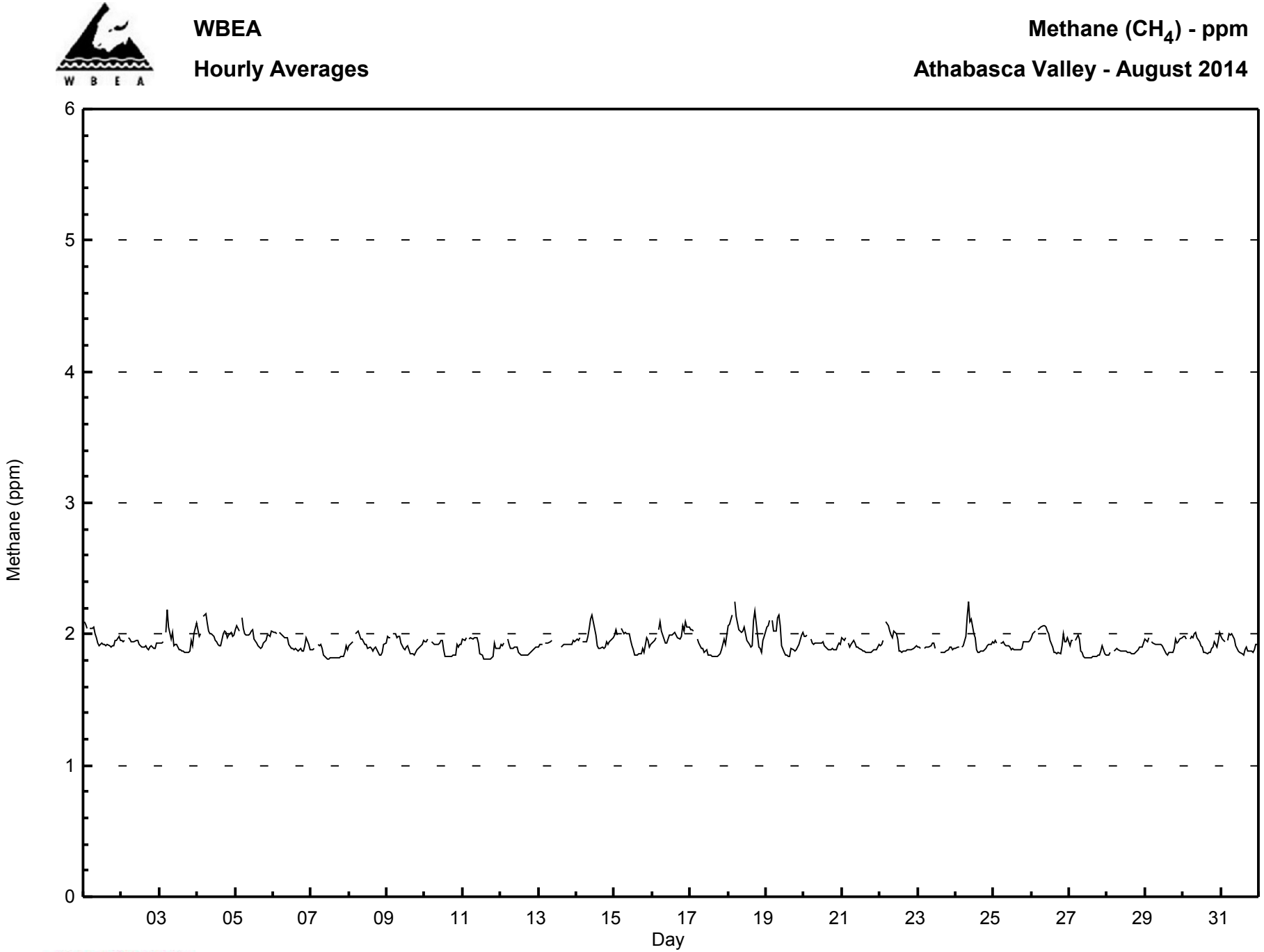
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.2 ppm on Aug 18 05:00
Maximum Daily Average: 2.0 ppm on Aug 18

Minimum Value: 1.8 ppm on Aug 11 17:00
Maximum Diurnal Average: 2.0 ppm at hour 5
Monthly Average: 1.93 ppm
Minimum Daily Average: 1.9 ppm on Aug 7
Minimum Diurnal Average: 1.9 ppm at hour 15
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} = 2.1

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	2.1	2.1	2.0	Z	2.0	2.0	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1
2-Aug	2.0	1.9	1.9	Z	2.0	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	2.0
3-Aug	1.9	1.9	1.9	Z	2.0	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.1	1.9	2.2
4-Aug	2.0	2.0	2.0	Z	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
5-Aug	2.0	2.1	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
6-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0
7-Aug	1.9	1.9	1.9	Z	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	1.8	1.9	1.9	1.9	1.9	1.9
8-Aug	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	2.0
9-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
10-Aug	1.9	1.9	2.0	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	1.9	1.9	1.9	1.9	1.9	2.0
11-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0
12-Aug	1.9	1.9	1.9	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0
13-Aug	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0
14-Aug	2.0	2.0	2.0	Z	1.9	1.9	1.9	2.0	2.0	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	2.0	2.0	2.0	2.1
15-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0
16-Aug	1.9	2.0	2.0	Z	2.0	2.1	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.1
17-Aug	2.0	2.0	2.0	Z	2.0	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	2.0	1.9	2.0	1.9	2.0
18-Aug	2.1	2.1	2.2	Z	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	1.9	1.9	1.9	2.1	2.2	2.1	1.9	1.9	1.9	1.9	2.0	2.0	2.2
19-Aug	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.1	2.1	2.1	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
20-Aug	2.0	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
21-Aug	2.0	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	1.9	2.0
22-Aug	1.9	1.9	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
23-Aug	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
24-Aug	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.1	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
25-Aug	1.9	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0
26-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	2.0	1.9	1.9	2.0	2.0	2.1
27-Aug	1.9	2.0	1.9	Z	2.0	2.0	2.0	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	1.9	1.9	1.8	1.8	1.9	2.0
28-Aug	1.8	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
29-Aug	2.0	1.9	2.0	Z	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	1.9	1.9	2.0	1.9	1.9	2.0	2.0	1.9	2.0
30-Aug	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0
31-Aug	2.0	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	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	2.0
	2.0	2.0	2.0	--	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.1	2.1	2.2	--	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance


WBEA
Hourly Averages
Methane (CH_4) - ppm
Athabasca Valley - August 2014
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	662	93.77	93.77
2.1 - 3.0	44	6.23	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Methane (CH_4) - ppm

Athabasca Valley - August 2014

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	57	12	5	10	34	51	155	32	27	21	66	39	18	22	38	75	662
2.1 - 3.0	2	0	0	1	0	5	19	2	0	1	1	0	0	1	5	7	44
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	59	12	5	11	34	56	174	34	27	22	67	39	18	23	43	82	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

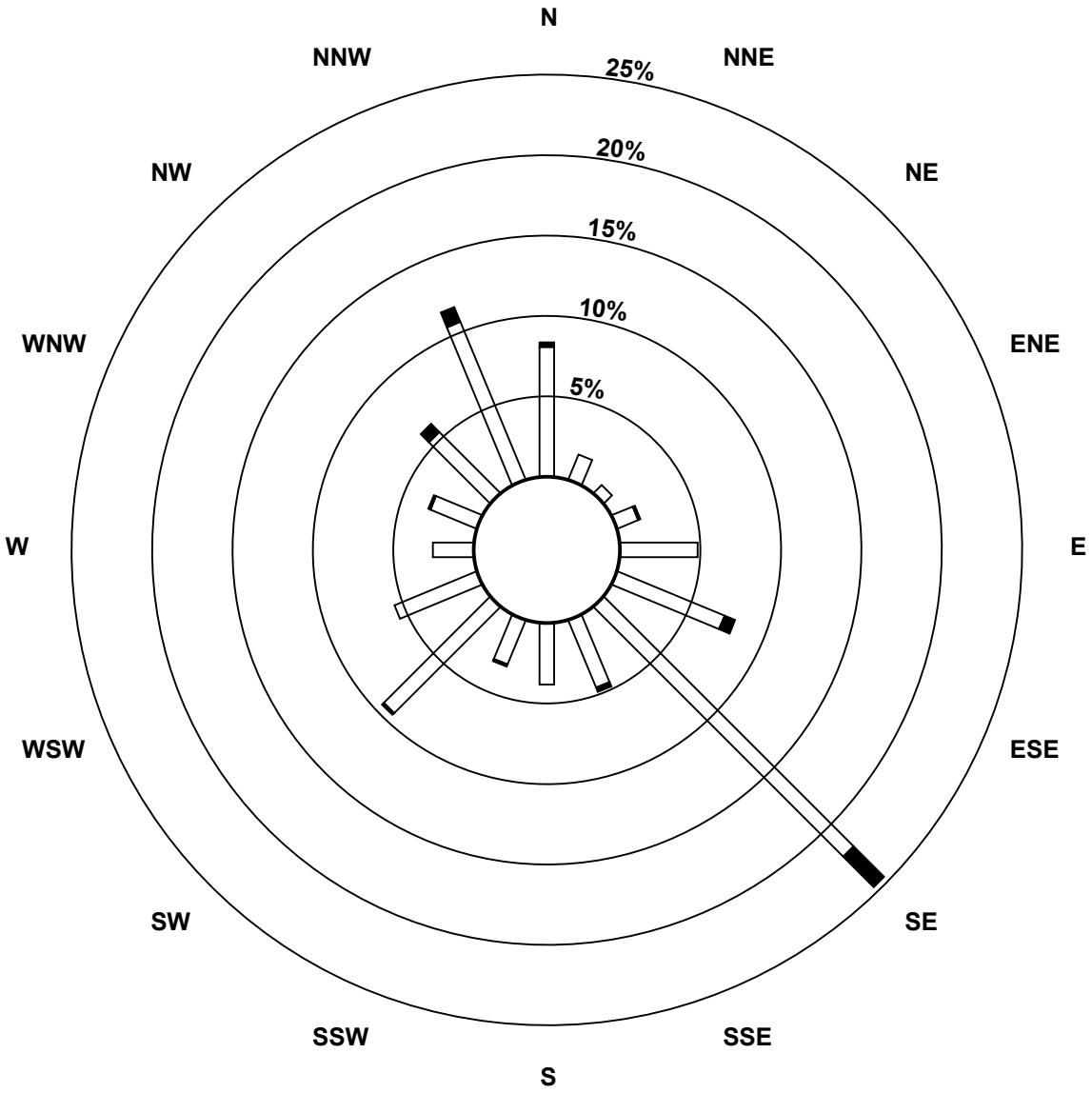
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

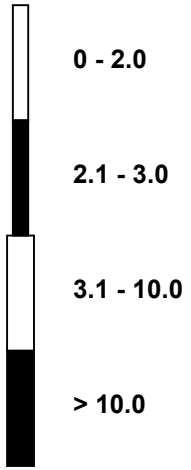
Wind Rose Aug 2014

Methane (CH_4) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)



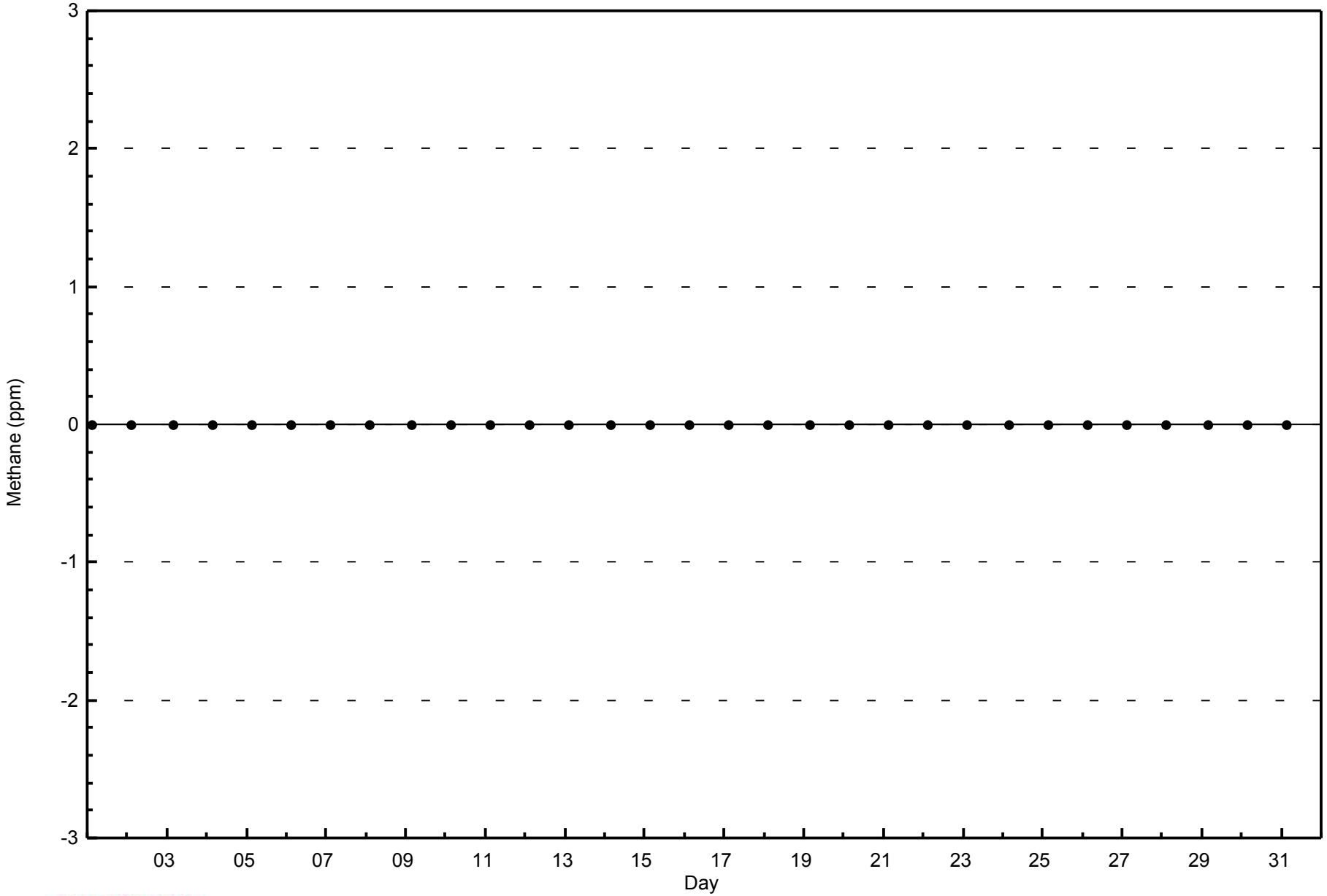
Total Number of Valid Hours: 706

WBEA

Zero Responses

Methane (CH_4) - ppm

Athabasca Valley - August 2014



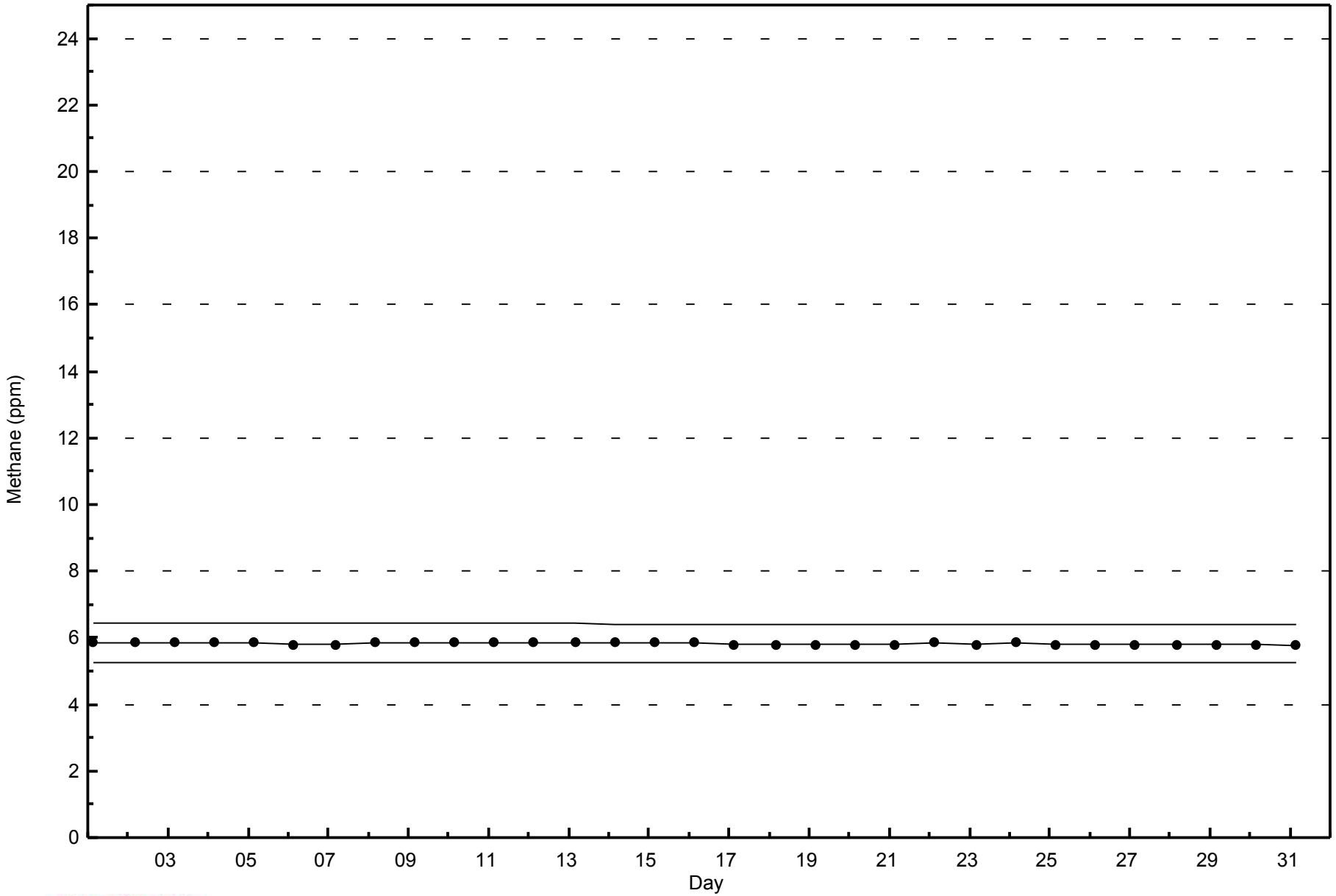
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Methane (CH_4) - ppm

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Athabasca Valley - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 77 ppb on Aug 4 17:00 Maximum Daily Average: 32.5 ppb on Aug 4

Minimum Value: 1 ppb on Aug 22 05:00 Minimum Daily Average: 10.8 ppb on Aug 20
Maximum Diurnal Average: 33.7 ppb at hour 15 Minimum Diurnal Average: 5.9 ppb at hour 6
Monthly Average: 19.3 ppb Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 9$ Median = 17 $Q_3 = 27$ $P_{90} = 36$ $P_{99} = 60$

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-Aug	8	9	11	Z	10	11	11	14	18	22	27	31	36	41	42	42	42	40	39	30	24	18	12	14	24.0	42
2-Aug	12	9	8	Z	4	6	8	8	11	17	25	34	35	36	36	35	47	52	43	38	33	34	25	23	25.1	52
3-Aug	20	15	17	Z	5	5	10	16	19	30	32	34	45	43	48	52	49	43	35	26	19	13	8	4	25.5	52
4-Aug	8	12	10	Z	6	6	9	12	17	23	36	57	63	63	61	59	77	67	53	35	26	17	15	15	32.5	77
5-Aug	12	10	11	Z	3	5	10	13	18	23	30	40	51	53	54	51	40	33	33	31	23	16	15	20	25.9	54
6-Aug	22	22	23	Z	18	16	20	23	24	31	45	52	48	43	43	43	42	37	35	30	19	14	16	20	29.8	52
7-Aug	22	26	25	Z	19	21	19	23	27	28	27	26	28	29	29	29	28	28	27	25	23	18	11	11	23.9	29
8-Aug	10	9	7	Z	2	2	4	7	13	19	23	28	37	44	44	38	38	29	31	29	26	23	22	13	21.6	44
9-Aug	5	5	6	Z	3	3	6	8	6	11	17	20	19	21	25	25	23	20	14	9	6	1	1	1	11.0	25
10-Aug	3	5	4	Z	1	1	2	2	4	7	9	15	22	25	25	23	26	24	22	16	9	5	2	2	11.0	26
11-Aug	3	5	4	Z	1	2	4	8	12	16	22	25	24	21	21	20	20	20	22	17	3	3	4	5	12.4	25
12-Aug	4	3	2	Z	1	1	3	5	10	16	19	21	22	21	21	22	23	22	19	15	13	15	14	14	13.3	23
13-Aug	12	11	9	Z	6	4	6	9	13	20	30	36	37	M	43	49	48	48	44	37	37	39	37	35	27.8	49
14-Aug	28	18	11	Z	5	5	9	12	C	C	C	C	75	64	61	59	50	44	32	27	20	14	14	14	29.5	75
15-Aug	11	9	12	Z	8	6	8	8	12	20	34	49	52	38	37	38	40	36	30	22	11	12	14	12	22.5	52
16-Aug	9	8	5	Z	1	1	5	7	9	13	21	24	26	32	25	32	36	36	22	11	11	7	7	9	15.6	36
17-Aug	10	12	19	Z	14	14	14	15	20	32	41	38	37	36	35	33	31	29	27	18	15	11	8	7	22.5	41
18-Aug	8	8	6	Z	2	3	3	4	6	5	15	20	23	24	24	22	19	19	21	16	10	11	9	11	12.6	24
19-Aug	9	7	4	Z	3	3	3	1	3	8	25	31	29	28	27	31	27	26	26	24	20	13	7	9	15.8	31
20-Aug	6	7	4	Z	5	8	8	7	9	9	10	10	9	11	11	13	16	17	16	17	17	15	11	13	10.8	17
21-Aug	7	4	4	Z	4	6	5	4	10	16	20	24	29	32	32	33	34	28	26	25	25	23	16	8	18.0	34
22-Aug	10	6	4	Z	1	1	1	2	3	7	12	17	28	30	32	33	34	29	26	21	19	15	10	10	15.3	34
23-Aug	11	11	10	Z	8	8	6	7	7	9	11	25	34	33	34	33	33	36	34	27	17	16	17	17	19.2	36
24-Aug	18	15	15	Z	9	9	4	4	6	13	15	21	23	25	28	24	24	24	20	16	12	9	10	8	15.3	28
25-Aug	10	8	8	Z	6	5	4	7	10	12	18	23	25	29	33	35	34	32	27	16	15	18	20	20	18.0	35
26-Aug	21	20	19	Z	12	9	8	9	11	13	18	22	27	31	27	30	27	24	20	20	14	8	10	9	17.7	31
27-Aug	9	7	7	Z	7	1	4	12	20	30	30	33	34	32	33	32	34	33	28	22	17	11	26	25	21.1	34
28-Aug	20	18	17	Z	12	10	9	11	14	14	15	16	16	21	24	25	24	25	24	11	8	5	5	5	15.2	25
29-Aug	7	6	5	Z	3	2	2	4	6	8	10	17	25	28	30	29	31	33	31	17	24	24	22	24	16.9	33
30-Aug	23	21	19	Z	14	9	10	5	7	13	19	27	27	31	30	27	27	27	20	9	7	6	6	2	16.8	31
31-Aug	5	8	9	Z	4	2	5	9	13	19	20	24	24	26	27	22	18	17	15	10	11	8	1	4	13.2	27
	11.7	10.8	10.1	--	6.3	5.9	7.1	8.9	11.9	16.9	22.5	27.9	32.5	33.0	33.7	33.6	33.6	31.6	27.8	21.5	17.2	14.2	12.8	12.3	Diurnal Average	
	28	26	25	--	19	21	20	23	27	32	45	57	75	64	61	59	77	67	53	38	37	39	37	35	Diurnal Maximum	

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

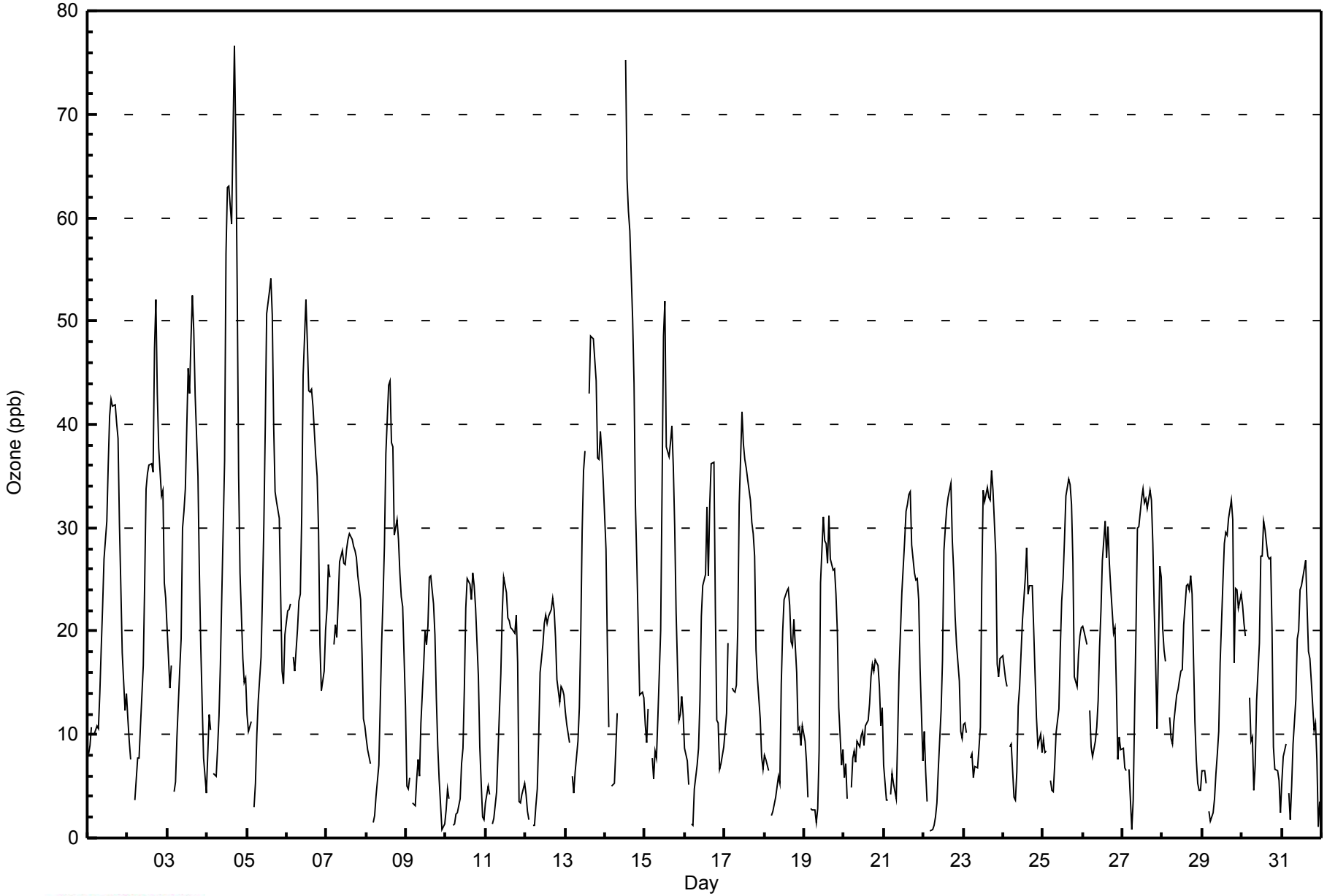
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ozone (O_3) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	415	58.62	58.62
21 - 50	273	38.56	97.18
51 - 82	20	2.82	100.00
> 83	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	20	5	1	8	25	37	152	28	14	9	28	14	5	11	21	37	415
21 - 50	35	6	4	3	8	19	22	6	13	11	41	26	13	11	20	35	273
51 - 82	2	0	0	0	1	2	1	0	0	2	0	0	0	1	1	10	20
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	11	5	11	34	58	175	34	27	22	69	40	18	23	42	82	708

Total Number of Valid Hours: 708

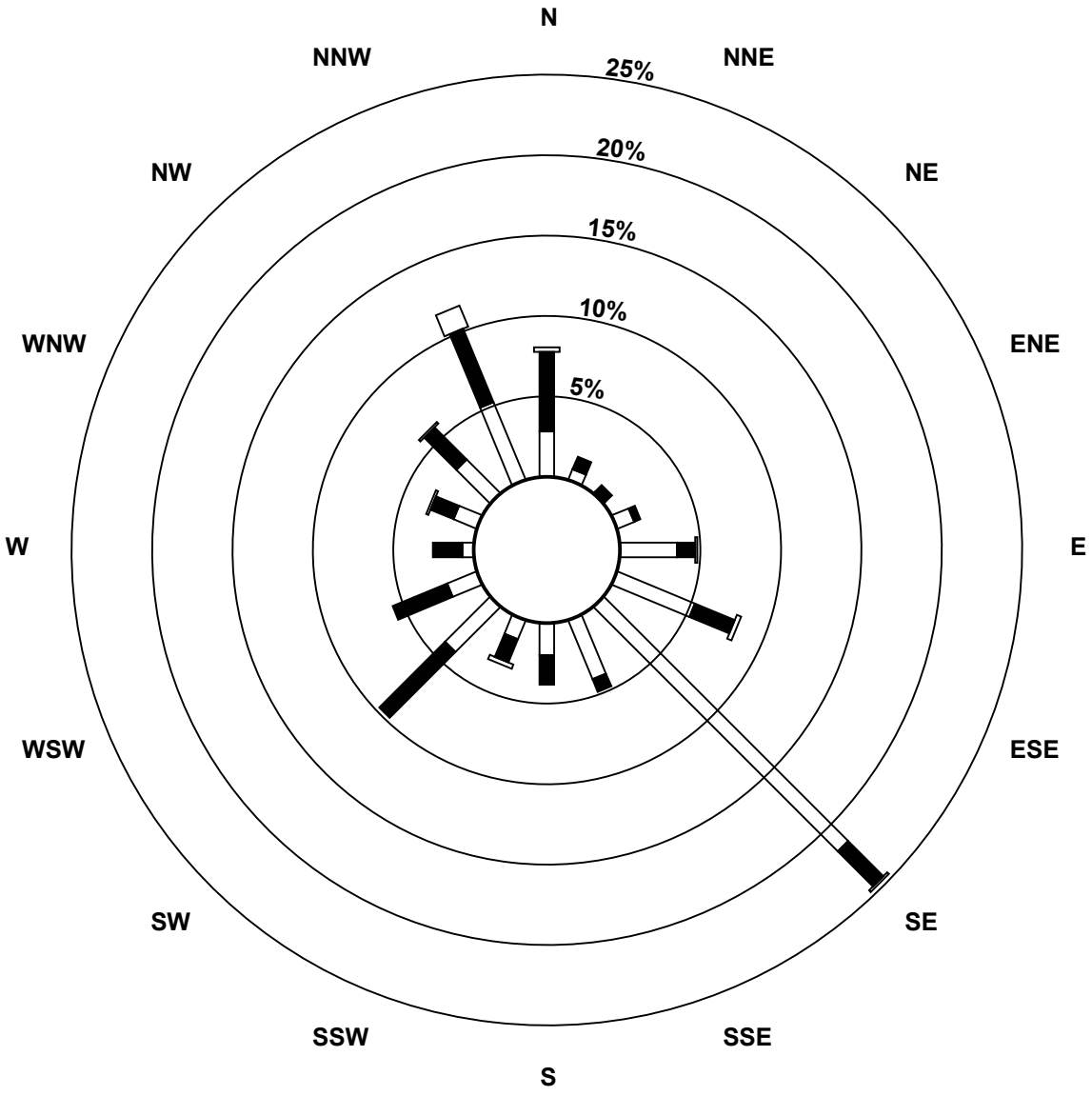
Total Number of Hours: 744

Wood Buffalo Environmental Association

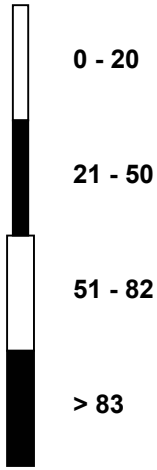
Wind Rose Aug 2014

Ozone (O_3) - ppb

Athabasca Valley (AMS 7)



Classes (ppb)



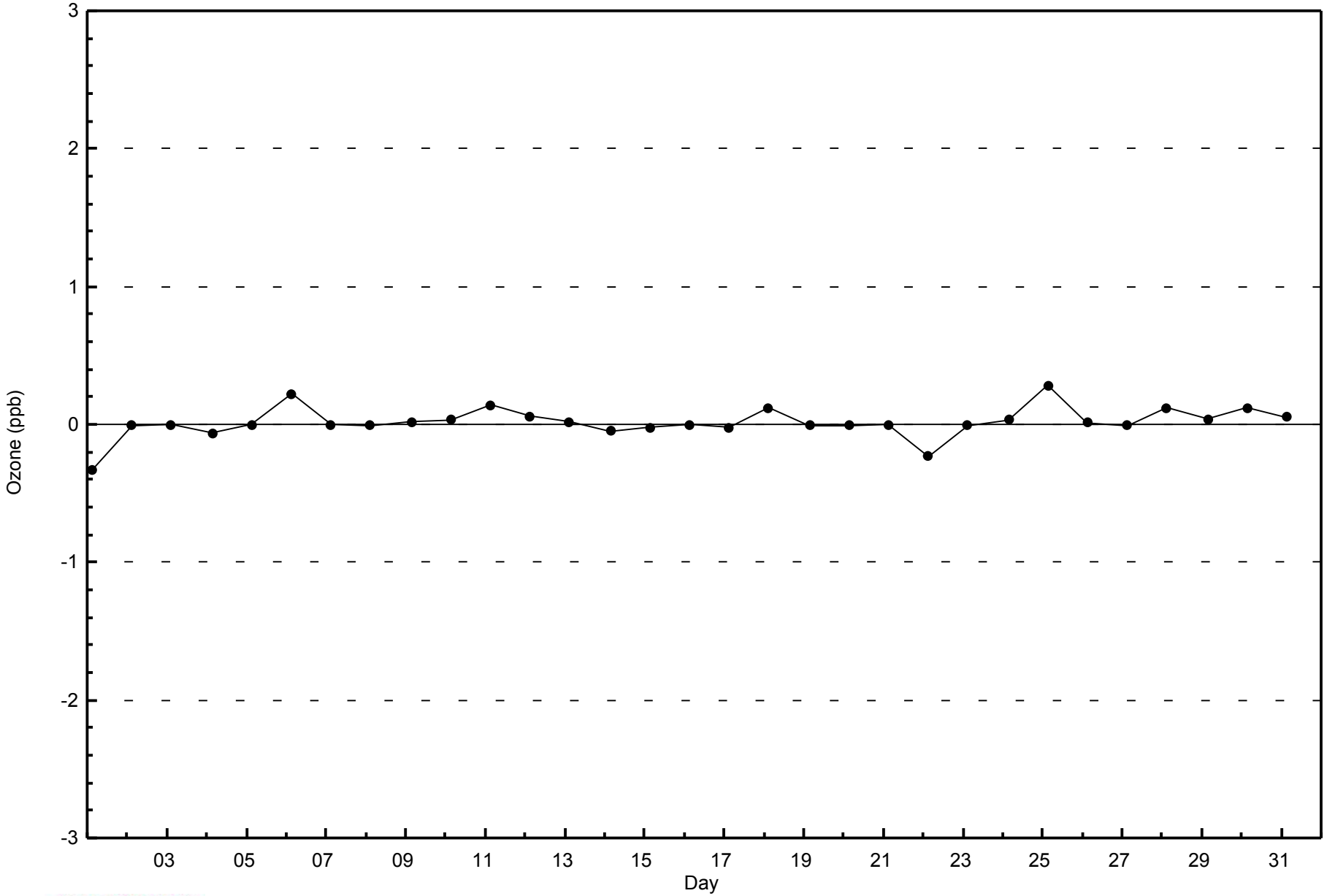
Total Number of Valid Hours: 708

WBEA

Zero Responses

Ozone (O_3) - ppb

Athabasca Valley - August 2014



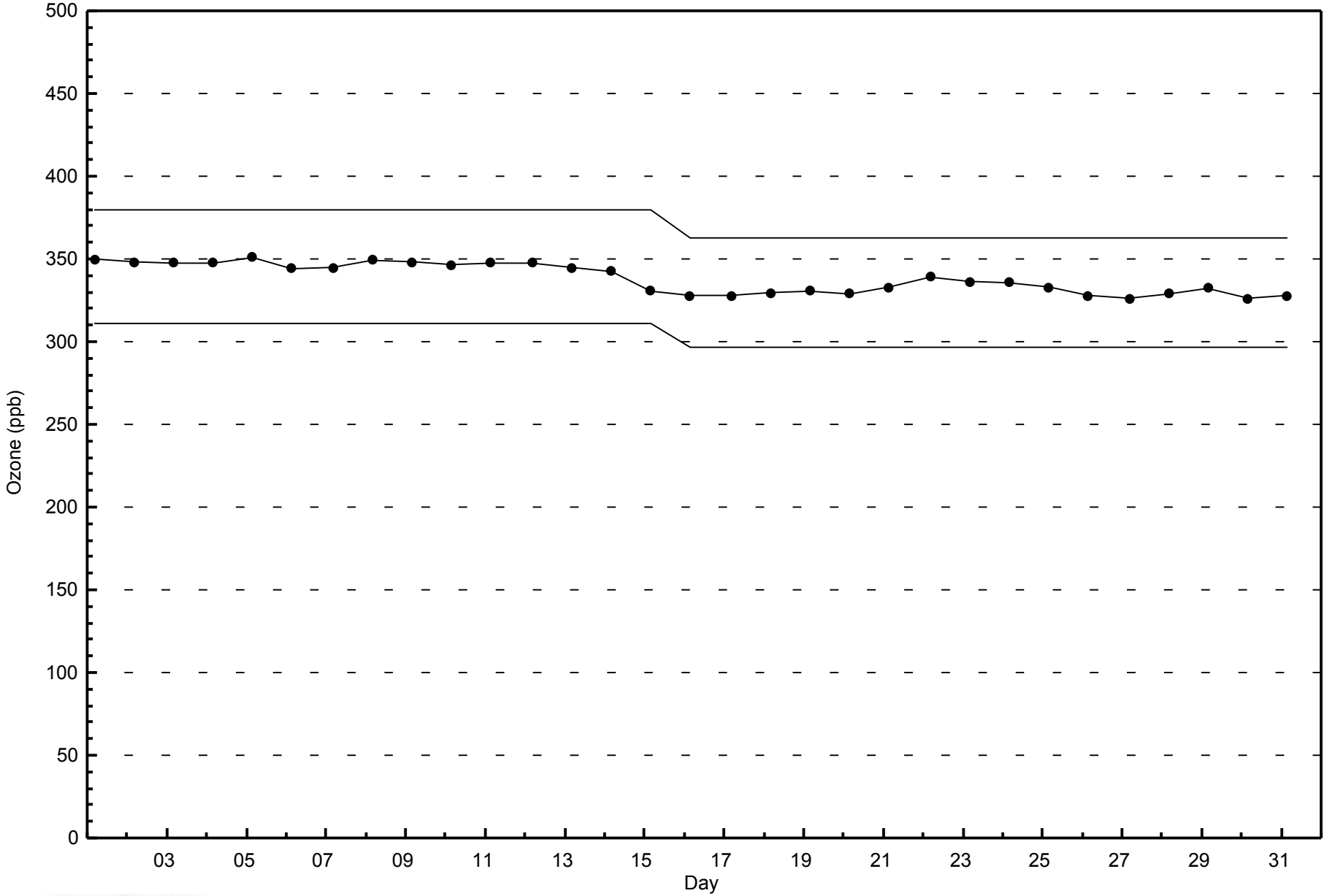
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

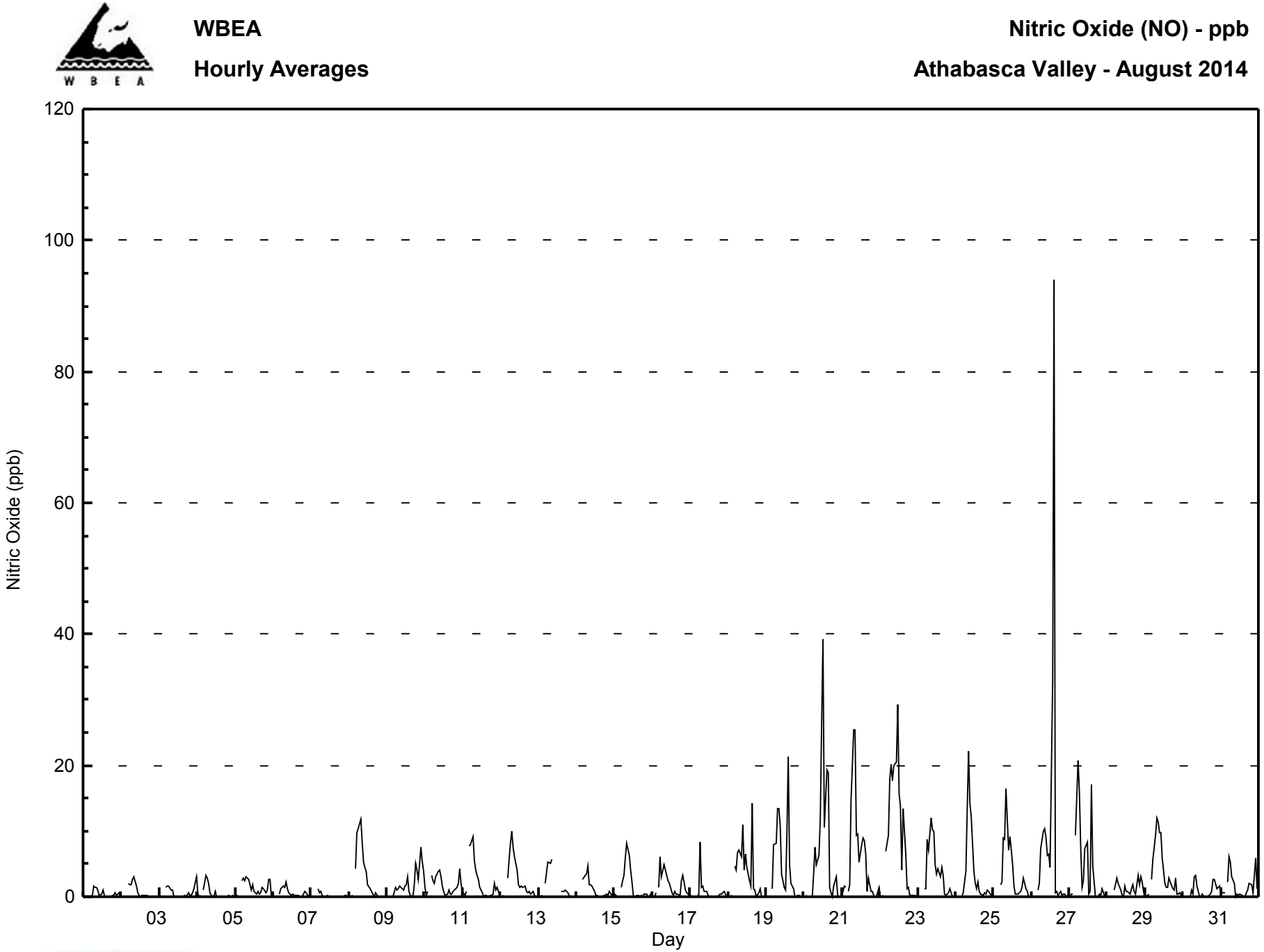
Maximum Value: 94 ppb on Aug 26 15:00
Maximum Daily Average: 8.6 ppb on Aug 22

Minimum Value: 0 ppb on Aug 1 01:00
Minimum Daily Average: 0.1 ppb on Aug 7
Maximum Diurnal Average: 6.6 ppb at hour 8
Minimum Diurnal Average: 0.1 ppb at hour 2
Monthly Average: 2.6 ppb
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 3$ $P_{90} = 8$ $P_{99} = 25$

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-Aug	0	0	0	Z	0	0	2	1	2	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0.4	2
2-Aug	0	0	0	Z	2	2	2	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	3
3-Aug	0	0	0	Z	1	2	2	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	3	0.6	3
4-Aug	1	0	0	Z	1	3	3	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3
5-Aug	0	0	0	Z	3	3	2	3	3	2	1	2	1	0	1	0	1	2	1	1	1	3	3	0	1.3	3
6-Aug	0	0	0	Z	0	1	2	2	2	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0.5	2
7-Aug	0	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
8-Aug	0	0	0	Z	4	10	10	12	8	5	4	4	2	1	1	0	0	1	0	0	0	0	0	0	2.8	12
9-Aug	0	0	0	Z	0	1	1	1	2	1	1	2	2	3	1	0	0	2	5	4	3	8	5	4	2.0	8
10-Aug	1	0	1	Z	3	2	2	3	4	4	3	2	1	0	0	1	0	0	1	1	1	2	4	2	1.8	4
11-Aug	1	0	1	Z	8	8	9	6	4	3	3	1	1	0	0	0	0	0	0	0	2	1	1	0	2.2	9
12-Aug	0	0	0	Z	3	6	8	10	7	6	4	2	1	2	1	2	1	1	1	0	1	0	0	0	2.4	10
13-Aug	0	0	0	Z	2	4	5	5	6	C	C	C	C	C	1	1	1	1	1	0	0	0	0	0	1.5	6
14-Aug	0	0	0	Z	3	3	3	5	2	2	2	1	0	0	0	0	0	0	0	0	0	1	0	0	1.0	5
15-Aug	0	0	0	Z	1	2	3	6	8	6	4	2	0	0	0	0	0	0	0	0	0	0	0	0	1.6	8
16-Aug	0	0	1	Z	1	6	3	5	4	3	2	2	1	0	1	0	0	0	2	3	2	1	1	0	1.7	6
17-Aug	0	0	0	Z	0	0	8	1	2	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0.7	8
18-Aug	0	0	0	Z	5	4	7	7	6	11	4	7	4	2	2	14	1	1	0	1	1	0	0	0	3.4	14
19-Aug	0	0	0	Z	1	8	8	13	13	11	3	1	1	10	21	5	2	1	0	0	0	0	0	0	4.4	21
20-Aug	0	0	0	Z	0	0	4	7	5	6	12	26	39	11	19	19	1	1	0	2	3	0	0	0	6.8	39
21-Aug	0	2	1	Z	1	2	15	25	26	9	10	5	8	9	8	7	1	3	1	1	0	0	0	1	5.9	26
22-Aug	0	0	0	Z	7	9	18	20	18	20	20	29	16	14	4	13	6	1	1	0	0	0	0	0	8.6	29
23-Aug	0	0	0	Z	1	1	9	7	12	10	10	5	4	4	3	4	3	0	0	1	1	1	0	0	3.3	12
24-Aug	0	0	0	Z	0	1	4	13	22	14	12	4	2	1	2	1	0	0	1	1	1	1	0	0	3.5	22
25-Aug	0	0	0	Z	2	2	9	9	17	7	9	7	5	2	0	0	1	1	1	3	1	1	0	0	3.3	17
26-Aug	0	0	0	Z	1	2	7	10	10	9	6	7	4	33	94	1	1	0	1	0	0	0	0	0	8.2	94
27-Aug	0	0	0	Z	9	21	16	7	1	2	7	8	0	1	17	5	0	0	0	0	0	1	0	0	4.3	21
28-Aug	0	0	0	Z	1	2	3	2	1	0	0	2	1	1	0	1	2	1	0	3	2	3	2	1	1.2	3
29-Aug	0	0	0	Z	3	6	9	12	11	10	10	6	2	1	1	3	2	1	1	3	0	0	1	0	3.6	12
30-Aug	0	0	0	Z	0	1	0	3	3	2	0	0	0	0	0	0	0	0	1	3	3	1	1	2	0.9	3
31-Aug	0	1	1	Z	2	6	5	3	2	0	0	0	0	0	0	0	1	1	2	2	1	3	6	1	1.6	6
	0.1	0.1	0.2	--	2.2	3.8	5.8	6.6	6.6	5.0	4.4	4.2	3.2	3.2	5.8	2.5	0.8	0.6	0.7	1.0	0.9	1.0	0.9	0.5	Diurnal Average	
	1	2	1	--	9	21	18	25	26	20	20	29	39	33	94	19	6	3	5	4	3	8	6	4	Diurnal Maximum	

Z - zerospan C - Calibration


WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Athabasca Valley - August 2014
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	698	98.59	98.59
21 - 40	9	1.27	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: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Athabasca Valley - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	58	12	5	11	32	57	174	34	27	22	66	39	18	23	43	77	698
21 - 40	1	0	0	0	2	0	1	0	0	0	0	0	0	0	0	5	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	1	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	59	12	5	11	34	57	175	34	27	22	67	39	18	23	43	82	708

Total Number of Valid Hours: 708

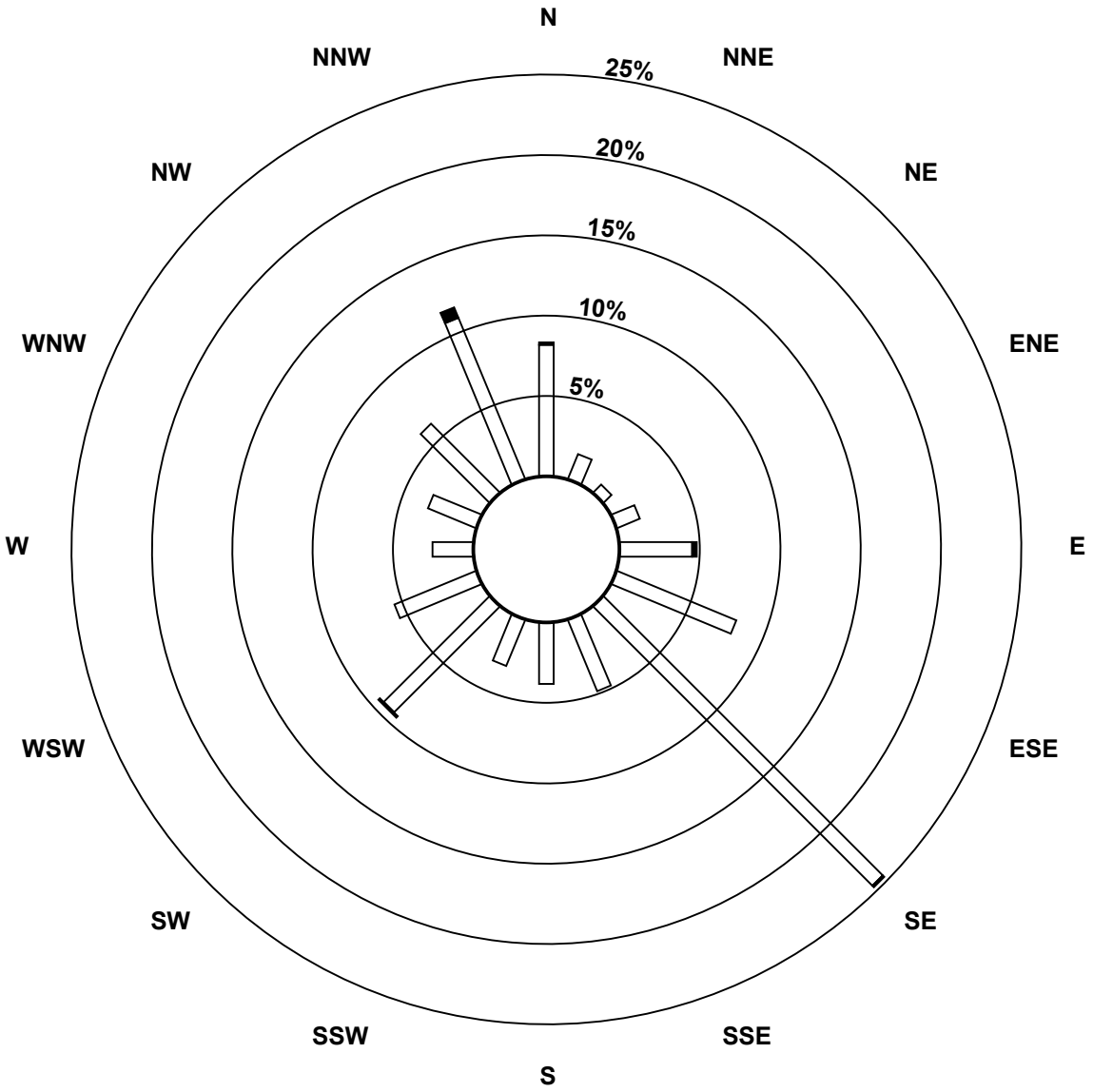
Total Number of Hours: 744

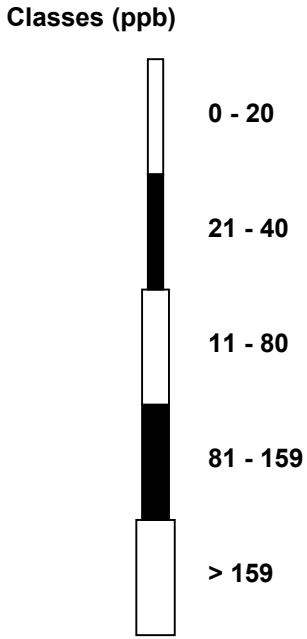
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Athabasca Valley (AMS 7)





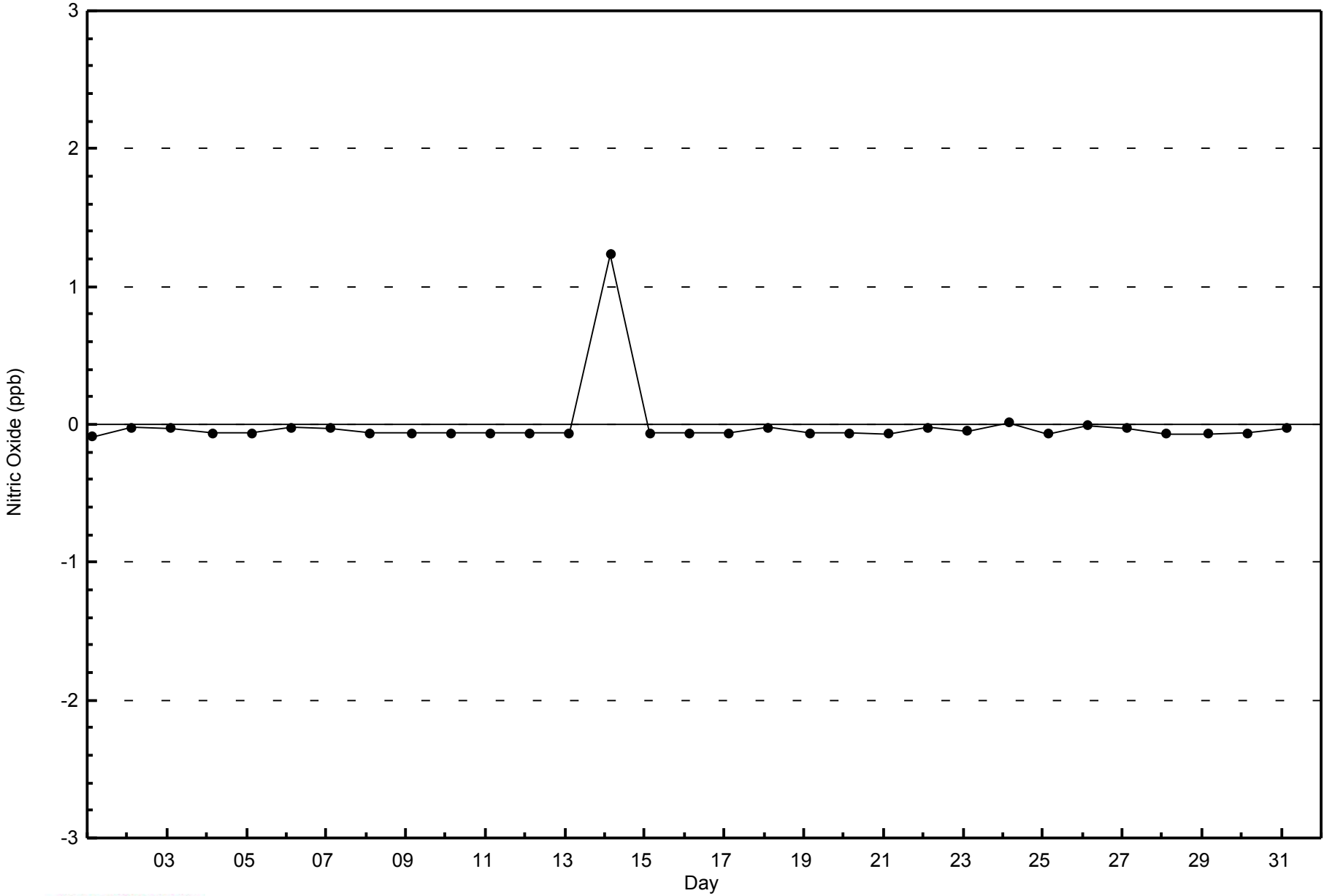
Total Number of Valid Hours: 708

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - August 2014



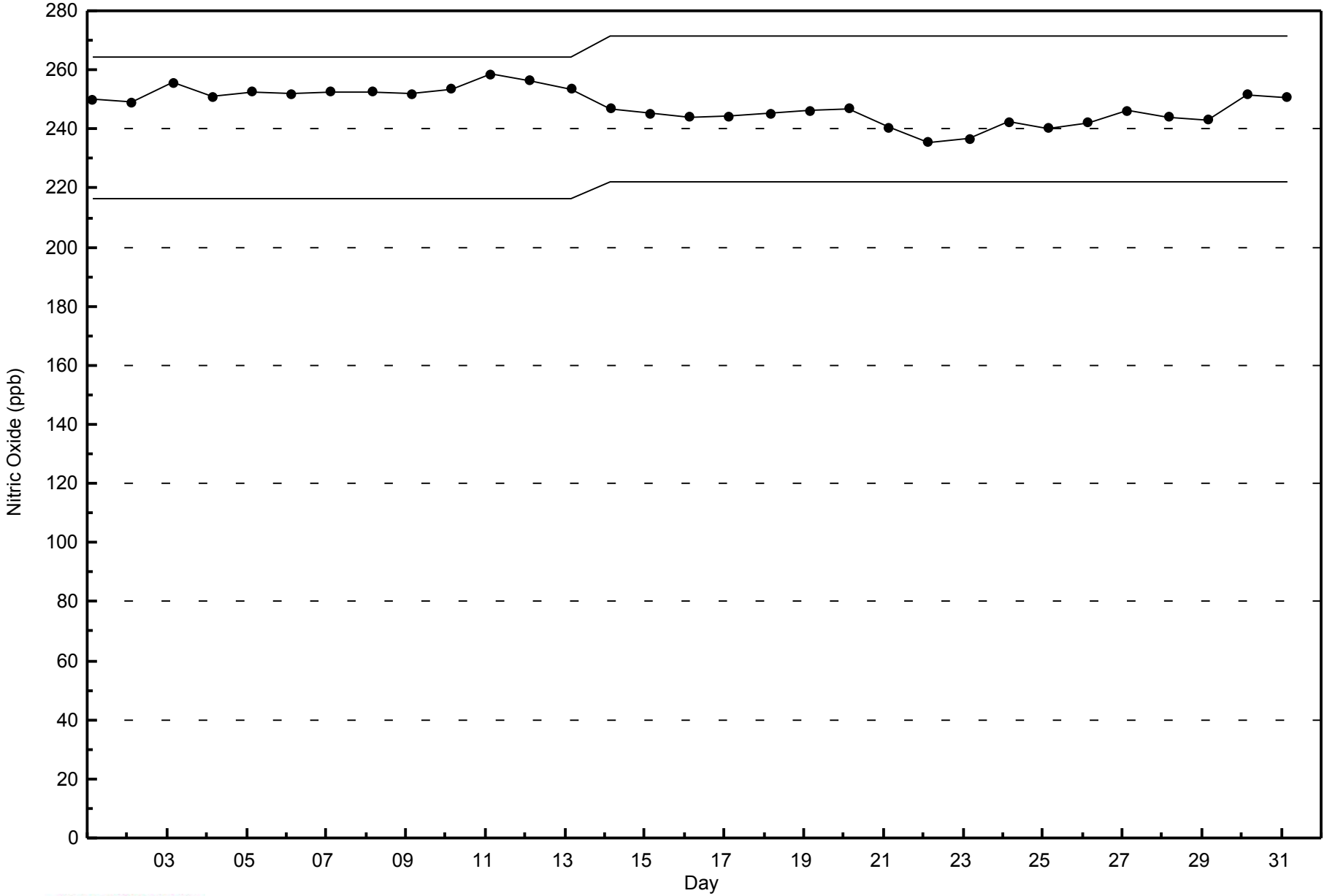
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 22 ppb on Aug 29 20:00 Maximum Daily Average: 7.7 ppb on Aug 26

Minimum Value: 0 ppb on Aug 17 14:00
Maximum Diurnal Average: 8.1 ppb at hour 21
Monthly Average: 5.4 ppb

Minimum Daily Average: 1.9 ppb on Aug 7
Minimum Diurnal Average: 3.4 ppb at hour 16
Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 3$ Median = 5 $Q_3 = 7$ $P_{90} = 10$ $P_{99} = 16$

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-Aug	3	2	4	Z	5	5	6	4	3	3	3	3	4	4	4	4	5	4	5	9	10	10	14	6	5.2	14
2-Aug	4	3	3	Z	6	4	3	3	4	3	3	3	2	2	2	2	4	3	5	6	5	3	7	4	3.6	7
3-Aug	2	2	2	Z	9	6	3	3	2	1	2	1	2	2	2	2	2	2	6	6	7	12	13	14	4.4	14
4-Aug	8	4	4	Z	7	7	6	4	2	2	3	8	5	4	3	3	4	6	8	12	8	4	11	5	5.5	12
5-Aug	4	5	3	Z	10	7	7	8	8	7	8	12	6	4	5	4	3	9	9	10	9	11	16	7	7.4	16
6-Aug	4	4	3	Z	6	8	6	5	6	5	5	4	3	3	3	3	4	2	2	6	9	10	5	1	4.7	10
7-Aug	1	0	1	Z	6	3	2	2	1	1	1	1	1	1	1	1	1	1	1	3	3	3	7	6	1.9	7
8-Aug	4	4	4	Z	10	9	7	8	9	8	8	9	8	9	8	7	7	9	4	2	2	2	1	3	6.2	10
9-Aug	7	8	6	Z	7	8	6	5	6	3	3	4	6	5	3	2	1	4	11	13	10	14	10	8	6.5	14
10-Aug	6	3	3	Z	3	2	2	2	2	3	3	2	2	1	2	3	2	3	4	6	7	10	13	11	4.0	13
11-Aug	8	6	6	Z	9	7	6	5	4	4	5	4	2	1	1	1	1	2	3	4	17	12	8	5	5.3	17
12-Aug	3	4	4	Z	4	4	5	5	6	7	5	2	2	2	2	2	2	2	2	4	6	3	3	2	3.5	7
13-Aug	2	1	2	Z	4	7	7	7	7	C	C	C	C	C	3	4	4	4	4	7	7	4	3	2	4.2	7
14-Aug	2	2	3	Z	5	6	8	9	7	9	11	10	10	6	4	4	3	8	9	7	9	11	9	7	6.8	11
15-Aug	7	5	4	Z	7	7	5	7	10	11	13	10	6	2	2	2	1	3	1	8	14	12	6	5	6.4	14
16-Aug	4	3	5	Z	6	7	4	7	6	4	6	6	4	5	4	3	4	5	14	17	10	12	9	8	6.6	17
17-Aug	6	2	1	Z	2	2	2	3	5	5	5	2	0	0	0	0	1	1	2	7	5	4	8	8	3.0	8
18-Aug	5	4	5	Z	9	8	8	9	7	12	6	5	2	4	5	7	10	12	5	4	6	3	4	5	6.2	12
19-Aug	4	5	8	Z	6	9	10	10	9	8	5	3	2	7	12	4	9	6	4	7	10	7	18	13	7.6	18
20-Aug	13	11	10	Z	6	4	6	7	4	6	2	7	10	6	7	6	4	4	4	5	7	7	7	4	6.3	13
21-Aug	7	10	10	Z	13	8	8	11	12	8	7	6	8	7	7	5	3	6	5	3	1	2	3	9	6.9	13
22-Aug	3	5	6	Z	8	7	8	7	7	9	13	9	8	7	5	8	4	5	8	9	7	5	8	7	7.0	13
23-Aug	5	3	2	Z	4	4	6	6	7	7	7	5	4	5	5	6	6	2	2	6	12	7	6	3	5.2	12
24-Aug	1	0	1	Z	5	3	8	12	15	9	9	5	6	3	2	2	2	1	3	5	7	8	4	5	5.1	15
25-Aug	3	2	2	Z	5	5	6	7	8	6	7	6	4	4	3	3	3	4	8	19	16	10	5	3	6.0	19
26-Aug	3	3	4	Z	8	10	11	9	9	8	8	9	8	12	17	4	3	4	8	8	11	8	7	7	7.7	17
27-Aug	4	4	3	Z	10	17	12	2	3	0	4	3	1	3	5	3	1	1	4	5	5	7	2	1	4.3	17
28-Aug	1	0	0	Z	3	3	4	2	2	1	0	0	1	1	1	1	3	2	3	9	10	12	8	6	3.3	12
29-Aug	4	3	3	Z	4	5	6	6	5	4	6	7	3	3	4	5	5	7	10	22	11	7	5	3	5.9	22
30-Aug	3	2	2	Z	5	6	5	9	7	6	2	2	2	1	0	0	2	2	6	9	7	5	5	7	4.0	9
31-Aug	4	4	3	Z	9	11	9	5	3	1	1	1	1	1	1	5	8	6	8	8	4	7	10	5	4.9	11
	4.4	3.7	3.7	--	6.5	6.4	6.1	6.1	6.0	5.3	5.3	4.9	4.1	3.8	3.9	3.4	3.7	4.2	5.4	7.8	8.1	7.5	7.4	5.7	Diurnal Average	
	13	11	10	--	13	17	12	12	15	12	13	12	10	12	17	8	10	12	14	22	17	14	18	14	Diurnal Maximum	

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

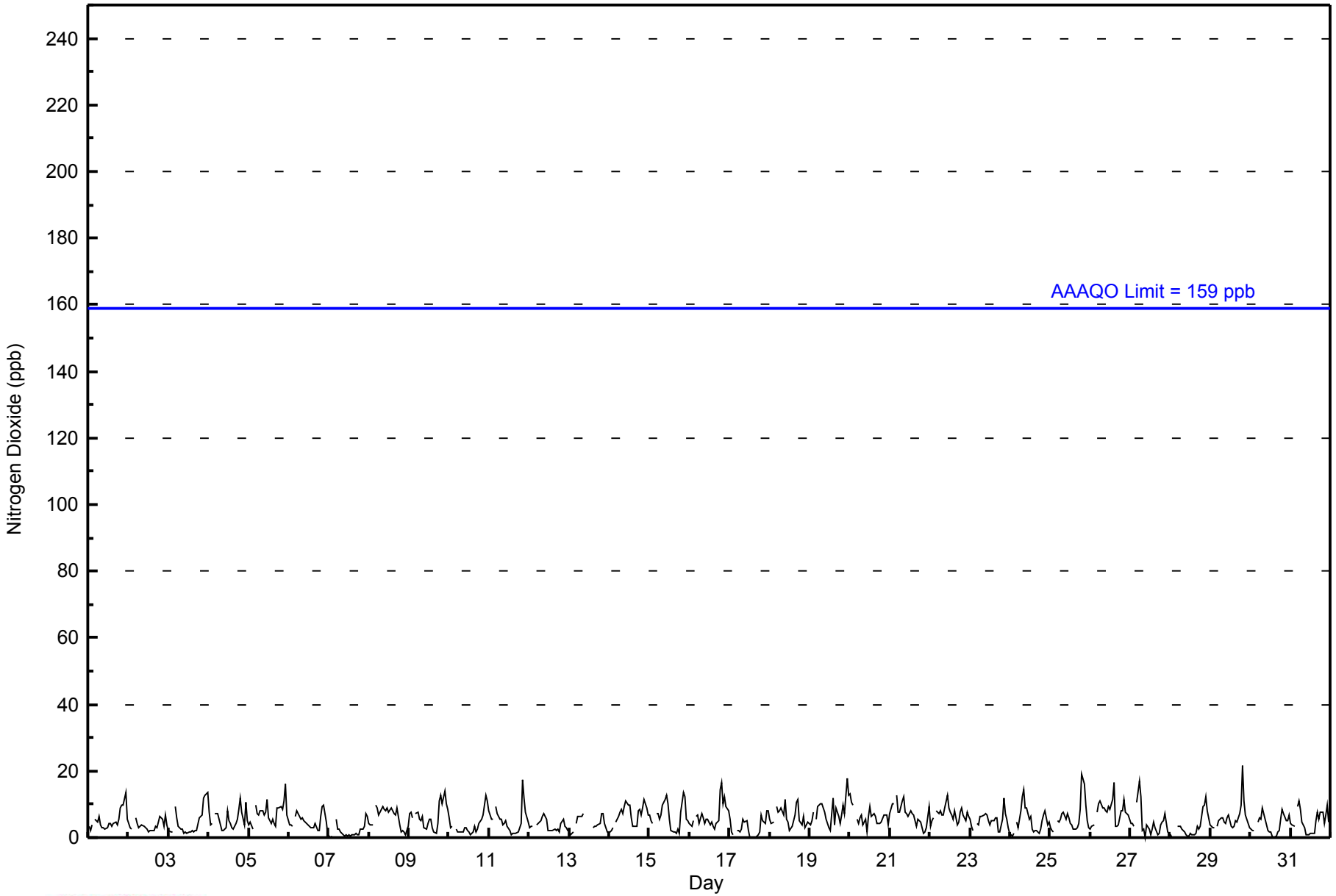
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	59	12	5	11	34	57	175	33	27	22	67	39	18	23	43	82	707
21 - 40	0	0	0	0	0	0	0	1	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	59	12	5	11	34	57	175	34	27	22	67	39	18	23	43	82	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

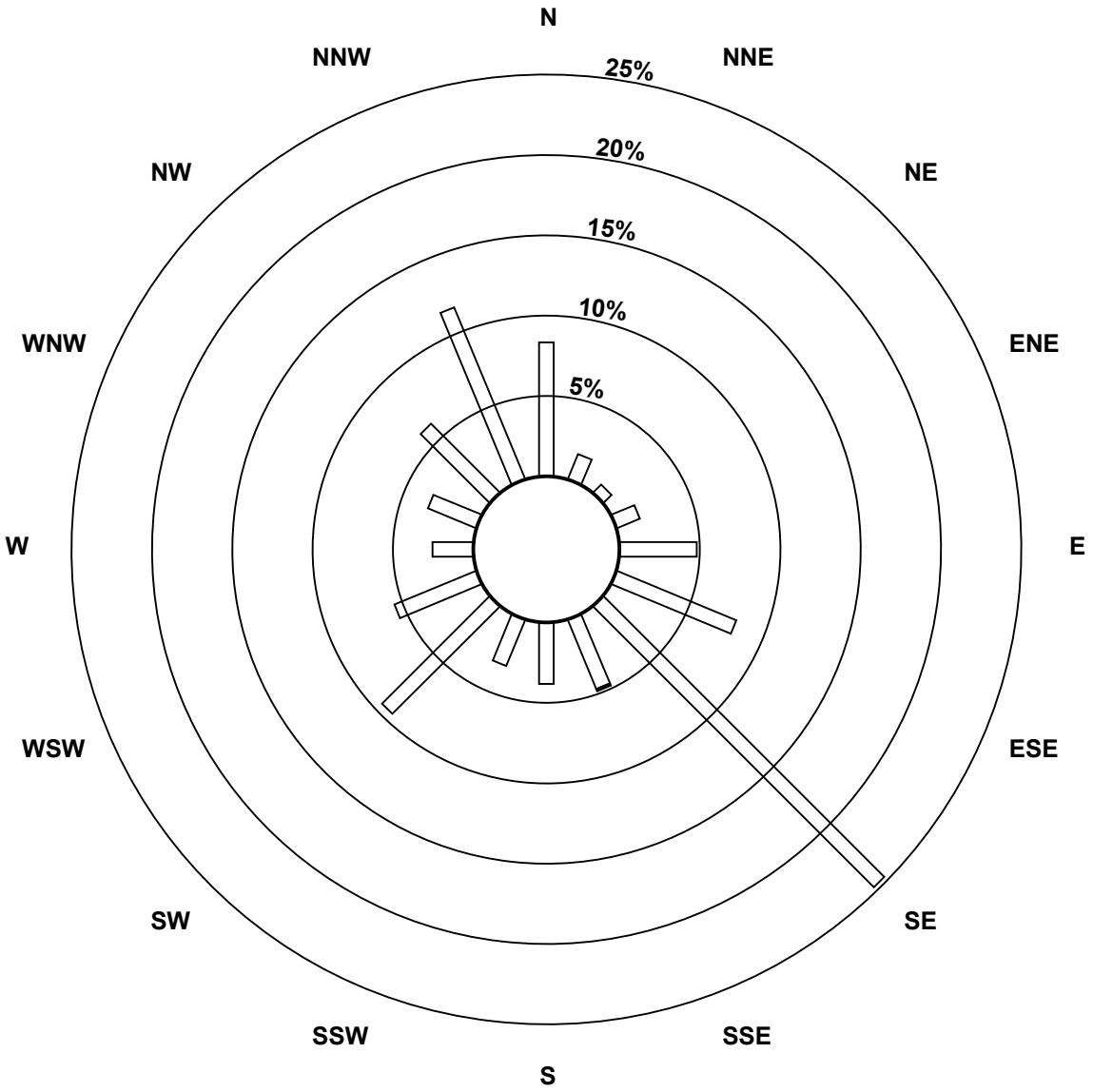
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

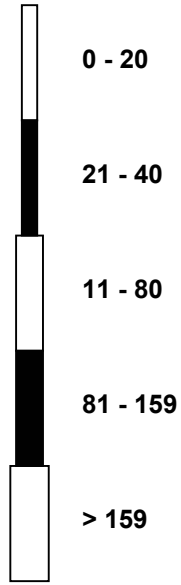
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley (AMS 7)



Classes (ppb)



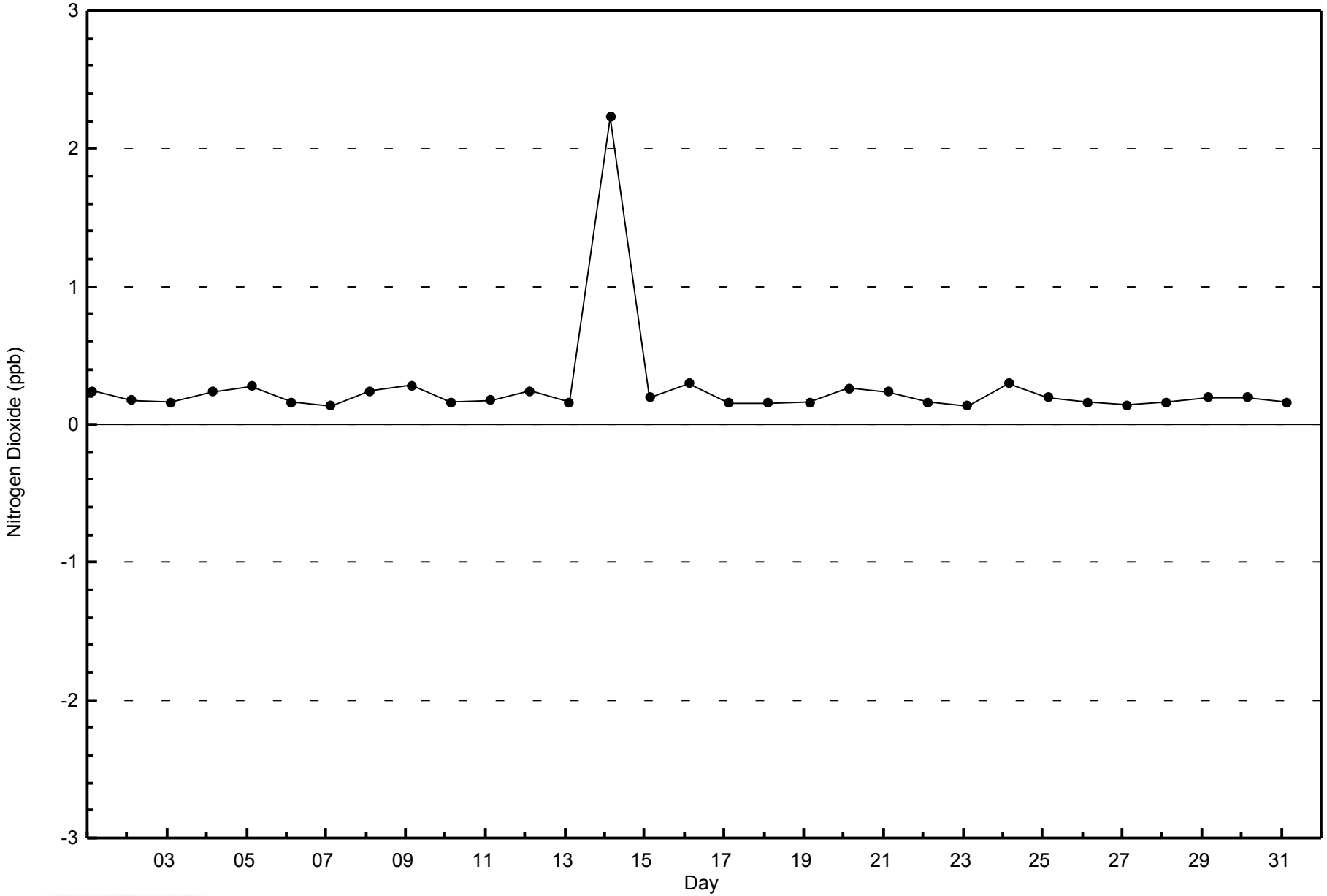
Total Number of Valid Hours: 708

WBEA

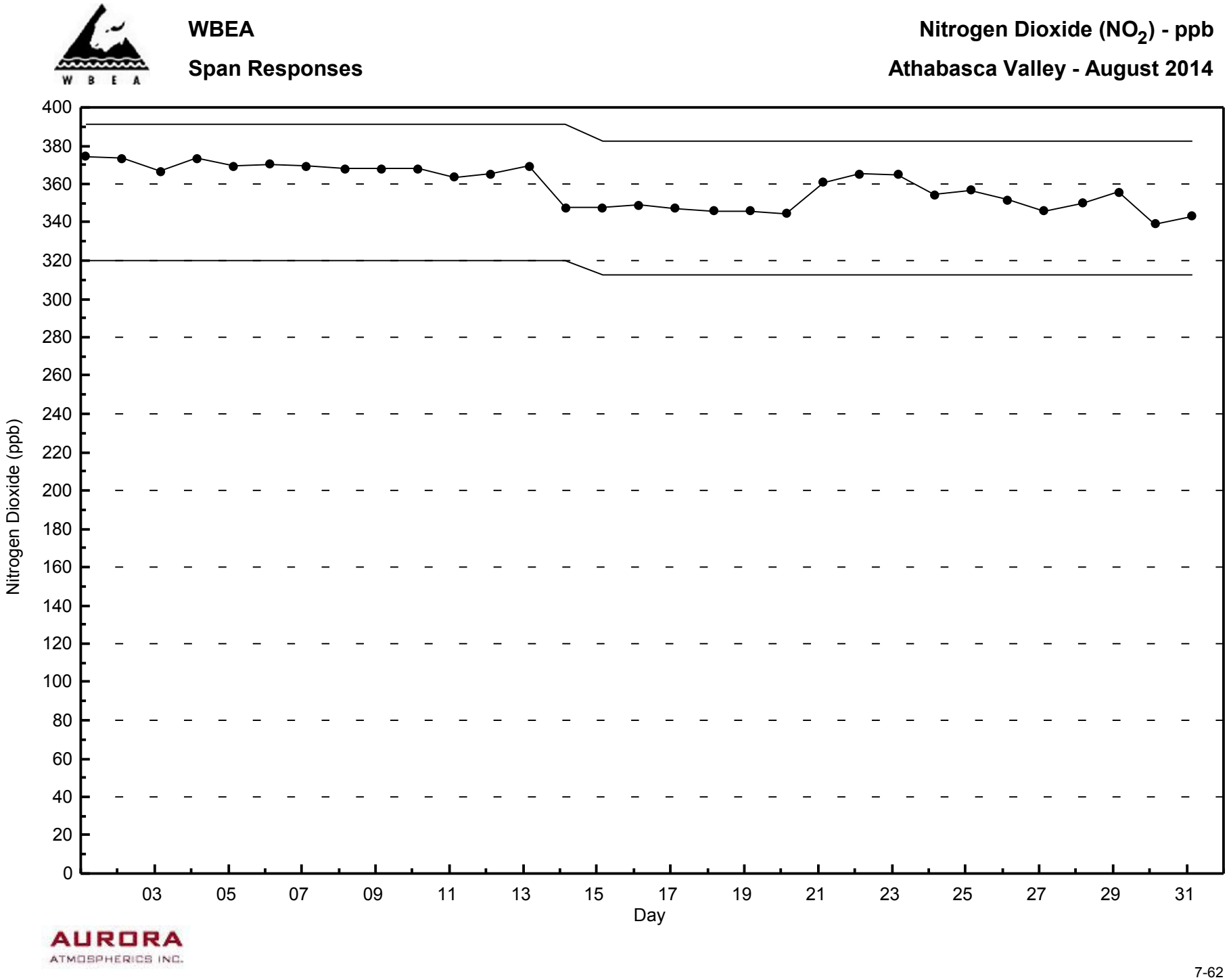
Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.


WBEA
Span Responses
Nitrogen Dioxide (NO_2) - ppb
Athabasca Valley - August 2014
Nitrogen Dioxide (ppb)
400
380
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 Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - August 2014

Maximum Value: 110 ppb on Aug 26 15:00

Maximum Daily Average: 15.9 ppb on Aug 26

Minimum Value: 0 ppb on Aug 17 14:00

Minimum Daily Average: 2.1 ppb on Aug 7

Maximum Diurnal Average: 12.7 ppb at hour 8

Minimum Diurnal Average: 3.8 ppb at hour 2

Monthly Average: 8.0 ppb

Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 3$ Median = 6 $Q_3 = 10$ $P_{90} = 16$ $P_{99} = 36$

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-Aug	3	2	4	Z	5	5	8	5	4	4	3	3	5	5	4	4	5	4	5	9	10	10	14	6	5.6	14
2-Aug	4	3	3	Z	8	6	5	6	7	5	4	3	2	2	2	3	4	3	5	6	5	3	7	4	4.3	8
3-Aug	2	2	2	Z	11	8	5	4	3	1	2	1	2	2	2	2	2	2	6	7	7	12	14	17	5.0	17
4-Aug	8	4	4	Z	8	10	8	6	3	2	3	9	5	4	3	3	4	5	8	12	8	4	11	5	6.0	12
5-Aug	4	5	2	Z	12	10	9	11	11	8	9	13	7	5	6	5	4	11	10	10	10	14	19	7	8.7	19
6-Aug	4	4	3	Z	7	9	8	7	8	6	5	4	4	3	3	3	4	2	2	7	10	10	5	1	5.2	10
7-Aug	0	0	1	Z	7	3	3	2	1	0	1	1	1	1	1	1	1	1	1	3	3	4	7	6	2.1	7
8-Aug	4	4	4	Z	14	19	17	20	18	14	13	13	10	10	9	7	7	10	4	2	2	2	1	3	8.9	20
9-Aug	7	8	6	Z	8	9	7	7	8	4	4	6	7	8	4	2	1	6	16	17	13	21	15	12	8.5	21
10-Aug	7	3	4	Z	6	4	4	5	6	7	6	4	3	1	2	4	2	3	5	7	8	12	17	13	5.8	17
11-Aug	9	6	6	Z	17	15	15	11	8	8	8	5	3	1	2	2	1	2	3	5	19	13	9	5	7.5	19
12-Aug	3	4	4	Z	6	10	13	15	14	13	9	4	4	4	4	4	3	3	2	5	6	3	3	2	6.0	15
13-Aug	2	1	2	Z	6	10	12	12	13	C	C	C	C	C	4	4	4	5	5	8	7	4	3	2	5.7	13
14-Aug	2	2	3	Z	7	9	11	13	9	11	13	11	10	6	3	4	3	8	9	7	9	12	9	7	7.8	13
15-Aug	7	5	4	Z	9	10	9	13	18	18	17	12	6	2	2	2	1	3	1	8	14	12	6	6	8.0	18
16-Aug	4	3	5	Z	8	13	7	12	10	8	8	8	4	5	4	3	5	5	17	20	12	13	10	8	8.4	20
17-Aug	6	2	1	Z	2	2	10	4	7	5	6	2	0	0	0	0	1	1	2	7	6	5	8	8	3.7	10
18-Aug	5	4	5	Z	14	11	15	16	13	23	9	11	7	6	7	21	12	13	5	4	7	3	4	5	9.6	23
19-Aug	4	5	8	Z	7	17	18	24	22	18	9	4	3	17	33	9	11	7	4	7	10	7	18	13	12.0	33
20-Aug	13	11	10	Z	6	4	10	14	9	12	14	33	49	17	27	25	6	5	4	6	10	7	7	4	13.1	49
21-Aug	7	12	11	Z	14	10	23	37	38	17	17	12	16	16	15	11	4	8	6	4	2	1	3	11	12.7	38
22-Aug	3	5	6	Z	15	17	26	27	24	29	33	38	23	21	10	22	10	6	9	9	7	5	8	7	15.7	38
23-Aug	5	3	2	Z	6	5	15	13	19	17	17	10	7	9	8	10	9	2	2	6	13	8	6	3	8.5	19
24-Aug	1	0	1	Z	5	3	12	26	37	23	21	9	8	4	4	3	2	2	3	6	8	9	4	5	8.5	37
25-Aug	3	2	2	Z	7	7	15	16	24	13	17	13	9	5	3	3	4	5	10	22	18	10	5	3	9.4	24
26-Aug	3	3	4	Z	9	12	18	19	19	17	14	16	13	45	110	4	4	4	9	8	12	8	7	7	15.9	110
27-Aug	4	5	4	Z	20	38	28	9	4	2	11	11	1	3	22	8	1	1	4	5	5	8	1	1	8.6	38
28-Aug	1	0	0	Z	4	5	6	4	3	1	0	2	2	2	1	3	5	3	3	12	12	15	10	7	4.5	15
29-Aug	4	3	3	Z	6	11	15	18	16	14	16	13	5	4	5	8	7	8	11	24	12	7	6	3	9.6	24
30-Aug	3	2	2	Z	5	7	6	12	10	7	2	2	2	1	0	0	2	2	6	11	10	6	7	8	4.9	12
31-Aug	5	4	4	Z	12	17	14	8	5	1	1	1	2	1	1	5	8	7	10	10	5	10	15	6	6.6	17
	4.5	3.8	3.9	--	8.7	10.2	12.0	12.7	12.6	10.3	9.7	9.1	7.3	7.0	9.7	5.9	4.5	4.8	6.1	8.8	9.0	8.4	8.3	6.2	Diurnal Average	
	13	12	11	--	20	38	28	37	38	29	33	38	49	45	110	25	12	13	17	24	19	21	19	17	Diurnal Maximum	

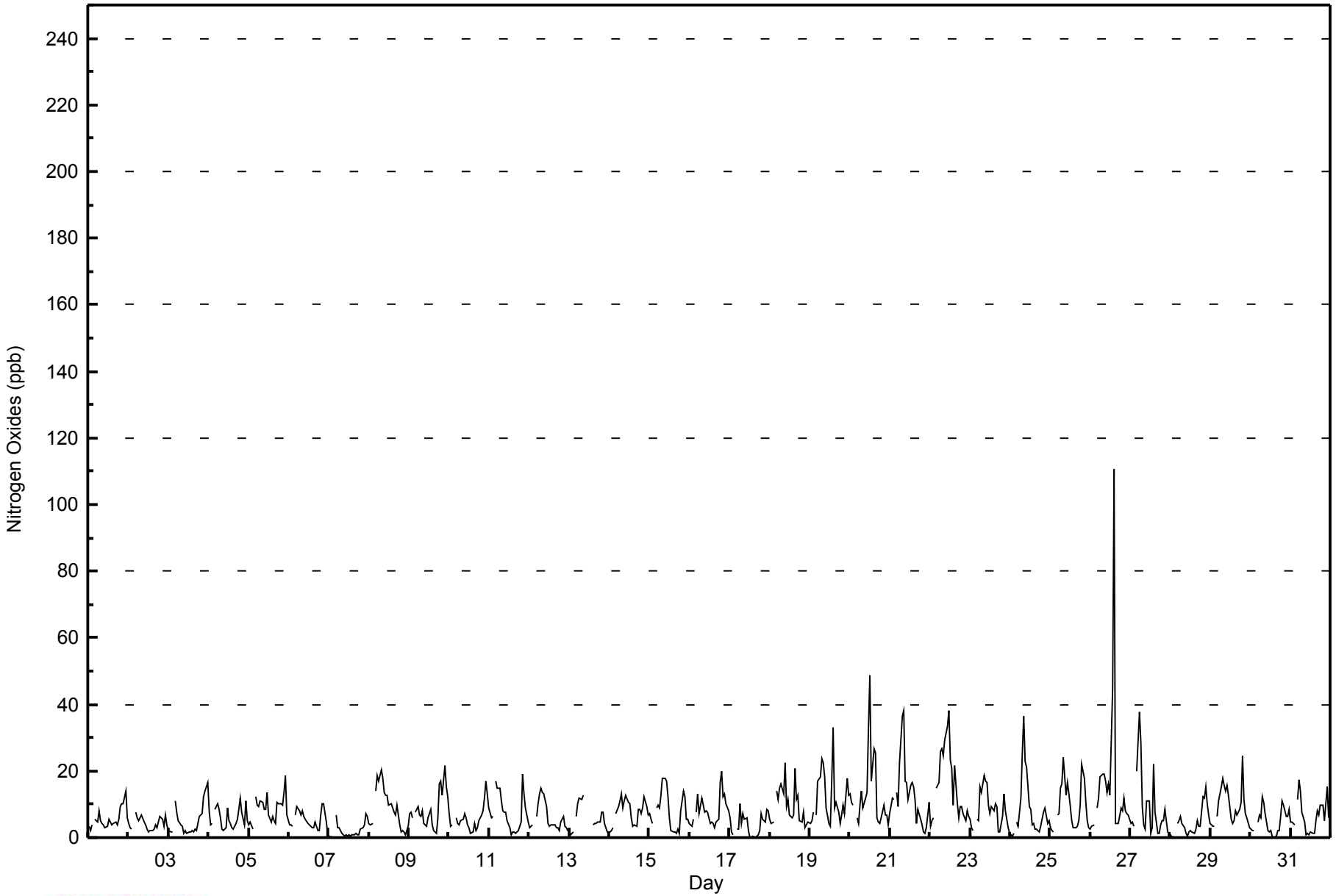
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	674	95.20	95.20
21 - 40	31	4.38	99.58
11 - 80	2	0.28	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	58	12	5	10	31	55	169	32	27	21	66	38	18	23	39	70	674
21 - 40	1	0	0	1	2	2	6	2	0	1	0	1	0	0	4	11	31
11 - 80	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2
81 - 159	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	59	12	5	11	34	57	175	34	27	22	67	39	18	23	43	82	708

Total Number of Valid Hours: 708

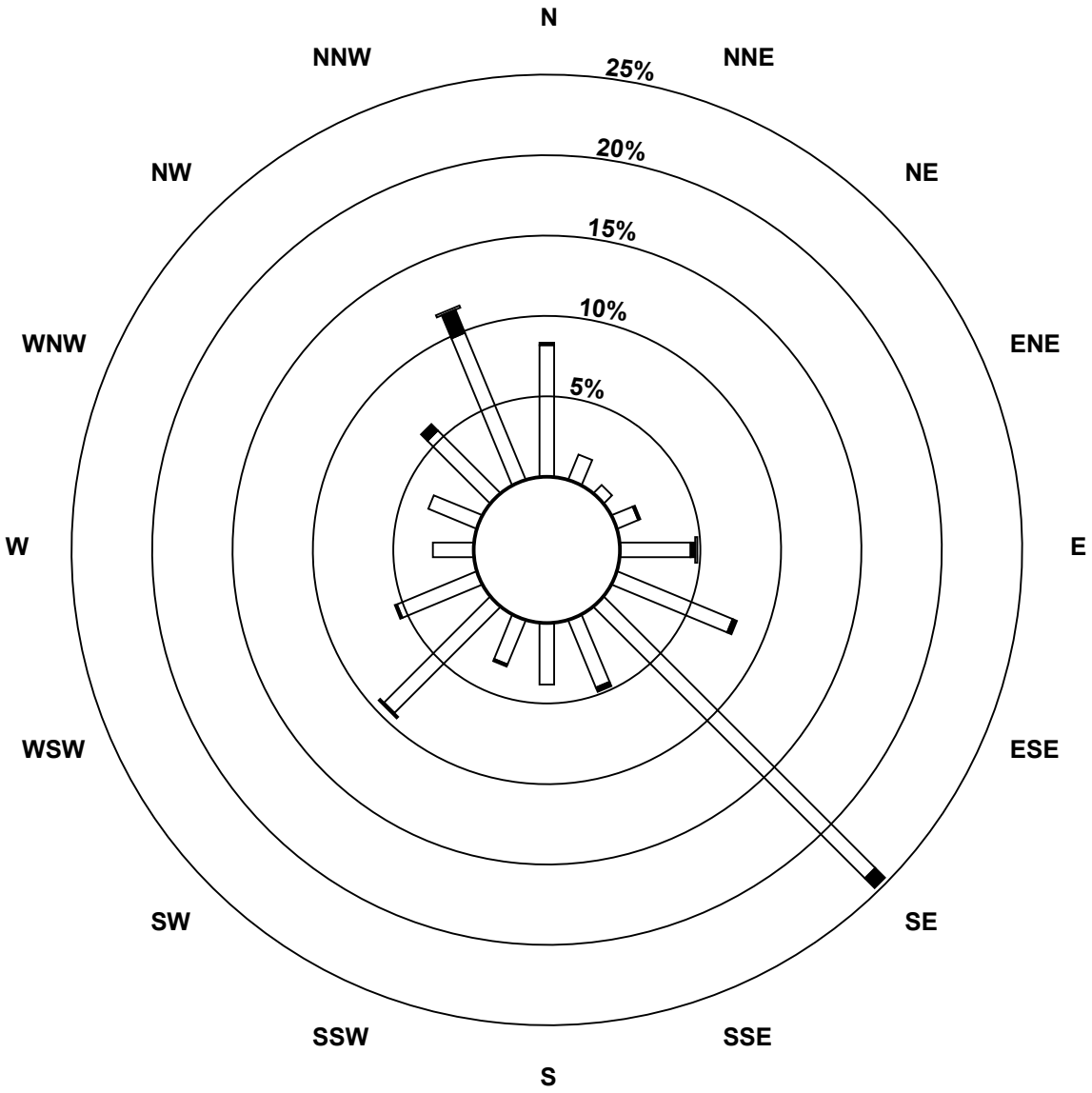
Total Number of Hours: 744

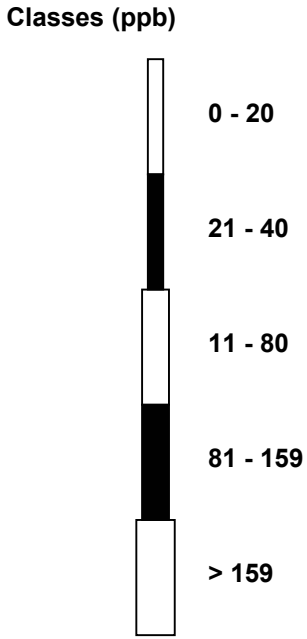
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley (AMS 7)

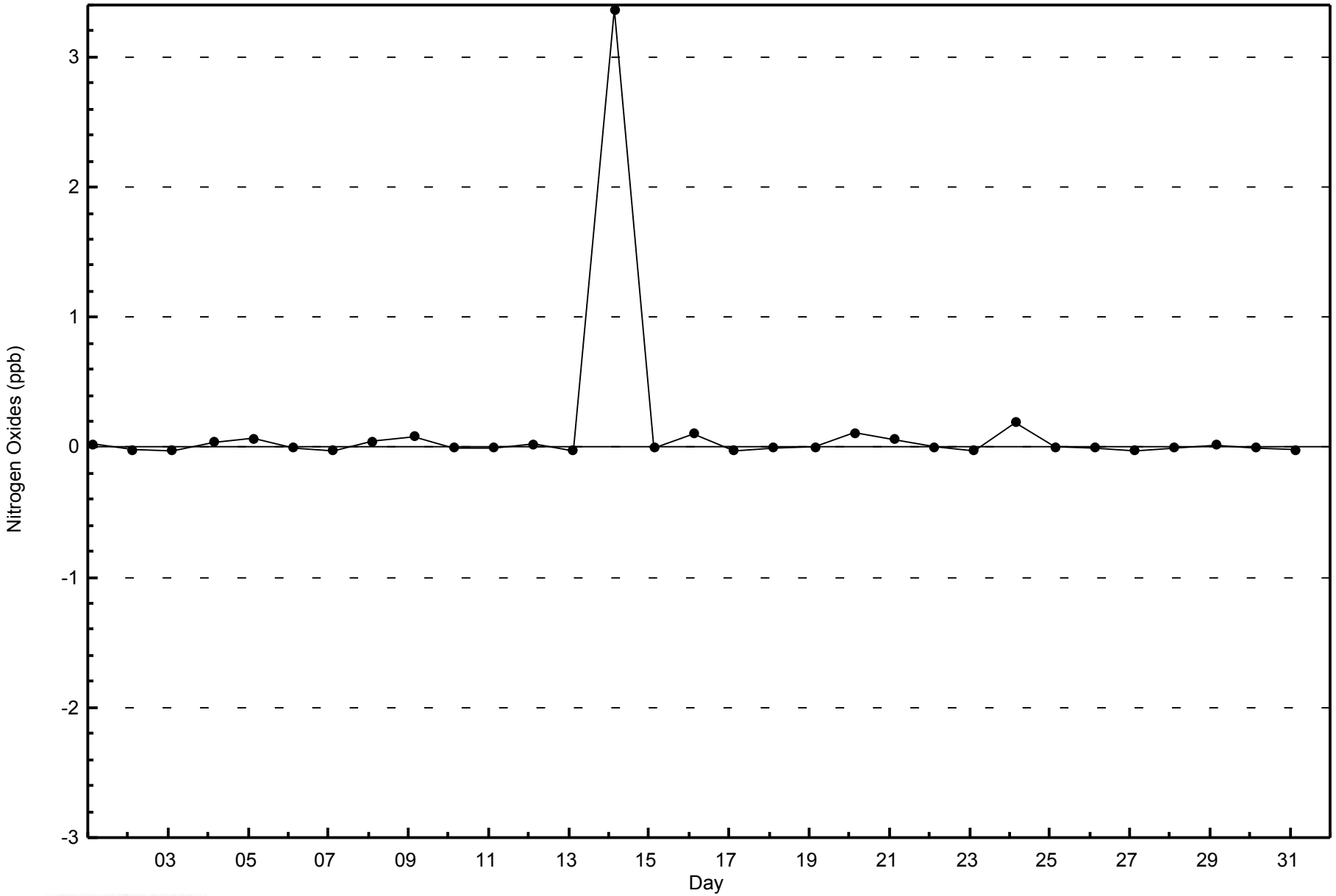




Total Number of Valid Hours: 708

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Athabasca Valley - August 2014



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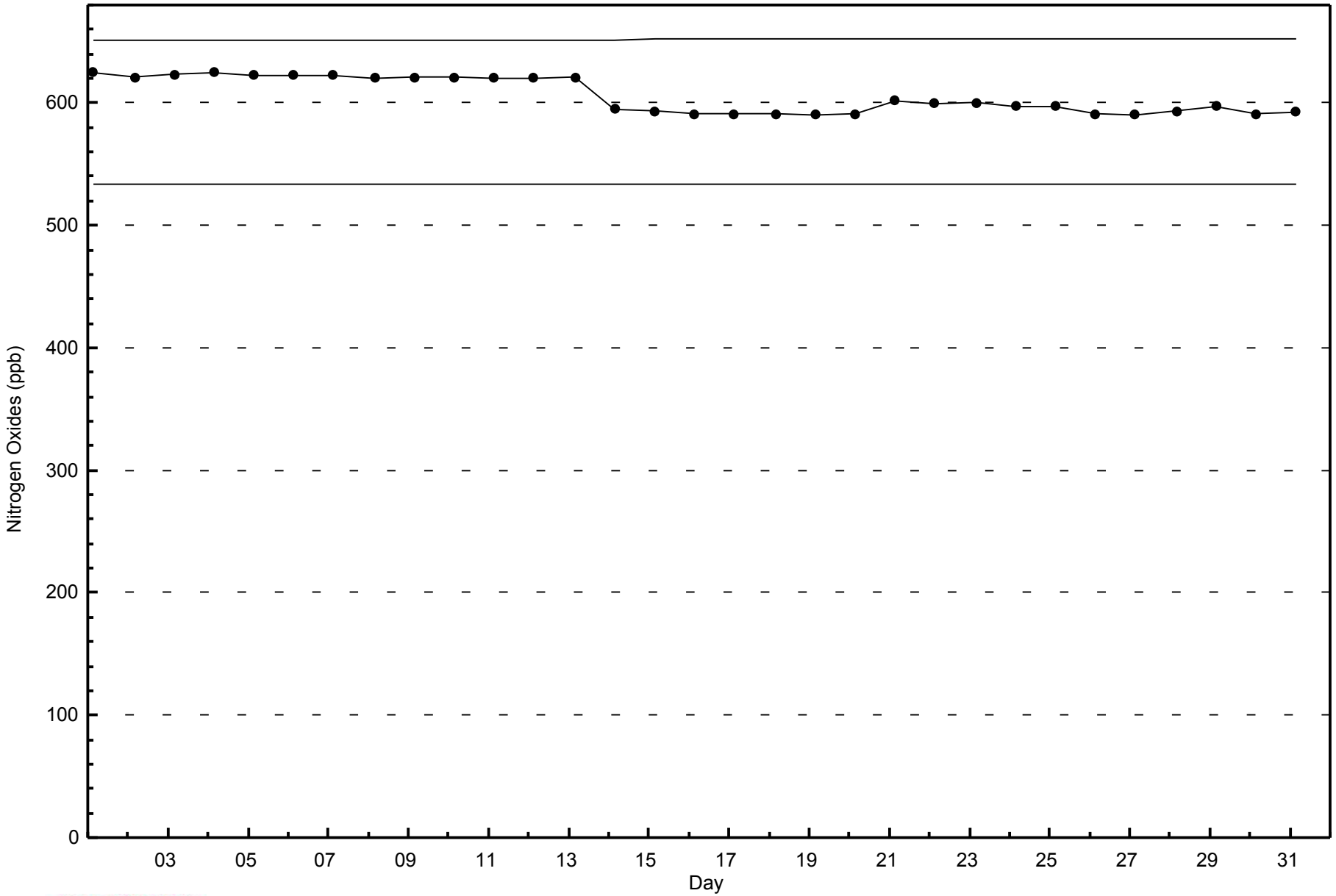
WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - August 2014

Number of Exceedences (AAAQO): 24-hr: 3

Maximum Value: 213.1 $\mu g/m^3$ on Aug 4 17:00

Maximum Daily Average: 62.2 $\mu g/m^3$ on Aug 5

Minimum Value: 2.0 $\mu g/m^3$ on Aug 7 18:00

Minimum Daily Average: 4.7 $\mu g/m^3$ on Aug 28

Maximum Diurnal Average: 18.7 $\mu g/m^3$ at hour 17

Minimum Diurnal Average: 13.6 $\mu g/m^3$ at hour 9

Monthly Average: 15.44 $\mu g/m^3$

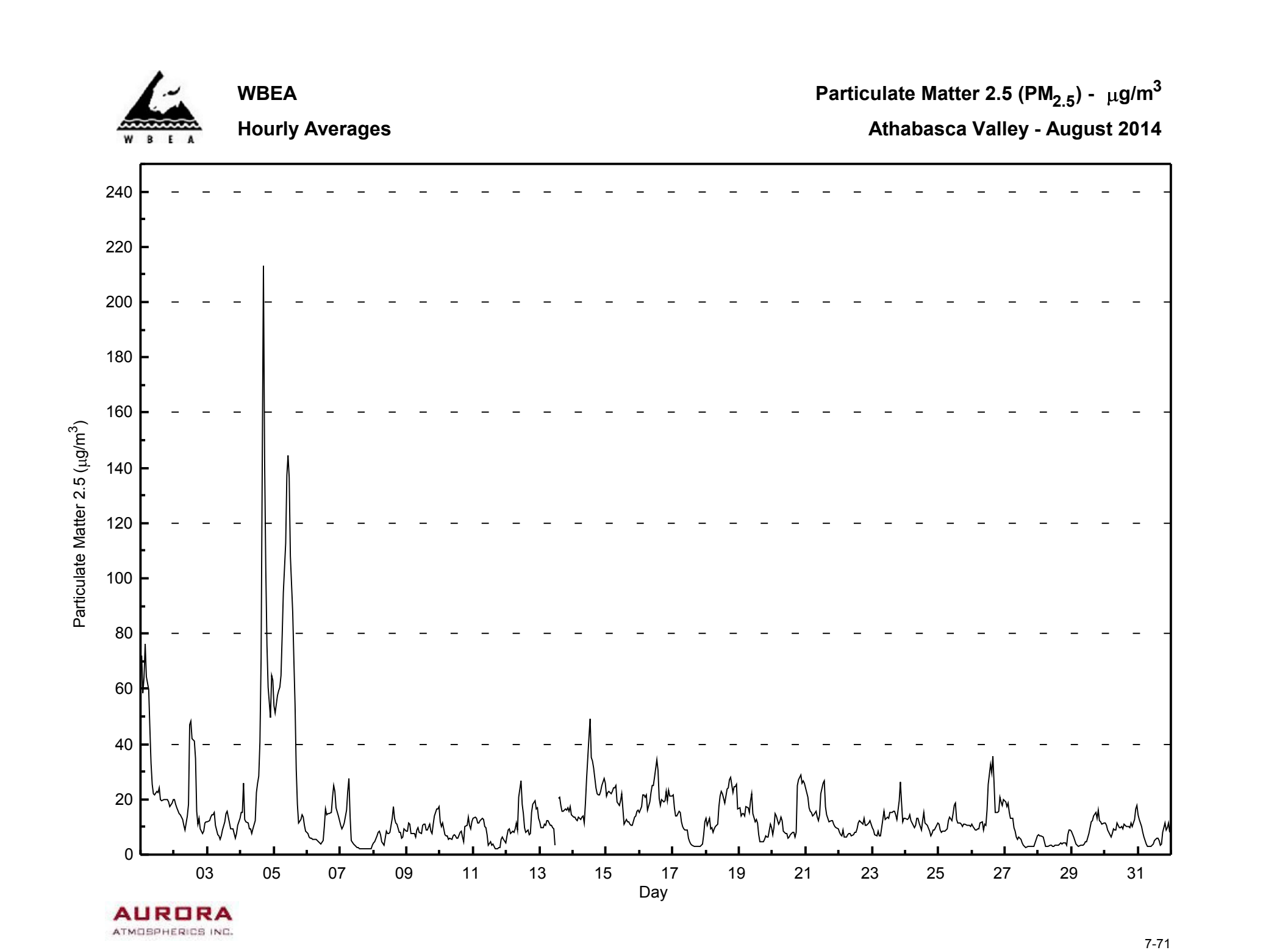
Percentiles: P_1 = 2.1 P_{10} = 4.1 Q_1 = 7.7 Median = 11.3 Q_3 = 16.5 P_{90} = 24.9 P_{99} = 104.2

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	71.9	58.5	64.0	76.3	64.5	59.7	45.9	33.1	25.6	22.0	21.5	22.8	22.5	24.3	20.0	19.4	19.9	20.1	20.1	19.9	19.0	17.6	18.8	19.9	33.6	76.3
2-Aug	19.7	18.3	16.9	14.9	14.3	13.5	12.8	10.4	9.1	13.9	18.2	46.9	48.2	41.8	41.1	34.7	15.7	11.2	13.3	9.4	7.7	8.5	11.6	11.9	19.3	48.2
3-Aug	11.9	12.3	13.6	14.3	14.3	15.1	10.7	7.3	6.7	5.5	7.0	9.0	11.8	15.0	15.5	13.4	11.5	9.4	9.4	7.6	6.1	7.6	10.6	13.3	10.8	15.5
4-Aug	15.1	15.1	25.8	12.6	11.9	11.5	9.1	9.3	7.6	9.2	12.3	22.3	25.7	28.3	40.8	71.0	213.1	142.6	103.4	75.9	60.7	49.7	64.8	63.1	45.9	213.1
5-Aug	53.6	51.3	57.8	59.3	60.8	65.0	79.4	95.0	112.5	137.3	144.4	136.3	108.2	87.8	70.2	54.4	30.9	18.2	11.3	12.7	14.4	13.4	10.4	8.5	62.2	144.4
6-Aug	7.5	6.4	5.9	5.8	5.6	5.7	5.6	5.1	4.6	4.2	4.0	5.2	10.1	16.4	14.3	14.8	14.8	15.3	20.8	24.9	23.0	17.1	13.8	12.3	11.0	24.9
7-Aug	10.4	9.2	10.2	11.3	15.9	22.7	27.5	13.9	4.9	3.9	3.4	3.0	2.7	2.6	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	3.2	6.8	27.5
8-Aug	4.1	4.7	6.7	8.0	8.5	7.4	4.5	3.6	5.9	8.4	7.6	7.8	8.1	13.0	17.2	13.0	11.4	11.0	8.0	8.2	6.1	6.3	9.4	8.5	8.2	17.2
9-Aug	8.7	11.4	11.1	7.8	7.6	7.8	6.4	9.0	10.0	8.1	7.6	10.7	11.0	11.0	9.0	8.9	11.1	8.5	7.6	10.9	13.9	16.5	16.3	17.2	10.3	17.2
10-Aug	11.7	10.3	11.3	7.2	6.8	6.9	5.7	5.8	5.4	6.7	7.4	6.7	5.9	6.1	7.9	8.5	6.4	4.8	10.2	10.6	13.5	10.6	9.1	11.8	8.2	13.5
11-Aug	13.1	13.6	13.1	11.4	11.6	12.4	13.1	12.7	10.2	9.8	7.3	3.4	4.8	3.4	3.9	2.8	2.1	2.1	2.5	2.6	5.5	6.2	5.5	4.4	7.4	13.6
12-Aug	7.0	9.0	9.3	7.7	8.4	8.0	9.4	11.5	8.9	20.7	26.5	18.2	14.8	9.9	8.2	9.1	7.3	7.6	15.3	18.2	19.5	16.3	17.1	13.3	12.5	26.5
13-Aug	12.1	9.8	9.6	11.0	10.6	12.2	12.3	10.5	10.7	9.8	9.2	3.5	M	20.5	20.9	17.6	15.9	15.8	16.5	16.1	16.9	15.7	17.4	14.5	13.4	20.9
14-Aug	13.5	13.7	12.7	12.2	13.4	12.6	13.7	14.0	11.6	18.8	27.4	42.4	49.0	35.3	33.9	31.3	24.1	22.1	21.5	21.7	23.0	24.8	27.4	25.9	22.8	49.0
15-Aug	21.4	22.3	22.7	22.2	22.8	24.0	24.1	24.9	19.2	17.7	19.6	21.9	16.6	11.1	12.6	11.8	12.0	11.1	10.7	10.6	13.5	14.1	15.7	16.2	17.5	24.9
16-Aug	15.3	17.3	21.8	21.4	20.7	21.5	16.1	19.0	22.5	25.0	25.1	27.9	34.2	30.6	20.5	18.0	20.1	19.0	19.3	22.7	19.6	23.4	21.2	21.1	21.8	34.2
17-Aug	21.5	16.8	13.9	14.1	15.8	15.5	12.0	10.2	9.1	8.9	9.0	6.0	4.6	3.9	3.3	2.8	2.9	3.0	3.0	3.1	3.1	3.9	7.0	12.0	8.6	21.5
18-Aug	13.1	10.5	13.0	9.3	9.9	8.2	9.5	10.1	10.8	17.4	21.3	22.8	21.8	18.7	21.2	23.9	24.3	26.9	27.9	22.7	24.4	24.8	25.3	16.5	18.1	27.9
19-Aug	17.0	14.1	14.7	14.7	14.1	17.6	17.0	15.1	19.4	21.9	14.9	11.8	12.7	11.4	7.4	4.8	4.8	4.6	5.4	7.0	6.5	6.2	11.0	9.8	11.8	21.9
20-Aug	7.2	9.7	15.0	14.0	10.8	11.9	13.4	12.2	8.7	7.7	7.6	6.0	6.2	7.4	8.0	8.1	6.2	8.1	25.1	27.0	28.6	25.7	26.7	26.0	13.6	28.6
21-Aug	24.1	20.7	16.8	15.9	15.4	14.0	14.2	15.6	13.4	12.1	14.5	21.9	25.8	26.9	17.3	14.5	12.9	11.9	12.4	12.2	11.0	10.2	9.7	9.2	15.5	26.9
22-Aug	8.0	7.4	6.8	8.9	6.4	6.2	7.3	7.7	7.6	6.7	7.2	7.9	8.0	9.5	11.6	12.2	11.5	11.0	13.2	10.6	10.4	11.3	12.3	11.0	9.2	13.2
23-Aug	9.9	8.8	7.3	6.9	8.5	6.8	7.0	9.6	15.7	12.8	13.3	13.5	12.9	15.4	15.1	15.7	15.8	14.4	12.6	19.4	26.2	18.9	11.8	13.1	13.0	26.2
24-Aug	13.2	12.9	13.2	14.3	12.1	11.6	9.9	10.4	13.3	13.1	11.6	9.0	12.3	15.3	11.5	11.1	10.6	8.3	7.0	7.6	8.7	9.0	10.7	11.3	11.2	15.3
25-Aug	11.0	8.9	8.2	8.7	8.5	8.9	9.5	12.3	13.4	12.1	14.9	17.9	18.5	12.8	11.6	11.4	11.1	10.4	11.2	11.2	10.7	10.4	10.7	10.1	11.4	18.5
26-Aug	10.8	10.1	8.7	9.0	9.3	9.3	11.2	12.0	9.1	10.8	10.6	16.1	25.5	32.8	29.5	35.4	26.0	15.3	15.2	15.7	20.6	19.3	17.6	20.0	16.7	35.4
27-Aug	19.0	17.5	18.5	15.4	13.1	13.0	9.6	8.6	6.3	5.3	6.3	5.7	4.4	3.5	2.8	2.8	2.8	2.8	2.9	3.0	2.9	2.9	5.5	6.9	7.6	19.0
28-Aug	7.4	6.7	6.7	6.4	4.7	3.1	3.1	3.2	3.2	3.2	3.1	3.2	3.3	3.3	3.4	3.7	4.1	4.0	4.0	4.1	3.6	7.0	9.0	8.9	4.7	9.0
29-Aug	8.4	6.5	5.0	3.9	3.3	3.1	3.2	3.5	3.5	3.6	4.6	4.7	7.8	9.7	12.0	12.5	13.8	15.1	13.0	16.0	12.3	12.0	11.2	11.4	8.3	16.0
30-Aug	11.3	10.6	9.0	8.0	6.5	7.7	9.2	8.8	8.7	11.3	9.7	9.8	10.3	9.2	11.0	10.3	10.0	10.3	9.6	11.3	10.1	12.5	16.5	17.7	10.4	17.7
31-Aug	14.2	12.7	10.2	8.0	6.6	5.0	3.6	3.0	2.9	2.8	3.5	3.7	5.0	6.0	5.8	5.1	3.6	3.8	8.0	11.5	9.0	9.9	11.5	8.2	6.8	14.2
	15.9	14.8	15.5	14.9	14.3	14.5	14.1	13.8	13.6	15.2	16.1	17.7	18.4	17.5	16.4	16.3	18.7	15.2	14.9	14.7	14.6	14.0	15.1	14.7	Diurnal Average	
	71.9	58.5	64.0	76.3	64.5	65.0	79.4	95.0	112.5	137.3	144.4	136.3	108.2	87.8	70.2	71.0	213.1	142.6	103.4	75.9	60.7	49.7	64.8	63.1	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
Athabasca Valley - August 2014
Particulate Matter 2.5 (μg/m^3)
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 ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	102	13.73	13.73
6 - 15	430	57.87	71.60
16 - 25	140	18.84	90.44
26 - 80	61	8.21	98.65
> 81.0	10	1.35	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Athabasca Valley - August 2014

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	7	0	1	2	2	7	13	3	1	3	11	6	10	10	15	11	102
6 - 15	34	4	4	6	16	37	132	25	19	13	36	22	6	9	19	48	430
16 - 25	10	4	0	3	12	11	31	8	7	7	15	12	1	3	6	10	140
26 - 80	10	3	0	0	4	3	11	1	1	0	10	1	1	2	2	12	61
> 81.0	0	1	0	0	0	2	3	0	0	0	0	1	0	0	1	2	10
Totals	61	12	5	11	34	60	190	37	28	23	72	42	18	24	43	83	743

Total Number of Valid Hours: 743

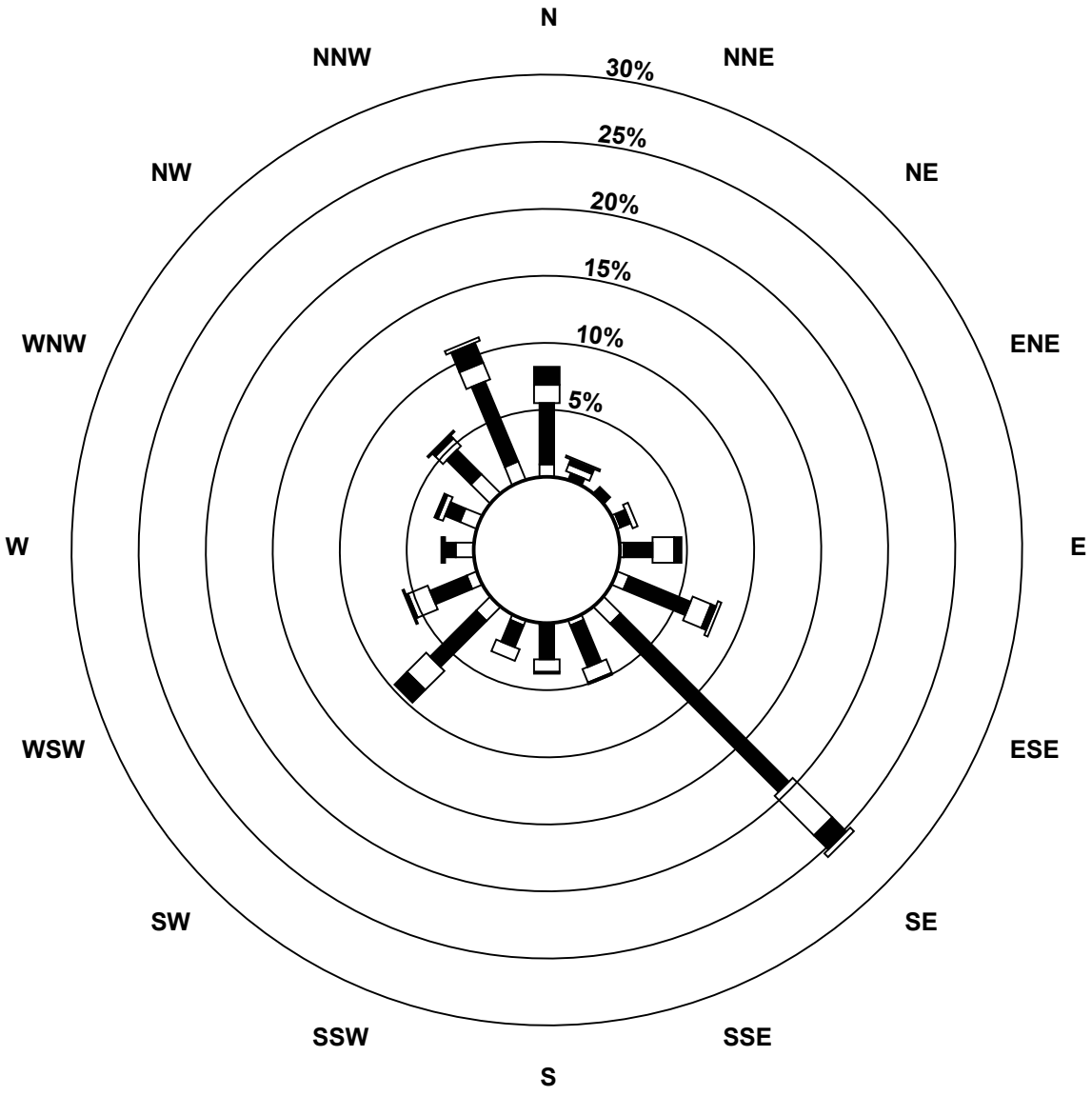
Total Number of Hours: 744

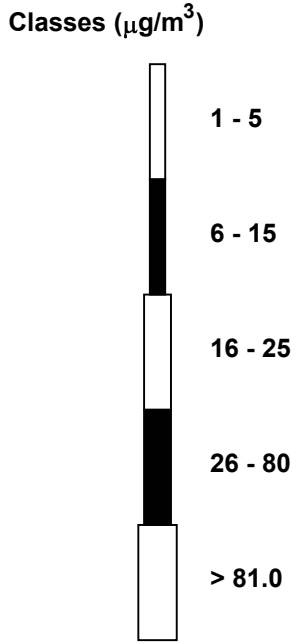
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Athabasca Valley (AMS 7)





Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 1.4 ppm on Aug 5 12:00 Maximum Daily Average: 0.6 ppm on Aug 5

Minimum Value: 0.0 ppm on Aug 13 15:00 Minimum Daily Average: 0.1 ppm on Aug 13
Maximum Diurnal Average: 0.2 ppm at hour 21 Minimum Diurnal Average: 0.1 ppm at hour 16
Monthly Average: 0.20 ppm Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.1 Median = 0.2 Q_3 = 0.2 P_{90} = 0.3 P_{99} = 0.9

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-Aug	1.1	0.9	0.9	1.0	0.8	Z	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.4	1.1
2-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.5
3-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.3	0.3	0.2	0.4
4-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.9	0.8	0.7	0.7	0.6	0.5	0.6	0.6	0.4	0.9
5-Aug	0.5	0.5	0.5	0.5	0.5	Z	0.5	0.6	0.8	1.2	1.3	1.4	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.6	1.4
6-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3
7-Aug	0.2	0.1	0.1	0.1	0.2	Z	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3
8-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
9-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.4
10-Aug	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3
11-Aug	0.2	0.2	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3
12-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
13-Aug	0.2	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.0	0.0	M	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
14-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3
15-Aug	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	C	C	C	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
16-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4
17-Aug	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3
18-Aug	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	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4
19-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3
20-Aug	0.1	0.1	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
21-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
22-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2
23-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2
24-Aug	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
25-Aug	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.3
26-Aug	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
27-Aug	0.2	0.2	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2
28-Aug	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3
29-Aug	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	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.3
30-Aug	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
31-Aug	0.2	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2
	0.2	0.2	0.2	0.2	0.2	--	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
	1.1	0.9	0.9	1.0	0.8	--	0.6	0.6	0.8	1.2	1.3	1.4	1.0	0.7	0.5	0.4	0.9	0.8	0.7	0.7	0.6	0.5	0.6	0.6	Diurnal Maximum	

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

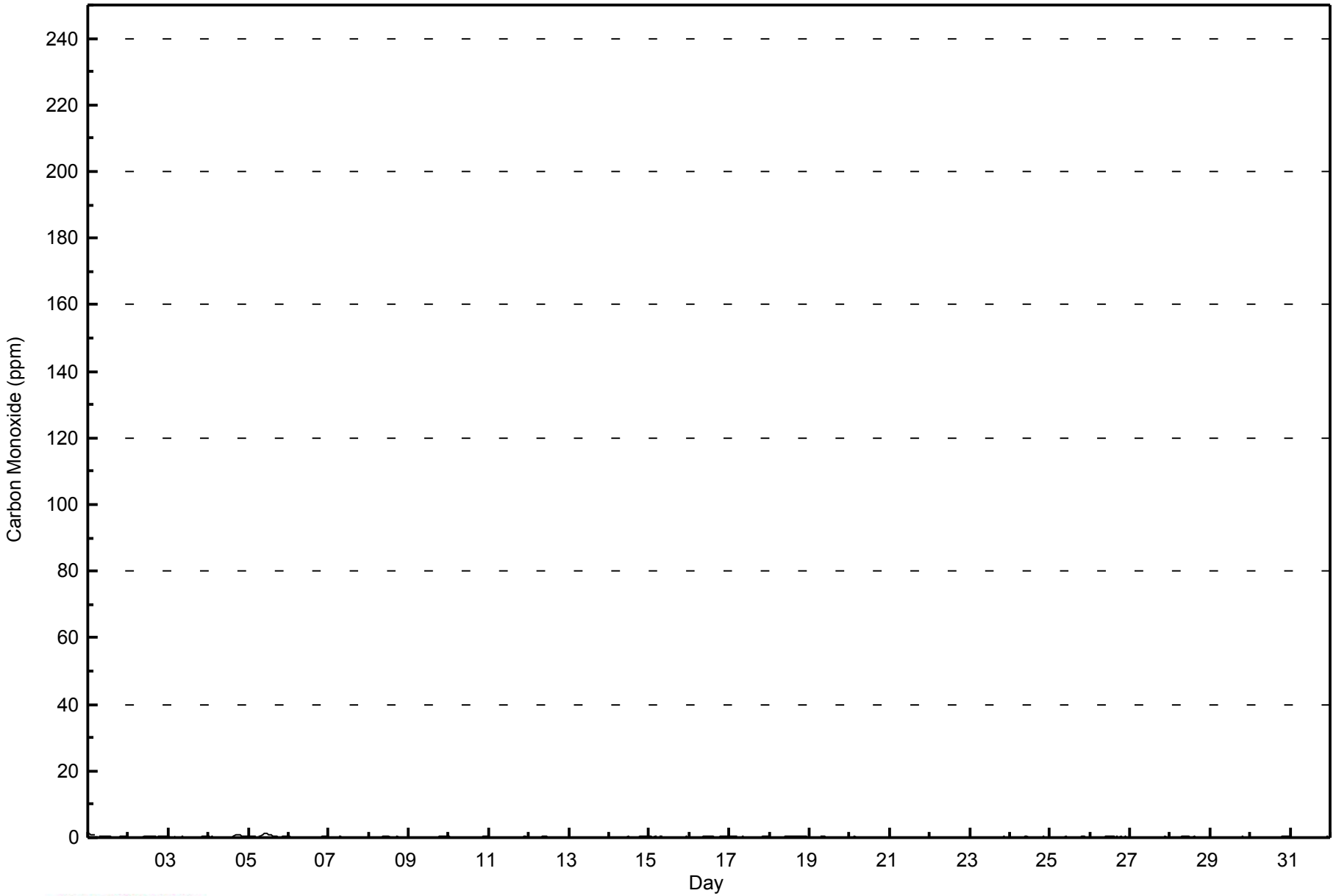
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	667	94.08	94.08
0.4 - 0.5	22	3.10	97.18
0.6 - 0.7	8	1.13	98.31
0.8 - 1.4	12	1.69	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA

Frequency Distribution

Carbon Monoxide (CO) - ppm

Athabasca Valley - August 2014

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	54	10	5	9	31	53	159	34	25	23	67	37	18	24	41	77	667
0.4 - 0.5	3	0	0	0	2	3	9	1	2	0	2	0	0	0	0	0	22
0.6 - 0.7	0	0	0	0	0	1	2	1	0	0	1	1	0	0	1	1	8
0.8 - 1.4	2	1	0	0	0	1	2	0	0	0	0	1	0	0	0	5	12
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	59	11	5	9	33	58	172	36	27	23	70	39	18	24	42	83	709

Total Number of Valid Hours: 709

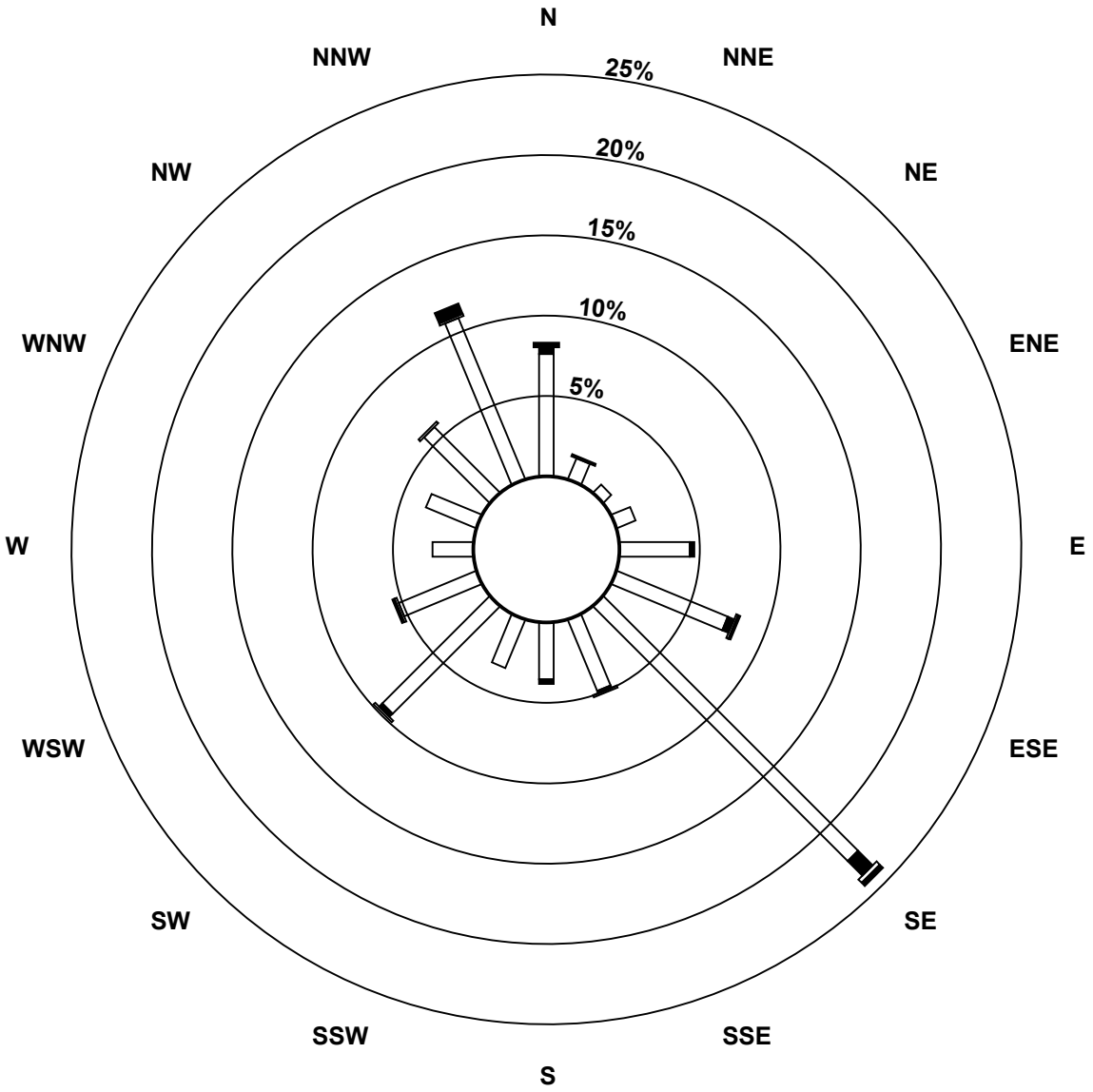
Total Number of Hours: 744

Wood Buffalo Environmental Association

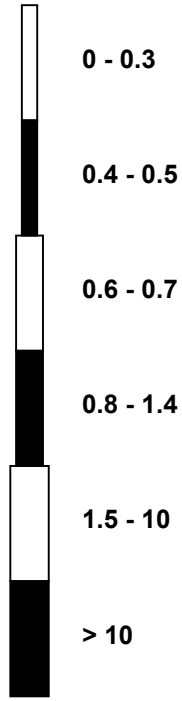
Wind Rose Aug 2014

Carbon Monoxide (CO) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)



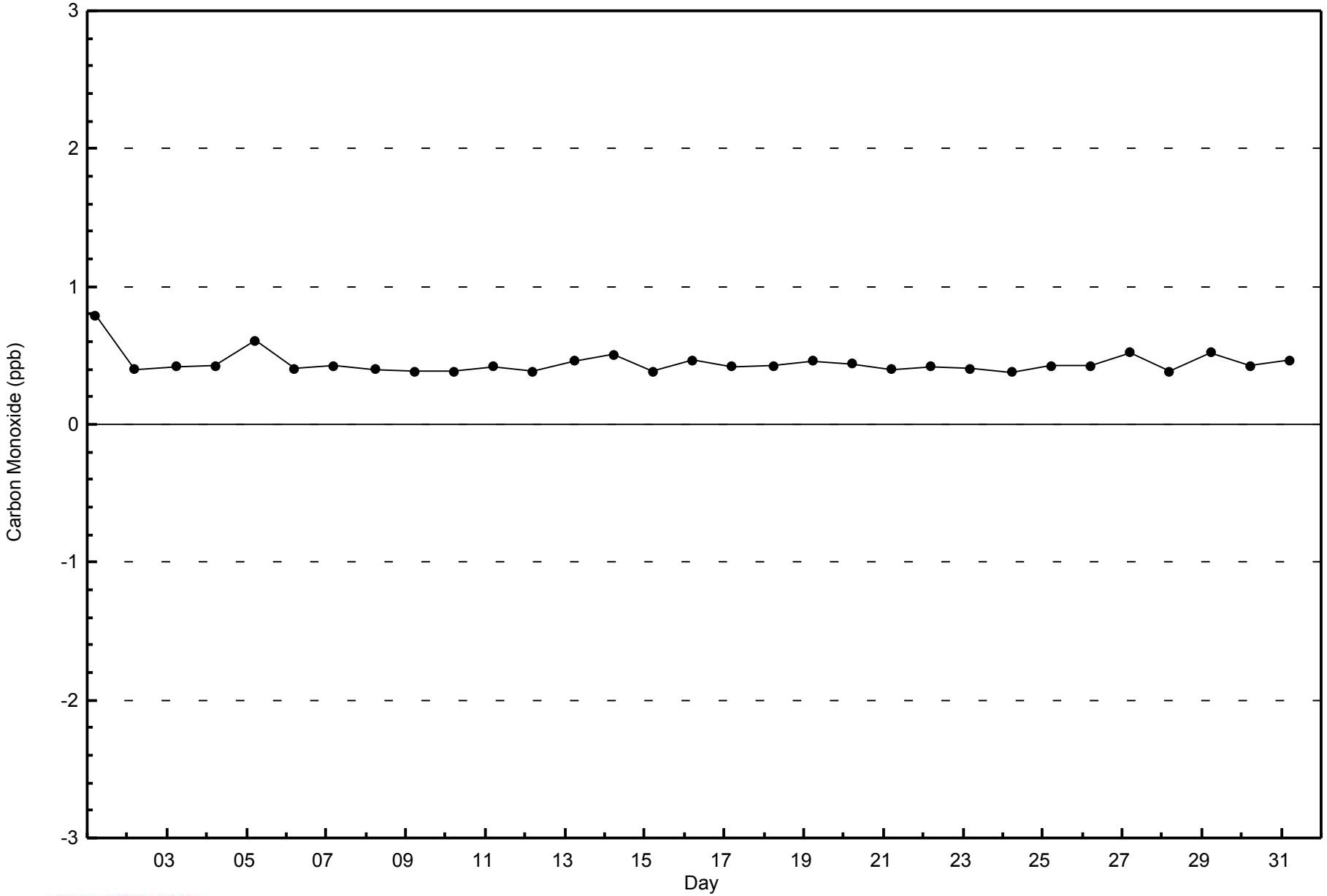
Total Number of Valid Hours: 709

WBEA

Zero Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - August 2014



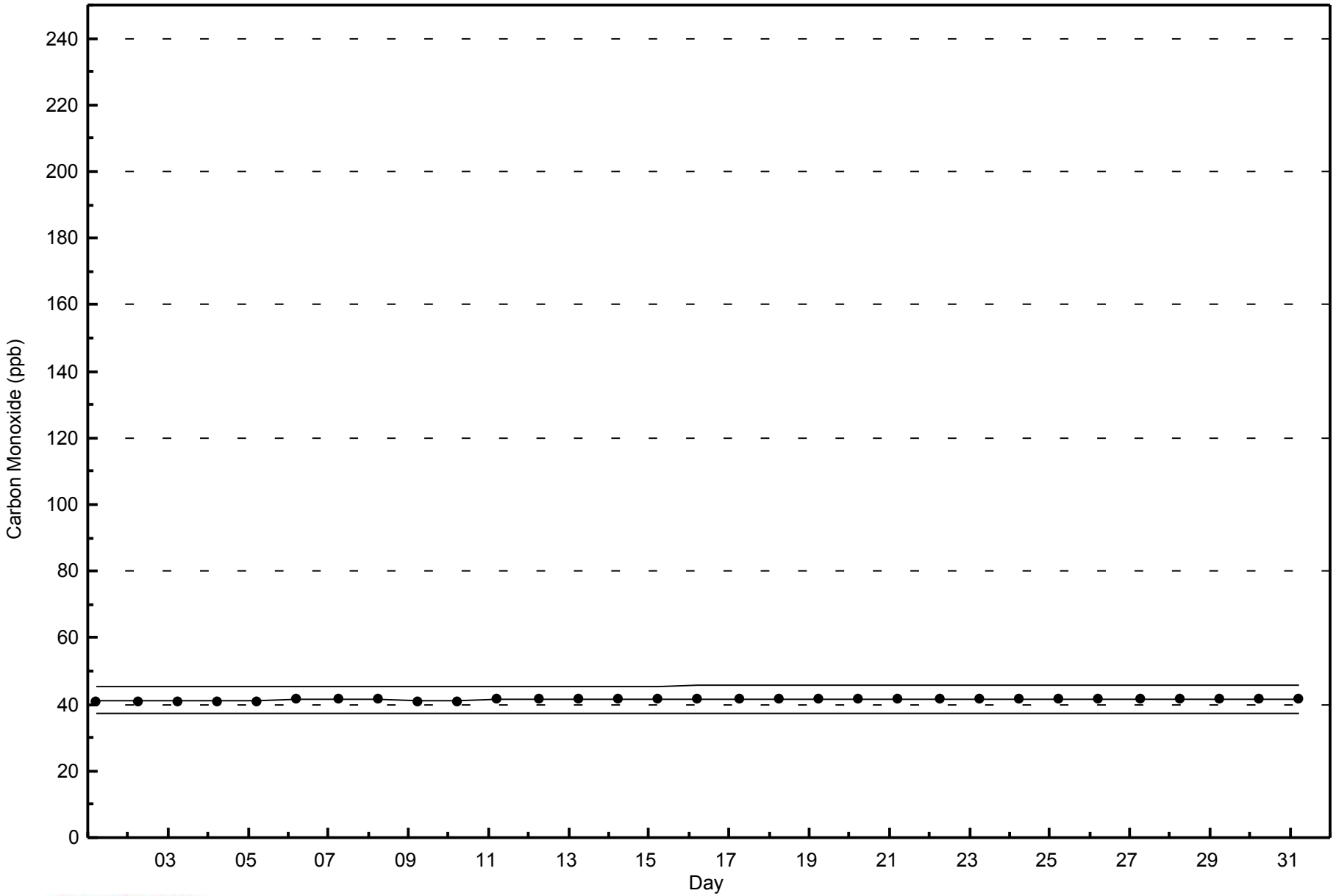
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 32.0 C on Aug 5 18:00

Maximum Daily Average: 25.2 C on Aug 13

Minimum Value: 2.6 C on Aug 22 07:00

Minimum Daily Average: 10.6 C on Aug 22

Maximum Diurnal Average: 24.1 C at hour 16

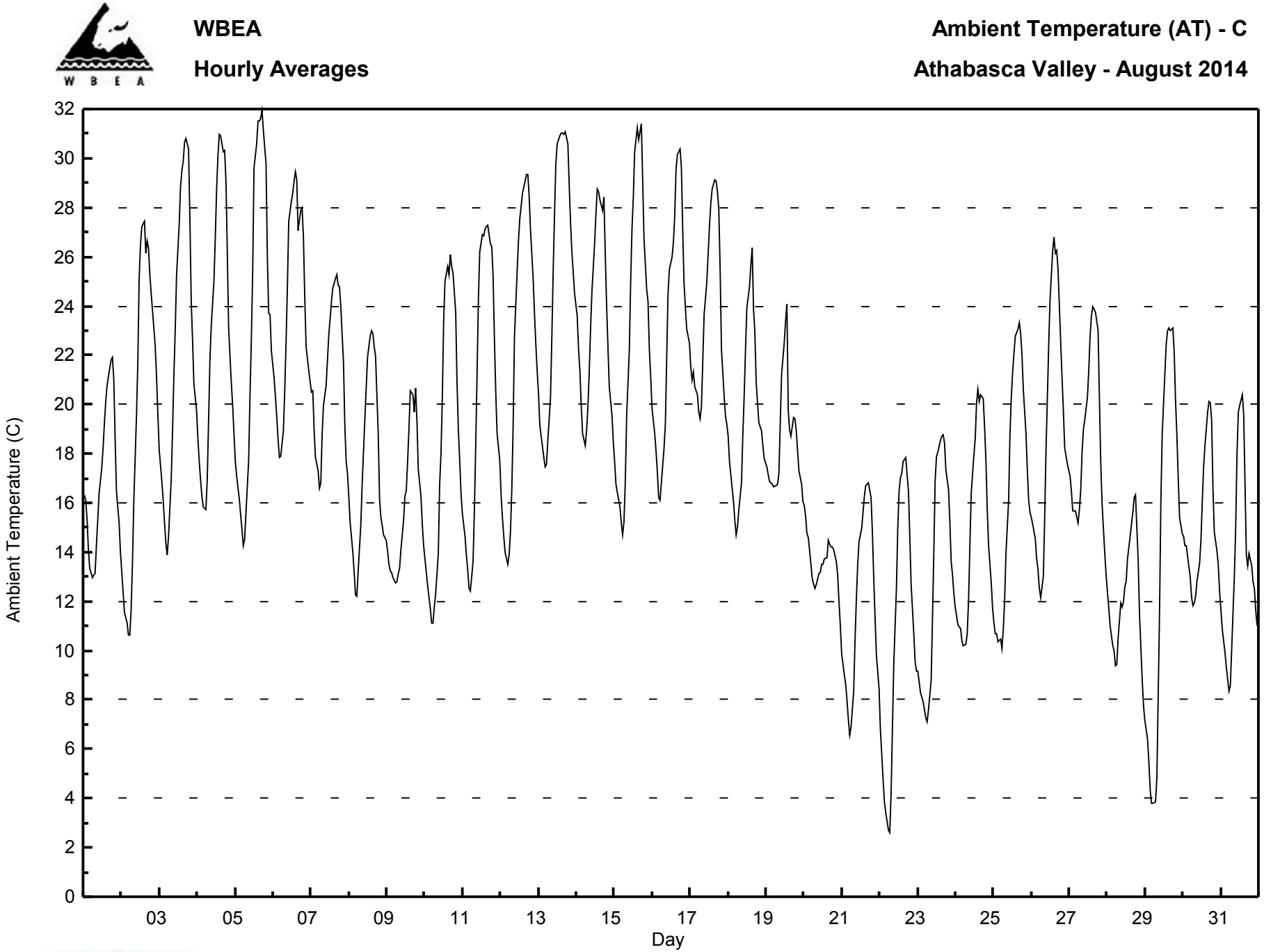
Minimum Diurnal Average: 12.7 C at hour 6

Monthly Average: 18.52 C

Percentiles: P_1 = 4.2 P_{10} = 11.1 Q_1 = 14.0 Median = 18.0 Q_3 = 22.9 P_{90} = 27.3 P_{99} = 31.0

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-Aug	16.3	16.1	15.4	14.1	13.3	12.9	13.1	13.1	14.3	15.3	16.4	17.4	18.2	19.3	20.1	20.8	21.5	21.8	21.9	21.0	18.7	16.5	15.2	14.0	16.9	21.9
2-Aug	13.2	12.3	11.6	11.1	10.6	10.6	11.6	13.5	16.1	19.5	21.7	25.1	26.4	27.2	27.4	26.1	26.7	26.4	25.3	24.5	23.1	22.4	21.2	19.6	19.7	27.4
3-Aug	18.2	16.8	16.1	15.2	14.4	13.9	14.6	16.9	18.9	21.2	23.0	25.2	27.3	28.8	29.5	29.9	30.6	30.8	30.4	27.6	24.2	22.6	20.8	19.7	22.4	30.8
4-Aug	18.6	17.7	16.9	16.2	15.8	15.7	17.0	19.4	21.8	23.2	25.0	26.7	28.7	30.1	30.9	30.9	30.3	30.3	29.1	26.2	23.1	20.9	19.9	18.8	23.1	30.9
5-Aug	17.7	17.1	16.1	15.5	14.9	14.3	14.5	15.6	17.8	20.4	22.6	25.4	29.6	30.6	31.5	31.5	31.6	32.0	31.1	29.8	26.0	23.7	23.6	22.2	23.1	32.0
6-Aug	21.1	20.4	19.5	18.6	17.9	17.9	18.9	20.5	22.5	24.8	27.5	28.3	28.6	29.1	29.4	29.1	27.1	27.9	28.0	26.8	24.4	22.3	21.4	21.0	23.9	29.4
7-Aug	20.5	20.5	19.0	17.9	17.3	16.6	16.8	18.8	20.0	20.7	21.8	22.8	23.5	24.2	24.7	25.1	25.3	24.8	24.8	24.0	21.7	19.2	17.7	17.2	21.0	25.3
8-Aug	16.2	15.2	14.0	13.2	12.3	12.2	13.3	15.1	16.8	18.1	19.4	20.6	21.9	22.8	23.0	22.9	22.3	22.0	18.8	16.2	15.4	15.1	14.7	14.5	17.3	23.0
9-Aug	14.0	13.5	13.2	13.2	12.9	12.8	12.8	13.1	13.3	14.1	15.3	16.3	16.5	17.7	19.0	20.5	20.4	19.7	20.7	19.3	17.4	16.3	15.1	14.3	15.9	20.7
10-Aug	13.7	13.2	12.6	11.7	11.1	11.1	11.8	12.3	13.9	16.8	18.0	20.3	23.4	25.0	25.6	25.3	26.1	25.6	25.4	23.8	20.9	19.0	17.7	16.4	18.4	26.1
11-Aug	15.6	14.6	13.9	13.3	12.5	12.4	13.6	15.7	18.4	21.2	24.2	26.2	26.9	26.9	27.1	27.2	27.3	26.5	26.4	25.2	22.7	20.5	18.8	17.7	20.6	27.3
12-Aug	16.3	15.4	14.6	14.0	13.5	13.9	14.8	16.5	19.1	22.7	25.4	26.7	27.5	28.0	28.6	29.1	29.3	29.3	28.5	27.1	25.1	23.7	22.4	21.4	22.2	29.3
13-Aug	20.4	19.2	18.3	17.8	17.5	17.6	18.5	20.3	22.7	25.5	27.7	29.8	30.6	30.9	31.0	31.0	31.0	31.1	30.6	28.9	27.4	26.2	25.4	24.5	25.2	31.1
14-Aug	23.6	22.2	21.4	20.0	18.8	18.3	19.0	19.9	21.3	23.1	24.6	26.5	27.7	28.7	28.6	28.3	27.9	28.4	26.1	24.0	22.3	20.7	19.6	18.5	23.3	28.7
15-Aug	17.7	16.8	16.5	15.8	15.2	14.7	15.2	16.9	19.5	22.2	24.9	27.1	28.4	30.3	31.2	30.7	31.1	31.4	29.1	26.7	24.7	24.2	22.2	21.1	23.1	31.4
16-Aug	19.8	18.8	18.1	17.2	16.2	16.1	16.8	18.2	19.2	21.9	24.5	25.5	26.0	26.6	27.7	29.5	30.2	30.4	29.6	27.1	24.9	23.9	23.1	22.5	23.1	30.4
17-Aug	21.6	21.0	21.3	20.7	20.4	19.7	19.4	19.9	21.8	23.6	24.9	26.1	27.2	28.2	28.7	29.1	29.1	28.7	27.9	25.5	22.2	20.3	19.5	19.2	23.6	29.1
18-Aug	18.7	17.7	16.6	16.1	15.3	14.7	15.0	15.7	16.8	18.7	20.4	22.2	23.9	24.8	25.6	26.4	23.8	23.0	20.9	19.3	19.1	18.9	18.3	17.8	19.6	26.4
19-Aug	17.5	17.2	16.9	16.8	16.7	16.7	16.7	16.7	17.2	19.2	21.2	22.5	23.4	24.1	19.8	19.0	18.7	19.5	19.4	18.9	18.1	17.3	16.8	16.0	18.6	24.1
20-Aug	15.9	15.5	14.7	14.6	13.5	12.9	12.7	12.5	12.7	13.2	13.2	13.5	13.5	13.7	13.8	14.5	14.3	14.2	14.2	14.1	13.6	13.1	12.0	11.0	13.6	15.9
21-Aug	9.9	9.0	8.6	8.0	7.2	6.6	6.9	8.4	10.4	12.1	13.5	14.4	15.0	15.6	16.3	16.7	16.8	16.8	16.2	14.8	13.0	11.3	9.8	8.5	11.9	16.8
22-Aug	6.8	5.8	4.8	3.9	3.4	2.7	2.6	4.2	6.8	9.5	12.5	14.9	16.5	17.1	17.2	17.7	17.9	17.1	16.5	14.6	12.7	10.7	9.5	9.2	10.6	17.9
23-Aug	9.2	8.7	8.3	7.9	7.6	7.3	7.1	7.6	8.8	11.3	14.0	16.9	17.9	18.1	18.6	18.7	18.8	18.4	17.4	16.6	15.2	13.6	13.1	12.3	13.1	18.8
24-Aug	11.8	11.1	11.0	10.9	10.4	10.2	10.3	10.7	12.0	14.2	16.4	17.9	18.6	20.1	20.6	20.1	20.4	20.2	19.1	17.7	15.7	14.3	12.8	11.7	14.9	20.6
25-Aug	11.1	10.7	10.7	10.4	10.5	10.1	10.8	12.0	13.9	16.1	18.8	20.3	21.3	22.1	22.8	23.1	23.3	22.9	22.0	20.6	18.8	17.4	16.1	15.6	16.7	23.3
26-Aug	15.4	15.1	14.6	13.7	13.3	12.5	12.1	13.0	15.4	18.2	20.2	22.4	24.2	26.3	26.8	26.1	26.2	25.5	22.5	21.1	19.8	18.2	17.9	17.6	19.1	26.8
27-Aug	17.1	16.5	15.7	15.7	15.7	15.2	15.8	16.6	18.1	19.0	19.4	20.3	21.4	22.8	23.6	24.0	23.8	23.4	23.0	20.2	17.6	15.9	14.0	13.1	18.6	24.0
28-Aug	12.4	11.7	11.0	10.2	10.0	9.4	9.4	10.5	11.9	11.8	12.0	12.6	12.8	13.7	14.7	15.1	15.6	16.2	16.3	13.7	11.5	10.1	8.8	7.8	12.1	16.3
29-Aug	7.1	6.4	5.5	4.4	3.8	3.8	3.8	4.8	8.2	11.5	16.0	18.8	21.2	22.4	23.0	23.1	23.0	23.1	22.1	20.1	18.7	17.0	15.4	14.8	14.1	23.1
30-Aug	14.6	14.3	14.3	13.8	13.0	12.1	11.8	11.9	12.2	12.8	13.6	14.5	16.0	17.5	18.4	19.7	20.1	20.0	19.4	16.6	14.8	14.1	13.4	12.4	15.1	20.1
31-Aug	11.6	10.8	9.9	9.4	8.8	8.4	8.6	10.1	13.0	15.0	18.0	19.7	20.0	20.4	19.6	16.7	13.9	13.5	14.0	13.4	12.8	12.5	11.6	11.0	13.4	20.4
	15.6	14.9	14.2	13.6	13.0	12.7	13.1	14.2	16.0	18.0	19.9	21.5	22.7	23.6	24.0	24.1	24.0	23.9	23.1	21.5	19.5	18.1	17.0	16.2	Diurnal Average	
	23.6	22.2	21.4	20.7	20.4	19.7	19.4	20.5	22.7	25.5	27.7	29.8	30.6	30.9	31.5	31.5	31.6	32.0	31.1	29.8	27.4	26.2	25.4	24.5	Diurnal Maximum	


WBEA
Hourly Averages
Ambient Temperature (AT) - C
Athabasca Valley - August 2014
Ambient Temperature (C)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
03
05
07
09
11
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17
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21
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27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	50	6.72	6.72
10 - 20	410	55.11	61.83
> 20	284	38.17	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 29.4 % on Aug 23 07:00

Maximum Daily Average: 29.4 % on Aug 22

Minimum Value: 28.6 % on Aug 30 16:00

Minimum Daily Average: 28.6 % on Aug 30

Maximum Diurnal Average: 29.0 % at hour 8

Minimum Diurnal Average: 28.9 % at hour 18

Monthly Average: 28.96 %

Percentiles: P_1 = 28.6 P_{10} = 28.7 Q_1 = 28.8 Median = 29.0 Q_3 = 29.1 P_{90} = 29.3 P_{99} = 29.4

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

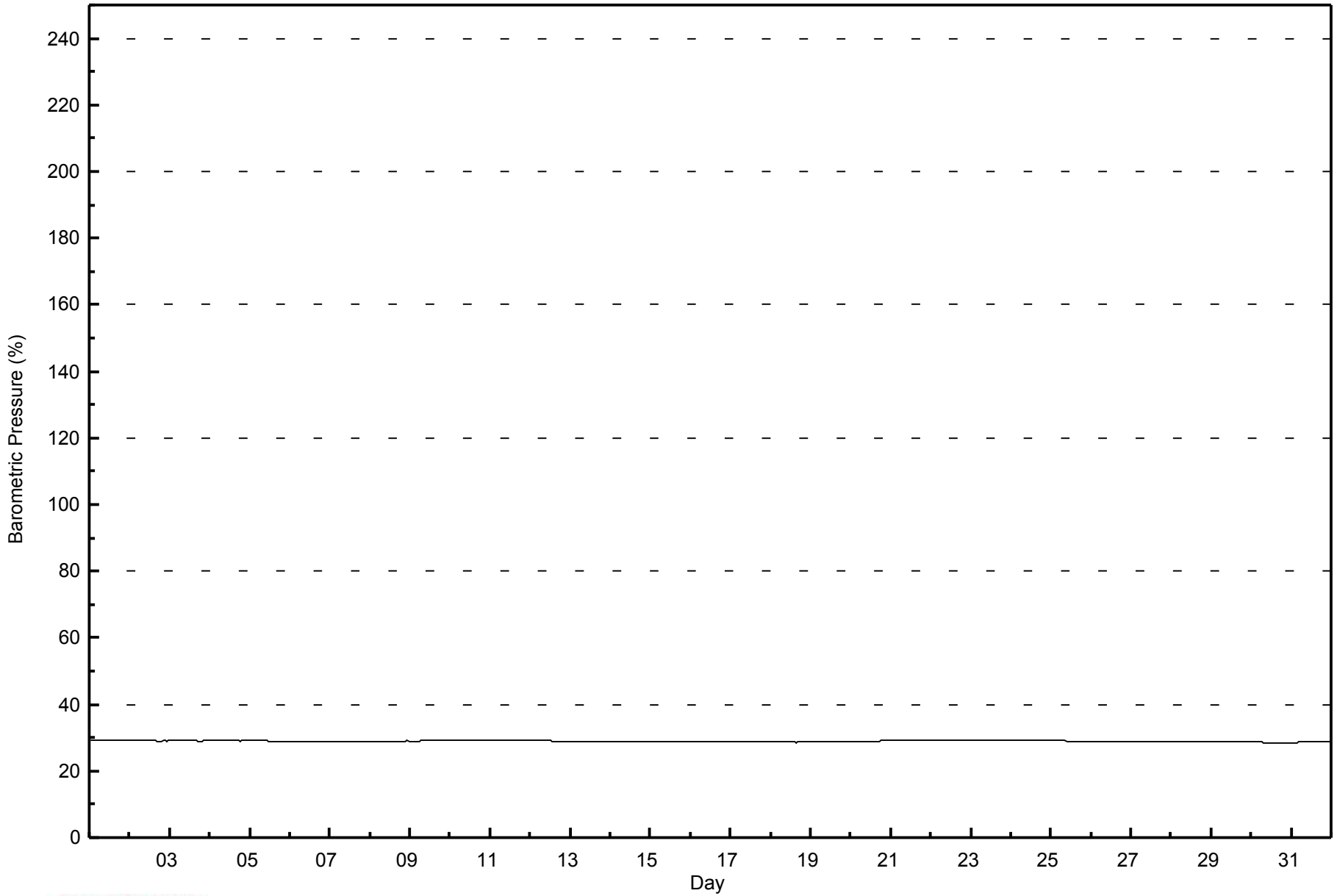
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3
2-Aug	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2
3-Aug	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.0	29.1
4-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1
5-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
6-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.9
7-Aug	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.8	28.9
8-Aug	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
9-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1
10-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
11-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
12-Aug	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	28.9	28.9	28.9	28.9	29.0	29.1
13-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.9
14-Aug	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	28.9	29.0
15-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
16-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9
17-Aug	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.8	28.8	28.8	28.8	28.9
18-Aug	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.8
19-Aug	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.7	28.8
20-Aug	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	28.9	29.1
21-Aug	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3
22-Aug	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4
23-Aug	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4
24-Aug	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	29.1	29.1	29.1	29.1	29.1	29.2	29.3
25-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
26-Aug	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9
27-Aug	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
28-Aug	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	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-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.9	29.0
30-Aug	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7
31-Aug	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.7
	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	Diurnal Average	
	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	Diurnal Maximum	

WBEA

Hourly Averages

Barometric Pressure (BP) - %

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 99 inHg on Aug 29 06:00
Maximum Daily Average: 82.1 inHg on Aug 9

Minimum Value: 26 inHg on Aug 17 15:00
Minimum Daily Average: 51.9 inHg on Aug 7
Maximum Diurnal Average: 86.4 inHg at hour 6
Minimum Diurnal Average: 42.3 inHg at hour 15
Monthly Average: 66.0 inHg
Percentiles: P_1 = 29 P_{10} = 38 Q_1 = 49 Median = 69 Q_3 = 82 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

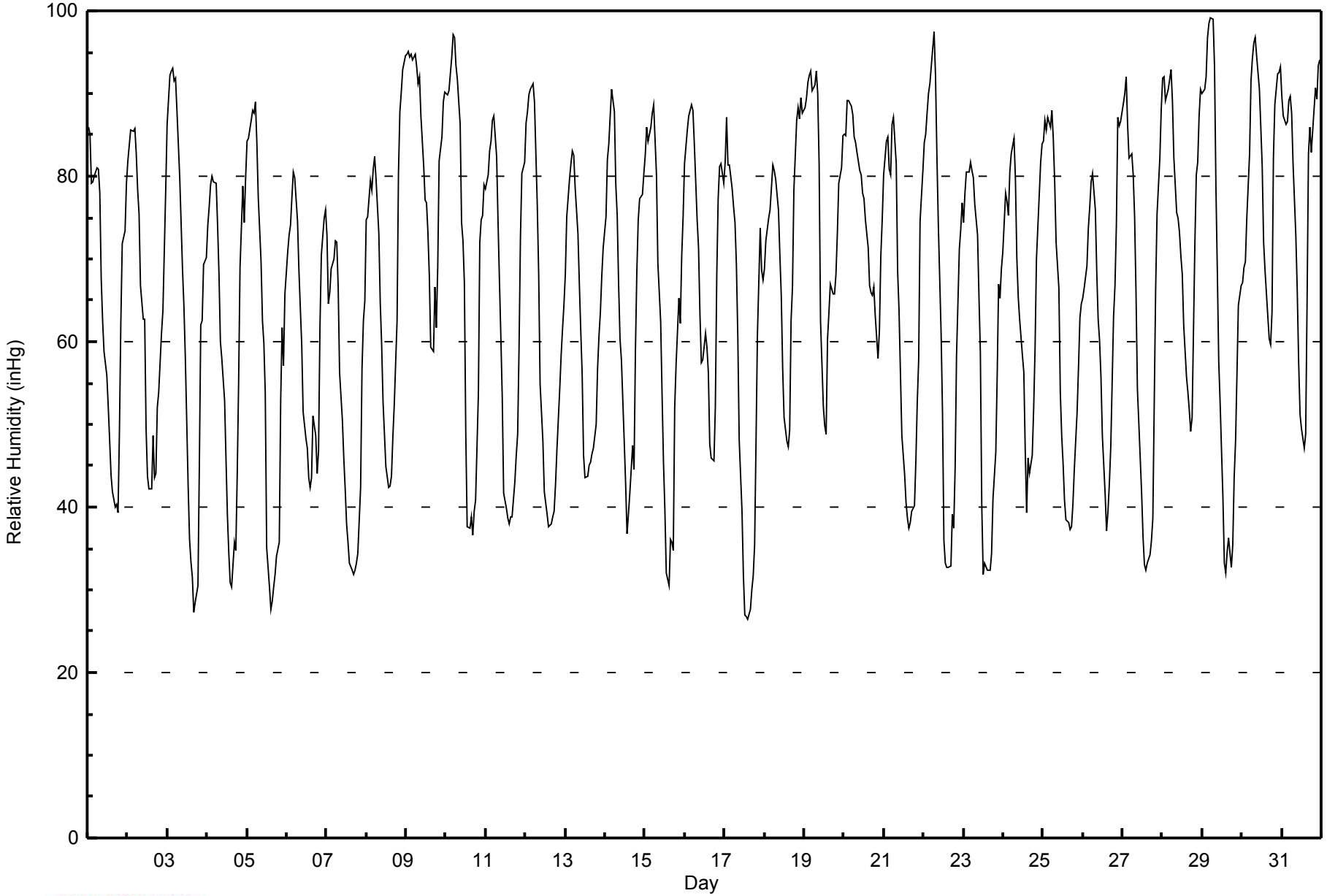
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	86	85	79	79	80	81	81	78	68	62	59	56	52	48	44	42	40	40	39	49	62	72	73	79	64.0	86
2-Aug	82	84	86	85	86	83	78	75	67	63	63	50	44	42	42	49	44	44	52	54	61	64	71	78	64.4	86
3-Aug	86	92	93	93	92	92	88	80	74	69	64	58	43	36	33	31	27	28	31	45	62	63	69	70	63.3	93
4-Aug	74	76	79	80	79	79	74	68	60	58	53	46	39	34	31	30	36	35	44	55	69	79	74	80	59.7	80
5-Aug	84	85	87	88	88	89	84	77	70	63	60	54	35	30	28	29	30	32	34	36	53	62	57	66	59.1	89
6-Aug	71	73	74	77	81	80	75	69	64	60	52	48	47	44	42	44	51	49	44	47	62	70	75	76	61.4	81
7-Aug	73	65	66	69	70	72	72	67	56	51	46	42	38	36	33	32	32	32	33	34	42	57	63	65	51.9	73
8-Aug	75	75	79	78	81	82	80	73	65	60	53	49	45	42	43	44	48	52	62	80	88	90	93	95	68.0	95
9-Aug	95	95	94	95	94	95	93	91	92	87	81	77	77	73	68	59	59	67	62	69	82	85	89	90	82.1	95
10-Aug	90	90	90	94	97	97	93	92	86	74	72	67	49	38	38	39	37	39	41	54	72	75	75	79	69.9	97
11-Aug	78	80	83	84	87	87	82	75	67	61	53	42	40	39	38	39	39	43	46	49	59	73	80	82	62.8	87
12-Aug	86	88	90	90	91	89	83	76	68	55	48	42	41	39	38	38	39	39	43	47	54	58	62	64	61.2	91
13-Aug	68	75	80	82	83	83	79	73	67	61	56	46	44	44	45	45	47	47	50	57	61	64	68	71	62.3	83
14-Aug	75	82	84	87	91	88	79	75	67	60	58	48	43	37	39	42	48	45	59	69	75	77	78	80	66.0	91
15-Aug	83	86	84	86	88	89	84	80	70	62	53	45	40	32	31	36	36	35	52	57	65	62	70	75	62.6	89
16-Aug	82	86	87	88	89	88	84	75	71	63	57	58	61	59	56	48	46	46	52	68	77	81	81	79	70.1	89
17-Aug	82	87	81	81	78	76	74	69	61	48	40	32	27	27	26	28	30	32	35	48	61	74	69	67	55.6	87
18-Aug	69	72	75	76	79	81	81	80	76	71	66	57	51	48	47	49	63	67	78	87	88	87	89	88	71.8	89
19-Aug	88	89	91	92	93	90	91	93	90	82	63	52	50	49	60	64	67	66	66	68	73	79	81	85	75.9	93
20-Aug	85	85	89	89	89	87	85	84	83	81	80	78	77	75	71	67	66	66	67	63	58	61	70	75	76.3	89
21-Aug	80	84	85	81	80	86	87	82	69	64	56	49	44	40	39	37	38	39	40	46	53	58	75	81	62.1	87
22-Aug	84	85	88	90	91	95	98	92	83	74	61	51	36	33	33	33	33	39	37	45	58	71	74	77	65.0	98
23-Aug	74	78	80	81	82	81	80	77	73	65	59	40	32	33	32	32	32	34	41	47	56	67	65	69	58.8	82
24-Aug	71	78	77	75	80	83	85	80	70	65	63	58	56	47	39	46	44	46	52	59	70	74	82	84	66.0	85
25-Aug	84	87	86	87	86	88	85	79	72	66	54	49	45	41	39	38	37	38	40	45	52	57	63	65	61.7	88
26-Aug	65	66	69	74	76	79	80	76	68	63	60	56	49	41	37	40	43	47	63	67	74	87	86	87	64.8	87
27-Aug	89	90	92	86	82	83	80	75	66	54	50	42	36	33	32	33	34	36	39	52	66	75	82	88	62.4	92
28-Aug	92	92	89	90	92	93	89	82	76	75	73	70	68	62	56	54	52	49	51	72	80	82	87	91	75.7	93
29-Aug	90	91	92	97	99	99	99	93	79	68	58	52	41	33	32	35	36	33	35	44	48	56	64	67	64.2	99
30-Aug	67	69	70	75	83	92	94	96	97	95	90	86	81	72	69	63	60	60	64	82	89	92	93	93	80.4	97
31-Aug	90	87	86	87	89	90	88	82	73	66	57	51	49	47	49	65	83	86	83	88	91	89	93	94	77.6	94
	80.6	82.5	83.4	84.5	85.6	86.4	84.0	79.5	72.4	66.0	59.9	53.3	47.7	43.7	42.3	42.9	44.4	45.5	49.5	57.5	66.5	72.3	75.9	78.7	Diurnal Average	
	95	95	94	97	99	99	99	96	97	95	90	86	81	75	71	67	83	86	83	88	91	92	93	95	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - inHg

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Athabasca Valley - August 2014

Maximum Speed: 32 km/h on Aug 7 14:00

Maximum Daily Speed Average: 15.6 km/h on Aug 7

Minimum Speed Value: 1 km/h on Aug 8 01:00

Minimum Daily Speed Average: 1.1 km/h on Aug 18

Maximum Diurnal Speed Average: 4.9 km/h at hour 15

Minimum Diurnal Speed Average: 0.7 km/h at hour 9

Monthly Average Velocity: 0.7 km/h 246.0 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 4 Median = 6 Q_3 = 10 P_{90} = 13 P_{99} = 26

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-Aug	NNW20	NNW20	NNW21	N16	N12	N10	NNW12	N13	N12	NNW13	NNW13	N12	N11	N10	NNW12	NNW10	NNW6	NNW5	ENE2	SSW4	S3	ESE2	SE3	SE5	NNW8.8	NNW21
2-Aug	SE5	SE7	SSE7	SE6	SSE5	SE8	SE8	ESE4	SE7	ESE5	N4	SW8	SW13	SW13	SW14	SW14	SSW10	SW11	SSW5	S4	SW4	S5	SSE7	S1	S5.4	SW14
3-Aug	SSE2	WSW3	SSW4	SE2	SSE3	ESE4	SE4	S1	E4	SW5	W4	WSW5	SW5	N6	N5	NNW4	NE1	SW4	S6	SSW4	SE2	SSE3	SSE2	SSE4	SSW1.3	N6
4-Aug	SE2	SE5	SE5	SSE5	SE6	SE7	SE6	SE2	SE2	WNW2	NNW5	NNW8	NNW8	NNW8	NNW9	NNW11	NNW11	NNW6	NW3	WSW4	SW2	E2	SSE3	SE2	N1.2	NNW11
5-Aug	ESE3	SE2	SE2	SE1	SE4	SE6	SE7	SE8	SE4	ESE5	NNE1	WSW1	SE9	ESE9	ESE8	E10	E10	S10	S12	SSE10	S2	SSE4	S5	SE7	SE5.1	S12
6-Aug	SE5	SE5	SE9	SE9	SE10	SE10	SE11	SE11	SE8	ESE7	S7	SSW14	SW16	SW15	SW16	WSW12	N9	WNW12	WSW14	WSW7	S1	ESE4	SW4	SW13	SSW5.1	SW16
7-Aug	SW13	WSW17	SW10	SW6	SW6	WSW13	SW11	W18	W26	WNW25	W27	W29	W32	W32	WNW28	W26	W24	WNW20	WNW18	W10	WSW10	SSW3	ESE3	ESE1	W15.6	W32
8-Aug	ESE1	ESE1	SSE3	SE3	SE3	SE3	E5	ENE4	N3	NNW5	NNW10	NNW6	NNW8	NNW7	NNW9	N7	NNW7	N5	WSW18	WSW12	SW6	NNW8	NNW13	NNW15	NNW3.4	WSW18
9-Aug	NNW16	NNW16	NNW13	N10	N9	NW12	NW11	NW10	NW9	W5	N6	NNW11	N8	N6	N3	WNW6	N7	SE1	S4	S5	SE3	SE4	SE4	SE6	NNW5.1	NNW16
10-Aug	SE6	SE7	SE8	SE10	SE11	SE11	SE9	SE9	SE9	SE5	SSW3	E5	SSW3	SW9	SW12	SW6	SW9	WSW8	SW7	SW5	E2	SSE3	SE4	SE4	SSE4.9	SW12
11-Aug	SE6	SE6	SE5	SE6	SSE7	SE7	SE7	SE7	S4	ESE2	NE3	N8	NNW4	NW16	NNW14	NW15	NNW15	NNW9	N7	N6	NNW4	W2	W3	SW3	NNW1.8	NW16
12-Aug	ENE2	E2	E2	ESE3	ESE4	SE5	SE4	E3	E4	SE5	SE7	SE10	SE10	ESE11	ESE11	ESE11	ESE11	ESE11	ESE9	ESE8	SE9	SE12	SE8	SE7	ESE7.0	SE12
13-Aug	SE6	SE5	SE6	SE6	SE6	SE6	SE10	SE11	SE8	ESE5	WSW3	SW11	SW16	SW15	WSW12	WSW14	SW12	SW11	SW6	SSW5	SSW6	SW9	WSW7	SW6	SSW5.9	SW16
14-Aug	WSW5	WSW5	WSW1	WSW3	SSW2	SW3	WSW5	NW3	N6	N6	NW3	NNE2	N4	N6	NNW6	NNW4	N3	E1	WSW2	ESE2	E1	E3	ESE3	SE6	NW1.3	N6
15-Aug	SE4	SE5	SE7	SE4	SE6	SE9	SE9	E5	ESE4	E5	ENE6	NNE2	WNW3	NW2	NNE2	NW4	NNW6	N2	N3	WSW3	NNW3	NW4	WSW5	WSW5	ESE1.1	SE9
16-Aug	WSW5	SW3	WSW4	SSW1	E3	ESE4	E4	ESE2	SE6	SE5	SSE6	S4	N3	W3	SW7	SW7	SW6	SSW5	S5	SSE3	S2	ESE3	SE3	SE4	S2.5	SW7
17-Aug	SSE2	SW3	SW7	SW9	SW8	WSW9	SW9	SW9	NW3	N7	N8	N9	NW14	NW18	NW22	NW21	NW21	NW20	NW12	WNW4	SW4	ENE3	SE3	SE3	WNW6.3	NNW22
18-Aug	SE4	SE3	SE5	SE7	SE6	SE9	SE9	SE8	SE8	E2	SSW2	SW6	WSW11	SW12	WSW5	NNW6	NNW9	NW8	NNW11	NNE2	SE2	W5	NW10	NW5	SSW1.1	SW12
19-Aug	WNW5	NW4	N2	WSW2	SW1	S4	SE3	SE5	SE4	ENE3	ESE7	ESE7	ESE7	N3	NNW26	N13	N7	NW5	NW6	NW5	SW4	N2	NNW11	NNW13	NNW2.9	NNW26
20-Aug	NNW11	NNW4	NNW9	NNW15	NNW20	N15	N15	N11	N12	NNW14	NNW16	NNW18	NNW18	NNW16	NNW15	NNW13	N14	NNW15	NW10	NNW10	NNE6	NNE3	WNW3	WNW7	NNW11.7	NNW20
21-Aug	NW4	NW5	NW7	WNW7	WNW6	WSW5	SSW1	E4	N4	N9	N9	N10	N12	N10	N10	N11	NNW12	N10	NNE8	NE7	ENE8	NE2	SW3	WNW2	N5.2	N12
22-Aug	ENE3	E3	ESE3	ESE4	ESE5	SE7	SE6	ESE5	ENE2	NW3	NNW7	NNW8	NNW9	NNW7	NW4	NW9	NNW8	NNW13	NNE7	N4	WSW3	E1	ESE2	ESE3	N2.3	NNW13
23-Aug	ESE5	SE6	SE6	SE6	SE6	SE8	SE8	SE7	SE6	SE4	ESE4	SE8	SE6	ESE8	SE9	SE7	ESE8	ESE8	E6	ESE4	SE3	ESE3	SE4	SE5	SE5.9	SE9
24-Aug	ESE5	E5	E3	SE3	E2	E2	WSW3	NW3	NNW5	NW4	NNW6	NNW9	NNW8	ESE2	E4	ESE8	SE7	ESE9	ESE7	ESE5	SE6	SE4	ESE3	SSE4	E2.2	NNW9
25-Aug	SSE4	SSE5	SE7	SSE9	SE7	SE6	SE8	SE11	SE12	SE10	SE10	SE11	SE12	SSW9	SSW13	SW15	SW14	SSW10	SSE8	SSE7	SE7	SE7	ESE6	SE8	SSE7.6	SW15
26-Aug	SE10	SE10	SE11	SE10	SE10	SE10	SE12	SE11	SE7	ESE6	E7	E6	E2	E2	SW12	SW15	SW13	WSW9	SW5	N5	NNE1	NNE2	N1	S2	SSE4.2	SW15
27-Aug	SSE4	SSE4	E3	SE3	SSE2	SE4	ESE2	SW10	WNW12	NW18	NW14	NW12	WNW9	SW7	WSW8	WSW10	WNW15	WNW15	W9	SW6	SW3	E2	NNW18	W4	W5.4	NW18
28-Aug	SW8	SSW5	WSW6	SW3	SW8	SW11	WSW7	W6	NW9	NW13	NW15	WNW14	NNW11	NW13	NW13	N10	N8	NNW7	NNW2	SSE1	ESE2	SE3	SE4	SE4	WNW4.5	NW15
29-Aug	SE8	SE9	SE10	SE10	SE10	SSE7	SSE7	SE8	SE8	SE9	ESE3	NE2	E9	SSE5	S9	SE9	SE11	SSE10	S8	SSE6	SE11	SE11	SE8	ESE8	SE7.7	SE11
30-Aug	SE8	SE7	SE6	S6	SE7	SE8	SE9	SE4	SSE4	SW3	WNW8	NNW6	NNE6	N6	NNW6	WNW3	NW4	N6	WNW2	S1	E2	SSW4	SSE3	SE3	SE1.2	SE9
31-Aug	S3	S3	SE4	SE4	SSE3	SE5	SE5	SE4	SE2	SW9	SSW6	SW11	SW10	SW10	WSW11	NNW18	WNW5	SW8	S4	SE1	SW3	S4	SE6	SE8	SSW3.5	NNW18
	SSE1.2	SSE1.5	SE2.0	SSE2.4	SE2.6	SSE3.6	SE3.5	SE2.4	ESE0.7	NNW1.3	NNW2.8	NW3.0	WNW3.1	WNW4.0	WNW4.9	WNW4.8	NW4.0	WNW3.3	WSW2.1	SSW1.5	SSE1.6	SE1.9	SSE0.8	SSE1.7		Diurnal Average	
	NNW20	NNW20	NNW21	N16	NNW20	N15	N15	W18	W26	WNW25	W27	W29	W32	W32	WNW28	W26	W24	NW20	WNW18	WSW12	SE11	SE12	NNW18	NNW15		Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 13 km/h on Aug 27 23:00

Minimum Value: 1 km/h on Aug 15 13:00

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

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

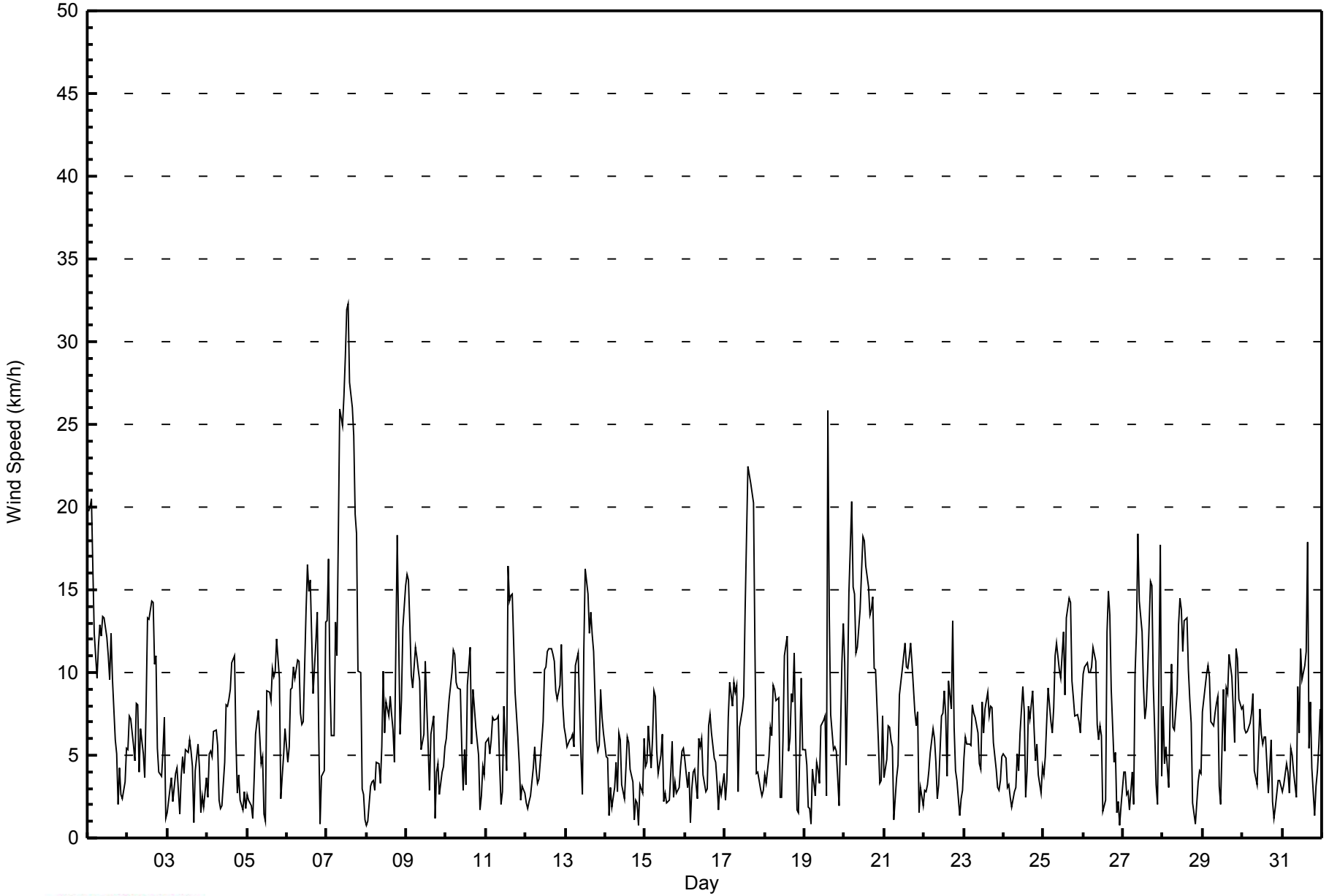
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	4	4	5	4	3	3	3	4	4	3	4	3	4	3	3	3	2	1	1	2	2	2	1	2	5
2-Aug	2	2	2	2	2	3	4	2	2	2	1	4	4	5	5	4	4	4	2	2	1	2	2	1	5
3-Aug	2	2	2	1	1	2	2	2	1	1	2	1	2	3	2	2	1	2	1	2	2	2	1	1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

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	319	42.88	42.88
6 - 11	316	42.47	85.35
12 - 19	90	12.10	97.45
20 - 28	16	2.15	99.60
29 - 38	3	0.40	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

Athabasca Valley - August 2014

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	17	8	4	9	28	38	69	24	21	15	20	21	7	9	18	11	319
6 - 11	34	4	1	2	6	22	117	13	6	6	34	13	3	6	10	39	316
12 - 19	10	0	0	0	0	0	4	0	1	2	19	8	1	6	12	27	90
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	4	3	3	6	16
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	61	12	5	11	34	60	190	37	28	23	73	42	18	24	43	83	744

Total Number of Valid Hours: 744

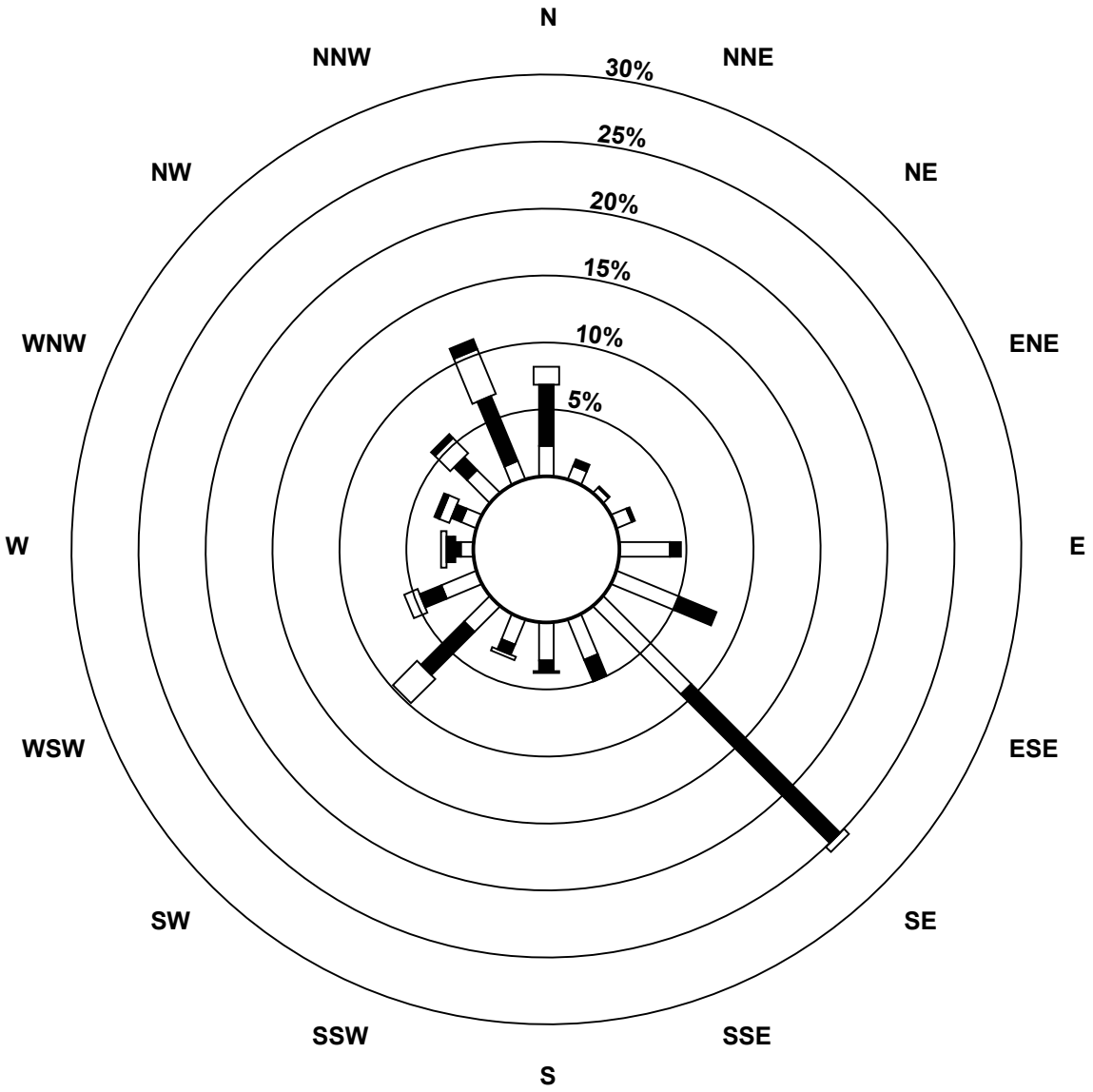
Total Number of Hours: 744

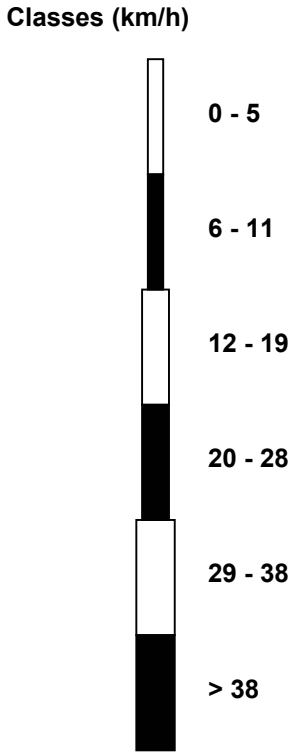
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Athabasca Valley (AMS 7)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 279 deg on Aug 7 14:00
Direction of Maximum Daily Speed Average: 271.8 deg on Aug 7

Direction of Minimum Speed: 123 deg on Aug 8 01:00

Direction of Minimum Daily Speed Average: 1.1 deg on Aug 18

Monthly Average Direction: 275.5 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-Aug	334	339	347	349	351	1	341	349	354	339	338	356	353	1	340	340	343	335	71	209	178	116	141	141	346.8
2-Aug	143	146	148	144	148	145	141	103	136	102	2	236	224	222	217	225	206	214	206	181	226	185	151	185	187.0
3-Aug	162	240	212	131	147	122	131	187	84	232	265	238	235	8	7	330	38	232	187	204	138	155	165	164	196.9
4-Aug	137	134	139	153	141	143	138	136	133	295	342	342	344	339	339	344	343	344	319	258	222	89	160	145	0.9
5-Aug	120	131	129	140	129	133	137	138	135	108	23	251	139	110	115	96	96	174	174	167	174	159	172	140	136.8
6-Aug	136	138	134	137	141	142	141	144	129	107	191	210	232	233	235	254	357	295	255	239	169	120	220	234	198.8
7-Aug	234	242	227	223	227	242	228	273	277	286	278	281	279	279	285	281	281	303	297	264	246	211	112	113	271.8
8-Aug	123	102	150	135	127	127	81	78	5	348	340	331	338	336	341	349	345	9	239	237	236	339	339	342	329.1
9-Aug	337	329	328	349	349	324	323	321	305	272	351	340	2	5	356	291	351	133	176	171	142	141	141	142	332.8
10-Aug	135	133	136	136	137	138	140	137	136	136	208	79	210	217	223	233	227	241	230	221	92	149	141	137	165.0
11-Aug	143	138	144	145	147	139	133	132	187	110	47	9	348	312	328	326	332	348	350	358	337	275	263	221	346.3
12-Aug	77	90	93	112	110	133	130	101	90	138	128	127	124	119	110	110	113	118	111	119	128	130	126	132	119.2
13-Aug	140	127	133	134	134	139	139	141	137	121	248	231	226	233	245	244	235	227	230	213	200	217	249	227	202.2
14-Aug	249	253	250	243	211	228	256	319	349	356	320	14	356	349	342	343	351	99	237	105	91	99	115	136	322.0
15-Aug	141	128	141	129	138	142	142	89	110	87	76	23	286	312	18	320	344	9	353	243	327	315	245	247	113.3
16-Aug	238	222	241	199	92	116	84	105	134	124	152	182	3	261	221	219	226	194	170	157	170	107	145	141	173.8
17-Aug	160	232	226	229	236	237	235	224	324	4	1	359	309	320	326	310	320	319	324	290	225	74	134	125	302.0
18-Aug	126	134	134	134	133	136	139	144	134	99	195	228	238	232	253	334	332	318	346	16	130	277	319	313	211.3
19-Aug	292	308	355	249	221	170	136	126	131	77	103	108	119	355	338	355	351	316	316	314	233	4	330	335	346.6
20-Aug	337	348	334	329	333	355	355	1	356	345	334	341	344	345	348	347	349	340	326	345	23	24	296	283	342.7
21-Aug	313	321	321	293	295	256	198	90	351	358	4	3	355	5	359	349	341	349	32	48	71	43	223	294	351.6
22-Aug	72	81	105	115	122	129	126	102	72	305	346	337	334	329	318	311	345	347	16	350	252	101	109	112	8.3
23-Aug	119	125	132	146	132	138	131	141	137	138	111	146	127	121	137	127	121	103	91	110	127	118	132	125	127.4
24-Aug	116	88	98	135	100	79	257	315	344	315	340	340	345	113	91	109	132	111	117	115	128	134	109	153	91.3
25-Aug	147	152	138	147	138	136	136	133	143	135	130	131	128	200	208	218	219	200	165	151	143	144	119	125	156.4
26-Aug	131	137	135	132	134	136	135	138	125	110	81	90	83	91	229	228	229	249	233	2	12	18	358	169	152.7
27-Aug	147	152	88	142	154	129	116	232	289	313	313	309	285	235	257	246	287	284	260	236	223	94	328	268	279.7
28-Aug	224	212	241	215	233	234	239	275	321	322	314	292	336	311	322	350	1	347	340	158	111	132	141	134	298.3
29-Aug	136	145	141	144	145	155	157	142	132	133	120	53	97	160	181	133	128	166	170	148	137	135	127	121	140.7
30-Aug	125	131	138	170	137	130	134	136	150	230	284	345	23	4	333	303	322	353	300	190	81	198	163	132	126.8
31-Aug	170	173	142	144	148	135	136	132	140	219	207	218	225	232	240	328	289	226	189	131	214	172	130	135	202.9
	154.8	156.9	145.4	148.6	141.1	149.1	143.4	140.8	109.9	341.2	328.5	310.6	297.0	290.1	292.7	299.3	309.9	295.0	258.1	210.6	168.3	141.1	161.8	162.9	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 106 deg on Aug 14 21:00

Minimum Value: 8 deg on Aug 17 08:00

Percentiles: P_1 = 9 P_{10} = 13 Q_1 = 17 Median = 23 Q_3 = 39 P_{90} = 64 P_{99} = 89

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

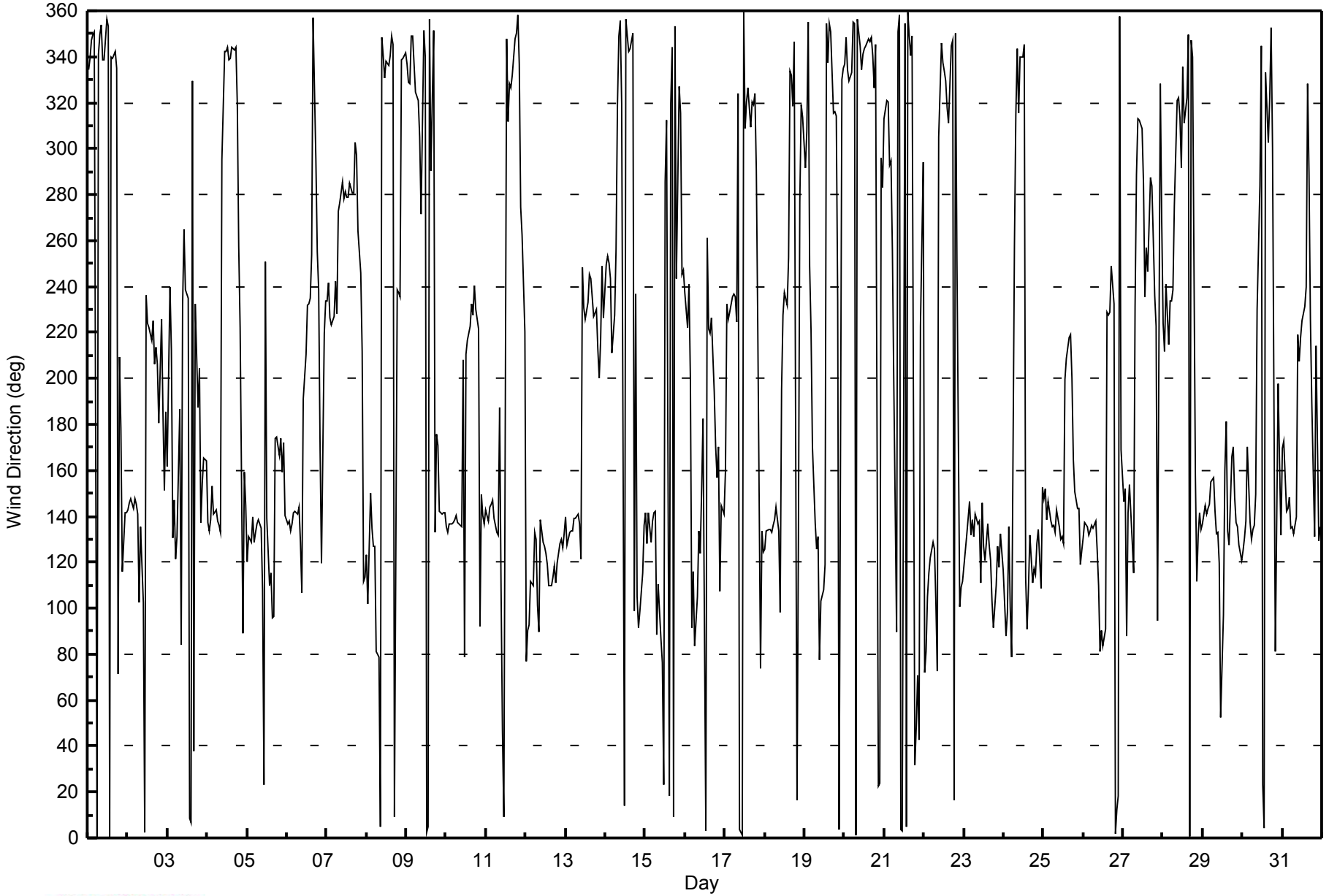
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	9	11	18	19	21	24	18	20	21	14	15	22	21	23	13	17	24	17	44	36	56	45	37	32	56
2-Aug	25	17	15	21	22	15	24	34	19	42	46	49	16	24	26	14	28	29	33	36	34	27	20	80	80
3-Aug	65	80	58	60	22	21	70	101	41	19	30	20	52	35	48	43	88	64	19	34	74	64	68	21	101
4-Aug	37	21	17	20	15	17	14	90	67	46	28	13	13	10	14	11	11	14	21	26	69	77	48	72	90
5-Aug	52	74	54	53	26	17	17	20	43	34	70	88	25	25	32	19	19	25	14	14	54	50	15	25	88
6-Aug	28	17	12	12	11	11	12	17	26	36	60	32	20	20	13	48	21	33	17	26	87	23	72	10	87
7-Aug	14	13	29	37	42	17	14	19	14	17	18	16	14	14	21	18	16	15	14	23	9	73	36	95	95
8-Aug	81	81	56	50	24	45	17	29	56	28	11	20	17	14	12	20	15	27	36	17	28	17	11	16	81
9-Aug	12	9	14	22	21	11	11	11	20	29	26	19	20	34	64	67	23	79	26	23	53	18	24	14	79
10-Aug	13	13	12	13	12	11	12	12	13	20	78	14	83	27	18	19	18	13	13	12	56	38	27	18	83
11-Aug	11	13	12	11	15	16	11	11	55	66	64	22	81	18	17	17	19	17	20	17	21	41	56	73	81
12-Aug	63	63	54	21	28	16	26	38	49	34	25	24	24	25	25	26	21	22	21	19	16	16	21	24	63
13-Aug	18	19	19	21	20	19	15	14	22	30	85	19	18	20	17	14	16	14	15	19	19	22	47	25	85
14-Aug	59	18	87	75	86	57	20	50	15	22	34	73	53	35	22	17	26	67	72	64	106	24	25	19	106
15-Aug	22	24	18	21	21	15	17	24	38	28	11	52	32	43	62	27	19	45	13	42	83	39	19	16	83
16-Aug	17	68	18	75	28	29	19	73	20	27	31	67	62	28	13	17	17	29	29	48	65	30	42	40	75
17-Aug	47	55	23	8	16	9	12	8	37	31	24	26	24	18	18	14	15	13	11	40	83	35	42	30	83
18-Aug	23	23	22	15	15	10	11	15	12	62	79	39	19	13	50	36	29	35	17	69	61	28	16	23	79
19-Aug	18	39	41	78	87	27	59	33	35	56	37	42	40	86	16	20	51	29	22	24	48	68	12	11	87
20-Aug	17	54	16	11	12	20	21	20	22	22	12	15	18	17	19	22	19	15	14	21	20	21	51	9	54
21-Aug	42	24	16	20	22	28	79	31	37	25	29	28	23	32	34	26	14	23	29	20	17	63	69	87	87
22-Aug	16	13	19	19	11	11	13	26	64	28	17	17	28	38	59	30	43	18	25	16	47	88	55	45	88
23-Aug	24	26	27	19	19	18	16	17	15	34	37	26	41	29	30	32	27	24	15	22	39	43	40	25	43
24-Aug	21	9	24	34	24	54	35	45	25	22	24	12	14	83	76	28	26	24	22	19	18	34	53	29	83
25-Aug	47	34	22	17	19	20	17	15	14	17	20	22	17	46	31	23	25	31	18	16	20	20	24	14	47
26-Aug	11	10	11	13	14	13	12	12	20	28	11	22	90	90	18	17	18	23	58	43	84	84	94	70	94
27-Aug	39	33	45	48	85	30	74	11	36	14	20	23	31	41	38	31	20	17	20	26	73	58	39	67	85
28-Aug	18	50	36	43	12	9	21	38	27	22	19	17	18	23	22	22	23	25	48	82	57	25	31	28	82
29-Aug	16	14	13	13	14	19	19	16	16	17	64	76	23	57	36	43	30	24	14	17	14	14	18	19	76
30-Aug	20	21	19	24	17	33	13	24	44	33	28	26	32	29	18	45	60	27	53	84	81	59	51	46	84
31-Aug	55	59	29	17	37	16	18	24	87	14	27	13	14	17	15	31	60	16	34	65	53	57	22	15	87
	81	81	87	78	87	57	79	101	87	66	85	88	90	90	76	67	88	79	72	84	106	88	94	95	
	Diurnal Maximum																								

WBEA

Hourly Averages

Wind Direction (WD) - deg

Athabasca Valley - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7

Reason: Routine

Start Time (MST)	8:50	End Time (MST)	13:25
Barometric Pressure	732 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Cal Gas Concentration	50.8 ppm	Cal Gas Expiry Date	41557
Gas Cert Reference	LL 105142		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2575
DACS voltage range	0-5V	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-681	-681
Analyzer Range (mv)	5000	5000	Lamp voltage	796	795
Calculated slope	0.983085	0.985334	Chamber temp.	43.5	43.9
Calculated intercept	1.420694	0.375625	Pressure (mmHg)	706.4	699.3
Analyzer Background	10.4	10.5	Flow (lpm)	0.510	0.546
Analyzer Coefficient	0.814	0.814	Intensity	49000	49000

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	0.1	NA
as found span	5000	58.8	597.4	606.0	0.986
calibrator zero	5000	0.0	0.0	0.1	NA
high point	5000	58.8	597.4	606.0	0.986
second point	5000	29.4	298.7	303.0	0.986
third point	5000	14.7	149.4	150.4	0.993
calibrator zero	6000	0.0	0.0	0.1	NA
as left zero	6000	0.0	0.0	0.7	NA
as left span	5000	58.8	597.4	614.0	0.973
				Average Correction Factor	0.988

Corrected As found	605.9	Previous response	606.3	% change	0.1%

Notes:

no adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

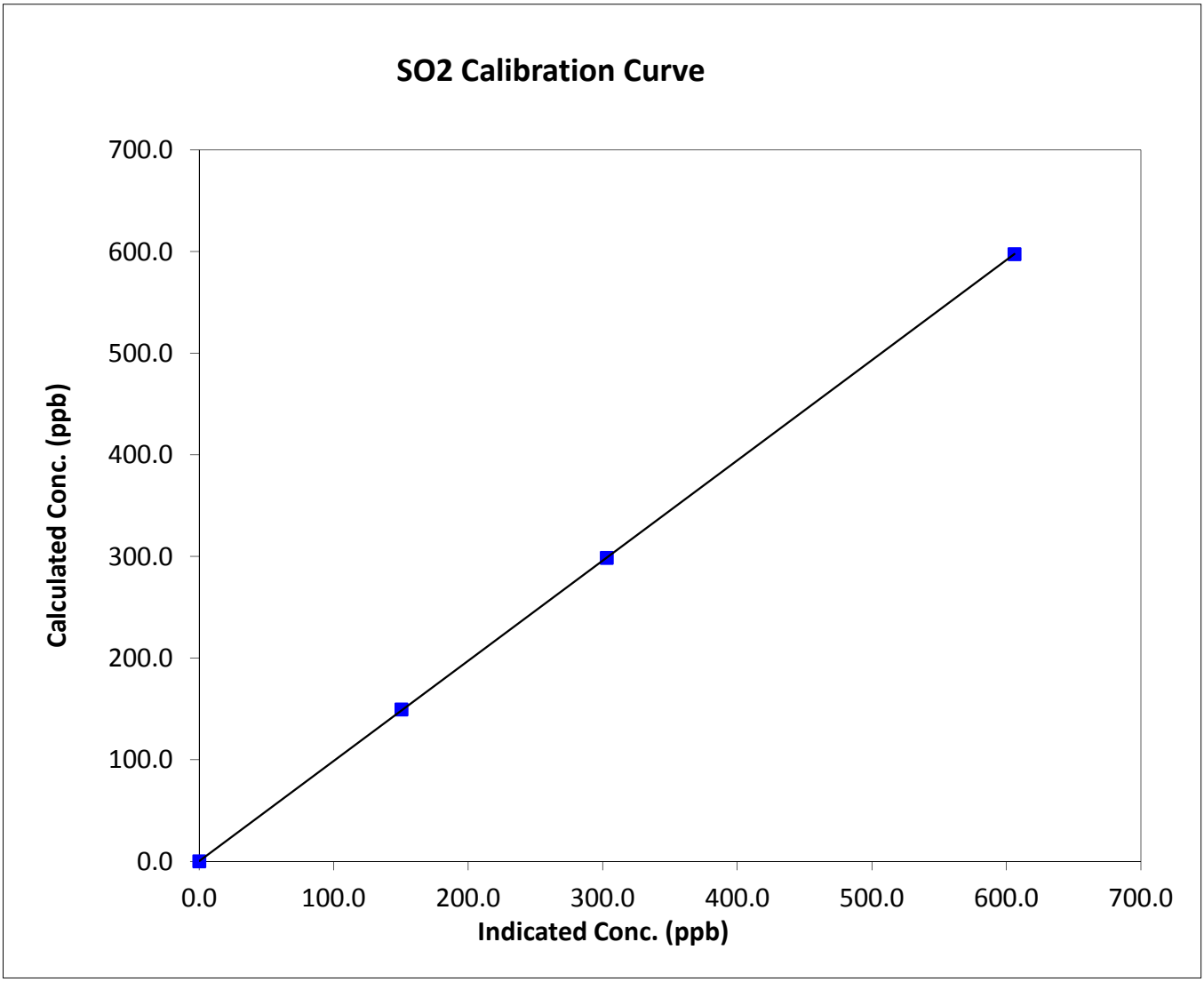
SO_2 Calibration Summary

Station Information

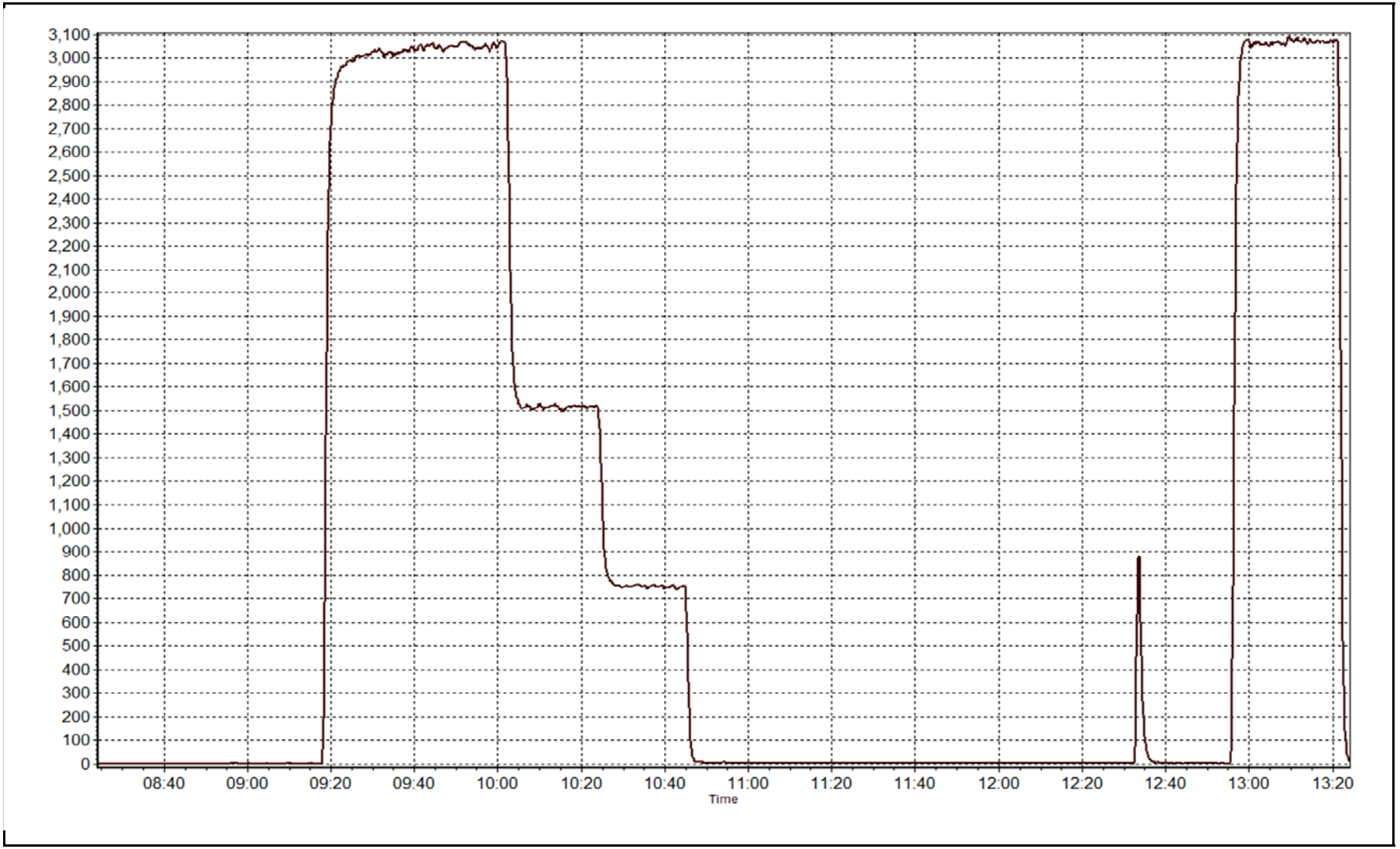
Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:50	End Time (MST)	13:25
Analyzer make	Thermo 43c	Analyzer serial #	607415781

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999995
597.4	606.0	0.9858		
298.7	303.0	0.9858	Slope	0.985334
149.4	150.4	0.9930		
			Intercept	0.375625



SO2 Calibration Plot Date: August 13, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 14, 2014	Previous Calibration	July 22, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	11:15	End Time (MST)	14:05
Barometric Pressure	735 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	8400311
Cal Gas Concentration	5.64 ppm H2S	Cal Gas Expiry Date	11/3/2009
Gas Cert Reference	CC 188098	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)	5000	5000	Lamp voltage	808	808
Calculated slope	0.995784	1.003487	Chamber temp.	44	44
Calculated intercept	0.529000	-0.168376	Pressure	680.2	681.5
Analyzer Background	17	16.7	Flow	0.472	0.472
Analyzer Coefficient	0.975	1.011	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	0.1	NA
as found span	6000	79.8	75.0	72.3	1.037
SO2 scrubber check	5000	8.9	90.4	0.1	NA
calibrator zero	6000	0.0	0.0	0.1	NA
high point	6000	79.8	75.0	74.9	1.002
second point	6000	44.7	42.0	42.0	0.999
third point	6000	26.6	25.0	25.3	0.990
calibrator zero	5000	0.0	0.0	0.1	NA
as left zero	5000	0.0	0.0	0.1	NA
as left span	6000	79.8	75.0	74.9	1.002
				Average Correction Factor	0.997

Corrected As found	72.3	Previous response	74.8	% change	3.5%

Notes:

adjusted span

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

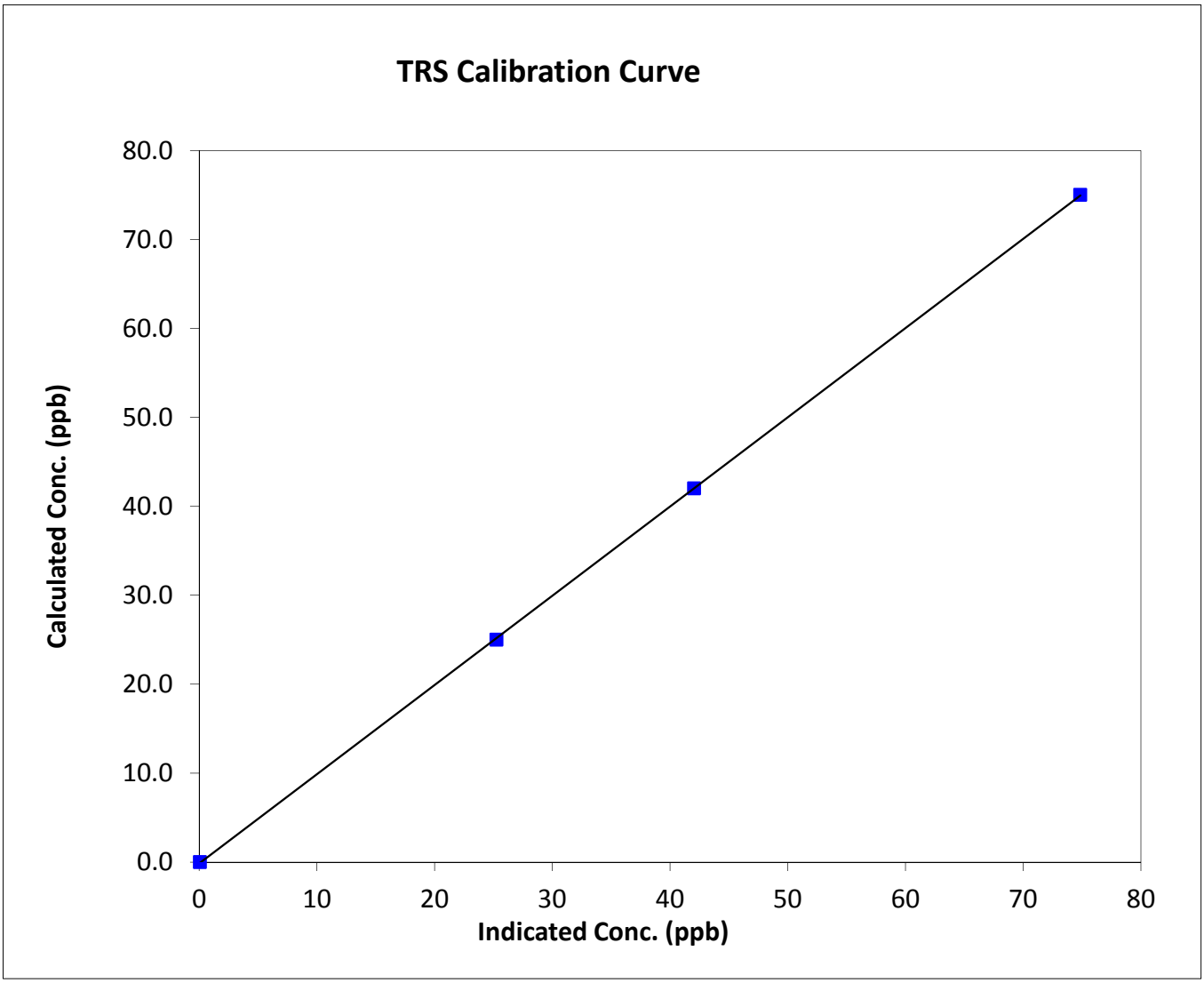
TRS Calibration Summary

Station Information

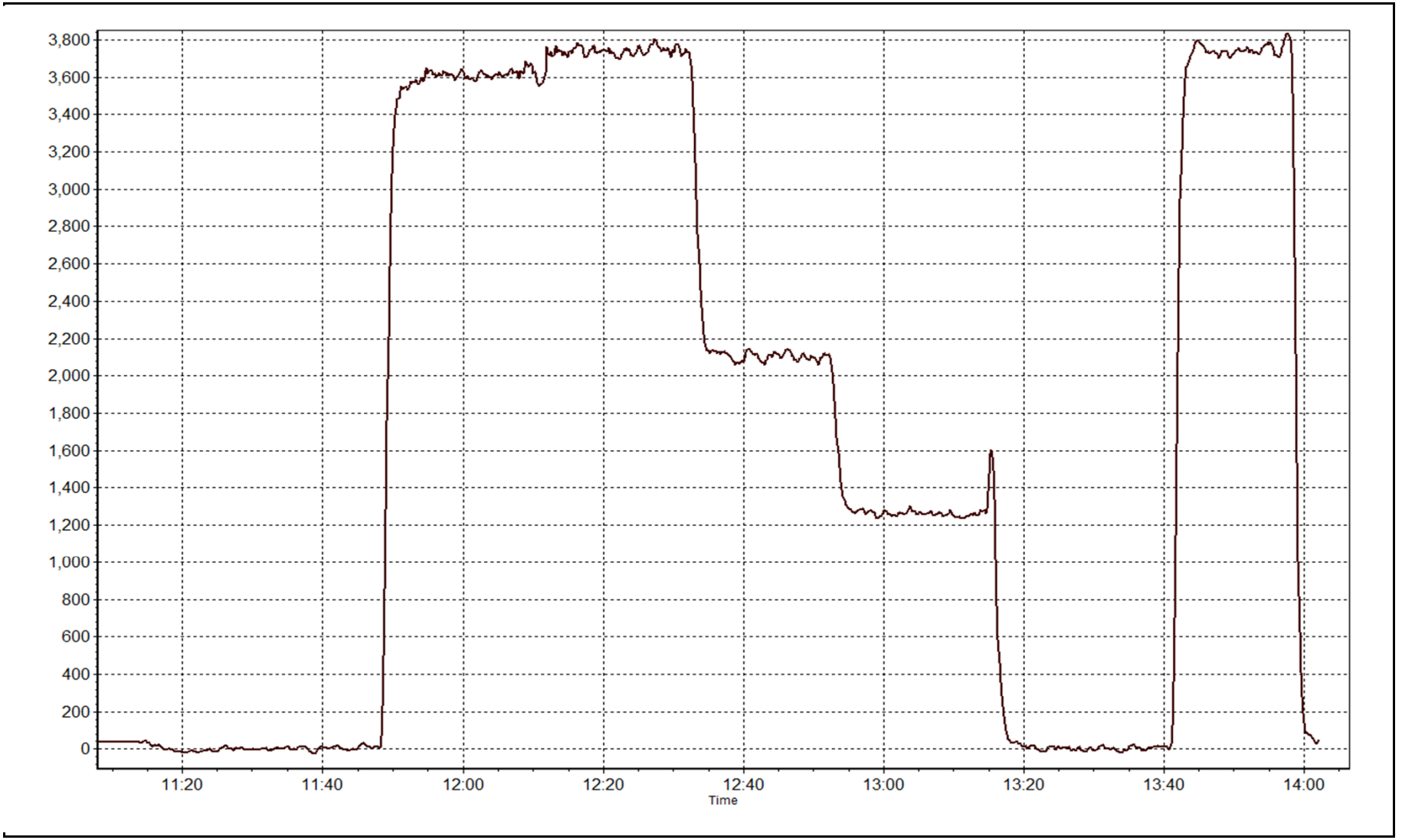
Calibration Date	August 14, 2014	Previous Calibration	July 22, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	11:15	End Time (MST)	14:05
Analyzer make	TEI 45C	Analyzer serial #	630718530

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999984
75.0	74.9	1.0020		
42.0	42.0	0.9995	Slope	1.003487
25.0	25.3	0.9899		
			Intercept	-0.168376



TRS Calibration Plot Date: August 14, 2014



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Wednesday, August 13, 2014	Prev Calibration	Monday, July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	8:45	End Time (MST)	13:25
Barometric Pressure	732 mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	LL 105142	Cal Gas Expiry Date	Thursday, October 10, 2013
CH4 Cal Gas Conc.	502.0 ppm	CH4 Equiv Conc.	1063.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	30.6	37.6
THC Range (input)	50	50	Flame Temp	385.7	387.3
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	1.005252	1.003777	Air Pressure	32.5	32.5
THC Calc intercept	0.018158	0.016118			
NMHC Calc slope	0.995614	0.996137			
NMHC Calc intercept	0.013998	0.009999			

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	58.8	12.50	12.45	1.004
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	58.8	12.50	12.45	1.004
second point	5000	29.4	6.25	6.19	1.010
third point	5000	14.7	3.13	3.09	1.011
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	58.8	12.50	12.45	1.004
				Average Correction Factor	1.008

Corrected As found	12.45	Previous response	12.42	% change	-0.3%

Notes:

No adjustments or maintenance performed.

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	58.8	6.60	6.62	0.997
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	58.8	6.60	6.62	0.997
second point	5000	29.4	3.30	3.29	1.003
third point	5000	14.7	1.65	1.64	1.006
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	58.8	6.60	6.61	0.998
				Average Correction Factor	1.002

Corrected As found	6.62	Previous response	6.61	% 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	5000	0	0.00	0.00	N/A
as found span	5000	58.8	5.90	5.83	1.013
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	58.8	5.90	5.83	1.013
second point	5000	29.4	2.95	2.91	1.014
third point	5000	14.7	1.48	1.45	1.018
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	58.8	5.90	5.84	1.011
				Average Correction Factor	

Corrected As found	5.83	Previous response	5.80	% change	-0.4%

Wood Buffalo Environmental Association

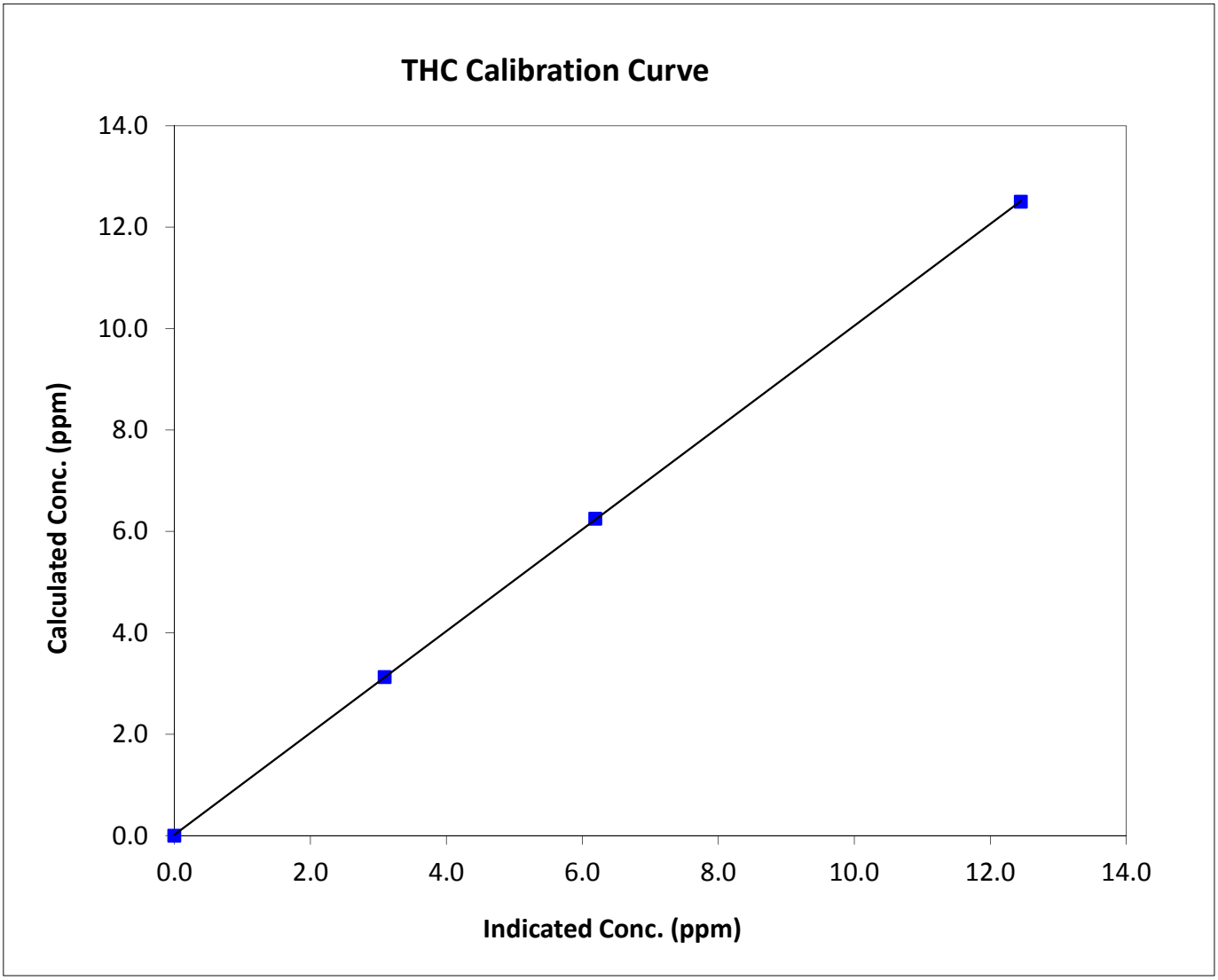
THC Calibration Summary

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:45	End Time (MST)	13:25
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	0.999989
12.50	12.45	1.0041		
6.25	6.19	1.0098	Slope	1.003777
3.13	3.09	1.0114		
			Intercept	0.016118



Wood Buffalo Environmental Association

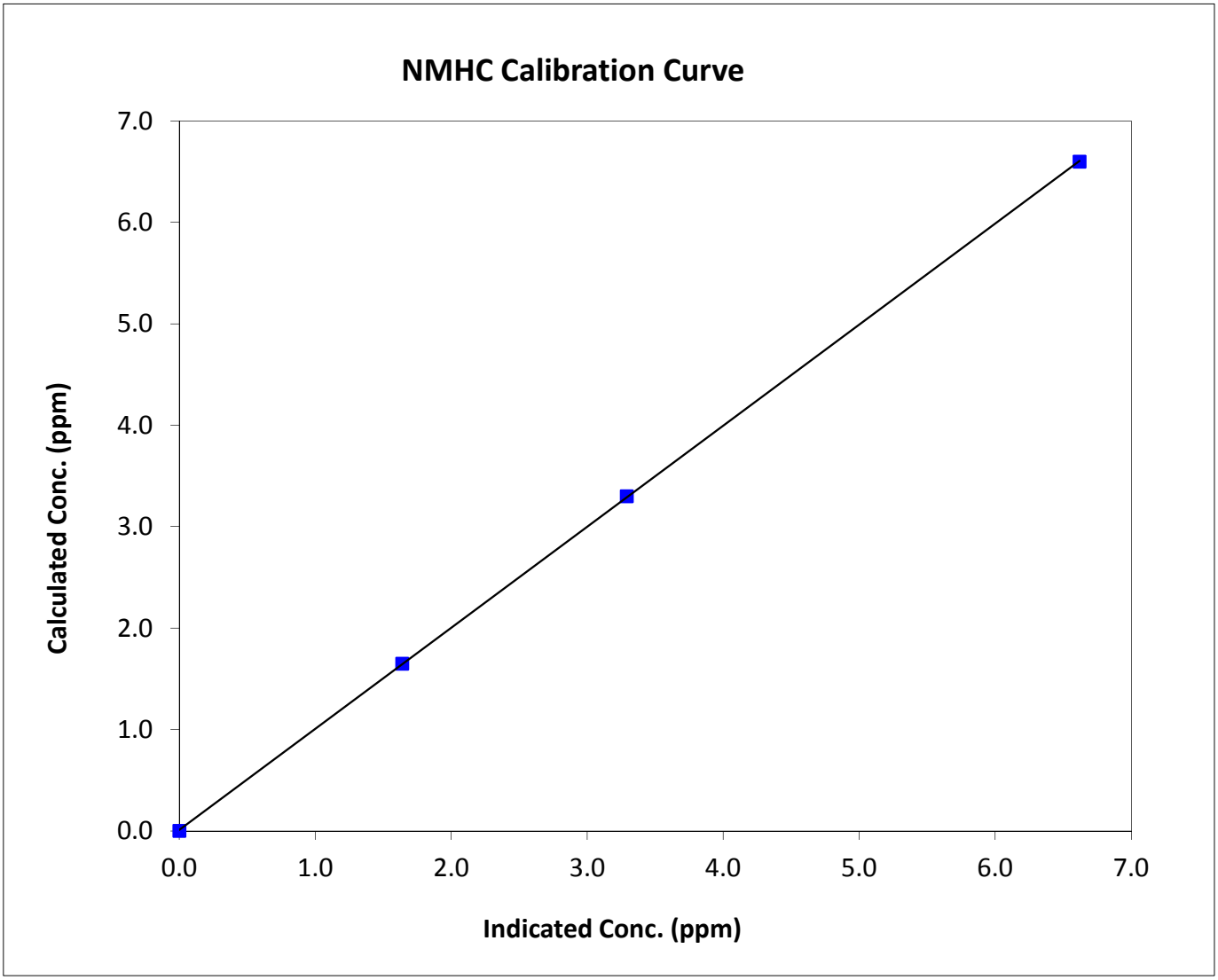
NMHC Calibration Summary

Station Information

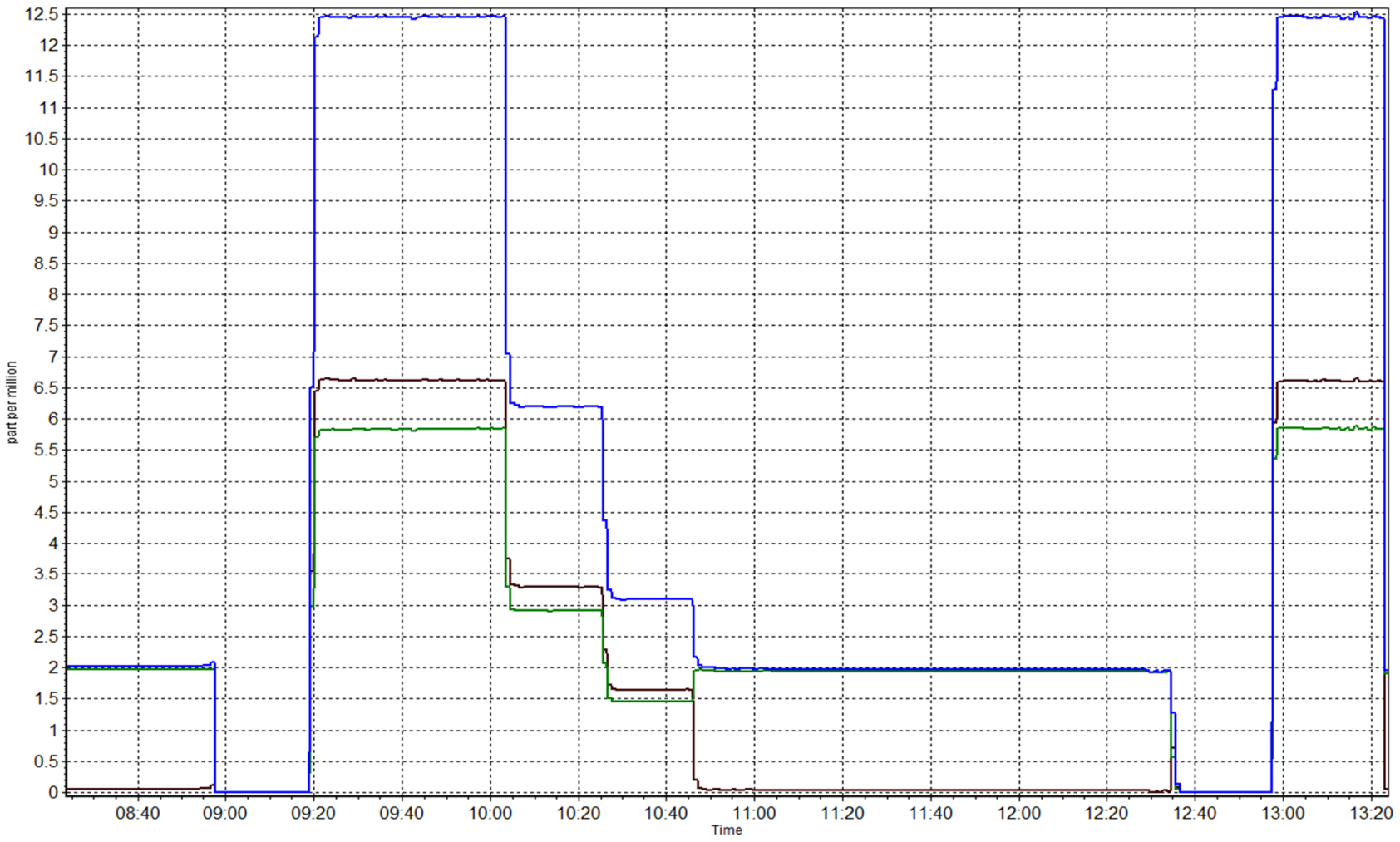
Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:45	End Time (MST)	13:25
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999987
6.60	6.62	0.9966		
3.30	3.29	1.0026	Slope	0.996137
1.65	1.64	1.0057		
			Intercept	0.009999



THC/NMHC Calibration Plot Date:



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 14, 2014	Previous Calibration	July 23, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	8:30	End Time (MST)	11:15
Barometric Pressure	735 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11021107
NO2 calibration used	Wednesday, August 13, 2014	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.	29.8	30.8
Analyzer Range (input)	5000	5000	Lamp temp.	70.8	70.9
Calculated slope	1.003886	1.008294	Pressure	719.5	718.6
Calculated intercept	0.677668	1.220597	Flow cell A	0.679	0.678
Analyzer Background	-0.2	-0.2	Flow cell B	0.744	0.742
Analyzer Coefficient	1.053	1.009	Cell A Intensity	106500	106800
			Cell B Intensity	89400	89700

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	336.2	348.2	0.965
calibrator zero	5000	0.00	0.0	0.0	N/A
high point	5000	N/A	336.2	332.8	1.010
second point	5000	N/A	171.6	168.4	1.019
third point	5000	N/A	88.6	85.4	1.038
calibrator zero	5000	0.00	0.0	0.0	N/A
as left zero	5000	0.00	0.0	0.1	N/A
as left span	5000	N/A	336.2	328.0	1.025
				Average Correction Factor	1.022

Corrected As found	348.2	Previous response	334.2	% change	-4.0%

Notes:

Adjusted span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

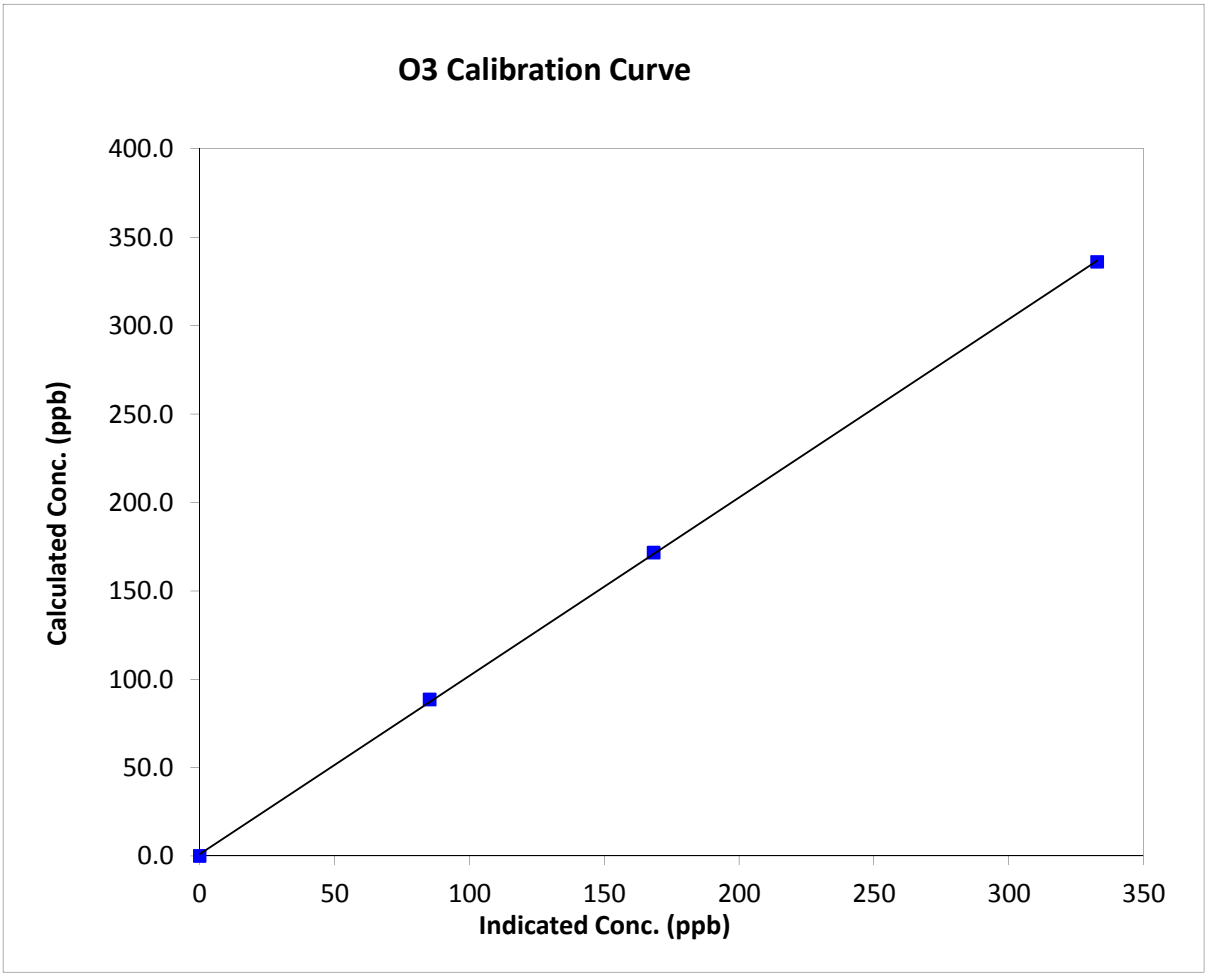
O_3 Calibration Summary

Station Information

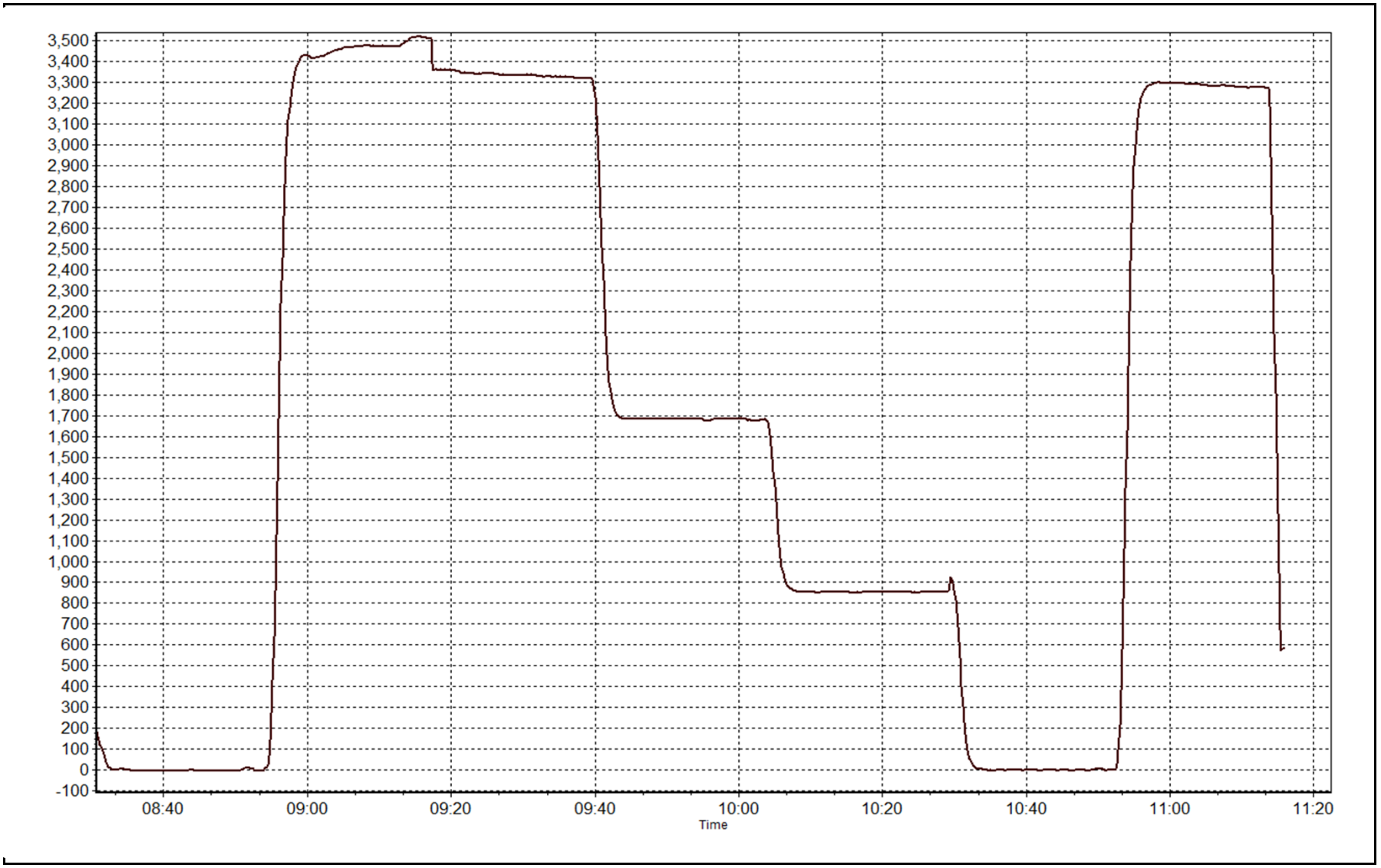
Calibration Date	Thursday, August 14, 2014	Previous Calibration	July 23, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:30	End Time (MST)	11:15
Analyzer make	TEI 49C	Analyzer serial #	607415760

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999936
336.2	332.8	1.0101		
171.6	168.4	1.0188	Slope	1.008294
88.6	85.4	1.0379		
			Intercept	1.220597



O3 Calibration Plot Date: August 14, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	8:50	End Time (MST)	13:25
Barometric Pressure	732 mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	11021107
NO Cal Gas Conc	51 ppm	Cal Gas Expiry Date	October 10, 2013
NOx Cal Gas Conc	51.2 ppm	Cal Gas Serial #	LL 105142

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)	5000	5000	5000
Before	Data Slope	1.002811	0.997727	1.003483
	Data Offset	1.410038	1.449295	0.824401
After	Data Slope	1.004137	0.999866	0.989355
	Data Offset	1.632538	1.721982	0.171895
Channel #		4	5	6
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	0.895	ppb	0.854	ppb
NOX coefficient	0.998	ppb	0.998	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	3.8		3.6	
NOX bkgrnd	4.0		3.9	
Nt coefficient	n/a		n/a	
Chamber Temp	49.6	Deg C	49.6	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	158.7	mmHg	168.3	mmHg
Sample Flow	0.726	ccm	0.791	ccm

Notes:

adjusted span

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 13, 2014 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	0.1	N/A	N/A
as found span	5000	58.8	602.1	599.8	2.4	630.6	630.2	0.7	0.9548	0.9517
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
high point	5000	58.8	602.1	599.8	2.4	599.6	599.8	0.1	1.0041	0.9999
second point	5000	29.4	301.1	299.9	1.2	296.3	296.1	0.3	1.0159	1.0126
third point	5000	14.7	150.5	149.9	0.6	145.4	145.3	0.0	1.0353	1.0318
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	0.0	0.0	0.2	N/A	N/A
as left span	5000	58.8	602.1	249.9	352.2	576.1	257.9	318.2	1.0452	0.9688
								Average Correction Factor	1.0185	1.0148

Corrcted As found NO_X= 630.7 NO= 630.3 Percent Change NO_X= -5.0% NO= -4.9%

Previous Response NO_X= 599.0 NO= 599.7

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 58.80 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	249.9	336.2	589.6	249.9	339.7	1.0094	1.0000	0.9895	101.1%
2nd NO2 (200)	N/A	414.5	171.6	587.7	414.5	173.2	1.0125	1.0000	0.9904	101.0%
3rd NO2 (100)	N/A	497.4	88.6	586.1	497.4	89.0	1.0153	1.0000	0.9959	100.4%
4th NO2 (0)	586.1	N/A	-0.8	585.2	586.1	-0.6	1.0169	1.0000	N/A	N/A
					Average Correction Factor		1.0135	1.0000	0.9919	100.8%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

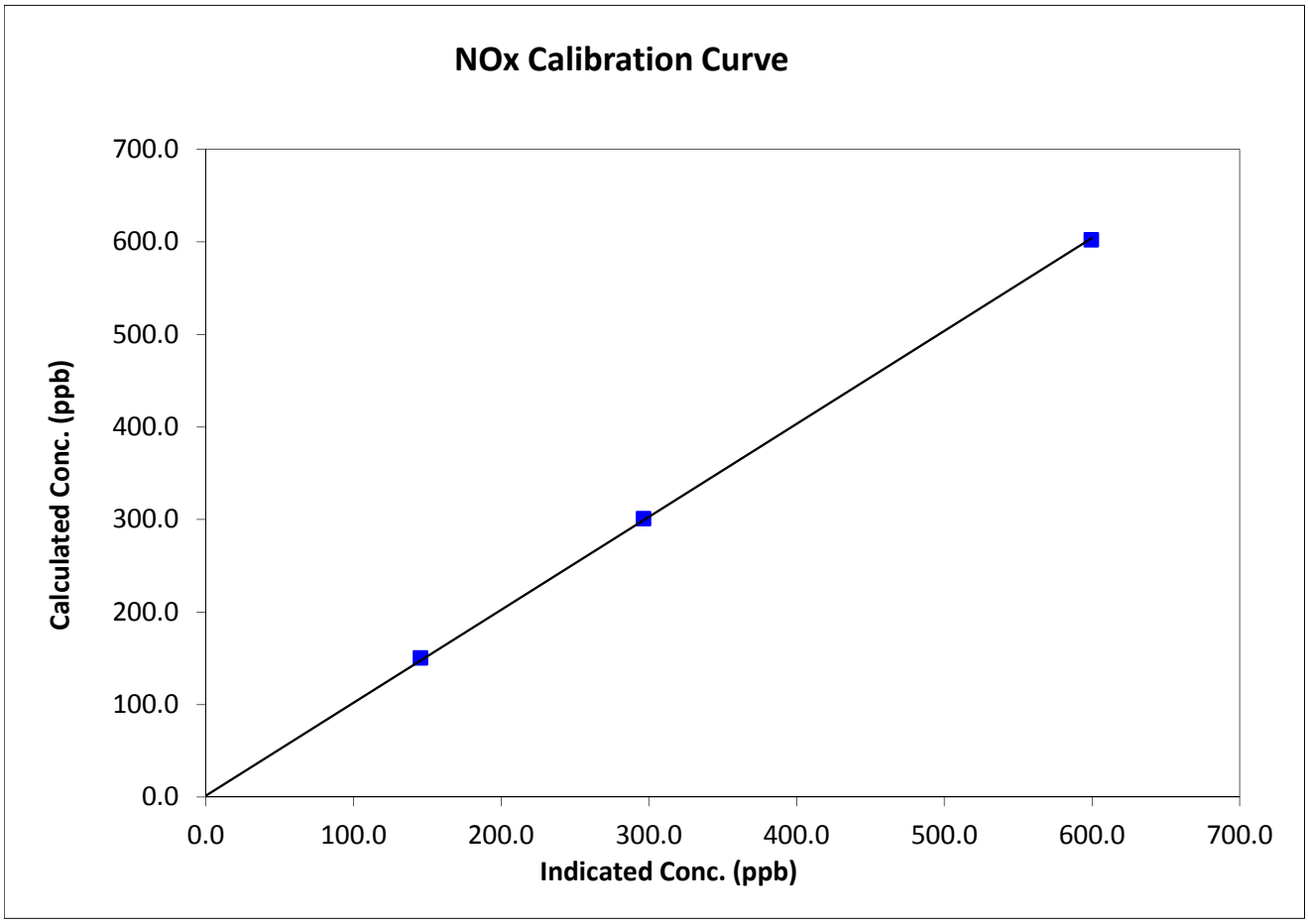
NO_X Calibration Summary

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:50	End Time (MST)	13:25
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	0.999923
602.1	599.6	1.0041		
301.1	296.3	1.0159	Slope	1.004137
150.5	145.4	1.0353		
0.0	-0.1	0.0000	Intercept	1.632538



Wood Buffalo Environmental Association

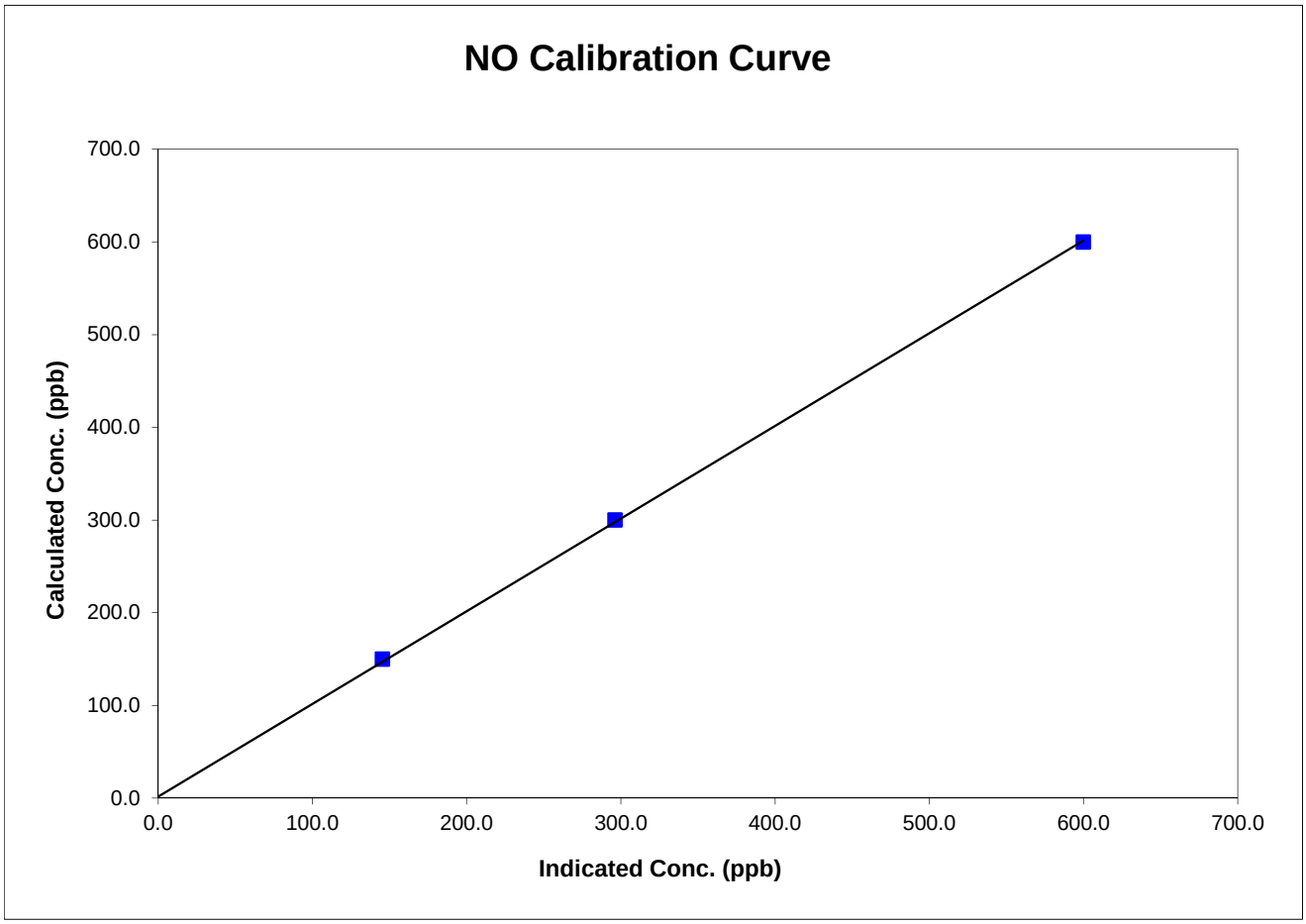
NO Calibration Summary

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:50	End Time (MST)	13:25
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	0.999917
599.8	599.8	0.9999		
299.9	296.1	1.0126	Slope	0.999866
149.9	145.3	1.0318		
0.0	-0.1	0.0000	Intercept	1.721982



Wood Buffalo Environmental Association

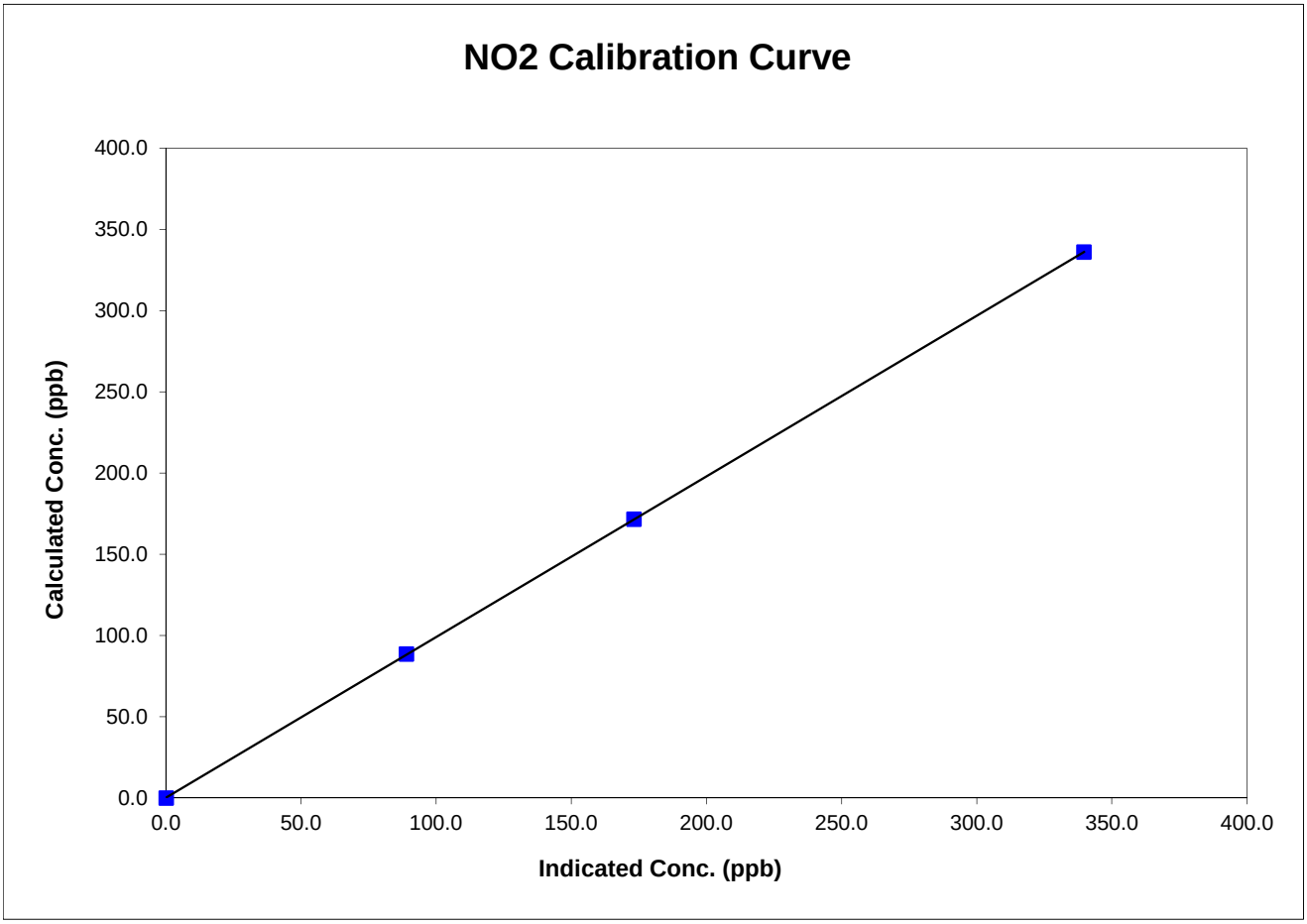
NO_2 Calibration Summary

Station Information

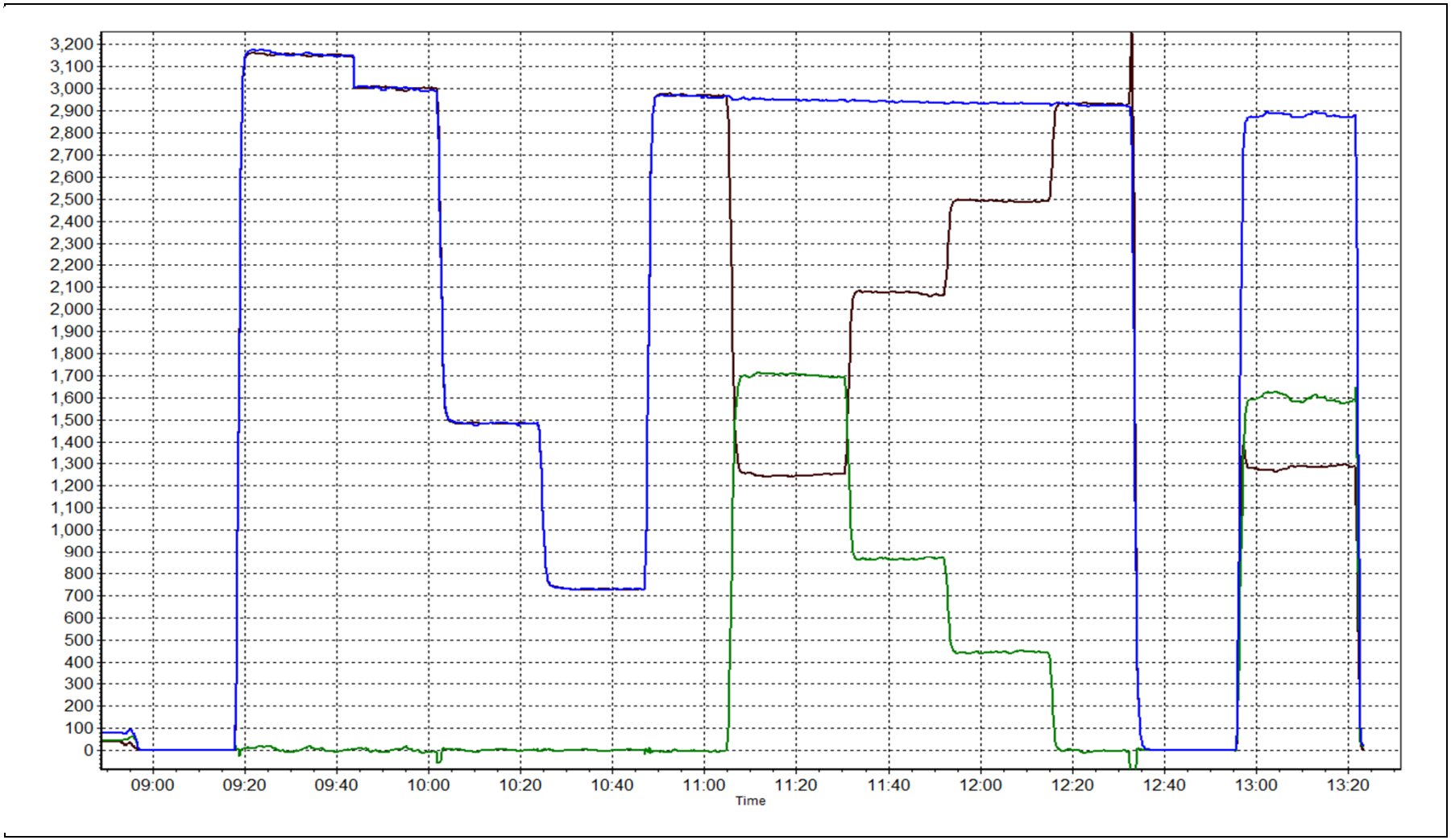
Calibration Date	August 13, 2014	Previous Calibration	July 21, 2014
Station Number	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	8:50	End Time (MST)	13:25
Analyzer make	Thermo 42c	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999996
336.2	339.7	0.9895		
171.6	173.2	0.9904	Slope	0.989355
88.6	89.0	0.9959		
			Intercept	0.171895



NOx, NO & NO_2 Calibration Plot Date: August 13, 2014



Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Calibration Date	August 15, 2014	Previous Calibration	July 16, 2014
Station Name	Athabasca Valley	Station Number	7

Reason:	Routine	Install	Removal	Other:

Start Time (MST)	9:20	End Time (MST)	11:55
Barometric Pressure	735 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11021107
Cal Gas Concentration	3060 ppm	Cal Gas Expiry Date	4/27/2015
Gas Cert Reference	LL 85940		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563
DACS voltage range	0-5V	DACS channel #	11

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	50	50	Chamber temp.	47.8	47.7
Analyzer Range (mv)	5000	5000	Pressure	723.0	713.6
Calculated slope	0.998545	0.996857	Flow	1.282	1.270
Calculated intercept	0.024186	0.008741	Intensity	200000	200000
Analyzer Background	1.608	1.611	S/R ratio	1.166000	1.165400
Analyzer Coefficient	1.020	1.020			

Analyzer make	TEI 48C	Analyzer serial #	508011060

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	0.2	N/A
as found span	5000	67.60	41.4	41.6	0.994
calibrator zero	5000	0.00	0.0	0.2	N/A
high point	5000	67.60	41.4	41.6	0.994
second point	5000	34.20	20.9	20.8	1.007
third point	5000	14.70	9.0	8.9	1.006
calibrator zero	6000	0.00	0.0	0.2	N/A
as left zero	6000	0.00	0.0	0.1	N/A
as left span	5000	67.60	41.4	41.4	0.999
				Average Correction Factor	1.003

Corrected As found	41.5	Previous response	41.3	% change	-0.4%

Notes:

No adjustments required. Inlet filter changed last week

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

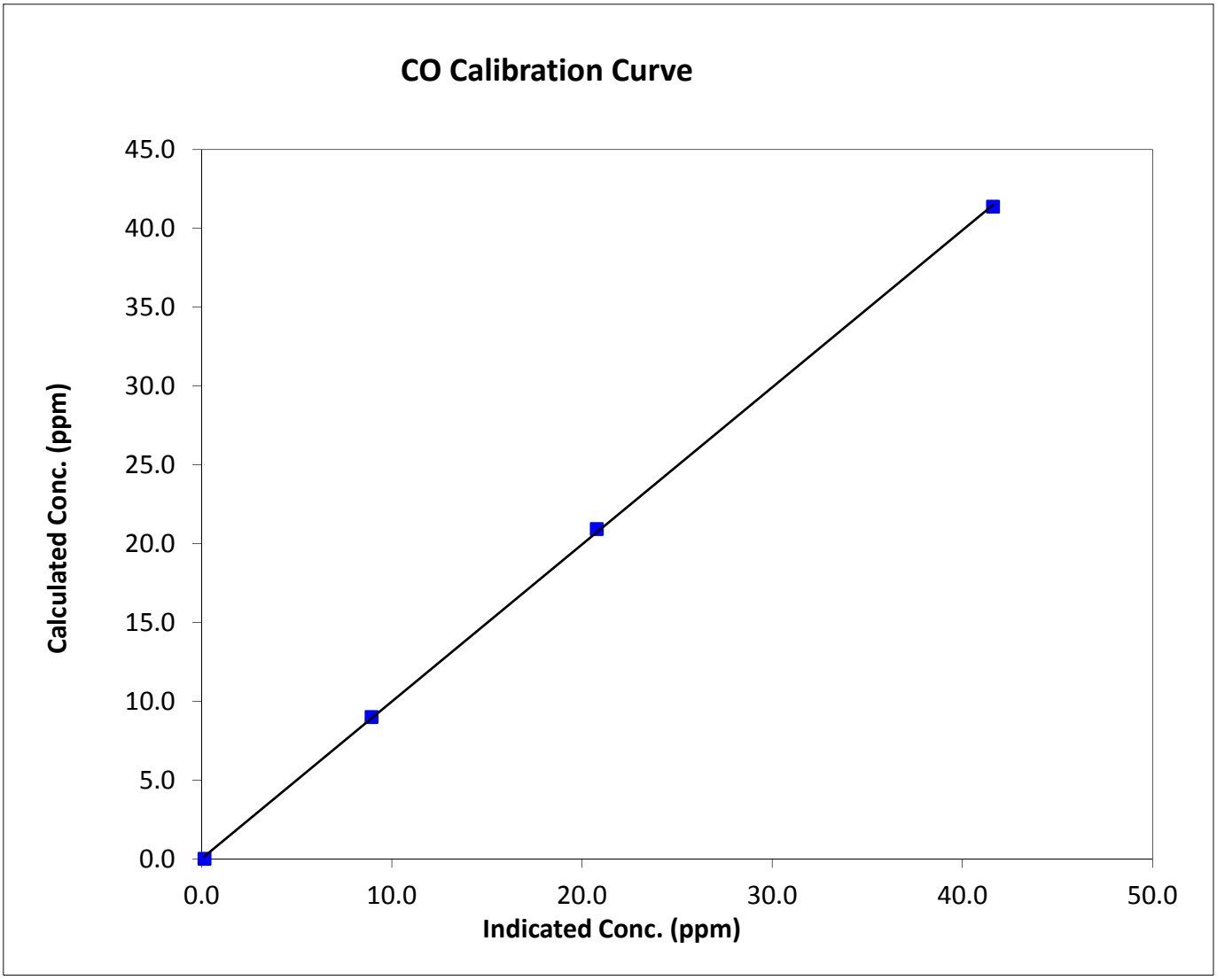
CO Calibration Summary

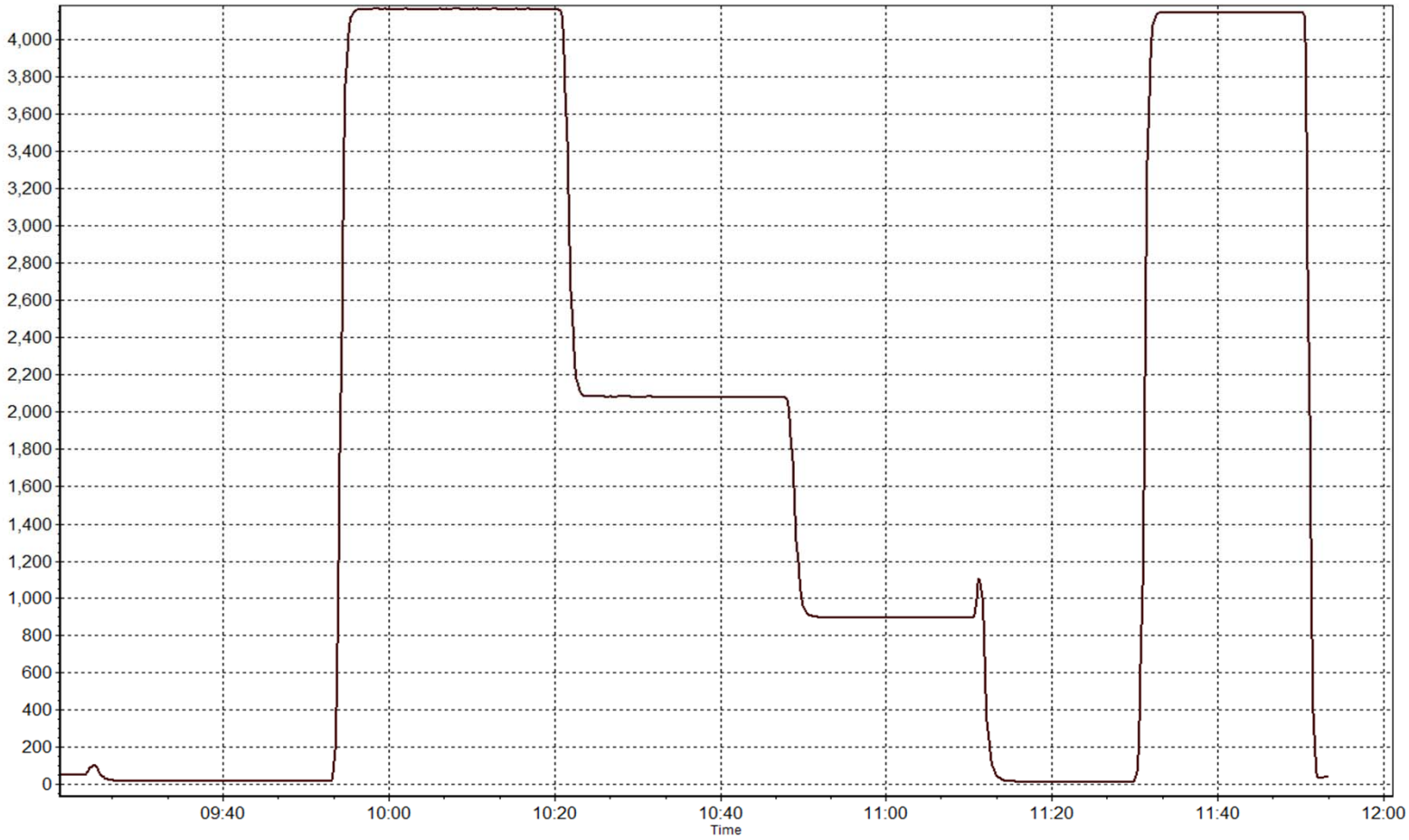
Station Information

Calibration Date	August 15, 2014	Previous Calibration	July 16, 2014
Station Name	Athabasca Valley	Station Number	7
Start Time (MST)	9:20	End Time (MST)	11:55
Analyzer make	TEI 48C	Analyzer serial #	508011060

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999906
41.4	41.6	0.9942		
20.9	20.8	1.0074	Slope	0.996857
9.0	8.9	1.0060		
			Intercept	0.008741




4,000
3,800
3,600
3,400
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3,000
2,800
2,600
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2,200
2,000
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1,400
1,200
1,000
800
600
400
200
0
09:40
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
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
AUGUST 2014

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	699	38	45	99.06	6	0	1	0
O3(ppb) Average	704	36	40	99.46	68	0	49	-
NO2(ppb) Average	702	37	42	99.33	8	0	2	-
NO(ppb) Average	702	37	42	99.33	6	-	1	-
NOX(ppb) Average	702	37	42	99.33	14	-	2	-
PM2.5(ug/m3) Average	741	0	3	99.60	354.5	-	206.4	9
Wind Speed 10 m (km/h) Average	743	0	1	99.87	27	-	-	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Temperature 2 m (C) Average	744	0	0	100.00	30.5	-	23.9	-
Relative Humidity (%) Average	744	0	0	100.00	98	-	-	-
Precipitation (mm) Total	744	0	0	100.00	7.1	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	820	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	699	0.3	1	-	0	0	0	0	0	1	6
O3(ppb) Average	704	26.2	10	-	6	15	20	25	31	40	68
NO2(ppb) Average	702	0.6	1	-	0	0	0	0	1	2	8
NO(ppb) Average	702	0.1	0	-	0	0	0	0	0	0	6
NOX(ppb) Average	702	0.8	1	-	0	0	0	0	1	2	14
PM2.5(ug/m3) Average	741	26.71	48.2	-	1	1.9	3.4	8.2	29.5	70.6	354.5
Wind Speed 10 m (km/h) Average	743	10.6	5	-	0	5	7	10	14	18	27
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	744	17.22	5.1	-	6.7	10.6	13	17	21	24.2	30.5
Relative Humidity (%) Average	744	66.9	16	-	27	44	56	67	78	89	98
Precipitation (mm) Total	744	-	-	18.03	0	0	0	0	0	0	7.1
Global Solar Radiation (W/m2) Average	744	208.9	250	-	0	0	0	80	391	625	820

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	01 Aug 2014 11:00	01 Aug 2014 14:00	4	Station power failure
AIR QUALITY ANALYZERS	16 Aug 2014 14:00	16 Aug 2014 16:00	3	Station power failure
NO2, NO, NOX	14 Aug 2014 16:00	14 Aug 2014 16:00	1	Power spike
PM2.5	07 Aug 2014 18:00	07 Aug 2014 18:00	1	Maintenance - Flow and zero check, sample head cleaning
PM2.5	21 Aug 2014 10:00	21 Aug 2014 10:00	1	Power spike
Wind Speed, Wind Direction	22 Aug 2014 21:00	22 Aug 2014 21:00	1	Flatline in sensor output signal

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 ppb on Aug 2 09:00 Maximum Daily Average: 1.3 ppb on Aug 25

Minimum Value: 0 ppb on Aug 1 05:00 Minimum Daily Average: 0.0 ppb on Aug 1
Maximum Diurnal Average: 0.7 ppb at hour 9 Minimum Diurnal Average: 0.1 ppb at hour 22
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:	699
Hours of Missing Data:	45
Hours of Calibration:	38
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-Aug	0	Z	0	0	0	0	0	0	0	0	PF	PF	PF	PF	0	0	0	0	0	0	0	0	0	0	0.0	0
2-Aug	0	Z	0	0	1	2	3	5	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1.1	6
3-Aug	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
4-Aug	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
5-Aug	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0.4	1
6-Aug	0	Z	0	1	1	1	1	2	2	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0.7	2
7-Aug	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	--	0
8-Aug	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
9-Aug	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
10-Aug	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
11-Aug	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
12-Aug	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
13-Aug	0	Z	0	0	0	1	3	3	4	3	3	2	1	1	1	1	1	1	0	0	0	0	0	0	1.3	4
14-Aug	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
15-Aug	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
16-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	0	0	0	0	0	1	0.2	1
17-Aug	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
18-Aug	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-Aug	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-Aug	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
21-Aug	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
22-Aug	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
23-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0.2	1
24-Aug	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
25-Aug	0	Z	0	0	1	1	4	3	4	2	2	1	1	2	2	1	1	1	1	0	0	0	1	2	1.3	4
26-Aug	1	Z	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
27-Aug	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
28-Aug	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
29-Aug	0	Z	0	0	0	0	0	1	2	5	4	3	3	1	1	0	0	1	1	0	0	0	0	0	1.0	5
30-Aug	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
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
	0.2	--	0.2	0.2	0.3	0.3	0.5	0.6	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	Diurnal Average	
	1	--	2	2	2	2	4	5	6	5	4	3	3	2	2	1	1	1	1	1	0	0	1	2	Diurnal Maximum	

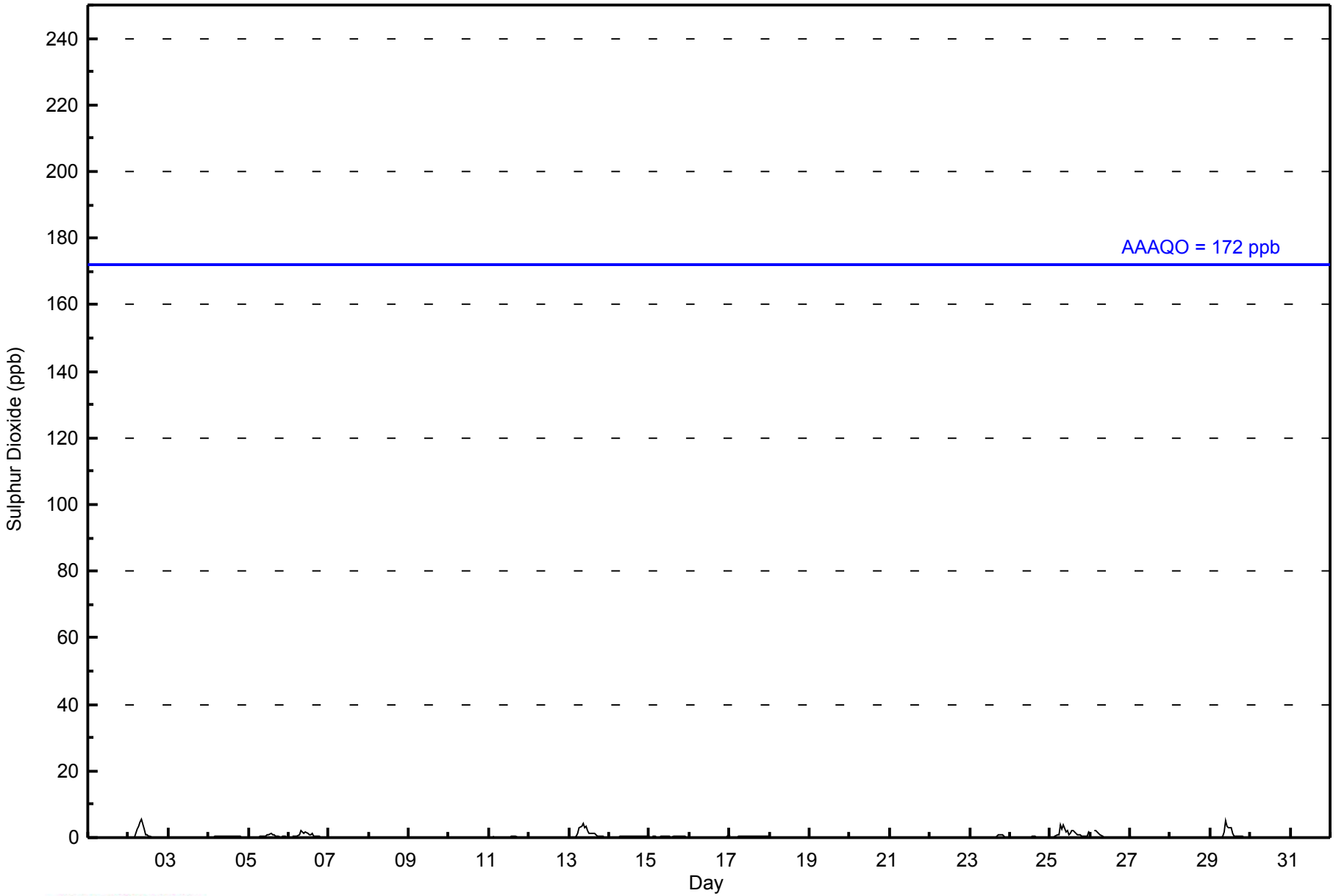
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - August 2014



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WBEA

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	699	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: 699

Total Number of Hours: 744

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Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	27	5	6	11	57	59	41	50	51	41	41	38	68	56	83	64	698
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	5	6	11	57	59	41	50	51	41	41	38	68	56	83	64	698

Total Number of Valid Hours: 698

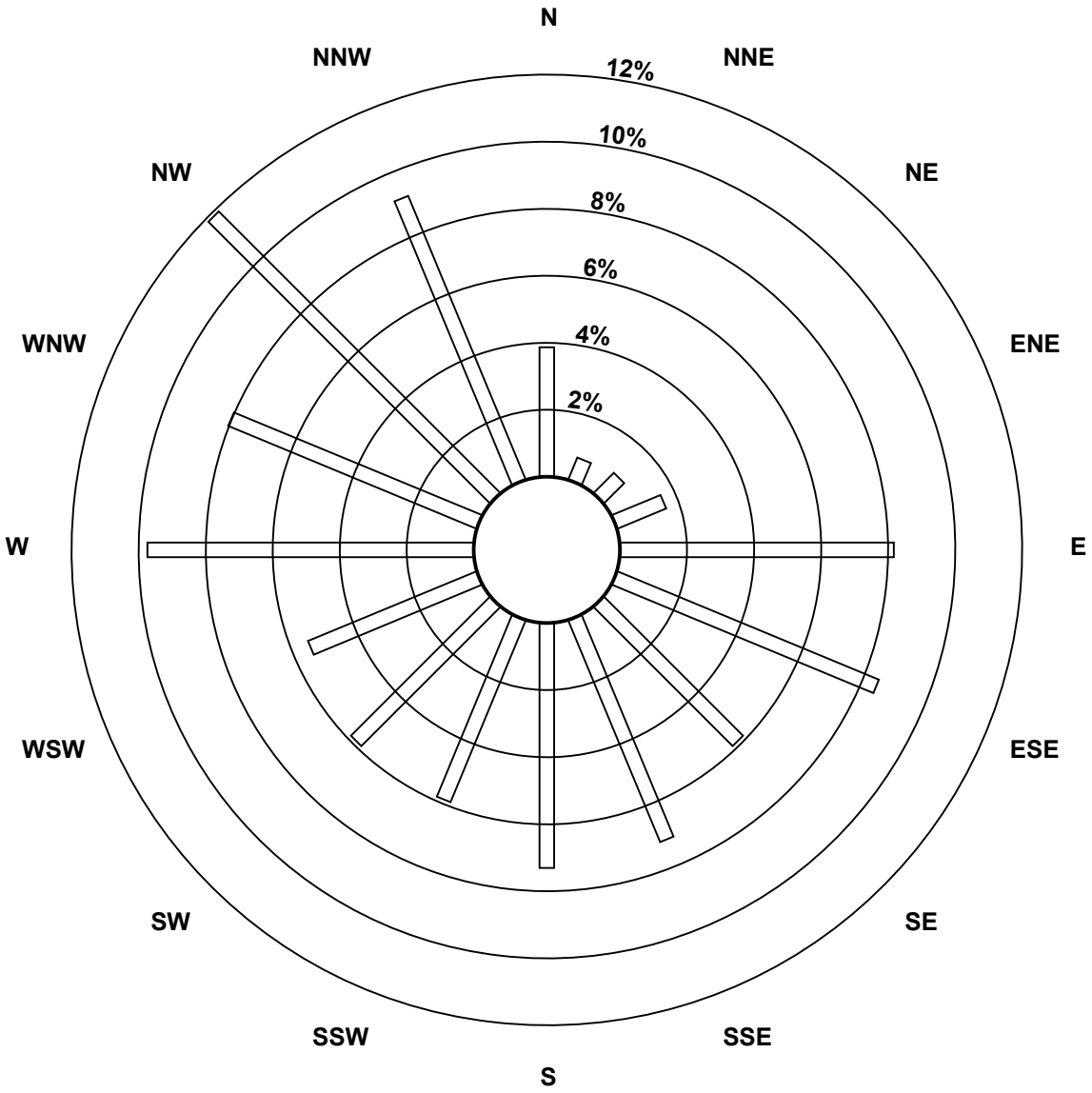
Total Number of Hours: 744

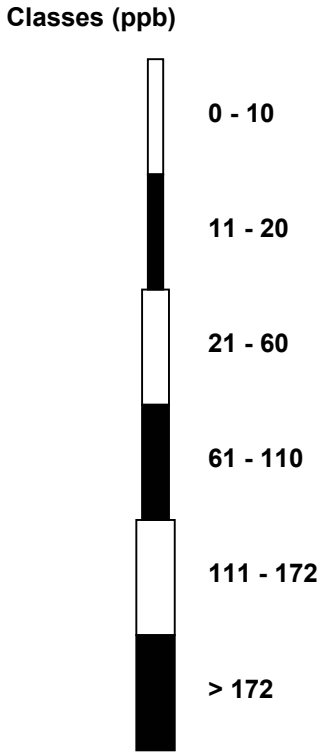
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan (AMS 8)





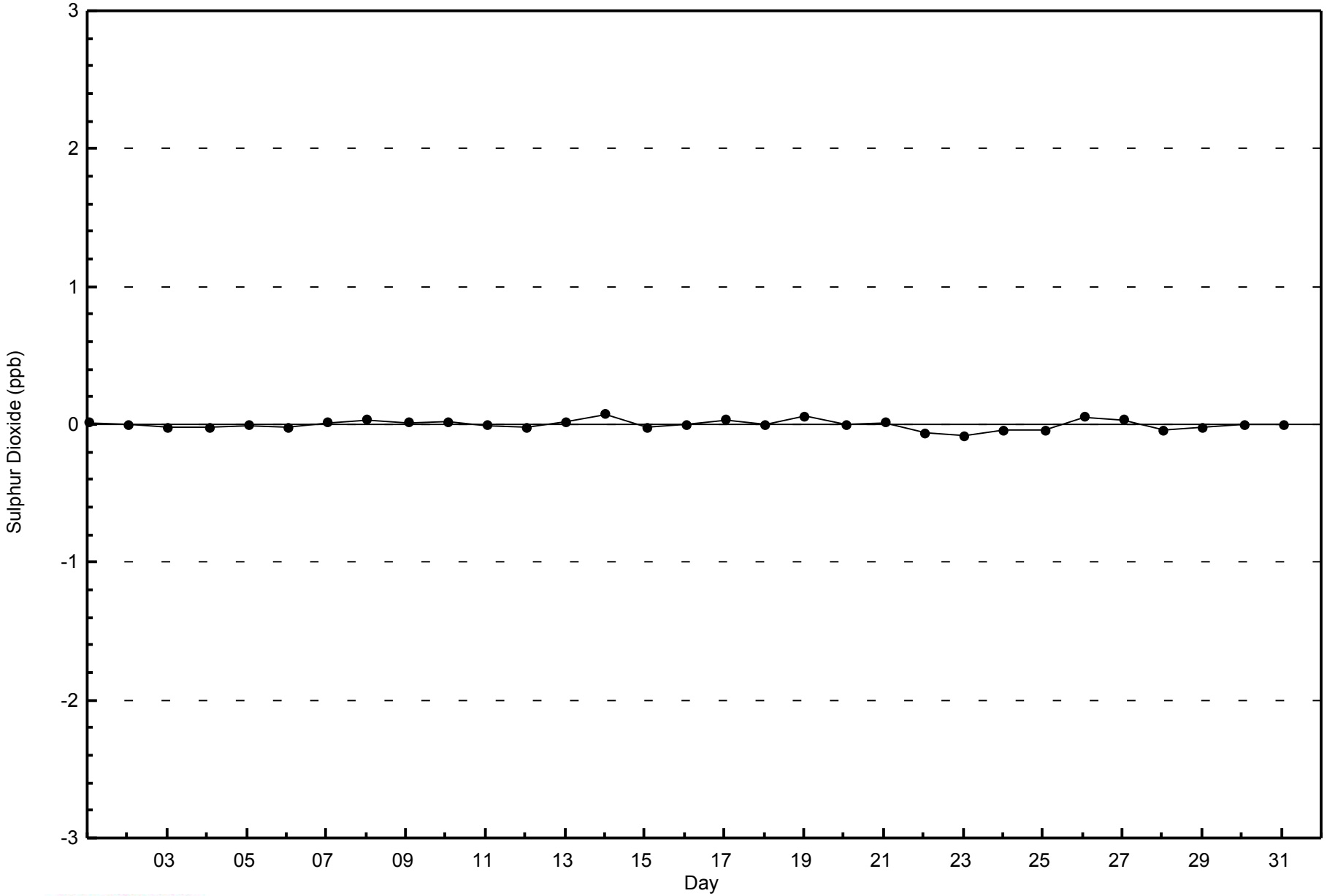
Total Number of Valid Hours: 698

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - August 2014



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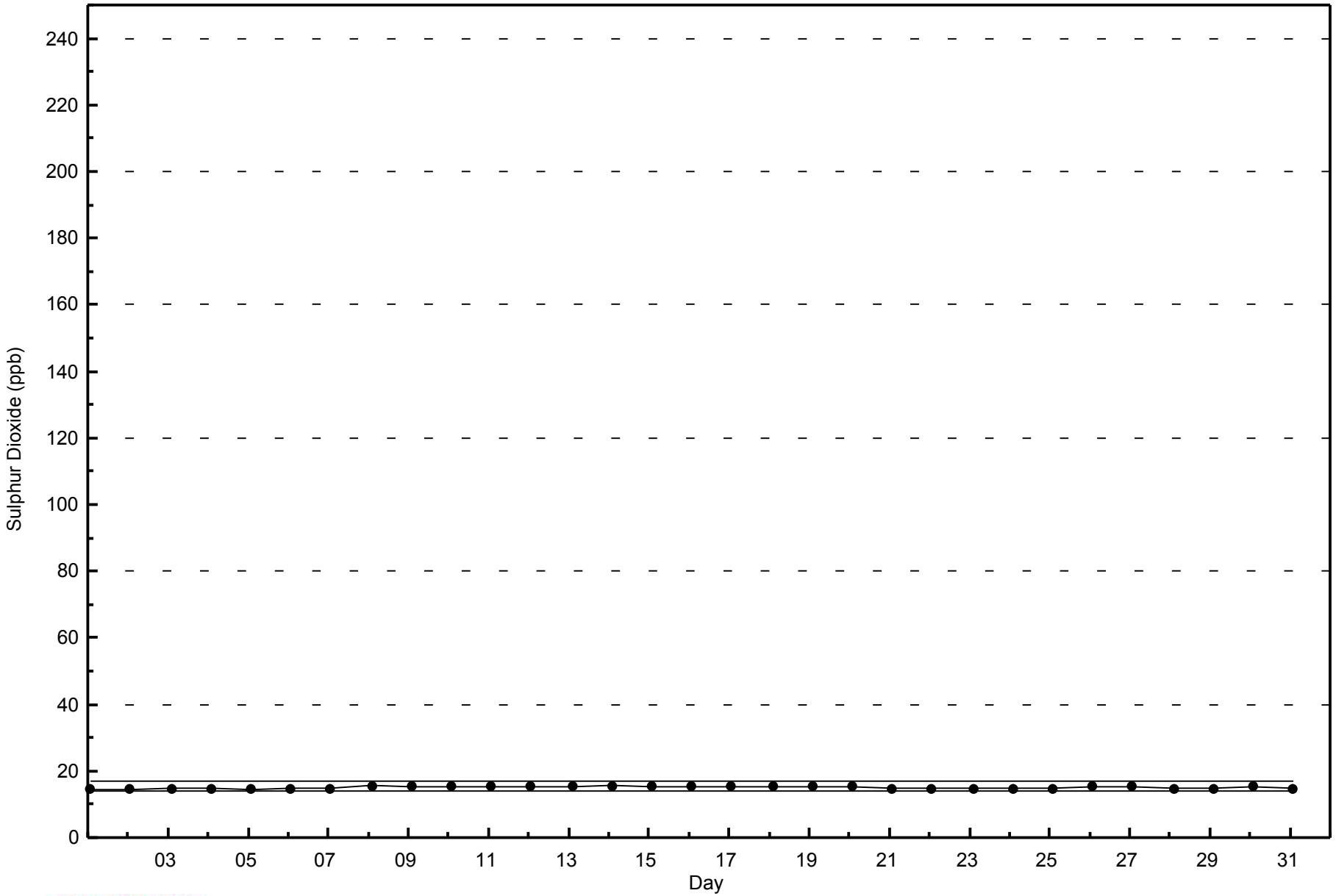
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Chipeywan - August 2014

Maximum Value: 6 ppb on Aug 29 08:00

Maximum Daily Average: 0.8 ppb on Aug 29

Minimum Value: 0 ppb on Aug 1 01:00

Minimum Daily Average: 0.0 ppb on Aug 30

Maximum Diurnal Average: 0.4 ppb at hour 8

Minimum Diurnal Average: 0.0 ppb at hour 23

Monthly Average: 0.1 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	37
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	Z	0	0	0	0	0	0	0	0	PF	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
2-Aug	0	Z	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
3-Aug	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
4-Aug	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
5-Aug	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
6-Aug	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
7-Aug	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	0
8-Aug	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
9-Aug	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
10-Aug	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
11-Aug	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
12-Aug	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
13-Aug	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	0	0	0	0	0	0	0	0	0.1	0
15-Aug	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
16-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	0	0	0	0	0	0	0.0	0
17-Aug	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
18-Aug	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-Aug	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-Aug	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
21-Aug	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
22-Aug	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
23-Aug	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
24-Aug	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
25-Aug	0	Z	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
26-Aug	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
27-Aug	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
28-Aug	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
29-Aug	0	Z	0	0	0	0	2	6	4	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.8	6
30-Aug	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
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
	0.0	--	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	Diurnal Average	
	0	--	0	0	0	1	2	6	4	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum	

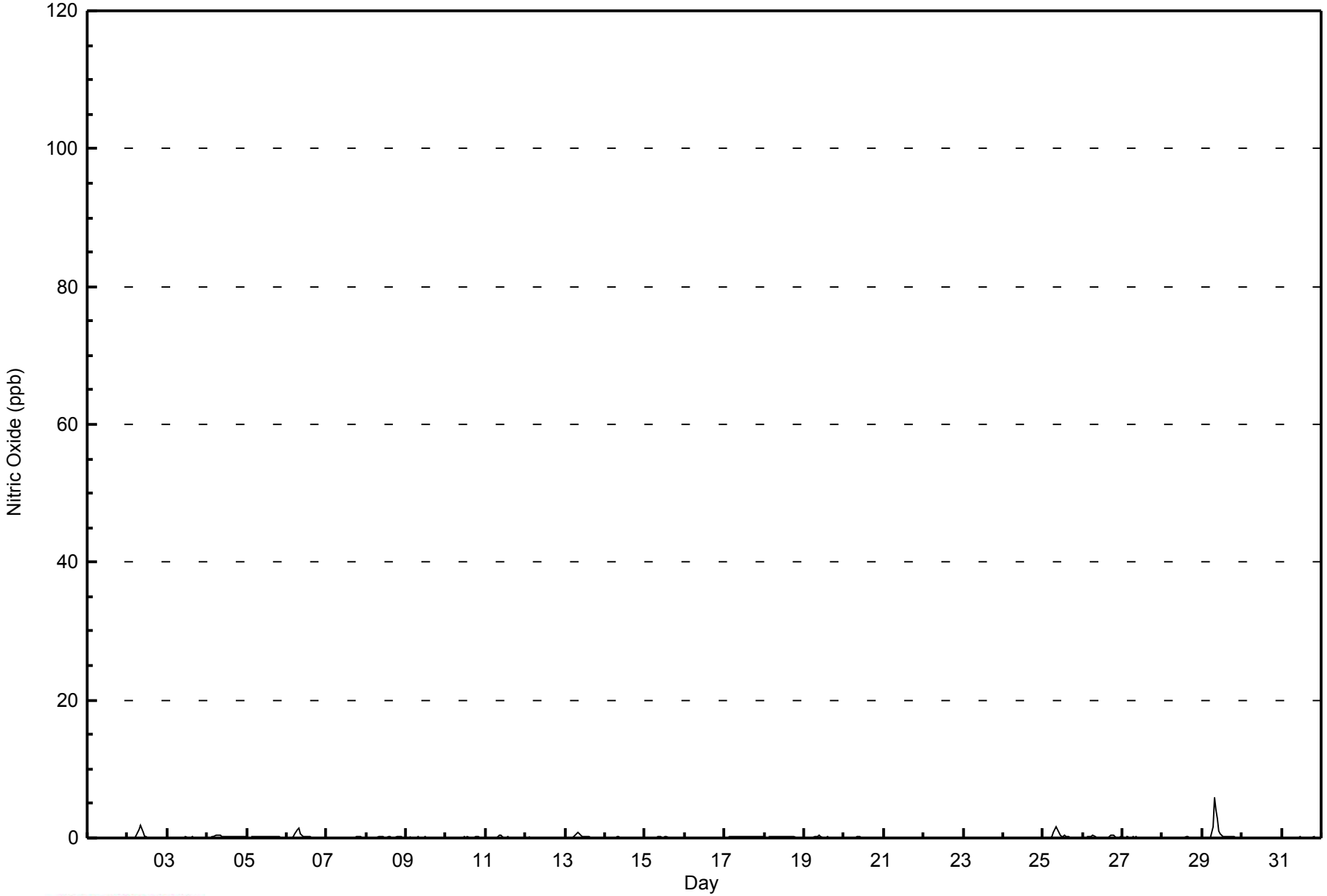
Z - zerospan C - Calibration PF - Power Failure

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Fort Chipeywan - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	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: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort Chipeywan - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	27	5	6	11	57	59	41	50	51	41	41	38	69	58	83	64	701
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	5	6	11	57	59	41	50	51	41	41	38	69	58	83	64	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

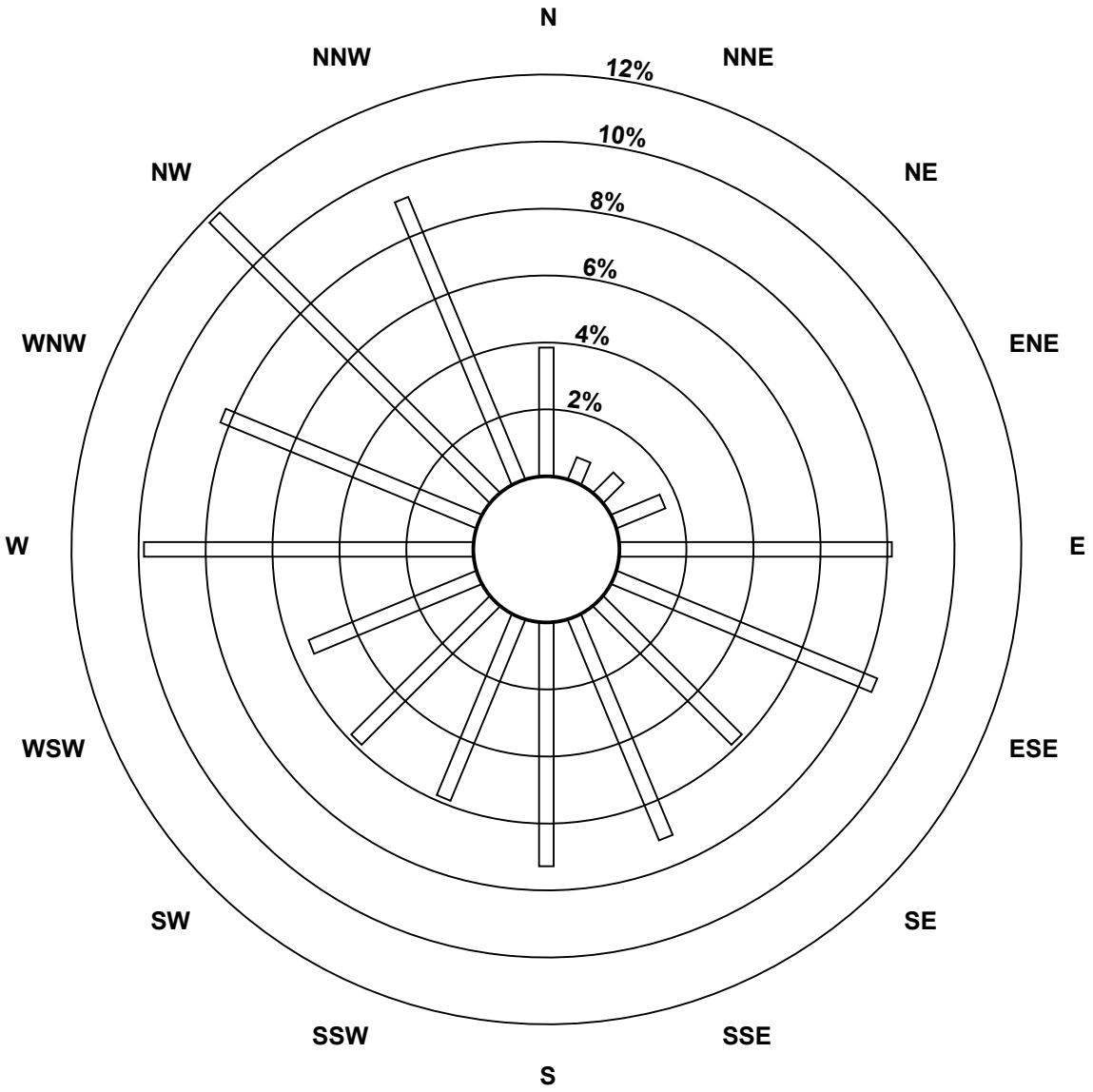
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

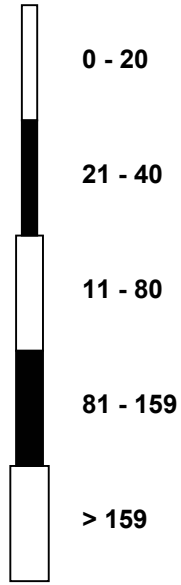
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Fort Chipeywan (AMS 8)



Classes (ppb)



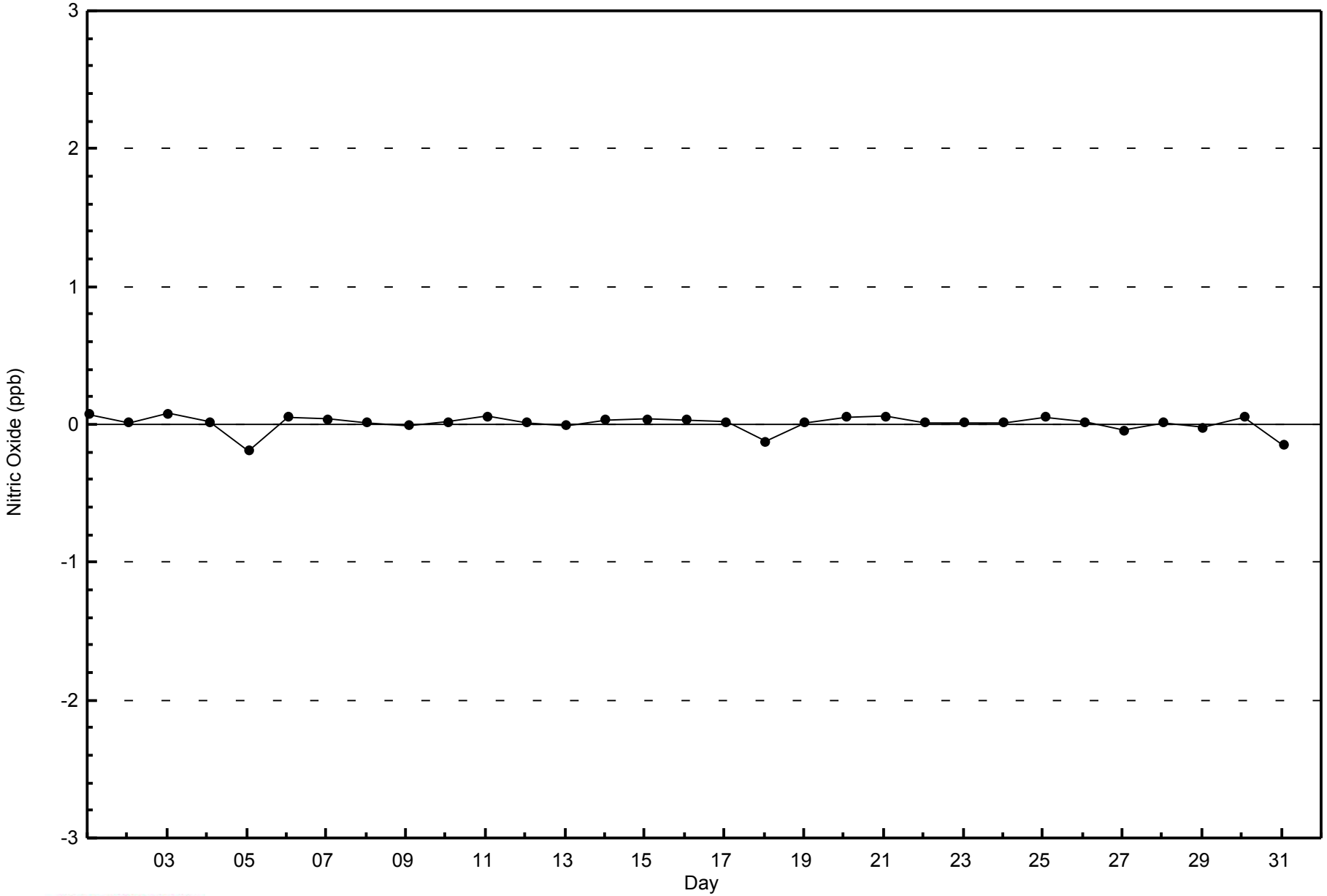
Total Number of Valid Hours: 701

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Fort Chipeywan - August 2014



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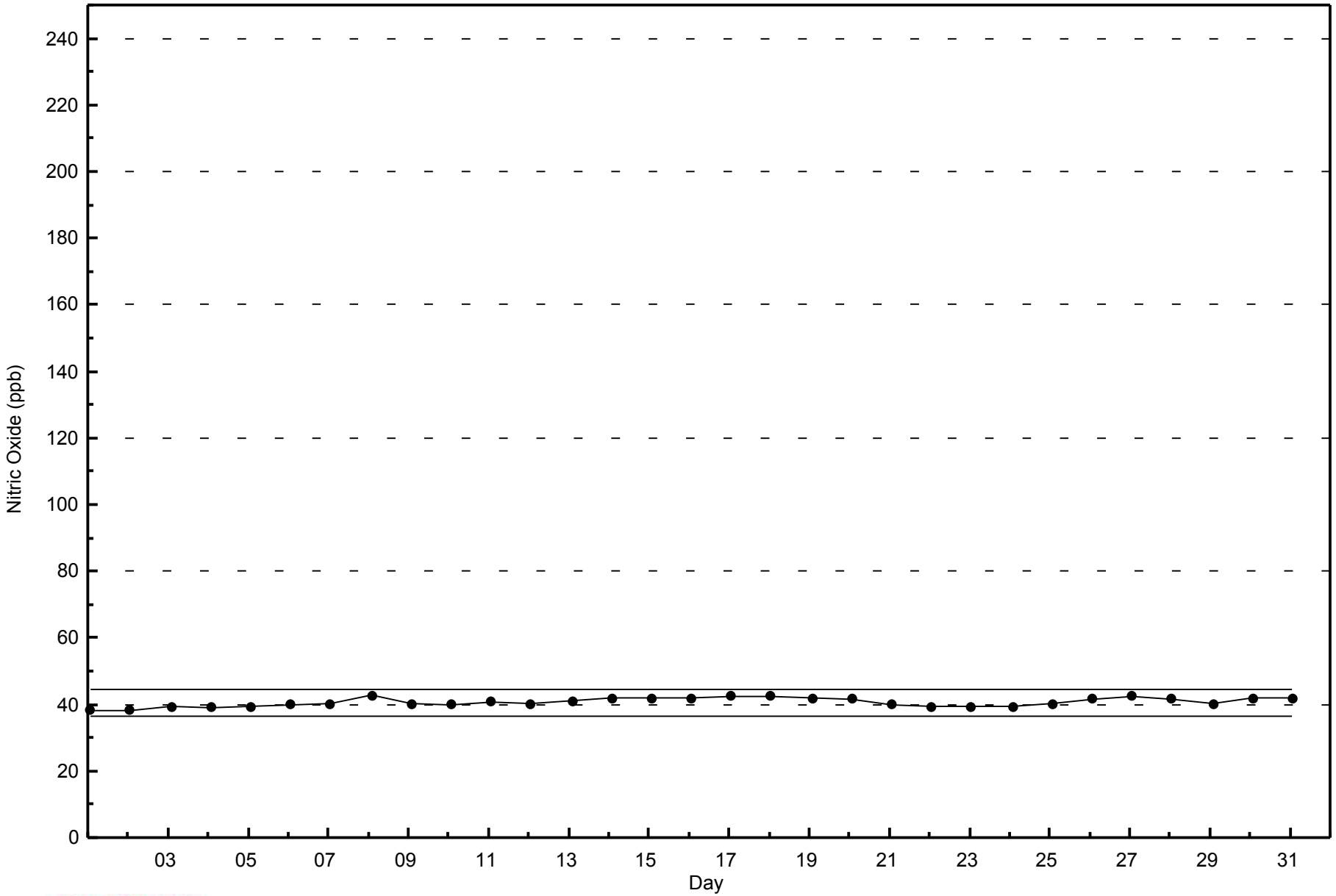
WBEA

Span Responses

Nitric Oxide (NO) - ppb

Fort Chipeywan - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - August 2014

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

Maximum Value: 8 ppb on Aug 29 08:00 Maximum Daily Average: 1.9 ppb on Aug 4

Minimum Value: 0 ppb on Aug 3 11:00

Maximum Diurnal Average: 1.2 ppb at hour 7

Monthly Average: 0.6 ppb

Minimum Daily Average: 0.1 ppb on Aug 20

Minimum Diurnal Average: 0.3 ppb at hour 24

Percentiles: P_1 = 0 P_{10} = 0 Q_1 = 0 Median = 0 Q_3 = 1 P_{90} = 2 P_{99} = 5

Hours in Service: 744

Hours of Data: 702

Hours of Missing Data: 42

Hours of Calibration: 37

Percent Operational Time: 99.3

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
	Hourly Period Ending At (MST)																									
1-Aug	0	Z	0	0	1	1	1	1	1	1	PF	1	1	1	1	1	1	1	1	1	1	1	1	0	0.6	1
2-Aug	0	Z	0	0	2	5	5	5	5	3	2	1	1	1	0	0	0	0	0	1	0	1	1	1	1.5	5
3-Aug	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.2	1
4-Aug	0	Z	0	0	1	2	3	3	3	3	2	3	3	3	3	3	2	2	2	2	2	1	1	1	1.9	3
5-Aug	1	Z	1	1	0	1	1	1	1	2	1	1	2	2	1	1	1	1	1	1	1	1	1	0	0.9	2
6-Aug	0	Z	2	3	5	6	6	5	3	2	1	1	1	1	1	1	1	0	1	0	1	1	0	0	1.9	6
7-Aug	0	Z	1	1	2	1	1	0	0	C	C	C	C	C	C	0	0	0	0	0	1	0	0	0	--	2
8-Aug	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
9-Aug	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
10-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0.2	2
11-Aug	0	Z	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	0	0	0	0	0	1	0	0.4	1
12-Aug	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.2	1
13-Aug	0	Z	0	0	1	3	4	3	2	2	2	2	1	2	2	1	1	0	0	0	0	0	0	0	1.2	4
14-Aug	0	Z	1	1	1	1	1	2	2	2	2	2	2	2	1	PF	1	1	1	3	2	1	1	1	1.3	3
15-Aug	1	Z	1	0	0	0	0	1	2	1	1	1	1	0	0	0	0	0	0	0	1	3	1	0	0.7	3
16-Aug	1	Z	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	1	0	1	0	0	1	0.3	1
17-Aug	1	Z	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	0.7	1
18-Aug	1	Z	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.5	1
19-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.1	1
24-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.2	1
25-Aug	0	Z	1	5	3	3	4	2	3	2	1	1	1	2	2	2	1	1	1	1	1	1	1	2	1.8	5
26-Aug	4	Z	5	5	5	5	4	1	1	0	0	0	0	1	0	0	0	2	2	2	1	0	0	0	1.7	5
27-Aug	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
28-Aug	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
29-Aug	0	Z	0	0	0	1	5	8	5	4	2	1	1	1	1	1	1	1	1	1	0	0	0	0	1.5	8
30-Aug	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0.5	1
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
	0.4	--	0.5	0.7	0.8	1.0	1.2	1.2	1.0	0.8	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.4	0.3	Diurnal Average	
	4	--	5	5	5	6	6	8	5	4	2	3	3	3	3	3	2	2	2	3	2	3	1	2	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

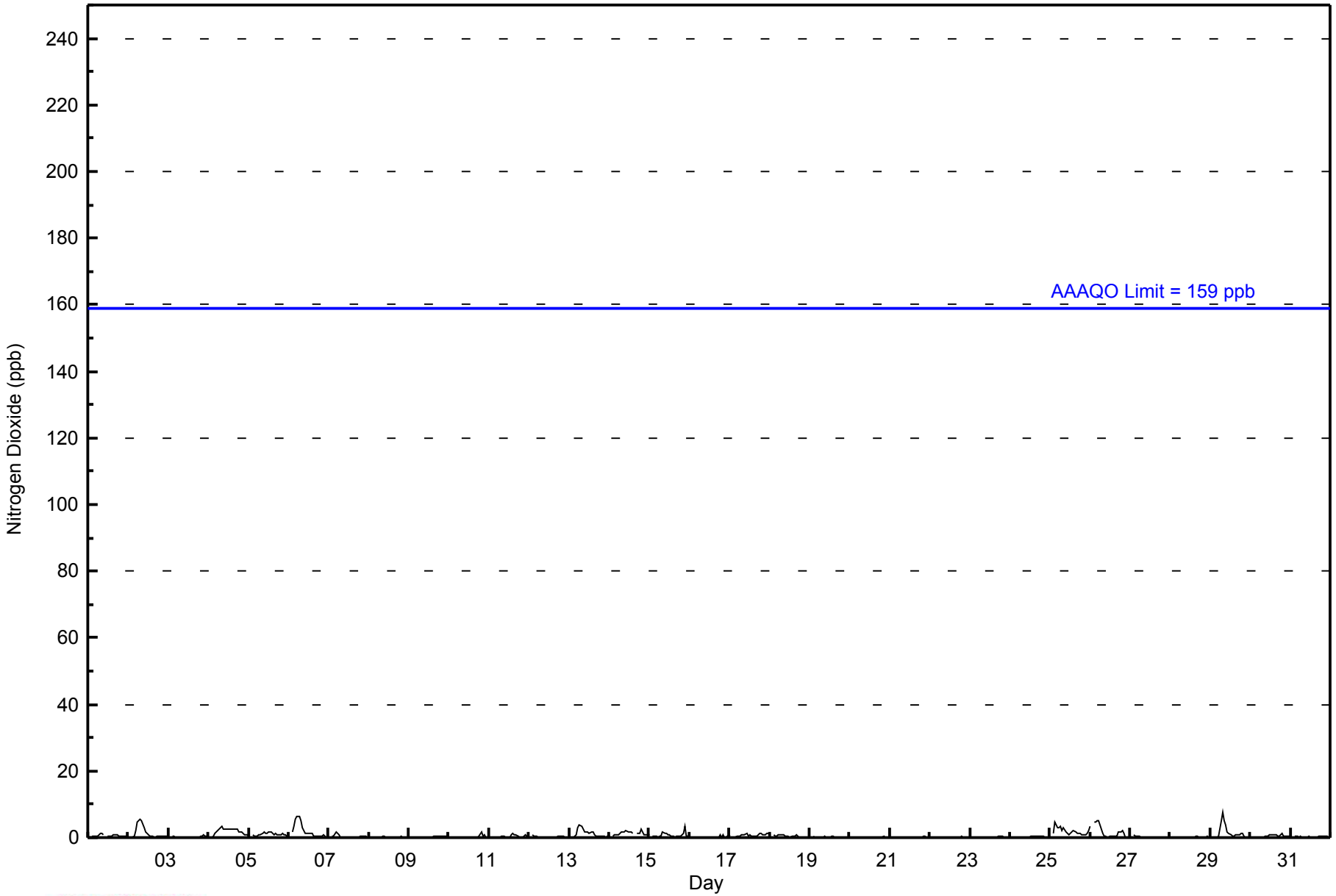
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Nitrogen Dioxide (NO_2) - ppb
Fort Chipeywan - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	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: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	27	5	6	11	57	59	41	50	51	41	41	38	69	58	83	64	701
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	5	6	11	57	59	41	50	51	41	41	38	69	58	83	64	701

Total Number of Valid Hours: 701

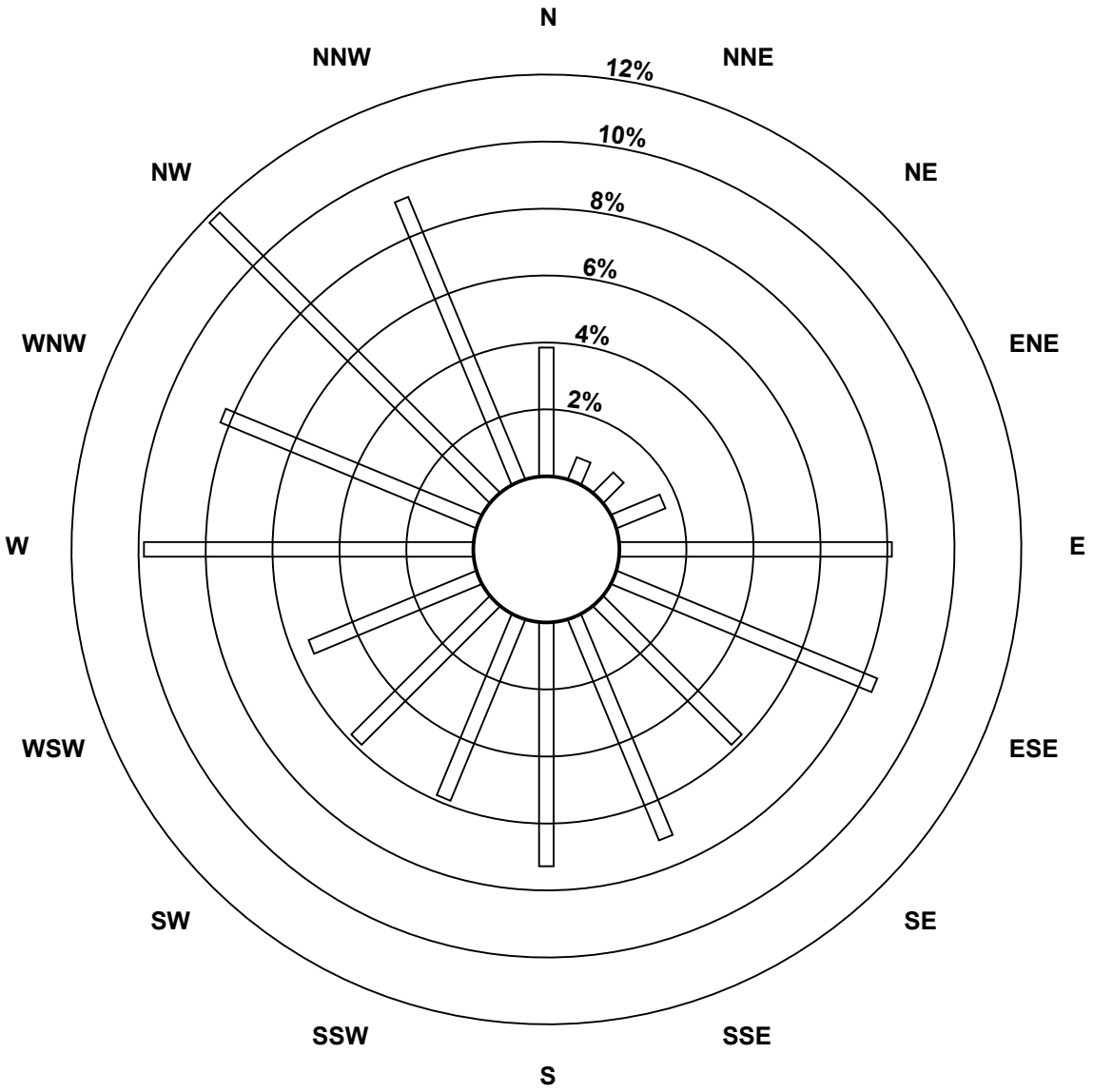
Total Number of Hours: 744

Wood Buffalo Environmental Association

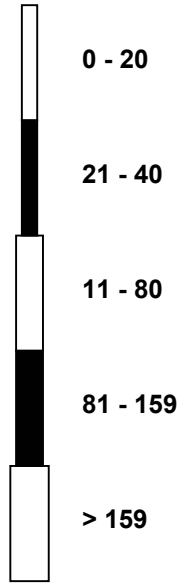
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan (AMS 8)



Classes (ppb)



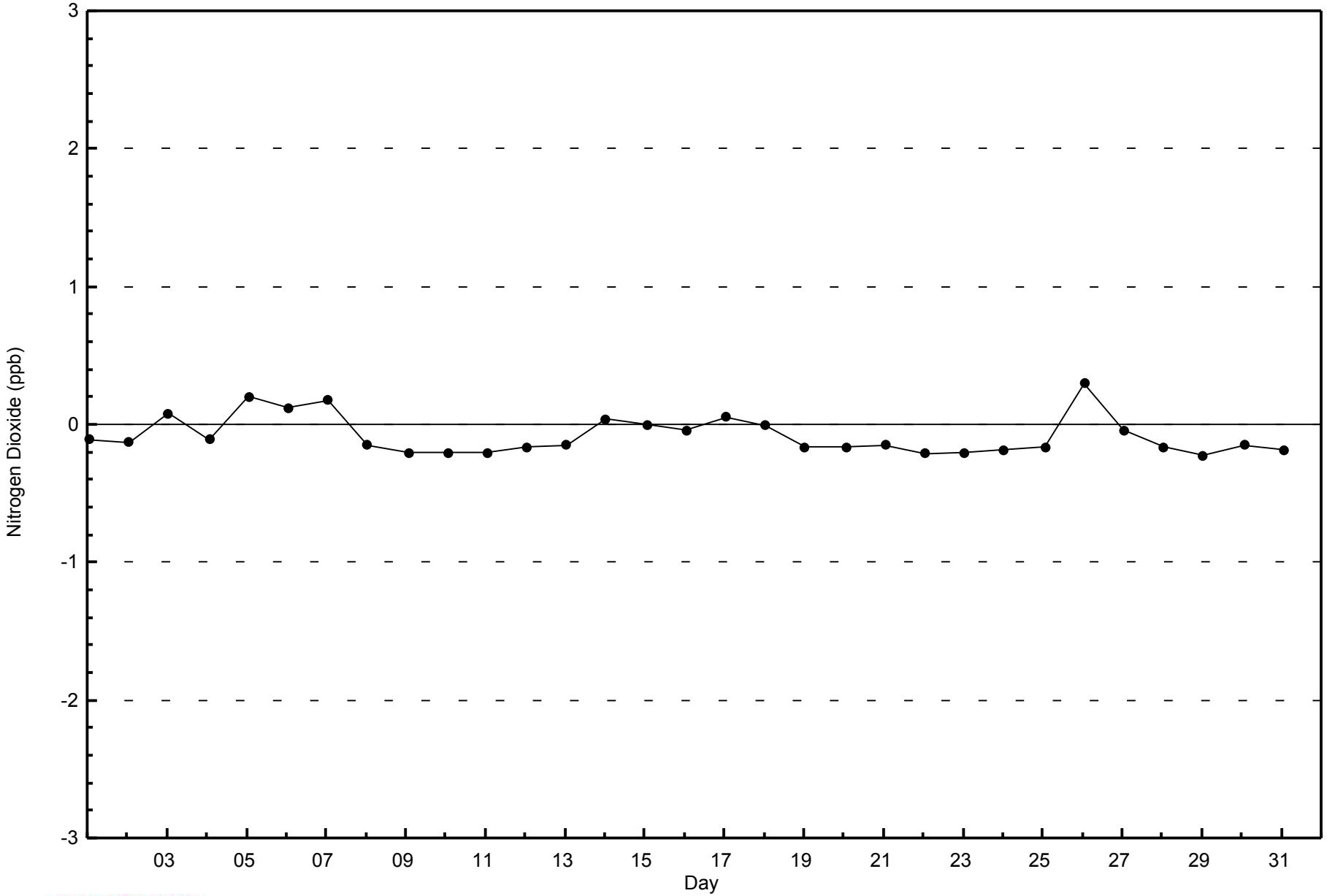
Total Number of Valid Hours: 701

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - August 2014



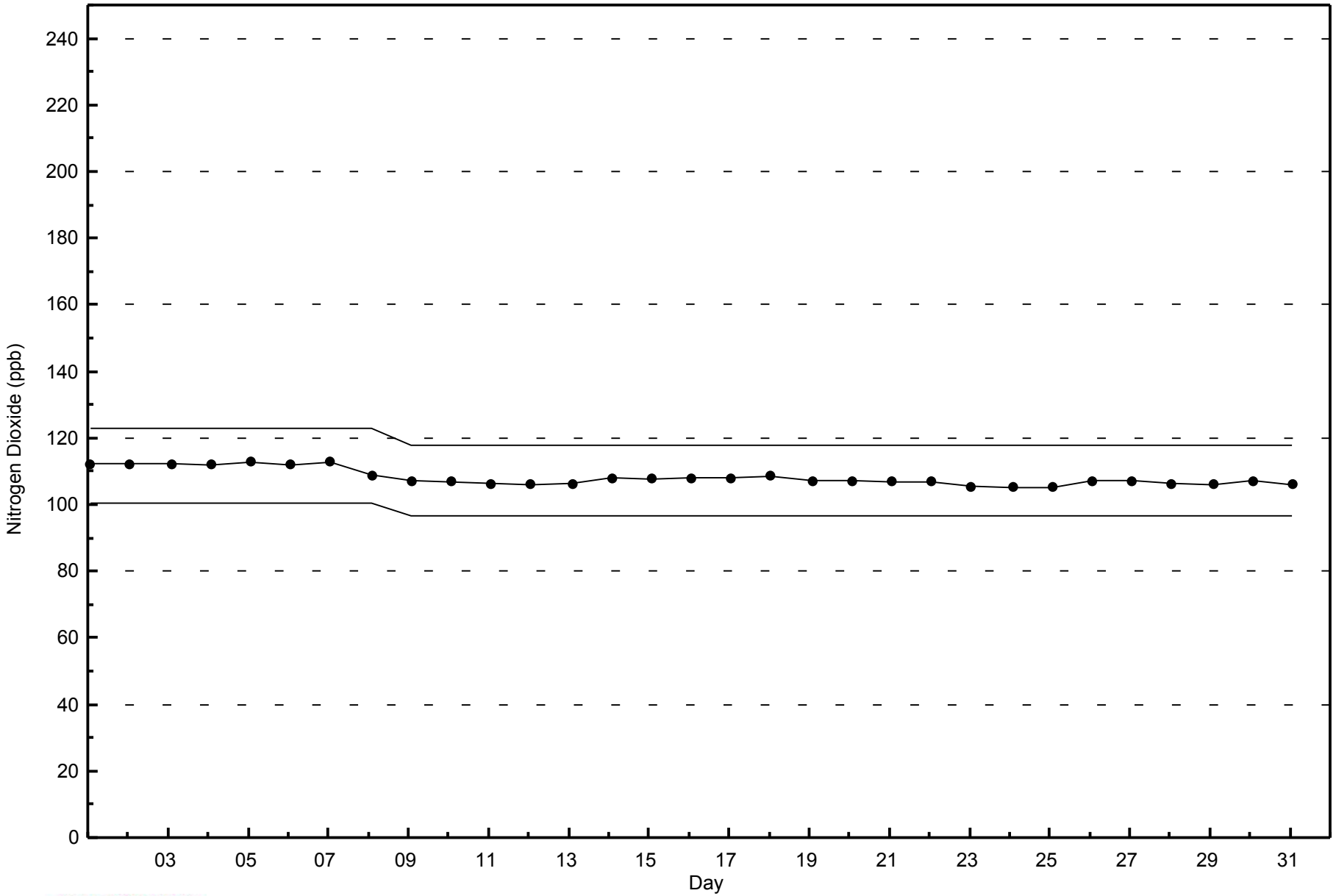
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan - August 2014

Maximum Value: 14 ppb on Aug 29 08:00

Maximum Daily Average: 2.2 ppb on Aug 29

Minimum Value: 0 ppb on Aug 3 17:00

Minimum Daily Average: 0.1 ppb on Aug 21

Maximum Diurnal Average: 1.6 ppb at hour 8

Minimum Diurnal Average: 0.4 ppb at hour 24

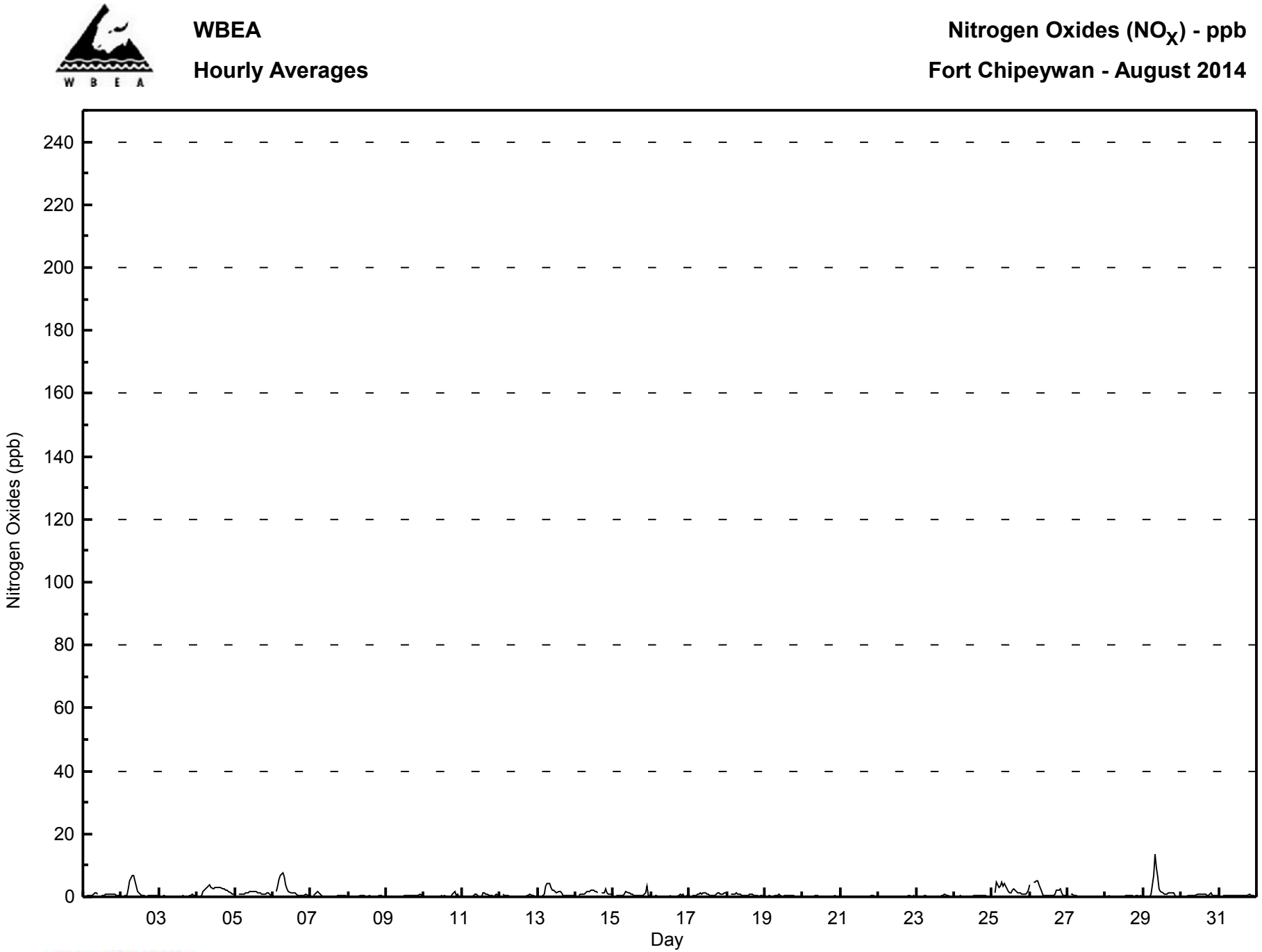
Monthly Average: 0.8 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 7$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	37
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	Z	0	0	0	1	1	1	1	1	PF	0	1	1	1	1	1	1	1	1	1	1	1	0	0.7	1
2-Aug	0	Z	0	0	2	5	6	7	7	4	2	1	1	1	0	0	0	0	0	0	0	1	1	0	1.7	7
3-Aug	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
4-Aug	0	Z	0	0	2	3	3	3	4	3	3	3	3	3	3	3	3	3	2	2	2	1	1	1	2.1	4
5-Aug	1	Z	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	1.1	2
6-Aug	0	Z	2	3	6	7	7	7	4	2	1	1	1	1	1	1	1	1	1	0	1	1	0	0	2.1	7
7-Aug	0	Z	1	1	2	1	1	0	0	C	C	C	C	C	C	0	0	0	0	1	1	1	0	0	--	2
8-Aug	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
9-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0.3	1
10-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0.3	2
11-Aug	0	Z	0	0	0	0	0	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	1	0	0.5	1
12-Aug	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.3	1
13-Aug	0	Z	0	0	1	3	4	4	3	2	2	2	1	2	2	1	1	0	0	1	0	0	0	0	1.4	4
14-Aug	0	Z	1	1	1	1	1	2	2	2	2	2	2	2	1	PF	1	1	1	3	1	1	1	1	1.4	3
15-Aug	1	Z	1	0	0	0	0	1	2	1	1	1	1	0	0	0	0	0	0	0	1	3	1	0	0.7	3
16-Aug	1	Z	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	1	0	1	0	0	1	0.3	1
17-Aug	1	Z	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0.9	1
18-Aug	1	Z	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0.6	1
19-Aug	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0.2	1
24-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0.2	1
25-Aug	0	Z	1	5	3	3	5	3	4	2	2	1	1	2	3	2	1	1	1	1	1	1	1	2	2.1	5
26-Aug	4	Z	5	5	5	5	4	2	1	0	0	0	1	1	1	0	1	2	2	2	1	0	0	0	1.8	5
27-Aug	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
28-Aug	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
29-Aug	0	Z	0	0	0	1	7	14	9	6	3	2	1	1	1	1	1	1	1	1	0	0	0	0	2.2	14
30-Aug	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0.5	1
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
	0.4	--	0.6	0.7	0.9	1.1	1.4	1.6	1.4	1.1	0.8	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.4	0.4	Diurnal Average	
	4	--	5	5	6	7	7	14	9	6	3	3	3	3	3	3	3	3	2	3	2	3	1	2	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure


WBEA
Hourly Averages
Nitrogen Oxides (NO_X) - ppb
Fort Chipeywan - August 2014
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.

Nitrogen Oxides (NO_X) - ppb
Fort Chipeywan - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	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: 702

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	27	5	6	11	57	59	41	50	51	41	41	38	69	58	83	64	701
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	5	6	11	57	59	41	50	51	41	41	38	69	58	83	64	701

Total Number of Valid Hours: 701

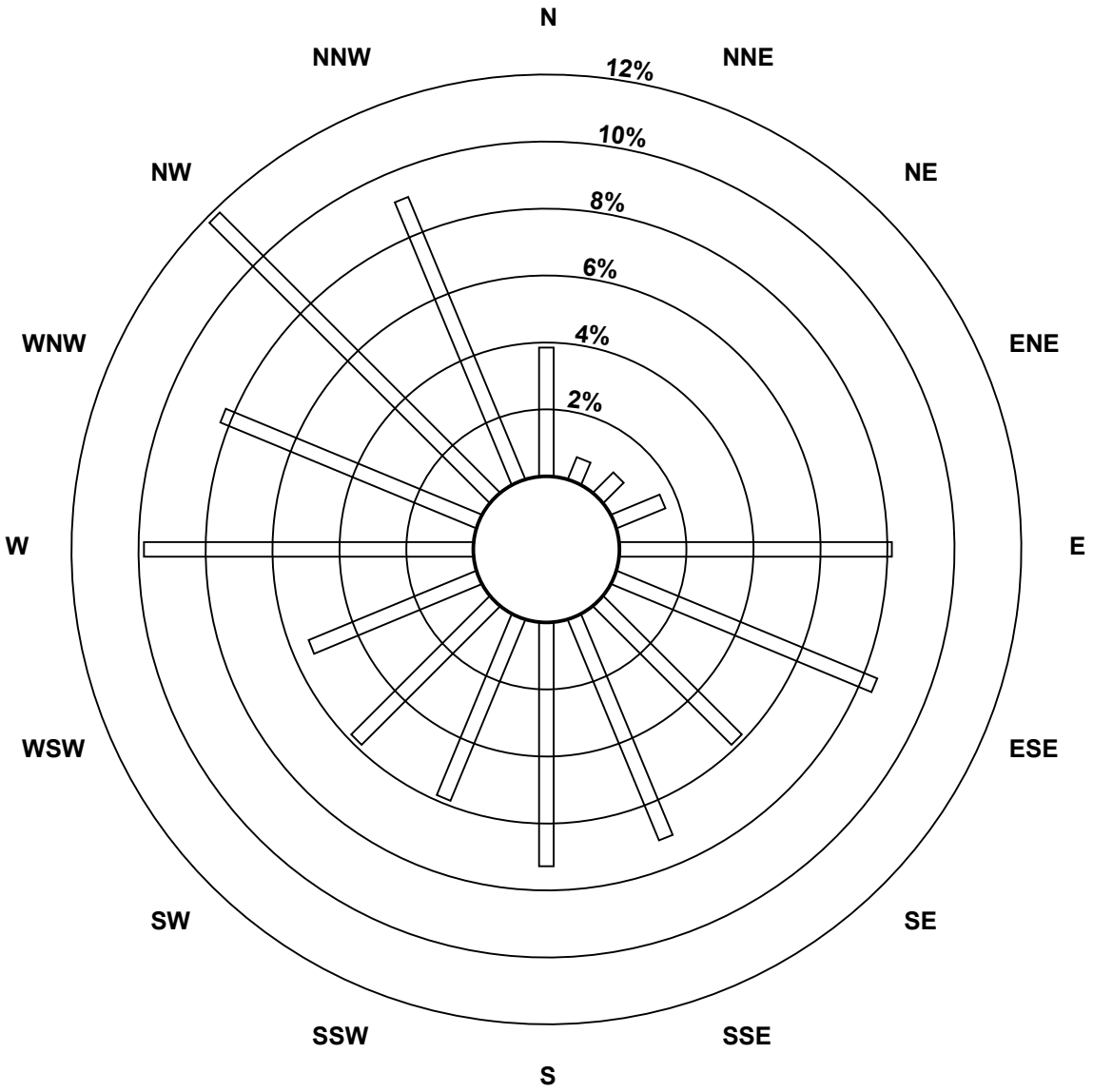
Total Number of Hours: 744

Wood Buffalo Environmental Association

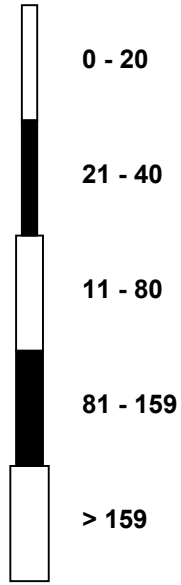
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan (AMS 8)



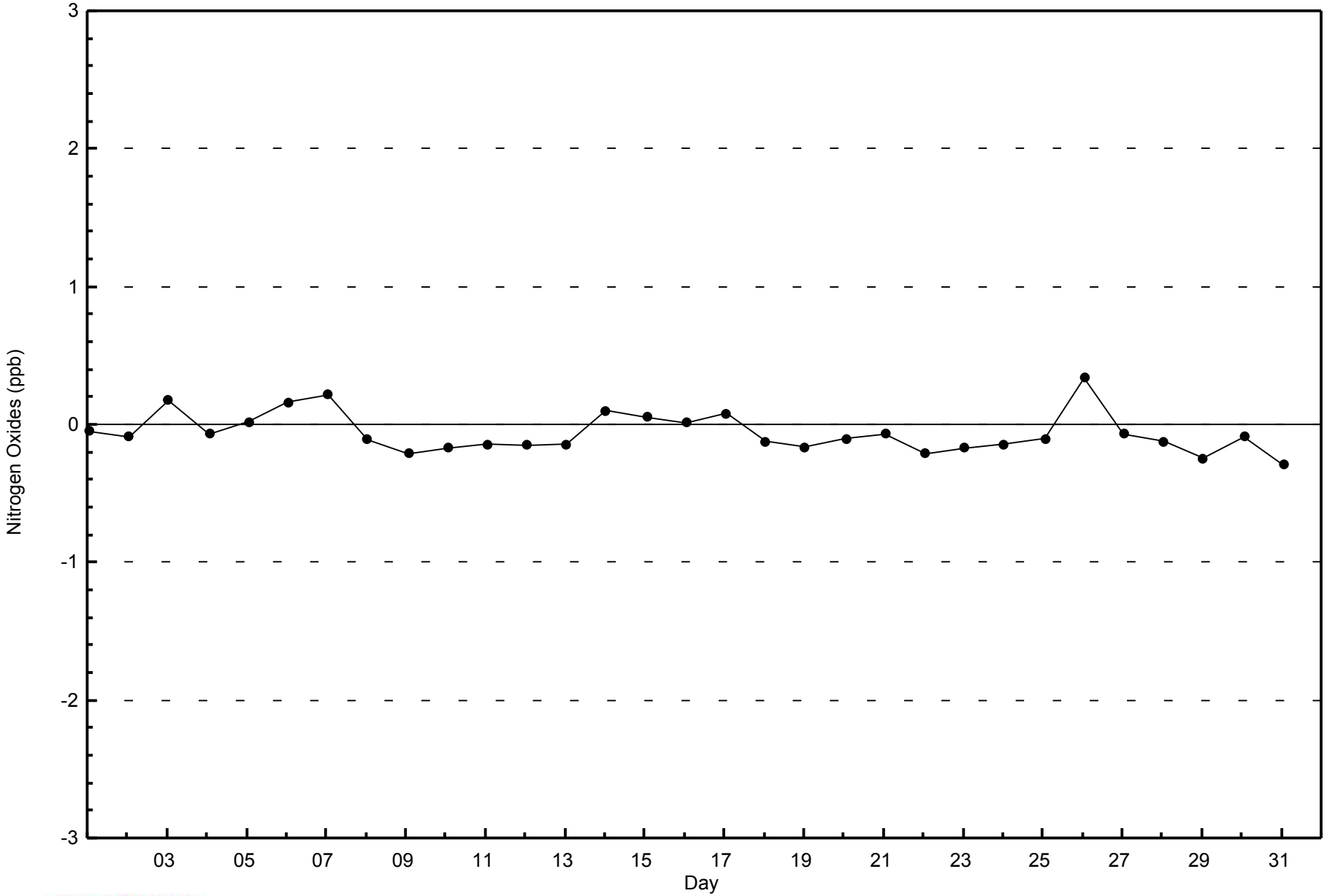
Classes (ppb)



Total Number of Valid Hours: 701

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Fort Chipeywan - August 2014



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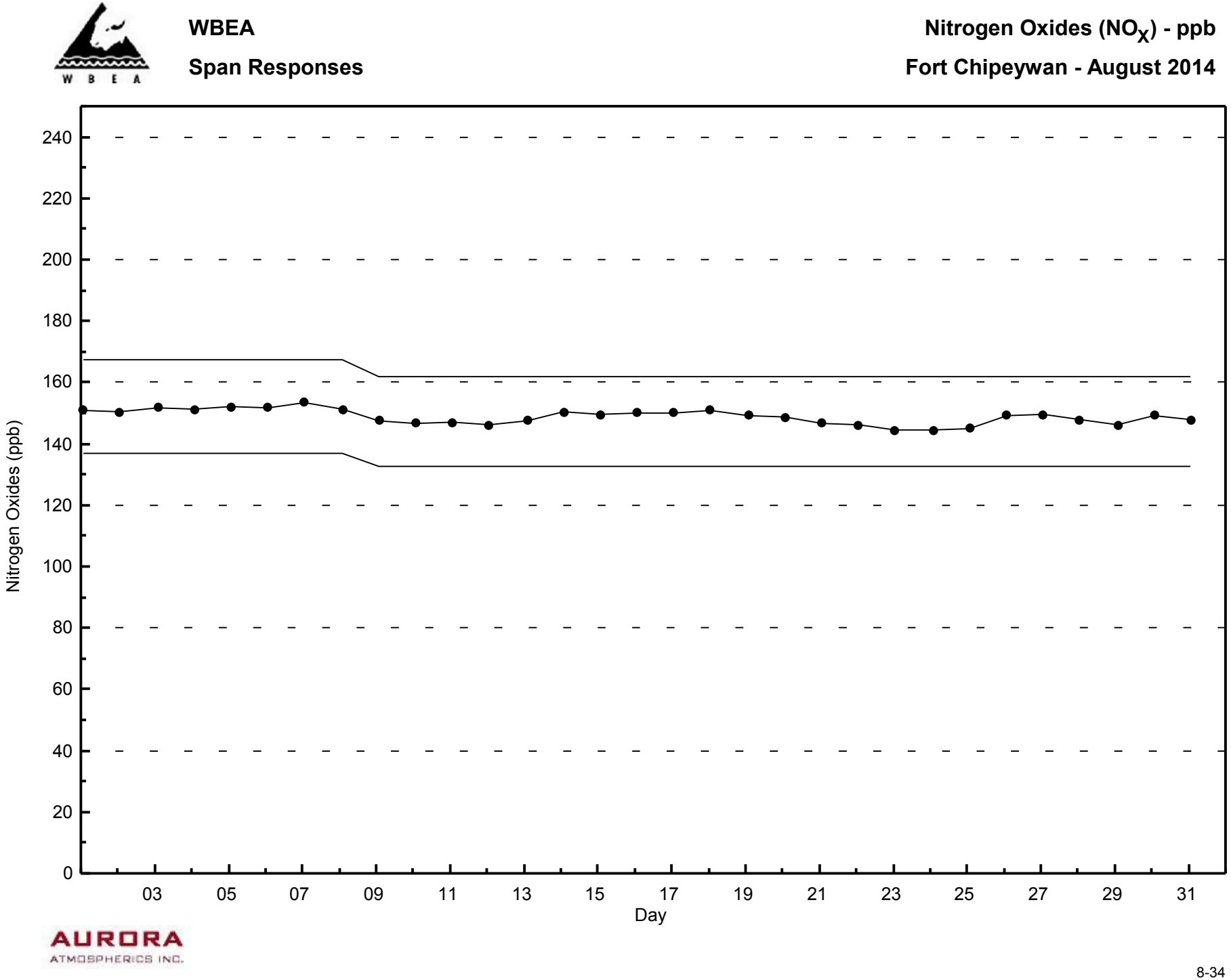

WBEA
Span Responses
Nitrogen Oxides (NO_X) - ppb
Fort Chipeywan - August 2014
Nitrogen Oxides (ppb)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort Chipeywan - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 68 ppb on Aug 5 15:00 Maximum Daily Average: 49.5 ppb on Aug 5

Minimum Value: 6 ppb on Aug 9 05:00
Maximum Diurnal Average: 32.3 ppb at hour 17
Monthly Average: 26.2 ppb

Minimum Daily Average: 13.6 ppb on Aug 8
Minimum Diurnal Average: 19.1 ppb at hour 7
Percentiles: P_1 = 8 P_{10} = 15 Q_1 = 20 Median = 25 Q_3 = 31 P_{90} = 40 P_{99} = 60

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	17	16	Z	18	15	12	15	18	23	24	PF	25	25	25	25	26	27	27	27	27	27	26	27	26	22.5	27
2-Aug	24	22	Z	22	21	21	22	22	25	32	36	36	34	33	33	32	30	28	38	37	36	37	36	33	29.9	38
3-Aug	32	33	Z	32	30	27	26	29	27	27	27	27	27	27	28	32	34	33	30	28	29	26	26	24	28.8	34
4-Aug	22	25	Z	20	19	18	16	16	16	18	22	28	34	38	44	50	50	51	54	57	51	46	42	42	33.9	57
5-Aug	43	42	Z	41	39	38	37	37	41	48	50	54	60	66	68	66	61	62	57	52	48	45	43	39	49.5	68
6-Aug	38	34	Z	24	21	20	23	28	35	42	46	55	63	58	49	46	44	40	39	41	40	36	28	25	38.1	63
7-Aug	26	21	Z	16	13	17	22	24	25	24	23	23	25	23	C	C	C	C	C	11	8	8	11	12	18.5	26
8-Aug	11	13	Z	14	15	15	15	15	15	15	15	15	15	14	14	14	14	14	15	13	12	12	11	9	13.6	15
9-Aug	9	7	Z	7	6	6	7	10	13	16	18	19	20	21	22	24	28	28	26	24	22	21	22	21	17.2	28
10-Aug	18	20	Z	17	14	13	13	12	13	13	15	18	22	24	26	27	27	26	23	19	21	20	17	16	18.8	27
11-Aug	17	19	Z	15	13	11	11	10	12	15	17	17	18	26	32	30	33	28	25	24	24	24	24	27	20.6	33
12-Aug	28	28	Z	24	25	24	24	22	22	22	21	22	24	26	25	25	27	29	29	27	26	24	20	20	24.4	29
13-Aug	20	20	Z	21	18	14	14	15	22	29	34	36	40	47	52	48	39	35	32	27	30	33	32	31	29.9	52
14-Aug	31	29	Z	28	27	25	24	25	25	28	30	32	36	39	41	43	47	49	49	43	45	40	37	36	35.2	49
15-Aug	37	37	Z	30	25	21	18	21	26	30	34	35	33	32	33	33	34	33	30	27	26	23	26	29	29.1	37
16-Aug	26	26	Z	26	26	25	24	22	23	23	29	27	27	PF	PF	PF	30	29	28	25	24	21	26	36	26.2	36
17-Aug	29	30	Z	28	25	24	23	21	17	21	29	32	35	32	33	34	36	41	43	40	34	32	32	31	30.4	43
18-Aug	30	27	Z	26	25	23	23	23	20	18	20	23	21	21	16	15	11	14	19	18	14	12	14	16	19.6	30
19-Aug	15	11	Z	10	10	9	9	10	13	13	13	13	15	20	19	18	18	17	16	16	16	16	17	16	14.4	20
20-Aug	16	14	Z	14	15	15	15	16	17	18	19	18	19	20	22	24	26	28	26	21	20	18	17	17	19.0	28
21-Aug	16	16	Z	20	19	18	16	16	20	20	23	26	30	31	31	30	30	30	30	28	26	25	25	25	23.9	31
22-Aug	26	26	Z	23	23	20	19	20	22	26	27	30	31	30	31	31	31	30	31	29	30	32	26	30	27.1	32
23-Aug	28	25	Z	25	22	18	15	14	20	20	29	32	33	30	30	31	35	39	40	37	30	26	25	22	27.2	40
24-Aug	21	20	Z	27	28	28	29	28	28	29	29	32	42	47	47	45	43	42	42	40	37	36	34	31	34.1	47
25-Aug	29	27	Z	16	15	14	15	17	20	25	29	33	38	41	42	42	43	43	41	41	40	36	33	30	30.9	43
26-Aug	27	24	Z	19	17	15	17	20	21	22	20	23	25	25	22	22	23	21	23	23	22	21	19	18	21.2	27
27-Aug	26	28	Z	28	19	18	16	18	20	22	25	27	29	31	32	33	34	34	33	33	34	33	28	25	27.2	34
28-Aug	23	19	Z	17	22	26	29	29	30	30	28	29	31	28	29	29	29	28	29	28	25	25	25	24	26.6	31
29-Aug	23	23	Z	26	24	21	15	13	17	20	25	29	32	33	34	35	34	34	30	27	30	28	28	27	26.4	35
30-Aug	25	24	Z	23	23	21	21	20	19	19	19	20	23	25	26	23	27	28	26	23	30	31	28	27	24.0	31
31-Aug	24	25	Z	24	24	29	25	19	19	26	27	28	27	29	27	27	25	20	17	13	11	11	13	14	21.8	29
	24.4	23.6	--	21.9	20.6	19.5	19.1	19.7	21.4	23.7	26.0	27.9	30.1	31.5	32.2	32.3	32.3	32.1	31.6	29.0	28.0	26.7	25.5	25.1	Diurnal Average	
	43	42	--	41	39	38	37	37	41	48	50	55	63	66	68	66	61	62	57	57	51	46	43	42	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

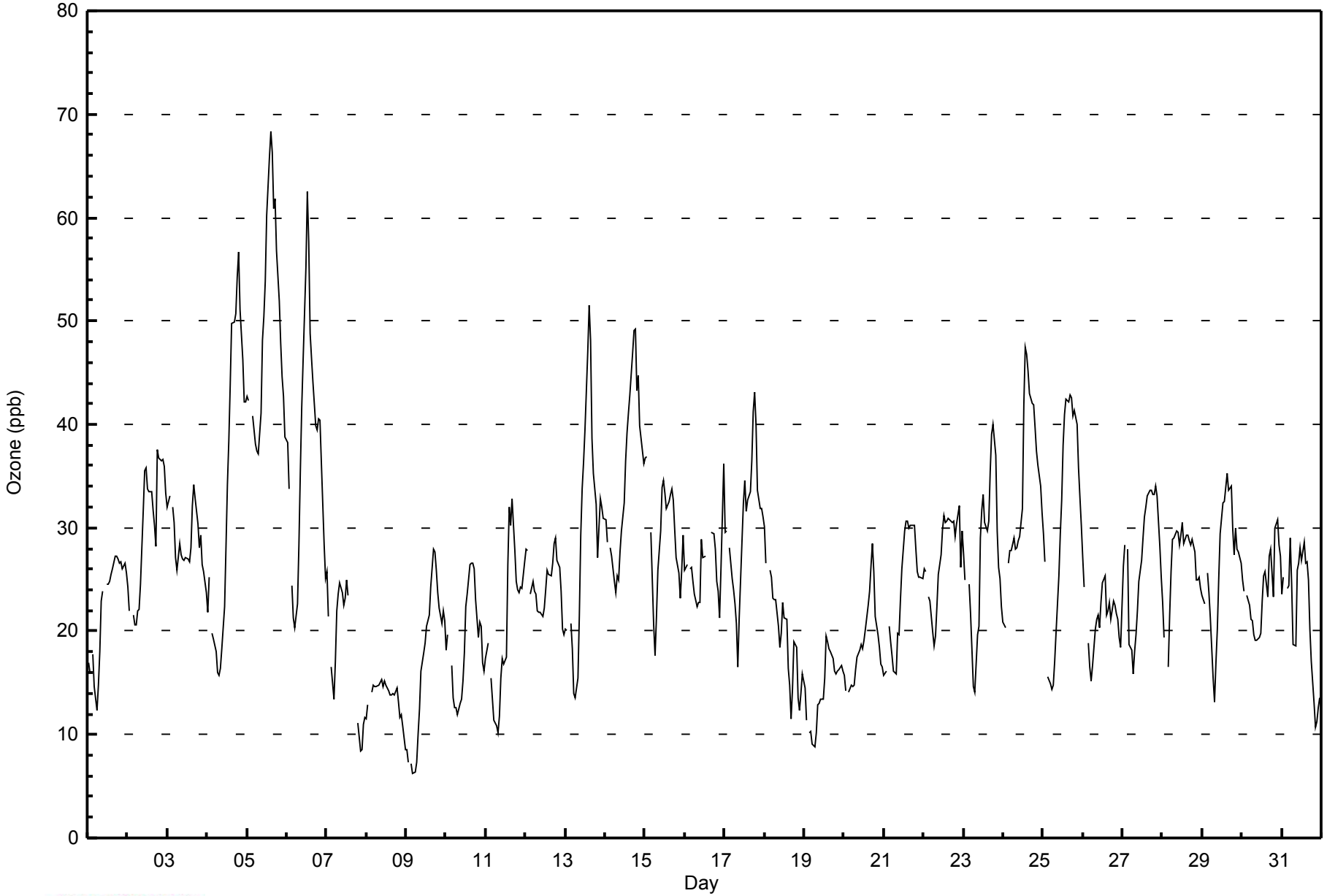
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ozone (O_3) - ppb

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	205	29.12	29.12
21 - 50	482	68.47	97.59
51 - 82	17	2.41	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

Fort Chipeywan - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	5	0	0	0	4	5	6	11	13	13	11	9	20	31	45	32	205
21 - 50	22	5	6	12	46	52	35	37	35	27	28	33	52	25	34	32	481
51 - 82	0	0	0	0	7	0	1	4	2	2	1	0	0	0	0	0	17
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	5	6	12	57	57	42	52	50	42	40	42	72	56	79	64	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

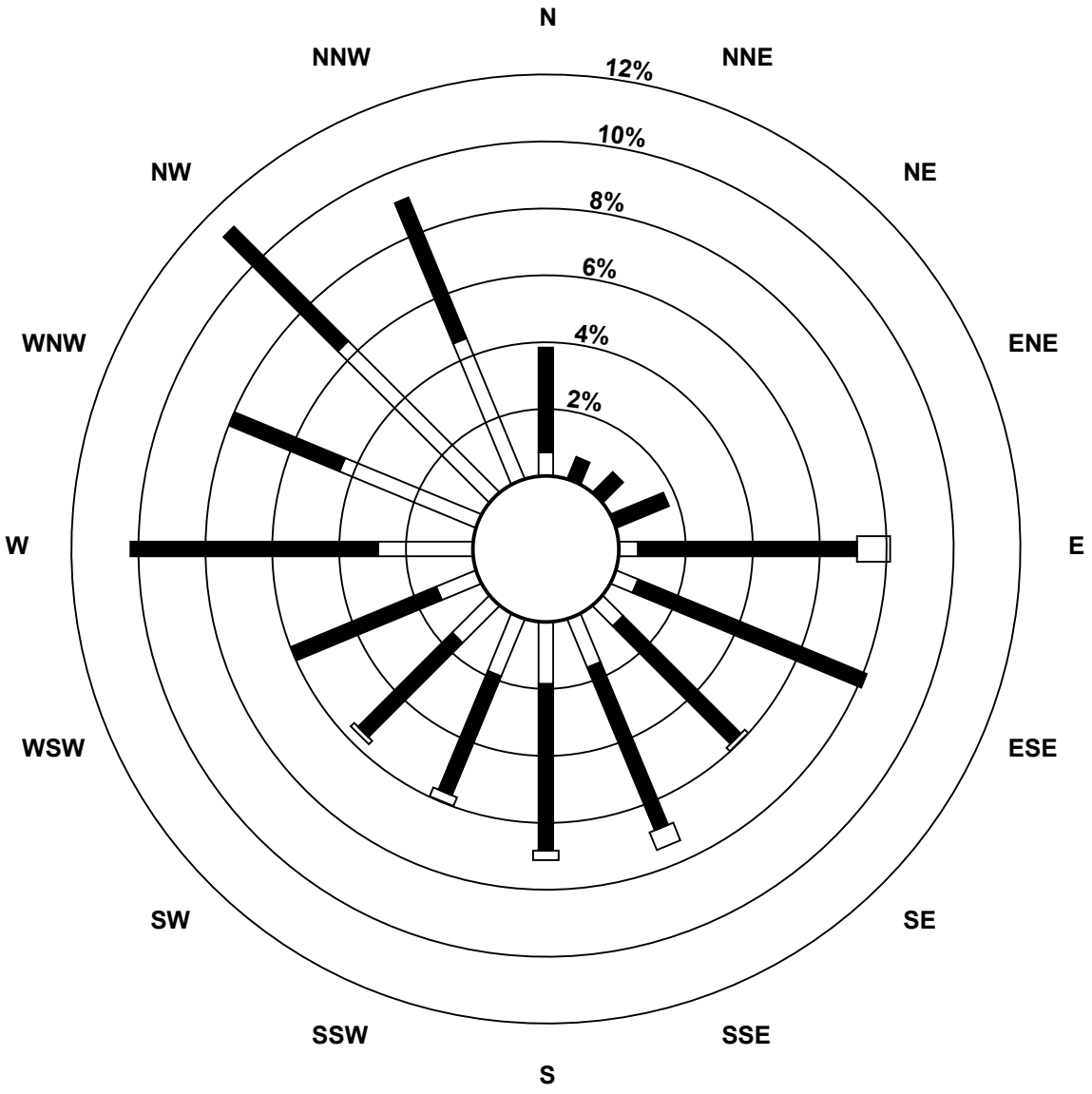
AURORA ATMOSPHERICS INC.

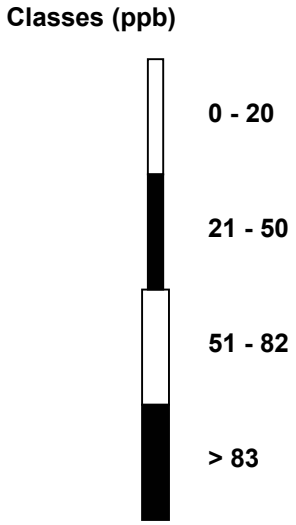
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Ozone (O_3) - ppb

Fort Chipeywan (AMS 8)





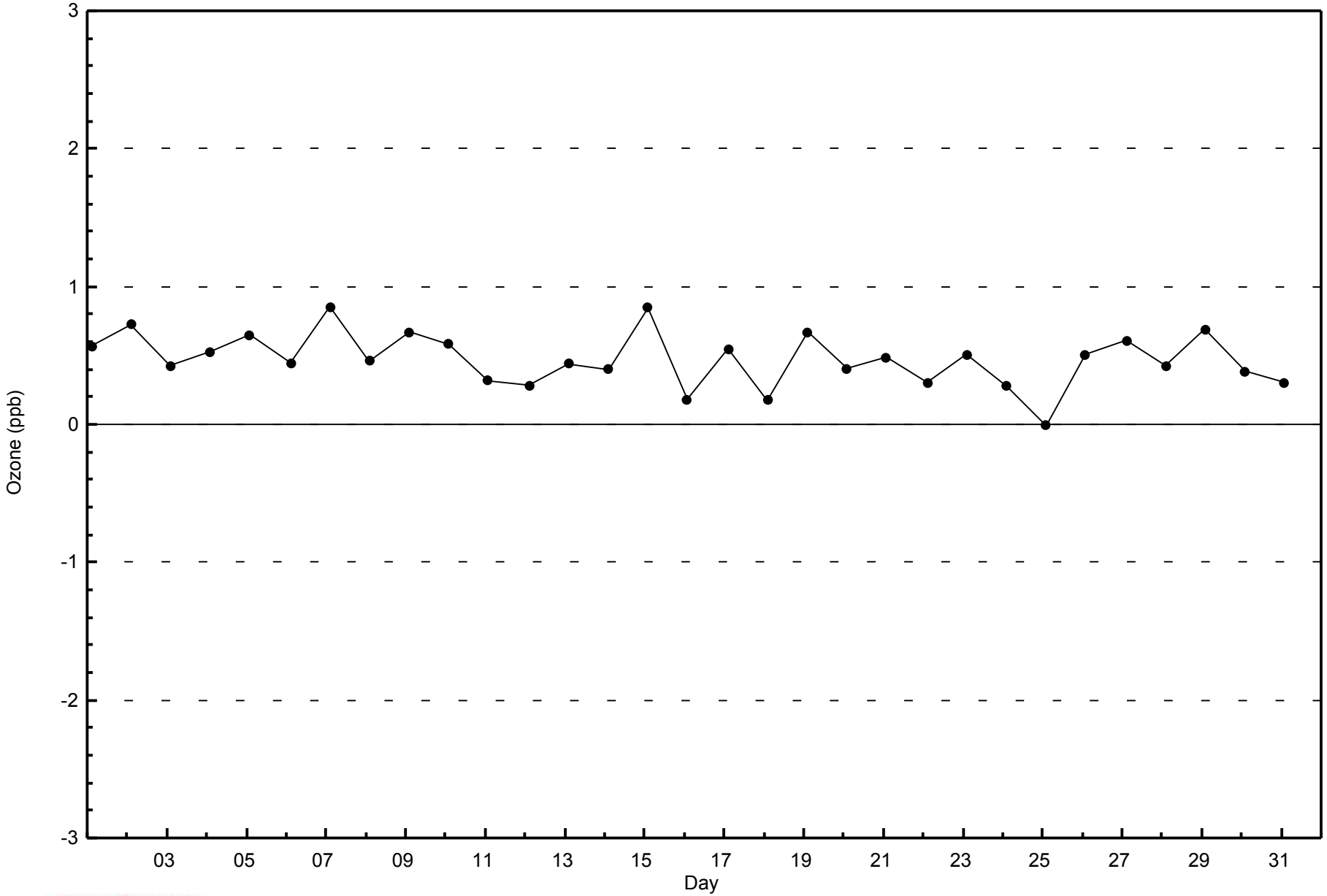
Total Number of Valid Hours: 703

WBEA

Zero Responses

Ozone (O_3) - ppb

Fort Chipeywan - August 2014



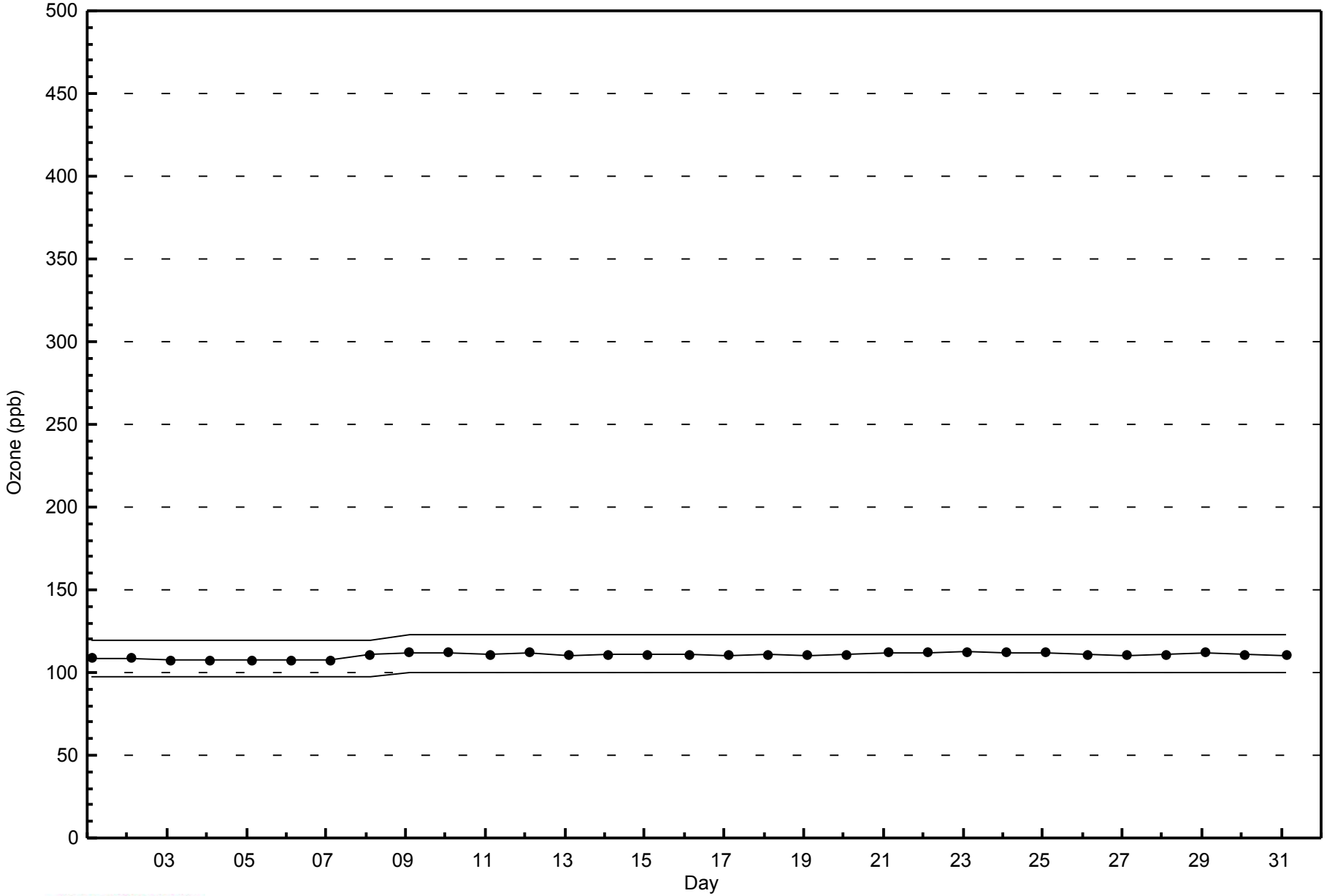
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 24-hr: 9

Maximum Value: 354.5 $\mu g/m^3$ on Aug 4 08:00

Maximum Daily Average: 206.4 $\mu g/m^3$ on Aug 4

Minimum Value: 1.0 $\mu g/m^3$ on Aug 21 14:00

Minimum Daily Average: 1.6 $\mu g/m^3$ on Aug 8

Maximum Diurnal Average: 35.6 $\mu g/m^3$ at hour 8

Minimum Diurnal Average: 17.4 $\mu g/m^3$ at hour 24

Monthly Average: 26.71 $\mu g/m^3$

Percentiles: P_1 = 1.1 P_{10} = 1.9 Q_1 = 3.4 Median = 8.2 Q_3 = 29.5 P_{90} = 70.6 P_{99} = 306.2

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-Aug	42.1	42.2	36.6	35.3	42.4	55.9	72.6	85.3	59.6	40.2	44.8	58.4	69.4	70.5	85.5	98.4	104.8	103.7	78.9	49.2	47.1	45.2	42.1	36.6	60.3	104.8
2-Aug	29.5	23.2	19.5	17.3	17.5	18.8	18.5	19.2	21.1	24.3	26.8	25.2	23.4	20.3	17.5	16.7	16.2	16.0	10.6	9.2	10.4	12.1	12.5	13.9	18.3	29.5
3-Aug	16.0	16.8	15.6	13.4	12.1	10.9	9.1	9.4	9.0	8.2	7.8	7.3	8.2	8.2	6.5	5.0	4.0	4.3	4.4	4.7	5.1	6.1	6.3	6.4	8.5	16.8
4-Aug	7.5	9.2	10.2	64.8	223.3	271.8	310.8	354.5	353.6	325.1	306.5	311.7	306.8	292.7	289.1	285.2	236.7	189.2	181.3	165.2	143.7	119.5	110.1	86.2	206.4	354.5
5-Aug	82.1	91.1	92.2	85.9	79.6	80.9	90.6	95.3	100.0	107.6	101.1	108.7	121.7	114.9	93.4	79.0	78.1	92.8	78.9	69.2	68.4	59.4	54.5	46.2	86.3	121.7
6-Aug	46.9	45.5	43.8	41.7	31.0	21.4	16.2	12.1	10.1	8.5	7.3	6.4	5.2	5.5	6.3	5.4	5.7	6.1	6.2	6.3	7.0	7.4	9.0	10.0	15.5	46.9
7-Aug	16.8	33.5	76.1	136.0	273.1	189.0	100.0	43.7	8.4	3.2	2.0	3.9	3.7	1.9	1.4	1.3	1.5	M	2.8	3.2	3.5	3.6	1.7	1.1	39.6	273.1
8-Aug	1.2	1.0	1.2	1.5	1.4	1.3	1.4	1.5	1.6	1.6	1.9	2.0	1.9	1.7	1.6	1.6	1.4	1.1	1.2	1.5	1.6	2.0	2.1	2.7	1.6	2.7
9-Aug	4.0	4.7	3.7	3.1	3.0	3.3	2.9	2.1	2.4	4.4	4.1	5.1	7.6	10.3	10.1	14.7	21.9	20.4	17.5	17.0	16.7	16.3	13.4	11.9	9.2	21.9
10-Aug	10.9	9.1	7.3	7.3	7.2	7.1	6.2	5.5	5.0	4.7	4.8	4.8	4.5	4.2	4.0	3.7	3.7	3.9	4.5	5.0	5.4	5.6	5.6	6.0	5.7	10.9
11-Aug	6.1	6.5	7.6	9.0	10.8	10.5	8.1	7.2	6.4	4.0	2.2	1.8	1.5	61.1	51.8	39.3	54.3	27.3	8.6	7.4	8.1	10.2	12.9	15.5	15.8	61.1
12-Aug	16.1	19.4	41.2	19.5	20.1	19.4	15.8	15.1	14.5	13.7	12.6	11.4	10.9	11.9	11.9	12.3	13.4	15.5	18.2	17.7	16.5	13.1	11.5	12.0	16.0	41.2
13-Aug	14.1	13.7	15.9	16.7	15.3	12.6	11.5	10.4	9.8	8.7	8.9	7.6	6.6	7.0	7.9	8.0	7.3	9.0	9.9	10.0	11.4	11.0	18.7	24.3	11.5	24.3
14-Aug	34.4	39.6	52.8	73.1	71.3	86.2	122.5	152.2	140.9	144.6	142.5	130.3	115.8	94.9	91.6	80.5	73.3	59.7	70.4	66.8	75.3	80.9	80.4	67.2	89.5	152.2
15-Aug	63.1	62.4	61.1	58.7	51.2	42.5	37.8	61.2	102.1	95.5	91.8	72.9	49.3	27.6	27.8	27.9	34.8	35.2	30.4	28.7	29.3	29.5	28.1	33.0	49.2	102.1
16-Aug	33.3	34.5	37.3	38.7	37.9	35.7	33.8	31.6	29.8	28.4	29.5	30.6	33.0	PF	61.5	62.1	64.3	54.2	53.9	52.4	50.8	20.6	24.4	32.0	39.6	64.3
17-Aug	28.3	18.8	16.4	22.1	35.8	50.9	53.8	64.1	59.7	62.8	61.1	38.8	41.8	22.0	31.3	25.2	22.8	57.0	84.2	71.3	30.5	48.9	61.3	61.0	44.6	84.2
18-Aug	62.0	53.7	50.9	47.3	38.4	53.1	75.1	63.5	63.1	50.0	39.5	31.0	32.0	29.2	29.8	30.3	29.2	26.4	21.8	13.3	9.7	8.0	6.9	6.2	36.3	75.1
19-Aug	6.7	6.7	6.3	5.5	5.2	4.4	3.5	4.1	6.1	6.6	7.2	8.6	14.5	30.3	31.1	24.5	22.1	14.2	5.2	3.3	4.9	8.1	9.9	6.2	10.2	31.1
20-Aug	4.1	2.3	1.9	1.9	1.8	1.6	1.7	1.5	1.4	1.4	1.4	1.4	1.3	1.1	1.2	1.4	2.1	3.3	1.5	1.2	1.7	2.1	2.1	2.0	1.8	4.1
21-Aug	2.3	2.7	3.1	3.9	3.7	4.5	5.2	4.7	2.6	PF	1.9	1.3	1.0	1.0	1.0	1.1	1.0	1.1	1.1	1.1	1.7	2.0	2.3	2.3	2.3	5.2
22-Aug	3.2	3.8	3.9	3.8	3.4	3.3	2.7	1.8	1.5	1.5	1.8	3.0	3.3	2.6	2.7	3.0	2.9	3.5	3.9	3.7	4.2	4.5	4.1	4.2	3.2	4.5
23-Aug	3.9	3.0	3.1	3.3	3.3	3.2	2.3	1.9	1.6	1.5	2.4	2.2	2.0	1.9	2.0	2.4	2.6	3.1	4.2	4.0	2.9	2.4	2.0	2.1	2.6	4.2
24-Aug	2.3	3.1	3.4	4.4	4.7	4.8	4.5	3.8	3.0	2.5	1.9	2.0	2.8	3.7	3.9	3.9	4.1	4.3	4.9	5.8	5.6	5.3	4.9	6.1	4.0	6.1
25-Aug	11.3	17.6	17.6	14.1	12.3	10.0	9.8	9.7	11.1	10.4	10.4	8.5	7.1	7.0	6.9	6.5	7.2	8.2	7.6	5.0	7.3	7.9	8.4	9.7	9.6	17.6
26-Aug	10.4	10.6	11.4	12.4	12.9	12.6	13.4	19.3	21.2	14.5	11.1	9.5	18.3	24.9	21.6	19.2	20.6	19.4	32.2	37.7	26.3	17.2	17.0	14.7	17.8	37.7
27-Aug	13.5	14.5	12.2	7.8	11.2	7.5	5.3	4.7	2.8	1.8	1.7	1.7	1.7	1.4	1.3	1.1	1.0	1.2	1.2	1.4	2.0	1.8	1.7	1.8	4.3	14.5
28-Aug	2.1	3.2	3.9	4.2	3.4	3.2	3.2	3.4	2.5	2.1	2.8	3.5	3.0	2.9	3.3	2.7	3.4	3.4	3.1	3.3	3.7	3.9	3.8	3.5	3.2	4.2
29-Aug	3.1	3.3	3.7	3.6	3.6	3.6	3.4	3.2	3.0	3.3	2.7	2.5	2.2	1.7	1.2	1.4	1.9	2.1	2.7	3.1	3.0	2.6	2.8	2.8	2.8	3.7
30-Aug	4.0	5.9	8.5	9.8	10.8	10.7	8.7	6.7	5.9	5.4	7.2	8.2	7.0	6.7	7.1	9.4	15.7	9.3	7.8	7.1	9.0	7.3	6.1	6.2	7.9	15.7
31-Aug	6.1	6.3	5.8	5.9	5.7	5.4	4.8	3.5	3.5	4.0	3.3	3.2	3.0	2.5	2.7	2.6	2.7	3.9	4.6	5.5	6.9	6.2	5.6	5.2	4.5	6.9
	18.9	19.6	21.7	24.9	34.0	33.7	34.0	35.6	34.3	33.0	30.7	29.5	29.4	29.1	29.5	28.2	27.8	26.6	24.6	21.9	20.0	18.4	18.5	17.4	Diurnal Average	
	82.1	91.1	92.2	136.0	273.1	271.8	310.8	354.5	353.6	325.1	306.5	311.7	306.8	292.7	289.1	285.2	236.7	189.2	181.3	165.2	143.7	119.5	110.1	86.2	Diurnal Maximum	

M - Maintenance PF - Power Failure

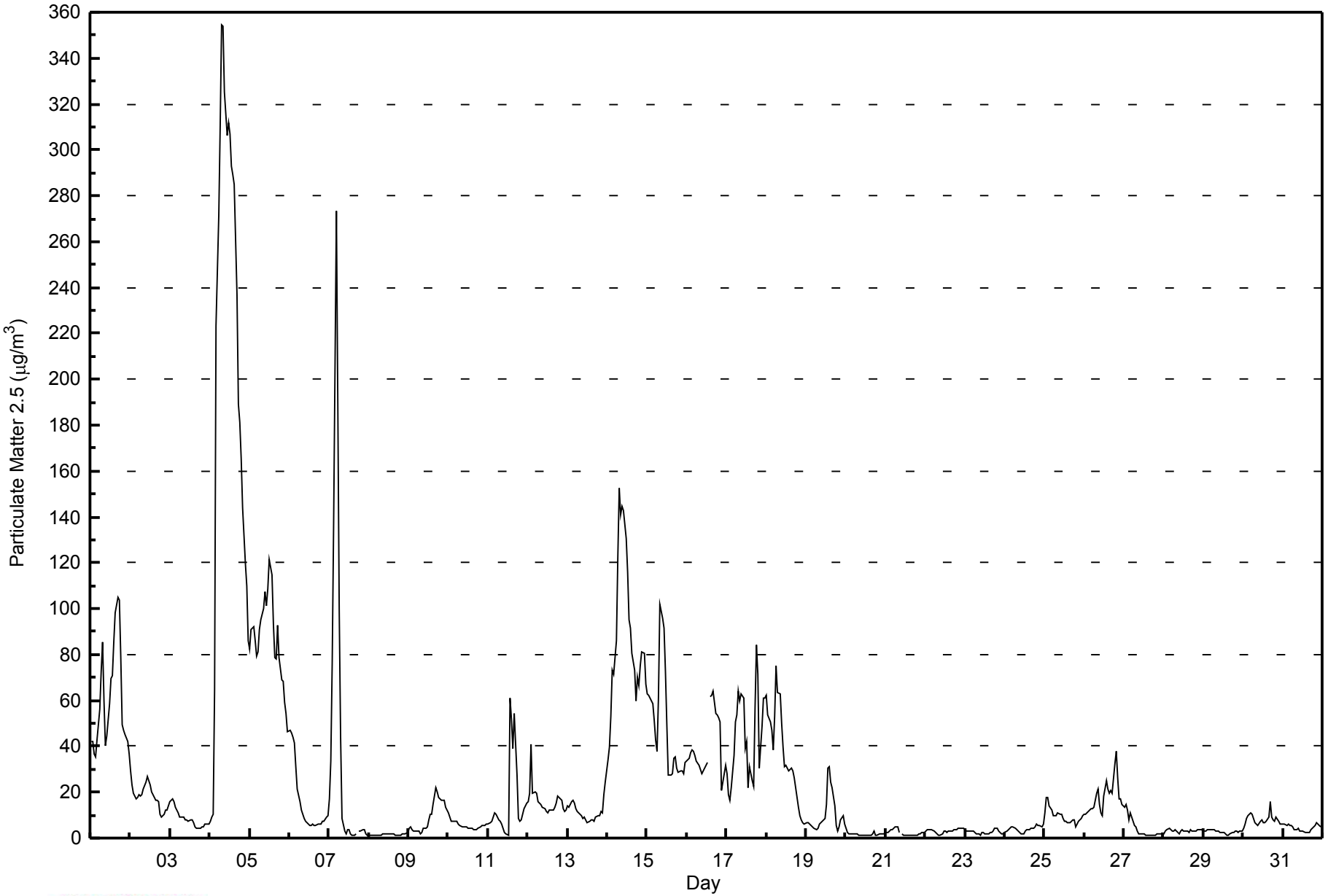
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	284	38.33	38.33
6 - 15	192	25.91	64.24
16 - 25	65	8.77	73.01
26 - 80	139	18.76	91.77
> 81.0	60	8.10	99.87

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Fort Chipeywan - August 2014

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	17	2	2	0	13	26	14	22	7	8	9	12	38	34	43	36	283
6 - 15	4	1	1	6	16	9	9	12	36	20	21	19	16	9	10	3	192
16 - 25	0	0	0	3	4	5	3	3	4	12	5	4	8	6	6	2	65
26 - 80	4	2	3	3	22	18	9	8	2	6	6	7	6	9	16	18	139
> 81.0	3	0	0	0	5	2	9	9	3	0	1	1	8	2	11	6	60
Totals	28	5	6	12	60	60	44	54	52	46	42	43	76	60	86	65	739

Total Number of Valid Hours: 740

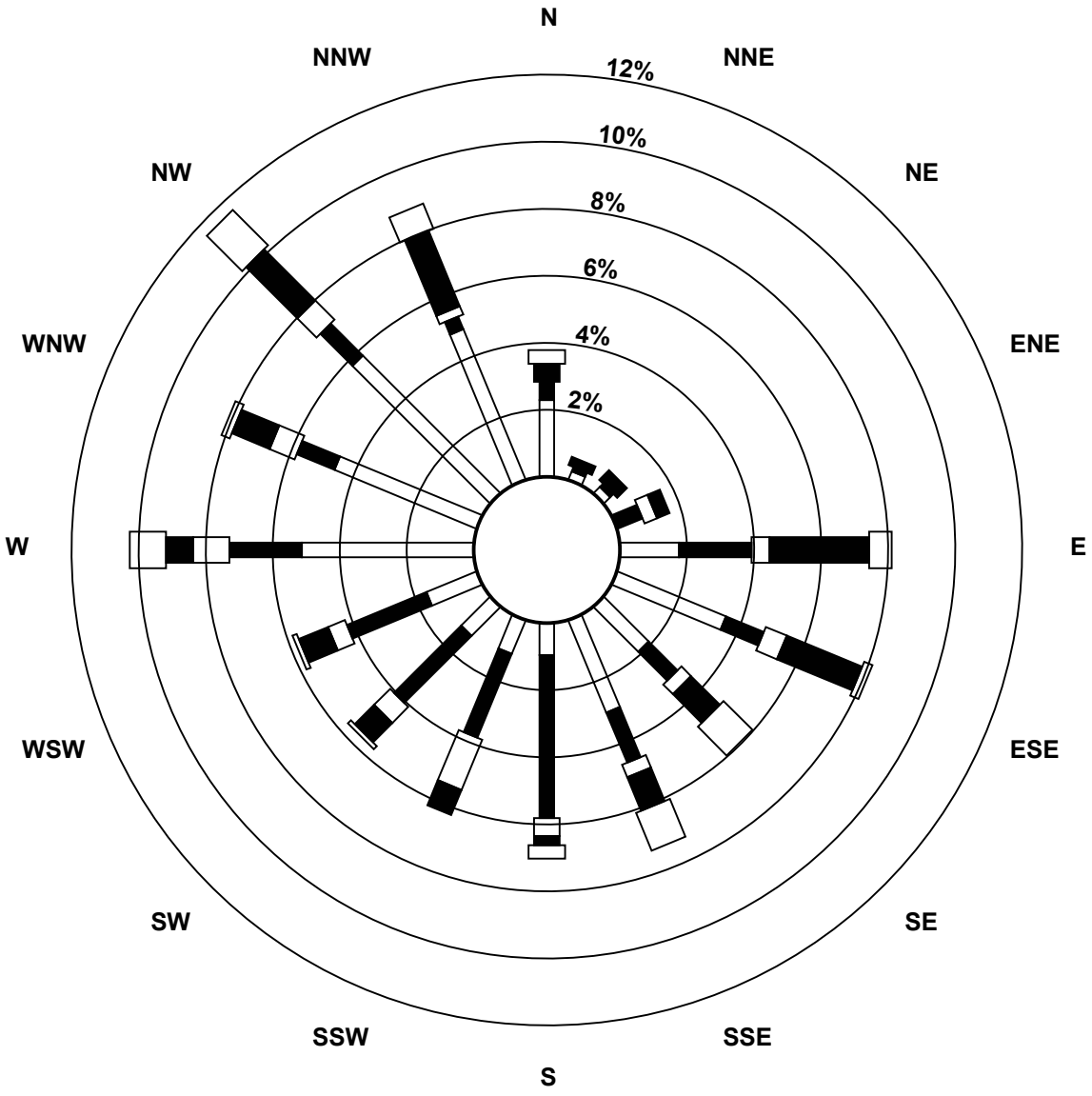
Total Number of Hours: 744

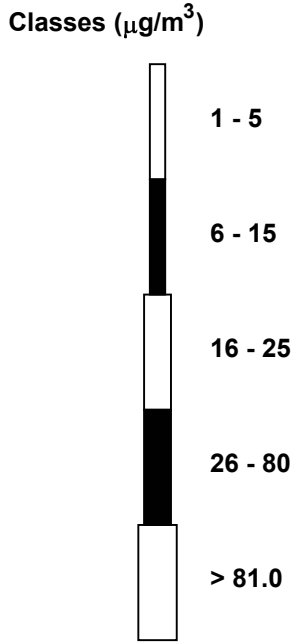
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Fort Chipeywan (AMS 8)





Total Number of Valid Hours: 740

Ambient Temperature 2m (AT 2m) - C

Fort Chipeywan - August 2014

Maximum Value: 30.5 C on Aug 13 15:00

Maximum Daily Average: 23.9 C on Aug 13

Minimum Value: 6.7 C on Aug 22 06:00

Minimum Daily Average: 9.8 C on Aug 20

Maximum Diurnal Average: 20.8 C at hour 15

Minimum Diurnal Average: 13.3 C at hour 6

Monthly Average: 17.22 C

Percentiles: P_1 = 7.6 P_{10} = 10.6 Q_1 = 13.0 Median = 17.0 Q_3 = 21.0 P_{90} = 24.2 P_{99} = 28.8

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

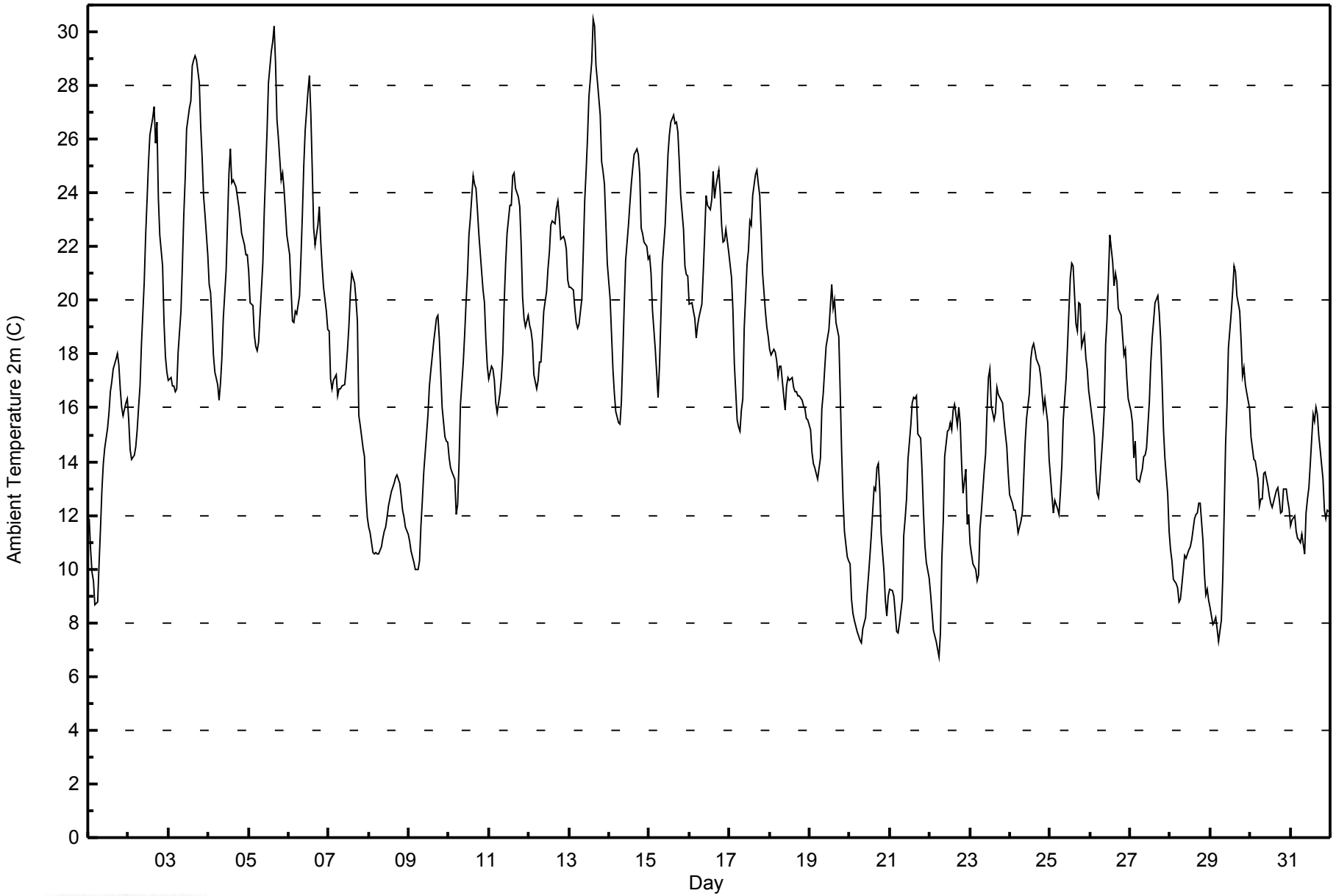
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	11.9	10.7	9.9	9.5	8.7	8.8	10.2	11.5	12.9	13.9	14.5	15.2	15.8	16.6	17.0	17.5	17.8	18.0	17.6	16.7	16.0	15.7	16.2	16.3	14.1	18.0
2-Aug	15.6	14.5	14.1	14.2	14.5	15.2	16.0	16.8	18.3	20.7	22.4	23.7	25.1	26.2	26.8	27.2	25.8	26.6	23.8	22.4	21.3	19.2	17.9	17.3	20.2	27.2
3-Aug	17.0	17.1	16.8	16.8	16.6	16.7	18.1	19.6	21.3	23.1	24.5	26.4	27.2	27.4	28.7	29.0	29.1	28.9	28.1	26.5	25.3	23.9	23.2	21.7	23.0	29.1
4-Aug	20.6	20.3	19.2	18.0	17.4	16.8	16.3	16.9	17.8	19.3	21.1	22.9	24.7	25.7	24.4	24.5	24.2	23.9	23.5	23.0	22.5	22.1	21.7	21.7	21.2	25.7
5-Aug	21.1	19.9	19.8	18.7	18.3	18.1	18.4	19.5	21.4	23.3	24.8	26.3	28.1	29.3	29.6	30.2	28.9	26.7	26.1	24.5	24.8	24.2	23.3	22.4	23.7	30.2
6-Aug	21.7	20.5	19.2	19.2	19.6	19.5	20.2	21.6	23.1	25.0	26.3	27.8	28.4	26.9	24.9	22.7	22.1	22.8	23.5	22.2	21.3	20.5	19.6	18.9	22.4	28.4
7-Aug	18.8	17.1	16.7	17.0	17.2	16.4	16.7	16.7	16.8	16.9	17.5	18.2	19.1	20.3	21.0	20.6	20.0	19.3	15.7	15.4	14.5	14.2	12.8	11.9	17.1	21.0
8-Aug	11.6	11.3	10.6	10.6	10.6	10.5	10.6	10.8	11.1	11.4	11.6	11.9	12.3	12.9	13.0	13.2	13.4	13.5	13.2	12.7	12.2	11.9	11.5	11.3	11.8	13.5
9-Aug	11.0	10.7	10.5	10.2	10.0	10.0	10.3	11.6	12.6	13.6	15.0	15.7	16.8	17.4	17.9	18.5	19.3	19.4	18.6	17.4	16.0	14.9	14.8	14.7	14.5	19.4
10-Aug	14.2	13.8	13.6	13.4	12.0	12.4	14.0	16.1	17.7	18.7	20.0	21.0	22.5	23.1	24.6	24.3	24.2	23.4	22.5	21.1	20.4	19.9	18.5	17.6	18.7	24.6
11-Aug	17.1	17.5	17.5	17.0	16.2	15.8	16.5	17.1	18.0	20.0	21.4	22.5	23.5	23.6	24.7	24.7	24.2	23.9	23.5	22.1	20.1	19.3	19.0	19.4	20.2	24.7
12-Aug	19.1	18.8	18.4	17.2	16.7	17.0	17.7	17.7	18.6	19.6	20.3	21.2	21.8	22.8	23.0	22.9	23.4	23.7	23.1	22.3	22.4	22.2	21.9	20.7	20.5	23.7
13-Aug	20.5	20.5	20.4	19.7	19.2	19.0	19.1	20.1	21.8	23.7	24.8	26.1	27.6	28.9	30.5	30.2	28.7	28.2	26.9	25.2	24.8	24.3	22.8	21.4	23.9	30.5
14-Aug	20.1	18.7	17.4	16.6	15.8	15.4	15.4	16.2	18.0	19.8	21.5	22.8	23.6	24.3	24.9	25.4	25.6	25.5	24.7	22.7	22.5	22.1	22.0	21.5	20.9	25.6
15-Aug	21.6	21.0	19.6	18.2	17.3	16.4	17.6	19.5	21.4	22.8	24.1	25.5	26.2	26.6	26.9	26.6	26.6	26.3	25.1	23.9	22.7	21.3	21.0	20.9	22.5	26.9
16-Aug	19.9	19.9	19.6	19.3	18.6	19.1	19.4	19.8	21.1	22.5	23.9	23.6	23.4	23.8	24.8	23.8	24.3	24.9	24.0	22.8	22.2	22.2	22.7	21.8	22.0	24.9
17-Aug	21.3	20.9	19.6	17.6	15.6	15.3	15.1	15.9	16.3	18.9	21.3	21.8	23.0	22.8	23.9	24.7	24.8	24.3	23.9	22.6	21.0	19.6	19.0	18.7	20.3	24.8
18-Aug	18.2	18.0	18.2	18.1	17.8	17.2	17.6	17.6	16.5	15.9	16.8	17.1	17.0	17.1	16.8	16.6	16.6	16.5	16.4	16.3	16.1	16.0	15.6	15.6	16.9	18.2
19-Aug	15.2	14.3	13.9	13.7	13.6	13.3	14.1	16.0	16.5	17.5	18.3	18.9	19.8	20.6	19.7	20.0	19.2	18.6	16.6	14.4	12.6	11.4	10.4	10.3	15.8	20.6
20-Aug	10.2	8.9	8.4	8.1	7.7	7.5	7.3	7.2	7.8	8.2	9.0	9.7	10.4	11.2	13.0	12.9	13.8	13.9	13.0	11.3	9.9	8.8	8.2	9.0	9.8	13.9
21-Aug	9.3	9.2	9.0	8.4	7.7	7.6	8.0	8.9	11.2	11.9	12.6	14.1	15.3	16.2	16.4	16.3	16.4	15.0	14.9	13.6	12.1	10.9	10.2	9.7	11.9	16.4
22-Aug	9.1	8.4	7.7	7.5	7.3	6.7	7.6	10.4	11.8	14.2	15.1	15.2	15.4	15.2	15.9	16.1	15.4	16.0	15.4	13.9	12.8	13.7	11.7	12.0	12.3	16.1
23-Aug	10.9	10.6	10.2	10.0	9.6	9.8	11.5	12.2	13.7	14.3	15.8	17.1	17.4	16.1	15.6	15.8	16.7	16.5	16.4	16.2	15.5	15.0	14.6	13.6	14.0	17.4
24-Aug	12.8	12.5	12.2	12.2	11.8	11.4	11.8	12.1	13.4	14.7	15.6	16.6	17.8	18.2	18.4	18.1	17.8	17.6	17.2	16.6	15.9	16.3	15.5	14.1	15.0	18.4
25-Aug	13.4	12.7	12.1	12.6	12.3	12.0	12.9	13.9	15.6	17.1	18.3	19.6	20.9	21.4	21.3	19.1	18.9	19.9	19.9	18.3	18.7	17.8	17.4	16.7	16.8	21.4
26-Aug	16.2	15.8	14.9	13.6	12.8	12.7	13.3	14.9	15.9	18.4	19.3	20.8	22.4	21.4	20.5	21.0	20.7	19.7	19.4	18.7	17.9	18.2	17.2	16.3	17.6	22.4
27-Aug	15.8	15.4	14.2	14.8	13.4	13.2	13.5	13.7	14.2	14.2	14.5	16.3	17.7	18.6	19.2	19.9	20.2	19.6	18.6	17.0	15.2	14.1	12.8	11.4	15.7	20.2
28-Aug	10.7	10.3	9.6	9.5	9.3	8.8	8.9	9.4	10.5	10.4	10.6	10.7	10.8	11.1	11.9	12.1	12.1	12.4	12.4	11.0	9.8	9.1	9.2	8.8	10.4	12.4
29-Aug	8.6	8.0	8.1	8.2	7.8	7.3	8.1	9.7	12.1	14.6	16.1	18.2	19.5	20.3	21.3	21.1	20.2	19.6	18.5	17.2	17.5	16.9	16.6	16.0	14.6	21.3
30-Aug	14.9	14.5	14.1	14.0	13.4	12.3	12.6	12.6	13.6	13.6	13.1	12.7	12.4	12.3	12.5	12.9	13.0	12.6	12.1	12.1	13.0	13.0	12.6	12.3	13.0	14.9
31-Aug	11.6	11.8	12.0	11.4	11.1	11.1	11.0	11.3	10.5	12.1	12.6	13.0	13.9	15.8	15.5	16.0	15.7	15.0	14.4	13.3	12.2	11.9	12.2	12.2	12.8	16.0
	15.5	15.0	14.4	14.0	13.5	13.3	13.9	14.8	15.9	17.1	18.2	19.1	20.0	20.5	20.8	20.8	20.6	20.4	19.6	18.5	17.7	17.1	16.5	16.0	Diurnal Average	
	21.7	21.0	20.4	19.7	19.6	19.5	20.2	21.6	23.1	25.0	26.3	27.8	28.4	29.3	30.5	30.2	29.1	28.9	28.1	26.5	25.3	24.3	23.3	22.4	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	57	7.66	7.66
10 - 20	472	63.44	71.10
> 20	215	28.90	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 98 % on Aug 19 06:00

Maximum Daily Average: 87.0 % on Aug 31

Minimum Value: 27 % on Aug 3 17:00

Minimum Daily Average: 53.8 % on Aug 17

Maximum Diurnal Average: 81.3 % at hour 6

Minimum Diurnal Average: 52.5 % at hour 15

Monthly Average: 66.9 %

Percentiles: P_1 = 33 P_{10} = 44 Q_1 = 56 Median = 67 Q_3 = 78 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

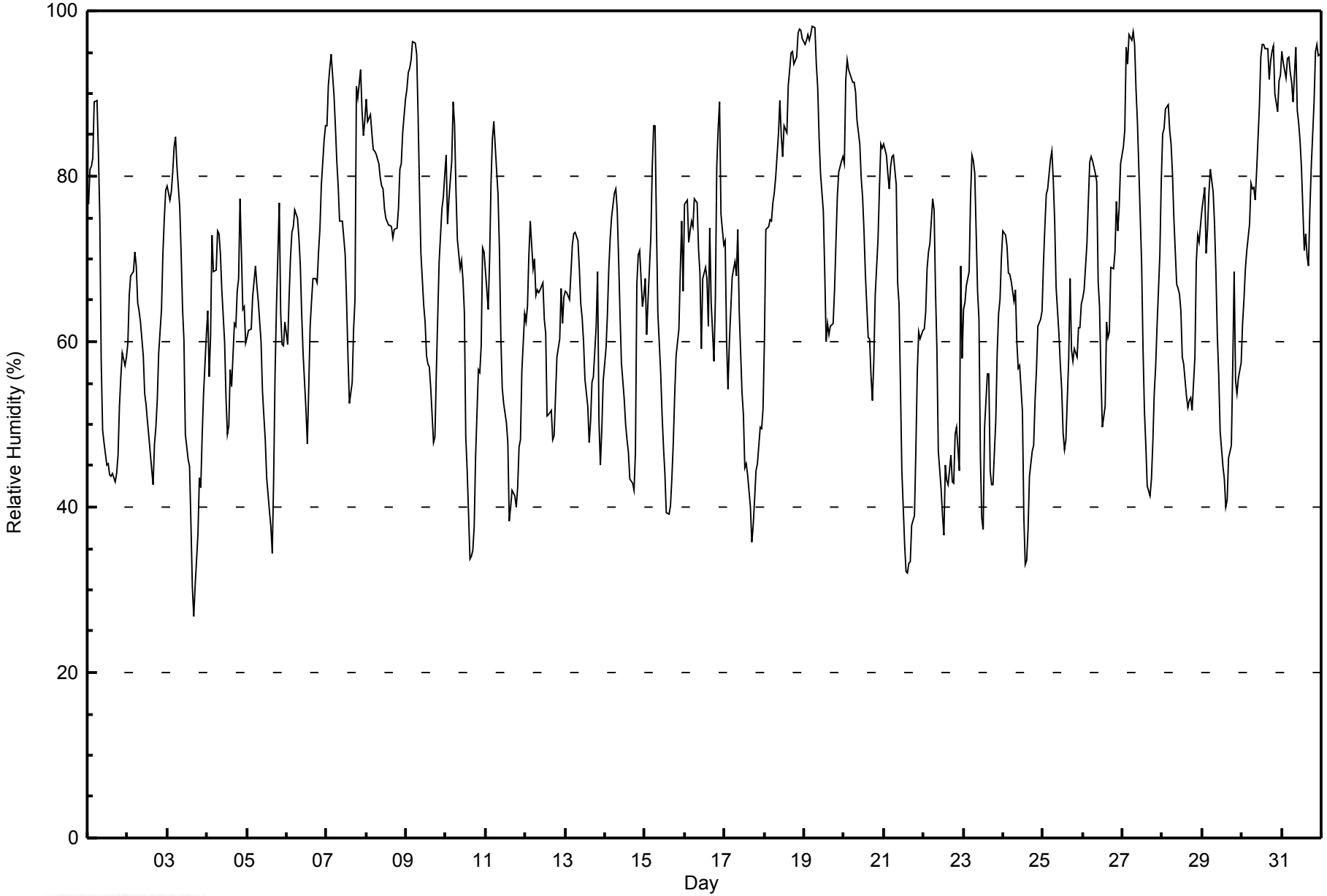
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	77	81	81	82	89	89	83	75	58	49	48	45	45	44	44	44	43	44	46	52	56	59	57	58	60.4	89
2-Aug	60	66	68	69	71	69	65	64	62	58	54	52	50	48	45	43	48	50	53	59	64	71	75	78	60.0	78
3-Aug	79	77	78	81	84	85	81	76	71	64	60	49	46	45	38	30	27	30	37	44	42	49	54	61	57.8	85
4-Aug	64	56	61	73	68	69	73	73	71	66	60	53	49	50	57	55	62	62	66	68	77	64	64	60	63.3	77
5-Aug	61	61	62	65	67	69	67	65	60	54	51	48	44	40	38	34	44	56	64	77	63	60	59	62	57.1	77
6-Aug	60	65	70	73	74	76	75	73	69	63	58	52	48	54	62	65	68	68	67	71	74	79	84	86	68.1	86
7-Aug	86	91	93	95	90	86	82	79	75	75	73	70	65	58	53	55	62	65	91	90	93	88	85	87	78.5	95
8-Aug	89	87	87	85	83	83	83	81	80	79	78	76	75	74	74	74	73	74	74	76	81	82	85	89	80.1	89
9-Aug	90	93	93	94	96	96	95	87	78	71	64	62	58	57	57	54	48	49	56	63	70	76	77	80	73.6	96
10-Aug	83	74	77	82	89	86	78	72	69	70	68	64	48	44	34	34	35	38	46	57	56	59	71	71	62.7	89
11-Aug	69	64	70	79	85	87	81	78	71	61	54	53	50	48	38	40	42	41	40	42	47	48	56	63	58.7	87
12-Aug	62	64	71	74	69	70	66	66	66	66	67	63	61	51	51	52	48	49	53	58	60	66	62	65	61.7	74
13-Aug	66	66	65	68	72	73	73	72	69	65	63	60	55	52	48	50	55	56	62	68	50	45	49	55	60.8	73
14-Aug	59	63	69	73	75	78	78	76	70	63	57	53	50	48	47	43	43	42	47	67	71	71	64	66	61.4	78
15-Aug	68	61	65	73	81	86	86	74	63	56	51	47	44	39	39	40	44	48	54	58	61	69	75	66	60.4	86
16-Aug	77	77	72	73	75	74	77	77	71	68	59	68	69	68	62	74	65	58	65	81	86	89	75	72	72.1	89
17-Aug	72	60	54	60	68	69	70	68	73	64	54	51	45	45	44	40	36	38	41	44	45	50	49	52	53.8	73
18-Aug	60	74	74	75	75	77	78	80	85	89	85	82	86	85	91	93	95	95	94	94	97	98	98	97	85.7	98
19-Aug	96	96	97	96	97	98	98	94	91	85	80	76	68	60	62	61	62	62	66	72	78	81	82	82	80.8	98
20-Aug	81	92	94	93	92	91	91	90	87	84	80	78	73	68	61	60	56	53	58	66	72	78	84	83	77.7	94
21-Aug	84	82	80	79	81	82	83	79	67	65	55	44	35	32	32	33	33	38	39	47	56	61	60	61	58.8	84
22-Aug	62	64	69	71	72	77	76	66	59	47	42	39	37	45	43	43	46	43	43	49	50	44	69	58	54.7	77
23-Aug	64	65	67	69	78	83	82	80	66	63	46	39	37	50	56	56	44	43	43	50	59	63	65	70	59.9	83
24-Aug	73	73	72	68	68	67	65	66	60	57	57	52	39	33	34	37	44	47	47	53	57	62	63	64	56.5	73
25-Aug	69	74	78	79	82	83	79	75	67	61	57	54	49	47	48	58	68	59	58	59	58	62	62	65	64.6	83
26-Aug	65	66	72	77	82	82	82	80	79	67	64	56	50	52	62	61	61	69	69	71	77	73	76	81	69.8	82
27-Aug	83	86	96	94	97	96	97	96	91	87	81	70	59	52	47	43	41	43	48	54	57	62	71	79	72.0	97
28-Aug	85	86	88	89	86	84	80	75	67	66	66	64	58	57	53	52	53	53	52	58	70	73	72	74	69.2	89
29-Aug	76	79	71	74	78	81	78	74	68	61	56	49	45	43	40	41	46	47	57	68	55	54	56	57	60.6	81
30-Aug	62	65	69	71	74	79	78	79	77	81	88	94	96	96	95	96	92	94	95	96	90	88	92	92	85.0	96
31-Aug	95	94	92	94	94	93	91	89	96	88	86	84	81	71	73	70	69	76	81	89	95	96	95	95	87.0	96
	73.4	74.2	75.9	78.2	80.3	81.3	79.7	76.7	72.1	67.5	63.4	59.6	55.3	53.5	52.5	52.6	53.2	54.4	58.4	64.6	66.7	68.4	70.6	72.0	Diurnal Average	
	96	96	97	96	97	98	98	96	96	89	88	94	96	96	95	96	95	95	95	96	97	98	98	97	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Fort Chipeywan - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	32	4.30	4.30
40 - 60	218	29.30	33.60
60 - 80	324	43.55	77.15
80 - 100	170	22.85	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 7.1 mm on Aug 27 03:00

Maximum Daily Total: 7.6 mm on Aug 27

Minimum Value: 0.0 mm on Aug 1 01:00

Minimum Daily Total: 0.0 mm on Aug 1

Maximum Diurnal Total: 9.9 mm at hour 3

Minimum Diurnal Total: 0.0 mm at hour 1

Monthly Total: 18.03 mm

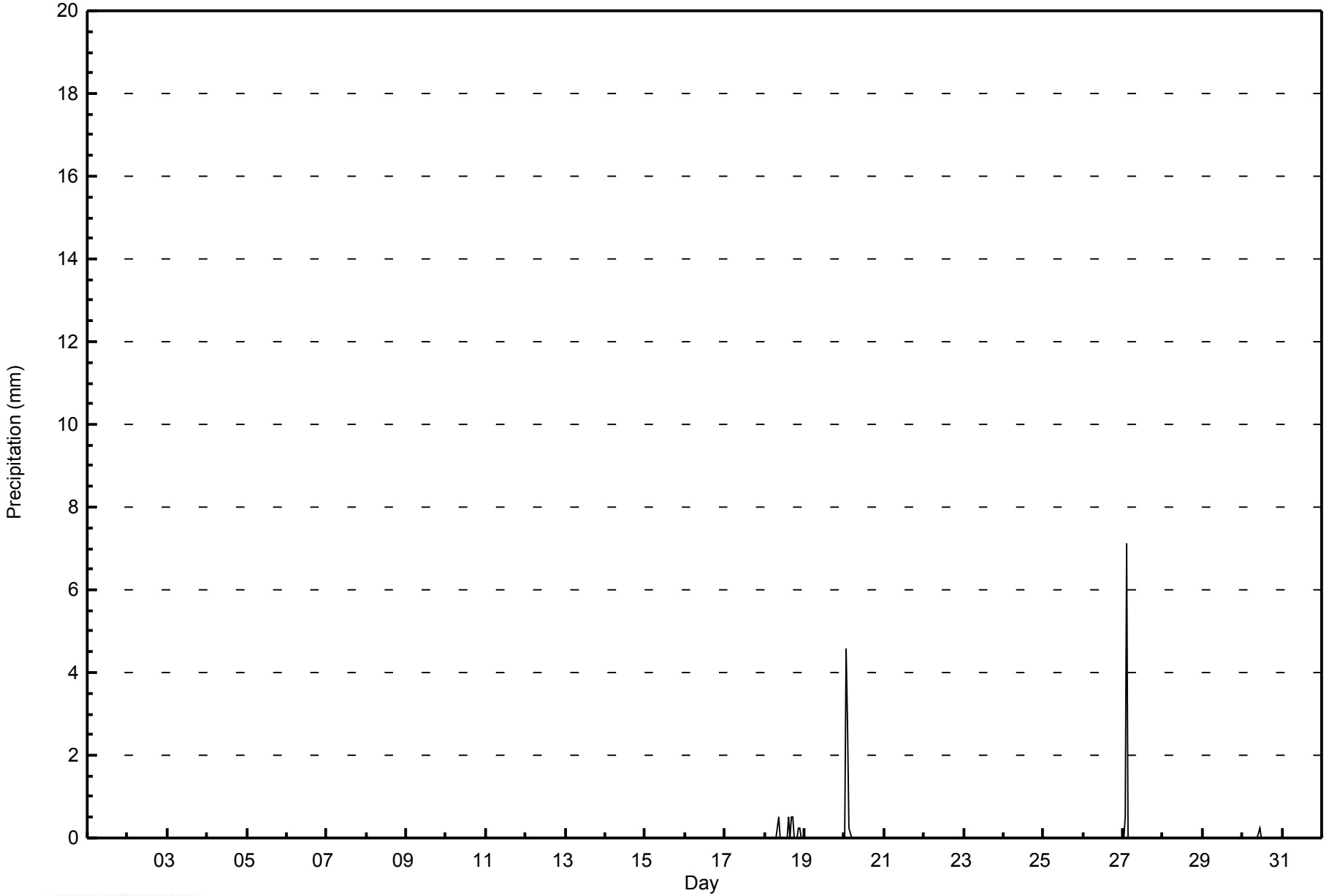
Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.5

Hours in Service:	744
Hours of Data:	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	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	0.5	0.0	0.5	0.5	0.0	0.0	0.3	0.3	0.0	0.0	2.5	0.5
19-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	4.6	2.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	4.6
21-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.5	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	7.1
28-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	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	0.0	0.0	0.0	0.3	0.3
31-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	9.9	0.3	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.0	0.3	0.3	0.0	0.0	Diurnal Average	
	0.0	4.6	7.1	0.3	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.0	0.3	0.3	0.0	0.0	Diurnal Maximum	

Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort Chipeywan - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	736	98.92	98.92
0.4 - 0.5	5	0.67	99.60
0.6 - 0.7	0	0.00	99.60
0.8 - 1.4	0	0.00	99.60
1.5 - 10	3	0.40	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 820 W/m2 on Aug 3 13:00

Maximum Daily Average: 316.0 W/m2 on Aug 3

Minimum Value: 0 W/m2 on Aug 3 01:00

Minimum Daily Average: 45.1 W/m2 on Aug 18

Maximum Diurnal Average: 600.3 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 2

Monthly Average: 208.9 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 80 $Q_3 = 391$ $P_{90} = 625$ $P_{99} = 789$

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

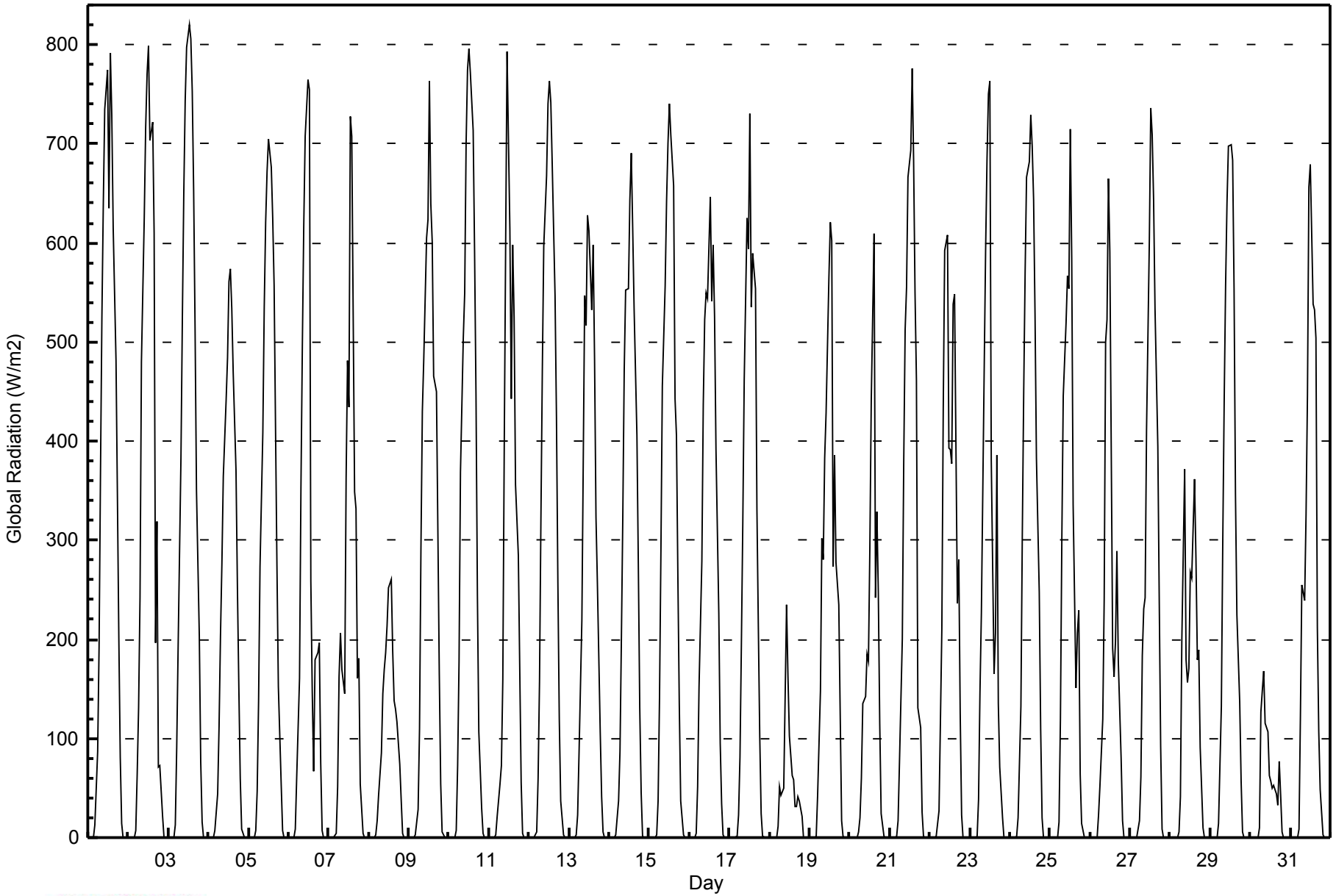
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	0	0	0	13	87	192	367	525	639	735	775	636	792	730	615	482	343	201	81	14	1	0	0	301.1	792
2-Aug	0	0	0	0	7	64	131	242	480	625	716	771	799	703	722	609	197	319	71	73	21	1	0	0	272.9	799
3-Aug	0	0	0	0	12	91	193	383	524	649	743	797	820	806	753	652	514	351	203	76	16	0	0	0	316.0	820
4-Aug	0	0	0	0	7	44	112	203	276	365	441	483	561	574	534	469	370	253	153	60	9	0	0	0	204.8	574
5-Aug	0	0	0	0	7	47	138	273	409	536	621	672	704	676	625	557	412	274	152	54	7	0	0	0	256.9	704
6-Aug	0	0	0	0	8	61	161	354	497	619	708	764	755	259	147	67	180	186	196	75	7	0	0	0	210.2	764
7-Aug	0	0	0	0	5	51	162	206	170	145	363	481	435	728	708	349	332	161	181	54	4	0	0	0	189.0	728
8-Aug	0	0	0	0	3	17	43	86	145	170	186	214	252	261	188	138	130	117	74	38	5	0	0	0	86.1	261
9-Aug	0	0	0	0	2	29	109	291	431	482	605	624	763	639	600	465	450	310	165	55	6	0	0	0	251.1	763
10-Aug	0	0	0	0	7	73	178	369	505	549	700	774	795	771	713	591	447	244	107	30	4	0	0	0	285.8	795
11-Aug	0	0	0	0	3	21	54	73	159	391	596	794	614	443	598	526	356	284	169	55	5	0	0	0	214.2	794
12-Aug	0	0	0	0	5	60	159	323	472	596	668	740	763	741	679	546	424	258	120	36	3	0	0	0	274.8	763
13-Aug	0	0	0	0	3	22	86	220	382	546	517	627	613	532	598	481	323	257	106	41	5	0	0	0	223.3	627
14-Aug	0	0	0	0	3	38	87	200	324	471	553	553	644	691	615	534	406	275	131	45	1	0	0	0	232.1	691
15-Aug	0	0	0	0	3	37	141	288	456	557	642	701	741	708	657	443	406	265	135	37	3	0	0	0	259.2	741
16-Aug	0	0	0	0	4	52	153	278	436	522	550	544	647	541	598	525	392	226	96	34	3	0	0	0	233.4	647
17-Aug	0	0	0	0	2	23	81	195	318	461	625	594	731	535	589	553	332	214	102	25	1	0	0	0	224.3	731
18-Aug	0	0	0	0	0	12	51	43	50	143	235	162	103	63	58	31	31	42	37	21	1	0	0	0	45.1	235
19-Aug	0	0	0	0	1	43	148	302	280	383	429	565	621	602	273	386	278	235	123	17	1	0	0	0	195.4	621
20-Aug	0	0	0	0	0	6	20	60	135	142	185	177	291	442	609	243	328	246	115	24	1	0	0	0	126.0	609
21-Aug	0	0	0	0	1	16	77	201	379	512	556	666	694	776	684	549	461	131	111	26	1	0	0	0	243.4	776
22-Aug	0	0	0	0	1	26	118	210	434	592	608	392	391	377	539	548	236	280	126	23	1	0	0	0	204.3	608
23-Aug	0	0	0	0	1	39	147	226	472	592	685	751	764	381	165	207	386	135	71	20	1	0	0	0	210.1	764
24-Aug	0	0	0	0	1	20	132	306	451	571	666	681	729	698	643	528	384	248	110	20	0	0	0	0	257.9	729
25-Aug	0	0	0	0	0	15	119	302	446	520	566	553	715	586	336	151	207	230	65	15	0	0	0	0	201.1	715
26-Aug	0	0	0	0	0	23	52	119	240	499	523	665	591	190	162	197	289	178	80	17	0	0	0	0	159.5	665
27-Aug	0	0	0	0	0	16	61	183	231	242	412	604	736	709	644	534	394	239	93	8	0	0	0	0	212.7	736
28-Aug	0	0	0	0	0	6	42	199	371	179	156	171	268	262	361	281	180	189	91	10	0	0	0	0	115.2	371
29-Aug	0	0	0	0	1	14	132	299	440	556	641	698	700	683	554	345	225	136	57	6	0	0	0	0	228.7	700
30-Aug	0	0	0	0	0	9	127	148	168	116	106	62	57	50	53	45	32	77	43	6	0	0	0	0	45.9	168
31-Aug	0	0	0	0	0	8	123	254	239	326	447	656	679	538	532	504	211	107	48	3	0	0	0	0	194.9	679
	0.1	0.0	0.1	0.1	3.2	34.6	113.8	232.5	349.8	441.8	522.1	571.4	600.3	540.6	505.4	408.7	316.0	219.7	113.9	35.0	3.9	0.1	0.1	0.1	Diurnal Average	
	0	0	0	0	13	91	193	383	525	649	743	797	820	806	753	652	514	351	203	81	21	1	0	0	Diurnal Maximum	

WBEA

Hourly Averages

Global Radiation (GR) - W/m2

Fort Chipeywan - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	300	40.32	40.32
21 - 100	82	11.02	51.34
101 - 300	138	18.55	69.89
301 - 600	135	18.15	88.04
601 - 900	89	11.96	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 Chipeywan - August 2014

Maximum Speed: 27 km/h on Aug 7 15:00

Maximum Daily Speed Average: 17.0 km/h on Aug 25

Minimum Speed Value: 0 km/h on Aug 15 21:00

Minimum Daily Speed Average: 1.7 km/h on Aug 31

Maximum Diurnal Speed Average: 4.0 km/h at hour 13

Minimum Diurnal Speed Average: 0.8 km/h at hour 18

Monthly Average Velocity: 2.1 km/h 215.6 deg

Percentiles: P_1 = 1 P_{10} = 5 Q_1 = 7 Median = 10 Q_3 = 14 P_{90} = 18 P_{99} = 25

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNW7	NNW5	N7	NNW6	NW6	NW6	NNW6	NNW7	NW7	NNW6	NW7	WNW9	WNW7	W7	WNW7	W5	SW6	S6	SSW6	S10	SSE11	SSE10	SE15	SE17	W1.9	SE17
2-Aug	SSE19	SSE20	SSE18	SSE20	S17	S13	SSW18	SSW21	SSW20	SSW20	SSW17	SSW14	SW13	SW12	SW13	WSW10	W7	SSW4	SW11	SSW11	SSW15	SW11	SW11	SW10	SSW12.6	SSW21
3-Aug	SW7	SW7	WSW8	WSW8	WSW9	WSW5	WSW7	W11	W9	WSW8	SSW10	SW12	SW14	WSW12	W9	W10	W11	WSW9	WSW6	SW5	SSW3	ESE2	SE2	SSW3	WSW7.1	SW14
4-Aug	SW7	WSW7	W6	NNW11	N15	N14	NW7	NW8	NW6	NW6	NW5	NNW5	NW1	S5	SE8	SE8	ESE11	E11	E8	E10	E13	SSE11	SE14	SE19	E1.8	SE19
5-Aug	SE19	SE17	SE19	SSE15	SE13	SE15	SE14	SE9	SSE9	SSE9	SSE11	SSE10	SSE12	S12	SSE14	SSE14	SE11	E15	E15	E12	E6	E7	E7	E9	SE11.1	SE19
6-Aug	SE5	SSW11	SW11	SW7	SSW14	SSW13	SSW13	SSW15	S17	S15	S16	SSW20	SSW25	S24	SW18	SW15	SSW11	WSW5	S7	S10	E1	S2	WSW7	WNW5	SSW11.0	SSW25
7-Aug	NW9	W8	WNW10	W12	W15	W19	W17	W21	WSW23	WSW22	W24	W24	W25	W26	W27	W19	NW12	NW10	NW11	WNW9	W5	WNW11	WNW16	WNW16	W15.5	W27
8-Aug	WNW14	WNW16	WNW14	WNW17	WNW16	WNW16	WNW15	WNW15	WNW16	WNW15	WNW13	WNW12	WNW10	WNW8	WNW6	NW5	NW5	NNW6	N6	NW2	NNW5	NNW7	NW7	NW7	WNW10.0	WNW17
9-Aug	NNW7	NNW7	NNW7	NNW8	NNW6	NNW8	NNW6	NNW8	NW11	NNW10	NW10	NW12	WNW13	WNW13	W12	W12	WNW12	WNW11	W9	W6	W8	W8	WSW3	WSW4	WNW7.8	WNW13
10-Aug	SW4	SSW2	SSW6	SSE2	SW6	SW6	SSW4	S3	SE3	ESE4	ESE7	E9	ESE6	ESE7	SW11	WSW12	W10	W8	WSW2	SSW4	S4	S3	SW6	SW12	SSW3.5	SW12
11-Aug	WSW9	WSW8	W12	W11	WNW9	WNW9	NW8	NW8	NW7	WNW8	WNW10	W13	W13	NW10	NNW11	NNW9	NNW10	NNW9	NNW8	N6	N8	NNE10	ENE15	E25	NW5.6	E25
12-Aug	E24	E22	ESE16	SE12	SE10	ESE11	ESE9	ESE12	E14	ESE14	E16	E18	E19	E23	E25	E23	E22	ENE18	ENE14	ENE14	E14	ESE16	SE17	SE15	E16.0	E25
13-Aug	S20	S19	S21	S15	SSE11	SSE11	S10	S10	S16	S16	S16	S20	SSW18	SSW14	SW12	WSW14	W14	W13	W10	WNW8	NW8	NW8	NNW6	NNW6	SSW9.0	S21
14-Aug	NNW7	NNW9	NNW10	NNW9	NNW9	NNW8	NNW8	NNW9	NNW7	NW6	NW6	NW3	W8	W10	WSW8	W6	SW6	SW5	WSW3	ESE6	ESE11	ESE13	SE15	E18	NNW2.1	E18
15-Aug	ESE25	SSE18	S11	SSW5	SW8	W5	NW9	NW8	NW8	NW9	WNW10	NW9	NW9	NW13	WNW12	WNW10	WNW7	SW10	SW7	WNW4	NNE0	E4	SE4	ESE3	W3.1	ESE25
16-Aug	E8	ESE7	ESE6	ESE5	SSE5	ESE5	ESE8	ESE11	ESE10	ESE12	SE14	ESE14	E13	E12	E13	E16	E13	E9	E10	E9	E11	ESE6	SW2	W12	ESE8.2	E16
17-Aug	NW12	NW12	NW9	WNW9	NW10	NNW11	NW11	NW5	W7	WSW7	WSW10	WSW12	WSW14	W14	W13	WNW12	WNW11	NNW7	N3	N4	N8	N9	NE5	NE9	WNW7.2	W14
18-Aug	NE13	ENE17	E20	E21	ENE14	ENE11	E21	ESE19	SE14	S9	S3	ESE2	ESE5	NNE2	NNW1	NW1	WNW3	SSW5	SSW11	SSW11	SSW9	SSW7	SSW6	SSW6	ESE5.8	E21
19-Aug	SW9	WSW7	SW6	WSW5	WSW6	W7	W4	W5	WNW7	NW5	WNW5	NNW6	NW9	WNW9	NW9	WNW8	NW12	NW12	NNW13	NNW12	NNW12	NNW9	N10	NW6	NW6.4	NNW13
20-Aug	NW8	NW7	NW8	NW9	NW8	NW8	NW8	NW9	NNW9	NW10	NW10	NW9	NW10	NW11	NNW8	N7	N6	N9	NNE8	NNE6	NNW6	NNW5	NNW7	NW8	NNW7.7	NW11
21-Aug	NW9	NW10	NW11	NW10	NW9	NNW9	NW6	NW7	NNW9	NNW9	NNW9	NNW7	N10	NNW10	NNW12	NNW12	NW11	NNW9	NNW8	NNW7	NNW7	N9	N9	N10	NNW8.8	NNW12
22-Aug	N10	N10	NNW10	N10	N10	NNW8	NNW9	N6	N5	NNW6	NNW9	N8	N6	ESE7	SE9	ESE10	ESE8	SSW5	W8	W4	AF	NE3	SW2	WSW2	N3.7	NNW10
23-Aug	WSW4	WSW4	WNW5	NE1	N0	E1	ESE1	SSE4	ESE6	ESE7	ESE8	SSE9	SE10	E14	E15	E17	E12	ESE10	SSE8	SE12	ESE18	ESE21	SE22	SE17	ESE7.9	SE22
24-Aug	SSE17	SSE12	SE4	SSE6	SSE4	SSE5	SE7	ESE9	E6	ESE7	ESE9	E8	ESE9	ESE10	ESE13	E15	E13	E13	E13	ENE14	ENE14	E16	ESE12	SSE12	ESE9.2	SSE17
25-Aug	S15	SSW14	SSW13	S15	SSE12	S14	S18	S19	S20	S21	S22	S22	S22	S21	S21	S15	ESE13	S13	S14	S13	S20	S20	S21	S21	S17.0	S22
26-Aug	SSW19	SSW17	SSW10	SW10	SW11	SW11	SW10	WSW10	W10	W8	W8	W8	NW6	NW3	W6	WSW4	ESE4	ESE7	E6	E6	ESE7	SE13	E8	E6	SSW3.9	SSW19
27-Aug	SE4	SE5	NW1	SSE7	WSW10	WSW12	W15	W19	W17	W21	W20	W21	W26	W26	W26	W25	W23	W23	W20	W18	WNW13	WNW10	W7	W9	W14.6	W26
28-Aug	WNW9	WNW13	WNW12	WNW15	WNW16	WNW15	WNW16	NW17	NW17	NW17	NW15	NW15	NW17	NNW12	NW14	NW12	NW9	WNW7	W5	WSW6	SW5	SW6	WSW6	SW9	WNW10.8	NW17
29-Aug	SW9	SSW10	SSW11	SSE12	SE9	SSE9	SE8	SSE10	SSE9	SSE11	SSE15	SSE17	SSE20	SSE16	S17	S14	SSE13	SSE12	SSE11	ESE10	SE17	SE20	SE23	SE22	SSE12.6	SE23
30-Aug	SSE18	SSE17	SSE17	SE18	SSE18	SSE12	ESE10	SE7	SSE7	SSW10	WSW4	SW3	S5	ESE4	E16	ENE15	ENE13	NE11	N5	ENE9	E25	E27	E20	ESE17	ESE9.8	E27
31-Aug	E3	SE8	ESE13	SE10	SE9	ESE13	SSE5	SSW4	S5	S5	ESE5	ESE10	ESE7	SW3	WNW8	WNW9	NW7	W4	W5	NW4	W4	W7	WNW9	W10	S1.7	ESE13
	S3.2	S3.4	SSW2.8	SSW2.5	SW2.9	WSW2.5	WSW2.3	WSW3.1	WSW3.3	SW3.8	WSW3.4	SW3.4	SW4.0	WSW3.4	WSW3.7	WSW2.6	WNW1.2	WNW0.8	WSW0.9	SE0.9	ESE2.5	SE3.1	SE3.4	SSE3.5	Diurnal Average	
	ESE25	E22	S21	E21	SSE18	W19	E21	SSW21	WSW23	WSW22	W24	W24	W26	W26	W27	W25	W23	W23	W20	W18	E25	E27	SE23	E25	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 Aug 7 16:00

Minimum Value: 1 km/h on Aug 10 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:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

Diurnal Maximum

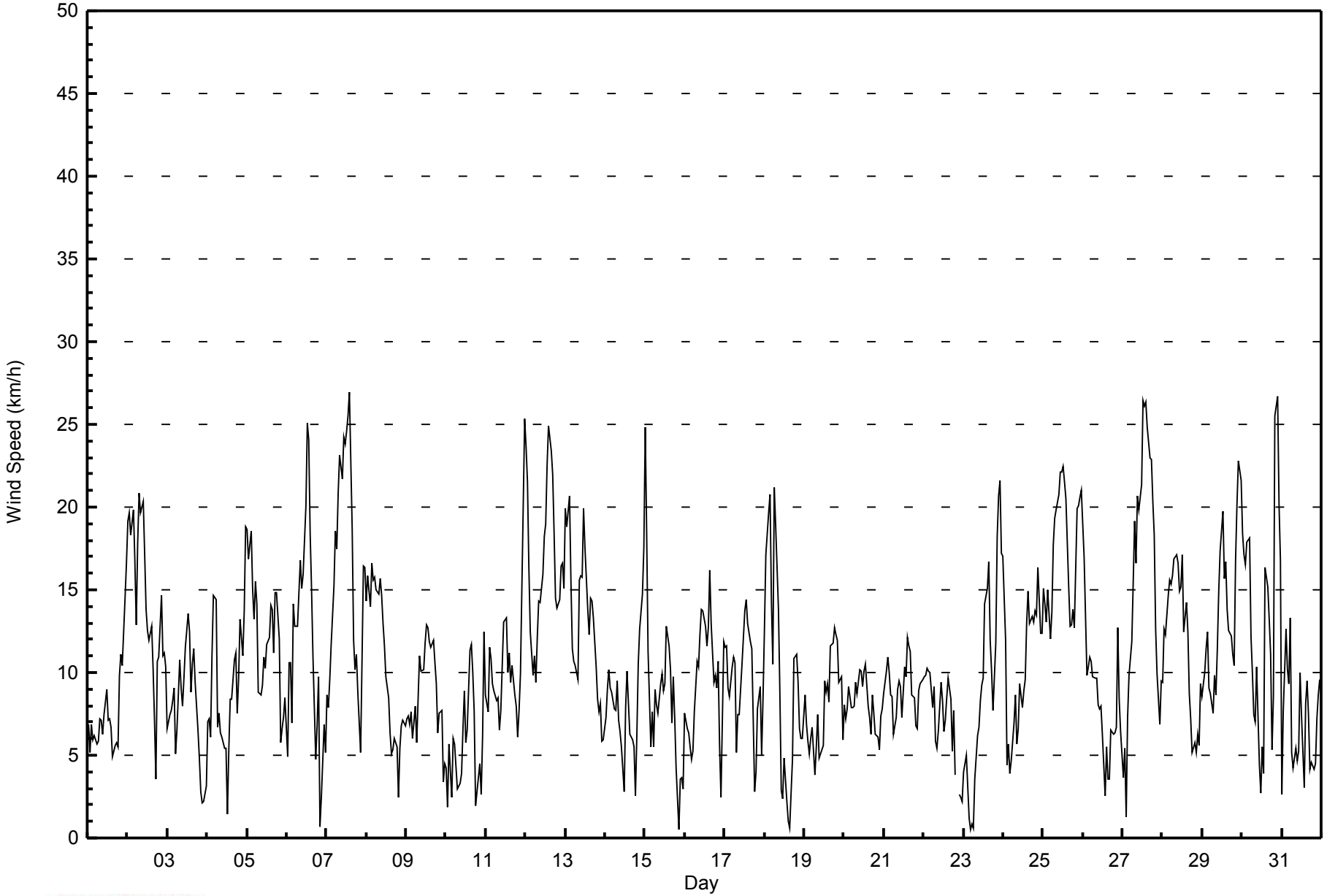
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	109	14.67	14.67
6 - 11	361	48.59	63.26
12 - 19	213	28.67	91.92
20 - 28	60	8.08	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Fort Chipeywan - August 2014

Wind Speed	Wind Direction																
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	5	2	3	0	4	11	7	7	8	11	7	12	10	5	12	5	109
6 - 11	21	3	2	2	19	32	14	20	7	16	26	22	32	29	60	56	361
12 - 19	2	0	1	10	25	15	19	24	22	14	9	6	19	26	15	6	213
20 - 28	0	0	0	0	13	2	4	3	15	5	0	3	15	0	0	0	60
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	5	6	12	61	60	44	54	52	46	42	43	76	60	87	67	743

Total Number of Valid Hours: 743

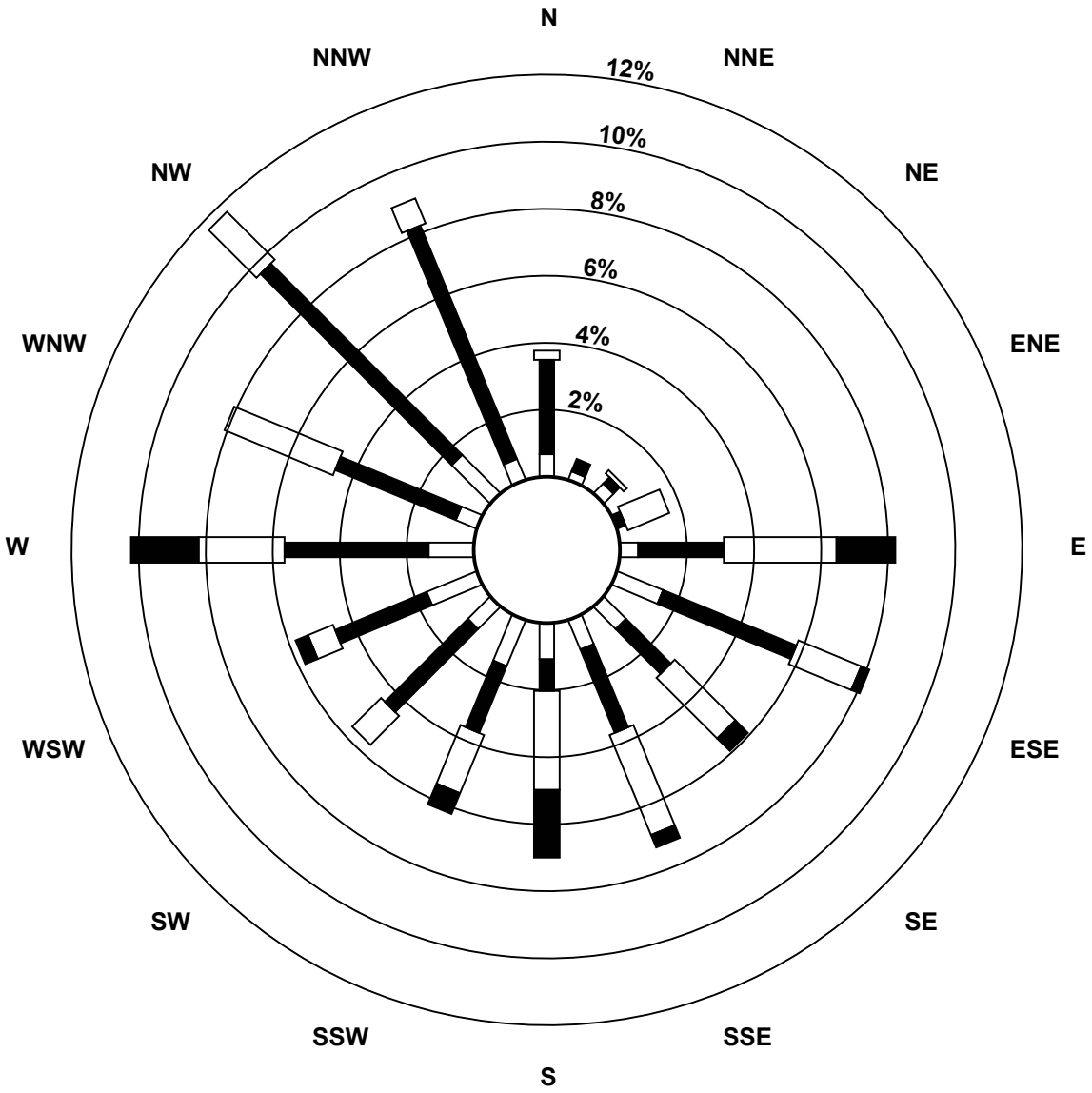
Total Number of Hours: 744

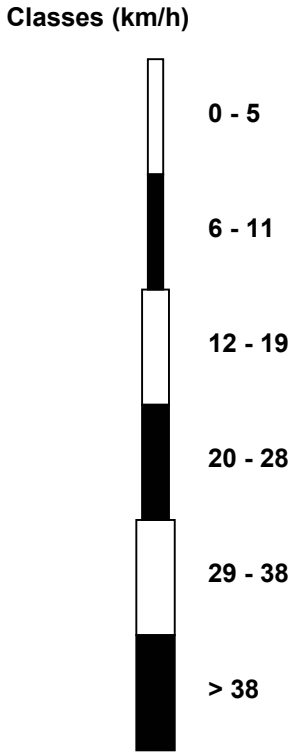
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Fort Chipeywan (AMS 8)





Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort Chipeywan - August 2014

Direction of Maximum Speed: 265 deg on Aug 7 15:00
Direction of Maximum Daily Speed Average: 178.7 deg on Aug 25

Direction of Minimum Speed: 24 deg on Aug 15 21:00

Direction of Minimum Daily Speed Average: 1.7 deg on Aug 31

Monthly Average Direction: 279.3 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	347	345	351	342	310	313	332	332	315	333	310	302	294	280	287	259	234	183	195	169	165	166	143	142	269.2
2-Aug	149	150	156	163	179	190	195	193	192	192	210	213	221	229	235	243	271	213	223	209	212	215	218	223	197.2
3-Aug	235	234	245	254	248	241	240	270	261	239	204	223	229	254	268	266	263	245	237	215	204	110	127	205	242.3
4-Aug	222	239	281	332	351	352	312	316	316	311	325	327	317	181	133	124	114	99	93	89	99	148	130	130	84.0
5-Aug	130	146	143	151	143	135	146	145	151	147	152	152	162	170	157	159	137	92	92	89	89	96	96	98	135.3
6-Aug	134	211	222	217	204	196	200	196	184	175	182	192	195	185	227	229	205	239	172	177	79	188	238	286	199.2
7-Aug	309	280	290	277	270	272	264	259	254	254	260	269	265	260	265	280	315	318	306	282	277	301	290	288	273.9
8-Aug	285	287	289	288	290	288	291	289	291	293	296	302	283	284	285	307	315	344	5	323	328	332	324	312	296.7
9-Aug	327	339	347	342	340	336	335	329	316	333	320	308	299	285	280	281	292	285	261	264	269	275	254	247	302.9
10-Aug	228	195	194	163	227	221	206	182	142	122	105	100	105	113	234	251	261	276	257	200	189	188	223	224	206.2
11-Aug	237	241	263	268	288	293	316	310	312	299	295	278	274	310	344	341	346	340	341	357	4	27	77	95	317.5
12-Aug	95	97	108	126	134	111	106	116	97	102	91	91	92	87	86	84	81	77	70	68	85	105	125	132	96.2
13-Aug	177	172	170	177	168	168	173	178	188	191	183	185	194	211	230	253	270	271	269	285	325	320	337	345	204.0
14-Aug	328	342	343	338	338	332	328	335	333	316	321	325	259	270	249	266	217	217	240	111	120	116	132	88	328.1
15-Aug	116	149	170	206	228	267	306	313	307	305	300	308	305	309	300	288	283	235	236	287	24	88	126	123	266.5
16-Aug	94	106	122	118	158	120	110	109	107	111	126	105	99	95	94	93	94	92	89	101	91	110	214	279	104.9
17-Aug	317	315	310	297	306	327	325	307	262	245	250	257	257	274	277	290	296	340	350	351	352	8	37	48	301.9
18-Aug	56	76	92	90	73	64	90	114	133	182	169	112	116	24	338	324	297	206	197	204	198	194	209	196	115.3
19-Aug	215	239	224	243	252	275	272	261	295	312	288	331	324	303	312	302	318	324	335	339	337	345	354	325	307.2
20-Aug	311	322	322	324	313	313	321	323	328	317	324	318	325	324	340	359	5	353	16	18	347	343	329	323	331.2
21-Aug	317	311	315	323	317	328	319	317	338	328	335	333	0	347	328	328	321	342	346	328	339	349	356	353	332.4
22-Aug	355	353	348	352	355	347	347	360	1	343	331	5	6	108	127	123	110	210	260	275	AF	49	226	256	358.9
23-Aug	242	254	283	48	350	93	109	167	116	112	109	153	127	101	94	97	98	111	147	128	123	123	129	146	121.9
24-Aug	154	155	131	162	152	154	127	114	95	102	102	98	104	102	105	94	94	90	84	78	73	100	114	153	109.9
25-Aug	187	193	194	179	164	186	176	179	178	178	175	174	172	171	188	177	114	183	184	188	179	182	186	186	178.7
26-Aug	193	197	207	221	224	230	231	254	270	279	273	278	323	322	273	244	107	106	91	89	123	133	84	89	211.1
27-Aug	132	139	310	153	254	258	277	275	271	268	266	266	266	267	263	263	262	263	262	270	290	294	272	280	265.9
28-Aug	283	291	287	291	293	289	296	310	313	309	314	312	313	329	322	307	309	291	271	253	228	223	239	222	296.8
29-Aug	217	213	195	162	136	152	145	162	152	159	152	160	158	151	183	171	153	155	147	115	140	146	137	146	156.4
30-Aug	157	153	149	146	149	150	113	131	157	208	243	226	180	117	86	72	71	46	10	62	94	98	100	122	119.0
31-Aug	82	131	117	135	127	120	161	203	188	169	112	115	115	233	288	285	305	281	272	319	266	279	287	279	179.2
	172.6	187.4	198.0	205.2	234.4	246.6	243.2	242.0	239.1	236.1	236.6	233.7	232.8	237.0	247.3	254.5	295.6	281.7	239.7	142.0	120.8	124.1	139.1	156.2	
	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: 92 deg on Aug 23 05:00

Minimum Value: 3 deg on Aug 14 21:00

Percentiles: P_1 = 4 P_{10} = 7 Q_1 = 11 Median = 16 Q_3 = 23 P_{90} = 34 P_{99} = 75

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	24	22	22	23	9	13	25	29	32	44	40	39	45	69	41	69	45	18	29	14	10	14	6	7	69
2-Aug	6	6	8	7	11	9	8	7	8	9	12	14	14	18	20	23	16	43	11	8	8	9	13	11	43
3-Aug	14	11	13	13	12	17	20	17	20	33	13	14	14	20	27	21	17	17	12	8	32	27	31	42	42
4-Aug	18	17	18	22	19	21	33	20	23	17	28	30	91	59	6	5	6	5	6	5	15	17	15	8	91
5-Aug	7	10	7	6	11	11	10	14	14	15	11	11	12	17	10	10	28	3	5	6	11	7	8	15	28
6-Aug	50	14	12	15	11	10	13	11	7	11	13	12	14	11	16	14	13	68	15	8	77	73	48	32	77
7-Aug	21	15	16	14	14	15	17	16	15	15	15	16	16	17	18	29	24	23	18	15	16	19	14	14	29
8-Aug	15	15	14	15	16	16	16	15	16	17	21	19	23	22	27	24	26	26	31	24	14	14	14	11	31
9-Aug	14	16	17	16	17	19	21	23	19	27	32	28	27	20	20	20	22	22	16	12	12	13	19	17	32
10-Aug	15	62	15	40	15	7	12	26	24	24	11	8	47	32	24	26	19	14	35	9	7	25	18	9	62
11-Aug	14	17	16	13	13	9	13	12	15	20	25	20	21	25	29	33	27	27	23	20	13	18	19	5	33
12-Aug	5	5	16	6	10	10	11	6	6	5	4	5	4	5	5	6	6	8	7	9	7	11	10	16	16
13-Aug	8	8	8	9	11	12	11	11	8	9	12	8	9	12	12	19	17	16	14	19	15	18	20	15	20
14-Aug	14	17	15	15	15	18	18	20	21	25	39	81	32	29	33	34	31	18	34	14	3	8	8	18	81
15-Aug	11	10	20	21	10	22	14	16	21	21	24	29	36	25	27	24	38	13	12	20	88	51	35	72	88
16-Aug	10	14	12	15	26	14	6	5	6	10	9	13	4	4	4	4	5	8	7	9	7	17	63	19	63
17-Aug	16	16	17	16	11	13	12	33	14	23	23	21	25	16	18	22	21	28	21	21	19	19	20	14	33
18-Aug	13	8	11	8	10	26	10	13	14	18	39	31	20	36	22	56	11	32	12	14	12	11	11	16	56
19-Aug	15	22	11	24	12	17	29	26	17	63	31	50	31	27	23	34	23	24	24	24	23	23	26	30	63
20-Aug	19	20	20	23	21	18	21	23	27	20	23	26	28	29	40	27	38	28	20	17	16	13	14	14	40
21-Aug	14	13	17	16	15	19	20	22	35	33	37	67	35	43	39	34	32	24	25	22	17	16	15	15	67
22-Aug	17	16	14	16	16	23	18	29	33	43	36	35	42	26	29	26	19	61	14	13	AF	55	15	15	61
23-Aug	19	14	22	52	92	62	74	36	20	10	11	23	42	8	7	7	11	17	16	9	7	4	8	7	92
24-Aug	6	8	35	17	18	27	14	13	11	12	7	7	6	6	7	8	6	7	6	9	9	13	7	12	35
25-Aug	8	6	7	11	13	11	9	8	9	10	9	10	15	13	12	37	9	35	17	12	4	6	7	6	37
26-Aug	7	6	15	11	12	11	13	15	16	22	23	27	47	70	34	32	60	16	8	12	17	21	20	21	70
27-Aug	79	45	82	45	31	17	15	14	14	15	16	16	16	16	16	16	16	16	14	18	16	16	19	12	82
28-Aug	13	16	15	17	16	15	17	18	21	19	23	20	20	26	26	25	26	21	19	13	6	8	15	10	26
29-Aug	14	11	14	18	17	22	20	20	22	14	12	12	12	12	16	14	7	8	16	14	13	7	6	7	22
30-Aug	7	7	7	8	6	12	20	14	25	12	29	42	76	47	7	11	15	12	28	37	6	7	15	15	76
31-Aug	59	33	19	10	11	8	37	25	18	29	23	8	15	65	29	22	22	25	19	55	26	11	9	13	65
	79	62	82	52	92	62	74	36	35	63	40	81	91	70	41	69	60	68	35	55	88	73	63	72	
	Diurnal Maximum																								

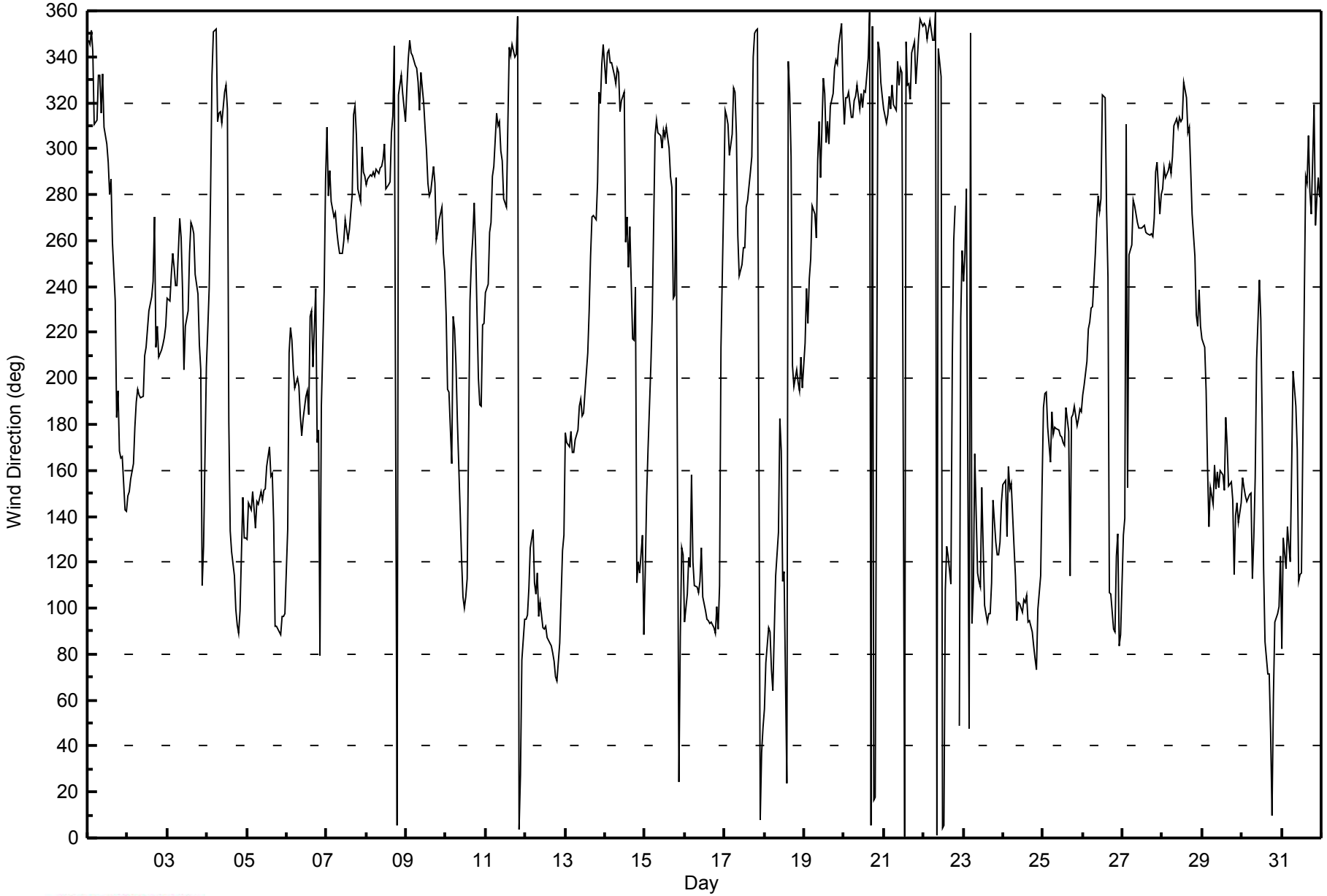
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Fort Chipeywan - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 8, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8

Reason: Routine

Start Time (MST)	9:25	End Time (MST)	14:40
Barometric Pressure	735 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	747
Cal Gas Concentration	2.45 ppm	Cal Gas Expiry Date	9/16/2016
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)	7	7
Analyzer Range (mv)	5000	5000	HV power supply (V)	529	529
Calculated slope	0.996148	0.995001	Chamber temp.	50.0	50.0
Calculated intercept	-0.041594	-0.012923	Pressure (in Hg)	26.6	26.3
Analyzer Background	6.9	6.9	Flow (lpm)	0.632	0.624
Analyzer Coefficient	0.990	0.990	UV Lamp (mV)	4408	4410

Analyzer make	T100u	Analyzer serial #	138

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	0.00	NA
as found span	5000	37.1	18.2	17.20	1.057
calibrator zero	5000	0.0	0.0	0.00	NA
high point	5000	37.1	18.2	18.28	0.994
second point	5000	19.8	9.7	9.74	0.996
third point	5000	9.9	4.9	4.92	0.985
calibrator zero					
as left zero	5000	0.0	0.0	0.0	NA
as left span	5000	37.1	18.2	16.4	1.110
				Average Correction Factor	0.992

Corrected As found	17.2	Previous response	18.3	% change	6.3%

Notes:

As found zero used as calibrator zero
Span adjusted
Filter changed after As Founds

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

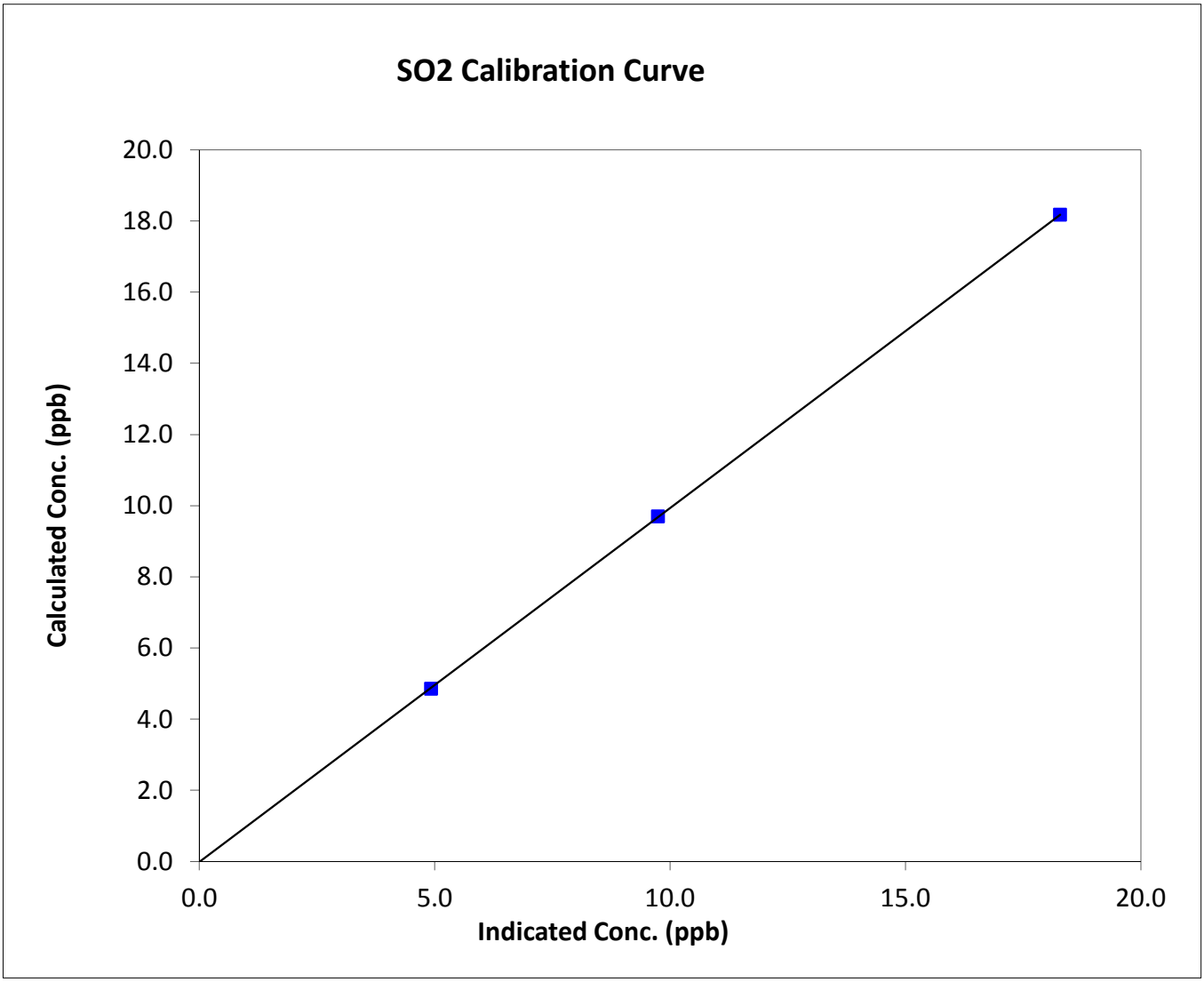
SO_2 Calibration Summary

Station Information

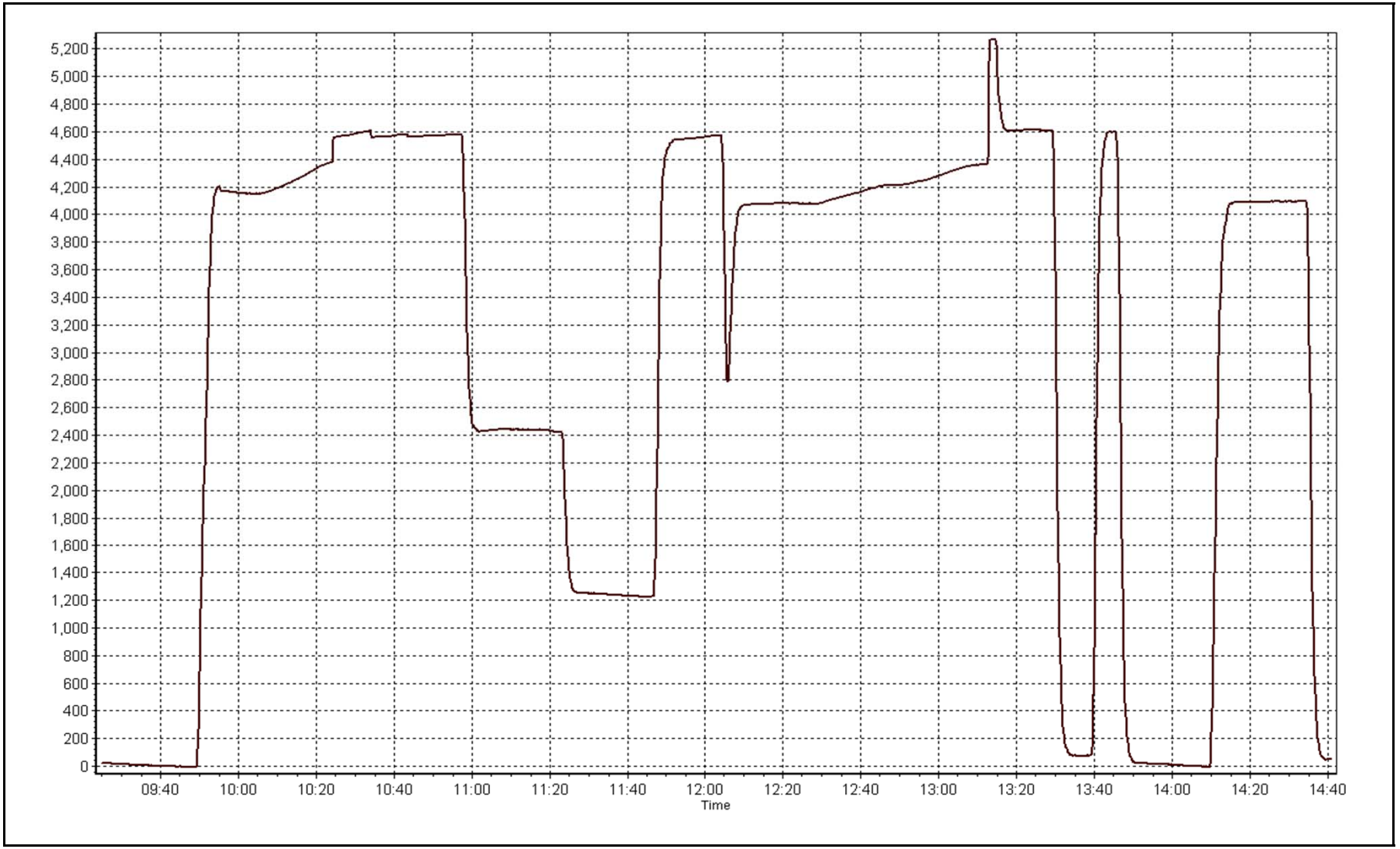
Calibration Date	August 7, 2014	Previous Calibration	July 8, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	9:25	End Time (MST)	14:40
Analyzer make	T100u	Analyzer serial #	138

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
18.2	18.3	0.9943		
9.7	9.7	0.9956	Slope	0.995001
4.9	4.9	0.9852		
			Intercept	-0.012923



SO2 Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 8, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Reason:	Routine		
Start Time (MST)	14:45	End Time (MST)	18:00
Barometric Pressure	735 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	735
NO2 calibration used	Thursday, August 07, 2014	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)	26.6	26.3
Analyzer Range (input)	5000	5000	Lamp temp. (Deg C)	58.0	58.0
Calculated slope	1.005481	0.981886	Pressure (in Hg)	21.0	26.7
Calculated intercept	-0.768152	-0.108449	Flow cell (LPM)	0.525	0.738
Analyzer Background	-0.50	-0.5			
Analyzer Coefficient	1.008	1.008	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	2.7	N/A
as found span	5000	197.5 -- 810.1	106.0	107.6	0.985
calibrator zero	5000	0.00	0.0	0.1	N/A
high point	5000	197.5 -- 810.1	106.0	107.9	0.982
second point	5000	148 -- 772	80.8	82.6	0.978
third point	5000	93 -- 715	53.5	54.6	0.981
calibrator zero					
as left zero	5000	0.00	0.0	0.3	N/A
as left span	5000	197.5 -- 810.1	106.0	111.8	N/A
				Average Correction Factor	0.980

Corrected As found	104.9	Previous response	106.2	% change	1.3%

Notes:

Filter changed after As Founds, flow and pressure returned to normal. Span and zero adjusted

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

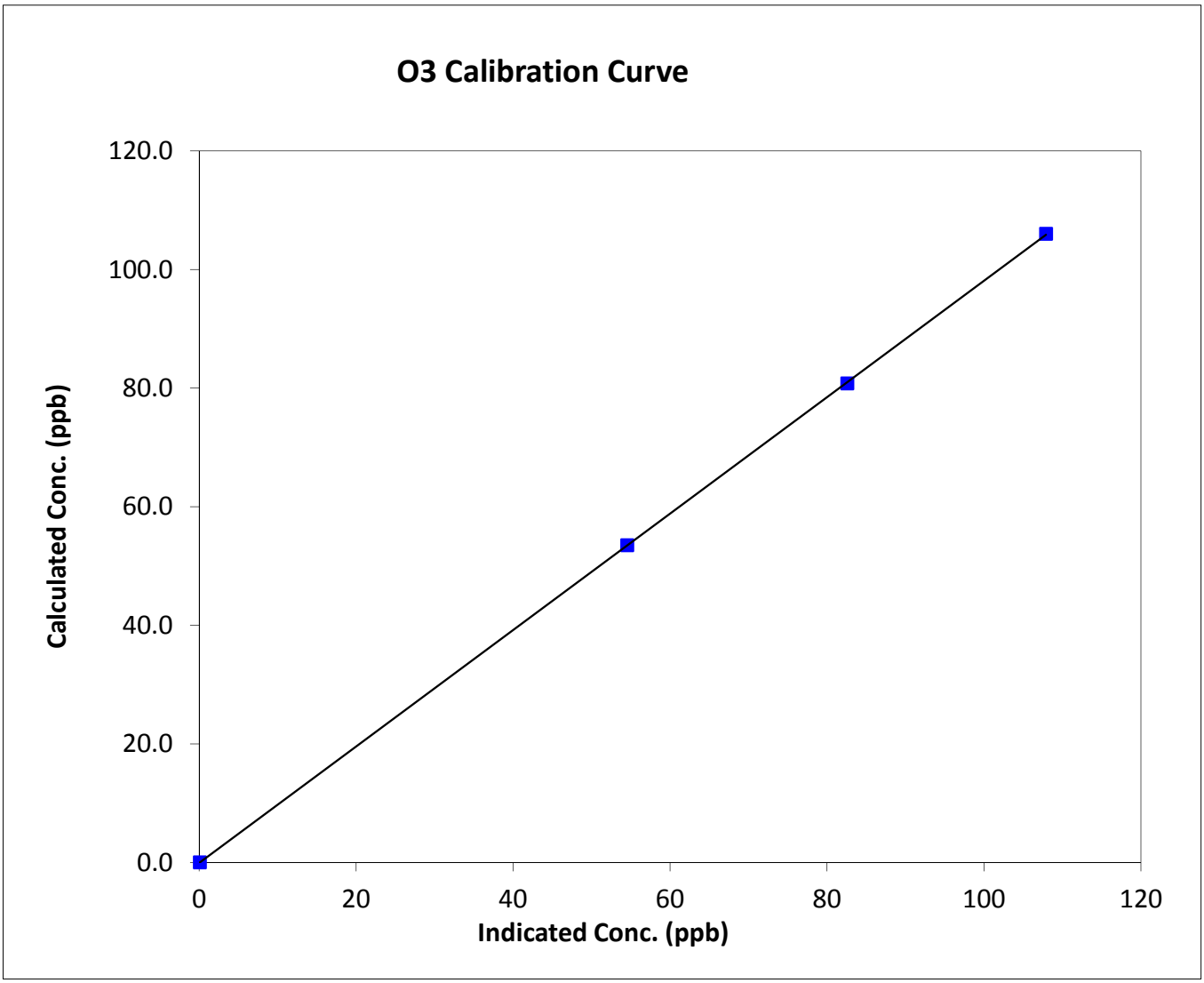
O_3 Calibration Summary

Station Information

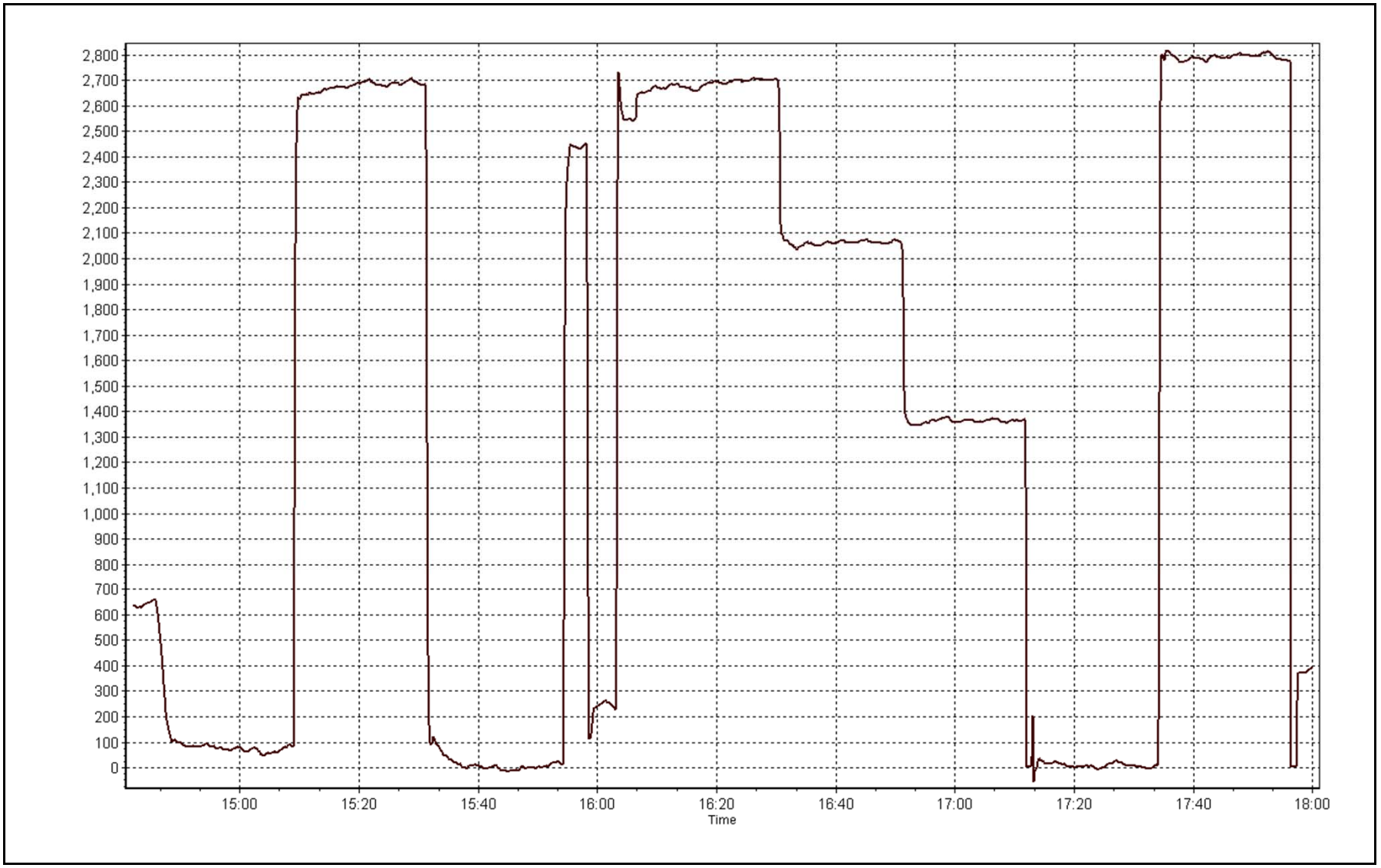
Calibration Date	Thursday, August 07, 2014	Previous Calibration	July 8, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	14:45	End Time (MST)	18:00
Analyzer make	API T400	Analyzer serial #	1020

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999990
106.0	107.9	0.9822		
80.8	82.6	0.9781	Slope	0.981886
53.5	54.6	0.9806		
			Intercept	-0.108449



O3 Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 7, 2014		Previous Calibration	July 8, 2014	
Station Name	Fort Chipewyan		Station Number	AMS 8	
Reason:	Routine				
Start Time (MST)	9:25		End Time (MST)	14:37	
Barometric Pressure	735	mmHg	Station Temperature	21.0	Deg C
Calibrator	API T700		Serial Number	747	
NO Cal Gas Conc	20.2	ppm	Cal Gas Expiry Date	09-16-2016	
NOx Cal Gas Conc	20.3	ppm	Cal Gas Serial #	LL103809	

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	8205

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	200	200	200
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.990436	0.992696	0.980768
	Data Offset	-0.111899	0.079961	0.168999
After	Data Slope	0.999929	0.999196	0.986947
	Data Offset	0.095357	0.215067	0.086648
Channel #		DIFF 3	DIFF 1	DIFF 2
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	API T200u	Analyzer serial #	172

Test Point	before		after	
Concentration range	200	ppb	200	ppb
NO coefficient	1.196	mv	1.171	mv
NOX coefficient	1.207	mv	1.184	mv
NO bkgrnd	-0.1	mv	-0.1	mv
NOX bkgrnd	0.4	mv	0.4	mv
Chamber Temp	40	Deg C	40	Deg C
Moly Temp	314.2	Deg C	316.5	Deg C
PMT Temp	5.1	Deg C	5.1	Deg C
O3 flow	88	ccm	88	ccm
R Cell Press	2.6	mmHg	2.6	mmHg
Sample Flow	1129	ccm	1115	ccm
PMT Voltage	-807.0	V	-807.0	V

Notes:
As found zero used as calibrator zero
Small adjustment to span
Filter changed before As Lefts

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 7, 2014 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	-0.2	0.0	-0.2	N/A	N/A
as found span	5000	37.1	150.6	149.9	0.7	153.3	152.7	0.5	0.982	0.982
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	N/A	N/A
high point	5000	37.1	150.6	149.9	0.7	150.6	149.9	0.6	1.000	1.000
second point	5000	19.8	80.4	80.0	0.4	79.9	79.6	0.4	1.006	1.005
third point	5000	9.9	40.2	40.0	0.2	40.2	40.0	0.1	1.001	1.000
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	-0.2	0.1	-0.2	NA	NA
as left span	5000	37.1	150.6	149.9	0.7	153.0	44.8	108.1	NA	NA
								Average Correction Factor	1.002	1.002

Corrcted As found NO_X= 153.5 NO= 152.7 Percent Change NO_X= -2.7% NO= -2.6%

Previous Response NO_X= 149.3 NO= 148.7

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			-0.2			N/A	
1st NO2 (100ppb O3)	N/A	43.8	106.0	151.1	43.8	107.2	0.997	1.000	0.989	101.1%
2nd NO2 (75ppb O3)	N/A	69.0	80.8	150.8	69.0	81.7	0.999	1.000	0.988	101.2%
3rd NO2 (50ppb O3)	N/A	96.3	53.5	150.7	96.3	54.4	0.999	1.000	0.983	101.7%
4th NO2 (0ppb O3)	149.8	N/A	0.8	150.6	149.8	0.7	1.000	1.000	N/A	N/A
					Average Correction Factor		0.999	1.000	0.987	101.3%

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

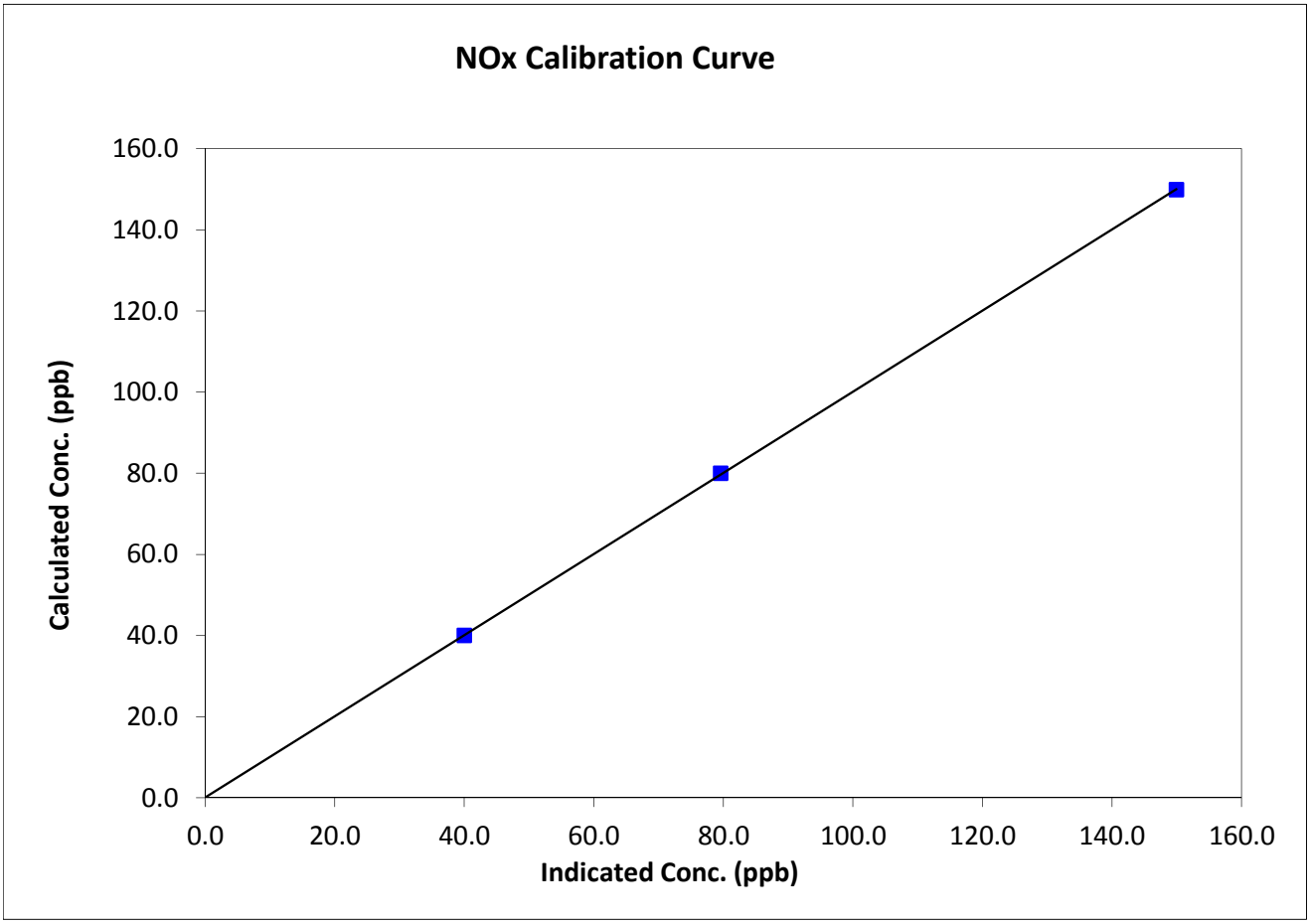
NO_X Calibration Summary

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 8, 2014
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	9:25	End Time (MST)	14:37
Analyzer make	API T200u	Analyzer serial #	172

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999988
149.9	149.9	0.9996		
80.0	79.6	1.0052	Slope	0.999929
40.0	40.0	1.0001		
			Intercept	0.095357



Wood Buffalo Environmental Association

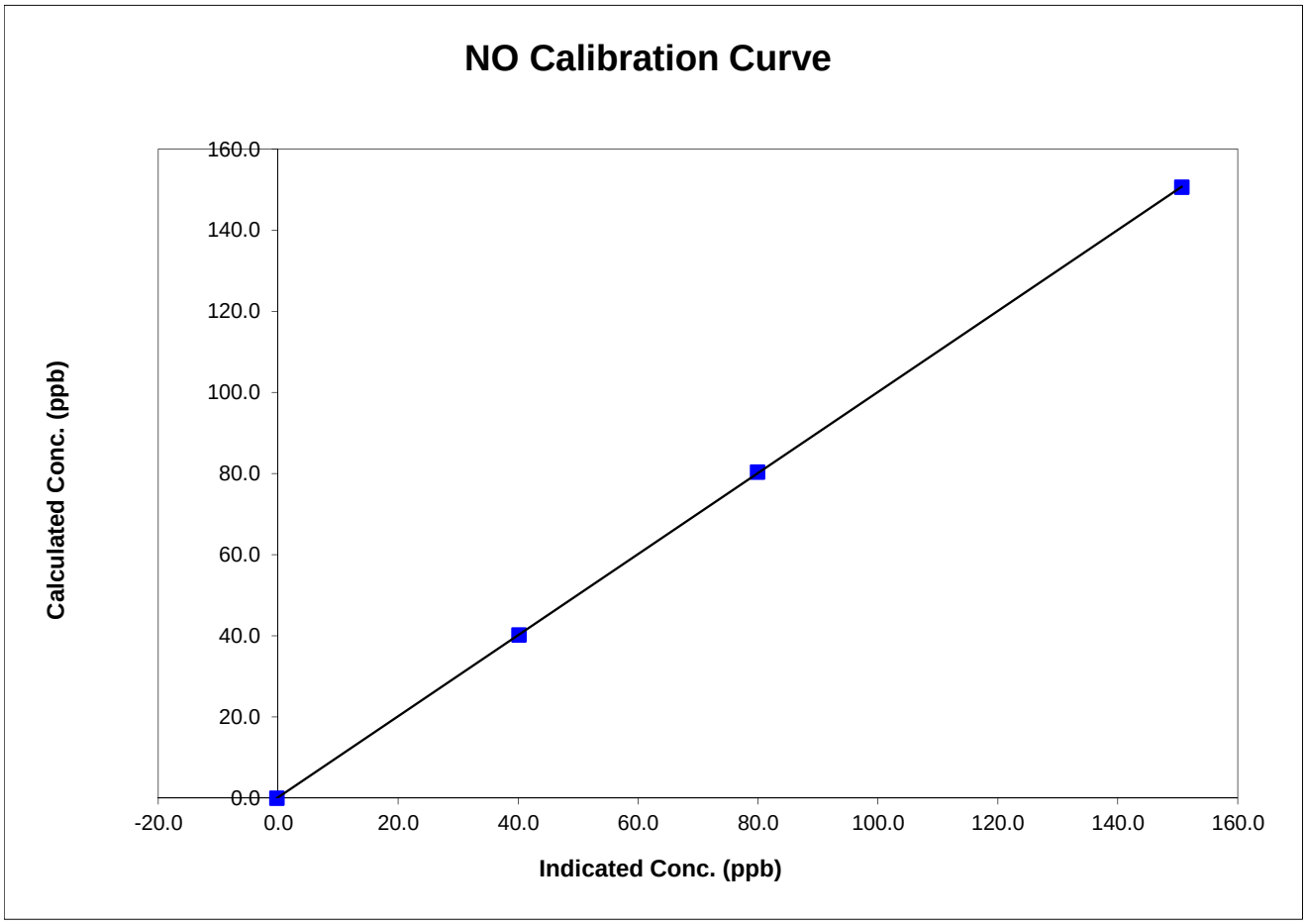
NO Calibration Summary

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 8, 2014
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	9:25	End Time (MST)	14:37
Analyzer make	API T200u	Analyzer serial #	172

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999989
150.6	150.6	0.9998		
80.4	79.9	1.0057	Slope	0.999196
40.2	40.2	1.0006		
			Intercept	0.215067



Wood Buffalo Environmental Association

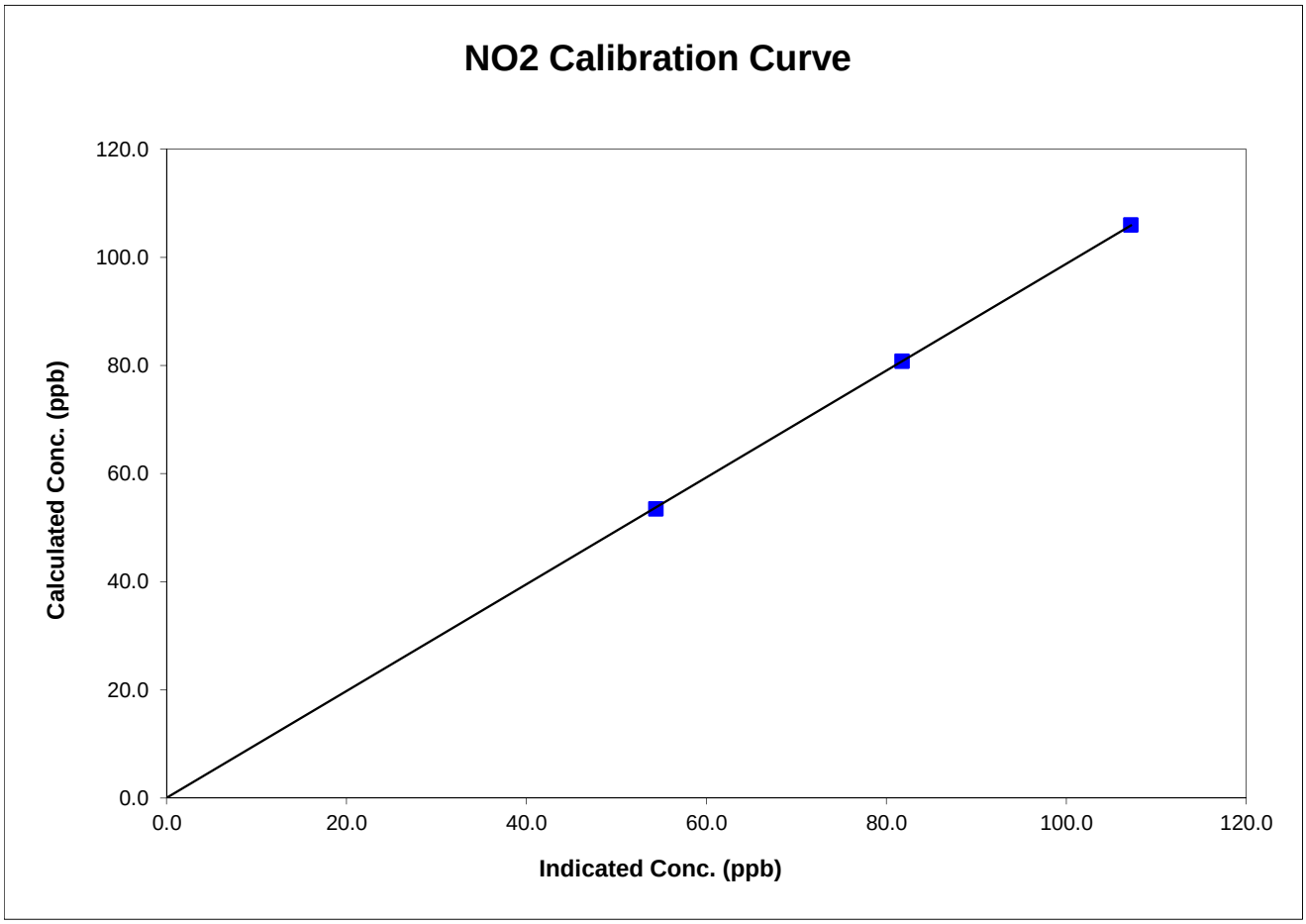
NO_2 Calibration Summary

Station Information

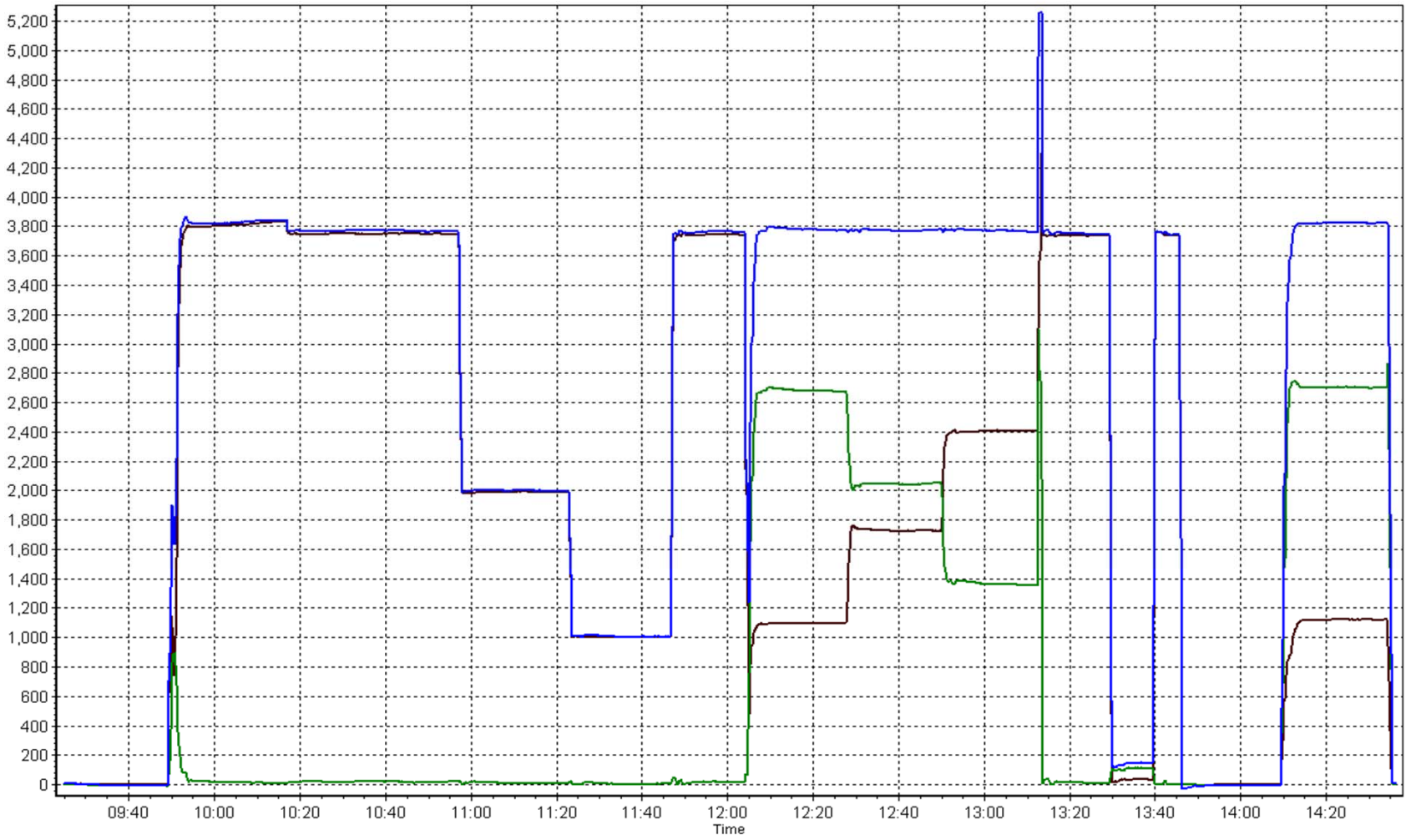
Calibration Date	August 7, 2014	Previous Calibration	July 8, 2014
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	9:25	End Time (MST)	14:37
Analyzer make	API T200u	Analyzer serial #	172

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
106.0	107.2	0.9889		
80.8	81.7	0.9883	Slope	0.986947
53.5	54.4	0.9834		
			Intercept	0.086648



NOx, NO & NO_2 Calibration Plot **Date:** **August 7, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 9
BARGE LANDING
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
AUGUST 2014

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	704	36	40	99.46	4	0	1	0
THC(ppm) Average	636	35	108	90.19	3.1	-	2.4	-
Temperature (C) Average	742	0	2	99.73	33.6	-	26.2	-
Wind Speed 10 m (km/h) Average	738	0	6	99.19	16	-	9	-
Wind Direction 10 m (deg) Average	738	0	6	99.19	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
TRS(ppb) Average	704	0.3	0	-	0	0	0	0	0	1	4
THC(ppm) Average	636	2.14	0.2	-	1.8	1.9	2	2.1	2.3	2.4	3.1
Temperature (C) Average	742	19.25	6.8	-	2.8	11.4	14.5	18.5	24	29.5	33.6
Wind Speed 10 m (km/h) Average	738	4.8	3	-	0	2	3	4	6	8	16
Wind Direction 10 m (deg) Average	738	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	19 Aug 2014 14:00	19 Aug 2014 16:00	3	Station power failure
TRS	22 Aug 2014 09:00	22 Aug 2014 09:00	1	Maintenance - sample manifold cleaned
THC	01 Aug 2014 12:00	01 Aug 2014 12:00	1	Intermittent unstable operation - baseline drift
THC	01 Aug 2014 18:00	01 Aug 2014 18:00	1	Intermittent unstable operation - baseline drift
THC	02 Aug 2014 13:00	02 Aug 2014 23:00	11	Intermittent unstable operation - baseline drift
THC	03 Aug 2014 12:00	03 Aug 2014 16:00	5	Intermittent unstable operation - baseline drift
THC	03 Aug 2014 18:00	03 Aug 2014 22:00	5	Intermittent unstable operation - baseline drift
THC	04 Aug 2014 18:00	04 Aug 2014 18:00	1	Intermittent unstable operation - baseline drift
THC	05 Aug 2014 15:00	05 Aug 2014 18:00	4	Intermittent unstable operation - baseline drift
THC	06 Aug 2014 12:00	06 Aug 2014 17:00	6	Intermittent unstable operation - baseline drift
THC	06 Aug 2014 19:00	07 Aug 2014 01:00	7	Intermittent unstable operation - baseline drift
THC	07 Aug 2014 03:00	08 Aug 2014 01:00	23	Intermittent unstable operation - baseline drift
THC	08 Aug 2014 03:00	08 Aug 2014 04:00	2	Intermittent unstable operation - baseline drift
THC	08 Aug 2014 07:00	08 Aug 2014 08:00	2	Intermittent unstable operation - baseline drift
THC	09 Aug 2014 07:00	09 Aug 2014 07:00	1	Power spike
THC	22 Aug 2014 09:00	22 Aug 2014 09:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	16 Aug 2014 05:00	16 Aug 2014 06:00	2	Flatline in sensor output signal
Wind Speed, Wind Direction	22 Aug 2014 21:00	22 Aug 2014 21:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	27 Aug 2014 21:00	27 Aug 2014 21:00	1	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 ppb on Aug 26 08:00 Maximum Daily Average: 0.9 ppb on Aug 26

Minimum Value: 0 ppb on Aug 22 17:00 Minimum Daily Average: 0.1 ppb on Aug 28
Maximum Diurnal Average: 0.7 ppb at hour 8 Minimum Diurnal Average: 0.1 ppb at hour 17
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 2$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	1	Z	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
2-Aug	0	0	Z	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
3-Aug	0	0	Z	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
4-Aug	0	0	Z	0	1	1	1	2	2	2	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0.8	2
5-Aug	0	0	Z	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
6-Aug	0	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
7-Aug	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
8-Aug	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-Aug	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
10-Aug	0	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
11-Aug	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
12-Aug	0	0	Z	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
13-Aug	0	0	Z	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
14-Aug	0	0	Z	0	1	1	0	0	0	C	C	C	C	C	0	0	0	0	0	0	1	1	1	1	0.4	1
15-Aug	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.6	1
16-Aug	0	0	Z	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
17-Aug	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
18-Aug	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.4	1
19-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	AF	AF	AF	0	0	0	0	0	0	0	0	0.2	0
20-Aug	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
21-Aug	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
22-Aug	0	0	Z	0	0	0	0	0	M	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
23-Aug	0	0	Z	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Aug	0	0	Z	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
25-Aug	0	0	Z	1	1	0	1	2	1	1	1	0	0	0	0	0	0	0	0	1	2	1	1	1	0.6	2
26-Aug	1	1	Z	1	2	1	3	4	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	0.9	4
27-Aug	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
28-Aug	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
29-Aug	0	0	Z	0	0	0	0	1	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0.5	2
30-Aug	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
31-Aug	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
	0.3	0.3	--	0.4	0.5	0.5	0.5	0.7	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	Diurnal Average	
	1	1	--	1	2	2	3	4	2	2	2	2	2	1	1	1	0	0	0	1	2	1	1	1	Diurnal Maximum	

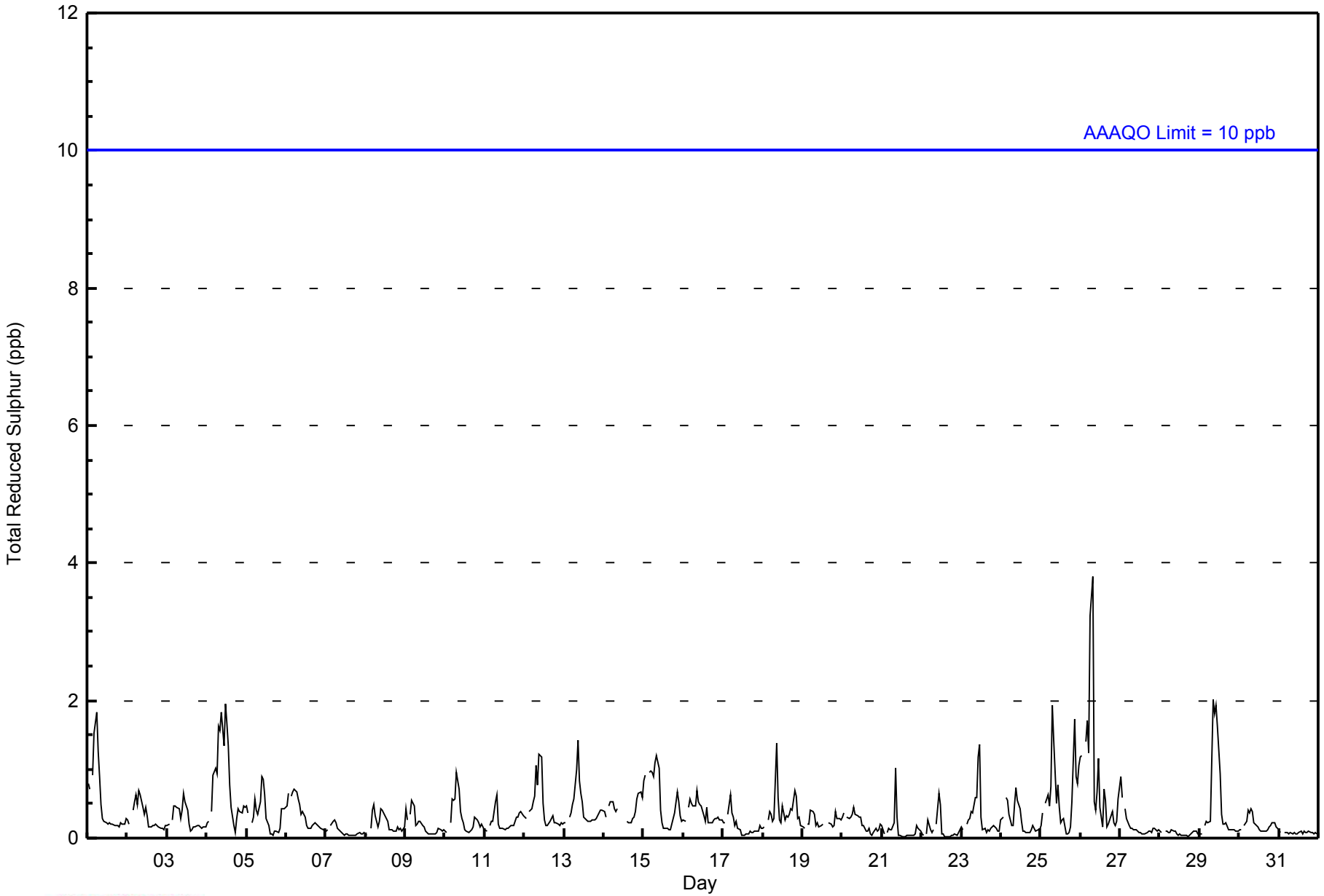
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	702	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Barge Landing - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	39	23	11	25	14	28	48	84	71	66	55	52	32	31	61	58	698
3 - 4	0	0	0	0	0	0	0	1	0	1	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	39	23	11	25	14	28	48	85	71	67	55	52	32	31	61	58	700

Total Number of Valid Hours: 700

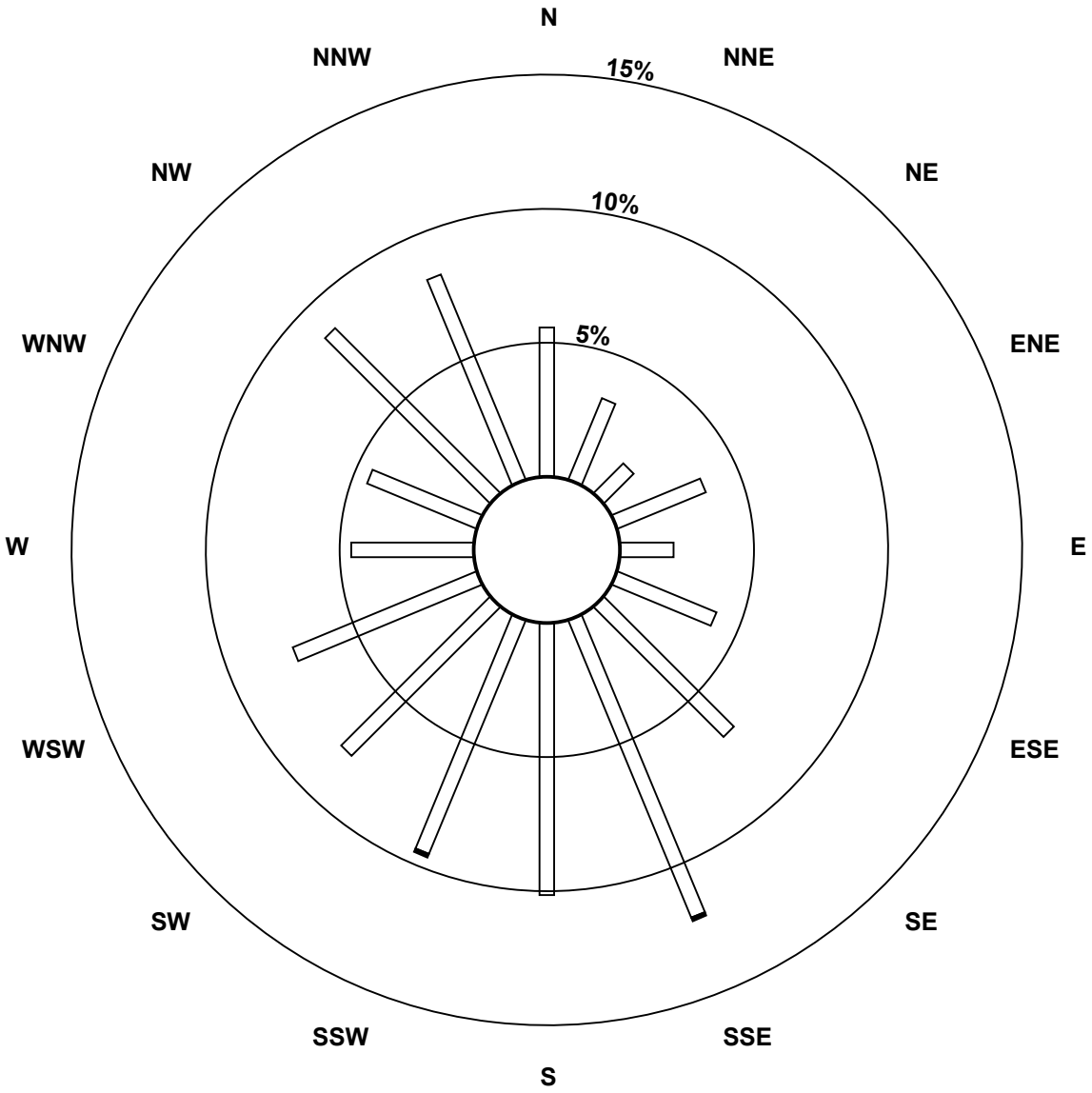
Total Number of Hours: 744

Wood Buffalo Environmental Association

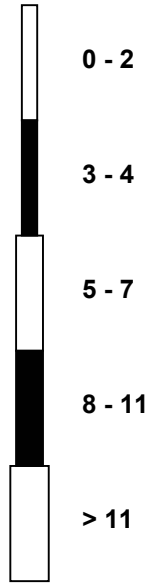
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Barge Landing (AMS 9)



Classes (ppb)



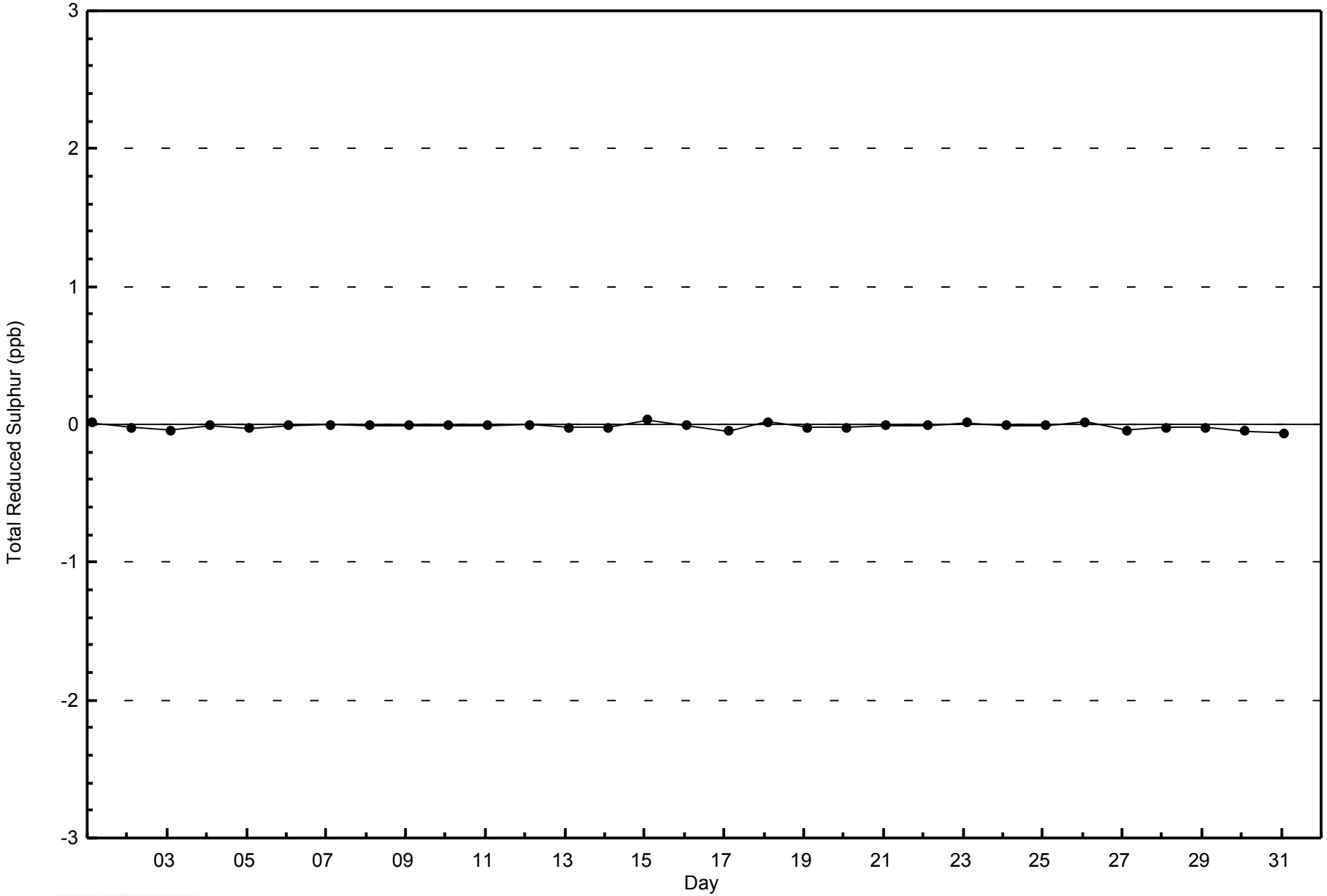
Total Number of Valid Hours: 700

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - August 2014



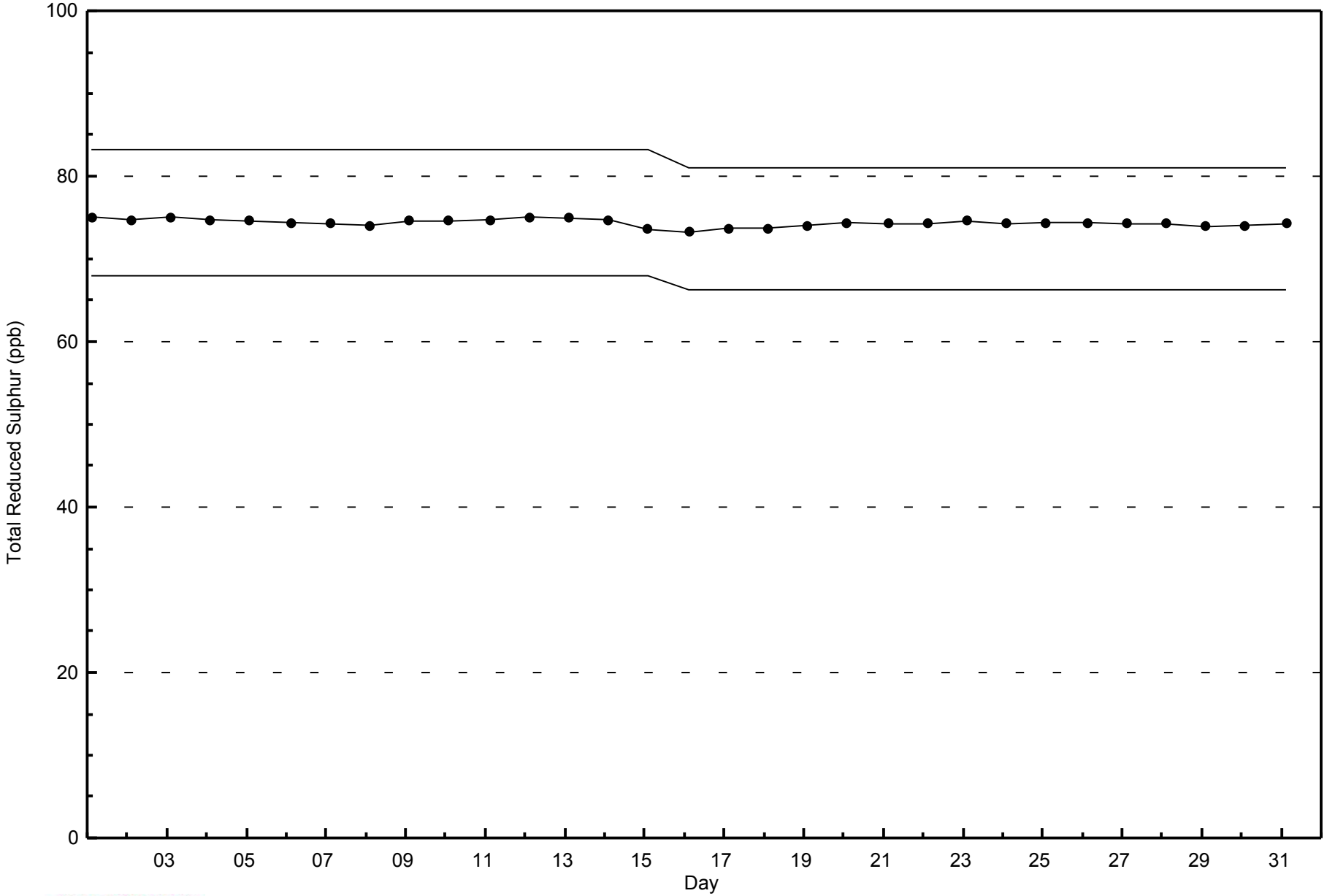
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - August 2014

Maximum Value: 3.1 ppm on Aug 15 09:00

Maximum Daily Average: 2.4 ppm on Aug 15

Minimum Value: 1.8 ppm on Aug 1 17:00

Minimum Daily Average: 1.9 ppm on Aug 1

Maximum Diurnal Average: 2.3 ppm at hour 9

Minimum Diurnal Average: 2.0 ppm at hour 17

Monthly Average: 2.14 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.9 Q_1 = 2.0 Median = 2.1 Q_3 = 2.3 P_{90} = 2.4 P_{99} = 2.8

Hours in Service:	744
Hours of Data:	636
Hours of Missing Data:	108
Hours of Calibration:	35
Percent Operational Time:	90.2

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

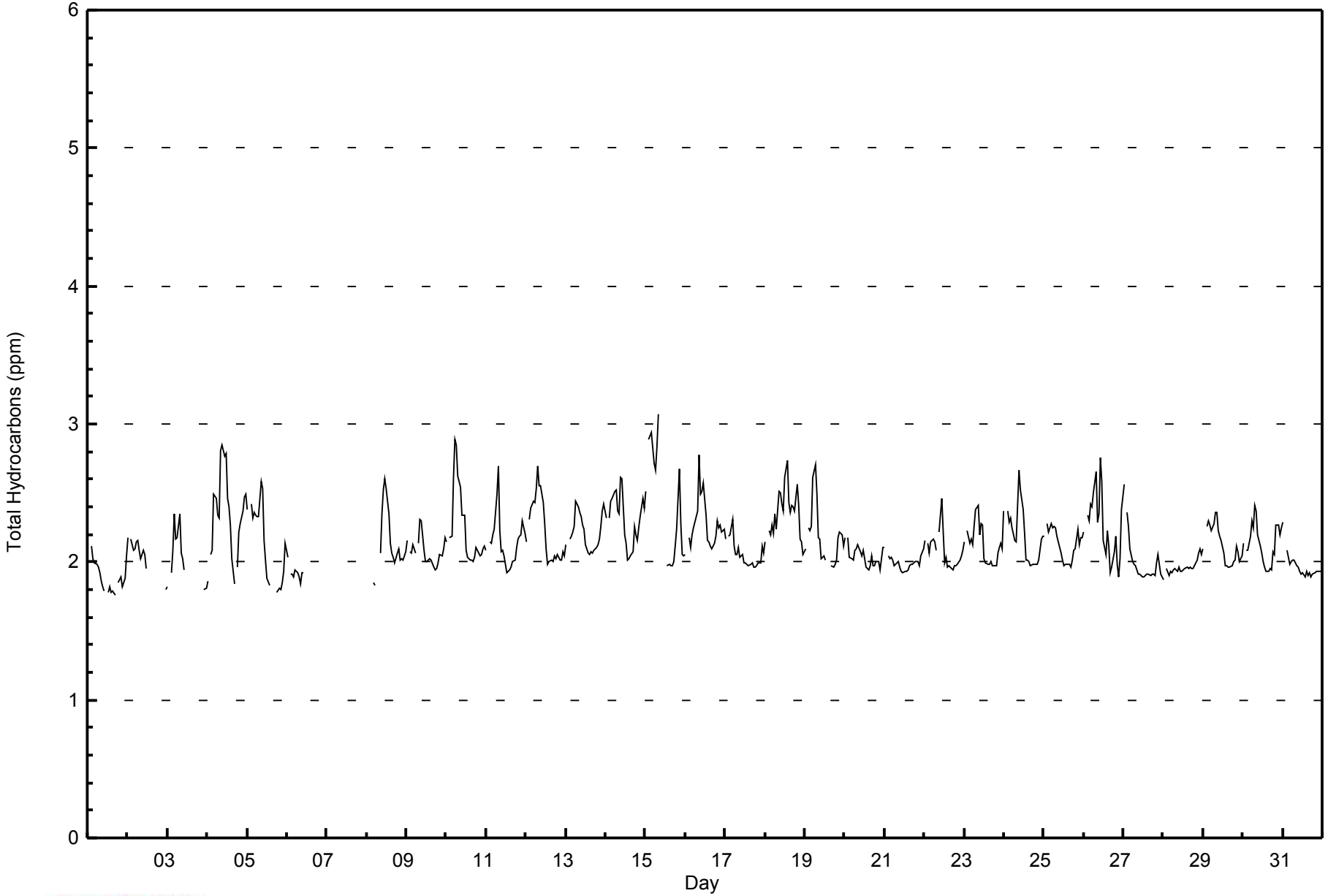
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure UO - Unstable Operation PF - Power Failure

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - August 2014



AURORA
ATMOSPHERICS INC.

Total Hydrocarbons (THC) - ppm
Barge Landing - August 2014

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	271	42.61	42.61
2.1 - 3.0	364	57.23	99.84
3.1 - 10.0	1	0.16	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Barge Landing - August 2014

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	24	11	3	9	7	17	19	31	21	13	16	25	5	13	30	25	269
2.1 - 3.0	14	12	7	13	5	10	23	53	45	38	31	16	17	16	33	29	362
3.1 - 10.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	23	10	22	12	27	42	84	67	51	47	41	22	29	63	54	632

Total Number of Valid Hours: 632

Total Number of Hours: 744

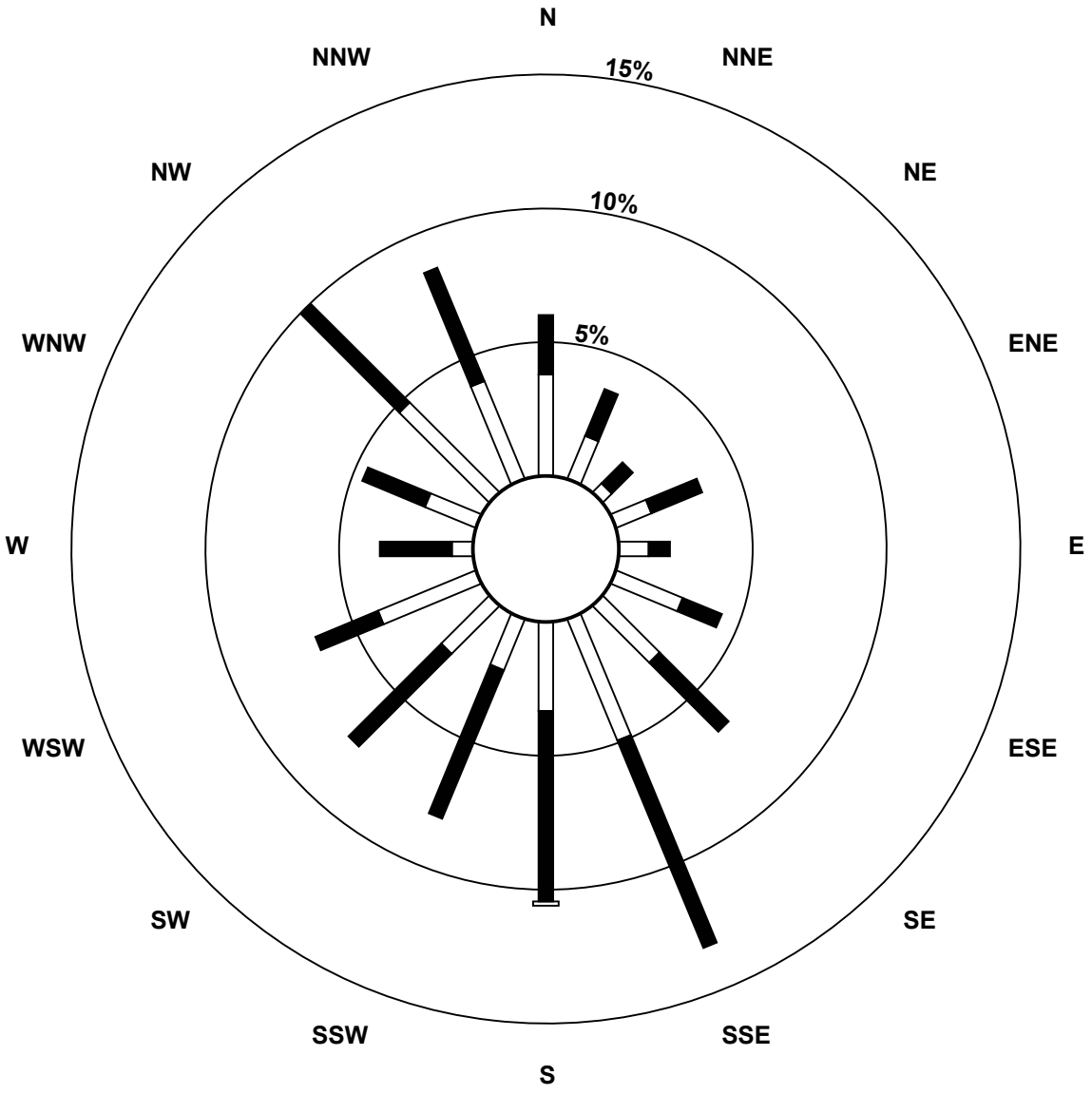
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

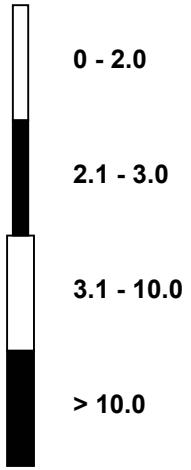
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Barge Landing (AMS 9)



Classes (ppm)



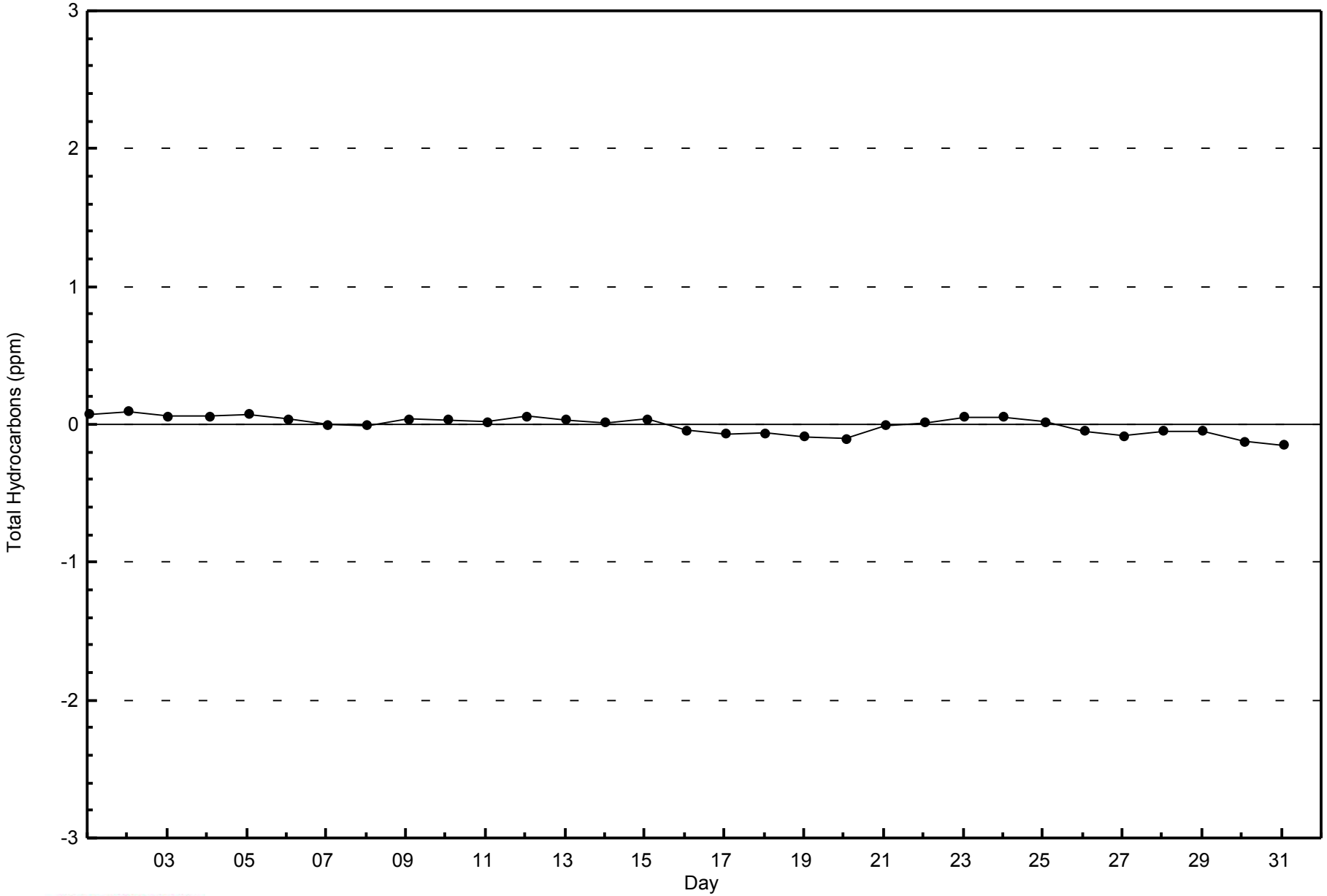
Total Number of Valid Hours: 632

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - August 2014



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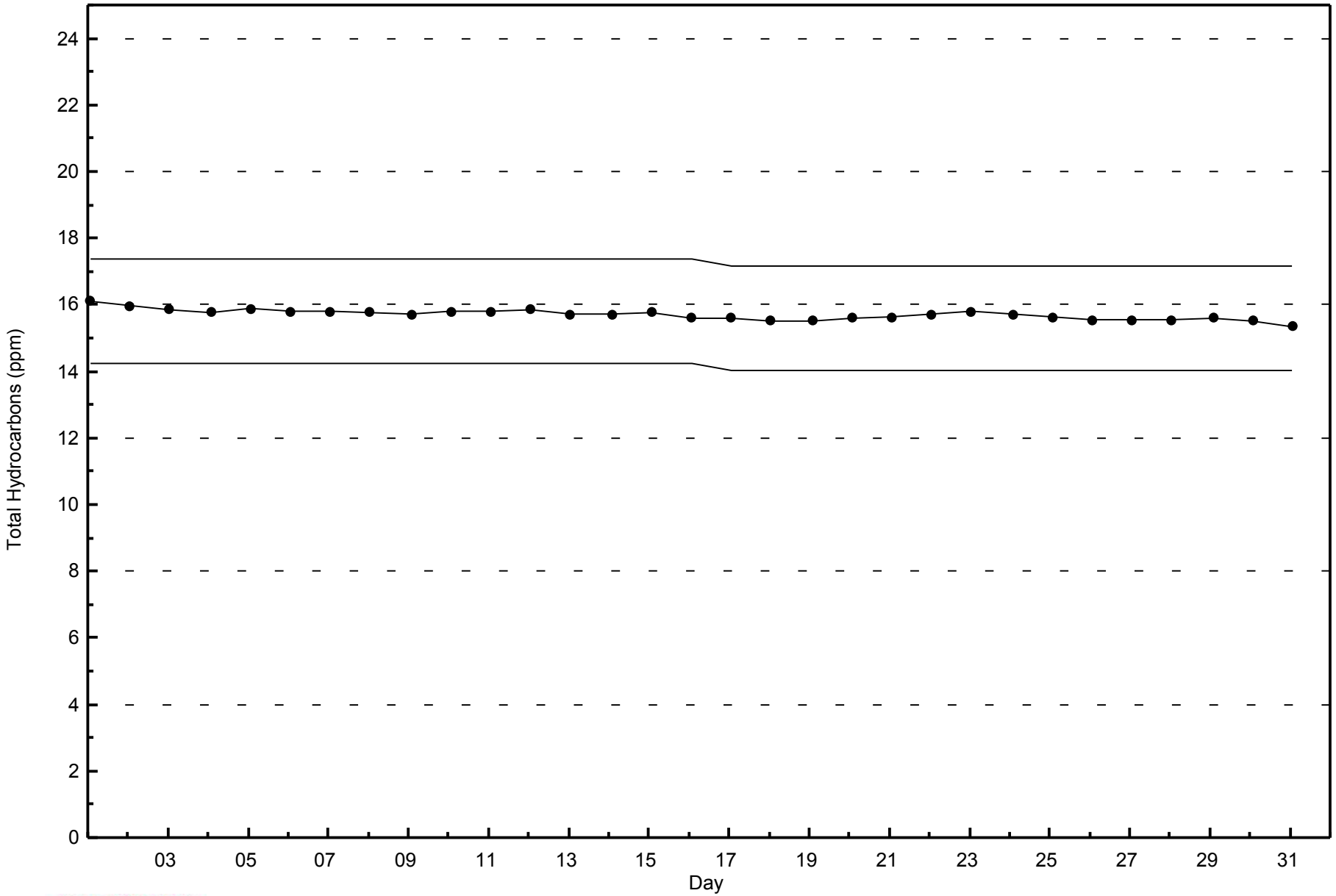
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 33.6 C on Aug 13 17:00

Maximum Daily Average: 26.2 C on Aug 13

Minimum Value: 2.8 C on Aug 22 05:00

Minimum Daily Average: 11.3 C on Aug 22

Maximum Diurnal Average: 25.9 C at hour 15

Minimum Diurnal Average: 12.6 C at hour 6

Monthly Average: 19.25 C

Percentiles: P_1 = 4.6 P_{10} = 11.4 Q_1 = 14.5 Median = 18.5 Q_3 = 24.0 P_{90} = 29.5 P_{99} = 33.0

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-Aug	15.8	14.7	13.7	12.9	12.2	12.2	12.8	14.7	16.6	17.9	18.7	19.8	21.2	21.8	22.3	22.7	22.9	22.9	22.4	20.8	18.7	17.0	15.3	14.3	17.7	22.9
2-Aug	13.3	12.3	11.6	11.1	11.0	11.4	12.8	15.6	19.8	22.4	25.0	26.8	28.8	29.5	29.7	29.4	27.8	26.3	23.9	21.3	21.2	19.8	18.6	17.0	20.3	29.7
3-Aug	16.1	15.2	14.6	14.8	14.6	15.0	16.3	19.0	23.2	25.5	27.8	29.6	30.9	31.8	32.5	31.9	31.6	31.0	30.3	28.5	25.6	24.0	21.1	19.5	23.8	32.5
4-Aug	18.3	17.5	17.3	17.6	16.2	16.1	18.4	21.0	24.5	26.8	28.3	28.9	29.6	30.7	31.9	32.1	31.9	31.1	29.5	27.2	24.6	22.8	21.2	19.5	24.3	32.1
5-Aug	18.9	17.2	15.9	15.0	14.5	14.4	15.7	18.5	21.4	24.0	26.5	28.8	31.1	32.5	33.2	33.3	33.1	32.3	30.9	29.4	27.4	25.4	23.4	22.6	24.4	33.3
6-Aug	21.8	21.4	20.8	19.9	19.3	19.2	20.5	22.1	23.3	24.0	26.8	29.6	31.0	31.6	31.9	29.0	28.1	28.1	27.0	25.8	25.0	24.1	22.4	20.8	24.7	31.9
7-Aug	21.2	19.8	18.7	17.6	16.1	16.2	17.8	19.5	21.6	23.2	24.5	25.6	26.4	26.7	27.5	27.2	26.6	26.1	25.1	23.8	20.8	18.4	17.2	16.0	21.8	27.5
8-Aug	16.4	14.7	13.3	12.2	11.0	10.8	12.9	15.7	18.4	20.1	21.1	22.2	23.1	23.8	24.0	23.3	23.3	22.2	21.6	20.1	17.1	15.1	14.2	13.9	17.9	24.0
9-Aug	13.7	13.3	13.1	13.1	13.0	13.1	13.3	13.3	13.8	14.5	16.5	18.7	20.0	21.3	21.9	22.3	22.8	22.9	22.4	20.4	17.8	16.0	14.8	13.2	16.9	22.9
10-Aug	12.5	12.5	12.3	11.8	11.5	11.6	12.9	16.1	19.6	21.5	23.6	25.4	27.0	28.2	28.2	27.6	26.9	26.0	24.6	24.0	22.0	20.2	18.0	16.6	20.0	28.2
11-Aug	15.8	15.7	14.6	14.3	14.7	15.1	16.7	17.7	20.4	24.1	27.7	29.1	30.1	30.6	30.1	29.2	28.5	27.4	26.4	24.9	21.9	20.3	19.0	17.7	22.2	30.6
12-Aug	16.6	15.4	14.6	13.7	12.6	12.6	14.2	17.9	22.9	25.7	27.0	29.1	30.1	30.8	30.9	31.0	30.7	30.4	29.3	27.1	25.4	23.7	22.8	22.0	23.2	31.0
13-Aug	21.2	19.8	19.1	18.6	17.9	17.5	18.8	22.1	24.8	27.0	28.7	30.5	31.7	32.9	33.2	33.4	33.6	33.0	31.9	30.0	27.5	26.0	24.8	23.7	26.2	33.6
14-Aug	21.8	20.7	19.4	17.9	17.2	16.2	17.0	20.1	23.7	26.5	28.4	30.5	31.2	31.8	31.7	31.1	31.2	30.2	28.4	26.8	24.0	21.9	20.9	20.0	24.5	31.8
15-Aug	19.0	18.3	17.7	16.6	15.9	15.6	17.0	20.3	24.4	27.4	30.0	31.8	32.4	33.4	33.0	32.5	32.1	30.7	29.2	28.1	26.3	23.7	22.3	21.1	25.0	33.4
16-Aug	19.9	19.1	18.3	17.1	16.1	15.6	17.3	19.9	22.9	24.7	27.0	28.0	30.5	31.8	32.1	32.4	32.5	31.1	29.7	28.2	26.6	24.6	23.8	22.5	24.7	32.5
17-Aug	21.7	21.3	20.7	19.5	18.9	18.6	18.5	21.4	25.2	27.6	29.2	30.0	31.3	32.3	32.3	32.0	30.8	29.8	28.2	25.6	23.1	20.9	19.4	17.7	24.8	32.3
18-Aug	17.1	15.5	14.5	14.1	13.7	13.7	15.3	16.9	18.0	18.6	20.4	22.2	23.5	24.4	24.6	24.6	23.7	20.4	19.9	19.2	18.5	18.2	17.8	17.3	18.8	24.6
19-Aug	16.8	16.0	15.7	15.6	15.7	16.3	16.7	17.2	18.5	23.2	25.2	26.1	26.6	AF	AF	16.7	18.3	19.1	18.8	17.2	15.9	15.7	15.6	15.9	18.3	26.6
20-Aug	14.9	14.1	13.5	13.1	12.8	12.3	12.0	12.0	12.0	12.0	12.3	13.1	14.1	15.2	15.3	15.3	15.9	14.8	14.3	13.9	11.6	9.8	9.0	8.4	13.0	15.9
21-Aug	7.7	6.6	5.5	4.7	4.0	4.0	5.3	8.2	12.9	15.2	15.8	16.2	17.4	18.1	18.1	18.0	17.7	16.9	15.9	14.0	11.8	9.5	7.9	6.3	11.6	18.1
22-Aug	5.1	4.6	3.7	3.0	2.8	3.2	5.1	7.2	9.9	13.1	15.6	18.4	18.7	18.6	19.2	18.6	18.5	17.5	16.6	14.7	11.9	9.7	8.0	6.8	11.3	19.2
23-Aug	6.3	6.9	7.1	7.3	7.6	7.8	8.4	9.2	10.9	13.4	15.9	18.4	19.9	20.2	19.8	19.4	19.1	19.3	17.9	16.5	14.5	13.3	12.1	9.6	13.4	20.2
24-Aug	9.1	7.8	7.4	8.2	8.4	8.4	8.6	9.7	11.8	12.8	15.7	18.9	20.7	21.9	22.4	22.8	21.8	21.4	19.8	18.1	16.4	14.9	13.7	13.2	14.7	22.8
25-Aug	13.1	12.7	12.8	12.5	12.0	11.9	12.3	13.0	14.9	17.9	20.6	22.1	24.2	23.6	24.7	24.9	24.4	23.7	21.7	20.3	19.3	19.0	18.8	18.3	18.3	24.9
26-Aug	17.9	17.1	16.9	16.0	14.9	13.5	14.3	16.3	18.2	20.1	21.6	23.4	24.0	26.7	27.6	28.4	27.9	21.8	18.7	18.1	17.8	17.7	17.3	16.8	19.7	28.4
27-Aug	16.0	15.5	15.0	14.1	13.9	14.0	14.6	15.5	16.4	18.4	18.8	21.8	23.4	24.6	24.8	24.9	23.9	22.5	21.5	19.2	16.9	15.7	13.7	12.5	18.2	24.9
28-Aug	11.8	10.4	10.1	9.8	9.1	8.4	8.7	10.7	13.0	13.5	14.4	14.8	14.6	15.5	16.9	17.2	17.2	16.6	15.5	13.7	11.7	10.1	9.0	8.9	12.6	17.2
29-Aug	7.3	6.4	5.7	5.1	4.6	4.5	5.9	8.7	13.5	16.6	18.6	21.2	22.4	23.6	24.1	23.9	23.5	23.1	21.1	19.7	18.3	17.0	15.8	14.8	15.2	24.1
30-Aug	14.7	14.1	13.6	13.4	12.7	12.5	12.9	12.9	13.1	12.8	13.3	14.4	16.5	18.1	19.7	19.8	21.1	20.3	18.6	16.5	15.4	14.8	14.2	12.9	15.3	21.1
31-Aug	12.0	11.2	10.4	10.3	10.2	9.8	10.6	11.4	14.8	18.7	21.3	22.7	19.9	16.3	14.8	13.4	15.1	16.7	15.6	14.2	13.3	13.1	11.7	10.7	14.1	22.7
	15.3	14.4	13.8	13.2	12.7	12.6	13.7	15.6	18.2	20.3	22.1	23.8	24.9	25.6	25.9	25.4	25.2	24.4	23.1	21.5	19.6	18.1	16.9	15.8	Diurnal Average	
	21.8	21.4	20.8	19.9	19.3	19.2	20.5	22.1	25.2	27.6	30.0	31.8	32.4	33.4	33.2	33.4	33.6	33.0	31.9	30.0	27.5	26.0	24.8	23.7	Diurnal Maximum	

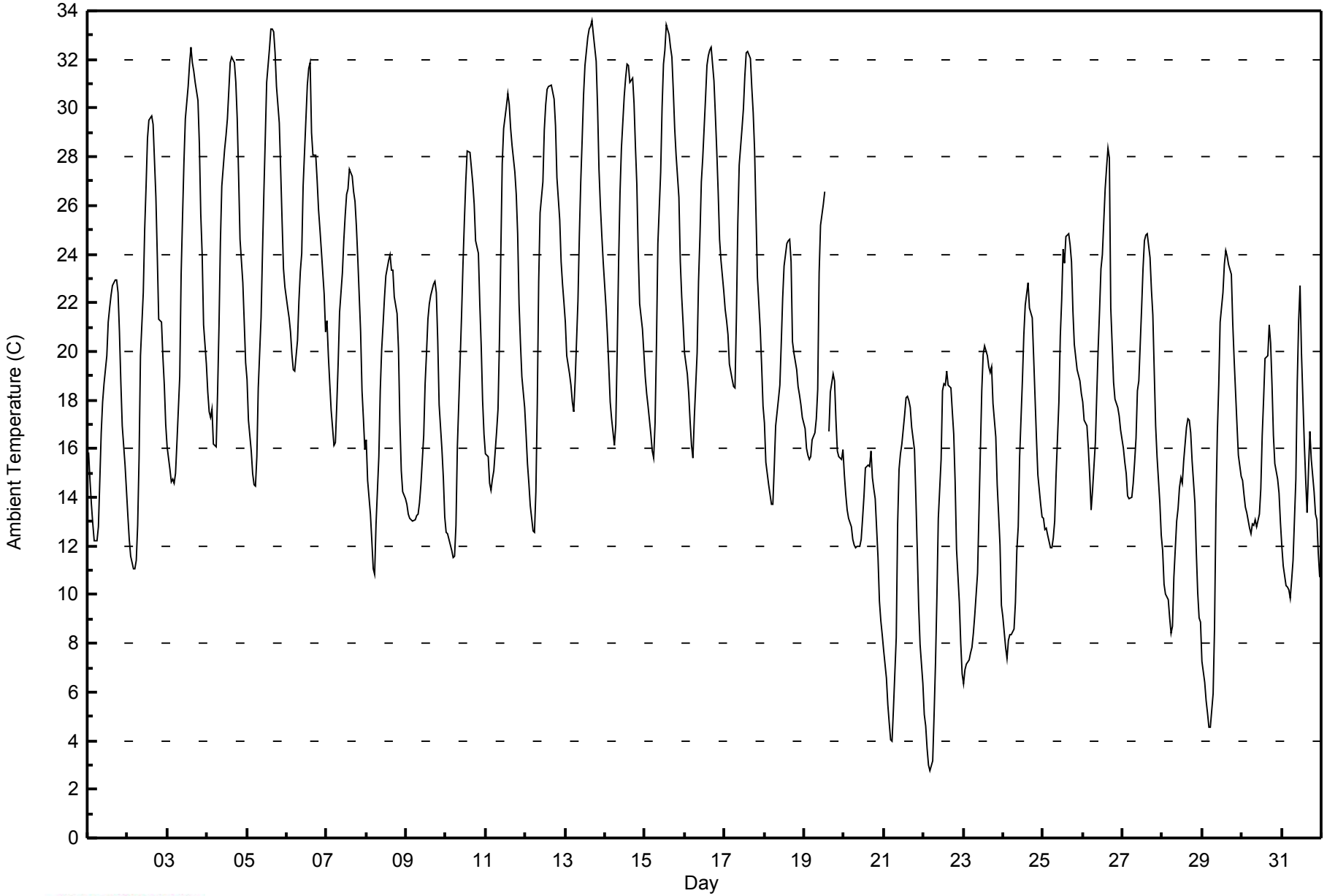
AF - Analyzer Failure

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Barge Landing - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	58	7.82	7.82
10 - 20	376	50.67	58.49
> 20	308	41.51	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Barge Landing - August 2014

Maximum Speed: 16 km/h on Aug 7 13:00

Maximum Daily Speed Average: 8.1 km/h on Aug 25

Minimum Speed Value: 0 km/h on Aug 8 02:00

Minimum Daily Speed Average: 0.2 km/h on Aug 15

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

Minimum Diurnal Speed Average: 0.3 km/h at hour 18

Monthly Average Velocity: 1.3 km/h 215.3 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 3 Median = 4 Q_3 = 6 P_{90} = 8 P_{99} = 13

Hours in Service: 744

Hours of Data: 738

Hours of Missing Data: 6

Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Aug	N8	N9	N8	NNW8	NNW8	NNW8	N7	N6	N6	NNW7	N6	NW3	ENE1	ESE4	E4	E2	E4	SE4	SSE5	ESE3	ESE3	SE5	ESE4	SE4	NNE2.9	N9
2-Aug	SE3	ESE2	SE3	ESE4	SSE3	NNW1	SSE2	S4	S6	SSW6	SSE7	SSE8	SSW8	SSW11	SSW10	S10	SSW12	SSW7	NE5	E7	S1	SE2	SE1	SW3	S4.0	SSW12
3-Aug	SW3	SSW3	S4	S5	SSE5	S5	SW5	SSW5	S5	S6	S5	S4	SW5	WSW7	W4	S6	SSE9	S7	SE5	SSW3	SW2	WSW4	WSW3	SW1	SSW4.0	SSE9
4-Aug	SSW2	SSW3	S4	SSW3	SE3	SSE4	SSE5	NNW1	ENE2	N4	NNW5	NW7	NW6	NNW4	NE4	ENE4	ENE4	ENE4	ENE4	ENE5	ENE3	NNW1	NW2	NW2	NE0.9	NNW7
5-Aug	NNW2	SW1	SE2	SSW1	SE2	ESE3	SW1	WSW2	SW4	SSW4	SSW6	SE5	SSE3	WSW7	S8	SSE6	SSE7	SE6	ESE4	ESE5	SE7	S4	SE5	SSE6	SSE3.2	S8
6-Aug	SSE7	SSE7	SSE6	SSE5	SSE6	SSE5	SSE6	SSE7	S6	SSE6	SSE7	S10	SSW12	SW12	SW12	W7	ENE4	SE6	SE6	S4	SW7	WSW8	SW6	SW6	S5.4	SW12
7-Aug	WSW9	WSW3	SSW6	SSW4	SSE4	SW6	WSW11	WSW14	WSW12	WSW10	WSW13	WSW15	WSW16	W14	W12	W11	W13	WNW9	W7	W6	WSW4	W3	NNW4	WNW4	WSW7.9	WSW16
8-Aug	W4	N0	WSW4	NNW2	ESE1	W1	ENE1	E4	NE3	ENE3	ENE4	ENE5	E5	ENE6	ENE3	ENE6	ENE6	ENE7	NE7	N6	NW7	NNW7	NNW4	NNW4	NE2.5	NW7
9-Aug	NNW4	N5	N5	N4	NNW5	NNW4	NW4	WNW4	WNW4	NW2	NNW3	NW4	WSW3	NW2	NNW3	NW5	WSW4	WSW6	WNW5	WNW2	SW1	SW4	W1	SW4	NW2.7	WSW6
10-Aug	SSW2	SSW3	SSE3	SSE3	SSE4	SE3	SSE3	SSW5	SSW6	S6	S6	SSW8	SSW7	SW7	SSW7	SW6	SW5	S2	SSE3	SSE4	S4	SSW4	S3	S3	SSW4.1	SSW8
11-Aug	SSE5	S4	S4	S5	SSW5	SSW5	SSW4	SSW5	SSW6	S4	SSW3	NW7	NW11	NW11	NW10	NW10	N8	N8	NNE7	NNE6	NNW3	NNW3	NE2	NW2	WNW1.9	NW11
12-Aug	NW3	NNW2	W2	NW1	SSE1	SE1	NNE0	ESE1	SSW3	W4	WNW4	WNW6	WSW3	SSE6	SSE7	SSE7	SSE8	SSE9	SE8	ESE6	SE7	SSE7	SSE7	SSE7	SSE2.7	SSE9
13-Aug	SSE5	SE2	SSE4	SE5	SE4	N1	S1	SSW4	S6	S7	S7	S9	SW11	SW12	SW12	SW11	WSW9	SW8	SSW5	SW4	NW2	NW4	NW2	S3	SSW4.4	SW12
14-Aug	W3	WNW4	NW3	NW4	NNW3	SW2	WNW2	W2	NW3	WNW3	NW4	W3	NW3	S2	SSE2	ESE2	SSW3	S4	SSE4	SSE4	S2	ESE1	SW2	SSE3	WSW1.1	S4
15-Aug	SSE5	SSE3	S3	SSE3	SSE2	SE4	SSW3	SW5	S4	S5	SSW5	SSW3	W1	WNW2	ESE3	ENE1	E2	NNW6	N8	NNE8	NNE5	NNW2	NNW5	NNW5	S0.2	N8
16-Aug	NNW4	NNW5	NNW4	NW2	AF	AF	W1	SW1	N0	NNW2	NW4	NW5	W5	SSW6	SSW7	WSW6	SW6	SW5	SW4	SSW4	SSW3	S3	SSW3	SSE3	WSW2.2	SSW7
17-Aug	WSW3	SW2	WSW4	WNW3	WNW4	W4	WNW3	NW4	NW3	WNW2	W4	WNW5	WNW7	WNW10	NW12	NW12	NW12	NW10	NW7	WNW3	NW2	NNE1	W3	SSW2	WNW4.8	NW12
18-Aug	W1	SSW1	SW2	SW2	SW2	SSE3	SSE1	NNW2	E2	ESE5	SE5	WSW4	W3	WSW5	WNW4	NNW3	NNW3	S2	WSW1	NNE5	N5	N3	NE2	WSW3	W0.5	WSW5
19-Aug	W3	SSW2	SSE3	SSE3	S4	SSW5	SSE3	S4	S4	SSW8	SSW10	S9	S11	MS	MS	E1	ESE5	ENE4	NE2	NW1	NNW5	NNW4	NW4	N6	S2.0	S11
20-Aug	NNE7	N6	N7	N7	N8	N10	NNE6	NNE8	NNE6	NNE8	NNE9	NNE8	NNE8	N8	N7	NNE5	NNE5	N8	N6	NNW5	NW2	NW2	NW4	NW4	N6.0	N10
21-Aug	WNW4	WNW4	WNW3	W2	SW3	WSW3	WNW3	NW2	NW4	NNW5	N6	N6	N7	N7	NNE6	NNE7	NNE7	NNE8	N7	N5	NNW4	NNW3	WSW3	WSW2	NNW3.4	NNE8
22-Aug	SW3	WSW3	WSW3	WSW3	W3	SW3	SW3	SW2	WSW3	NW3	NNW3	N3	NNW5	N4	NW6	N4	NNW5	N4	NE4	ENE3	AF	S1	SE1	SW2	NW1.6	NW6
23-Aug	SE1	S1	S2	W1	S1	S2	SE3	SE3	ESE3	SSE3	SW4	WSW4	ESE3	SSW1	S4	ESE2	SSE6	SSE5	SE2	E1	E4	E4	E3	ENE1	SE1.9	SSE6
24-Aug	NNW3	NNW3	NW3	NW3	NNW3	NW3	WNW3	NW3	NW3	NW3	WNW3	NE1	NE4	NNE3	NNE3	NW4	ESE5	ESE3	SE2	ESE3	SE5	SE6	SE7	SSE6	NE0.7	SE7
25-Aug	SSE5	SE5	SE5	ESE3	SE3	SE6	SSE7	S7	S8	SSE9	S9	SSE10	SSE12	SSE13	S13	S12	SSW12	S10	S8	SSE9	SSE9	SSE9	SSE10	SSE9	SSE8.1	S13
26-Aug	SSE7	SSE6	S6	S7	SSE6	SSE5	SSE5	SSW5	SSW7	SSW6	SSW7	SSW6	SSW7	SSW8	S9	S7	SW13	NNW10	WNW1	SSE5	SSW6	WSW6	S4	S4	SSW5.1	SW13
27-Aug	WSW2	W2	SW3	SSW3	SW6	WSW9	WSW9	WSW9	WSW8	WSW9	SW7	W8	WSW8	W7	SW10	WSW7	WNW5	NNW4	NW4	NNW4	AF	NW7	SW1	SSW2	WSW5.1	SW10
28-Aug	SSW3	SW3	WSW6	W5	W5	NW3	WNW3	WSW7	NW6	NW5	NNW8	NNW8	NNW6	NW5	NNW7	NW7	NNW6	N2	E1	ESE3	SSE2	ENE1	ESE3	SE5	NW2.5	NNW8
29-Aug	ESE3	SE4	SSE5	SSE4	SSE4	SSE5	SSE4	S6	S7	S8	S8	S7	SSE9	SSE10	SSE10	SSE9	SSE9	SE8	SE8	SE9	SE8	SE8	SE8	SE7	SSE6.7	SSE10
30-Aug	SE7	SE7	SE6	W1	W0	S2	S3	SSE3	SW3	NW3	NW3	WSW5	WNW4	NE1	ESE3	SE2	S2	E3	ENE5	E2	N2	NNW4	NW4	W1	SSE0.6	SE7
31-Aug	SSE3	SSW4	SW4	WSW4	SSW3	SSW4	SSW4	SW3	SW3	WSW4	SW5	WSW5	WSW5	NNW3	NNW8	S4	WSW6	NW4	WSW4	S3	SW3	WSW3	S4	SSW2	SW2.8	NNW8
	SSW1.1	SSW0.8	SSW1.5	SSW0.9	SSW1.2	SSW1.3	SW1.7	SW2.2	SW2.1	SW2.0	SW2.2	WSW2.3	WSW2.8	WSW2.6	SW2.2	SW1.7	SSW1.6	SSW0.3	E1.0	ESE1.2	SSE0.7	SW0.8	S1.1	S1.6	Diurnal Average	
	WSW9	N9	N8	NNW8	N8	N10	WSW11	WSW14	WSW12	WSW10	WSW13	WSW15	WSW16	W14	S13	S12	W13	NW10	N8	SE9	SSE9	SSE9	SSE10	SSE9	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

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 Aug 27 22:00

Minimum Value: 1 km/h on Aug 16 22:00

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

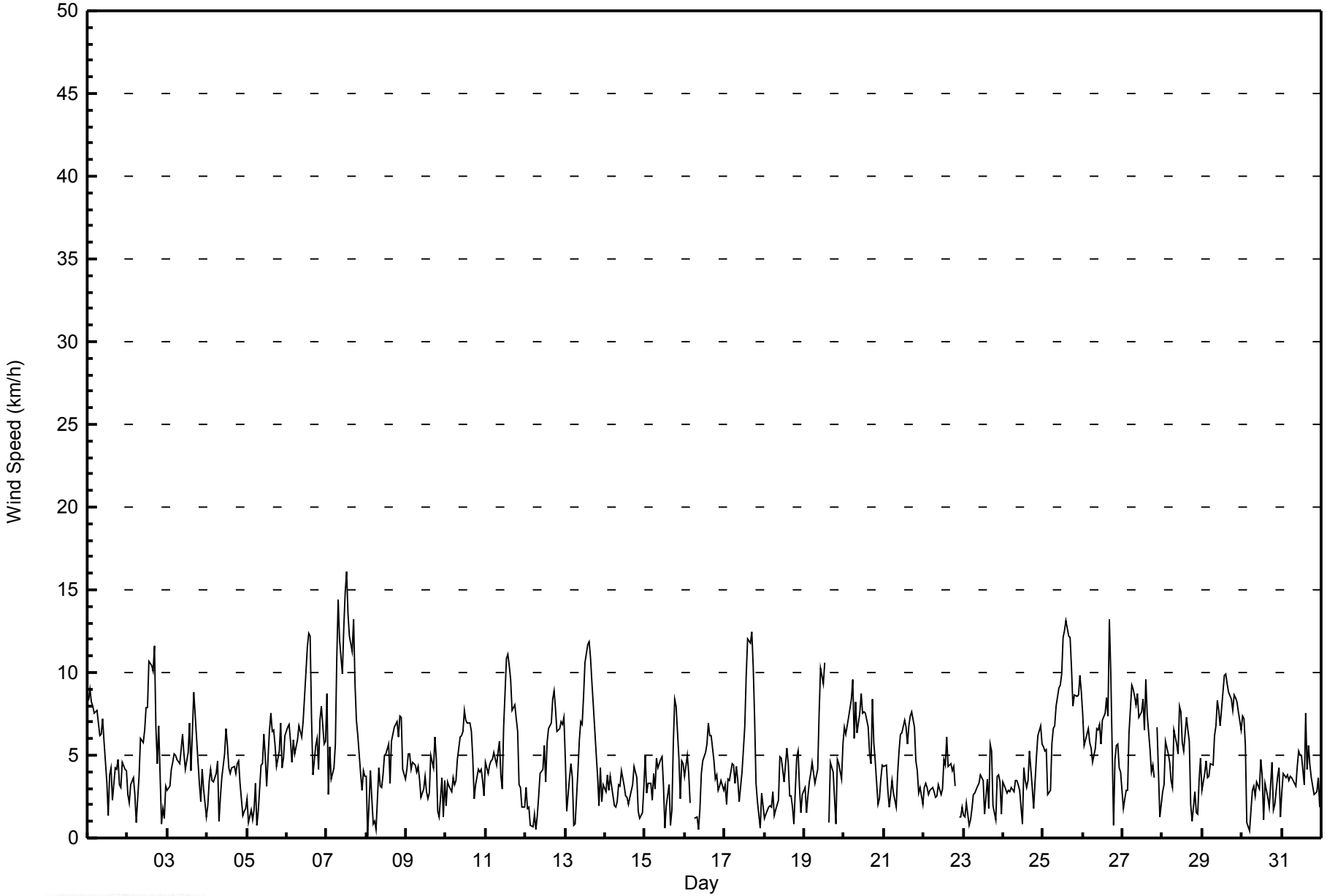
AF - Analyzer Failure MS - Missing

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Barge Landing - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	485	65.72	65.72
6 - 11	230	31.17	96.88
12 - 19	23	3.12	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 738

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Barge Landing - August 2014

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	16	8	10	21	14	27	33	48	46	42	40	31	26	29	49	45	485
6 - 11	26	15	1	4	1	1	19	40	30	23	13	21	5	4	13	14	230
12 - 19	0	0	0	0	0	0	0	2	2	3	5	5	3	0	3	0	23
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	42	23	11	25	15	28	52	90	78	68	58	57	34	33	65	59	738

Total Number of Valid Hours: 738

Total Number of Hours: 744

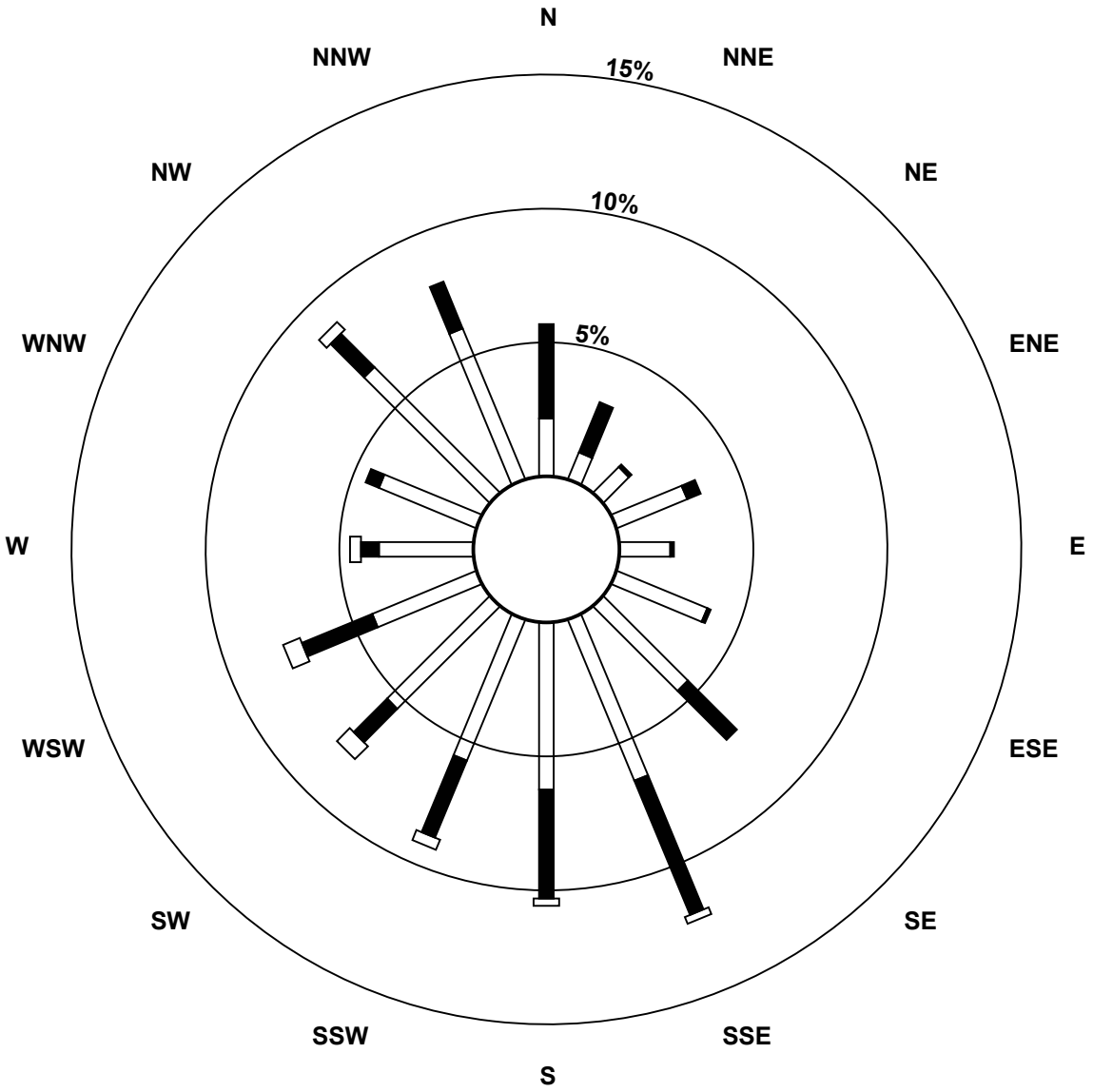
AURORA
ATMOSPHERICS INC.

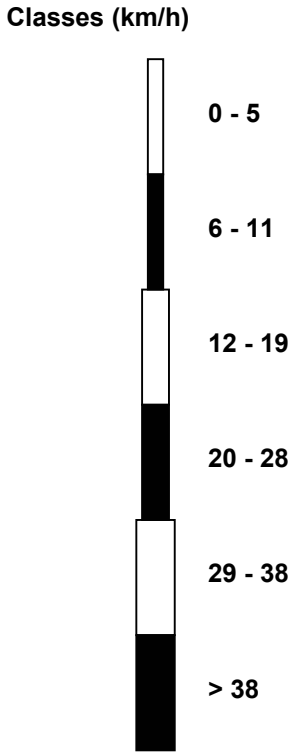
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Barge Landing (AMS 9)





Total Number of Valid Hours: 738

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Barge Landing - August 2014

Direction of Maximum Speed: 256 deg on Aug 7 13:00
Direction of Maximum Daily Speed Average: 166.6 deg on Aug 25

Direction of Minimum Speed: 352 deg on Aug 8 02:00
Direction of Minimum Daily Speed Average: 0.2 deg on Aug 15

Monthly Average Direction: 252.8 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-Aug	356	1	355	348	341	343	353	351	352	344	7	323	63	112	89	80	89	125	152	118	112	131	117	130	20.0
2-Aug	143	117	134	115	154	343	157	185	182	200	159	166	213	192	197	188	199	195	42	94	170	130	138	227	176.3
3-Aug	225	198	169	173	167	177	215	211	183	188	177	191	235	254	261	176	157	175	144	203	216	256	240	222	195.1
4-Aug	195	192	189	193	144	149	160	345	68	351	327	326	314	337	44	68	70	63	66	72	63	332	317	317	42.8
5-Aug	345	220	128	200	125	121	236	253	232	200	213	135	157	240	187	165	150	136	123	123	142	169	144	161	166.1
6-Aug	155	160	156	167	153	157	159	160	184	156	164	176	210	225	234	259	64	142	131	191	231	237	227	218	188.2
7-Aug	242	238	202	197	165	231	249	250	256	247	241	256	256	268	266	276	267	288	277	271	249	275	329	302	256.8
8-Aug	262	352	257	332	119	263	61	85	42	71	78	66	79	72	57	74	64	60	56	355	314	344	343	347	35.7
9-Aug	346	349	360	351	345	341	309	292	282	316	347	312	246	306	334	326	248	253	285	297	225	217	272	229	306.3
10-Aug	204	212	159	147	150	138	161	212	213	174	184	205	192	225	204	218	224	191	152	154	189	211	186	170	191.7
11-Aug	163	185	174	171	195	205	204	206	209	175	209	320	313	317	308	316	6	7	19	22	342	342	40	309	301.6
12-Aug	319	344	280	322	167	130	20	109	200	262	296	296	258	161	156	160	159	160	141	123	128	147	154	153	162.3
13-Aug	156	124	156	140	137	8	177	205	181	186	176	187	215	227	224	227	240	229	210	219	304	323	317	189	207.7
14-Aug	266	303	304	318	327	234	286	281	320	291	307	266	307	190	158	106	206	173	150	147	183	117	217	165	249.7
15-Aug	153	163	176	163	167	145	198	218	185	190	211	207	266	293	114	77	83	339	10	18	18	335	330	335	190.6
16-Aug	327	330	327	318	AF	AF	281	226	354	345	315	318	262	213	192	241	222	217	216	197	200	187	213	155	243.9
17-Aug	245	230	252	290	301	281	292	306	314	293	267	296	282	301	306	312	316	308	313	283	310	24	275	203	297.0
18-Aug	265	209	217	215	225	149	156	347	88	106	137	250	271	242	291	336	345	189	246	21	0	4	51	252	272.9
19-Aug	261	198	167	164	188	199	166	184	189	194	209	175	181	MS	MS	81	109	63	52	308	346	348	319	10	185.0
20-Aug	20	7	0	1	359	4	21	24	32	16	19	19	19	10	10	17	12	2	3	342	320	318	318	314	7.1
21-Aug	299	294	282	264	222	243	303	310	322	343	352	359	358	356	24	23	17	16	9	1	348	329	241	240	343.8
22-Aug	236	243	242	249	267	225	230	234	256	307	345	351	340	6	324	2	335	353	47	71	AF	190	146	231	308.9
23-Aug	128	183	179	270	189	170	141	132	119	152	232	240	117	213	185	108	150	155	125	83	89	93	84	63	144.3
24-Aug	343	328	324	325	333	319	301	324	314	306	295	37	37	30	29	318	117	113	131	117	129	142	133	151	36.4
25-Aug	150	146	145	110	129	138	155	179	170	161	176	160	167	157	169	187	197	190	176	157	159	168	168	165	166.6
26-Aug	162	164	179	174	158	154	166	199	206	209	192	194	209	203	178	173	223	335	298	160	195	240	181	180	191.5
27-Aug	250	267	228	206	221	240	250	243	244	245	231	260	251	259	235	249	297	327	325	335	AF	306	225	212	253.5
28-Aug	207	235	253	261	262	313	286	251	311	317	329	333	335	318	338	324	343	350	89	118	164	61	107	138	307.0
29-Aug	120	129	152	155	151	150	161	180	171	175	175	172	158	153	159	153	147	139	132	132	138	139	140	144	151.7
30-Aug	144	134	141	264	273	178	190	150	229	307	304	256	297	46	107	142	184	89	65	81	5	335	312	281	154.1
31-Aug	166	212	223	240	193	204	210	215	219	237	228	238	252	331	339	191	242	311	244	190	214	241	169	198	230.9
	207.0	208.0	200.4	210.9	191.8	201.5	215.2	224.8	221.0	219.2	224.9	238.8	240.8	244.4	231.1	228.5	208.7	204.7	85.2	106.9	166.7	223.4	181.6	186.4	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 110 deg on Aug 15 13:00

Minimum Value: 8 deg on Aug 25 06:00

Percentiles: P_1 = 11 P_{10} = 16 Q_1 = 23 Median = 32 Q_3 = 44 P_{90} = 68 P_{99} = 95

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-Aug	22	24	22	21	20	20	23	28	35	34	44	73	98	61	54	87	51	43	26	22	9	12	12	16	98
2-Aug	42	15	11	13	81	89	45	60	36	43	44	38	46	34	30	31	29	37	91	31	85	90	92	36	92
3-Aug	38	29	19	22	19	24	26	34	30	32	50	64	52	34	63	54	30	27	27	34	64	14	18	69	69
4-Aug	33	16	20	28	28	24	26	94	60	52	26	21	25	46	42	31	25	20	20	22	46	60	57	54	94
5-Aug	47	83	56	59	40	14	93	41	17	42	35	38	68	55	34	39	30	21	14	12	9	12	27	17	93
6-Aug	15	18	17	20	15	17	26	27	33	31	37	35	30	27	25	59	54	20	17	38	21	16	21	25	59
7-Aug	36	89	28	38	27	32	25	24	31	33	28	31	28	35	34	37	33	36	34	29	19	43	11	19	89
8-Aug	39	81	34	20	92	45	83	31	61	74	62	48	41	34	65	24	24	23	23	32	31	23	24	23	92
9-Aug	20	22	22	20	21	21	26	31	40	42	62	61	75	87	69	37	47	40	32	60	55	17	56	29	87
10-Aug	46	25	32	23	16	21	30	33	32	40	40	37	43	39	45	31	21	27	17	14	20	20	34	35	46
11-Aug	16	24	15	20	22	26	29	25	31	55	76	61	30	29	30	32	32	26	27	27	17	17	22	24	76
12-Aug	21	39	28	75	78	39	67	64	72	43	44	32	70	47	42	38	33	27	18	12	13	15	16	17	78
13-Aug	18	30	18	12	39	33	72	32	33	30	38	36	29	25	26	24	22	21	23	19	49	15	76	32	76
14-Aug	31	17	63	22	19	51	39	47	34	53	41	66	81	75	95	60	59	29	19	14	68	84	53	39	95
15-Aug	10	14	19	27	25	17	37	25	41	38	41	83	110	93	65	87	78	40	27	24	32	29	12	14	110
16-Aug	14	14	16	15	AF	AF	45	41	80	48	34	35	48	57	44	41	40	28	26	20	16	16	39	31	80
17-Aug	29	63	19	21	15	21	26	27	36	74	61	71	44	38	36	31	25	27	22	26	58	77	41	40	77
18-Aug	50	79	29	51	52	35	60	41	72	22	38	54	71	31	41	34	41	65	96	24	25	43	41	46	96
19-Aug	41	59	27	26	29	29	37	32	29	31	29	39	34	MS	MS	82	30	33	34	64	24	24	53	33	82
20-Aug	38	26	26	26	24	25	31	24	24	27	26	29	29	33	33	33	38	23	26	19	28	18	11	15	38
21-Aug	16	18	61	28	38	23	26	53	36	45	40	43	37	40	44	42	29	30	28	23	16	30	14	33	61
22-Aug	25	15	18	19	18	15	18	29	44	37	64	74	51	53	37	46	33	28	41	31	AF	69	87	59	87
23-Aug	54	61	55	88	85	51	19	36	21	40	46	65	76	99	67	91	34	27	19	31	27	18	20	70	99
24-Aug	15	16	20	15	22	15	24	25	28	34	40	102	45	75	62	58	30	35	48	12	10	13	9	27	102
25-Aug	16	14	17	40	58	8	17	30	27	27	35	30	33	24	34	29	32	30	26	18	19	22	22	22	58
26-Aug	24	16	22	19	19	17	21	30	28	30	29	40	29	38	33	41	27	36	94	39	44	63	71	23	94
27-Aug	44	23	21	32	21	15	21	19	20	20	25	34	31	42	28	42	32	20	17	23	AF	70	82	71	82
28-Aug	47	37	28	40	34	35	44	29	33	36	28	31	32	45	33	40	33	44	77	20	61	58	16	15	77
29-Aug	22	12	14	21	11	15	24	26	32	32	35	39	34	30	30	28	22	18	13	12	11	13	13	11	39
30-Aug	13	10	17	78	95	70	60	47	46	41	48	30	45	93	73	74	81	39	21	74	46	28	23	75	95
31-Aug	46	42	36	29	35	28	28	27	33	39	41	52	67	54	28	57	28	37	44	49	67	45	25	48	67
	54	89	63	88	95	89	93	94	80	74	76	102	110	99	95	91	81	65	96	74	85	90	92	75	
	Diurnal Maximum																								

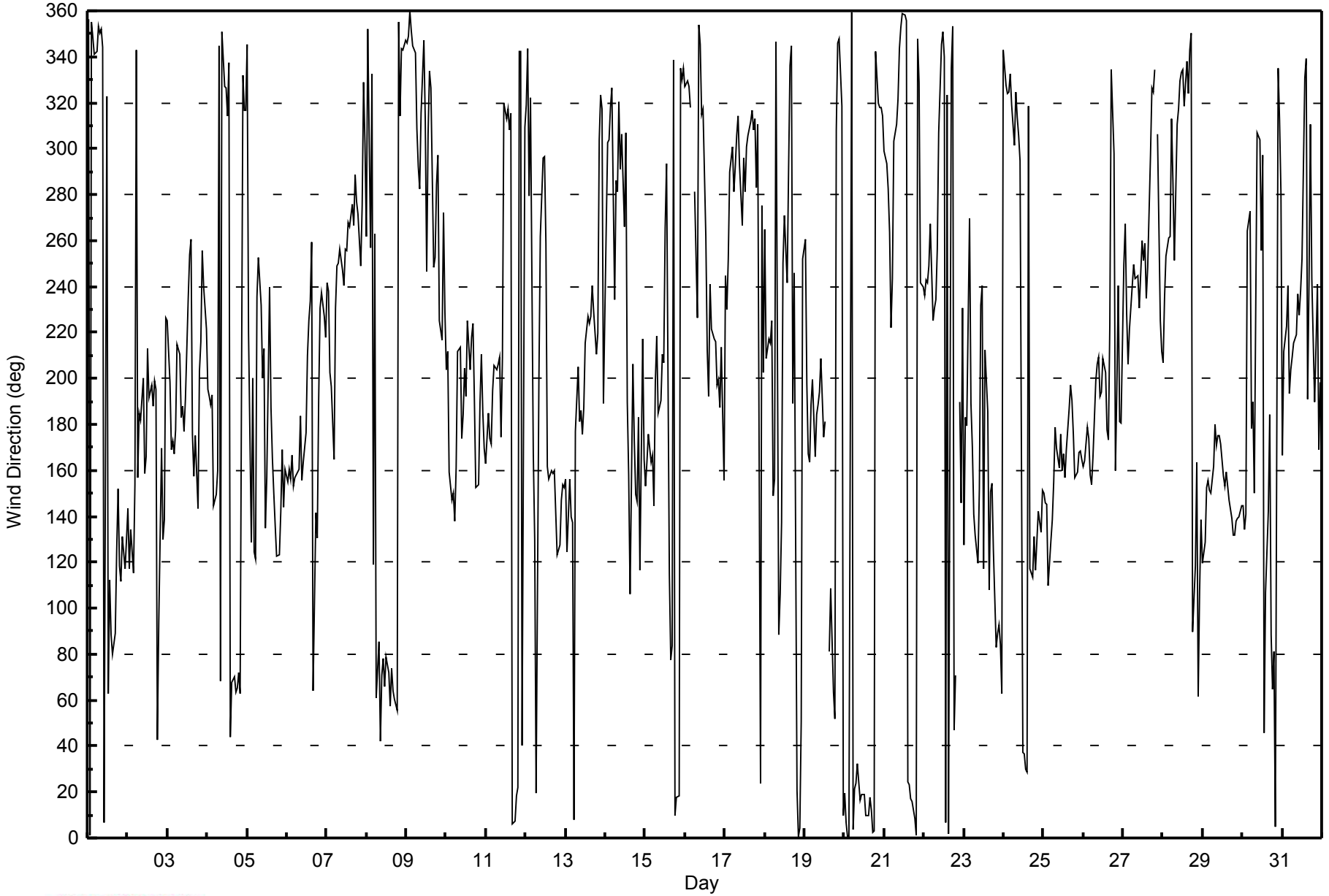
AF - Analyzer Failure MS - Missing

WBEA

Hourly Averages

Wind Direction (WD) - deg

Barge Landing - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 14, 2014	Previous Calibration	July 4, 2014
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Routine		
Start Time (MST)	9:00	End Time (MST)	13:15
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	-689	-689
Analyzer Range (input)	5000	5000	Lamp voltage	993	992
Calculated slope	0.989481	0.991434	Chamber temp.	45	45
Calculated intercept	-0.045125	0.053768	Pressure	574	554.3
Analyzer Background	2.27	2.28	Flow	0.373	0.363
Analyzer Coefficient	0.978	0.963	Intensity	31	91
			Converter temp.	850	850

Analyzer make/model	Thermo 45C	Analyzer serial #	328702540
Converter make/model	CDN-101	Converter serial #	376

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	83.8	79.9	81.1	0.986
SO2 scrubber check	5000	10.1	119.2	0.1	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	83.8	79.9	80.6	0.992
second point	5000	41.9	40.0	40.3	0.991
third point	5000	21.0	20.0	20.0	1.002
calibrator zero	6000	0.0	0.0	0.0	NA
as left zero	6000	0.0	0.0	0.2	NA
as left span	5000	83.7	79.8	80.4	0.993
				Average Correction Factor	0.995

Corrected As found	81.0	Previous response	80.8	% change	-0.2%

Notes:

Changed filter after as founds. Adjusted span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

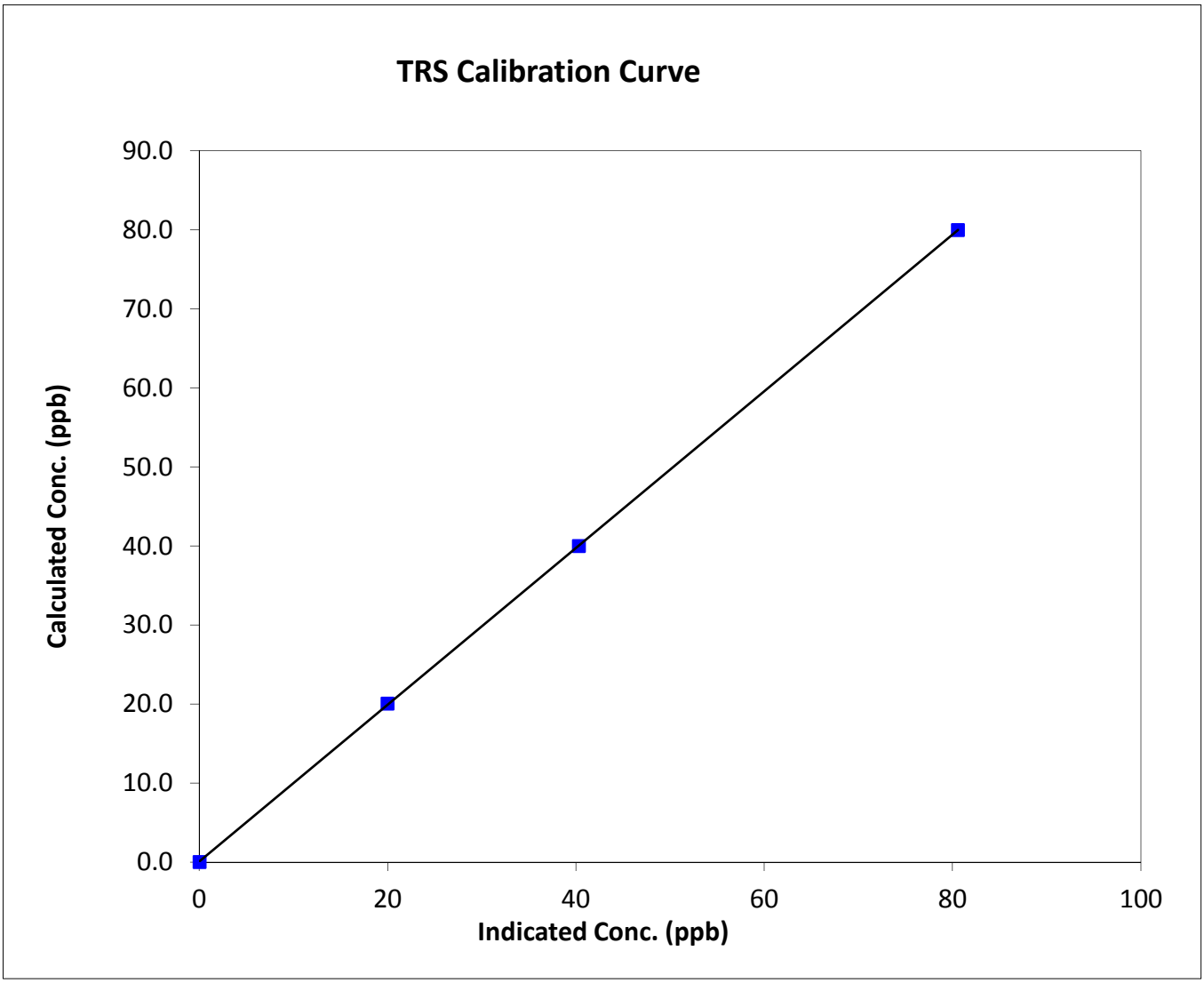
TRS Calibration Summary

Station Information

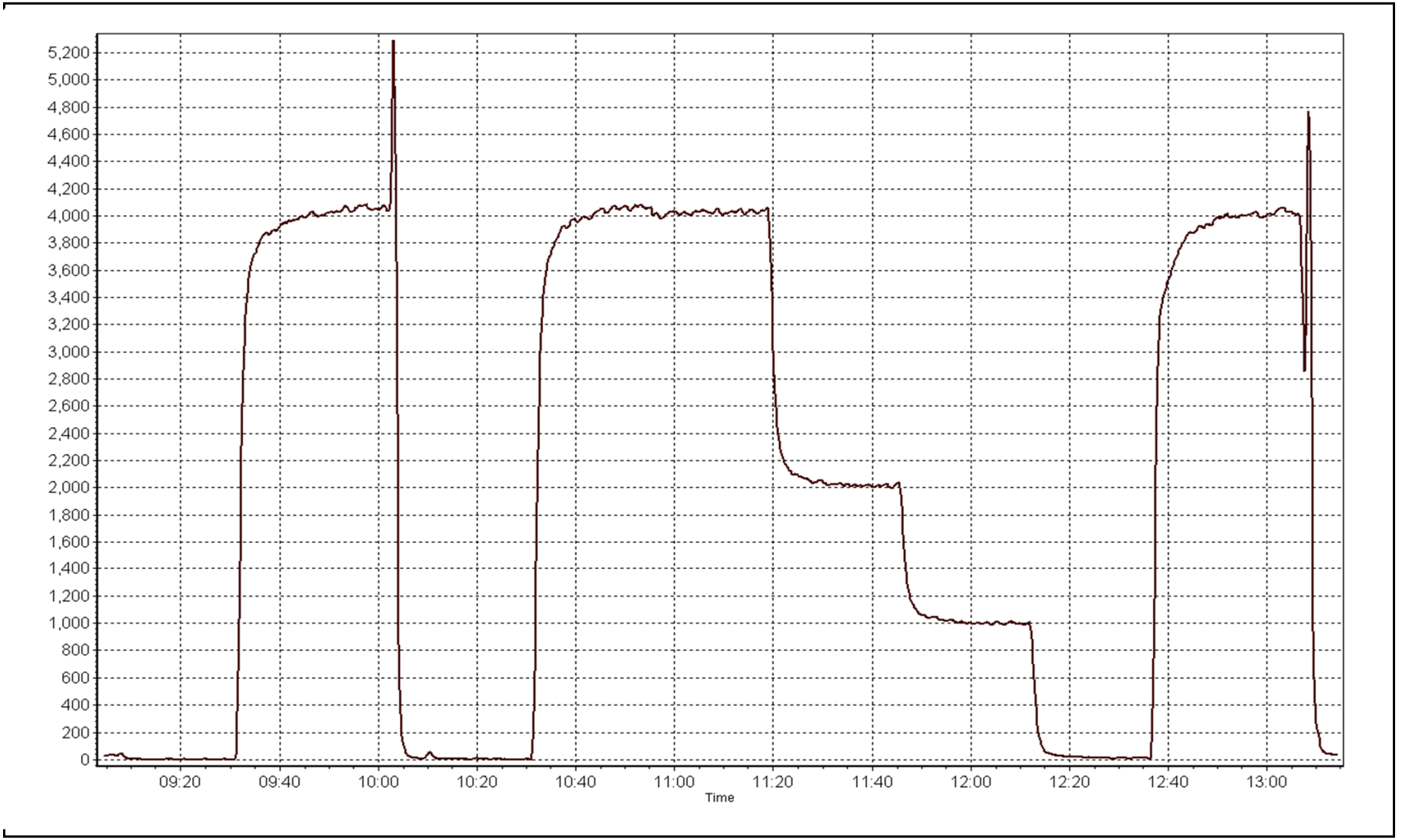
Calibration Date	August 14, 2014	Previous Calibration	July 4, 2014
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	9:00	End Time (MST)	13:15
Analyzer make	Thermo 45C	Analyzer serial #	328702540

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
79.9	80.6	0.9920		
40.0	40.3	0.9912	Slope	0.991434
20.0	20.0	1.0017		
			Intercept	0.053768



TRS Calibration Plot Date: August 14, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Friday, August 15, 2014	Previous Calibration	Tuesday, July 08, 2014
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Routine		
Start Time (MST)	9:15	End Time (MST)	12:40
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	1.000559	0.994949	Fuel Pressure	24.1	24.1
Calculated intercept	-0.107497	-0.012940	BKG	5.68	5.73
			COEF	4.179	4.165

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	0.08	N/A
as found span	6000	89.7	15.69	15.87	0.989
calibrator zero	6000	0.0	0.00	0.00	N/A
high point	6000	89.7	15.69	15.79	0.994
second point	6000	48.0	8.40	8.44	0.995
third point	6000	18.0	3.15	3.20	0.983
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.5	0.09	0.04	N/A
as left span	6000	89.7	15.69	16.01	0.980
				Average Correction Factor	0.991

Corrected As found	15.79	Previous response	15.79	% change	0.0%

Notes:

Filter changed after as founds. Zero and span adjusted.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

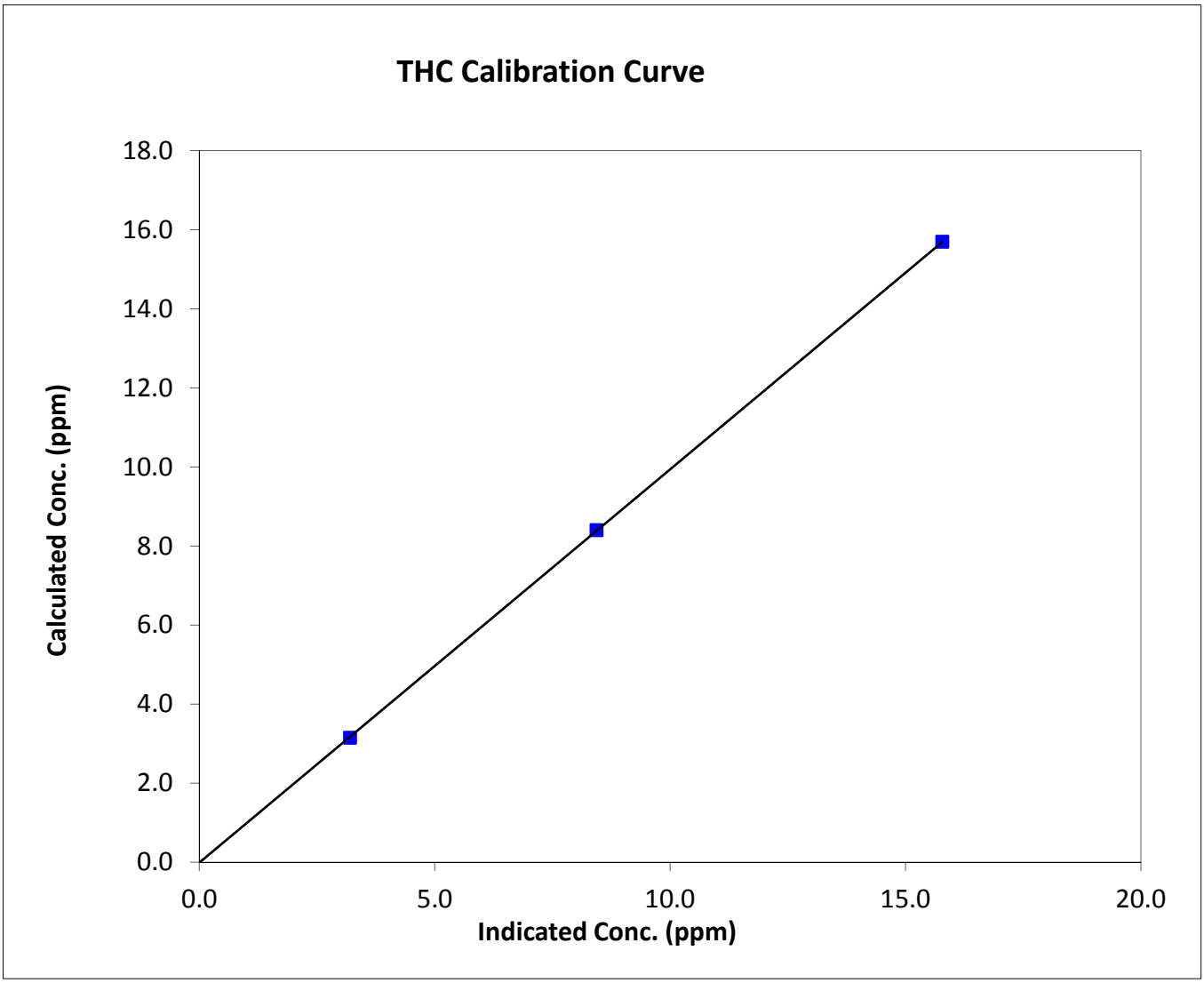
THC Calibration Summary

Station Information

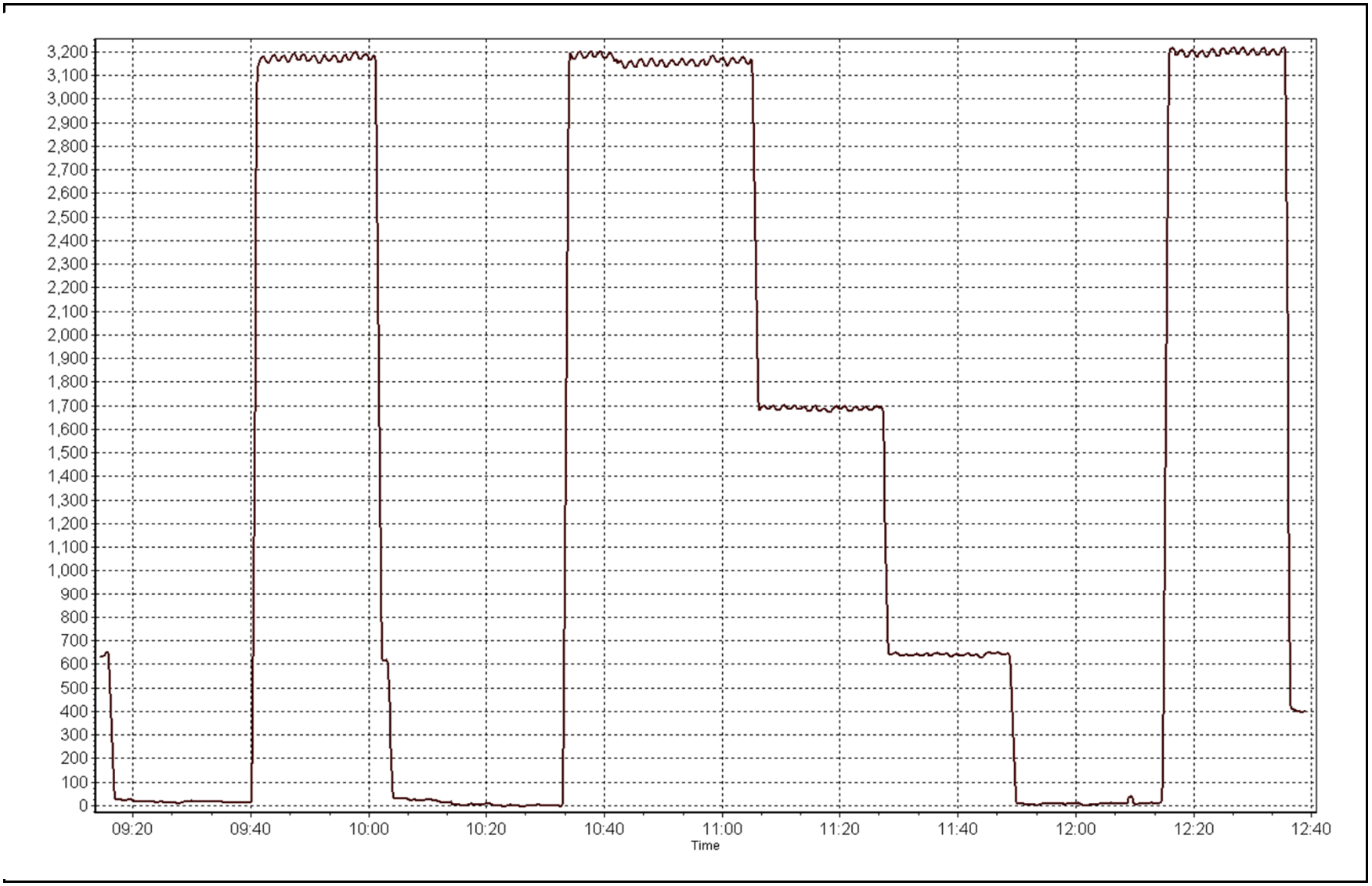
Calibration Date	August 15, 2014	Previous Calibration	July 8, 2014
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	9:15	End Time (MST)	12:40
Analyzer make	Thermo 51i-LT	Analyzer serial #	1327059296

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999992
15.69	15.79	0.9940		
8.40	8.44	0.9952	Slope	0.994949
3.15	3.20	0.9828		
			Intercept	-0.012940



THC Calibration Plot Date: August 15, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 11
LOWER CAMP
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
AUGUST 2014

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	659	36	85	93.41	34	0	7	0
H2S (ppb) Average	709	35	35	100.00	4	0	1	0
THC (ppm) Average	709	35	35	100.00	3.9	-	2.7	-
Temperature (C) Average	744	0	0	100.00	32.3	-	25.4	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	25	-	17	-
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 - LOWER CAMP (AMS 11)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	659	0.8	2	-	0	0	0	0	1	1	34
H2S (ppb) Average	709	0.6	0	-	0	0	0	0	1	1	4
THC (ppm) Average	709	2.34	0.3	-	1.9	2.1	2.1	2.3	2.5	2.7	3.9
Temperature 2 m (C) Average	744	18.43	6.2	-	4.2	11	14.1	17.9	22.6	27.5	32.3
Wind Speed 10 m (km/h) Average	744	6.7	4	-	0	2	3	6	9	12	25
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	18 Aug 2014 10:00	18 Aug 2014 14:00	5	Maintenance - Flash lamp and socket replaced
SO2	18 Aug 2014 15:00	20 Aug 2014 10:00	44	Analyzer drfit after repairs, analyzer replaced

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 34 ppb on Aug 27 10:00 Maximum Daily Average: 6.7 ppb on Aug 27

Minimum Value: 0 ppb on Aug 1 05:00 Minimum Daily Average: 0.1 ppb on Aug 16
Maximum Diurnal Average: 1.8 ppb at hour 10 Minimum Diurnal Average: 0.3 ppb at hour 6
Monthly Average: 0.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 13$

Hours in Service:	744
Hours of Data:	659
Hours of Missing Data:	85
Hours of Calibration:	36
Percent Operational Time:	93.4

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-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0.2	1
2-Aug	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
3-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	1	0.4	1
4-Aug	1	Z	1	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0.5	1
5-Aug	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
6-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	3	0.5	4
7-Aug	2	Z	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	2	1	2	0	0	0.5	2
8-Aug	0	Z	0	0	0	0	0	0	0	3	4	2	1	0	0	0	0	0	0	0	23	3	1	1	1.7	23
9-Aug	0	Z	0	0	0	0	0	0	0	2	2	1	1	1	1	3	1	1	0	0	0	0	0	0	0.6	3
10-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.1	1
11-Aug	0	Z	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	2
12-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0.3	2
13-Aug	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.1	1
15-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.1	1
16-Aug	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
17-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0.3	2
18-Aug	0	Z	0	0	0	0	0	0	0	M	M	M	M	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0
19-Aug	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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	C	C	1	1	1	0	0	1	1	--	1
21-Aug	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
22-Aug	1	Z	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	0.6	1
23-Aug	0	Z	1	1	1	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	0	0	0	1	0.9	2
24-Aug	1	Z	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0.4	1
25-Aug	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	0.4	1
26-Aug	0	Z	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2	1	1	1	0	1	1	1	0.6	2
27-Aug	1	Z	1	1	1	1	2	7	14	34	11	20	17	18	9	6	2	2	2	2	2	1	2	1	6.7	34
28-Aug	1	Z	1	1	1	1	0	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	6
29-Aug	1	Z	1	1	1	1	1	1	1	1	3	1	1	5	3	4	2	3	2	1	1	1	1	1	1.5	5
30-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	3	12	14	19	6	4	2	2	1	1	1	1	3.3	19
31-Aug	1	Z	1	1	1	1	1	1	1	3	4	3	3	2	1	1	1	2	1	1	1	1	1	1	1.4	4
	0.4	--	0.3	0.3	0.3	0.3	0.3	0.6	1.0	1.8	1.2	1.3	1.3	1.7	1.4	1.5	0.9	0.7	0.6	0.6	1.2	0.6	0.6	0.5	Diurnal Average	
	2	--	1	1	1	1	2	7	14	34	11	20	17	18	14	19	6	4	2	2	23	3	4	3	Diurnal Maximum	

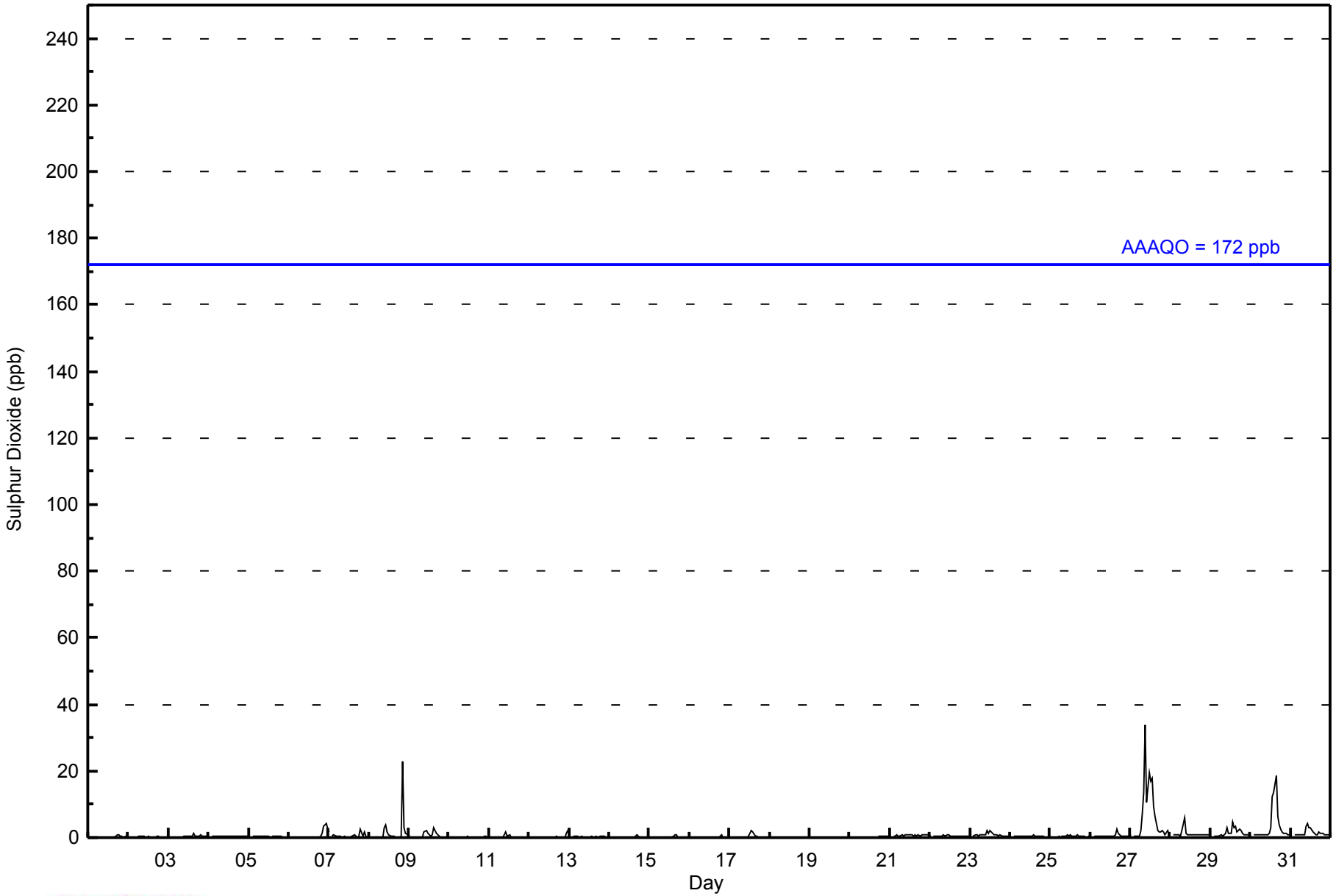
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	649	98.48	98.48
11 - 20	8	1.21	99.70
21 - 60	2	0.30	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: 659

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Lower Camp - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	55	23	23	24	17	59	134	46	11	15	16	23	34	50	63	56	649
11 - 20	0	1	1	0	0	0	0	0	0	0	0	0	3	2	1	0	8
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	24	24	24	17	59	134	46	11	15	16	23	39	52	64	56	659

Total Number of Valid Hours: 659

Total Number of Hours: 744

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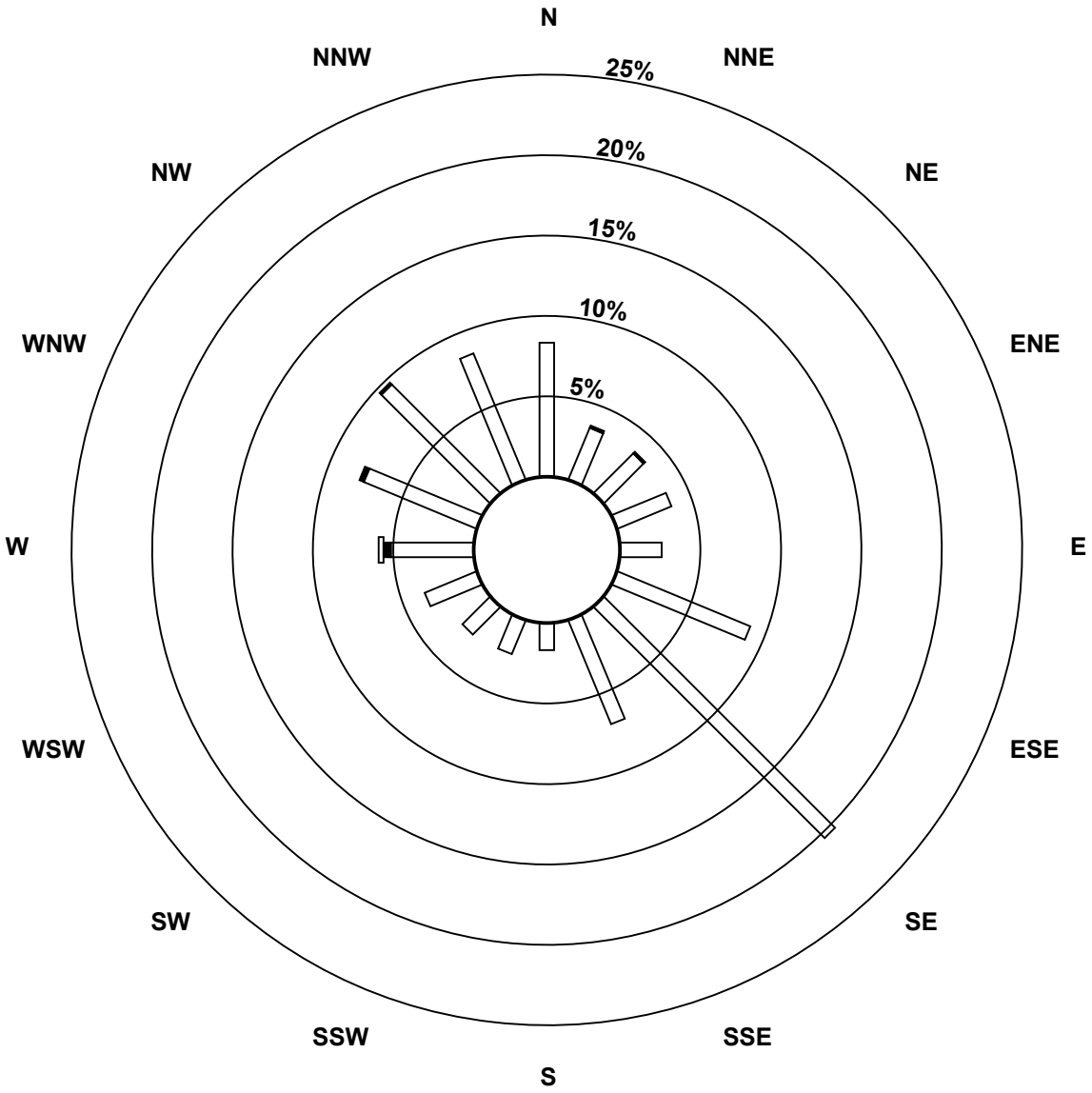
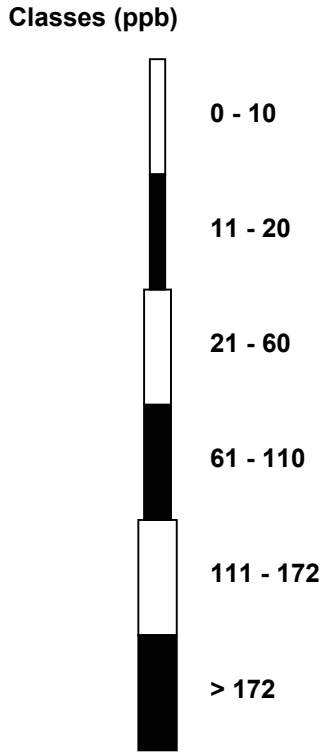
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Lower Camp (AMS 11)





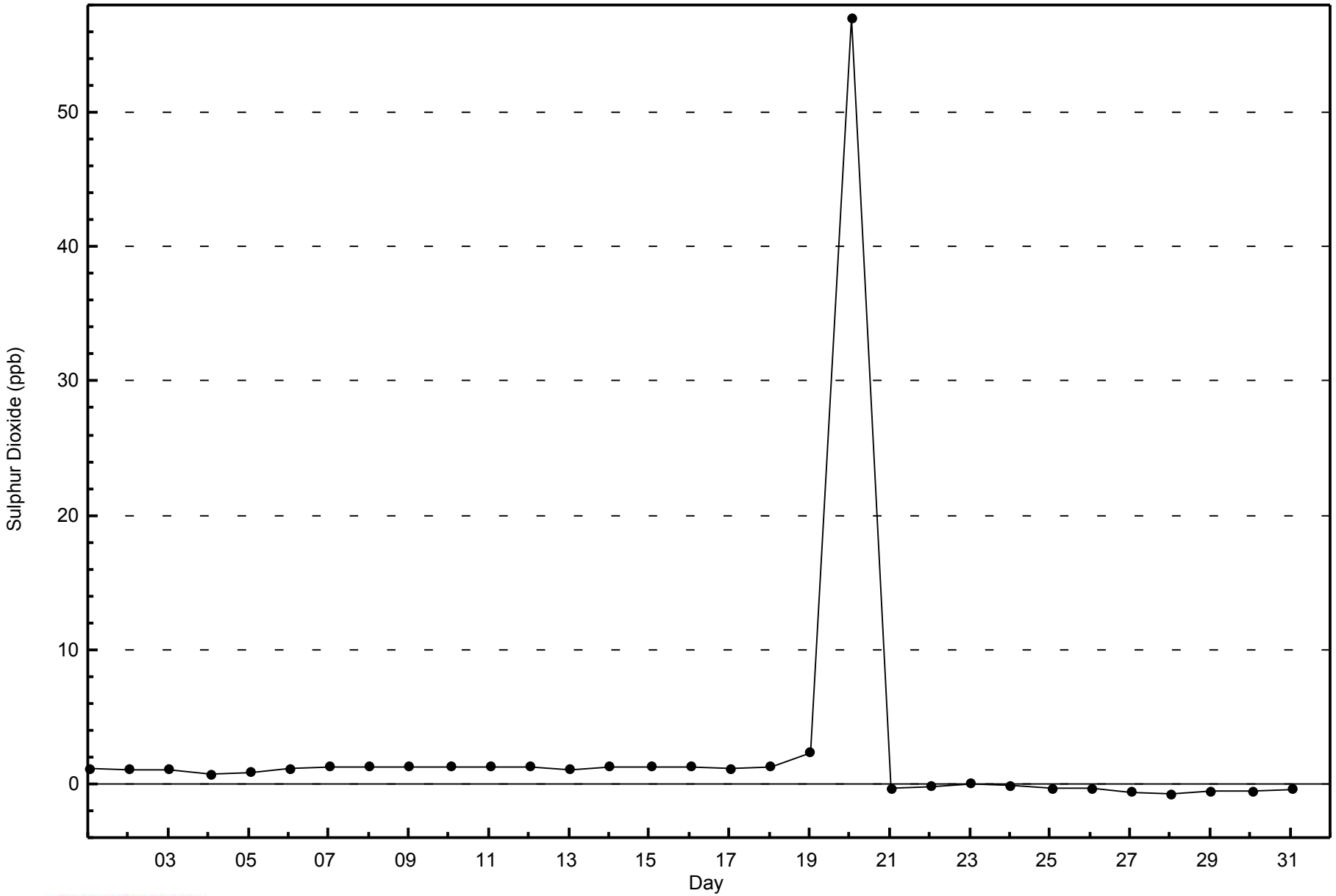
Total Number of Valid Hours: 659

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - August 2014



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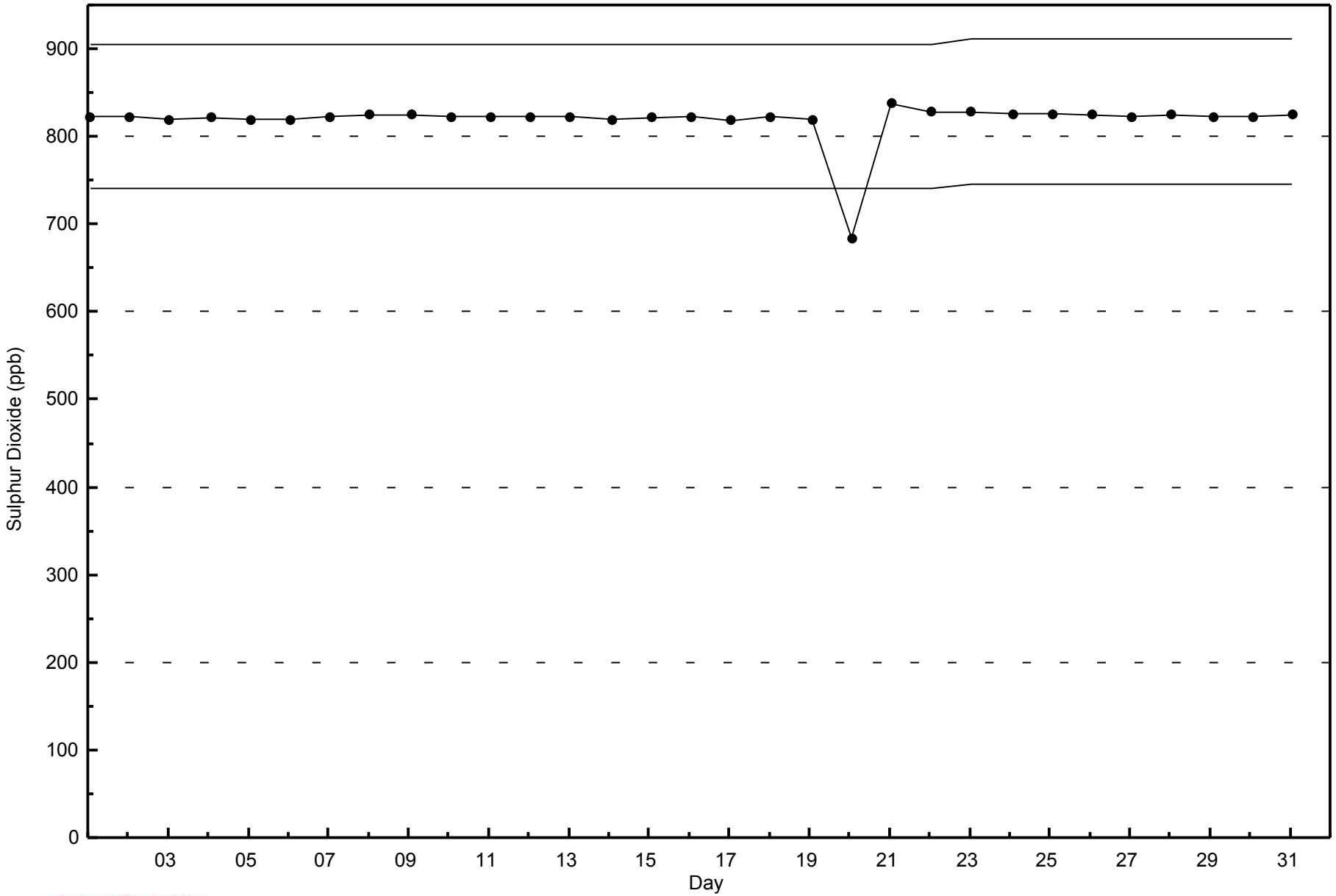
Span Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 ppb on Aug 25 19:00 Maximum Daily Average: 1.2 ppb on Aug 25

Minimum Value: 0 ppb on Aug 28 20:00 Minimum Daily Average: 0.3 ppb on Aug 20
Maximum Diurnal Average: 0.7 ppb at hour 23 Minimum Diurnal Average: 0.4 ppb at hour 17
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:	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-Aug	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.5	1
2-Aug	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0.5	1
3-Aug	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0.6	1
4-Aug	1	1	Z	0	0	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0.5	1
5-Aug	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	2	1	1	0.7	2
6-Aug	1	1	Z	1	1	0	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0.6	1
7-Aug	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0.5	2
8-Aug	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	1
9-Aug	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.3	1
10-Aug	1	1	Z	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0.6	1
11-Aug	1	0	Z	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	1
12-Aug	1	0	Z	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0.5	1
13-Aug	1	1	Z	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	1	2	2	2	1	1	0.8	2
14-Aug	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0.7	1
15-Aug	1	1	Z	0	0	0	0	0	0	0	1	2	3	1	1	0	0	0	0	0	0	0	1	0	0.7	3
16-Aug	0	1	Z	0	0	0	0	0	0	0	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0.6	1
17-Aug	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
18-Aug	0	1	Z	1	1	1	1	3	2	1	1	2	1	0	0	0	0	0	1	1	0	0	0	0	0.8	3
19-Aug	0	0	Z	0	0	0	0	1	1	C	C	C	C	1	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
21-Aug	0	0	Z	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.4	1
22-Aug	0	0	Z	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
23-Aug	0	0	Z	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.6	1
24-Aug	0	0	Z	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0.5	1
25-Aug	1	1	Z	1	0	1	0	0	0	1	1	1	1	1	1	1	2	3	4	2	1	2	2	2	1.2	4
26-Aug	1	1	Z	1	1	1	3	1	1	0	1	1	1	1	0	0	1	0	0	0	0	0	1	1	0.8	3
27-Aug	2	1	Z	1	1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	1	0	0.8	2
28-Aug	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
29-Aug	1	0	Z	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	2	1	1	1	1	0.5	2
30-Aug	1	1	Z	1	2	1	2	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.8	2
31-Aug	0	0	Z	1	1	1	1	1	1	3	2	2	0	0	0	0	0	1	0	1	1	1	0	0	0.7	3
	0.6	0.5	--	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.6	Diurnal Average	
	2	1	--	1	2	1	3	3	2	3	2	2	3	1	1	1	2	3	4	2	2	2	2	2	Diurnal Maximum	

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

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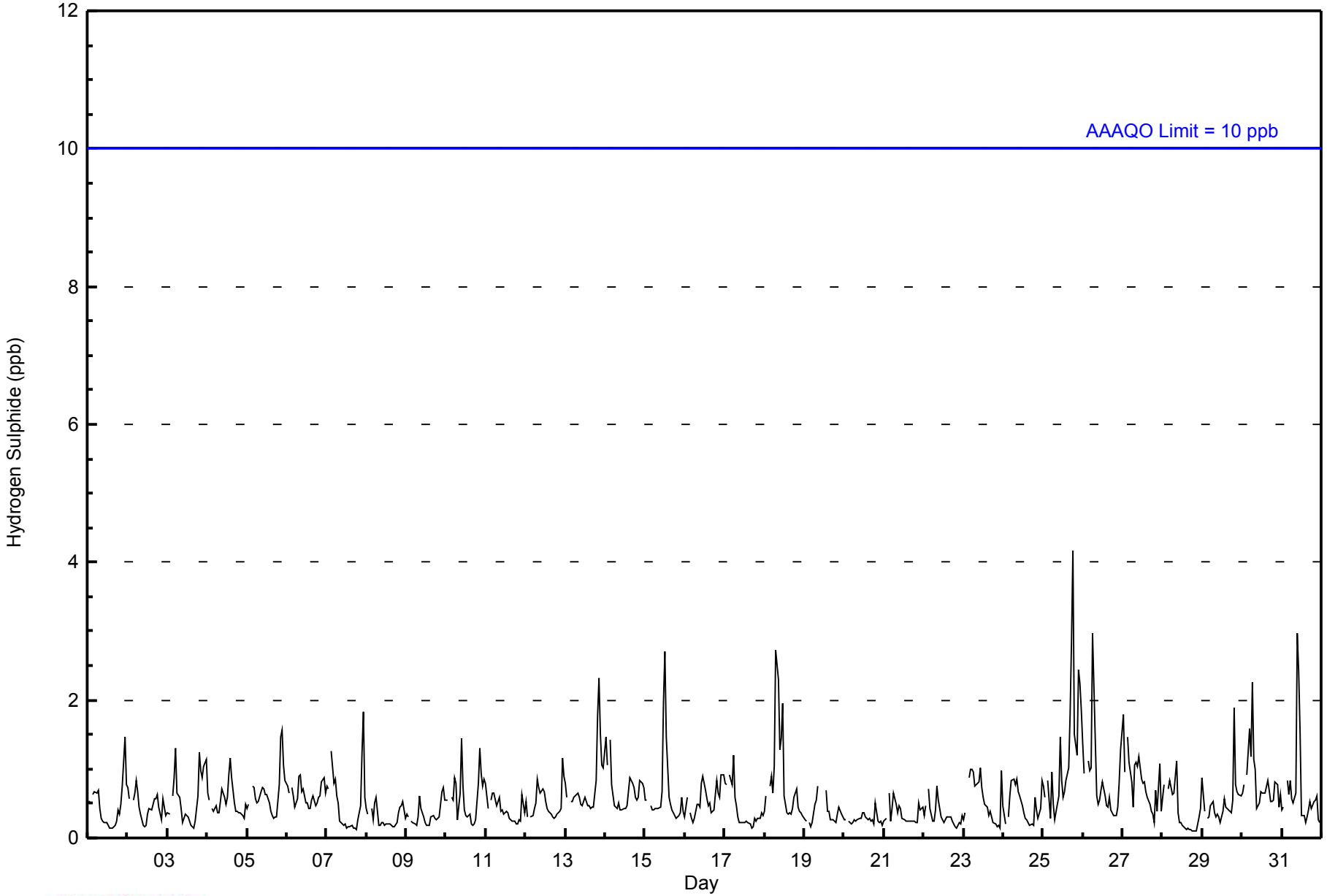
Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.15	99.15
3 - 4	6	0.85	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

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	71	28	26	26	19	57	137	44	14	15	15	22	42	59	71	57	703
3 - 4	0	1	0	0	0	0	1	3	0	1	0	0	0	0	0	0	6
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	29	26	26	19	57	138	47	14	16	15	22	42	59	71	57	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

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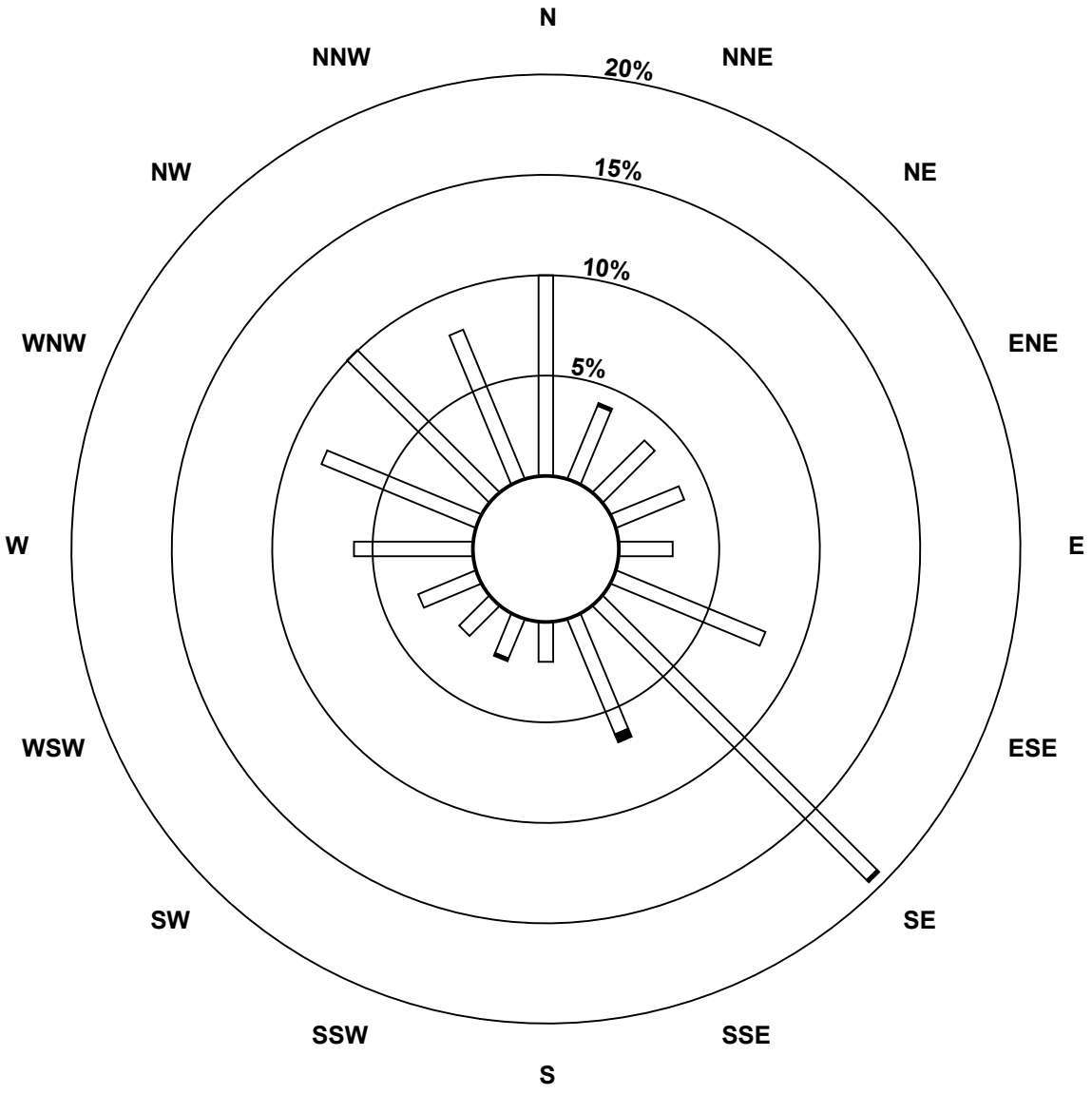
Wood Buffalo Environmental Association

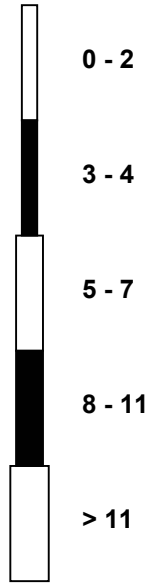
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Lower Camp (AMS 11)



Classes (ppb)



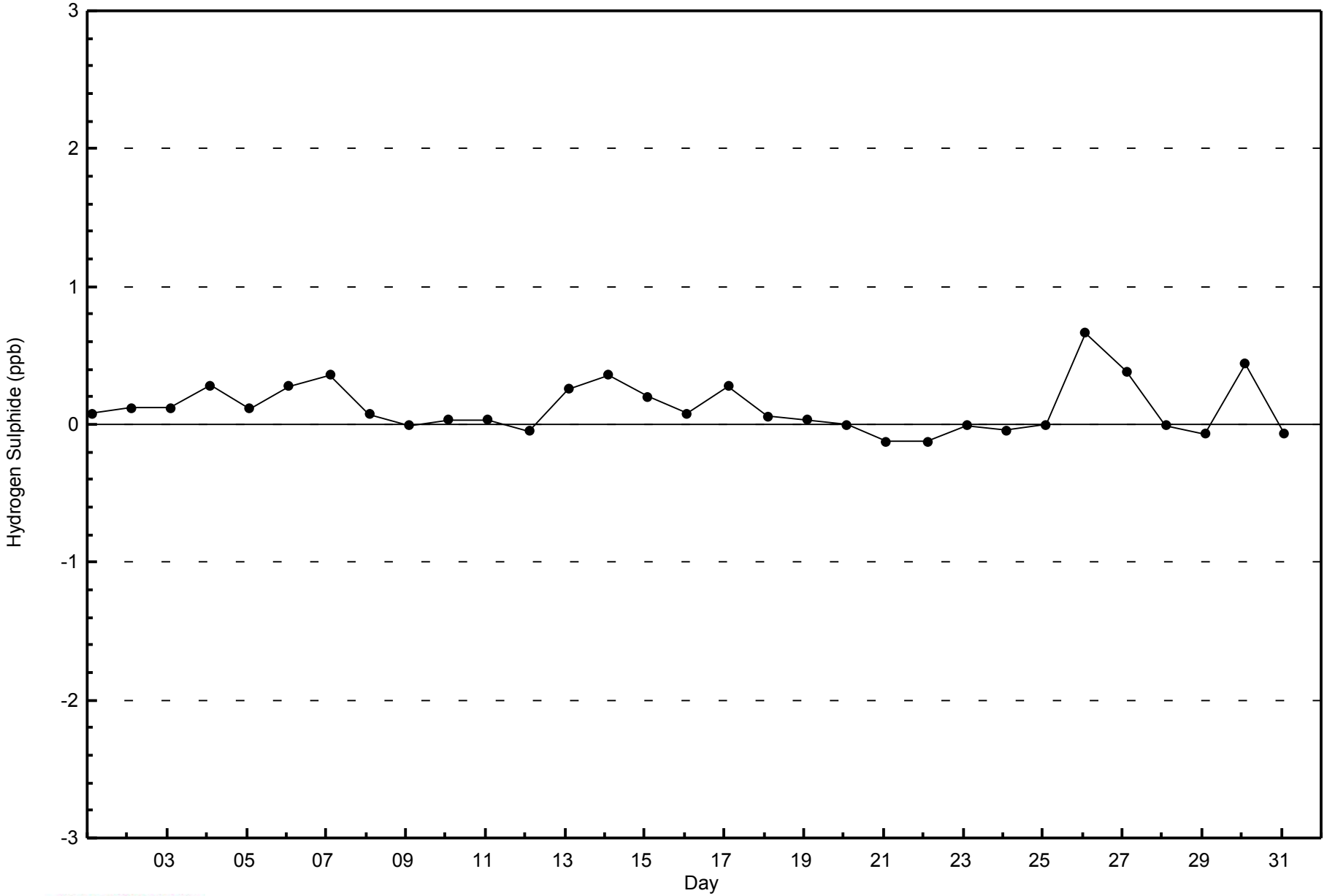
Total Number of Valid Hours: 709

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - August 2014



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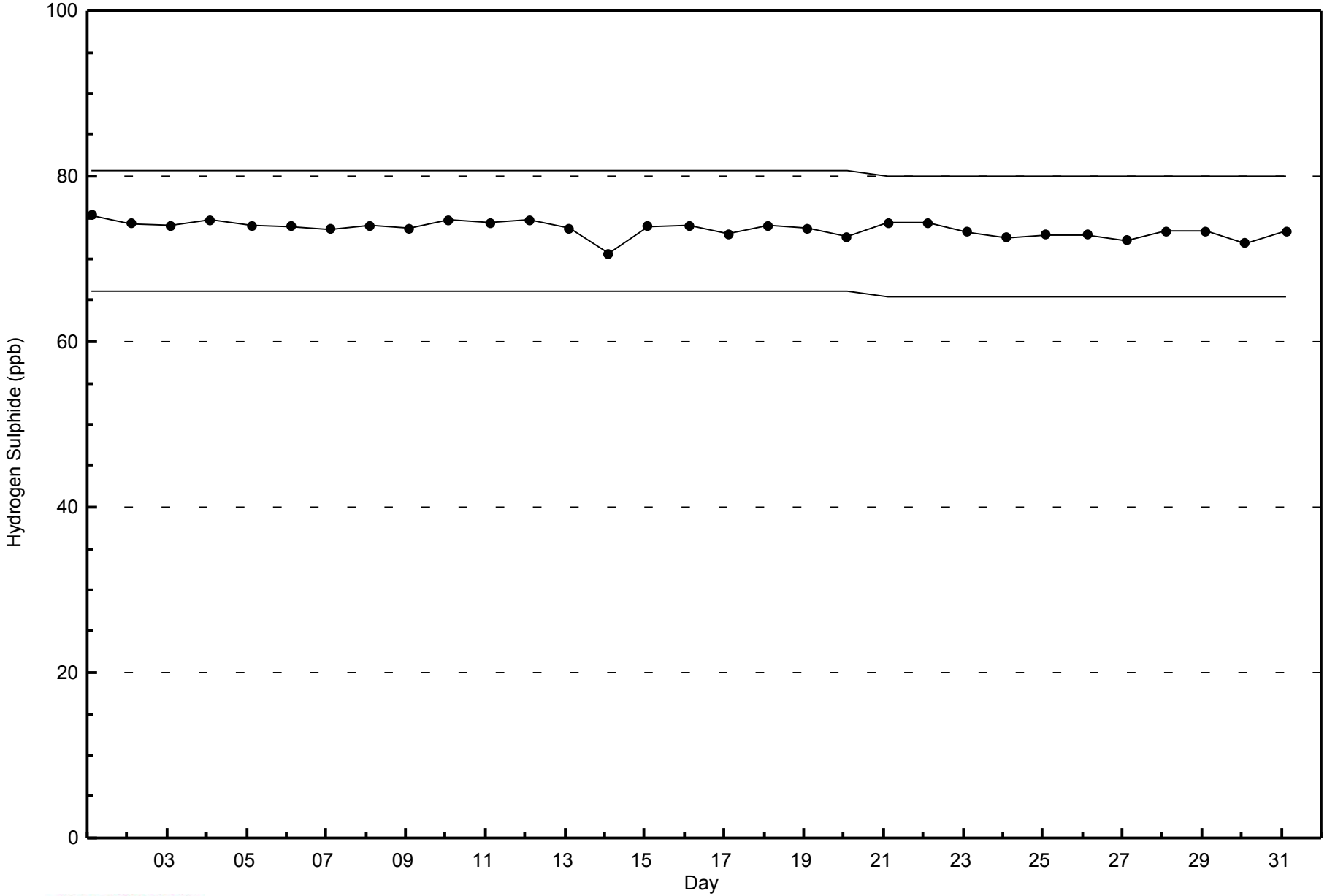
WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - August 2014

Maximum Value: 3.9 ppm on Aug 13 21:00

Maximum Daily Average: 2.7 ppm on Aug 4

Minimum Value: 1.9 ppm on Aug 7 17:00

Minimum Daily Average: 2.1 ppm on Aug 20

Maximum Diurnal Average: 2.5 ppm at hour 4

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.34 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.3 Q_3 = 2.5 P_{90} = 2.7 P_{99} = 3.3

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-Aug	2.4	Z	2.4	2.4	2.5	2.6	2.6	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.4	2.7	2.6	2.3	2.7
2-Aug	2.4	Z	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.4
3-Aug	2.5	Z	2.9	3.0	3.1	3.0	2.5	2.5	2.6	2.3	2.3	2.3	2.3	2.1	2.1	2.2	2.1	2.2	2.1	2.3	2.4	2.5	3.0	3.1	2.5	3.1
4-Aug	3.0	Z	2.6	2.8	2.7	2.6	2.7	2.6	3.0	2.8	2.8	2.7	2.7	3.0	3.0	2.7	2.3	2.3	2.8	2.7	2.5	2.4	2.4	2.6	2.7	3.0
5-Aug	3.0	Z	3.1	3.2	3.3	3.3	3.3	2.9	2.8	2.8	2.6	2.6	2.6	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.5	2.4	2.6	2.6	3.3
6-Aug	2.5	Z	2.2	2.1	2.2	2.3	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.5
7-Aug	2.1	Z	2.3	2.4	2.3	2.4	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.2	2.4	2.3	2.8	2.5	2.2	2.8
8-Aug	2.3	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.2	2.3	2.2	2.1	2.2	2.3
9-Aug	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.2	2.3	2.5	2.4	2.2	2.5
10-Aug	2.5	Z	2.7	2.7	2.3	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.5	2.5	2.3	2.2	2.4	2.3	2.7
11-Aug	2.5	Z	2.4	2.4	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.3	2.2	2.5
12-Aug	2.4	Z	2.4	2.3	2.4	2.5	2.7	2.7	2.8	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.2	2.2	2.3	2.8
13-Aug	2.2	Z	2.4	2.6	2.5	2.4	2.5	2.5	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.3	3.4	3.9	3.2	2.9	2.7	2.5	3.9
14-Aug	2.8	Z	3.4	3.5	2.9	2.4	2.4	2.4	2.4	2.4	2.4	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.2	2.3	2.5	2.7	2.9	2.9	2.6	3.5
15-Aug	2.8	Z	2.8	2.5	2.4	2.4	2.4	2.3	2.2	2.3	2.5	3.1	3.3	2.6	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.4	3.3
16-Aug	2.4	Z	2.6	2.4	2.4	2.5	2.6	2.6	2.6	2.7	2.7	2.5	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.5	2.9	3.1	3.1	2.5	3.1
17-Aug	2.9	Z	2.9	3.2	3.1	3.0	2.7	2.3	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.3	2.5	2.4	2.4	3.2
18-Aug	2.6	Z	3.7	3.1	3.2	3.5	2.8	2.4	2.5	C	C	C	C	2.4	2.6	2.5	2.5	2.5	2.6	2.6	2.5	2.3	2.3	2.3	2.7	3.7
19-Aug	2.3	Z	2.5	2.4	2.5	2.6	2.7	2.7	2.9	2.9	2.5	2.3	2.1	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.2	2.3	2.3	2.3	2.4	2.9
20-Aug	2.3	Z	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.3
21-Aug	2.2	Z	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.2	2.4
22-Aug	2.3	Z	2.4	2.3	2.3	2.3	2.2	2.4	2.5	2.3	2.3	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.3	2.2	2.5
23-Aug	2.3	Z	2.5	2.7	2.7	2.7	2.7	2.6	2.4	2.6	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.5	2.4	2.7
24-Aug	2.4	Z	2.2	2.3	2.4	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.3	2.5
25-Aug	2.2	Z	2.3	2.2	2.3	2.3	2.3	2.2	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.3	2.1	2.1	2.1	2.1	2.2	2.2	2.5
26-Aug	2.2	Z	2.7	2.9	2.9	2.4	2.3	2.3	2.3	2.4	2.5	2.9	2.6	2.3	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.9	3.0	2.4	3.0
27-Aug	2.8	Z	2.5	2.7	2.7	2.6	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.3	2.5	2.2	2.3	2.8
28-Aug	2.2	Z	2.2	2.3	2.5	2.7	2.7	2.5	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.5	2.2	2.7
29-Aug	2.6	Z	2.5	2.3	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.5	2.6	2.3	2.2	2.6
30-Aug	2.5	Z	2.4	2.3	2.3	2.3	2.6	2.3	2.4	2.6	3.0	2.9	2.7	2.3	2.4	2.5	2.2	2.2	2.4	2.5	2.6	2.7	2.6	2.6	2.5	3.0
31-Aug	2.6	Z	2.5	2.4	2.4	2.3	2.3	2.2	2.3	2.8	2.8	2.5	2.2	2.0	2.1	2.1	2.2	2.3	2.6	2.6	2.3	2.4	2.2	2.3	2.4	2.8
	2.5	--	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.4	Diurnal Average	
	3.0	--	3.7	3.5	3.3	3.5	3.3	2.9	3.0	2.9	3.0	3.1	3.3	3.0	3.0	2.7	2.5	2.5	2.8	3.4	3.9	3.2	3.1	3.1	Diurnal Maximum	

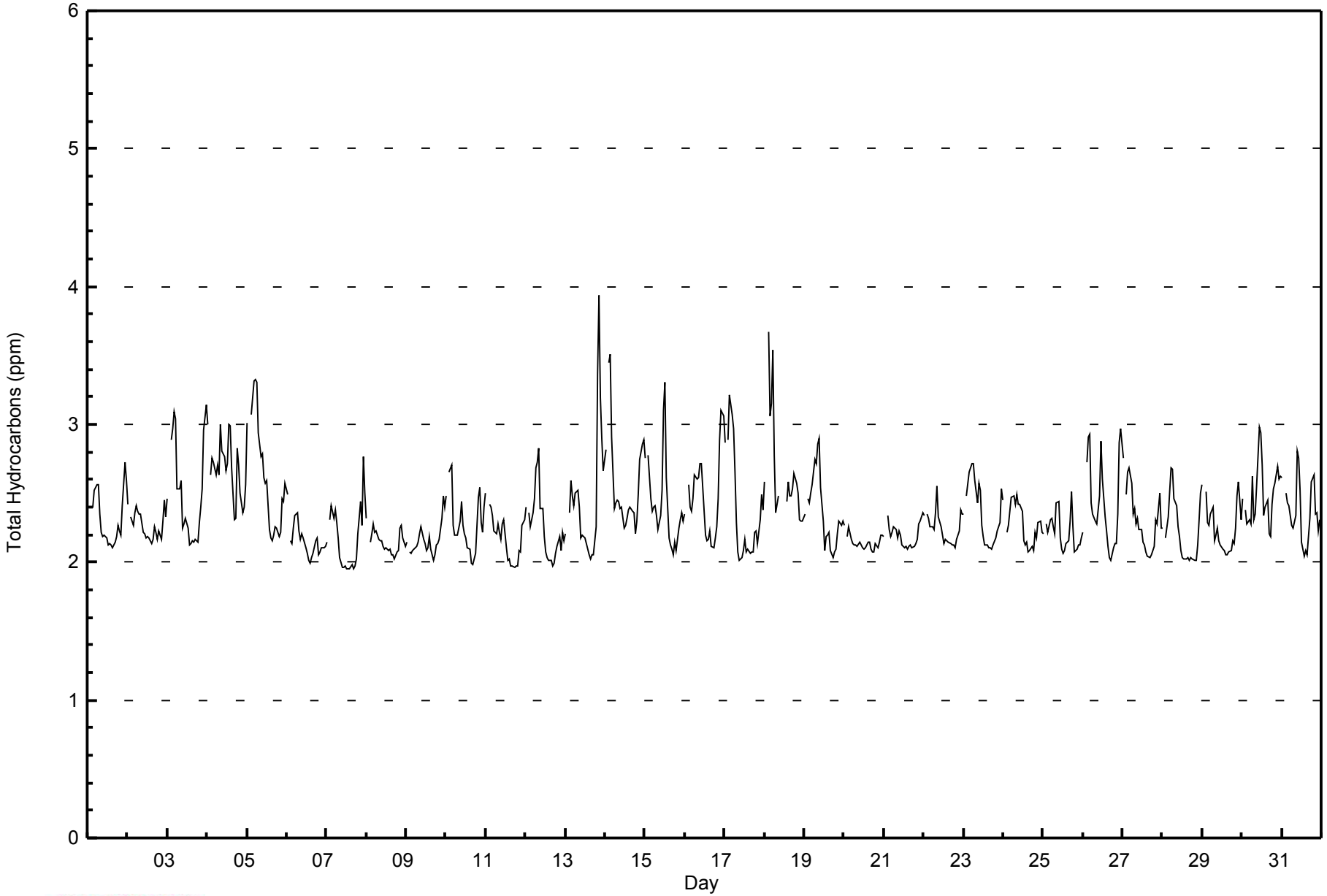
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	51	7.19	7.19
2.1 - 3.0	636	89.70	96.90
3.1 - 10.0	22	3.10	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

Lower Camp - August 2014

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	2	4	1	1	1	5	0	0	0	2	8	13	4	2	3	51
2.1 - 3.0	65	25	21	24	15	56	133	48	12	14	14	15	26	48	66	54	636
3.1 - 10.0	2	1	1	1	2	2	2	0	0	1	0	0	1	3	3	3	22
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	28	26	26	18	59	140	48	12	15	16	23	40	55	71	60	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

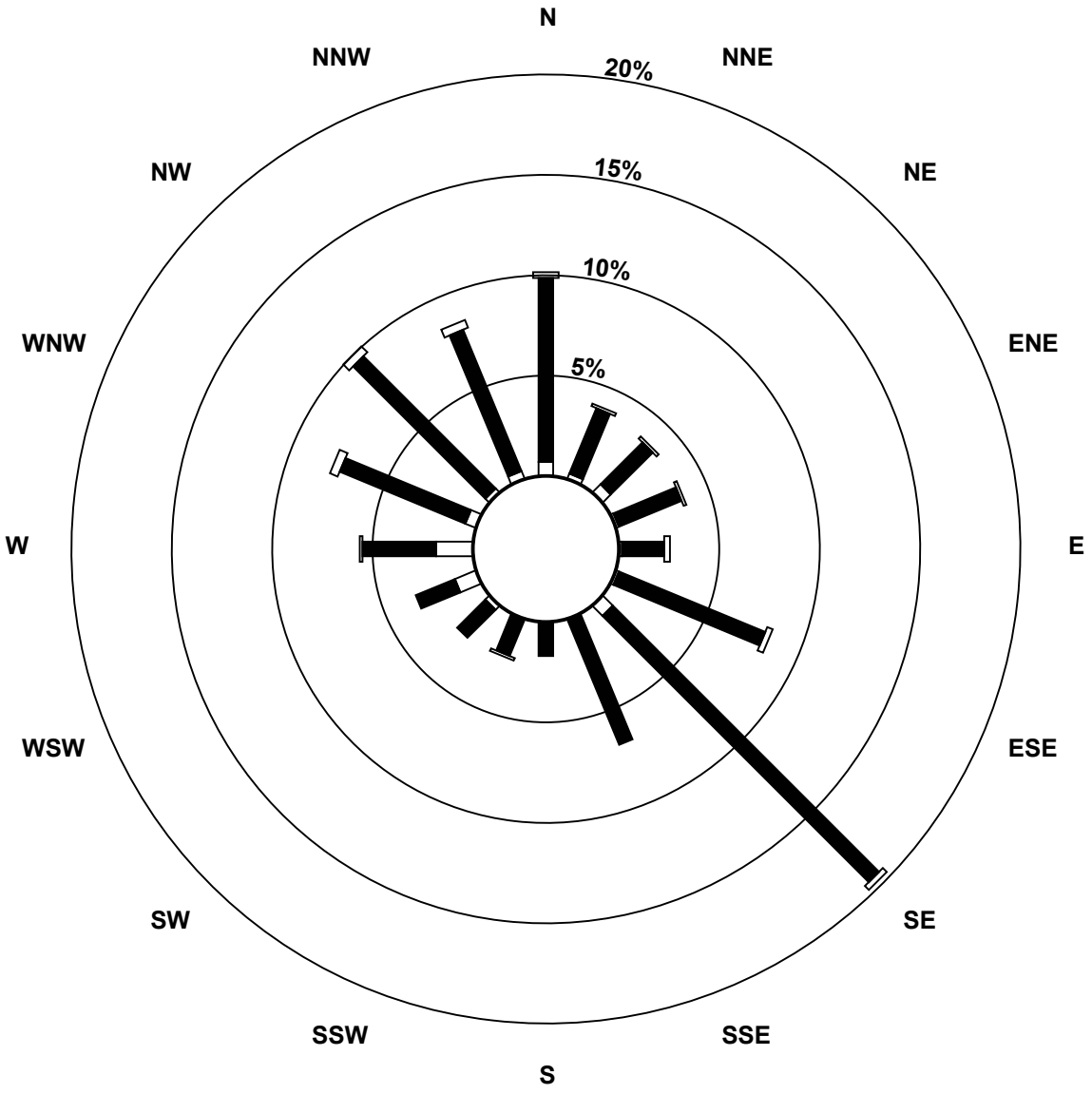
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

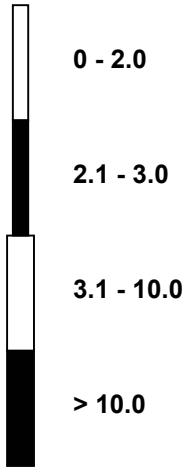
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Lower Camp (AMS 11)



Classes (ppm)



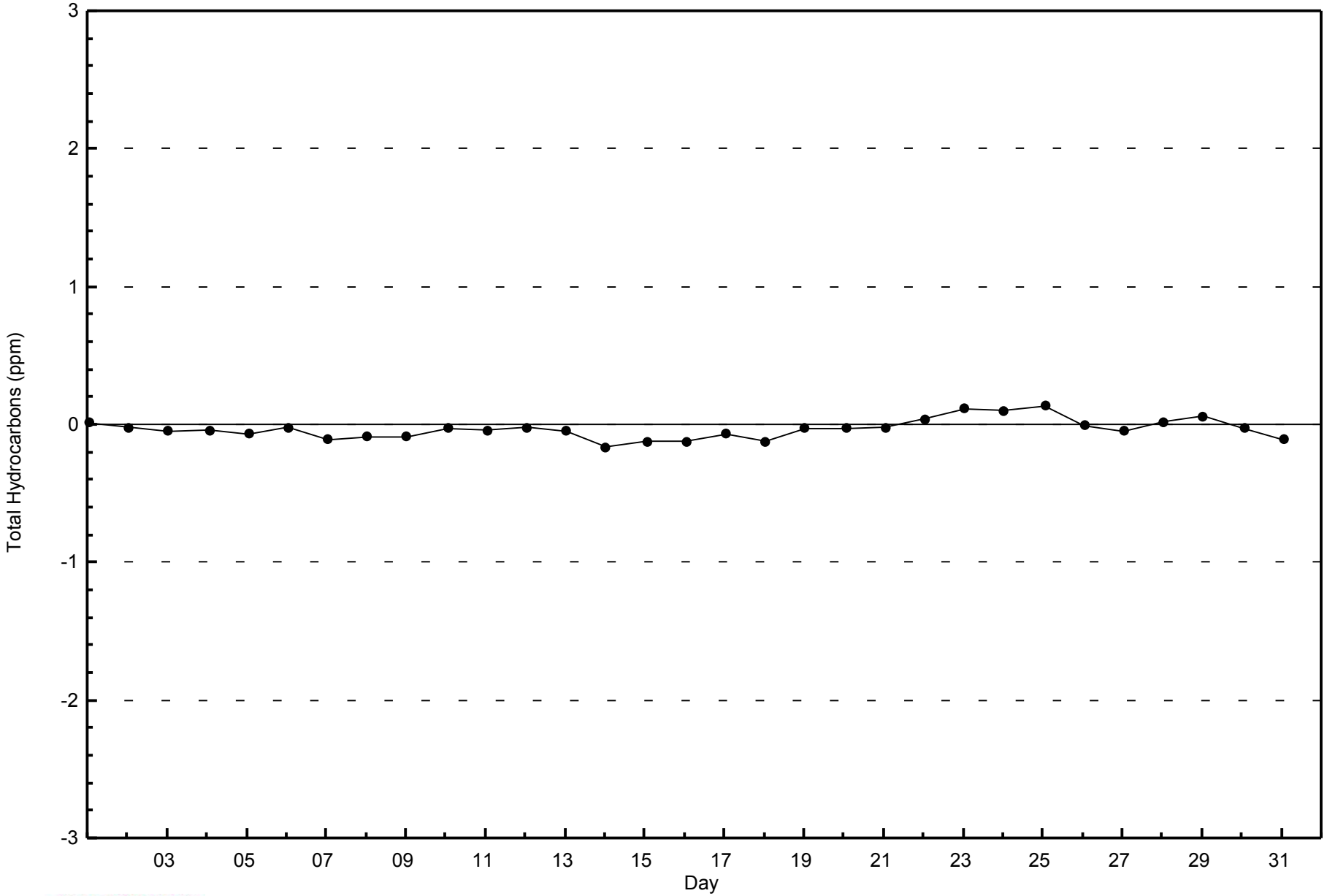
Total Number of Valid Hours: 709

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - August 2014



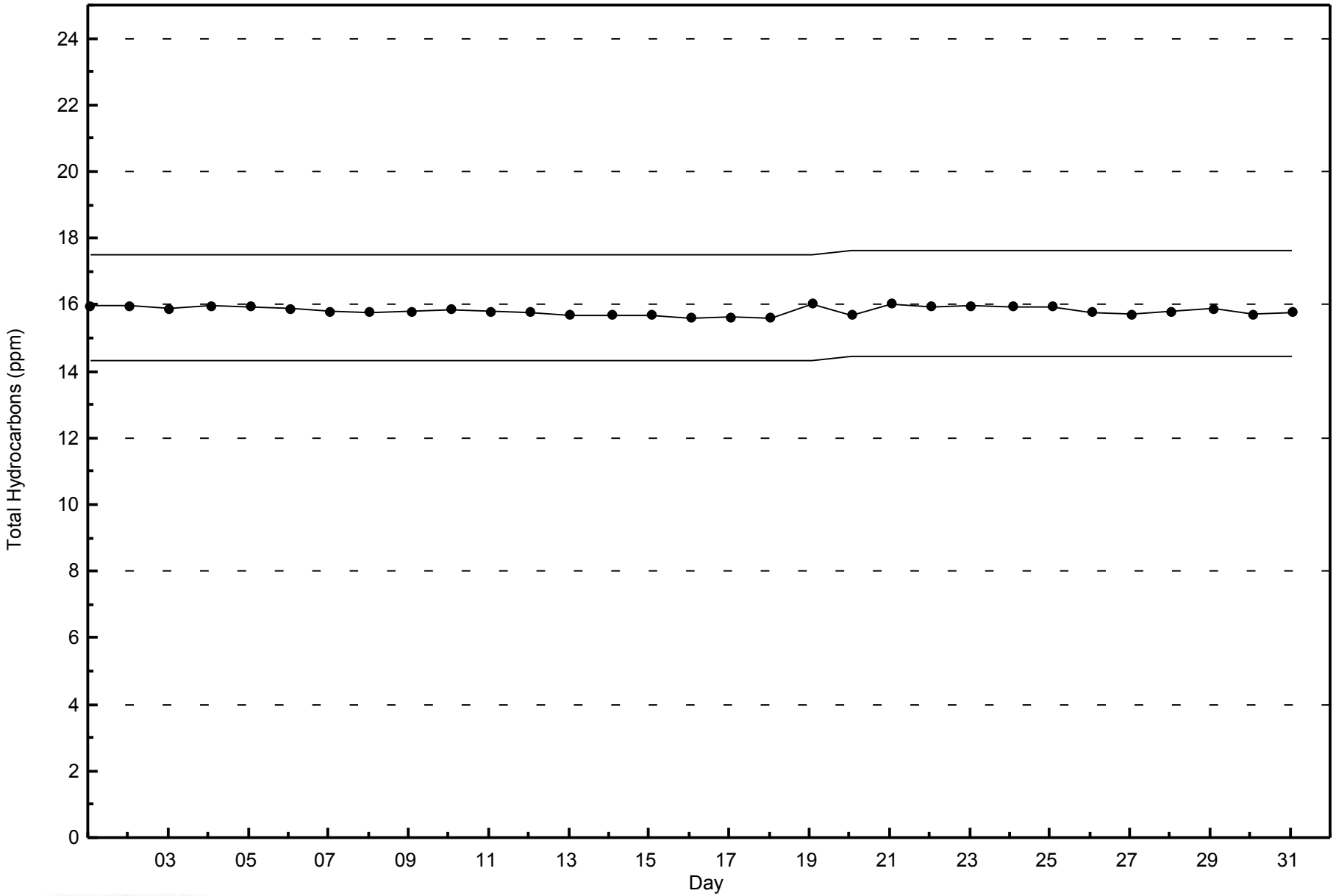
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 32.3 C on Aug 13 17:00

Maximum Daily Average: 25.4 C on Aug 13

Minimum Value: 4.2 C on Aug 22 06:00

Minimum Daily Average: 10.4 C on Aug 22

Maximum Diurnal Average: 24.2 C at hour 15

Minimum Diurnal Average: 13.0 C at hour 6

Monthly Average: 18.43 C

Percentiles: P_1 = 5.4 P_{10} = 11.0 Q_1 = 14.1 Median = 17.9 Q_3 = 22.6 P_{90} = 27.5 P_{99} = 31.5

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

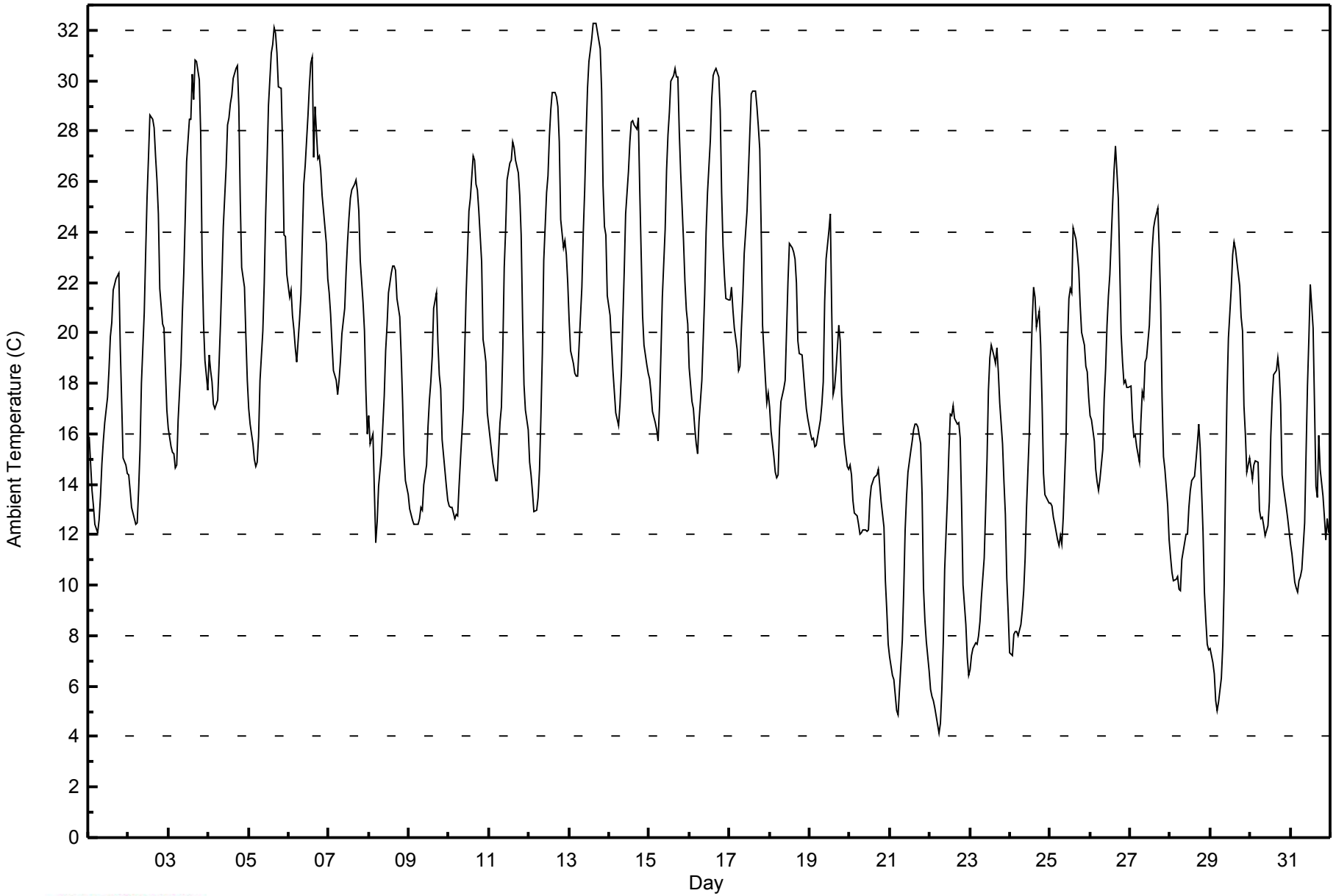
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	15.9	14.8	13.8	13.1	12.4	12.1	12.6	13.5	14.8	15.7	16.4	17.5	18.5	19.9	20.4	21.7	22.2	22.3	22.4	19.5	17.3	15.0	14.8	14.4	16.7	22.4
2-Aug	14.4	13.8	13.1	12.6	12.4	12.5	13.8	15.4	18.0	20.8	23.2	25.4	26.9	28.6	28.4	28.1	27.0	26.1	24.7	21.8	20.3	20.2	18.5	17.0	20.1	28.6
3-Aug	16.2	15.5	15.3	15.2	14.6	14.8	16.6	18.8	20.8	22.4	24.5	26.8	28.5	28.5	30.2	29.3	30.8	30.8	30.0	27.8	22.9	20.4	18.9	17.7	22.4	30.8
4-Aug	19.1	18.5	18.0	17.2	17.0	17.3	18.8	20.3	22.2	24.2	26.6	28.2	28.5	29.1	29.4	30.1	30.5	30.6	29.0	25.3	22.6	21.8	19.9	18.1	23.4	30.6
5-Aug	17.0	16.4	15.6	15.0	14.7	14.9	15.9	18.1	20.1	22.0	24.7	26.8	29.1	31.1	31.4	32.1	31.9	31.1	29.8	29.7	27.4	23.9	23.8	22.3	23.5	32.1
6-Aug	21.4	21.7	20.7	20.1	19.4	18.9	20.5	21.6	23.7	25.9	26.6	28.7	29.8	30.7	30.9	27.0	29.0	26.9	27.0	26.5	25.5	24.8	23.5	22.2	24.7	30.9
7-Aug	21.6	20.7	19.6	18.5	18.1	17.6	18.1	18.9	20.0	21.0	22.4	23.6	24.5	25.3	25.6	25.9	26.0	25.6	24.8	22.9	21.2	20.1	17.7	16.0	21.5	26.0
8-Aug	16.7	15.6	16.0	13.7	11.7	12.5	13.9	15.2	16.3	17.5	19.3	20.3	21.6	22.4	22.6	22.7	22.5	21.4	20.6	19.2	17.3	15.2	14.2	13.6	17.6	22.7
9-Aug	13.0	12.8	12.6	12.4	12.4	12.4	12.6	13.1	13.0	14.0	14.8	16.3	17.4	18.1	19.1	21.0	21.6	19.6	18.3	17.8	15.8	14.6	14.0	13.3	15.4	21.6
10-Aug	13.2	13.1	13.1	12.6	12.8	12.7	13.9	15.0	17.0	19.2	21.5	23.2	24.8	25.3	27.0	26.9	25.9	25.7	24.8	22.8	19.7	19.3	18.8	16.9	19.4	27.0
11-Aug	16.3	15.3	14.8	14.5	14.2	14.2	16.5	17.1	19.4	22.6	24.1	26.1	26.7	26.9	27.6	27.4	26.8	26.3	25.5	23.9	20.6	18.0	16.9	16.2	20.7	27.6
12-Aug	14.9	14.4	13.7	12.9	13.0	13.5	14.6	16.7	19.2	22.9	25.6	26.2	27.8	28.9	29.5	29.5	29.4	29.0	27.6	24.5	23.4	23.7	23.1	22.0	21.9	29.5
13-Aug	20.5	19.3	18.8	18.4	18.3	18.3	19.4	21.8	24.0	25.7	27.8	29.7	30.8	31.7	32.3	32.3	32.3	31.9	31.3	29.6	25.9	24.2	23.9	21.5	25.4	32.3
14-Aug	20.7	19.6	18.5	17.7	16.8	16.3	17.2	18.4	20.5	22.4	24.7	26.4	27.6	28.4	28.4	28.2	28.1	28.5	25.7	23.1	20.7	19.5	18.8	18.4	22.3	28.5
15-Aug	18.2	17.6	16.9	16.4	16.2	15.7	17.1	19.2	21.4	24.1	26.5	27.8	28.7	30.0	30.2	30.5	30.2	30.1	27.9	26.4	23.7	22.0	20.9	20.4	23.3	30.5
16-Aug	18.6	17.3	17.0	16.2	15.6	15.2	16.5	18.1	19.8	21.6	24.0	25.6	27.7	29.3	30.2	30.4	30.5	30.2	28.8	25.6	23.4	22.2	21.4	21.3	22.8	30.5
17-Aug	21.3	21.8	20.9	20.2	19.4	18.5	18.7	20.2	21.5	23.1	24.8	26.4	27.9	29.5	29.6	29.6	29.0	28.2	27.3	24.2	20.3	18.2	17.2	17.6	23.1	29.6
18-Aug	17.1	16.1	15.1	14.5	14.3	14.4	16.2	17.3	17.8	18.1	20.1	22.0	23.6	23.4	23.2	23.0	22.0	19.7	19.2	19.1	18.4	17.7	17.0	16.6	18.6	23.6
19-Aug	16.0	15.8	15.8	15.5	15.6	15.9	16.6	17.1	18.1	21.2	22.9	24.1	24.7	20.8	17.6	17.9	18.5	20.3	19.7	17.6	16.4	15.6	14.7	14.6	18.0	24.7
20-Aug	14.8	14.4	13.4	12.9	12.7	12.4	12.0	12.1	12.2	12.2	12.1	12.2	13.4	13.9	14.3	14.3	14.4	14.6	14.0	13.3	12.3	10.2	9.0	7.6	12.7	14.8
21-Aug	7.2	6.4	6.3	5.7	5.0	4.9	5.9	7.9	9.8	12.2	13.5	14.5	15.3	15.7	16.2	16.4	16.4	16.3	15.6	13.6	9.9	8.6	7.8	6.6	10.7	16.4
22-Aug	5.9	5.6	5.4	5.2	4.8	4.2	4.5	5.9	7.7	10.6	13.6	15.3	16.8	16.7	17.1	16.6	16.4	16.4	15.8	13.1	10.0	8.4	7.2	6.4	10.4	17.1
23-Aug	6.7	7.2	7.5	7.7	7.7	8.0	8.6	9.5	11.1	13.0	15.0	17.7	19.0	19.5	19.1	18.8	19.4	18.5	17.2	15.6	14.1	12.8	10.3	8.9	13.0	19.5
24-Aug	7.3	7.2	8.0	8.1	8.1	8.0	8.4	9.0	9.8	11.1	13.1	16.1	18.5	20.5	21.8	21.4	20.2	20.9	19.5	17.3	14.4	13.6	13.4	13.2	13.7	21.8
25-Aug	13.3	13.2	12.7	12.4	11.8	11.6	12.0	11.7	12.7	15.9	19.5	21.4	21.8	21.6	24.2	23.7	23.1	22.5	21.1	20.0	19.5	18.7	18.4	17.4	17.5	24.2
26-Aug	16.7	16.6	15.7	14.6	14.1	13.8	14.2	15.4	17.4	18.6	20.3	21.5	22.3	25.2	26.5	27.4	26.4	25.3	20.0	18.9	18.0	18.1	17.9	17.9	19.3	27.4
27-Aug	17.9	16.6	15.9	16.0	15.5	14.9	16.5	17.7	17.4	18.8	19.0	20.3	21.9	23.3	24.2	24.5	25.0	23.3	21.2	17.5	15.1	14.6	13.2	11.8	18.4	25.0
28-Aug	11.1	10.5	10.2	10.2	10.3	9.8	9.8	11.0	11.7	12.0	12.0	13.1	13.7	14.1	14.3	15.0	15.6	16.4	15.5	12.1	9.7	8.6	7.7	7.4	11.7	16.4
29-Aug	7.5	6.9	6.5	5.5	5.0	5.4	6.3	7.6	10.1	14.1	17.6	19.8	21.7	23.1	23.6	23.3	22.8	21.9	20.6	20.1	17.1	16.0	14.5	15.1	14.7	23.6
30-Aug	14.7	14.2	14.8	15.0	14.9	13.0	12.6	12.7	12.4	11.9	12.3	13.3	15.9	17.4	18.3	18.5	19.0	18.5	17.2	14.4	13.9	13.1	12.6	12.1	14.7	19.0
31-Aug	11.6	11.2	10.2	9.9	9.7	10.2	10.3	10.6	12.5	15.2	17.9	19.8	21.9	20.2	17.1	13.9	13.5	15.9	14.6	13.5	12.7	11.8	12.7	12.1	13.7	21.9
	15.1	14.5	14.1	13.5	13.2	13.0	13.9	15.1	16.5	18.4	20.2	21.8	23.1	23.8	24.2	24.1	24.1	23.7	22.5	20.5	18.4	17.1	16.2	15.4	Diurnal Average	
	21.6	21.8	20.9	20.2	19.4	18.9	20.5	21.8	24.0	25.9	27.8	29.7	30.8	31.7	32.3	32.3	32.3	31.9	31.3	29.7	27.4	24.8	23.9	22.3	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Lower Camp - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	61	8.20	8.20
10 - 20	402	54.03	62.23
> 20	281	37.77	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

Lower Camp - August 2014

Maximum Speed: 25 km/h on Aug 7 13:00

Maximum Daily Speed Average: 17.1 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 21 01:00

Minimum Daily Speed Average: 0.1 km/h on Aug 16

Maximum Diurnal Speed Average: 3.0 km/h at hour 14

Minimum Diurnal Speed Average: 0.3 km/h at hour 9

Monthly Average Velocity: 0.3 km/h 266.0 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 3 Median = 6 Q_3 = 9 P_{90} = 12 P_{99} = 22

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-Aug	NNW13	NNW14	N11	NNW9	NW10	NW7	NNW7	N10	N10	N14	N13	NW12	NW10	NW8	N6	WNW3	WNW3	NE3	ESE5	SE4	ESE3	ENE0	SE5	SE6	NNW5.5	N14
2-Aug	SE8	SE7	SE7	SSE7	SSE7	SSE6	SE6	SE8	ESE11	SE13	SE14	SE11	SE11	S8	S9	S11	SSW11	SSW10	SSW5	NNE4	ESE2	SE1	ESE4	ESE1	SSE6.4	SE14
3-Aug	N2	WNW1	ESE3	E2	E3	SE5	ESE7	SE7	SE7	SE8	SE8	SE6	SE6	NNE4	NNW0	N5	SE3	SSE6	SE7	SE5	NE1	ENE1	E2	SE4	ESE3.3	SE8
4-Aug	SE7	SE6	SE7	SE5	SE7	ESE8	ESE10	SE9	ENE2	NW4	NW5	NW8	NNW8	NNW9	NNW9	NNW7	NNE5	NE7	NNW4	NW2	SW1	SSE3	N1	N1	ENE1.4	ESE10
5-Aug	WNW3	NW2	NE1	WNW2	NW1	ESE3	E4	ESE5	ESE4	ESE4	SE8	SE7	SE8	SE10	SE9	SE7	SE6	SE6	SSE6	SSE9	SSE6	SE8	SE9	SSE7	SE4.8	SE10
6-Aug	SE9	SSE9	SE10	SE9	ESE8	SE8	SE6	SE6	SE8	SE8	SSE7	SSE9	SSW12	SW12	WSW16	WSW15	WSW9	E11	SW7	SW14	SW13	SW15	SW15	WSW13	SSW6.6	WSW16
7-Aug	WSW16	W17	WSW15	W14	W13	W16	W19	W19	W24	W21	W21	W24	W25	W24	W23	W21	W22	W21	W18	WNW10	W9	WSW11	NW4	W6	W17.1	W25
8-Aug	NNW3	WNW4	NW6	NW3	WNW4	NW4	N4	NNE6	N5	N5	N7	N8	N8	N7	NNE7	NE9	NE10	NE9	NNW4	W13	W17	WNW8	NNW7	N6	NNW4.8	W17
9-Aug	NNW8	NNW10	NNW10	N8	NNW7	NW7	WNW8	NW8	NW8	NW8	NW8	NW8	N6	NE4	ENE3	WSW9	WSW12	W3	ESE3	SE2	SE2	E2	E2	SE3	NNW3.8	WSW12
10-Aug	E2	SE2	ESE3	ESE3	SE5	SE6	SE8	SE9	SSE5	SE6	SE9	ESE10	ESE7	E4	ESE2	W7	WSW7	WSW6	W2	NNW1	NE2	WSW6	N1	ESE2	SE2.6	ESE10
11-Aug	SE6	SE6	SE7	SE9	SE8	SE7	SE8	SE6	SW4	WSW8	WNW4	E4	NW9	WNW15	WNW17	WNW16	NW13	N11	N9	NNE8	WNW3	NW1	WNW4	N1	NW1.8	WNW17
12-Aug	WNW3	WNW4	NW1	ENE1	NNE1	NNW1	NW3	NNW4	NE3	ESE6	SE6	ESE9	ESE11	SE10	SE9	SE9	SE9	SE8	SE11	ESE10	SE10	SE12	SE12	SE10	SE5.2	SE12
13-Aug	SE8	SE10	SE6	SSE4	SSE7	SSE4	SSE5	SE5	SE9	SE11	SE9	S8	SSW11	SW10	WSW14	SW13	WSW14	SW11	SSW7	SSW5	N2	NNW3	NW3	W4	S4.8	WSW14
14-Aug	N1	NW2	NW2	NNW2	WNW4	NNW1	N3	NW3	NNW4	NW4	N2	ENE4	NW3	NNW2	N3	NNE3	SE4	S3	ESE3	ESE2	E1	ENE2	ESE3	ESE5	NNE1.1	ESE5
15-Aug	SE3	ESE2	ESE4	SE5	SE6	SE5	ESE9	ESE9	SE9	SE6	E2	ENE3	NNE4	NNE4	NE7	NE8	NNE8	N5	N8	N9	WNW7	WNW4	NW5	NW2	ENE2.2	ESE9
16-Aug	N1	WNW2	NW2	WNW4	ENE1	NE2	NW2	NW3	WNW4	NNW4	NNE5	N3	ESE9	SE7	SSE5	SSW2	WSW4	WSW9	SW6	N1	ENE2	ENE3	ESE3	SE3	SW0.1	WSW9
17-Aug	SSW1	NW3	ENE1	WNW6	NW4	NW4	NW5	NNW7	N6	N10	NNE5	NW7	WNW12	W13	WNW17	WNW20	WNW22	WNW19	NW12	NW4	ENE1	ESE3	ENE1	ENE1	NW6.5	WNW22
18-Aug	ENE2	WNW2	NNW1	N1	WNW3	W2	SE1	SSE6	ESE4	NE3	SE7	S5	W6	WNW8	NNW8	N9	NNE2	W3	S4	N3	N6	NNW7	NW2	NW4	NNW1.3	N9
19-Aug	NNE1	ENE1	N2	E2	SE1	ENE1	SE3	SE5	SE4	SE4	SE7	SSE7	SSE9	WNW18	NW12	NNW7	ENE3	NE6	NE6	WNW5	NW6	NW7	NW4	NW6	NNW0.8	WNW18
20-Aug	N4	N8	NNW11	N11	N12	N14	N13	NNE12	NNE14	N14	N14	N14	N12	N15	N14	N10	N10	N9	N11	NNW6	NNW4	NNW2	NW3	W4	N9.8	N15
21-Aug	WNW0	NNE1	NNW4	NNW6	NNW3	NW3	NNW3	N3	N5	WNW4	N9	N11	NNW11	NNW11	NNW10	NNW10	N11	NNE12	NNE12	NE8	NE2	NW3	N2	N1	N5.4	NNE12
22-Aug	NNE1	NW1	NNW1	WNW3	NE3	ENE4	NE4	ENE3	NNE3	NNW3	NW5	N6	NNW6	NNW9	N10	NE11	NE8	ENE6	N6	NE4	NNE1	WNW2	N1	NE1	NNE3.5	NE11
23-Aug	N2	NW3	NNW1	NE1	NW2	NNW2	NW4	NNE3	E3	ESE4	ESE6	SE8	SE6	SSW2	S2	SE5	SE5	SE4	E2	ENE4	WNW3	NW4	NW1	WNW2	ESE1.0	SE8
24-Aug	W5	W5	WNW5	WNW6	WNW6	NW7	WNW6	WNW6	NW5	NW5	NNW6	N6	NNW3	ENE4	ESE5	E6	ENE8	ENE9	ESE11	SE4	ESE5	SE5	SE7	SE8	NNE1.2	ESE11
25-Aug	SE6	ESE10	ESE4	SE8	SE6	SE8	SE7	SSE10	SE7	SE10	SSE11	SSE10	SSE10	SSE11	S10	S10	SSW11	SSW8	SSE8	SSE8	SSE9	SSE9	SSE12	SE7	SSE8.2	SSE12
26-Aug	SE9	ESE9	SE9	SE8	SE9	SE9	SE8	SE7	SE11	SE9	SE8	SE6	ESE5	ESE8	SE9	SW12	SW16	W12	N7	E4	NNE2	SSW1	ESE2	SE5	SE5.3	SW16
27-Aug	SSE6	SE8	SE6	SSE5	SSE6	S3	W13	WNW16	WNW17	W17	WNW16	W13	W11	W11	W12	W11	W13	WNW12	NNW7	NW1	WNW2	NW5	WNW7	S1	W6.6	WNW17
28-Aug	WSW2	S1	W6	NW2	NW9	NW8	NNW8	WNW11	WNW14	WNW15	NW11	NW11	NW11	NNW11	N11	NNW8	N8	ENE2	E4	ESE3	NE1	NNE1	NNE1	NNE1	NW5.3	WNW15
29-Aug	SSE1	E1	ESE2	SE4	SE5	E7	ESE8	ESE10	SE9	SE7	ESE14	SE12	SSE10	SSE9	SE9	SSE9	SE10	SSE7	SSE7	SSE8	SE6	SE6	SE6	SE8	SE7.0	ESE14
30-Aug	SE7	ESE14	ESE17	SE12	SSE10	SSE6	SSE4	SE4	SW7	WNW6	NW5	NNW5	W5	NW6	NNE4	NE2	WSW6	S1	SE3	NW2	S1	WNW3	WNW1	N1	SSE1.7	ESE17
31-Aug	ESE3	S1	SW4	SSE5	SE6	SSE5	SSE7	SE7	SE7	SE7	SE7	NW2	WNW7	NNW11	NNW14	NW8	SW1	W5	WSW2	SSE3	SSW2	WSW2	W9	NW5	SW0.9	NNW14
	SE0.8	ESE0.7	ESE0.6	SE0.7	SSE0.8	ESE0.7	ESE0.6	ESE1.1	NE0.3	NNW0.4	ENE1.0	NNE0.4	W1.5	WNW3.0	NW2.9	WNW2.9	W2.5	WNW1.1	NNE0.5	SSE0.3	SW0.7	SW1.0	S0.6	SSE1.0	Diurnal Average	
	WSW16	W17	ESE17	W14	W13	W16	W19	W19	W24	W21	W21	W24	W25	W24	WSW23	W21	W22	W21	WNW18	SW14	W17	SW15	SW15	WSW13	Diurnal Maximum	

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Lower Camp - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 24 02:00

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

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

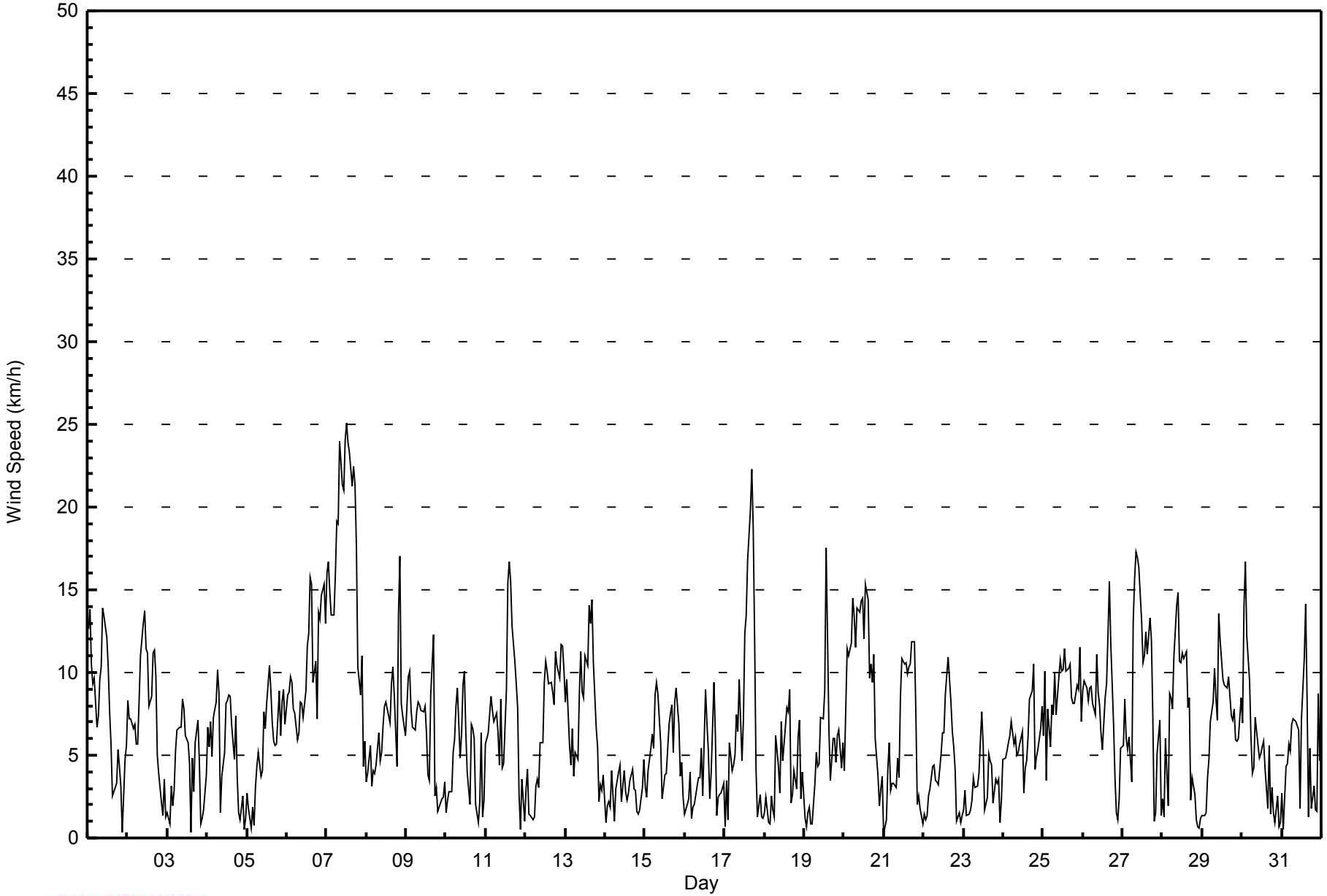
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Lower Camp - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	326	43.82	43.82
6 - 11	328	44.09	87.90
12 - 19	78	10.48	98.39
20 - 28	12	1.61	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Lower Camp - August 2014

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	21	16	24	17	34	34	12	8	9	4	4	10	30	48	27	326
6 - 11	34	4	11	3	2	26	107	36	6	6	5	9	9	14	23	33	328
12 - 19	11	4	0	0	0	3	6	1	0	1	7	9	15	14	4	3	78
20 - 28	0	0	0	0	0	0	0	0	0	0	0	1	9	2	0	0	12
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	29	27	27	19	63	147	49	14	16	16	23	43	60	75	63	744

Total Number of Valid Hours: 744

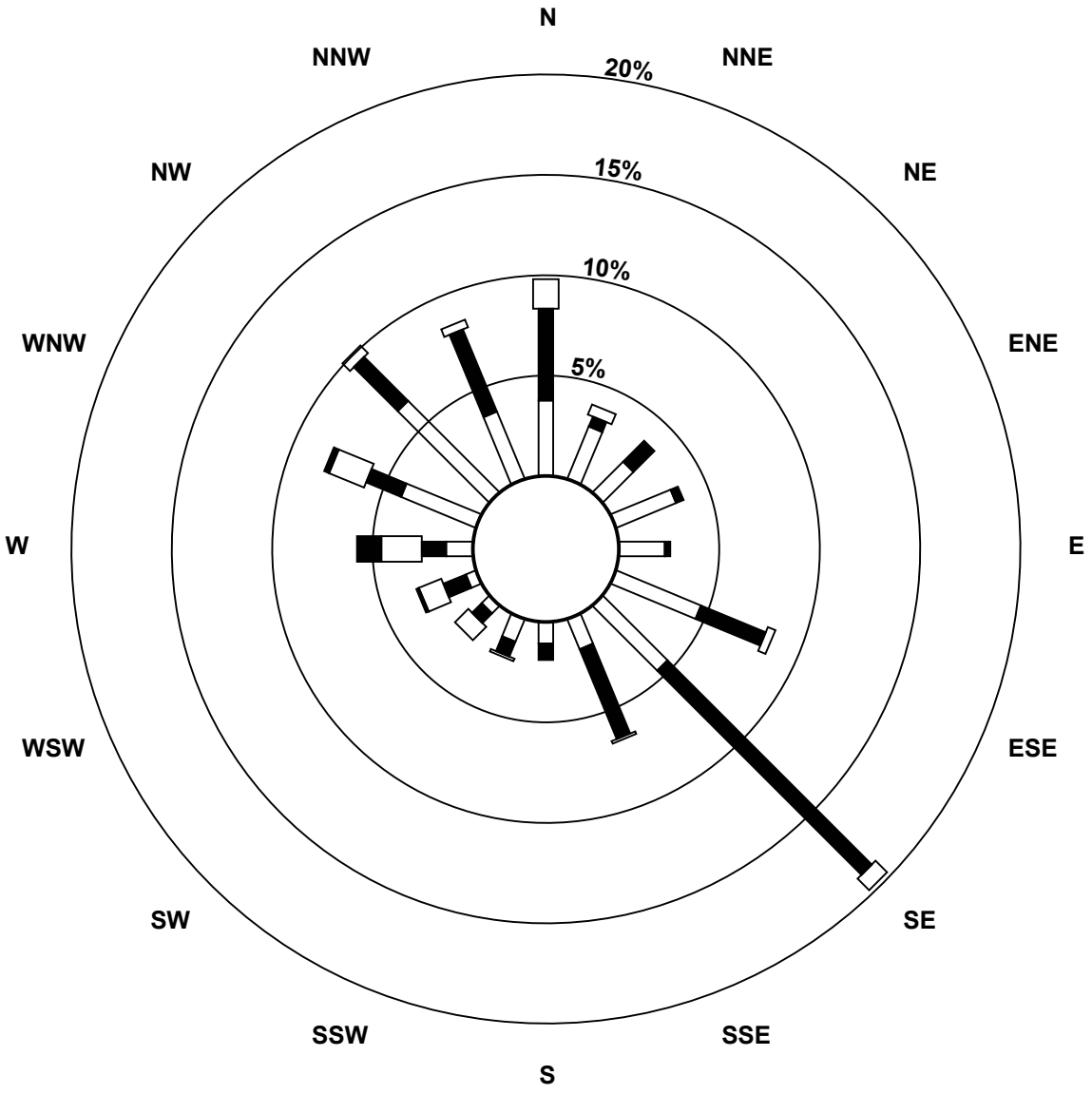
Total Number of Hours: 744

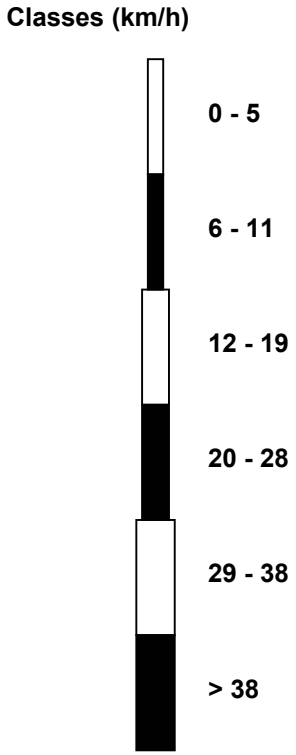
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Lower Camp (AMS 11)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 264 deg on Aug 7 13:00
Direction of Maximum Daily Speed Average: 263.3 deg on Aug 7

Direction of Minimum Speed: 295 deg on Aug 21 01:00

Direction of Minimum Daily Speed Average: 0.1 deg on Aug 16

Monthly Average Direction: 307.3 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	340	345	356	346	317	325	334	349	358	352	0	322	314	308	354	296	301	56	116	136	103	78	138	143	344.9
2-Aug	143	139	142	160	163	168	143	131	114	130	128	130	141	186	184	182	198	204	209	33	108	132	118	114	151.4
3-Aug	356	298	106	93	100	129	118	130	133	129	131	138	135	20	345	358	128	154	146	144	41	66	97	126	122.5
4-Aug	146	127	134	135	131	123	121	126	74	313	324	312	345	339	341	337	18	53	342	325	216	155	349	351	58.0
5-Aug	297	314	48	290	310	109	98	121	108	118	124	132	126	128	134	134	132	141	155	162	158	141	146	147	135.5
6-Aug	136	149	134	142	111	128	145	146	140	137	156	162	204	233	249	249	240	101	219	235	224	233	233	255	195.7
7-Aug	258	261	257	259	260	260	260	262	265	267	262	261	264	262	259	261	259	263	281	286	267	249	307	268	263.3
8-Aug	331	294	314	306	294	320	351	16	10	10	1	359	349	350	25	48	54	41	329	260	273	296	344	6	342.0
9-Aug	341	345	345	353	348	320	298	315	326	326	323	320	2	41	65	246	253	268	110	139	130	99	94	124	328.1
10-Aug	101	138	117	118	142	142	132	126	164	129	124	123	119	88	114	272	258	251	280	334	37	246	10	103	141.9
11-Aug	134	139	136	139	136	129	131	137	229	258	290	87	316	303	298	301	323	353	0	14	292	323	293	6	313.0
12-Aug	300	294	316	58	21	347	325	338	36	113	140	123	122	125	130	132	138	139	124	114	126	130	142	137	125.5
13-Aug	134	126	140	162	151	152	154	141	128	126	134	173	209	214	242	236	239	230	207	193	1	333	312	272	187.0
14-Aug	2	326	324	342	299	338	358	323	330	319	352	57	312	341	359	31	129	177	121	117	84	63	116	116	11.7
15-Aug	124	119	108	135	127	124	122	123	133	140	100	61	16	14	36	37	19	1	349	350	293	291	320	304	63.5
16-Aug	351	288	312	295	62	47	307	326	294	341	25	9	123	129	155	199	240	248	225	8	71	62	108	130	226.3
17-Aug	198	315	58	300	304	321	322	343	8	5	33	318	299	280	292	298	297	301	306	308	77	103	60	64	310.3
18-Aug	73	303	328	358	299	261	144	156	112	49	137	181	270	301	346	353	28	279	188	6	353	331	310	319	327.4
19-Aug	14	71	359	90	129	72	128	124	136	141	142	152	150	285	319	345	74	47	37	299	304	319	324	323	344.9
20-Aug	8	349	343	353	3	358	1	23	13	2	8	9	350	356	3	353	354	355	4	347	336	331	304	269	358.2
21-Aug	295	23	336	332	342	318	340	10	355	298	6	351	340	335	341	346	359	19	32	51	51	323	7	1	355.6
22-Aug	23	326	328	298	53	60	48	60	16	331	307	7	331	337	349	36	37	66	9	51	20	303	5	42	12.9
23-Aug	10	313	348	39	312	346	317	31	98	115	118	130	124	209	191	140	142	126	95	77	301	315	324	293	103.1
24-Aug	281	278	286	293	295	305	294	295	316	326	343	351	337	72	109	81	70	72	103	126	117	136	129	131	25.1
25-Aug	136	116	123	129	135	125	137	149	130	138	154	149	147	154	183	182	198	192	167	156	155	156	151	139	151.9
26-Aug	135	122	137	134	144	144	146	138	127	127	129	128	111	117	126	214	221	273	355	94	26	209	105	142	144.2
27-Aug	167	126	141	152	147	180	270	284	289	280	293	275	269	263	272	268	260	284	329	309	296	308	292	171	271.0
28-Aug	251	191	259	325	311	315	341	303	303	295	305	316	315	338	355	338	3	67	99	120	54	29	32	33	320.7
29-Aug	158	95	115	146	124	100	104	119	125	133	120	124	149	148	146	151	139	147	154	154	144	143	130	134	134.0
30-Aug	130	114	117	125	161	159	158	132	235	283	308	328	271	319	28	37	246	184	137	316	186	297	303	359	149.2
31-Aug	115	175	234	167	145	149	147	144	139	135	129	309	288	333	337	325	229	267	255	160	198	248	278	309	231.8
	141.5	111.9	114.0	135.7	147.2	122.6	122.8	114.0	54.4	339.5	77.5	33.0	274.6	297.5	305.9	288.8	266.0	286.9	22.2	147.9	234.1	234.7	186.3	153.2	
	Diurnal Average																								

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 Aug 17 01:00

Minimum Value: 12 deg on Aug 17 10:00

Percentiles: P_1 = 13 P_{10} = 18 Q_1 = 23 Median = 32 Q_3 = 46 P_{90} = 74 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

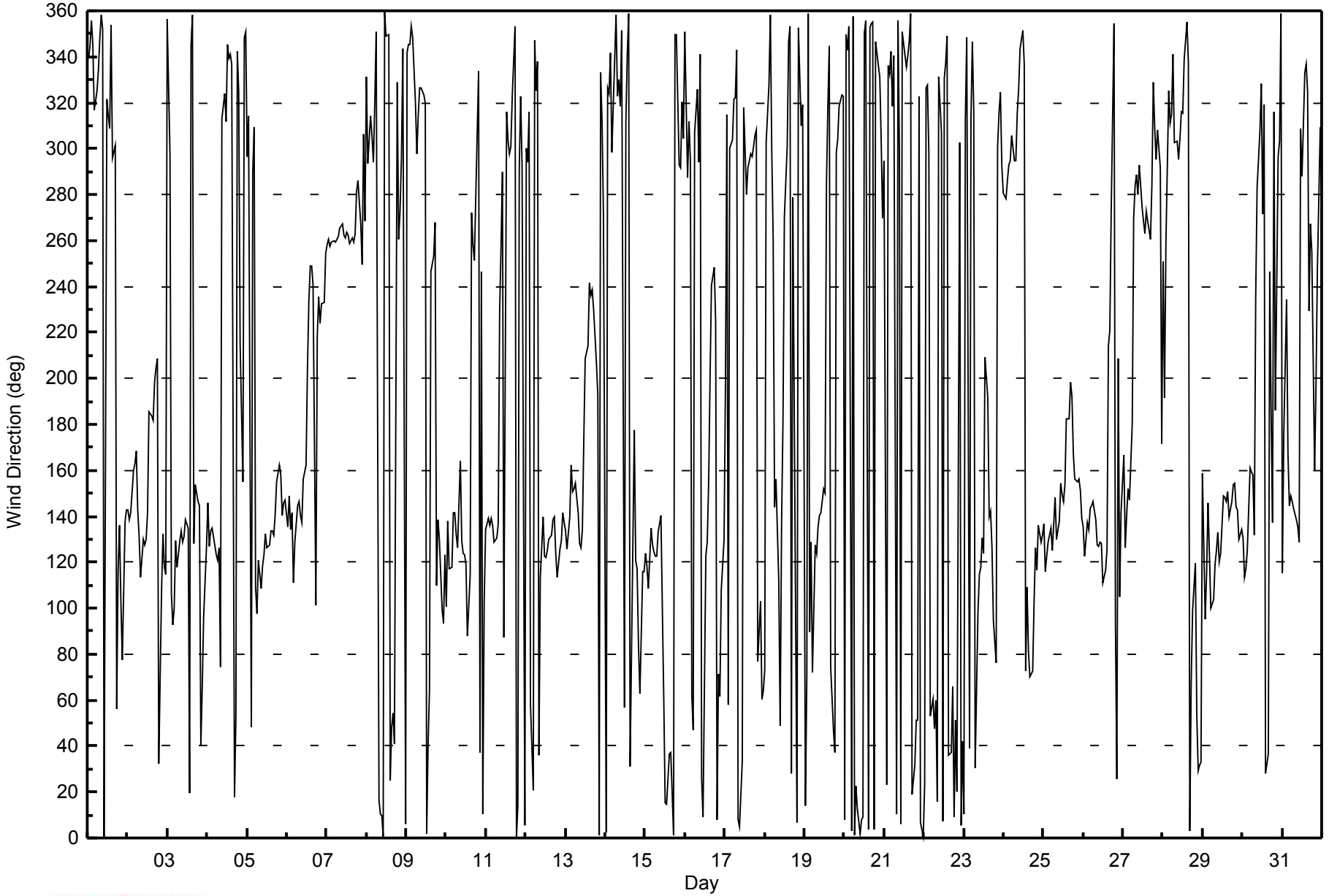
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	21	21	22	20	22	22	26	23	26	22	28	25	32	37	39	85	70	29	27	28	24	99	37	36	99
2-Aug	26	41	38	39	36	28	32	28	17	27	25	29	29	50	41	36	33	30	26	82	89	97	50	88	97
3-Aug	74	91	56	87	46	41	32	23	27	20	24	22	23	36	97	42	87	33	19	45	95	82	38	23	97
4-Aug	19	38	25	39	31	36	24	23	76	36	37	18	21	19	17	24	37	20	33	37	83	70	97	62	97
5-Aug	47	62	88	63	68	44	45	30	31	17	21	23	17	22	29	22	33	28	32	26	22	15	20	38	88
6-Aug	35	31	35	33	37	29	35	39	41	35	46	42	38	31	17	33	48	21	54	14	17	13	14	17	54
7-Aug	15	13	12	14	15	15	13	14	13	15	16	14	15	15	14	19	14	13	17	14	22	21	41	19	41
8-Aug	60	35	40	43	33	28	38	24	33	32	35	28	26	34	32	26	14	18	19	37	14	18	32	25	60
9-Aug	25	21	21	26	22	25	15	17	13	18	25	30	31	32	27	40	14	88	38	69	36	26	59	26	88
10-Aug	66	53	61	55	40	32	36	30	54	47	30	20	56	62	77	48	30	18	90	72	44	61	84	76	90
11-Aug	32	19	21	20	27	35	33	30	57	20	62	30	83	19	16	17	23	22	23	23	48	89	21	58	89
12-Aug	39	16	51	40	51	82	48	37	35	27	26	18	22	22	25	28	32	33	25	16	27	33	31	32	82
13-Aug	35	33	46	39	32	76	39	35	23	23	33	44	37	35	23	25	18	20	28	27	86	62	87	82	87
14-Aug	79	70	68	68	19	62	35	25	28	30	59	18	74	66	58	25	19	48	28	78	44	52	27	29	79
15-Aug	37	44	41	26	33	35	20	19	32	30	47	29	32	60	27	17	33	33	20	28	13	23	24	52	60
16-Aug	45	54	30	16	59	41	46	37	20	36	25	67	26	32	55	96	90	16	21	79	28	39	45	41	96
17-Aug	100	48	74	25	34	21	15	22	20	12	35	45	22	25	19	17	13	14	14	52	46	37	36	35	100
18-Aug	41	51	71	49	29	87	94	41	52	53	39	68	59	22	33	16	88	64	38	61	27	18	60	23	94
19-Aug	80	100	73	62	92	73	44	28	53	57	48	44	36	50	27	41	67	38	27	27	27	15	33	40	100
20-Aug	76	36	21	21	19	20	20	23	24	21	23	20	30	22	22	30	23	29	22	23	32	34	24	27	76
21-Aug	99	78	26	23	47	35	31	45	40	62	32	31	31	28	36	24	25	24	18	14	46	52	27	62	99
22-Aug	34	41	51	28	75	19	20	29	31	45	41	29	45	28	29	24	24	21	26	50	77	51	54	37	77
23-Aug	58	75	79	84	68	43	32	43	29	28	21	27	33	86	83	33	48	34	73	67	30	27	73	38	86
24-Aug	18	17	17	17	16	17	17	19	22	24	28	27	61	46	36	27	13	13	25	41	39	26	37	33	61
25-Aug	40	29	81	38	43	33	39	30	29	36	33	36	30	29	41	35	37	33	26	23	24	25	24	43	81
26-Aug	32	27	27	23	20	20	28	43	27	20	23	19	33	20	20	43	21	52	42	46	87	83	68	39	87
27-Aug	49	38	21	20	22	60	16	18	14	17	13	18	28	26	19	26	18	28	15	88	79	83	95	83	95
28-Aug	65	84	28	82	24	25	25	20	16	15	17	20	22	24	22	28	29	60	31	34	64	60	80	74	84
29-Aug	85	95	87	49	46	33	32	22	26	31	19	23	33	37	36	31	34	33	27	28	19	24	30	35	95
30-Aug	35	23	13	27	38	31	59	42	33	36	31	32	54	37	38	76	49	84	37	90	93	77	98	81	98
31-Aug	55	96	47	37	19	24	24	27	35	26	26	83	43	23	24	60	87	41	64	48	73	86	14	41	96
	100	100	88	87	92	87	94	45	76	62	62	83	83	86	97	96	90	88	90	90	95	99	98	88	
	Diurnal Maximum																								

WBEA

Hourly Averages

Wind Direction (WD) - deg

Lower Camp - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 11, 2014
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	9:10	End Time (MST)	12:50
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	5/29/2014
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	-557	-558
Analyzer Range (mv)	5000	5000	Lamp voltage	880	855
Calculated slope	0.996959	0.996251	Chamber temp.	45.2	45.2
Calculated intercept	-0.032060	1.195861	Pressure (mmHg)	708.8	700.0
Analyzer Background	20.8	26.0	Flow (lpm)	0.496	0.482
Analyzer Coefficient	0.982	0.990	Intensity	34xxx	34xxx

Analyzer make	TEI 43C	Analyzer serial #	518112184

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	3.3	NA
as found span	5001	80.9	829.9	824.1	1.007
calibrator zero	5000	0.0	0.0	-0.7	NA
high point	5001	80.9	829.9	832.3	0.997
second point	5000	40.9	419.6	419.0	1.002
third point	5002	20.4	209.2	208.8	1.002
calibrator zero	5000	0.0	0.0	-0.7	NA
as left zero	5000	0.0	0.0	0.2	NA
as left span	5000	80.9	830.0	835.0	0.994
				Average Correction Factor	1.000

Corrected As found	820.9	Previous response	832.4	% change	1.4%

Notes:

Changed filter after as founds. Adjusted zero and span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

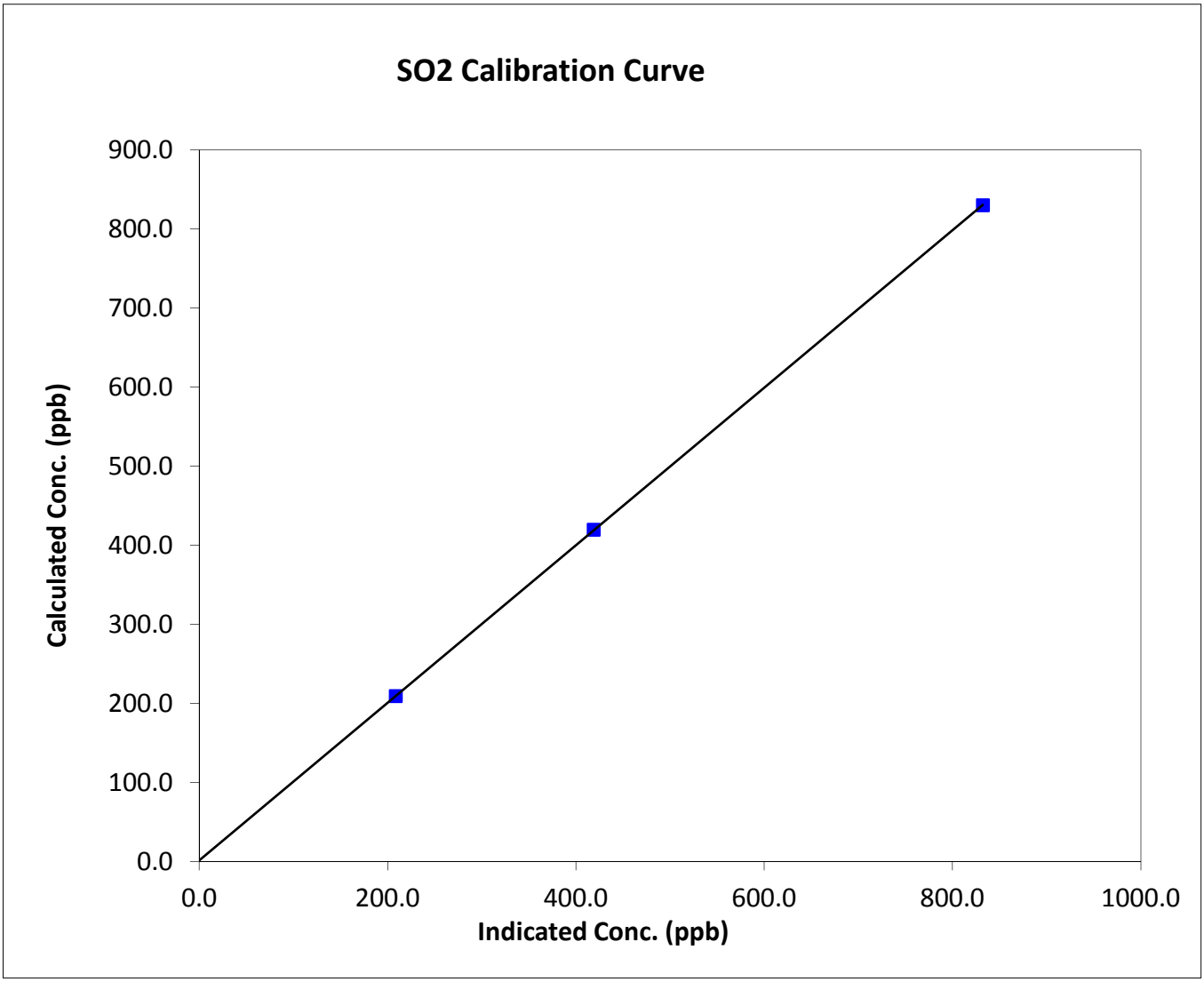
SO_2 Calibration Summary

Station Information

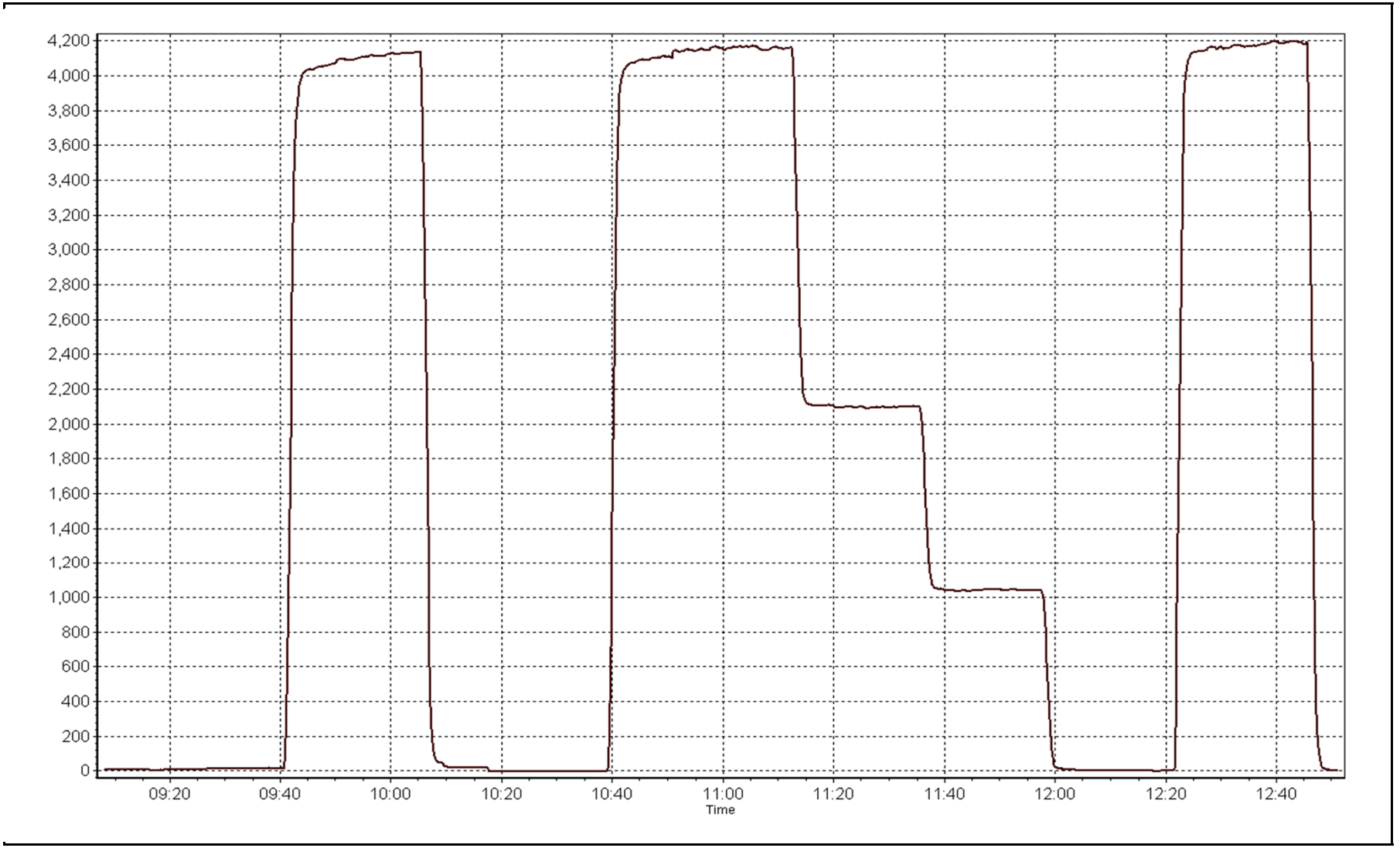
Calibration Date	August 18, 2014	Previous Calibration	July 11, 2014
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	9:10	End Time (MST)	12:50
Analyzer make	TEI 43C	Analyzer serial #	518112184

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.7	N/A	Correlation Coefficient	0.999996
829.9	832.3	0.9971		
419.6	419.0	1.0016	Slope	0.996251
209.2	208.8	1.0018		
			Intercept	1.195861



SO2 Calibration Plot Date: August 18, 2014



Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 20, 2014	Previous Calibration	August 18, 2014
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	9:15	End Time (MST)	11:20
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	5/29/2014
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	-558	-558
Analyzer Range (mv)	5000	5000	Lamp voltage	855	1367
Calculated slope	0.996251	1.305547	Chamber temp.	45.2	45.2
Calculated intercept	1.195861	-77.740072	Pressure (mmHg)	700.0	707.9
Analyzer Background	26.0	26.0	Flow (lpm)	0.482	0.485
Analyzer Coefficient	0.990	0.990	Intensity	34xxx	53

Analyzer make	TEI 43C	Analyzer serial #	518112184

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	59.5	NA
as found span	5001	80.9	829.9	695.2	1.194
calibrator zero	5000	0.0	0.0	59.5	NA
high point	5001	80.9	829.9	695.2	1.194
second point					
third point					
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.194

Corrected As found	635.6	Previous response	831.8	% change	30.9%

Notes:

Flash lamp, socket, and board replaced; did not fix response issue. Analyzer removed.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 20, 2014	Previous Calibration	N/A
Station Name	Lower Camp	Station Number	AMS 11

Reason: Install

Start Time (MST)	13:20	End Time (MST)	16:25
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	5/29/2014
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	NA	-626
Analyzer Range (mv)	5000	5000	Lamp voltage	NA	848
Calculated slope	NA	0.998839	Chamber temp.	NA	43.8
Calculated intercept	NA	0.610700	Pressure (mmHg)	NA	710.4
Analyzer Background	NA	28.3	Flow (lpm)	NA	0.459
Analyzer Coefficient	NA	1.008	Intensity	NA	35xxx

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					
as found span					
calibrator zero	5000	0.0	0.0	0.3	NA
high point	5000	80.9	830.0	831.3	0.999
second point	5000	40.9	419.6	417.8	1.004
third point	5002	20.4	209.2	208.8	1.002
calibrator zero	5000	0.0	0.0	0.3	NA
as left zero	5000	0.0	0.0	-0.8	NA
as left span	5000	80.9	830.0	837.2	0.991
				Average Correction Factor	1.002

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Flow sensor replaced during high point. Adjusted span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

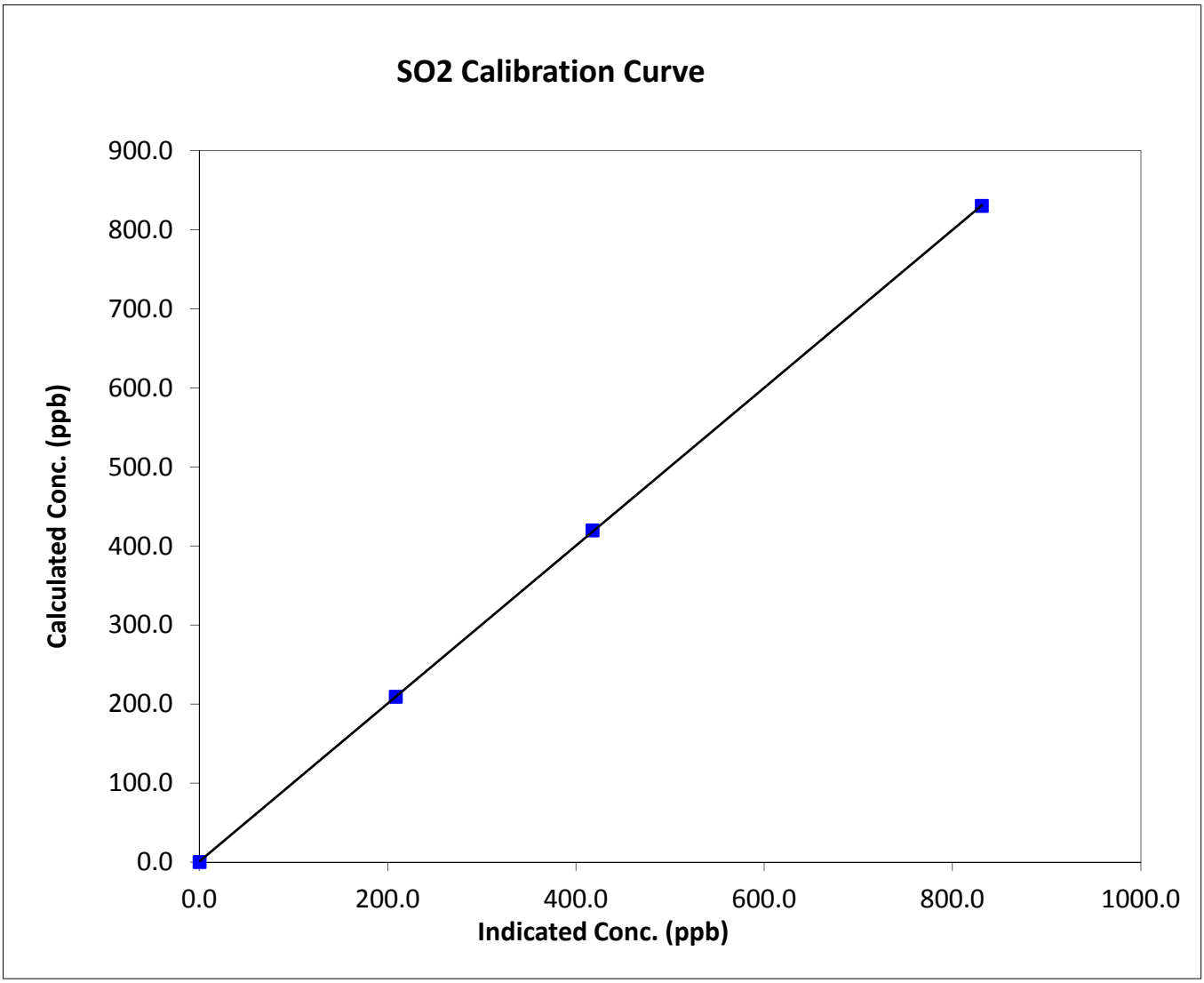
SO_2 Calibration Summary

Station Information

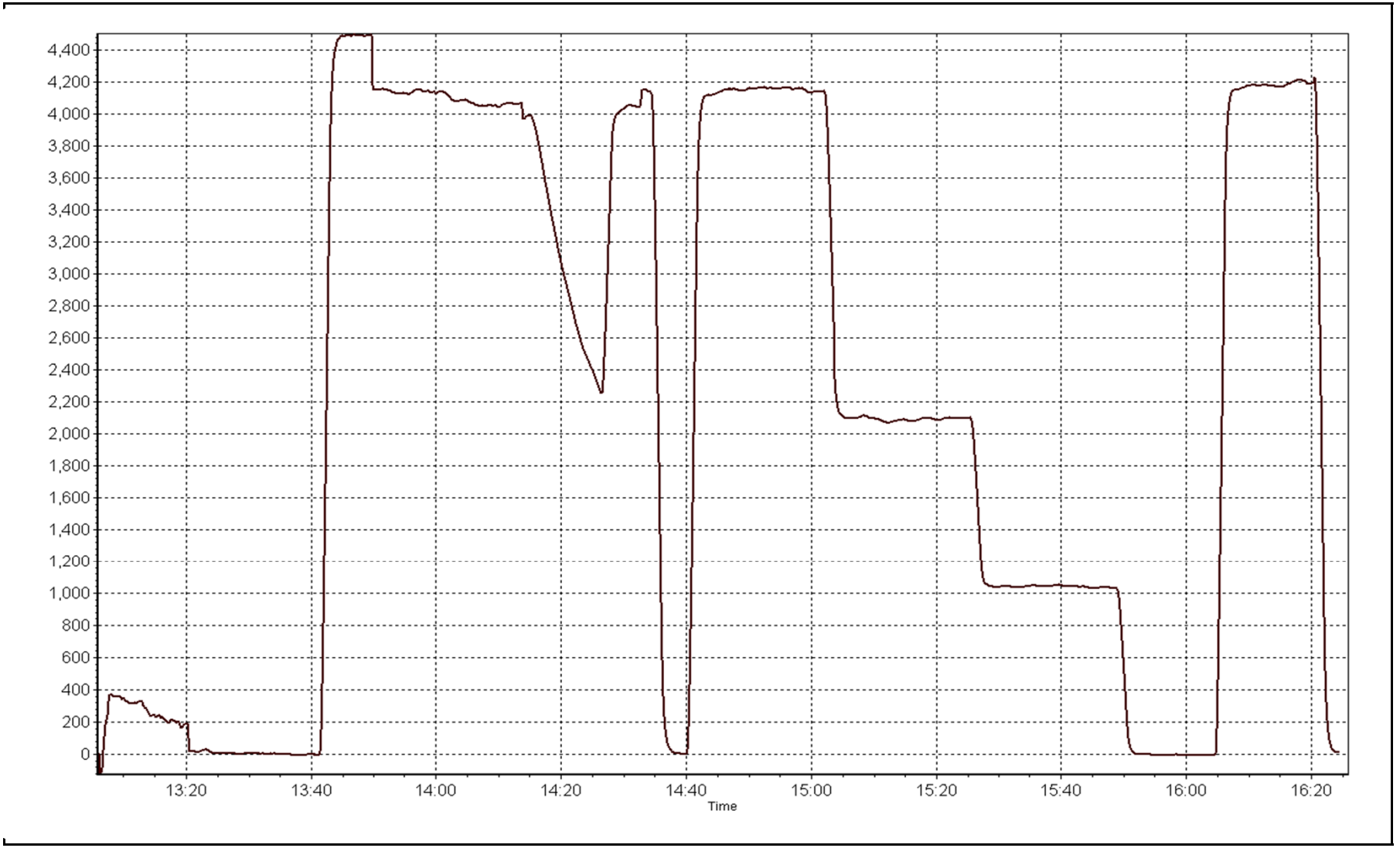
Calibration Date	August 20, 2014	Previous Calibration	N/A
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	13:20	End Time (MST)	16:25
Analyzer make	TEI 43C	Analyzer serial #	613516794

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999988
830.0	831.3	0.9985		
419.6	417.8	1.0044	Slope	0.998839
209.2	208.8	1.0021		
			Intercept	0.610700



SO2 Calibration Plot Date: August 20, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 19, 2014	Previous Calibration	July 14, 2014
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	9:10	End Time (MST)	12:55
Barometric Pressure	760 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11051107
Cal Gas Concentration	10.3 ppm H2S	Cal Gas Expiry Date	5/30/2013
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)	-681	-681
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	971	966
Calculated slope	1.002962	1.000921	Chamber temp. (deg C)	45	45
Calculated intercept	0.051685	-0.117720	Pressure (mmHg)	580.5	556.1
Analyzer Background	1.59	1.65	Flow(LPM)	0.405	0.385
Analyzer Coefficient	0.874	0.862	Intensity(%)	91	91
			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	36.4	75.0	74.5	1.006
SO2 scrubber check	5000	20.5	210.3	1.5	NA
calibrator zero	5000	0.0	0.0	0.1	NA
high point	5001	36.4	75.0	75.0	0.999
second point	5002	19.4	39.9	40.0	0.998
third point	5002	9.7	20.0	20.1	0.995
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	36.4	75.0	75.6	0.993
				Average Correction Factor	0.998

Corrected As found	74.4	Previous response	74.7	% change	0.4%

Notes:

Changed filter after as founds. Adjusted span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

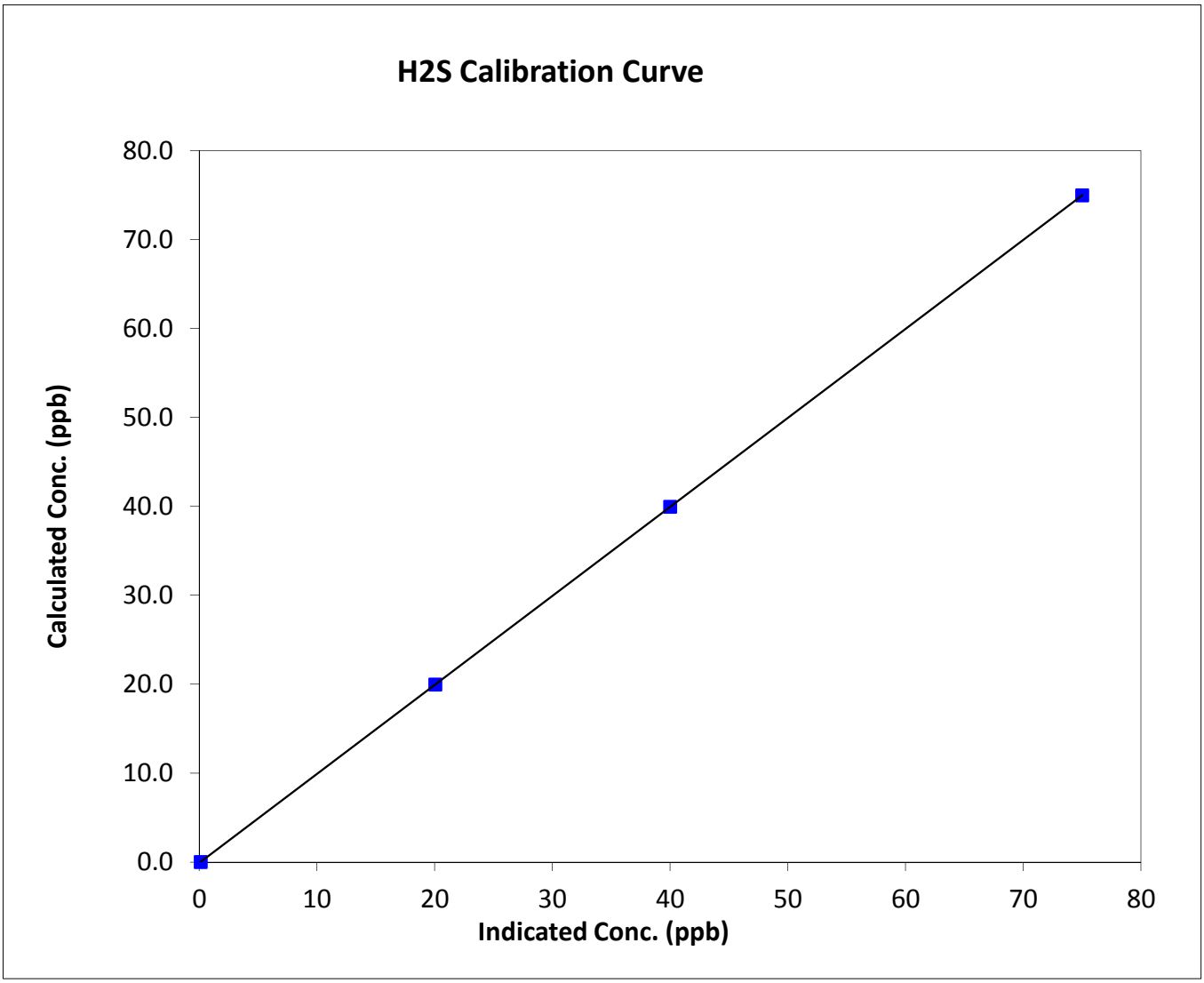
H2S Calibration Summary

Station Information

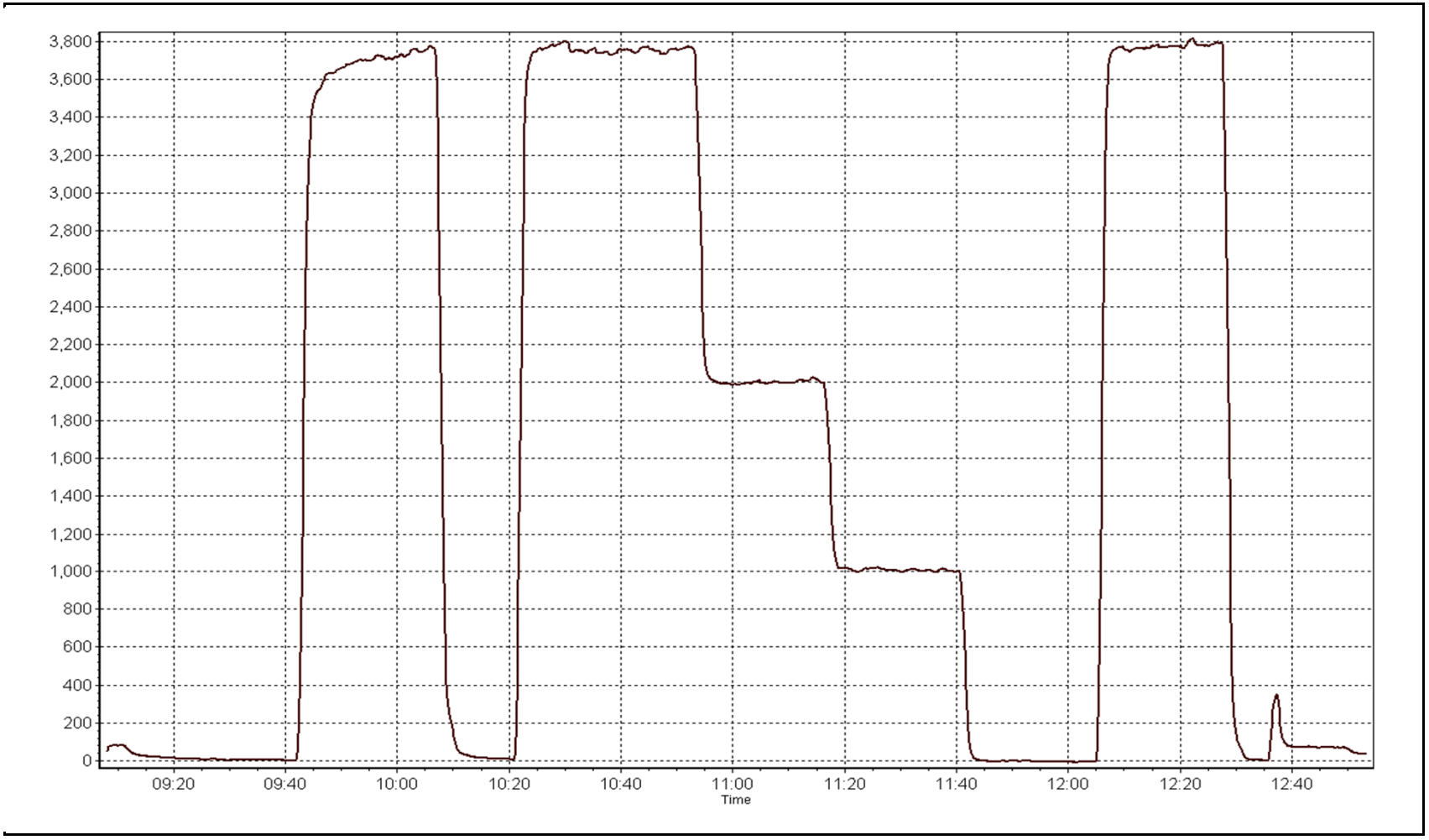
Calibration Date	August 19, 2014	Previous Calibration	July 14, 2014
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	9:10	End Time (MST)	12:55
Analyzer make	Thermo 43i	Analyzer serial #	1008841400

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	1.000000
75.0	75.0	0.9993		
39.9	40.0	0.9981	Slope	1.000921
20.0	20.1	0.9953		
			Intercept	-0.117720



H2S Calibration Plot Date: Tuesday, August 19, 2014



SO2
scrubber

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	August-18-14	Previous Calibration	July-11-14
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	9:10	End Time (MST)	12:50
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	8.2	8.2
Analyzer Range (mv)	5000	5000	Air or Bypass press	37.8	37.8
Calculated slope	1.002608	0.999547	Fuel Pressure	24.2	24.2
Calculated intercept	-0.023396	0.040957			

Analyzer make	51i-LT	Analyzer serial #	1218153580

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	5001	80.9	17.37	16.68	1.041
calibrator zero	5000	0.0	0.00	0.01	N/A
high point	5001	80.9	17.37	17.38	0.999
second point	5000	40.9	8.78	8.66	1.014
third point	5002	20.4	4.38	4.33	1.011
calibrator zero	5000	0.0	0.00	0.01	N/A
as left zero	5000	0.0	0.00	-0.05	N/A
as left span	5000	80.9	17.37	17.66	0.984
				Average Correction Factor	1.008

Corrected As found	16.81	Previous response	17.35	% change	3.2%

Notes:

Changed filter after as founds. Adjusted zero and span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

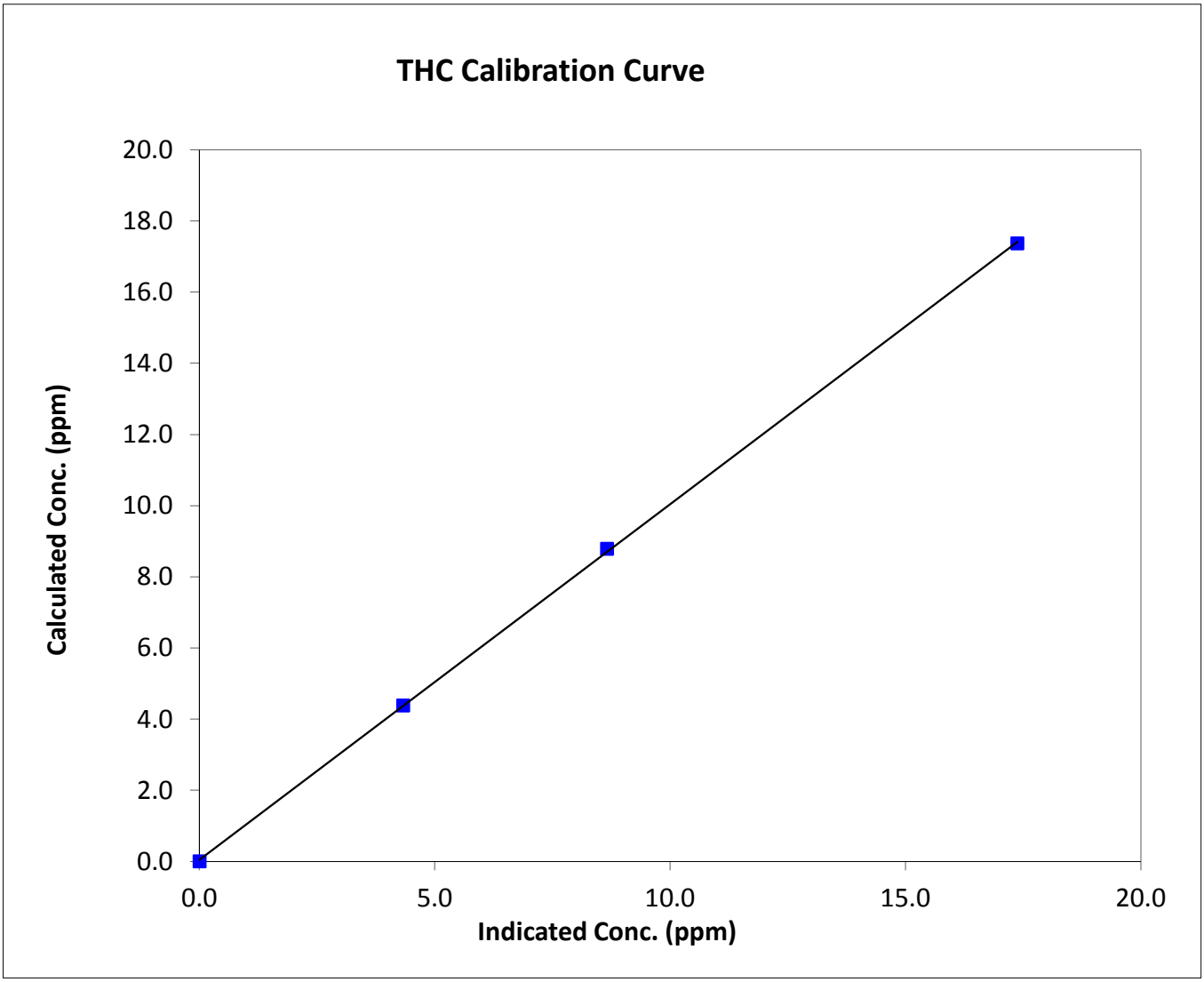
THC Calibration Summary

Station Information

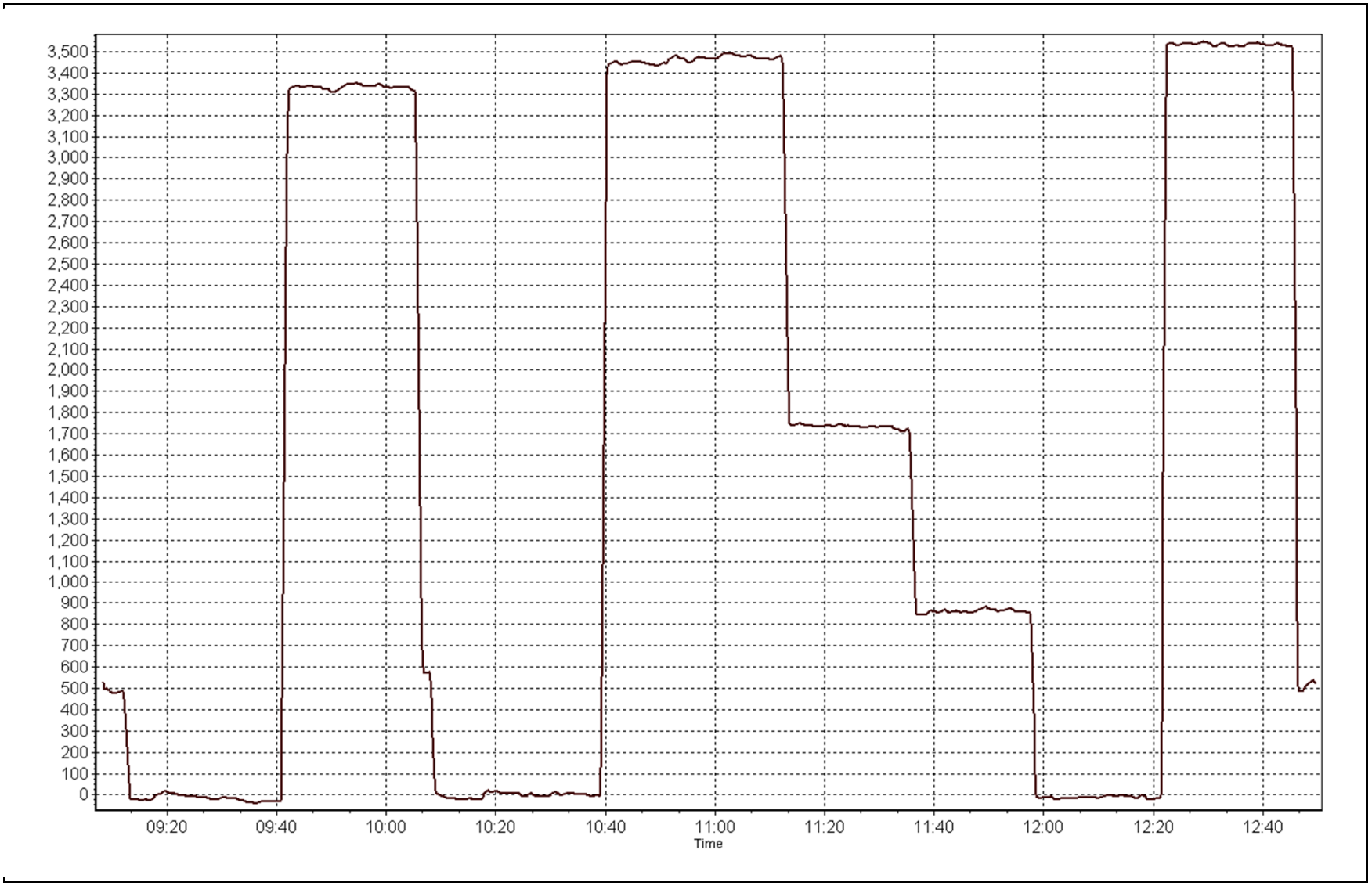
Calibration Date	August-18-14	Previous Calibration	July-11-14
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	9:10	End Time (MST)	12:50
Analyzer make	51i-LT	Analyzer serial #	1218153580

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.01	N/A	Correlation Coefficient	0.999932
17.37	17.38	0.9994		
8.78	8.66	1.0139	Slope	0.999547
4.38	4.33	1.0108		
			Intercept	0.040957



THC Calibration Plot Date:



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 12
MILLENNIUM MINE
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILLENNIUM MINE (AMS 12)
AUGUST 2014

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	37	0	6	0
TRS(ppb) Average	710	34	34	100.00	13	1	1	0
THC(ppm) Average	707	37	37	100.00	6.3	-	2.8	-
NO2(ppb) Average	696	37	48	98.52	37	0	13	-
NO(ppb) Average	696	37	48	98.52	125	-	18	-
NOX(ppb) Average	696	37	48	98.52	145	-	28	-
PM2.5(ug/m3) Average	718	0	26	96.51	275.6	-	103.4	4
Temperature 2 m (C) Average	744	0	0	100.00	31.5	-	25.1	-
Wind Speed 10 m (km/h) Average	736	0	8	98.92	20	-	-	-
Wind Direction 10 m (deg) Average	736	0	8	98.92	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILLENNIUM MINE (AMS 12)
AUGUST 2014

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	1.7	4	-	0	0	0	0	1	4	37
TRS(ppb) Average	710	0.7	1	-	0	0	0	1	1	1	13
THC(ppm) Average	707	2.51	0.5	-	2	2.1	2.2	2.3	2.6	3.1	6.3
NO2(ppb) Average	696	8	7	-	0	1	2	7	13	17	37
NO(ppb) Average	696	7.2	13	-	0	0	1	2	7	22	125
NOX(ppb) Average	696	15.2	18	-	0	1	3	9	22	37	145
PM2.5(ug/m3) Average	718	19.03	27.8	-	1.2	4.4	6.7	10.9	19	35.1	275.6
Temperature 2 m (C) Average	744	18.01	6.1	-	2.4	10.5	13.6	17.5	22.3	27	31.5
Wind Speed 10 m (km/h) Average	736	6.8	3	-	0	3	4	6	9	11	20
Wind Direction 10 m (deg) Average	736	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MILLENNIUM MINE (AMS 12)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, NO, NOX	07 Aug 2014 09:00	07 Aug 2014 19:00	11	Unstable operation - baseline collapse
PM2.5	02 Aug 2014 16:00	03 Aug 2014 15:00	25	Analyzer failure - filter tape failed to advance
PM2.5	28 Aug 2014 08:00	28 Aug 2014 08:00	1	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	12 Aug 2014 01:00	12 Aug 2014 02:00	2	Flatline in sensor output signal
Wind Speed, Wind Direction	14 Aug 2014 19:00	14 Aug 2014 19:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	16 Aug 2014 01:00	16 Aug 2014 01:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	16 Aug 2014 07:00	16 Aug 2014 07:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	24 Aug 2014 06:00	24 Aug 2014 06:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	30 Aug 2014 17:00	30 Aug 2014 17:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	31 Aug 2014 19:00	31 Aug 2014 19:00	1	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Millennium - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 37 ppb on Aug 8 10:00 Maximum Daily Average: 6.5 ppb on Aug 14

Minimum Value: 0 ppb on Aug 3 04:00 Minimum Daily Average: 0.2 ppb on Aug 20
Maximum Diurnal Average: 4.2 ppb at hour 13 Minimum Diurnal Average: 0.4 ppb at hour 4
Monthly Average: 1.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 22$

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-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	1	3	1	0	10	18	16	8	9	4	2	1	3.3	18
2-Aug	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
3-Aug	0	Z	0	0	0	0	0	0	0	0	1	1	8	9	20	15	11	5	4	1	1	1	1	1	3.4	20
4-Aug	1	Z	0	0	0	0	0	0	13	20	11	7	2	1	1	1	0	0	0	0	0	0	0	0	2.7	20
5-Aug	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	1	0	0	0	0	0.5	2
6-Aug	0	Z	0	0	0	0	0	0	1	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0.5	2
7-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	1
8-Aug	1	Z	1	0	0	0	1	0	3	37	13	9	4	1	2	1	1	0	0	1	1	1	3	1	3.5	37
9-Aug	0	Z	0	0	0	0	0	0	0	3	9	4	3	13	29	22	7	2	23	10	3	1	1	1	5.7	29
10-Aug	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Aug	0	Z	0	0	1	0	0	0	0	1	9	19	20	5	4	4	1	1	0	0	0	1	1	0	3.0	20
12-Aug	0	Z	1	1	1	1	0	0	0	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0.5	1
13-Aug	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0.8	1
14-Aug	0	Z	2	1	1	1	1	1	1	1	1	20	36	22	20	20	9	4	2	2	2	2	1	1	6.5	36
15-Aug	2	Z	1	1	0	0	0	0	1	1	1	1	1	1	1	5	4	1	2	1	0	0	0	0	1.1	5
16-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0.4	1
17-Aug	0	Z	1	1	2	3	2	4	2	2	11	16	11	1	4	7	8	5	5	1	1	2	1	1	4.0	16
18-Aug	1	Z	1	1	0	0	0	0	0	0	1	0	0	0	2	10	10	2	1	1	0	0	0	0	1.4	10
19-Aug	0	Z	0	0	0	0	0	0	1	1	1	2	2	8	8	1	1	1	0	0	1	1	0	0	1.3	8
20-Aug	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
21-Aug	0	Z	0	0	0	0	4	10	3	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1.1	10
22-Aug	0	Z	0	0	0	1	1	0	2	2	1	1	2	1	1	0	0	0	0	0	0	0	0	1	0.7	2
23-Aug	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.4	1
24-Aug	0	Z	0	1	0	1	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
25-Aug	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
26-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	3	1	0.5	3
27-Aug	1	Z	0	0	0	0	0	4	16	16	14	13	11	1	1	1	0	0	1	0	0	0	4	2	3.8	16
28-Aug	1	Z	0	0	0	0	C	C	C	C	C	C	4	1	2	1	3	8	2	0	1	1	1	1	--	8
29-Aug	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
30-Aug	0	Z	0	0	0	0	0	0	0	0	0	2	17	12	15	29	17	3	1	1	1	0	0	0	4.5	29
31-Aug	0	Z	0	0	0	0	0	0	0	0	1	1	0	5	1	1	1	1	1	1	0	0	0	0	0.7	5
	0.5	--	0.5	0.4	0.4	0.4	0.6	0.9	1.7	3.0	2.7	3.5	4.2	2.9	3.8	4.0	3.0	1.9	2.2	1.1	0.8	0.7	0.8	0.5	Diurnal Average	
	2	--	2	1	2	3	4	10	16	37	14	20	36	22	29	29	17	18	23	10	9	4	4	2	Diurnal Maximum	

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

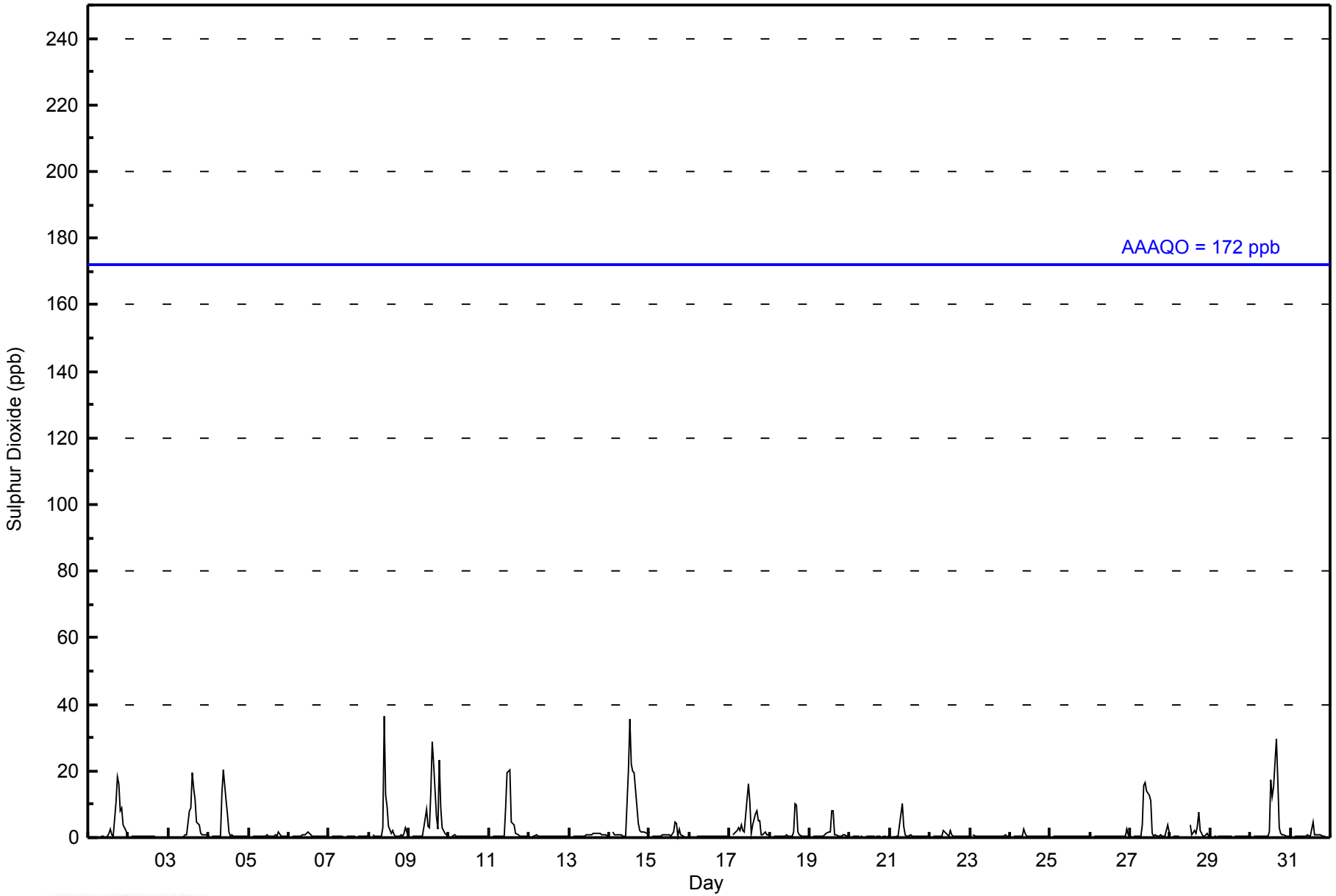
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	673	95.19	95.19
11 - 20	27	3.82	99.01
21 - 60	7	0.99	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Millennium - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	62	35	11	14	8	19	70	66	98	84	46	24	27	29	37	37	667
11 - 20	8	1	0	0	0	0	0	0	0	0	5	0	5	4	0	3	26
21 - 60	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	39	11	14	8	19	70	66	98	84	51	24	32	33	37	41	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

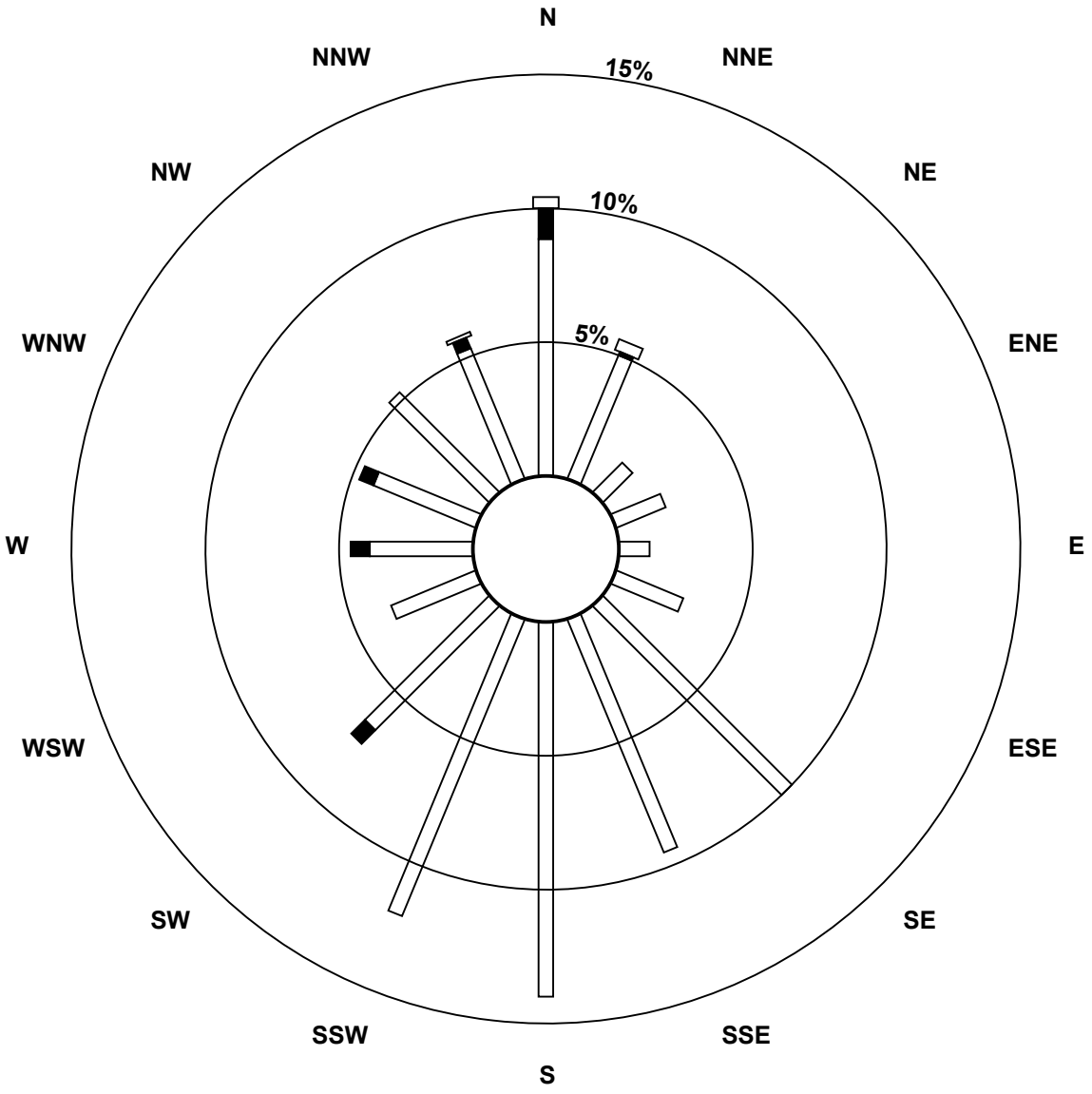
AURORA
ATMOSPHERICS INC.

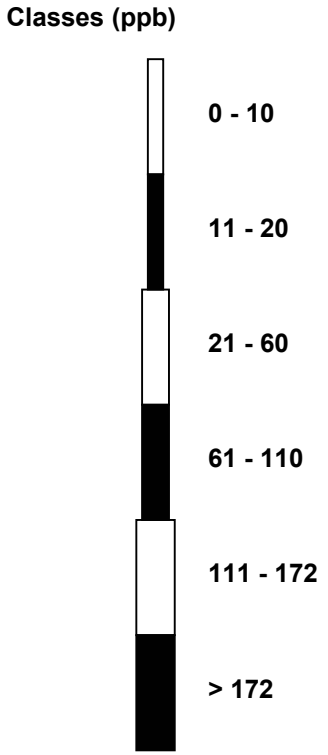
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Millennium (AMS 12)





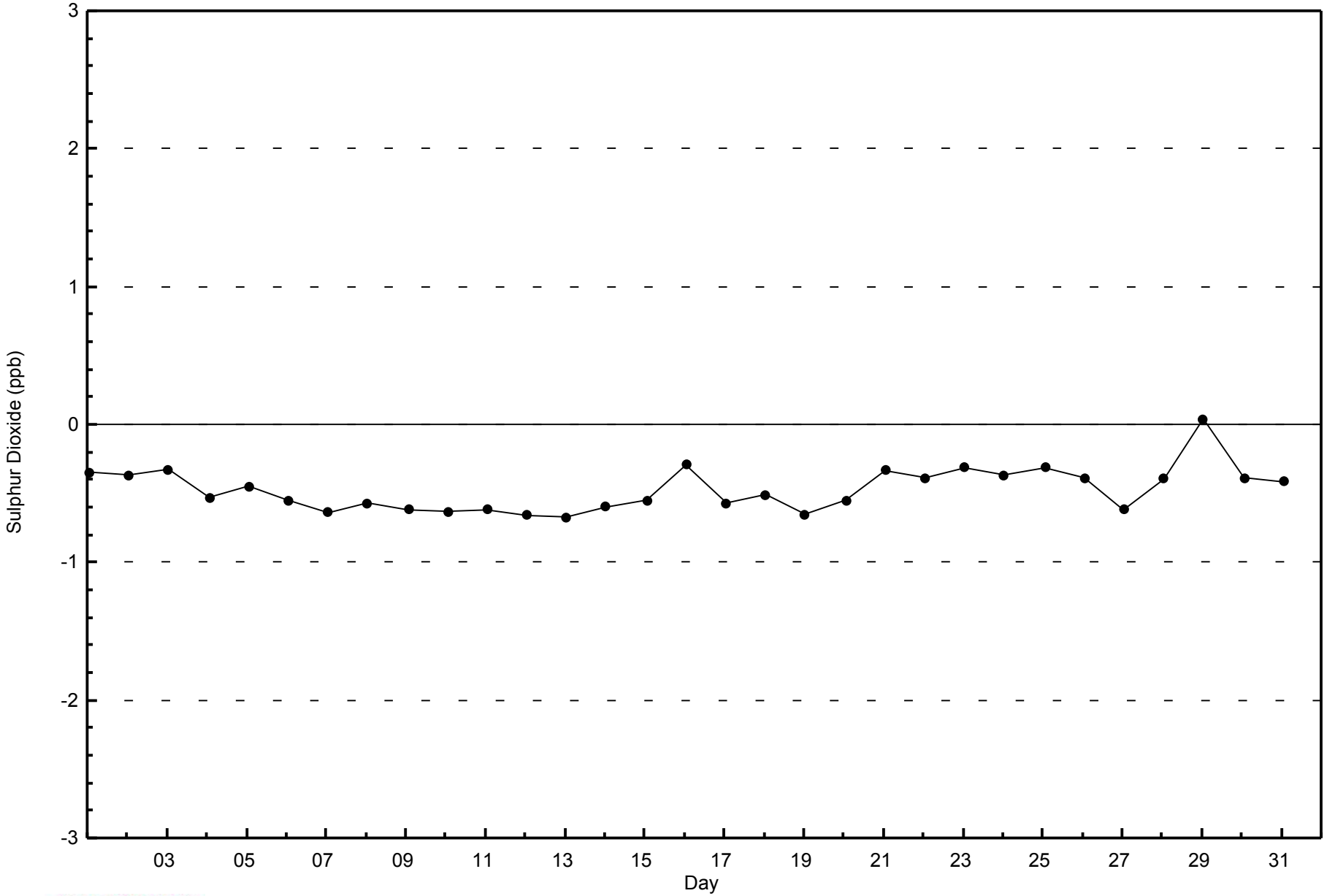
Total Number of Valid Hours: 700

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Millennium - August 2014



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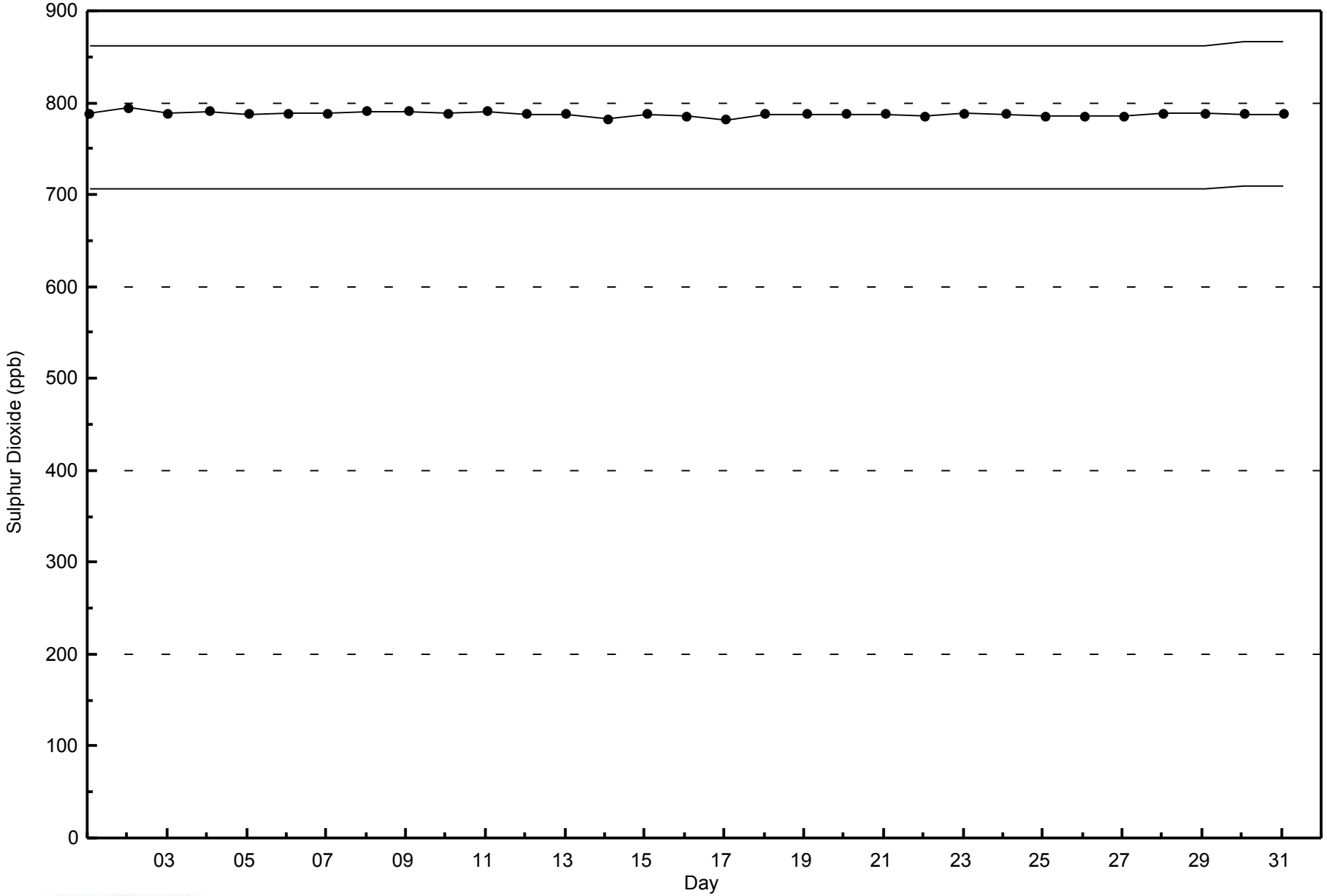
Span Responses

Sulphur Dioxide (SO_2) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Millennium - August 2014

Number of Exceedences (AAAQO): 1-hr: 1 24-hr: 0
Maximum Value: 13 ppb on Aug 27 23:00 Maximum Daily Average: 1.5 ppb on Aug 27

Minimum Value: 0 ppb on Aug 21 20:00 Minimum Daily Average: 0.4 ppb on Aug 2
Maximum Diurnal Average: 1.0 ppb at hour 9 Minimum Diurnal Average: 0.5 ppb at hour 21
Monthly Average: 0.7 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:	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-Aug	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0.5	1
2-Aug	0	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
3-Aug	1	1	Z	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.4	1
4-Aug	0	1	Z	0	0	0	0	0	2	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0.6	2
5-Aug	1	1	Z	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0.5	1
6-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0.5	1
7-Aug	0	0	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0.5	1
8-Aug	0	0	Z	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0.5	2
9-Aug	0	0	Z	0	0	0	0	1	1	1	0	0	1	1	1	1	1	0	1	1	1	1	1	1	0.6	1
10-Aug	1	1	Z	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0.5	1
11-Aug	1	1	Z	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
12-Aug	0	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1
13-Aug	0	0	Z	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
14-Aug	2	4	Z	2	1	1	1	1	1	1	0	1	2	2	1	1	1	0	0	1	1	1	1	1	1.1	4
15-Aug	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0.7	1
16-Aug	1	1	Z	1	1	1	2	2	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0.8	2
17-Aug	1	1	Z	3	2	2	4	3	1	1	1	1	1	0	1	1	1	1	2	0	0	1	2	1	1.4	4
18-Aug	1	1	Z	1	1	1	0	0	0	1	2	0	1	0	1	1	1	10	4	1	1	1	1	1	1.3	10
19-Aug	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	0.8	1
20-Aug	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0.5	1
21-Aug	1	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Aug	1	1	Z	1	1	1	1	1	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.8	4
23-Aug	0	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
24-Aug	0	0	Z	0	0	0	1	2	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.7	5
25-Aug	0	1	Z	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
26-Aug	0	0	Z	1	1	1	1	0	0	0	1	1	1	0	0	1	0	0	1	1	1	1	2	1	0.6	2
27-Aug	1	1	Z	1	1	1	1	2	C	C	C	1	1	1	1	1	1	0	1	0	0	0	13	1	1.5	13
28-Aug	2	1	Z	0	1	1	1	3	5	2	1	0	1	0	0	0	0	0	0	0	0	1	1	1	1.0	5
29-Aug	1	1	Z	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
30-Aug	0	0	Z	0	0	0	0	0	0	0	0	1	2	0	1	1	1	1	1	1	1	0	1	1	0.5	2
31-Aug	1	1	Z	1	1	1	1	1	0	0	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0.6	1
	0.7	0.7	--	0.7	0.7	0.7	0.8	0.9	1.0	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.8	0.6	0.5	0.5	0.5	1.0	0.6	Diurnal Average	
	2	4	--	3	2	2	4	3	5	3	2	1	2	2	1	1	1	10	4	1	1	2	13	1	Diurnal Maximum	

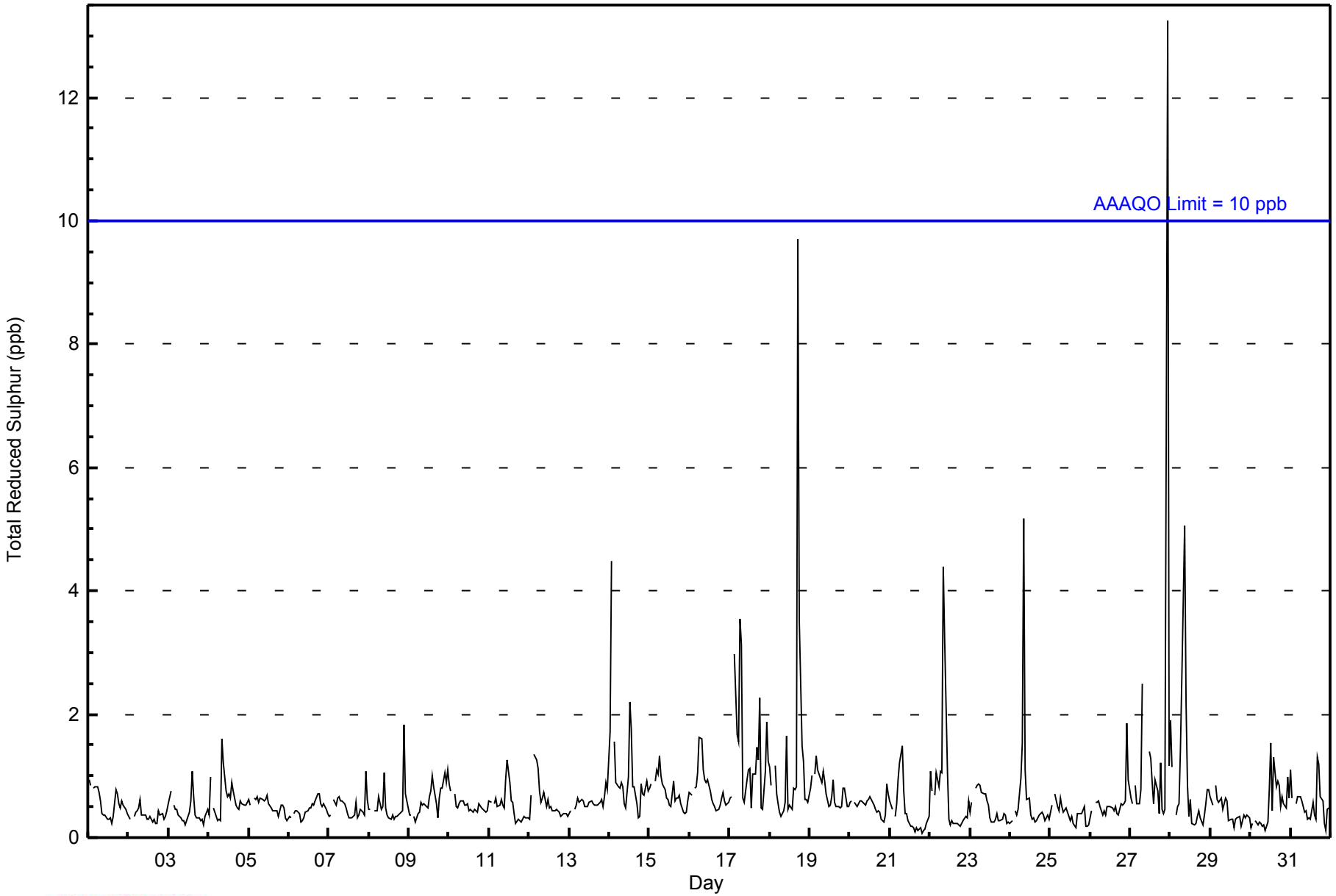
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Millennium - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	698	98.31	98.31
3 - 4	8	1.13	99.44
5 - 7	2	0.28	99.72
8 - 11	1	0.14	99.86
> 11	1	0.14	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Millennium - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	72	41	11	13	9	20	71	67	95	84	50	25	25	32	34	41	690
3 - 4	0	0	0	0	0	0	0	0	0	1	0	0	2	3	2	0	8
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Totals	72	41	11	13	9	20	71	67	95	85	50	25	28	36	38	41	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

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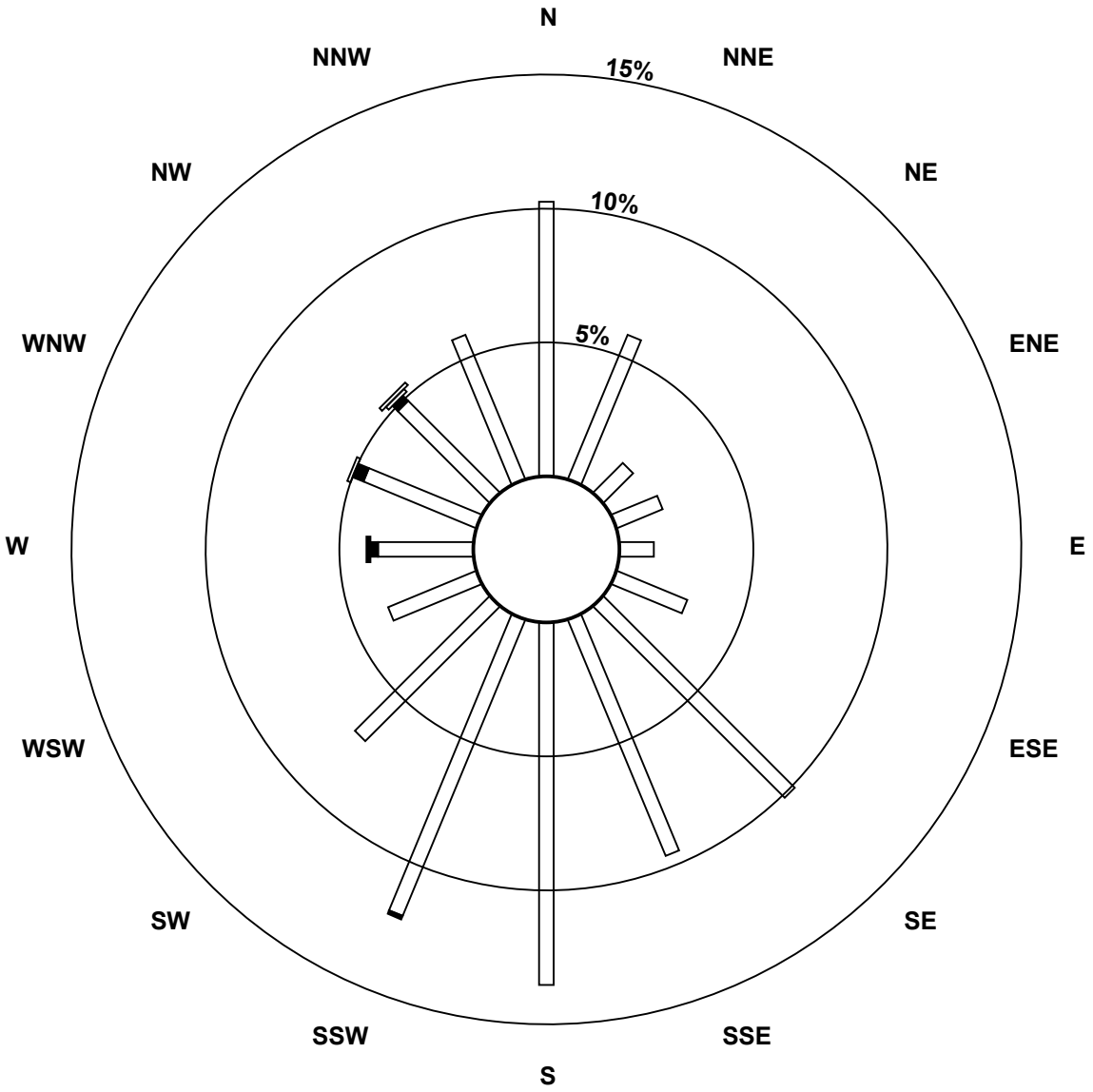
Wood Buffalo Environmental Association

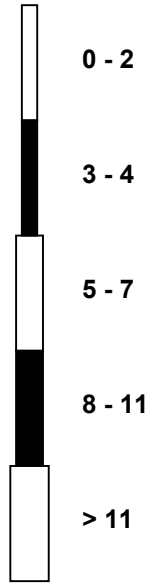
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Millennium (AMS 12)



Classes (ppb)



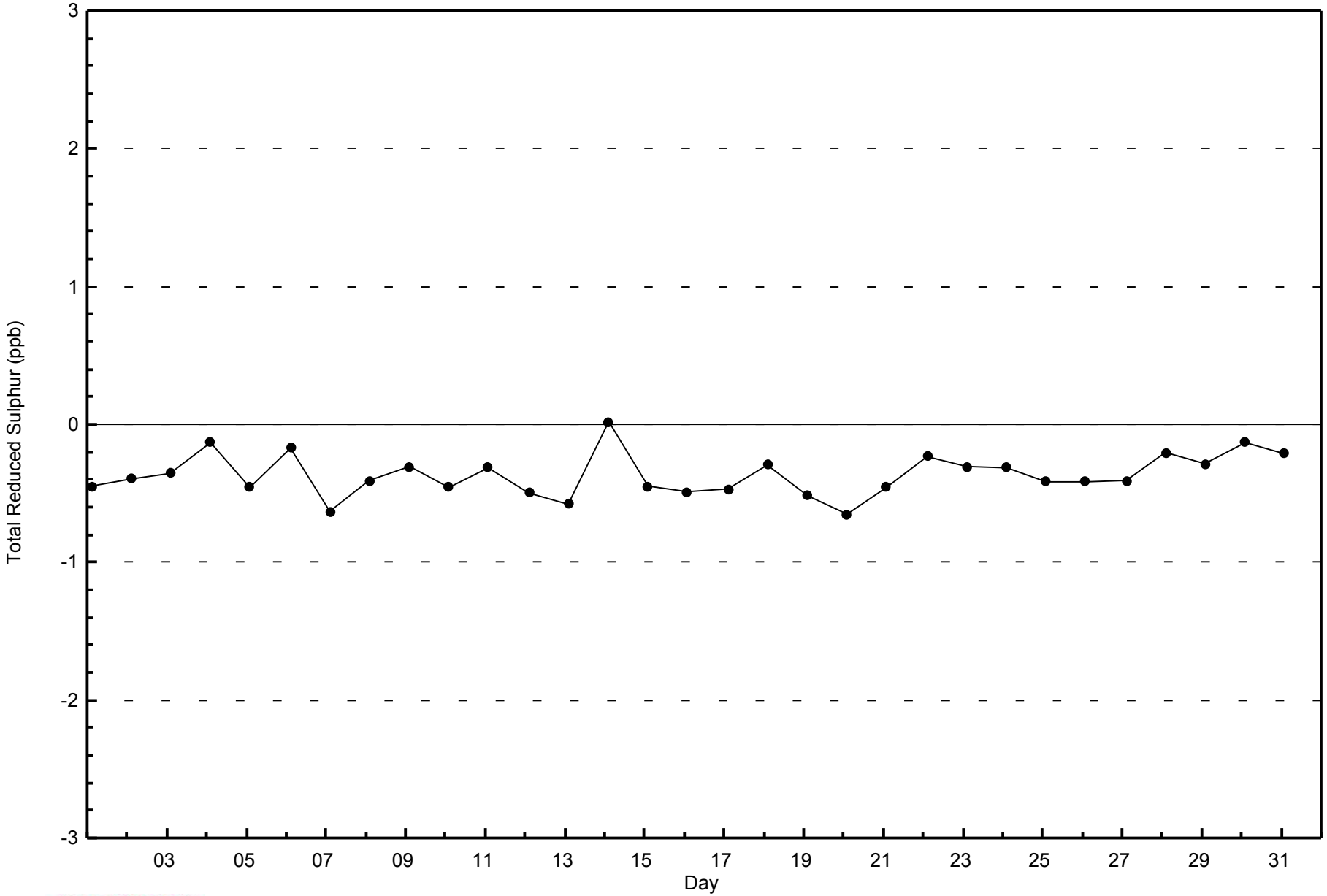
Total Number of Valid Hours: 702

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Millennium - August 2014



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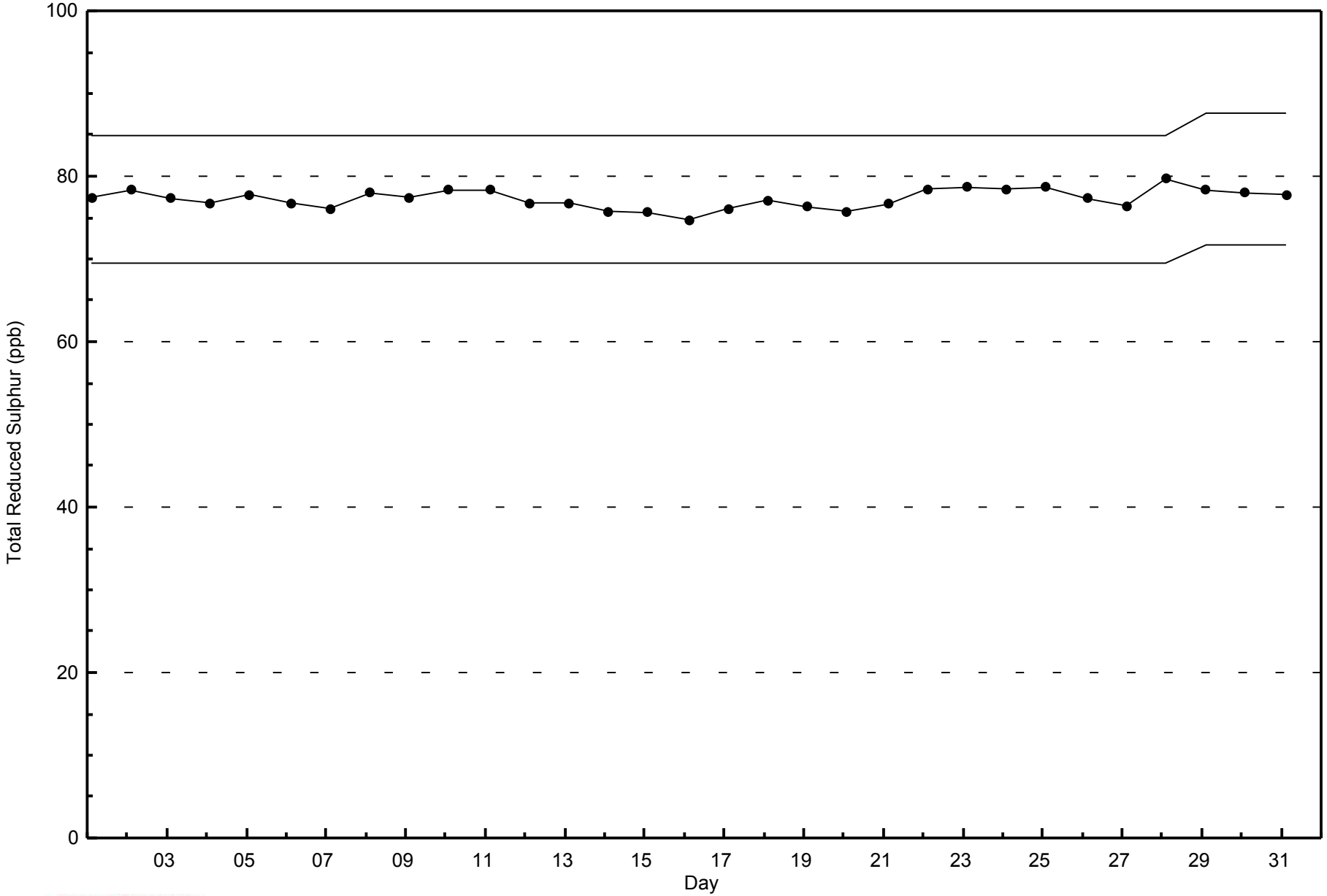
WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Millennium - August 2014



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Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Millennium - August 2014

Maximum Value: 6.3 ppm on Aug 12 05:00

Maximum Daily Average: 2.8 ppm on Aug 4

Minimum Value: 2.0 ppm on Aug 19 19:00

Minimum Daily Average: 2.1 ppm on Aug 20

Maximum Diurnal Average: 2.9 ppm at hour 5

Minimum Diurnal Average: 2.2 ppm at hour 14

Monthly Average: 2.51 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} = 4.5

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-Aug	2.5	Z	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.5	2.6	2.8	2.6	2.4	2.8
2-Aug	2.8	Z	2.4	2.7	2.5	2.5	3.0	2.9	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.5	2.4	2.5	2.4	2.6	2.9	2.5	3.0
3-Aug	2.7	Z	2.8	2.8	2.8	2.7	2.6	2.3	2.4	2.3	2.3	2.3	2.4	2.2	2.4	2.4	2.3	2.3	2.4	2.4	2.5	3.1	3.2	3.5	2.6	3.5
4-Aug	3.5	Z	3.6	3.7	3.2	2.5	2.6	2.8	2.8	2.7	2.6	2.6	2.6	2.5	2.7	2.6	2.4	2.4	2.4	2.6	3.0	2.9	3.0	3.0	2.8	3.7
5-Aug	2.9	Z	2.8	2.8	2.7	3.2	3.5	3.0	3.2	3.1	2.6	2.7	2.4	2.4	2.3	2.4	2.4	2.4	2.5	2.5	2.6	2.7	2.6	2.6	2.7	3.5
6-Aug	2.6	Z	2.4	2.4	2.5	2.5	2.4	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.6	2.7	2.3	2.9	3.8	2.8	2.4	2.5	3.8
7-Aug	2.1	Z	2.2	2.2	2.2	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.4	2.2	2.4
8-Aug	2.5	Z	2.5	2.3	2.3	2.3	2.6	2.9	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	2.4	2.2	2.2	2.3	2.9
9-Aug	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.1	2.1	2.2	2.3	3.4	3.4	3.1	3.5	2.4	3.5
10-Aug	3.3	Z	3.1	3.5	2.5	2.5	2.7	2.7	2.5	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	3.8	4.4	3.7	2.5	2.7	4.4
11-Aug	2.9	Z	2.6	2.5	3.4	2.7	2.7	2.7	2.5	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.6	2.8	2.5	2.4	3.4
12-Aug	2.6	Z	3.9	4.1	6.3	5.7	3.1	2.5	2.3	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.8	6.3
13-Aug	2.3	Z	3.0	3.0	2.9	2.6	2.6	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.3	2.6	2.4	2.4	2.4	3.0
14-Aug	2.6	Z	3.8	3.3	2.2	2.3	2.4	2.6	2.5	2.4	2.3	2.3	2.7	2.5	2.3	2.3	2.2	2.1	2.1	3.1	3.2	3.8	3.6	4.8	2.8	4.8
15-Aug	3.4	Z	4.5	3.4	4.2	3.5	3.4	3.2	2.5	2.5	2.4	2.3	2.2	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.6	2.2	2.5	2.7	4.5
16-Aug	2.6	Z	2.9	3.0	2.8	3.4	4.8	3.8	3.0	2.6	2.2	2.2	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.5	2.8	2.6	2.6	2.6	2.7	4.8
17-Aug	2.6	Z	2.3	2.6	3.3	3.1	3.0	3.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.6	4.4	4.2	2.6	4.4
18-Aug	4.6	Z	4.0	4.0	3.3	2.5	2.5	2.4	2.4	2.5	2.5	2.3	2.3	2.2	2.3	2.4	2.5	2.8	2.7	2.3	2.3	2.2	2.2	2.3	2.7	4.6
19-Aug	2.3	Z	2.4	2.5	3.4	3.4	2.8	2.8	2.7	2.2	2.1	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.1	2.1	2.3	3.4
20-Aug	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.1	2.1	2.5
21-Aug	2.2	Z	2.5	2.3	2.4	2.8	2.9	2.9	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.4	2.6	2.3	2.9
22-Aug	2.5	Z	2.5	2.6	3.3	3.9	4.1	3.2	3.0	2.9	2.7	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6	2.7	4.1	2.7	4.1
23-Aug	3.9	Z	3.1	2.9	3.0	3.0	2.9	2.6	2.3	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	3.1	3.4	2.5	2.9	2.6	3.9
24-Aug	2.7	Z	2.7	3.1	2.8	3.1	3.7	3.1	3.2	3.1	2.8	2.7	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.6	3.7
25-Aug	2.3	Z	2.5	2.7	2.6	2.7	2.7	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.3	2.7
26-Aug	2.2	Z	2.4	2.4	2.4	2.5	2.3	2.3	2.2	2.2	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.7	2.6	2.8	2.8	2.3	2.8
27-Aug	2.3	Z	2.7	3.1	3.0	3.2	2.5	2.3	2.5	2.3	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.4	2.7	2.5	2.4	3.2
28-Aug	2.5	Z	2.0	2.1	2.1	2.1	C	C	C	C	C	C	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	3.3	3.5	4.6	5.5	--	5.5
29-Aug	3.9	Z	2.6	2.5	2.3	3.5	3.0	2.5	2.9	2.8	2.4	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.3	2.4	2.4	2.4	2.6	2.4	2.5	3.9
30-Aug	2.4	Z	2.4	2.3	2.2	2.3	2.3	2.3	2.4	2.2	2.2	2.3	2.4	2.1	2.3	2.3	2.3	2.3	2.3	3.1	3.5	2.7	2.5	2.8	2.4	3.5
31-Aug	3.2	Z	2.3	3.0	4.4	3.2	3.8	3.0	2.9	2.6	2.2	2.1	2.0	2.1	2.1	2.2	2.4	2.2	2.4	2.8	2.2	2.1	2.1	2.1	2.6	4.4
	2.7	--	2.8	2.8	2.9	2.9	2.9	2.7	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.7	2.7	2.8	Diurnal Average	
	4.6	--	4.5	4.1	6.3	5.7	4.8	3.8	3.2	3.1	2.8	2.7	2.7	2.5	2.7	2.6	2.5	2.8	2.7	3.1	3.8	4.4	4.6	5.5	Diurnal Maximum	

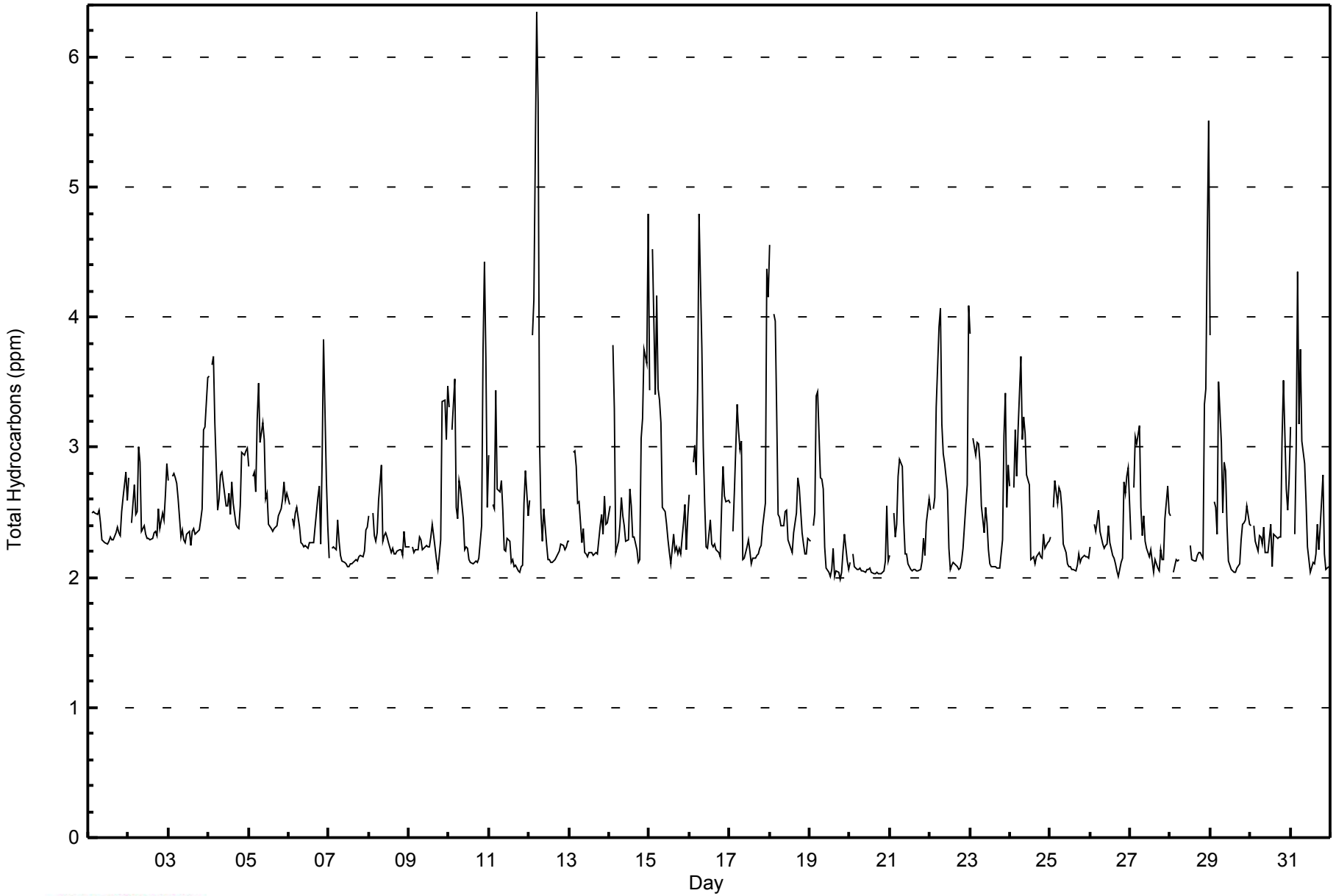
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Millennium - August 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	27	3.82	3.82
2.1 - 3.0	595	84.16	87.98
3.1 - 10.0	85	12.02	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 - August 2014

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	9	7	1	0	0	0	1	3	1	0	2	0	1	1	0	1	27
2.1 - 3.0	64	31	10	13	7	15	63	59	81	59	33	24	30	27	34	40	590
3.1 - 10.0	0	1	0	1	1	4	6	4	16	25	16	0	1	5	3	0	83
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	39	11	14	8	19	70	66	98	84	51	24	32	33	37	41	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

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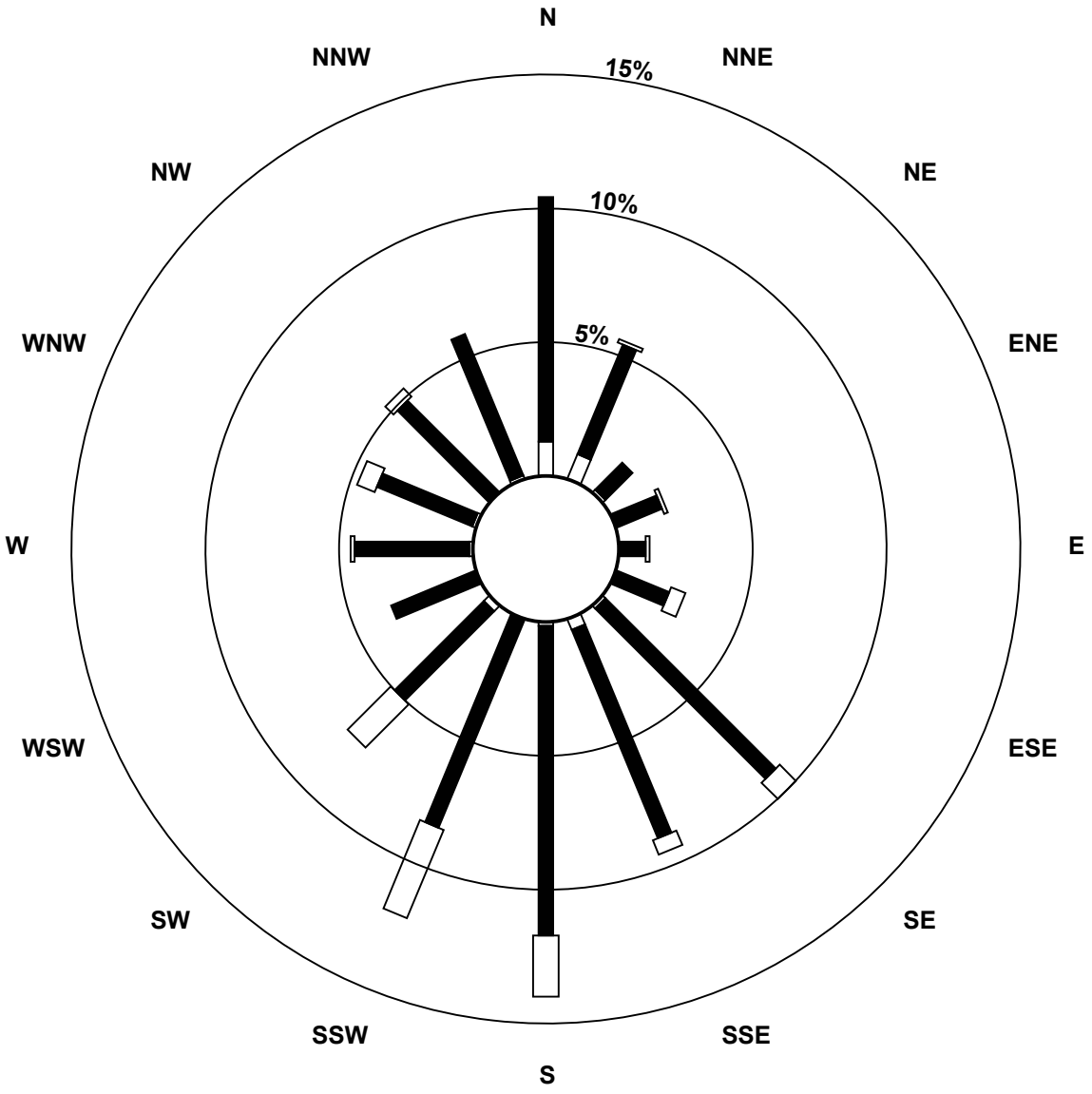
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

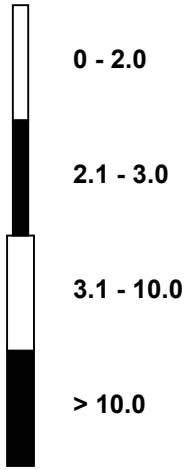
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Millennium (AMS 12)



Classes (ppm)



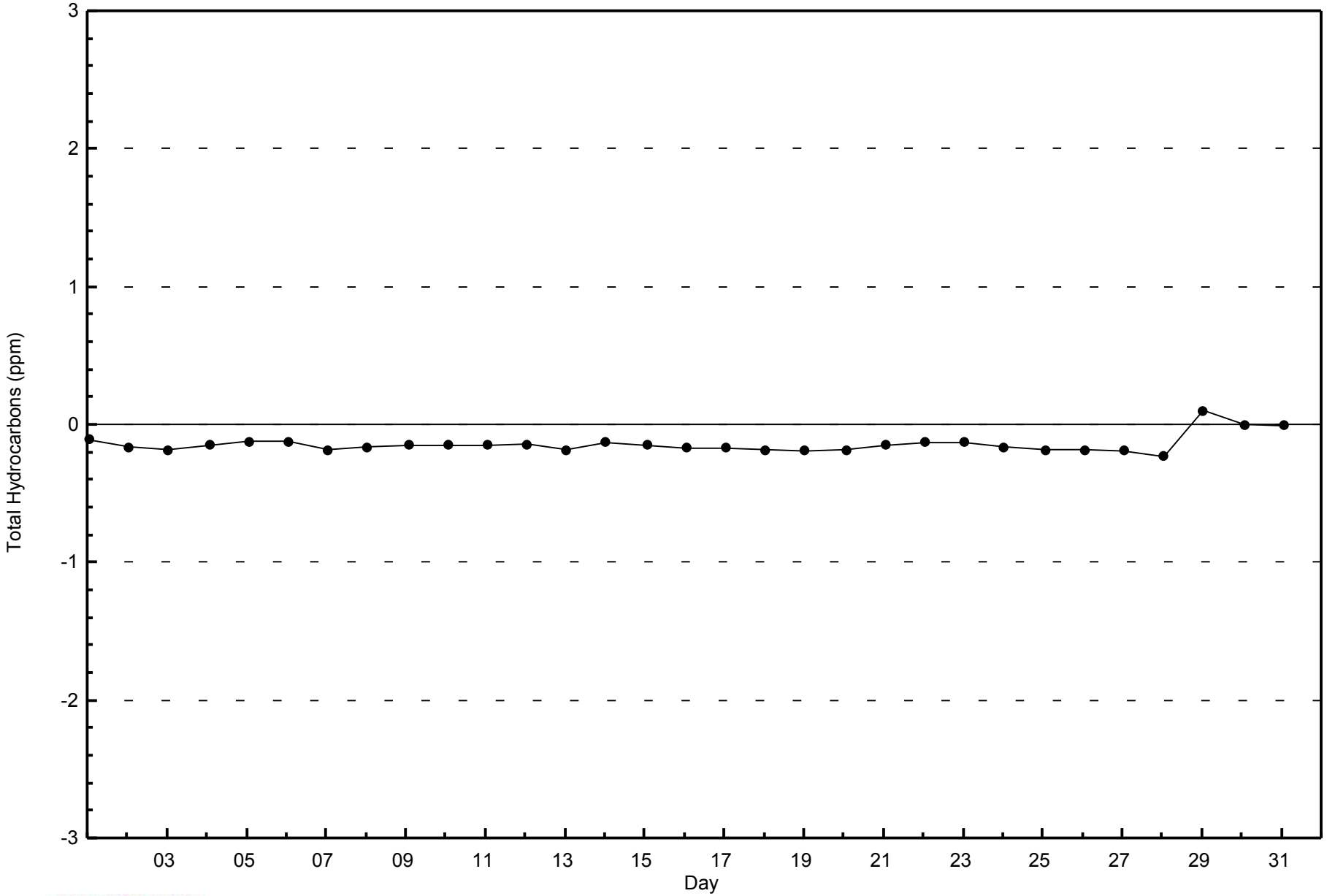
Total Number of Valid Hours: 700

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Millennium - August 2014



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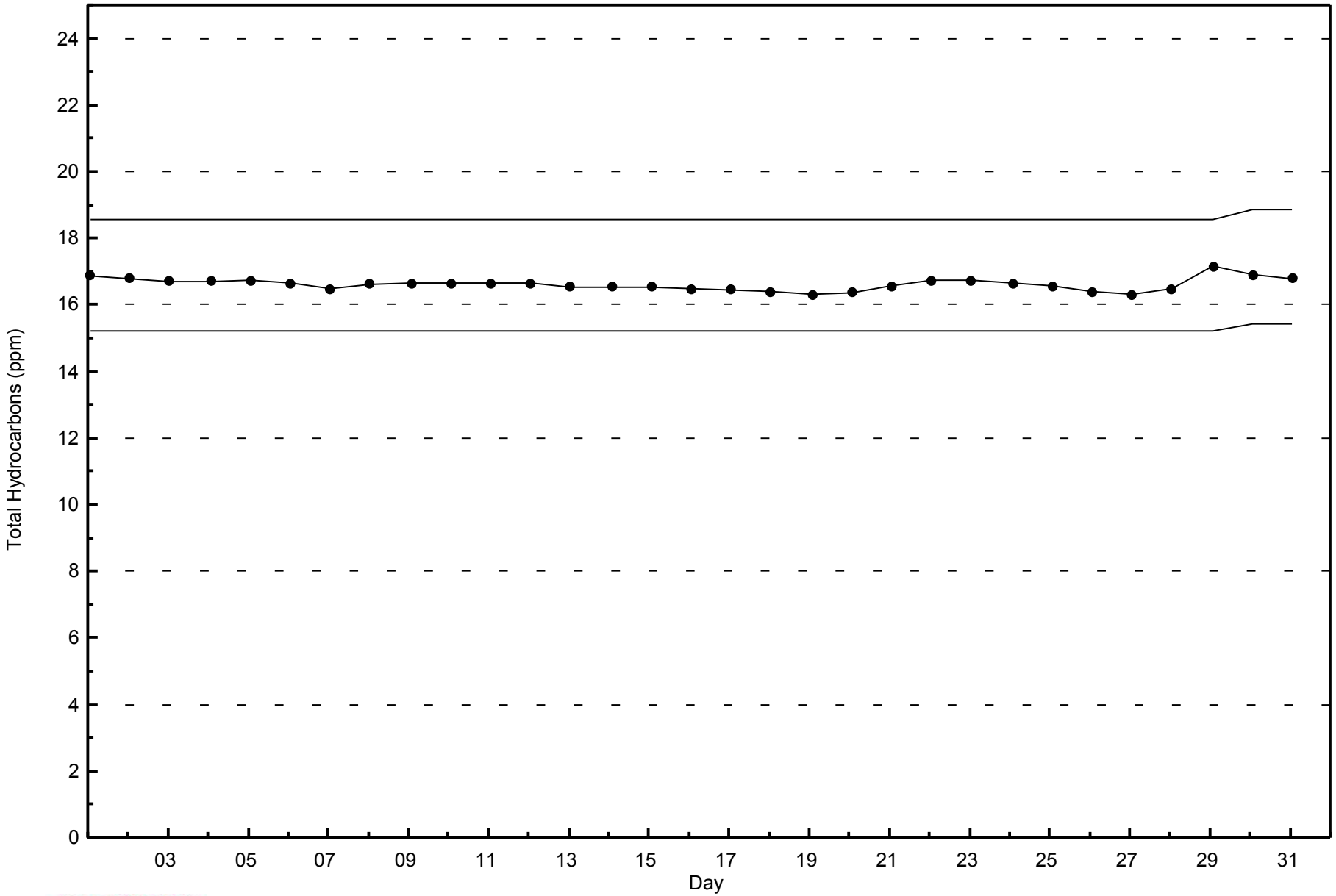
Span Responses

Total Hydrocarbons (THC) - ppm

Millennium - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Millennium - August 2014

Maximum Value: 125 ppb on Aug 28 23:00

Maximum Daily Average: 17.6 ppb on Aug 29

Minimum Value: 0 ppb on Aug 7 21:00

Minimum Daily Average: 0.8 ppb on Aug 20

Maximum Diurnal Average: 17.1 ppb at hour 1

Minimum Diurnal Average: 0.8 ppb at hour 18

Monthly Average: 7.2 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 2 $Q_3 = 7$ $P_{90} = 22$ $P_{99} = 66$

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	37
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	Z	0	0	0	1	2	1	1	1	0	0	1	1	0	1	1	1	1	1	2	1	15	30	2.7	30
2-Aug	12	Z	4	12	7	14	20	15	5	4	1	1	0	0	1	1	1	0	1	0	1	1	1	11	4.9	20
3-Aug	31	Z	2	2	8	9	8	4	5	3	2	3	1	1	1	1	0	0	0	0	0	13	10	44	6.5	44
4-Aug	34	Z	21	37	26	12	8	7	4	6	3	1	0	0	0	1	0	0	1	0	2	1	1	1	7.3	37
5-Aug	2	Z	10	18	0	5	5	2	10	6	2	2	1	1	1	1	0	1	2	1	2	8	1	1	3.5	18
6-Aug	1	Z	1	1	4	8	6	1	1	1	1	1	0	1	0	0	2	2	1	0	2	8	1	0	1.8	8
7-Aug	0	Z	0	0	0	1	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0	0	0	0	3	--	3
8-Aug	3	Z	0	1	1	13	54	26	5	8	5	2	1	1	1	1	1	1	2	1	0	0	0	1	5.6	54
9-Aug	1	Z	1	1	1	2	2	2	1	2	3	2	2	3	4	3	1	1	2	3	19	23	3	25	4.7	25
10-Aug	68	Z	38	60	27	24	20	14	9	6	5	4	2	1	1	0	0	0	1	1	17	12	3	9	14.0	68
11-Aug	44	Z	28	24	35	23	29	17	8	2	2	2	2	1	1	1	1	1	1	1	2	29	18	18	12.6	44
12-Aug	9	Z	30	25	73	58	22	6	5	11	4	2	1	1	1	2	2	1	1	1	1	0	2	4	11.4	73
13-Aug	5	Z	17	17	12	16	18	2	3	1	1	1	1	1	0	0	0	1	1	2	3	1	1	1	4.5	18
14-Aug	1	Z	4	3	1	1	10	7	4	4	2	3	4	1	1	1	1	0	0	2	8	44	11	49	7.1	49
15-Aug	71	Z	25	34	16	18	10	6	7	9	4	2	1	0	0	1	0	0	0	0	1	1	0	3	9.2	71
16-Aug	3	Z	10	19	6	31	64	43	22	9	2	1	2	1	0	0	0	0	0	0	0	10	7	1	10.1	64
17-Aug	0	Z	0	1	0	1	5	7	2	2	1	2	2	1	1	1	1	1	1	0	1	0	6	15	2.3	15
18-Aug	27	Z	26	24	21	11	10	1	2	2	2	2	0	0	1	2	1	1	1	0	0	0	0	1	6.0	27
19-Aug	3	Z	10	18	31	16	17	17	10	5	2	1	1	2	2	1	1	1	0	0	0	1	2	2	6.3	31
20-Aug	1	Z	2	0	0	0	0	1	1	1	1	1	2	1	1	1	1	0	0	0	0	0	2	1	0.8	2
21-Aug	5	Z	4	2	0	2	9	24	10	5	3	2	1	1	1	1	0	1	1	0	2	7	18	20	5.1	24
22-Aug	27	Z	11	15	17	46	36	21	22	26	12	4	1	1	1	1	1	1	1	0	9	11	16	44	14.0	46
23-Aug	48	Z	62	13	11	20	19	6	10	26	13	4	2	1	1	1	1	1	1	1	25	53	10	10	14.6	62
24-Aug	11	Z	7	33	27	44	23	10	5	27	18	12	3	2	1	1	1	1	1	0	11	5	3	5	10.9	44
25-Aug	5	Z	4	9	10	9	14	9	9	5	2	1	1	0	0	0	0	0	1	0	1	0	0	0	3.6	14
26-Aug	2	Z	4	3	2	7	8	2	4	5	3	4	2	1	1	0	0	0	1	0	7	14	5	19	4.1	19
27-Aug	7	Z	1	1	3	6	3	2	2	3	3	2	2	1	1	1	1	1	1	1	1	12	3	1	2.5	12
28-Aug	1	Z	0	0	0	1	C	C	C	C	C	C	1	1	1	1	1	2	0	0	49	79	125	91	--	125
29-Aug	99	Z	45	48	20	43	48	22	27	22	8	2	1	0	0	0	0	1	1	1	6	5	2	3	17.6	99
30-Aug	3	Z	4	4	1	1	1	1	2	1	1	2	3	1	2	3	2	1	1	6	13	4	3	1	2.6	13
31-Aug	5	Z	2	6	28	15	31	17	20	7	4	2	1	1	1	1	2	1	2	5	0	0	0	0	6.6	31
	17.1	--	12.2	13.9	12.6	14.7	16.8	9.8	7.4	7.2	3.7	2.3	1.3	0.9	1.0	0.9	0.9	0.8	0.8	1.0	6.0	11.1	8.7	13.4	Diurnal Average	
	99	--	62	60	73	58	64	43	27	27	18	12	4	3	4	3	2	2	2	6	49	79	125	91	Diurnal Maximum	

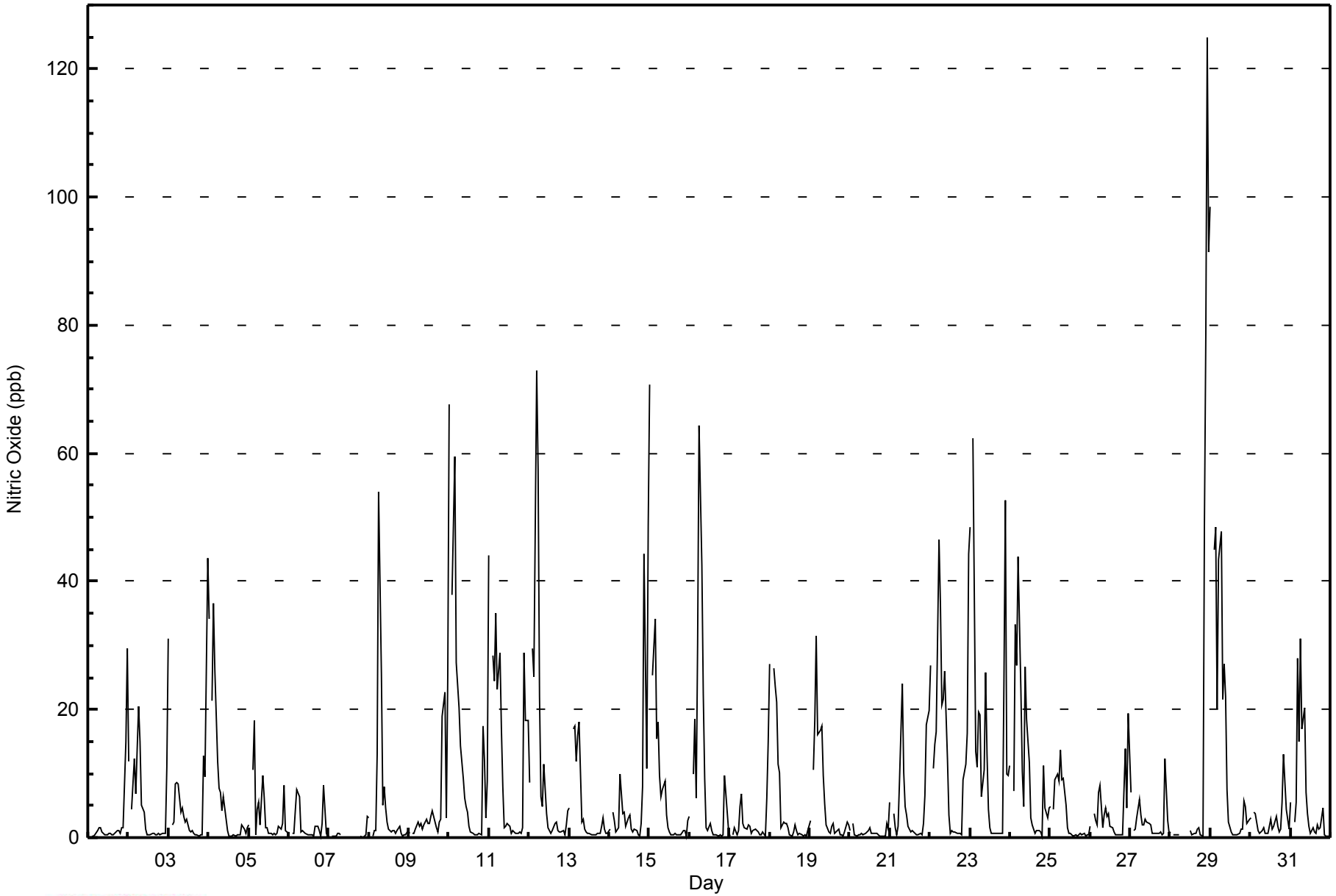
Z - zerospan C - Calibration UO - Unstable Operation

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	622	89.37	89.37
21 - 40	47	6.75	96.12
11 - 80	24	3.45	99.57
81 - 159	3	0.43	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Millennium - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	73	36	10	12	7	15	60	58	80	73	43	22	22	30	35	41	617
21 - 40	0	1	1	2	1	1	3	4	13	8	7	0	1	3	2	0	47
11 - 80	0	2	0	0	0	3	5	3	5	3	1	0	0	0	0	0	22
81 - 159	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	39	11	14	8	19	70	66	98	84	51	22	23	33	37	41	689

Total Number of Valid Hours: 689

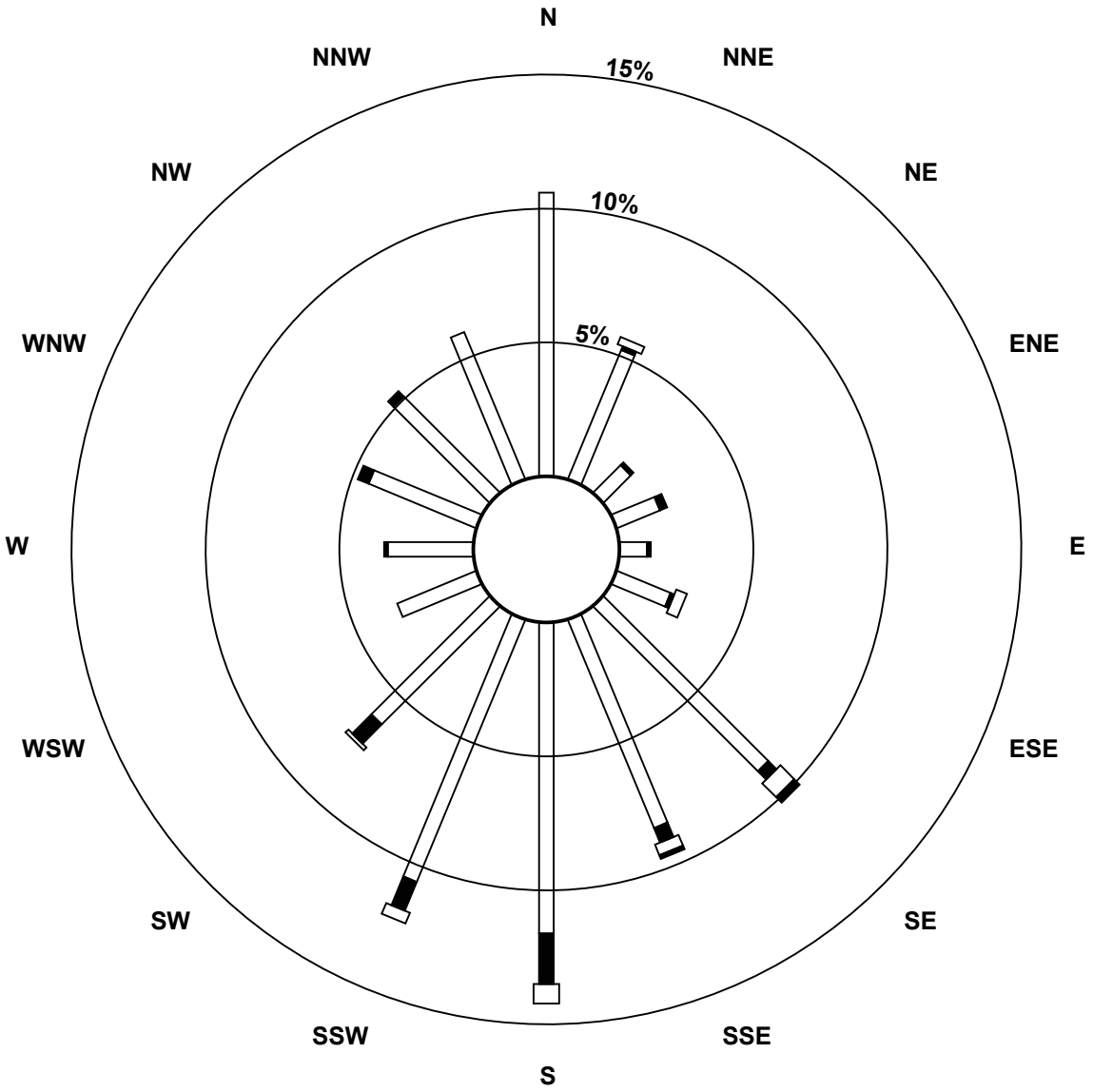
Total Number of Hours: 744

Wood Buffalo Environmental Association

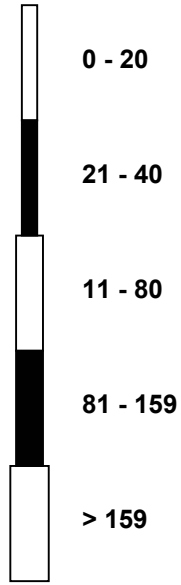
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Millennium (AMS 12)



Classes (ppb)



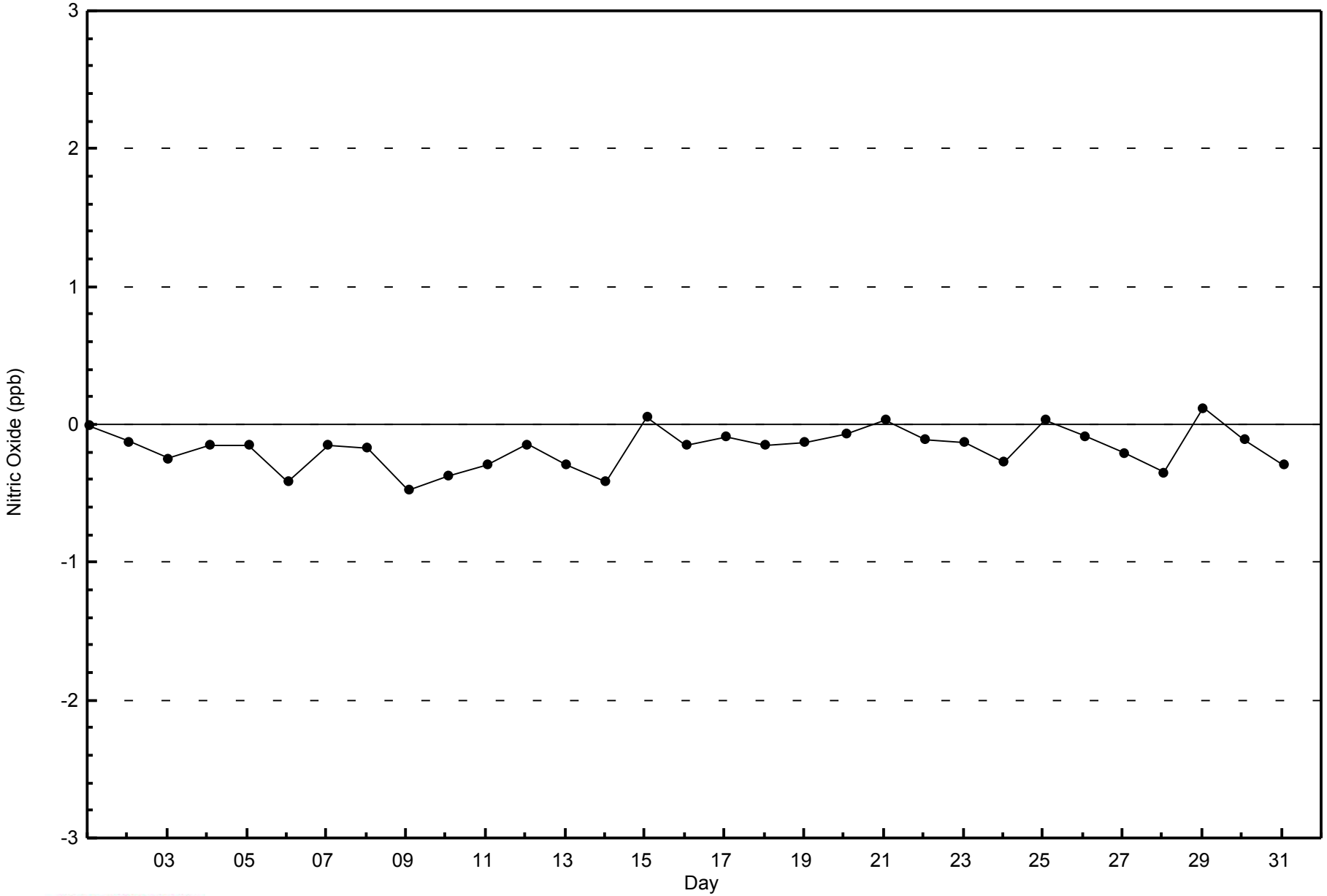
Total Number of Valid Hours: 689

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Millennium - August 2014



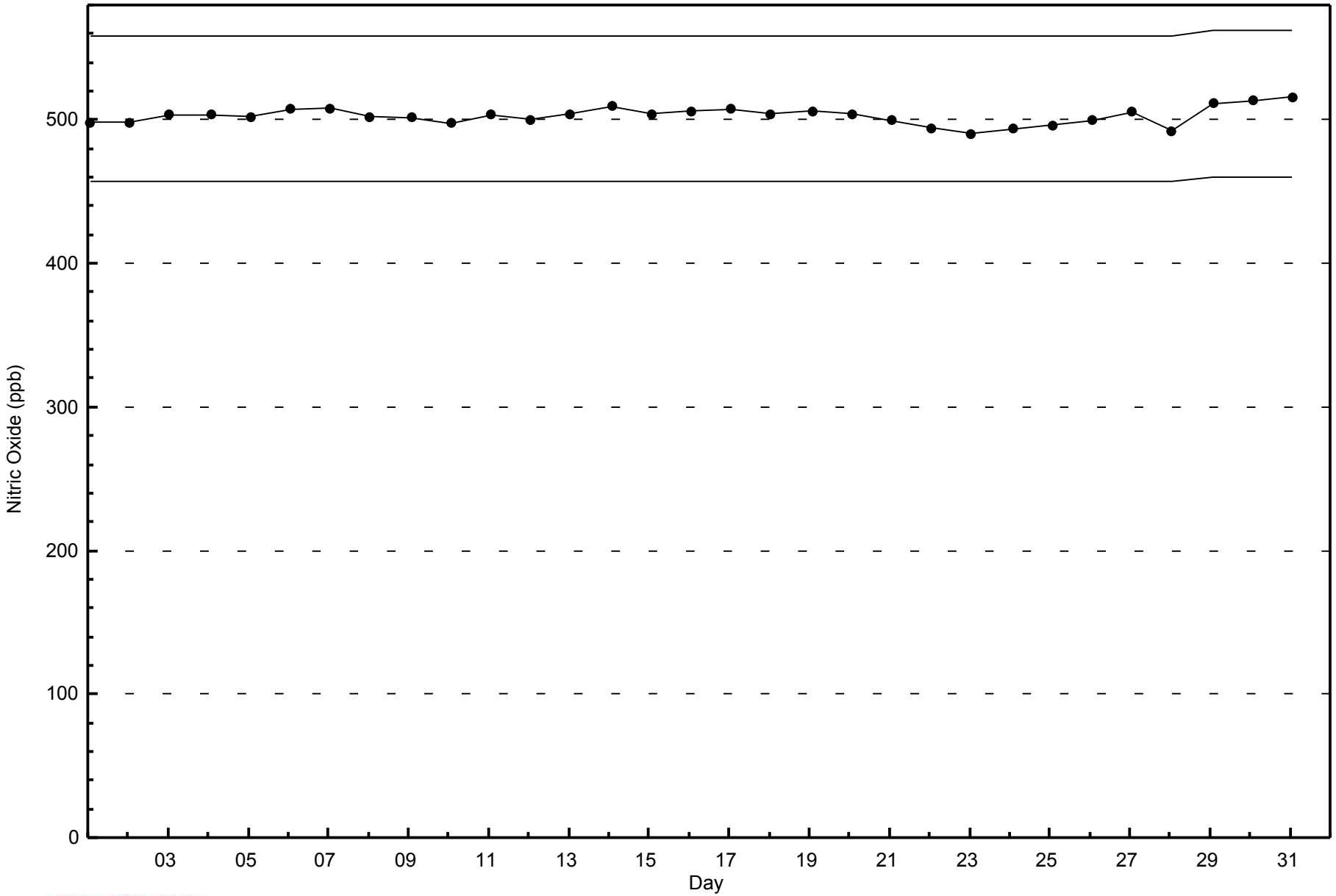
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Millennium - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 37 ppb on Aug 14 22:00 Maximum Daily Average: 13.2 ppb on Aug 14

Minimum Value: 0 ppb on Aug 1 11:00 Minimum Daily Average: 2.3 ppb on Aug 20
Maximum Diurnal Average: 16.3 ppb at hour 22 Minimum Diurnal Average: 1.6 ppb at hour 14
Monthly Average: 8.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 7 $Q_3 = 13$ $P_{90} = 17$ $P_{99} = 29$

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	37
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	2	Z	3	3	4	4	3	2	1	0	0	0	1	2	1	1	3	5	6	4	16	21	28	28	6.0	28
2-Aug	21	Z	16	15	10	8	8	9	7	6	2	1	1	0	1	1	0	1	8	6	13	14	12	24	8.0	24
3-Aug	24	Z	12	14	14	13	10	7	8	7	6	8	4	2	4	3	2	2	3	4	11	29	26	26	10.3	29
4-Aug	19	Z	16	15	12	12	10	9	8	15	11	7	5	2	4	2	1	1	4	6	33	23	19	22	11.2	33
5-Aug	19	Z	28	28	16	23	20	13	18	15	7	8	2	2	1	2	2	3	11	11	17	27	18	15	13.2	28
6-Aug	13	Z	11	8	15	19	13	2	2	2	1	1	1	1	0	1	7	10	10	1	9	22	13	5	7.3	22
7-Aug	1	Z	1	2	1	3	2	0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	2	3	4	15	--	15
8-Aug	15	Z	4	10	9	12	16	12	5	8	6	4	3	2	3	3	2	6	11	3	1	2	2	6	6.2	16
9-Aug	5	Z	0	1	5	6	4	4	2	1	2	1	2	4	7	7	2	1	7	10	17	16	10	12	5.4	17
10-Aug	12	Z	10	8	8	8	8	5	5	4	4	4	2	1	0	0	0	0	1	3	16	18	12	13	6.1	18
11-Aug	17	Z	14	13	13	11	13	12	7	2	3	6	6	1	1	0	1	1	2	3	11	16	16	13	7.7	17
12-Aug	13	Z	9	8	9	9	11	9	8	13	6	3	1	0	1	2	3	2	2	3	8	5	8	12	6.3	13
13-Aug	11	Z	12	13	13	14	15	5	6	3	2	1	1	0	0	0	0	1	4	17	25	19	8	6	7.7	25
14-Aug	9	Z	15	13	5	7	12	11	8	8	5	11	21	10	8	11	8	2	1	14	30	37	28	29	13.2	37
15-Aug	32	Z	16	16	14	12	12	9	11	13	10	7	4	1	1	2	2	1	3	5	14	13	5	12	9.2	32
16-Aug	13	Z	12	12	10	11	13	17	18	13	4	4	6	3	1	1	0	1	3	3	19	26	27	13	10.0	27
17-Aug	6	Z	3	13	9	9	13	13	4	4	4	6	5	1	2	3	3	4	3	4	11	9	18	19	7.2	19
18-Aug	16	Z	11	12	12	12	9	4	7	7	6	3	1	0	4	8	10	6	8	4	3	4	4	4	6.6	16
19-Aug	7	Z	8	7	10	7	7	8	7	6	4	3	2	4	5	1	4	4	1	2	5	12	13	12	5.9	13
20-Aug	7	Z	5	2	1	1	1	1	0	0	0	0	1	0	0	0	1	1	1	2	3	6	12	9	2.3	12
21-Aug	13	Z	10	7	5	7	11	14	9	5	4	2	1	1	1	0	0	0	1	3	16	16	16	17	6.9	17
22-Aug	17	Z	9	9	8	10	8	6	11	14	9	3	0	1	1	1	2	1	1	3	17	20	20	20	8.3	20
23-Aug	16	Z	14	13	10	11	10	8	8	14	9	5	3	0	0	0	0	0	1	7	30	29	25	25	10.4	30
24-Aug	27	Z	18	22	20	19	16	13	17	16	14	11	3	3	4	1	2	4	4	4	18	15	13	14	12.0	27
25-Aug	14	Z	13	13	13	9	11	8	11	7	3	1	1	1	0	1	1	3	4	7	13	8	5	11	6.7	14
26-Aug	10	Z	20	16	17	18	13	4	7	7	8	9	6	4	2	1	1	1	5	6	17	16	20	18	9.8	20
27-Aug	16	Z	9	11	13	13	8	4	6	5	5	4	3	0	0	0	0	0	4	3	10	23	9	13	6.9	23
28-Aug	11	Z	0	0	1	2	C	C	C	C	C	C	2	0	1	1	2	4	2	5	20	21	20	17	--	21
29-Aug	18	Z	15	16	14	13	13	8	7	9	6	4	1	0	1	1	1	4	14	13	26	25	21	19	10.8	26
30-Aug	19	Z	18	16	9	9	9	8	6	2	3	6	5	2	4	11	9	3	5	10	16	13	8	6	8.5	19
31-Aug	9	Z	6	7	10	9	10	9	9	6	3	1	0	2	2	4	9	5	7	13	3	2	3	3	5.6	13
	13.9	--	10.8	11.0	9.9	10.2	10.2	7.8	7.7	7.2	5.1	4.3	3.0	1.6	2.0	2.3	2.6	2.6	4.5	5.8	14.5	16.3	14.3	14.7	Diurnal Average	
	32	--	28	28	20	23	20	17	18	16	14	11	21	10	8	11	10	10	14	17	33	37	28	29	Diurnal Maximum	

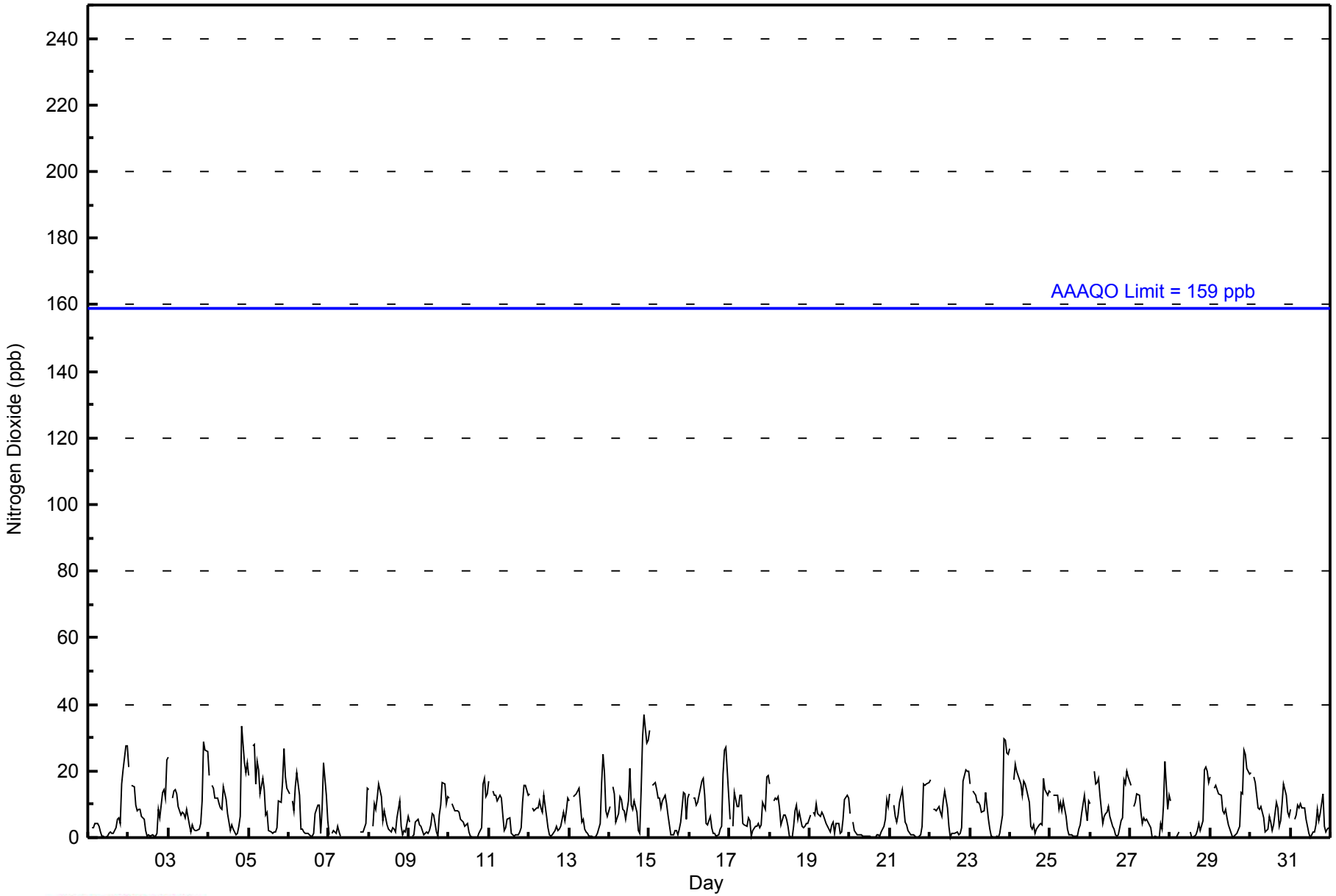
Z - zerospan C - Calibration UO - Unstable Operation
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	659	94.68	94.68
21 - 40	37	5.32	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Millennium - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	72	39	11	10	6	15	62	61	91	78	51	22	23	33	37	41	652
21 - 40	1	0	0	4	2	4	8	5	7	6	0	0	0	0	0	0	37
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	39	11	14	8	19	70	66	98	84	51	22	23	33	37	41	689

Total Number of Valid Hours: 689

Total Number of Hours: 744

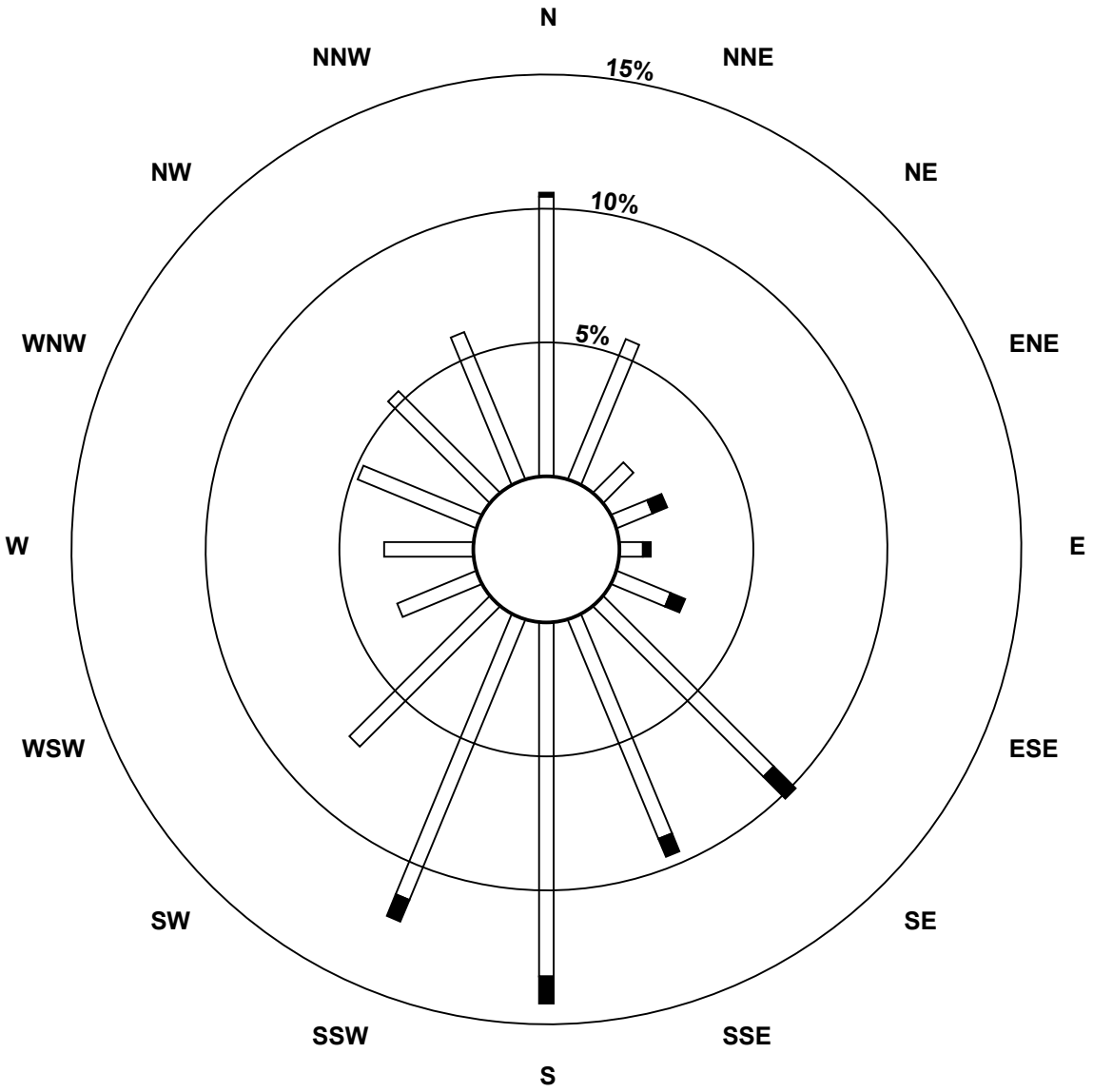
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

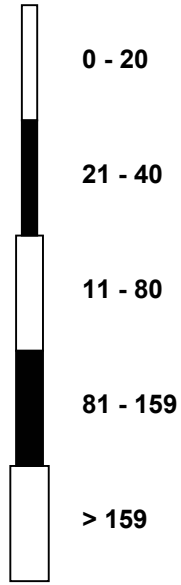
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Millennium (AMS 12)



Classes (ppb)



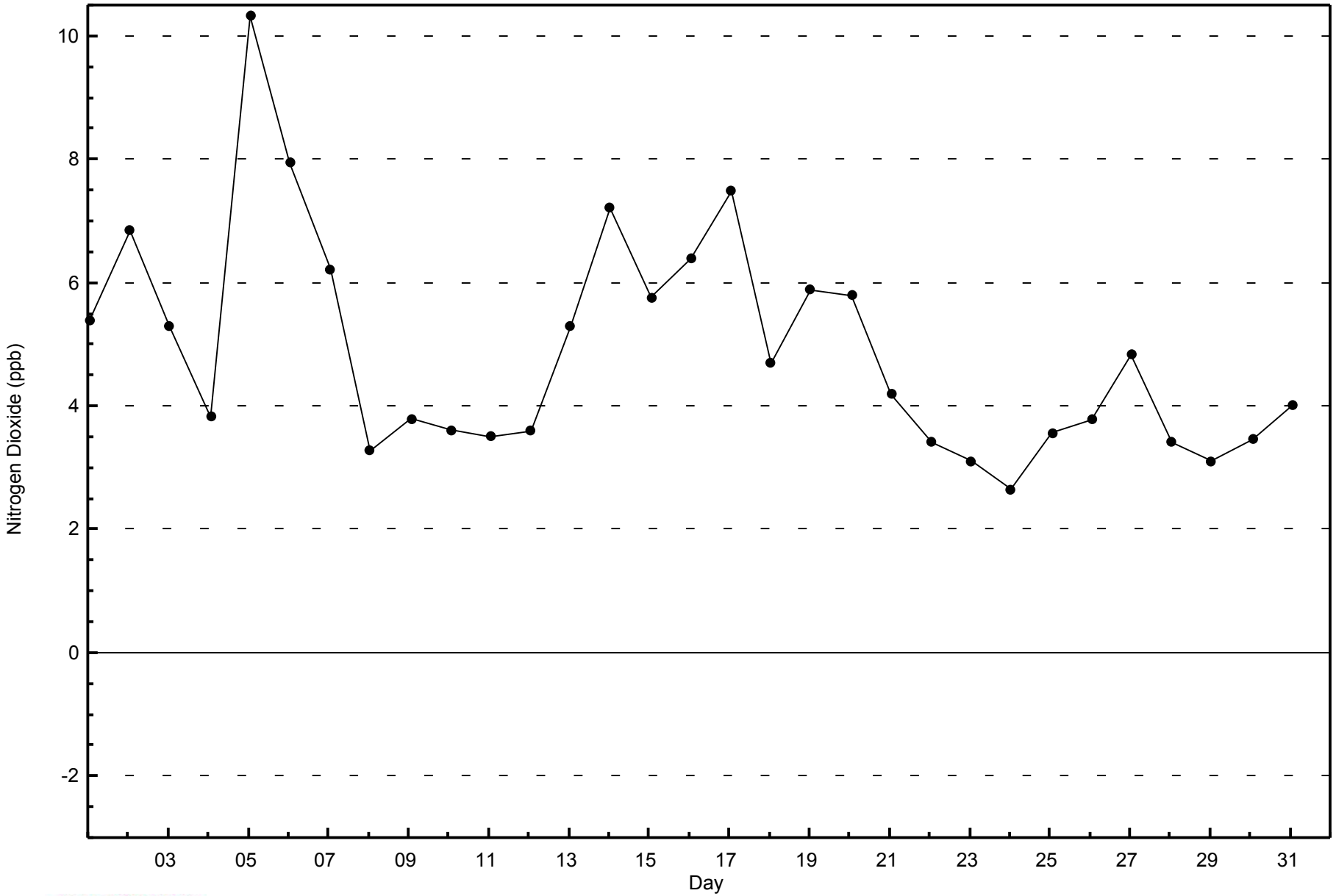
Total Number of Valid Hours: 689

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Millennium - August 2014



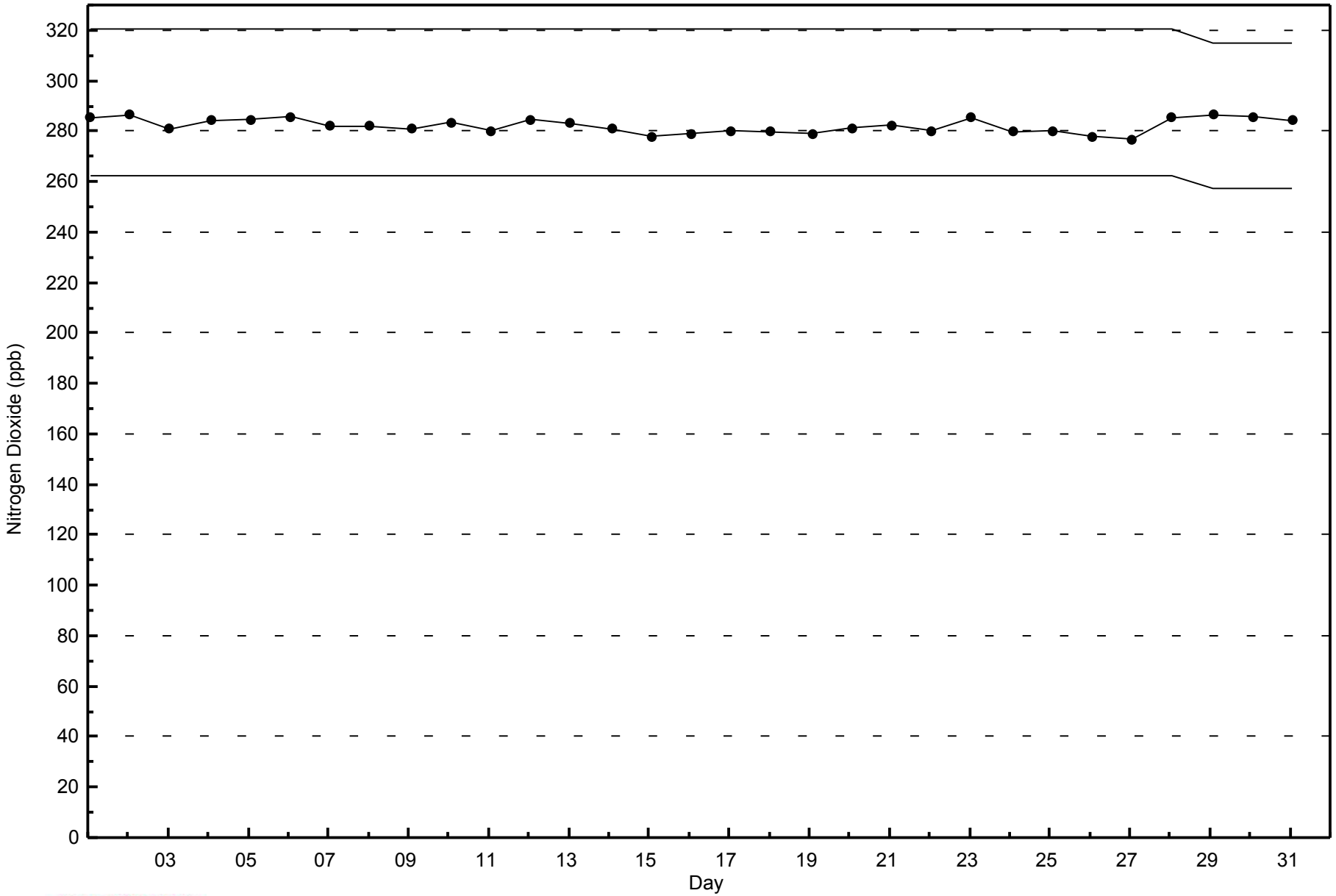
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Millennium - August 2014

Maximum Value: 145 ppb on Aug 28 23:00

Maximum Daily Average: 28.4 ppb on Aug 29

Minimum Value: 0 ppb on Aug 28 04:00

Minimum Daily Average: 3.1 ppb on Aug 20

Maximum Diurnal Average: 31.0 ppb at hour 1

Minimum Diurnal Average: 2.5 ppb at hour 14

Monthly Average: 15.2 ppb

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 3$ Median = 9 $Q_3 = 22$ $P_{90} = 37$ $P_{99} = 82$

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	37
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	3	Z	3	3	5	5	5	3	1	1	1	1	2	2	2	2	4	7	7	5	18	22	43	57	8.7	57
2-Aug	33	Z	20	28	17	22	29	24	12	10	4	1	1	1	2	1	1	2	9	6	14	15	13	34	12.9	34
3-Aug	55	Z	14	16	23	22	18	11	12	10	8	11	5	3	5	3	3	2	3	4	11	41	36	69	16.8	69
4-Aug	53	Z	37	52	38	24	18	16	12	21	14	8	5	2	4	3	1	2	4	7	35	24	20	24	18.4	53
5-Aug	20	Z	38	46	17	27	26	15	27	21	8	9	3	3	2	2	2	4	13	12	19	35	19	16	16.7	46
6-Aug	14	Z	12	9	19	27	19	3	3	3	2	2	1	1	1	2	9	12	11	2	11	31	13	5	9.2	31
7-Aug	1	Z	2	2	2	4	2	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	2	3	5	18	--	18
8-Aug	17	Z	4	11	10	25	70	38	10	16	11	6	4	3	4	4	2	7	13	4	1	3	2	8	11.8	70
9-Aug	5	Z	1	2	6	8	5	6	3	3	5	4	4	7	12	10	3	1	9	13	36	39	13	37	10.1	39
10-Aug	80	Z	48	68	35	32	28	20	14	10	9	8	3	1	1	0	0	0	2	3	33	30	15	22	20.1	80
11-Aug	61	Z	42	37	47	34	41	29	15	4	5	8	8	2	2	1	2	1	2	4	12	45	34	31	20.3	61
12-Aug	22	Z	39	33	82	66	33	15	12	24	10	4	2	1	2	4	6	3	3	4	9	6	10	16	17.7	82
13-Aug	16	Z	30	30	25	30	33	7	9	4	3	2	1	1	1	1	1	2	5	18	28	21	9	7	12.2	33
14-Aug	11	Z	19	16	5	8	22	18	12	12	7	14	24	11	9	13	9	3	1	17	38	81	39	78	20.3	81
15-Aug	103	Z	41	50	30	30	22	15	18	21	13	8	5	1	1	3	2	1	3	5	15	14	5	14	18.4	103
16-Aug	16	Z	22	31	16	41	77	59	40	22	6	5	9	4	2	1	1	1	3	3	20	36	34	13	20.1	77
17-Aug	6	Z	4	15	10	10	18	19	6	5	5	8	7	1	3	5	4	5	3	4	11	9	24	34	9.5	34
18-Aug	43	Z	37	35	33	24	19	5	9	9	8	5	1	0	5	10	11	6	8	4	3	4	5	6	12.6	43
19-Aug	9	Z	18	25	41	23	23	25	17	11	6	4	2	5	7	2	5	5	1	2	6	12	15	14	12.2	41
20-Aug	9	Z	7	3	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	4	6	14	11	3.1	14
21-Aug	19	Z	14	8	5	9	19	38	19	10	7	4	2	2	2	1	1	1	1	4	18	22	34	36	12.0	38
22-Aug	44	Z	19	23	25	56	44	27	33	40	21	7	1	2	2	2	2	1	2	3	26	32	36	64	22.3	64
23-Aug	64	Z	76	26	21	30	29	14	19	39	22	10	4	1	1	1	1	1	2	7	54	82	35	35	25.0	82
24-Aug	38	Z	25	55	47	63	39	23	22	43	33	22	6	5	5	2	4	5	5	4	29	19	16	19	22.9	63
25-Aug	18	Z	17	22	23	17	24	17	20	12	4	2	1	1	1	1	1	3	5	8	13	9	6	11	10.2	24
26-Aug	12	Z	24	19	18	25	21	6	10	12	11	13	8	5	3	1	1	2	5	6	25	30	25	38	13.9	38
27-Aug	23	Z	10	12	16	18	11	6	8	8	8	6	5	1	1	1	1	1	5	3	10	35	11	13	9.3	35
28-Aug	12	Z	0	0	1	2	C	C	C	C	C	C	3	1	1	1	3	6	3	5	69	100	145	108	--	145
29-Aug	117	Z	60	64	35	57	61	30	34	31	14	6	2	1	1	1	2	4	15	14	32	30	23	22	28.4	117
30-Aug	22	Z	22	20	10	9	10	9	8	2	3	8	8	4	6	14	11	4	6	16	29	17	11	8	11.1	29
31-Aug	14	Z	8	12	38	24	41	26	29	13	7	3	1	3	3	4	10	6	9	18	4	2	3	3	12.2	41
	31.0	--	23.0	24.9	22.6	25.0	27.0	17.6	15.1	14.4	8.8	6.6	4.3	2.5	2.9	3.2	3.5	3.3	5.4	6.8	20.5	27.5	23.0	28.1	Diurnal Average	
	117	--	76	68	82	66	77	59	40	43	33	22	24	11	12	14	11	12	15	18	69	100	145	108	Diurnal Maximum	

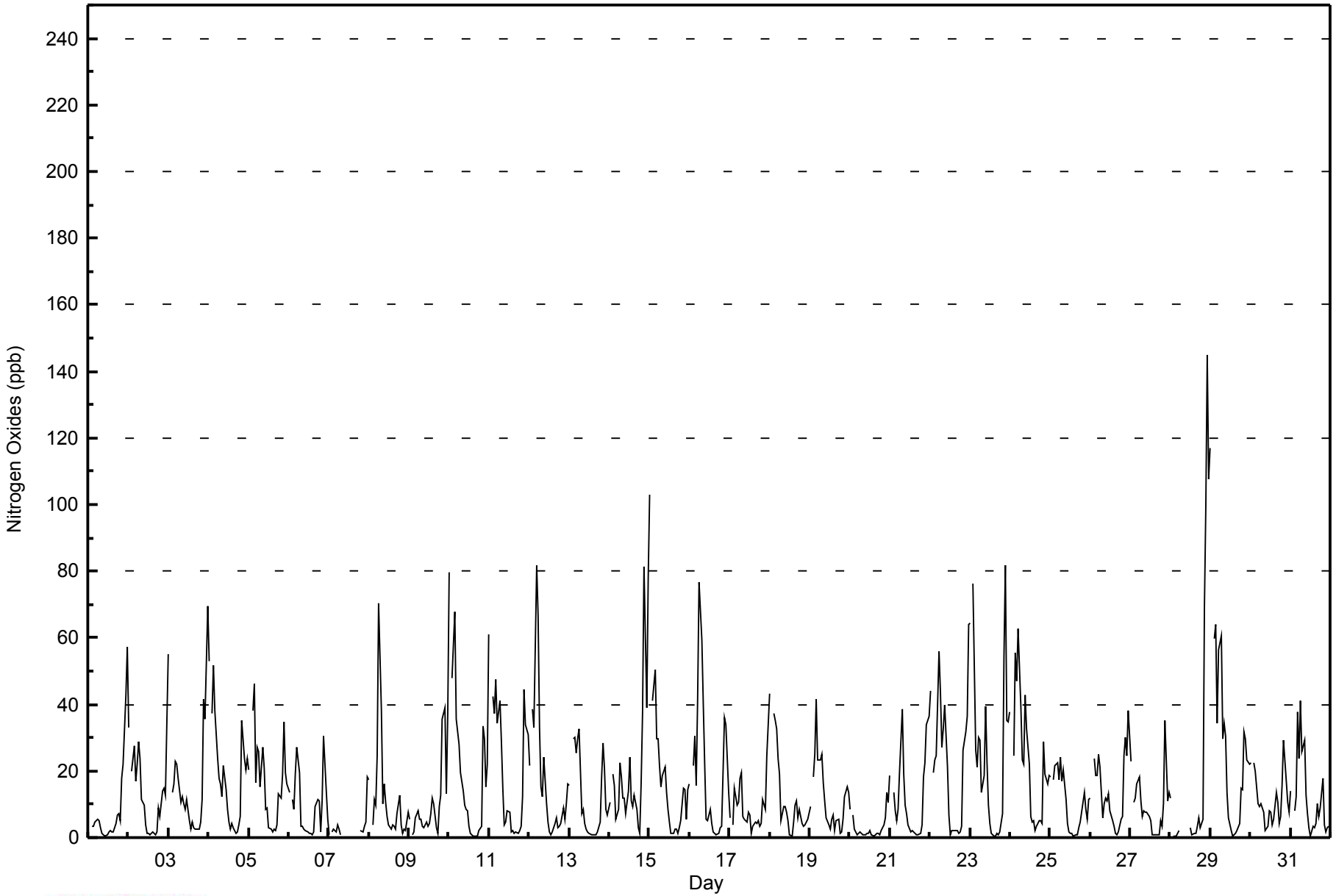
Z - zerospan C - Calibration UO - Unstable Operation

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Millennium - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	512	73.56	73.56
21 - 40	133	19.11	92.67
11 - 80	43	6.18	98.85
81 - 159	7	1.01	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 696

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Millennium - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	70	36	9	4	4	9	39	46	64	54	33	21	21	29	31	38	508
21 - 40	3	1	1	8	3	7	22	14	23	22	14	1	2	3	5	3	132
11 - 80	0	2	1	2	1	2	6	4	11	6	4	0	0	1	1	0	41
81 - 159	0	0	0	0	0	1	3	2	0	1	0	0	0	0	0	0	7
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	39	11	14	8	19	70	66	98	83	51	22	23	33	37	41	688

Total Number of Valid Hours: 689

Total Number of Hours: 744

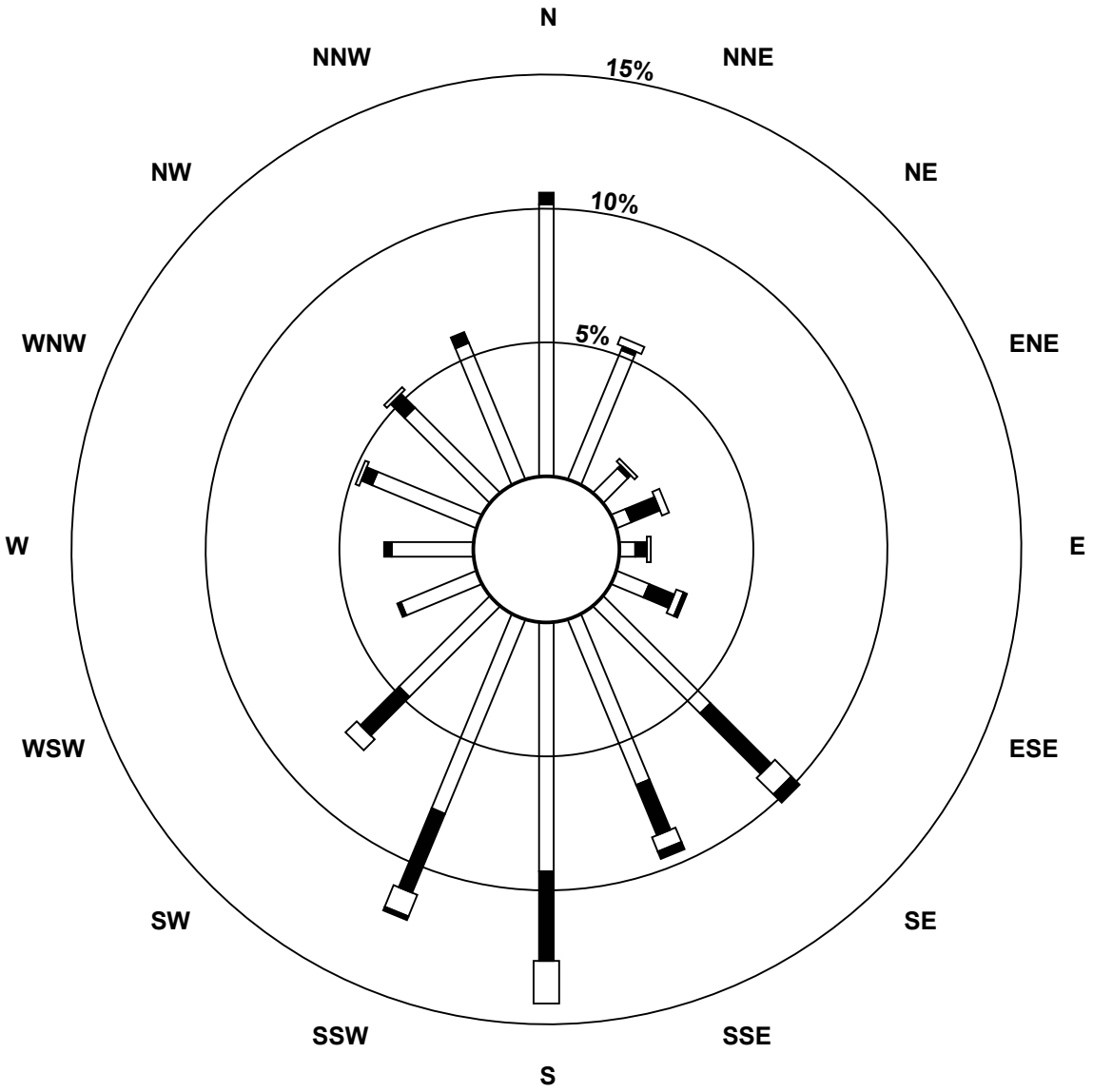
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

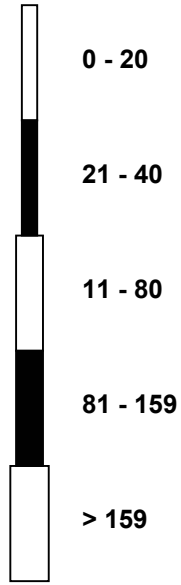
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Millennium (AMS 12)



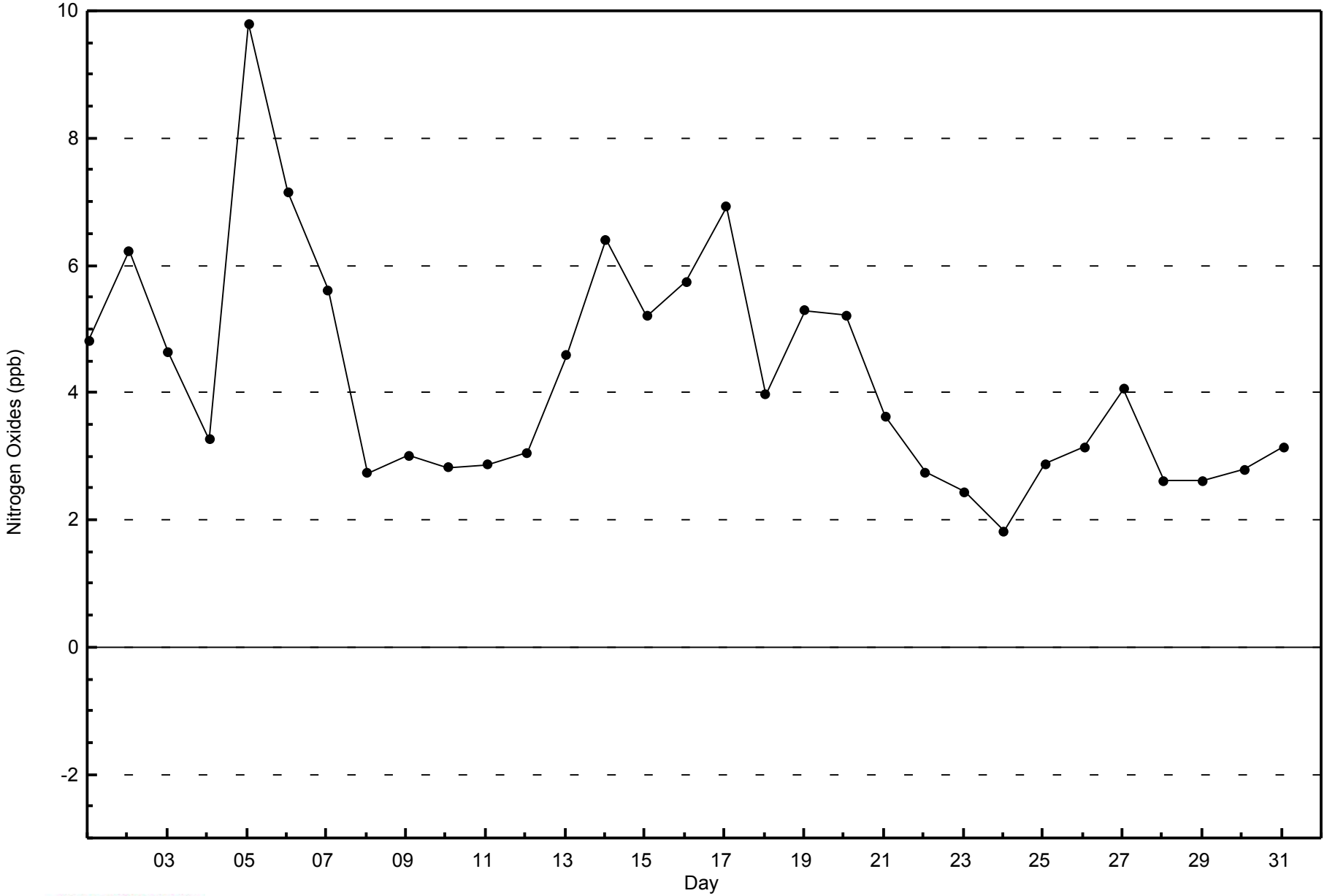
Classes (ppb)



Total Number of Valid Hours: 689

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Millennium - August 2014



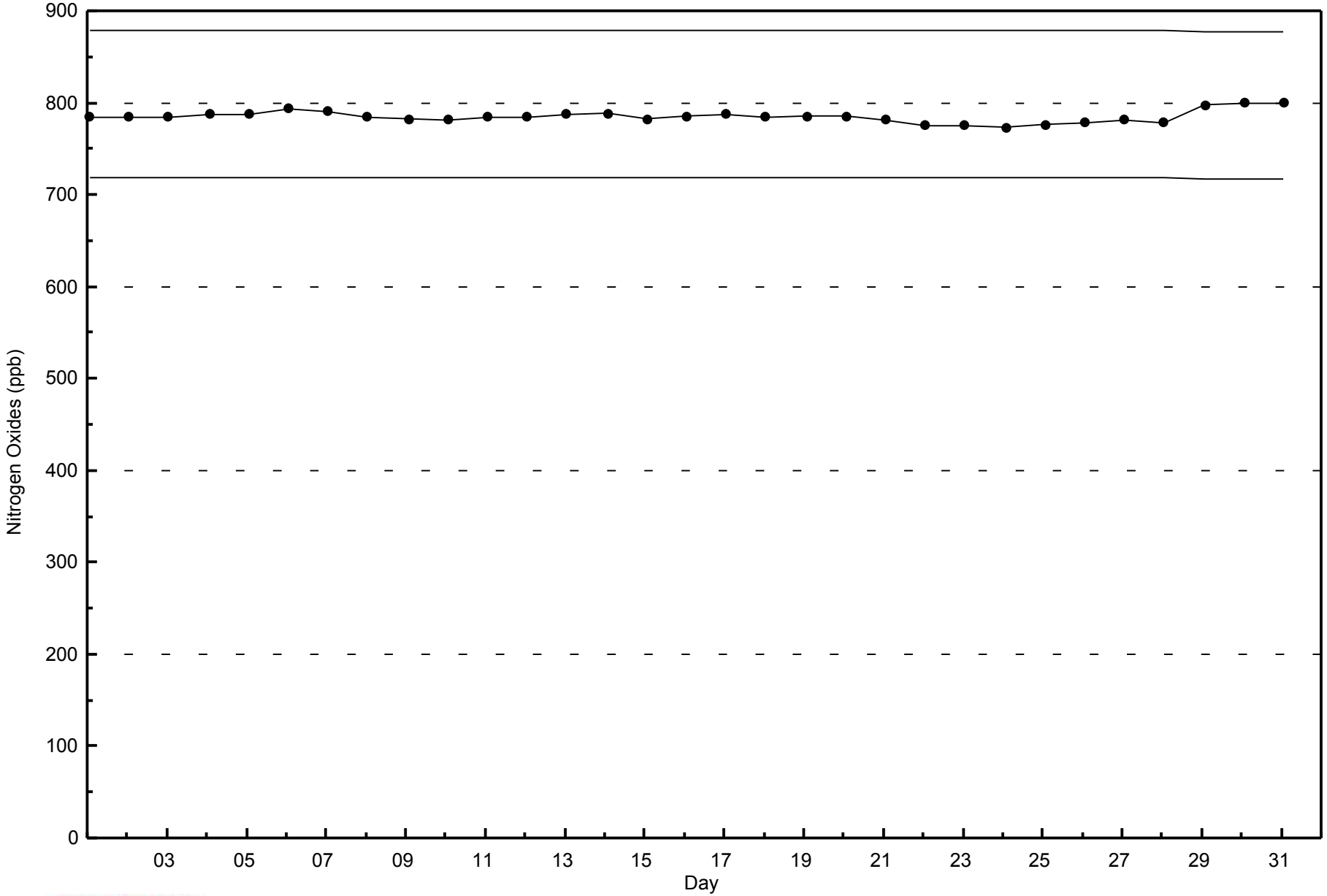
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Millennium - August 2014

Number of Exceedences (AAAQO): 24-hr: 4

Maximum Value: 275.6 $\mu g/m^3$ on Aug 4 15:00

Maximum Daily Average: 103.4 $\mu g/m^3$ on Aug 5

Minimum Value: 1.2 $\mu g/m^3$ on Aug 11 17:00

Minimum Daily Average: 6.3 $\mu g/m^3$ on Aug 31

Maximum Diurnal Average: 23.8 $\mu g/m^3$ at hour 8

Minimum Diurnal Average: 13.0 $\mu g/m^3$ at hour 18

Monthly Average: 19.03 $\mu g/m^3$

Percentiles: P_1 = 2.3 P_{10} = 4.4 Q_1 = 6.7 Median = 10.9 Q_3 = 19.0 P_{90} = 35.1 P_{99} = 161.3

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-Aug	54.3	53.6	71.4	75.9	64.5	44.9	41.2	37.1	20.2	22.1	20.1	22.0	22.3	21.9	18.2	17.5	18.6	21.2	19.9	18.3	19.0	20.9	20.0	17.4	31.8	75.9
2-Aug	19.2	19.6	19.5	18.4	15.4	13.1	14.9	14.6	18.8	23.2	27.8	27.4	29.6	29.5	29.3	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	29.6
3-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	11.1	8.7	9.1	8.4	12.2	12.1	10.8	15.5	--	15.5
4-Aug	12.2	10.5	3.9	4.7	5.6	6.2	8.2	12.4	14.3	24.7	23.8	30.3	110.1	107.5	275.6	149.7	66.9	59.2	62.4	113.3	99.3	108.8	152.5	149.1	67.1	275.6
5-Aug	145.8	148.3	134.2	122.7	146.9	167.8	191.3	226.7	172.1	155.0	181.8	163.9	112.2	78.7	57.6	67.5	66.8	42.3	22.4	15.4	16.4	18.8	14.2	11.6	103.4	226.7
6-Aug	8.5	5.4	5.4	4.7	4.9	4.9	5.0	5.1	9.4	4.9	4.6	5.5	7.8	14.0	13.4	16.3	18.5	17.8	20.1	24.3	26.2	25.0	23.0	17.8	12.2	26.2
7-Aug	10.5	8.4	21.5	51.9	73.0	72.8	82.3	24.4	8.9	4.1	3.1	2.3	2.1	2.3	2.0	2.0	2.3	2.3	2.5	3.0	2.8	3.3	3.3	5.4	16.5	82.3
8-Aug	4.2	3.0	3.4	3.7	3.8	6.2	10.7	11.4	8.0	11.1	14.3	19.4	17.2	15.2	14.0	10.4	8.1	12.1	15.2	8.6	6.7	5.7	4.7	5.8	9.3	19.4
9-Aug	5.6	4.8	4.6	4.2	3.3	3.4	4.3	4.8	4.4	5.1	5.7	8.1	10.7	20.8	25.1	19.4	11.0	9.2	20.4	13.5	11.8	9.4	9.9	12.5	9.7	25.1
10-Aug	12.9	10.2	10.2	10.9	7.3	6.7	7.9	8.2	8.5	10.5	10.3	9.4	7.5	6.8	5.6	5.3	5.1	5.8	6.8	8.0	15.1	11.1	15.0	22.0	9.5	22.0
11-Aug	17.7	13.6	13.5	12.3	12.5	10.9	11.4	13.2	12.7	7.9	11.6	15.8	17.8	3.2	3.1	1.3	1.2	4.4	6.0	6.5	4.6	6.7	22.1	13.3	10.1	22.1
12-Aug	30.3	30.8	9.8	8.4	16.7	30.6	68.1	66.3	55.2	51.9	42.4	23.9	10.3	7.5	6.4	7.9	6.8	6.8	8.1	9.0	13.4	14.6	12.0	10.2	22.8	68.1
13-Aug	9.1	8.3	8.6	8.8	8.4	8.7	8.8	9.1	11.2	11.8	12.0	10.1	9.5	9.1	9.6	10.4	10.7	12.8	17.1	28.5	24.1	17.1	19.8	29.2	13.0	29.2
14-Aug	22.8	18.7	16.0	14.3	11.4	11.3	13.0	18.3	23.9	24.9	38.4	46.6	67.9	61.5	41.8	44.8	33.7	19.5	16.4	33.8	48.7	57.6	33.1	35.1	31.4	67.9
15-Aug	40.0	39.2	31.8	32.4	28.7	29.5	35.4	40.7	37.0	48.5	37.1	31.9	20.1	8.5	8.0	10.4	10.6	5.5	32.7	43.2	24.0	35.3	30.5	27.2	28.7	48.5
16-Aug	26.8	25.1	21.8	18.3	16.7	20.6	25.9	30.8	44.5	53.6	52.8	58.5	45.8	25.5	17.3	20.3	19.7	20.8	21.2	21.8	24.4	21.0	19.3	17.4	27.9	58.5
17-Aug	15.5	15.7	17.7	22.4	16.6	16.4	15.5	15.5	8.6	12.0	14.6	14.6	10.2	5.2	8.2	12.5	14.2	13.0	14.1	11.4	7.7	12.0	16.9	16.4	13.6	22.4
18-Aug	18.4	17.0	29.2	16.7	15.8	15.6	17.0	23.6	28.5	27.2	31.2	35.1	29.2	25.0	31.0	34.3	47.4	35.0	32.8	27.3	25.8	11.1	10.0	9.7	24.7	47.4
19-Aug	10.0	10.4	10.5	10.6	12.6	12.8	13.6	17.2	19.0	19.5	16.8	16.0	12.1	19.6	9.8	3.0	4.0	3.1	4.3	4.6	8.6	6.7	3.6	3.6	10.5	19.6
20-Aug	12.3	15.3	14.2	7.5	10.3	11.7	13.0	13.0	9.6	7.1	5.8	5.4	6.2	4.9	4.4	4.1	4.3	4.8	5.8	5.6	4.7	4.7	4.4	3.5	7.6	15.3
21-Aug	4.9	6.0	6.3	7.3	8.1	9.3	11.5	11.2	8.8	6.9	9.4	11.0	4.6	5.1	4.2	3.9	4.6	4.3	6.6	6.8	12.9	6.7	6.0	6.4	7.2	12.9
22-Aug	7.7	5.8	6.1	7.3	9.6	10.4	11.1	7.2	8.4	8.0	6.4	3.5	3.8	3.9	3.9	5.6	7.0	7.7	11.9	20.0	16.0	19.2	17.9	17.4	9.4	20.0
23-Aug	12.7	16.0	14.5	11.1	10.8	10.5	12.8	12.6	13.4	15.0	14.0	10.9	7.3	6.3	5.8	6.1	5.9	6.4	6.4	9.6	13.7	16.6	15.0	12.3	11.1	16.6
24-Aug	15.6	14.5	13.0	11.6	19.5	14.3	15.2	16.6	21.8	15.7	19.3	17.5	9.4	9.9	8.3	7.4	8.7	8.6	6.4	5.1	6.2	4.8	5.1	5.5	11.7	21.8
25-Aug	5.9	8.9	10.8	10.2	12.4	10.7	15.4	14.9	11.3	9.9	9.6	7.2	7.4	7.2	9.6	10.2	9.8	10.5	10.6	10.5	10.8	9.1	8.2	8.1	10.0	15.4
26-Aug	6.5	6.7	6.6	6.4	6.2	6.6	6.6	8.7	9.9	11.6	14.1	15.3	19.6	23.3	26.2	23.0	19.3	11.7	15.7	13.5	16.4	15.0	17.7	14.6	13.4	26.2
27-Aug	15.5	16.9	14.8	11.9	9.1	7.6	6.8	6.3	7.0	6.2	6.4	6.2	7.4	3.7	3.2	3.6	3.5	3.7	4.7	5.5	10.4	7.8	13.2	13.7	8.1	16.9
28-Aug	7.8	3.7	2.8	2.8	3.6	4.2	11.4	M	11.0	9.5	5.6	3.7	4.4	3.6	4.9	6.3	7.7	8.8	7.1	8.6	27.4	21.6	19.7	12.8	8.7	27.4
29-Aug	13.7	9.4	10.2	9.3	7.4	8.6	8.8	7.5	9.3	10.5	6.0	4.4	2.9	3.0	4.5	7.6	6.6	9.5	12.7	10.2	11.5	13.5	10.5	7.5	8.5	13.7
30-Aug	6.5	5.9	5.7	5.8	5.6	3.7	4.8	4.7	5.6	7.1	8.8	8.4	12.9	8.6	12.0	14.3	13.7	9.8	7.2	10.2	11.3	9.2	9.2	9.5	8.4	14.3
31-Aug	10.3	8.4	7.9	9.6	10.2	8.4	8.6	6.7	7.4	6.3	5.5	4.0	3.3	7.1	7.5	3.9	3.9	4.9	6.5	7.2	4.0	3.6	3.7	3.3	6.3	10.3
	19.4	18.7	18.2	18.1	19.2	19.6	23.3	23.8	21.0	21.1	22.0	21.3	21.1	18.3	22.3	18.2	15.1	13.0	14.4	17.1	17.9	17.6	18.4	17.8	Diurnal Average	
	145.8	148.3	134.2	122.7	146.9	167.8	191.3	226.7	172.1	155.0	181.8	163.9	112.2	107.5	275.6	149.7	66.9	59.2	62.4	113.3	99.3	108.8	152.5	149.1	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure

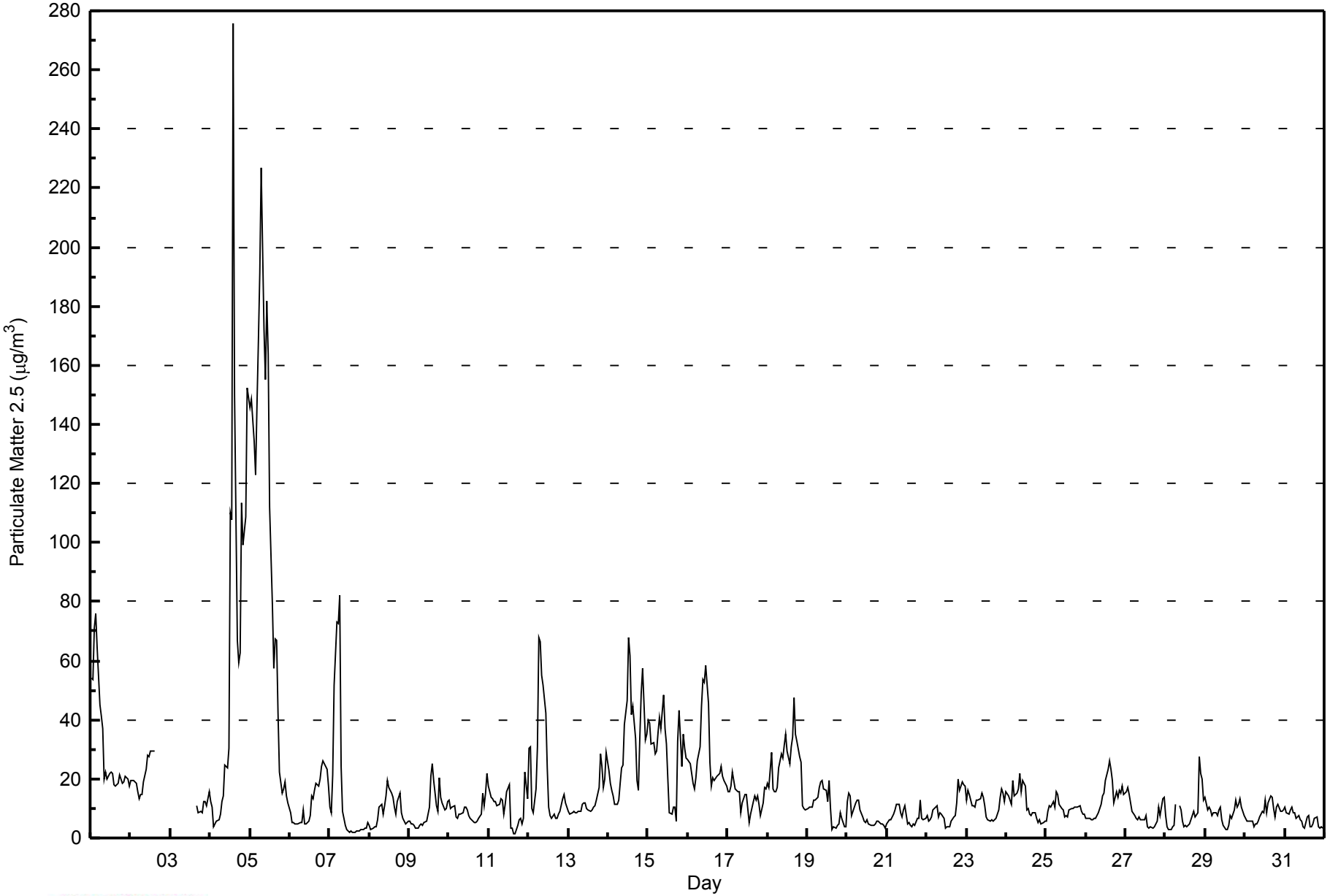
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	113	15.74	15.74
6 - 15	365	50.84	66.57
16 - 25	129	17.97	84.54
26 - 80	88	12.26	96.80
> 81.0	23	3.20	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Millennium - August 2014

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	17	9	1	0	0	1	4	8	9	4	5	7	15	4	12	17	113
6 - 15	28	20	5	10	5	10	49	40	49	42	28	10	9	27	16	14	362
16 - 25	11	4	3	3	3	3	7	9	20	21	11	3	7	6	11	6	128
26 - 80	15	7	2	0	0	2	11	6	10	12	8	4	1	1	3	2	84
> 81.0	2	1	0	1	0	5	3	4	3	1	0	1	0	0	0	2	23
Totals	73	41	11	14	8	21	74	67	91	80	52	25	32	38	42	41	710

Total Number of Valid Hours: 710

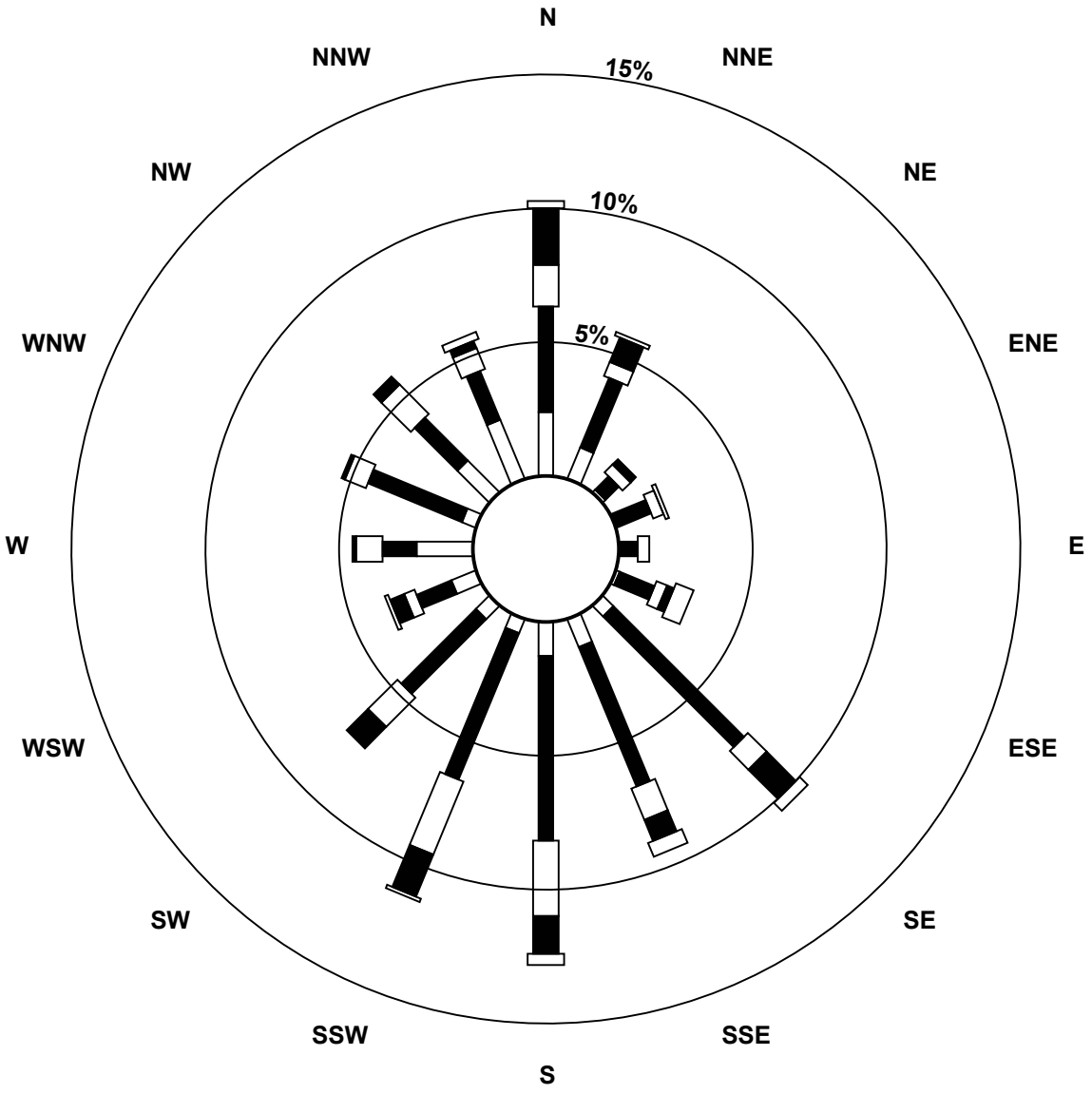
Total Number of Hours: 744

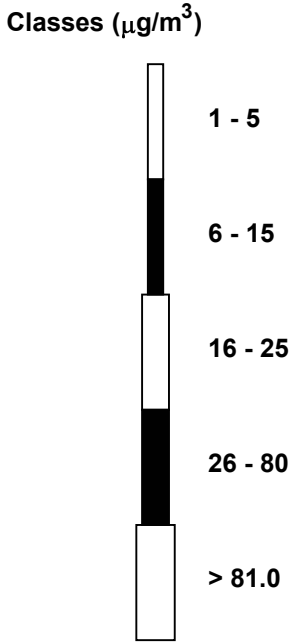
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Millennium (AMS 12)





Total Number of Valid Hours: 710

Maximum Value: 31.5 C on Aug 5 15:00

Maximum Daily Average: 25.1 C on Aug 13

Minimum Value: 2.4 C on Aug 22 06:00

Minimum Daily Average: 10.0 C on Aug 22

Maximum Diurnal Average: 23.4 C at hour 15

Minimum Diurnal Average: 12.5 C at hour 6

Monthly Average: 18.01 C

Percentiles: P_1 = 5.4 P_{10} = 10.5 Q_1 = 13.6 Median = 17.5 Q_3 = 22.3 P_{90} = 27.0 P_{99} = 30.9

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

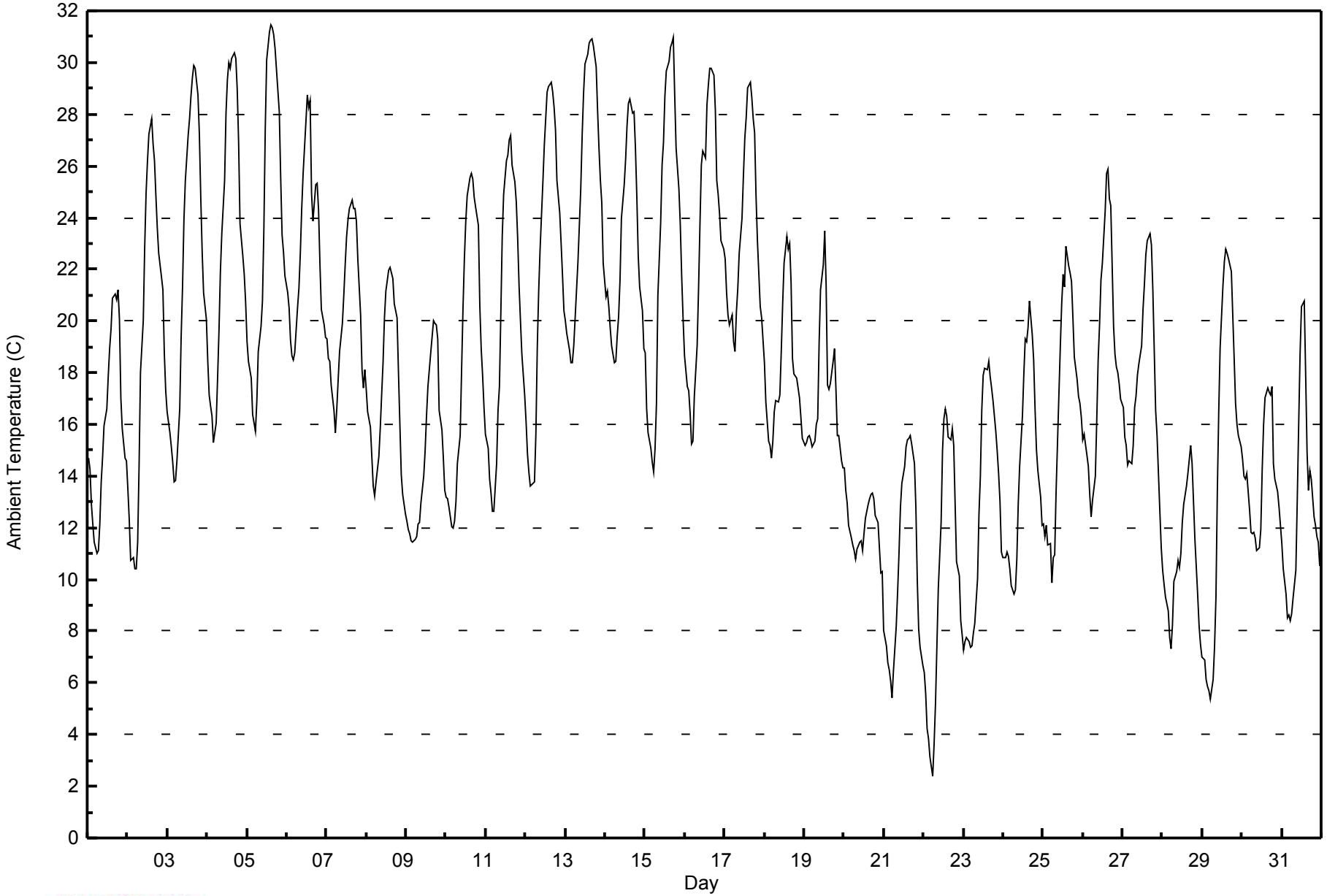
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.7	14.2	12.9	12.2	11.4	11.0	11.1	12.1	13.8	14.8	15.9	16.6	17.8	18.9	19.7	20.9	21.0	20.8	21.2	20.1	17.0	15.8	14.7	14.6	16.0	21.2
2-Aug	13.5	12.3	10.7	10.9	10.4	10.4	11.5	14.4	18.0	20.0	22.9	24.9	26.2	27.2	27.8	26.8	26.2	24.9	23.6	22.6	21.7	21.2	18.8	17.3	19.3	27.8
3-Aug	16.5	15.7	15.1	14.5	13.8	13.8	14.6	16.6	19.3	21.3	23.9	25.4	27.2	27.8	28.7	29.4	29.9	29.8	28.7	27.2	24.8	22.6	21.1	20.1	22.0	29.9
4-Aug	18.5	17.1	16.7	16.3	15.3	16.1	17.8	19.6	21.9	23.4	25.5	28.0	29.4	30.0	29.8	30.2	30.4	30.1	28.9	26.9	23.8	22.5	21.8	20.7	23.4	30.4
5-Aug	19.2	18.4	17.8	16.4	16.1	15.7	16.9	18.8	19.8	20.8	23.5	27.4	30.1	31.2	31.5	31.4	31.1	30.5	29.7	28.1	25.6	23.3	22.7	21.7	23.7	31.5
6-Aug	21.1	20.5	19.3	18.6	18.5	18.8	20.5	21.3	22.6	24.3	25.7	27.7	28.7	28.3	28.5	25.0	23.9	25.3	25.3	24.3	22.2	20.5	19.9	19.3	22.9	28.7
7-Aug	19.3	18.5	18.4	17.5	16.5	15.7	16.6	17.8	18.8	19.9	21.0	22.2	23.2	23.9	24.4	24.7	24.3	24.4	23.9	22.4	20.2	18.1	17.4	18.1	20.3	24.7
8-Aug	17.4	16.5	15.9	14.8	13.6	13.3	13.8	14.7	15.8	17.1	18.4	20.1	21.1	22.0	22.1	21.9	21.6	20.7	20.1	18.0	16.0	14.1	13.3	12.5	17.3	22.1
9-Aug	12.2	11.9	11.8	11.5	11.4	11.5	11.6	12.1	12.2	13.0	14.0	15.0	16.3	17.5	18.1	18.8	20.0	19.9	19.8	19.3	16.5	15.8	14.7	13.4	14.9	20.0
10-Aug	13.2	13.1	12.8	12.0	12.0	12.3	13.0	14.5	15.6	18.1	20.5	22.4	23.9	24.8	25.6	25.7	25.5	24.8	24.4	23.7	20.6	18.9	17.9	16.7	18.8	25.7
11-Aug	15.6	15.1	13.9	13.3	12.6	12.6	14.5	16.6	17.5	20.3	23.2	24.9	26.2	26.4	27.0	27.2	26.0	25.4	24.6	23.2	21.4	20.0	18.7	17.1	20.1	27.2
12-Aug	16.1	14.9	14.2	13.6	13.7	13.8	15.6	19.0	21.1	22.8	25.4	26.8	27.8	28.8	29.1	29.2	28.9	28.3	27.4	25.4	24.2	23.0	21.7	20.4	22.1	29.2
13-Aug	20.0	19.5	18.9	18.4	18.4	19.1	20.1	22.3	23.7	25.1	27.2	28.8	29.9	30.3	30.7	30.9	30.9	30.7	29.8	28.1	26.7	25.4	24.6	22.2	25.1	30.9
14-Aug	21.0	21.2	20.6	19.7	19.0	18.4	18.5	19.4	20.2	21.6	24.0	25.3	26.2	27.6	28.4	28.6	28.0	28.1	26.7	24.8	22.5	21.3	20.4	18.9	22.9	28.6
15-Aug	18.8	16.6	15.7	15.1	14.6	14.2	15.1	16.8	21.0	23.8	26.0	26.9	28.7	29.7	30.1	30.6	30.7	31.0	28.7	26.7	25.1	23.7	21.7	20.1	23.0	31.0
16-Aug	18.6	17.5	17.3	16.4	15.2	15.4	17.1	19.1	21.2	23.7	26.1	26.6	26.3	28.4	29.1	29.8	29.8	29.5	28.1	25.5	24.9	24.2	23.1	22.8	23.1	29.8
17-Aug	22.4	21.1	20.2	19.8	20.2	19.2	18.8	20.4	21.3	22.6	24.0	25.6	27.1	27.9	29.0	29.3	28.6	27.8	27.3	24.9	23.1	20.5	20.1	19.3	23.4	29.3
18-Aug	18.4	16.9	15.3	15.2	14.7	15.3	16.5	16.9	16.9	17.2	18.8	20.7	22.2	23.3	22.8	23.0	21.5	18.6	18.0	17.8	17.4	17.0	16.3	15.4	18.2	23.3
19-Aug	15.2	15.3	15.5	15.6	15.4	15.1	15.3	16.0	16.2	19.2	21.2	22.2	23.5	21.4	17.5	17.3	17.6	18.4	18.9	17.3	15.6	15.6	14.6	14.3	17.3	23.5
20-Aug	14.3	13.5	13.0	12.1	11.6	11.4	11.1	10.8	11.2	11.4	11.5	11.1	11.8	12.4	12.9	13.1	13.3	13.4	13.1	12.5	12.2	11.2	10.3	10.3	12.1	14.3
21-Aug	8.0	7.4	6.8	6.5	6.1	5.4	6.5	8.2	9.5	11.1	12.8	13.7	14.4	15.1	15.4	15.4	15.6	15.2	14.5	12.8	10.0	8.1	7.4	6.7	10.5	15.6
22-Aug	6.4	5.6	4.2	3.9	3.1	2.4	3.6	5.2	7.4	9.7	12.2	15.0	16.2	16.6	16.3	15.5	15.4	15.8	15.2	12.9	10.7	10.1	8.4	7.9	10.0	16.6
23-Aug	7.3	7.6	7.7	7.6	7.4	7.4	7.9	8.3	10.0	12.6	14.0	16.5	17.9	18.2	18.1	18.4	17.9	17.4	16.9	15.7	15.0	14.1	13.0	11.1	12.8	18.4
24-Aug	10.8	10.9	11.1	10.9	10.4	9.7	9.4	9.6	10.8	12.9	14.4	16.3	18.0	19.3	19.2	19.8	20.8	19.5	18.5	16.6	15.0	14.2	13.2	12.1	14.3	20.8
25-Aug	12.2	11.7	12.1	11.4	11.4	9.9	10.9	11.0	13.4	17.1	19.0	20.7	21.8	21.3	22.9	22.1	21.9	21.5	20.1	18.6	17.8	17.1	16.8	16.3	16.6	22.9
26-Aug	15.4	15.6	14.8	14.4	13.3	12.4	13.1	14.0	16.2	18.5	19.8	21.6	22.3	24.3	25.7	25.8	24.7	24.5	19.8	18.7	18.3	18.0	17.6	17.0	18.6	25.8
27-Aug	16.6	15.5	15.2	14.4	14.6	14.5	15.2	16.7	17.1	17.9	18.3	19.0	20.5	21.4	22.6	23.1	23.4	22.9	21.2	18.9	16.6	15.6	12.6	11.2	17.7	23.4
28-Aug	10.4	9.8	9.3	8.8	7.8	7.3	8.2	9.9	10.3	10.7	10.5	11.0	12.2	12.9	13.6	14.1	14.6	15.2	14.5	11.5	10.4	9.4	8.2	7.5	10.8	15.2
29-Aug	7.0	6.9	6.1	5.8	5.7	5.4	6.1	7.4	9.2	13.4	16.5	19.0	21.4	22.3	22.8	22.6	22.4	21.9	20.2	18.6	16.8	16.0	15.5	15.1	14.3	22.8
30-Aug	14.6	14.0	13.9	14.1	12.7	11.8	11.8	11.8	11.6	11.1	11.2	12.0	14.2	16.0	17.0	17.4	17.3	17.1	17.5	14.5	13.9	13.4	12.8	12.1	13.9	17.5
31-Aug	11.4	10.4	9.4	8.5	8.6	8.4	8.7	9.3	10.4	13.1	15.9	18.7	20.6	20.8	17.9	14.9	13.4	14.2	13.9	12.4	12.1	11.7	11.5	10.5	12.8	20.8
	15.0	14.4	13.8	13.2	12.8	12.5	13.3	14.5	15.9	17.7	19.5	21.0	22.4	23.1	23.4	23.3	23.1	22.8	22.0	20.3	18.6	17.5	16.5	15.6	Diurnal Average	
	22.4	21.2	20.6	19.8	20.2	19.2	20.5	22.3	23.7	25.1	27.2	28.8	30.1	31.2	31.5	31.4	31.1	31.0	29.8	28.1	26.7	25.4	24.6	22.8	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	62	8.33	8.33
10 - 20	410	55.11	63.44
> 20	272	36.56	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

Millennium - August 2014

Maximum Speed: 20 km/h on Aug 31 15:00

Maximum Daily Speed Average: 12.8 km/h on Aug 20

Minimum Speed Value: 0 km/h on Aug 23 09:00

Minimum Daily Speed Average: 1.2 km/h on Aug 15

Maximum Diurnal Speed Average: 2.3 km/h at hour 14

Minimum Diurnal Speed Average: 0.8 km/h at hour 2

Monthly Average Velocity: 0.9 km/h 218.3 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 4 Median = 6 Q_3 = 9 P_{90} = 11 P_{99} = 16

Hours in Service: 744

Hours of Data: 736

Hours of Missing Data: 8

Percent Operational Time: 98.9

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-Aug	N17	N17	N17	N14	N11	N9	N10	N10	N14	N13	N12	N11	N9	NNW7	N3	NNW4	W6	SW5	SW2	S2	S4	S4	SE5	SE6	N6.3	N17
2-Aug	S5	S5	S4	SSE5	S5	S5	SSW5	S6	S9	S9	S11	S11	S11	S11	S11	S14	S14	SSW11	SSW9	S4	S4	SSE7	E5	SE5	S7.3	S14
3-Aug	S4	SSW5	SSW6	SSW6	SSW6	SSW5	SSW7	S6	S7	S6	SSE4	S3	SW3	N5	N4	SW5	SW1	SSW5	SSE6	SSW8	SSW7	SSW5	S3	S4	SSW4.1	SSW8
4-Aug	SSW5	SSW5	S4	S4	S4	SSE4	S5	SSW3	NNW2	N4	N5	NW5	NNW6	N8	NNW9	N8	N8	NNE9	NNE9	NNE9	ENE7	ESE7	ESE5	SSE3	NNE1.8	NNE9
5-Aug	SSE3	SSE5	S5	SSE5	SE5	ESE8	SE8	SE6	S4	SSW6	S6	ESE7	ESE9	SSE8	SSE8	SE7	SE8	SE9	SE9	SSE7	SSE5	SSE5	S7	S7	SSE6.1	SE9
6-Aug	SSE8	S8	SSE5	SSE6	SSE7	SSE7	SSE7	S8	S9	S8	S10	S12	SSW13	SSW12	SW10	SW11	SSE6	E4	S4	SW7	S5	S6	SSW7	SSW7	S7.0	SSW13
7-Aug	SSW5	SW4	W9	WSW8	WSW8	SW4	WSW7	W10	W13	W14	W15	W16	WSW15	W15	WSW15	W15	W13	W13	W11	W8	WSW5	SW4	WNW6	N10	W9.4	W16
8-Aug	NNW7	NW6	NW4	NW5	NNW5	N5	NNE4	NNE6	NNE6	N5	N5	NW6	N7	N7	N7	N11	NNE10	NE9	NNE5	WSW7	WSW5	WNW8	N11	NNE9	N5.2	N11
9-Aug	N13	N16	N16	NNE11	NNE9	N6	NNW5	NW5	NW7	NNW7	NNW7	NW8	NW7	NNW5	NNE5	NNW3	WSW7	WSW3	NNE3	SE2	SSW4	SW7	SW2	SSW4	NNW4.5	N16
10-Aug	S3	SSE3	S4	S4	SE6	SSE4	S5	S5	SSW8	S6	SSE5	SSE5	S5	S7	SSE5	S4	SSW5	WSW2	SSW3	SSW5	SSW6	SSW6	SSW6	S4	S4.6	SSW8
11-Aug	SE4	SE4	SSE4	SSE4	S4	SSE3	S4	SSW4	SSW5	SW6	WNW4	NNE4	N4	NW11	NW11	NW11	NNW10	N13	NNE13	NE10	NNE8	NE9	NE4	ENE5	N2.4	NNE13
12-Aug	AF	AF	SW3	SSW4	SSW3	S2	SE5	SE5	SE5	SE3	SE6	SE6	SE8	SSE7	SSE8	SSE8	SSE8	SE11	ESE11	SE10	SE14	SE14	SE9	SSE6	SE6.7	SE14
13-Aug	SE9	SE9	SE8	SE8	SE8	SE10	SE11	SE8	S6	S10	S11	S11	SSW12	SSW12	SW12	SW11	SW11	SW10	SSW7	SSW6	SSW7	SW5	NW5	NNW3	S6.7	SSW12
14-Aug	WSW4	WNW7	WNW7	WNW5	NW6	NW6	NNW6	NW6	NNW6	NW5	WNW4	N7	N7	N7	NNW1	SW4	SW3	SSW3	AF	SW5	SSE3	SSW4	SSW4	SE5	NW2.7	WNW7
15-Aug	SSE4	SW3	SSW5	SSW4	SSW5	SW5	SW5	SSW7	S5	S4	NNE3	N7	N6	NNW5	N5	NW2	N3	WSW5	NNE4	NNE13	NE16	NE11	NE5	NW3	NNE1.2	NE16
16-Aug	AF	NW2	NW3	NW4	W3	SW1	AF	NNE2	ESE3	SE6	SE6	SSE7	SSW8	S8	SSW7	SSW7	SSW10	SW8	SW4	SSW3	SSW5	SSW6	SSW6	SW6	SSW3.8	SSW10
17-Aug	SW6	WSW5	W4	WNW6	WNW8	WNW6	W4	NW5	NNW7	NNW7	N7	WNW7	W9	W11	WNW12	WNW14	WNW14	WNW12	WNW9	NW6	NW3	SW4	SW5	SW3	WNW6.3	WNW14
18-Aug	SSW5	SSW4	SW1	SSW4	S5	SSE4	SSE5	S8	SSW8	SSW5	S5	S7	SW4	WSW4	N7	N7	NNE4	W5	SSW4	WSW4	NW3	NNE13	NNE5	NW2	SW1.5	NNE13
19-Aug	WNW3	NNE1	W1	S1	SW5	SSW4	S4	SSW3	SSW5	S5	SSE6	S8	SSE7	W9	NW13	N9	NE9	NNE10	N6	NNW2	WNW5	N8	N8	NNE9	NNW1.2	NW13
20-Aug	NNE14	NNE12	N8	N14	N16	N15	N15	NNE14	N14	N17	N18	N16	N15	N16	NNE14	N14	NNE13	N12	N14	NNE10	N10	NNW5	NW6	NNW8	N12.8	N18
21-Aug	NW3	WNW6	NW6	NW7	WNW5	WNW6	WNW5	WNW4	NNW5	NNW3	NW7	NNW10	NNW10	NNW10	N11	N11	N13	NNE13	NNE14	NE11	ENE5	ENE3	E3	WSW1	N5.7	NNE14
22-Aug	WNW5	WNW5	NW3	WNW3	SW3	SW4	SW3	SW3	W4	NW4	NNW4	NNW7	NNW8	NNW8	N6	N10	N11	NNE10	NE8	NE7	ENE5	ESE5	S1	SSW5	NNW2.8	N11
23-Aug	SSE1	ESE2	S1	SW2	SW3	S2	SW3	SW5	ESE0	S2	SSW2	SSW1	SE5	ESE4	SE5	SSE4	SSE4	S3	SSE3	E4	E4	ESE4	ESE4	ENE3	SSE2.1	SE5
24-Aug	E3	E3	ENE3	ENE3	ENE4	AF	WNW4	W4	NW4	NW4	NW6	NNW6	N6	NNE4	SE3	ENE2	ESE8	ESE8	SE8	SE7	SE7	SE6	SE5	ESE6	E1.8	SE8
25-Aug	SSE5	SE6	SE5	SE4	SSE5	S4	SSE4	SSE3	SE9	SSE10	SSE10	S13	SSE11	S11	S13	S13	SSW13	SSW12	S10	S9	S9	S10	SSE9	SSE6	S8.1	SSW13
26-Aug	SE5	SE9	SE10	SE9	SE8	SE7	SSE7	SSE7	SSE6	SSE5	SSE5	SE6	S5	S4	SSE5	SSW13	SSW14	SW9	NNE15	ENE4	E4	ESE4	ENE1	SE4	SSE4.6	NNE15
27-Aug	SSE7	SSE5	SSW8	S5	SSW8	SSW8	WSW5	WNW12	WNW12	WNW13	W11	W11	W10	W8	WNW9	WNW8	W9	W9	NW6	N4	NNE4	ENE3	NW11	E2	W5.3	WNW13
28-Aug	W2	SW5	SW7	SW6	WSW4	W5	WNW7	WNW8	WNW9	NW8	NW7	NW7	NW7	NNW8	NNW9	NNW8	N6	NNW4	NNE3	ENE4	ESE4	SE4	SE3	SSE3	WNW3.2	WNW9
29-Aug	SE6	SE7	SE6	SE7	SE8	ESE7	SSE5	S5	S5	S6	SSW8	SSW9	SSE8	SSE9	SE9	SSE9	SE11	SE11	SE10	SE9	SE9	SE9	SE11	SE11	SSE7.7	SE11
30-Aug	SE9	SE10	ESE10	SE11	SSE6	S6	SSE5	S5	SSW7	WSW5	SW5	WNW5	W5	WNW5	N6	NNE4	AF	S2	S2	SSW4	SW2	SW5	SW4	WSW4	S2.7	SE11
31-Aug	SSW3	SSW5	SW6	SSW4	SSW5	SSW6	S5	S3	SSW4	S5	S4	WSW4	W8	NNW8	N20	NNW11	SW6	WSW6	AF	SW8	SW6	WSW4	WNW3	SSW2	WSW2.8	N20
	SSE1.2	SSE0.8	SSW1.0	SSW1.0	SSW1.5	S1.6	SSW1.6	SW1.8	SW1.9	WSW1.8	WSW1.4	W1.7	WSW1.7	W2.3	NW2.0	WNW2.0	WSW1.3	WSW0.8	NE0.9	SE1.1	SE1.8	SSE2.0	SSE0.9	SE1.5	Diurnal Average	
	N17	N17	N17	N14	N16	N15	N15	NNE14	N14	N17	N18	N16	WSW15	N16	N20	W15	WNW14	W13	NNE15	NNE13	NE16	SE14	NW11	SE11	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 Aug 27 23:00

Minimum Value: 1 km/h on Aug 11 03:00

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:	736
Hours of Missing Data:	8
Hours of Calibration:	0
Percent Operational Time:	98.9

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

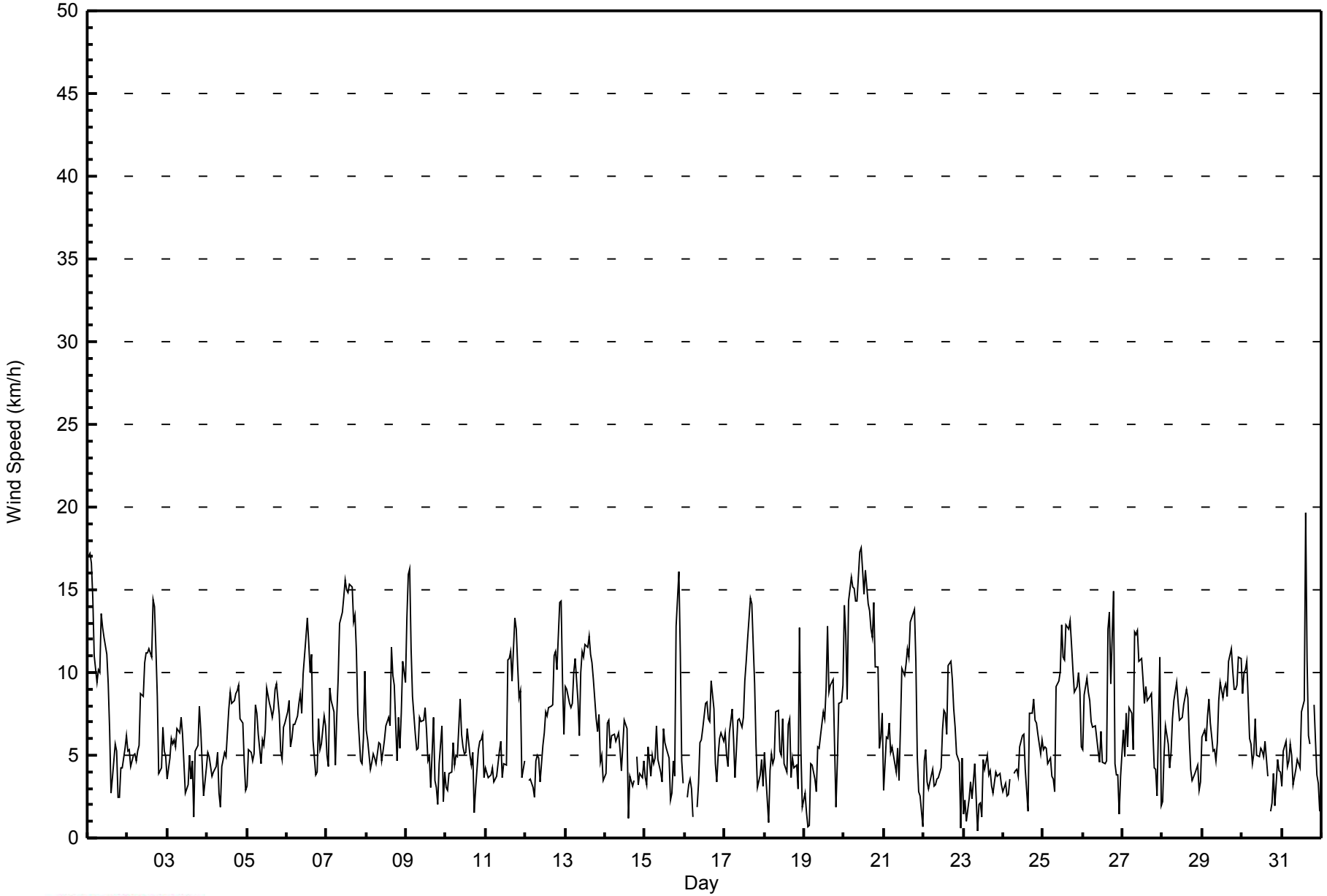
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Millennium - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	335	45.52	45.52
6 - 11	328	44.57	90.08
12 - 19	72	9.78	99.86
20 - 28	1	0.14	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 736

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Millennium - August 2014

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	12	15	2	13	9	10	21	37	57	45	37	17	9	16	19	16	335
6 - 11	38	14	8	1	0	11	52	32	37	34	17	6	15	16	22	25	328
12 - 19	24	12	1	0	0	0	2	0	6	9	0	2	8	7	1	0	72
20 - 28	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	41	11	14	9	21	75	69	100	88	54	25	32	39	42	41	736

Total Number of Valid Hours: 736

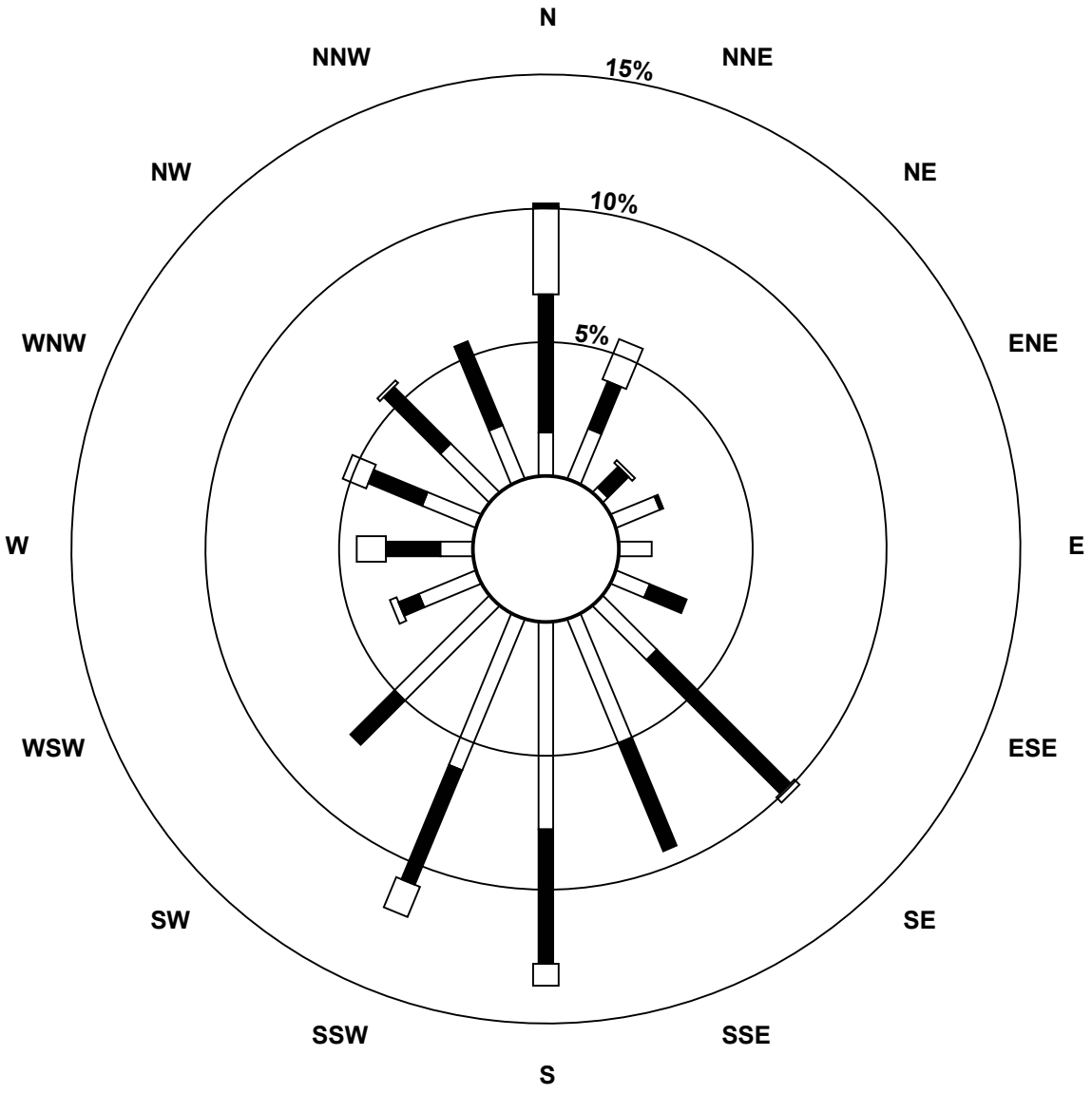
Total Number of Hours: 744

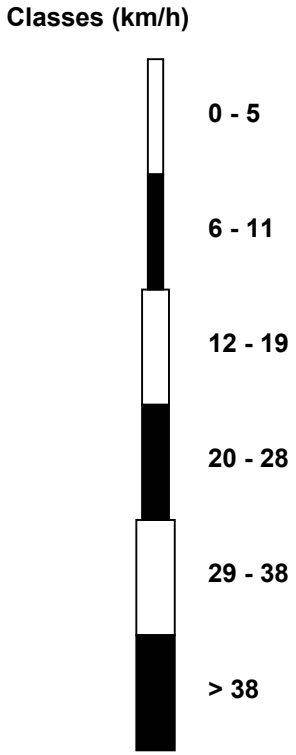
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Millennium (AMS 12)





Total Number of Valid Hours: 736

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Millennium - August 2014

Direction of Maximum Speed: 1 deg on Aug 31 15:00
Direction of Maximum Daily Speed Average: 6.5 deg on Aug 20

Direction of Minimum Speed: 102 deg on Aug 23 09:00

Direction of Minimum Daily Speed Average: 1.2 deg on Aug 15

Monthly Average Direction: 238.7 deg

Hours in Service:	744
Hours of Data:	736
Hours of Missing Data:	8
Percent Operational Time:	98.9

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-Aug	354	1	9	360	350	353	352	3	11	358	355	355	349	336	355	342	261	223	236	189	171	173	134	142	355.7
2-Aug	172	188	172	152	177	189	208	188	185	184	181	180	175	177	173	182	185	199	201	187	187	156	96	126	179.0
3-Aug	183	211	206	213	199	198	195	187	190	184	159	183	226	6	2	228	222	199	168	197	200	200	181	189	196.5
4-Aug	196	201	184	176	175	161	172	205	340	350	358	313	328	352	347	358	10	31	14	31	59	107	117	156	23.1
5-Aug	155	158	177	156	145	121	127	141	190	208	178	107	123	148	161	137	133	135	142	161	164	154	172	174	149.8
6-Aug	168	171	153	161	150	148	159	170	180	186	176	182	192	213	235	224	158	90	183	218	191	184	193	200	183.8
7-Aug	203	233	260	255	252	223	258	263	265	272	277	263	251	260	255	261	267	262	260	267	254	228	296	358	262.3
8-Aug	346	317	318	318	342	356	16	17	24	356	357	323	351	6	358	10	33	44	13	245	238	291	351	21	353.2
9-Aug	10	8	9	17	19	7	341	321	319	335	335	326	326	334	25	336	256	257	27	145	207	216	220	194	345.2
10-Aug	176	164	189	182	146	162	174	170	196	182	161	164	181	176	163	171	208	256	213	206	200	203	206	169	182.4
11-Aug	136	137	162	157	178	166	173	194	202	234	291	13	358	310	321	324	336	11	28	35	31	36	45	72	4.7
12-Aug	AF	AF	216	213	202	175	134	138	142	144	140	142	125	157	150	151	150	133	123	125	128	128	138	152	141.0
13-Aug	142	136	130	129	135	131	129	146	188	184	190	189	199	204	214	217	217	218	206	192	194	235	319	346	181.1
14-Aug	244	294	297	303	324	326	331	314	338	322	299	9	8	352	328	233	236	211	AF	217	161	195	193	130	305.0
15-Aug	162	217	205	200	197	222	216	209	170	184	25	8	3	345	355	310	356	243	32	25	42	43	37	308	12.7
16-Aug	AF	321	313	310	281	226	AF	13	118	133	145	149	205	190	194	203	213	220	222	199	210	207	203	217	202.0
17-Aug	230	246	260	290	299	290	259	310	331	347	355	300	277	269	284	301	294	299	298	307	322	235	221	215	290.2
18-Aug	206	210	222	198	187	164	156	172	196	211	174	183	229	258	4	9	13	271	205	240	322	14	25	307	214.7
19-Aug	285	15	266	189	217	201	185	192	204	169	167	188	160	278	320	10	39	30	358	333	287	353	1	21	330.6
20-Aug	24	19	2	356	7	6	10	17	7	4	8	1	6	9	13	9	12	8	3	12	6	347	308	346	6.5
21-Aug	326	301	306	309	300	286	294	290	347	336	326	343	347	343	2	3	9	21	23	41	59	65	97	252	351.3
22-Aug	290	300	317	284	232	218	221	218	261	305	336	343	337	342	353	0	7	23	45	46	73	103	187	207	345.1
23-Aug	156	115	191	227	229	178	222	227	102	176	210	196	131	123	140	160	150	171	151	95	96	105	118	68	150.6
24-Aug	95	82	73	63	59	AF	293	278	306	325	318	332	350	17	126	61	102	102	127	146	137	146	134	121	90.9
25-Aug	151	142	139	145	156	179	166	148	127	151	167	176	168	174	185	179	196	194	179	170	171	172	168	157	169.2
26-Aug	145	132	136	143	138	138	162	168	168	159	151	141	176	182	158	208	207	224	14	69	96	112	57	146	155.1
27-Aug	168	164	192	186	203	208	256	283	287	282	278	276	279	275	283	297	271	265	313	358	24	67	317	94	270.5
28-Aug	260	214	224	230	249	262	286	286	288	305	312	308	310	328	340	343	1	339	21	67	105	136	128	166	300.4
29-Aug	131	140	139	135	134	122	147	182	189	189	197	194	147	149	144	165	140	138	141	143	141	142	137	143	149.2
30-Aug	131	124	123	130	166	183	166	185	207	246	235	283	268	282	357	16	AF	191	169	194	225	214	227	251	184.3
31-Aug	207	213	217	195	200	195	189	179	193	186	181	254	272	333	1	340	214	251	AF	214	224	243	292	202	241.7
	157.1	168.7	198.4	196.3	193.9	184.2	197.4	221.6	235.8	246.7	247.7	260.7	258.6	281.2	310.7	291.3	246.5	240.8	51.9	143.5	140.0	148.7	160.6	145.1	
	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: 101 deg on Aug 23 12:00

Minimum Value: 9 deg on Aug 10 21:00

Percentiles: P_1 = 10 P_{10} = 15 Q_1 = 19 Median = 26 Q_3 = 36 P_{90} = 55 P_{99} = 88

Hours in Service:	744
Hours of Data:	736
Hours of Missing Data:	8
Hours of Calibration:	0
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	22	20	15	20	25	23	25	22	22	25	28	23	30	49	89	80	50	33	48	32	17	16	15	19	89
2-Aug	22	19	28	21	15	14	16	26	23	24	23	23	24	26	25	23	23	22	17	21	39	28	27	20	39
3-Aug	28	14	17	20	14	19	20	26	24	31	52	78	77	47	77	59	95	30	28	17	17	38	27	15	95
4-Aug	17	14	22	19	15	21	16	56	88	35	24	50	37	29	30	23	20	19	14	14	20	23	37	72	88
5-Aug	59	20	18	18	14	15	24	26	32	26	49	35	28	32	34	31	27	21	18	20	17	19	17	18	59
6-Aug	20	20	16	19	17	22	21	21	25	27	26	25	26	30	29	32	28	45	42	20	20	11	12	20	45
7-Aug	53	72	25	21	21	26	42	33	31	33	32	31	34	36	35	31	31	31	28	26	24	21	22	19	72
8-Aug	31	31	50	41	27	19	24	23	37	41	43	43	36	30	30	16	19	14	64	42	26	34	26	16	64
9-Aug	15	15	15	17	22	25	30	36	30	34	31	32	34	53	38	54	35	62	71	20	16	12	85	23	85
10-Aug	17	13	17	17	17	20	23	30	21	31	43	51	55	48	60	63	57	54	35	11	9	10	10	22	63
11-Aug	12	26	14	13	17	19	25	28	27	42	66	55	69	36	35	34	34	21	14	12	11	9	70	30	70
12-Aug	AF	AF	10	15	26	41	27	32	48	56	42	38	36	38	34	30	30	20	22	17	16	17	26	22	56
13-Aug	15	15	17	14	16	16	16	23	30	24	25	25	25	26	26	26	26	22	18	15	18	41	55	76	76
14-Aug	31	23	23	22	27	27	22	26	27	36	50	20	24	35	91	53	34	18	AF	11	28	16	26	13	91
15-Aug	21	27	13	37	15	14	13	15	27	42	56	16	51	54	61	83	82	43	53	19	12	15	41	56	83
16-Aug	AF	34	15	27	13	49	AF	62	48	34	28	29	27	30	35	33	24	23	15	13	15	10	9	18	62
17-Aug	23	19	25	19	25	20	23	33	30	33	36	50	36	34	34	32	35	33	36	35	34	27	35	41	50
18-Aug	12	26	66	16	15	23	27	24	23	29	28	33	72	50	32	13	57	53	34	29	52	13	44	47	72
19-Aug	39	58	65	86	15	18	22	36	23	24	36	35	30	56	32	33	19	19	26	30	27	35	21	20	86
20-Aug	19	30	38	22	16	18	17	18	19	18	17	19	17	17	21	18	20	17	19	17	17	33	24	37	38
21-Aug	55	27	26	31	28	17	17	30	37	67	49	33	31	33	29	25	20	18	17	13	10	41	21	79	79
22-Aug	14	10	21	29	25	10	16	21	37	50	54	42	41	41	40	21	19	20	17	17	27	21	86	10	86
23-Aug	59	69	98	65	29	64	32	27	95	66	79	101	63	63	66	70	53	61	58	32	21	23	26	56	101
24-Aug	54	22	25	36	11	AF	22	26	28	33	32	35	31	75	60	90	37	30	27	17	16	19	23	21	90
25-Aug	35	23	44	34	36	38	45	67	18	34	26	25	25	25	26	24	23	22	20	17	18	18	21	22	67
26-Aug	19	15	15	15	14	13	21	20	24	38	34	31	27	55	48	24	20	30	22	34	48	69	84	39	84
27-Aug	22	17	16	13	12	14	64	27	27	28	33	35	35	40	41	41	37	30	37	30	24	51	53	83	83
28-Aug	57	19	17	17	18	23	22	26	30	34	34	32	38	38	38	36	50	54	46	12	15	17	30	39	57
29-Aug	16	15	17	15	15	15	21	31	25	26	25	27	33	27	29	30	22	21	18	17	17	16	17	18	33
30-Aug	20	16	16	18	19	25	25	29	23	32	27	34	43	51	40	37	AF	68	35	28	64	36	26	46	68
31-Aug	60	22	19	18	16	17	17	25	24	31	46	70	46	47	20	37	43	32	AF	14	21	30	32	46	70
	60	72	98	86	36	64	64	67	95	67	79	101	77	75	91	90	95	68	71	42	64	69	86	83	
	Diurnal Maximum																								

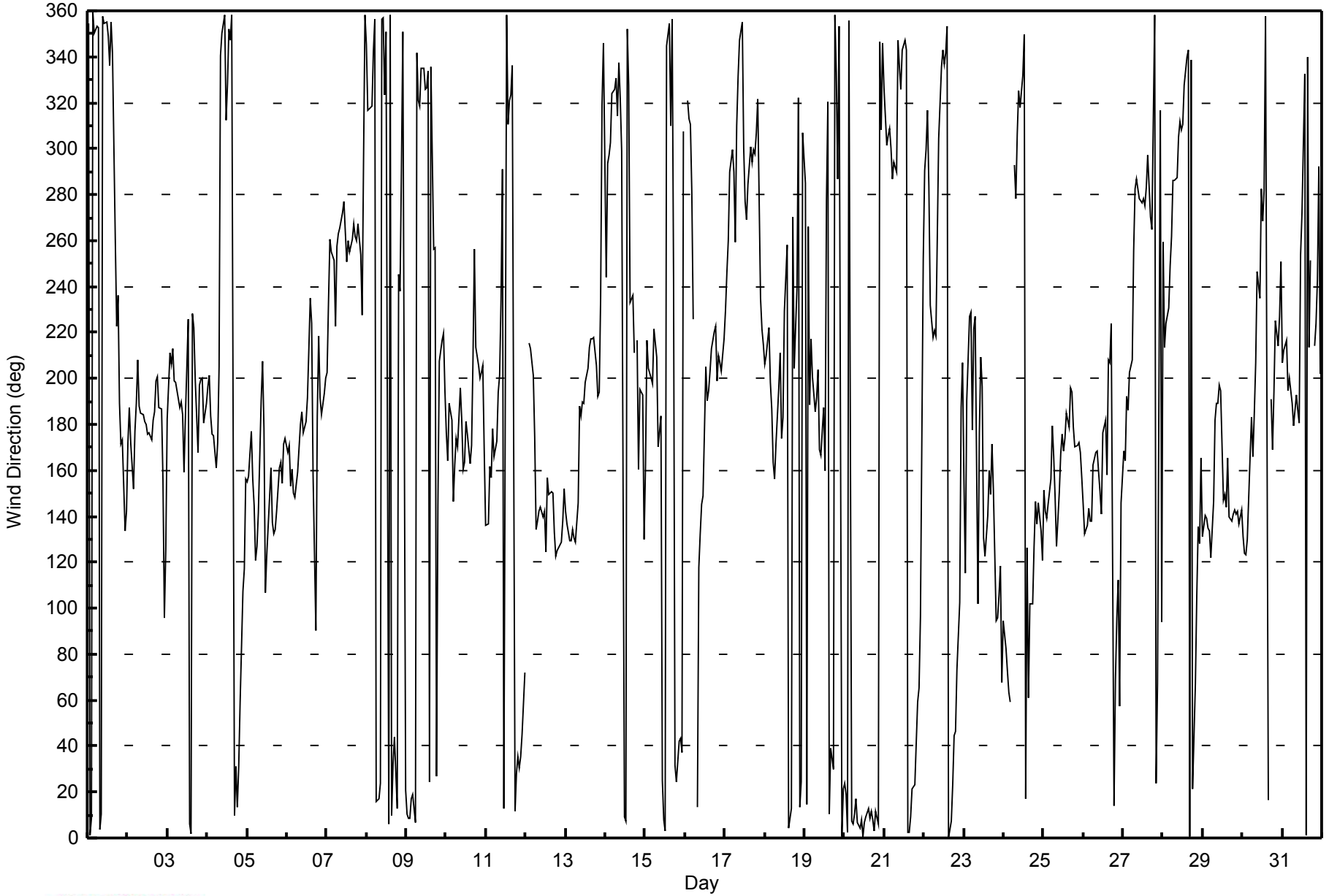
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Millennium - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	AMS 12

Reason: Routine

Start Time (MST)	6:30	End Time (MST)	10:56
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	5/29/2014
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)	5000	5000	Lamp voltage	790	790
Calculated slope	1.001162	0.993595	Chamber temp.	44.9	44.9
Calculated intercept	-0.831184	-0.310588	Pressure (mmHg)	704.9	704.9
Analyzer Background	8.4	8.4	Flow (lpm)	0.426	0.426
	1.199	1.199	Intensity	92	92

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	-0.3	NA
as found span	6000	94.1	801.4	799.8	1.002
calibrator zero	6000	0.0	0.0	0.0	NA
high point	6000	94.1	801.4	806.8	0.993
second point	6000	47.1	401.1	404.0	0.993
third point	6000	23.5	200.1	202.2	0.990
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	805.8	0.995
				Average Correction Factor	0.992

Corrected As found	800.1	Previous response	801.3	% change	0.1%

Notes:

Filter changed No mainanence or adjustments made

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

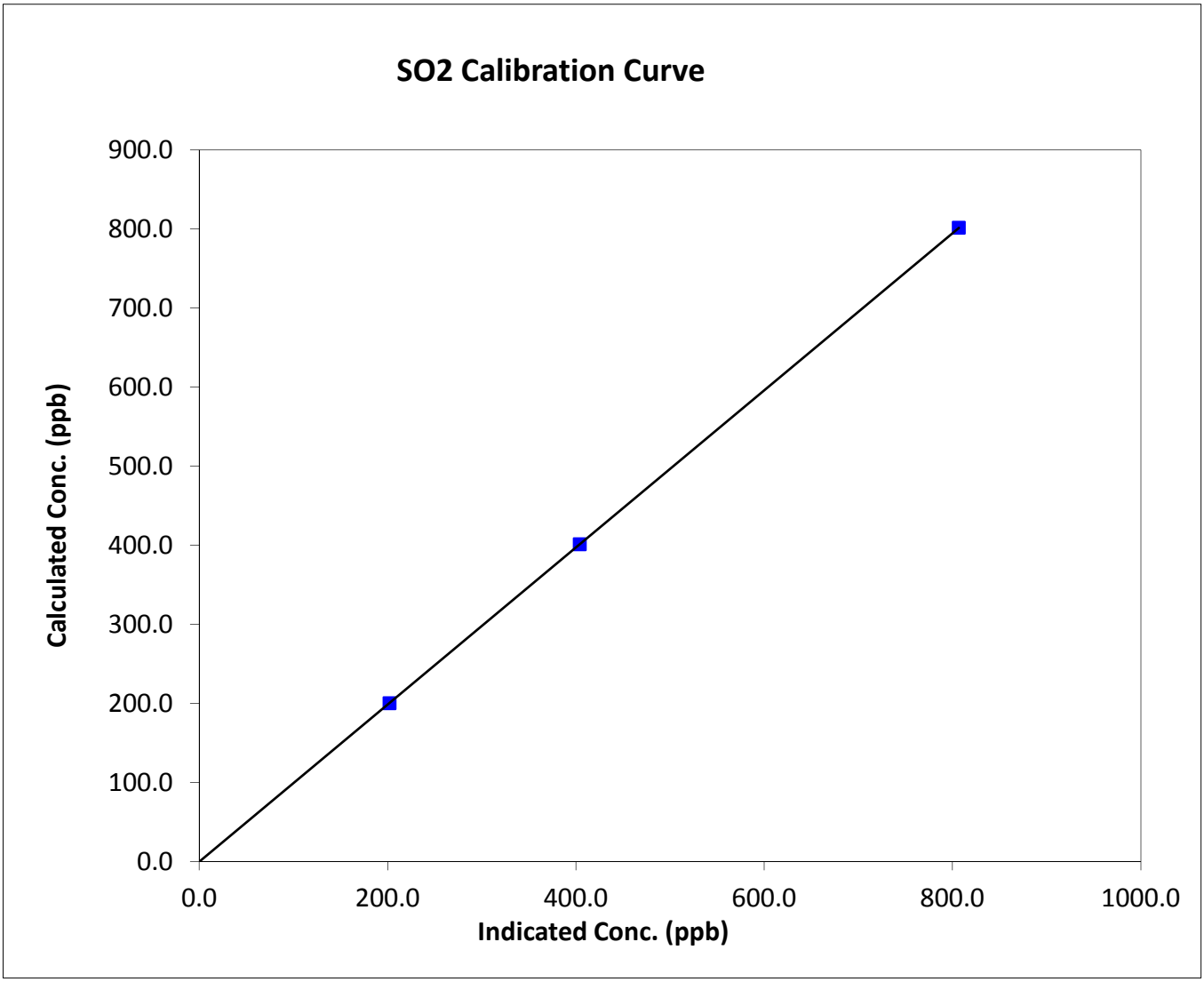
SO_2 Calibration Summary

Station Information

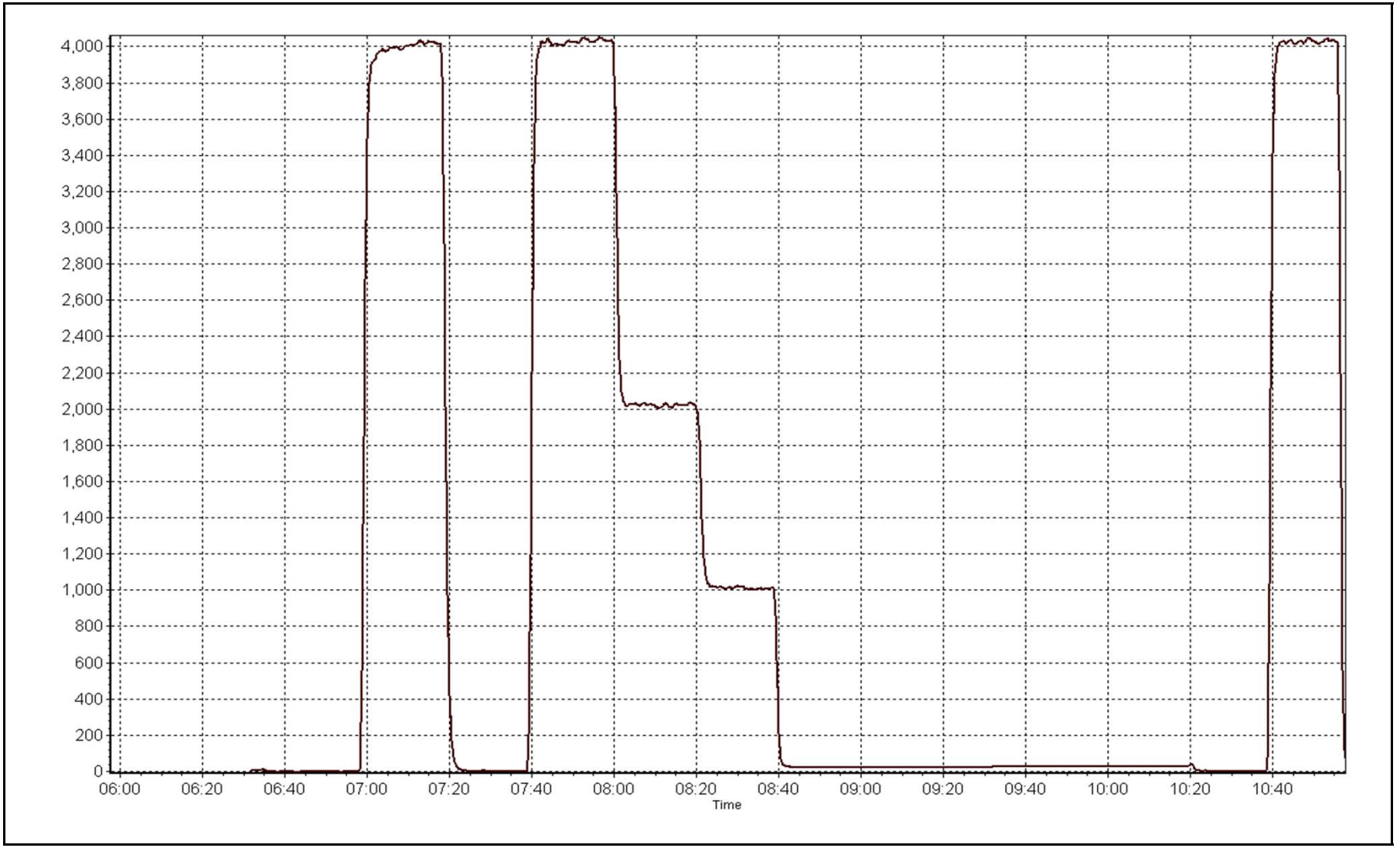
Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Start Time (MST)	6:30	End Time (MST)	10:56
Analyzer make	43i Thermo	Analyzer serial #	1118148499

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999999
801.4	806.8	0.9933		
401.1	404.0	0.9929	Slope	0.993595
200.1	202.2	0.9898		
			Intercept	-0.310588



SO2 Calibration Plot Date: August 28, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 27, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	Ams 12
Reason:	Routine		
Start Time (MST)	8:30	End Time (MST)	10:45
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	5/29/2014
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)	5000	5000	Lamp voltage	879	874
Calculated slope	0.992581	0.985925	Chamber temp.	44	44.1
Calculated intercept	-0.462951	0.481100	Pressure	678.9	687
Analyzer Background	19.4	19.4	Flow	0.599	0.605
Analyzer Coefficient	0.667	0.667	Intensity	46803	46700
			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	-0.1	NA
as found span	5000	38.5	80.1	81.0	0.989
SO2 scrubber check	6000	47.1	401.1	0.9	NA
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5000	38.5	80.1	81.0	0.989
second point	5000	19.2	39.9	39.6	1.007
third point	5000	9.6	20.0	19.5	1.023
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	80.0	1.000
				Average Correction Factor	1.006

Corrected As found	81.1	Previous response	81.1	% change	0.1%

Notes:

No adjustments made, filter changed out, scrubber checked before as founds

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

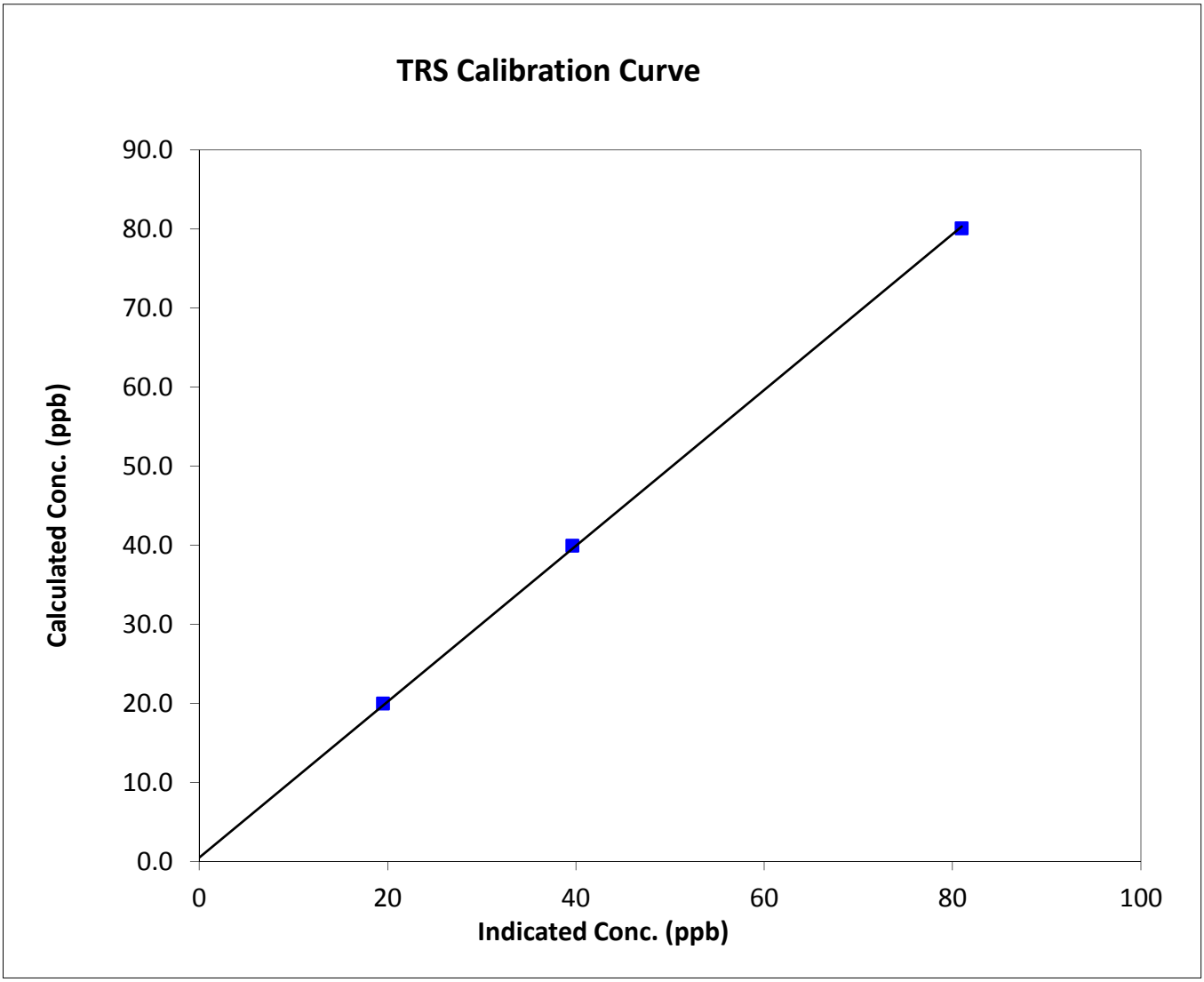
TRS Calibration Summary

Station Information

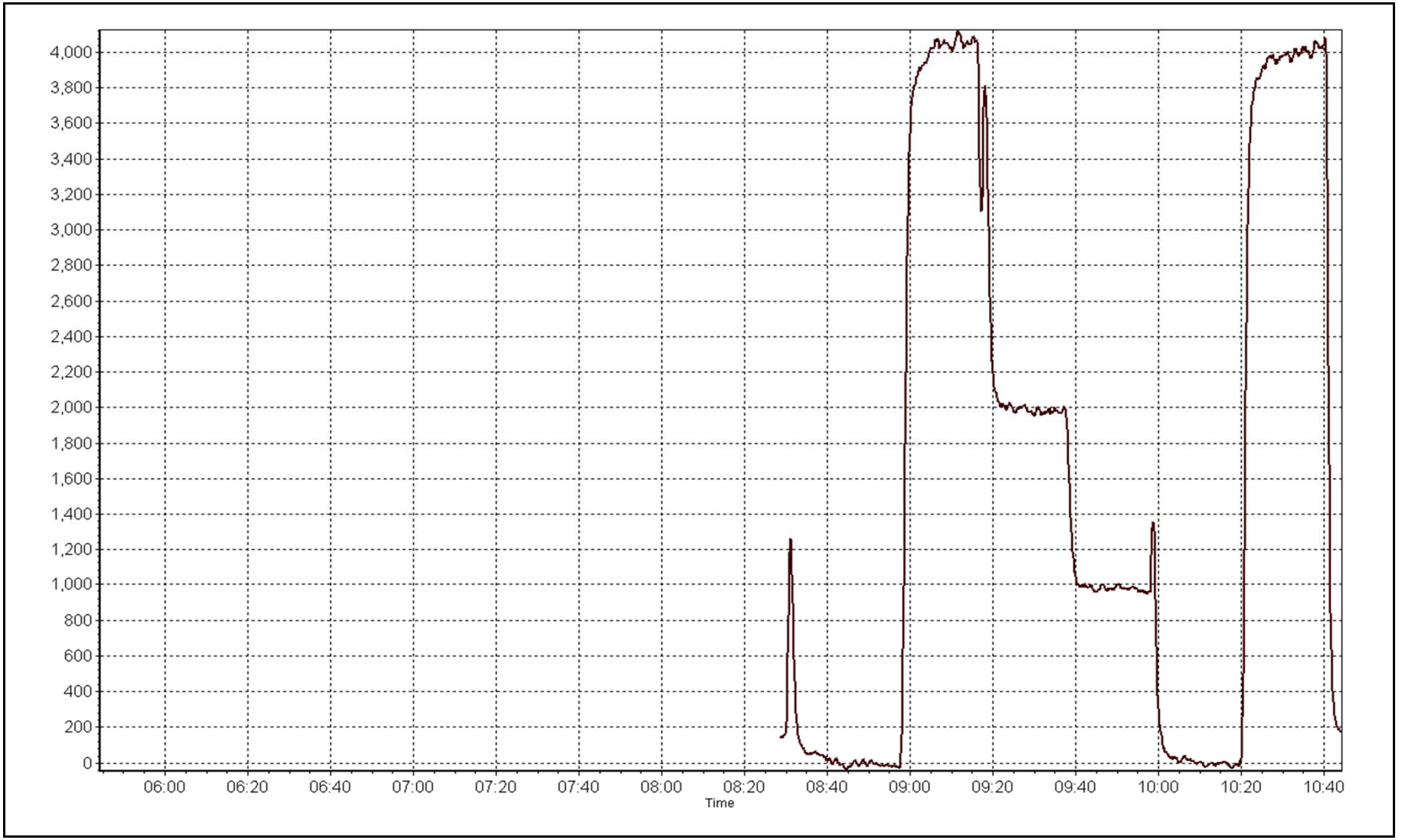
Calibration Date	August 27, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	Ams 12
Start Time (MST)	8:30	End Time (MST)	10:45
Analyzer make	TEI 43C	Analyzer serial #	0509110887

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999887
80.1	81.0	0.9889		
39.9	39.6	1.0075	Slope	0.985925
20.0	19.5	1.0230		
			Intercept	0.481100



TRS Calibration Plot Date: August 27, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, August 28, 2014	Previous Calibration	Tuesday, July 29, 2014
Station Name	Millennium	Station Number	AMS 12
Reason:	Routine		
Start Time (MST)	6:30	End Time (MST)	10:56
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	5/29/2014
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)	5000	5000	Air or Bypass press	42.9	42.9
Calculated slope	1.000507	1.001966	Fuel Pressure	19.3	19.3
Calculated intercept	-0.009127	-0.012651		4.05	3.87
				2.17	2.23

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	-0.15	N/A
as found span	6000	94.1	16.93	16.21	1.044
calibrator zero	6000	0.0	0.00	0.00	N/A
high point	6000	94.1	16.93	16.91	1.001
second point	6000	47.1	8.47	8.45	1.003
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	17.07	0.992
				Average Correction Factor	0.999

Corrected As found	16.36	Previous response	16.93	% change	3.4%

Notes:

Filter changed out, zero and span adjusted, NO maintenance done,

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

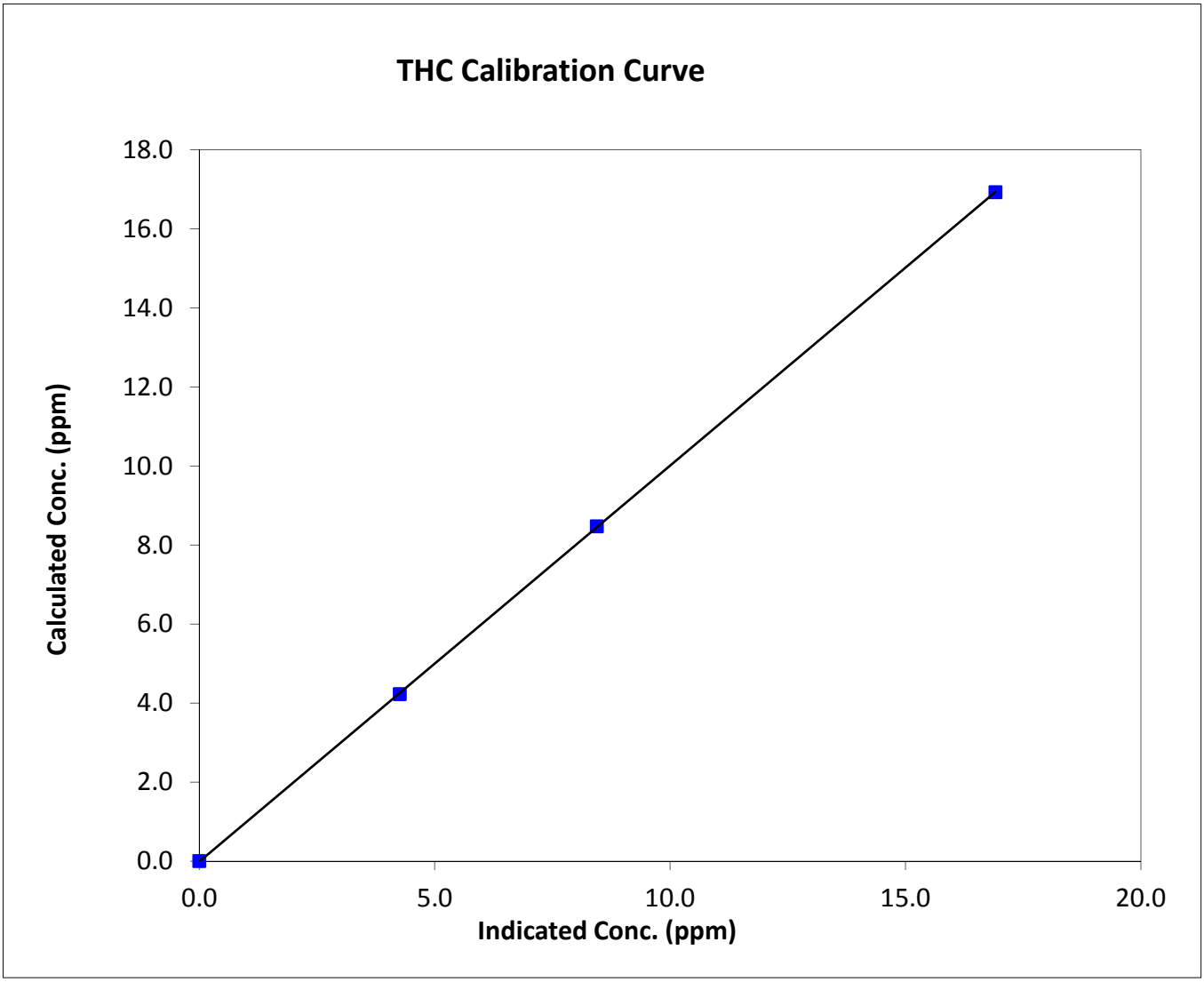
THC Calibration Summary

Station Information

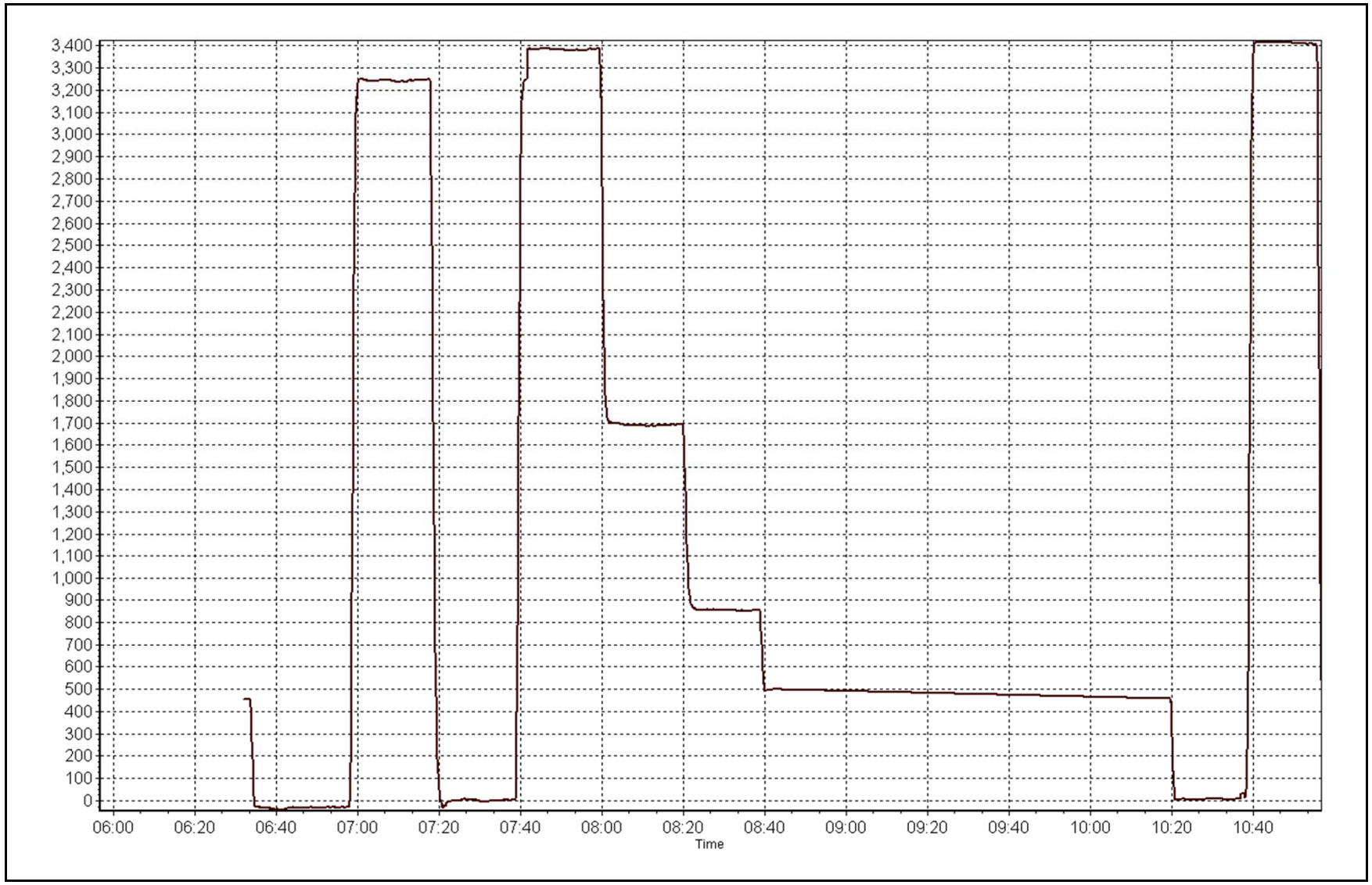
Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Name	Millennium	Station Number	AMS 12
Start Time (MST)	6:30	End Time (MST)	10:56
Analyzer make	Thermo 51i-LT	Analyzer serial #	1317958296

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999991
16.93	16.91	1.0010		
8.47	8.45	1.0032	Slope	1.001966
4.23	4.26	0.9923		
			Intercept	-0.012651



THC Calibration Plot Date: August 28, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Reason:	Routine		
Start Time (MST)	6:30	End Time (MST)	10:56
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)	5000	5000	5000
Before	Data Slope	0.998869	0.998898	1.005666
	Data Offset	1.113760	-0.244705	-0.077911
After	Data Slope	0.995519	0.999994	1.008579
	Data Offset	1.608225	-0.011150	0.835671
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	1.130	ppb	1.141	ppb
NOX coefficient	1.122	ppb	1.148	ppb
NO2 coefficient		ppb		ppb
NO bkgrnd	0.6		0.6	
NOX bkgrnd	1.6		1.6	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	315.7	Deg C	315.7	Deg C
PMT Temp	6.8	Deg C	6.8	Deg C
O3 flow	87.0	ccm	87.0	ccm
R Cell Press	2.8	mmHg	2.8	mmHg
Sample Flow	496-503	ccm	496-503	ccm

Notes:

Filter changed, No mainenance, span adjusted,

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 28, 2014 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	-0.5	-0.4	0.5	N/A	N/A
as found span	6000	94.1	799.9	799.9	0.0	784.2	785.2	-0.5	1.0200	1.0187
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.9	0.2	-0.5	N/A	N/A
high point	6000	94.1	799.9	799.9	0.0	803.2	800.6	3.0	0.9958	0.9991
second point	6000	47.1	400.4	400.4	0.0	397.8	398.8	0.1	1.0064	1.0039
third point	6000	23.5	199.8	199.8	0.0	199.0	199.9	0.3	1.0038	0.9990
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.9	0.5	-0.6	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	-0.9	0.5	-0.6	N/A	N/A
as left span	6000	94.1	799.9	490.6	309.3	795.8	504.0	292.0	1.0051	0.9734
								Average Correction Factor	1.0020	1.0007

Corrcted As found NO_X= 784.7 NO= 785.6 Percent Change NO_X= 1.9% NO= 2.0%

Previous Response NO_X= 799.6 NO= 801.0

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			-0.5			N/A	
1st NO2 (300)	N/A	490.6	309.2	796.2	490.6	305.6	0.9891	1.0000	1.0118	98.8%
2nd NO2 (200)	N/A	596.0	203.8	799.2	596.0	201.8	0.9854	1.0000	1.0099	99.0%
3rd NO2 (100)	N/A	698.0	101.8	796.8	698.0	99.4	0.9883	1.0000	1.0241	97.6%
4th NO2 (0)	799.8	N/A	1.2	801.0	799.8	1.6	0.9831	1.0000	N/A	N/A
					Average Correction Factor		0.9865	1.0000	1.0153	98.5%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

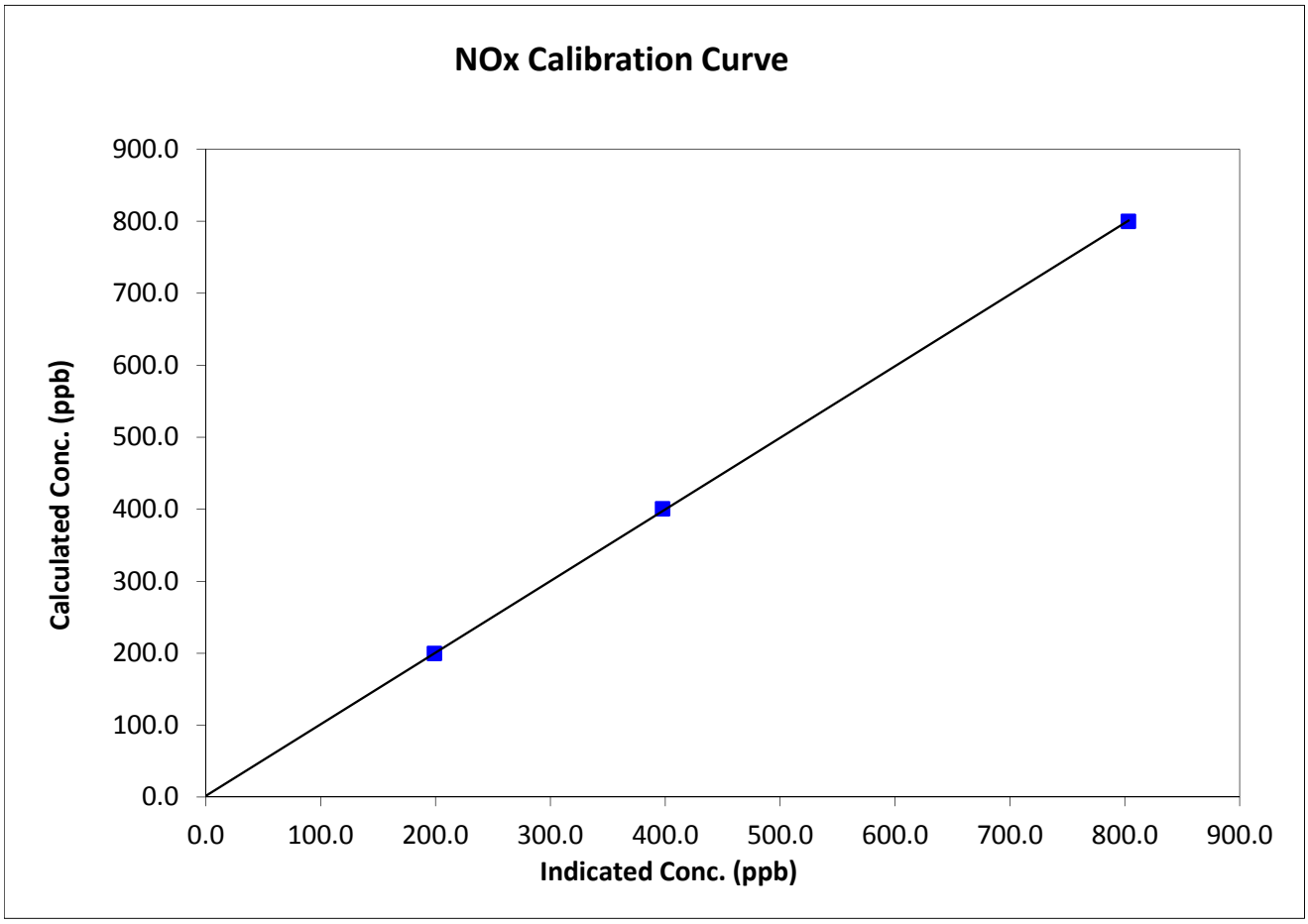
NO_X Calibration Summary

Station Information

Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Start Time (MST)	6:30	End Time (MST)	10:56
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	-0.9	N/A	Correlation Coefficient	0.999977
799.9	803.2	0.9958		
400.4	397.8	1.0064	Slope	0.995519
199.8	199.0	1.0038		
0.0	-0.9	0.0000	Intercept	1.608225



Wood Buffalo Environmental Association

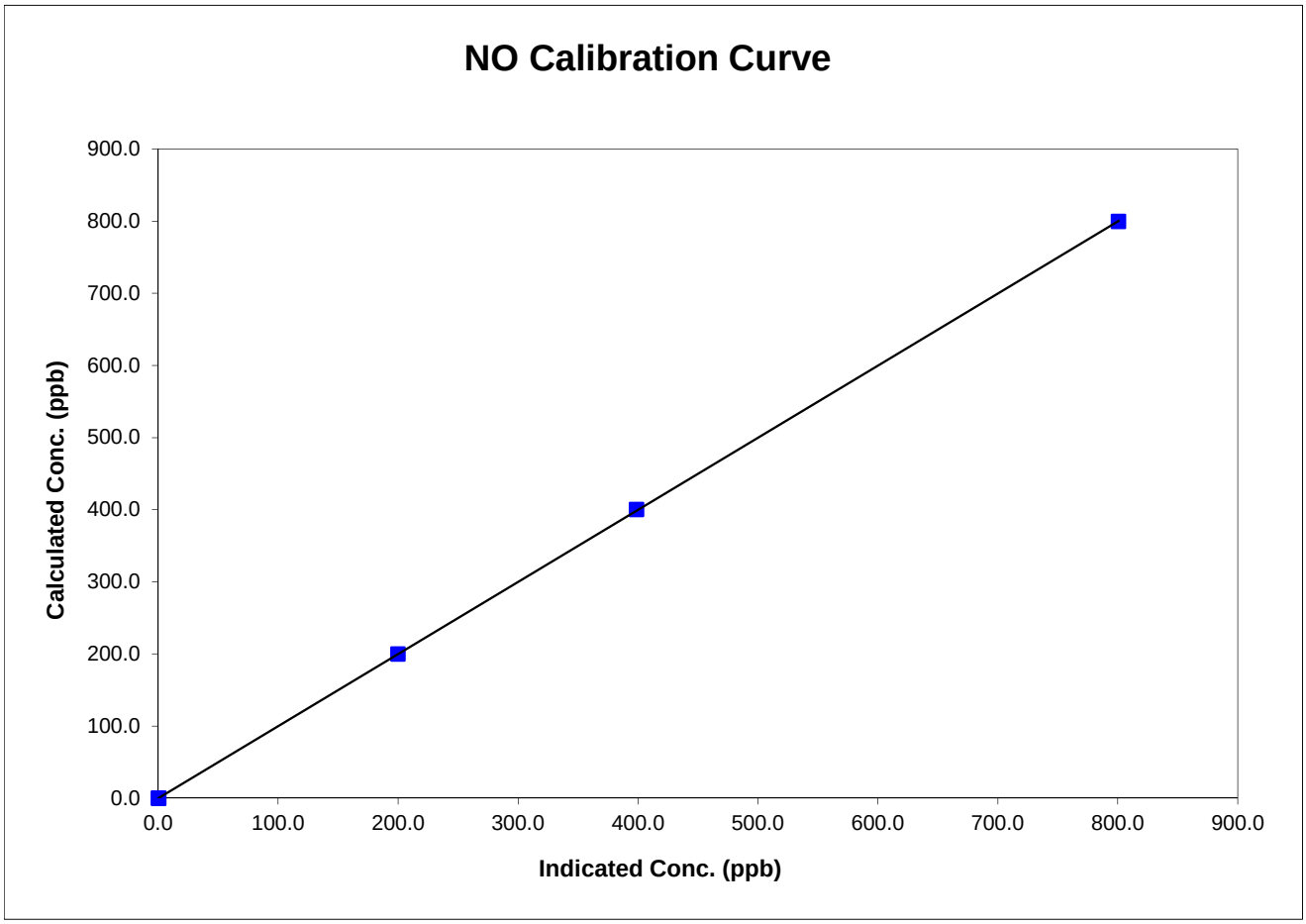
NO Calibration Summary

Station Information

Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Start Time (MST)	6:30	End Time (MST)	10:56
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	0.999993
799.9	800.6	0.9991		
400.4	398.8	1.0039	Slope	0.999994
199.8	199.9	0.9990		
0.0	0.5	0.0000	Intercept	-0.011150



Wood Buffalo Environmental Association

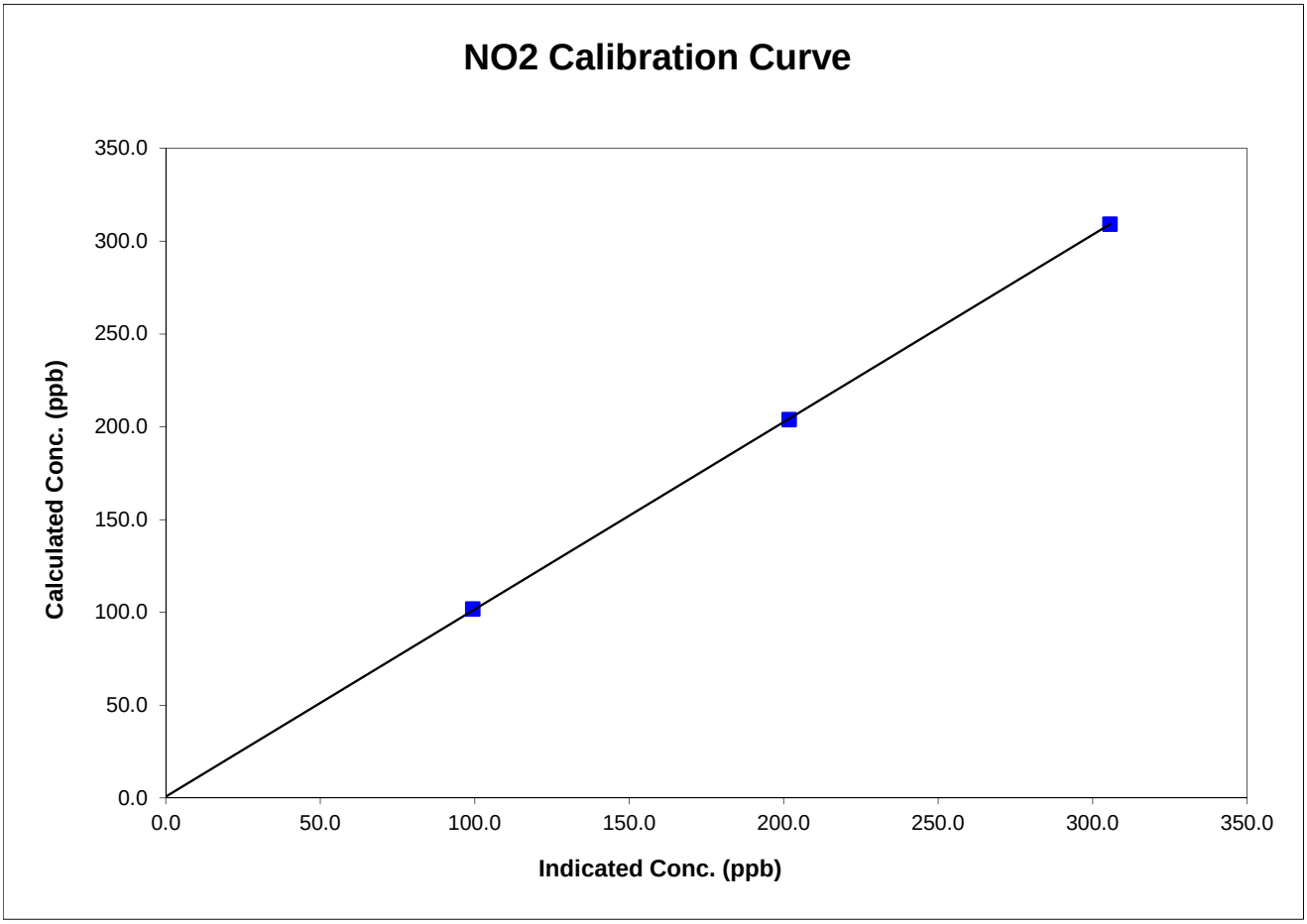
NO_2 Calibration Summary

Station Information

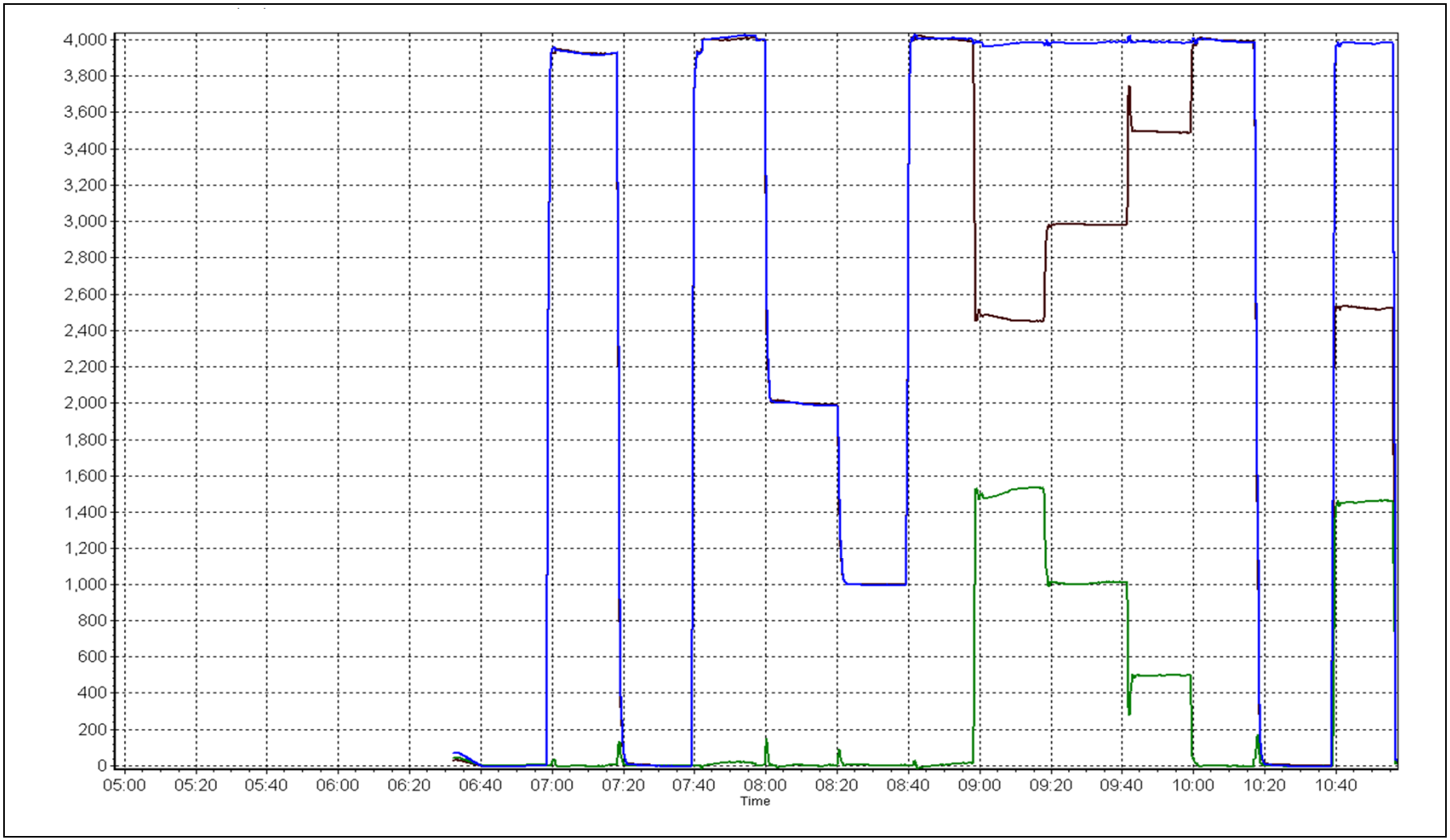
Calibration Date	August 28, 2014	Previous Calibration	July 29, 2014
Station Number	Millenium Mine	Station Number	AMS 12
Start Time (MST)	6:30	End Time (MST)	10:56
Analyzer make	API T200	Analyzer serial #	723

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999982
309.2	305.6	1.0118		
203.8	201.8	1.0099	Slope	1.008579
101.8	99.4	1.0241		
			Intercept	0.835671



NOx, NO & NO_2 Calibration Plot Date: August 28, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 13
FORT MCKAY SOUTH
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS 13)
AUGUST 2014

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	699	38	45	99.06	36	0	5	0
TRS(ppb) Average	703	35	41	99.19	4	0	1	0
THC(ppm) Average	701	37	43	99.19	7.9	-	2.7	-
O3(ppb) Average	703	35	41	99.19	105	2	28	-
NO2(ppb) Average	700	38	44	99.19	36	0	8	-
NO(ppb) Average	700	38	44	99.19	30	-	6	-
NOX(ppb) Average	700	38	44	99.19	47	-	12	-
PM2.5(ug/m3) Average	738	0	6	99.19	617.3	-	137.3	3
Temperature 2 m (C) Average	744	0	0	100.00	31.9	-	23.4	-
Relative Humidity (%) Average	744	0	0	100.00	100	-	92.0	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	14	-	8.0	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS 13)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	699	1.7	4	-	0	0	0	1	1	3	36
TRS(ppb) Average	703	0.4	0	-	0	0	0	0	0	1	4
THC(ppm) Average	701	2.18	0.4	-	1.8	1.9	2	2.1	2.3	2.5	7.9
O3(ppb) Average	703	16.1	15	-	0	0	3	12	26	35	105
NO2(ppb) Average	700	3.1	4	-	0	0	1	2	4	8	36
NO(ppb) Average	700	1.2	3	-	0	0	0	0	1	3	30
NOX(ppb) Average	700	4.3	6	-	0	0	1	2	5	11	47
PM2.5(ug/m3) Average	738	17.33	43.5	-	0.4	2.3	4.5	8.4	14	24	617.3
Temperature 2 m (C) Average	744	16.23	7.4	-	-2	7.3	11.1	15.6	21.6	27.1	31.9
Relative Humidity (%) Average	744	72.7	23	-	21	39	52	78	94	98	100
Wind Speed 10 m (km/h) Average	743	4.1	3	-	0	1	2	3	6	8	14
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -FORT McKAY SOUTH (AMS 13)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	19 Aug 2014 12:00	19 Aug 2014 13:00	2	Maintenance - cleaned glass manifold
AIR QUALITY ANALYZERS	19 Aug 2014 14:00	19 Aug 2014 18:00	5	Station power failure
Wind Speed, Wind Direction	13 Aug 2014 07:00	13 Aug 2014 07:00	1	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 36 ppb on Aug 6 12:00 Maximum Daily Average: 4.9 ppb on Aug 29

Minimum Value: 0 ppb on Aug 11 04:00 Minimum Daily Average: 0.1 ppb on Aug 11
Maximum Diurnal Average: 5.4 ppb at hour 12 Minimum Diurnal Average: 0.3 ppb at hour 5
Monthly Average: 1.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 25$

Hours in Service:	744
Hours of Data:	699
Hours of Missing Data:	45
Hours of Calibration:	38
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-Aug	1	Z	1	0	0	0	1	0	0	0	0	1	2	2	2	1	3	20	29	11	2	1	0	0	3.4	29
2-Aug	0	Z	0	0	0	0	0	2	17	13	9	10	2	1	1	1	0	0	1	1	1	0	0	0	2.6	17
3-Aug	0	Z	0	0	0	1	1	1	1	6	5	9	6	7	6	16	30	16	2	2	1	1	1	1	4.8	30
4-Aug	1	Z	1	0	0	0	0	1	1	1	2	1	1	1	1	1	1	0	1	1	0	0	0	0	0.7	2
5-Aug	0	Z	0	0	0	0	0	0	2	4	9	29	8	2	13	6	3	3	1	1	1	1	1	1	3.8	29
6-Aug	0	Z	0	0	0	0	1	3	6	3	23	36	2	1	1	1	4	3	1	1	1	1	1	1	4.0	36
7-Aug	1	Z	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0.5	1
8-Aug	0	Z	0	0	0	0	0	1	1	7	3	2	1	2	3	2	1	1	1	1	1	1	1	1	1.3	7
9-Aug	1	Z	1	0	1	0	0	1	3	2	1	1	2	2	1	0	0	1	0	0	0	0	0	0	0.9	3
10-Aug	0	Z	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
11-Aug	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
12-Aug	0	Z	0	0	0	0	0	0	5	7	28	10	11	7	5	4	3	3	3	1	1	1	1	2	4.0	28
13-Aug	1	Z	1	1	0	0	1	1	6	18	13	5	2	2	2	2	2	1	1	1	1	1	1	0	2.7	18
14-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	4	2	1	1	0	0	0	1.0	9
15-Aug	0	Z	0	0	0	0	0	0	1	2	2	1	1	5	1	1	1	1	1	0	0	0	0	0	0.9	5
16-Aug	0	Z	0	0	0	0	0	1	1	1	2	2	1	7	23	1	1	1	1	1	1	0	1	1	1.9	23
17-Aug	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
18-Aug	0	Z	0	0	0	1	1	0	0	C	C	C	C	C	C	C	1	1	1	1	0	1	1	1	--	1
19-Aug	1	Z	1	1	1	1	1	0	1	1	1	M	M	PF	PF	PF	PF	PF	0	1	1	1	1	1	--	1
20-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0.7	1
21-Aug	1	Z	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0.7	1
22-Aug	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
23-Aug	0	Z	0	0	0	0	0	0	0	1	2	4	11	9	7	8	3	1	1	1	1	0	0	0	2.4	11
24-Aug	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	2	4	2	1	1	1	1	0	0	0	0.8	4
25-Aug	0	Z	1	0	0	0	0	0	1	2	8	11	5	1	1	1	1	1	2	3	5	16	11	6	3.4	16
26-Aug	5	Z	3	1	1	1	1	1	1	1	2	4	1	2	21	4	1	1	1	1	1	0	0	0	2.2	21
27-Aug	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.3	1
28-Aug	0	Z	1	0	0	0	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0.5	1
29-Aug	1	Z	0	0	0	0	1	1	7	13	32	26	5	3	6	3	5	3	2	1	1	1	1	0	4.9	32
30-Aug	1	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0.4	2
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.2	1
	0.5	--	0.5	0.4	0.3	0.4	0.4	0.6	1.9	2.9	5.0	5.4	2.3	2.1	3.4	2.1	2.5	2.2	1.8	1.1	0.8	1.0	0.8	0.6	Diurnal Average	
	5	--	3	1	1	1	1	3	17	18	32	36	11	9	23	16	30	20	29	11	5	16	11	6	Diurnal Maximum	

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

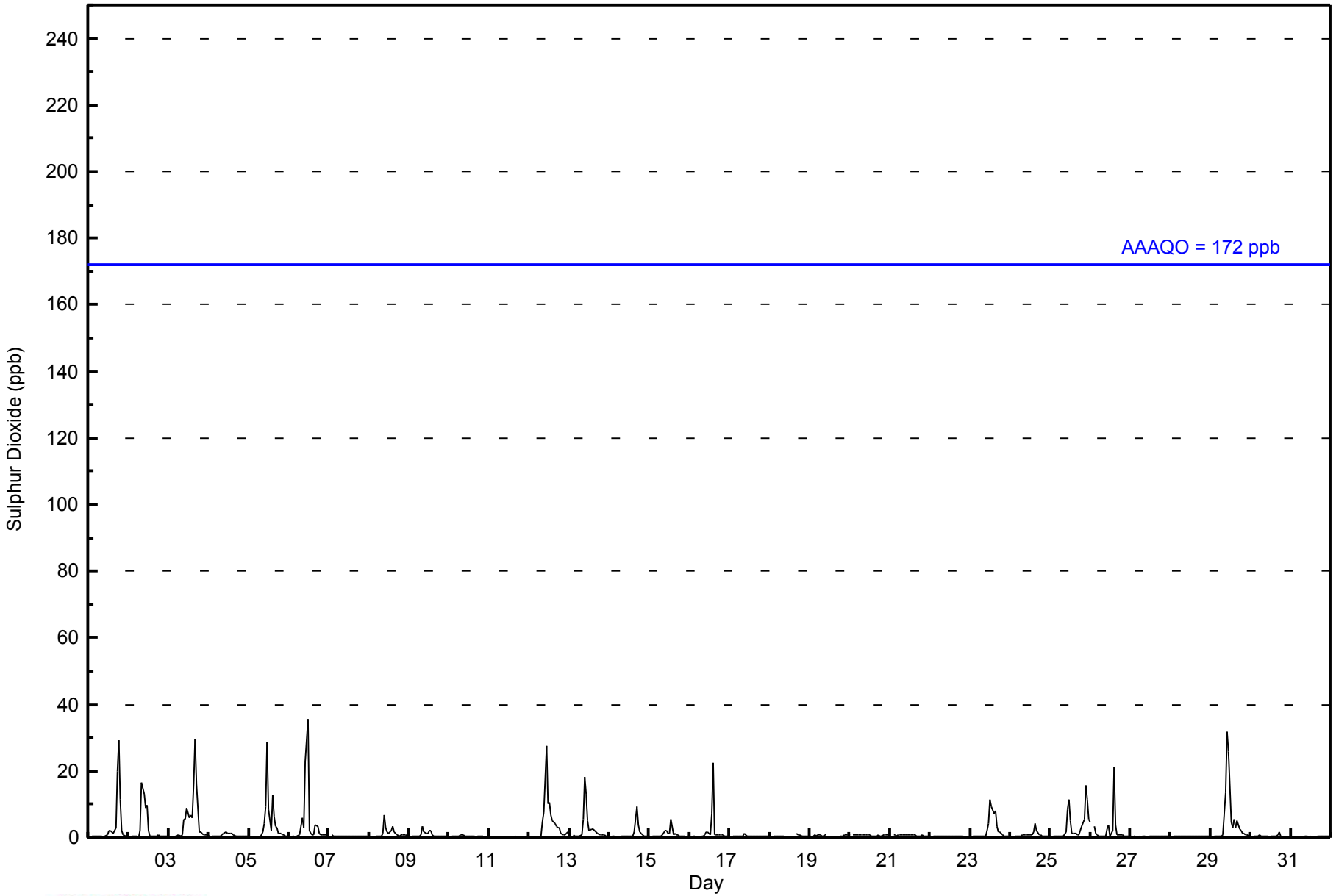
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - August 2014



AURORA ATMOSPHERICS INC.

WBEA

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	674	96.42	96.42
11 - 20	15	2.15	98.57
21 - 60	10	1.43	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: 699

Total Number of Hours: 744

AURORA
ATMOSPHERICS INC.

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - August 2014

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	34	20	3	11	22	31	37	73	104	90	62	22	29	41	40	673
11 - 20	0	0	0	0	0	2	3	6	4	0	0	0	0	0	0	0	15
21 - 60	0	0	0	0	0	1	5	4	0	0	0	0	0	0	0	0	10
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	34	20	3	11	25	39	47	77	104	90	62	22	29	41	40	698

Total Number of Valid Hours: 698

Total Number of Hours: 744

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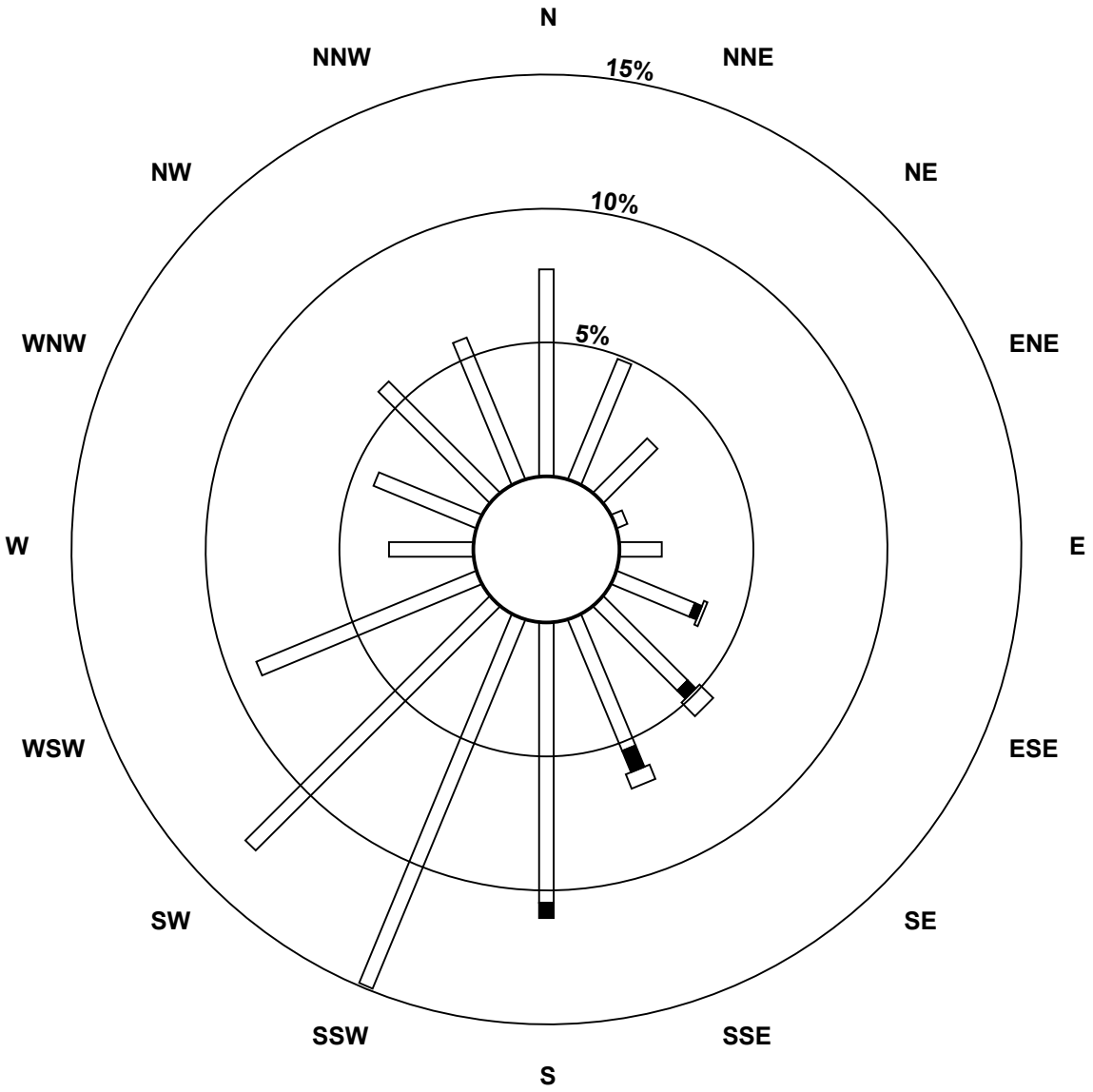
ATMOSPHERICS INC.

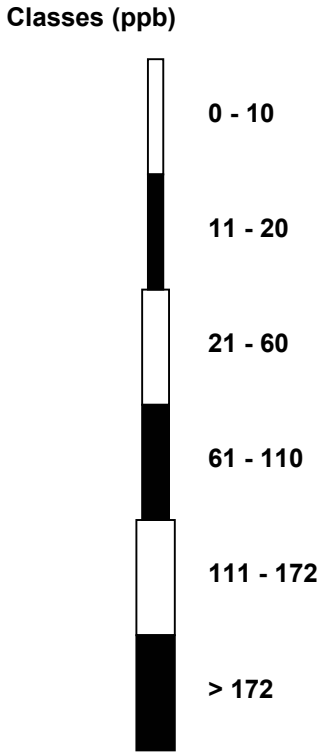
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Fort McKay South (AMS 13)





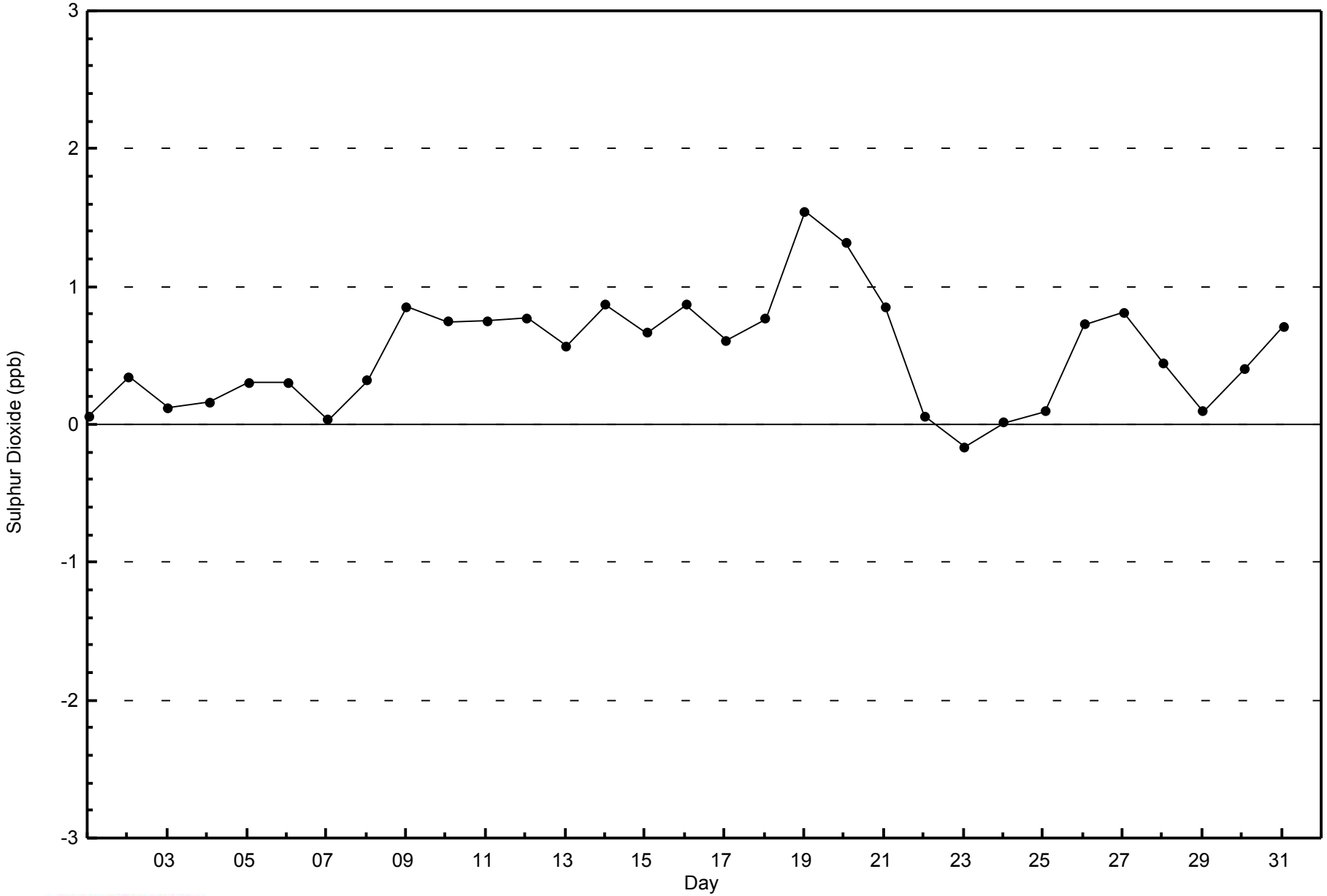
Total Number of Valid Hours: 698

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - August 2014



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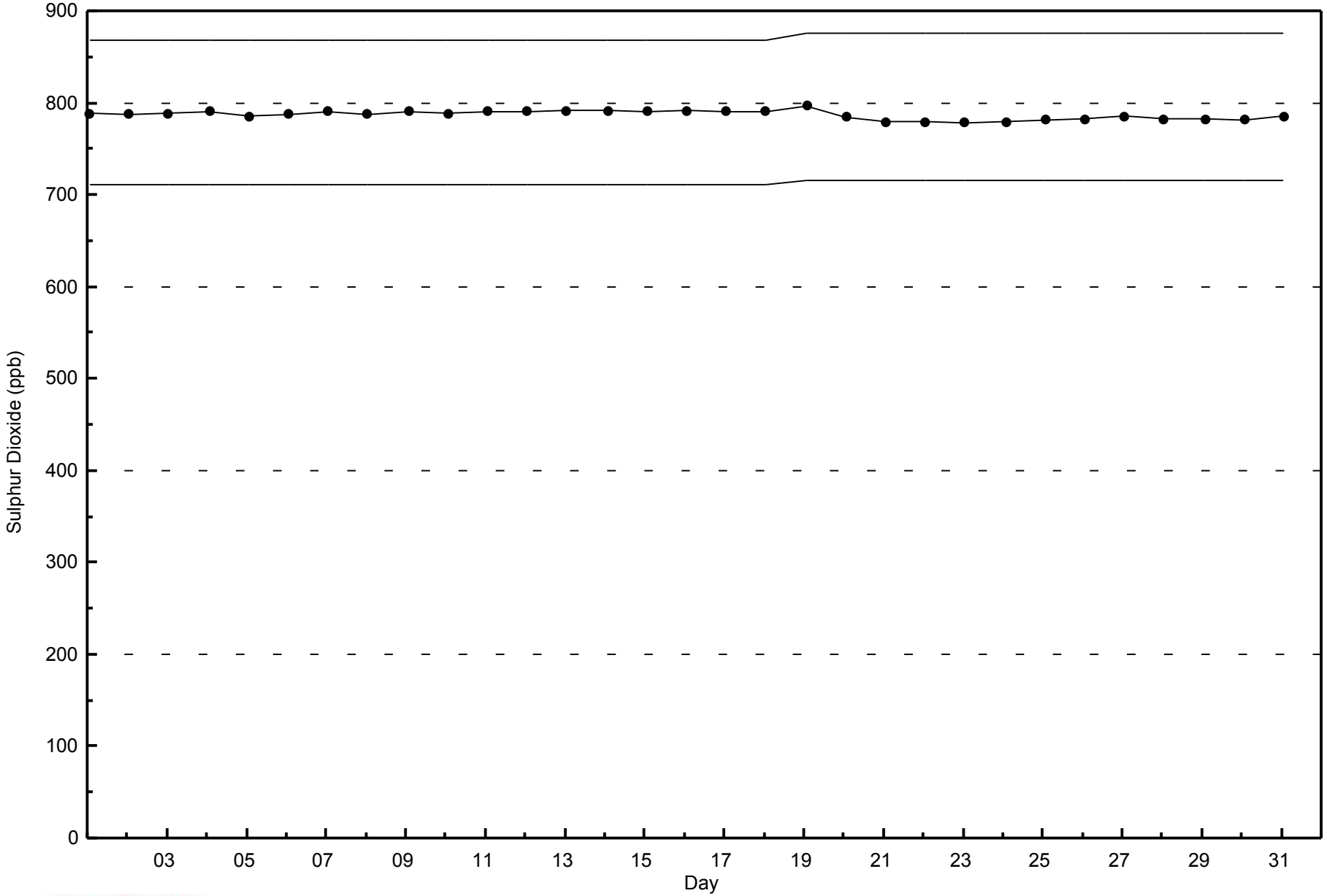
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 ppb on Aug 25 09:00 Maximum Daily Average: 1.1 ppb on Aug 25

Minimum Value: 0 ppb on Aug 29 05:00 Minimum Daily Average: 0.1 ppb on Aug 31
Maximum Diurnal Average: 0.7 ppb at hour 11 Minimum Diurnal Average: 0.2 ppb at hour 17
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	35
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-Aug	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.5	1
2-Aug	0	0	Z	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
3-Aug	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Aug	0	0	Z	0	0	0	0	1	1	2	2	2	3	2	2	1	0	0	0	0	1	1	1	0	0.8	3
5-Aug	0	0	Z	0	0	0	0	0	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0.5	2
6-Aug	1	1	Z	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
7-Aug	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
8-Aug	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Aug	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
10-Aug	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
11-Aug	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
12-Aug	0	0	Z	0	0	0	0	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	1	2	0.6	2
13-Aug	3	3	Z	2	2	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	3
14-Aug	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
15-Aug	0	0	Z	0	0	0	0	1	1	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Aug	0	0	Z	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.3	1
17-Aug	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
18-Aug	0	0	Z	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
19-Aug	0	0	Z	0	0	0	0	0	0	0	0	M	M	PF	PF	PF	PF	0	0	0	0	0	0	0	--	0
20-Aug	0	0	Z	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
21-Aug	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
22-Aug	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
23-Aug	0	0	Z	0	0	0	0	0	0	1	2	4	1	1	0	0	1	0	1	1	1	0	0	0	0.6	4
24-Aug	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
25-Aug	1	1	Z	2	2	2	1	1	4	2	1	0	0	0	0	0	0	0	0	1	1	1	1	2	1.1	4
26-Aug	2	2	Z	2	2	1	1	1	0	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0.8	2
27-Aug	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
28-Aug	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
29-Aug	0	0	Z	0	0	0	0	1	2	2	2	2	1	0	0	0	0	0	0	1	1	3	2	1	0.9	3
30-Aug	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
31-Aug	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
	0.4	0.4	--	0.4	0.4	0.4	0.3	0.5	0.7	0.6	0.7	0.7	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	Diurnal Average	
	3	3	--	2	2	2	1	2	4	2	2	4	3	2	2	1	1	0	1	1	1	3	2	2	Diurnal Maximum	

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

AURORA ATMOSPHERICS INC.

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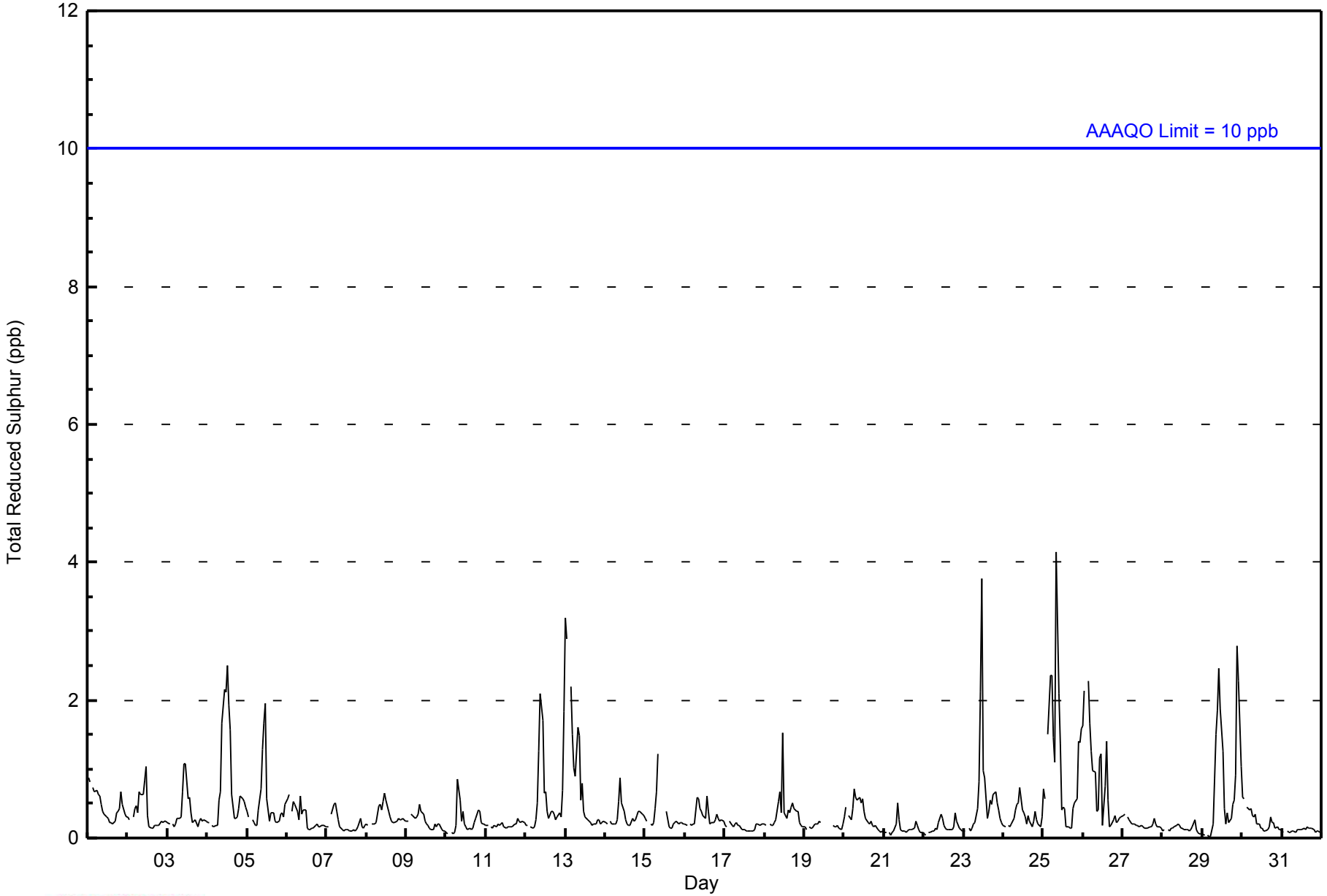
Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - August 2014



AURORA
ATMOSPHERICS INC.

WBEA

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	697	99.15	99.15
3 - 4	6	0.85	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

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ATMOSPHERICS INC.

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	54	34	19	3	8	26	40	47	74	98	96	63	22	31	41	40	696
3 - 4	1	0	0	0	1	0	0	1	3	0	0	0	0	0	0	0	6
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	34	19	3	9	26	40	48	77	98	96	63	22	31	41	40	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

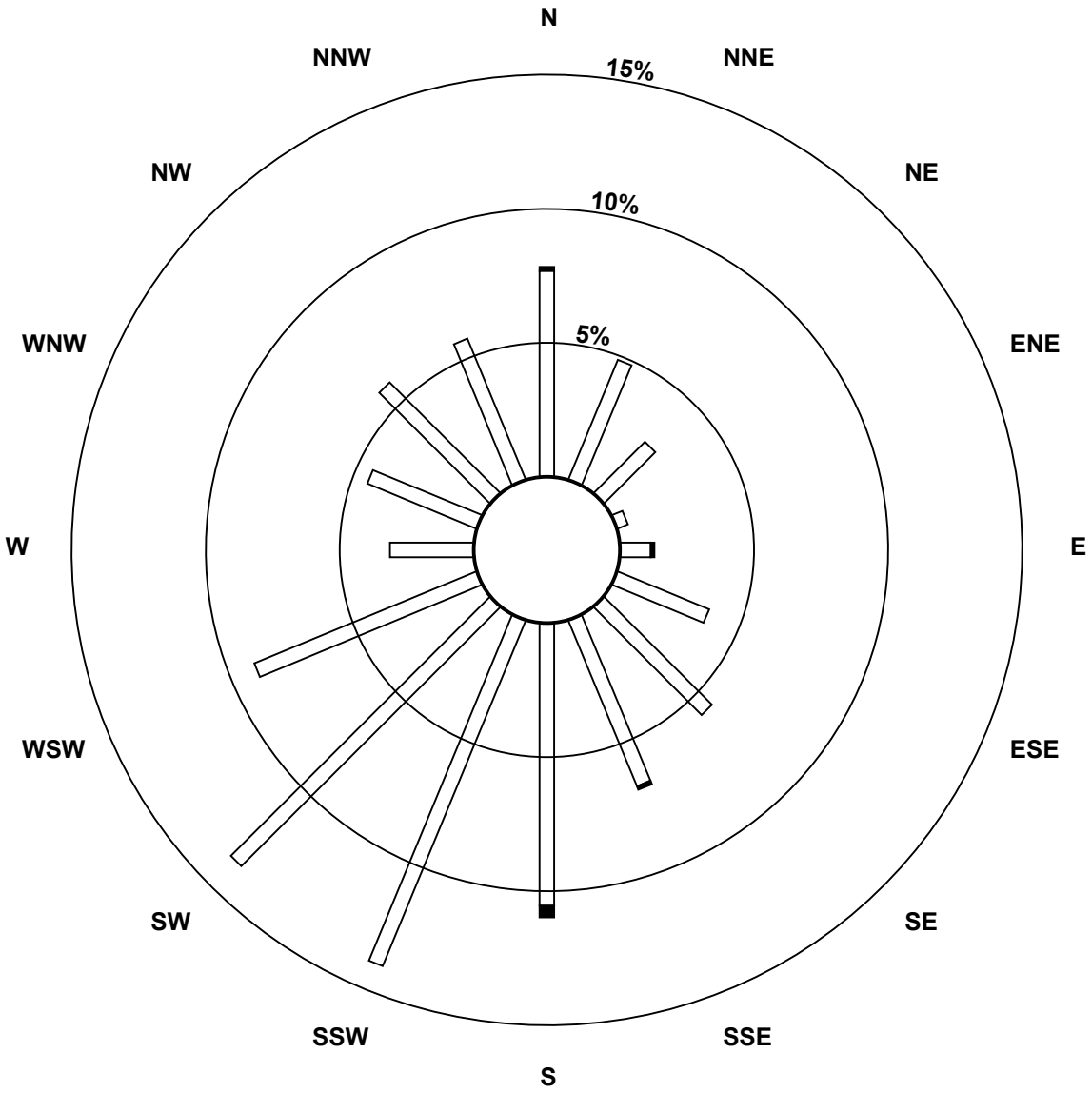
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

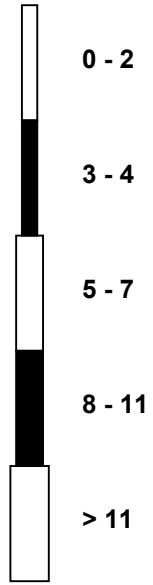
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



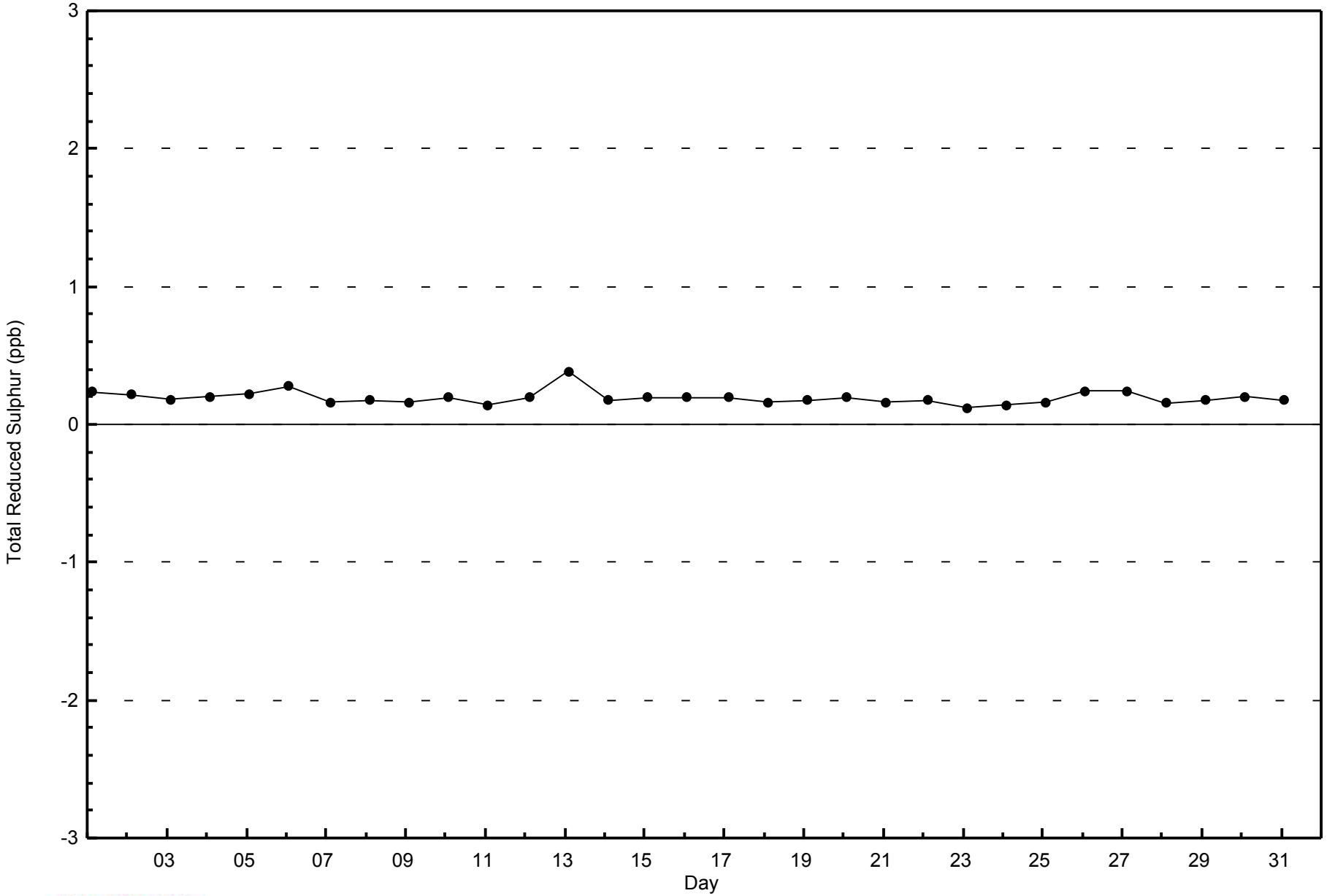
Total Number of Valid Hours: 702

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - August 2014



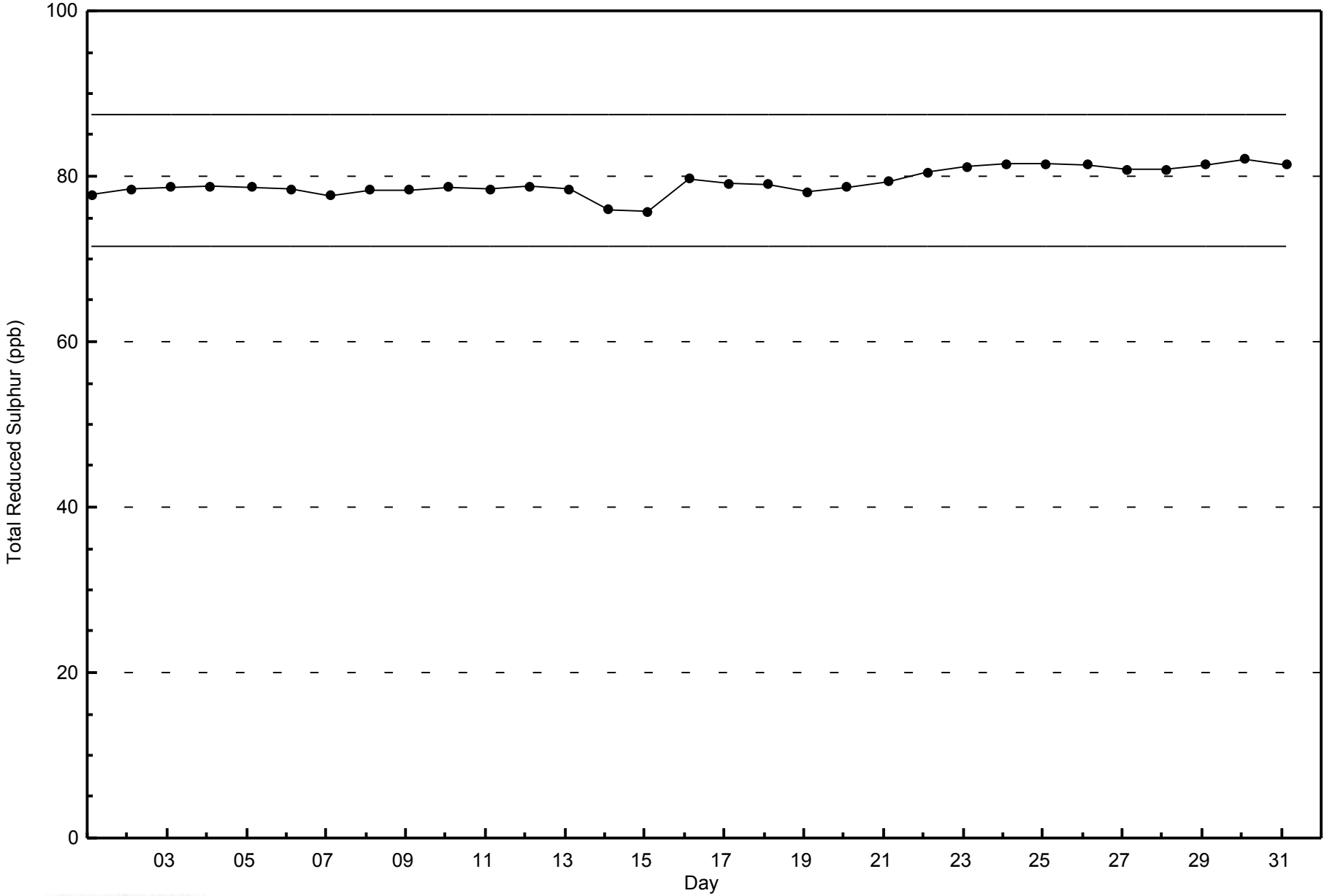
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - August 2014

Maximum Value: 7.9 ppm on Aug 16 08:00

Maximum Daily Average: 2.7 ppm on Aug 16

Minimum Value: 1.8 ppm on Aug 11 16:00

Minimum Daily Average: 2.0 ppm on Aug 28

Maximum Diurnal Average: 2.5 ppm at hour 8

Minimum Diurnal Average: 2.0 ppm at hour 16

Monthly Average: 2.18 ppm

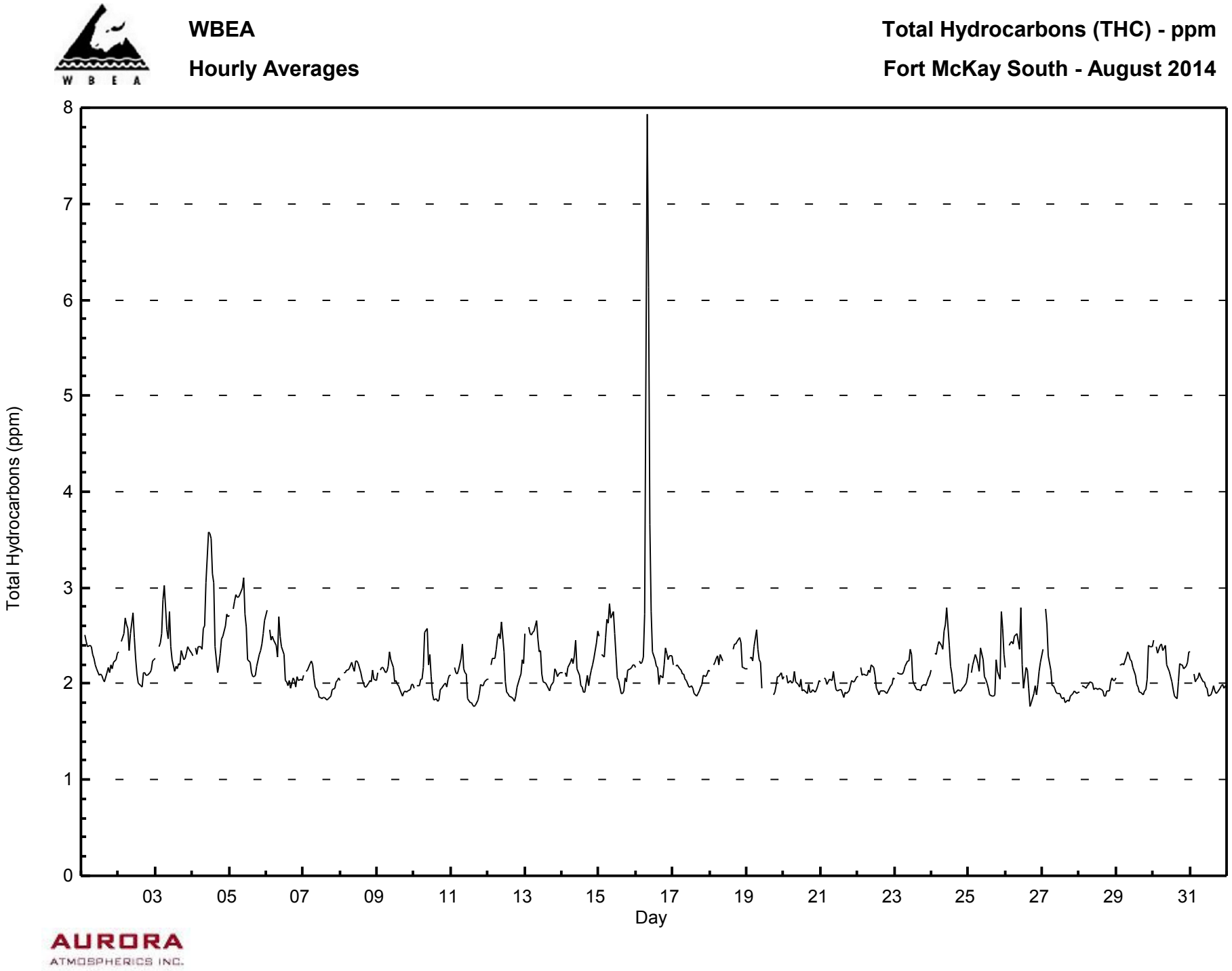
Percentiles: P_1 = 1.8 P_{10} = 1.9 Q_1 = 2.0 Median = 2.1 Q_3 = 2.3 P_{90} = 2.5 P_{99} = 3.0

Hours in Service:	744
Hours of Data:	701
Hours of Missing Data:	43
Hours of Calibration:	37
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-Aug	2.4	Z	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.5
2-Aug	2.3	Z	2.4	2.5	2.7	2.6	2.6	2.3	2.5	2.7	2.5	2.3	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.7
3-Aug	2.3	Z	2.4	2.4	2.5	2.9	3.0	2.6	2.5	2.8	2.4	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.4	2.3	2.4	3.0
4-Aug	2.3	Z	2.4	2.3	2.4	2.4	2.4	2.6	2.6	3.0	3.6	3.6	3.5	3.1	3.1	2.4	2.1	2.2	2.3	2.5	2.5	2.6	2.7	2.7	2.7	3.6
5-Aug	2.7	Z	2.8	2.9	2.9	2.9	2.9	2.9	3.0	3.1	2.7	2.6	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.7	2.6	3.1
6-Aug	2.8	Z	2.6	2.5	2.5	2.5	2.4	2.3	2.7	2.5	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.2	2.8
7-Aug	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.1	2.0	1.9	1.9	1.9	1.8	1.9	1.9	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.2
8-Aug	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2
9-Aug	2.1	Z	2.1	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.3
10-Aug	2.0	Z	2.0	2.0	2.1	2.1	2.2	2.5	2.6	2.2	2.3	2.1	1.9	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.6
11-Aug	2.1	Z	2.2	2.1	2.1	2.1	2.3	2.4	2.2	2.1	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.4
12-Aug	2.0	Z	2.2	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.3	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.9	2.0	2.1	2.1	2.2	2.2	2.1	2.6
13-Aug	2.5	Z	2.6	2.5	2.5	2.5	2.5	2.7	2.5	2.3	2.3	2.1	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.2	2.7
14-Aug	2.1	Z	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.5	2.2	2.1	2.0	2.0	1.9	1.9	2.1	2.0	2.1	2.1	2.2	2.3	2.4	2.5	2.2	2.5
15-Aug	2.5	Z	2.3	2.3	2.5	2.7	2.6	2.8	2.7	2.8	2.5	2.3	2.1	2.0	1.9	1.9	1.9	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.3	2.8
16-Aug	2.2	Z	2.2	2.2	2.2	2.3	2.7	7.9	6.1	3.7	2.7	2.3	2.2	2.2	2.2	2.0	2.1	2.1	2.2	2.4	2.3	2.2	2.3	2.3	2.7	7.9
17-Aug	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.2
18-Aug	2.1	Z	2.2	2.2	2.3	2.3	2.2	2.3	2.2	C	C	C	C	C	C	2.4	2.4	2.4	2.4	2.5	2.4	2.2	2.2	2.1	--	2.5
19-Aug	2.2	Z	2.3	2.3	2.2	2.4	2.6	2.4	2.2	2.2	2.0	M	M	PF	PF	PF	PF	1.9	1.9	2.0	2.1	2.1	2.1	2.0	--	2.6
20-Aug	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
21-Aug	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.1
22-Aug	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.2
23-Aug	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.4	2.3	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.4
24-Aug	2.1	Z	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.6	2.8	2.4	2.2	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.8
25-Aug	2.2	Z	2.1	2.2	2.3	2.3	2.2	2.1	2.4	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	2.3	2.1	2.0	2.7	2.6	2.3	2.2	2.7
26-Aug	2.2	Z	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.8	2.2	1.9	2.2	2.1	2.0	1.8	1.8	1.9	2.0	1.9	2.0	2.1	2.2	2.2	2.8
27-Aug	2.4	Z	2.8	2.6	2.3	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.8
28-Aug	1.9	Z	2.0	2.0	2.0	2.0	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	1.9	2.0	2.1	2.0	2.0	2.0	2.1
29-Aug	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.4	2.4	2.4	2.1	2.4
30-Aug	2.5	Z	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.2	2.1	2.1	2.0	1.9	1.9	1.8	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.5
31-Aug	2.3	Z	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.3
	2.2	--	2.3	2.3	2.3	2.3	2.3	2.5	2.4	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	Diurnal Average	
	2.8	--	2.8	2.9	2.9	2.9	3.0	7.9	6.1	3.7	3.6	3.6	3.5	3.1	3.1	2.4	2.4	2.4	2.4	2.5	2.5	2.7	2.7	2.7	Diurnal Maximum	

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

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Total Hydrocarbons (THC) - ppm
Fort McKay South - August 2014
Total Hydrocarbons (ppm)
0
1
2
3
4
5
6
7
8
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
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WBEA

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay South - August 2014

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	280	39.94	39.94
2.1 - 3.0	412	58.77	98.72
3.1 - 10.0	9	1.28	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744

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Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay South - August 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2.0	32	11	5	2	4	10	11	11	20	33	37	38	10	15	25	16	280
2.1 - 3.0	17	23	15	1	6	15	28	36	57	71	53	24	12	14	16	23	411
3.1 - 10.0	7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	9
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	34	20	3	11	25	39	47	77	104	90	62	22	29	41	40	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

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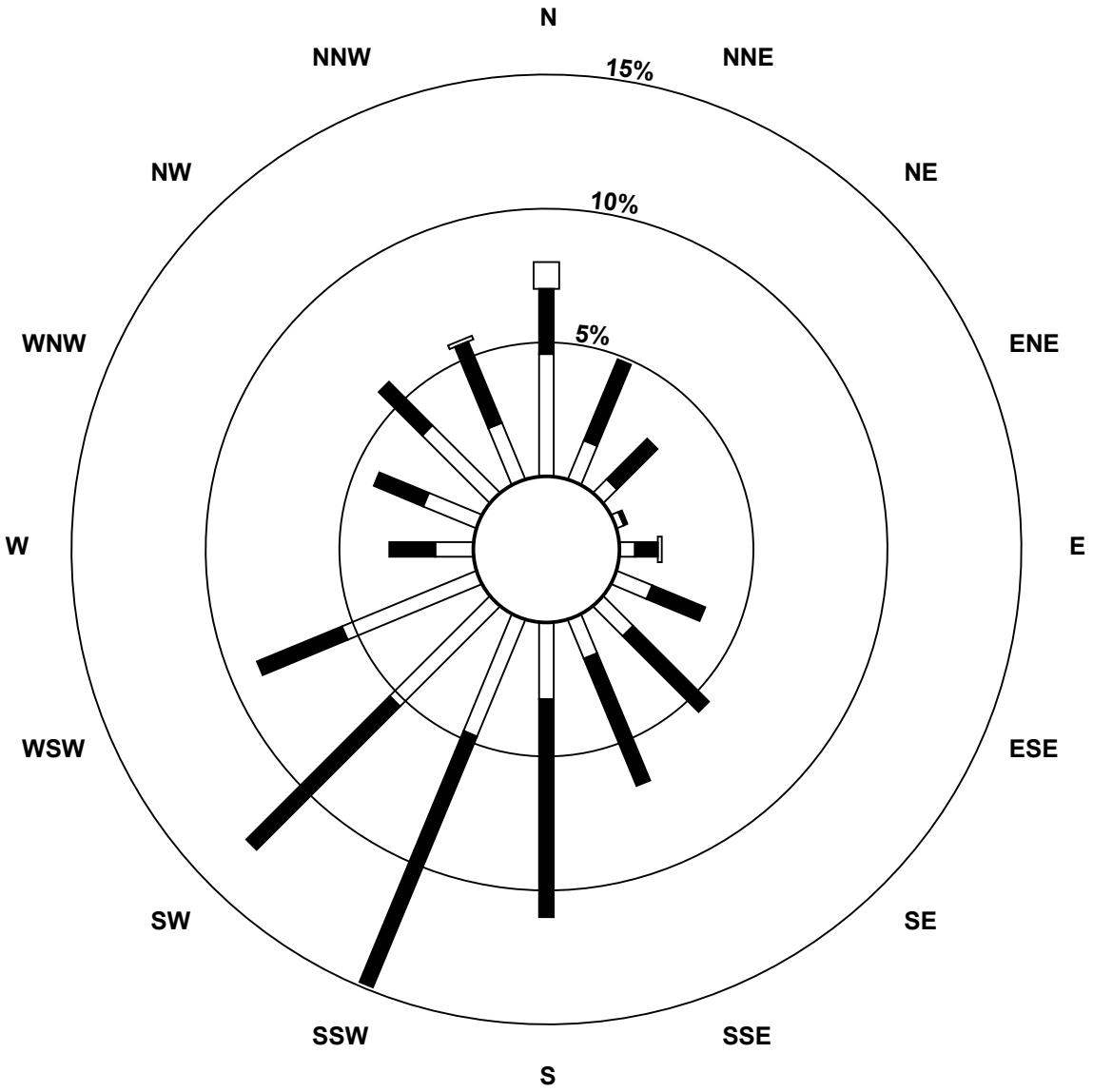
Wood Buffalo Environmental Association

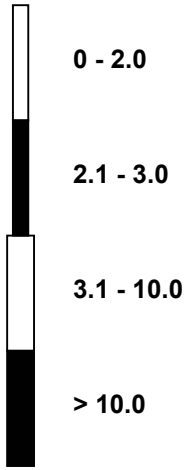
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Fort McKay South (AMS 13)



Classes (ppm)



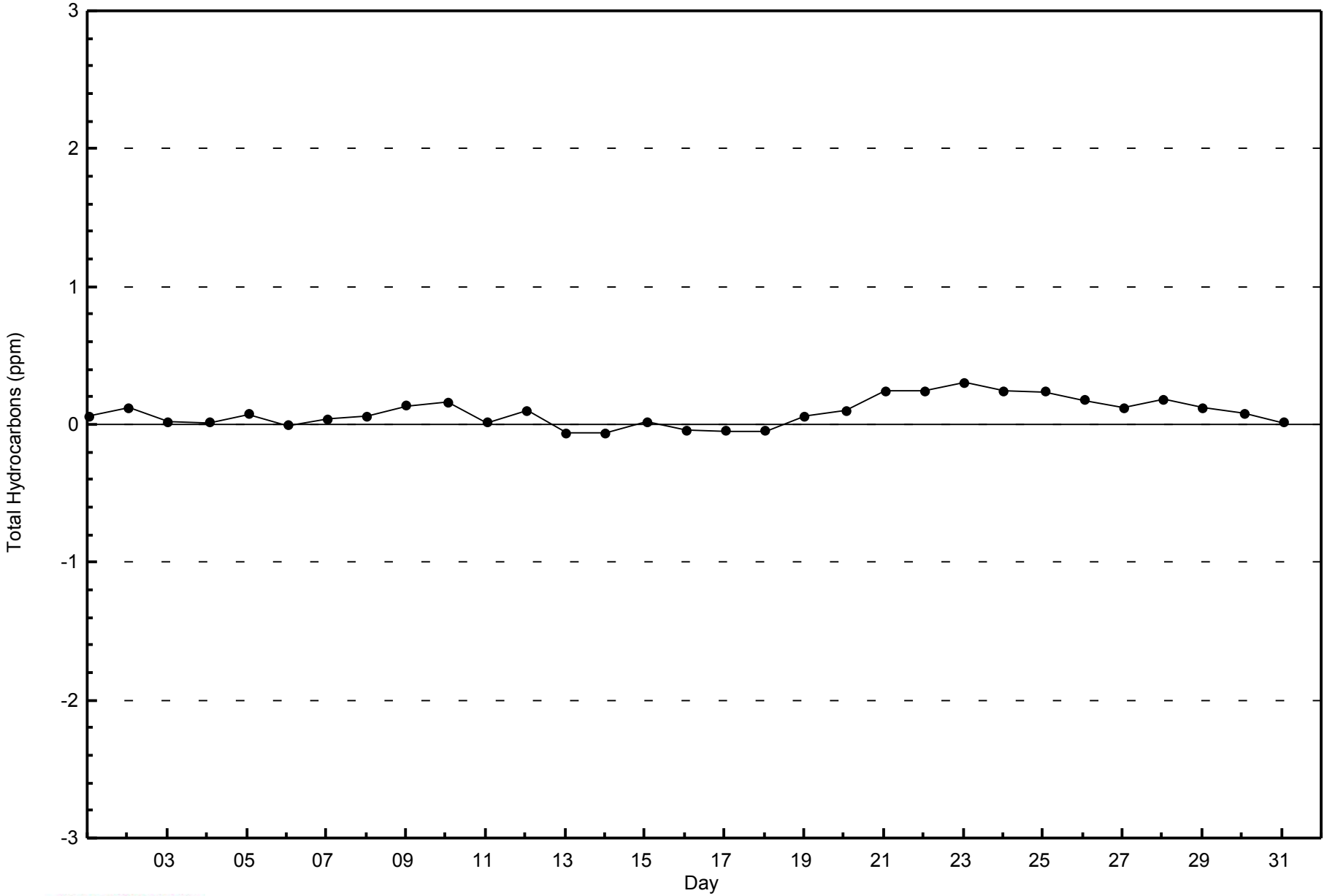
Total Number of Valid Hours: 700

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - August 2014



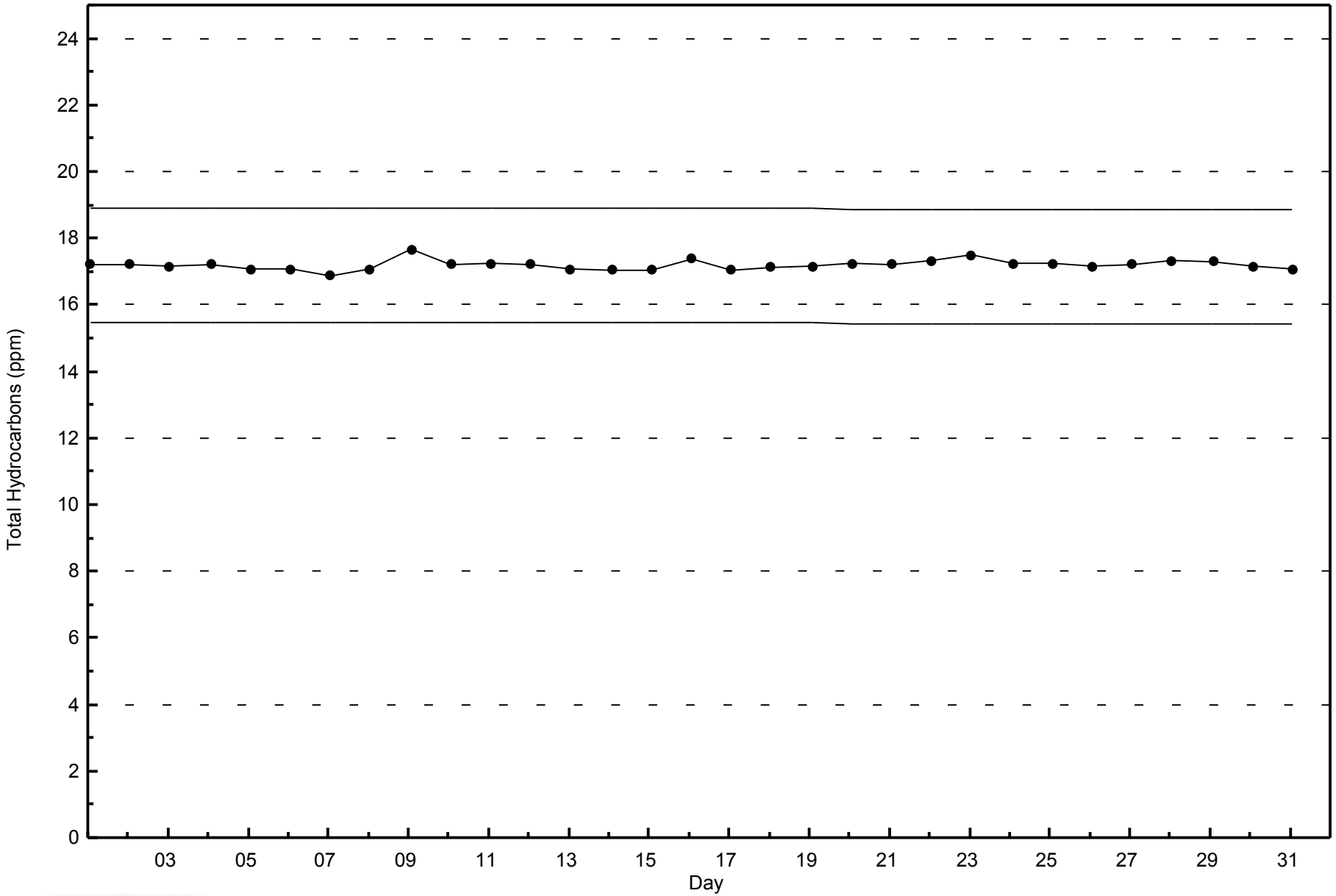
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 1-hr: 2 24-hr: 0
Maximum Value: 105 ppb on Aug 4 12:00 Maximum Daily Average: 27.5 ppb on Aug 4

Minimum Value: 0 ppb on Aug 3 04:00 Minimum Daily Average: 8.8 ppb on Aug 9
Maximum Diurnal Average: 34.4 ppb at hour 16 Minimum Diurnal Average: 2.6 ppb at hour 5
Monthly Average: 16.1 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 3$ Median = 12 $Q_3 = 26$ $P_{90} = 35$ $P_{99} = 59$

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	35
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-Aug	9	9	Z	9	9	9	12	15	20	23	24	23	25	26	27	28	31	31	26	13	5	2	1	1	16.4	31
2-Aug	1	0	Z	0	0	0	1	11	14	21	28	35	34	33	34	34	33	36	31	35	26	15	5	2	18.7	36
3-Aug	1	1	Z	0	0	0	2	13	23	33	45	54	50	56	54	54	51	34	26	14	6	3	3	2	22.9	56
4-Aug	1	0	Z	0	0	1	4	8	21	36	67	105	94	M	M	77	52	44	26	15	11	7	5	3	27.5	105
5-Aug	1	0	Z	0	0	0	0	4	14	23	41	52	61	73	64	59	56	59	39	22	12	8	6	5	26.1	73
6-Aug	3	7	Z	5	4	2	11	19	24	24	34	41	46	46	46	40	42	40	34	31	28	27	27	26	26.4	46
7-Aug	24	25	Z	23	21	19	20	21	23	24	25	26	27	27	29	30	29	28	27	22	13	13	16	13	22.8	30
8-Aug	11	6	Z	4	2	1	5	9	11	19	25	28	31	34	36	33	30	26	21	14	11	8	5	6	16.3	36
9-Aug	5	5	Z	5	5	5	5	4	4	7	11	15	18	20	21	22	17	12	17	5	1	0	0	0	8.8	22
10-Aug	0	0	Z	0	0	0	0	1	3	8	14	22	27	28	29	28	23	12	8	5	3	4	7	8	10.0	29
11-Aug	4	3	Z	1	0	0	0	2	11	14	18	22	21	20	19	19	21	21	19	13	7	3	1	1	10.5	22
12-Aug	1	0	Z	0	0	0	2	6	12	17	22	26	27	32	31	29	27	26	24	15	6	5	3	6	13.8	32
13-Aug	6	4	Z	0	0	0	1	5	12	20	31	34	39	45	48	46	44	41	35	14	10	22	16	6	20.8	48
14-Aug	7	13	Z	6	4	2	4	13	16	22	35	50	57	53	46	45	54	42	26	17	8	3	0	0	22.8	57
15-Aug	0	0	Z	0	0	0	1	4	17	35	47	50	48	54	31	35	29	22	23	21	13	6	5	5	19.3	54
16-Aug	4	6	Z	2	2	1	1	16	15	19	29	38	46	44	37	33	35	26	18	9	6	8	6	7	17.7	46
17-Aug	15	15	Z	5	4	7	10	18	25	35	34	37	38	38	36	35	35	34	32	21	12	9	7	6	22.1	38
18-Aug	6	4	Z	2	1	1	2	4	6	4	9	12	25	31	36	36	30	17	12	8	3	4	0	0	10.9	36
19-Aug	1	0	Z	0	0	0	0	3	5	C	C	C	C	PF	PF	PF	PF	22	14	2	3	2	1	6	--	22
20-Aug	7	2	Z	9	10	11	10	7	8	9	12	10	13	14	15	14	14	16	14	9	3	3	2	1	9.2	16
21-Aug	2	3	Z	1	0	1	1	8	13	21	27	29	30	30	30	29	28	28	27	13	5	3	2	1	14.5	30
22-Aug	1	1	Z	1	1	0	2	5	6	8	14	23	34	31	32	31	31	30	23	12	6	3	2	1	13.0	34
23-Aug	1	0	Z	0	0	0	0	1	3	6	8	19	35	39	41	40	39	38	27	17	11	8	6	4	14.9	41
24-Aug	3	2	Z	0	0	0	1	3	2	2	5	16	22	26	33	34	32	31	17	10	5	2	1	0	10.7	34
25-Aug	1	4	Z	5	4	2	4	8	10	13	21	26	31	33	38	36	36	34	31	25	23	21	20	17	19.3	38
26-Aug	18	15	Z	7	3	1	1	6	8	12	16	24	26	32	38	35	28	30	29	15	21	14	8	2	16.8	38
27-Aug	0	0	Z	0	3	4	11	12	14	18	19	24	27	30	31	32	33	25	18	7	3	10	20	6	15.0	33
28-Aug	3	4	Z	7	4	8	6	9	11	14	21	25	25	25	26	26	27	27	12	5	2	1	0	0	12.6	27
29-Aug	0	0	Z	0	0	0	0	3	9	14	16	21	29	30	30	32	33	30	20	12	10	8	4	2	13.2	33
30-Aug	1	1	Z	0	0	7	2	2	8	14	14	15	23	32	31	22	25	17	3	4	1	3	2	2	10.0	32
31-Aug	0	2	Z	6	3	1	1	7	11	13	21	24	22	9	17	14	18	16	6	3	1	2	5	1	8.9	24
	4.4	4.3	--	3.2	2.6	2.7	3.9	8.0	12.2	17.6	24.4	30.8	34.2	34.2	34.1	34.4	32.8	29.0	22.1	13.8	8.8	7.3	6.0	4.5	Diurnal Average	
	24	25	--	23	21	19	20	21	25	36	67	105	94	73	64	77	56	59	39	35	28	27	27	26	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

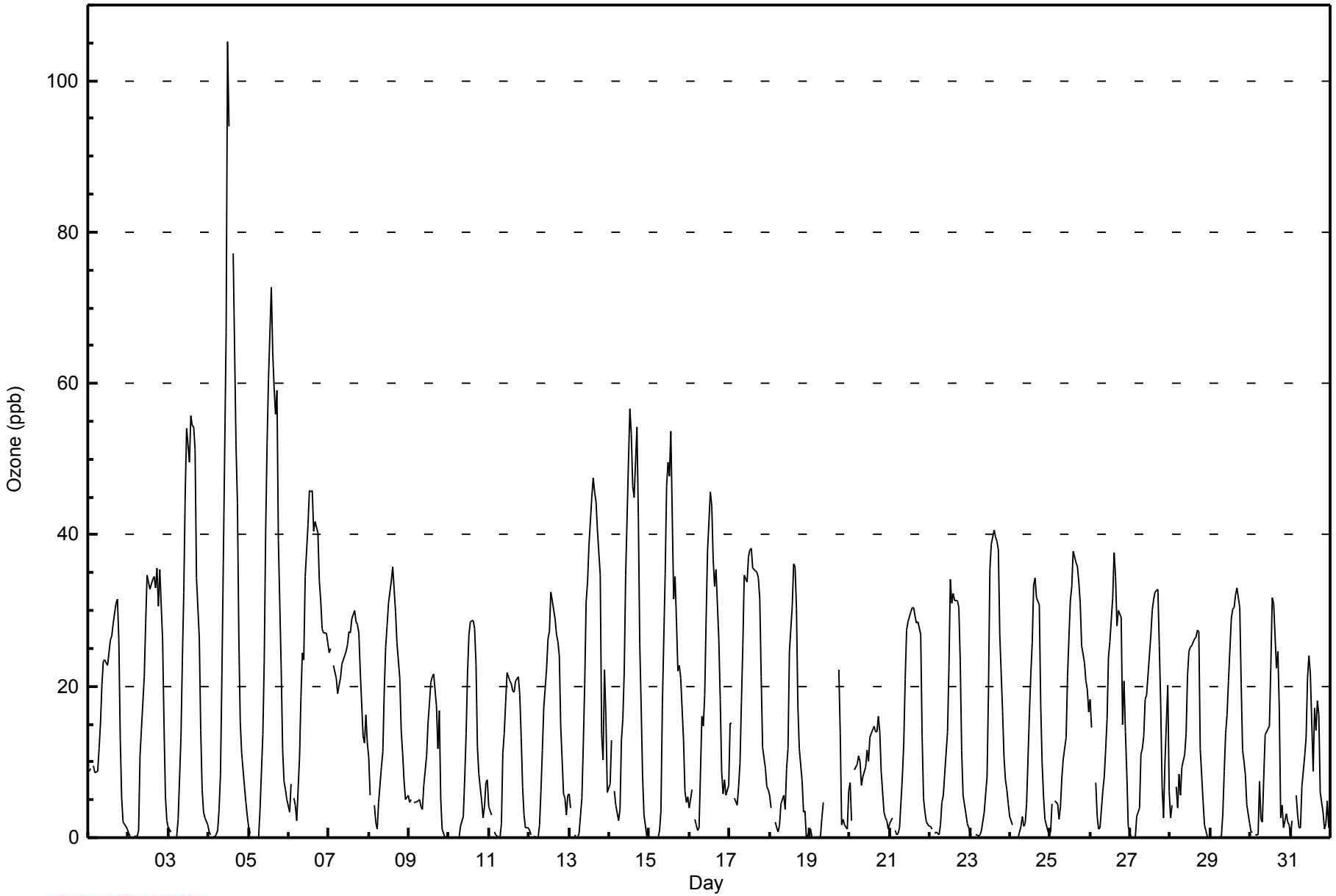
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ozone (O_3) - ppb

Fort McKay South - August 2014



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WBEA

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	448	63.73	63.73
21 - 50	234	33.29	97.01
51 - 82	19	2.70	99.72
> 83	2	0.28	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

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Frequency Distribution

Ozone (O_3) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	22	10	11	1	4	2	14	31	53	77	79	42	19	24	26	32	447
21 - 50	28	22	9	2	6	19	18	16	23	20	17	21	3	7	15	8	234
51 - 82	1	2	1	0	1	5	8	1	0	0	0	0	0	0	0	0	19
> 83	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Totals	53	34	21	3	11	26	40	48	76	97	96	63	22	31	41	40	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

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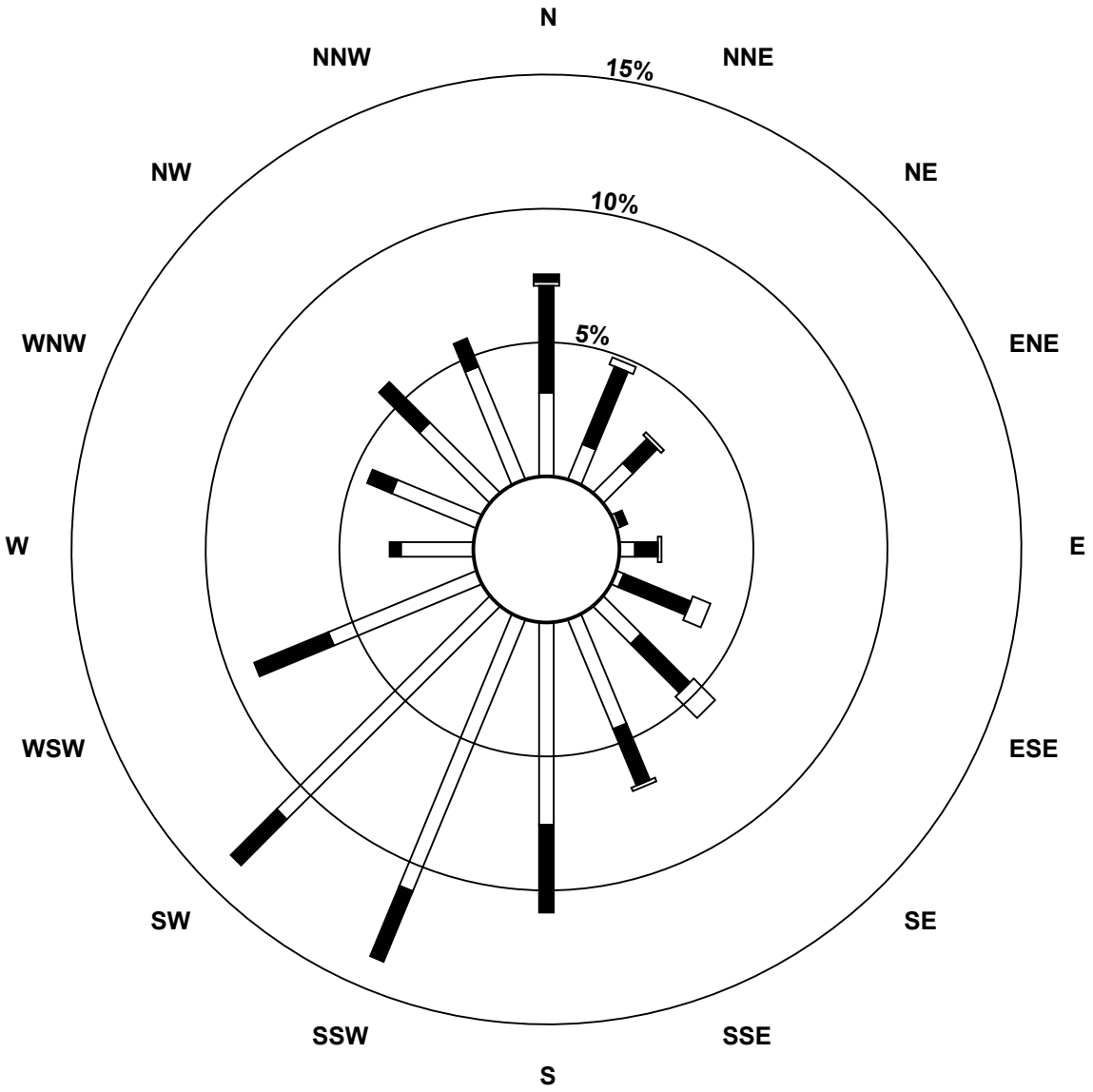
Wood Buffalo Environmental Association

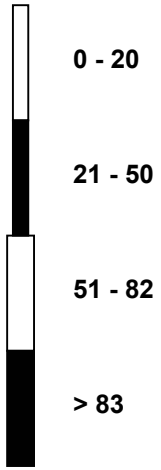
Wind Rose Aug 2014

Ozone (O_3) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



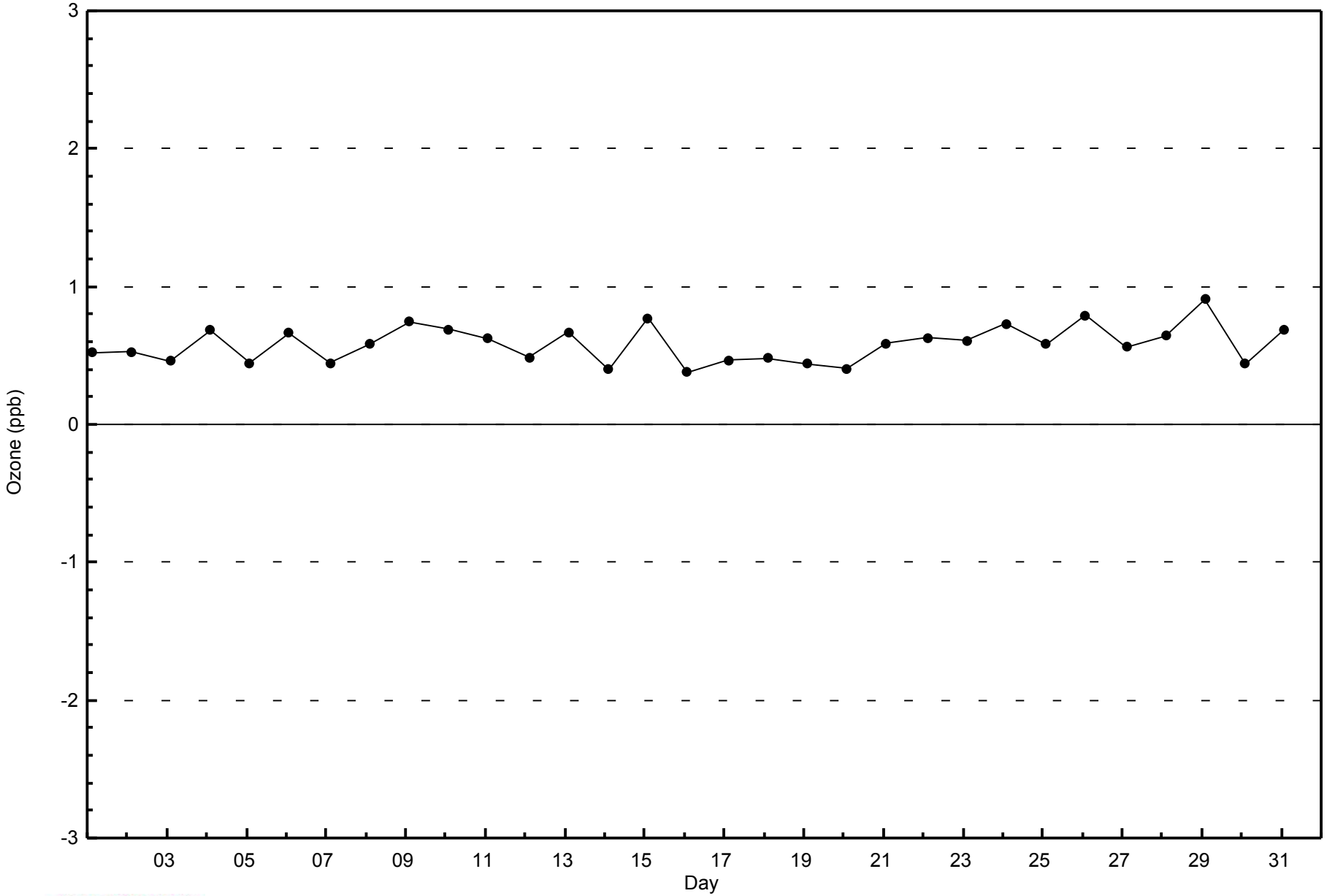
Total Number of Valid Hours: 702

WBEA

Zero Responses

Ozone (O_3) - ppb

Fort McKay South - August 2014



AURORA
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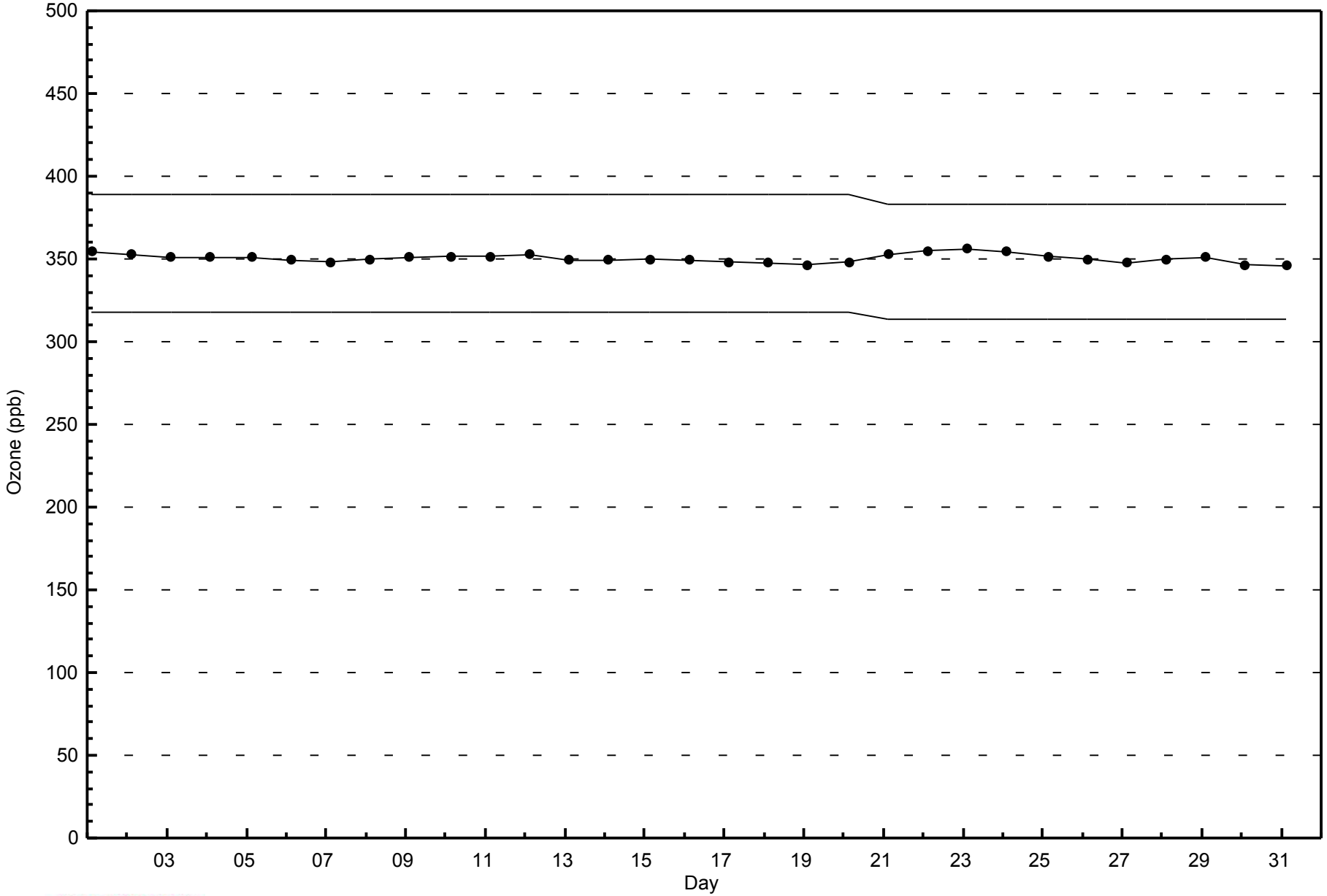
WBEA

Span Responses

Ozone (O_3) - ppb

Fort McKay South - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort McKay South - August 2014

Maximum Value: 30 ppb on Aug 3 07:00

Maximum Daily Average: 6.1 ppb on Aug 24

Minimum Value: 0 ppb on Aug 1 03:00

Minimum Daily Average: 0.0 ppb on Aug 7

Maximum Diurnal Average: 4.5 ppb at hour 9

Minimum Diurnal Average: 0.0 ppb at hour 22

Monthly Average: 1.2 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 16$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	38
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-Aug	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0.3	1
2-Aug	0	Z	0	0	0	1	1	2	4	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	4
3-Aug	0	Z	0	1	6	17	30	14	3	2	1	1	0	0	0	0	1	0	0	0	0	0	0	0	3.3	30
4-Aug	0	Z	0	0	0	0	0	4	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0.7	4
5-Aug	0	Z	0	1	1	1	1	3	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.7	4
6-Aug	0	Z	0	0	0	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
7-Aug	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
8-Aug	0	Z	0	0	0	0	0	6	7	3	3	3	2	2	1	1	0	0	0	0	0	0	0	0	1.2	7
9-Aug	0	Z	0	0	1	0	0	0	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
10-Aug	0	Z	0	0	0	0	4	19	29	9	7	3	0	0	0	0	0	0	0	0	0	0	0	0	3.2	29
11-Aug	0	Z	0	0	0	0	4	15	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	15
12-Aug	0	Z	0	0	0	1	4	7	9	11	9	3	2	1	1	0	0	0	0	0	0	0	0	0	2.1	11
13-Aug	0	Z	0	0	1	3	6	7	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1.0	7
14-Aug	0	Z	0	0	0	0	1	1	6	8	3	1	0	0	0	0	0	0	0	0	0	0	3	9	1.4	9
15-Aug	5	Z	0	0	10	16	10	15	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2.8	16
16-Aug	0	Z	0	0	0	1	1	2	6	4	2	1	1	1	2	0	0	0	0	0	0	0	0	0	0.9	6
17-Aug	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
18-Aug	0	Z	0	0	0	0	0	1	1	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	--	1
19-Aug	0	Z	0	0	1	5	5	1	2	4	1	M	M	PF	PF	PF	PF	0	0	0	0	0	0	0	--	5
20-Aug	0	Z	0	0	0	0	0	1	1	1	1	2	1	1	0	0	1	0	0	0	0	0	0	0	0.4	2
21-Aug	0	Z	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	3
22-Aug	0	Z	0	0	0	0	0	0	0	6	7	4	0	1	0	0	0	0	0	0	0	0	0	0	0.8	7
23-Aug	0	Z	0	0	0	0	0	3	6	10	11	6	2	1	0	1	0	0	0	0	0	0	0	0	1.7	11
24-Aug	0	Z	1	3	6	7	7	14	21	26	30	11	7	5	1	1	0	0	0	0	0	0	0	0	6.1	30
25-Aug	0	Z	0	0	0	0	1	2	3	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0.7	5
26-Aug	0	Z	0	0	0	1	7	7	12	8	6	1	0	2	1	0	0	0	0	0	0	0	0	0	2.0	12
27-Aug	0	Z	12	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	12
28-Aug	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
29-Aug	0	Z	0	0	0	1	3	5	7	5	5	4	1	0	0	0	0	0	0	0	0	0	0	0	1.4	7
30-Aug	0	Z	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.2	2
31-Aug	0	Z	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
	0.2	--	0.4	0.4	0.9	1.8	2.8	4.4	4.5	4.1	3.5	1.7	0.6	0.5	0.3	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.3	Diurnal Average	
	5	--	12	7	10	17	30	19	29	26	30	11	7	5	2	1	1	1	1	1	0	0	3	9	Diurnal Maximum	

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

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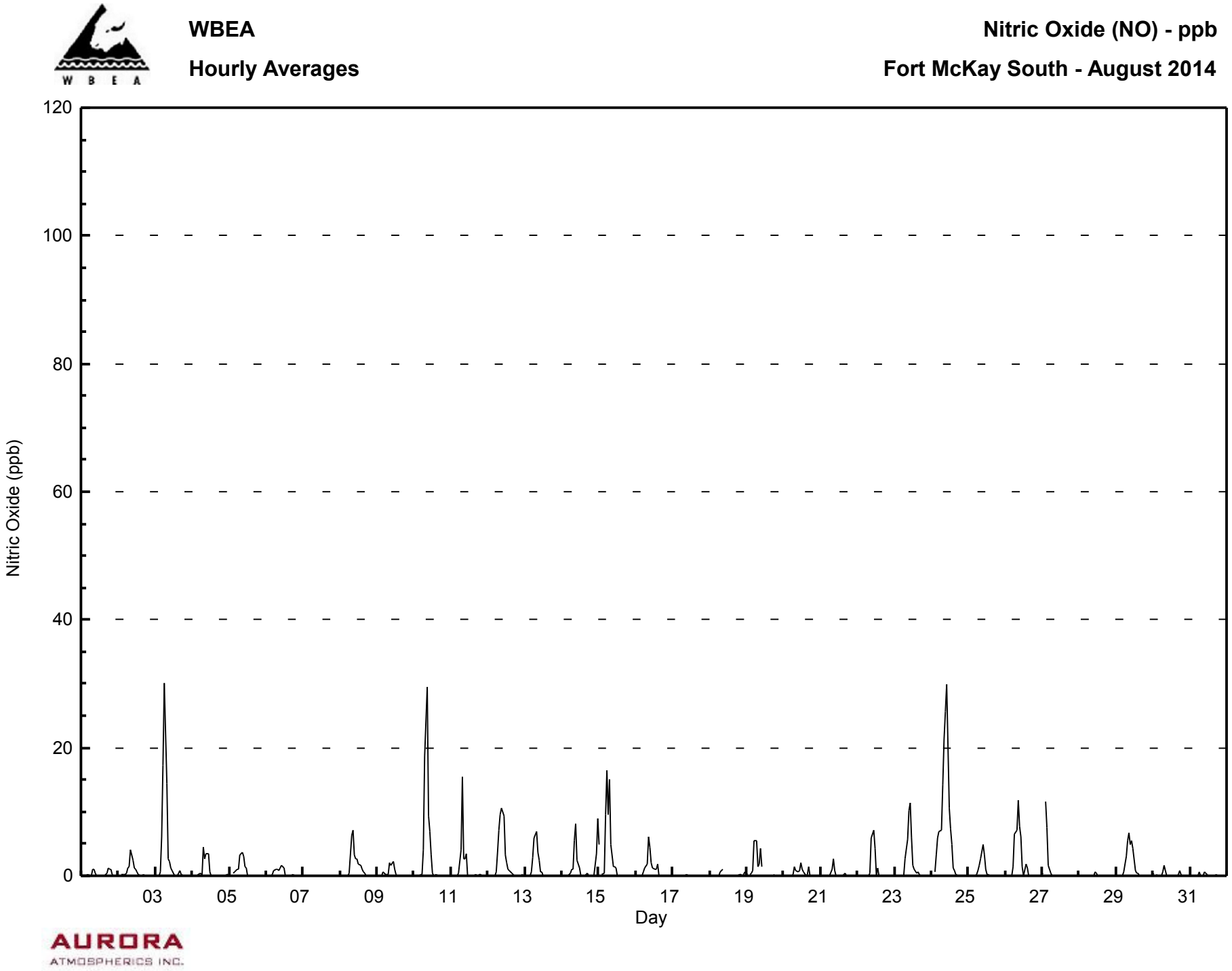
WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Fort McKay South - August 2014
120
100
80
60
40
20
0
Nitric Oxide (ppb)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

WBEA

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	99.29	99.29
21 - 40	5	0.71	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

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Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay South - August 2014

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	34	20	3	11	25	39	47	76	103	90	62	22	29	40	39	694
21 - 40	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	34	20	3	11	25	39	47	77	104	90	62	22	29	41	40	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

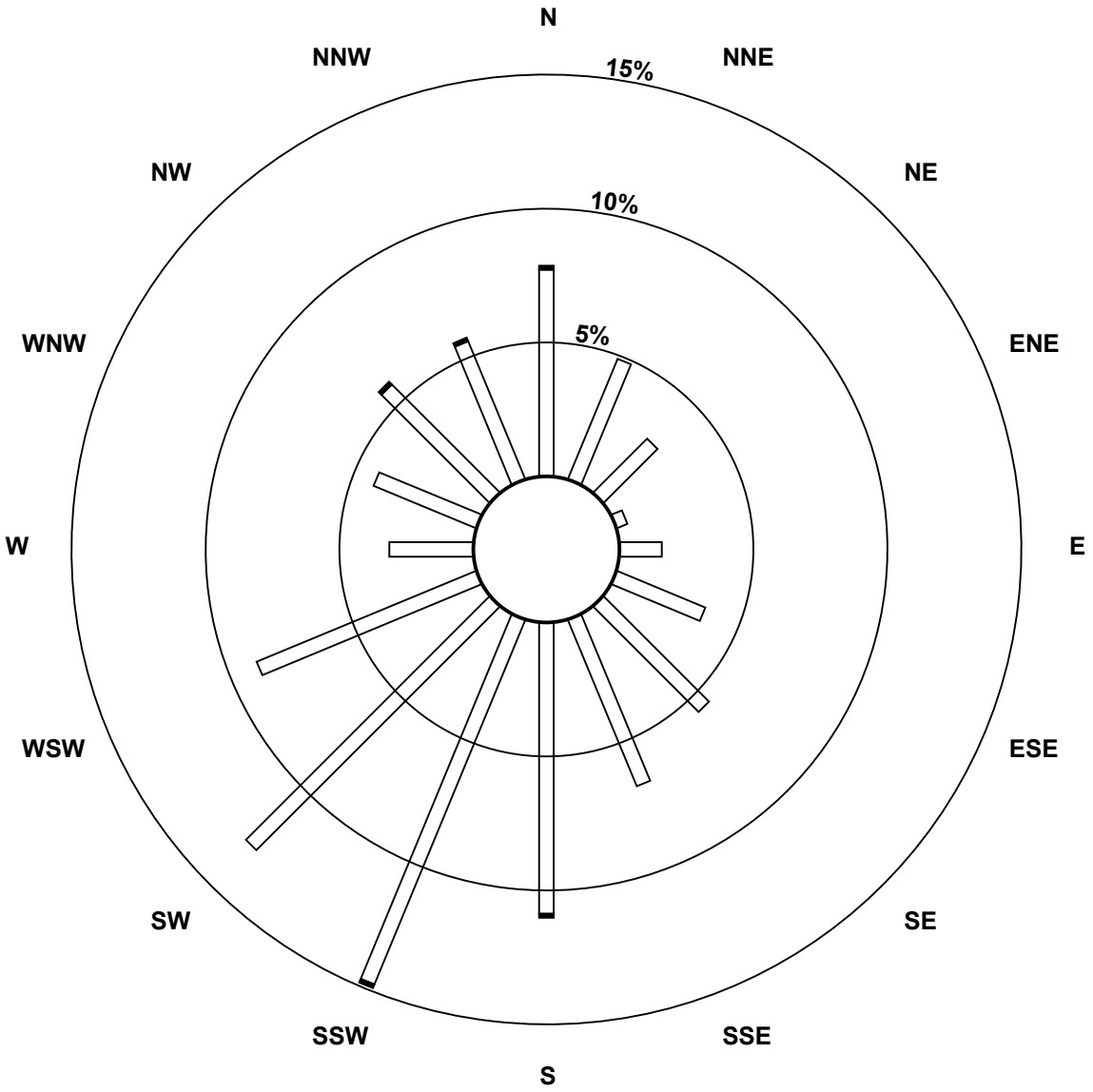
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

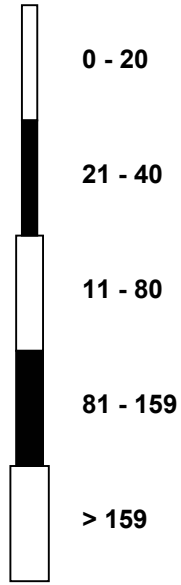
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



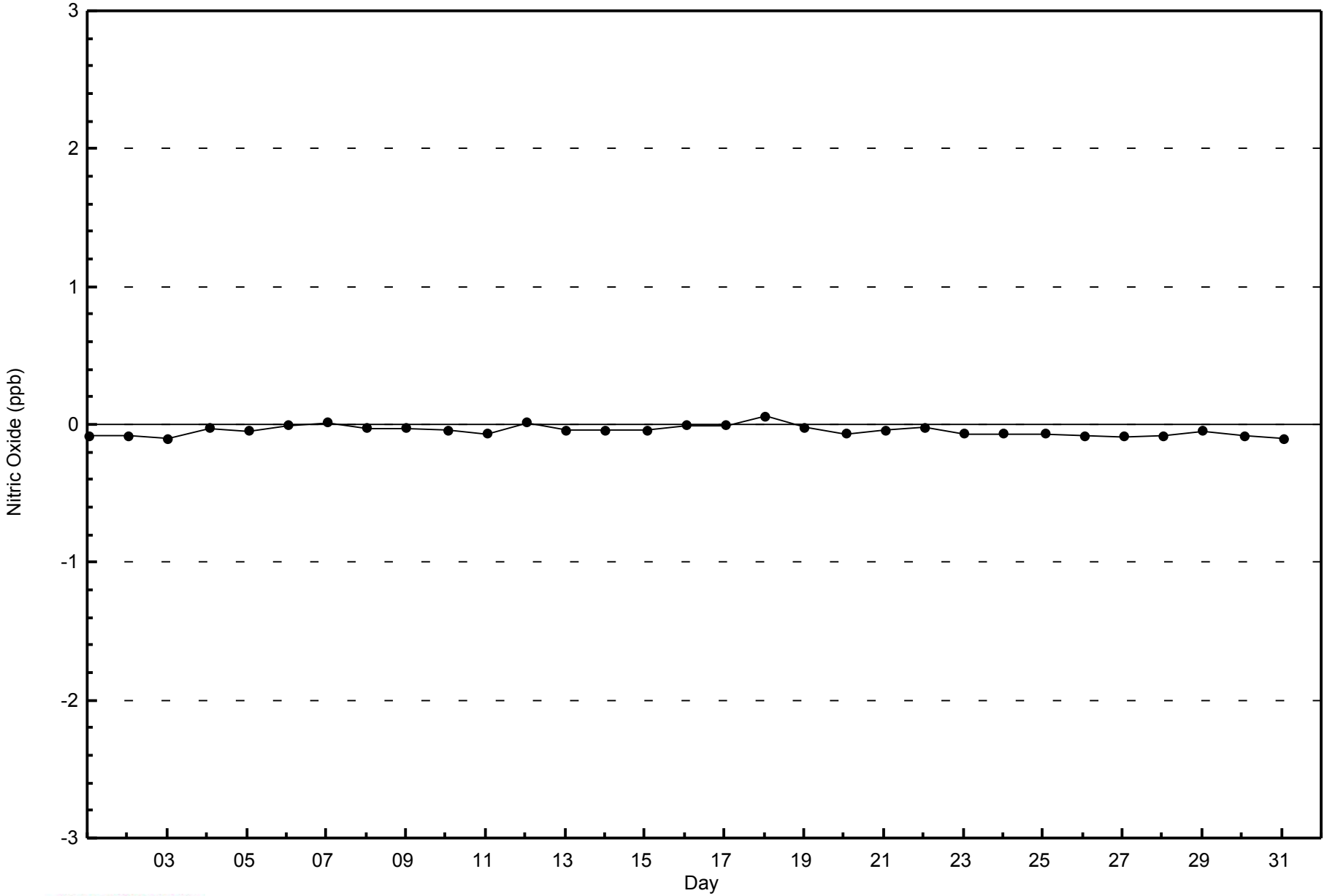
Total Number of Valid Hours: 699

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay South - August 2014



AURORA
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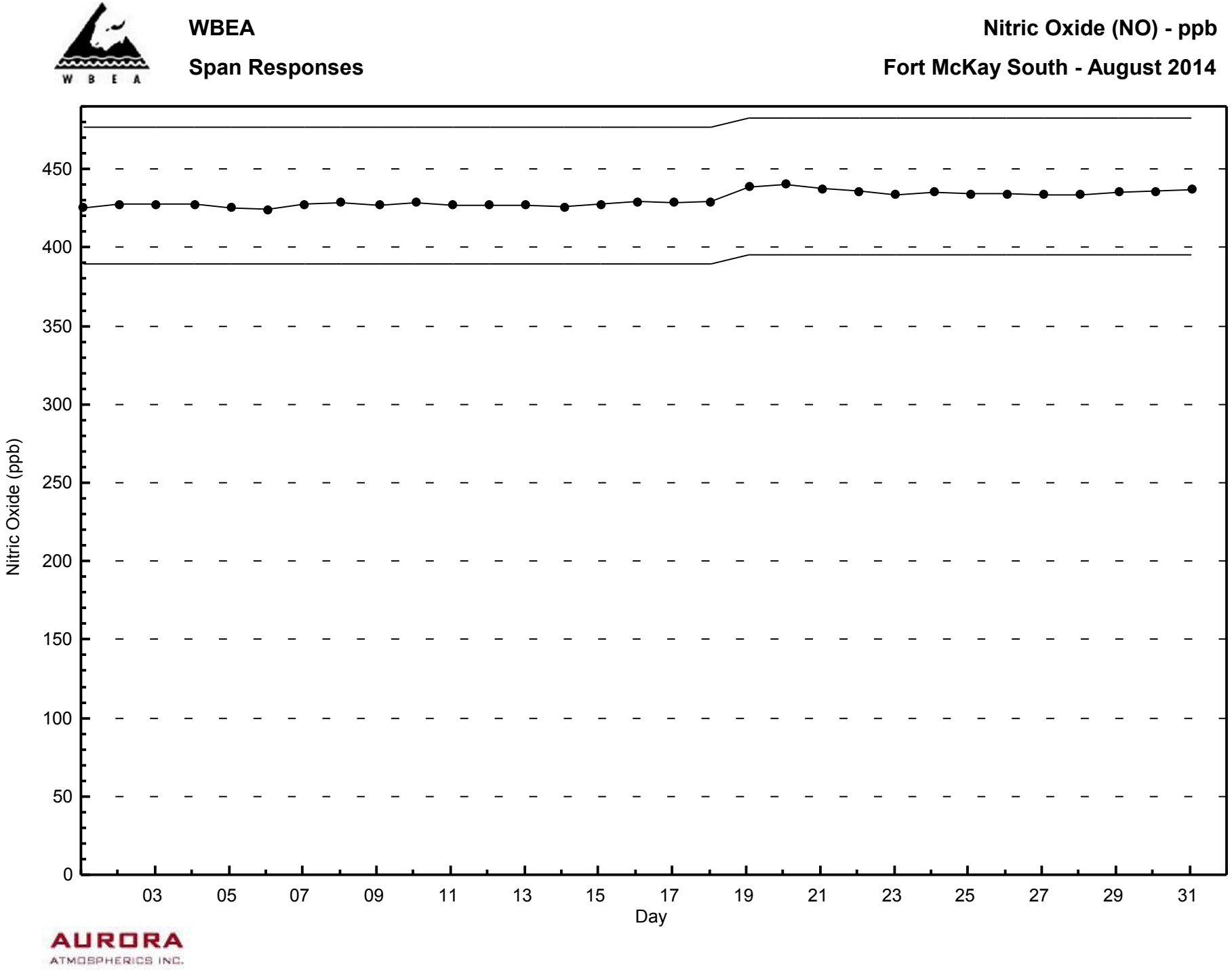
WBEA
Span Responses
Nitric Oxide (NO) - ppb
Fort McKay South - August 2014
Nitric Oxide (ppb)
0
50
100
150
200
250
300
350
400
450
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 36 ppb on Aug 4 11:00 Maximum Daily Average: 7.6 ppb on Aug 4

Minimum Value: 0 ppb on Aug 7 13:00 Minimum Daily Average: 0.5 ppb on Aug 28
Maximum Diurnal Average: 7.4 ppb at hour 11 Minimum Diurnal Average: 1.5 ppb at hour 5
Monthly Average: 3.1 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 2 $Q_3 = 4$ $P_{90} = 8$ $P_{99} = 18$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	38
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-Aug	1	Z	2	3	2	2	2	1	2	2	2	1	1	1	1	2	3	9	11	8	6	3	2	1	2.9	11
2-Aug	1	Z	1	1	1	1	1	4	8	7	5	4	3	2	2	2	3	2	3	3	3	2	1	1	2.5	8
3-Aug	1	Z	1	1	1	3	15	10	7	9	7	5	3	3	3	5	7	4	1	1	1	1	1	1	3.9	15
4-Aug	1	Z	1	1	1	1	1	6	7	19	36	22	16	12	13	8	4	2	3	3	4	6	6	3	7.6	36
5-Aug	2	Z	2	2	1	1	1	6	12	15	14	13	5	5	5	4	4	4	3	3	3	3	4	5	5.0	15
6-Aug	7	Z	3	3	3	2	4	6	4	6	7	6	3	2	2	2	2	5	3	1	1	1	1	1	3.2	7
7-Aug	1	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	2	0.7	2
8-Aug	1	Z	1	1	1	1	1	7	8	6	7	8	7	8	7	5	4	3	3	3	2	3	2	2	3.9	8
9-Aug	2	Z	3	4	4	3	2	2	4	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1.8	4
10-Aug	1	Z	1	1	1	1	1	6	11	7	8	6	2	1	2	2	1	1	1	1	1	1	1	2	2.7	11
11-Aug	1	Z	1	1	1	1	1	6	4	4	6	1	0	0	0	0	2	2	2	4	3	2	3	2	2.0	6
12-Aug	2	Z	2	2	1	1	3	7	13	19	20	9	7	5	4	3	3	3	3	3	3	6	10	8	5.9	20
13-Aug	5	Z	5	4	4	3	4	10	11	10	4	4	3	2	2	2	1	2	1	1	1	1	1	1	3.5	11
14-Aug	1	Z	1	2	2	2	1	3	12	18	10	7	4	2	2	3	10	5	4	3	3	3	8	9	4.9	18
15-Aug	7	Z	1	1	2	2	3	11	9	8	10	9	4	5	1	1	1	2	2	3	6	5	6	3	4.4	11
16-Aug	2	Z	1	1	2	2	2	12	19	16	10	8	8	6	8	2	3	2	2	2	2	2	1	1	4.9	19
17-Aug	1	Z	1	1	1	1	1	1	1	3	1	0	0	0	0	0	1	0	0	0	1	1	1	1	0.7	3
18-Aug	1	Z	1	1	1	1	1	2	3	C	C	C	C	C	C	C	5	4	4	6	10	3	1	0	--	10
19-Aug	1	Z	1	1	0	1	3	2	2	5	4	M	M	PF	PF	PF	PF	2	2	1	2	2	1	2	--	5
20-Aug	3	Z	3	2	2	1	2	6	3	2	1	4	2	1	1	2	5	2	2	1	1	1	1	1	2.1	6
21-Aug	1	Z	0	0	0	0	0	1	3	1	1	1	1	1	1	1	2	2	1	1	1	1	0	1	0.9	3
22-Aug	1	Z	0	0	0	0	0	1	1	5	8	6	1	3	1	2	2	1	1	1	1	1	0	1	1.6	8
23-Aug	0	Z	0	0	0	0	1	2	5	9	11	10	6	5	3	4	3	2	2	2	2	2	2	2	3.1	11
24-Aug	2	Z	3	4	3	5	6	12	14	13	17	15	13	10	5	4	3	2	2	2	1	1	1	3	6.1	17
25-Aug	4	Z	2	2	3	3	3	6	6	8	6	4	2	2	2	1	2	2	1	4	6	6	5	5	3.6	8
26-Aug	5	Z	5	6	5	8	9	9	16	14	14	6	2	7	7	3	1	1	3	3	2	3	6	4	6.1	16
27-Aug	3	Z	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.6	3
28-Aug	0	Z	0	0	0	0	0	0	0	1	2	2	0	1	1	1	0	1	1	1	1	1	1	0	0.5	2
29-Aug	0	Z	0	0	0	0	1	3	6	7	8	8	3	2	3	2	2	4	3	3	4	3	5	7	3.3	8
30-Aug	6	Z	3	3	3	4	5	6	5	1	1	1	1	1	1	1	2	4	2	3	2	3	2	3	2.7	6
31-Aug	2	Z	0	0	0	1	1	0	0	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0.5	2
	2.0	--	1.6	1.5	1.5	1.6	2.4	4.8	6.4	7.3	7.4	5.6	3.4	3.1	2.7	2.1	2.6	2.4	2.2	2.2	2.3	2.2	2.4	2.3	Diurnal Average	
	7	--	5	6	5	8	15	12	19	19	36	22	16	12	13	8	10	9	11	8	10	6	10	9	Diurnal Maximum	

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

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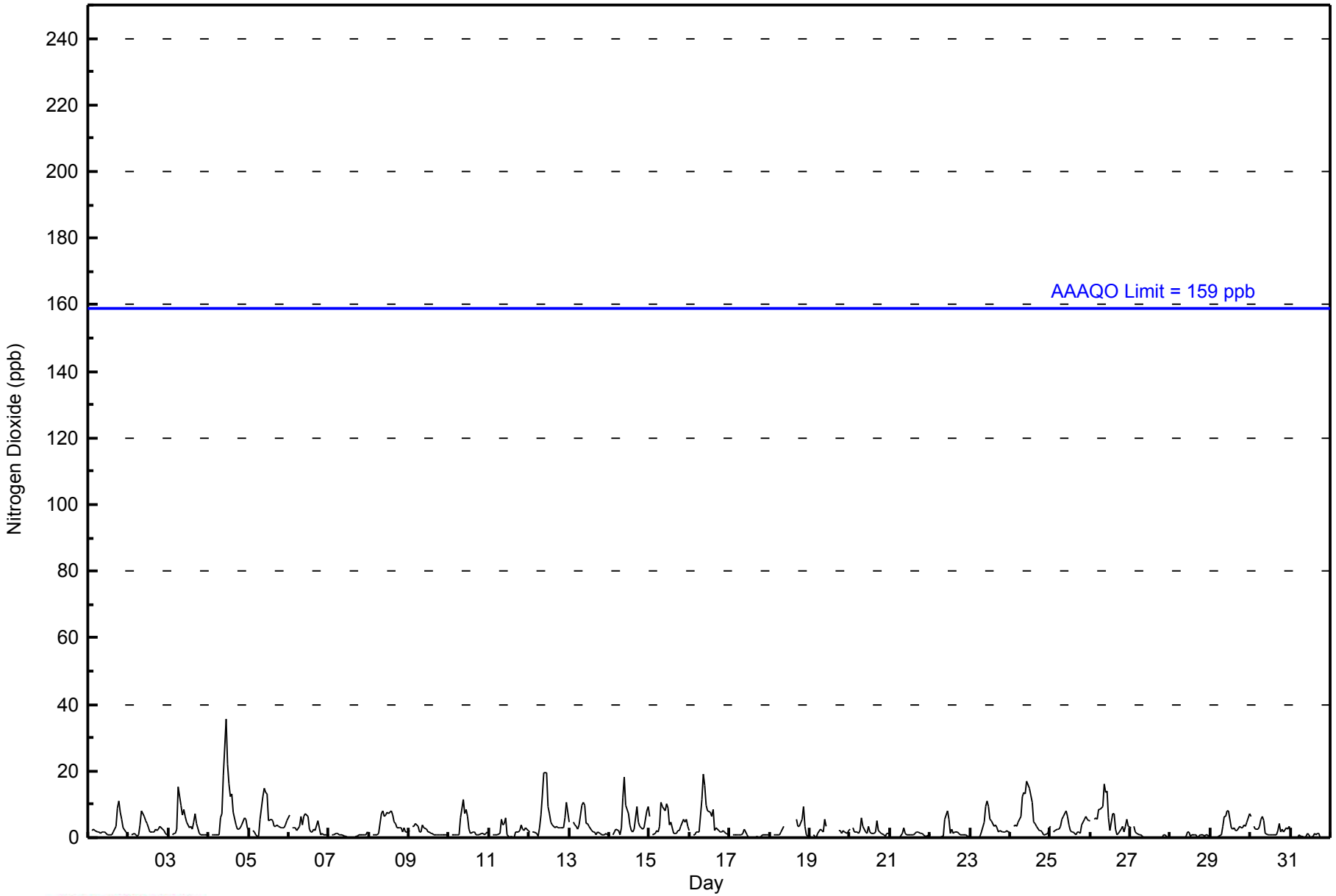
WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - August 2014



AURORA ATMOSPHERICS INC.

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Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	99.71	99.71
21 - 40	2	0.29	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: 700

Total Number of Hours: 744

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ATMOSPHERICS INC.

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	53	34	20	3	11	25	39	47	77	104	90	62	22	29	41	40	697
21 - 40	2	0	0	0	0	0	0	0	0	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	55	34	20	3	11	25	39	47	77	104	90	62	22	29	41	40	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

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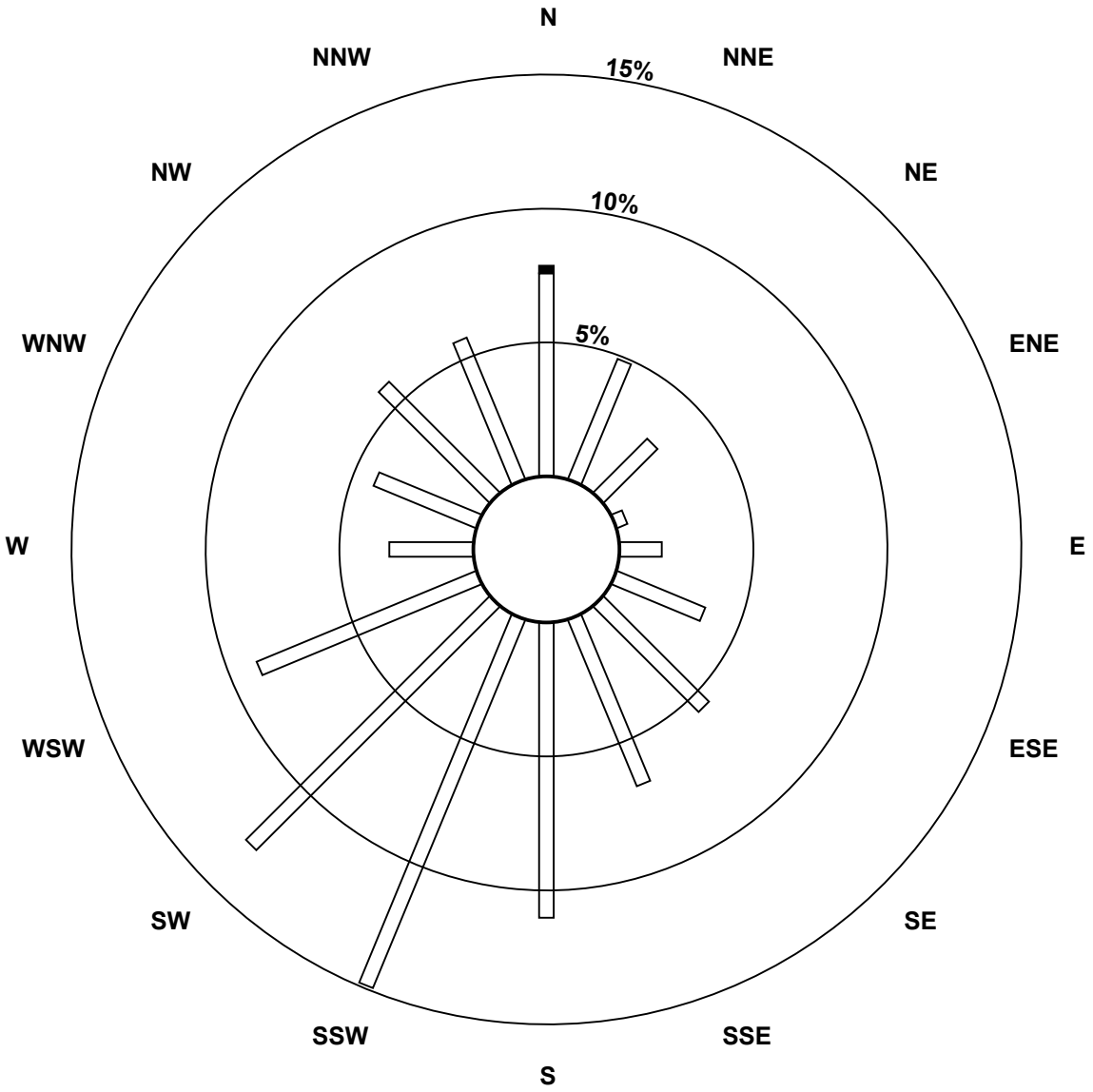
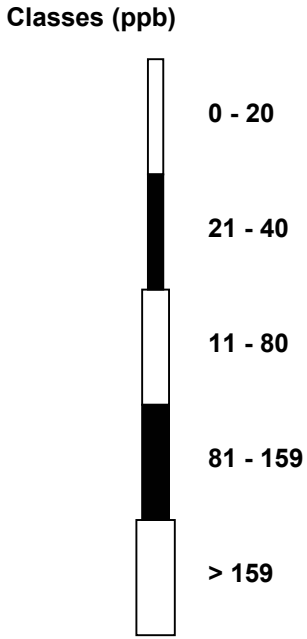
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South (AMS 13)





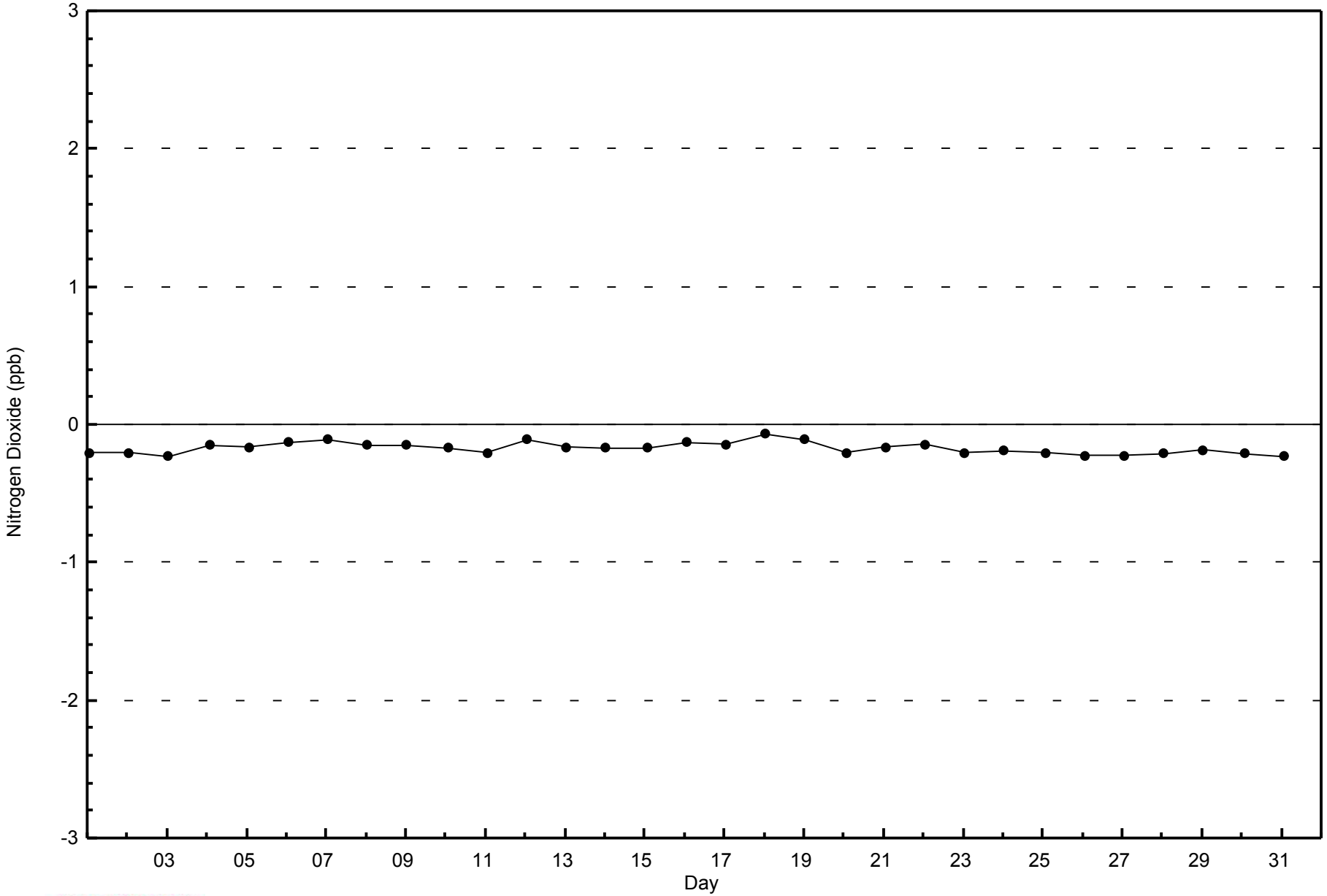
Total Number of Valid Hours: 699

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - August 2014



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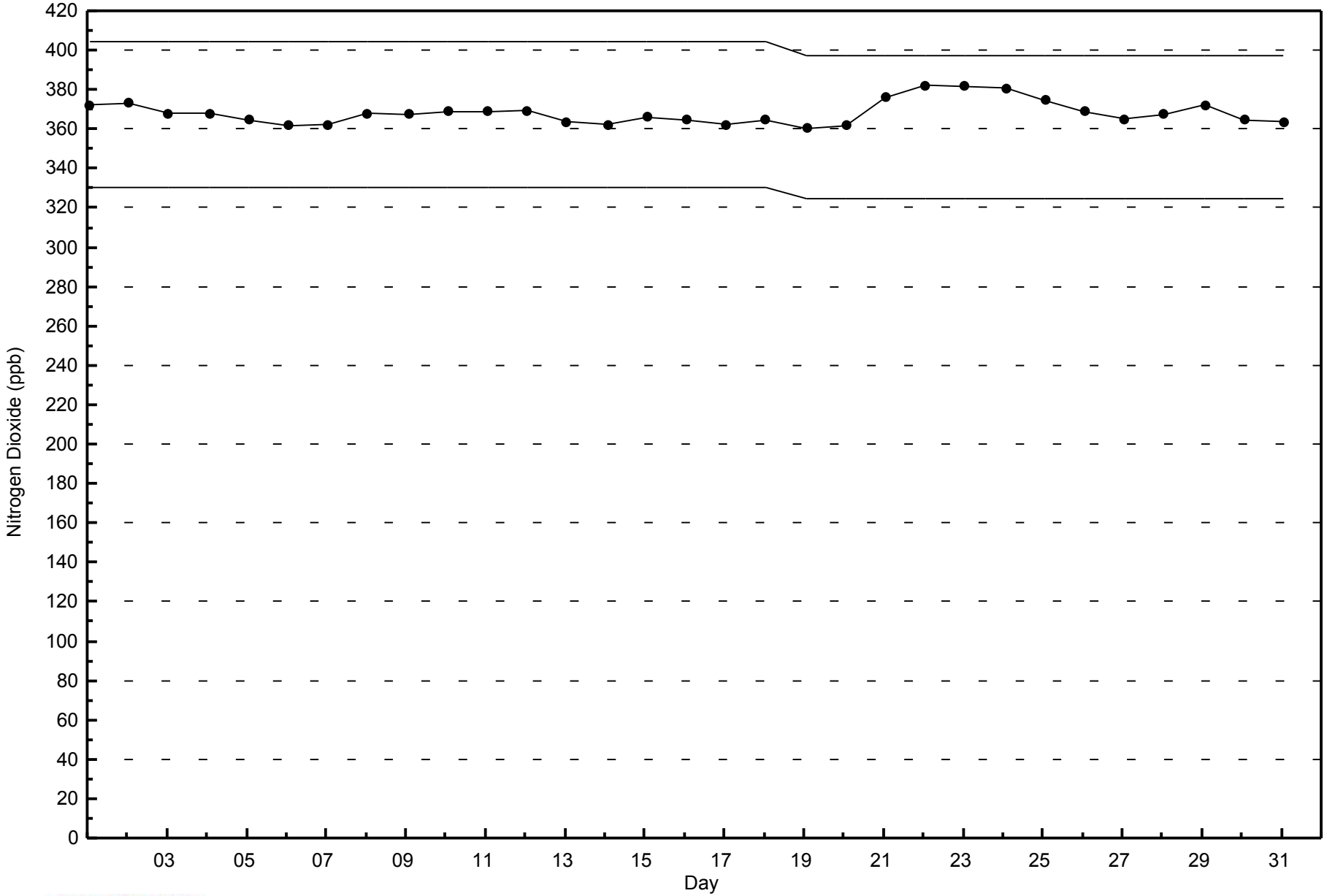
WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - August 2014

Maximum Value: 47 ppb on Aug 24 11:00

Maximum Daily Average: 12.2 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 13:00

Minimum Daily Average: 0.6 ppb on Aug 28

Maximum Diurnal Average: 11.3 ppb at hour 10

Minimum Diurnal Average: 2.0 ppb at hour 4

Monthly Average: 4.3 ppb

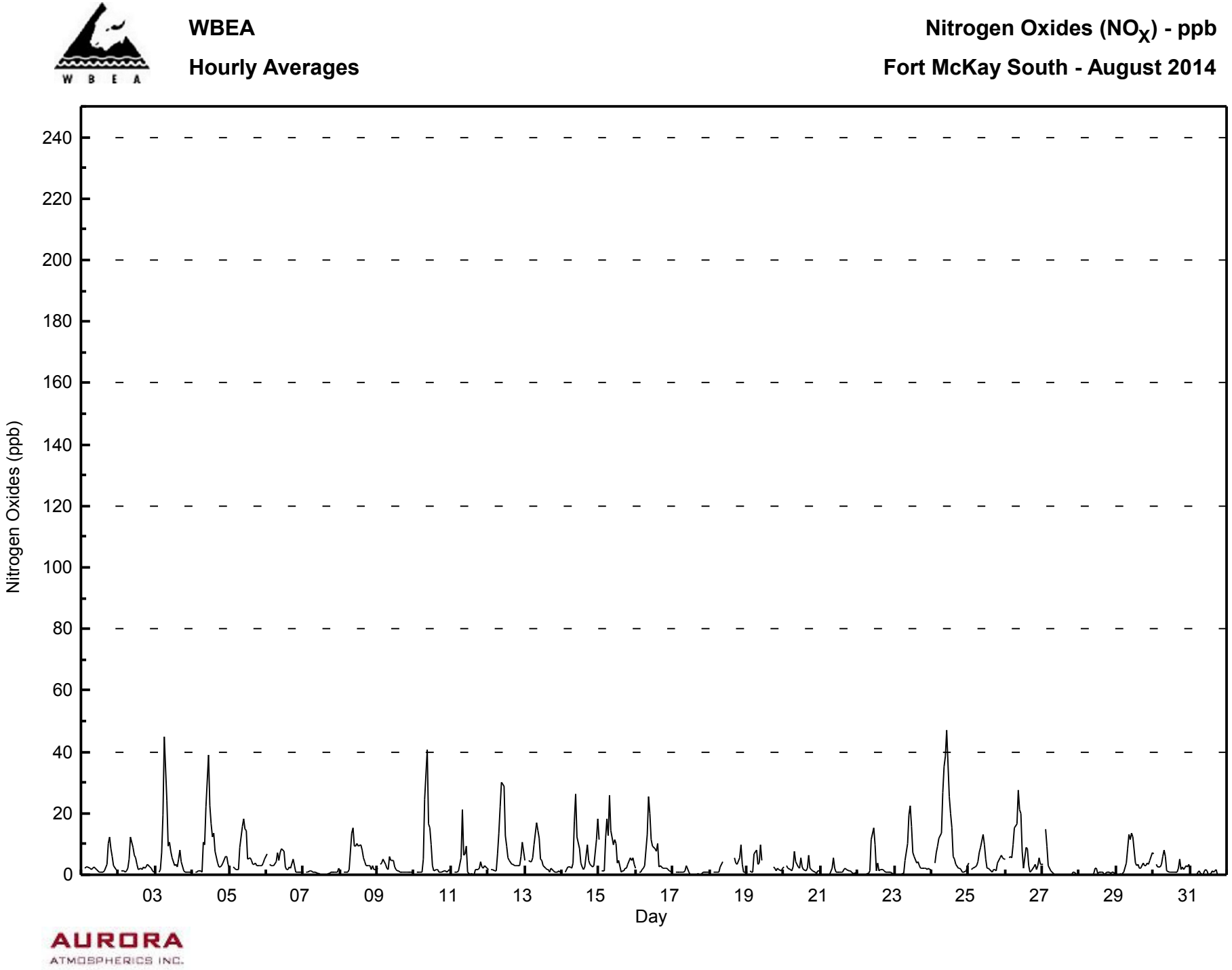
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 2 $Q_3 = 5$ $P_{90} = 11$ $P_{99} = 27$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	38
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-Aug	1	Z	2	3	2	2	2	2	3	2	2	1	1	1	1	1	4	10	12	9	6	3	2	1	3.2	12
2-Aug	1	Z	1	1	1	1	2	5	12	9	6	5	4	2	2	2	3	2	3	3	3	2	1	1	3.1	12
3-Aug	1	Z	1	2	7	20	45	24	9	11	8	6	3	3	3	5	8	4	1	1	1	1	1	1	7.2	45
4-Aug	1	Z	1	1	1	1	1	11	10	22	39	23	16	12	13	8	4	2	3	3	4	6	6	3	8.3	39
5-Aug	2	Z	2	2	2	2	2	9	16	18	15	14	5	5	5	4	4	4	3	3	3	3	4	5	5.7	18
6-Aug	7	Z	3	3	3	3	4	7	5	7	9	8	3	2	2	2	2	5	3	1	1	1	1	1	3.6	9
7-Aug	1	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	2	0.7	2
8-Aug	1	Z	1	1	1	1	2	14	15	9	9	10	9	10	8	5	4	3	3	3	2	3	2	1	5.1	15
9-Aug	2	Z	3	4	5	3	2	2	6	5	5	2	2	1	1	1	1	1	1	1	1	1	1	1	2.2	6
10-Aug	1	Z	1	1	1	1	5	25	41	17	15	10	3	1	2	2	1	1	1	1	1	1	1	2	5.8	41
11-Aug	1	Z	1	1	1	1	5	21	7	7	9	1	0	0	0	0	2	2	2	4	3	2	3	2	3.3	21
12-Aug	2	Z	2	2	1	1	7	14	22	30	29	13	9	6	5	3	3	3	3	3	3	6	11	8	8.0	30
13-Aug	5	Z	5	4	4	5	10	17	14	12	5	5	3	2	2	2	1	2	1	1	1	1	1	1	4.5	17
14-Aug	1	Z	1	2	2	2	2	4	18	26	12	9	4	2	2	3	10	5	4	3	3	3	11	18	6.3	26
15-Aug	11	Z	1	1	12	18	13	26	14	10	11	10	4	5	1	1	1	2	2	3	5	5	6	3	7.2	26
16-Aug	2	Z	1	1	2	2	3	13	25	20	12	9	9	7	10	2	3	2	2	2	2	2	1	1	5.8	25
17-Aug	1	Z	1	1	1	1	1	1	1	3	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0.7	3
18-Aug	1	Z	1	1	1	1	1	2	4	C	C	C	C	C	C	C	5	4	4	6	10	3	1	1	--	10
19-Aug	1	Z	1	1	1	7	8	4	4	10	5	M	M	PF	PF	PF	PF	3	2	1	2	1	1	2	--	10
20-Aug	3	Z	3	2	2	1	2	7	4	2	2	5	3	2	1	2	6	2	2	1	1	1	1	1	2.5	7
21-Aug	1	Z	0	0	0	0	0	2	6	2	1	1	1	1	1	2	2	2	1	1	1	1	0	1	1.1	6
22-Aug	1	Z	0	0	0	0	0	0	1	11	15	10	1	4	1	2	2	1	1	1	1	1	0	1	2.4	15
23-Aug	0	Z	0	0	0	0	1	4	10	20	22	16	7	6	4	4	3	2	2	2	2	2	2	2	4.9	22
24-Aug	2	Z	4	7	9	12	13	27	35	39	47	26	20	15	6	5	3	2	2	2	1	1	1	3	12.2	47
25-Aug	4	Z	2	2	3	3	4	7	9	13	10	5	2	2	2	1	2	2	1	4	5	6	5	5	4.3	13
26-Aug	5	Z	5	6	5	10	15	17	28	21	20	7	2	9	8	3	1	1	3	3	2	3	6	4	8.0	28
27-Aug	3	Z	15	9	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1.5	15
28-Aug	0	Z	0	0	0	0	0	0	0	1	2	2	1	1	1	1	0	1	1	1	0	1	1	0	0.6	2
29-Aug	0	Z	0	0	0	1	4	9	13	11	14	12	4	3	3	2	2	4	3	3	4	3	5	7	4.7	14
30-Aug	7	Z	4	3	3	4	6	8	6	1	1	1	1	1	1	1	2	5	2	3	2	3	2	3	3.0	8
31-Aug	2	Z	0	0	0	1	1	0	0	1	2	1	0	1	1	1	1	2	0	0	0	0	0	0	0.6	2
	2.3	--	2.1	2.0	2.4	3.4	5.2	9.1	10.9	11.3	10.9	7.3	4.0	3.6	2.9	2.2	2.7	2.5	2.2	2.3	2.3	2.2	2.6	2.7	Diurnal Average	
	11	--	15	9	12	20	45	27	41	39	47	26	20	15	13	8	10	10	12	9	10	6	11	18	Diurnal Maximum	

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

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Nitrogen Oxides (NO_X) - ppb
Fort McKay South - August 2014
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.

WBEA

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	96.86	96.86
21 - 40	19	2.71	99.57
11 - 80	3	0.43	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

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Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	49	32	18	3	11	25	37	46	74	101	90	62	22	29	39	39	677
21 - 40	5	2	2	0	0	0	2	1	2	2	0	0	0	0	2	1	19
11 - 80	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	3
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	34	20	3	11	25	39	47	77	104	90	62	22	29	41	40	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

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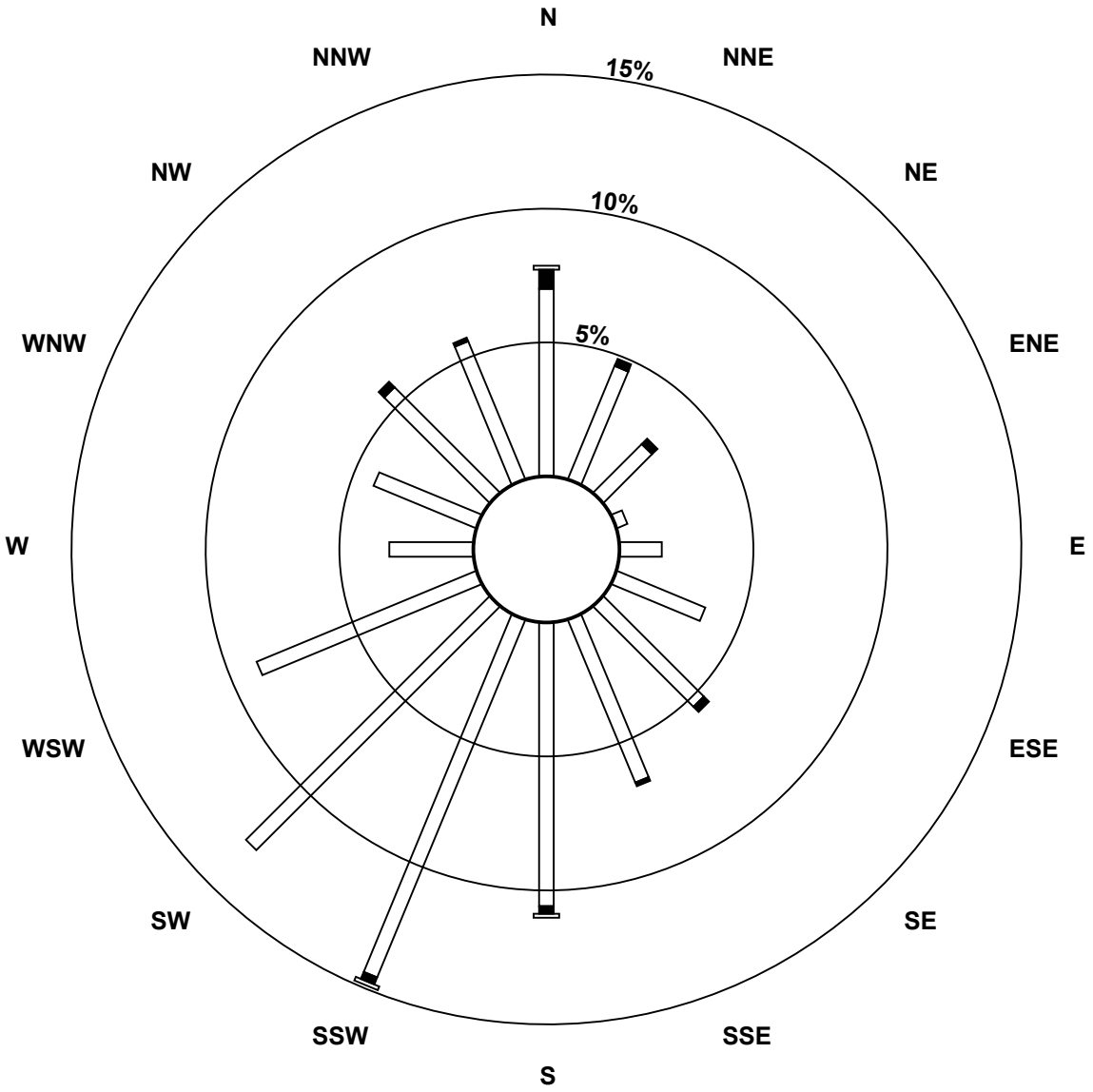
Wood Buffalo Environmental Association

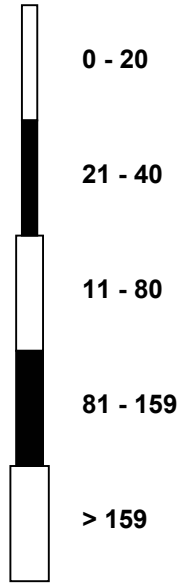
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Fort McKay South (AMS 13)



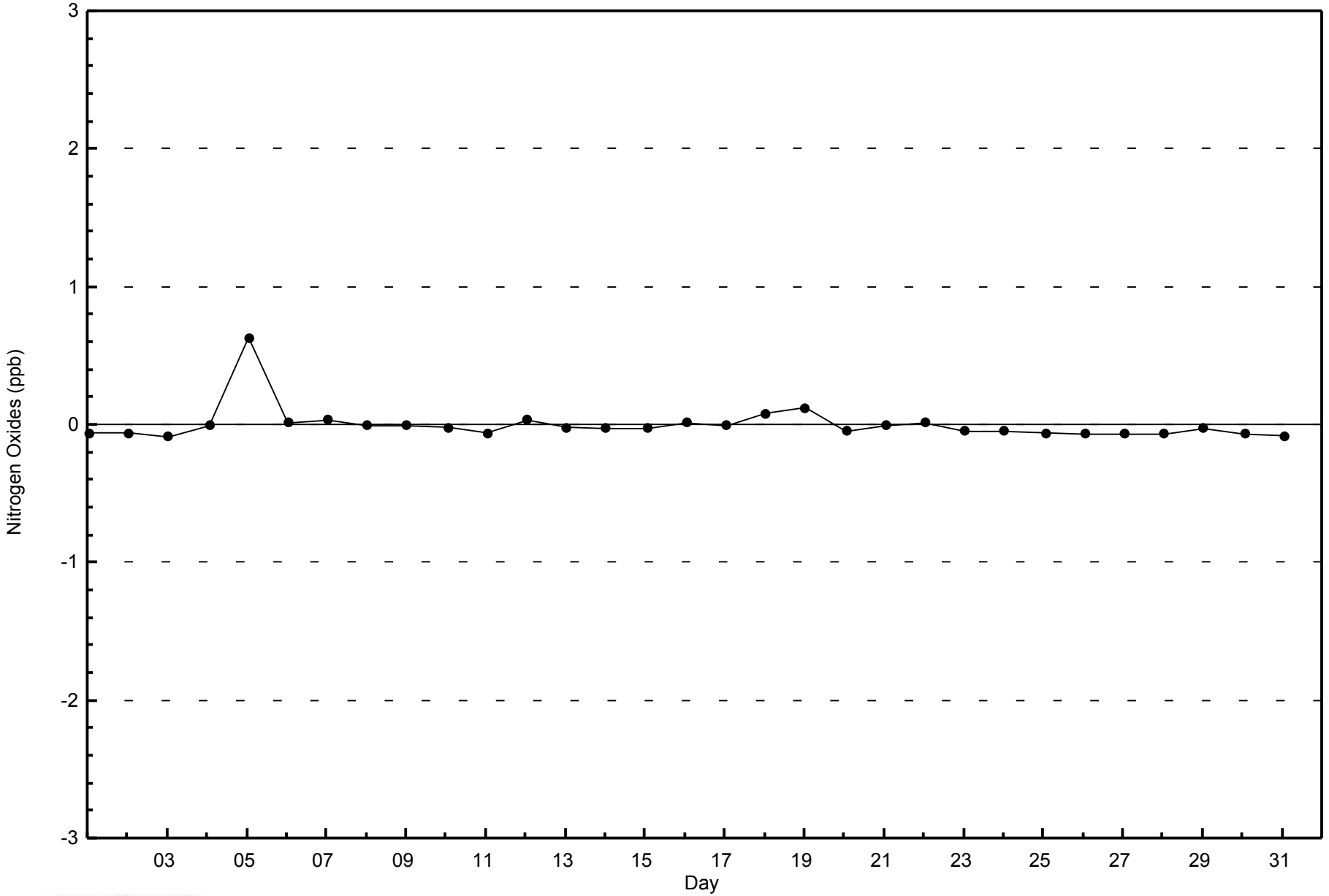
Classes (ppb)



Total Number of Valid Hours: 699

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Fort McKay South - August 2014



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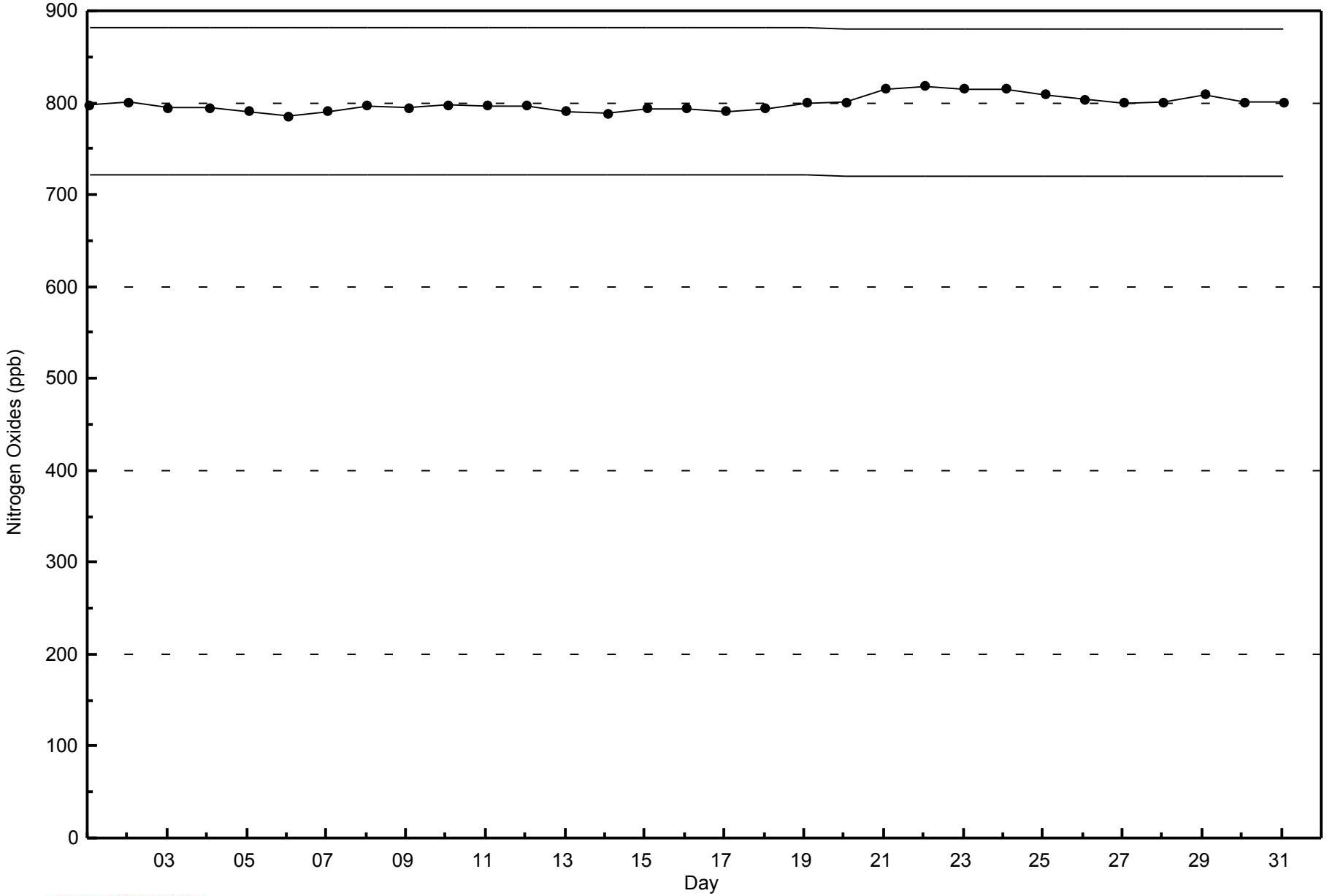
WBEA
Span Responses
Nitrogen Oxides (NO_X) - ppb
Fort McKay South - August 2014
Nitrogen Oxides (ppb)
900
800
700
600
500
400
300
200
100
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 24-hr: 3

Maximum Value: 617.3 $\mu g/m^3$ on Aug 4 13:00

Maximum Daily Average: 137.3 $\mu g/m^3$ on Aug 4

Minimum Value: 0.4 $\mu g/m^3$ on Aug 27 13:00

Minimum Daily Average: 2.9 $\mu g/m^3$ on Aug 22

Maximum Diurnal Average: 33.4 $\mu g/m^3$ at hour 13

Minimum Diurnal Average: 11.4 $\mu g/m^3$ at hour 19

Monthly Average: 17.33 $\mu g/m^3$

Percentiles: P_1 = 0.8 P_{10} = 2.3 Q_1 = 4.5 Median = 8.4 Q_3 = 14.0 P_{90} = 24.0 P_{99} = 152.8

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	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	69.4	71.5	80.5	74.5	70.8	65.9	49.9	40.9	34.4	31.7	30.2	26.6	21.3	17.8	17.2	16.0	16.5	20.1	20.8	20.7	20.7	19.3	18.1	18.7	36.4	80.5
2-Aug	19.4	19.9	21.5	22.6	22.5	21.4	16.9	15.7	19.5	17.6	21.2	27.3	24.4	19.8	18.4	18.9	24.1	19.8	13.2	11.8	13.6	13.5	13.1	12.5	18.7	27.3
3-Aug	12.4	12.0	12.9	12.1	12.5	14.6	15.0	10.8	9.7	13.9	12.5	10.5	9.5	10.4	11.1	18.4	20.5	11.5	7.2	7.1	7.8	7.9	7.8	7.6	11.5	20.5
4-Aug	7.6	7.9	8.3	8.6	9.3	12.4	13.5	13.2	13.9	83.6	315.0	508.1	617.3	451.8	355.3	139.1	62.7	59.9	56.1	76.6	106.6	120.9	125.6	122.6	137.3	617.3
5-Aug	127.5	126.6	130.5	130.9	136.5	143.0	129.3	145.3	133.5	144.4	165.9	158.9	135.8	110.1	70.1	55.2	47.6	66.6	63.2	56.5	45.3	26.5	17.4	15.3	99.2	165.9
6-Aug	14.3	12.7	9.4	7.5	6.4	5.9	6.6	9.3	7.2	7.2	9.3	8.6	7.1	8.9	8.4	10.3	13.4	14.4	16.0	17.3	17.0	16.3	14.0	12.7	10.8	17.3
7-Aug	9.3	9.3	22.1	68.3	112.0	109.6	77.6	40.0	12.9	5.2	2.8	2.0	2.0	2.3	2.3	2.5	2.8	2.8	2.8	2.9	2.3	1.8	1.8	2.4	20.8	112.0
8-Aug	2.7	2.4	3.1	4.1	4.8	5.4	5.6	3.8	2.0	2.7	4.2	4.6	5.0	7.2	8.5	7.7	6.5	5.1	4.9	4.9	5.3	5.8	5.2	4.9	4.8	8.5
9-Aug	5.1	5.1	5.1	4.7	4.7	4.4	4.1	4.5	5.0	4.8	4.0	4.0	4.8	4.4	4.6	5.5	7.2	7.2	5.5	5.3	5.8	5.9	8.1	10.4	5.4	10.4
10-Aug	11.6	12.7	12.7	10.8	10.8	10.6	6.9	4.3	2.9	2.1	2.2	2.0	2.1	2.6	4.5	4.4	3.5	2.9	2.6	2.9	3.5	4.5	7.0	8.8	5.8	12.7
11-Aug	12.5	16.8	17.8	17.6	14.7	10.1	7.3	5.5	3.8	3.0	2.9	1.3	1.3	1.9	1.9	1.0	1.5	1.5	1.4	1.7	2.7	4.3	5.0	7.2	6.0	17.8
12-Aug	10.3	13.8	21.2	28.0	28.6	21.3	24.1	24.7	26.0	29.8	28.4	17.7	11.3	10.0	7.6	6.5	6.3	5.6	6.3	7.2	7.8	10.5	14.6	15.3	16.0	29.8
13-Aug	13.9	12.6	12.0	11.5	11.0	10.7	11.9	12.8	16.8	20.6	12.6	10.5	10.2	9.9	10.0	10.4	10.3	11.2	11.8	13.1	14.3	15.7	15.7	15.6	12.7	20.6
14-Aug	14.1	11.6	9.7	9.5	9.0	8.9	9.9	13.4	14.8	19.1	19.0	23.3	21.3	18.1	15.9	19.4	31.6	18.8	17.3	16.6	15.9	15.7	16.0	16.5	16.1	31.6
15-Aug	13.7	10.7	8.7	7.3	8.4	9.7	14.5	19.6	20.1	20.0	20.1	15.3	10.2	12.8	5.8	6.7	6.6	10.3	16.0	13.4	11.7	11.8	11.2	9.2	12.3	20.1
16-Aug	8.7	10.0	10.5	11.4	15.0	18.7	17.3	24.8	22.5	25.8	29.2	30.9	32.4	34.0	25.1	14.5	13.1	10.3	12.3	13.7	15.7	17.6	16.8	14.6	18.5	34.0
17-Aug	12.1	12.6	14.0	13.7	11.7	9.6	8.5	6.6	4.6	5.0	5.0	4.7	4.5	4.4	4.6	5.0	5.1	4.5	4.0	2.8	2.3	2.2	2.2	3.5	6.4	14.0
18-Aug	6.0	6.5	7.3	9.3	10.3	8.7	6.4	5.0	4.9	6.7	8.4	15.6	19.4	20.9	20.7	21.0	22.5	25.6	26.7	24.4	13.0	10.8	9.4	8.5	13.3	26.7
19-Aug	8.3	8.0	8.4	8.0	7.6	8.3	9.7	10.7	11.5	10.7	6.2	M	M	PF	PF	PF	PF	9.7	8.5	7.1	6.0	5.4	4.9	10.5	8.3	11.5
20-Aug	17.5	13.3	8.9	9.6	10.9	13.5	12.7	10.4	9.6	8.8	9.4	10.4	8.8	7.5	5.6	4.7	5.8	5.1	4.1	1.3	1.1	1.2	2.4	2.5	7.7	17.5
21-Aug	3.0	3.7	4.5	4.5	4.4	5.0	4.4	4.4	3.2	2.2	3.2	1.4	1.3	1.4	1.4	1.5	1.8	2.6	3.3	4.4	4.2	3.9	4.0	4.5	3.2	5.0
22-Aug	4.4	4.0	3.7	3.7	3.6	3.0	2.7	2.6	1.9	2.0	2.2	1.7	1.1	1.9	1.6	1.7	2.2	1.9	3.1	3.6	3.2	4.2	4.4	5.1	2.9	5.1
23-Aug	6.5	5.8	5.1	5.0	4.6	4.6	4.6	3.5	2.6	4.0	7.3	10.9	4.7	7.9	5.9	7.5	6.1	5.6	6.8	6.0	3.9	4.0	6.6	8.6	5.8	10.9
24-Aug	10.2	12.1	13.0	15.0	15.1	15.7	16.0	16.4	15.6	13.2	10.0	9.1	11.0	10.3	9.2	9.0	8.6	6.1	4.2	4.0	3.9	5.4	7.6	9.2	10.4	16.4
25-Aug	8.4	6.6	4.9	7.3	10.2	12.5	14.5	12.4	9.8	8.3	8.6	7.0	6.3	6.9	7.7	9.4	8.4	6.5	7.8	7.8	8.4	12.3	12.8	11.1	9.0	14.5
26-Aug	8.6	7.0	8.1	10.1	11.6	12.9	12.7	9.8	9.5	11.8	14.1	17.1	18.4	21.9	23.8	17.1	11.4	8.5	11.4	12.6	9.9	9.1	7.5	6.9	12.2	23.8
27-Aug	7.9	9.1	10.9	11.9	13.6	9.8	7.2	5.6	4.1	2.1	1.5	0.7	0.4	0.4	0.6	0.9	6.6	1.9	1.8	1.1	1.0	0.9	0.7	0.6	4.2	13.6
28-Aug	0.9	2.4	3.7	4.9	5.2	6.0	5.6	4.1	1.8	1.2	1.0	1.0	1.3	2.3	2.4	2.5	2.2	2.3	3.2	2.6	2.3	2.5	3.9	4.5	2.9	6.0
29-Aug	5.7	5.7	5.5	5.4	5.6	6.4	6.4	6.2	7.3	5.8	7.0	5.6	1.8	2.2	4.3	5.7	8.1	5.8	4.5	3.5	4.0	6.2	10.1	13.7	5.9	13.7
30-Aug	15.9	14.4	12.7	9.0	6.0	4.8	4.3	4.4	5.6	4.2	4.7	5.1	3.9	2.5	2.7	3.6	4.6	5.9	6.7	8.3	7.2	7.1	6.8	7.7	6.6	15.9
31-Aug	8.5	9.9	9.5	6.1	5.3	6.4	7.1	5.0	2.6	1.5	1.3	1.2	2.4	4.7	2.6	1.7	1.0	0.8	0.8	0.8	0.9	2.2	4.2	5.6	3.8	9.9
	15.4	15.4	16.3	17.8	19.4	19.4	17.2	16.0	14.2	16.7	24.8	31.4	33.4	27.2	22.0	14.3	12.3	11.6	11.4	11.7	11.9	12.1	12.4	12.8	Diurnal Average	
	127.5	126.6	130.5	130.9	136.5	143.0	129.3	145.3	133.5	144.4	315.0	508.1	617.3	451.8	355.3	139.1	62.7	66.6	63.2	76.6	106.6	120.9	125.6	122.6	Diurnal Maximum	

M - Maintenance PF - Power Failure

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

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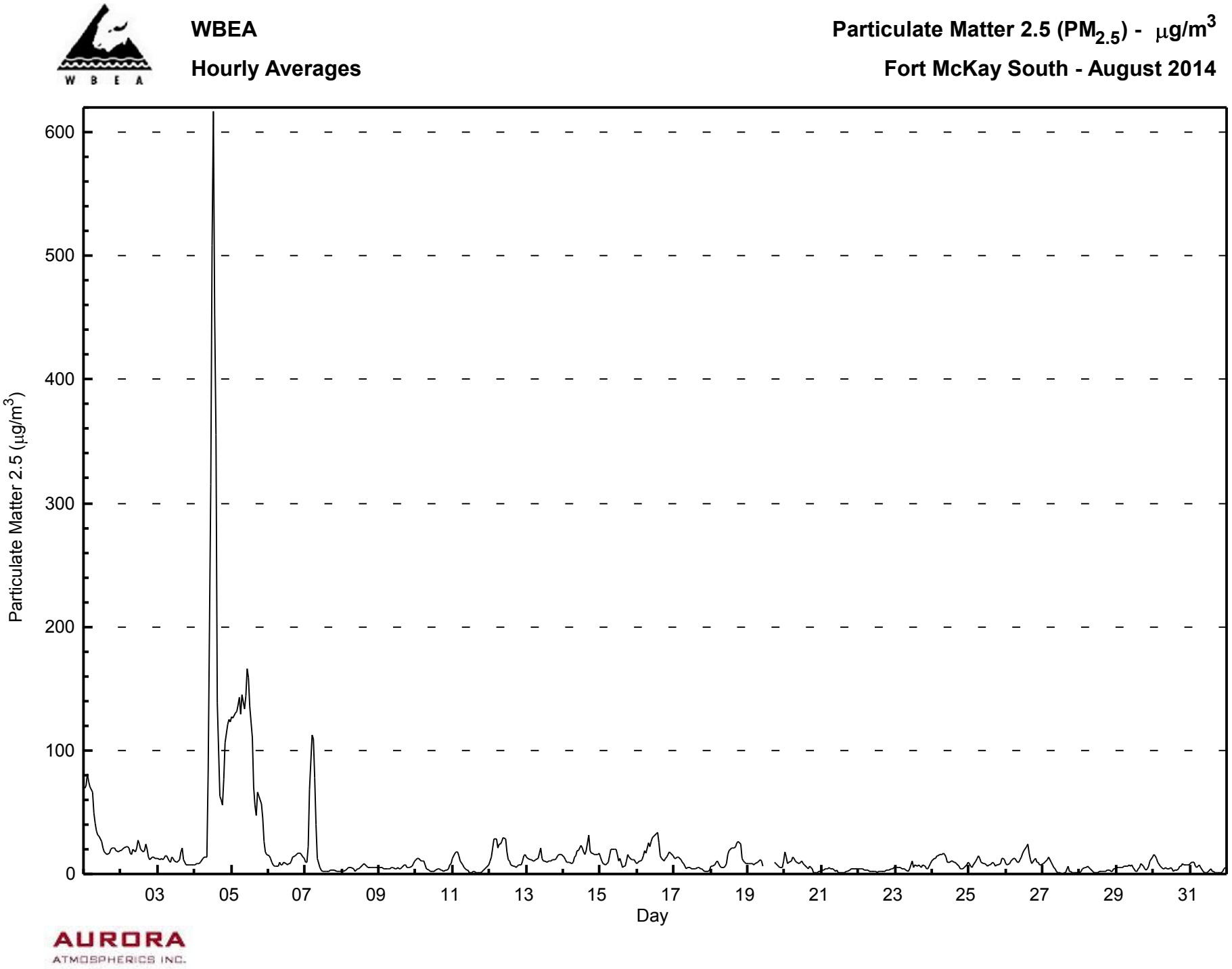
WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$
Fort McKay South - August 2014
Particulate Matter 2.5 ($\mu g/m^3$)
600
500
400
300
200
100
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

WBEA

Cumulative Frequency Distribution

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

Fort McKay South - August 2014

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	230	31.17	31.17
6 - 15	329	44.58	75.75
16 - 25	95	12.87	88.62
26 - 80	40	5.42	94.04
> 81.0	28	3.79	97.83

Total Number of Valid Hours: 738

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Fort McKay South - August 2014

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	20	12	7	2	3	4	5	9	16	24	26	29	12	18	24	19	230
6 - 15	22	12	7	1	2	12	17	35	51	62	47	22	9	9	9	11	328
16 - 25	5	5	4	0	5	8	6	5	12	15	17	3	0	3	3	4	95
26 - 80	3	3	3	0	0	2	7	1	1	2	2	4	1	1	2	8	40
> 81.0	7	2	0	0	1	0	5	0	0	3	7	2	1	0	0	0	28
Totals	57	34	21	3	11	26	40	50	80	106	99	60	23	31	38	42	721

Total Number of Valid Hours: 737

Total Number of Hours: 744

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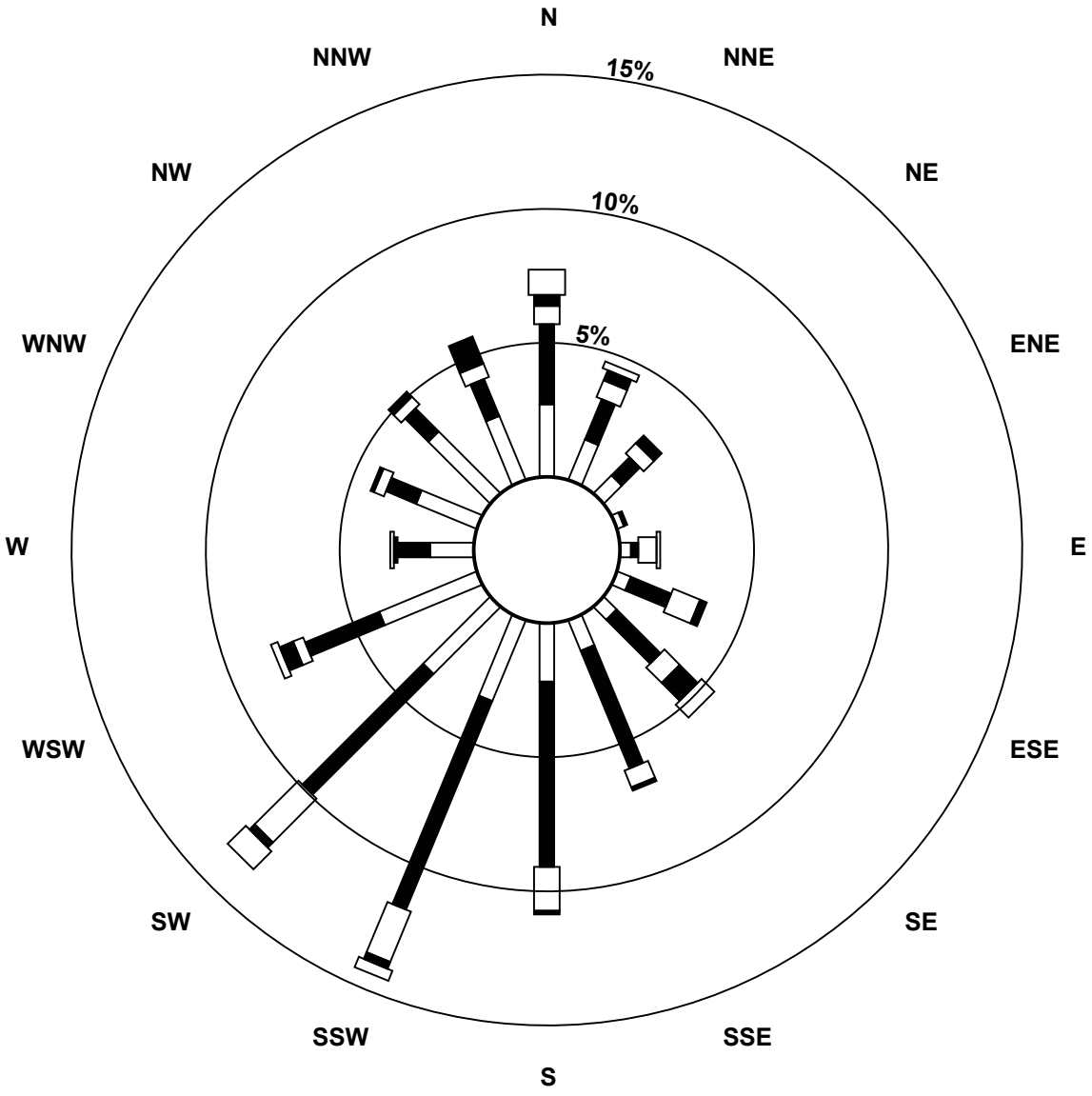
ATMOSPHERICS INC.

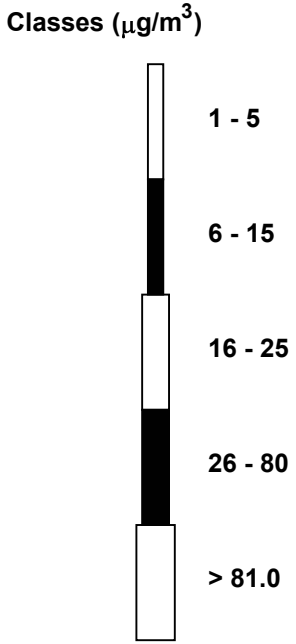
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Fort McKay South (AMS 13)





Total Number of Valid Hours: 737

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Fort McKay South - August 2014

Maximum Value: 31.9 C on Aug 15 15:00

Maximum Daily Average: 23.4 C on Aug 13

Minimum Value: -2.0 C on Aug 22 05:00

Minimum Daily Average: 7.5 C on Aug 22

Maximum Diurnal Average: 23.9 C at hour 16

Minimum Diurnal Average: 8.5 C at hour 5

Monthly Average: 16.23 C

Percentiles: P_1 = -0.5 P_{10} = 7.3 Q_1 = 11.1 Median = 15.6 Q_3 = 21.6 P_{90} = 27.1 P_{99} = 31.3

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-Aug	14.3	13.2	12.4	11.3	10.4	10.6	11.5	12.9	14.1	15.0	15.8	17.2	18.0	19.3	20.4	21.7	21.7	21.6	20.7	18.1	13.8	11.2	9.5	8.4	15.1	21.7
2-Aug	7.5	6.8	6.3	5.9	5.9	6.8	10.1	14.8	18.2	20.4	22.8	24.8	26.6	28.1	28.3	28.6	26.6	24.8	22.7	20.3	19.5	17.6	14.7	12.7	17.5	28.6
3-Aug	11.3	10.4	10.0	9.3	8.4	9.2	14.8	18.6	20.8	22.7	24.8	26.7	28.1	29.1	30.2	30.8	30.7	29.8	29.2	23.8	19.6	17.2	15.4	14.1	20.2	30.8
4-Aug	12.9	11.9	11.3	10.9	10.3	11.1	15.9	19.7	21.3	23.6	25.1	26.3	27.3	27.8	29.1	30.4	30.7	30.0	26.7	22.5	19.2	17.0	15.4	13.9	20.4	30.7
5-Aug	12.8	11.8	11.0	10.3	9.7	9.7	12.3	16.7	19.5	21.4	24.2	26.3	28.6	30.5	31.4	31.9	31.6	31.0	28.5	24.9	21.5	18.9	17.4	16.5	20.8	31.9
6-Aug	15.4	15.6	15.4	14.6	14.1	14.2	17.8	20.3	21.8	23.0	26.2	28.0	29.1	29.8	29.7	27.5	27.2	27.5	26.5	24.9	22.8	21.8	20.1	19.1	22.2	29.8
7-Aug	17.7	17.7	16.4	16.2	15.8	15.3	16.8	18.1	19.2	20.6	22.0	23.2	23.8	24.9	25.7	25.1	25.2	25.0	23.1	20.6	16.1	12.9	14.8	13.6	19.6	25.7
8-Aug	13.0	10.1	8.8	7.9	6.0	6.0	11.3	14.3	16.1	17.1	18.6	19.7	20.6	21.5	21.9	21.8	21.8	20.7	19.9	18.6	16.1	13.6	13.0	12.5	15.5	21.9
9-Aug	12.2	11.9	11.8	11.7	11.5	11.5	11.6	11.7	12.1	12.8	14.6	15.7	17.1	18.8	20.2	21.4	20.8	20.2	20.6	16.4	12.8	10.5	9.4	8.7	14.4	21.4
10-Aug	7.8	7.3	6.9	6.5	6.3	6.8	9.9	14.8	16.9	18.8	21.6	23.7	25.0	26.0	26.6	26.1	24.9	23.3	22.0	21.3	17.0	14.6	13.6	13.1	16.7	26.6
11-Aug	11.5	9.7	8.5	7.8	7.5	8.1	12.1	14.7	18.2	22.5	25.0	26.8	27.6	27.3	27.0	27.0	26.5	26.0	24.8	23.0	18.9	15.9	13.5	12.3	18.4	27.6
12-Aug	11.2	10.2	9.3	8.5	8.0	8.4	12.3	16.5	19.0	21.5	24.2	26.5	27.6	28.6	29.0	29.4	29.4	29.2	27.6	24.2	20.2	19.3	18.6	17.6	19.8	29.4
13-Aug	16.9	16.0	15.0	13.8	13.1	13.1	16.2	20.9	23.0	25.4	27.5	28.6	29.7	30.7	31.3	31.9	31.8	31.4	30.1	26.3	23.4	24.5	22.6	19.6	23.4	31.9
14-Aug	18.5	18.8	16.9	14.9	13.4	11.7	14.9	19.4	21.5	22.8	24.7	26.4	27.8	28.7	29.5	29.4	29.0	28.7	25.8	22.6	19.3	17.2	15.8	15.0	21.4	29.5
15-Aug	14.5	13.4	12.5	11.3	10.5	10.2	13.9	19.6	21.7	24.0	26.6	28.2	29.6	30.8	31.9	31.1	29.7	28.0	26.7	25.7	22.9	19.5	18.4	17.5	21.6	31.9
16-Aug	15.6	15.1	13.4	12.2	11.3	10.9	13.7	17.6	19.6	21.7	23.6	24.8	27.5	29.3	30.4	30.7	31.0	29.0	27.2	24.1	21.8	20.3	19.0	17.9	21.2	31.0
17-Aug	18.4	18.6	18.4	16.1	14.3	14.5	15.9	19.5	22.4	23.9	25.4	27.0	28.3	29.8	30.1	30.1	28.7	28.0	26.3	21.7	17.4	15.4	13.6	12.4	21.5	30.1
18-Aug	11.8	10.5	9.6	9.2	8.7	9.0	11.8	14.4	15.1	16.7	18.5	19.7	21.6	22.4	22.3	22.4	21.3	18.4	18.3	17.9	16.8	15.8	14.9	14.3	15.9	22.4
19-Aug	14.0	12.8	12.7	12.6	12.5	12.9	14.0	15.2	17.3	21.4	22.5	23.7	24.1	16.4	15.0	15.0	17.4	17.8	16.7	14.0	12.5	11.5	11.2	13.1	15.7	24.1
20-Aug	13.3	12.8	11.9	11.5	11.0	10.7	10.4	10.4	10.4	10.5	10.7	11.2	12.5	13.2	13.4	13.2	13.5	12.9	12.1	11.1	8.7	6.6	5.9	4.6	10.9	13.5
21-Aug	3.2	1.9	1.6	0.6	-0.7	-0.7	1.3	6.9	10.1	12.1	12.8	14.1	14.7	15.4	15.9	16.0	16.0	15.3	14.1	10.1	6.3	3.9	2.2	1.0	8.1	16.0
22-Aug	0.3	-0.5	-1.2	-1.7	-2.0	-1.6	0.9	4.2	7.5	10.8	13.0	15.2	16.2	16.7	16.1	16.2	16.2	15.7	14.3	10.0	6.1	3.9	2.1	1.1	7.5	16.7
23-Aug	1.4	3.1	3.8	4.1	4.1	4.4	5.4	7.2	9.0	10.9	13.0	15.7	17.8	18.2	18.6	20.1	19.3	18.1	16.5	13.0	10.7	7.8	5.5	3.8	10.5	20.1
24-Aug	2.7	1.7	1.6	3.1	4.0	4.6	5.9	8.1	9.1	10.5	13.2	15.3	17.6	19.2	20.2	20.3	19.4	20.0	17.3	14.6	11.1	8.7	7.8	7.5	11.0	20.3
25-Aug	8.2	8.8	9.3	9.7	9.4	8.1	9.5	11.1	13.1	15.7	19.0	20.6	22.4	22.6	23.9	23.3	23.1	21.9	19.8	18.4	17.0	16.4	16.5	14.8	15.9	23.9
26-Aug	15.5	14.4	13.8	11.5	9.5	8.3	9.9	13.4	16.7	18.3	20.1	21.6	22.0	24.4	26.3	27.0	26.6	21.9	18.5	17.0	16.3	16.0	15.5	14.3	17.4	27.0
27-Aug	13.0	11.6	10.5	9.8	9.8	10.2	12.5	13.8	14.5	16.4	16.7	18.9	20.6	21.6	22.8	23.6	23.7	21.5	19.3	14.7	11.5	11.8	11.5	10.0	15.4	23.7
28-Aug	8.6	7.7	6.8	6.9	5.5	6.2	6.4	8.8	10.8	11.3	12.2	12.9	12.9	13.5	14.4	14.9	15.8	15.6	12.3	8.6	6.0	4.5	3.9	3.9	9.6	15.8
29-Aug	3.3	1.7	0.4	-0.5	-0.3	0.5	1.5	6.1	12.0	14.6	16.8	18.7	20.3	21.9	22.9	22.6	22.5	21.0	17.9	15.2	12.4	11.3	9.7	8.4	11.7	22.9
30-Aug	7.9	7.3	7.5	8.2	8.6	10.5	10.8	11.0	11.3	11.1	11.8	12.4	15.0	15.9	17.5	18.2	20.0	19.2	15.5	13.4	12.3	11.7	10.5	9.9	12.4	20.0
31-Aug	7.7	7.2	8.7	8.3	7.3	6.8	7.8	9.4	12.6	15.9	18.6	19.9	17.7	15.0	13.0	11.8	12.9	14.6	12.6	11.4	9.8	8.7	8.7	7.5	11.4	19.9
	11.0	10.3	9.7	9.1	8.5	8.6	10.9	13.9	16.0	17.8	19.7	21.3	22.5	23.1	23.7	23.9	23.7	22.8	21.1	18.3	15.5	13.7	12.6	11.6	Diurnal Average	
	18.5	18.8	18.4	16.2	15.8	15.3	17.8	20.9	23.0	25.4	27.5	28.6	29.7	30.8	31.9	31.9	31.8	31.4	30.1	26.3	23.4	24.5	22.6	19.6	Diurnal Maximum	

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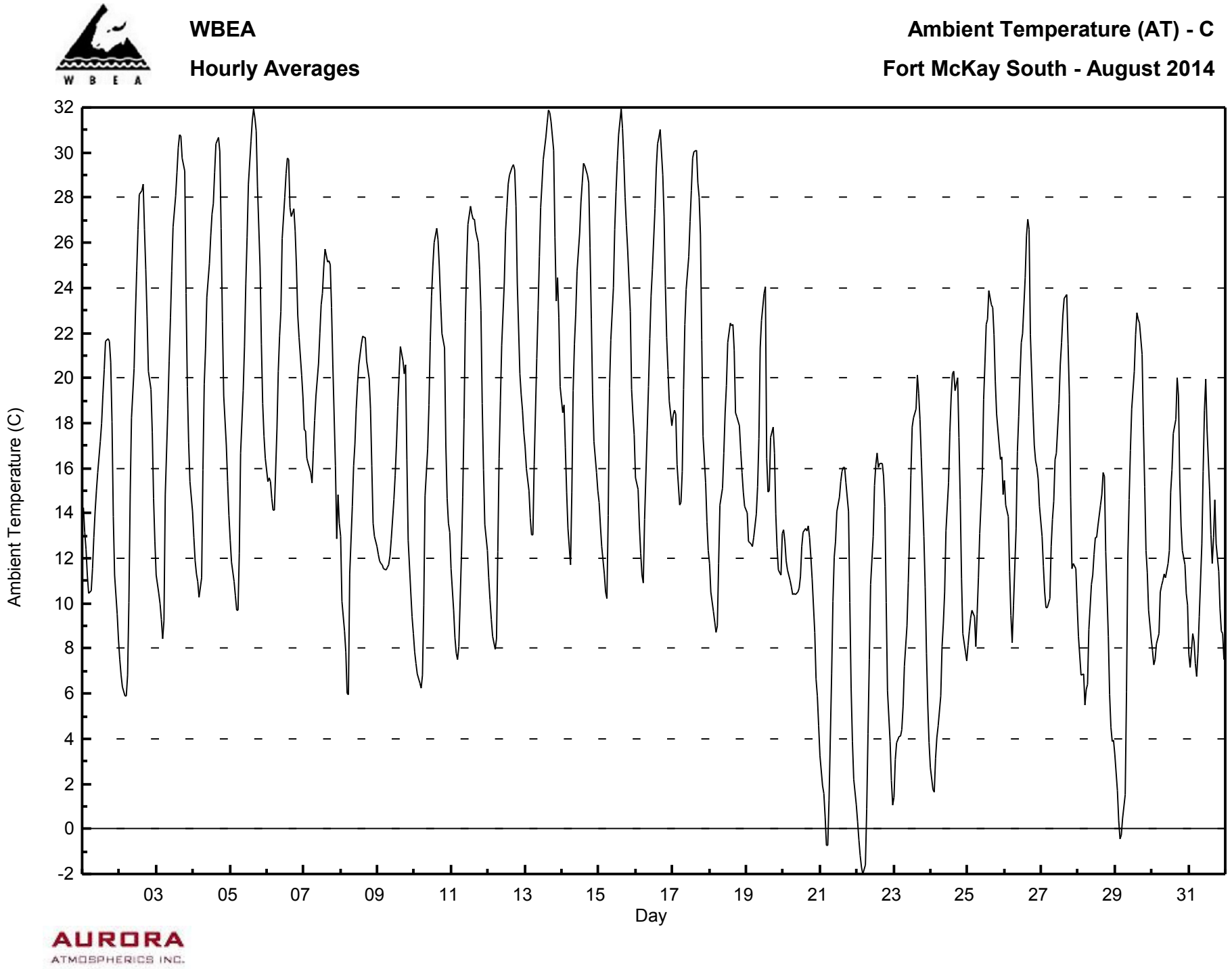
WBEA
Hourly Averages
Ambient Temperature (AT) - C
Fort McKay South - August 2014
Ambient Temperature (C)
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
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ATMOSPHERICS INC.

WBEA

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Fort McKay South - August 2014

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	9	1.21	1.21
0 - 10	136	18.28	19.49
10 - 20	370	49.73	69.22
> 20	229	30.78	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

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ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay South - August 2014

Maximum Value: 100 % on Aug 19 07:00

Maximum Daily Average: 91.7 % on Aug 30

Minimum Value: 21 % on Aug 17 14:00

Minimum Daily Average: 54.6 % on Aug 7

Maximum Diurnal Average: 95.8 % at hour 6

Minimum Diurnal Average: 44.7 % at hour 16

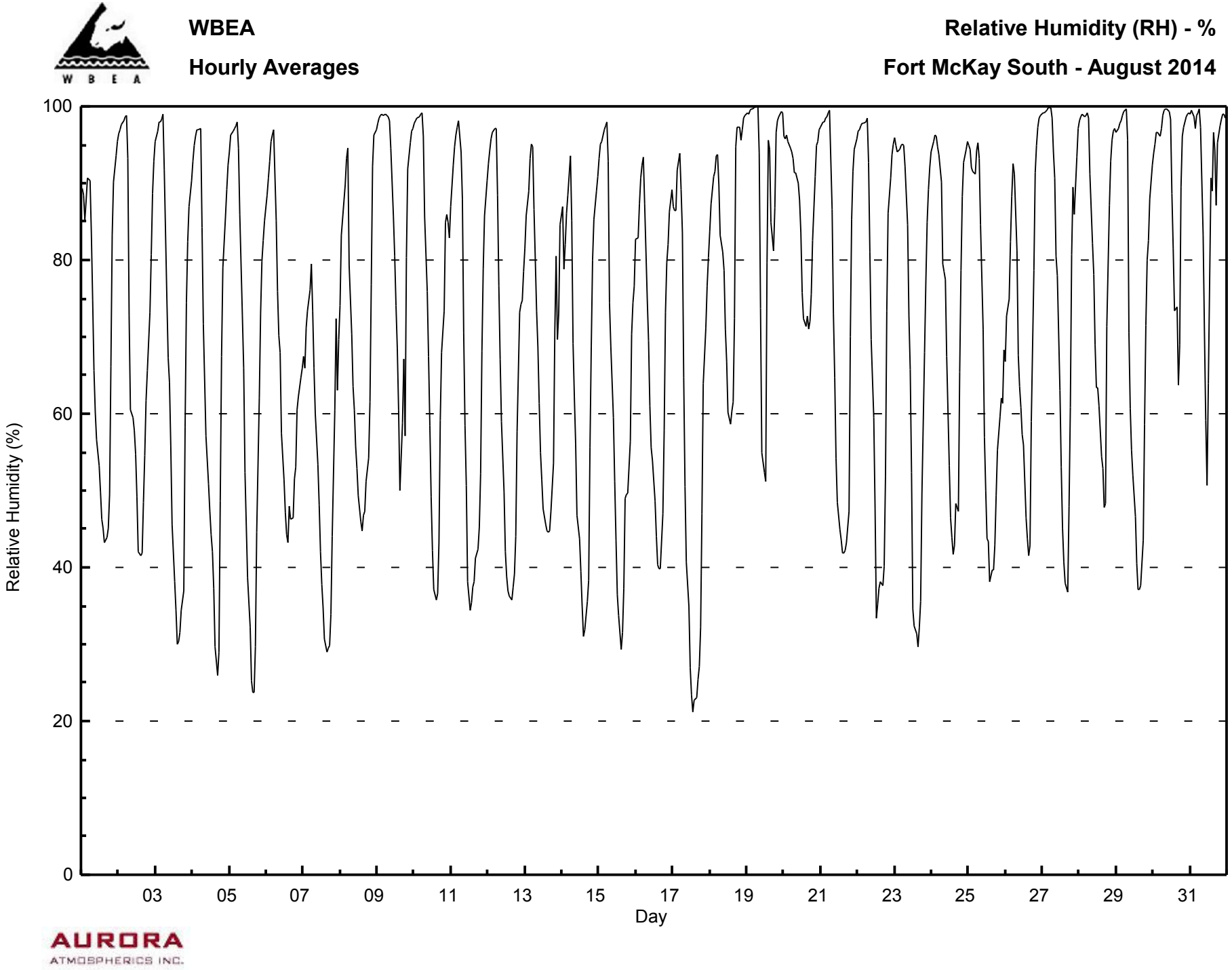
Monthly Average: 72.7 %

Percentiles: P_1 = 25 P_{10} = 39 Q_1 = 52 Median = 78 Q_3 = 94 P_{90} = 98 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-Aug	89	89	85	88	91	90	83	75	66	60	57	53	50	46	45	43	44	45	49	66	83	90	94	95	69.8	95
2-Aug	97	97	98	98	99	99	93	73	60	59	58	55	49	42	42	42	48	55	62	66	73	81	89	93	71.9	99
3-Aug	95	97	98	98	98	99	92	75	67	64	56	46	38	34	30	30	32	34	37	58	74	82	87	90	67.2	99
4-Aug	93	95	96	97	97	97	84	72	64	57	51	47	44	42	37	30	26	29	49	67	79	86	89	92	67.5	97
5-Aug	94	96	97	97	97	98	95	86	73	66	52	45	39	32	25	24	24	30	45	62	73	80	83	85	66.5	98
6-Aug	88	91	93	95	96	97	85	76	70	68	57	51	47	44	43	48	46	46	52	53	61	62	65	66	66.7	97
7-Aug	67	66	71	73	76	79	73	66	60	53	48	42	38	35	31	29	30	30	34	44	60	72	63	70	54.6	79
8-Aug	74	83	88	90	93	94	79	70	63	60	56	53	49	46	45	47	47	51	54	62	77	92	96	97	69.5	97
9-Aug	98	98	99	99	99	99	99	99	98	95	86	81	74	68	61	50	59	67	57	80	92	95	97	97	85.3	99
10-Aug	98	98	98	99	99	99	96	86	76	67	58	49	42	37	36	37	43	59	68	73	85	86	85	83	73.2	99
11-Aug	87	92	95	96	97	98	94	88	70	58	51	38	34	35	37	38	41	42	45	52	68	79	86	90	67.3	98
12-Aug	93	94	96	97	97	97	88	77	67	59	50	42	39	37	36	36	37	39	44	58	73	74	75	78	66.0	97
13-Aug	81	86	89	93	95	95	87	73	69	61	55	51	48	46	45	45	45	47	54	71	81	70	73	85	68.4	95
14-Aug	87	79	82	86	89	94	85	69	62	56	47	44	39	35	31	32	36	38	56	69	80	85	89	91	65.0	94
15-Aug	93	95	95	97	97	98	93	74	69	60	51	44	36	34	29	31	37	49	50	50	56	70	74	77	65.0	98
16-Aug	83	83	87	91	92	93	87	75	69	61	56	54	49	44	40	40	40	47	58	73	80	82	86	89	69.1	93
17-Aug	87	86	86	92	94	89	84	65	50	41	35	27	23	21	23	23	25	27	32	47	64	71	77	80	56.3	94
18-Aug	84	87	91	91	94	94	90	83	81	79	71	67	60	59	60	61	72	95	97	97	96	97	98	99	83.5	99
19-Aug	99	99	99	100	100	100	100	100	94	74	55	52	51	80	96	94	85	81	87	97	98	99	99	99	89.0	100
20-Aug	96	96	96	95	95	94	93	91	91	90	88	84	76	72	71	73	71	72	76	83	91	95	95	97	86.7	97
21-Aug	97	98	98	98	99	99	99	87	73	65	54	48	45	44	42	42	42	43	47	70	85	91	94	96	73.2	99
22-Aug	97	97	97	98	98	98	98	93	81	70	60	48	33	35	37	38	38	40	52	73	86	91	94	95	72.8	98
23-Aug	96	95	94	94	95	95	95	92	85	73	66	52	35	32	31	30	32	36	50	68	77	85	89	92	70.4	96
24-Aug	94	95	96	96	95	94	90	80	78	78	67	53	46	44	42	43	48	47	65	79	88	93	94	95	75.1	96
25-Aug	95	94	92	91	91	94	95	93	85	71	57	50	44	43	38	40	40	43	49	55	60	62	61	68	67.2	95
26-Aug	67	73	75	82	88	93	91	81	68	64	61	57	56	46	44	42	43	59	79	91	95	97	98	99	72.8	99
27-Aug	99	99	99	100	100	100	99	94	91	80	78	63	53	45	41	38	37	48	61	81	89	86	93	97	77.9	100
28-Aug	98	99	99	99	99	99	99	91	82	78	69	63	63	61	54	53	48	48	71	87	93	96	97	97	81.0	99
29-Aug	97	97	98	98	99	99	100	96	71	61	55	52	47	41	37	37	38	44	59	71	80	82	88	92	72.4	100
30-Aug	94	95	97	97	96	97	99	99	100	100	99	98	89	82	73	74	64	69	89	96	97	99	99	99	91.7	100
31-Aug	99	99	99	97	99	99	100	97	83	71	59	51	64	91	89	97	94	87	95	97	98	99	99	98	90.1	100
	90.9	91.9	93.0	94.3	95.3	95.8	91.8	83.1	74.7	67.7	60.1	53.6	48.4	46.9	44.9	44.7	45.5	50.0	58.8	70.9	80.4	84.8	87.3	89.8	Diurnal Average	
	99	99	99	100	100	100	100	100	100	100	99	98	89	91	96	97	94	95	97	97	98	99	99	99	Diurnal Maximum	

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Relative Humidity (RH) - %
Fort McKay South - August 2014
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.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay South - August 2014

Maximum Speed: 14 km/h on Aug 7 15:00

Maximum Daily Speed Average: 7.7 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 21 03:00

Minimum Daily Speed Average: 0.6 km/h on Aug 14

Maximum Diurnal Speed Average: 2.1 km/h at hour 22

Minimum Diurnal Speed Average: 0.2 km/h at hour 18

Monthly Average Velocity: 1.0 km/h 227.0 deg

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 6$ $P_{90} = 8$ $P_{99} = 11$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNW10	NNW9	N10	NNW8	NNW7	NNW7	NNW8	NNW8	N8	N9	NNE9	NNE4	NNE4	NE6	NE3	ESE5	ESE6	ESE6	ESE4	S1	SW2	SW2	SSW2	SW2	N3.7	N10
2-Aug	SW1	SW2	SW2	SW2	WSW3	WSW2	S2	SSE5	SSE5	S7	ESE6	SE7	S8	S11	S9	S10	S12	SSW7	N6	NE3	SW2	W1	SW2	SSW2	S3.6	S12
3-Aug	S3	SSE2	S3	S2	SSW2	SSW3	SSW5	SSW3	SE4	ESE6	ESE6	ESE5	E5	ESE5	ESE5	SSE6	SE6	S6	SSW2	SW3	SW2	S1	S1	SSW2	SSE2.9	S6
4-Aug	SW2	SSW2	SW1	SSW2	SW2	S4	SE2	NE2	NNE4	N5	N7	N7	N7	N7	N5	NNE5	NNE6	N5	NW2	W1	WSW2	SW3	SW2	SW2	N1.7	N7
5-Aug	SSW2	SSW2	SSW2	WSW1	SW1	SW2	W1	NNE1	SE1	E4	SE5	SE4	SE4	SE6	SE7	SE6	ESE6	SE4	ESE1	SW1	SW1	WSW2	SSW3	S2	SSE2.1	SE7
6-Aug	S3	S4	S3	S4	S3	SSW2	S4	SSE5	S6	SE3	SSE7	SSE10	S11	SW9	SW11	SSW8	N6	E3	SSW4	SSW6	SSW6	SW7	SSW6	SSW7	SSW4.7	SW11
7-Aug	SW7	WSW7	SW5	WSW6	SW7	SW7	WSW9	WSW10	WSW11	WSW9	SW11	WSW11	WSW11	WSW11	SW14	WSW11	WSW10	WSW9	WSW7	WSW4	WSW3	WSW4	WNW5	WNW2	WSW7.7	SW14
8-Aug	SSW2	SW2	WSW3	SSE0	SW2	SSW1	NNE1	NE4	NE3	NE4	NE5	N5	NNE6	NNE5	NNE5	NNE6	NNE7	NNE7	N6	NW4	NW7	NNW5	NW2	NNW3	N2.7	NNE7
9-Aug	NNW3	NNW5	NNW4	NNW4	NNW5	NW3	WNW3	W3	WSW3	NW3	N4	NNW4	WNW2	NNW5	NNW4	NW6	W3	SSW3	NNW2	WSW2	SW3	SSW3	SE1	SW2	NW2.4	NW6
10-Aug	SSW1	SSW2	S3	SSW2	SSW2	SSW2	SSW1	SE2	S5	SSE4	S6	S7	S6	S7	SSW6	S5	WSW3	WSW1	SW1	SW2	SW3	SW5	SW6	SW4	SSW3.3	S7
11-Aug	S2	S1	S2	SSW2	SSW2	SSW2	SSW2	S3	S4	SE4	ENE3	NW8	NW11	NW11	WNW8	NW8	N10	N9	N8	N6	NW3	WNW2	SSW2	SW2	NW2.2	NW11
12-Aug	SSW2	SW2	SSW2	SSW2	S1	SW1	NNW1	NNE2	NE2	NE3	SE5	SE7	SSE7	SSE7	SE7	ESE7	ESE7	SE7	SE5	SSE3	SSW2	SSE4	S3	S4	SE2.9	ESE7
13-Aug	S4	S4	SW0	SW2	WSW1	NW1	AF	SE2	SE4	SE5	SSE6	S9	SSW10	SW11	SSW11	SW8	SW8	SSW7	SSW5	SW3	WSW4	NW5	WNW2	SW2	SSW4.0	SW11
14-Aug	WSW5	W5	W2	NW3	NNW2	S2	NNE0	NNW3	NE3	NNE5	NNE4	NNE3	NE5	E6	E6	ESE5	SE4	ESE3	ESE0	SW2	SSW2	SSW1	SW1	WSW2	NE0.6	E6
15-Aug	S3	SW2	SSW2	SSW2	SW2	S3	SSE2	SSE3	E4	E4	E4	NE5	NE5	ESE5	SW3	NNE5	N2	NNW5	NNW6	N7	NNW3	WNW3	NW3	NW3	NNE0.9	N7
16-Aug	WNW2	WNW3	W1	SSW2	S2	SSW2	S1	N1	N2	NNW2	NW2	NE4	SSE4	SE6	SSE6	SSW7	SSW6	SSW4	SW3	SW3	SW4	SSW3	SW3	SSW2	SSW1.7	SSW7
17-Aug	SW3	WSW4	SW3	SSW1	WSW4	W3	NE1	NW5	WNW5	N3	SSW1	NW6	WNW7	W8	W9	WNW8	NW9	WNW7	WNW6	W3	SW3	SW2	SSW1	SSW2	WNW3.5	NW9
18-Aug	SSW2	SW2	SSW2	SSW1	SW2	SSW1	SE1	N2	NNW3	ESE2	SE4	NE1	SW4	SW4	WNW4	N3	NNW2	SSW1	WNW2	N3	NNW4	W1	WSW1	SW2	W0.7	SW4
19-Aug	WSW3	SW2	SSE2	S2	SSW2	SSW3	SSE3	SSE2	SSE3	S6	SSW8	SSE7	S8	W10	W6	ENE1	E2	N3	NW2	WSW2	NW3	WNW2	WNW2	N3	SW1.8	W10
20-Aug	N8	N7	NNW8	NNW9	NNW9	N9	N8	NNE9	N8	N9	N10	N9	N9	N9	N8	NNW5	N4	NNW6	NNW4	WNW2	W2	W3	W3	NNW2	N6.2	N10
21-Aug	W2	W2	N0	SSE2	S2	SE1	SE1	NE1	NNE3	NNE6	NNW6	N7	N8	NNE8	NNE8	N8	N9	N9	N7	NW2	WSW2	SW3	SW2	SSW2	N2.8	N9
22-Aug	S2	SSE2	SSE1	SSE2	S2	SSW2	S2	SSE1	NE1	NNE3	NNE4	NNE4	N7	N6	N5	N6	NNE5	N5	NW2	WSW2	SW3	SSW2	SW2	SSW2	N1.1	NNE7
23-Aug	SW1	SW1	SSW1	WSW1	SW1	SSW1	SW1	SW0	NE2	E1	N3	E2	ESE6	ESE5	S5	SSE8	SE6	SE4	ESE1	WSW1	WSW1	SW2	SW2	WSW2	SSE1.3	SSE8
24-Aug	WSW1	SW2	SSW2	SW1	WNW1	WNW2	NW2	NW2	NNW2	NW2	N2	NNE4	N6	NNE4	NNE4	N2	NE3	ENE3	NW1	SW2	SW2	SSW2	SW1	SSW2	NNW0.9	N6
25-Aug	SSW3	S4	SSW2	S3	S3	S1	S5	S6	SSE6	SSE6	SE7	SSE9	SSE10	SSE9	S12	S11	S11	S10	S7	SSE6	SSE5	S6	SSE4	SSE5	S6.2	S12
26-Aug	SSE5	SSE4	SSW5	S3	SSE2	S3	S3	S4	S5	SSW5	SSE4	SSW5	SSW6	SE5	SE6	S9	SW12	NNW9	N4	S3	SW6	SW4	S4	SSW1	S3.4	SW12
27-Aug	W1	WSW1	SSW1	NNW2	SSW3	SW3	WSW7	SW6	WSW8	SW7	SW7	WSW6	WSW6	W5	SW7	WSW7	WSW7	NW3	WNW2	WSW2	SSW3	W5	SW4	S2	WSW4.0	WSW8
28-Aug	SSW3	SW2	WSW4	WSW4	WSW4	WSW5	WSW3	W5	WNW5	NW5	NW8	NW7	NW6	NNW6	NNW7	WNW4	NW3	NW3	WNW1	SW2	WSW2	WSW2	SSW2	SSW2	WNW3.1	NW8
29-Aug	SSW2	SSW2	SSW2	SSW2	SW2	SW2	SSW2	S3	SSE6	SE6	SSE6	SE6	SE8	SSE8	SSE8	SE6	SSE6	SE6	SE3	S2	SSW2	S2	SSW1	WSW2	SSE3.5	ESE8
30-Aug	SSW1	WSW2	SW2	WNW2	SSW2	SSW4	ESE1	S2	WSW4	NW2	W3	W4	N2	NE4	ENE3	E3	ESE3	SSE2	NW2	W1	WNW2	WNW2	WNW3	SSW1	WSW0.7	W4
31-Aug	SSE2	SW4	WSW7	SW1	S2	SSE2	SSE2	S2	SSW1	E3	S3	WSW3	W4	NW3	NW5	SSW2	SW5	NW3	SW3	WSW2	WSW1	SW3	SSW4	WNW1	SW1.9	WSW7
	SW1.4	SW1.7	SW1.5	WSW1.2	SW1.5	SW1.5	SW1.1	SW0.7	SSW0.5	E0.8	ESE0.9	S0.2	SW0.6	SW0.5	SW1.4	SSW1.3	SSW0.7	NW0.2	NW0.9	WSW1.2	WSW2.0	WSW2.1	SW1.9	SW1.6	Diurnal Average	
	NNW10	NNW9	N10	NNW9	NNW9	N9	WSW9	WSW10	WSW11	WSW9	SW11	WSW11	NW11	WSW11	SW14	WSW11	SW12	S10	N8	N7	NW7	SW7	SSW6	SSW7	Diurnal Maximum	

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 Speed (WS) - km/h

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Aug 7 15:00

Minimum Value: 0 km/h on Aug 24 22:00

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 1 $Q_3 = 2$ $P_{90} = 3$ $P_{99} = 5$

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

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

AF - Analyzer Failure

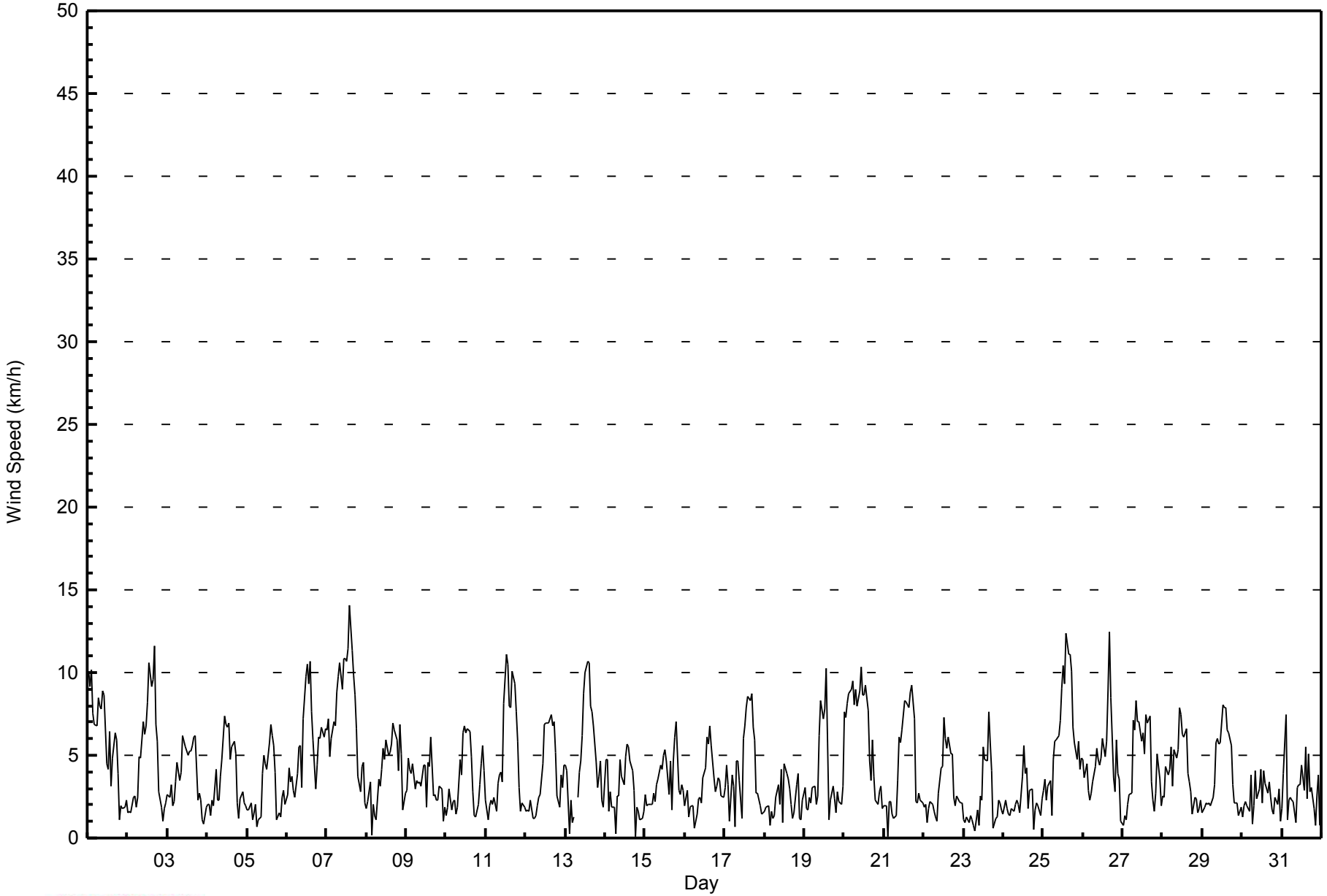
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay South - August 2014



AURORA
ATMOSPHERICS INC.

WBEA

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay South - August 2014

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	536	72.14	72.14
6 - 11	203	27.32	99.46
12 - 19	4	0.54	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay South - August 2014

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	22	23	20	4	10	16	24	31	58	93	85	46	22	26	30	26	536
6 - 11	35	11	1	0	2	10	16	20	22	15	15	20	4	5	11	16	203
12 - 19	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	4
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	57	34	21	4	12	26	40	51	82	108	102	66	26	31	41	42	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

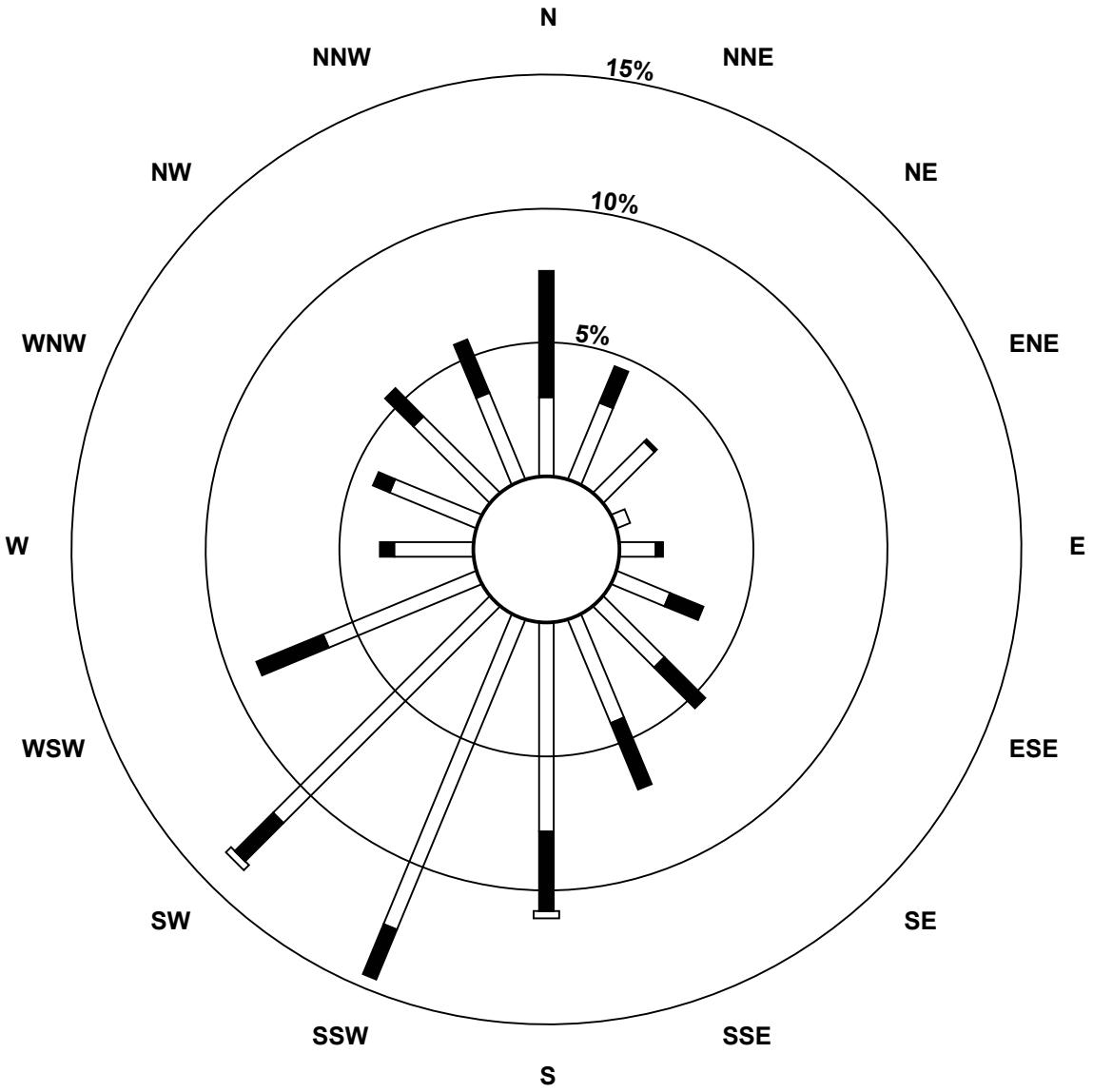
AURORA
ATMOSPHERICS INC.

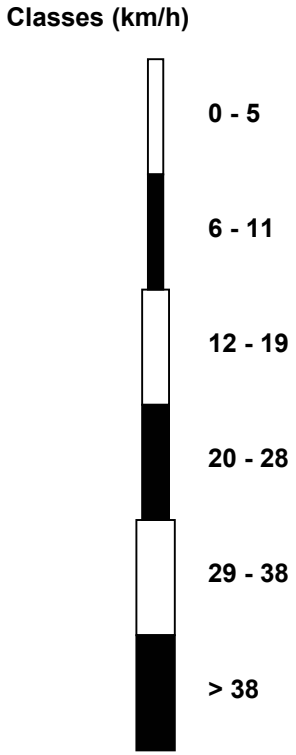
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Fort McKay South (AMS 13)





Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay South - August 2014

Direction of Maximum Speed: 234 deg on Aug 7 15:00
Direction of Maximum Daily Speed Average: 243.8 deg on Aug 7

Direction of Minimum Speed: 354 deg on Aug 21 03:00

Direction of Minimum Daily Speed Average: 0.6 deg on Aug 14

Monthly Average Direction: 241.1 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	346	348	350	343	339	341	345	343	7	4	20	16	28	35	54	112	109	123	122	173	219	217	212	226	6.7
2-Aug	233	228	233	227	241	257	179	157	161	177	123	137	185	187	185	184	188	194	9	45	224	276	226	201	182.6
3-Aug	175	163	180	189	204	193	195	194	125	116	121	119	101	107	106	160	144	170	197	229	229	184	185	210	153.4
4-Aug	216	213	227	194	216	170	143	43	20	4	357	1	352	359	9	15	12	11	306	266	238	230	216	219	351.2
5-Aug	199	192	207	252	215	217	280	19	124	89	139	136	145	139	129	128	119	126	120	236	235	237	201	187	149.5
6-Aug	184	184	190	188	189	203	171	159	170	137	165	166	188	214	226	207	9	98	196	206	212	216	213	209	192.6
7-Aug	229	241	233	245	230	226	237	246	245	240	233	240	252	256	234	250	254	246	243	244	237	253	300	293	243.8
8-Aug	194	222	253	155	227	213	13	34	53	50	46	360	20	25	29	27	20	15	10	316	312	334	314	339	5.8
9-Aug	334	331	332	348	336	315	284	277	258	321	3	343	290	344	347	314	280	210	328	252	214	207	137	231	311.3
10-Aug	201	202	175	200	210	207	193	141	178	151	179	173	187	189	203	186	254	246	236	225	221	229	225	229	197.6
11-Aug	177	169	171	200	212	193	199	174	176	130	72	305	312	323	288	308	360	2	358	359	317	299	210	226	317.0
12-Aug	201	216	209	198	182	235	339	21	38	39	139	139	150	152	129	116	115	134	131	150	196	154	172	182	142.0
13-Aug	188	190	234	231	241	313	AF	141	134	145	155	186	197	215	208	214	236	208	204	223	253	305	283	214	205.2
14-Aug	245	260	274	325	331	174	16	329	36	24	31	16	38	79	94	105	141	123	108	228	208	208	215	244	54.0
15-Aug	189	215	196	199	221	183	166	153	97	84	79	47	45	115	222	22	9	336	345	0	343	302	317	314	30.7
16-Aug	284	296	260	213	183	212	183	360	5	338	306	39	147	137	168	201	211	210	233	228	221	205	228	212	208.3
17-Aug	234	237	233	198	255	264	47	325	293	356	194	310	290	279	271	303	312	298	292	259	236	214	213	213	281.6
18-Aug	199	232	200	210	217	197	146	349	346	123	138	35	223	234	298	359	348	212	303	349	345	278	239	236	268.3
19-Aug	249	228	163	179	192	194	168	164	165	175	196	166	175	274	276	75	89	8	319	258	314	299	291	350	214.3
20-Aug	353	3	345	345	346	351	355	12	2	352	7	7	358	350	355	344	7	338	334	298	261	274	272	336	350.7
21-Aug	264	262	354	166	172	132	126	39	19	26	342	351	7	16	16	9	5	359	355	314	247	223	216	198	0.1
22-Aug	184	163	153	167	177	208	172	151	49	24	29	24	11	6	360	352	15	1	319	254	216	200	223	210	2.9
23-Aug	224	225	194	243	223	199	221	227	36	89	3	92	108	112	180	158	136	129	108	251	245	232	234	250	156.4
24-Aug	241	233	201	218	297	287	306	319	328	317	11	18	357	16	24	11	35	68	307	228	225	211	228	199	331.4
25-Aug	193	189	200	191	185	174	171	171	162	148	139	162	159	163	182	181	183	180	171	156	162	171	156	161	169.9
26-Aug	157	162	193	182	166	186	170	178	179	194	151	198	207	138	137	174	215	327	7	180	218	235	181	193	187.5
27-Aug	273	237	198	329	204	234	241	233	238	234	233	254	250	259	233	246	243	310	303	258	207	277	228	190	244.0
28-Aug	197	231	238	245	245	256	250	259	283	317	318	315	318	331	332	298	308	319	282	228	239	247	209	193	284.1
29-Aug	202	201	209	203	227	227	195	171	148	136	149	129	124	150	151	142	147	133	141	184	202	186	192	244	156.4
30-Aug	203	244	234	285	195	194	113	187	246	319	264	259	355	42	78	92	113	165	307	275	299	290	290	213	250.3
31-Aug	168	225	243	229	180	158	156	172	212	95	179	244	268	310	306	204	231	308	225	237	241	223	203	298	228.5
	226.3	235.9	235.7	239.4	234.4	227.6	216.4	220.7	198.4	81.9	118.9	171.7	216.2	232.7	216.2	197.4	204.0	309.2	309.2	250.0	240.9	237.5	226.5	220.8	
	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

Fort McKay South - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 102 deg on Aug 21 03:00

Minimum Value: 6 deg on Aug 16 20:00

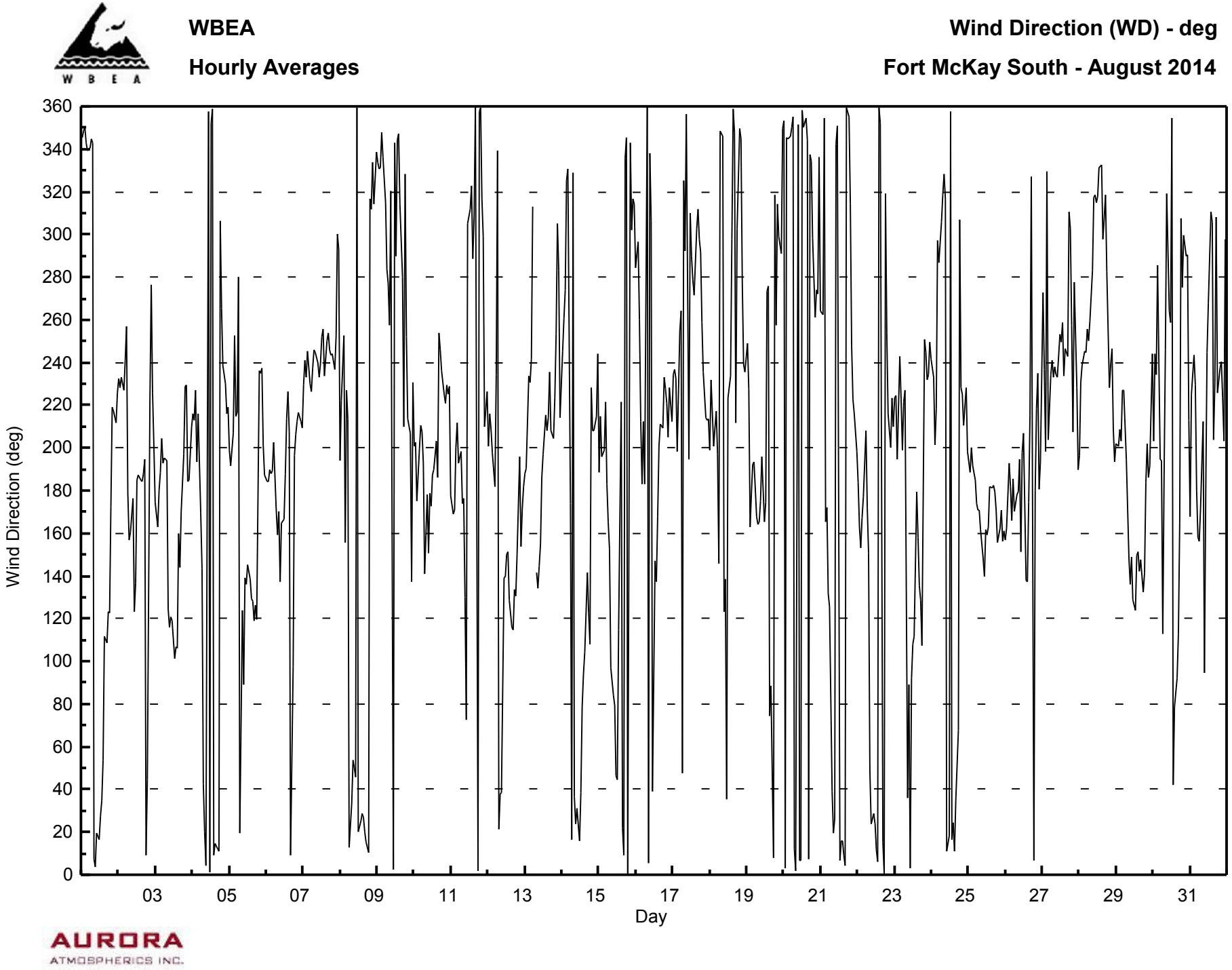
Percentiles: P_1 = 12 P_{10} = 22 Q_1 = 28 Median = 39 Q_3 = 52 P_{90} = 68 P_{99} = 95

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Aug	26	26	25	26	26	26	27	30	32	35	33	89	71	43	76	64	44	36	31	66	29	38	51	31	89
2-Aug	20	60	21	16	14	51	25	27	38	31	40	42	49	33	36	34	26	36	31	72	66	81	63	36	81
3-Aug	23	30	33	43	34	21	23	44	43	31	36	49	53	50	56	50	55	27	69	15	54	71	82	45	82
4-Aug	27	27	59	23	67	23	41	74	46	43	27	31	31	26	38	31	30	22	22	33	16	24	33	30	74
5-Aug	54	37	39	71	44	21	42	60	80	44	35	45	48	45	38	41	33	35	85	47	45	15	28	45	85
6-Aug	27	15	16	15	21	22	27	28	28	71	42	38	35	39	31	29	58	47	44	21	19	18	16	19	71
7-Aug	23	22	32	32	22	24	30	38	35	44	35	38	41	43	33	36	40	38	30	22	22	15	28	79	79
8-Aug	54	48	26	89	29	51	68	56	65	73	57	68	50	46	44	39	30	31	27	51	33	32	76	28	89
9-Aug	28	26	31	26	26	44	33	34	45	37	60	50	78	60	68	50	74	29	64	52	19	16	72	38	78
10-Aug	70	35	11	29	20	32	46	67	35	53	34	38	46	56	49	53	31	16	50	26	11	12	13	22	70
11-Aug	44	47	26	33	48	37	33	22	42	44	66	69	40	33	39	38	32	25	25	25	20	42	33	21	69
12-Aug	45	44	33	25	29	44	59	55	65	67	60	43	43	41	43	40	39	35	33	41	31	23	24	19	67
13-Aug	21	18	81	12	43	37	AF	36	40	40	49	32	30	31	29	37	31	30	22	15	22	41	73	57	81
14-Aug	20	29	88	41	74	30	92	46	46	35	63	75	62	43	47	35	41	46	96	42	33	66	62	47	96
15-Aug	26	27	20	25	17	16	27	31	43	42	42	47	52	49	92	53	65	25	28	24	35	33	17	19	92
16-Aug	35	29	51	34	15	24	85	68	36	51	67	47	67	54	48	35	46	26	19	6	13	13	15	33	85
17-Aug	61	31	44	65	23	43	93	43	54	73	100	68	56	50	45	43	46	45	33	21	26	43	55	56	100
18-Aug	33	57	43	77	46	58	48	40	58	61	49	98	62	43	49	50	53	88	76	68	27	74	51	28	98
19-Aug	20	46	53	18	41	20	27	73	56	29	32	44	38	40	33	92	65	48	47	36	36	39	52	56	92
20-Aug	28	29	26	25	25	28	28	27	29	26	27	31	34	30	30	45	49	32	30	30	19	30	46	52	52
21-Aug	74	67	102	14	27	53	57	77	48	36	48	58	48	45	39	38	32	29	25	43	13	12	17	25	102
22-Aug	33	24	66	29	25	33	10	34	74	75	56	75	36	61	45	33	41	26	34	34	21	30	63	25	75
23-Aug	66	78	64	65	51	60	59	91	47	99	64	82	48	60	80	45	45	38	82	36	40	23	30	50	99
24-Aug	44	20	32	42	60	41	39	55	43	56	78	43	37	69	67	93	55	52	74	14	13	19	58	33	93
25-Aug	37	29	29	31	30	63	21	23	25	32	39	30	35	33	32	30	25	24	21	26	24	22	27	26	63
26-Aug	25	25	27	32	40	25	17	25	31	33	41	50	31	52	49	41	28	54	53	67	40	58	30	64	67
27-Aug	76	66	60	33	69	74	29	23	24	30	25	52	43	62	43	46	43	30	25	33	28	45	65	53	76
28-Aug	36	47	25	26	28	25	71	43	51	48	39	39	47	47	47	61	53	75	49	11	44	46	23	27	75
29-Aug	42	35	20	33	17	28	23	38	27	39	47	45	36	38	34	42	35	28	23	32	23	27	44	33	47
30-Aug	61	33	16	38	42	45	87	25	26	48	54	39	75	48	63	50	56	48	45	88	25	70	37	71	88
31-Aug	49	31	23	100	55	24	27	64	96	55	67	90	54	46	40	61	25	60	41	88	75	35	29	99	100
	76	78	102	100	74	74	93	91	96	99	100	98	78	69	92	93	74	88	96	88	75	81	82	99	
	Diurnal Maximum																								

AF - Analyzer Failure

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Wind Direction (WD) - deg
Fort McKay South - August 2014
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	August 18, 2014	Previous Calibration	July 21, 2014
Station Name	Fort McKay South	Station Number	AMS 13

Reason: Routine

Start Time (MST)	9:45	End Time (MST)	14:52
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	5/29/2014
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	PMT voltage	26	28
Analyzer Range (mv)	5000	5000	Lamp voltage	2248	2251
Calculated slope	0.996266	0.996713	Chamber temp.	50.0	50.0
Calculated intercept	1.618113	1.001536	Pressure ("Hg)	25.9	25.8
Analyzer Background	26.3	26.3	Flow (lpm)	0.662	0.665
Analyzer Coefficient	1.616	1.613	Intensity	76	78

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	0.6	NA
as found span	5000	78.9	806.4	806.2	1.000
calibrator zero	5000	0.0	0.0	0.6	0.000
high point	5000	78.9	806.4	808.9	0.997
second point	5000	39.4	402.7	401.8	1.002
third point	5000	19.7	201.3	199.7	1.008
calibrator zero					
as left zero	5000	0.0	0.0	0.9	NA
as left span	5000	78.9	806.4	805.3	NA
				Average Correction Factor	1.002

Corrected As found	805.5	Previous response	807.8	% change	0.3%

Notes:

Slight adjustment to span

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

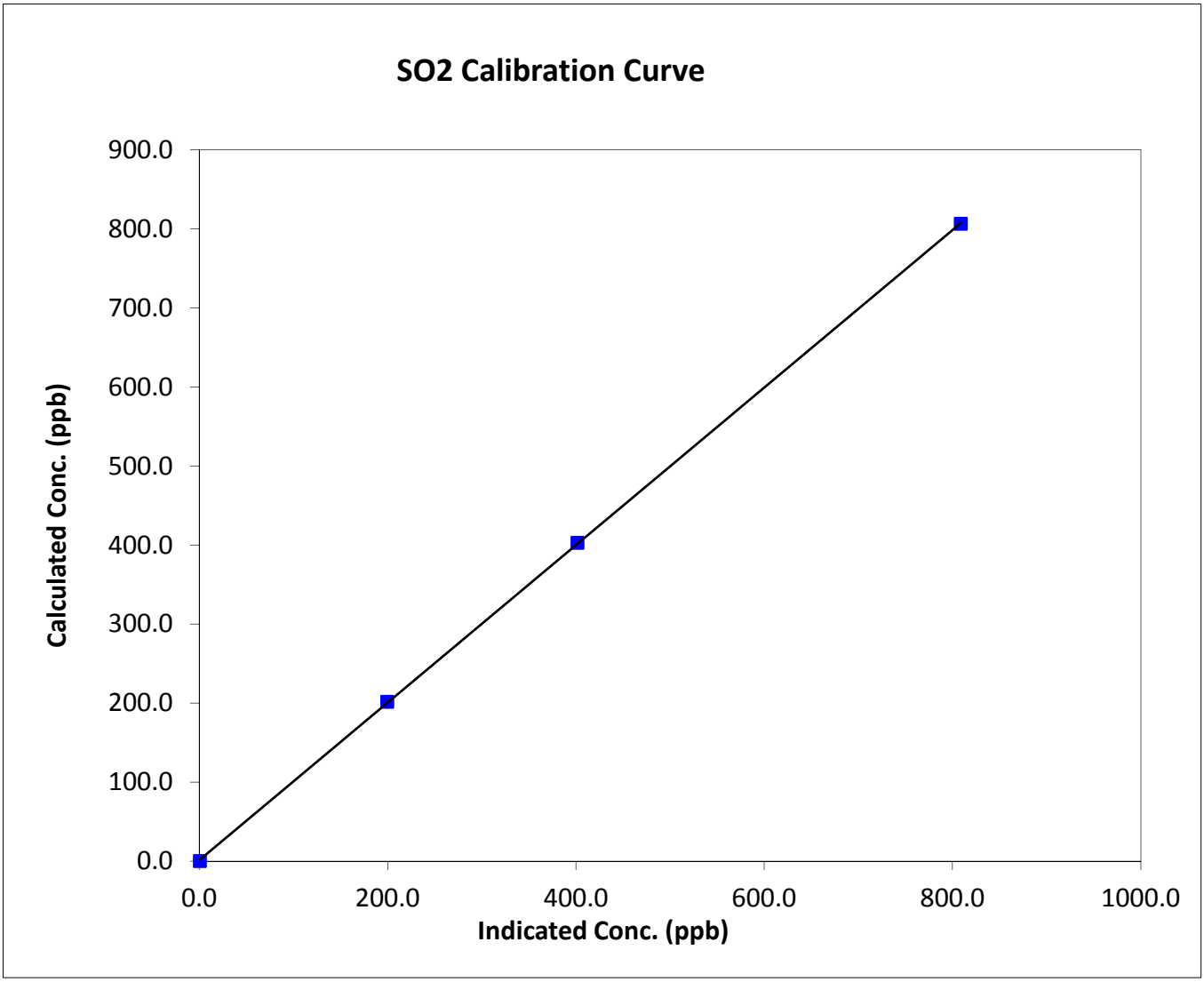
SO_2 Calibration Summary

Station Information

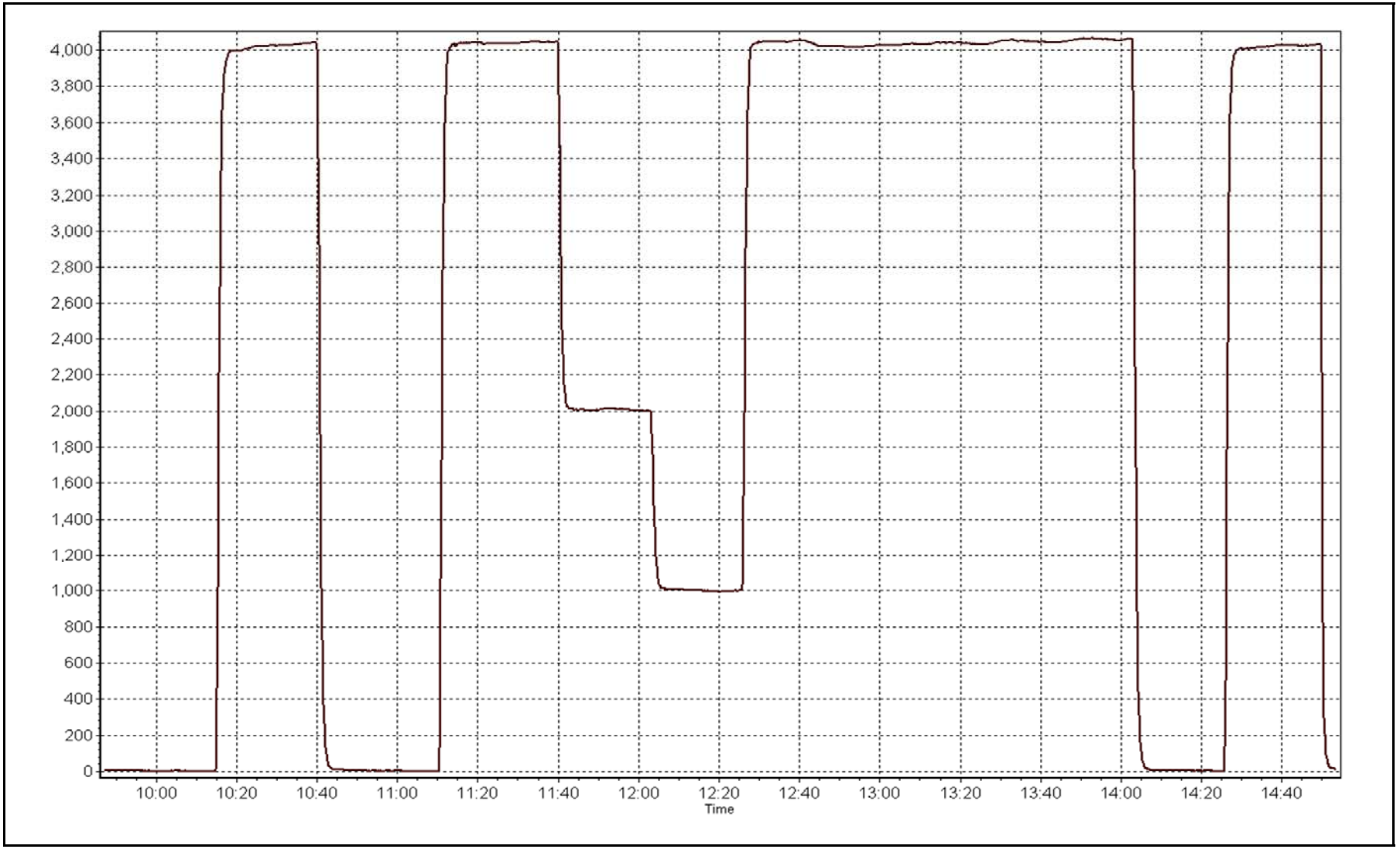
Calibration Date	August 18, 2014	Previous Calibration	July 21, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:45	End Time (MST)	14:52
Analyzer make	API T100	Analyzer serial #	599

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.6	N/A	Correlation Coefficient	0.999981
806.4	808.9	0.9968		
402.7	401.8	1.0022	Slope	0.996713
201.3	199.7	1.0083		
			Intercept	1.001536



SO2 Calibration Plot Date: August 18, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 15, 2014	Previous Calibration	July 14, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	9:20	End Time (MST)	12:16
Barometric Pressure	741 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11041107
Cal Gas Concentration	10.4 ppm H2S	Cal Gas Expiry Date	5/30/2013
Gas Cert Reference	LL82750	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)	5000	5000	Lamp voltage	987	986
Calculated slope	1.007002	1.001291	Chamber temp.	45	45
Calculated intercept	-0.244684	-0.266706	Pressure	687.8	686.8
Analyzer Background	1.8	1.87	Flow	0.434	0.434
Analyzer Coefficient	1.023	1.055	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	0.2	NA
as found span	5000	38.5	80.1	77.0	1.040
SO2 scrubber check	5000	39.4	402.7	0.6	NA
calibrator zero	5000	0.0	0.0	0.2	NA
high point	5000	38.5	80.1	80.1	1.000
second point	5000	19.2	39.9	40.5	0.986
third point	5000	9.6	20.0	20.0	0.996
calibrator zero					
as left zero	5000	0.0	0.0	0.3	NA
as left span	4000	30.8	80.1	80.8	0.991
				Average Correction Factor	0.994

Corrected As found	76.8	Previous response	79.8	% change	3.9%

Notes:

As found zero used as calibrator zero, scrubber check after third point.

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

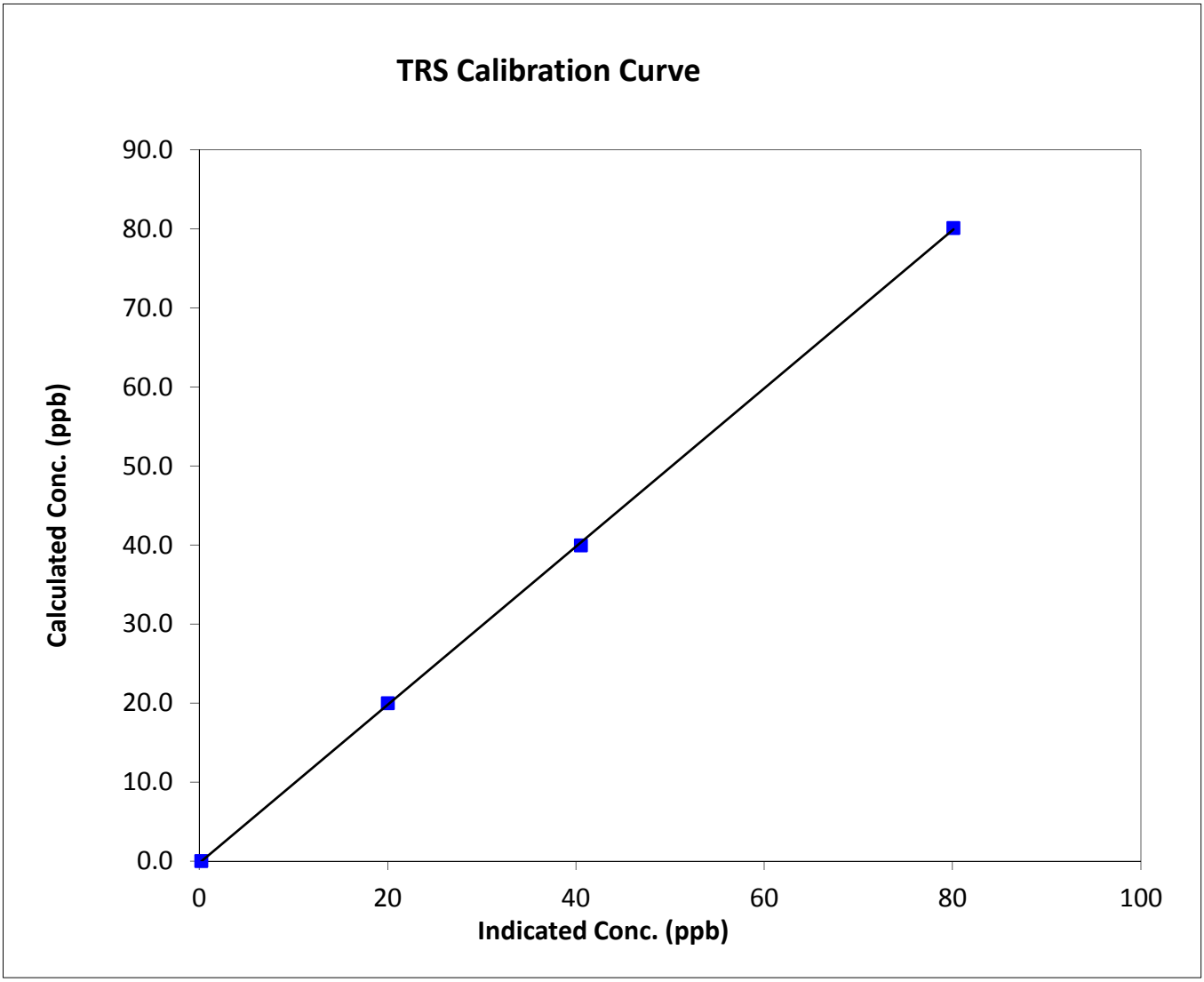
TRS Calibration Summary

Station Information

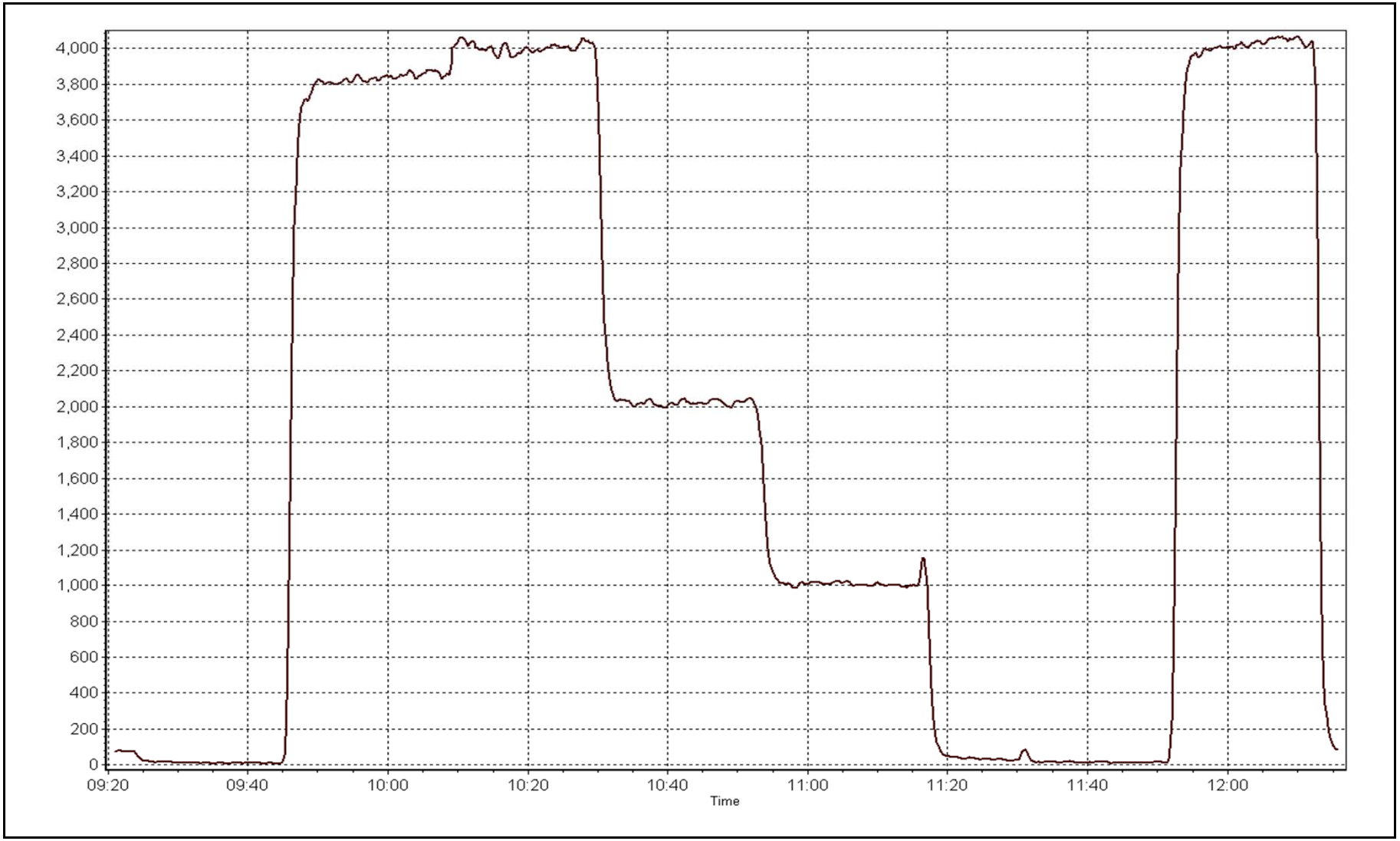
Calibration Date	August 15, 2014	Previous Calibration	July 14, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:20	End Time (MST)	12:16
Analyzer make	TEI 43i-TLE	Analyzer serial #	1218153359

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999946
80.1	80.1	0.9998		
39.9	40.5	0.9856	Slope	1.001291
20.0	20.0	0.9963		
			Intercept	-0.266706



TRS Calibration Plot Date: August 15, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Monday, August 18, 2014	Previous Calibration	Monday, July 21, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	9:45	End Time (MST)	14:52
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	5/29/2014
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)	5000	5000	Air or Bypass press	41.1	41.9
Calculated slope	1.005147	1.005573	Fuel Pressure	22.6	22.6
Calculated intercept	0.040653	-0.029612			
BKG	2.6	2.4			
COEF	4.773	4.773			

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	-0.07	N/A
as found span	5000	78.9	16.98	16.88	1.006
calibrator zero	5000	0.0	0.00	0.11	N/A
high point	5000	78.9	16.98	16.95	1.002
second point	5000	39.4	8.48	8.43	1.005
third point	5000	19.7	4.24	4.16	1.019
calibrator zero					
as left zero	5000	0.0	0.00	-0.03	N/A
as left span	5000	78.9	16.98	16.96	1.001
				Average Correction Factor	1.009

Corrected As found	16.95	Previous response	16.85	% change	-0.6%

Notes:

Zero slightly adjusted.

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

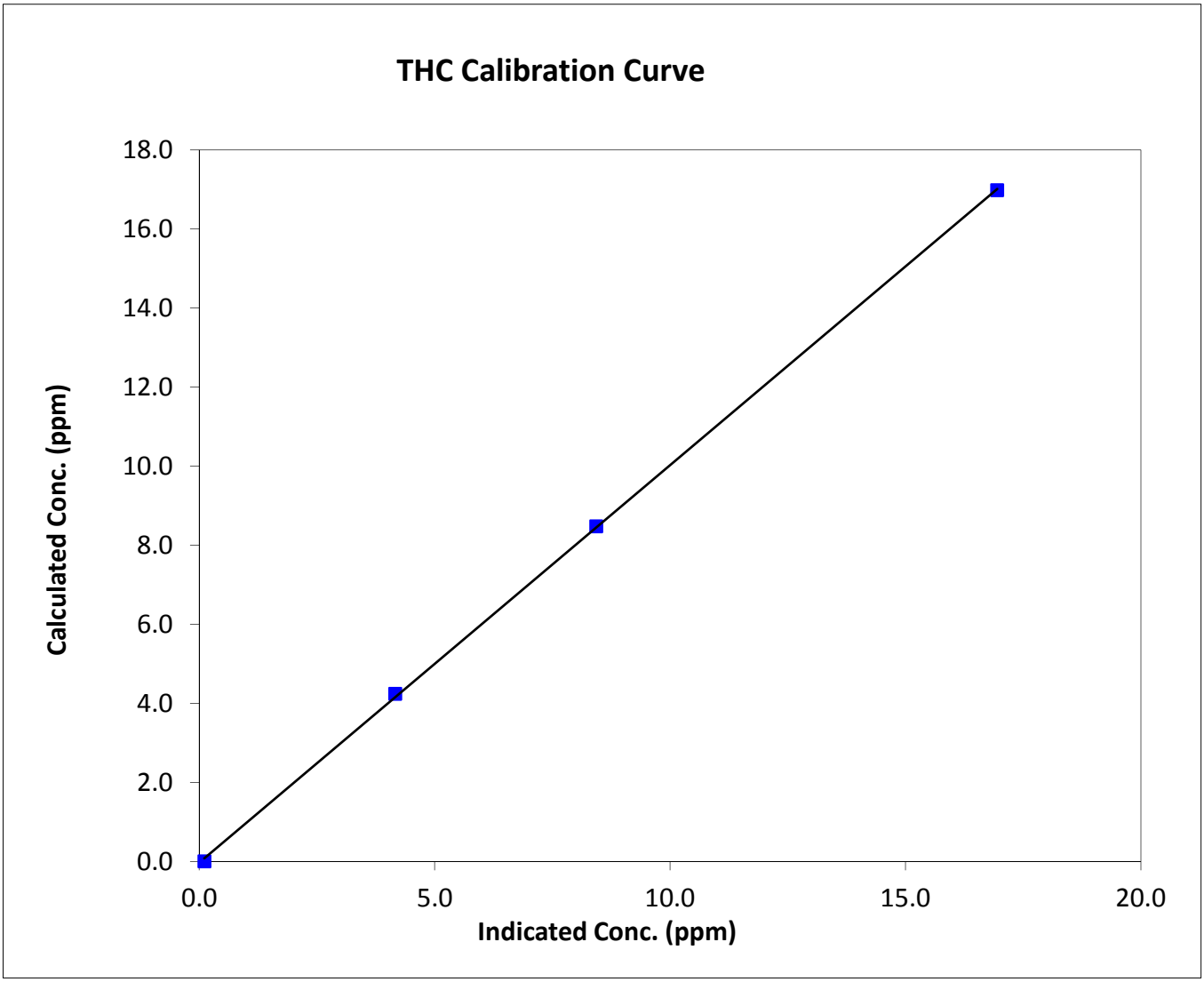
THC Calibration Summary

Station Information

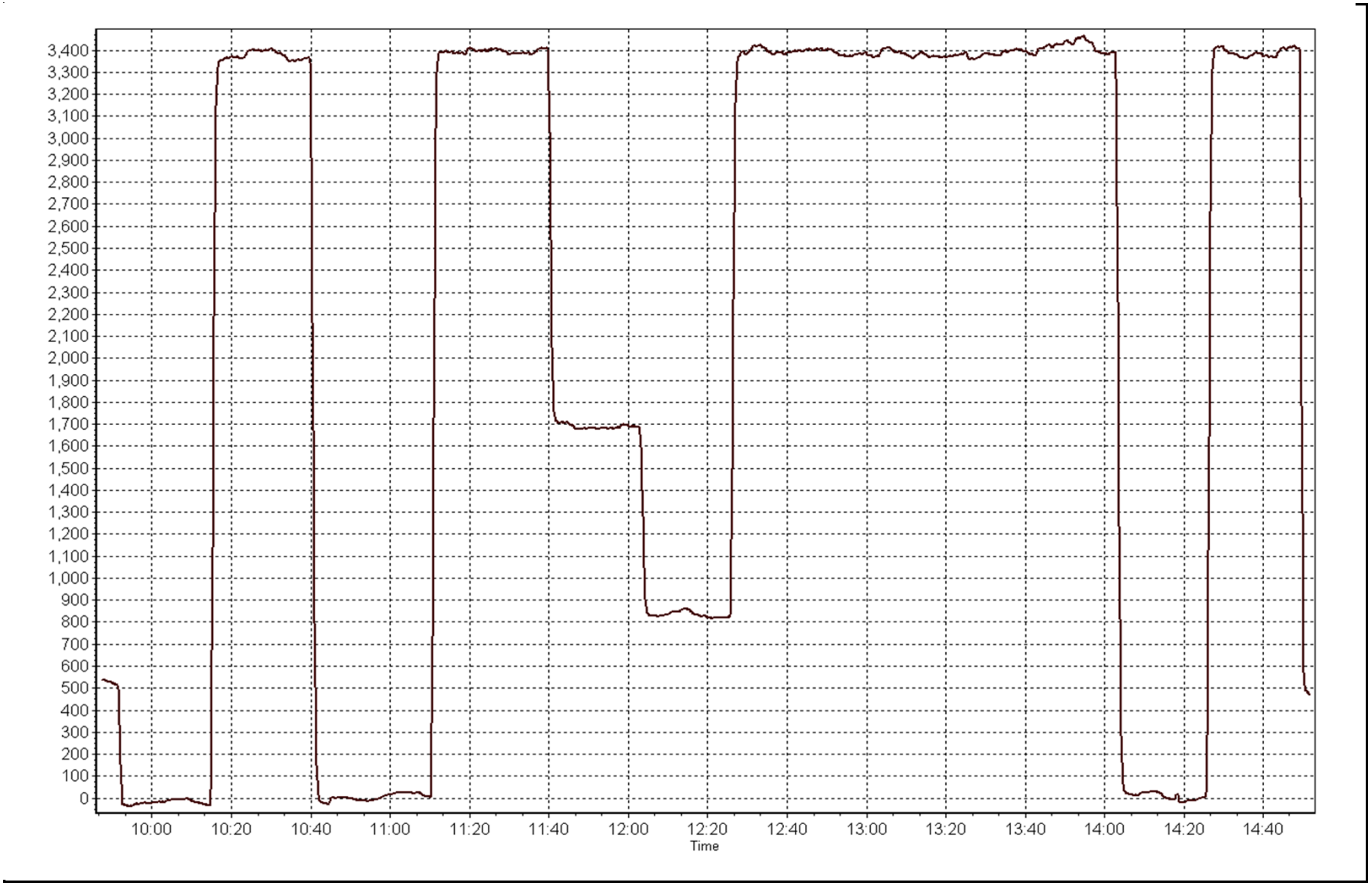
Calibration Date	August 18, 2014	Previous Calibration	July 21, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:45	End Time (MST)	14:52
Analyzer make	Thermo Model 51iLT	Analyzer serial #	1236656114

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.11	N/A	Correlation Coefficient	0.999900
16.98	16.95	1.0018		
8.48	8.43	1.0054	Slope	1.005573
4.24	4.16	1.0191		
			Intercept	-0.029612



THC Calibration Plot Date: August 18, 2014



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 19, 2014	Previous Calibration	August 4, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	9:30	End Time (MST)	12:14
Barometric Pressure	728 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11041107
NO2 calibration used	Monday, August 18, 2014	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.	30.0	30.1
Analyzer Range (input)	5000	5000	Lamp temp.	58.0	58.0
Calculated slope	1.001342	1.009164	Pressure ("Hg)	26.6	26.1
Calculated intercept	-1.018398	-0.267327	Flow cell A	700	700
Analyzer Background	-1.1	-1.1			
Analyzer Coefficient	1.014	1.014			

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	352.3	349.4	1.008
calibrator zero	5000	0.000	0.0	0.3	N/A
high point	5000	0.903	352.3	349.4	1.008
second point	5000	0.585	209.8	208.1	1.008
third point	5000	0.358	110.6	109.8	1.007
calibrator zero					
as left zero	5000	0.00	0.0	0.4	N/A
as left span	5000	0.903	352.3	346.7	N/A
				Average Correction Factor	1.008

Corrected As found	349.1	Previous response	352.8	% change	1.1%

Notes:

No adjustments, filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

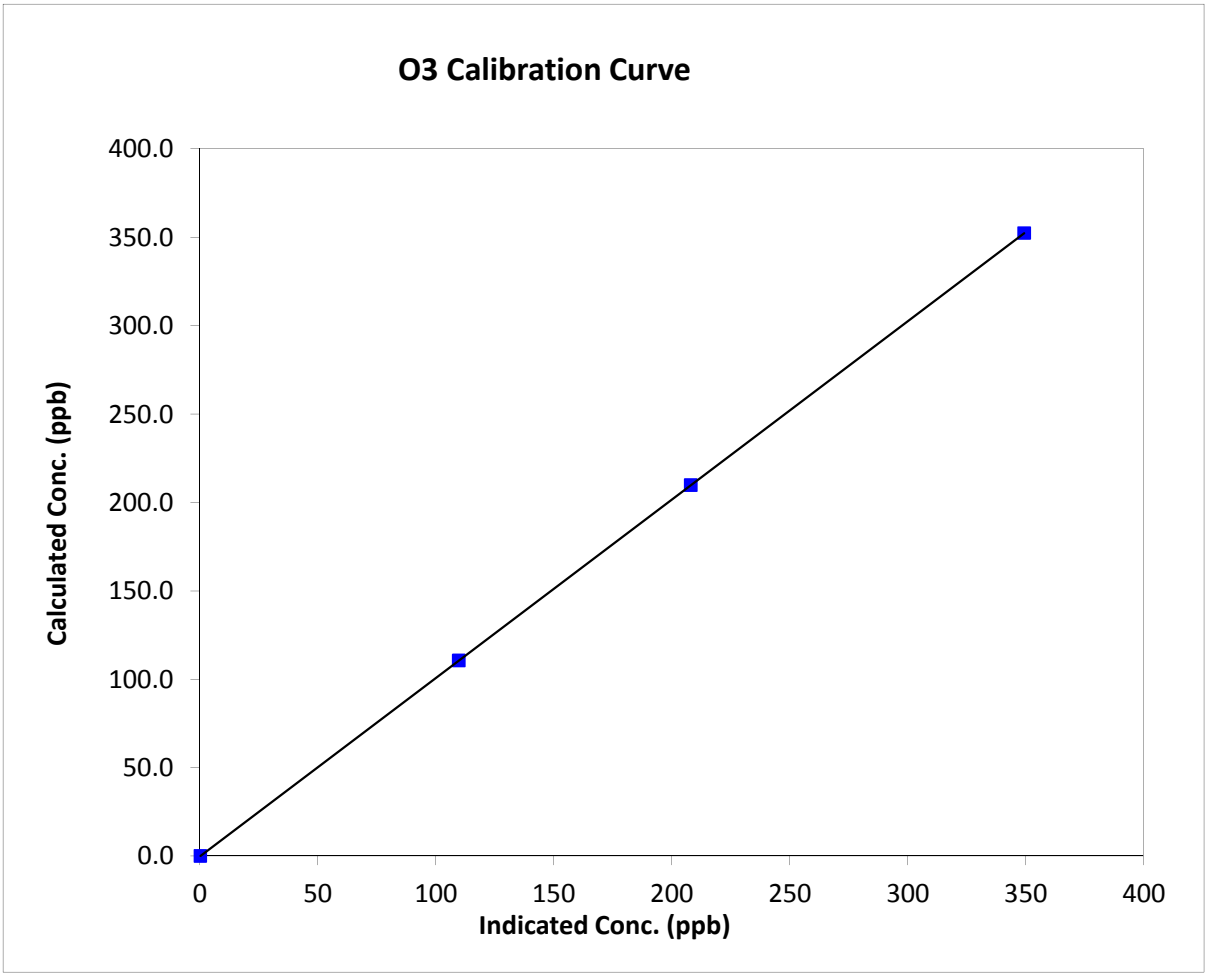
O_3 Calibration Summary

Station Information

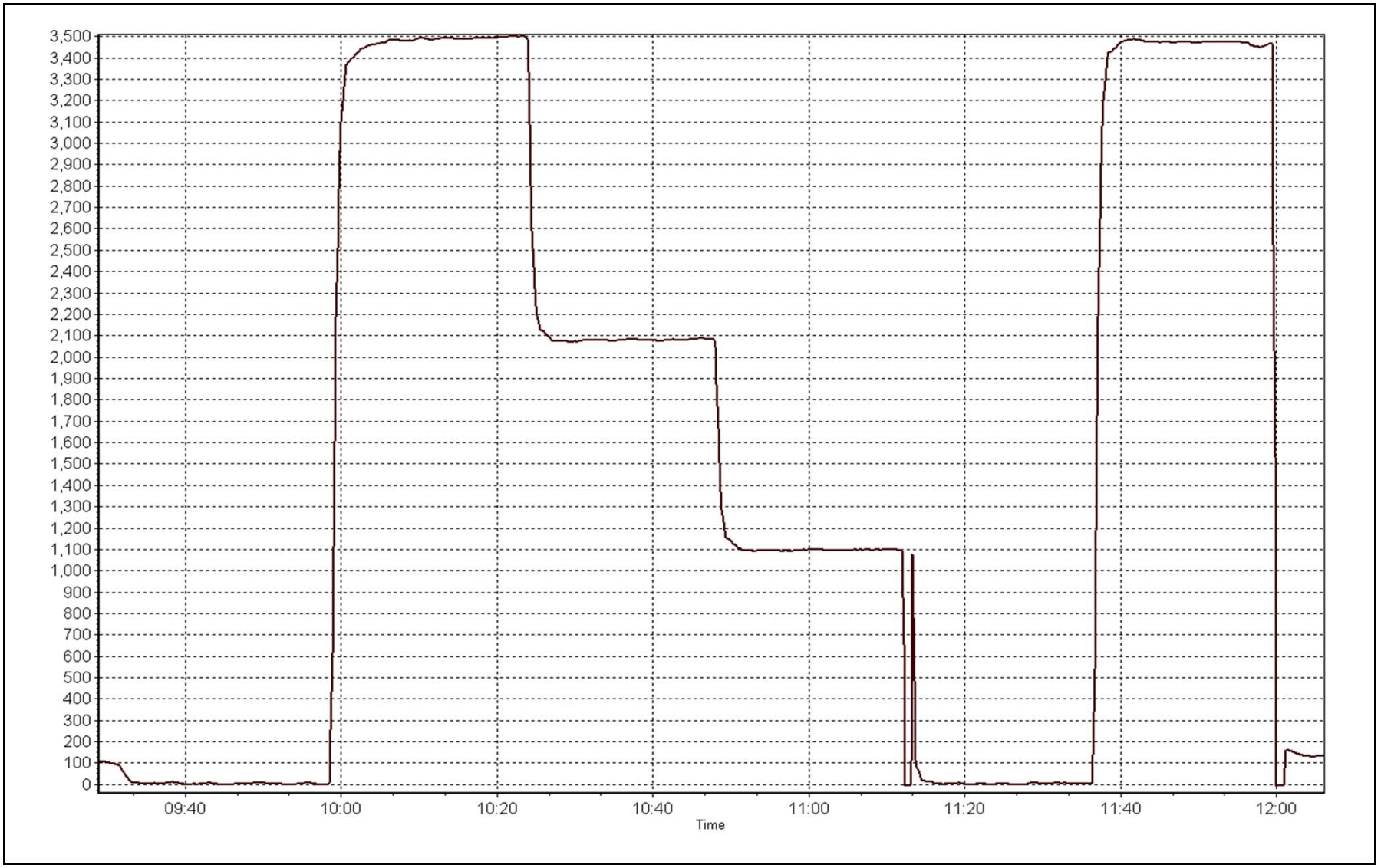
Calibration Date	Tuesday, August 19, 2014	Previous Calibration	August 4, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:30	End Time (MST)	12:14
Analyzer make	API T400	Analyzer serial #	825

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	1.000000
352.3	349.4	1.0083		
209.8	208.1	1.0081	Slope	1.009164
110.6	109.8	1.0071		
			Intercept	-0.267327



O3 Calibration Plot Date: August 19, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 18, 2014		Previous Calibration	July 21, 2014	
Station Name	Fort McKay South		Station Number	AMS 13	
Reason:	Routine				
Start Time (MST)	9:45		End Time (MST)	14:52	
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)	5000	5000	5000
Before	Data Slope	0.998656	0.998353	0.997074
	Data Offset	2.040642	2.013774	-0.495390
After	Data Slope	0.998712	0.997704	0.998629
	Data Offset	1.812218	1.764578	0.113273
Channel #		3	2	1
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	Thermo 42C	Analyzer serial #	2185

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	0.866	ppb	0.878	ppb
NOX coefficient	1.001	ppb	1.000	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	4.0		4.1	
NOX bkgrnd	4.1		4.1	
Nt coefficient	N/A		N/A	
Chamber Temp	49.9	Deg C	49.8	Deg C
Moly Temp	325.0	Deg C	325.0	Deg C
PMT Temp	-3.6	Deg C	-3.7	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	198.6	mmHg	197.1	mmHg
Sample Flow	0.809	ccm	0.808	ccm

Notes:

Span adjusted

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 18, 2014 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	0.0	0.0	-0.1	N/A	N/A
as found span	5000	78.9	801.6	800.0	1.6	791.1	789.5	2.0	1.0134	1.0134
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	N/A	N/A
high point	5000	78.9	801.6	800.0	1.6	802.1	801.3	1.3	0.9994	0.9984
second point	5000	39.4	400.3	399.5	0.8	397.1	396.8	0.4	1.0080	1.0069
third point	5000	19.7	200.2	199.8	0.4	197.4	197.3	0.0	1.0140	1.0124
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	N/A	N/A
as left span	5000	78.9	801.6	450.0	351.6	803.4	456.2	347.5	0.9978	0.9864
								Average Correction Factor	1.0072	1.0059

Corrcted As found NO_X= 791.0 NO= 789.5 Percent Change NO_X= 1.2% NO= 1.3%

Previous Response NO_X= 800.7 NO= 799.4

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	450.0	352.3	802.3	450.0	352.7	0.9837	1.0000	0.9989	100.1%
2nd NO2 (200)	N/A	592.5	209.8	801.9	592.5	209.9	0.9841	1.0000	0.9995	100.1%
3rd NO2 (100)	N/A	691.7	110.6	802.1	691.7	110.6	0.9839	1.0000	0.9995	100.0%
4th NO2 (0)	802.3	N/A	0.2	802.5	802.3	0.7	0.9834	1.0000	N/A	N/A
					Average Correction Factor		0.9838	1.0000	0.9993	100.1%

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

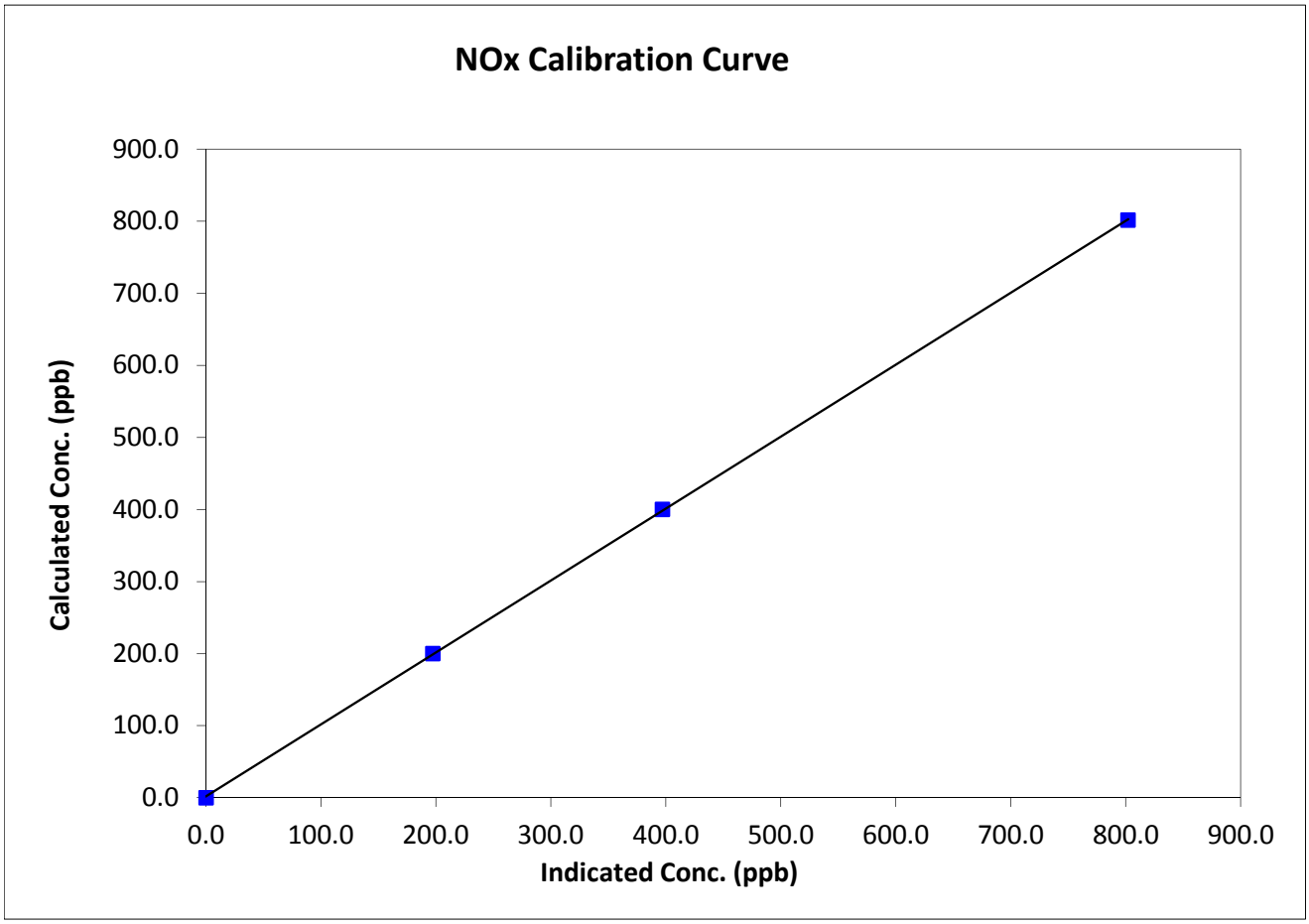
NO_X Calibration Summary

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 21, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:45	End Time (MST)	14:52
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	0.999972
801.6	802.1	0.9994		
400.3	397.1	1.0080	Slope	0.998712
200.2	197.4	1.0140		
			Intercept	1.812218



Wood Buffalo Environmental Association

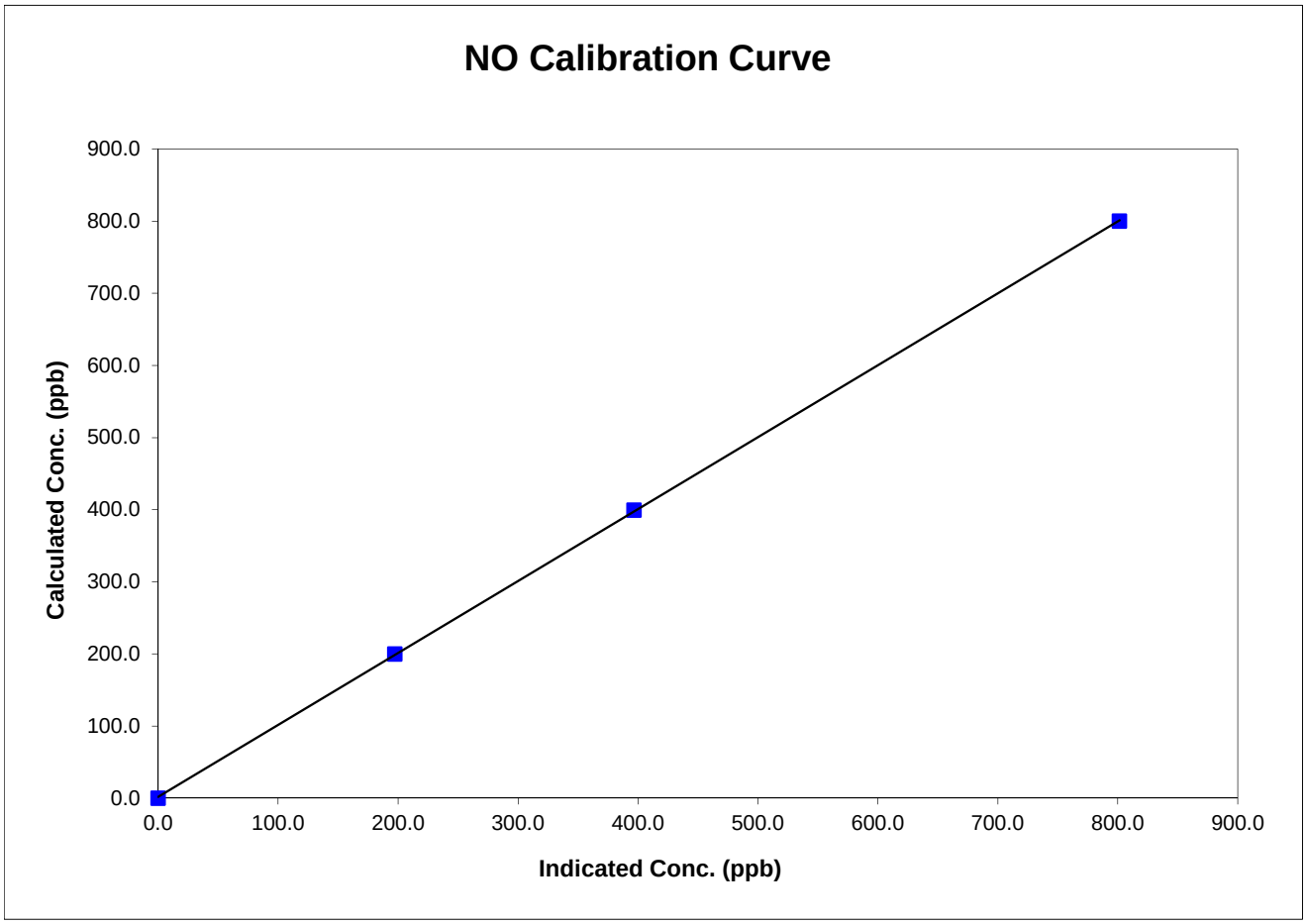
NO Calibration Summary

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 21, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:45	End Time (MST)	14:52
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	0.999973
800.0	801.3	0.9984		
399.5	396.8	1.0069	Slope	0.997704
199.8	197.3	1.0124		
			Intercept	1.764578



Wood Buffalo Environmental Association

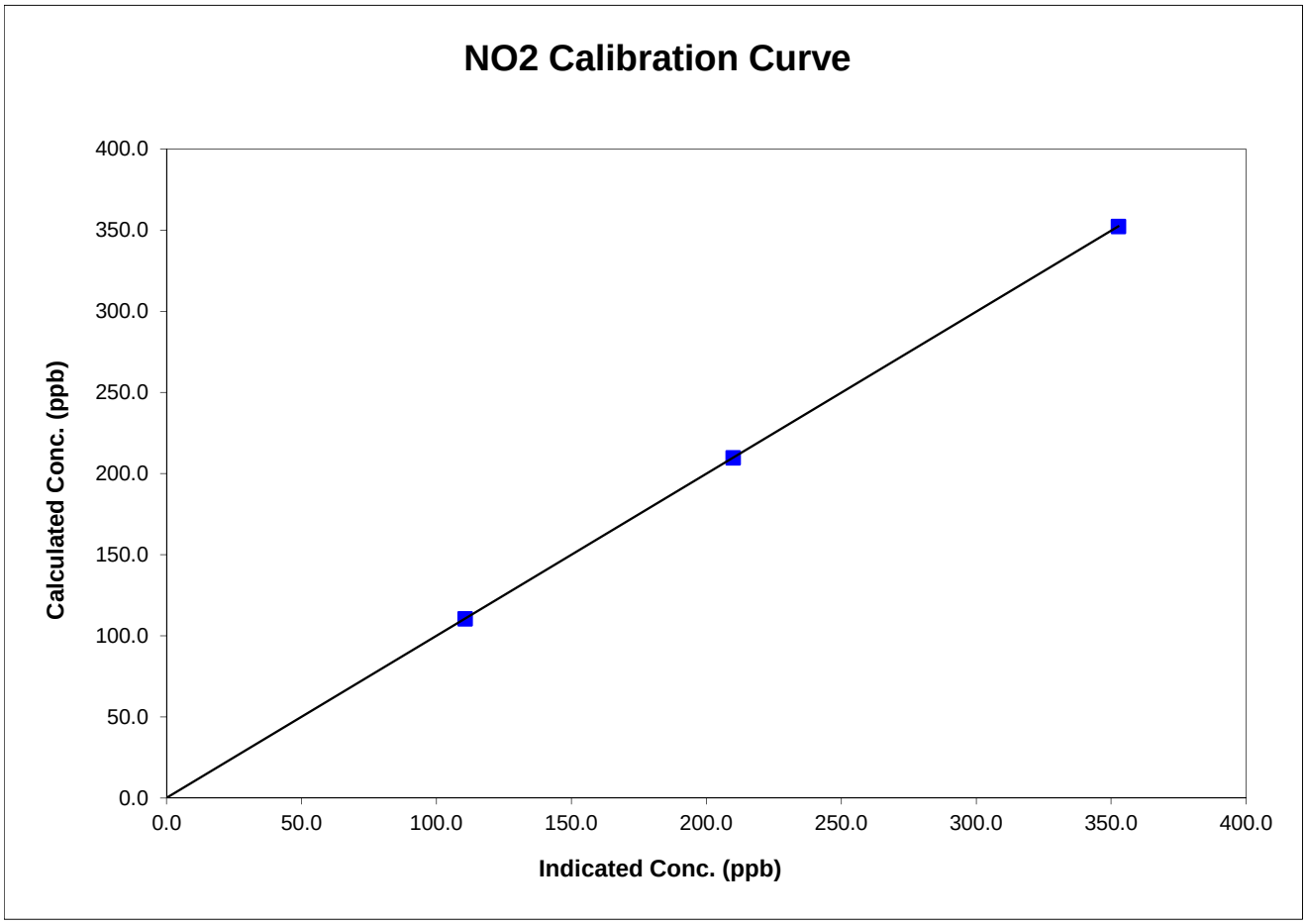
NO_2 Calibration Summary

Station Information

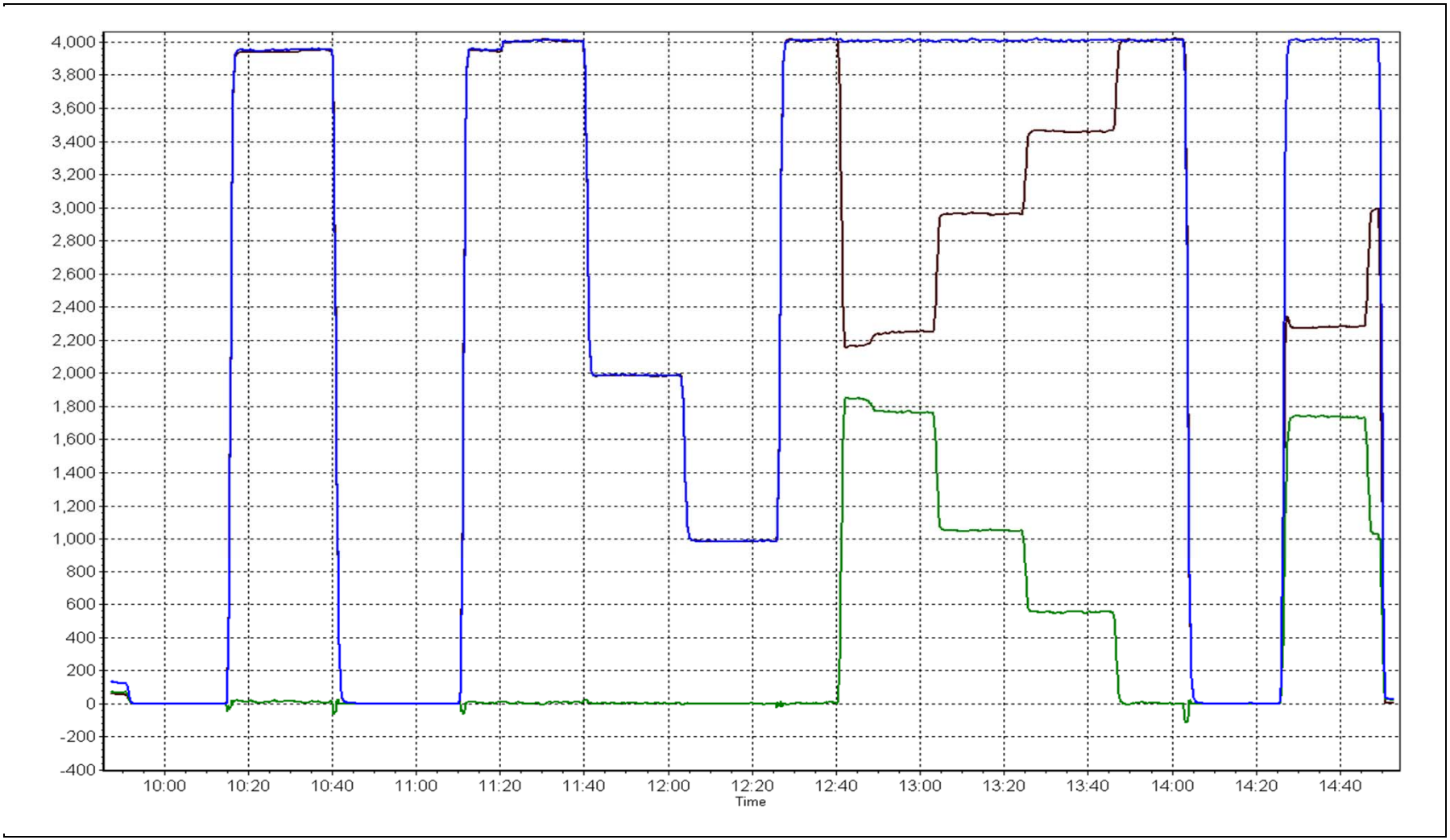
Calibration Date	August 18, 2014	Previous Calibration	July 21, 2014
Station Number	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:45	End Time (MST)	14:52
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	1.000000
352.3	352.7	0.9989		
209.8	209.9	0.9995	Slope	0.998629
110.6	110.6	0.9995		
			Intercept	0.113273



NOx, NO & NO_2 Calibration Plot Date: August 18, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 14
ANZAC
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
AUGUST 2014

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	704	37	40	99.60	12	0	2	0
TRS(ppb) Average	706	35	38	99.60	6	0	1	0
THC(ppm) Average	702	37	42	99.33	5.8	-	2.6	-
NMHC(ppm) Average	702	37	42	99.33	0.444	-	0.167	-
CH4(ppm) Average	702	37	42	99.33	5.8	-	2.5	-
NO2(ppb) Average	704	37	40	99.60	11	0	3	-
NO(ppb) Average	704	37	40	99.60	22	-	3	-
NOX(ppb) Average	704	37	40	99.60	32	-	6	-
O3(ppb) Average	707	34	37	99.60	60	0	36	-
PM2.5(ug/m3) Average	731	0	13	98.25	186.8	-	66.0	2
Temperature 2 m (C) Average	744	0	0	100.00	30.4	-	24.3	-
Relative Humidity (%) Average	744	0	0	100.00	98	-	-	-
Surface Wetness (% of range) Average	741	0	3	99.60	42	-	-	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	19	-	-	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Precipitation (mm) Total	744	0	0	100.00	3.8	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	704	0.7	1	-	0	0	0	0	1	2	12
TRS(ppb) Average	706	0.4	0	-	0	0	0	0	0	0	6
THC(ppm) Average	702	2.09	0.5	-	1.8	1.8	1.9	1.9	2.1	2.4	5.8
NMHC (ppm) Average	702	0.073	0.056	-	0	0	0	0.1	0.1	0.1	0.444
CH4(ppm) Average	702	2.02	0.5	-	1.8	1.8	1.8	1.9	1.9	2.4	5.8
NO2(ppb) Average	704	1.7	1	-	0	1	1	1	2	4	11
NO(ppb) Average	704	0.5	1	-	0	0	0	0	0	1	22
NOX(ppb) Average	704	2.2	3	-	0	1	1	1	2	5	32
O3(ppb) Average	707	23.7	13	-	0	6	13	24	33	40	60
PM2.5(ug/m3) Average	731	12.37	17.3	-	0.9	2.2	3.7	7.7	13.3	25.9	186.8
Temperature 2 m (C) Average	744	17.07	6.4	-	-0.1	10	12.2	16.6	21.6	26.3	30.4
Relative Humidity (%) Average	744	65.1	19	-	24	39	47	66	81	91	98
Surface Wetness (% of range) Average	741	2.9	8	-	0	0	0	0	0	12	42
Wind Speed 20 m (km/h) Average	743	6.4	3	-	0	2	4	6	8	11	19
Wind Direction 20 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	38.35	0	0	0	0	0	0	3.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	11 Aug 2014 16:00	11 Aug 2014 18:00	3	Station power failure
CH4, NMHC, THC	14 Aug 2014 10:00	14 Aug 2014 11:00	2	Maintenance - replaced fuel cylinder
PM2.5	11 Aug 2014 19:00	12 Aug 2014 01:00	7	Analyzer failure following power spike
PM2.5	14 Aug 2014 11:00	14 Aug 2014 13:00	3	Flow and zero reference checks, sample head cleaning
Wind Speed, Wind Direction	16 Aug 2014 02:00	16 Aug 2014 02:00	1	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Anzac - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 ppb on Aug 8 10:00 Maximum Daily Average: 1.9 ppb on Aug 8

Minimum Value: 0 ppb on Aug 1 01:00 Minimum Daily Average: 0.0 ppb on Aug 7
Maximum Diurnal Average: 1.3 ppb at hour 10 Minimum Diurnal Average: 0.2 ppb at hour 5
Monthly Average: 0.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 5$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.1	1
2-Aug	Z	0	0	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-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0.2	1
4-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0.2	3
5-Aug	0	0	0	Z	0	0	0	1	1	5	5	2	4	1	0	0	0	0	0	0	0	0	0	0	0.9	5
6-Aug	0	0	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
7-Aug	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
8-Aug	0	0	0	0	0	0	Z	6	11	12	4	2	1	1	2	2	2	1	0	0	0	0	0	0	1.9	12
9-Aug	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
10-Aug	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
11-Aug	0	0	Z	0	0	0	0	0	C	C	C	C	C	C	0	PF	PF	PF	0	0	0	0	0	0	--	0
12-Aug	0	0	0	Z	0	0	0	0	0	0	4	3	2	4	1	0	1	0	0	0	1	1	1	1	0.9	4
13-Aug	1	1	1	1	Z	1	1	1	1	0	0	1	1	1	2	2	3	2	1	1	1	1	1	1	1.1	3
14-Aug	1	1	1	1	1	Z	1	3	3	3	2	2	1	1	2	2	3	3	4	3	2	1	1	1	1.9	4
15-Aug	1	1	1	1	0	1	Z	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2
16-Aug	Z	1	1	1	1	1	1	1	2	2	2	5	9	3	2	2	1	1	1	1	1	1	1	1	1.8	9
17-Aug	1	Z	1	1	1	1	1	2	3	6	4	3	0	0	0	0	0	0	1	1	1	1	1	1	1.2	6
18-Aug	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	0.9	2
19-Aug	2	3	2	Z	1	1	1	1	1	1	3	7	5	3	2	1	5	1	0	0	0	0	0	0	1.8	7
20-Aug	1	1	0	1	Z	1	1	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0.4	2
21-Aug	0	0	0	0	0	Z	1	1	1	1	2	3	4	4	4	4	4	2	1	0	0	0	0	0	1.4	4
22-Aug	0	0	0	0	0	0	Z	2	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.4	2
23-Aug	Z	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	1	0	0	0	0	0	0.5	2
24-Aug	1	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0.6	1
25-Aug	1	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1
26-Aug	0	0	0	Z	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
27-Aug	1	1	1	1	Z	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
28-Aug	0	0	0	0	0	Z	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
29-Aug	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0.4	1
30-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0.2	1
	0.4	0.4	0.3	0.3	0.2	0.3	0.4	0.7	1.1	1.3	1.2	1.2	1.2	0.9	0.7	0.9	1.0	0.7	0.6	0.5	0.4	0.3	0.3	0.3	Diurnal Average	
	2	3	2	1	1	1	1	6	11	12	5	7	9	4	4	4	5	3	4	3	2	1	1	1	Diurnal Maximum	

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

AURORA ATMOSPHERICS INC.

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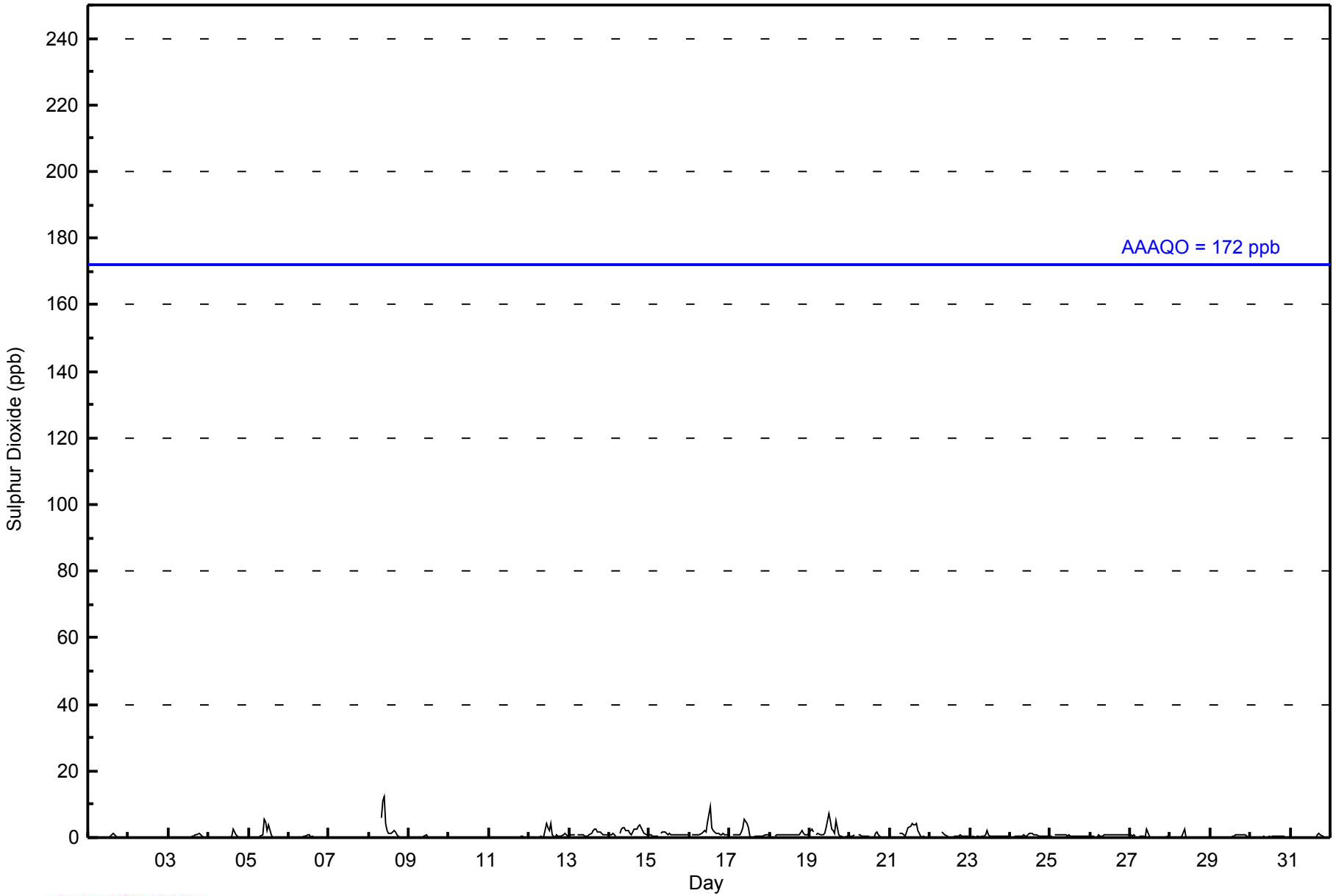
Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	702	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Anzac - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	30	8	8	8	10	20	53	100	62	54	49	30	62	90	48	69	701
11 - 20	0	0	0	0	0	0	0	0	0	0	1	0	0	1	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	30	8	8	8	10	20	53	100	62	54	50	30	62	91	48	69	703

Total Number of Valid Hours: 703

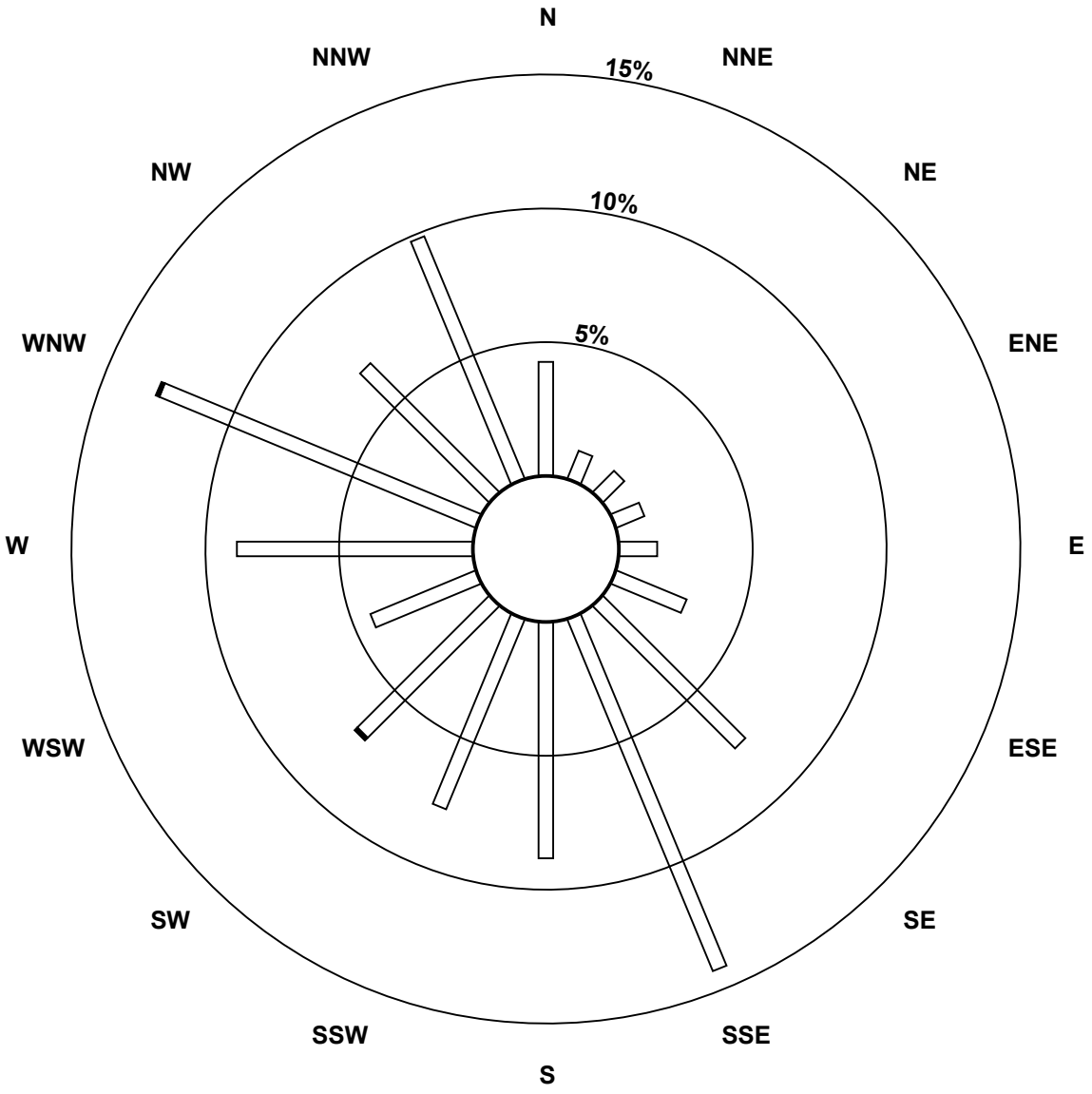
Total Number of Hours: 744

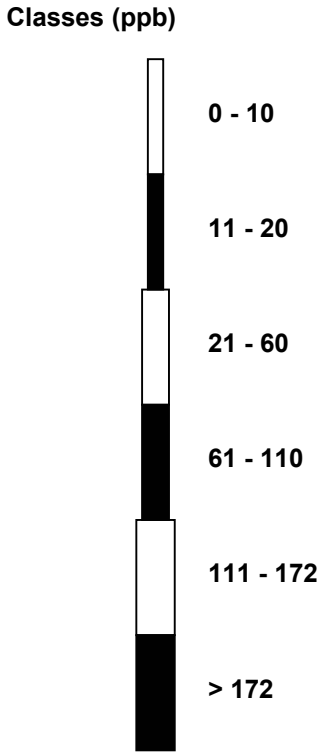
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Anzac (AMS 14)





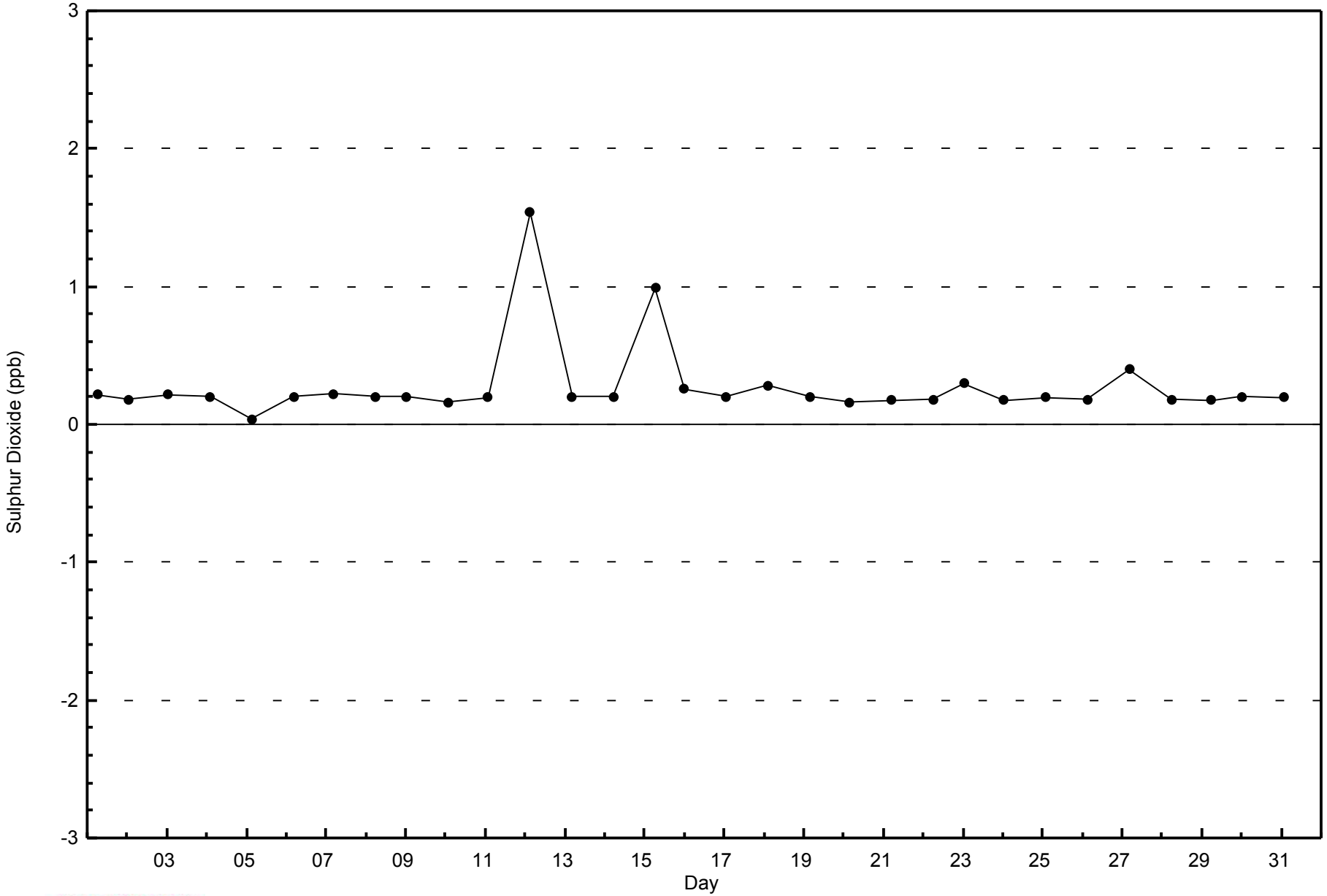
Total Number of Valid Hours: 703

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - August 2014



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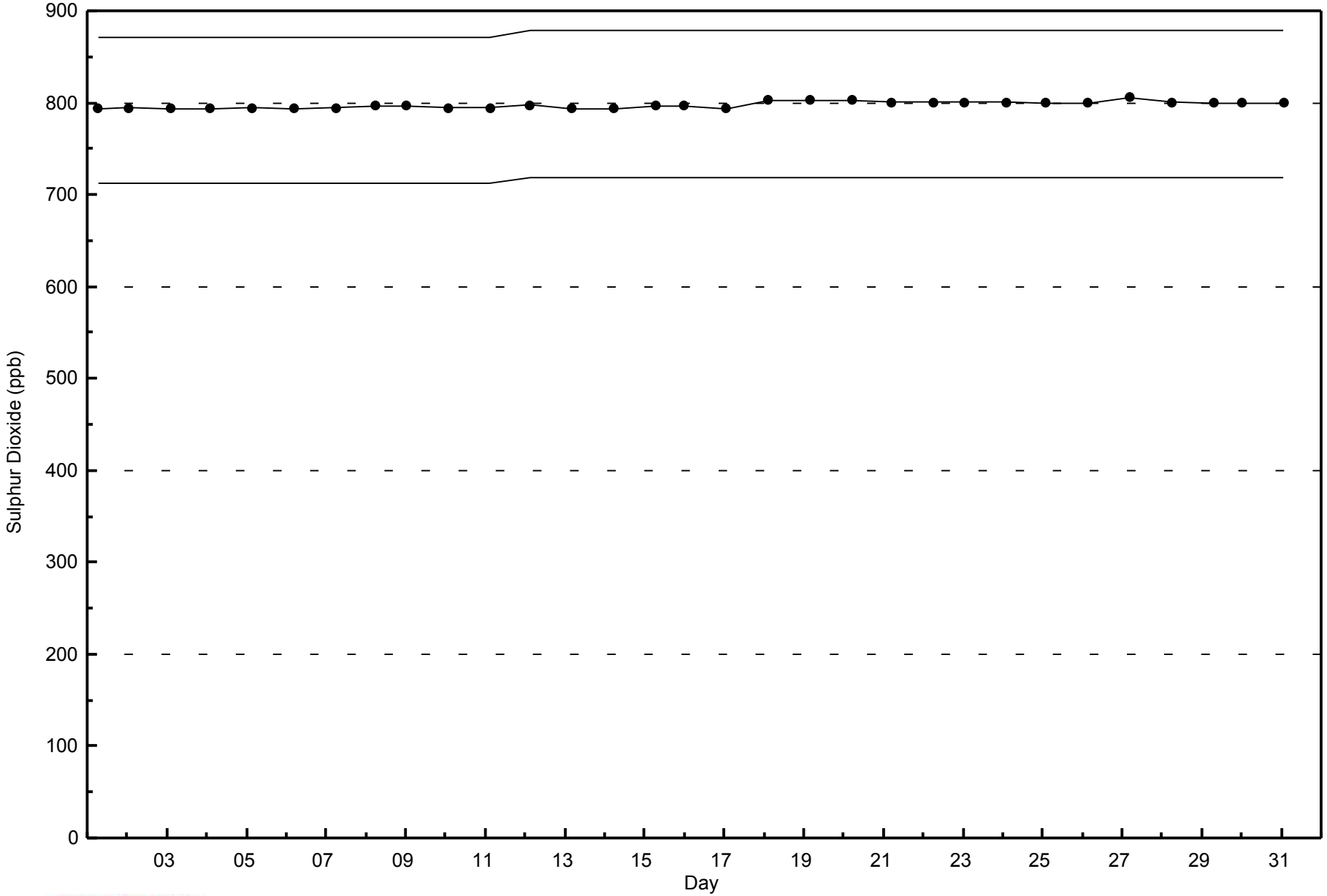
Span Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 ppb on Aug 25 09:00 Maximum Daily Average: 0.9 ppb on Aug 24

Minimum Value: 0 ppb on Aug 22 05:00 Minimum Daily Average: 0.2 ppb on Aug 29
Maximum Diurnal Average: 0.6 ppb at hour 9 Minimum Diurnal Average: 0.3 ppb at hour 24
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 2$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	1	1	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
2-Aug	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
3-Aug	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
4-Aug	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
5-Aug	0	0	0	0	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1
6-Aug	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
7-Aug	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
8-Aug	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
9-Aug	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
10-Aug	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
11-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	0	0	0	0	0.3	0
12-Aug	0	0	0	0	Z	0	1	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
13-Aug	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
14-Aug	0	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Aug	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
16-Aug	0	Z	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
17-Aug	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
18-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.3	1
19-Aug	0	1	1	1	Z	1	0	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0.5	1
20-Aug	0	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.4	1
21-Aug	0	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Aug	0	0	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
23-Aug	0	Z	0	0	0	1	2	2	0	1	6	1	0	0	1	0	0	0	0	0	0	0	1	0	0.8	6
24-Aug	0	0	Z	1	1	1	3	1	2	0	0	1	1	1	0	0	0	0	0	3	2	0	0	0	0.9	3
25-Aug	0	0	0	Z	0	0	2	3	6	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.8	6
26-Aug	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
27-Aug	0	0	0	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Aug	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
29-Aug	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Aug	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.2	1
	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	Diurnal Average	
	1	1	1	1	1	1	3	3	6	2	6	1	1	1	1	1	1	1	0	3	2	0	1	0	Diurnal Maximum	

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

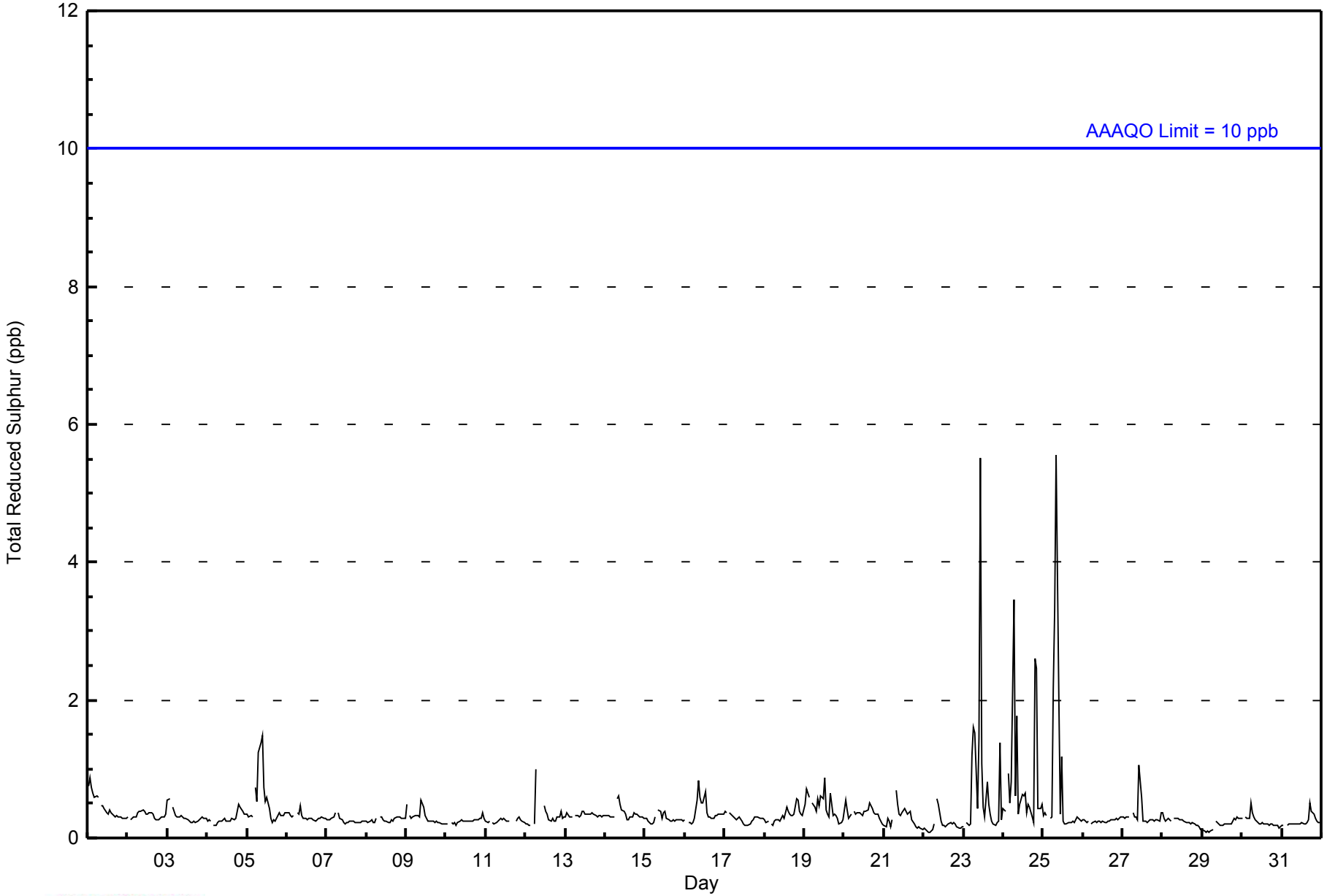
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	701	99.29	99.29
3 - 4	3	0.42	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: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Anzac - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	30	8	8	8	11	19	49	95	64	55	49	31	61	96	50	67	701
3 - 4	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
5 - 7	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	8	8	8	11	20	52	96	64	55	49	31	61	96	50	67	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

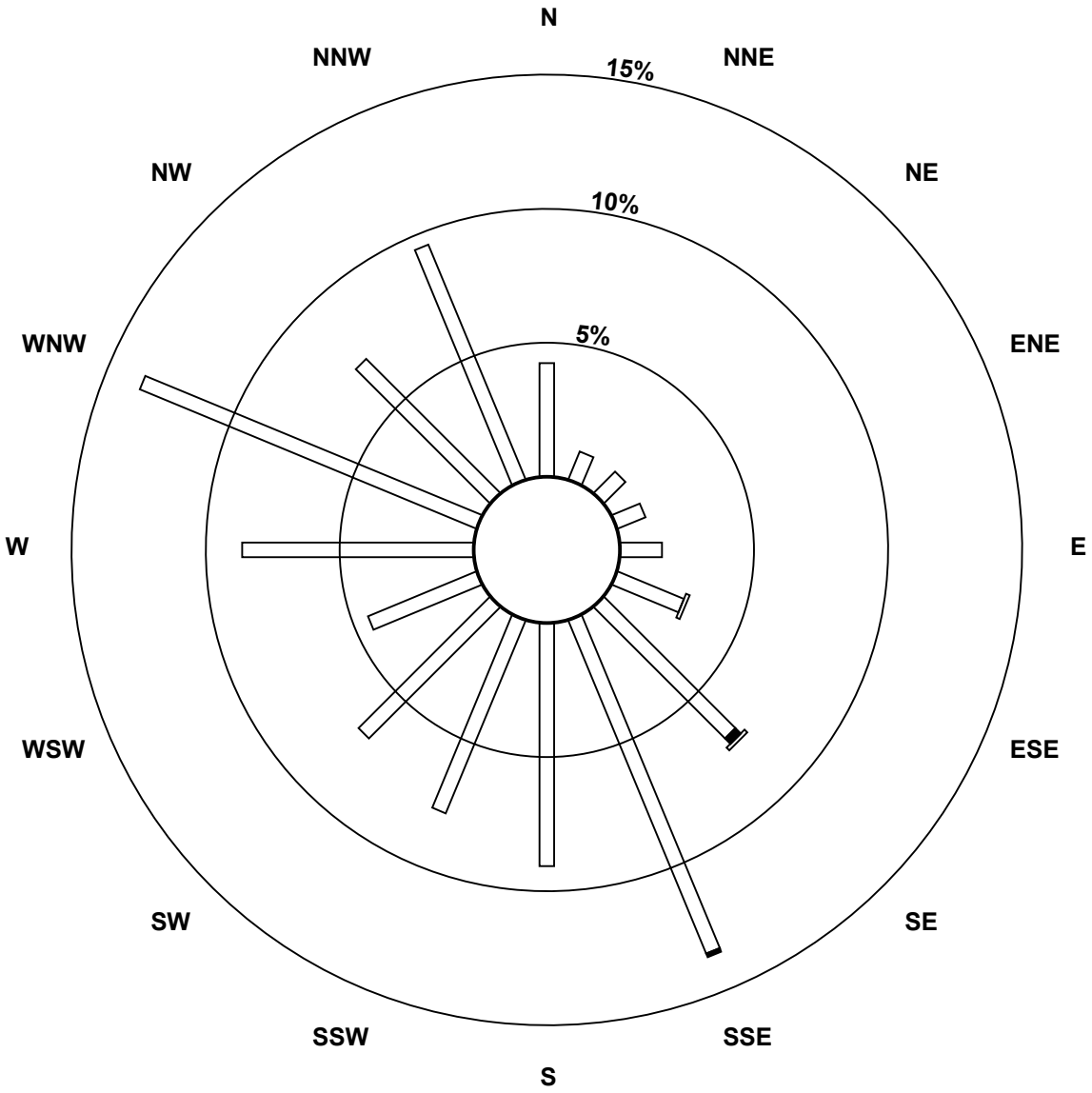
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

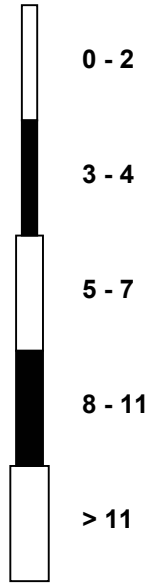
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

Anzac (AMS 14)



Classes (ppb)



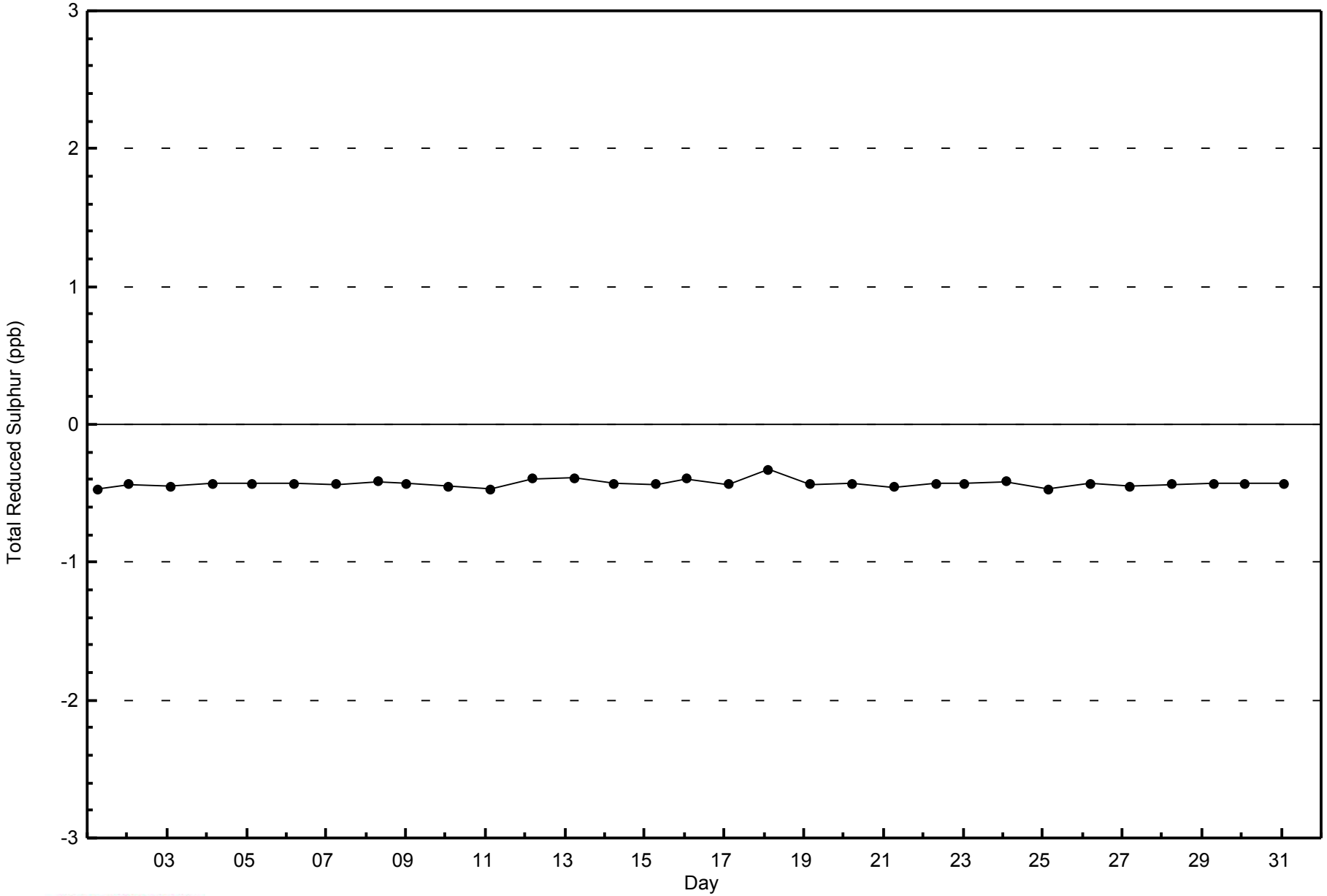
Total Number of Valid Hours: 706

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - August 2014



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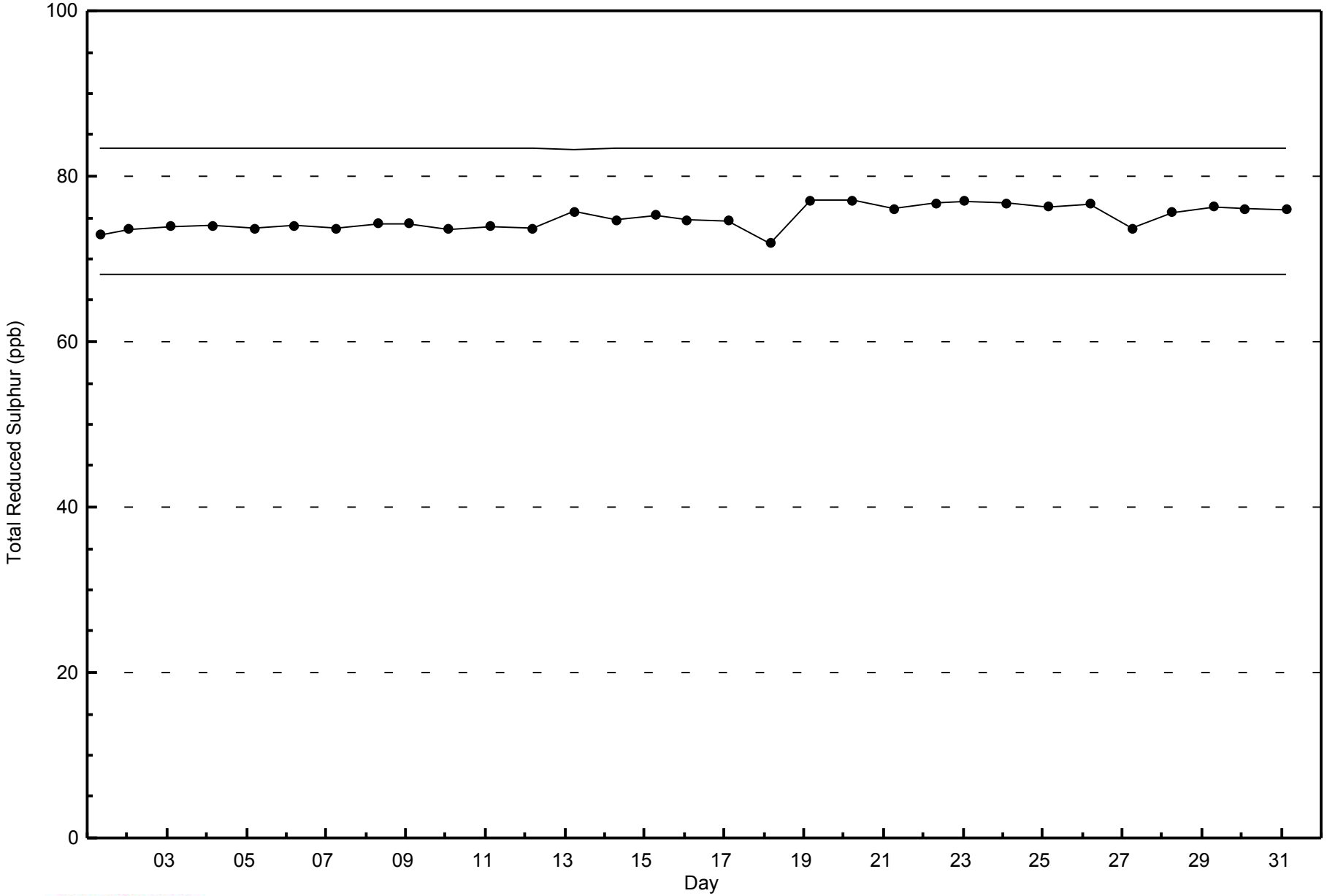
WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Anzac - August 2014

Maximum Value: 5.8 ppm on Aug 18 01:00

Maximum Daily Average: 2.6 ppm on Aug 18

Minimum Value: 1.8 ppm on Aug 7 12:00

Minimum Daily Average: 1.9 ppm on Aug 28

Maximum Diurnal Average: 2.6 ppm at hour 1

Minimum Diurnal Average: 1.9 ppm at hour 17

Monthly Average: 2.09 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.1 P_{90} = 2.4 P_{99} = 4.3

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	37
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	2.1	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1
2-Aug	Z	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.0	2.0	2.1
3-Aug	2.0	Z	2.4	2.5	2.5	4.1	3.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.8	3.4	2.3	4.1
4-Aug	2.7	3.8	Z	2.0	2.0	1.9	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.2	2.1	2.1	2.4	2.6	2.2	3.8
5-Aug	2.9	3.6	3.3	Z	2.0	2.6	3.5	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.3	3.6
6-Aug	2.0	2.0	2.1	2.0	Z	2.0	2.0	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.2	1.9	2.0	2.2
7-Aug	1.9	1.9	1.9	1.9	1.9	Z	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	1.9	4.7	4.4	2.1	4.7
8-Aug	3.7	2.4	2.0	2.0	2.1	2.6	Z	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	2.0	3.7
9-Aug	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	1.8	1.9	1.9	2.0	1.9	2.5	4.3	2.0	4.3
10-Aug	3.1	Z	2.3	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	3.1
11-Aug	4.1	5.5	Z	2.1	2.3	3.6	3.8	2.1	C	C	C	C	C	C	1.9	PF	PF	PF	1.8	1.9	1.9	1.9	1.9	2.6	--	5.5
12-Aug	2.9	2.4	2.5	Z	2.3	1.9	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.9
13-Aug	2.0	2.0	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	2.0	2.0	2.0	2.0	2.0	2.3	2.0	2.0	2.0	2.0	2.3
14-Aug	2.1	2.0	2.1	2.1	2.2	Z	2.1	2.1	2.1	M	M	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.3	3.9	2.1	3.9
15-Aug	4.4	3.9	4.4	3.5	3.6	5.4	Z	2.8	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.6	5.4
16-Aug	Z	2.4	2.5	2.3	2.1	3.6	3.2	2.7	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.3	2.3	3.6
17-Aug	2.3	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	4.3	5.4	2.2	5.4
18-Aug	5.8	3.4	Z	3.3	3.2	3.2	3.7	3.5	2.2	2.1	2.0	2.0	2.0	2.4	2.1	2.0	1.9	1.9	1.9	2.1	2.1	2.5	2.8	2.1	2.6	5.8
19-Aug	2.1	2.1	2.1	Z	2.1	2.1	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
20-Aug	1.9	2.0	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.9	2.0
21-Aug	1.8	1.8	1.9	2.2	2.1	Z	2.0	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.3	1.9	2.3
22-Aug	2.8	2.6	2.6	2.6	2.4	2.3	Z	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.2	2.4	2.1	2.8
23-Aug	Z	2.5	2.3	2.0	1.9	2.1	2.1	2.2	1.9	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.3	1.9	2.0	2.5
24-Aug	1.9	Z	1.9	1.9	1.9	2.8	3.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	3.1
25-Aug	1.9	2.0	Z	1.9	1.9	1.9	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	1.9	2.1
26-Aug	2.0	2.0	2.1	Z	2.1	2.3	2.7	2.4	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.7
27-Aug	1.9	1.9	1.9	1.9	Z	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	1.9	1.9	2.3	2.0	1.9	1.8	1.9	2.3
28-Aug	2.1	1.9	1.9	1.8	1.8	Z	1.8	1.8	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	2.0	2.0	1.9	2.1
29-Aug	2.6	2.5	2.5	2.5	2.4	2.1	Z	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.6
30-Aug	Z	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	3.0	2.5	2.3	4.6	2.1	4.6
31-Aug	2.6	Z	3.3	2.4	1.9	1.9	1.9	1.8	1.9	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.3	2.1	1.8	1.8	2.0	3.3
	2.6	2.5	2.3	2.2	2.2	2.5	2.3	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	2.0	2.3	2.5	Diurnal Average	
	5.8	5.5	4.4	3.5	3.6	5.4	3.8	3.5	2.3	2.2	2.2	2.1	2.1	2.4	2.1	2.1	2.0	2.0	2.1	2.2	3.0	2.5	4.7	5.4	Diurnal Maximum	

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

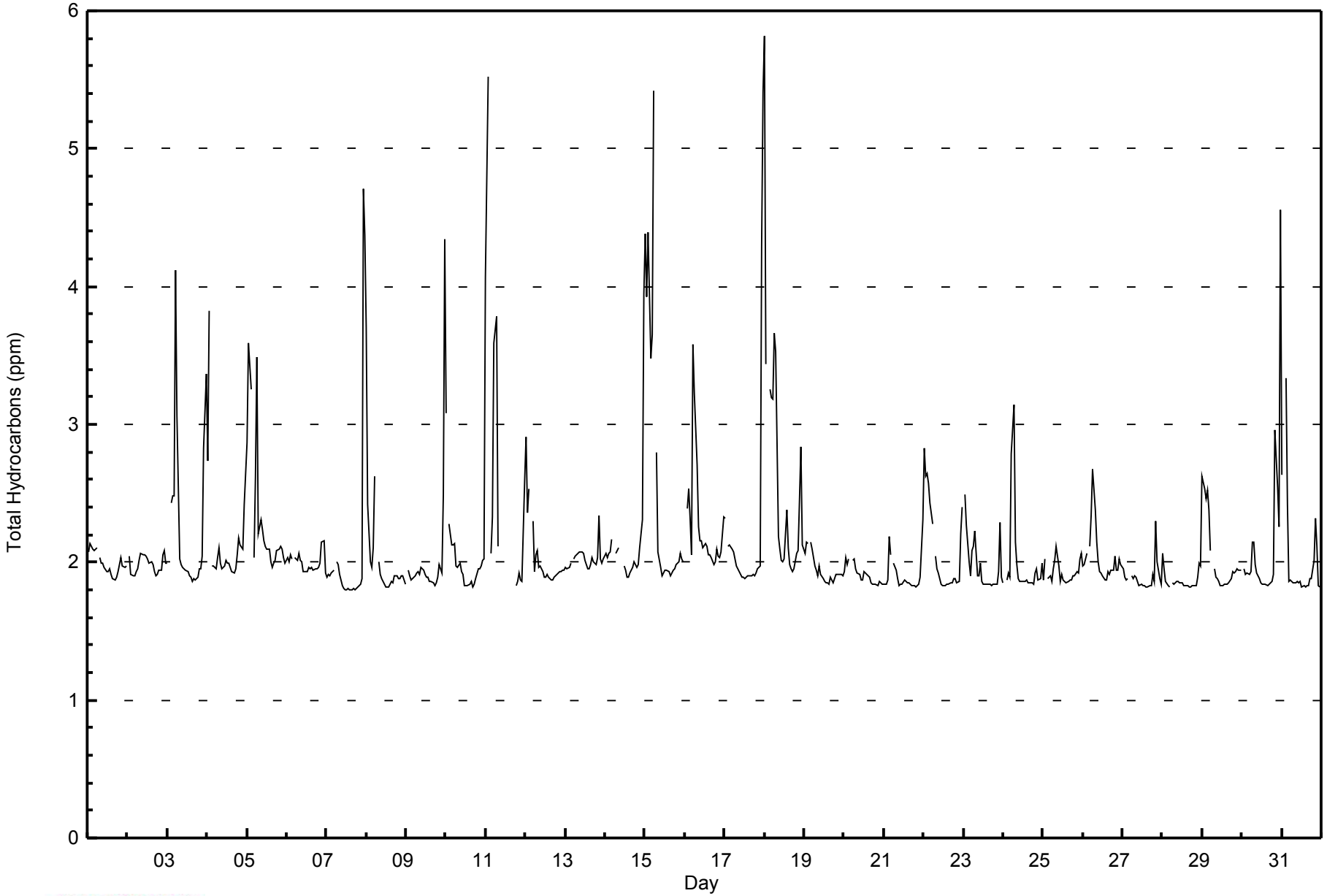
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	511	72.79	72.79
2.1 - 3.0	154	21.94	94.73
3.1 - 10.0	37	5.27	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Anzac - August 2014

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	27	8	7	6	6	13	37	73	32	30	24	17	54	74	41	62	511
2.1 - 3.0	3	0	1	2	3	6	15	22	22	13	19	10	8	15	7	7	153
3.1 - 10.0	0	0	0	0	1	1	1	5	8	11	7	3	0	0	0	0	37
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	8	8	8	10	20	53	100	62	54	50	30	62	89	48	69	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

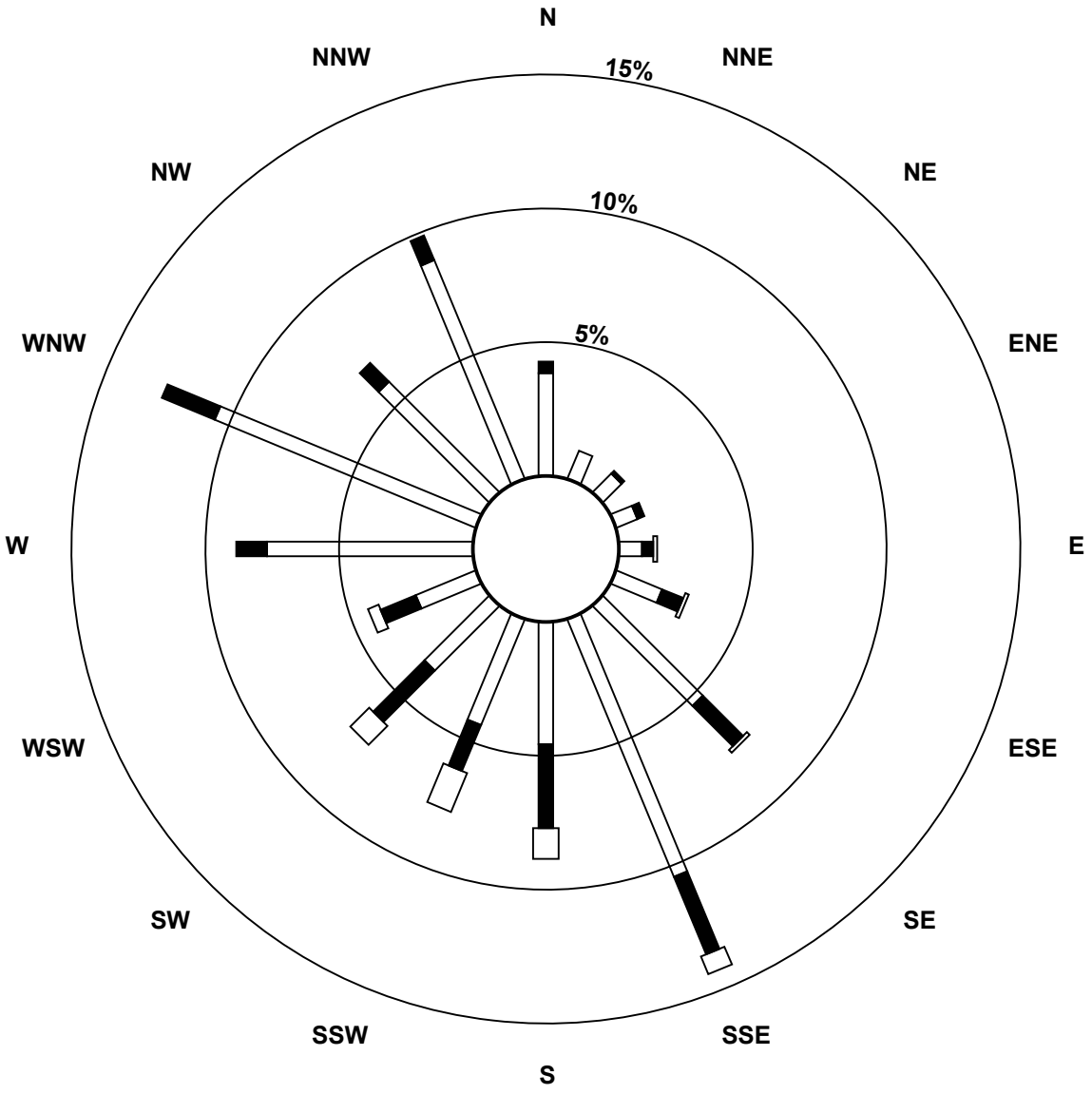
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

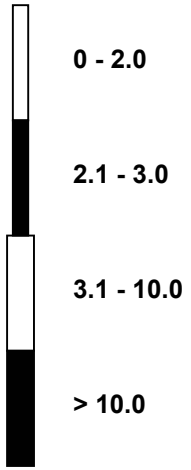
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Anzac (AMS 14)



Classes (ppm)



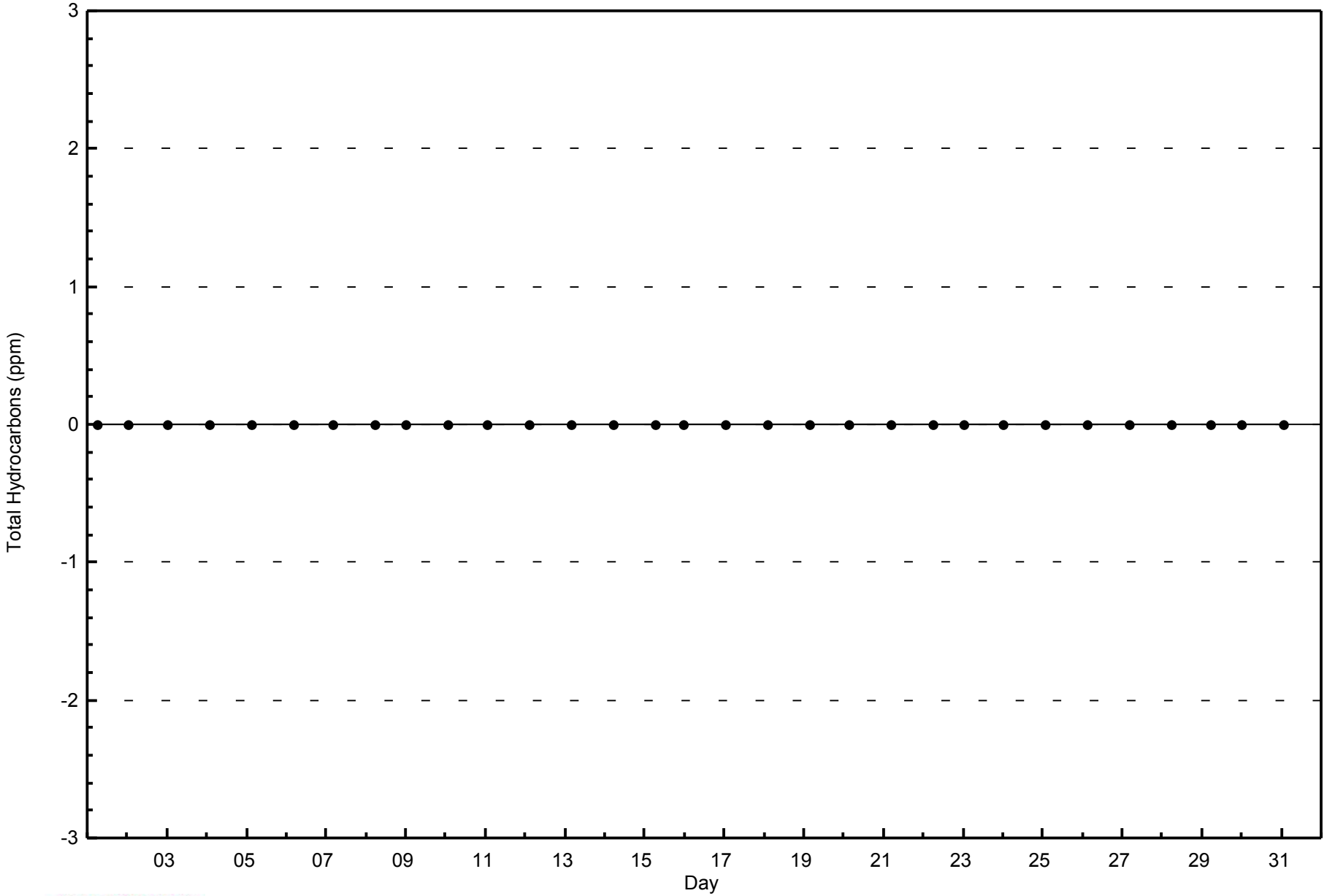
Total Number of Valid Hours: 701

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Anzac - August 2014



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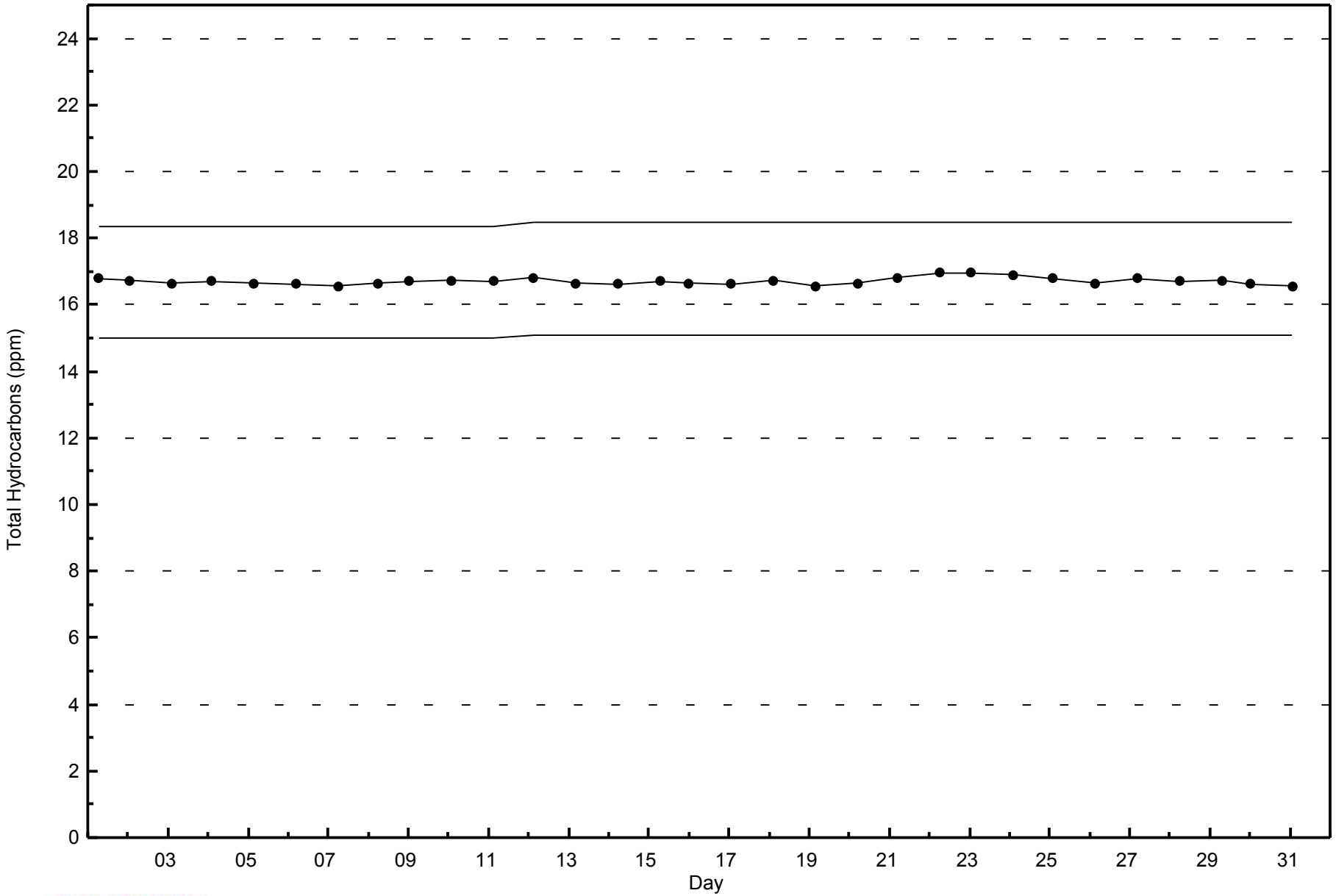
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - August 2014

Maximum Value: 0.444 ppm on Aug 18 14:00

Maximum Daily Average: 0.167 ppm on Aug 5

Minimum Value: 0.000 ppm on Aug 22 13:00

Minimum Daily Average: 0.011 ppm on Aug 21

Maximum Diurnal Average: 0.092 ppm at hour 21

Minimum Diurnal Average: 0.059 ppm at hour 16

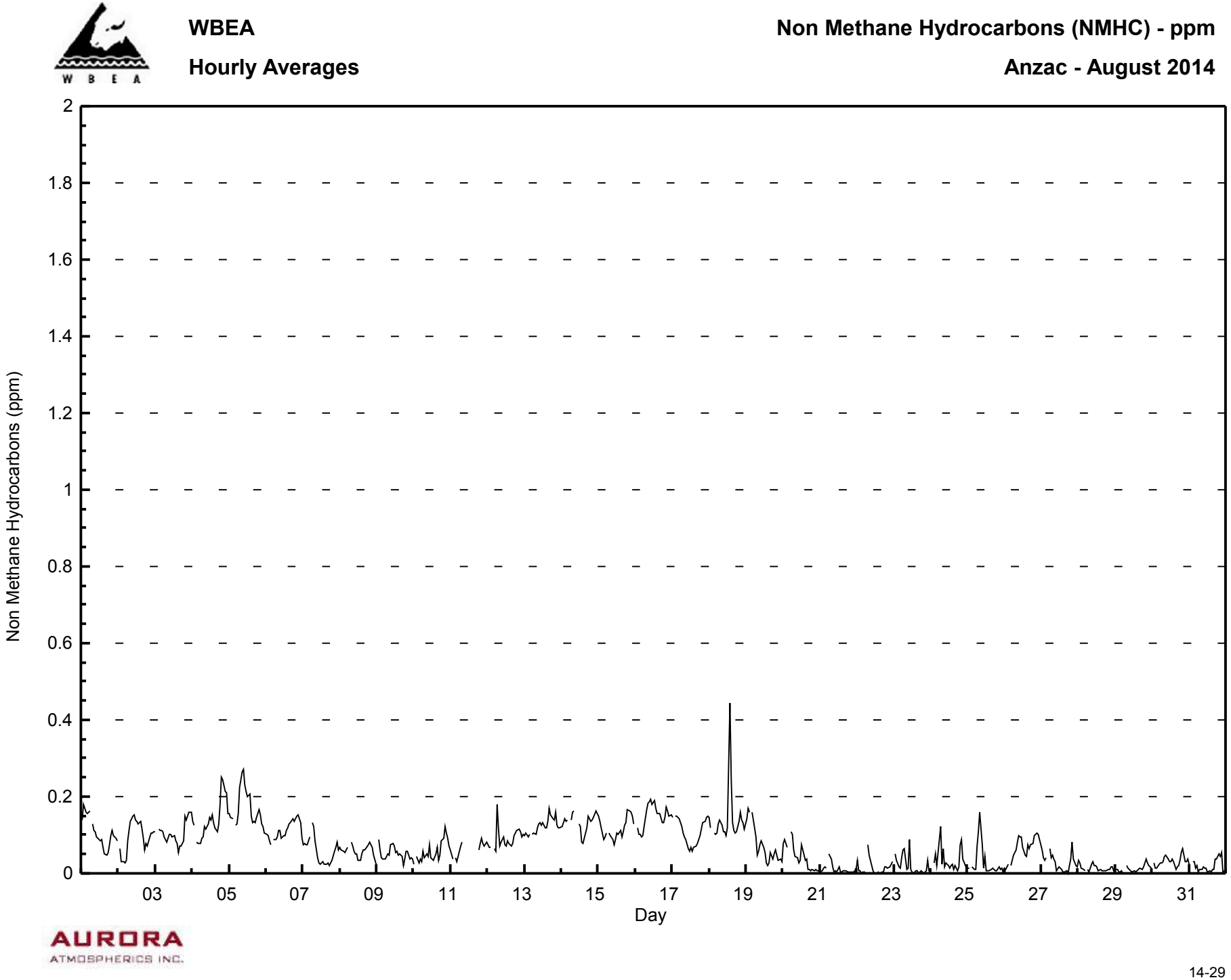
Monthly Average: 0.073 ppm

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

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	37
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0.140	0.180	0.171	0.159	0.157	0.164	Z	0.130	0.112	0.109	0.096	0.088	0.086	0.089	0.068	0.049	0.046	0.053	0.074	0.099	0.112	0.099	0.092	0.085	0.107	0.180
2-Aug	Z	0.066	0.031	0.032	0.027	0.034	0.084	0.113	0.136	0.149	0.152	0.140	0.137	0.129	0.136	0.116	0.092	0.063	0.078	0.072	0.094	0.104	0.106	0.109	0.095	0.152
3-Aug	0.108	Z	0.116	0.112	0.111	0.108	0.095	0.083	0.091	0.101	0.102	0.097	0.097	0.085	0.078	0.055	0.071	0.070	0.086	0.151	0.139	0.149	0.158	0.161	0.105	0.161
4-Aug	0.134	0.126	Z	0.082	0.078	0.078	0.093	0.094	0.122	0.114	0.130	0.146	0.138	0.151	0.131	0.118	0.107	0.130	0.179	0.250	0.246	0.214	0.210	0.157	0.140	0.250
5-Aug	0.158	0.145	0.141	Z	0.125	0.130	0.155	0.222	0.266	0.272	0.230	0.214	0.201	0.207	0.150	0.132	0.136	0.131	0.146	0.165	0.154	0.128	0.122	0.105	0.167	0.272
6-Aug	0.102	0.099	0.083	0.073	Z	0.088	0.089	0.096	0.112	0.113	0.092	0.097	0.097	0.111	0.118	0.129	0.132	0.143	0.134	0.143	0.148	0.154	0.132	0.092	0.112	0.154
7-Aug	0.076	0.079	0.074	0.076	0.094	Z	0.132	0.120	0.086	0.040	0.027	0.024	0.026	0.031	0.025	0.024	0.028	0.019	0.026	0.035	0.058	0.068	0.083	0.061	0.057	0.132
8-Aug	0.067	0.061	0.057	0.053	0.060	0.066	Z	0.080	0.071	0.059	0.051	0.050	0.034	0.034	0.052	0.061	0.061	0.064	0.075	0.081	0.074	0.069	0.046	0.023	0.059	0.081
9-Aug	Z	0.087	0.060	0.040	0.039	0.037	0.044	0.052	0.046	0.074	0.078	0.071	0.053	0.058	0.047	0.049	0.045	0.019	0.037	0.056	0.058	0.038	0.042	0.038	0.051	0.087
10-Aug	0.025	Z	0.044	0.026	0.036	0.032	0.056	0.040	0.050	0.046	0.075	0.039	0.038	0.032	0.051	0.069	0.034	0.049	0.085	0.093	0.123	0.105	0.090	0.070	0.057	0.123
11-Aug	0.062	0.037	Z	0.041	0.030	0.045	0.071	0.081	C	C	C	C	C	C	0.085	PF	PF	PF	0.063	0.077	0.091	0.078	0.071	0.083	--	0.091
12-Aug	0.076	0.069	0.066	Z	0.064	0.056	0.179	0.117	0.071	0.082	0.095	0.075	0.072	0.084	0.079	0.073	0.079	0.097	0.104	0.110	0.116	0.107	0.094	0.101	0.090	0.179
13-Aug	0.097	0.104	0.094	0.100	Z	0.103	0.106	0.102	0.117	0.130	0.131	0.127	0.132	0.118	0.119	0.135	0.168	0.152	0.143	0.141	0.160	0.126	0.118	0.118	0.124	0.168
14-Aug	0.122	0.131	0.142	0.136	0.139	Z	0.139	0.159	0.162	M	M	0.128	0.121	0.080	0.078	0.090	0.119	0.149	0.144	0.137	0.138	0.147	0.163	0.157	0.132	0.163
15-Aug	0.151	0.137	0.120	0.088	0.094	0.105	Z	0.104	0.099	0.088	0.076	0.089	0.106	0.102	0.111	0.096	0.108	0.126	0.134	0.166	0.163	0.159	0.151	0.130	0.117	0.166
16-Aug	Z	0.117	0.103	0.101	0.096	0.099	0.120	0.167	0.183	0.185	0.192	0.178	0.189	0.170	0.155	0.156	0.155	0.131	0.132	0.144	0.172	0.162	0.151	0.152	0.148	0.192
17-Aug	0.145	Z	0.150	0.150	0.143	0.131	0.121	0.106	0.095	0.088	0.065	0.057	0.069	0.059	0.068	0.072	0.079	0.088	0.100	0.116	0.131	0.136	0.144	0.148	0.107	0.150
18-Aug	0.147	0.117	Z	0.106	0.102	0.104	0.128	0.140	0.126	0.110	0.110	0.099	0.118	0.444	0.245	0.132	0.111	0.105	0.110	0.136	0.160	0.139	0.133	0.117	0.141	0.444
19-Aug	0.141	0.171	0.158	Z	0.159	0.141	0.094	0.048	0.058	0.074	0.086	0.069	0.054	0.027	0.021	0.028	0.055	0.039	0.051	0.061	0.048	0.034	0.036	0.029	0.073	0.171
20-Aug	0.078	0.088	0.079	0.069	Z	0.108	0.101	0.061	0.042	0.039	0.027	0.032	0.075	0.062	0.033	0.036	0.009	0.010	0.007	0.009	0.007	0.009	0.006	0.007	0.043	0.108
21-Aug	0.005	0.008	0.014	0.017	0.015	Z	0.052	0.038	0.016	0.003	0.008	0.004	0.017	0.004	0.004	0.006	0.006	0.006	0.003	0.002	0.003	0.005	0.004	0.010	0.011	0.052
22-Aug	0.033	0.006	0.006	0.002	0.005	0.003	Z	0.073	0.048	0.034	0.008	0.001	0.000	0.000	0.005	0.001	0.005	0.004	0.016	0.017	0.014	0.017	0.023	0.032	0.015	0.073
23-Aug	Z	0.049	0.034	0.016	0.013	0.040	0.062	0.063	0.011	0.015	0.089	0.011	0.003	0.000	0.006	0.006	0.001	0.002	0.008	0.001	0.002	0.007	0.035	0.006	0.021	0.089
24-Aug	0.005	Z	0.026	0.051	0.020	0.054	0.122	0.025	0.066	0.018	0.026	0.019	0.014	0.019	0.025	0.010	0.021	0.008	0.017	0.074	0.088	0.037	0.022	0.013	0.034	0.122
25-Aug	0.014	0.012	Z	0.018	0.011	0.010	0.072	0.109	0.158	0.076	0.012	0.044	0.005	0.006	0.008	0.010	0.012	0.012	0.007	0.005	0.016	0.011	0.013	0.003	0.028	0.158
26-Aug	0.013	0.009	0.023	Z	0.020	0.036	0.047	0.060	0.082	0.099	0.096	0.093	0.067	0.046	0.045	0.075	0.065	0.073	0.078	0.099	0.103	0.104	0.101	0.087	0.066	0.104
27-Aug	0.061	0.042	0.035	0.040	Z	0.065	0.041	0.047	0.037	0.029	0.007	0.018	0.014	0.011	0.003	0.002	0.005	0.001	0.020	0.037	0.081	0.037	0.019	0.016	0.029	0.081
28-Aug	0.036	0.028	0.015	0.011	0.006	Z	0.012	0.005	0.023	0.032	0.020	0.019	0.016	0.007	0.009	0.007	0.007	0.006	0.007	0.010	0.010	0.018	0.015	0.006	0.014	0.036
29-Aug	0.009	0.012	0.002	0.004	0.007	0.001	Z	0.022	0.013	0.010	0.006	0.004	0.005	0.005	0.006	0.009	0.014	0.012	0.016	0.027	0.037	0.029	0.020	0.014	0.012	0.037
30-Aug	Z	0.026	0.015	0.012	0.023	0.028	0.027	0.032	0.044	0.046	0.037	0.030	0.031	0.036	0.030	0.011	0.018	0.020	0.034	0.053	0.065	0.031	0.030	0.039	0.031	0.065
31-Aug	0.025	Z	0.031	0.032	0.012	0.022	0.005	0.009	0.009	0.016	0.013	0.013	0.004	0.007	0.005	0.010	0.009	0.037	0.038	0.049	0.043	0.054	0.005	0.006	0.020	0.054
	0.078	0.077	0.070	0.061	0.062	0.070	0.086	0.084	0.085	0.078	0.074	0.069	0.067	0.074	0.064	0.059	0.060	0.061	0.069	0.084	0.092	0.083	0.078	0.070	Diurnal Average	
	0.158	0.180	0.171	0.159	0.159	0.164	0.179	0.222	0.266	0.272	0.230	0.214	0.201	0.444	0.245	0.156	0.168	0.152	0.179	0.250	0.246	0.214	0.210	0.161	Diurnal Maximum	

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


WBEA
Hourly Averages
Non Methane Hydrocarbons (NMHC) - ppm
Anzac - August 2014
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	48	6.84	6.84
0.006 - 0.05	259	36.89	43.73
0.06 - 0.1	332	47.29	91.03
> 0.1	63	8.97	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - August 2014

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	3	1	0	1	2	2	2	6	5	1	0	1	5	6	0	13	48
0.006 - 0.05	15	4	1	1	2	7	20	41	13	12	20	10	22	40	23	28	259
0.06 - 0.1	9	3	5	3	3	7	23	45	37	37	26	16	32	37	24	24	331
> 0.1	3	0	2	3	3	4	8	8	7	4	4	3	3	6	1	4	63
Totals	30	8	8	8	10	20	53	100	62	54	50	30	62	89	48	69	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

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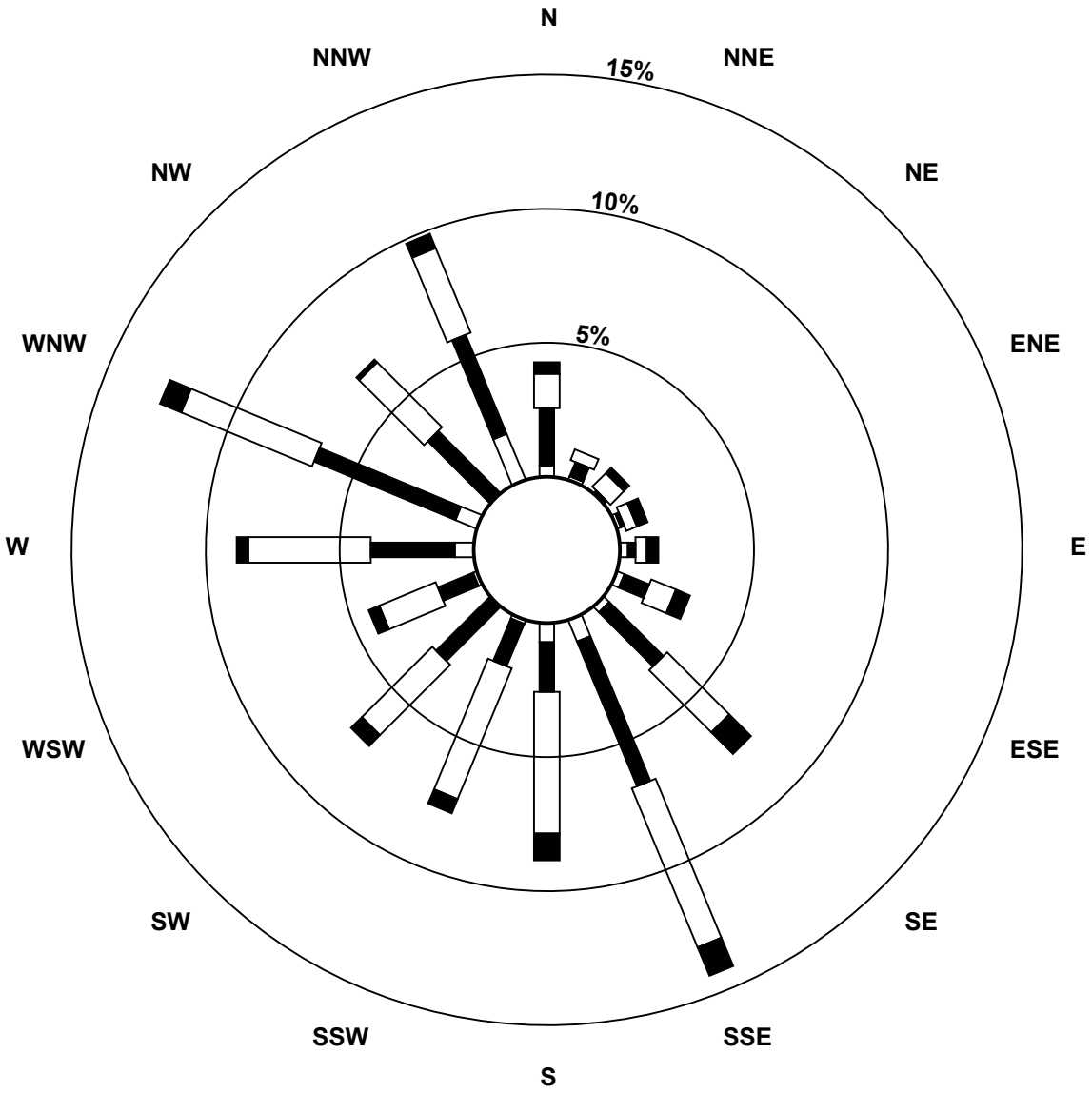
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Non Methane Hydrocarbons (NMHC) - ppm

Anzac (AMS 14)



Classes (ppm)

0 - 0.005

0.006 - 0.05

0.06 - 0.1

> 0.1

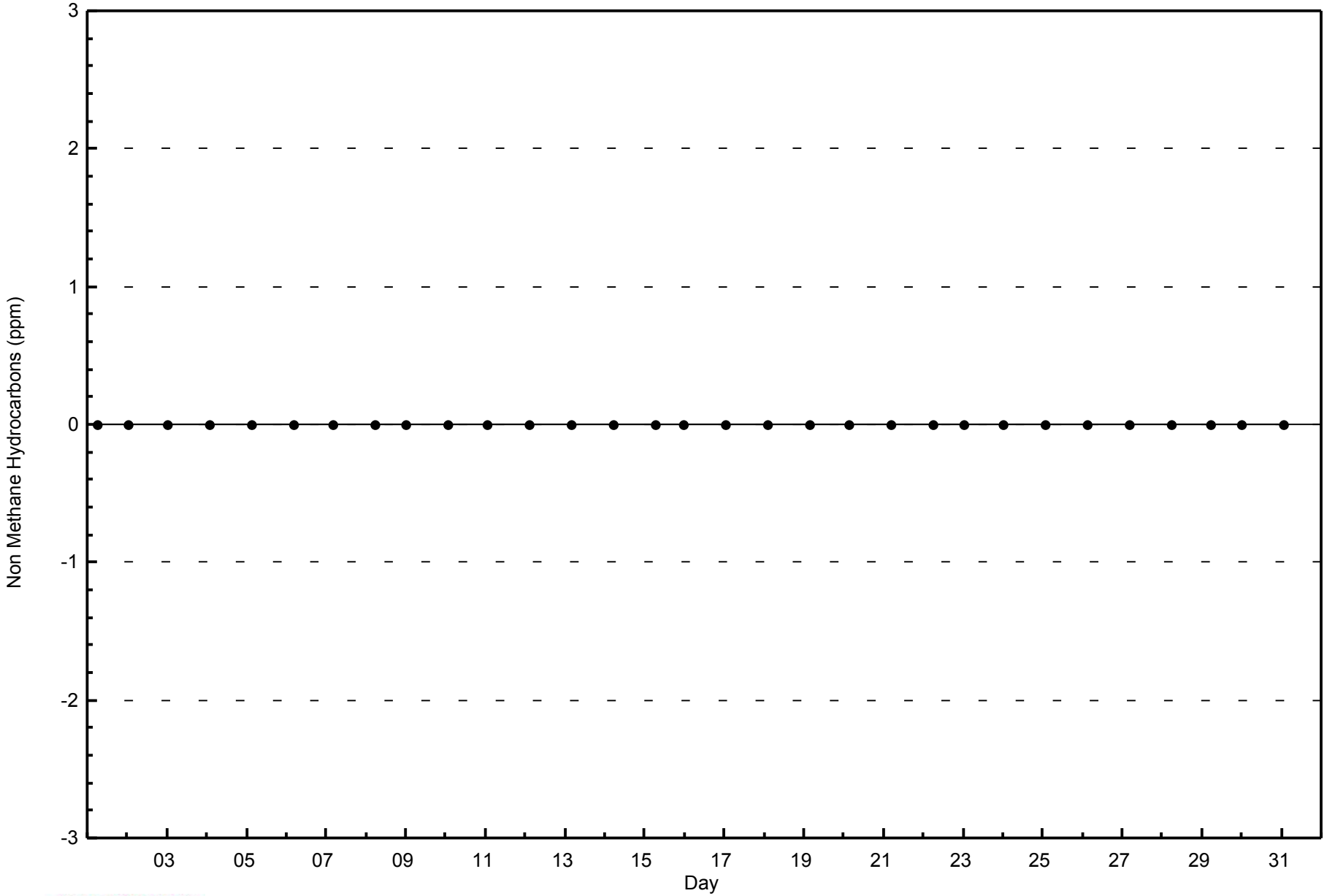
Total Number of Valid Hours: 701

WBEA

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - August 2014



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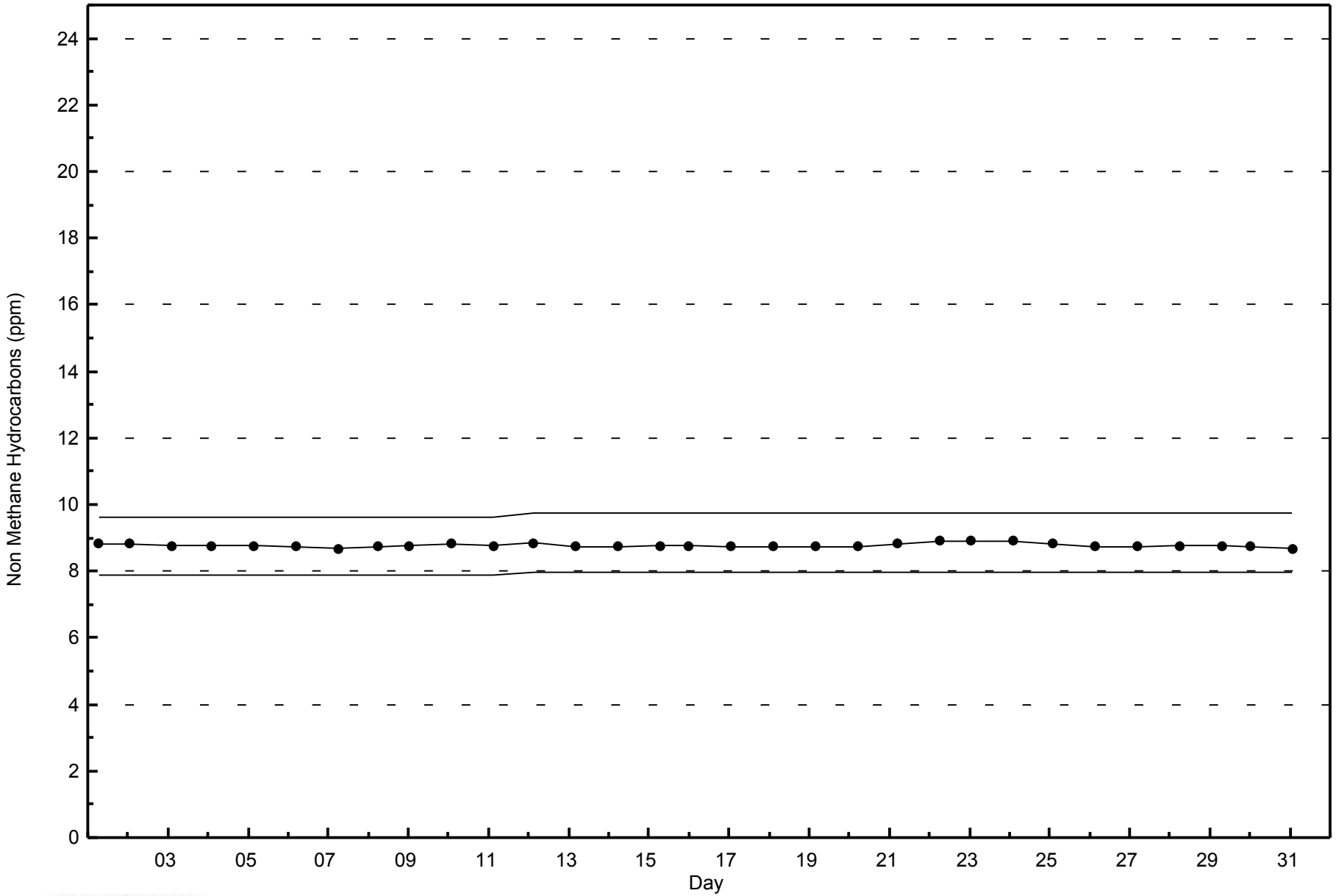
WBEA

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Anzac - August 2014

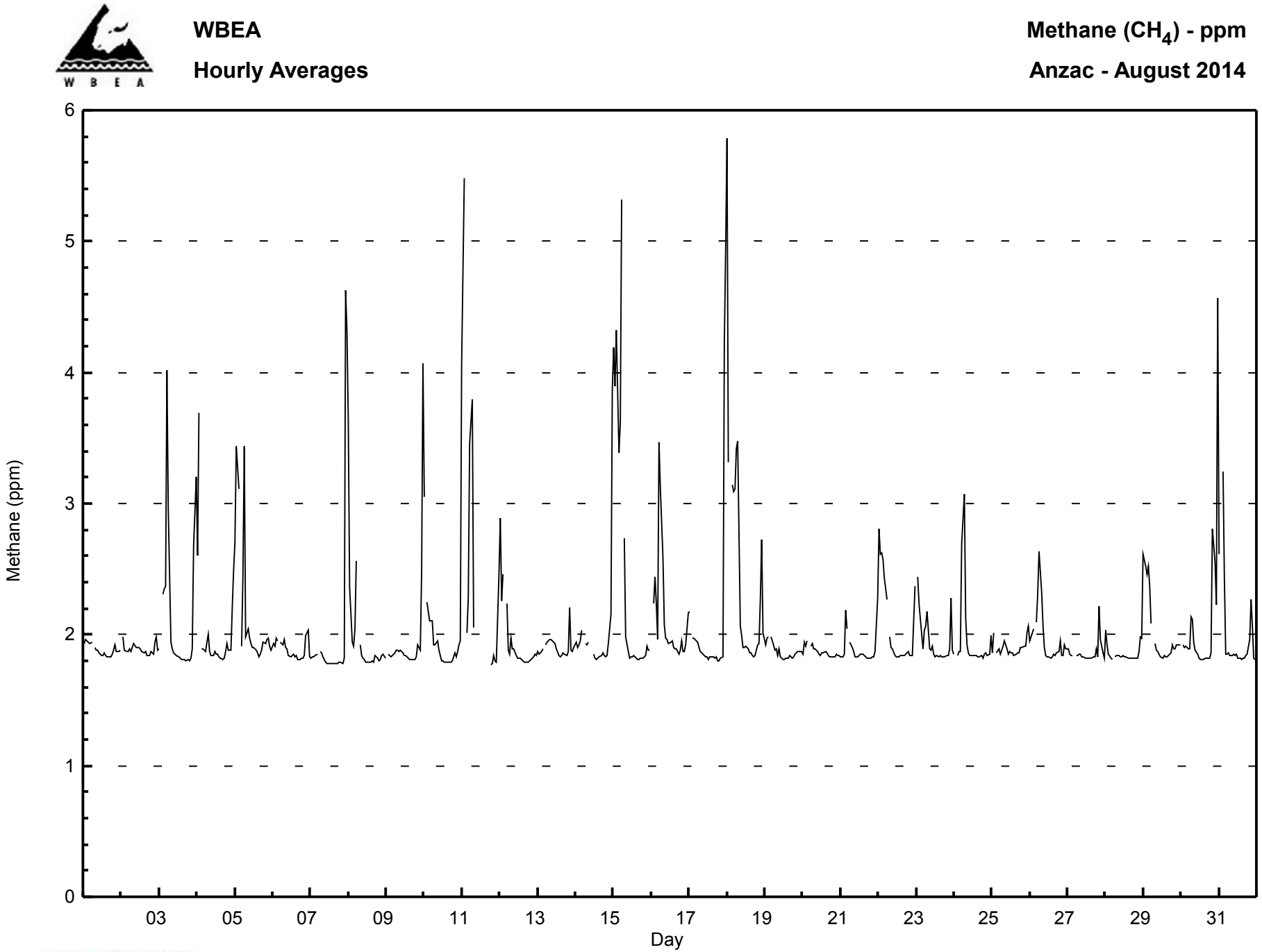
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5.8 ppm on Aug 18 01:00
Maximum Daily Average: 2.5 ppm on Aug 18

Minimum Value: 1.8 ppm on Aug 11 19:00
Maximum Diurnal Average: 2.5 ppm at hour 1
Monthly Average: 2.02 ppm
Minimum Daily Average: 1.9 ppm on Aug 28
Minimum Diurnal Average: 1.8 ppm at hour 17
Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 1.9 P_{90} = 2.4 P_{99} = 4.2

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	37
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1.9	2.0	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	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
2-Aug	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	1.8	1.8	1.8	1.9	1.9	1.9	2.0	1.9	1.9	2.0
3-Aug	1.9	Z	2.3	2.3	2.4	4.0	3.0	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	2.7	3.2	2.1	4.0
4-Aug	2.6	3.7	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.2	2.5	2.0	3.7
5-Aug	2.7	3.4	3.1	Z	1.9	2.5	3.4	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.2	3.4
6-Aug	1.9	1.9	2.0	2.0	Z	1.9	1.9	2.0	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	2.0	2.0	1.8	1.9	2.0
7-Aug	1.8	1.8	1.8	1.8	1.9	Z	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	4.6	4.3	2.0	4.6
8-Aug	3.6	2.4	1.9	1.9	2.0	2.6	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	1.8	1.8	1.8	1.9	1.8	2.0	3.6
9-Aug	Z	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.5	4.1	2.0	4.1
10-Aug	3.1	Z	2.2	2.1	2.1	2.1	1.9	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	2.0	2.0	3.1
11-Aug	4.1	5.5	Z	2.0	2.3	3.5	3.8	2.1	C	C	C	C	C	C	1.8	PF	PF	PF	1.8	1.8	1.8	1.8	1.8	2.5	--	5.5
12-Aug	2.9	2.3	2.5	Z	2.2	1.9	1.9	2.0	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	1.8	1.9	2.9
13-Aug	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.8	1.9	2.2	1.9	1.9	1.9	1.9	2.2
14-Aug	1.9	1.9	1.9	1.9	2.0	Z	1.9	1.9	1.9	M	M	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.9	2.2	3.9	2.0	3.9
15-Aug	4.2	3.9	4.3	3.4	3.6	5.3	Z	2.7	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	1.9	1.9	1.9	2.5	5.3
16-Aug	Z	2.2	2.4	2.2	2.0	3.5	3.1	2.6	2.1	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.2	2.1	3.5
17-Aug	2.2	Z	2.0	2.0	2.0	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	1.8	4.2	4.9	2.1	4.9
18-Aug	5.8	3.3	Z	3.1	3.1	3.1	3.4	3.5	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	2.3	2.7	2.0	2.5	5.8
19-Aug	1.9	2.0	2.0	Z	2.0	2.0	1.9	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0
20-Aug	1.9	1.9	1.9	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0
21-Aug	1.8	1.8	1.9	2.2	2.0	Z	1.9	1.9	1.9	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	1.9	2.3	1.9	2.3
22-Aug	2.8	2.6	2.6	2.6	2.4	2.3	Z	2.0	1.9	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	2.1	2.4	2.1	2.8
23-Aug	Z	2.4	2.2	2.0	1.9	2.0	2.1	2.2	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	2.3	1.9	2.0	2.4
24-Aug	1.8	Z	1.8	1.9	1.9	2.7	3.1	2.1	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	1.8	1.9	2.0	2.0	3.1
25-Aug	1.9	2.0	Z	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	1.9	2.1
26-Aug	2.0	2.0	2.0	Z	2.1	2.3	2.6	2.3	2.1	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	1.9	1.8	1.8	1.9	1.9	2.0	2.6
27-Aug	1.9	1.9	1.8	1.8	Z	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	1.9	1.8	2.2	2.0	1.9	1.8	1.9	2.2
28-Aug	2.0	1.9	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	1.9	2.0	2.0	1.9	2.0
29-Aug	2.6	2.5	2.5	2.5	2.4	2.1	Z	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.6
30-Aug	Z	1.9	1.9	1.9	1.9	1.9	2.1	2.1	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.8	2.6	2.2	4.6	2.1	4.6
31-Aug	2.6	Z	3.2	2.4	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	2.3	2.1	1.8	1.8	2.0	3.2
	2.5	2.4	2.2	2.1	2.1	2.4	2.3	2.1	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.2	2.4	Diurnal Average	
	5.8	5.5	4.3	3.4	3.6	5.3	3.8	3.5	2.1	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.8	2.6	4.6	4.9	Diurnal Maximum	

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


WBEA
Hourly Averages
Methane (CH_4) - ppm
Anzac - August 2014
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	590	84.05	84.05
2.1 - 3.0	76	10.83	94.87
3.1 - 10.0	36	5.13	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Methane (CH_4) - ppm

Anzac - August 2014

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	8	8	8	8	17	45	82	42	35	29	21	56	87	46	68	590
2.1 - 3.0	0	0	0	0	1	2	7	13	13	8	14	6	6	2	2	1	75
3.1 - 10.0	0	0	0	0	1	1	1	5	7	11	7	3	0	0	0	0	36
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	8	8	8	10	20	53	100	62	54	50	30	62	89	48	69	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

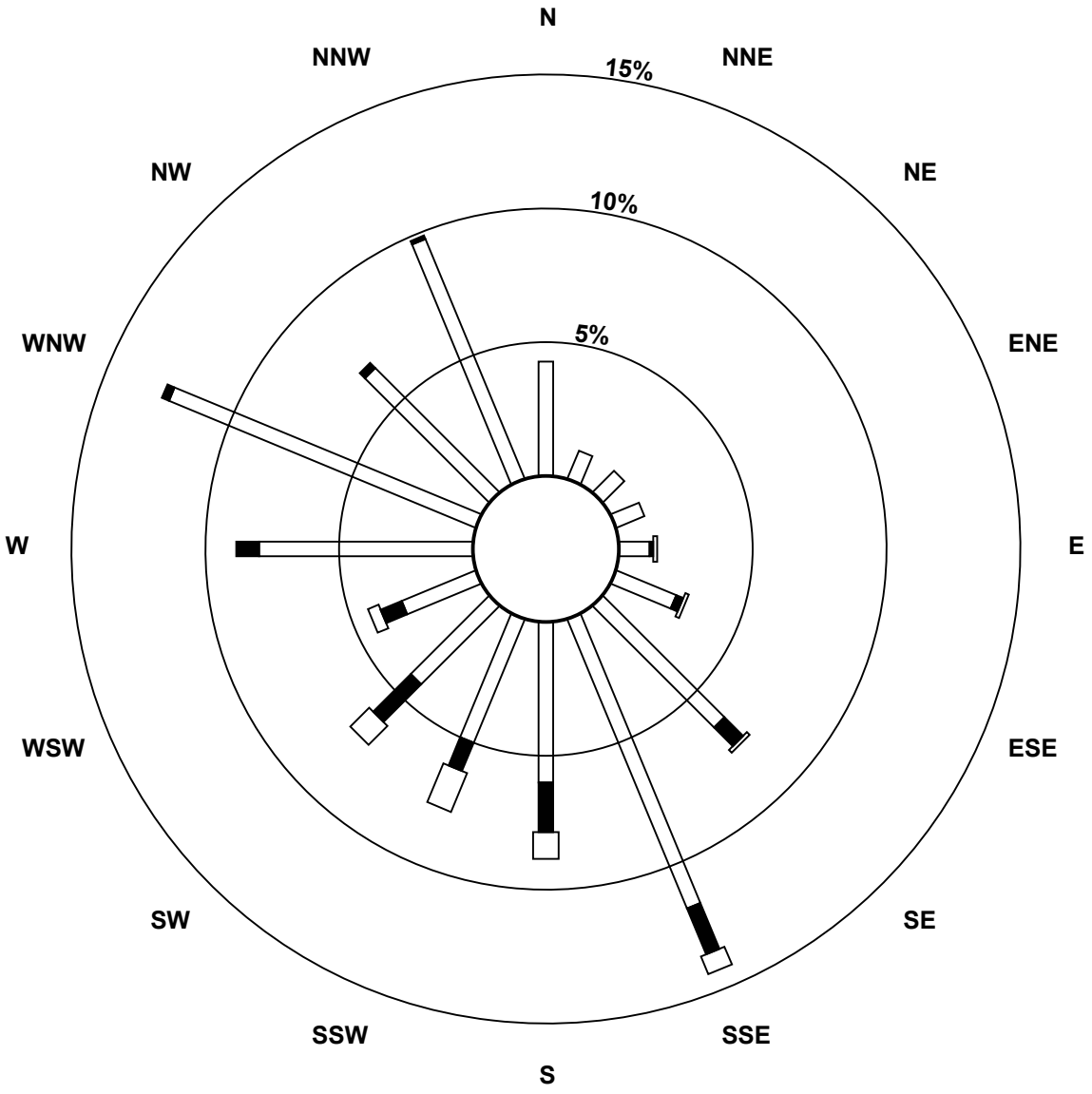
AURORA
ATMOSPHERICS INC.

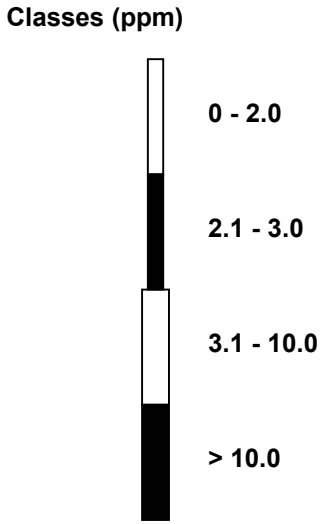
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Methane (CH_4) - ppm

Anzac (AMS 14)





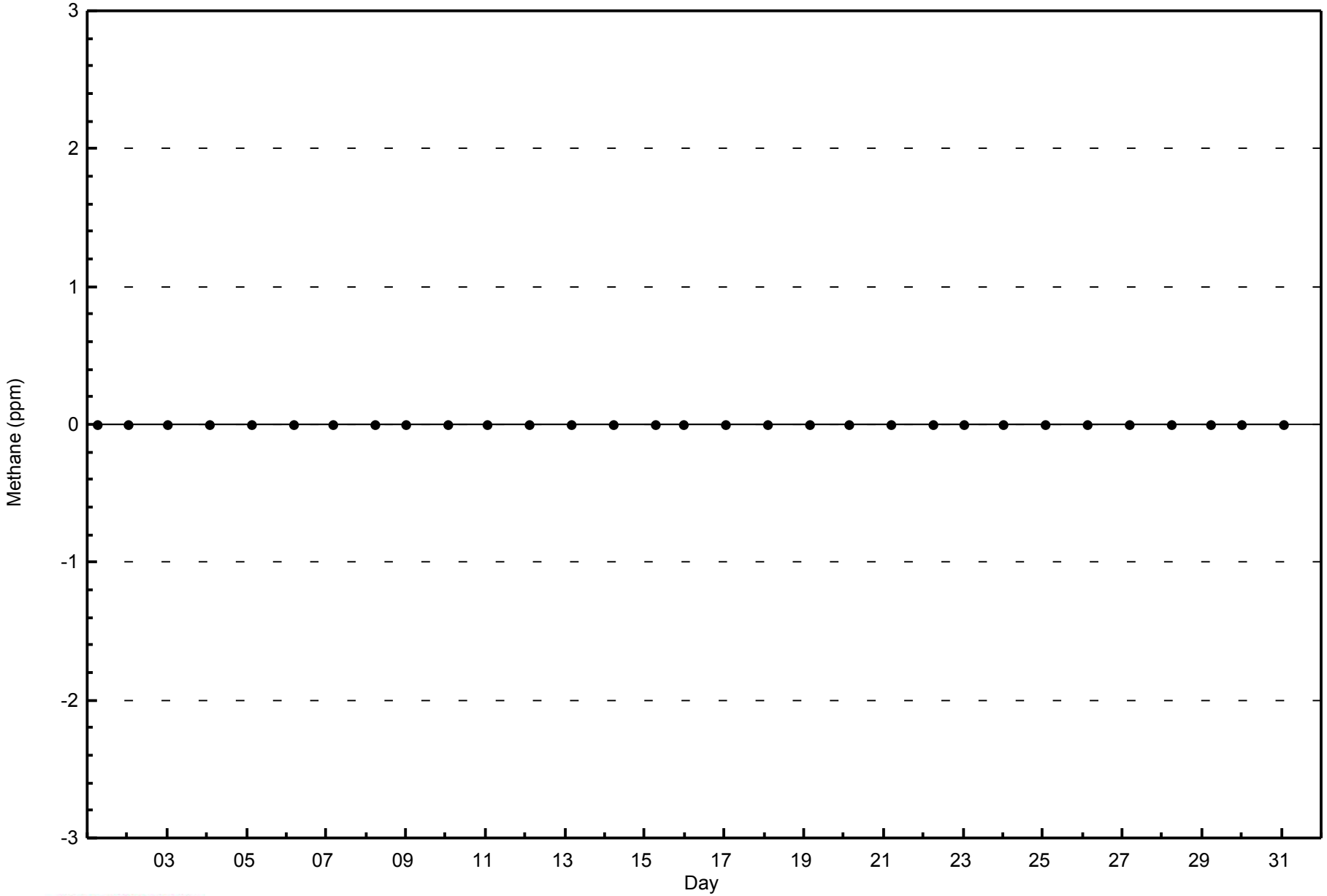
Total Number of Valid Hours: 701

WBEA

Zero Responses

Methane (CH_4) - ppm

Anzac - August 2014



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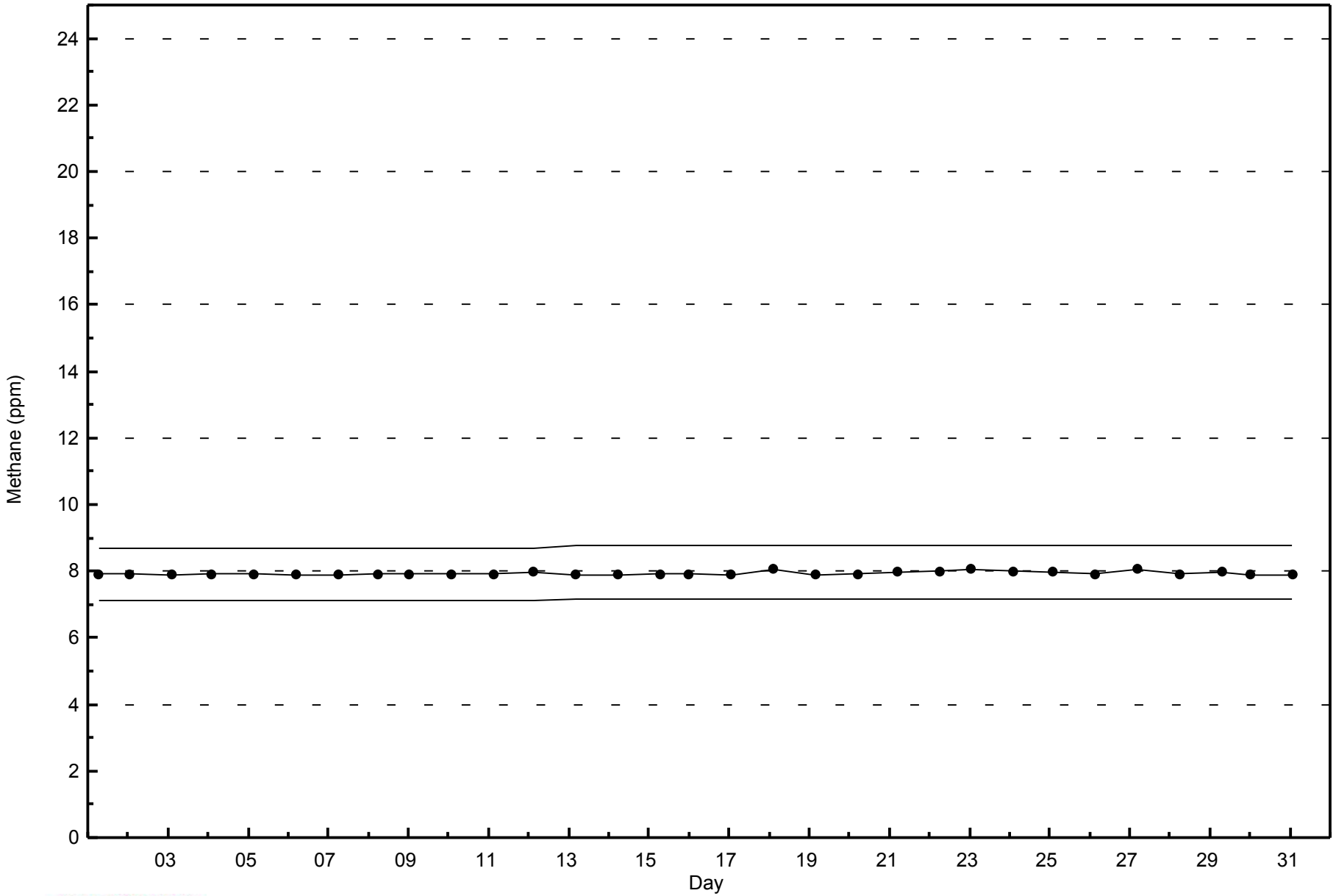
WBEA

Span Responses

Methane (CH_4) - ppm

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Anzac - August 2014

Maximum Value: 22 ppb on Aug 2 07:00

Maximum Daily Average: 3.3 ppb on Aug 2

Minimum Value: 0 ppb on Aug 12 16:00

Minimum Daily Average: 0.0 ppb on Aug 14

Maximum Diurnal Average: 1.7 ppb at hour 7

Minimum Diurnal Average: 0.1 ppb at hour 22

Monthly Average: 0.5 ppb

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

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-Aug	0	0	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0.4	2
2-Aug	Z	0	0	0	5	0	22	19	8	5	2	1	4	3	5	1	0	0	0	0	0	0	0	0	3.3	22
3-Aug	0	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
4-Aug	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	0	0	1	6	0.6	6
5-Aug	2	0	0	Z	0	1	3	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	3
6-Aug	0	0	0	0	Z	0	4	2	5	5	3	2	1	4	0	1	1	1	0	0	0	0	0	0	1.4	5
7-Aug	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
8-Aug	0	0	0	0	0	1	Z	1	2	2	1	7	2	0	0	0	0	0	0	0	0	1	0	0	0.9	7
9-Aug	Z	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	2	0	0	0	1	1	0.5	2
10-Aug	0	Z	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0.5	1
11-Aug	1	0	Z	0	0	1	5	4	C	C	C	C	C	C	0	PF	PF	PF	0	0	0	0	0	0	--	5
12-Aug	0	0	1	Z	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0.3	2
13-Aug	0	0	0	0	Z	0	0	0	0	0	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0.2	2
14-Aug	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
15-Aug	0	1	0	0	0	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
16-Aug	Z	0	8	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	8
17-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	0	0	0	0.3	2
18-Aug	0	2	Z	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3
19-Aug	0	0	0	Z	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0.2	2
20-Aug	0	0	0	1	Z	0	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0.3	1
21-Aug	2	0	0	0	0	Z	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.3	2
22-Aug	0	0	0	0	0	5	Z	6	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	6
23-Aug	Z	0	0	0	0	0	0	1	2	3	6	2	0	3	1	0	0	0	0	0	0	0	0	0	0.8	6
24-Aug	0	Z	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0.3	2
25-Aug	0	0	Z	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
26-Aug	4	0	0	Z	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	4
27-Aug	0	0	0	0	Z	0	0	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0.3	3
28-Aug	0	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
29-Aug	0	0	0	0	0	3	Z	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	3
30-Aug	Z	0	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-Aug	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.2	1
	0.4	0.2	0.4	0.3	0.3	0.6	1.7	1.5	1.0	0.9	0.7	0.8	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.4	Diurnal Average	
	4	2	8	2	5	5	22	19	8	5	6	7	4	4	5	1	1	1	2	2	2	1	2	6	Diurnal Maximum	

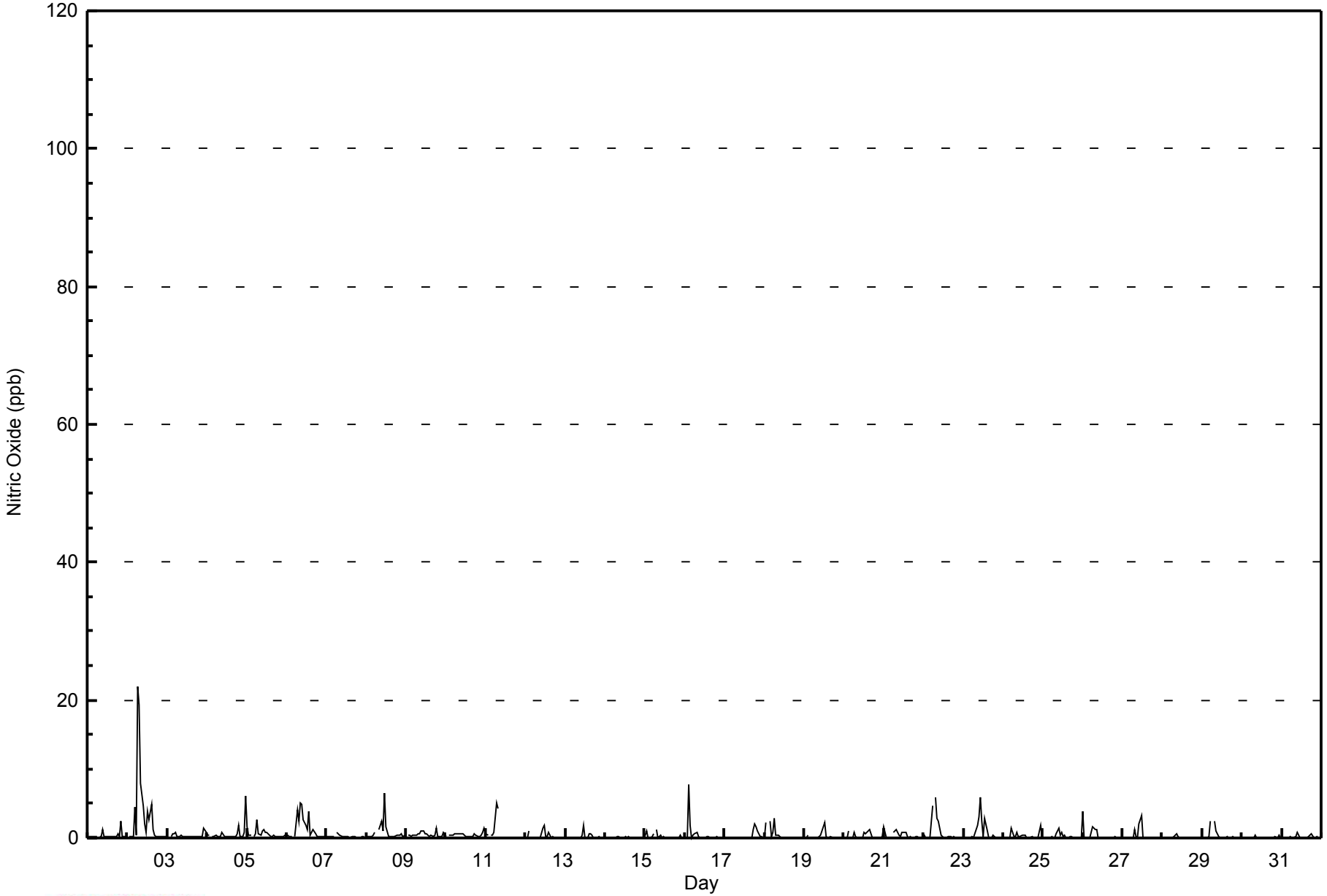
Z - zerospan C - Calibration PF - Power Failure

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Anzac - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	30	8	8	8	10	20	53	99	62	54	50	30	62	91	48	69	702
21 - 40	0	0	0	0	0	0	0	1	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	30	8	8	8	10	20	53	100	62	54	50	30	62	91	48	69	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

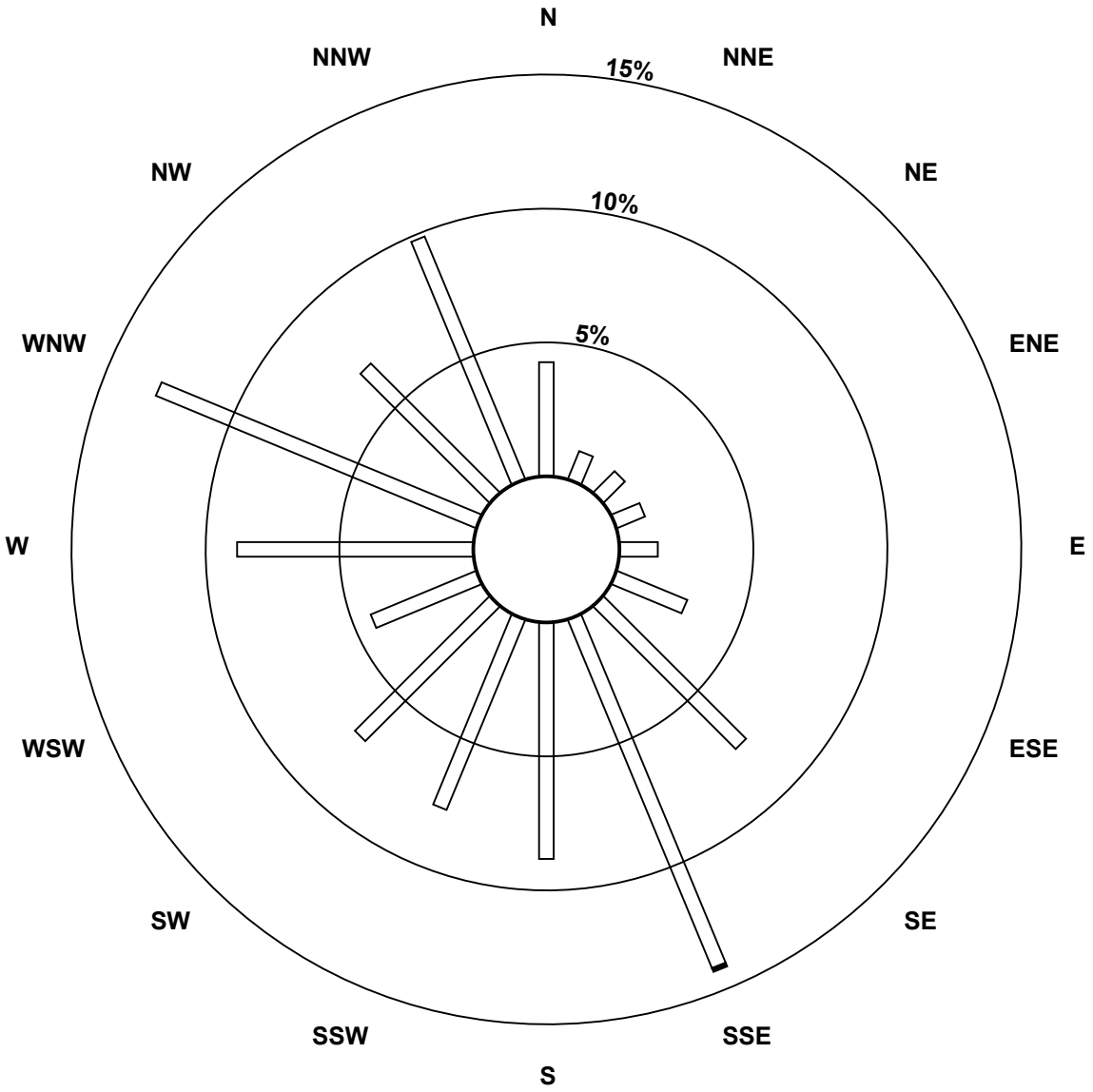
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

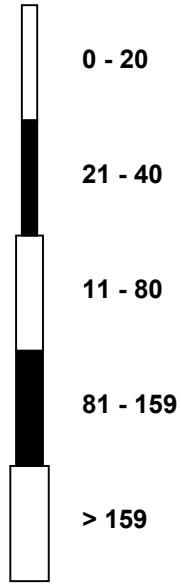
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Anzac (AMS 14)



Classes (ppb)



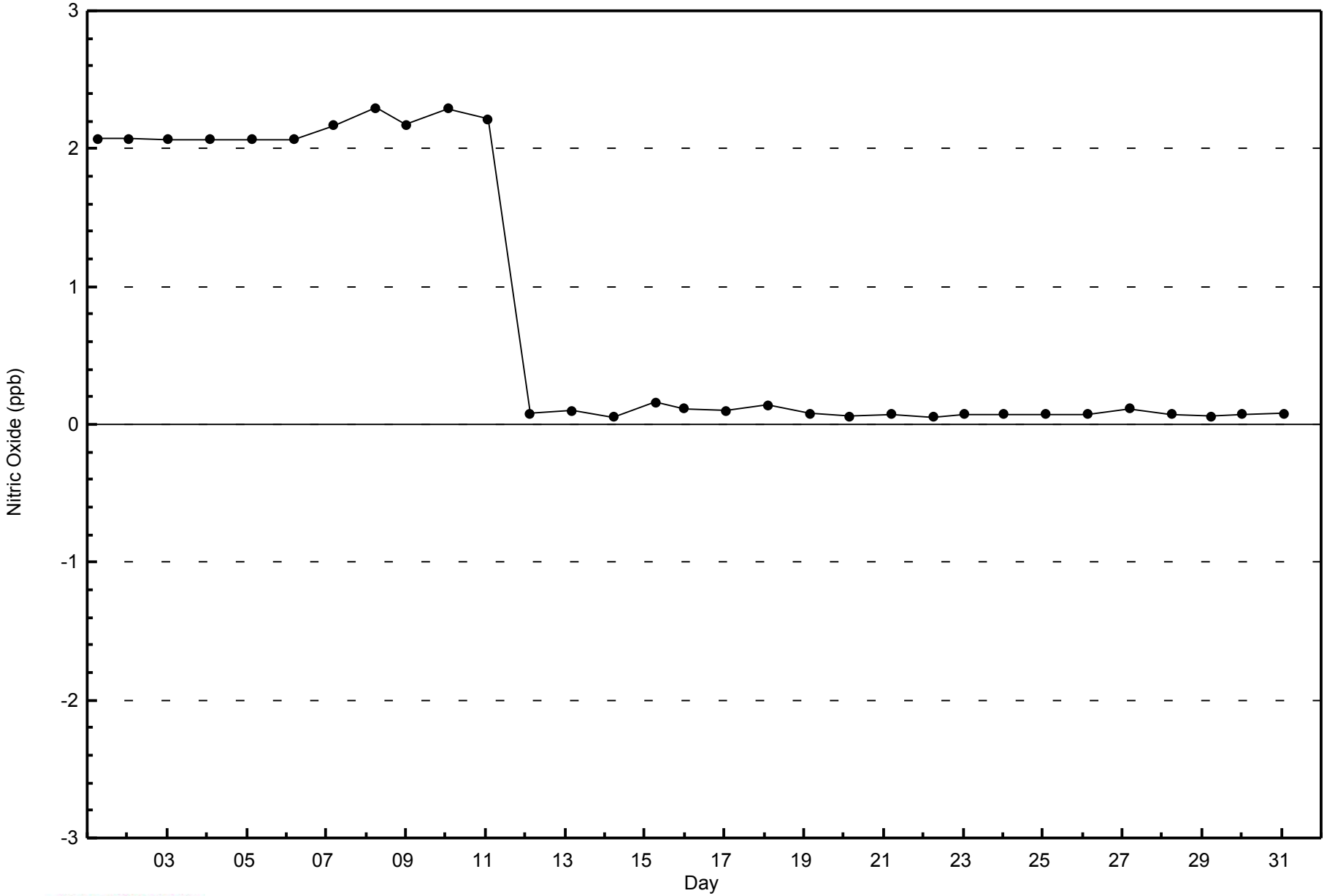
Total Number of Valid Hours: 703

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Anzac - August 2014



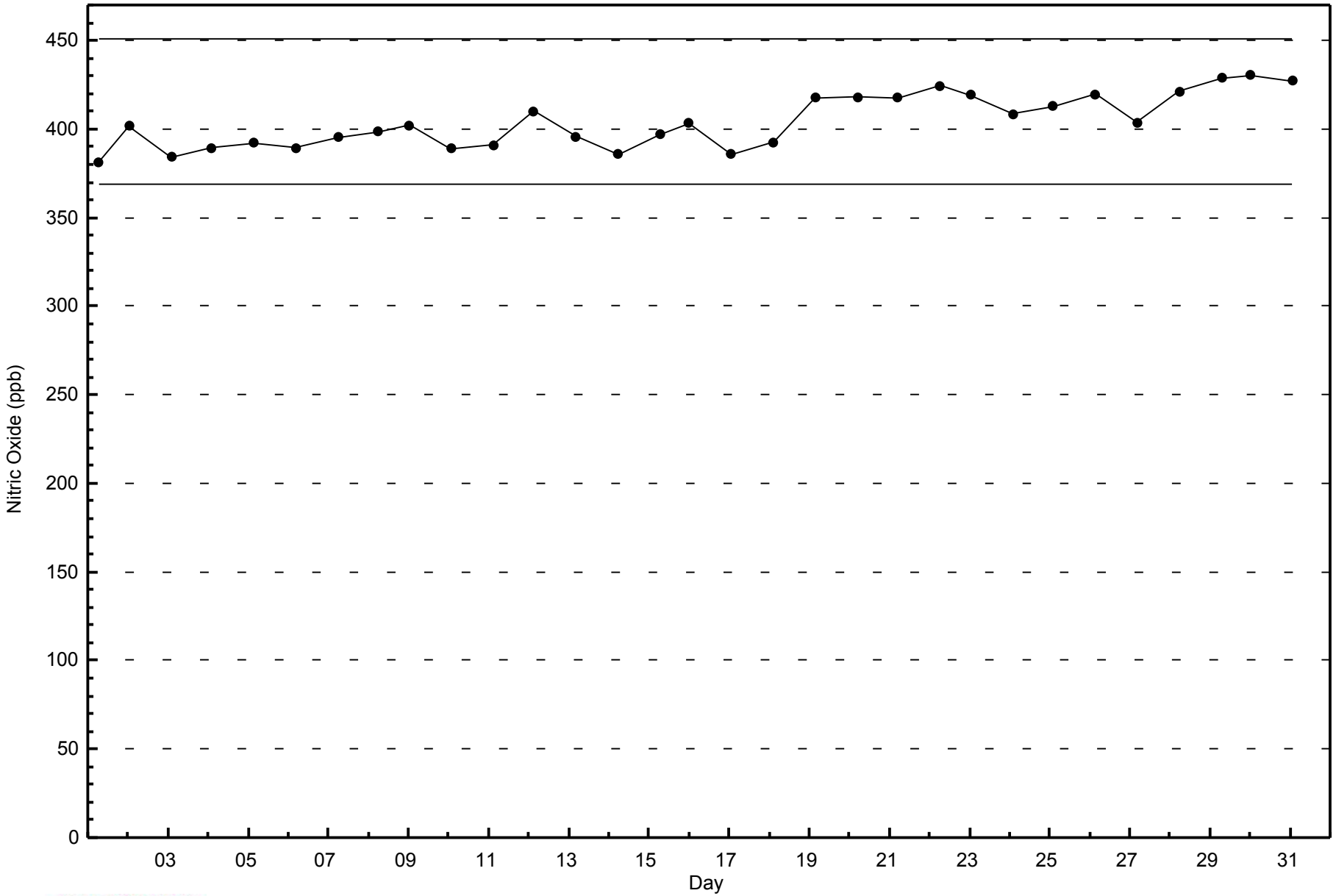
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 ppb on Aug 4 20:00 Maximum Daily Average: 3.0 ppb on Aug 2

Minimum Value: 0 ppb on Aug 11 15:00 Minimum Daily Average: 0.8 ppb on Aug 10
Maximum Diurnal Average: 2.7 ppb at hour 8 Minimum Diurnal Average: 1.1 ppb at hour 22
Monthly Average: 1.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 1 $Q_3 = 2$ $P_{90} = 4$ $P_{99} = 7$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	2	2	2	1	1	1	Z	1	1	1	1	1	1	2	1	1	2	2	2	1	5	2	1	1	1.5	5
2-Aug	Z	2	1	1	5	1	10	10	5	6	4	2	4	3	5	2	2	1	1	1	1	2	1	1	3.0	10
3-Aug	1	Z	1	1	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	8	4	1.3	8
4-Aug	2	1	Z	1	1	1	1	1	1	3	1	1	1	1	1	1	1	2	7	11	2	1	2	5	2.0	11
5-Aug	7	2	1	Z	1	1	2	3	3	6	5	3	4	2	1	1	1	1	1	2	1	1	1	2	2.2	7
6-Aug	5	2	1	1	Z	1	5	4	4	4	4	4	2	5	2	2	4	2	1	2	2	1	1	1	2.5	5
7-Aug	1	1	1	1	1	Z	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2
8-Aug	1	1	2	2	2	1	Z	3	4	5	2	4	2	1	1	2	1	2	2	2	1	1	1	1	1.8	5
9-Aug	Z	3	2	1	1	1	1	1	1	4	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1.1	4
10-Aug	1	Z	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	5	0.8	5
11-Aug	2	0	Z	0	0	1	7	7	C	C	C	C	C	C	0	PF	PF	PF	0	1	1	1	0	1	--	7
12-Aug	0	0	1	Z	1	1	1	1	1	1	3	3	1	2	1	0	1	0	0	0	0	1	0	1	0.9	3
13-Aug	1	2	2	2	Z	2	2	2	2	1	2	3	1	2	5	6	4	2	2	2	5	1	1	1	2.2	6
14-Aug	2	1	1	1	1	Z	2	4	4	3	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1.9	4
15-Aug	2	7	3	1	1	1	Z	3	2	5	3	2	1	1	1	1	1	1	1	1	1	2	1	1	1.8	7
16-Aug	Z	1	4	3	1	1	2	3	2	1	1	3	5	3	2	1	1	1	1	2	1	1	1	1	1.8	5
17-Aug	4	Z	1	1	1	1	1	1	2	2	2	1	1	0	0	0	0	1	1	1	1	1	2	1	1.1	4
18-Aug	1	3	Z	6	3	2	6	5	5	3	1	1	2	1	2	2	1	1	1	3	3	2	1	1	2.4	6
19-Aug	3	4	4	Z	2	2	3	2	2	2	3	5	5	3	2	1	4	1	1	1	1	1	1	1	2.3	5
20-Aug	3	4	2	2	Z	2	4	2	1	1	1	0	3	2	3	3	2	1	1	0	0	0	0	0	1.6	4
21-Aug	5	1	1	2	1	Z	4	4	2	1	2	2	3	3	3	3	4	3	2	1	2	0	1	1	2.2	5
22-Aug	1	1	1	1	1	1	Z	9	6	5	2	2	2	1	1	2	3	3	3	2	1	1	1	1	2.1	9
23-Aug	Z	1	1	1	1	1	1	3	3	3	6	5	2	4	2	1	1	1	1	1	1	1	2	1	1.8	6
24-Aug	1	Z	1	1	2	4	3	2	2	1	1	1	2	2	1	1	1	1	0	1	1	1	5	3	1.6	5
25-Aug	2	2	Z	1	1	2	2	2	3	1	2	2	1	2	1	1	2	2	1	1	2	1	1	2	1.6	3
26-Aug	5	1	1	Z	2	3	6	5	4	2	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2.0	6
27-Aug	2	1	1	1	Z	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	2	1.2	3
28-Aug	3	2	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	3
29-Aug	1	1	1	1	1	2	Z	3	1	1	1	1	1	1	1	1	2	1	2	2	2	1	1	1	1.3	3
30-Aug	Z	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1.1	2
31-Aug	1	Z	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	3	3	2	2	1	1	1.4	3
	2.1	1.7	1.4	1.3	1.2	1.4	2.7	2.7	2.3	2.3	1.9	1.9	1.8	1.6	1.4	1.4	1.6	1.3	1.5	1.6	1.4	1.1	1.3	1.4	Diurnal Average	
	7	7	4	6	5	4	10	10	6	6	6	5	5	5	5	6	4	3	7	11	5	2	8	5	Diurnal Maximum	

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

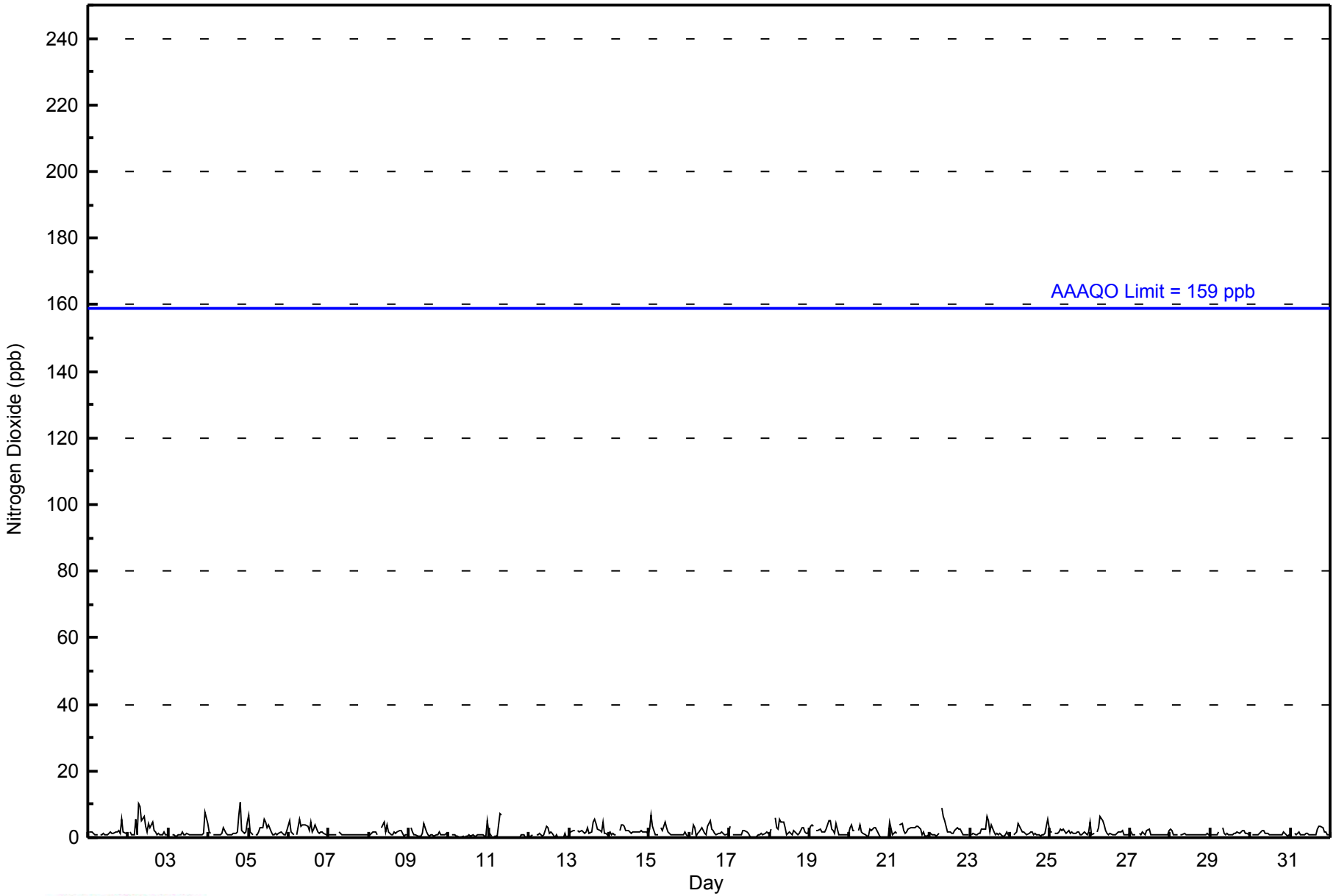
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

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

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Anzac - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	30	8	8	8	10	20	53	100	62	54	50	30	62	91	48	69	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	8	8	8	10	20	53	100	62	54	50	30	62	91	48	69	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

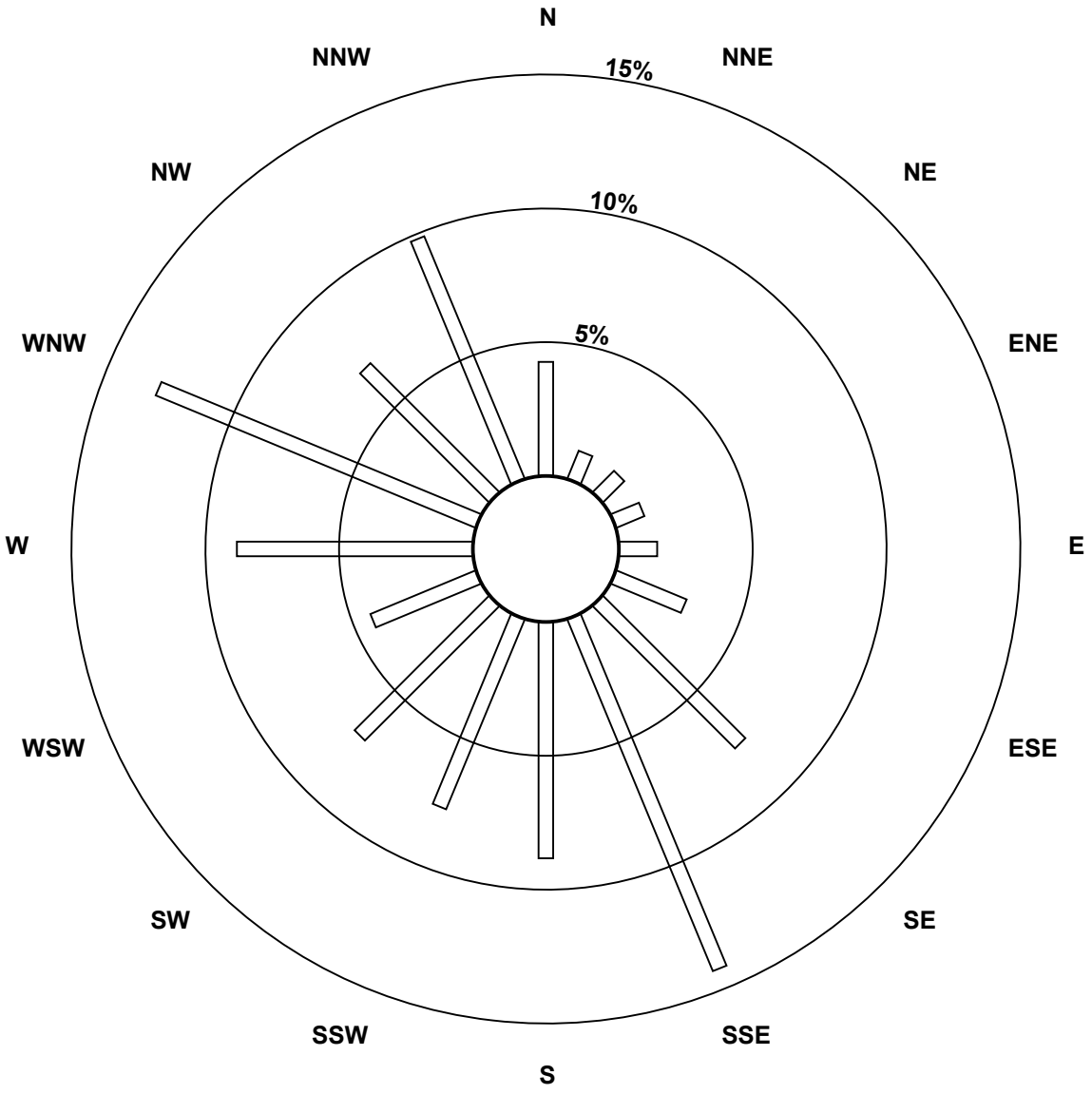
AURORA ATMOSPHERICS INC.

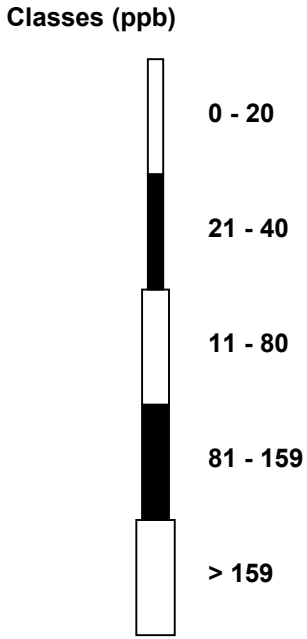
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Anzac (AMS 14)





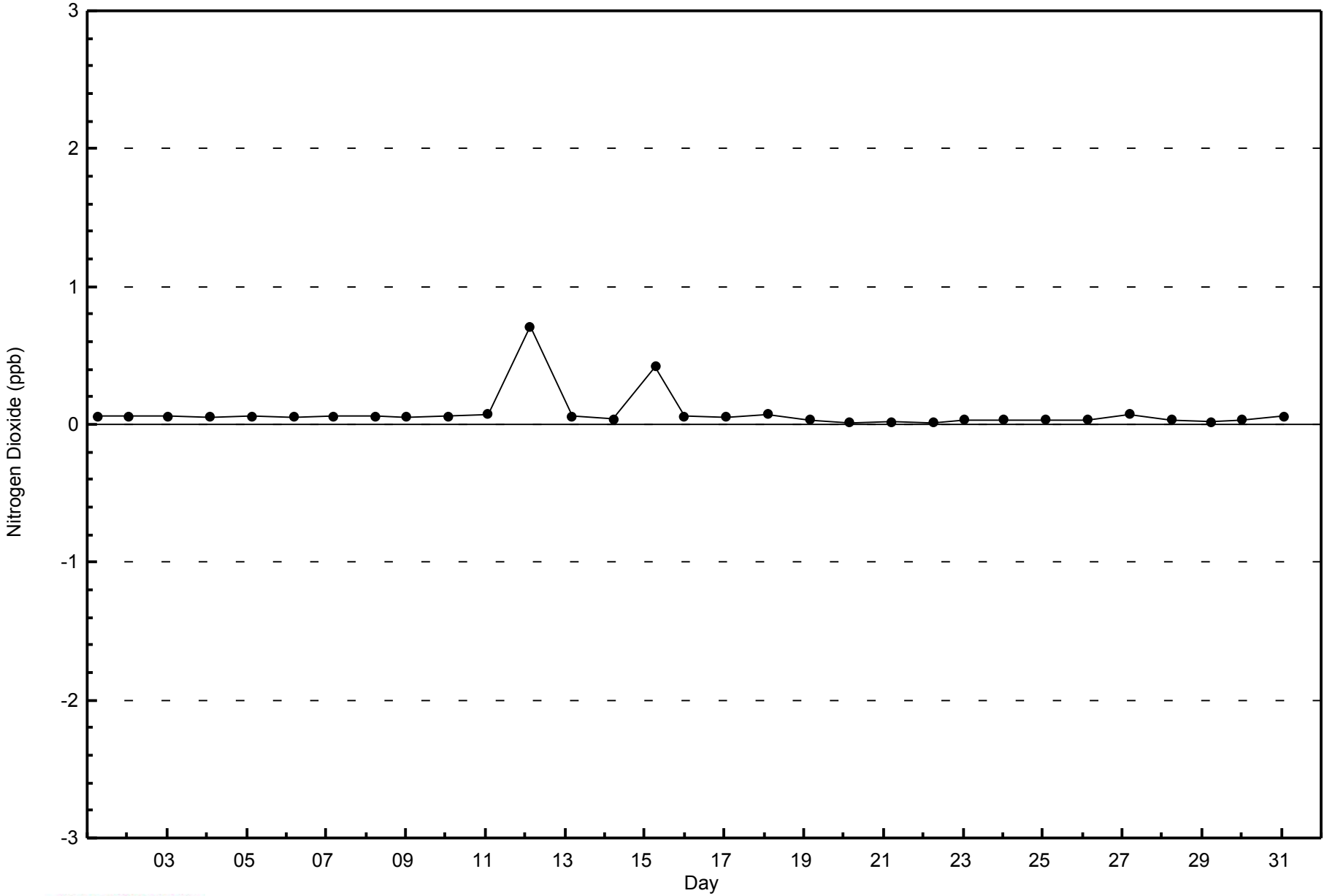
Total Number of Valid Hours: 703

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - August 2014



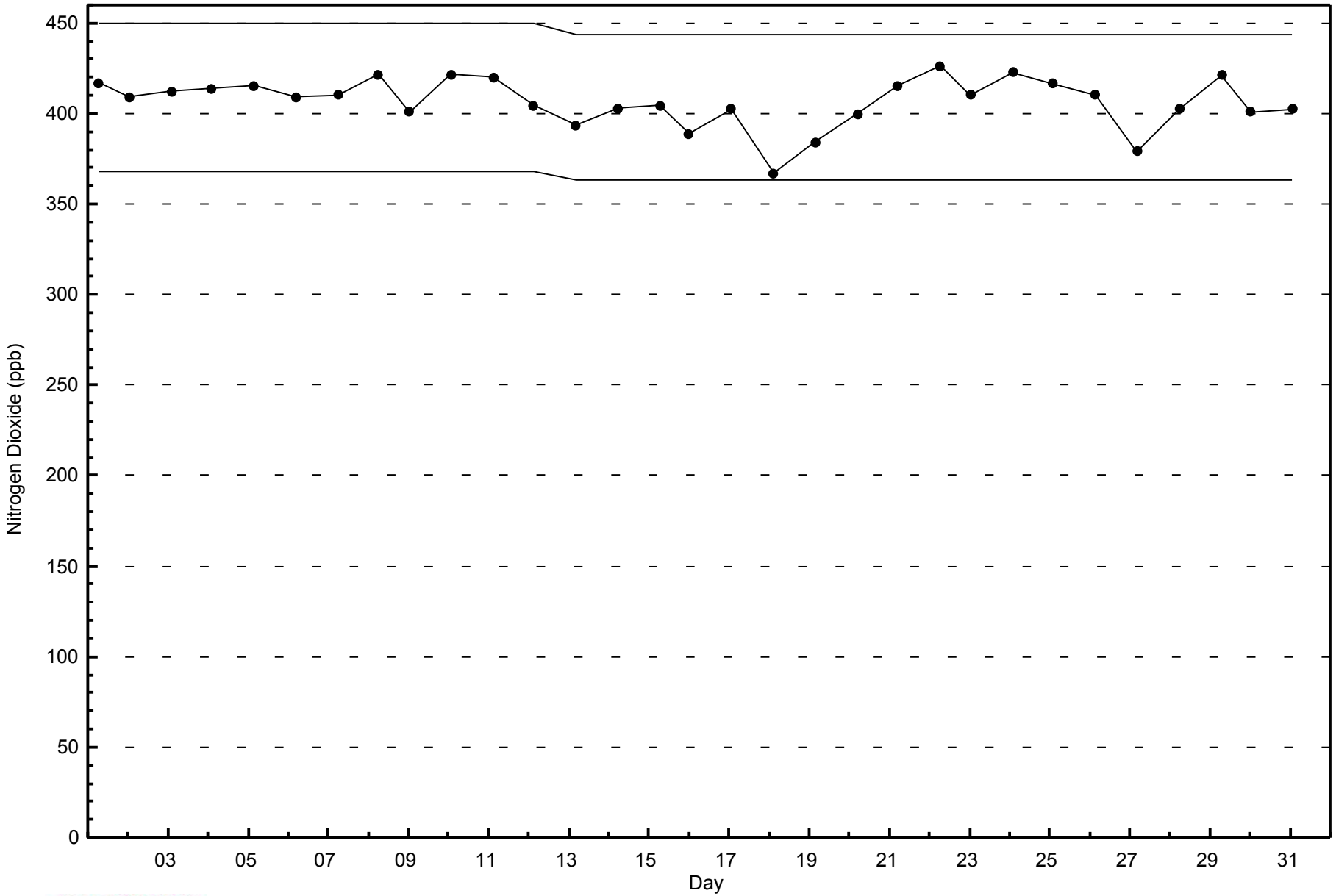
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - August 2014

Maximum Value: 32 ppb on Aug 2 07:00

Maximum Daily Average: 6.3 ppb on Aug 2

Minimum Value: 0 ppb on Aug 12 16:00

Minimum Daily Average: 1.1 ppb on Aug 7

Maximum Diurnal Average: 4.3 ppb at hour 7

Minimum Diurnal Average: 1.2 ppb at hour 22

Monthly Average: 2.2 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 1 $Q_3 = 2$ $P_{90} = 5$ $P_{99} = 12$

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-Aug	2	2	2	1	1	1	Z	1	1	2	1	1	1	2	2	1	2	2	3	2	8	2	2	2	1.9	8
2-Aug	Z	2	1	1	10	1	32	29	13	11	6	2	8	6	10	3	2	1	1	1	1	2	1	1	6.3	32
3-Aug	1	Z	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	9	5	1.6	9
4-Aug	2	1	Z	1	1	1	1	1	1	4	1	1	1	1	1	2	1	2	7	12	2	1	2	11	2.6	12
5-Aug	8	2	1	Z	1	1	4	3	3	7	6	4	5	2	1	1	2	1	2	2	1	1	1	3	2.8	8
6-Aug	5	2	1	1	Z	1	10	6	9	9	6	5	4	8	2	3	5	2	2	2	2	1	1	1	3.9	10
7-Aug	1	1	1	1	1	Z	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	3
8-Aug	1	1	2	2	2	2	Z	4	6	7	3	11	3	1	1	2	1	2	3	2	2	1	1	1	2.6	11
9-Aug	Z	3	2	1	1	1	1	1	2	5	3	2	1	1	1	1	1	1	3	1	1	1	2	1	1.6	5
10-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	1.2	6
11-Aug	2	1	Z	1	1	1	12	11	C	C	C	C	C	C	0	PF	PF	PF	0	1	1	1	0	1	--	12
12-Aug	0	0	2	Z	1	1	1	1	1	1	5	5	2	2	2	0	1	0	0	0	0	1	0	1	1.1	5
13-Aug	1	2	2	2	Z	2	2	2	2	1	2	5	1	2	5	6	5	2	2	2	5	1	1	1	2.4	6
14-Aug	1	1	1	1	1	Z	2	4	4	3	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1.9	4
15-Aug	3	8	3	1	1	2	Z	4	2	5	3	2	1	1	1	1	1	1	1	1	1	2	1	0	1.9	8
16-Aug	Z	1	12	5	1	2	2	4	2	1	1	3	5	3	2	1	1	1	1	2	1	1	1	1	2.3	12
17-Aug	4	Z	1	1	1	1	1	1	2	2	1	1	1	0	0	0	0	2	3	3	2	1	2	1	1.4	4
18-Aug	1	5	Z	8	3	3	8	5	5	3	1	1	2	1	2	2	1	1	1	3	3	2	1	1	2.8	8
19-Aug	3	4	4	Z	2	2	3	2	2	2	3	7	7	3	2	1	4	1	1	1	1	1	1	1	2.5	7
20-Aug	3	4	2	3	Z	2	5	2	1	1	1	0	3	3	4	4	3	1	1	0	0	0	0	0	1.9	5
21-Aug	6	1	1	2	1	Z	4	5	3	2	2	3	4	4	3	3	4	3	2	1	2	0	1	1	2.6	6
22-Aug	2	1	1	1	1	6	Z	15	9	7	2	2	2	1	1	2	3	3	3	2	1	1	1	1	2.9	15
23-Aug	Z	1	1	1	1	1	1	3	4	6	12	7	2	7	3	1	1	1	2	1	1	1	2	1	2.6	12
24-Aug	1	Z	1	1	1	6	3	2	3	1	1	2	2	2	1	1	1	1	0	1	1	1	7	3	1.9	7
25-Aug	2	2	Z	1	1	2	2	2	3	3	2	3	1	2	1	1	2	2	1	1	2	1	1	2	1.8	3
26-Aug	9	1	1	Z	2	4	8	6	5	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	2.4	9
27-Aug	2	1	1	1	Z	1	1	3	1	1	4	6	1	1	1	1	1	1	1	1	1	1	1	2	1.5	6
28-Aug	3	2	1	1	1	Z	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	3
29-Aug	1	1	1	1	1	4	Z	5	2	2	1	1	1	1	1	2	1	1	2	2	2	1	1	1	1.6	5
30-Aug	Z	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1.2	2
31-Aug	1	Z	1	1	1	2	1	1	1	2	2	1	1	1	1	1	3	4	4	3	2	2	1	1	1.6	4
	2.5	1.9	1.9	1.6	1.5	2.0	4.3	4.2	3.2	3.2	2.6	2.8	2.2	2.1	1.8	1.6	1.8	1.5	1.7	1.8	1.6	1.2	1.6	1.8	Diurnal Average	
	9	8	12	8	10	6	32	29	13	11	12	11	8	8	10	6	5	4	7	12	8	2	9	11	Diurnal Maximum	

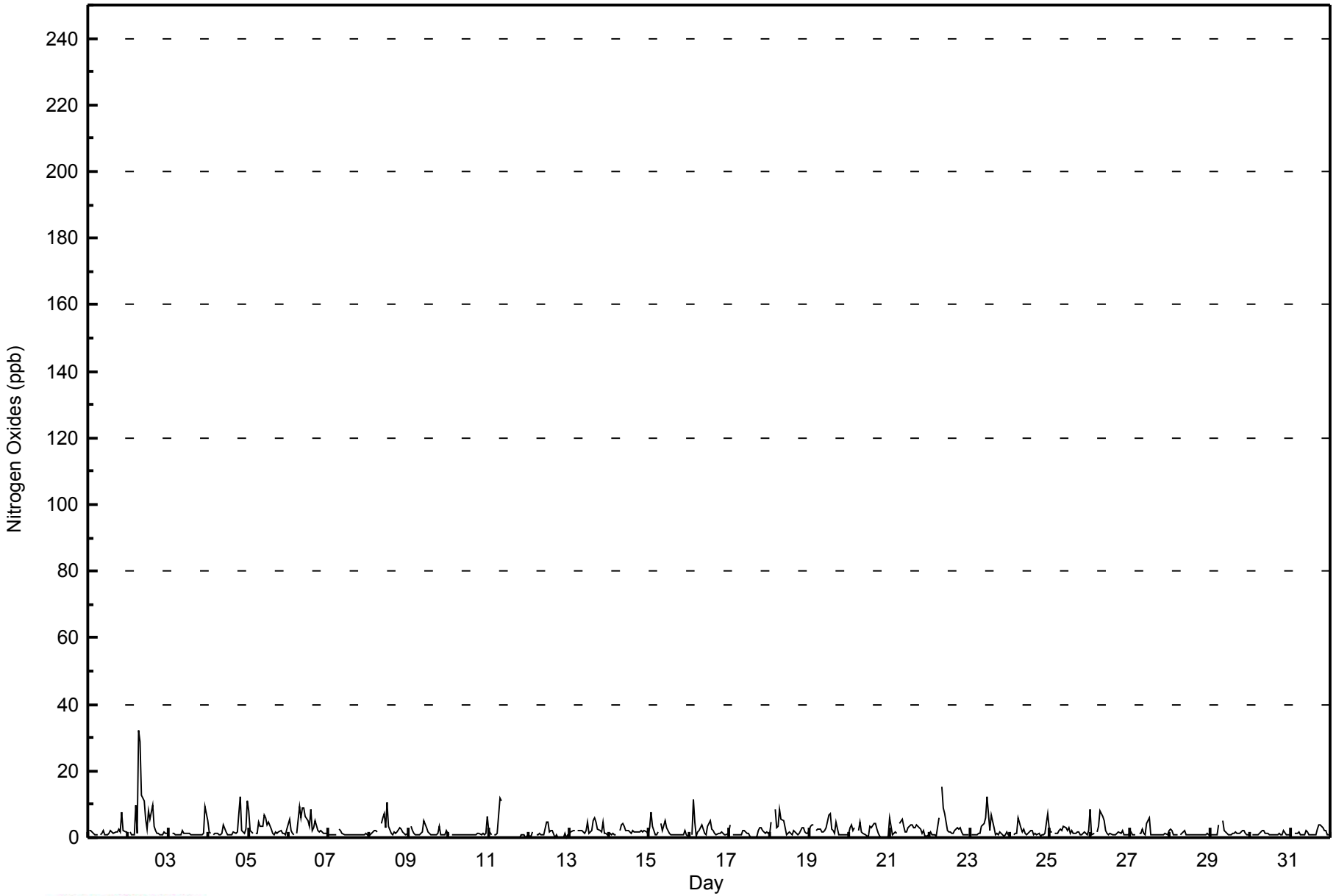
Z - zerospan C - Calibration PF - Power Failure

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Anzac - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	30	8	8	8	10	20	53	98	62	54	50	30	62	91	48	69	701
21 - 40	0	0	0	0	0	0	0	2	0	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	30	8	8	8	10	20	53	100	62	54	50	30	62	91	48	69	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

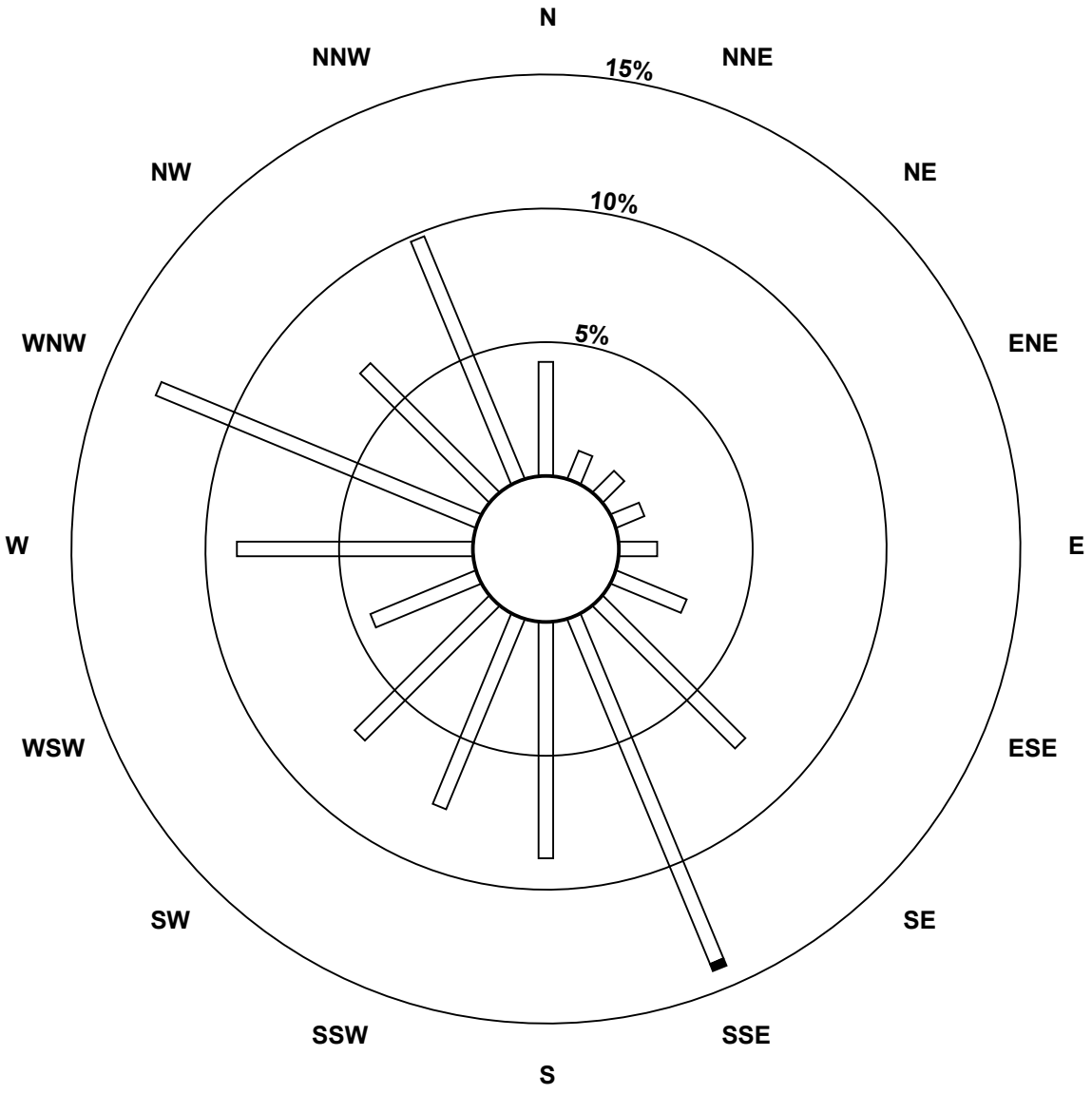
AURORA ATMOSPHERICS INC.

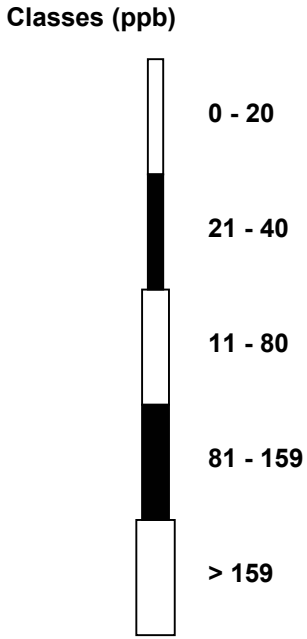
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Anzac (AMS 14)





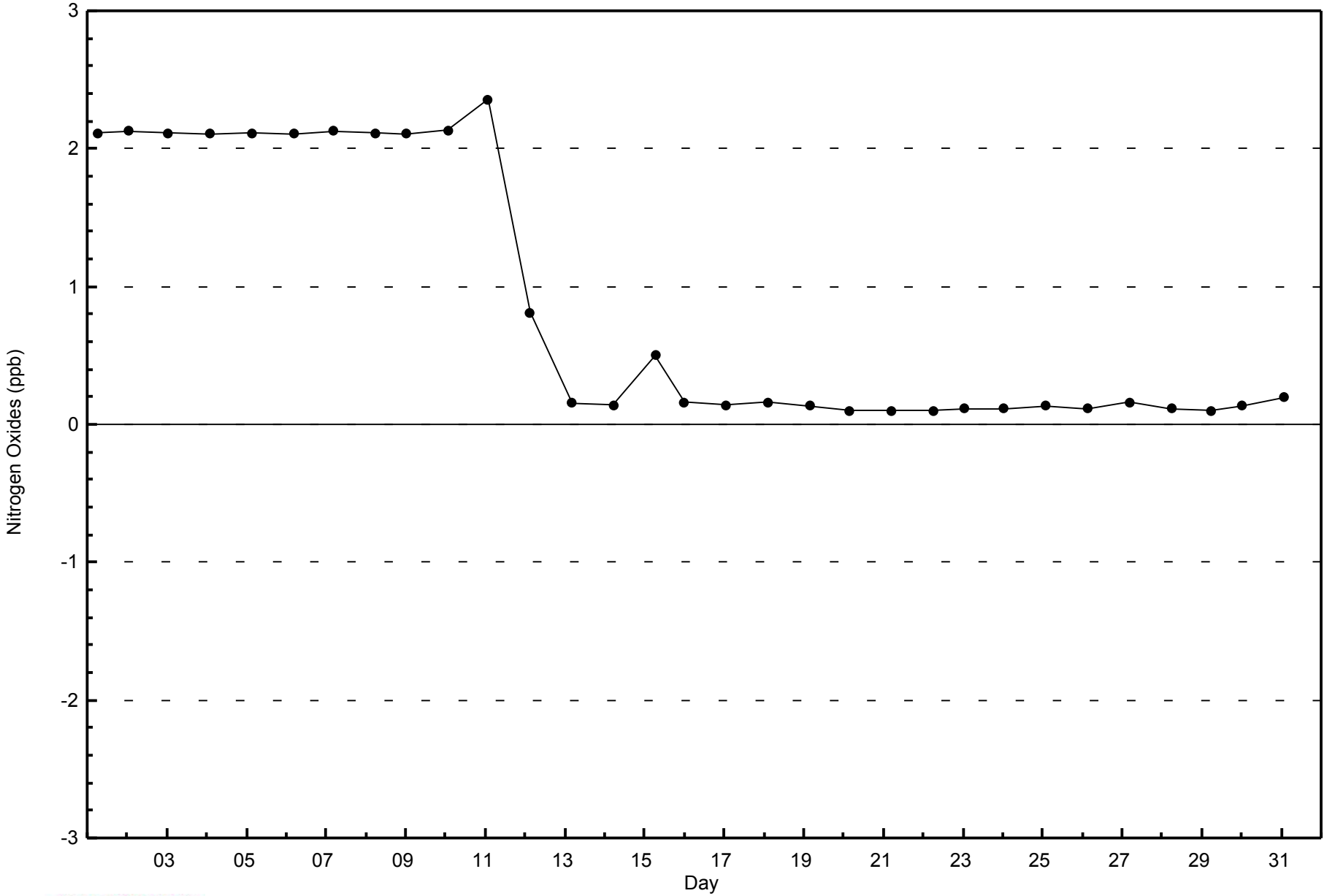
Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - August 2014



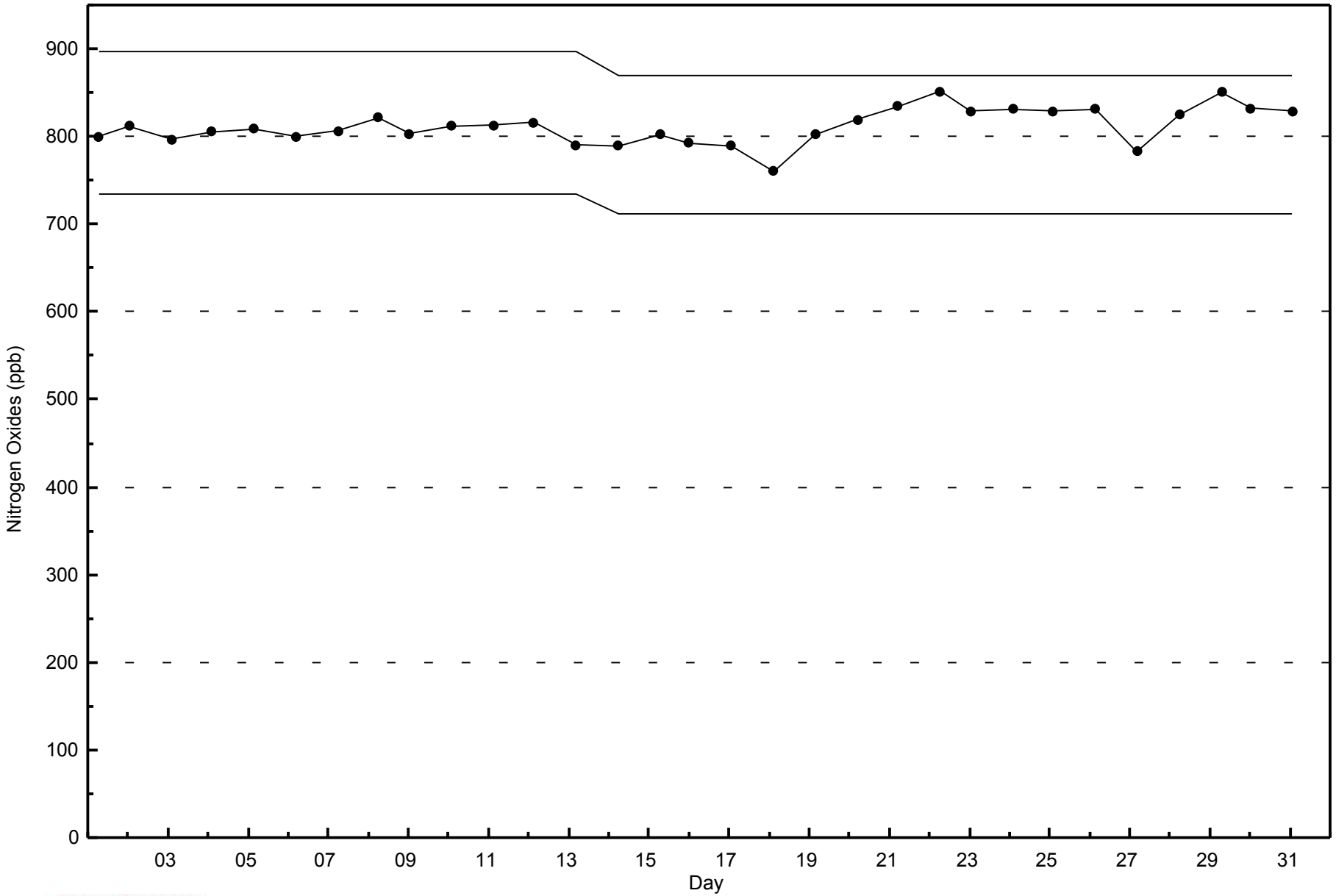
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Anzac - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 60 ppb on Aug 13 17:00 Maximum Daily Average: 36.3 ppb on Aug 13

Minimum Value: 0 ppb on Aug 15 04:00 Minimum Daily Average: 12.3 ppb on Aug 20
Maximum Diurnal Average: 36.3 ppb at hour 17 Minimum Diurnal Average: 10.1 ppb at hour 6
Monthly Average: 23.7 ppb Percentiles: $P_1 = 1$ $P_{10} = 6$ $Q_1 = 13$ Median = 24 $Q_3 = 33$ $P_{90} = 40$ $P_{99} = 53$

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	5	6	5	6	8	8	9	Z	15	16	19	19	27	35	35	38	39	37	34	24	15	12	11	13	19.0	39
2-Aug	20	Z	23	22	18	21	14	14	25	32	35	33	32	33	31	39	49	54	49	45	38	32	26	17	30.6	54
3-Aug	7	6	Z	2	1	2	15	31	40	39	42	46	45	44	44	48	46	44	43	34	28	13	4	3	27.2	48
4-Aug	10	13	10	Z	7	6	15	24	30	39	36	32	32	33	40	51	52	53	51	42	30	25	11	11	28.4	53
5-Aug	7	8	11	10	Z	6	9	26	34	37	39	47	54	46	37	38	42	41	37	33	35	34	32	32	30.3	54
6-Aug	28	31	35	35	30	Z	25	30	31	36	46	51	53	46	48	42	40	41	38	33	26	21	24	32	35.7	53
7-Aug	32	31	30	28	27	25	Z	25	27	29	29	28	28	28	29	29	30	30	29	27	20	15	13	16	26.3	32
8-Aug	12	11	9	6	2	2	5	Z	21	25	31	29	31	33	34	36	32	31	26	21	12	8	15	22	19.7	36
9-Aug	14	Z	13	16	14	11	10	9	12	10	18	20	20	22	21	24	25	26	24	18	10	10	10	7	15.9	26
10-Aug	9	9	Z	9	8	8	4	11	14	16	21	27	25	26	26	26	27	27	25	18	13	10	6	9	16.3	27
11-Aug	11	12	15	Z	13	13	11	18	25	27	24	24	25	24	21	PF	PF	PF	20	17	15	9	9	5	16.9	27
12-Aug	3	2	2	1	Z	1	8	17	17	18	C	C	C	23	22	23	23	23	21	20	18	17	16	14	14.5	23
13-Aug	14	15	15	17	18	Z	21	22	27	31	35	38	43	50	56	60	60	56	54	49	36	45	39	34	36.3	60
14-Aug	35	32	28	24	15	12	Z	23	30	38	42	44	44	45	49	50	48	49	49	42	32	21	13	7	33.6	50
15-Aug	2	2	2	0	2	3	4	Z	36	45	41	33	37	35	33	34	36	34	34	25	20	13	10	11	21.5	45
16-Aug	9	Z	3	2	3	3	3	11	17	21	23	40	52	47	49	45	43	46	38	32	20	16	16	14	24.1	52
17-Aug	19	30	Z	25	22	19	18	21	25	32	39	41	37	41	38	36	34	33	29	25	17	12	9	8	26.5	41
18-Aug	7	5	2	Z	4	5	6	17	24	27	31	30	28	29	30	30	29	26	26	25	21	17	10	12	19.2	31
19-Aug	11	11	4	5	Z	6	11	12	12	20	30	33	35	37	40	36	33	31	27	20	12	5	9	9	19.5	40
20-Aug	11	5	8	3	6	Z	3	6	9	10	16	18	14	17	16	15	17	18	21	19	18	12	12	9	12.3	21
21-Aug	4	5	6	4	2	7	Z	15	20	27	29	31	33	36	40	45	42	39	33	22	11	17	6	5	20.6	45
22-Aug	3	2	2	1	1	0	1	Z	18	22	34	35	37	37	37	39	40	40	29	24	20	13	9	7	19.6	40
23-Aug	8	Z	6	7	6	10	8	15	23	24	23	30	36	36	36	36	36	35	32	32	32	26	24	26	23.8	36
24-Aug	24	12	Z	16	20	12	12	18	20	20	23	25	24	27	26	26	29	28	26	22	19	19	13	16	20.7	29
25-Aug	15	18	18	Z	19	20	19	19	17	20	24	30	35	34	34	35	34	36	36	34	31	30	32	33	27.1	36
26-Aug	29	31	28	24	Z	12	17	20	24	31	37	40	40	38	39	37	37	35	34	25	18	10	17	27	28.2	40
27-Aug	29	32	27	25	24	Z	22	22	24	29	33	33	36	36	38	40	40	38	33	27	23	28	25	27	30.0	40
28-Aug	16	6	19	28	28	24	Z	20	18	20	19	19	21	23	24	26	28	27	25	20	13	10	6	2	19.2	28
29-Aug	3	2	1	2	2	3	4	Z	19	23	28	30	31	35	36	37	40	42	41	37	32	34	31	28	23.5	42
30-Aug	26	Z	24	23	13	10	11	12	19	27	29	27	25	28	29	30	27	28	21	12	10	11	3	4	19.5	30
31-Aug	21	23	Z	21	27	24	28	27	27	27	30	30	34	33	35	33	32	28	25	17	8	12	26	26	25.8	35
	14.4	13.9	13.4	13.4	12.5	10.1	11.7	18.6	22.6	26.5	30.1	32.1	33.8	34.1	34.6	36.1	36.3	35.9	32.6	27.1	21.1	18.0	15.8	15.5	Diurnal Average	
	35	32	35	35	30	25	28	31	40	45	46	51	54	50	56	60	60	56	54	49	38	45	39	34	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

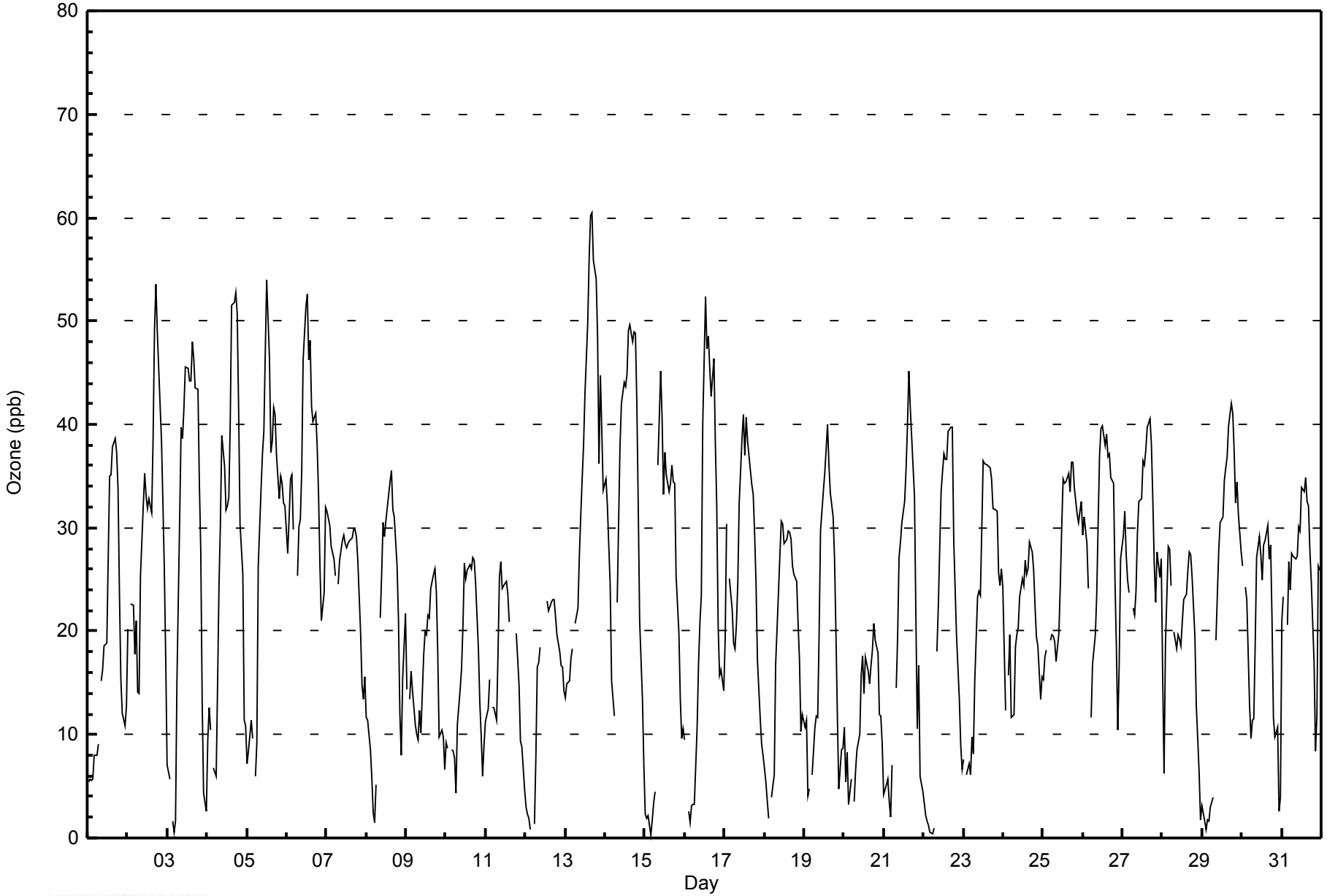
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ozone (O_3) - ppb

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	292	41.30	41.30
21 - 50	401	56.72	98.02
51 - 82	14	1.98	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Anzac - August 2014

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	3	4	4	5	11	18	54	26	33	29	12	8	13	22	37	292
21 - 50	14	5	4	4	6	9	31	44	38	19	17	19	51	83	28	29	401
51 - 82	3	0	0	0	0	0	2	0	0	3	3	0	2	0	0	1	14
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	8	8	8	11	20	51	98	64	55	49	31	61	96	50	67	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

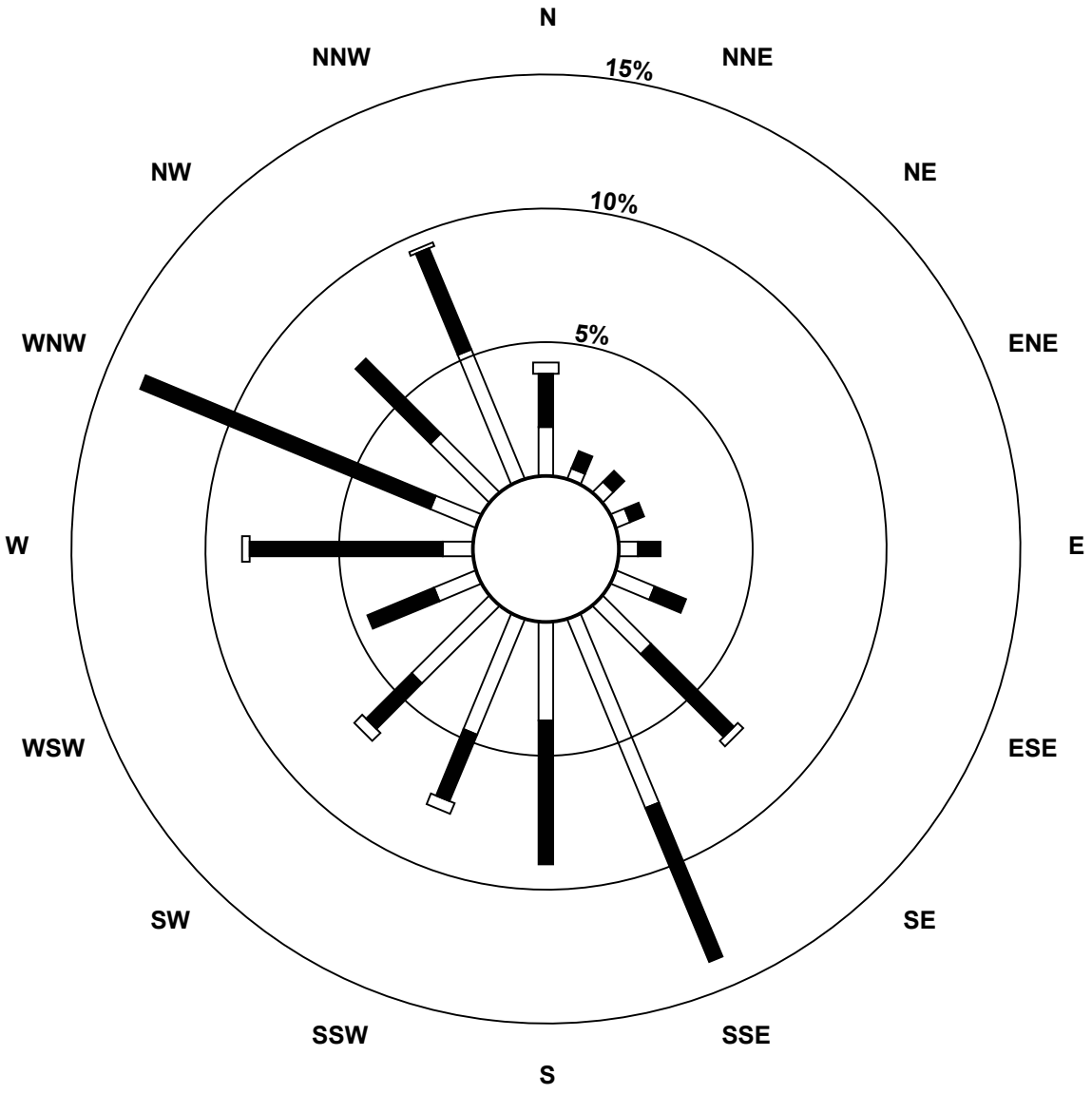
AURORA ATMOSPHERICS INC.

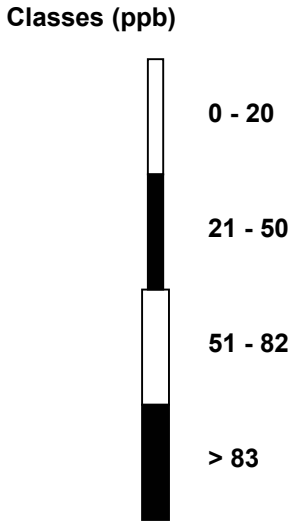
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Ozone (O_3) - ppb

Anzac (AMS 14)





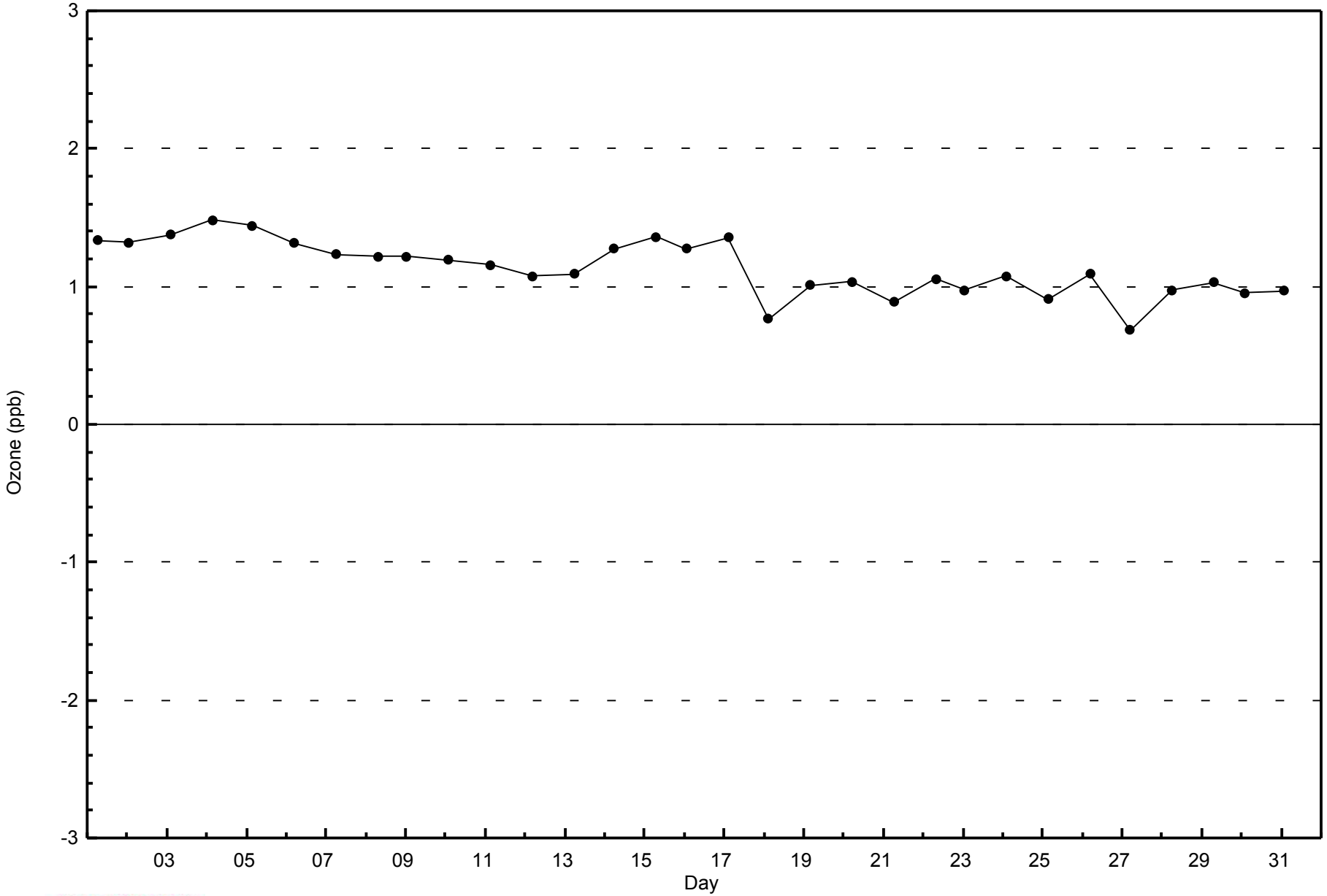
Total Number of Valid Hours: 707

WBEA

Zero Responses

Ozone (O_3) - ppb

Anzac - August 2014



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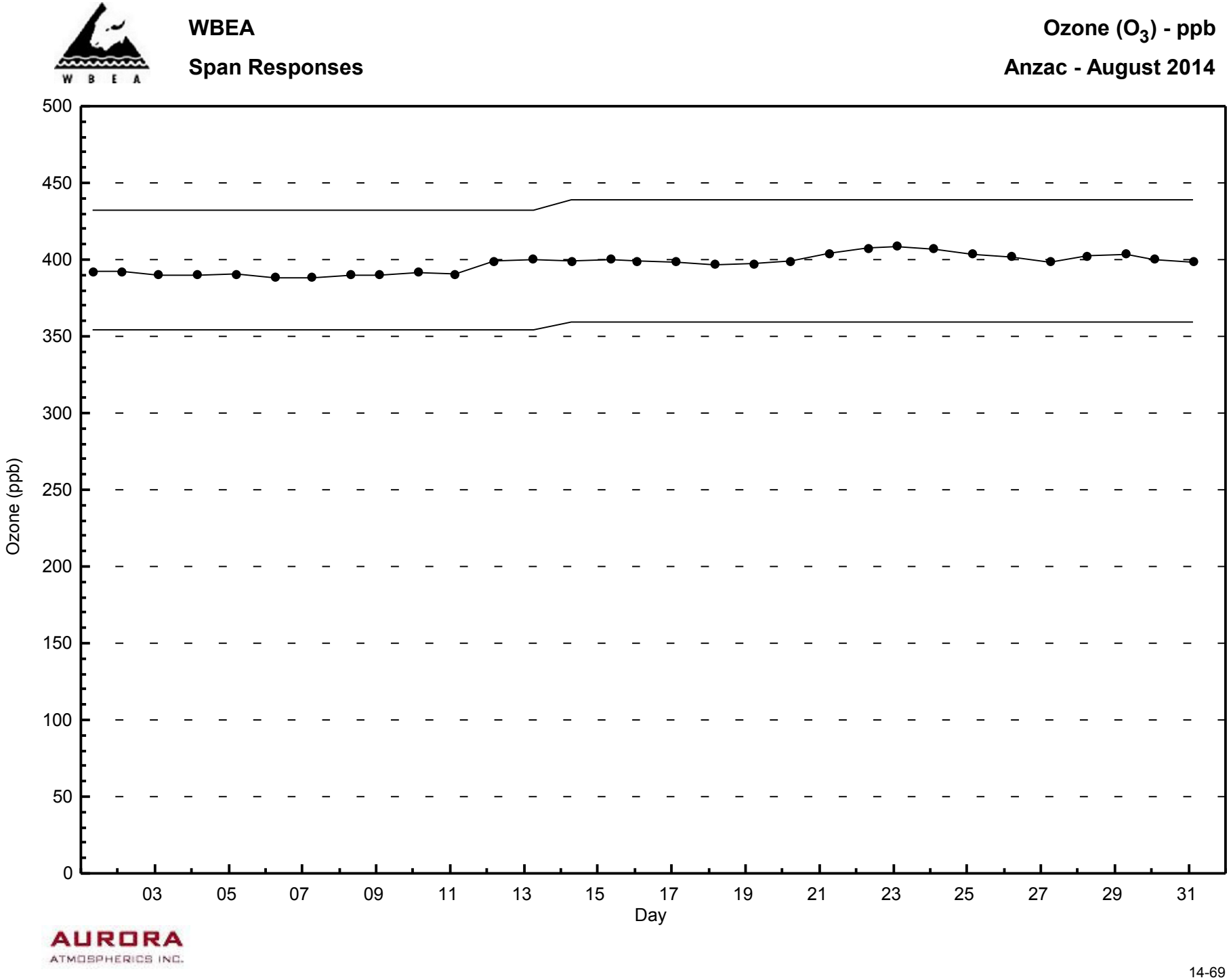

WBEA
Span Responses
Ozone (O_3) - ppb
Anzac - August 2014
Ozone (ppb)
500
450
400
350
300
250
200
150
100
50
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Anzac - August 2014

Number of Exceedences (AAAQO): 24-hr: 2

Maximum Value: 186.8 $\mu g/m^3$ on Aug 5 09:00

Maximum Daily Average: 66.0 $\mu g/m^3$ on Aug 5

Minimum Value: 0.9 $\mu g/m^3$ on Aug 12 12:00

Minimum Daily Average: 2.5 $\mu g/m^3$ on Aug 27

Maximum Diurnal Average: 17.3 $\mu g/m^3$ at hour 8

Minimum Diurnal Average: 8.0 $\mu g/m^3$ at hour 18

Monthly Average: 12.37 $\mu g/m^3$

Percentiles: P_1 = 1.1 P_{10} = 2.2 Q_1 = 3.7 Median = 7.7 Q_3 = 13.3 P_{90} = 25.9 P_{99} = 90.3

Hours in Service:	744
Hours of Data:	731
Hours of Missing Data:	13
Hours of Calibration:	0
Percent Operational Time:	98.3

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-Aug	36.9	51.9	41.6	36.7	44.4	55.1	55.4	41.1	33.5	32.0	25.7	21.0	21.9	25.9	20.0	17.5	17.3	17.9	19.4	20.5	26.0	26.1	26.8	26.3	30.9	55.4
2-Aug	25.5	23.1	19.4	18.1	17.8	16.8	17.4	28.2	46.6	53.3	45.1	37.3	34.1	33.5	35.0	25.9	15.9	10.9	10.4	11.8	13.6	12.1	11.9	12.6	24.0	53.3
3-Aug	13.9	16.3	17.5	18.3	18.3	18.8	14.6	10.5	7.9	6.6	6.0	6.6	6.9	7.0	7.3	7.5	8.3	8.3	9.3	11.3	13.9	15.6	14.0	12.0	11.5	18.8
4-Aug	11.4	12.4	13.3	14.6	16.0	17.3	15.9	12.0	8.9	7.3	6.4	6.3	6.4	6.8	7.3	8.6	8.6	14.1	43.6	76.5	74.6	61.6	55.5	47.1	23.0	76.5
5-Aug	49.8	51.2	60.0	72.5	89.7	92.4	93.2	163.0	186.8	176.9	119.1	107.0	96.6	71.2	29.7	20.2	17.6	15.2	15.7	16.2	13.3	10.0	9.0	8.7	66.0	186.8
6-Aug	9.1	9.7	9.5	9.4	9.7	9.5	8.7	8.1	7.1	5.9	5.1	5.3	6.0	8.0	9.9	10.0	11.3	13.7	17.2	19.9	17.6	16.3	15.0	11.9	10.6	19.9
7-Aug	10.7	11.3	12.8	15.9	23.0	33.4	48.6	36.7	16.4	8.5	6.5	5.9	5.8	5.6	5.5	5.5	5.6	5.8	6.3	7.2	8.7	10.5	11.7	11.9	13.3	48.6
8-Aug	12.0	12.4	12.1	11.6	11.2	11.1	11.3	9.3	6.9	5.3	3.7	3.6	2.7	2.7	2.7	2.8	3.3	5.1	5.1	2.9	2.8	2.9	2.8	2.9	6.2	12.4
9-Aug	5.4	7.7	8.9	10.1	10.2	10.4	9.4	7.1	5.9	7.0	7.2	3.7	2.8	2.7	2.7	2.8	2.8	2.7	3.1	4.7	5.0	4.3	4.2	5.1	5.7	10.4
10-Aug	6.5	8.3	9.6	10.4	11.1	12.4	9.3	4.0	3.1	3.1	3.1	2.9	2.8	2.7	2.8	2.7	2.9	3.5	4.8	5.8	6.9	6.1	7.1	6.9	5.8	12.4
11-Aug	8.9	10.9	11.6	11.7	11.7	11.9	11.1	6.8	3.0	2.8	2.7	2.8	2.7	2.6	2.5	PF	PF	PF	AF	AF	AF	AF	AF	AF	--	11.9
12-Aug	AF	5.8	8.1	9.2	9.8	10.3	6.3	4.4	1.7	1.9	1.3	0.9	1.0	1.4	1.2	1.3	1.4	1.9	1.8	2.1	3.1	3.5	4.3	4.9	3.8	10.3
13-Aug	3.3	3.1	3.7	4.4	3.6	3.9	4.7	3.5	3.0	2.6	2.1	3.5	5.2	8.0	9.8	9.0	8.5	8.1	8.5	9.5	10.0	8.1	8.3	9.6	6.0	10.0
14-Aug	7.9	6.3	7.2	8.5	8.4	8.6	11.7	19.2	23.8	21.5	M	M	M	20.0	18.5	18.4	23.5	29.9	31.5	27.9	23.5	27.2	23.5	20.1	18.4	31.5
15-Aug	19.7	15.3	14.3	14.9	15.6	17.5	16.8	14.9	12.9	12.4	7.5	6.1	7.9	8.8	9.4	11.4	12.2	12.1	11.8	12.0	9.8	8.7	9.8	11.9	12.2	19.7
16-Aug	16.0	17.2	20.6	21.9	22.1	22.4	18.2	25.8	28.6	24.6	17.9	15.6	16.5	15.1	16.1	15.6	13.3	12.8	15.7	14.4	12.6	13.2	13.9	14.1	17.7	28.6
17-Aug	12.5	10.2	9.5	11.9	13.3	12.8	11.8	12.3	12.0	11.7	10.6	8.5	4.4	3.2	2.8	3.2	2.4	1.9	2.2	2.4	2.9	3.7	5.0	5.0	7.3	13.3
18-Aug	5.3	6.4	6.8	7.0	7.2	10.5	18.3	31.7	37.9	28.1	17.5	16.3	15.8	22.3	41.6	34.4	42.5	36.0	36.7	40.6	40.8	38.1	37.8	29.5	25.4	42.5
19-Aug	45.8	46.9	42.8	38.9	30.4	23.8	16.8	11.7	9.0	7.3	9.3	7.3	7.0	6.2	5.4	3.4	4.8	3.1	4.0	5.2	8.0	12.2	13.1	9.0	15.5	46.9
20-Aug	10.7	15.6	18.8	25.0	35.7	35.7	17.1	7.4	8.0	9.2	7.9	7.5	10.5	9.2	7.8	12.1	11.4	7.0	4.4	4.5	5.3	5.7	5.0	4.5	11.9	35.7
21-Aug	5.1	4.7	5.6	5.5	5.8	10.4	14.7	11.6	5.3	3.4	4.4	4.7	6.1	8.4	10.0	11.5	5.3	2.4	2.1	2.2	3.3	3.9	4.4	5.3	6.1	14.7
22-Aug	5.5	5.5	5.2	4.7	4.3	6.3	7.2	7.2	3.3	1.5	1.0	1.0	1.1	1.1	1.1	1.4	1.6	1.7	1.8	1.7	2.8	5.9	7.4	12.0	3.9	12.0
23-Aug	15.7	12.5	12.2	9.0	7.3	7.6	6.8	6.6	4.6	3.2	3.0	2.3	2.7	2.6	2.5	2.5	2.5	2.1	2.3	3.4	5.0	7.1	7.7	8.1	5.8	15.7
24-Aug	7.6	8.5	8.8	9.2	8.3	10.5	8.7	6.9	4.8	2.3	1.2	1.2	1.2	1.3	1.2	1.2	1.4	1.2	1.4	3.1	6.0	9.2	12.5	13.7	5.5	13.7
25-Aug	14.9	19.0	21.1	23.4	20.9	17.9	15.4	14.0	12.4	8.1	4.5	4.0	3.1	2.4	1.9	1.4	1.3	1.5	1.5	1.4	2.3	3.5	4.5	5.0	8.5	23.4
26-Aug	5.4	5.3	6.3	6.9	7.5	9.0	9.3	7.7	3.6	7.0	11.4	10.8	8.8	6.2	5.3	6.0	3.6	4.9	4.5	5.0	6.4	8.3	8.0	5.9	6.8	11.4
27-Aug	3.8	2.4	1.6	1.3	1.1	0.9	1.0	1.7	2.2	2.1	4.3	2.9	1.8	1.7	1.5	1.5	1.3	1.1	1.2	1.4	3.0	4.9	7.8	8.4	2.5	8.4
28-Aug	10.2	11.7	10.2	8.8	5.7	4.9	4.7	4.8	5.4	2.9	2.7	3.2	3.7	3.4	2.8	2.5	2.2	2.1	2.2	3.0	5.5	6.9	7.1	6.4	5.1	11.7
29-Aug	7.3	8.2	7.8	7.9	7.6	7.9	7.5	7.1	3.1	2.7	1.9	1.4	2.0	2.6	3.4	5.5	8.7	8.5	6.4	5.4	3.2	5.0	5.2	5.3	5.5	8.7
30-Aug	6.0	6.7	6.7	7.3	6.9	4.0	3.6	3.7	5.3	2.9	1.6	1.9	2.5	3.4	2.7	2.2	2.2	2.3	2.3	3.5	6.6	7.5	10.6	11.1	4.7	11.1
31-Aug	10.5	9.9	9.5	8.6	7.5	7.5	6.4	5.8	4.6	3.5	2.7	2.0	1.7	1.8	1.9	2.2	1.7	2.1	2.7	4.5	7.6	9.0	6.1	5.8	5.2	10.5
	13.4	14.1	14.3	15.0	15.9	16.8	16.2	17.3	16.7	15.1	11.5	10.1	9.7	9.6	8.8	8.3	8.2	8.0	9.3	11.0	11.7	11.9	12.0	11.4	Diurnal Average	
	49.8	51.9	60.0	72.5	89.7	92.4	93.2	163.0	186.8	176.9	119.1	107.0	96.6	71.2	41.6	34.4	42.5	36.0	43.6	76.5	74.6	61.6	55.5	47.1	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure PF - Power Failure

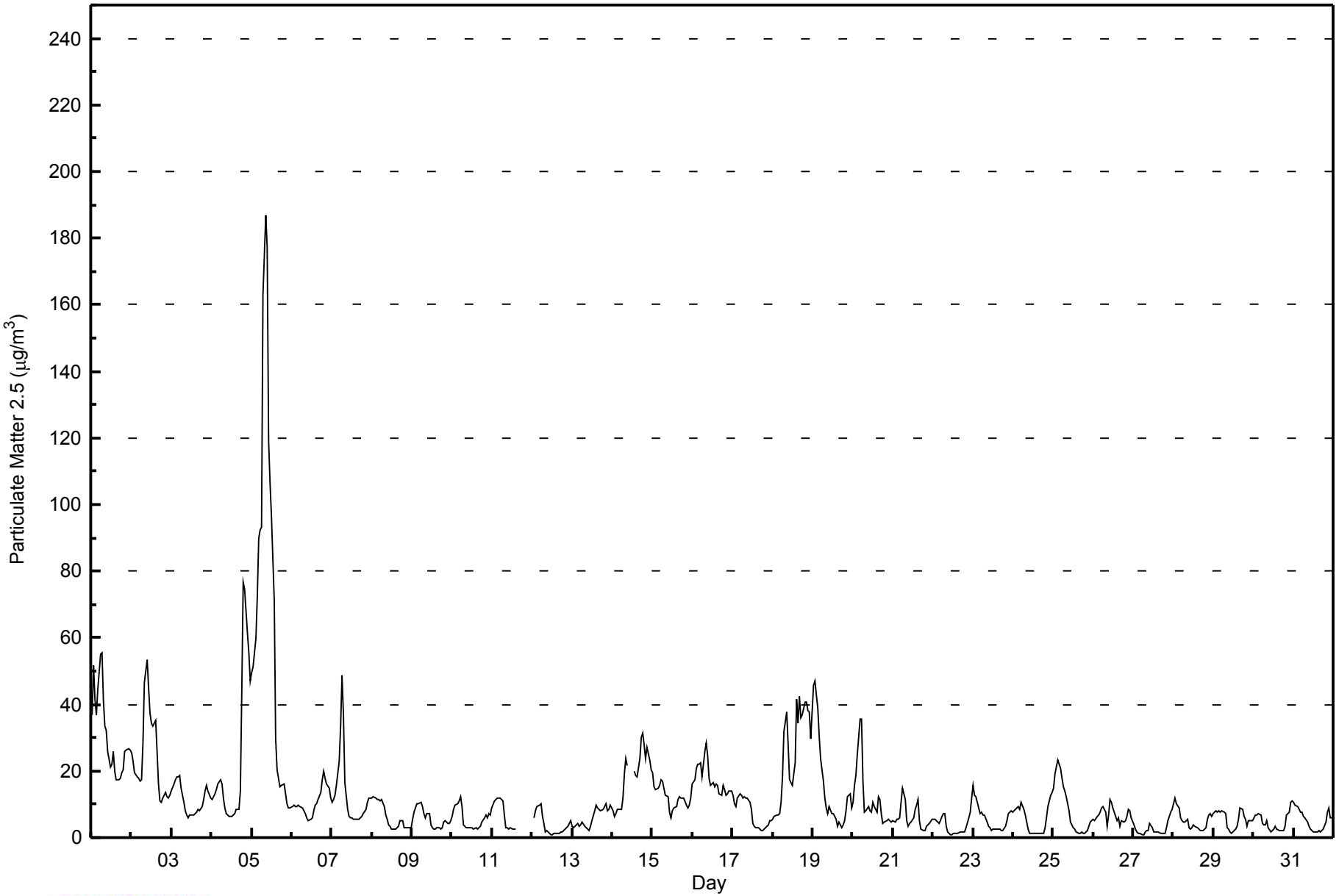
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	257	35.16	35.16
6 - 15	314	42.95	78.11
16 - 25	81	11.08	89.19
26 - 80	66	9.03	98.22
> 81.0	9	1.23	99.45

Total Number of Valid Hours: 731

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Anzac - August 2014

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	14	5	2	2	4	5	27	34	12	18	15	10	19	41	25	24	257
6 - 15	10	1	2	3	2	8	19	40	35	28	30	18	28	42	23	25	314
16 - 25	0	0	2	1	3	3	3	18	11	7	2	1	8	9	2	10	80
26 - 80	5	0	2	1	2	2	0	11	6	6	3	3	6	3	4	12	66
> 81.0	0	0	0	0	0	2	6	1	0	0	0	0	0	0	0	0	9
Totals	29	6	8	7	11	20	55	104	64	59	50	32	61	95	54	71	726

Total Number of Valid Hours: 730

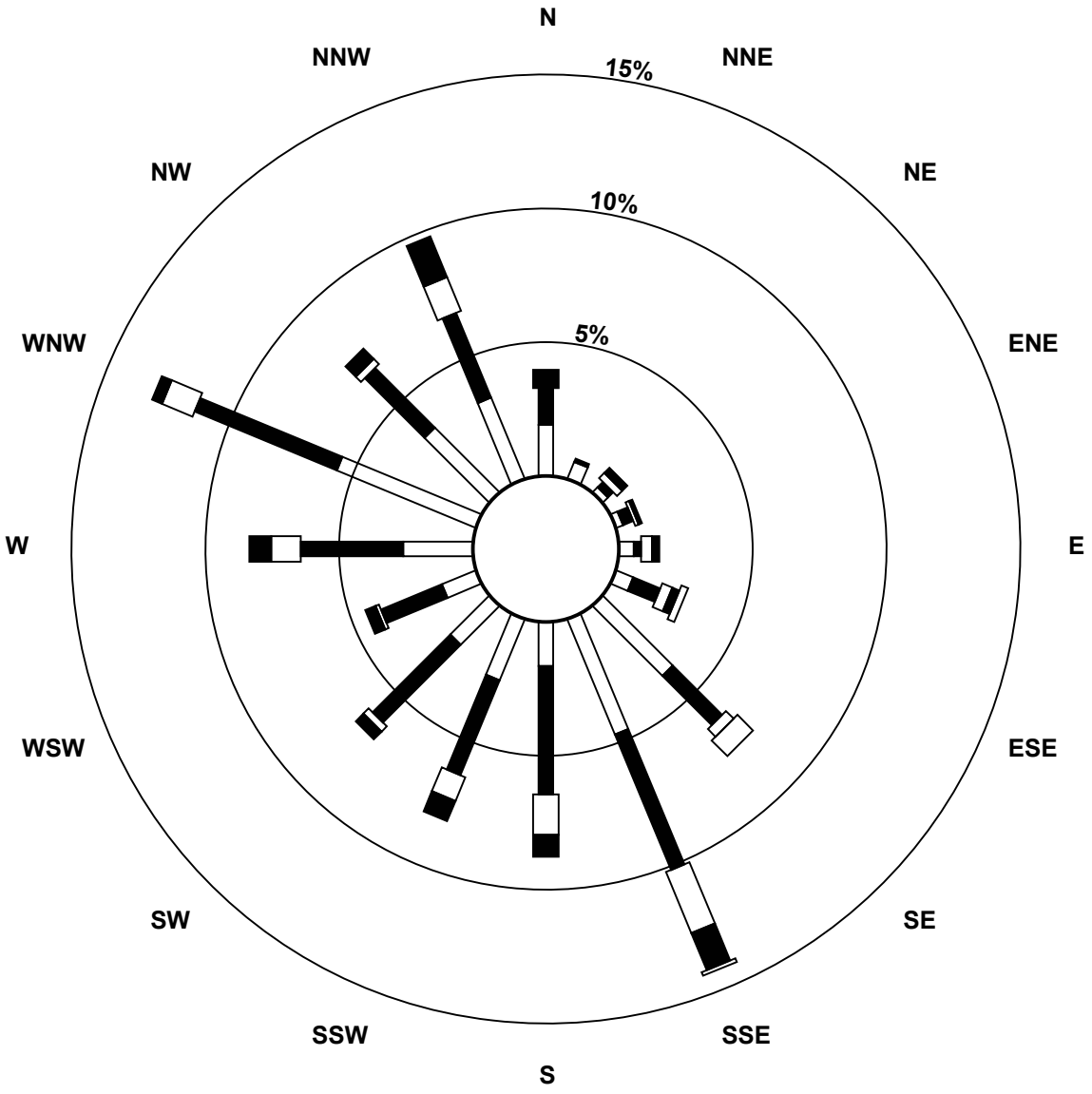
Total Number of Hours: 744

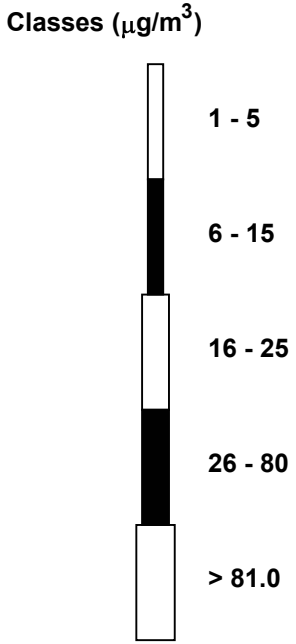
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Anzac (AMS 14)





Total Number of Valid Hours: 730

Maximum Value: 30.4 C on Aug 4 17:00

Maximum Daily Average: 24.3 C on Aug 13

Minimum Value: -0.1 C on Aug 22 06:00

Minimum Daily Average: 8.8 C on Aug 22

Maximum Diurnal Average: 22.9 C at hour 15

Minimum Diurnal Average: 11.6 C at hour 5

Monthly Average: 17.07 C

Percentiles: P_1 = 1.8 P_{10} = 10.0 Q_1 = 12.2 Median = 16.6 Q_3 = 21.6 P_{90} = 26.3 P_{99} = 30.1

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

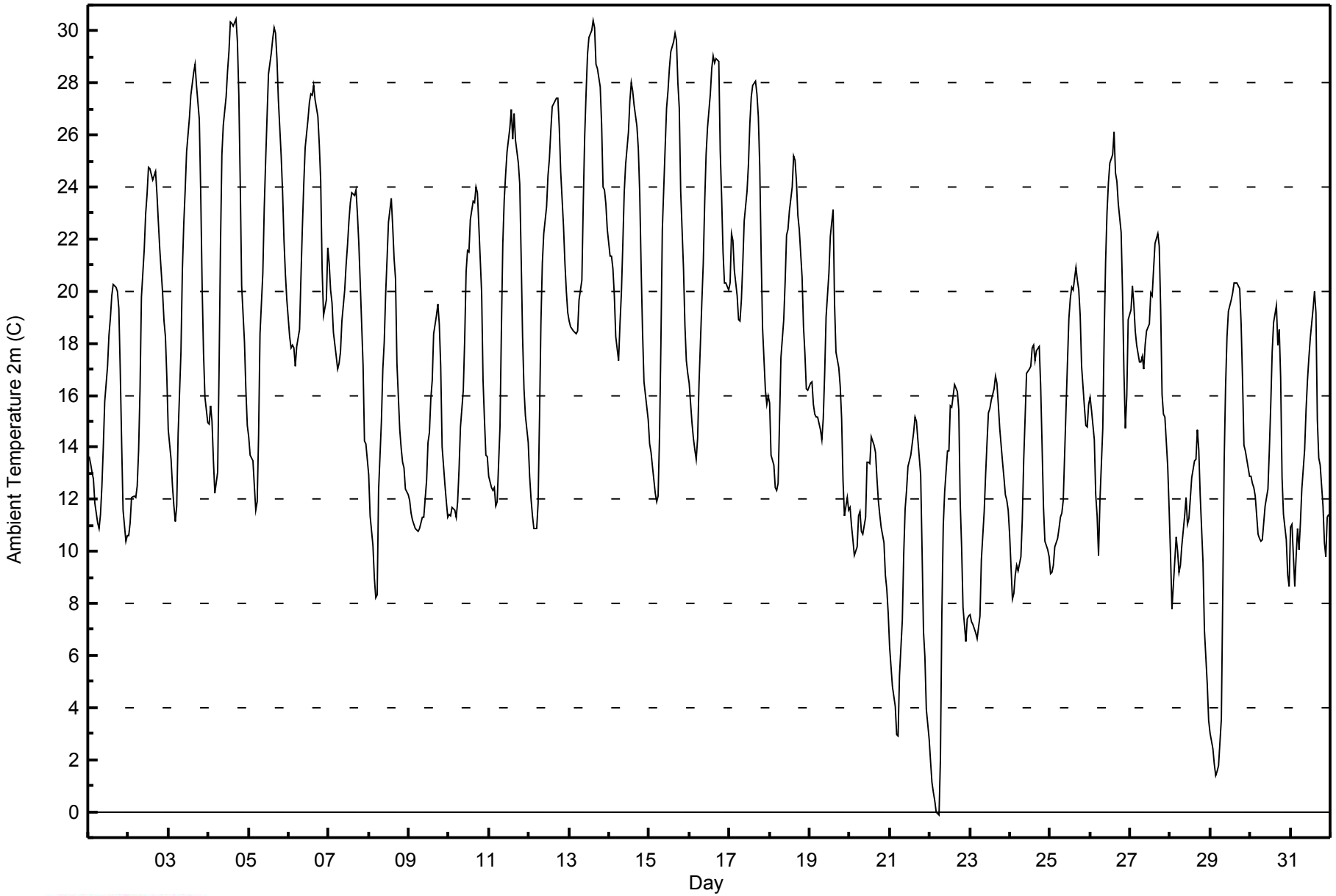
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	13.6	13.4	13.1	12.8	11.9	11.1	10.9	11.4	12.5	14.0	15.8	17.1	18.3	18.9	19.8	20.3	20.2	20.0	19.3	17.0	14.1	11.6	10.4	10.6	14.9	20.3
2-Aug	10.6	11.1	12.1	12.1	12.1	12.5	13.8	16.2	19.8	21.6	23.0	23.7	24.7	24.7	24.2	24.4	24.6	23.7	22.7	21.6	19.9	18.8	18.2	16.7	18.9	24.7
3-Aug	14.7	13.6	12.5	11.7	11.2	11.7	14.5	17.7	20.8	22.6	23.9	25.4	26.7	27.5	28.0	28.4	28.7	27.9	26.6	23.8	20.2	17.6	15.9	14.9	20.3	28.7
4-Aug	14.9	15.6	15.0	13.5	12.3	13.1	17.0	21.7	25.3	26.4	27.5	28.4	29.2	30.3	30.3	30.2	30.4	29.6	27.5	24.1	20.2	18.0	16.2	14.8	22.1	30.4
5-Aug	14.4	13.7	13.5	12.5	11.6	11.9	14.5	18.4	20.7	23.2	25.0	26.7	28.4	29.2	29.7	30.1	29.9	29.0	27.3	25.2	23.8	21.9	20.7	19.7	21.7	30.1
6-Aug	18.3	17.8	17.9	17.8	17.1	17.9	18.5	20.5	22.4	24.1	25.5	26.6	27.3	27.6	27.5	27.9	27.3	26.7	25.6	24.2	20.9	19.1	19.6	21.7	22.5	27.9
7-Aug	21.1	20.0	19.6	18.4	17.5	17.0	17.2	17.7	18.9	20.0	21.0	21.8	22.7	23.4	23.8	23.7	23.9	23.0	21.8	20.3	17.2	14.2	14.1	13.6	19.7	23.9
8-Aug	12.9	11.4	10.2	9.0	8.2	8.3	12.4	15.0	17.0	18.0	19.9	21.2	22.7	23.6	22.5	21.2	20.5	17.2	14.7	14.0	13.4	13.2	12.4	12.2	15.5	23.6
9-Aug	11.9	11.5	11.2	11.1	10.9	10.8	10.9	11.1	11.3	11.3	12.7	14.2	14.6	15.9	16.6	18.4	19.1	19.5	18.7	17.1	14.0	12.6	11.9	11.3	13.7	19.5
10-Aug	11.4	11.4	11.7	11.6	11.3	11.9	13.2	14.8	16.2	18.1	20.7	21.6	21.5	22.7	23.5	23.4	24.0	23.8	22.5	20.0	16.6	15.0	13.7	13.7	17.3	24.0
11-Aug	12.9	12.4	12.3	12.5	11.8	11.9	14.8	18.5	21.8	23.5	24.5	25.4	26.3	27.0	25.8	26.8	25.8	24.9	24.1	21.3	18.2	16.3	15.2	14.2	19.5	27.0
12-Aug	12.9	12.0	11.4	10.9	10.9	11.9	15.2	18.8	21.1	22.2	23.2	24.4	25.1	26.2	27.1	27.3	27.4	27.4	26.3	24.6	22.5	21.1	20.0	19.2	20.4	27.4
13-Aug	18.8	18.6	18.5	18.4	18.4	18.5	19.7	20.4	23.4	26.0	27.6	29.1	29.7	30.1	30.4	30.1	28.7	28.5	27.9	26.4	24.0	23.9	23.4	22.4	24.3	30.4
14-Aug	21.3	21.4	20.9	19.8	18.3	17.3	18.7	19.9	21.8	23.8	24.9	26.1	27.3	28.0	27.7	27.1	26.3	25.5	23.8	20.8	18.4	16.5	15.5	15.1	21.9	28.0
15-Aug	14.1	13.8	13.3	12.2	11.9	12.1	14.4	18.0	22.4	25.5	27.0	27.7	28.5	29.2	29.6	29.9	29.7	28.0	27.1	23.8	20.8	18.7	17.3	16.9	21.3	29.9
16-Aug	16.5	14.9	14.4	13.9	13.5	14.4	16.5	19.6	21.0	23.4	25.3	26.3	27.6	28.6	29.1	28.8	28.9	28.8	25.4	23.6	21.5	20.3	20.3	20.1	21.8	29.1
17-Aug	20.3	22.2	22.0	20.8	19.9	18.9	18.9	19.7	21.1	22.7	23.8	24.9	26.4	27.4	27.9	28.1	27.6	26.7	24.8	21.4	18.6	16.2	15.7	16.0	22.2	28.1
18-Aug	15.7	13.7	13.3	12.5	12.3	12.6	14.9	17.4	18.9	20.4	22.2	22.4	23.1	24.0	25.2	25.0	24.2	22.9	22.4	20.5	18.6	17.6	16.3	16.2	18.8	25.2
19-Aug	16.5	16.5	15.6	15.3	15.2	15.2	14.7	14.3	15.1	16.8	19.0	20.7	22.1	22.6	23.1	19.5	17.6	17.1	16.4	15.1	12.7	11.3	12.1	11.6	16.5	23.1
20-Aug	11.7	11.0	10.5	9.8	10.1	11.4	11.5	10.8	10.7	11.3	13.4	13.4	13.4	14.4	14.1	13.8	12.8	12.0	11.4	10.9	10.3	9.1	8.5	7.6	11.4	14.4
21-Aug	6.3	4.8	4.4	4.0	3.0	2.9	5.2	7.4	9.9	11.6	12.3	13.2	13.7	14.1	14.6	15.2	15.0	14.3	12.9	10.0	6.9	5.9	3.9	2.8	8.9	15.2
22-Aug	1.9	1.1	0.7	0.4	0.0	-0.1	2.0	7.6	11.0	12.3	13.9	13.9	15.6	15.5	16.0	16.4	16.1	15.4	11.9	10.2	7.8	6.5	7.4	7.5	8.8	16.4
23-Aug	7.6	7.3	7.2	6.8	6.6	7.1	7.5	9.7	11.5	12.9	14.2	15.4	15.5	15.8	16.2	16.8	16.4	15.7	14.7	13.4	12.8	12.2	12.0	11.6	12.0	16.8
24-Aug	10.7	8.2	8.4	9.1	9.5	9.2	9.8	11.2	13.5	15.2	16.8	17.0	17.1	17.8	17.9	17.3	17.7	17.9	16.4	14.1	11.7	10.4	10.0	9.8	13.2	17.9
25-Aug	9.1	9.2	9.5	10.2	10.5	10.9	11.3	11.5	12.0	15.6	17.3	18.9	19.7	20.2	20.1	20.9	20.4	20.0	19.1	17.1	15.6	14.8	14.8	15.6	15.2	20.9
26-Aug	15.9	15.5	14.3	12.2	11.4	9.9	12.0	14.7	18.3	21.1	23.0	24.2	24.9	25.3	26.1	24.6	24.2	23.3	22.2	20.0	16.9	14.7	16.0	18.9	18.7	26.1
27-Aug	19.3	20.2	19.5	18.5	18.0	17.3	17.3	17.5	17.0	17.9	18.5	18.7	19.9	19.9	20.8	21.8	22.2	21.7	19.3	16.0	15.3	15.2	13.3	11.7	18.2	22.2
28-Aug	9.8	7.8	8.7	10.6	10.0	9.2	9.5	10.2	11.4	12.1	11.1	11.3	12.0	12.8	13.5	13.5	14.7	13.9	12.2	9.6	7.0	5.9	4.9	3.5	10.2	14.7
29-Aug	3.0	2.4	1.8	1.4	1.6	1.8	3.6	8.4	13.5	16.3	18.2	19.2	19.7	19.9	20.3	20.3	20.3	20.1	18.7	16.6	14.1	13.8	13.5	12.9	12.6	20.3
30-Aug	12.9	12.6	12.5	12.1	10.7	10.5	10.4	10.4	11.1	11.8	12.4	13.9	15.6	17.7	18.8	19.4	17.9	18.5	16.7	12.9	11.4	10.5	9.1	8.7	13.3	19.4
31-Aug	11.0	11.0	8.7	9.8	10.9	10.1	11.1	12.4	13.9	15.4	16.6	17.4	18.2	19.4	20.0	19.2	15.1	13.6	13.3	11.7	10.3	9.8	11.3	11.4	13.4	20.0
	13.3	12.8	12.4	12.0	11.6	11.6	13.0	14.9	16.9	18.6	20.0	21.0	21.9	22.6	22.9	22.9	22.5	21.8	20.4	18.3	16.0	14.6	14.0	13.6	Diurnal Average	
	21.3	22.2	22.0	20.8	19.9	18.9	19.7	21.7	25.3	26.4	27.6	29.1	29.7	30.3	30.4	30.2	30.4	29.6	27.9	26.4	24.0	23.9	23.4	22.4	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	2	0.27	0.27
0 - 10	73	9.81	10.08
10 - 20	428	57.53	67.61
> 20	241	32.39	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 - August 2014

Maximum Value: 42 % on Aug 20 05:00

Maximum Daily Average: 12.3 % on Aug 20

Minimum Value: 0 % on Aug 1 06:00

Minimum Daily Average: 0.0 % on Aug 4

Maximum Diurnal Average: 8.9 % at hour 6

Minimum Diurnal Average: 0.0 % at hour 12

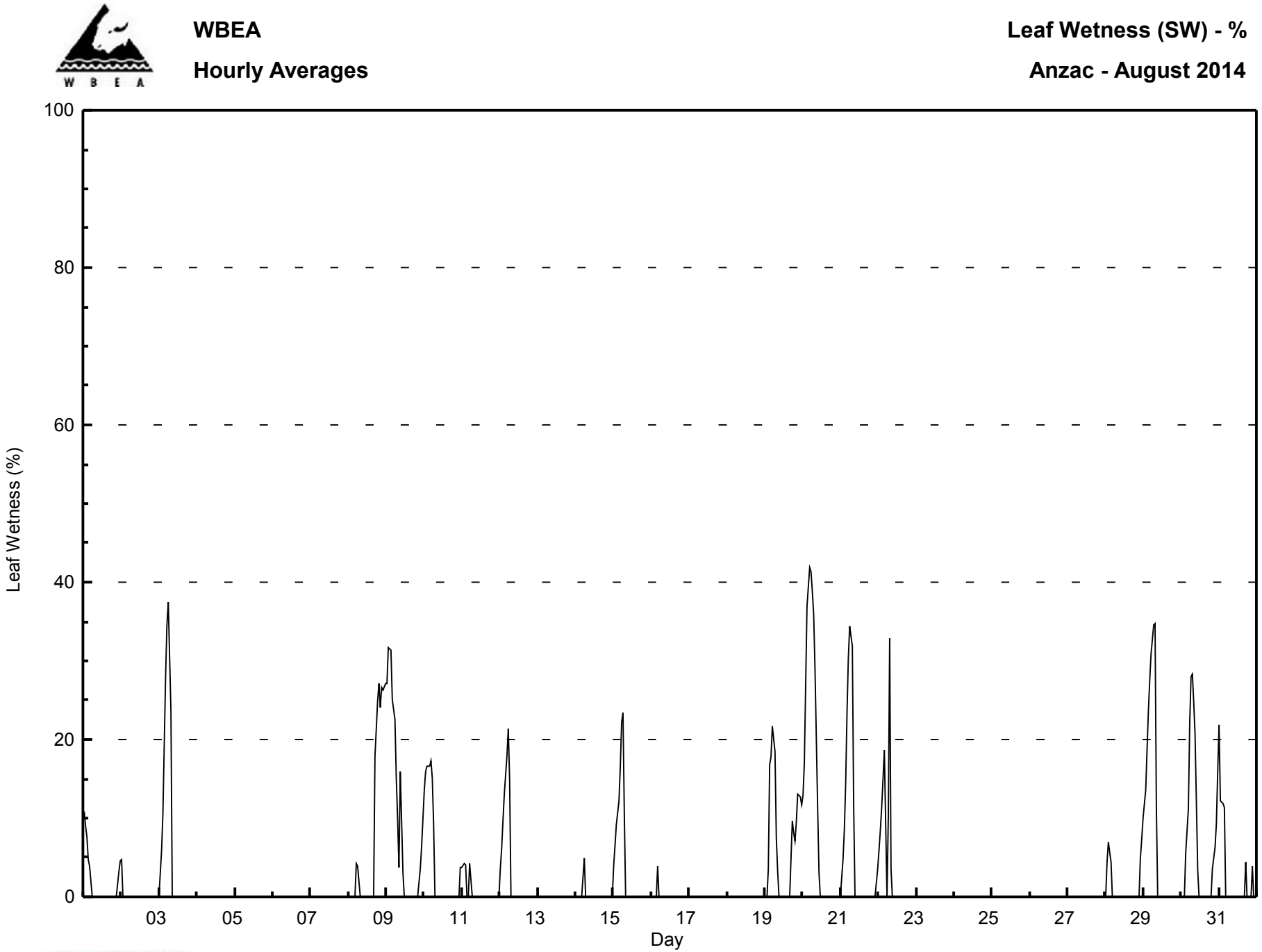
Monthly Average: 2.9 %

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 12$ $P_{99} = 34$

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-Aug	11	9	8	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	1.8	11
2-Aug	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	5
3-Aug	0	6	11	19	28	35	37	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.7	37
4-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	18	25	27	24	27	26	27	7.6	27
9-Aug	27	32	31	31	25	23	15	10	4	16	3	0	0	0	0	0	0	0	0	0	0	4	6	10	9.9	32
10-Aug	13	16	17	17	17	15	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4.5	17
11-Aug	4	4	4	0	0	4	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	0	0	0	0	0.8	4
12-Aug	4	6	10	13	18	21	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.6	21
13-Aug	0	0	0	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-Aug	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	5
15-Aug	4	6	9	12	17	22	23	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.4	23
16-Aug	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	4
17-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	4	17	18	22	19	7	3	0	0	0	0	0	0	0	0	10	8	7	10	13	13	12	6.7	22
20-Aug	13	17	27	37	42	41	39	36	29	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	12.3	42
21-Aug	0	5	9	14	23	30	34	32	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6.8	34
22-Aug	6	8	11	15	19	0	10	33	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.4	33
23-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	0	0	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-Aug	0	4	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	1.2	7
29-Aug	10	14	19	24	27	31	35	35	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.5	35
30-Aug	0	0	0	6	11	22	28	28	25	21	3	0	0	0	0	0	0	0	0	0	4	6	9	16	7.5	28
31-Aug	22	12	12	11	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	2.7	22
	3.8	4.5	5.7	7.3	8.2	8.9	8.7	7.0	2.8	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.2	1.7	2.0	2.7	Diurnal Average	
	27	32	31	37	42	41	39	36	29	21	3	0	0	0	0	0	0	18	25	27	24	27	26	27	Diurnal Maximum	

PF - Power Failure


WBEA
Hourly Averages
Leaf Wetness (SW) - %
Anzac - August 2014
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	600	80.97	80.97
0.4 - 0.5	0	0.00	80.97
0.6 - 0.7	0	0.00	80.97
0.8 - 1.4	0	0.00	80.97
1.5 - 10	57	7.69	88.66
> 10	84	11.34	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Anzac - August 2014

Maximum Value: 98 % on Aug 9 07:00

Maximum Daily Average: 86.1 % on Aug 9

Minimum Value: 24 % on Aug 17 14:00

Minimum Daily Average: 52.3 % on Aug 7

Maximum Diurnal Average: 85.0 % at hour 6

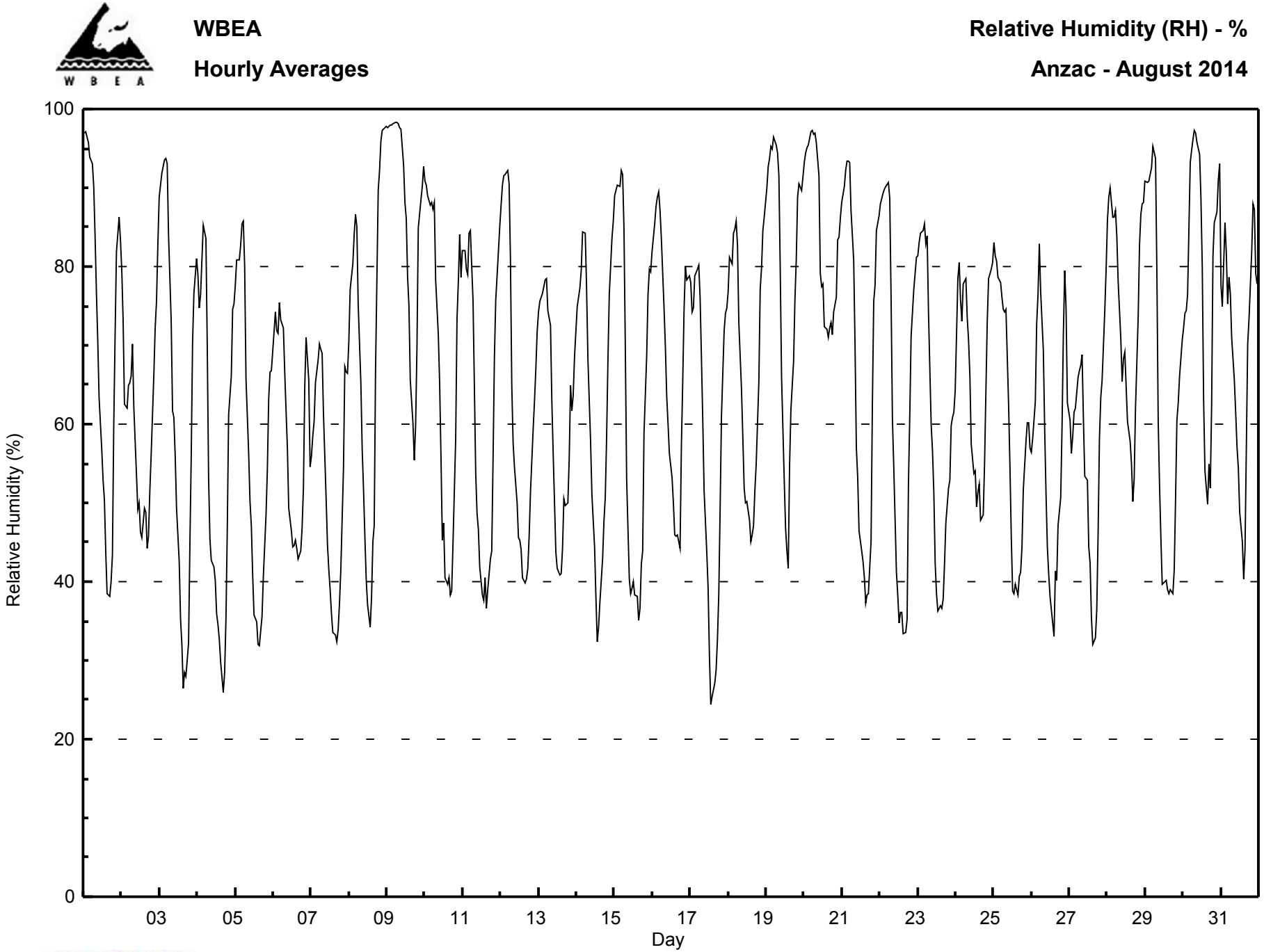
Minimum Diurnal Average: 42.0 % at hour 16

Monthly Average: 65.1 %

Percentiles: P_1 = 28 P_{10} = 39 Q_1 = 47 Median = 66 Q_3 = 81 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-Aug	97	97	97	96	94	93	90	84	77	71	63	57	53	50	44	38	38	40	43	60	71	82	86	83	71.0	97
2-Aug	80	73	63	62	65	65	66	70	62	54	49	50	46	46	49	49	44	46	52	56	66	72	76	83	60.1	83
3-Aug	89	92	93	94	94	93	84	73	62	61	56	49	43	35	32	26	28	28	32	45	56	70	77	81	62.2	94
4-Aug	79	75	76	81	85	84	70	53	45	43	42	40	36	35	33	30	26	28	35	47	61	66	75	75	55.0	85
5-Aug	78	81	81	83	85	86	80	66	56	50	47	41	36	35	32	32	34	36	41	48	54	63	67	67	57.4	86
6-Aug	72	74	72	72	75	73	72	67	62	57	49	46	44	45	45	44	43	44	47	52	65	71	66	55	58.8	75
7-Aug	56	58	60	65	68	70	69	69	61	51	45	42	39	36	34	33	32	34	37	42	54	67	67	66	52.3	70
8-Aug	70	77	80	84	87	85	75	65	57	52	46	40	37	34	38	45	47	67	90	92	96	97	97	98	69.1	98
9-Aug	98	98	98	98	98	98	98	98	98	97	93	88	86	79	75	66	60	55	60	70	85	88	90	93	86.1	98
10-Aug	91	90	89	88	88	87	88	78	71	65	56	45	47	41	40	41	38	39	45	58	73	78	84	79	66.7	91
11-Aug	82	82	80	79	84	85	76	65	54	49	47	42	38	38	41	37	39	43	44	56	68	76	79	85	61.1	85
12-Aug	88	90	91	92	92	91	81	65	58	55	50	46	45	44	40	40	40	42	46	51	59	63	67	72	62.8	92
13-Aug	74	76	77	77	78	78	74	72	63	56	50	44	42	41	41	44	50	50	50	56	65	62	64	69	60.5	78
14-Aug	75	76	77	80	84	84	77	68	63	58	51	44	38	32	34	37	43	48	51	58	68	76	84	86	62.2	86
15-Aug	89	90	90	90	92	92	85	70	53	40	39	39	40	38	38	35	37	42	44	59	69	76	80	79	62.7	92
16-Aug	82	85	88	89	90	87	84	75	70	64	60	56	53	50	46	46	46	44	57	65	75	80	78	79	68.7	90
17-Aug	78	74	75	79	80	80	76	69	61	52	44	39	31	24	26	27	29	33	38	49	61	72	74	75	56.0	80
18-Aug	77	81	80	84	85	86	83	73	64	58	52	50	50	48	45	46	47	52	55	65	77	80	85	86	67.0	86
19-Aug	90	93	94	95	95	96	95	94	92	80	66	53	47	44	42	55	62	68	76	81	89	90	90	91	78.2	96
20-Aug	93	94	95	96	97	97	97	97	96	92	79	77	78	72	72	71	72	73	71	74	76	83	84	86	84.3	97
21-Aug	88	90	92	93	93	93	87	81	70	57	53	46	44	43	40	37	38	39	45	62	76	78	85	87	67.4	93
22-Aug	88	89	89	90	90	91	89	76	61	55	41	38	35	36	36	33	34	35	52	61	71	77	79	81	63.6	91
23-Aug	81	83	84	85	85	83	84	74	60	57	51	42	39	36	37	37	38	42	47	52	53	60	61	62	59.7	85
24-Aug	64	78	81	76	73	78	78	74	71	66	57	54	54	49	51	52	48	48	55	64	73	79	80	81	66.0	81
25-Aug	83	81	81	79	78	76	75	74	75	62	55	46	39	38	40	38	41	41	44	52	58	60	60	57	59.7	83
26-Aug	56	58	63	73	76	83	77	69	59	51	44	41	38	35	33	41	40	47	51	60	71	79	75	63	57.7	83
27-Aug	61	56	58	61	62	66	67	67	69	61	53	53	44	42	35	32	33	36	46	58	63	66	74	80	56.1	80
28-Aug	86	89	90	86	86	87	84	78	71	65	68	69	65	60	58	55	50	53	62	74	83	87	88	88	74.3	90
29-Aug	91	91	91	92	93	95	94	79	60	52	46	40	40	40	39	38	39	38	42	51	60	63	66	71	62.9	95
30-Aug	72	74	74	77	93	95	96	97	97	96	94	89	80	63	54	50	55	52	62	81	86	87	91	93	79.5	97
31-Aug	78	75	86	82	75	79	77	71	66	61	57	54	49	45	40	44	57	70	73	82	88	87	79	78	68.9	88
	80.2	81.4	82.1	83.1	84.6	85.0	81.5	74.6	67.1	60.8	55.0	50.4	46.9	43.7	42.3	42.0	42.9	45.6	51.4	60.7	70.1	75.4	77.6	78.3	Diurnal Average	
	98	98	98	98	98	98	98	98	98	97	94	89	86	79	75	71	72	73	90	92	96	97	97	98	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity (RH) - %
Anzac - August 2014
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	90	12.10	12.10
40 - 60	212	28.49	40.59
60 - 80	245	32.93	73.52
80 - 100	197	26.48	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 - August 2014

Maximum Speed: 19 km/h on Aug 13 14:00

Maximum Daily Speed Average: 9.8 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 12 01:00

Minimum Daily Speed Average: 1.3 km/h on Aug 15

Maximum Diurnal Speed Average: 4.3 km/h at hour 16

Minimum Diurnal Speed Average: 1.0 km/h at hour 20

Monthly Average Velocity: 2.2 km/h 241.9 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 4 Median = 6 Q_3 = 8 P_{90} = 11 P_{99} = 15

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNW7	NNW8	N8	N7	NNW7	NNW5	NW5	NNW7	N7	NNW7	NNW8	NNW8	NNW9	NNW8	NNW7	NNW7	NNW7	NNW4	W2	SSW1	SSW2	S3	SSE4	SSE6	NNW4.6	NNW9
2-Aug	SSE8	SSE9	SSE10	SSE10	SSE10	SSE13	SSE12	SSE9	S10	S12	SSW12	S11	S12	SSW15	S14	SSW12	SW12	SSW10	SSW8	S7	SSE8	S5	SSE3	E4	S9.1	SSW15
3-Aug	E3	SSW1	NW2	S2	SSE2	S3	S4	S5	SSW4	WNW5	W4	W5	W8	W9	W8	W6	NW6	N6	NNE4	SSE2	S4	SSW4	S4	SSW4	WSW2.2	W9
4-Aug	SW5	SSW4	SSW4	SSW1	ESE2	SSE2	SSW5	S2	NW4	WNW7	WNW7	WNW7	W8	WNW7	NW6	N7	NNW7	N6	N5	NE3	ENE4	E5	SSE2	ESE4	WNW1.8	W8
5-Aug	SE4	SSE5	SSE6	SSE6	SE2	SSE2	SE5	SE7	SE8	ESE6	ESE7	SE10	SE9	SSE8	SSE10	SSE9	S11	S12	S7	SSE5	S8	S5	SSE7	SSE7	SSE6.4	S12
6-Aug	S6	SSE8	SSW7	S8	SSE6	SSE7	SSE7	SSE6	SSE9	S9	SSW12	SSW13	SSW16	SW15	W11	W11	WSW14	W10	W9	WSW5	SSW3	SW4	WSW6	W11	SW6.8	SSW16
7-Aug	W11	W10	WNW12	WNW11	W10	W10	W10	WNW13	WNW13	WNW14	WNW13	WNW15	WNW14	WNW14	WNW13	WNW14	WNW12	WNW10	NW8	NW6	SW3	SW4	SSW5	SW5	WNW9.8	WNW15
8-Aug	WSW3	NW4	WNW3	W2	SW2	WSW3	NW2	NNW5	WNW5	SW6	WSW6	WSW5	ESE2	N3	NNE5	NE6	ENE5	S11	W8	WSW4	NW1	N2	N7	N10	WNW2.0	S11
9-Aug	NNW8	NNW7	NNW8	N9	N7	N5	NW4	NNW6	NW6	NW7	WNW7	NW8	NW7	NW6	NNW5	WNW6	WNW8	WNW9	WNW7	WSW5	SW4	SW4	SW6	SW5	NW5.1	WNW9
10-Aug	SW5	SSW5	SW6	SW7	SW5	SW4	S3	SSW6	SW5	SW3	NW2	WNW5	NW5	WNW5	WNW5	WNW5	W6	W6	WNW4	SW3	WSW3	SW5	SW5	SW4	WSW3.9	SW7
11-Aug	SW4	SW5	SSW5	SSW5	SSW4	SW5	SW6	W5	WNW5	WNW8	WNW9	NW9	WNW8	WNW9	NW8	NW9	NW8	NNW7	NNW7	N4	NNE3	NNE4	ENE3	S2	WNW3.9	WNW9
12-Aug	SSE0	S1	SE3	SE2	SE4	SE5	SE6	SSE7	SSE7	SSE8	SE10	SSE11	SE10	SE10	SE10	SE10	SE11	SE10	SE8	SE8	SE9	SSE9	SSE10	SSE11	SE7.3	SSE11
13-Aug	SSE12	SSE10	SSE10	SSE11	SSE12	SSE12	SSE11	SSE11	SSE9	SE9	SSE12	SSW15	SW16	SW19	SW18	W12	W10	SW11	SW12	SW8	SW7	WSW9	WSW12	W7	SSW8.6	SW19
14-Aug	WNW6	WNW8	NW7	WNW6	WNW5	WNW5	WNW6	WNW6	WNW6	WNW6	WNW7	WNW6	WNW6	W7	W7	WNW5	NNW3	N3	NE3	ESE1	SSW2	SSW3	S2	S3	WNW4.2	WNW8
15-Aug	S1	SSE3	S4	S2	ESE1	S4	S4	SSW3	S3	S2	SSE3	SSW5	S5	S2	W6	W4	WNW3	N1	NE3	ENE2	SSE2	SSW1	NE3	ENE6	S1.3	W6
16-Aug	E1	AF	SSE1	SE2	ESE5	SE3	E2	E2	SSE1	ENE3	E4	SE5	SE3	S4	WNW5	WNW5	WNW4	WSW6	S8	S5	S4	SSW3	SW5	WSW5	S1.7	S8
17-Aug	WSW5	WNW6	NW8	WNW8	WNW8	WNW7	WNW7	WNW7	WNW7	NW6	WNW7	WNW8	WNW9	NW10	NW10	NW10	NW9	WNW8	NW6	NNW2	SSW3	SSW3	SSW3	SSW4	WNW6.0	NW10
18-Aug	SSW2	S1	SSW4	SSW3	SSW4	SSW4	SSW5	SSW4	SW6	SW4	WNW8	W8	W6	W6	WSW9	WSW13	W15	WNW11	W11	NNW8	W3	SW4	W4	NW5	W4.9	W15
19-Aug	WNW4	WSW4	NNW2	NNW3	NW3	NW4	NNW3	N2	ESE2	SSE2	ESE4	SE5	SE7	SE5	SE3	NNW13	N9	NNE3	NNE3	NNW3	N2	NNW2	W1	NNW4	N1.4	NNW13
20-Aug	NNW4	NNW3	NE5	NE1	NW5	NNW6	NNW6	NNW7	N6	NNW6	NNW8	NNW8	NW7	NW7	NNW9	NNW10	NNW9	NNW9	NNW8	NNW5	N5	NNW3	NNW3	NNW4	NNW5.8	NNW10
21-Aug	NNW3	NNW3	NW2	W4	WNW4	NW5	NW5	NW5	NNW5	NNW8	NNW8	NNW9	NNW8	NNW7	NNW7	NNW7	N7	N7	NNW6	N4	NNE4	ENE3	SSW1	SW2	NNW4.6	NNW9
22-Aug	SW2	WSW2	WSW3	W1	WNW1	NNW2	NNW3	NNW4	NW2	W5	N4	NNW5	N4	NNW4	N7	NNW7	NNW6	NNW6	N5	NNE5	NE4	ENE3	SE2	SSE1	NNW2.5	N7
23-Aug	S2	SSE1	SSE2	ESE2	ESE4	SSE4	ESE3	SE2	SE7	SE7	SE7	SE9	SSE7	SSE6	SE8	SE6	ESE6	ESE6	E4	E6	E6	SSE5	SSE6	SSE7	SE4.8	SE9
24-Aug	SSE5	SSE3	SE4	ESE5	ESE5	SE4	SSE2	SSE3	SSE6	SE8	SE10	SE8	ESE7	SE7	E8	ESE6	SSE7	SSE7	SE6	SE6	SSE6	SSE6	SSE7	SSE7	SE5.7	SE10
25-Aug	SSE8	SSE8	SSE7	SSE9	SSE9	SSE9	SE7	SE7	ESE7	SE9	SE10	SSE10	S11	SSW14	SW14	SSW13	S11	SSW10	SSW8	S9	S9	S10	S10	S11	S8.7	SSW14
26-Aug	SSE11	S10	SW7	S5	S5	SSW5	SW8	SSW6	S6	WSW5	WNW6	WNW7	NW8	WSW5	W6	W10	WSW7	SSW11	SW8	SSW4	S3	SSW5	SW7	SW8	SW5.1	SSW11
27-Aug	W8	W11	W10	W8	WSW9	W8	W13	WNW13	WNW11	WNW11	WNW11	WNW10	NW10	WNW7	WNW7	WNW6	W7	WNW7	NW4	W2	SW5	SW3	NNW3	NW4	WNW7.2	WNW13
28-Aug	WSW4	WNW4	NW7	WNW10	NW8	NW9	WNW10	WNW11	NW9	WNW9	NW8	NW9	NW9	NW9	NW8	NW7	NNW8	NNW7	N3	SE1	SSE4	SSE5	S4	S3	NW5.3	WNW11
29-Aug	SSE4	S3	S4	S3	SSW2	SE4	SE4	SSE4	SSE6	SSE8	SSE10	SSE11	SSE12	SSE12	SSE12	SSE12	SSE11	S11	S8	SSE6	SE6	SE7	SSE9	SE8	SSE7.2	SSE12
30-Aug	SE9	SSE9	SSE9	SSE7	SE4	SSE4	S4	S4	W6	W8	W9	WNW9	NW9	WNW11	WNW9	WNW8	WNW4	W5	W2	S1	SSW4	SSW4	WNW4	WSW5	WSW3.0	WNW11
31-Aug	WSW7	WSW7	WSW5	W9	W8	W7	WNW8	WNW9	WNW9	WNW9	WNW9	W11	W10	WNW9	W9	WNW8	NNW12	WSW4	SW5	SW3	SW4	W6	W8	W8	W6.9	NNW12
	SSW2.3	SW2.3	SW2.1	SW1.9	SW1.6	SW2.0	SW2.2	WSW2.0	WSW1.7	WSW2.3	W2.3	WSW3.1	WSW3.3	WSW4.0	W3.7	WNW4.3	WNW3.6	W2.8	W2.1	SSW1.0	S2.2	S2.6	SSW2.7	SSW2.4	Diurnal Average	
	SSE12	W11	WNW12	WNW11	SSE12	SSE13	W13	WNW13	WNW13	WNW14	WNW13	SSW15	SW16	SW19	SW18	WNW14	W15	S12	SW12	S9	S9	S10	WSW12	W11	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 Aug 7 10:00

Minimum Value: 0 km/h on Aug 3 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:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

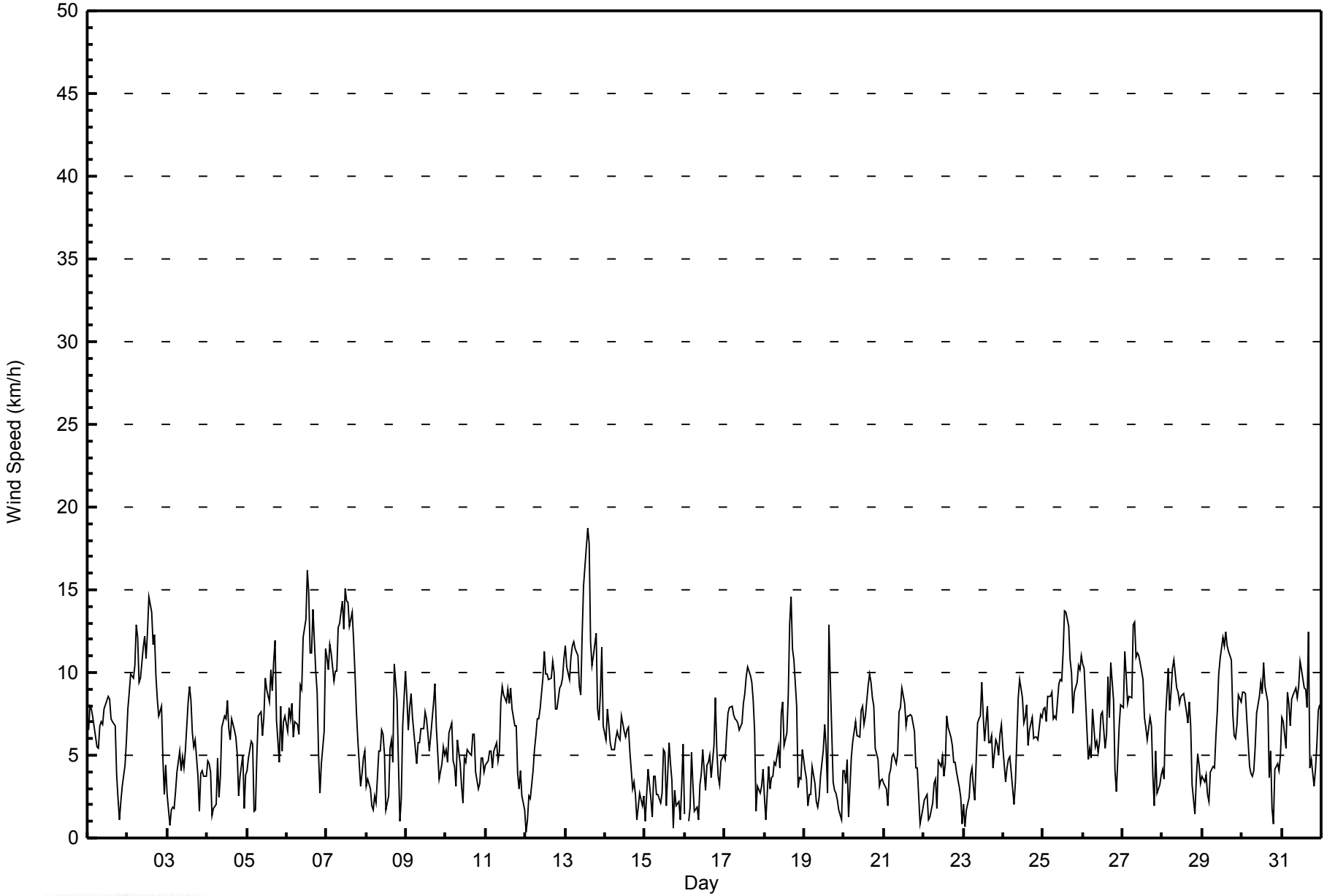
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Anzac - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	323	43.47	43.47
6 - 11	370	49.80	93.27
12 - 19	50	6.73	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Anzac - August 2014

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	15	8	7	7	8	13	20	32	39	42	29	19	15	22	20	27	323
6 - 11	15	0	1	1	3	7	36	64	22	8	14	10	45	64	36	44	370
12 - 19	0	0	0	0	0	0	0	10	4	9	7	3	3	12	0	2	50
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	30	8	8	8	11	20	56	106	65	59	50	32	63	98	56	73	743

Total Number of Valid Hours: 743

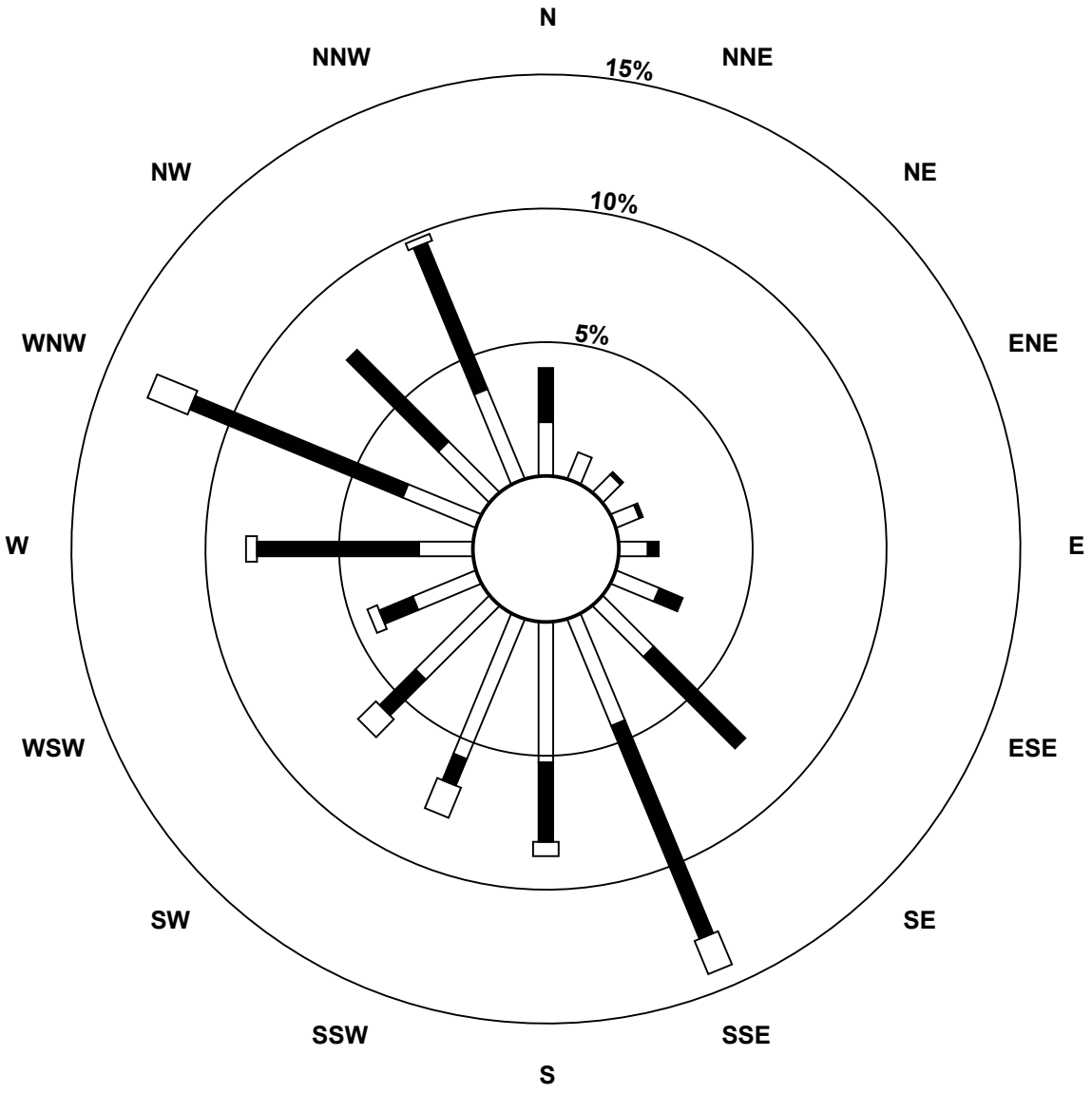
Total Number of Hours: 744

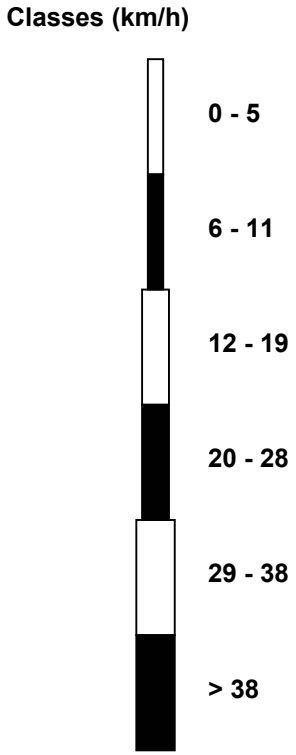
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Anzac (AMS 14)





Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Anzac - August 2014

Direction of Maximum Speed: 224 deg on Aug 13 14:00
Direction of Maximum Daily Speed Average: 284.9 deg on Aug 7

Direction of Minimum Speed: 167 deg on Aug 12 01:00

Direction of Minimum Daily Speed Average: 1.3 deg on Aug 15

Monthly Average Direction: 270.4 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	337	346	352	353	345	332	326	337	353	344	334	342	330	338	347	335	337	331	280	202	202	179	168	167	337.1
2-Aug	163	161	162	161	161	166	162	166	179	188	192	179	190	205	182	200	222	199	206	182	157	180	157	91	180.0
3-Aug	83	196	312	177	157	180	185	170	211	292	278	266	270	268	273	281	305	0	15	147	185	195	185	194	249.6
4-Aug	227	212	213	206	122	165	193	190	305	297	289	290	266	296	320	349	341	356	355	39	66	81	154	116	298.1
5-Aug	146	161	160	153	132	161	131	127	139	107	119	130	127	163	168	159	170	173	173	163	186	181	160	164	153.6
6-Aug	174	168	195	171	161	165	168	166	150	170	203	203	205	221	261	270	258	271	263	251	205	228	257	274	215.0
7-Aug	275	281	289	289	275	270	271	282	292	297	296	288	293	291	297	291	291	291	306	315	232	227	209	228	284.9
8-Aug	252	319	292	263	217	238	304	330	286	233	253	252	110	6	18	37	72	190	266	239	323	353	356	355	294.4
9-Aug	348	342	342	352	354	349	322	330	326	313	295	319	315	306	341	285	286	296	282	249	231	214	234	229	310.1
10-Aug	227	213	216	221	214	214	189	207	224	231	321	288	310	290	289	296	268	259	294	219	238	235	236	229	245.0
11-Aug	221	216	206	210	204	217	235	263	294	296	294	307	284	297	318	310	309	340	344	350	17	25	59	191	290.2
12-Aug	167	190	138	126	143	127	135	157	148	161	132	152	142	128	146	140	136	144	139	132	130	147	159	162	143.4
13-Aug	165	159	153	155	154	154	161	161	158	142	156	193	215	224	232	259	279	235	227	232	230	240	244	267	199.5
14-Aug	285	303	307	290	290	283	293	296	297	284	293	287	284	275	274	286	331	2	38	109	211	213	183	183	288.7
15-Aug	175	161	175	169	118	187	186	193	173	177	163	192	170	177	281	267	296	353	41	64	153	211	43	57	179.6
16-Aug	95	AF	151	133	120	146	100	96	147	77	85	135	128	173	302	296	293	257	172	185	177	205	223	249	177.6
17-Aug	249	289	307	301	300	301	302	296	301	309	299	291	296	314	321	319	315	302	325	331	210	206	207	213	299.0
18-Aug	202	189	213	208	206	206	194	211	224	231	296	279	276	278	254	258	277	303	277	330	269	230	273	316	264.3
19-Aug	299	256	343	331	325	324	341	350	120	161	114	142	136	142	145	342	355	17	22	339	356	337	280	337	355.4
20-Aug	348	346	48	44	321	337	327	340	354	348	342	339	322	324	332	333	334	341	346	344	350	348	338	337	340.0
21-Aug	341	348	316	262	288	314	307	313	339	341	338	329	335	327	341	340	360	352	342	10	27	64	196	221	335.6
22-Aug	225	243	242	274	301	332	327	342	322	272	359	348	4	332	349	337	332	332	356	17	46	78	134	166	339.4
23-Aug	186	160	166	104	103	149	117	143	133	131	135	133	151	162	138	146	123	119	99	82	101	148	165	168	134.8
24-Aug	153	150	125	119	121	129	157	157	147	146	134	130	119	124	93	123	158	149	141	132	163	161	159	165	139.2
25-Aug	158	165	161	163	159	156	138	137	121	140	145	163	187	204	218	203	175	201	197	173	173	169	176	179	172.8
26-Aug	163	170	218	189	187	205	217	203	186	238	300	299	304	253	277	277	239	212	229	210	179	196	230	233	224.9
27-Aug	261	266	263	261	252	269	279	290	297	297	302	300	305	302	298	288	279	295	309	270	214	229	336	319	283.5
28-Aug	255	282	306	300	307	306	298	303	304	303	322	321	306	319	324	322	334	346	0	132	162	159	172	176	307.0
29-Aug	163	173	184	174	200	134	138	148	153	156	164	167	152	156	155	158	159	169	172	159	143	144	149	140	157.4
30-Aug	142	147	149	160	139	148	185	191	265	267	271	288	306	299	302	286	286	261	266	189	206	200	288	249	243.1
31-Aug	256	251	242	279	265	272	286	287	293	292	292	278	276	290	279	296	344	246	216	233	233	259	271	259	276.6
	212.7	219.9	224.9	222.1	214.7	218.3	230.8	243.5	243.6	253.6	263.2	253.4	251.9	257.6	274.9	283.6	286.4	262.5	262.8	203.8	178.7	188.1	203.1	210.8	
	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

Anzac - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 101 deg on Aug 3 02:00

Minimum Value: 7 deg on Aug 17 22:00

Percentiles: P_1 = 11 P_{10} = 16 Q_1 = 22 Median = 29 Q_3 = 36 P_{90} = 52 P_{99} = 89

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	24	25	24	23	21	21	22	25	30	36	33	34	33	34	35	38	36	57	52	87	26	17	16	14	87
2-Aug	11	13	15	15	16	15	18	21	27	30	32	35	33	32	33	36	29	29	29	30	18	44	77	30	77
3-Aug	64	101	50	25	41	26	20	26	57	36	67	50	38	34	37	52	46	33	27	31	16	14	13	15	101
4-Aug	13	14	14	77	49	32	13	52	51	32	38	36	34	48	49	38	34	33	21	33	18	13	46	25	77
5-Aug	28	20	12	15	59	26	23	17	23	33	33	31	33	42	33	41	28	24	23	23	30	23	20	16	59
6-Aug	19	21	27	23	19	19	34	31	24	36	33	35	31	29	41	35	30	34	30	22	24	18	25	30	41
7-Aug	32	29	30	29	26	32	31	31	34	32	34	33	35	35	33	35	34	34	29	28	38	10	15	9	38
8-Aug	53	30	29	50	50	13	51	27	44	38	44	58	99	90	35	27	33	31	26	27	78	38	22	24	99
9-Aug	24	23	23	24	21	24	21	23	23	25	32	25	27	39	36	47	35	30	42	28	16	18	13	13	47
10-Aug	10	13	15	14	17	22	17	24	31	69	82	58	42	40	53	39	40	32	35	31	13	14	12	19	82
11-Aug	12	11	16	13	12	11	13	31	36	33	33	36	39	37	31	37	33	28	23	17	21	21	27	50	50
12-Aug	85	58	24	31	19	15	16	24	32	32	26	26	28	36	42	33	28	26	22	18	18	17	17	16	85
13-Aug	16	15	15	15	15	15	17	18	23	32	28	33	32	26	23	37	32	31	19	19	20	20	21	31	37
14-Aug	28	26	24	27	24	22	28	28	32	43	34	48	51	52	34	35	53	25	36	48	28	35	31	51	53
15-Aug	72	46	13	58	55	24	22	39	69	67	62	58	68	90	47	55	68	88	34	27	40	71	77	17	90
16-Aug	78	AF	58	42	11	46	86	56	73	45	50	41	85	57	56	29	44	44	22	26	33	19	22	17	86
17-Aug	27	29	28	26	26	25	25	29	32	38	43	41	34	32	31	32	31	31	21	49	21	7	9	11	49
18-Aug	22	78	18	40	21	21	21	20	25	39	32	32	41	43	35	35	34	31	31	38	52	20	29	21	78
19-Aug	27	39	40	27	27	19	28	22	66	76	59	54	44	65	83	27	29	60	54	35	25	27	54	17	83
20-Aug	21	23	28	96	22	23	22	25	25	29	28	27	32	29	25	25	28	25	24	21	21	16	17	12	96
21-Aug	12	16	59	24	26	22	25	31	39	30	32	32	34	42	40	42	36	26	24	20	23	22	82	28	82
22-Aug	22	15	13	38	34	21	18	20	82	49	59	64	80	59	33	42	32	39	23	24	23	37	43	84	84
23-Aug	42	89	54	64	23	34	45	85	23	29	33	36	33	43	30	47	48	22	22	20	24	20	16	14	89
24-Aug	14	21	8	17	16	14	40	35	34	29	32	40	37	37	30	30	26	31	21	15	15	12	14	13	40
25-Aug	13	14	14	17	16	17	20	20	21	28	26	39	32	31	27	34	27	30	30	17	17	17	20	24	39
26-Aug	20	21	34	32	15	19	14	22	28	47	34	34	32	57	48	31	34	26	27	30	52	26	23	21	57
27-Aug	30	29	30	30	31	33	30	30	32	31	29	28	31	30	35	41	40	31	30	54	21	81	96	73	96
28-Aug	26	29	29	27	29	29	28	29	32	33	26	30	33	31	34	29	37	29	27	59	25	22	16	15	59
29-Aug	10	14	12	51	61	25	17	22	23	26	33	29	30	28	22	23	22	25	19	16	13	16	17	17	61
30-Aug	18	18	19	23	29	26	36	29	32	30	32	31	32	35	36	34	39	34	46	86	13	19	22	21	86
31-Aug	19	18	18	24	24	28	27	26	29	32	34	31	36	37	36	40	25	51	33	23	21	24	28	25	51
	85	101	59	96	61	46	86	85	82	76	82	64	99	90	83	55	68	88	54	87	78	81	96	84	
	Diurnal Maximum																								

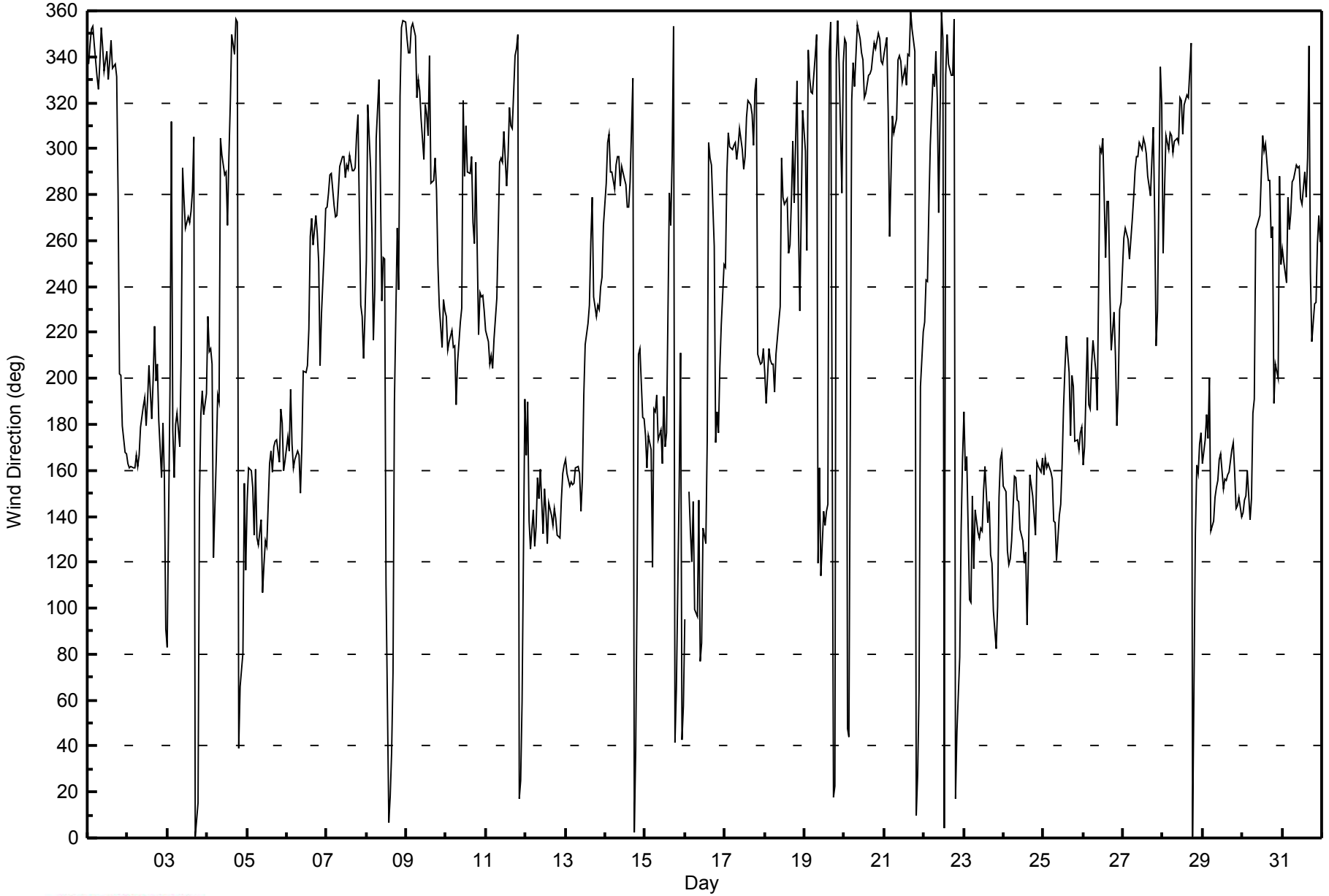
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Anzac - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Anzac - August 2014

Maximum Value: 3.8 mm on Aug 9 03:00

Maximum Daily Total: 16.0 mm on Aug 9

Minimum Value: 0.0 mm on Aug 1 01:00

Minimum Daily Total: 0.0 mm on Aug 1

Maximum Diurnal Total: 4.8 mm at hour 4

Minimum Diurnal Total: 0.0 mm at hour 11

Monthly Total: 38.35 mm

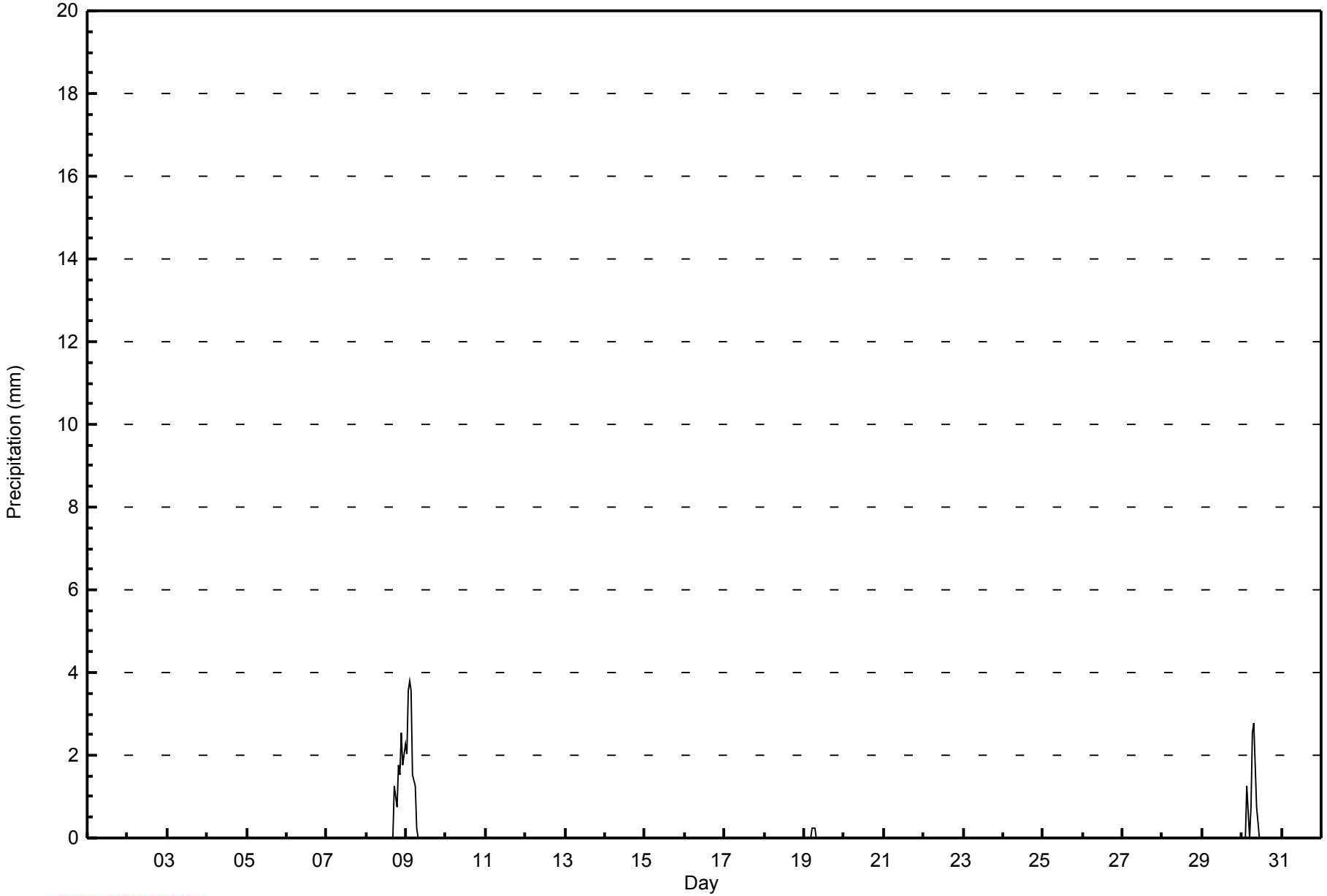
Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 2.0

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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.8	1.8	1.5	2.5	1.8	2.3	11.9	2.5
9-Aug	2.0	3.6	3.8	3.6	1.5	1.3	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	16.0	3.8
10-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3
20-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	1.3	0.0	0.8	2.5	2.8	1.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	2.8
31-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2.0	3.6	3.8	4.8	1.5	2.3	3.0	2.8	1.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.8	1.8	1.5	2.5	1.8	2.3	Diurnal Average	
	2.0	3.6	3.8	3.6	1.5	1.3	2.5	2.8	1.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.8	1.8	1.5	2.5	1.8	2.3	Diurnal Maximum	

Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Anzac - August 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	8:45	End Time (MST)	13:01
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	5/29/2014
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)	5000	5000	Lamp voltage	799	799
Calculated slope	0.996418	0.995194	Chamber temp.	44.1	44.1
Calculated intercept	0.603664	0.683790	Pressure (mmHg)	689.8	689.8
Analyzer Background	12.7	12.7	Flow (lpm)	0.392	0.392
Analyzer Coefficient	0.931	0.931	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	0.2	NA
as found span	5000	78.3	798.7	800.2	0.998
calibrator zero	5000	0.0	0.0	0.2	NA
high point	5000	78.3	798.7	802.8	0.995
second point	5000	39.1	398.8	398.0	1.002
third point	5000	19.6	199.9	200.4	0.998
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	78.3	798.7	801.8	0.996
				Average Correction Factor	0.998

Corrected As found	800.0	Previous response	800.9	% change	0.1%

Notes:

No adjustments or maintenance done, filter changed out

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

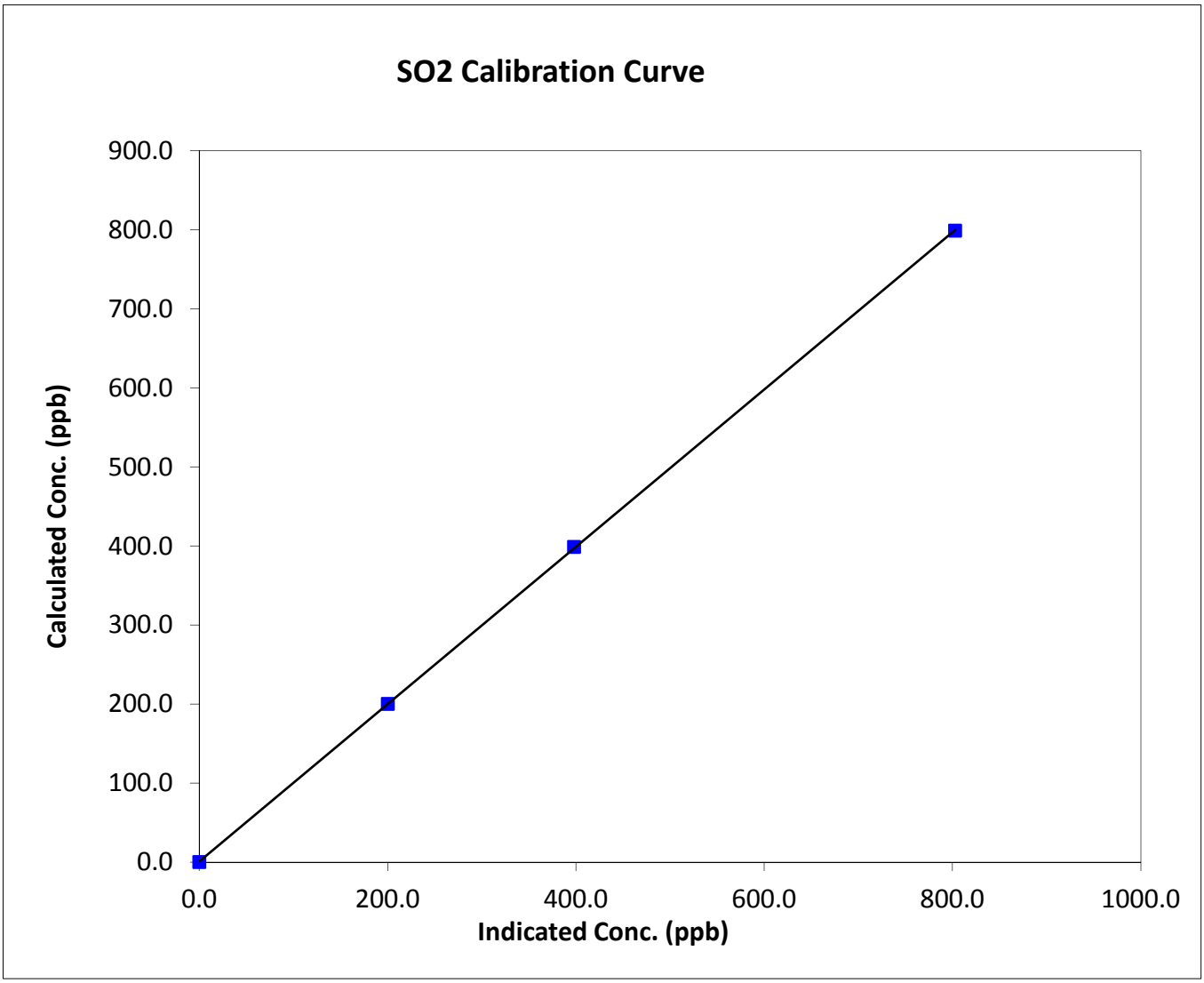
SO_2 Calibration Summary

Station Information

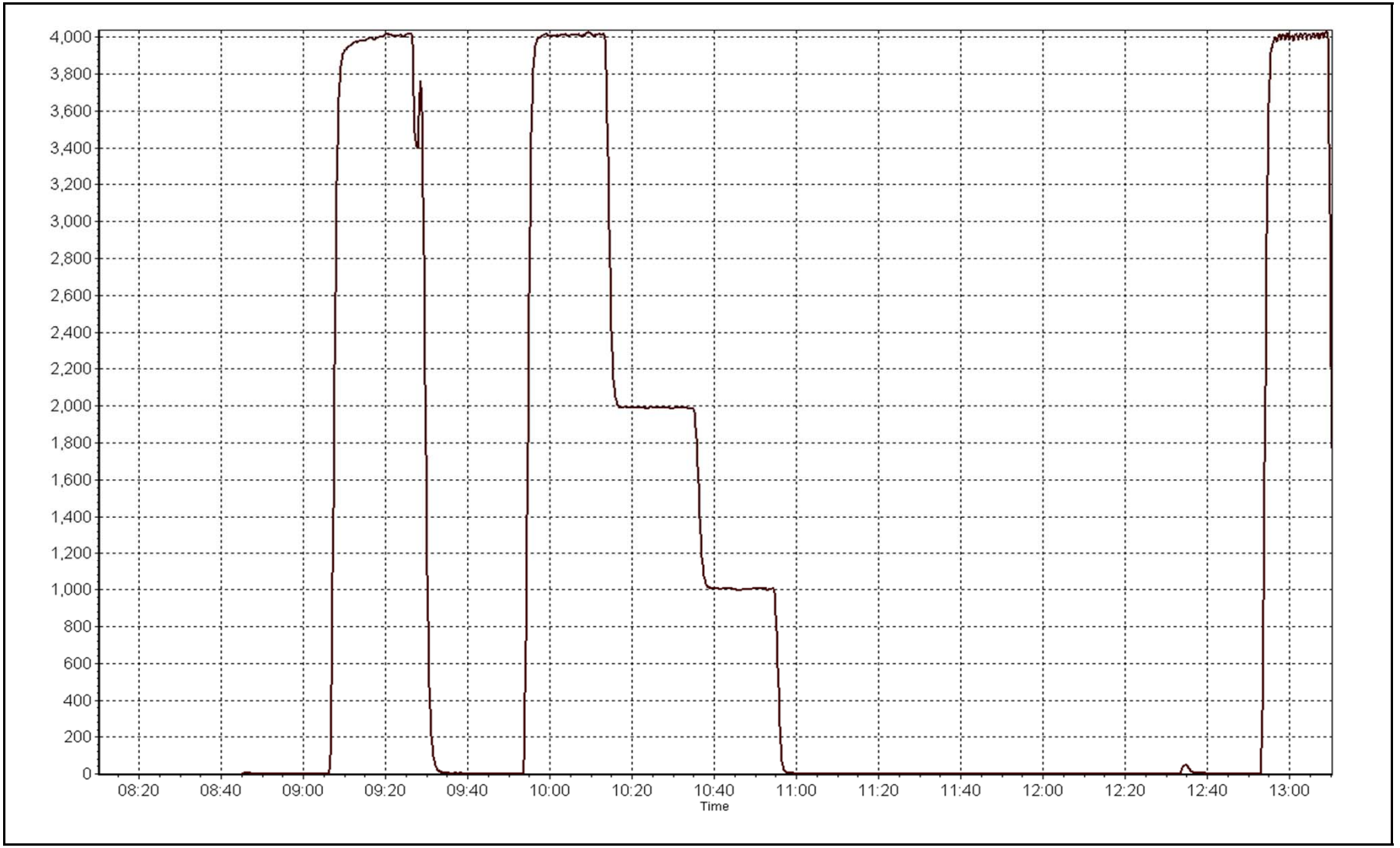
Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:01
Analyzer make	TEI 43C	Analyzer serial #	613516095

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999983
798.7	802.8	0.9948		
398.8	398.0	1.0021	Slope	0.995194
199.9	200.4	0.9976		
			Intercept	0.683790



SO2 Calibration Plot Date: August 11, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 12, 2014	Previous Calibration	July 16, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	7:38	End Time (MST)	10:10
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	2/22/2016
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	-731	-731
Analyzer Range (input)	5000	5000	Lamp voltage	979	979
Calculated slope	0.995985	0.990755	Chamber temp.	45	45
Calculated intercept	0.095130	0.172262	Pressure	662.9	662.9
Analyzer Background	2.05	2.07	Flow	0.398	0.398
Analyzer Coefficient	1.134	1.152	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	74.2	1.011
SO2 scrubber check	5000	39.1	398.8	-0.1	NA
calibrator zero	5000	0.0	0.0	-0.4	NA
high point	5000	39.1	75.1	75.4	0.996
second point	5000	20.8	39.9	40.5	0.987
third point	5000	10.4	20.0	20.1	0.993
calibrator zero	5000	0.0	0.0	-0.4	NA
as left zero	5000	0.0	0.0	-0.4	NA
as left span	5000	39.1	75.1	74.9	1.002
				Average Correction Factor	0.992

Corrected As found	74.6	Previous response	75.3	% change	0.9%

Notes:

scrubber checked before as founds,filter change out, span adjusted

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

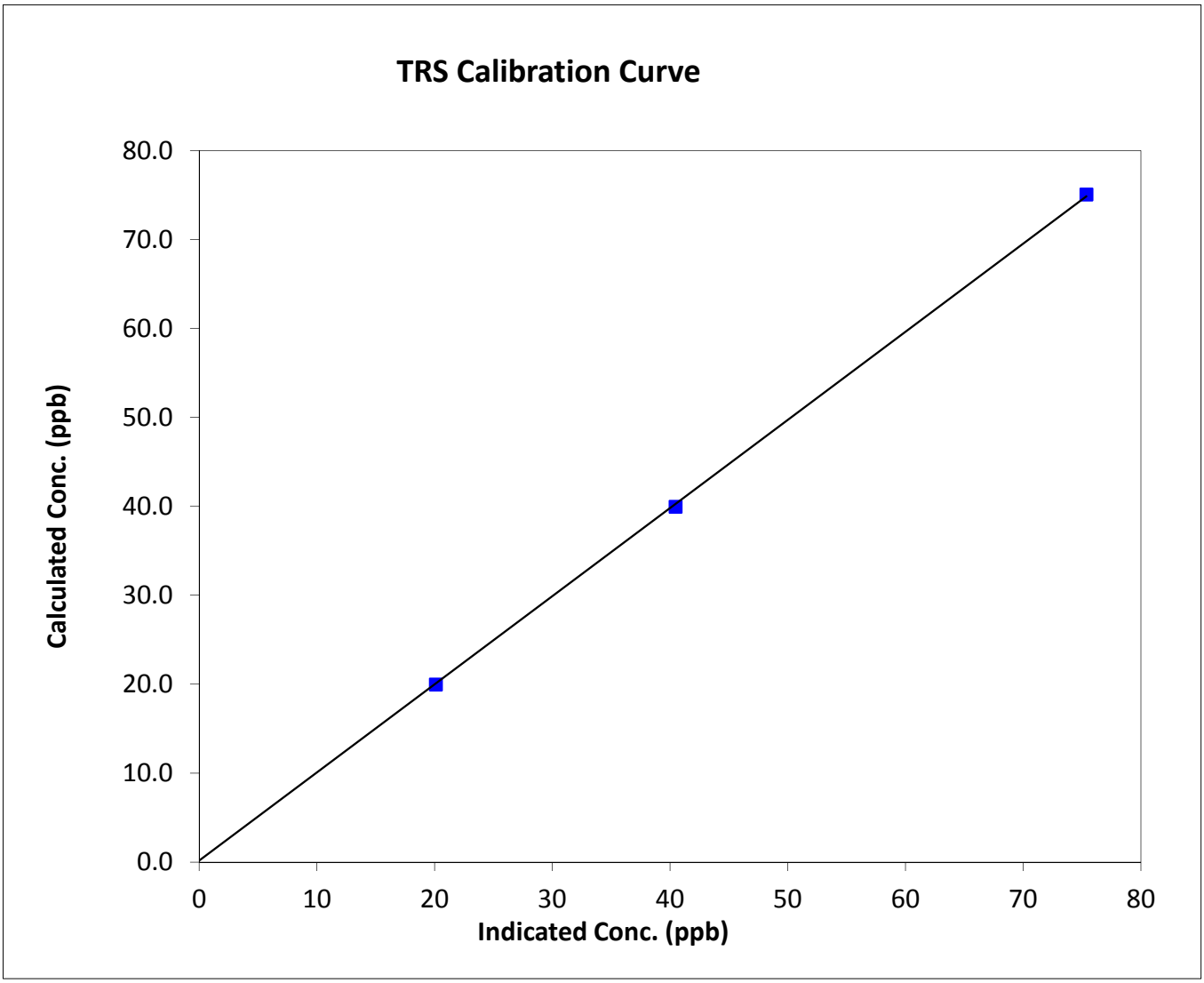
TRS Calibration Summary

Station Information

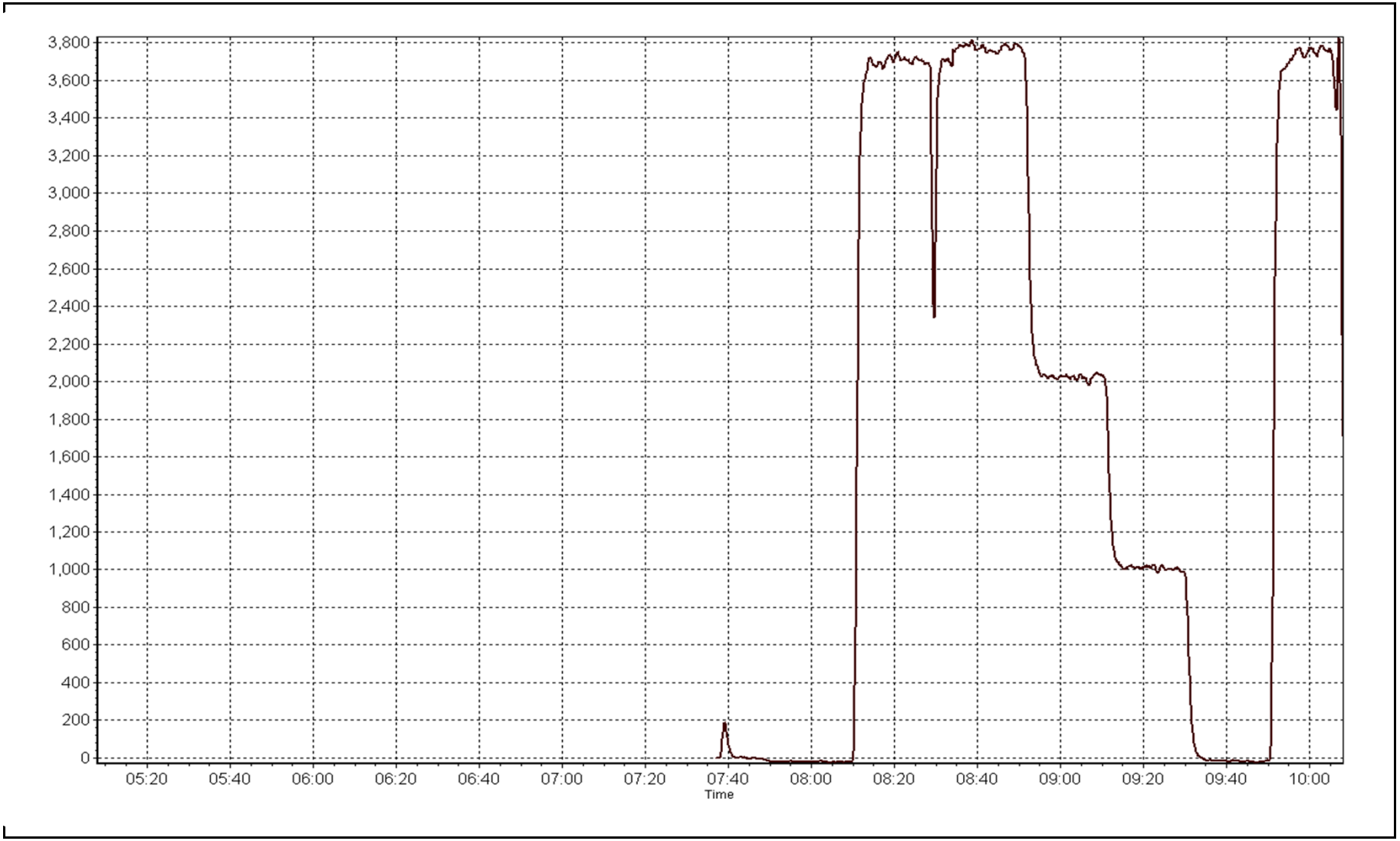
Calibration Date	August 12, 2014	Previous Calibration	July 16, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	7:38	End Time (MST)	10:10
Analyzer make	43i-TL	Analyzer serial #	1300156232

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	0.999923
75.1	75.4	0.9959		
39.9	40.5	0.9866	Slope	0.990755
20.0	20.1	0.9934		
			Intercept	0.172262



TRS Calibration Plot Date: August 12, 2014



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Monday, August 11, 2014	Prev Calibration	Thursday, July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	8:45	End Time (MST)	13:10
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	Thursday, May 29, 2014
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	34.1	34.1
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	1.009796	0.997724	Air Pressure	32.5	32.5
THC Calc intercept	0.016420	0.016221			
NMHC Calc slope	1.013385	0.999547			
NMHC Calc intercept	-0.008014	-0.007906			

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	0.90	N/A
as found span	5000	78.3	16.69	11.20	1.490
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	16.74	0.997
second point	5000	39.1	8.34	8.28	1.007
third point	5000	19.6	4.18	4.19	0.997
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	16.75	0.997
				Average Correction Factor	1.000

Corrected As found	10.30	Previous response	16.52	% change	60.3%

Notes:

Filter changed out, span went back up, No adjustments or maintenance done (due to forest fire)

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	5.33	1.648
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	8.80	0.998
second point	5000	39.1	4.39	4.38	1.002
third point	5000	19.6	2.20	2.23	0.986
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	8.80	0.998
				Average Correction Factor	0.995

Corrected As found	5.33	Previous response	8.68	% change	62.8%

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	0.90	N/A
as found span	5000	78.3	7.91	5.85	1.352
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	7.94	0.996
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	7.95	0.995
				Average Correction Factor	

Corrected As found	4.95	Previous response	7.84	% change	58.3%

Wood Buffalo Environmental Association

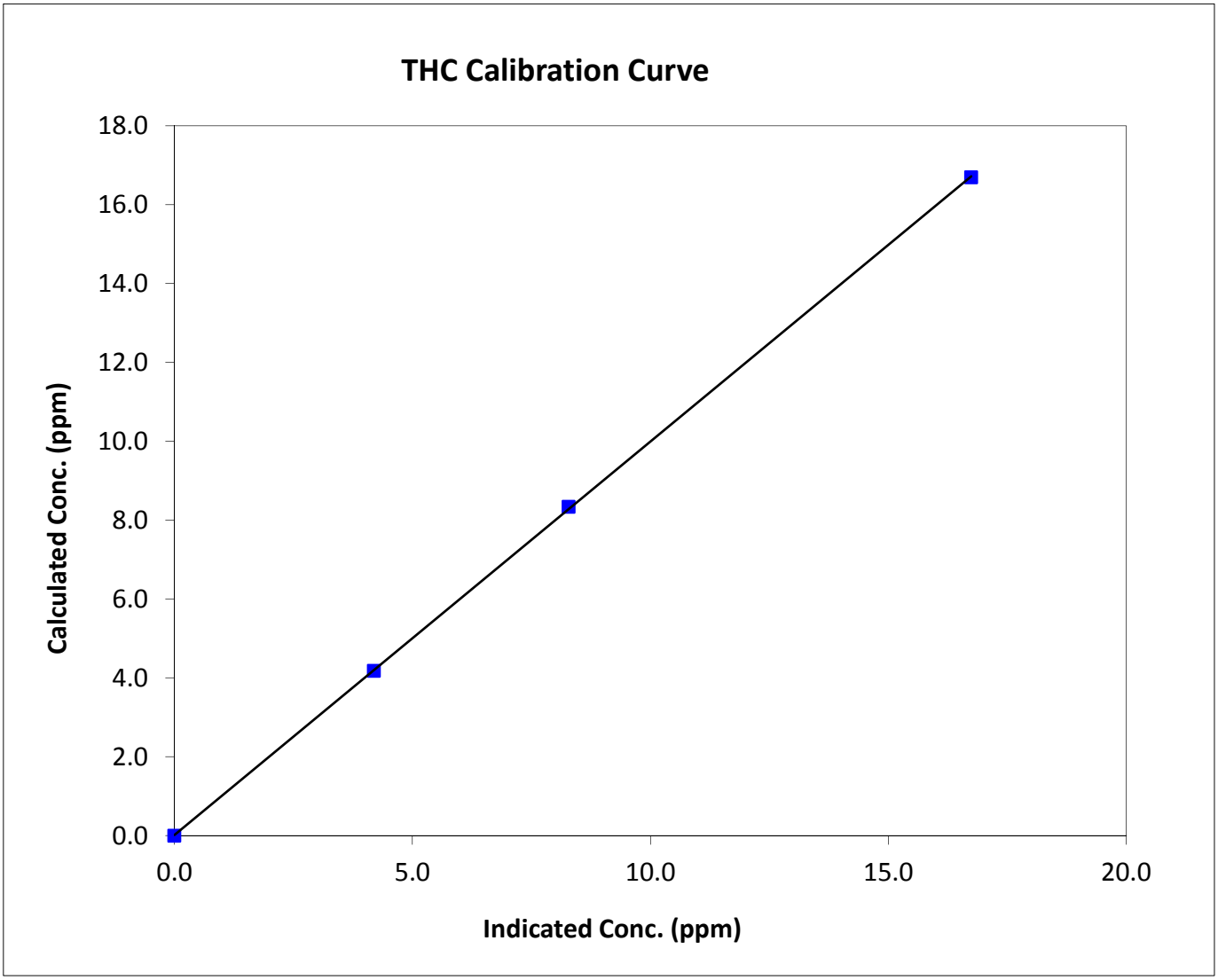
THC Calibration Summary

Station Information

Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:10
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	0.999970
16.69	16.74	0.9972		
8.34	8.28	1.0068	Slope	0.997724
4.18	4.19	0.9973		
			Intercept	0.016221



Wood Buffalo Environmental Association

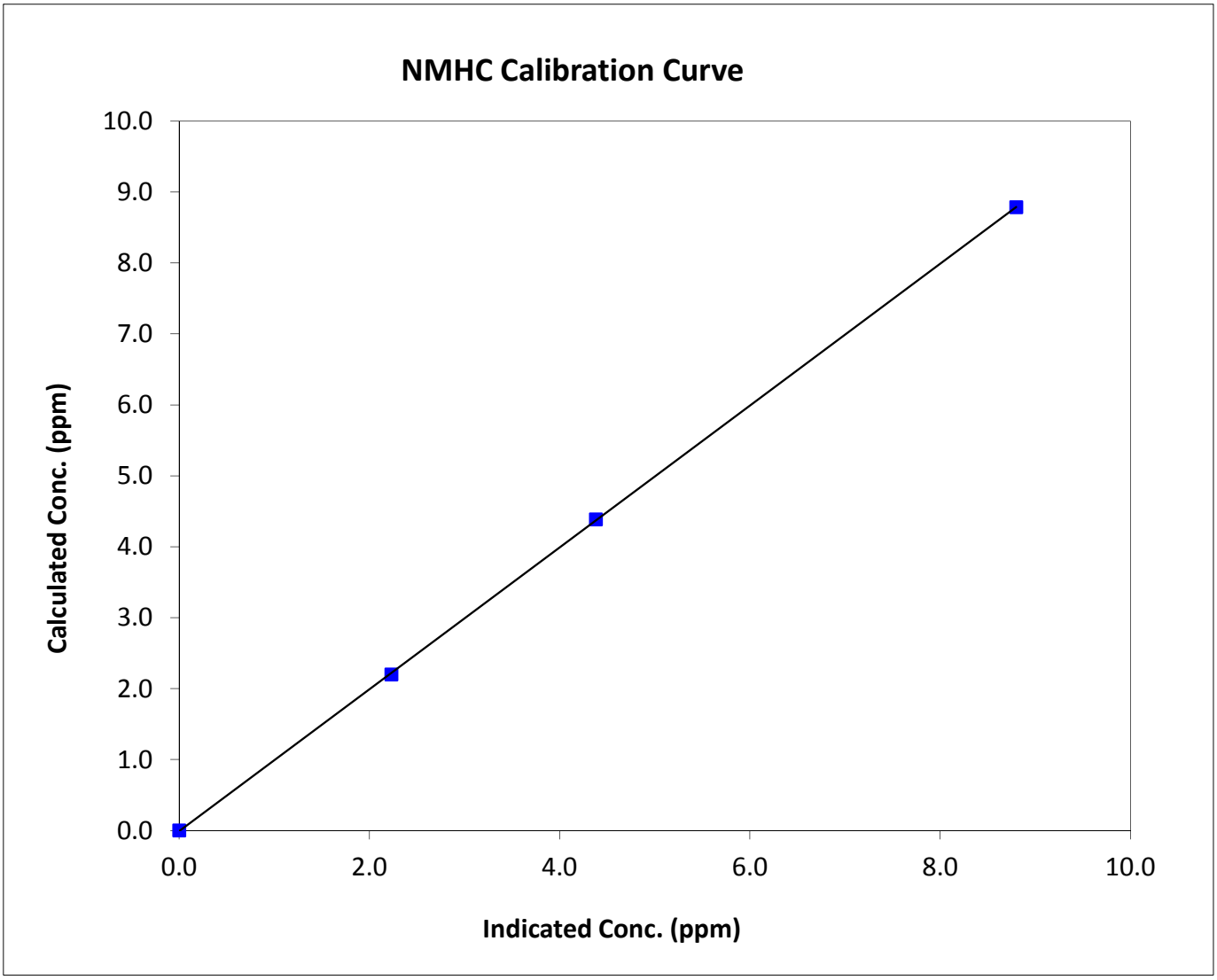
NMHC Calibration Summary

Station Information

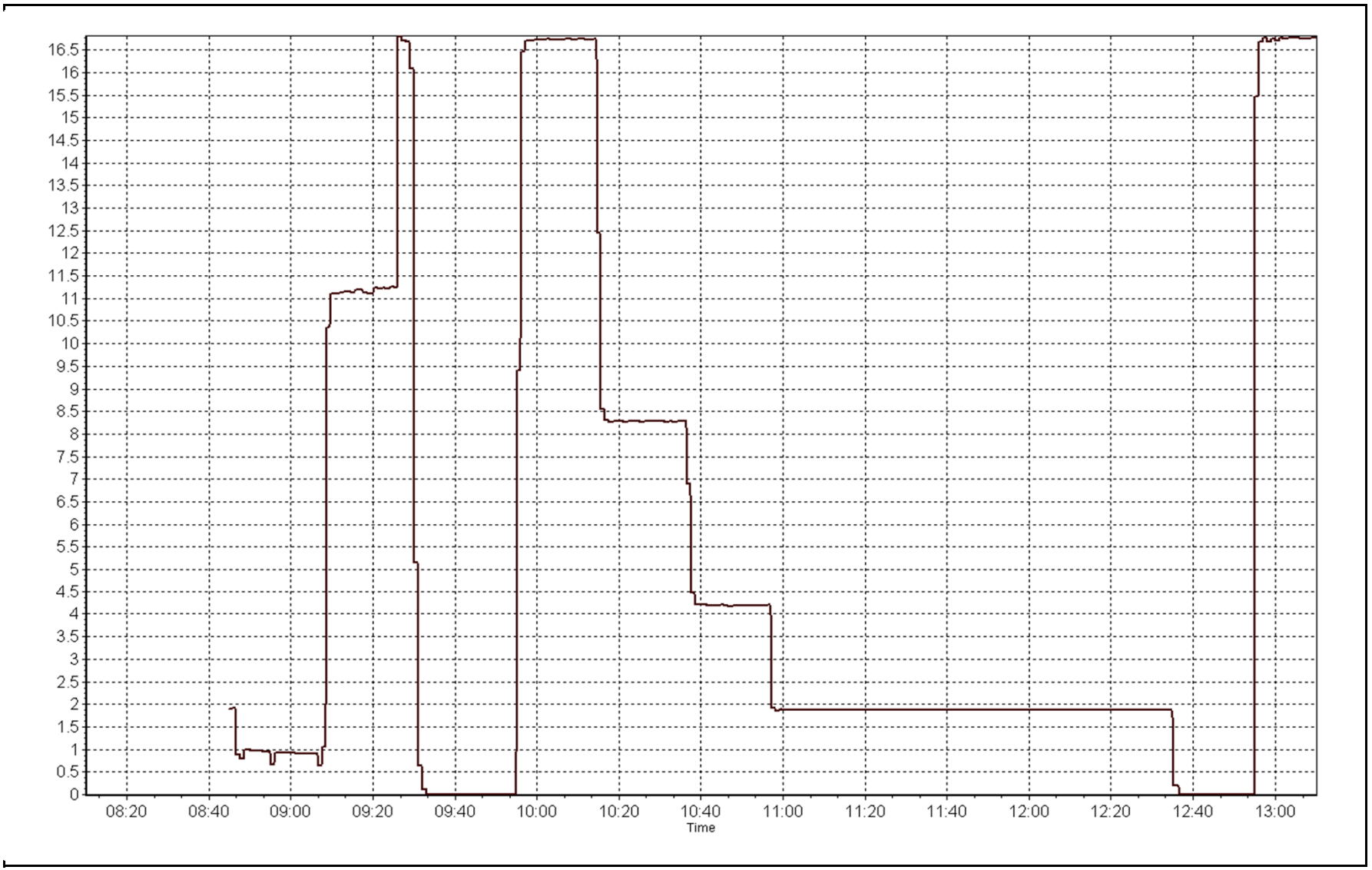
Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:10
Analyzer make	TEC 55i	Analyzer serial #	1218153355

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999980
8.79	8.80	0.9983		
4.39	4.38	1.0016	Slope	0.999547
2.20	2.23	0.9862		
			Intercept	-0.007906



THC/NMHC Calibration Plot Date: August 11, 2014



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 12, 2014	Previous Calibration	July 11, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	10:05	End Time (MST)	12:30
Barometric Pressure	732 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
NO2 calibration used	Monday, August 11, 2014	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.	28.6	28.6
Analyzer Range (input)	5000	5000	Lamp temp.	55.7	55.7
Calculated slope	0.986820	0.994989	Pressure	713.7	713.7
Calculated intercept	-0.962958	0.867380	Flow cell A	0.882	0.882
Analyzer Background	0.3	0.4	Flow cell B	0.774	0.774
Analyzer Coefficient	1.039	1.066	Cell A Intensity	91241	91241
			Cell B Intensity	65691	65691

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	0.6	N/A
as found span	5000	N/A	411.8	403.9	1.020
calibrator zero	5000	0.00	0.0	0.6	N/A
high point	5000	N/A	411.8	413.9	0.995
second point	5000	N/A	284.4	284.8	0.999
third point	5000	N/A	151.4	149.1	1.015
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	N/A	411.8	402.9	1.022
				Average Correction Factor	1.003

Corrected As found	403.3	Previous response	418.3	% change	3.7%

Notes:

Both Cells cleaned out, Pump changed out, Zero adjusted, Filter changed out

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

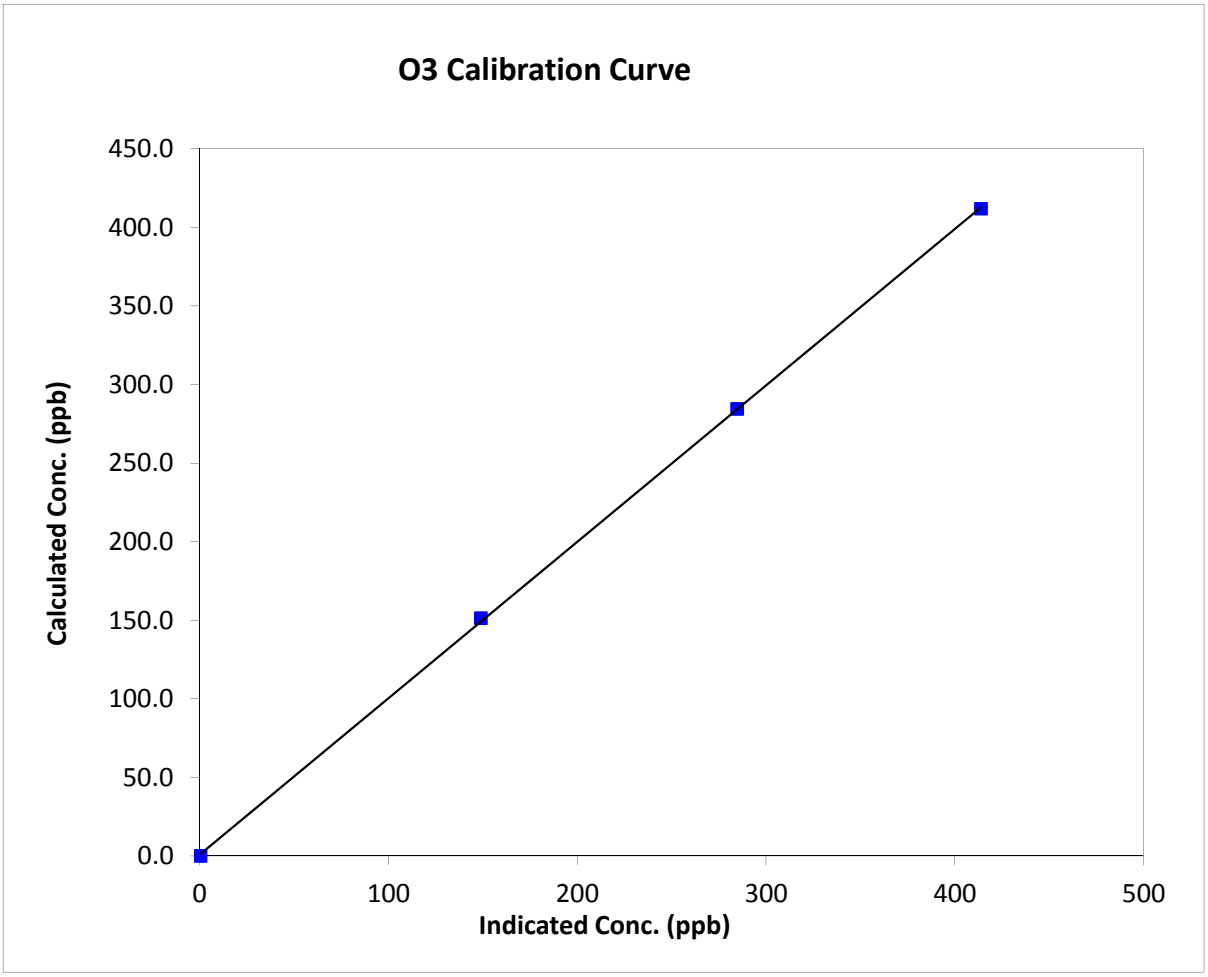
O_3 Calibration Summary

Station Information

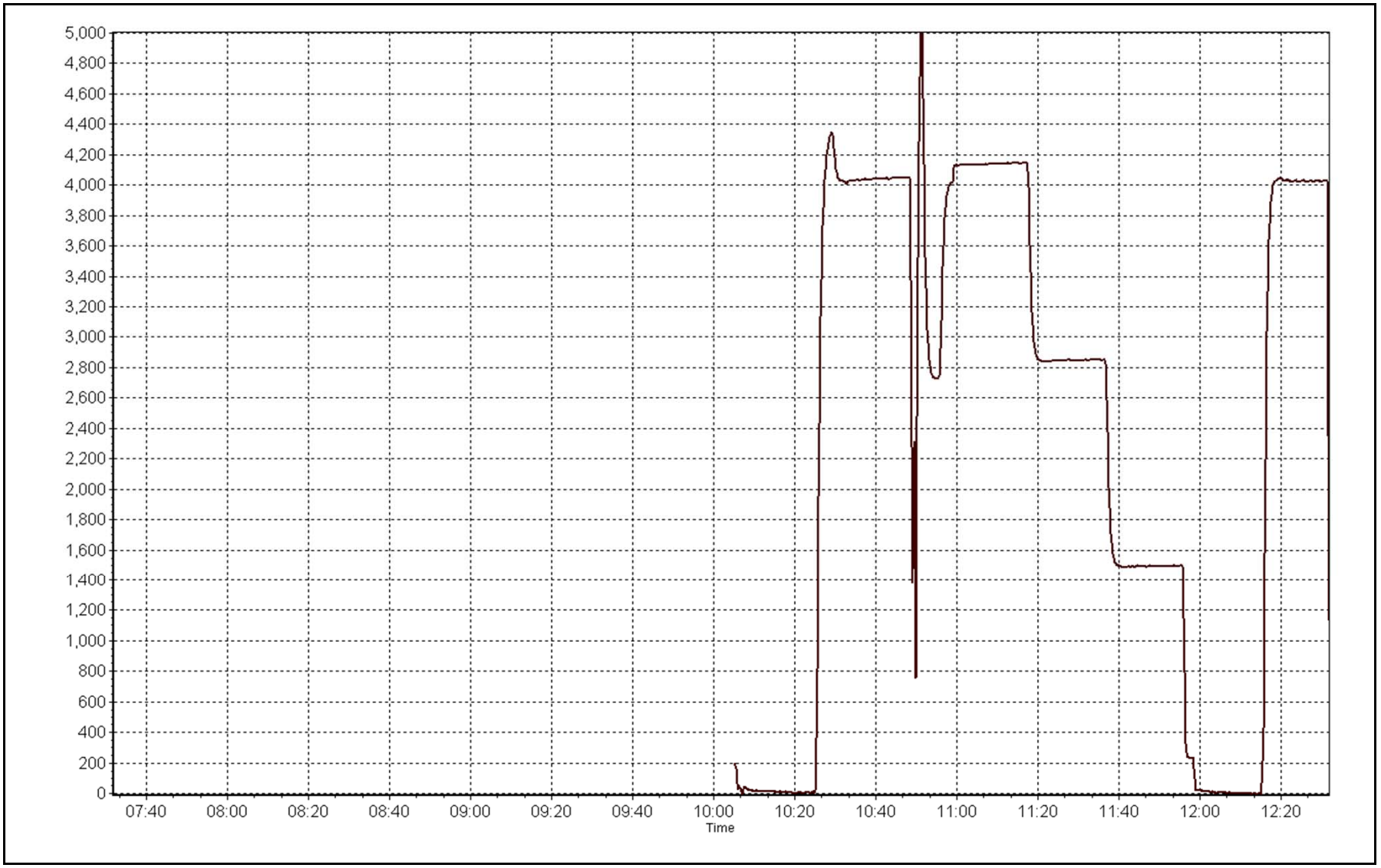
Calibration Date	Tuesday, August 12, 2014	Previous Calibration	July 11, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	10:05	End Time (MST)	12:30
Analyzer make	49C	Analyzer serial #	509110892

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.6	N/A	Correlation Coefficient	0.999918
411.8	413.9	0.9949		
284.4	284.8	0.9986	Slope	0.994989
151.4	149.1	1.0154		
			Intercept	0.867380



O3 Calibration Plot Date: August 12, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	8:45	End Time (MST)	13:01
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)	5000	5000	5000
Before	Data Slope	0.997449	0.997684	1.007691
	Data Offset	0.300003	0.380471	-0.183870
After	Data Slope	0.986192	0.986471	1.003443
	Data Offset	0.721241	0.785396	1.619986
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	1.052	ppb	1.052	ppb
NOX coefficient	0.999	ppb	0.999	ppb
NO2 coefficient	1.002	ppb	1.002	ppb
NO bkgrnd	13.0		15.8	
NOX bkgrnd	13.1		15.8	
Nt coefficient	n/a		n/a	
Chamber Temp	49.9	Deg C	49.9	Deg C
Moly Temp	318.0	Deg C	318.0	Deg C
PMT Temp	-2.5	Deg C	-2.5	Deg C
O3 flow	Ok	ccm	Ok	ccm
R Cell Press	214.9	mmHg	214.9	mmHg
Sample Flow	0.514	ccm	0.514	ccm

Notes:

Zero adjusted, filter changed, no maintenance done

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 11, 2014 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	2.3	2.3	0.0	N/A	N/A
as found span	5000	78.3	801.8	800.2	1.6	788.6	785.8	1.7	1.0167	1.0184
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	N/A	N/A
high point	5000	78.3	801.8	800.2	1.6	813.6	811.8	0.8	0.9855	0.9857
second point	5000	39.1	400.4	399.6	0.8	403.0	401.8	0.6	0.9935	0.9945
third point	5000	19.6	200.7	200.3	0.4	202.0	201.6	0.2	0.9936	0.9936
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	N/A	N/A
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	78.3	801.8	404.0	397.8	818.4	411.2	406.8	0.9797	0.9825
								Average Correction Factor	0.9909	0.9913

Corrcted As found NO_X= 786.3 NO= 783.5 Percent Change NO_X= 2.2% NO= 2.3%

Previous Response NO_X= 803.5 NO= 801.7

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	404.0	411.8	814.4	404.0	409.8	0.9693	1.0000	1.0049	99.5%
2nd NO2 (200)	N/A	531.4	284.4	813.8	531.4	281.6	0.9701	1.0000	1.0099	99.0%
3rd NO2 (100)	N/A	664.4	151.4	812.0	664.4	146.8	0.9722	1.0000	1.0313	97.0%
4th NO2 (0)	815.8	N/A	0.6	816.4	815.8	-0.5	0.9670	1.0000	N/A	N/A
					Average Correction Factor		0.9696	1.0000	1.0154	98.5%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

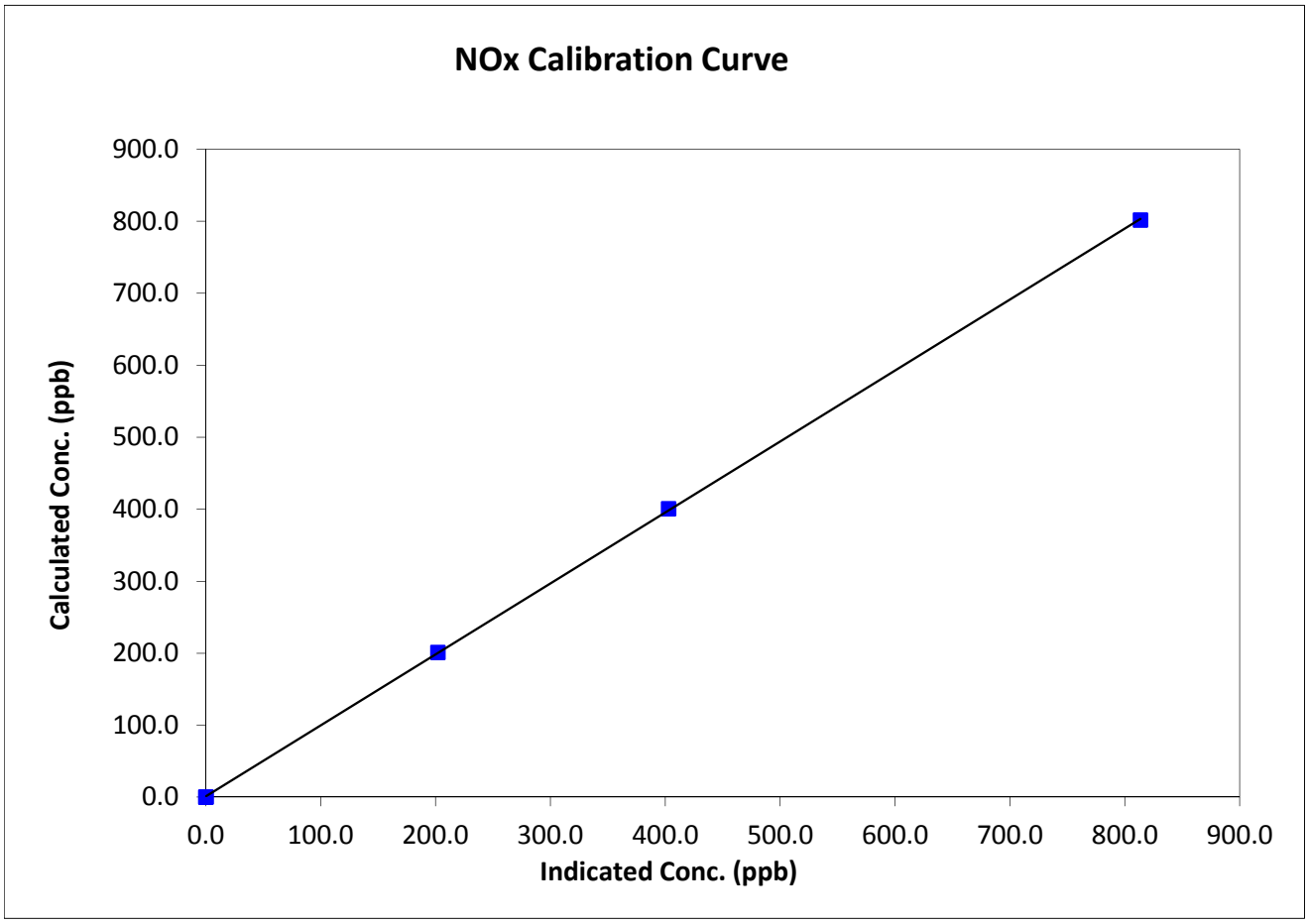
NO_X Calibration Summary

Station Information

Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:01
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	0.999981
801.8	813.6	0.9855		
400.4	403.0	0.9935	Slope	0.986192
200.7	202.0	0.9936		
0.0	0.1	0.0000	Intercept	0.721241



Wood Buffalo Environmental Association

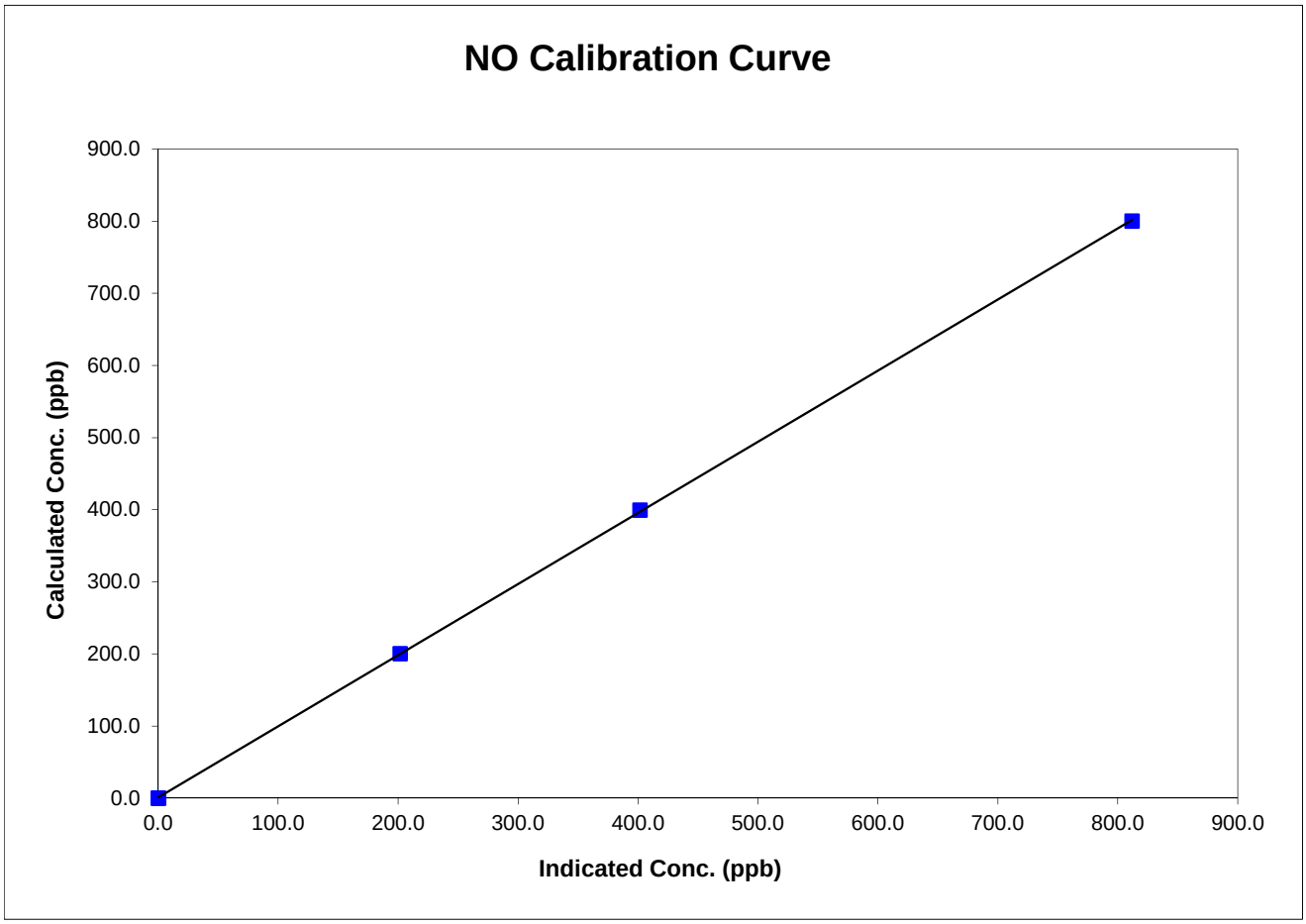
NO Calibration Summary

Station Information

Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:01
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	0.999978
800.2	811.8	0.9857		
399.6	401.8	0.9945	Slope	0.986471
200.3	201.6	0.9936		
0.0	0.1	0.0000	Intercept	0.785396



Wood Buffalo Environmental Association

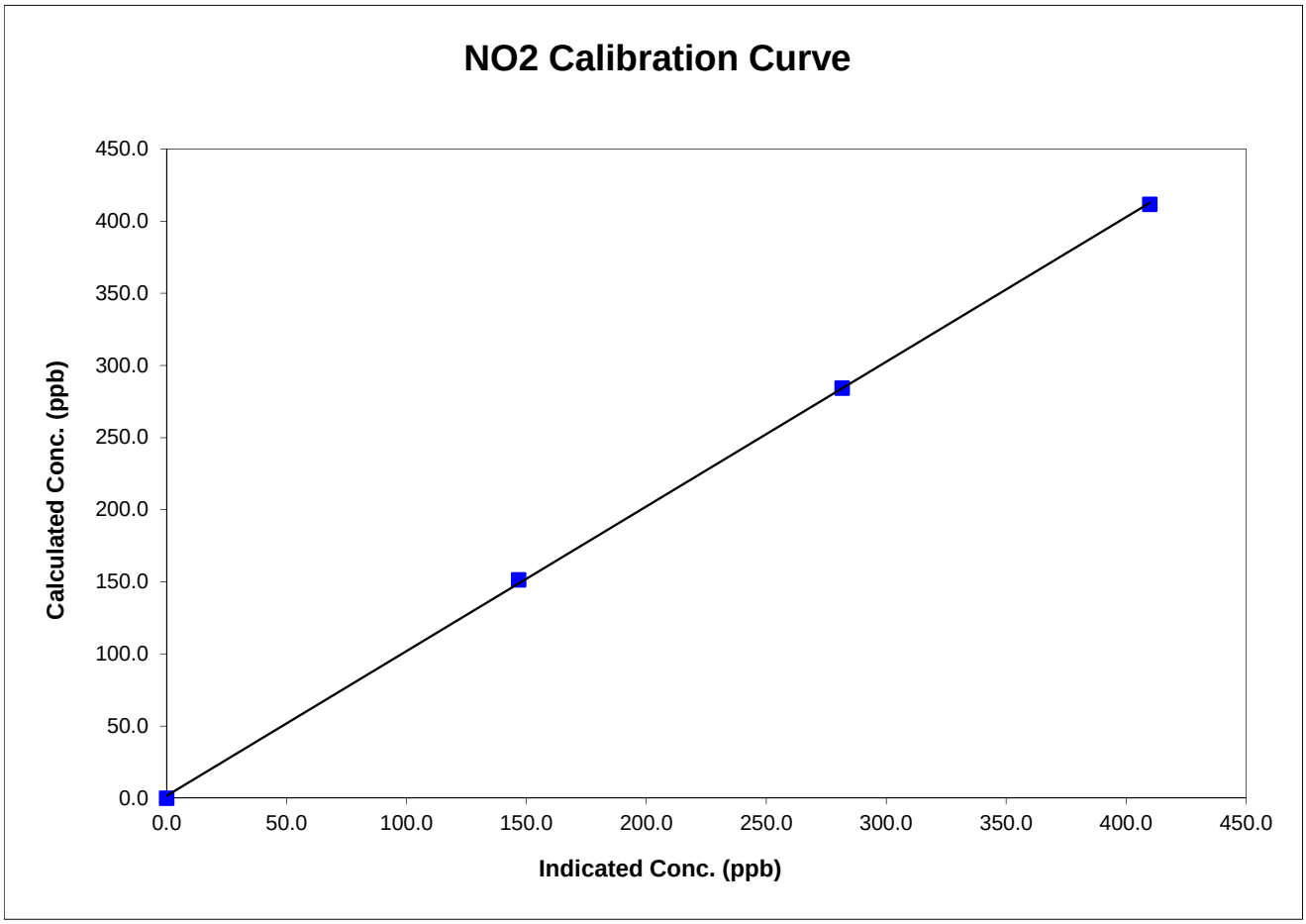
NO_2 Calibration Summary

Station Information

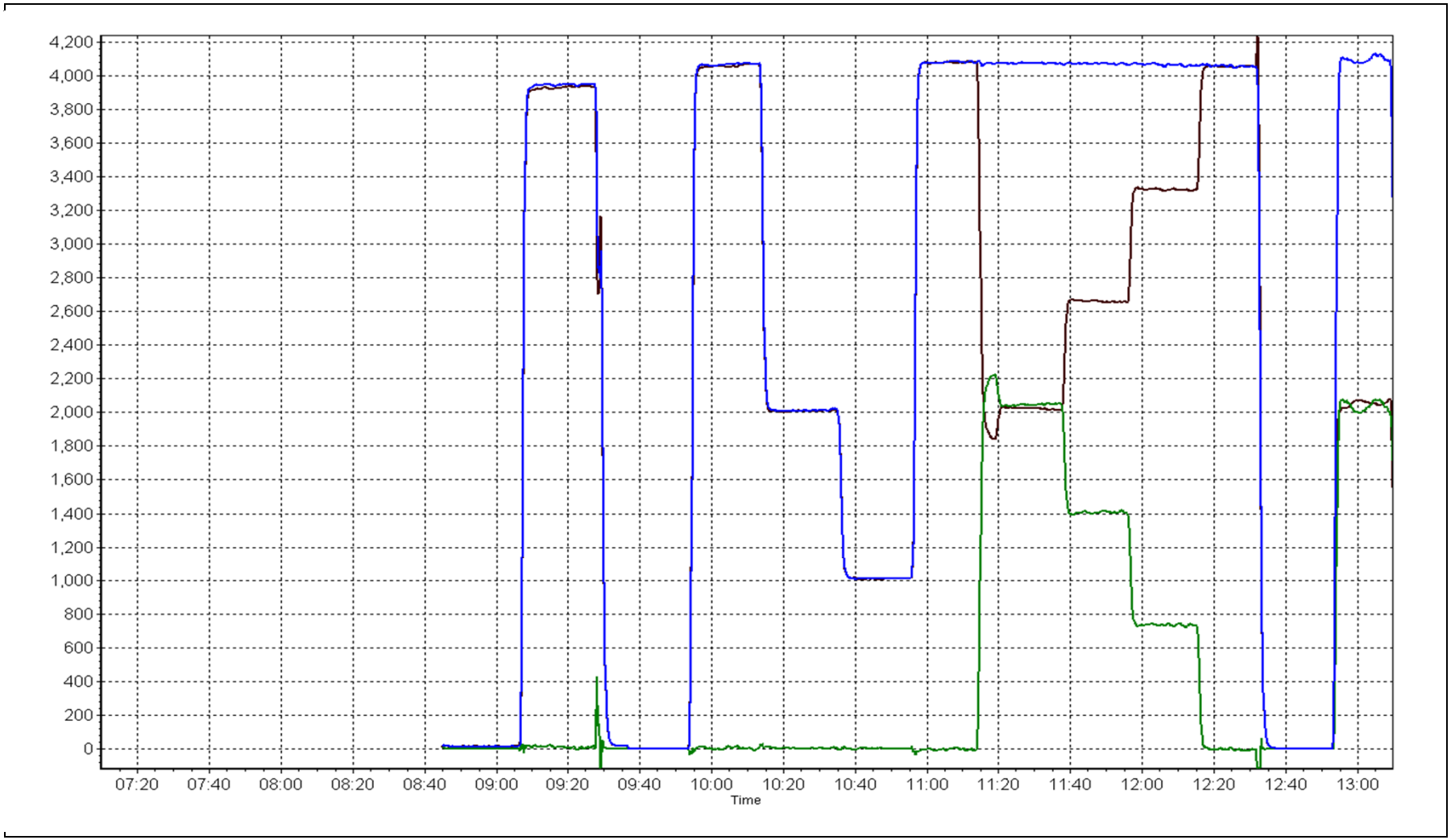
Calibration Date	August 11, 2014	Previous Calibration	July 10, 2014
Station Number	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:01
Analyzer make	42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999894
411.8	409.8	1.0049		
284.4	281.6	1.0099	Slope	1.003443
151.4	146.8	1.0313		
			Intercept	1.619986



NOx, NO & NO_2 Calibration Plot Date: August 11, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 15
CNRL HORIZON
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
AUGUST 2014

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	699	36	45	98.79	71	0	10	0
TRS (ppb) Average	700	35	44	98.79	2	0	1	0
THC (ppm) Average	690	36	54	97.58	5	-	2.9	-
NO2 (ppb) Average	700	36	44	98.92	38	0	12	-
NO (ppb) Average	700	36	44	98.92	61	-	16	-
NOX (ppb) Average	700	36	44	98.92	90	-	26	-
PM2.5 (ug/m3) Average	736	0	8	98.92	479.2	-	160.9	5
Temperature 2 m (C) Average	742	0	2	99.73	32.3	-	23.7	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	22	-	-	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Precipitation (mm) Total	742	0	2	99.73	5.6	-	14	-
Relative Humidity (%) Average	742	0	2	99.73	99	-	-	-
Global Solar Radiation (W/m2) Average	742	0	2	99.73	649	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	699	1.5	4	-	0	0	0	0	1	3	71
TRS (ppb) Average	700	0.3	0	-	0	0	0	0	0	0	2
THC (ppm) Average	690	2.39	0.4	-	1.8	2	2.2	2.3	2.5	2.8	5
NO2 (ppb) Average	700	4.3	6	-	0	0	1	2	6	11	38
NO (ppb) Average	700	2.3	6	-	0	0	0	0	1	5	61
NOX (ppb) Average	700	6.6	11	-	0	0	1	3	7	16	90
PM2.5 (ug/m3) Average	736	23.02	44.8	-	1.5	3.3	5.9	10.7	18.4	42.1	479.2
Temperature 2 m (C) Average	742	17.15	7.1	-	-0.6	9	12.1	16.4	22.1	27.5	32.3
Wind Speed 10 m (km/h) Average	743	6.9	3	-	0	3	5	6	9	11	22
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	742	-	-	48.77	0	0	0	0	0	0	5.6
Relative Humidity (%) Average	742	66.7	22	-	19	36	47	68	87	95	99
Global Solar Radiation (W/m2) Average	742	153.6	184	-	0	0	0	56	276	464	649

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	19 Aug 2014 13:00	19 Aug 2014 19:00	7	Station power failure
SO2	08 Aug 2014 21:00	08 Aug 2014 21:00	1	Power spike
SO2	13 Aug 2014 10:00	13 Aug 2014 10:00	1	Maintenance - replaced sample filters due to forest fire smoke
TRS	13 Aug 2014 10:00	13 Aug 2014 10:00	1	Maintenance - replaced sample filters due to forest fire smoke
TRS	26 Aug 2014 14:00	26 Aug 2014 14:00	1	Maintenance - replaced sample filters due to forest fire smoke
THC	11 Aug 2014 22:00	11 Aug 2014 22:00	1	Intermittent unstable operation - baseline drift
THC	12 Aug 2014 15:00	12 Aug 2014 16:00	2	Intermittent unstable operation - baseline drift
THC	12 Aug 2014 18:00	12 Aug 2014 23:00	6	Intermittent unstable operation - baseline drift
THC	13 Aug 2014 01:00	13 Aug 2014 01:00	1	Intermittent unstable operation - baseline drift
THC	19 Aug 2014 20:00	19 Aug 2014 20:00	1	Additional stabilization period following power failure
NO2, NO, NOX	13 Aug 2014 10:00	13 Aug 2014 10:00	1	Maintenance - replaced sample filters due to forest fire smoke
PM2.5	27 Aug 2014 12:00	27 Aug 2014 12:00	1	Maintenance - Flow and zero check, sample head cleaning
Temperature 2m	27 Aug 2014 11:00	27 Aug 2014 12:00	2	Maintenance - sensor calibration
Wind Speed, Wind Direction	27 Aug 2014 11:00	27 Aug 2014 11:00	1	Maintenance - sensor calibration
Precipitation Collector	27 Aug 2014 11:00	27 Aug 2014 12:00	2	Maintenance - sensor calibration
Relative Humidity	27 Aug 2014 11:00	27 Aug 2014 12:00	2	Maintenance - sensor calibration
Solar Global Radiation	27 Aug 2014 11:00	27 Aug 2014 12:00	2	Maintenance - sensor calibration

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 71 ppb on Aug 5 11:00 Maximum Daily Average: 9.8 ppb on Aug 5

Minimum Value: 0 ppb on Aug 3 05:00 Minimum Daily Average: 0.1 ppb on Aug 7
Maximum Diurnal Average: 4.3 ppb at hour 11 Minimum Diurnal Average: 0.3 ppb at hour 6
Monthly Average: 1.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 17$

Hours in Service:	744
Hours of Data:	699
Hours of Missing Data:	45
Hours of Calibration:	36
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-Aug	0	Z	0	0	0	0	0	0	3	0	10	23	8	2	3	1	1	1	1	2	1	1	1	1	2.6	23
2-Aug	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0.9	14
3-Aug	0	Z	0	0	0	0	0	0	2	1	1	1	1	1	8	5	3	17	1	1	1	1	0	0	1.9	17
4-Aug	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0.6	1
5-Aug	0	Z	0	0	0	0	0	3	9	29	71	41	18	10	4	7	8	10	6	4	2	2	1	1	9.8	71
6-Aug	1	Z	0	0	0	0	1	2	1	1	1	1	1	1	1	15	22	13	3	0	0	0	0	0	2.7	22
7-Aug	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
8-Aug	0	Z	0	0	0	0	0	0	0	0	1	3	11	10	8	3	1	0	0	0	PF	1	0	0	1.8	11
9-Aug	0	Z	0	0	0	0	0	0	0	0	18	7	0	0	0	0	0	0	1	1	0	0	0	0	1.3	18
10-Aug	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
11-Aug	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	0.4	1
12-Aug	1	Z	1	1	0	1	1	1	4	11	8	12	4	2	3	7	9	6	4	3	1	1	1	1	3.5	12
13-Aug	1	Z	4	1	1	1	1	8	17	M	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2.1	17
14-Aug	0	Z	1	0	0	0	0	1	0	0	0	1	2	2	1	1	1	2	3	2	1	1	0	0	0.9	3
15-Aug	0	Z	0	0	0	0	0	0	0	0	1	2	2	1	1	0	4	0	0	0	0	0	0	0	0.7	4
16-Aug	0	Z	1	0	0	0	0	0	0	1	2	2	1	1	9	9	2	1	1	1	1	0	0	0	1.4	9
17-Aug	0	Z	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0.5	2
18-Aug	0	Z	0	0	0	0	0	0	1	1	1	1	1	3	5	5	4	2	1	0	0	0	0	0	1.2	5
19-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	0	0	0	0	0	--	0
20-Aug	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
21-Aug	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
22-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0.3	1
23-Aug	0	Z	0	0	0	0	0	0	0	0	1	1	14	3	7	4	2	4	4	3	2	2	1	1	2.3	14
24-Aug	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	6	4	5	7	5	2	2	2	1	1	2.1	7
25-Aug	2	Z	1	1	1	1	1	2	5	8	4	3	5	1	1	1	1	1	1	1	1	1	1	1	1.9	8
26-Aug	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	0	6	1	0	0	0	0	0	0	0	0.7	6
27-Aug	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
28-Aug	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
29-Aug	0	Z	0	0	0	0	0	2	1	1	2	4	17	14	7	7	4	3	2	1	1	1	1	1	3.1	17
30-Aug	1	Z	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
31-Aug	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
	0.4	--	0.5	0.3	0.3	0.3	0.4	0.8	1.6	2.1	4.3	3.6	3.2	2.0	2.3	2.7	2.4	2.4	1.7	0.9	0.6	0.6	0.5	0.4	Diurnal Average	
	2	--	4	1	1	1	1	8	17	29	71	41	18	14	9	15	22	17	14	4	2	2	1	1	Diurnal Maximum	

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

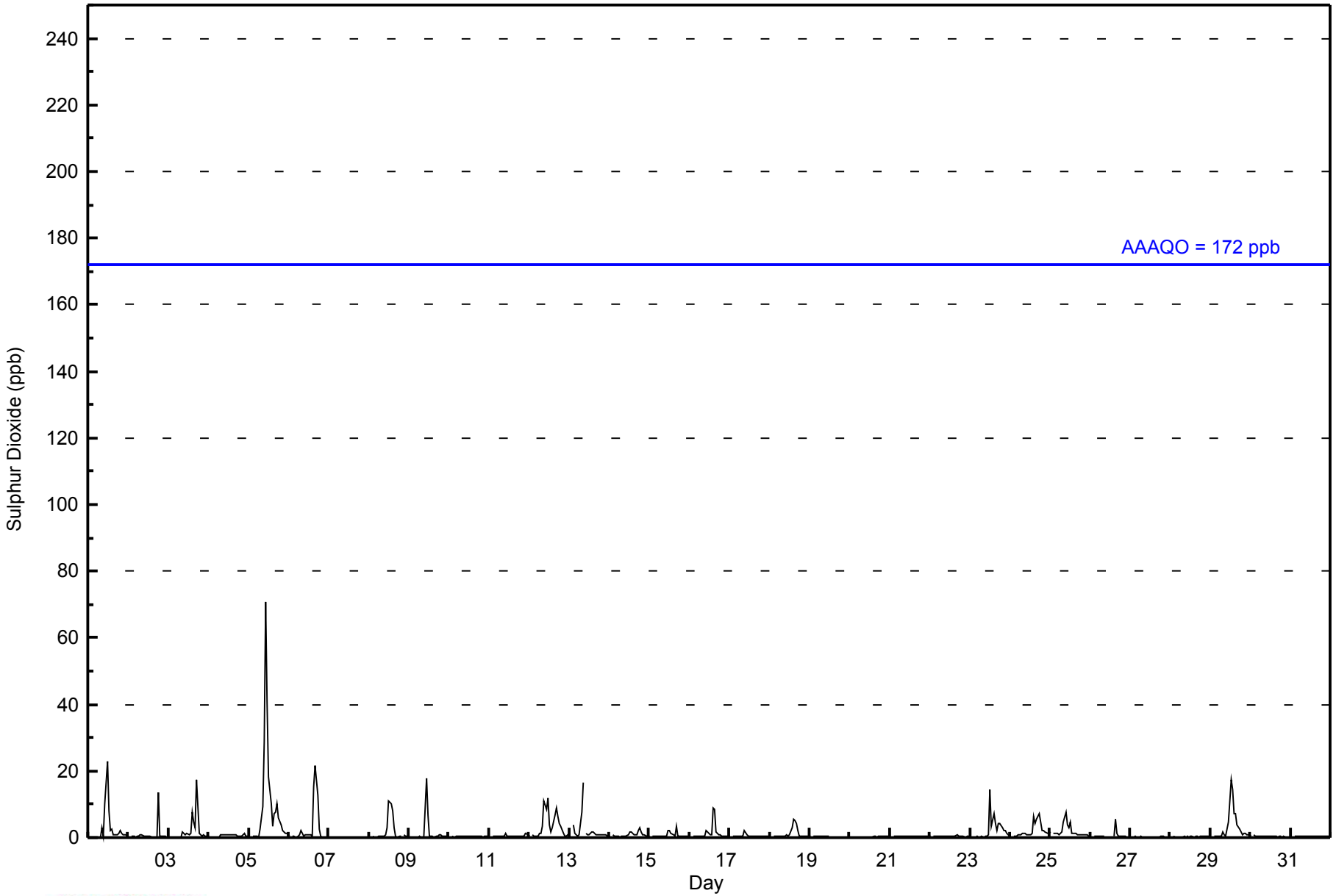
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	681	97.42	97.42
11 - 20	13	1.86	99.28
21 - 60	4	0.57	99.86
61 - 110	1	0.14	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	58	56	17	10	10	18	25	53	87	95	69	39	37	48	35	23	680
11 - 20	1	1	0	1	1	1	2	3	1	1	0	0	0	0	1	0	13
21 - 60	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	4
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	60	57	17	11	11	19	27	57	90	96	69	39	37	48	36	24	698

Total Number of Valid Hours: 698

Total Number of Hours: 744

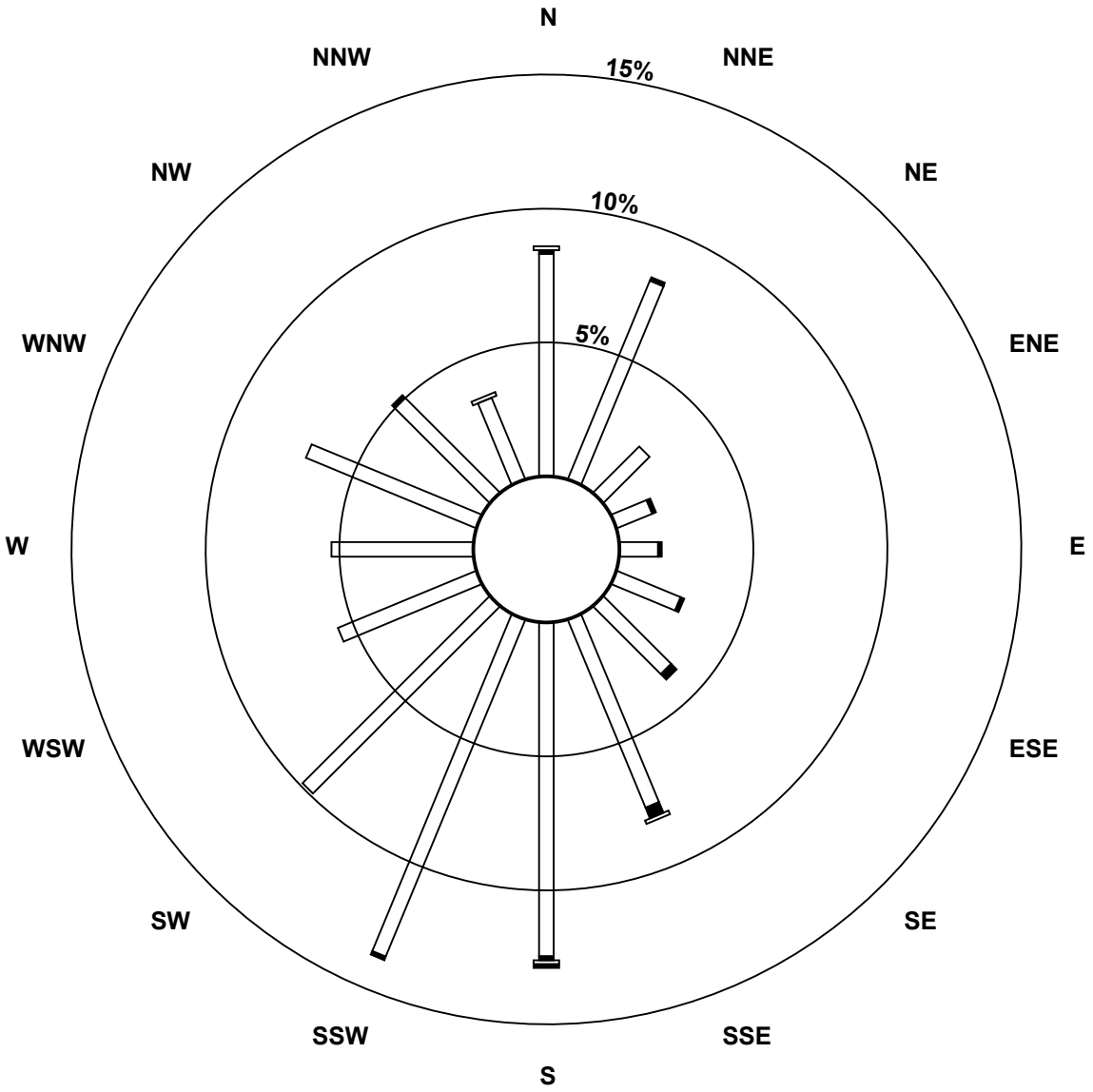
AURORA
ATMOSPHERICS INC.

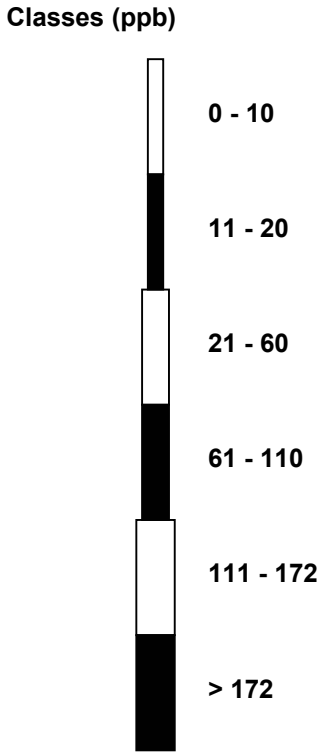
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon (AMS 15)





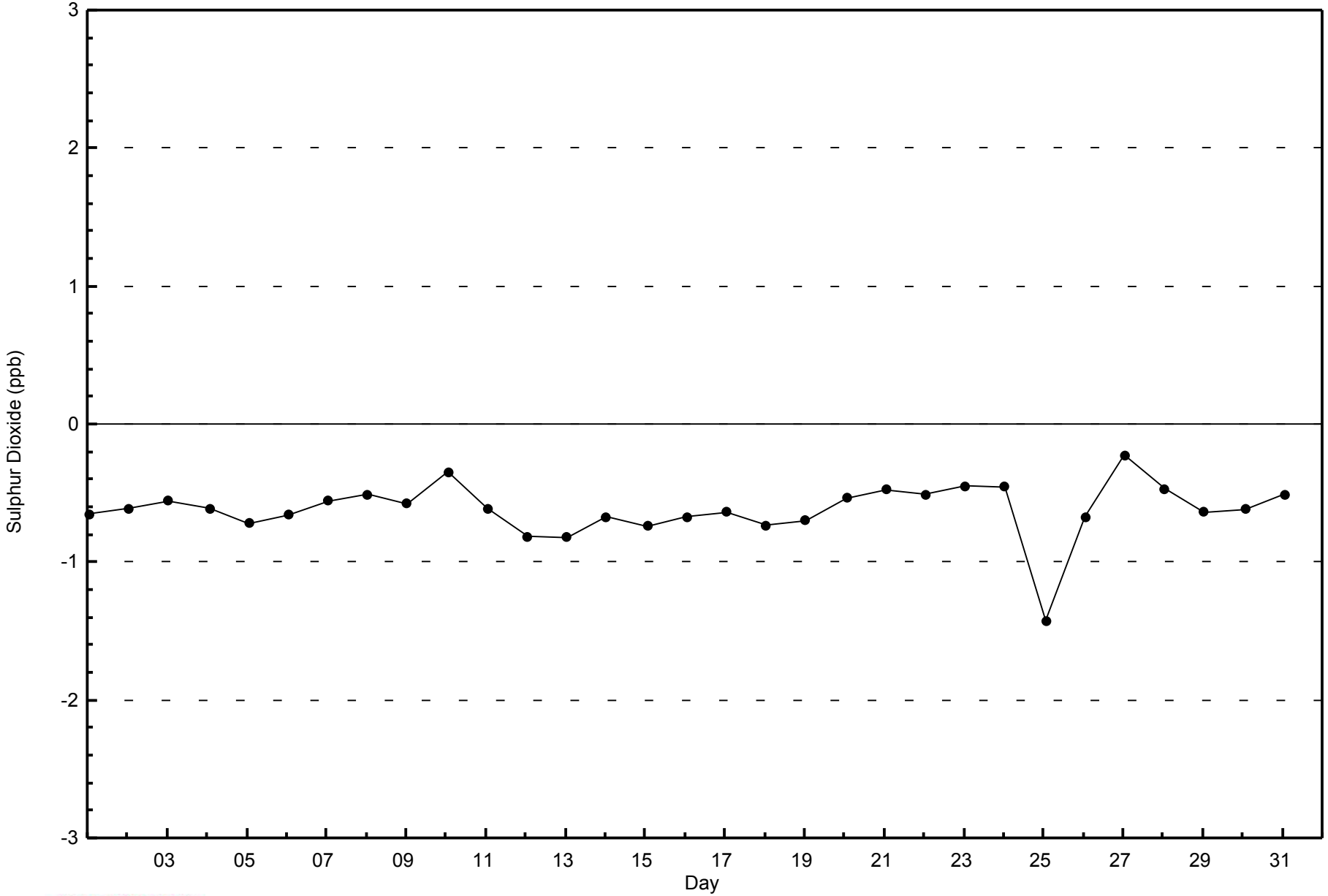
Total Number of Valid Hours: 698

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - August 2014



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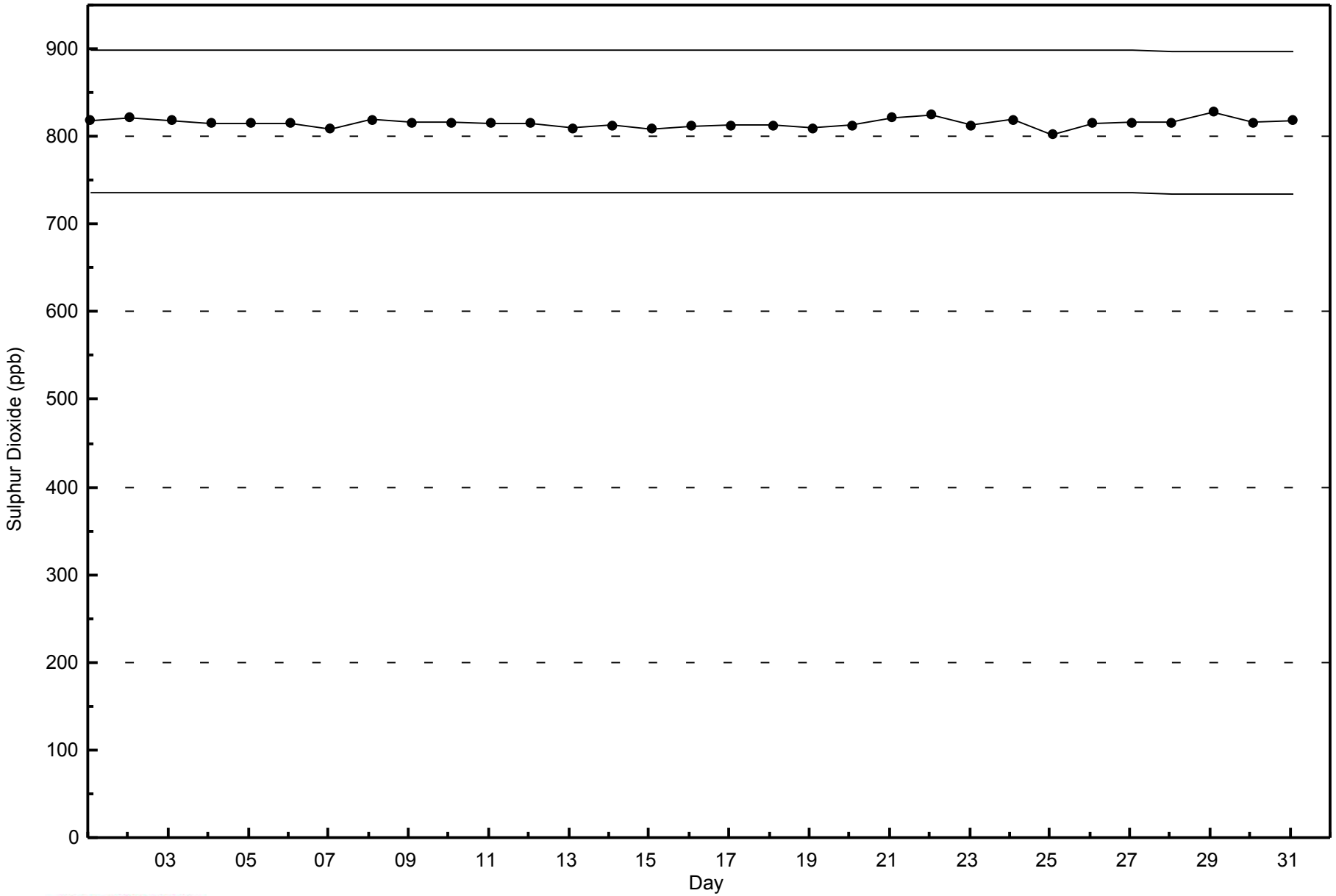
Span Responses

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2 ppb on Aug 5 10:00 Maximum Daily Average: 0.8 ppb on Aug 4

Minimum Value: 0 ppb on Aug 6 15:00 Minimum Daily Average: 0.1 ppb on Aug 7
Maximum Diurnal Average: 0.4 ppb at hour 10 Minimum Diurnal Average: 0.2 ppb at hour 17
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	35
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-Aug	1	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
2-Aug	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-Aug	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
4-Aug	0	0	Z	0	0	1	0	0	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2
5-Aug	1	1	Z	0	1	1	1	1	1	2	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0.6	2
6-Aug	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
7-Aug	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
8-Aug	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-Aug	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
10-Aug	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
11-Aug	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
12-Aug	0	0	Z	0	0	0	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
13-Aug	0	1	Z	0	0	0	0	0	1	M	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.3	1
14-Aug	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
15-Aug	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-Aug	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
17-Aug	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
18-Aug	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
19-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	0	0	0	0	0	--	0
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Aug	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0.3	1
25-Aug	1	1	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
26-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Aug	0	0	Z	0	0	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Aug	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
29-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Aug	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
31-Aug	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
	0.3	0.3	--	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	Diurnal Average	
	1	1	--	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

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

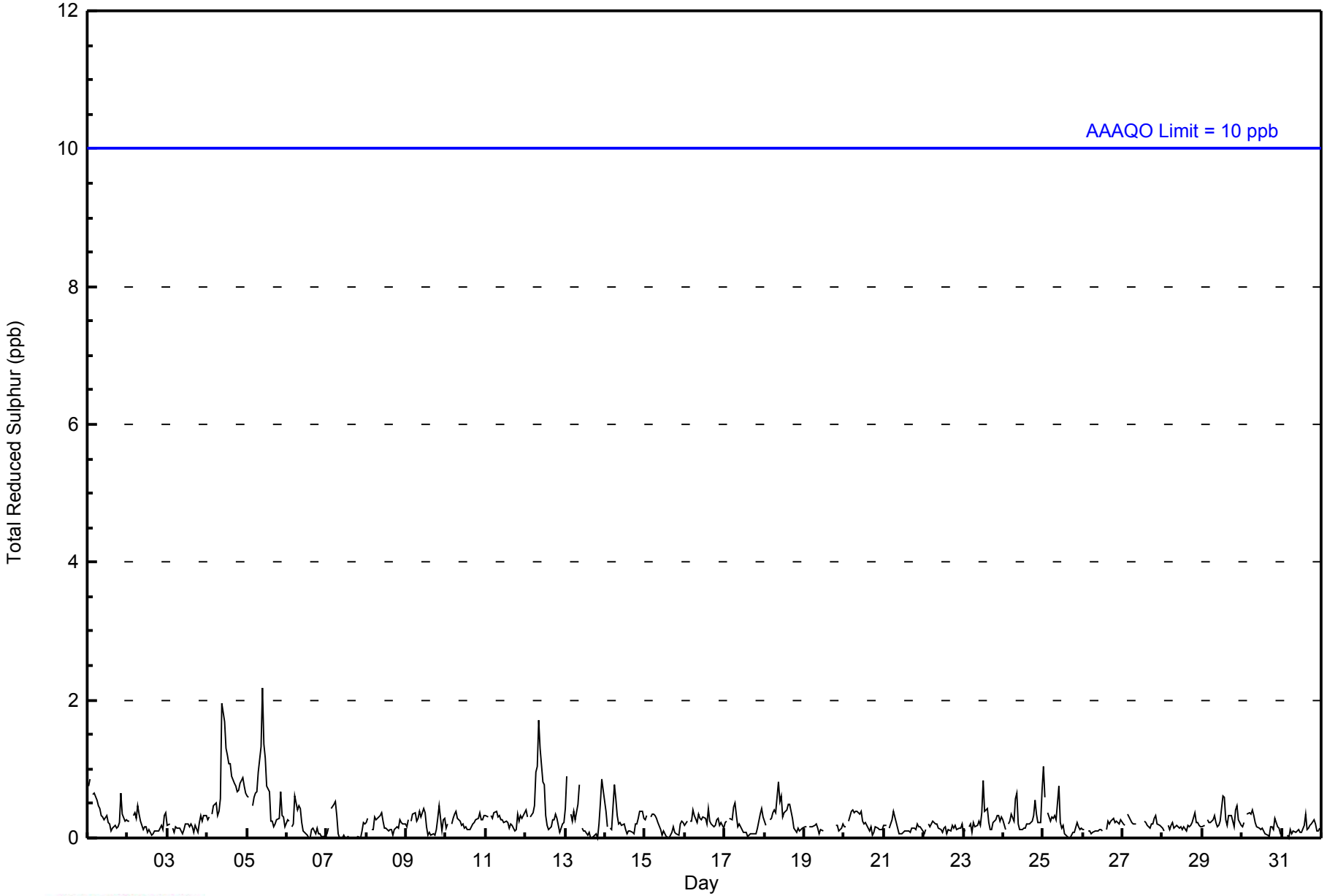
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	700	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	60	58	17	11	11	19	27	56	91	99	67	39	35	49	37	24	700
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	58	17	11	11	19	27	56	91	99	67	39	35	49	37	24	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

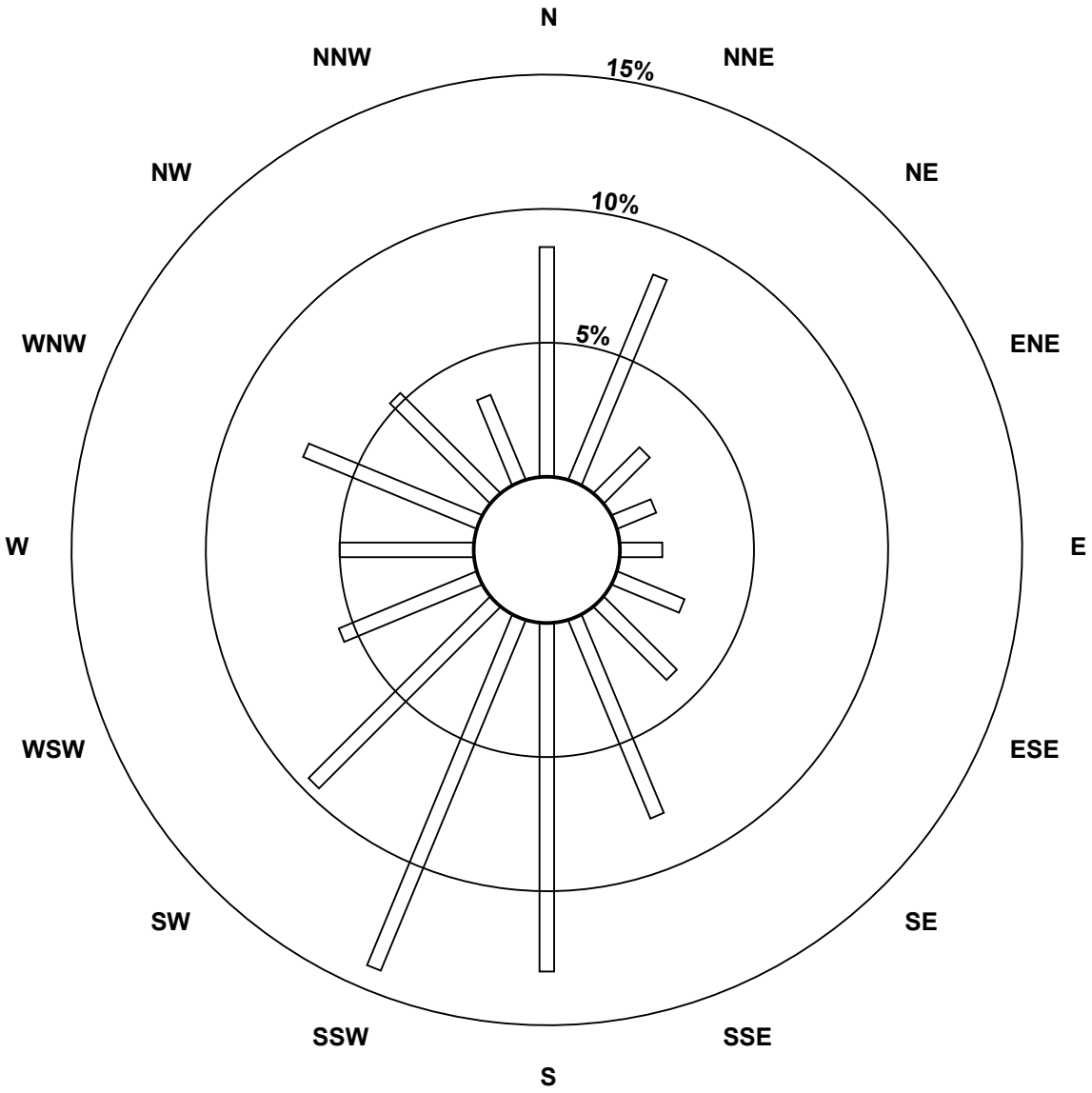
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

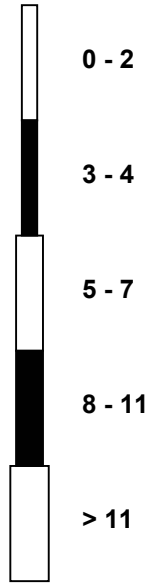
Wind Rose Aug 2014

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



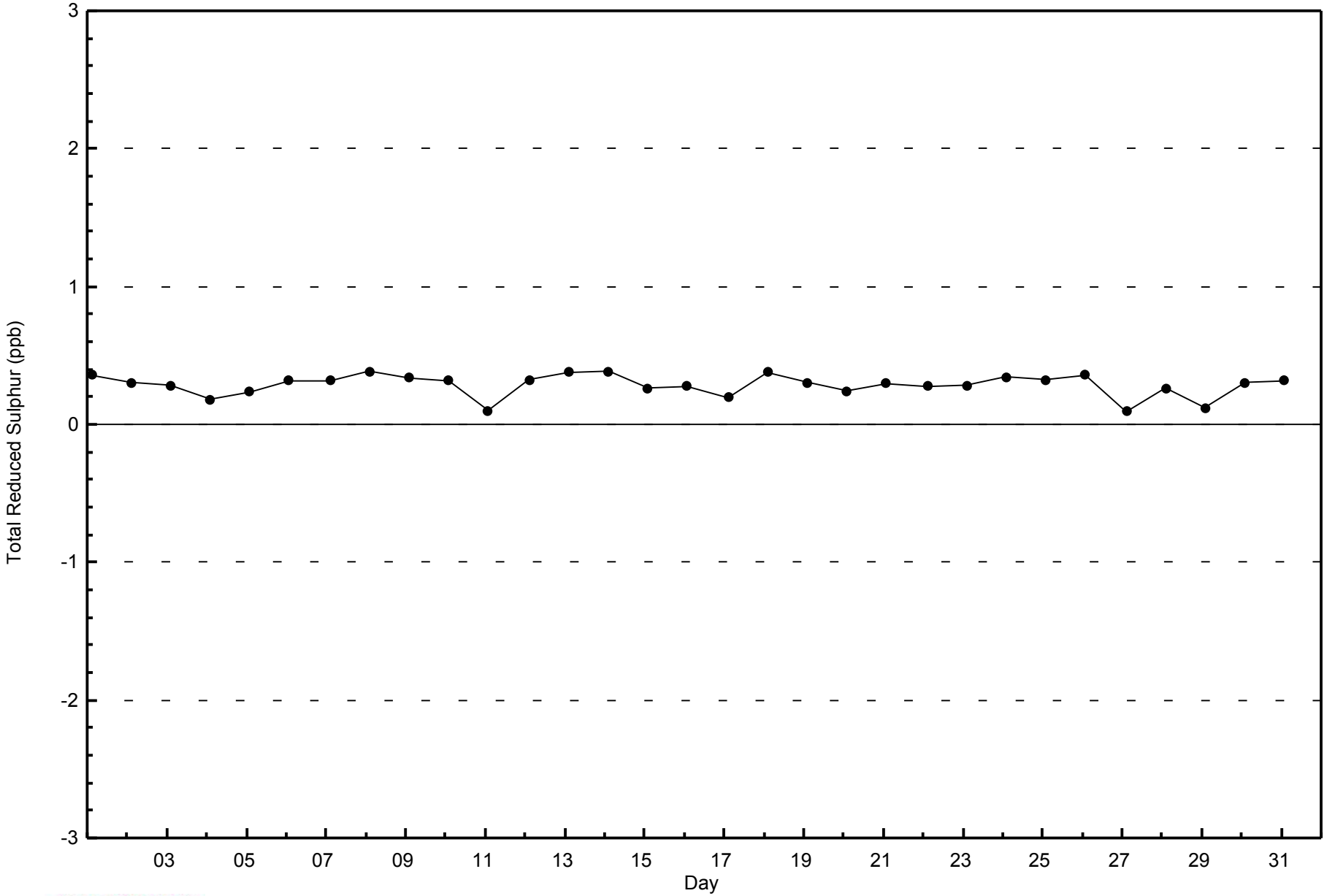
Total Number of Valid Hours: 700

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - August 2014



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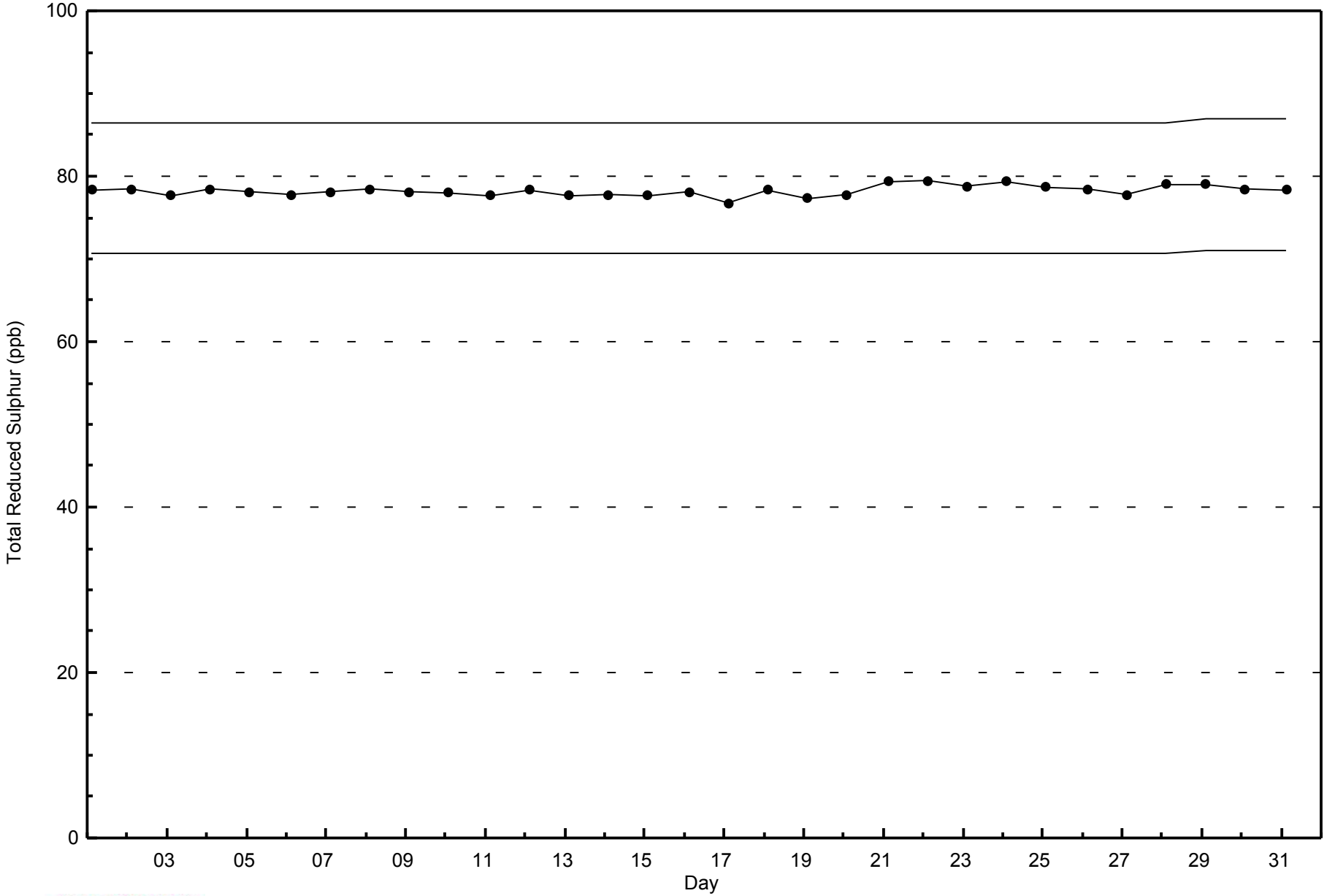
Span Responses

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

CNRL Horizon - August 2014

Maximum Value: 5.0 ppm on Aug 13 23:00

Maximum Daily Average: 2.9 ppm on Aug 5

Minimum Value: 1.8 ppm on Aug 13 00:00

Minimum Daily Average: 2.0 ppm on Aug 11

Maximum Diurnal Average: 2.6 ppm at hour 23

Minimum Diurnal Average: 2.2 ppm at hour 17

Monthly Average: 2.39 ppm

Percentiles: P_1 = 1.8 P_{10} = 2.0 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:	690
Hours of Missing Data:	54
Hours of Calibration:	36
Percent Operational Time:	97.6

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-Aug	2.6	Z	2.6	2.6	2.6	2.6	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.6
2-Aug	2.6	Z	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.6	2.4	2.7
3-Aug	2.6	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.6	3.2	2.9	3.4	2.5	2.5	3.4
4-Aug	2.4	Z	2.4	2.3	2.4	2.4	2.4	2.8	2.9	3.3	3.1	2.9	2.9	2.8	2.8	2.7	2.6	2.6	2.6	2.5	2.6	2.8	2.8	2.8	2.7	3.3
5-Aug	2.9	Z	3.2	3.8	3.9	3.5	3.4	3.7	3.6	3.9	3.2	3.1	2.6	2.5	2.4	2.4	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.9	3.9
6-Aug	2.6	Z	2.6	2.6	2.6	2.6	2.8	2.8	2.7	2.4	2.2	2.1	2.1	2.0	2.0	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.2	2.8
7-Aug	1.8	Z	2.4	2.2	2.2	2.2	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	2.6	2.8	2.6	2.1	2.8
8-Aug	2.1	Z	2.4	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.1	2.4
9-Aug	1.9	Z	2.2	2.2	2.2	2.2	2.3	2.5	2.5	2.1	2.1	2.2	2.3	2.2	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.1	2.4	2.1	2.5
10-Aug	2.0	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	2.0	2.3
11-Aug	1.8	Z	2.1	2.1	2.1	2.1	2.1	2.0	1.9	2.0	2.0	1.9	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	UO	2.3	2.4	2.0	2.4
12-Aug	2.3	Z	2.5	2.6	2.7	2.8	2.4	2.3	2.8	2.4	2.2	2.0	1.9	1.8	UO	UO	1.8	UO	UO	UO	UO	UO	UO	1.8	--	2.8
13-Aug	UO	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.4	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	4.1	4.7	5.0	3.2	2.6	5.0
14-Aug	2.6	Z	4.1	2.8	2.7	2.9	2.9	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.7	2.9	2.7	2.5	4.1
15-Aug	2.5	Z	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.5
16-Aug	2.4	Z	2.5	2.5	2.5	2.5	2.5	2.4	3.6	3.1	2.7	2.5	2.5	2.4	2.5	2.3	2.4	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.6	3.6
17-Aug	2.4	Z	2.4	2.4	2.7	3.5	3.7	2.6	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.7	3.6	4.1	3.4	2.6	2.7	4.1
18-Aug	2.3	Z	2.4	2.5	2.4	2.4	2.4	2.5	2.9	3.0	2.9	2.6	2.8	2.9	2.7	3.0	2.9	2.6	2.4	2.3	2.3	2.3	2.3	2.7	2.6	3.0
19-Aug	2.6	Z	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.1	PF	PF	PF	PF	PF	PF	PF	PF	2.4	2.4	2.5	2.3	--	2.6
20-Aug	2.3	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.9	2.6	2.3	2.9
21-Aug	2.5	Z	2.5	2.4	2.6	2.6	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	2.3	2.3	2.3	2.4	2.3	2.6
22-Aug	2.6	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.7	2.6	2.3	2.7
23-Aug	2.5	Z	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.8	2.8	2.8	2.4	2.8
24-Aug	2.7	Z	3.2	3.8	3.9	3.9	2.8	2.5	2.8	2.5	2.3	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.7	3.9
25-Aug	2.5	Z	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.7	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.6	2.5	2.5	2.5	2.5	2.7
26-Aug	2.6	Z	2.5	2.4	2.4	2.3	2.3	2.4	2.4	C	C	C	C	C	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6
27-Aug	2.2	Z	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.2	2.3	2.4
28-Aug	2.2	Z	2.5	2.4	2.3	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.5	2.4	2.3	2.6
29-Aug	2.5	Z	2.7	2.5	2.4	2.3	2.3	2.6	2.5	2.3	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.4	2.4	2.7
30-Aug	2.4	Z	3.0	2.9	2.8	3.1	3.1	2.7	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.5	2.3	3.3	3.1	2.8	2.8	2.6	3.3
31-Aug	2.6	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.6	2.5	2.2	2.2	2.4	2.8	2.6	2.4	2.2	2.2	2.2	2.3	2.8
	2.4	--	2.5	2.5	2.5	2.6	2.5	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.4	Diurnal Average	
	2.9	--	4.1	3.8	3.9	3.9	3.7	3.7	3.6	3.9	3.2	3.1	2.9	2.9	2.8	3.0	2.9	2.6	2.8	2.7	4.1	4.7	5.0	3.2	Diurnal Maximum	

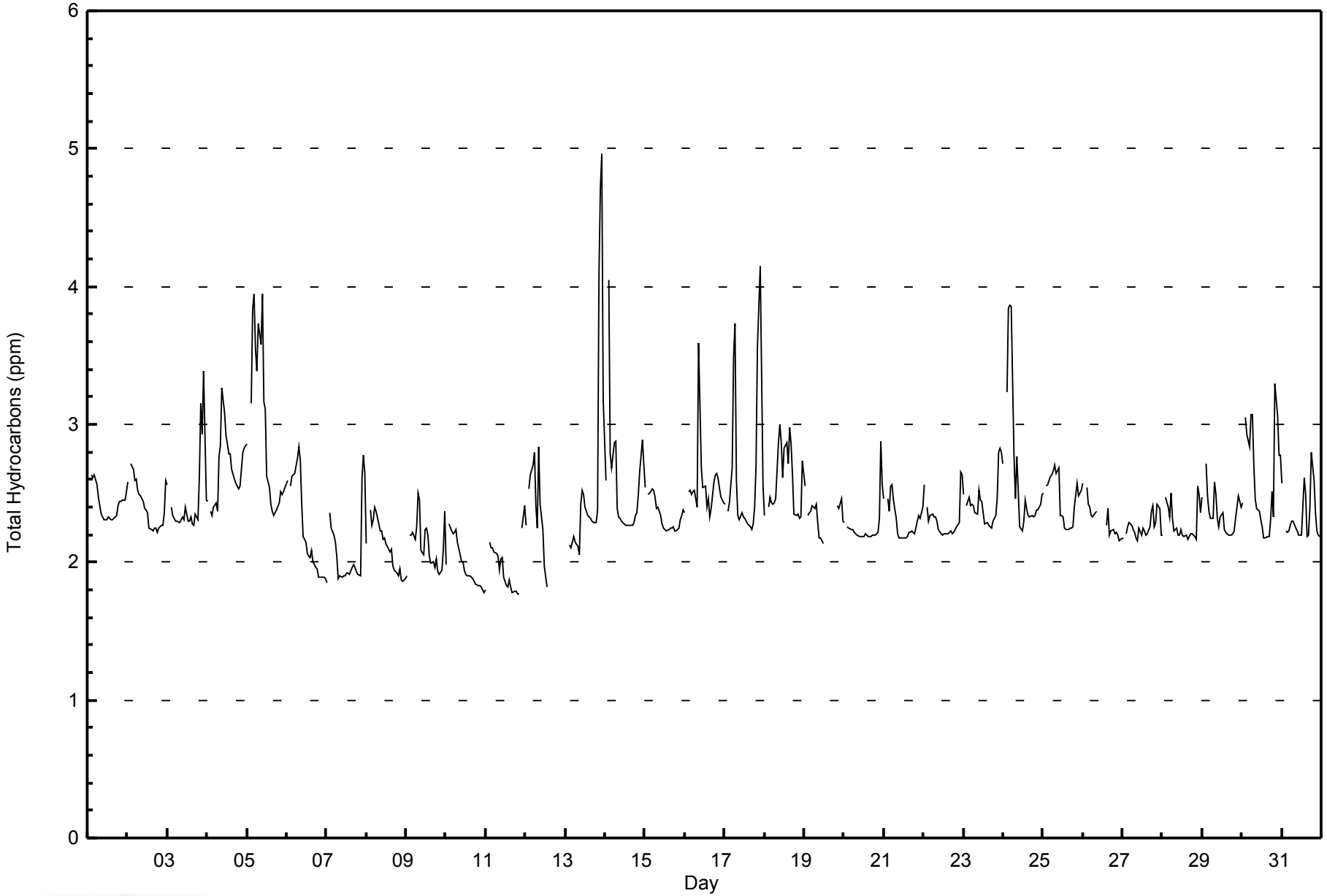
Z - zerospan C - Calibration UO - Unstable Operation PF - Power Failure

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

CNRL Horizon - August 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	79	11.45	11.45
2.1 - 3.0	577	83.62	95.07
3.1 - 10.0	34	4.93	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 690

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

CNRL Horizon - August 2014

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	8	5	0	2	0	4	1	3	6	11	8	10	10	5	5	1	79
2.1 - 3.0	52	49	16	9	10	15	21	47	81	82	59	26	26	37	28	18	576
3.1 - 10.0	0	3	1	0	1	0	0	4	4	2	2	3	1	5	3	5	34
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	57	17	11	11	19	22	54	91	95	69	39	37	47	36	24	689

Total Number of Valid Hours: 689

Total Number of Hours: 744

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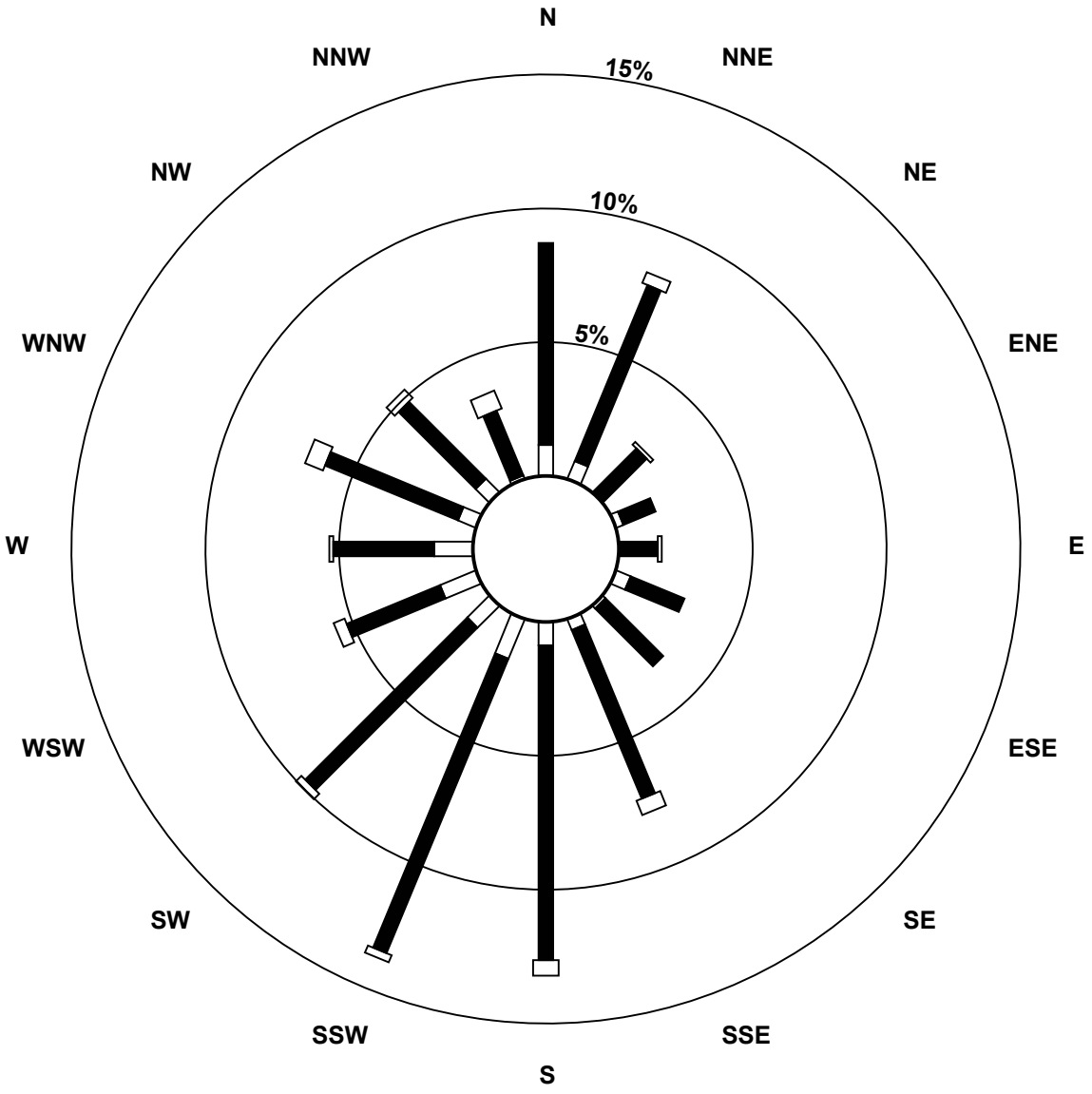
Wood Buffalo Environmental Association

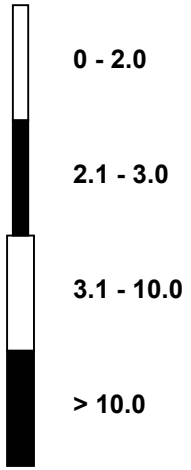
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

CNRL Horizon (AMS 15)



Classes (ppm)



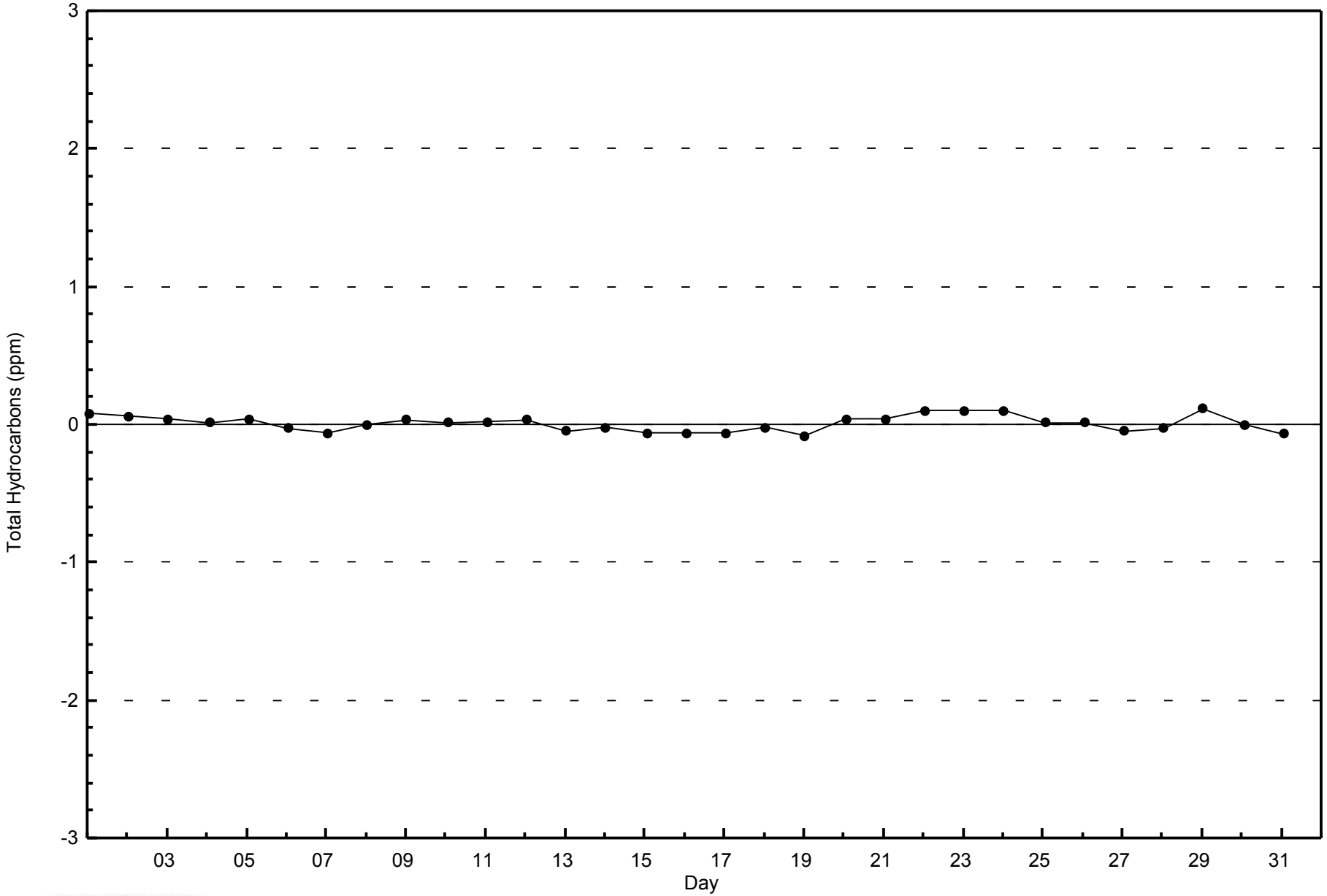
Total Number of Valid Hours: 689

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

CNRL Horizon - August 2014



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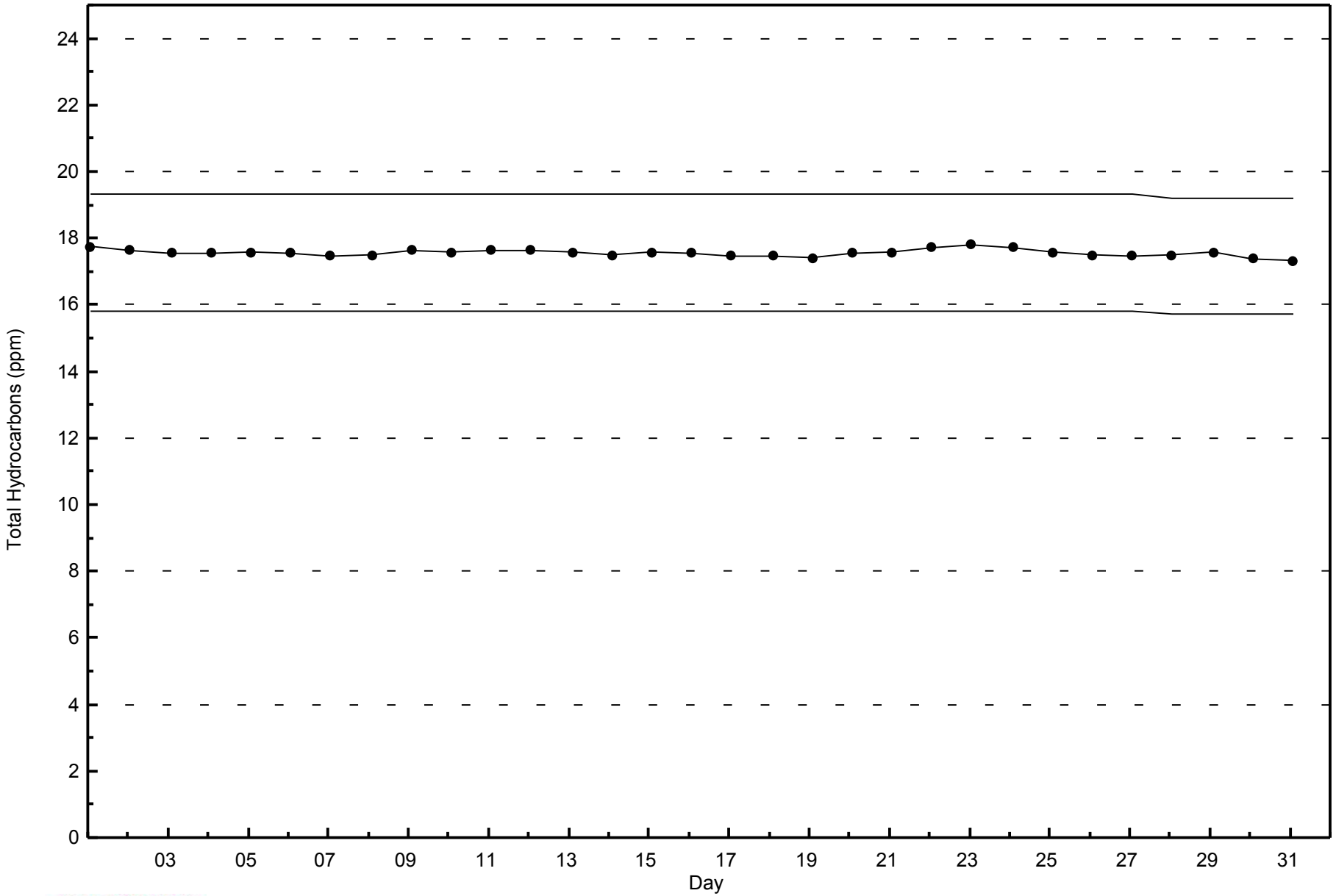
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

CNRL Horizon - August 2014

Maximum Value: 61 ppb on Aug 24 09:00

Maximum Daily Average: 15.6 ppb on Aug 24

Minimum Value: 0 ppb on Aug 14 20:00

Minimum Daily Average: 0.3 ppb on Aug 26

Maximum Diurnal Average: 6.0 ppb at hour 9

Minimum Diurnal Average: 0.3 ppb at hour 20

Monthly Average: 2.3 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 5$ $P_{99} = 32$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	36
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	0	Z	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0.4	2
2-Aug	0	Z	1	1	1	2	2	4	4	2	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.9	4
3-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	0	0.5	3
4-Aug	0	Z	0	0	0	1	1	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	5
5-Aug	0	Z	1	9	16	8	6	8	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2.6	16
6-Aug	0	Z	0	0	0	0	1	1	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0.4	1
7-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	3	0.5	4
8-Aug	0	Z	0	0	0	3	4	6	5	5	3	2	2	1	1	1	0	0	0	0	0	0	0	0	1.6	6
9-Aug	0	Z	0	0	0	0	0	2	2	1	2	2	2	2	1	1	1	0	1	0	0	0	1	7	1.2	7
10-Aug	1	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
11-Aug	0	Z	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	4	0.5	4
12-Aug	1	Z	1	1	3	7	3	13	33	10	5	2	1	0	0	0	0	0	0	0	0	0	0	0	3.6	33
13-Aug	0	Z	0	1	1	2	6	4	1	M	2	1	0	0	0	0	0	0	0	0	9	16	21	2	3.0	21
14-Aug	0	Z	2	0	0	4	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.8	9
15-Aug	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1
16-Aug	0	Z	12	14	6	3	1	4	8	9	6	3	2	0	1	0	0	0	0	0	0	0	0	0	3.1	14
17-Aug	0	Z	1	4	4	8	22	8	4	2	2	1	1	0	0	0	0	0	1	1	20	35	27	2	6.3	35
18-Aug	0	Z	0	0	0	0	1	2	22	16	17	8	8	6	1	3	2	1	0	0	0	0	0	5	4.0	22
19-Aug	5	Z	0	0	0	1	0	1	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	1	1	0	0	0	--	5
20-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	6	2	0.8	6
21-Aug	0	Z	0	0	6	5	5	12	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1.7	12
22-Aug	3	Z	2	0	1	1	1	2	3	3	1	1	1	1	1	1	1	0	1	1	0	0	13	28	2.8	28
23-Aug	11	Z	3	7	2	2	2	2	2	7	5	5	3	1	1	1	1	1	1	1	0	8	16	31	4.8	31
24-Aug	21	Z	30	59	57	50	14	36	61	8	1	1	4	6	4	2	1	1	1	1	1	0	0	0	15.6	61
25-Aug	0	Z	1	1	1	2	7	8	7	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1.5	8
26-Aug	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0.3	0
27-Aug	0	Z	0	0	0	0	0	1	1	0	1	1	1	1	0	0	1	1	1	1	1	2	0	0	0.6	2
28-Aug	0	Z	1	1	1	7	4	1	3	2	1	1	1	1	1	1	2	2	1	1	0	0	0	1	1.5	7
29-Aug	5	Z	16	4	1	0	3	23	16	4	2	2	3	2	1	1	1	1	1	1	1	1	1	1	3.9	23
30-Aug	1	Z	18	21	19	21	16	4	1	0	1	1	1	0	0	0	0	1	1	0	0	0	1	4	4.9	21
31-Aug	1	Z	0	0	0	1	1	1	0	1	1	0	0	1	1	0	1	1	1	1	0	0	0	0	0.5	1
	1.8	--	3.1	4.2	4.0	4.2	3.7	4.8	6.0	2.9	2.0	1.3	1.2	0.9	0.6	0.5	0.5	0.4	0.4	0.3	1.2	2.3	3.0	3.1	Diurnal Average	
	21	--	30	59	57	50	22	36	61	16	17	8	8	6	4	3	2	2	1	1	20	35	27	31	Diurnal Maximum	

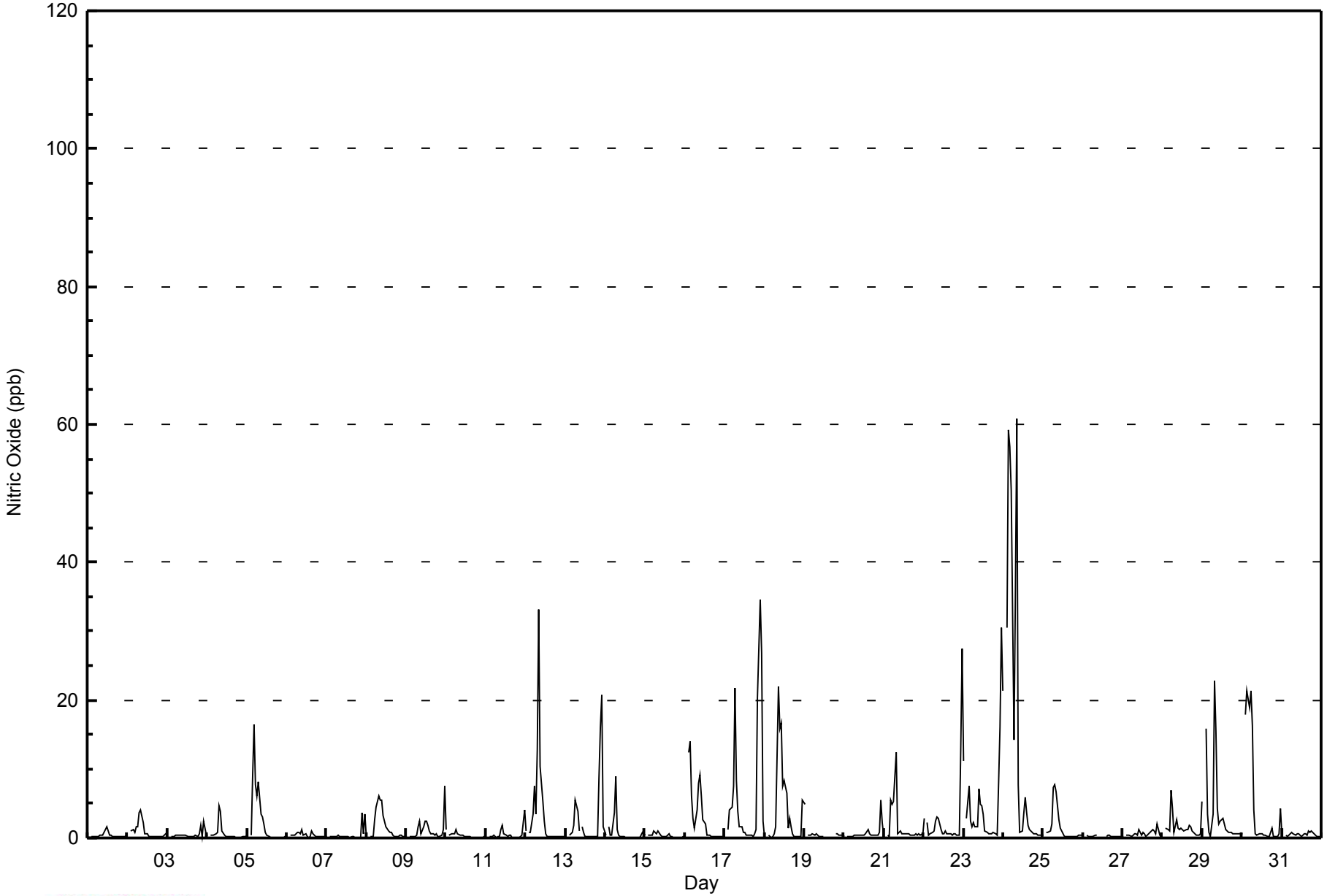
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	682	97.43	97.43
21 - 40	14	2.00	99.43
11 - 80	4	0.57	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

CNRL Horizon - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	60	55	17	10	11	19	27	57	90	94	68	37	37	46	35	18	681
21 - 40	0	2	0	1	0	0	0	0	0	1	1	2	0	2	2	3	14
11 - 80	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	4
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	57	17	11	11	19	27	57	90	96	69	39	37	48	37	24	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

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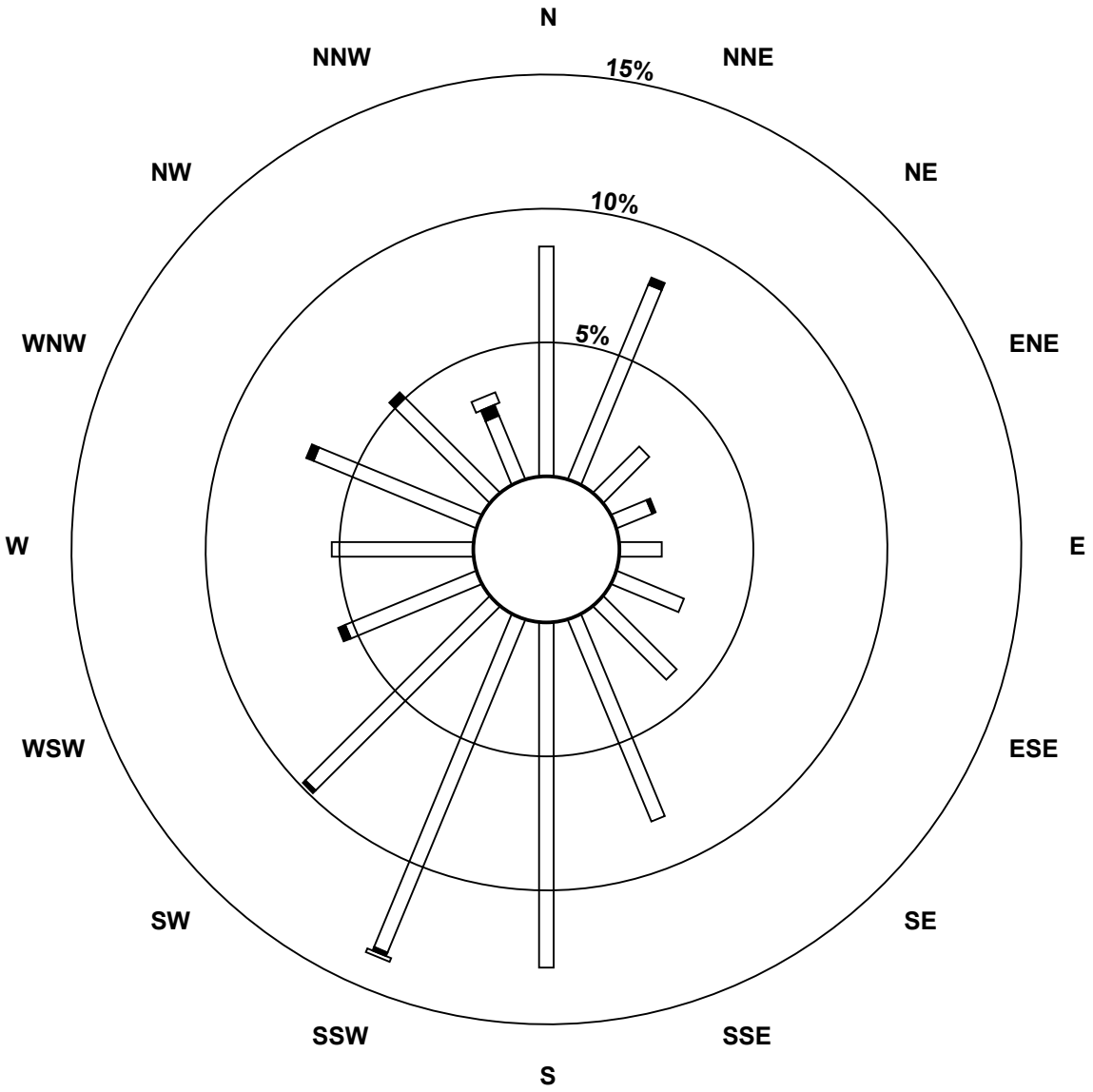
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

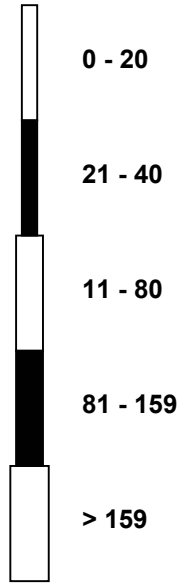
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



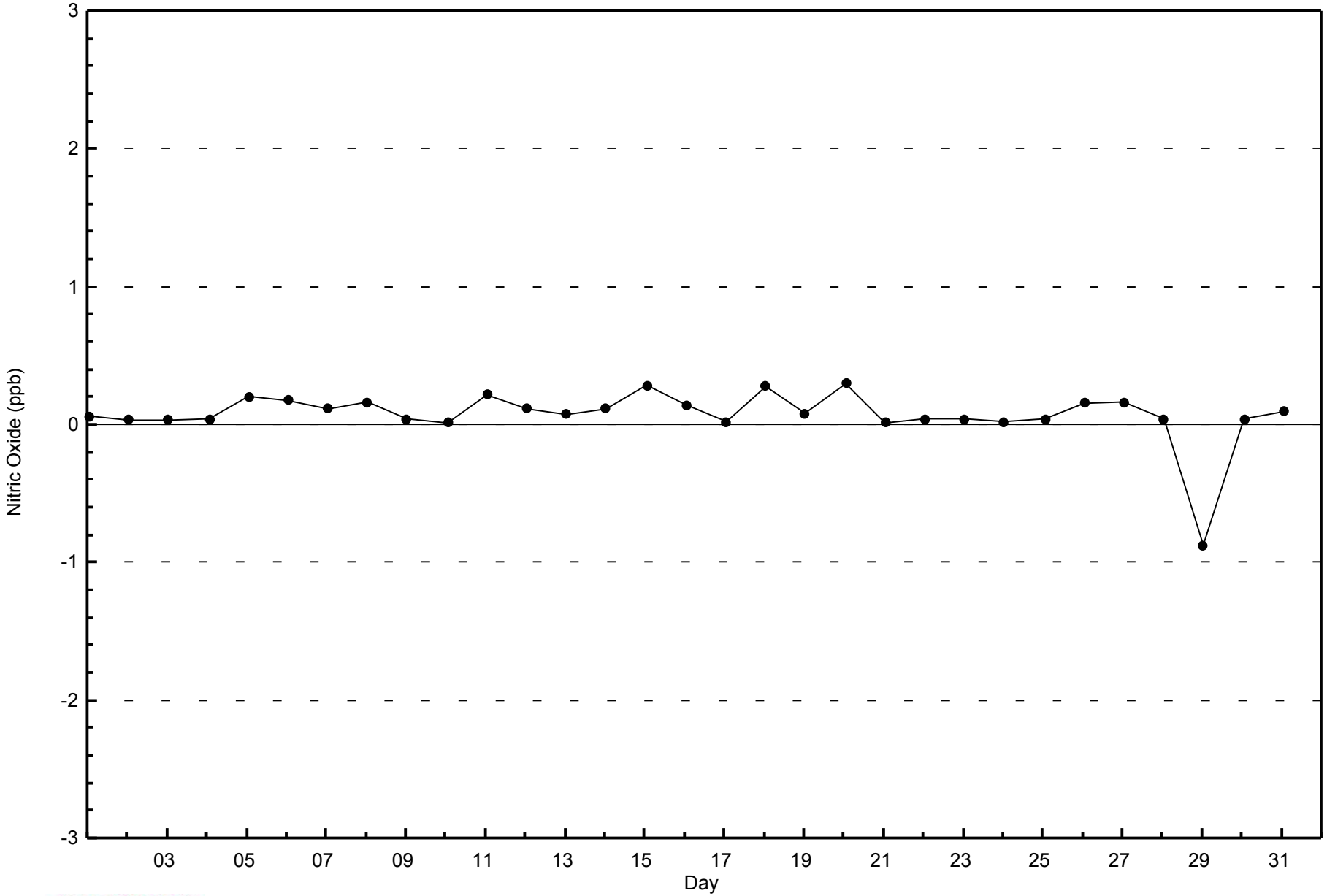
Total Number of Valid Hours: 699

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

CNRL Horizon - August 2014



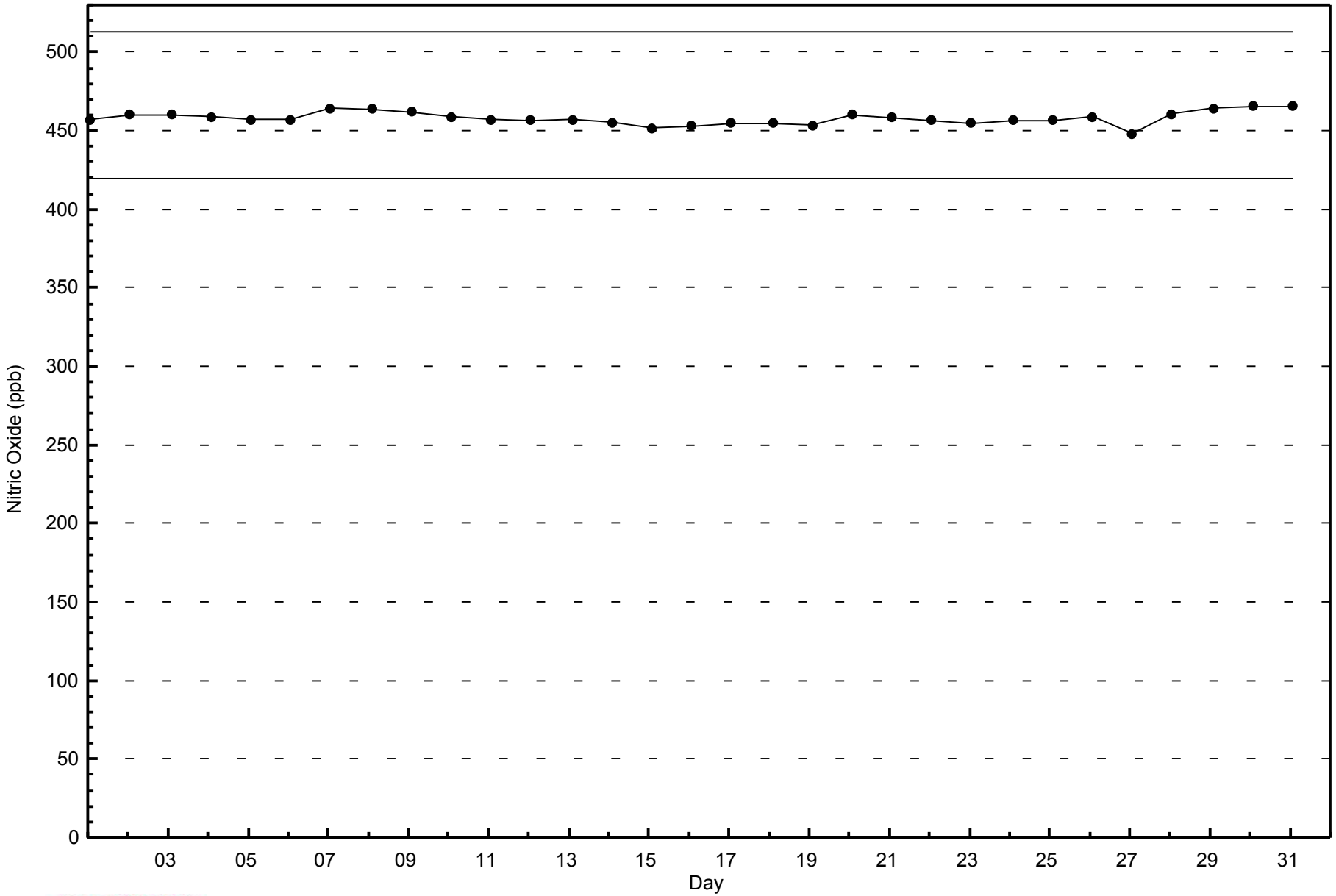
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 38 ppb on Aug 23 23:00 Maximum Daily Average: 11.5 ppb on Aug 17

Minimum Value: 0 ppb on Aug 6 20:00
Maximum Diurnal Average: 7.5 ppb at hour 23
Monthly Average: 4.3 ppb

Minimum Daily Average: 0.3 ppb on Aug 10
Minimum Diurnal Average: 2.1 ppb at hour 17
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 2 $Q_3 = 6$ $P_{90} = 11$ $P_{99} = 28$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	36
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	Z	1	1	2	1	1	1	1	0	1	3	2	1	1	1	1	1	2	2	2	3	3	4	1.5	4
2-Aug	2	Z	4	4	2	3	3	6	7	4	1	2	3	1	0	0	1	1	1	4	3	3	3	7	2.8	7
3-Aug	6	Z	1	1	0	1	0	0	0	1	1	2	1	1	2	1	1	3	1	7	17	12	11	3	3.1	17
4-Aug	4	Z	1	1	1	1	2	5	11	9	5	3	3	3	3	3	2	2	2	2	2	10	11	9	4.1	11
5-Aug	8	Z	11	10	9	7	5	16	15	18	16	11	6	4	3	2	2	3	2	2	2	3	4	4	7.1	18
6-Aug	2	Z	3	2	2	2	3	4	3	4	1	3	1	1	0	6	3	2	1	0	0	0	0	1	1.9	6
7-Aug	0	Z	3	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	6	12	1.4	12
8-Aug	4	Z	4	2	1	3	4	6	5	6	5	4	4	4	3	4	1	0	0	0	1	0	0	0	2.7	6
9-Aug	0	Z	0	0	0	0	2	3	3	0	1	3	2	3	1	1	1	0	1	0	1	3	4	4	1.5	4
10-Aug	3	Z	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.3	3
11-Aug	0	Z	0	0	1	1	0	0	0	2	3	1	0	0	1	1	0	0	0	0	1	1	5	8	1.1	8
12-Aug	8	Z	10	6	6	4	3	8	16	14	10	6	3	2	1	2	2	1	1	1	1	0	3	3	4.8	16
13-Aug	3	Z	3	4	4	3	4	5	3	M	7	4	2	1	1	1	1	1	1	2	29	28	25	16	6.6	29
14-Aug	8	Z	16	7	7	9	9	4	1	1	1	1	1	1	1	1	1	1	3	3	8	10	12	9	4.8	16
15-Aug	5	Z	2	1	1	2	1	1	2	2	1	1	1	1	2	1	1	0	0	0	1	2	2	3	1.4	5
16-Aug	4	Z	25	19	16	8	3	7	17	20	17	11	11	4	6	4	2	2	3	2	2	1	1	1	8.0	25
17-Aug	1	Z	6	14	19	21	22	15	9	5	5	2	2	1	1	1	1	1	7	22	35	33	30	11	11.5	35
18-Aug	1	Z	3	6	4	4	3	5	18	17	17	14	19	21	12	26	24	16	1	1	1	1	1	8	9.6	26
19-Aug	11	Z	1	0	1	1	0	1	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	2	3	1	3	2	--	11
20-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	9	11	7	1.3	11
21-Aug	10	Z	11	9	13	7	7	11	0	1	1	0	0	0	0	0	0	0	0	0	2	10	5	4	4.0	13
22-Aug	6	Z	7	2	2	3	2	3	4	5	2	1	0	2	0	0	0	0	0	0	1	3	9	10	2.8	10
23-Aug	7	Z	5	6	5	5	4	3	4	9	8	7	6	2	4	3	2	3	6	9	16	37	38	33	9.5	38
24-Aug	25	Z	17	15	13	10	10	21	29	14	2	2	7	11	8	5	5	6	5	4	6	5	4	13	10.3	29
25-Aug	8	Z	8	8	8	6	7	8	7	5	3	2	2	1	1	0	1	0	1	7	2	7	10	11	4.8	11
26-Aug	12	Z	7	4	2	1	0	0	1	C	C	C	C	C	1	3	2	2	2	1	1	0	0	0	2.2	12
27-Aug	0	Z	1	1	1	0	0	1	1	0	2	1	2	1	0	1	2	6	9	13	12	13	7	0	3.1	13
28-Aug	0	Z	20	16	6	8	4	1	4	3	2	3	2	2	2	2	4	4	3	3	2	3	5	8	4.5	20
29-Aug	9	Z	18	5	2	1	2	5	7	5	3	4	6	5	3	3	2	3	3	6	9	10	15	10	5.8	18
30-Aug	9	Z	22	22	14	13	16	11	3	1	1	1	1	0	0	0	0	5	12	3	3	5	5	9	6.7	22
31-Aug	4	Z	1	1	1	2	1	0	0	1	1	0	0	5	7	0	2	3	6	4	1	0	0	0	1.7	7
	5.2	--	6.9	5.5	4.6	4.1	3.8	4.8	5.5	5.0	3.9	3.0	3.0	2.6	2.2	2.3	2.1	2.2	2.4	3.2	5.2	7.1	7.5	6.7	Diurnal Average	
	25	--	25	22	19	21	22	21	29	20	17	14	19	21	12	26	24	16	12	22	35	37	38	33	Diurnal Maximum	

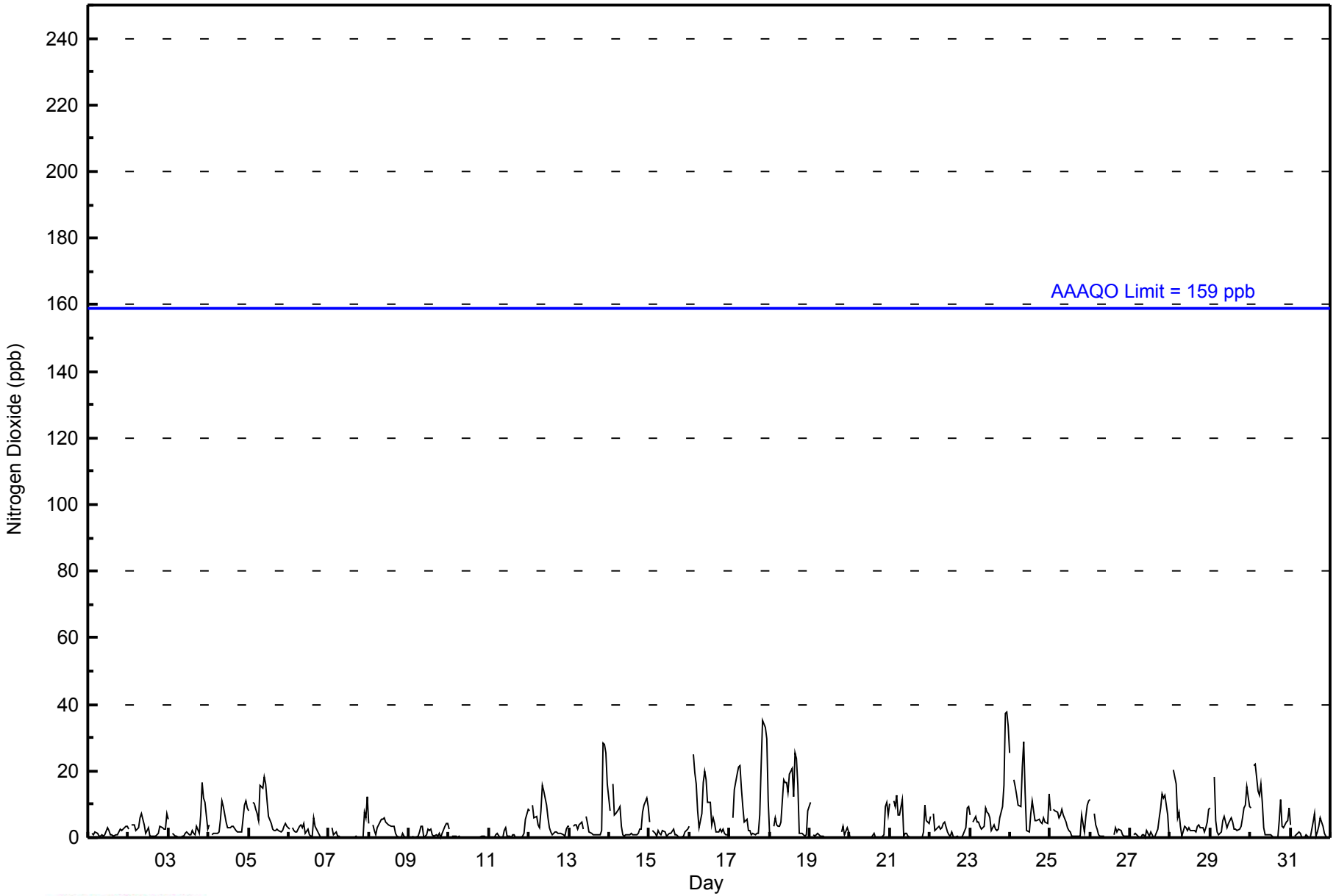
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	679	97.00	97.00
21 - 40	21	3.00	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: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	60	57	16	11	11	19	26	57	90	96	68	38	37	41	33	18	678
21 - 40	0	0	1	0	0	0	1	0	0	0	1	1	0	7	4	6	21
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	57	17	11	11	19	27	57	90	96	69	39	37	48	37	24	699

Total Number of Valid Hours: 699

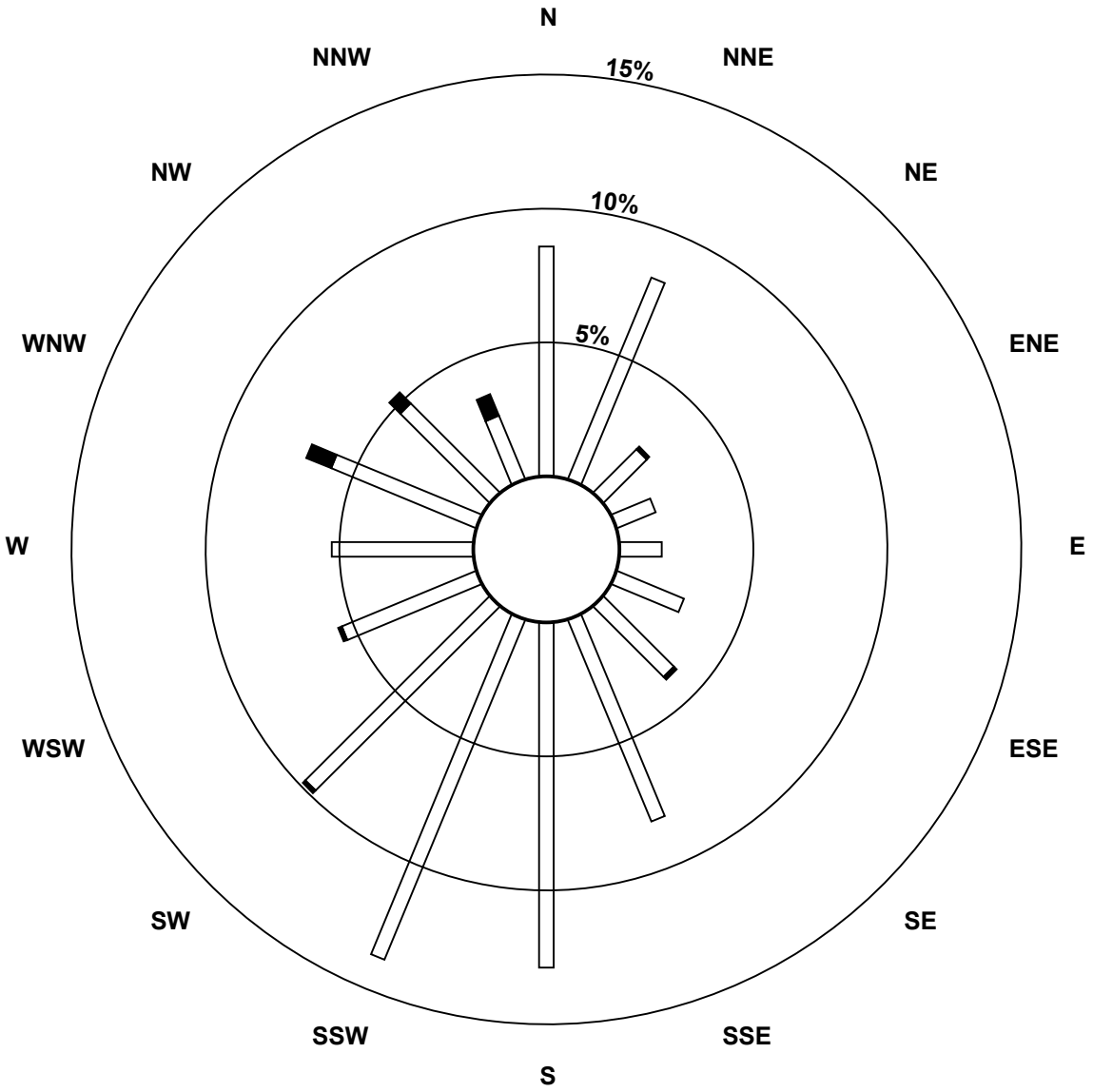
Total Number of Hours: 744

Wood Buffalo Environmental Association

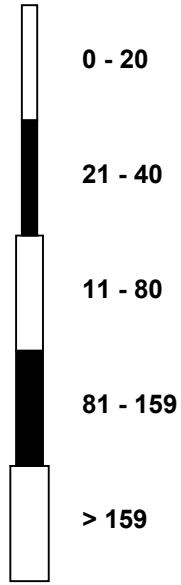
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



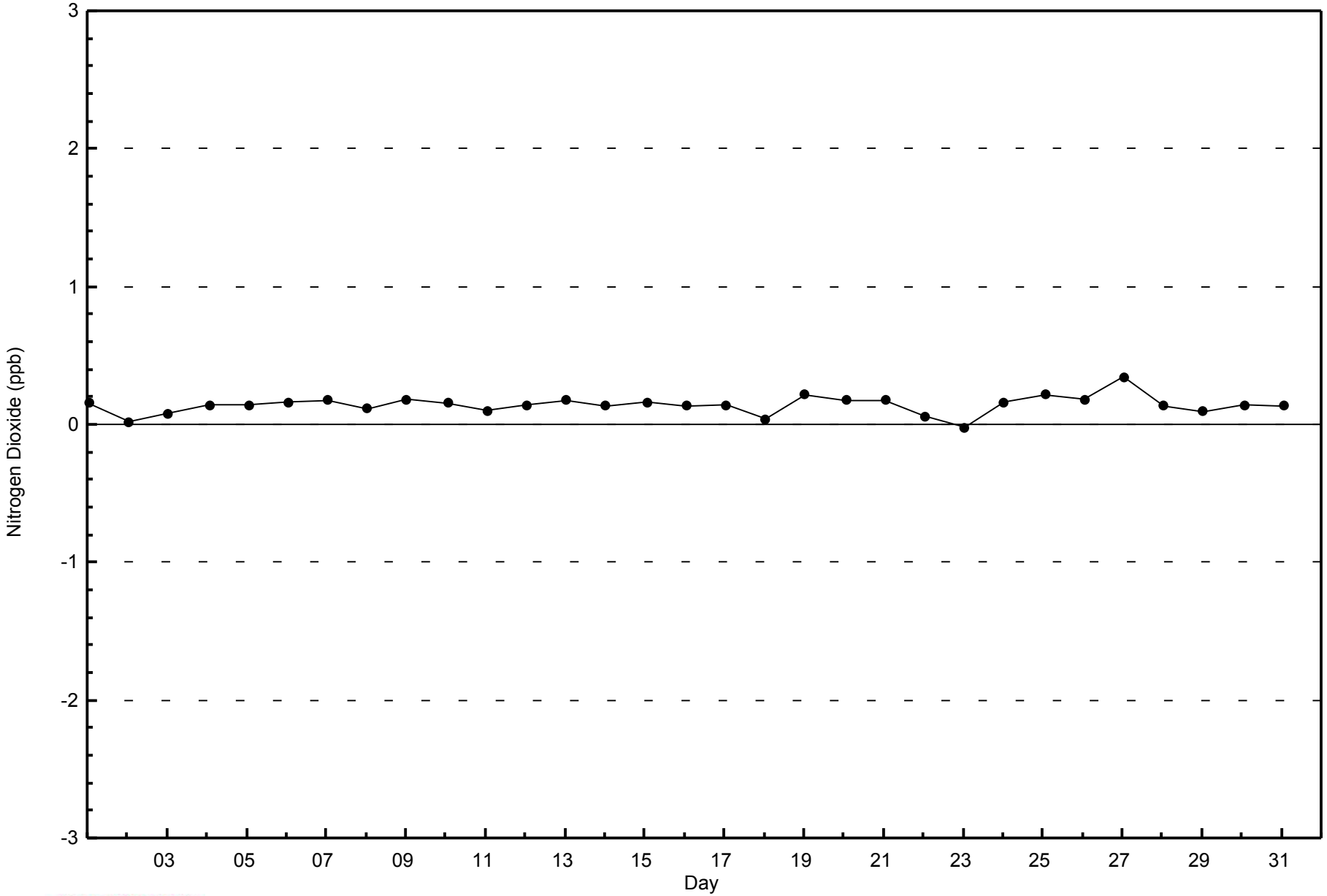
Total Number of Valid Hours: 699

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - August 2014



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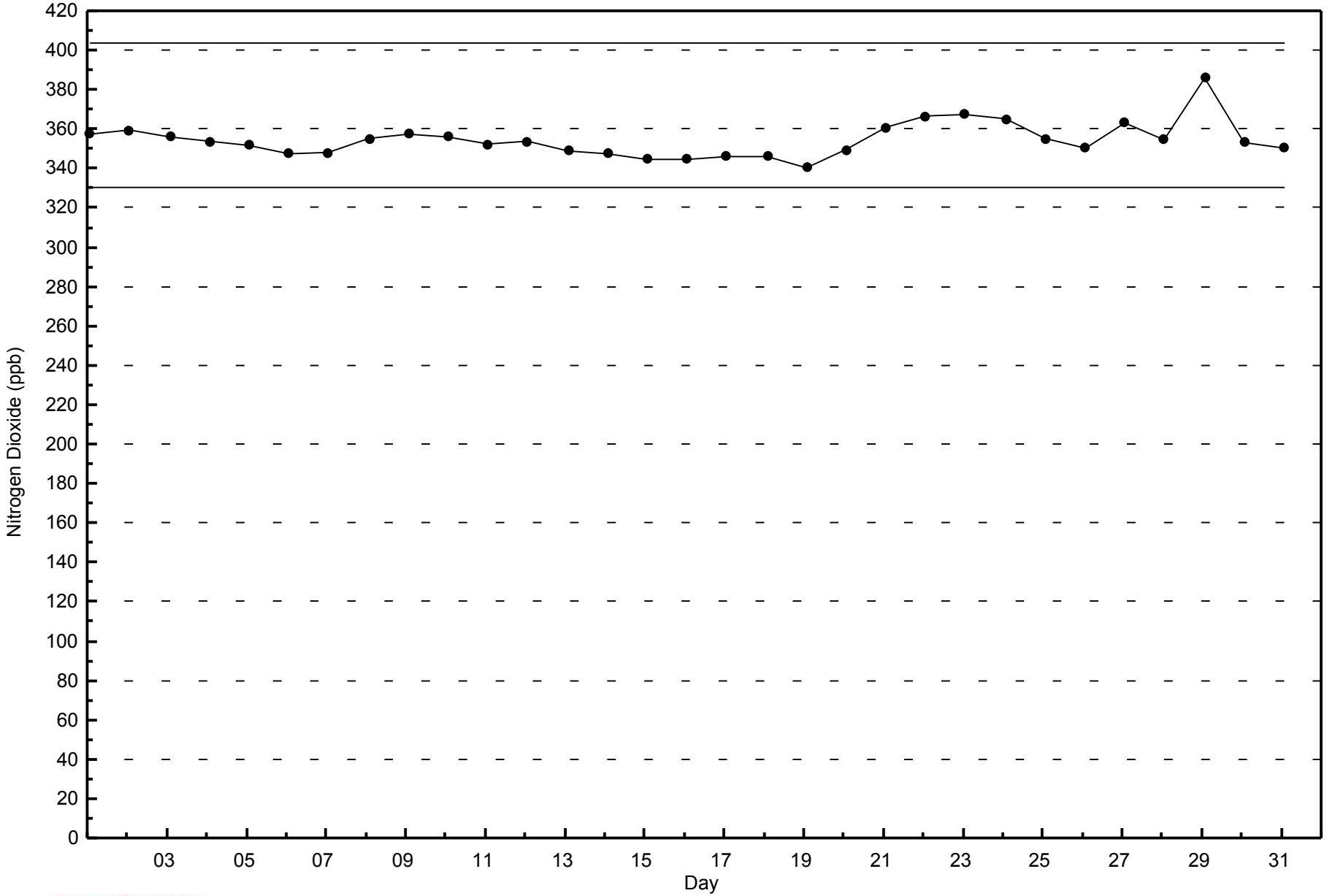
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - August 2014

Maximum Value: 90 ppb on Aug 24 09:00

Maximum Daily Average: 25.9 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 21:00

Minimum Daily Average: 0.7 ppb on Aug 10

Maximum Diurnal Average: 11.4 ppb at hour 9

Minimum Diurnal Average: 2.6 ppb at hour 17

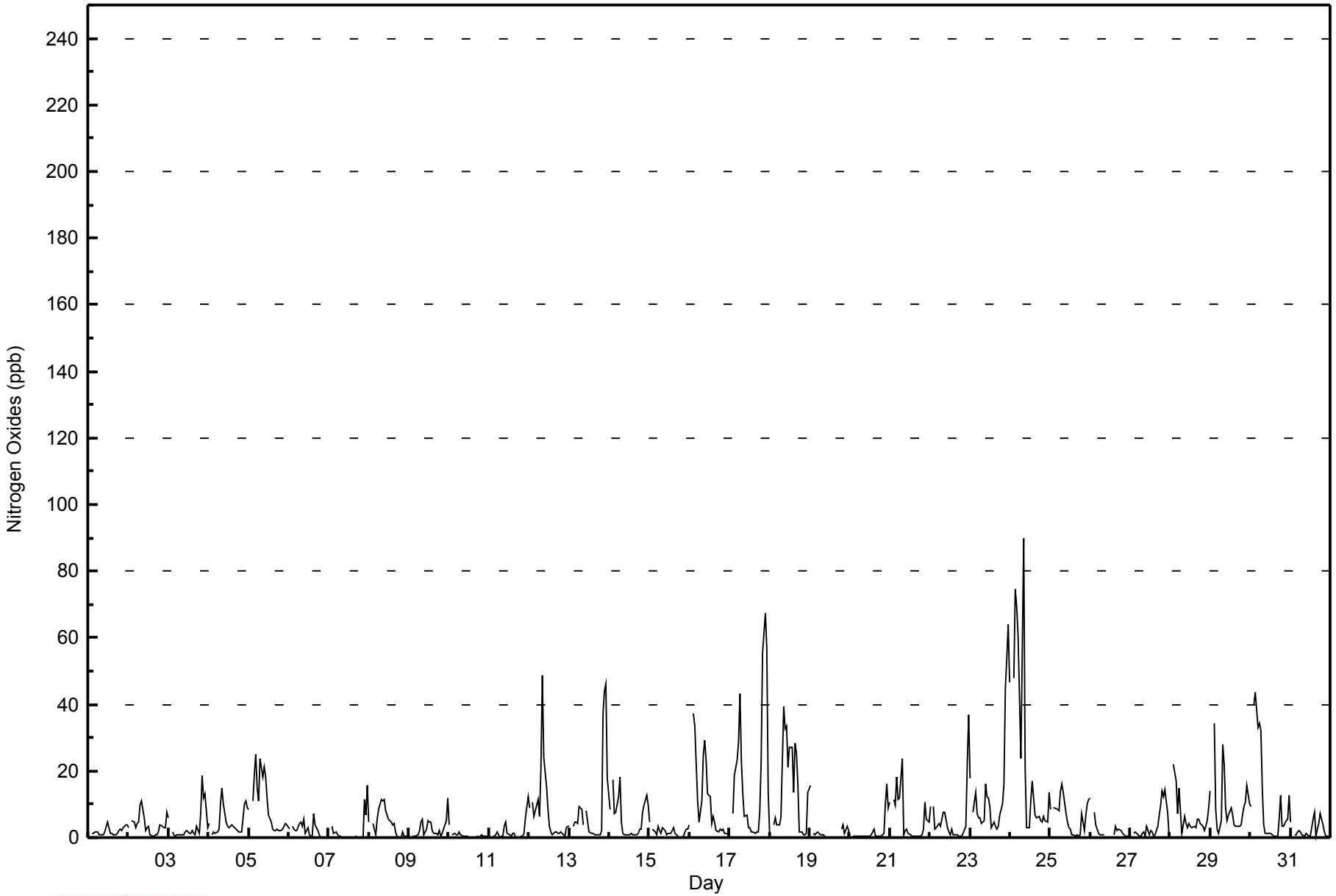
Monthly Average: 6.6 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 3 $Q_3 = 7$ $P_{90} = 16$ $P_{99} = 56$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	36
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	1	Z	1	1	2	2	1	1	1	1	2	5	3	1	1	1	1	1	2	3	2	3	4	4	1.8	5
2-Aug	3	Z	5	5	3	4	4	10	11	6	2	3	3	1	1	1	1	1	2	4	3	3	3	8	3.7	11
3-Aug	6	Z	2	1	1	1	1	1	1	1	2	2	1	1	2	1	1	4	1	7	19	12	13	3	3.6	19
4-Aug	4	Z	1	2	1	2	2	10	15	10	5	3	3	3	4	3	2	2	2	2	2	10	11	9	4.7	15
5-Aug	8	Z	11	19	25	15	11	24	18	21	18	12	7	5	3	2	2	3	2	2	2	3	4	4	9.7	25
6-Aug	3	Z	3	2	2	2	4	5	3	5	1	3	1	1	0	7	4	2	1	0	0	0	0	1	2.3	7
7-Aug	0	Z	3	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	7	16	1.9	16
8-Aug	5	Z	4	2	1	5	8	12	11	11	8	7	6	5	4	4	2	0	0	0	2	1	0	0	4.3	12
9-Aug	1	Z	1	0	0	1	2	5	6	1	3	5	5	4	2	1	1	1	2	0	1	4	5	12	2.7	12
10-Aug	4	Z	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.7	4
11-Aug	0	Z	0	0	1	2	0	0	0	3	5	1	1	0	1	1	0	0	0	0	1	1	6	12	1.6	12
12-Aug	9	Z	11	6	10	11	7	21	49	24	15	9	4	2	1	2	2	1	1	2	1	0	3	3	8.4	49
13-Aug	4	Z	4	5	5	4	9	8	4	M	8	5	2	1	1	1	1	1	1	2	37	44	46	18	9.6	46
14-Aug	9	Z	18	7	8	12	18	5	1	1	1	1	1	1	1	1	1	1	3	3	8	10	13	10	5.7	18
15-Aug	5	Z	2	2	1	3	2	1	3	2	1	1	1	1	3	1	1	0	0	0	1	2	2	3	1.7	5
16-Aug	4	Z	37	33	22	11	5	11	25	29	23	13	12	4	6	4	2	2	3	2	3	1	1	1	11.1	37
17-Aug	1	Z	7	18	23	29	43	23	13	6	7	3	3	2	1	1	2	2	8	23	55	68	57	14	17.8	68
18-Aug	1	Z	4	6	4	4	4	6	39	32	33	21	27	27	14	28	25	16	1	2	1	1	1	14	13.6	39
19-Aug	16	Z	1	1	1	2	1	1	1	0	0	0	PF	PF	PF	PF	PF	PF	PF	3	4	1	3	2	--	16
20-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	1	10	16	9	2.1	16
21-Aug	11	Z	12	10	18	11	12	24	1	2	3	1	1	1	1	1	1	0	0	1	2	10	5	5	5.7	24
22-Aug	9	Z	9	2	3	4	3	5	7	7	3	2	1	3	1	1	1	0	1	1	1	3	22	37	5.5	37
23-Aug	18	Z	8	14	7	6	6	4	5	16	12	12	9	3	5	3	3	3	7	10	16	45	54	64	14.4	64
24-Aug	47	Z	48	74	69	60	24	57	90	21	3	3	11	17	12	7	6	6	5	5	6	5	4	14	25.9	90
25-Aug	8	Z	9	9	8	8	14	16	14	7	5	3	3	1	1	1	1	1	1	7	2	7	10	12	6.4	16
26-Aug	12	Z	8	4	3	1	1	1	1	C	C	C	C	C	1	3	2	3	2	1	1	1	1	1	2.5	12
27-Aug	0	Z	1	2	1	0	0	1	2	0	3	1	2	2	0	1	3	7	10	14	12	15	7	0	3.7	15
28-Aug	0	Z	22	17	7	15	8	1	6	4	3	4	3	3	3	3	5	6	4	3	2	3	5	9	6.0	22
29-Aug	14	Z	34	8	2	1	5	28	22	9	5	7	9	7	4	3	3	3	4	7	9	11	16	10	9.7	34
30-Aug	9	Z	40	43	33	34	32	15	4	1	1	1	1	1	1	0	0	6	13	3	3	5	6	13	11.6	43
31-Aug	4	Z	1	1	2	2	2	1	0	1	1	0	0	5	8	1	3	4	7	4	2	1	0	0	2.2	8
	7.0	--	9.9	9.6	8.6	8.3	7.5	9.6	11.4	7.8	5.8	4.3	4.2	3.5	2.8	2.8	2.6	2.6	2.8	3.6	6.5	9.4	10.5	9.9	Diurnal Average	
	47	--	48	74	69	60	43	57	90	32	33	21	27	27	14	28	25	16	13	23	55	68	57	64	Diurnal Maximum	

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


WBEA
Hourly Averages
Nitrogen Oxides (NO_X) - ppb
CNRL Horizon - August 2014
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	645	92.14	92.14
21 - 40	37	5.29	97.43
11 - 80	17	2.43	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	53	52	16	9	10	19	26	54	88	91	66	37	36	40	32	15	644
21 - 40	7	4	1	1	1	0	0	3	2	4	3	1	1	4	2	3	37
11 - 80	0	1	0	1	0	0	1	0	0	1	0	1	0	4	3	5	17
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	57	17	11	11	19	27	57	90	96	69	39	37	48	37	24	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

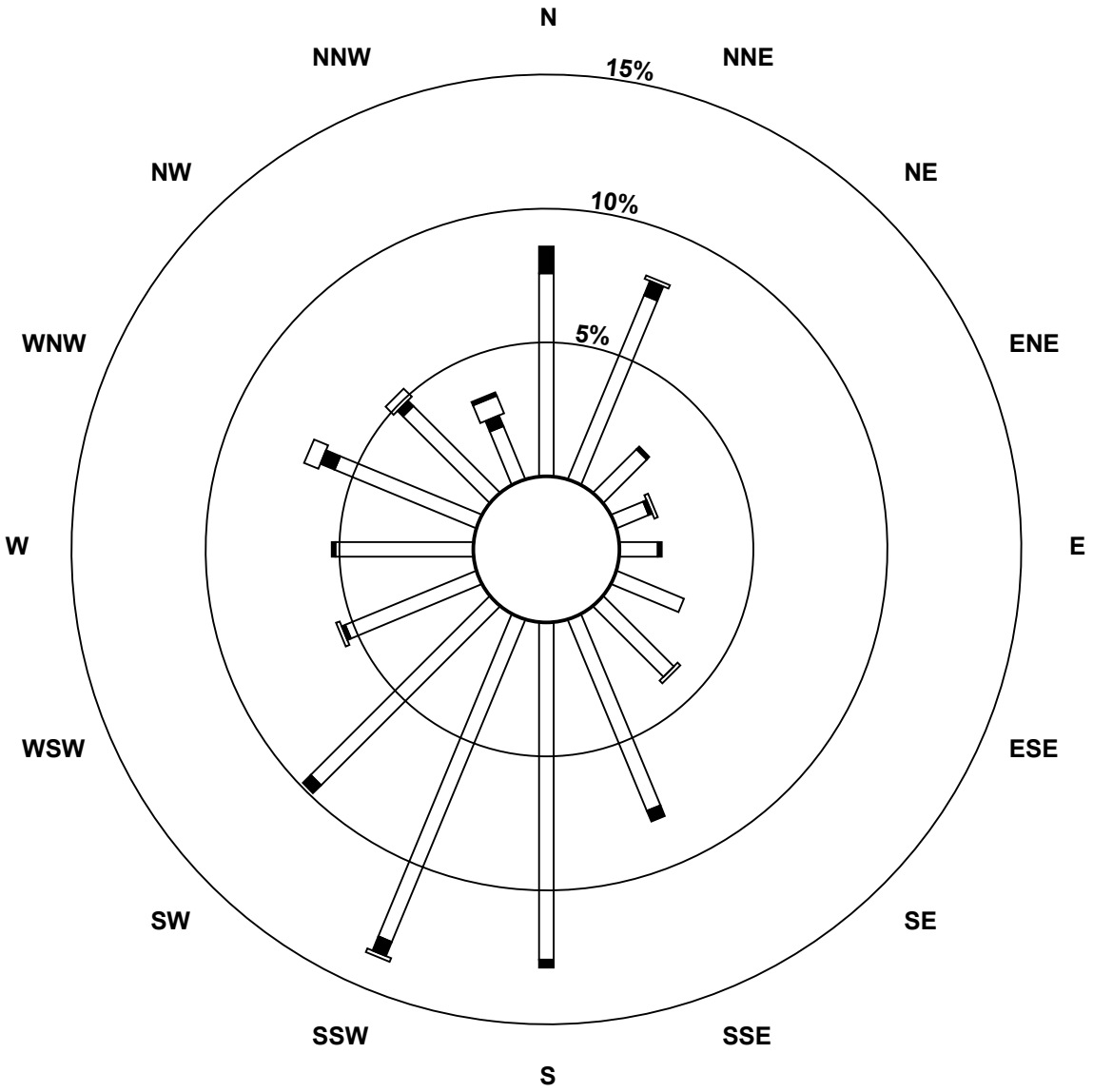
AURORA
ATMOSPHERICS INC.

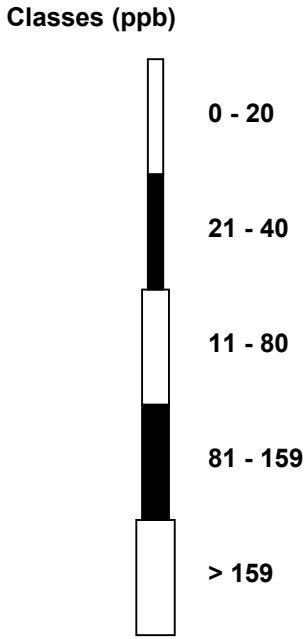
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon (AMS 15)

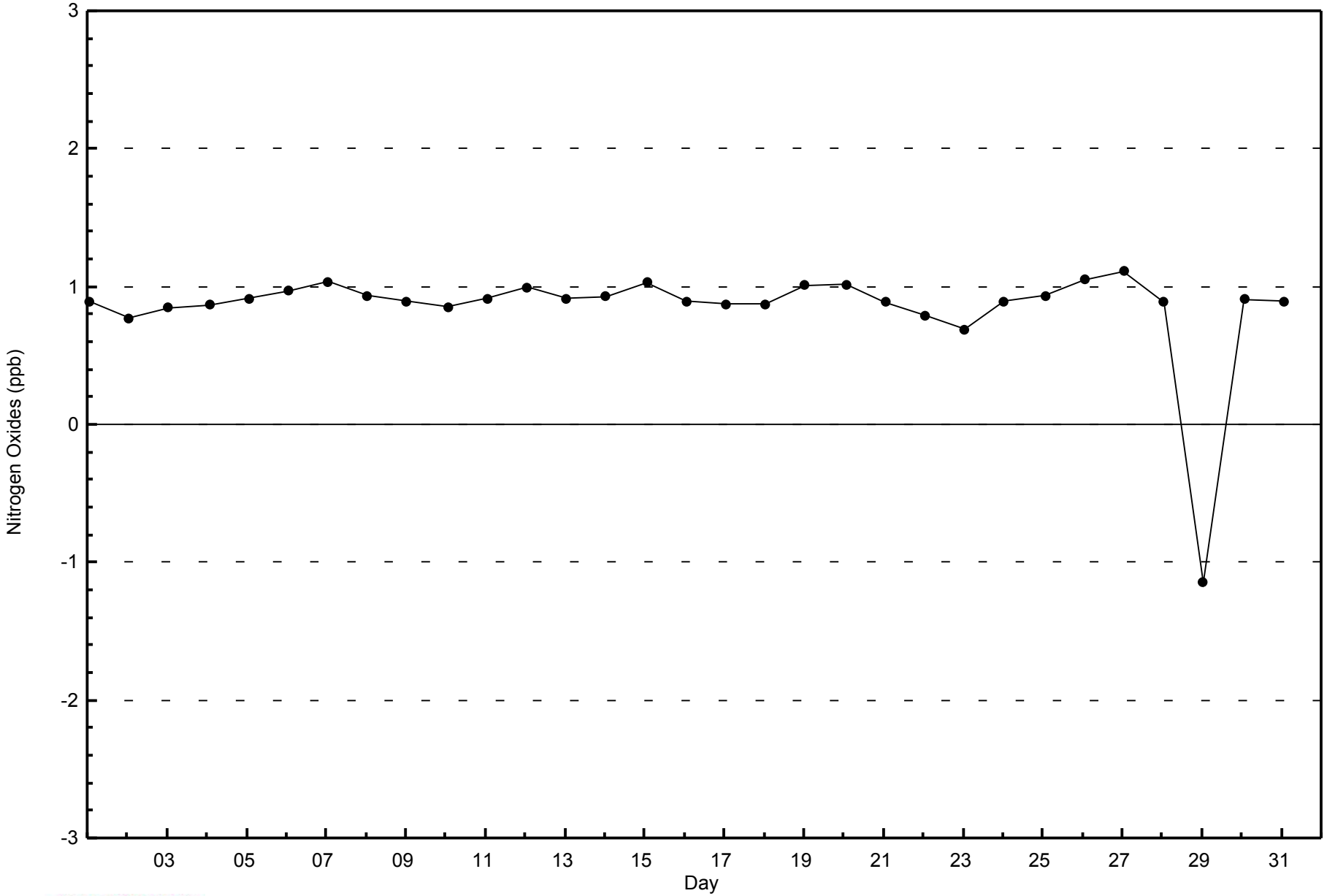




Total Number of Valid Hours: 699

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
CNRL Horizon - August 2014



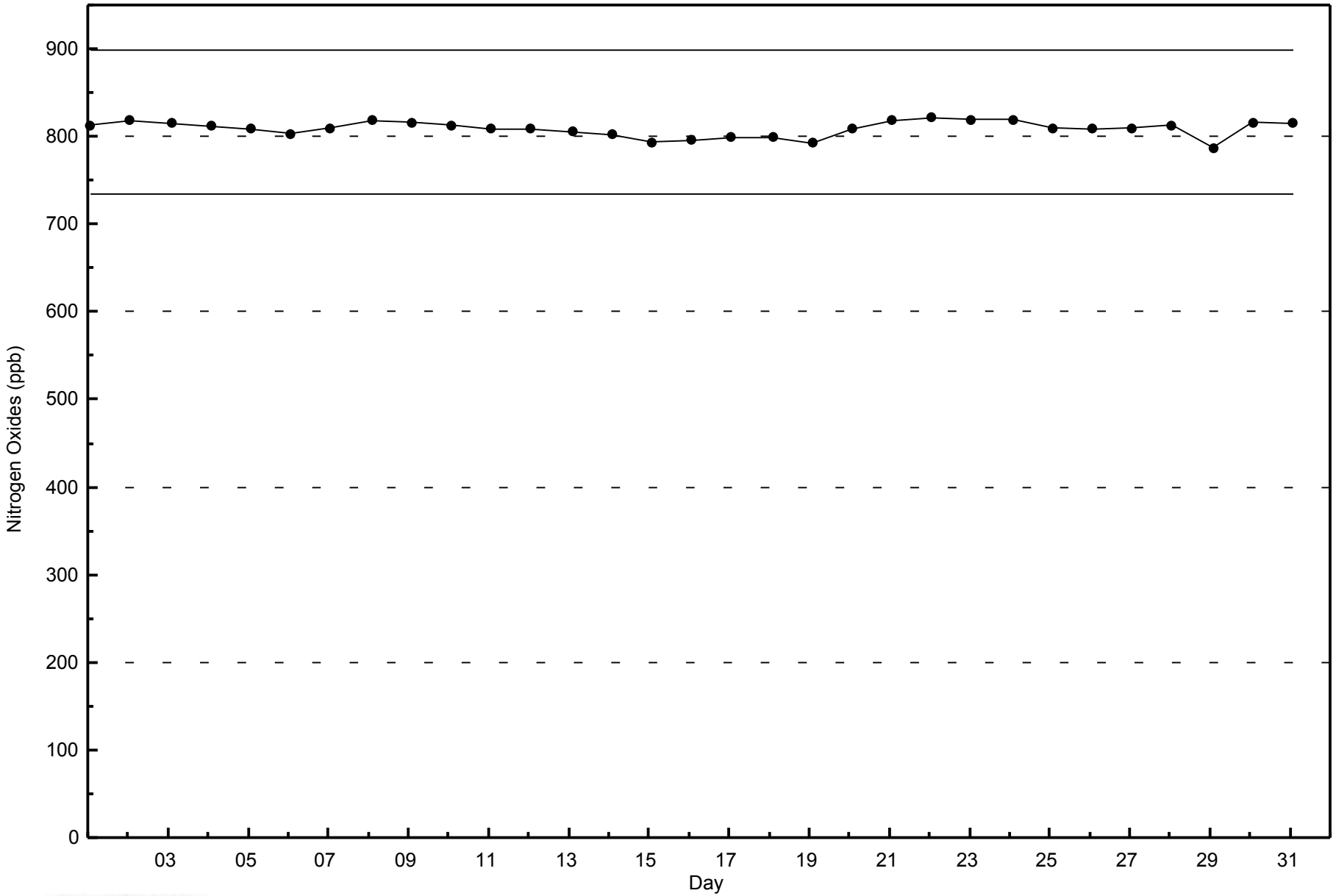
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - August 2014



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Number of Exceedences (AAAQO): 24-hr: 5

Maximum Value: 479.2 $\mu g/m^3$ on Aug 4 10:00

Maximum Daily Average: 160.9 $\mu g/m^3$ on Aug 4

Minimum Value: 1.5 $\mu g/m^3$ on Aug 28 10:00

Minimum Daily Average: 3.0 $\mu g/m^3$ on Aug 28

Maximum Diurnal Average: 33.6 $\mu g/m^3$ at hour 10

Minimum Diurnal Average: 16.7 $\mu g/m^3$ at hour 19

Monthly Average: 23.02 $\mu g/m^3$

Percentiles: P_1 = 1.8 P_{10} = 3.3 Q_1 = 5.9 Median = 10.7 Q_3 = 18.4 P_{90} = 42.1 P_{99} = 211.4

Hours in Service:	744
Hours of Data:	736
Hours of Missing Data:	8
Hours of Calibration:	0
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	91.7	102.5	98.4	83.4	78.3	64.2	46.8	40.1	31.4	23.7	23.4	22.7	21.4	19.1	17.9	17.1	17.5	18.0	19.8	21.2	23.7	25.2	27.0	30.0	40.2	102.5
2-Aug	32.4	31.1	28.7	27.6	25.7	23.8	22.0	19.1	16.5	17.9	20.3	25.6	29.1	22.1	19.0	16.2	19.7	19.6	9.8	13.0	13.0	13.8	15.3	15.3	20.7	32.4
3-Aug	14.6	13.6	14.1	13.7	12.7	11.8	11.5	9.9	8.8	8.6	8.9	11.9	10.7	9.9	13.1	11.1	9.1	15.5	9.5	12.7	18.0	15.6	21.8	14.8	12.6	21.8
4-Aug	14.8	15.4	15.4	14.6	15.2	15.2	12.9	13.4	72.9	479.2	341.7	273.5	254.1	239.9	253.9	218.5	192.0	186.2	186.3	194.2	207.3	212.7	215.4	216.6	160.9	479.2
5-Aug	213.1	211.8	206.3	188.7	185.8	186.5	182.7	186.8	180.3	203.8	224.6	197.2	160.6	140.9	105.9	61.5	49.8	46.6	52.4	60.0	52.5	42.1	40.4	50.4	134.6	224.6
6-Aug	53.4	39.4	27.7	31.1	23.3	18.0	14.1	10.7	9.4	7.1	5.9	6.6	5.9	6.5	7.5	14.5	20.0	19.8	18.4	17.9	18.7	19.6	19.6	18.4	18.0	53.4
7-Aug	15.7	35.6	62.2	171.0	169.3	152.9	101.0	18.6	3.8	2.3	2.1	2.0	2.0	2.0	1.9	2.1	2.1	2.0	2.0	2.1	2.1	3.0	3.4	2.9	31.8	171.0
8-Aug	2.8	3.2	3.0	2.9	3.3	8.8	5.7	4.2	5.5	7.4	6.9	7.9	8.1	9.2	9.7	8.8	6.6	5.5	6.6	8.0	7.7	7.4	7.2	7.3	6.4	9.7
9-Aug	7.0	6.2	5.7	5.4	5.2	4.6	4.6	6.0	5.9	4.7	4.9	5.6	7.0	8.8	7.8	7.1	7.3	7.5	7.1	9.3	10.8	8.5	9.8	8.9	6.9	10.8
10-Aug	8.1	8.0	8.3	8.9	8.7	9.3	9.5	8.8	7.8	6.8	5.7	4.6	3.6	3.6	3.6	4.1	4.3	4.4	4.4	5.1	5.3	7.5	10.9	16.4	7.0	16.4
11-Aug	18.6	19.3	18.4	17.9	16.8	15.3	12.6	9.3	7.7	6.8	4.3	2.1	1.8	1.8	2.0	2.8	3.0	2.8	2.8	3.0	9.6	14.4	18.8	36.6	10.3	36.6
12-Aug	46.8	62.7	63.7	55.2	58.4	50.6	54.2	51.6	52.6	59.4	40.3	28.6	30.3	23.7	11.3	9.6	9.6	8.8	7.3	7.2	8.5	9.8	12.7	15.3	32.4	63.7
13-Aug	16.0	16.3	16.8	16.9	16.9	16.2	15.9	14.2	16.9	11.9	10.9	10.7	9.5	8.8	8.8	8.7	9.7	10.5	11.0	12.8	21.0	22.5	23.6	21.2	14.5	23.6
14-Aug	17.6	10.4	11.4	10.8	20.9	24.1	20.3	23.8	26.5	43.1	46.3	31.2	22.3	17.4	13.9	13.0	13.1	14.1	17.4	42.2	61.7	60.9	58.7	54.9	28.2	61.7
15-Aug	51.1	41.9	22.4	15.0	12.0	10.9	10.3	9.2	9.4	7.0	5.1	4.4	4.5	4.5	4.9	4.1	8.9	13.8	11.1	9.6	11.4	11.2	13.3	15.4	13.0	51.1
16-Aug	16.9	26.8	30.9	29.9	27.8	28.5	26.5	27.6	27.0	29.1	42.8	55.1	54.4	42.8	44.8	29.5	17.2	12.9	14.6	13.8	15.1	16.1	17.1	18.5	27.7	55.1
17-Aug	18.7	19.8	15.3	10.5	9.3	10.1	10.7	8.5	6.6	6.2	6.1	4.3	4.4	3.8	3.8	5.5	5.5	7.2	8.4	11.9	19.9	21.4	16.6	12.8	10.3	21.4
18-Aug	9.1	9.9	24.9	13.2	12.4	10.4	10.4	13.3	21.8	19.4	16.7	17.8	20.3	26.6	33.5	34.5	34.8	32.1	13.9	14.4	14.3	13.9	14.0	14.9	18.6	34.8
19-Aug	15.0	13.5	12.1	12.3	13.8	16.3	17.2	15.0	9.9	7.4	6.6	6.0	PF	PF	PF	PF	PF	PF	PF	5.4	5.7	6.6	12.0	19.4	--	19.4
20-Aug	16.4	11.8	11.7	13.7	15.2	14.6	11.5	9.8	8.8	7.7	7.6	6.6	5.1	3.8	2.9	3.0	3.3	2.7	2.7	2.8	3.3	3.8	4.5	5.3	7.4	16.4
21-Aug	7.5	8.3	8.1	7.7	8.5	12.0	9.7	7.9	3.6	2.7	2.7	2.9	2.6	2.5	2.4	3.8	6.7	6.1	4.0	5.2	9.4	8.4	6.3	6.9	6.1	12.0
22-Aug	6.5	5.5	4.3	2.9	2.9	3.1	3.0	3.5	4.8	5.3	4.2	4.2	3.8	4.3	3.7	4.2	5.3	4.7	4.2	5.1	7.3	7.4	11.2	9.9	5.1	11.2
23-Aug	7.2	4.8	5.0	5.3	7.7	6.5	8.6	7.1	6.4	8.2	7.5	7.0	9.0	7.0	9.5	11.9	11.9	12.8	16.5	20.0	24.4	25.3	31.3	35.5	12.3	35.5
24-Aug	28.9	24.4	23.8	24.9	22.7	21.6	15.4	18.4	26.4	14.6	9.4	6.5	8.1	10.7	12.9	12.9	12.4	13.6	14.6	16.1	18.7	17.5	15.5	10.3	16.7	28.9
25-Aug	13.5	13.1	11.2	10.5	10.5	10.4	11.0	15.0	15.5	18.2	10.9	10.4	8.8	6.6	7.0	7.6	8.1	7.5	7.9	11.3	12.1	12.5	13.1	12.0	11.0	18.2
26-Aug	12.5	12.6	11.5	9.0	8.6	8.1	7.0	7.5	9.5	12.4	15.1	18.5	19.6	19.4	17.3	19.5	12.5	9.9	11.2	10.0	10.5	11.5	10.9	11.3	12.3	19.6
27-Aug	11.0	10.4	8.5	9.7	11.4	9.1	7.5	6.4	4.0	2.4	2.2	M	2.1	2.1	2.0	2.2	2.8	3.6	4.3	4.7	7.1	7.6	2.7	1.8	5.5	11.4
28-Aug	1.7	1.9	2.4	2.3	2.3	2.9	2.3	1.7	1.6	1.5	1.6	2.0	2.2	2.2	2.7	2.6	3.8	5.0	6.6	5.5	3.2	4.0	4.4	5.0	3.0	6.6
29-Aug	9.9	8.2	7.9	5.4	3.8	3.9	4.7	7.2	5.1	3.8	4.1	5.2	11.1	9.4	6.7	9.0	10.6	11.0	9.8	11.4	14.7	16.8	16.0	13.7	8.7	16.8
30-Aug	14.0	16.1	20.1	19.3	16.2	15.5	15.2	12.2	10.4	10.3	11.3	8.8	6.1	5.2	5.1	5.7	6.5	8.1	10.7	10.4	12.3	11.8	11.5	10.6	11.4	20.1
31-Aug	7.3	6.4	5.5	4.8	4.5	4.6	4.4	4.0	4.2	3.6	3.4	3.0	3.2	4.8	5.6	4.4	4.1	4.4	4.7	4.6	4.8	2.8	2.7	2.4	4.3	7.3
	25.8	26.2	26.0	27.2	26.8	25.5	22.2	19.1	20.0	33.6	29.1	26.4	24.4	22.3	21.4	18.5	17.3	17.2	16.7	18.4	21.1	21.3	22.2	23.1	Diurnal Average	
	213.1	211.8	206.3	188.7	185.8	186.5	182.7	186.8	180.3	479.2	341.7	273.5	254.1	239.9	253.9	218.5	192.0	186.2	186.3	194.2	207.3	212.7	215.4	216.6	Diurnal Maximum	

M - Maintenance PF - Power Failure

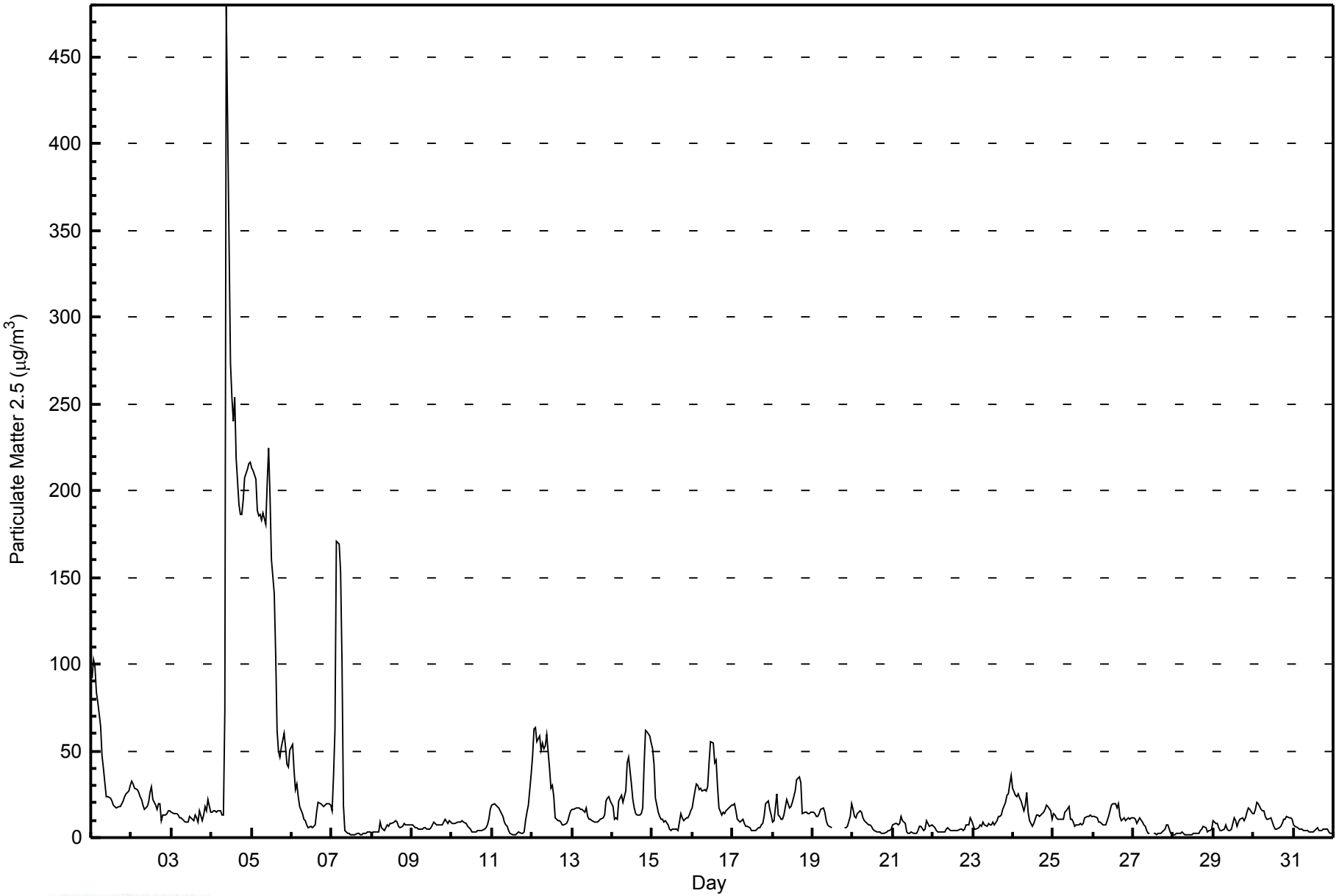
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	171	23.23	23.23
6 - 15	334	45.38	68.61
16 - 25	114	15.49	84.10
26 - 80	79	10.73	94.84
> 81.0	38	5.16	100.00

Total Number of Valid Hours: 736

Total Number of Hours: 744

WBEA

Frequency Distribution

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

CNRL Horizon - August 2014

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	18	16	3	1	2	0	0	5	11	25	17	8	22	21	16	5	170
6 - 15	27	21	6	7	6	7	20	34	57	48	35	20	10	19	11	6	334
16 - 25	5	7	0	2	3	7	4	7	16	20	13	7	3	7	4	9	114
26 - 80	7	9	3	1	0	5	3	6	7	12	7	3	2	2	7	5	79
> 81.0	6	6	5	0	0	0	0	5	5	0	4	2	1	2	2	0	38
Totals	63	59	17	11	11	19	27	57	96	105	76	40	38	51	40	25	735

Total Number of Valid Hours: 735

Total Number of Hours: 744

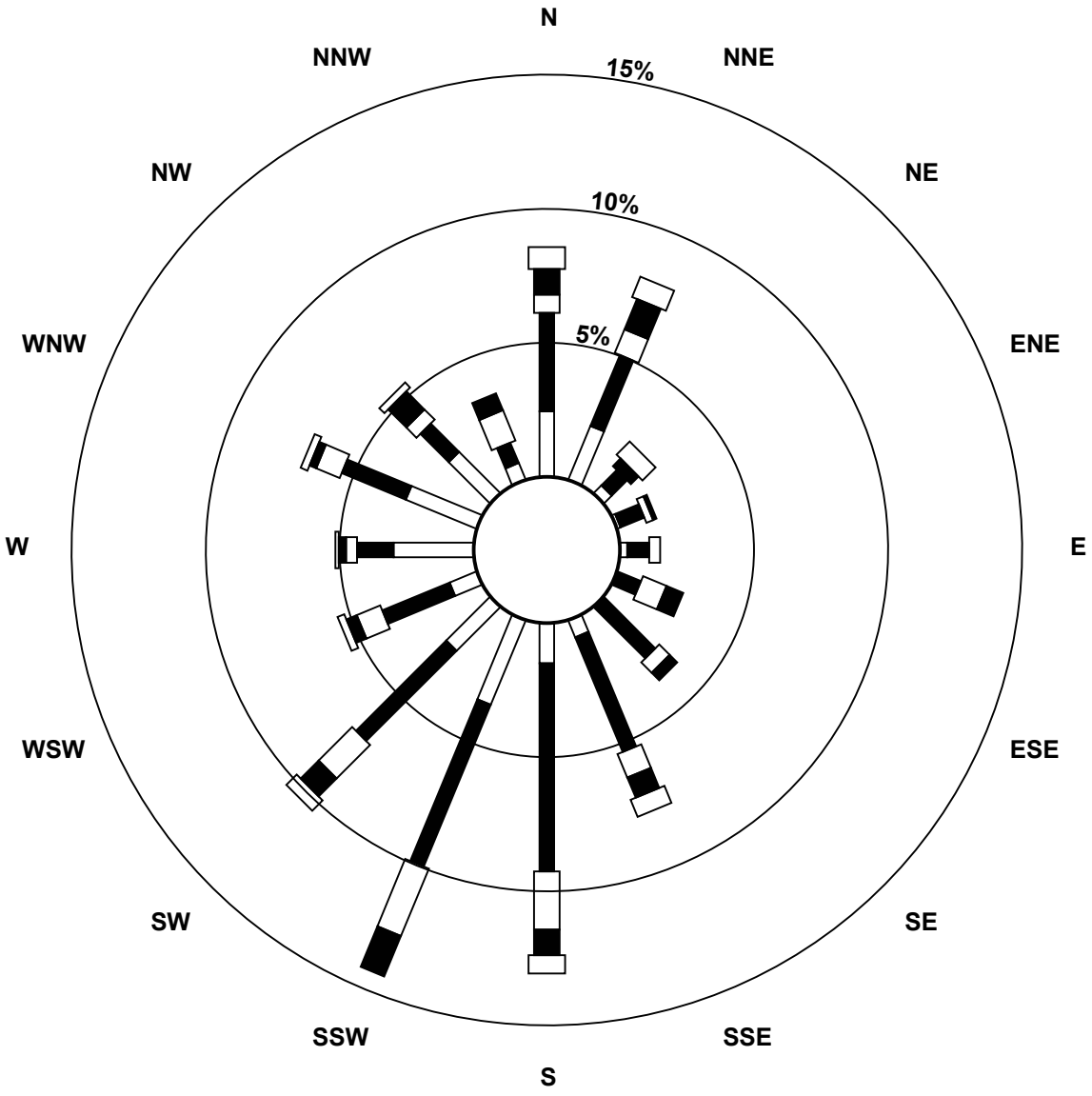
AURORA
ATMOSPHERICS INC.

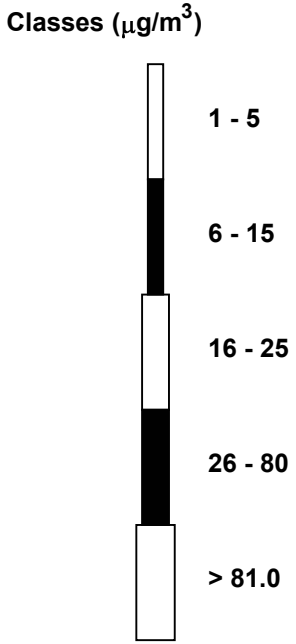
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

CNRL Horizon (AMS 15)





Total Number of Valid Hours: 735

Maximum Value: 32.3 C on Aug 5 16:00

Maximum Daily Average: 23.7 C on Aug 17

Minimum Value: -0.6 C on Aug 22 05:00

Minimum Daily Average: 8.5 C on Aug 22

Maximum Diurnal Average: 23.8 C at hour 16

Minimum Diurnal Average: 9.9 C at hour 5

Monthly Average: 17.15 C

Percentiles: P_1 = 1.0 P_{10} = 9.0 Q_1 = 12.1 Median = 16.4 Q_3 = 22.1 P_{90} = 27.5 P_{99} = 31.7

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	13.9	12.7	11.8	11.1	10.7	10.7	11.9	13.3	14.5	15.5	16.2	17.5	18.9	19.6	20.5	21.1	21.4	21.4	21.0	19.9	15.8	12.4	10.9	9.5	15.5	21.4
2-Aug	8.2	8.0	8.3	8.1	7.5	7.8	11.0	14.7	17.1	19.5	22.3	24.9	26.9	28.2	28.6	29.0	26.4	24.1	20.4	19.2	18.8	15.7	13.7	12.8	17.6	29.0
3-Aug	12.6	12.3	12.4	12.6	12.3	12.7	14.9	17.7	20.8	23.8	26.2	27.9	28.9	29.6	30.4	30.5	29.8	29.7	30.7	28.3	24.1	22.8	17.4	18.2	21.9	30.7
4-Aug	16.7	14.1	14.2	14.3	12.0	13.7	16.9	19.2	21.7	23.5	24.6	26.2	27.3	28.9	29.8	30.3	30.2	29.4	28.1	25.8	22.9	21.1	18.8	17.7	22.0	30.3
5-Aug	14.4	13.6	12.2	11.4	11.0	11.6	14.6	18.8	20.8	22.6	24.9	26.9	29.1	30.3	31.2	32.3	32.0	31.6	30.7	28.3	25.3	22.6	20.3	18.6	22.3	32.3
6-Aug	15.9	15.7	15.0	14.1	13.7	14.8	18.5	20.3	20.9	21.9	24.6	27.6	29.0	29.8	29.2	26.5	27.4	27.7	27.5	26.3	23.8	22.2	20.4	18.3	22.1	29.8
7-Aug	17.5	18.9	19.2	17.7	15.3	15.1	16.5	18.9	19.6	21.2	22.9	24.1	24.6	24.9	25.9	25.8	24.7	24.5	24.2	22.4	19.5	17.6	16.3	16.8	20.6	25.9
8-Aug	15.7	11.1	8.9	7.0	5.8	8.1	13.5	15.3	16.8	17.5	18.7	19.9	21.0	21.4	21.9	21.7	21.6	20.6	18.5	16.7	14.7	13.4	12.6	12.0	15.6	21.9
9-Aug	11.7	11.4	11.3	11.2	11.2	11.3	11.4	11.6	12.1	13.2	14.9	16.6	18.4	19.3	21.3	22.0	22.1	22.3	21.9	20.0	14.6	15.0	11.0	9.9	15.2	22.3
10-Aug	9.9	9.7	8.6	8.8	8.8	9.1	10.6	14.4	17.2	19.8	22.2	24.1	25.6	26.0	26.7	25.8	25.4	25.5	24.3	23.9	19.8	18.3	16.5	15.5	18.2	26.7
11-Aug	14.3	13.5	12.7	12.1	11.4	11.9	12.6	15.2	19.4	23.9	26.4	27.5	28.5	27.8	27.4	26.2	26.0	25.8	24.9	22.7	20.3	16.5	16.4	15.1	19.9	28.5
12-Aug	12.4	12.5	12.8	9.6	9.0	10.2	14.4	17.5	20.3	22.9	24.3	25.4	26.6	27.6	28.7	29.3	29.5	29.2	28.3	25.8	24.1	23.4	21.8	19.1	21.0	29.5
13-Aug	16.6	14.9	15.1	14.1	12.8	13.3	17.1	19.1	21.7	23.9	25.8	27.5	28.7	30.5	31.2	31.8	31.9	31.8	31.0	28.6	26.9	24.4	20.3	19.2	23.3	31.9
14-Aug	18.4	20.6	19.0	17.2	16.8	14.3	17.4	20.8	21.9	23.8	25.5	27.5	28.4	28.9	29.8	29.8	30.0	29.3	28.3	26.0	22.3	17.7	16.3	15.5	22.7	30.0
15-Aug	15.9	15.4	14.9	13.8	12.4	13.0	15.9	19.2	22.6	25.5	28.2	29.8	30.9	31.4	32.0	32.1	30.3	28.4	27.4	25.8	23.4	21.7	20.8	19.0	22.9	32.1
16-Aug	18.0	16.8	16.8	14.0	12.4	13.1	17.3	20.0	22.1	23.0	24.5	26.6	27.8	29.2	30.0	30.6	30.8	29.4	29.0	26.3	23.5	22.0	20.3	19.9	22.7	30.8
17-Aug	19.0	18.9	22.1	20.4	17.5	19.3	19.7	21.4	23.3	24.7	26.0	27.6	28.5	29.8	30.1	29.7	29.3	28.5	27.4	25.3	23.1	21.3	19.4	16.2	23.7	30.1
18-Aug	13.0	11.6	10.2	11.0	10.5	11.0	13.0	14.3	16.0	16.5	17.7	19.3	20.8	22.0	22.4	22.6	21.8	20.9	19.2	18.0	17.2	16.8	15.4	15.3	16.5	22.6
19-Aug	15.2	14.5	14.9	14.9	14.9	14.9	15.3	16.3	20.5	23.1	24.1	25.0	20.2	14.5	14.7	15.8	17.6	17.5	17.5	15.5	14.0	13.7	13.8	13.5	16.7	25.0
20-Aug	12.8	11.9	11.0	11.0	10.6	10.2	10.2	10.4	10.7	10.6	10.9	11.7	12.4	13.1	13.7	14.2	13.7	13.2	13.1	11.6	8.7	8.1	6.2	6.0	11.1	14.2
21-Aug	6.3	4.6	6.0	5.8	4.0	1.5	5.7	10.3	11.8	13.1	13.2	14.3	15.0	15.6	15.8	15.9	15.8	15.4	14.7	12.9	9.8	6.6	3.9	1.6	10.0	15.9
22-Aug	0.9	0.7	0.5	0.6	-0.6	0.6	3.2	6.5	9.8	11.7	13.8	14.9	15.6	16.1	16.4	16.3	16.1	16.2	15.4	12.1	7.1	5.0	2.9	2.2	8.5	16.4
23-Aug	3.3	4.6	5.4	5.5	5.5	6.1	6.8	8.1	9.6	11.5	13.7	15.6	17.2	17.9	17.8	17.8	17.8	17.6	17.2	13.5	9.8	7.8	6.1	5.7	10.9	17.9
24-Aug	3.0	2.1	1.0	1.4	2.8	3.9	6.5	9.3	11.4	13.6	15.3	17.7	18.9	19.7	20.2	20.5	20.8	20.2	19.2	15.4	11.9	11.4	10.0	11.5	12.0	20.8
25-Aug	11.6	10.5	10.1	9.7	9.6	8.8	9.6	12.1	15.2	17.4	18.2	20.2	22.1	22.6	23.1	22.9	22.4	22.5	20.8	19.4	17.4	16.2	14.8	15.2	16.3	23.1
26-Aug	13.6	12.0	10.1	10.8	10.7	11.1	12.3	13.8	15.5	17.3	19.8	20.3	21.5	24.1	25.3	25.6	24.7	16.8	16.4	16.2	16.0	16.2	16.1	15.4	16.7	25.6
27-Aug	14.8	13.6	12.9	12.5	12.1	12.6	13.3	13.9	15.9	17.2	M	M	21.0	22.1	23.0	22.4	22.2	21.3	20.9	17.0	12.0	13.7	11.8	10.7	16.2	23.0
28-Aug	10.0	9.8	10.2	8.9	5.0	4.2	7.6	10.8	11.5	11.9	12.2	12.5	12.7	13.4	14.3	15.2	15.9	15.6	16.5	12.0	10.8	8.7	6.9	4.6	10.9	16.5
29-Aug	2.6	1.6	1.1	1.6	1.3	1.7	4.1	6.9	10.2	13.6	16.4	18.5	19.8	21.2	21.7	22.4	22.0	21.9	19.6	18.7	17.5	16.9	15.7	13.6	12.9	22.4
30-Aug	10.6	9.4	10.1	10.2	9.3	9.4	10.0	10.3	10.8	10.8	11.7	13.5	14.8	16.7	17.7	18.4	18.7	18.2	16.9	14.7	13.0	12.6	11.6	10.3	12.9	18.7
31-Aug	9.2	9.3	9.4	9.6	9.3	8.9	9.4	10.9	14.0	16.6	18.4	20.6	19.0	15.4	12.5	13.1	15.7	15.3	14.8	12.3	10.6	10.6	10.2	10.4	12.7	20.6
	12.2	11.5	11.2	10.7	9.9	10.2	12.3	14.6	16.6	18.4	20.1	21.7	22.6	23.2	23.7	23.8	23.7	23.0	22.1	20.0	17.4	15.9	14.2	13.2	Diurnal Average	
	19.0	20.6	22.1	20.4	17.5	19.3	19.7	21.4	23.3	25.5	28.2	29.8	30.9	31.4	32.0	32.3	32.0	31.8	31.0	28.6	26.9	24.4	21.8	19.9	Diurnal Maximum	

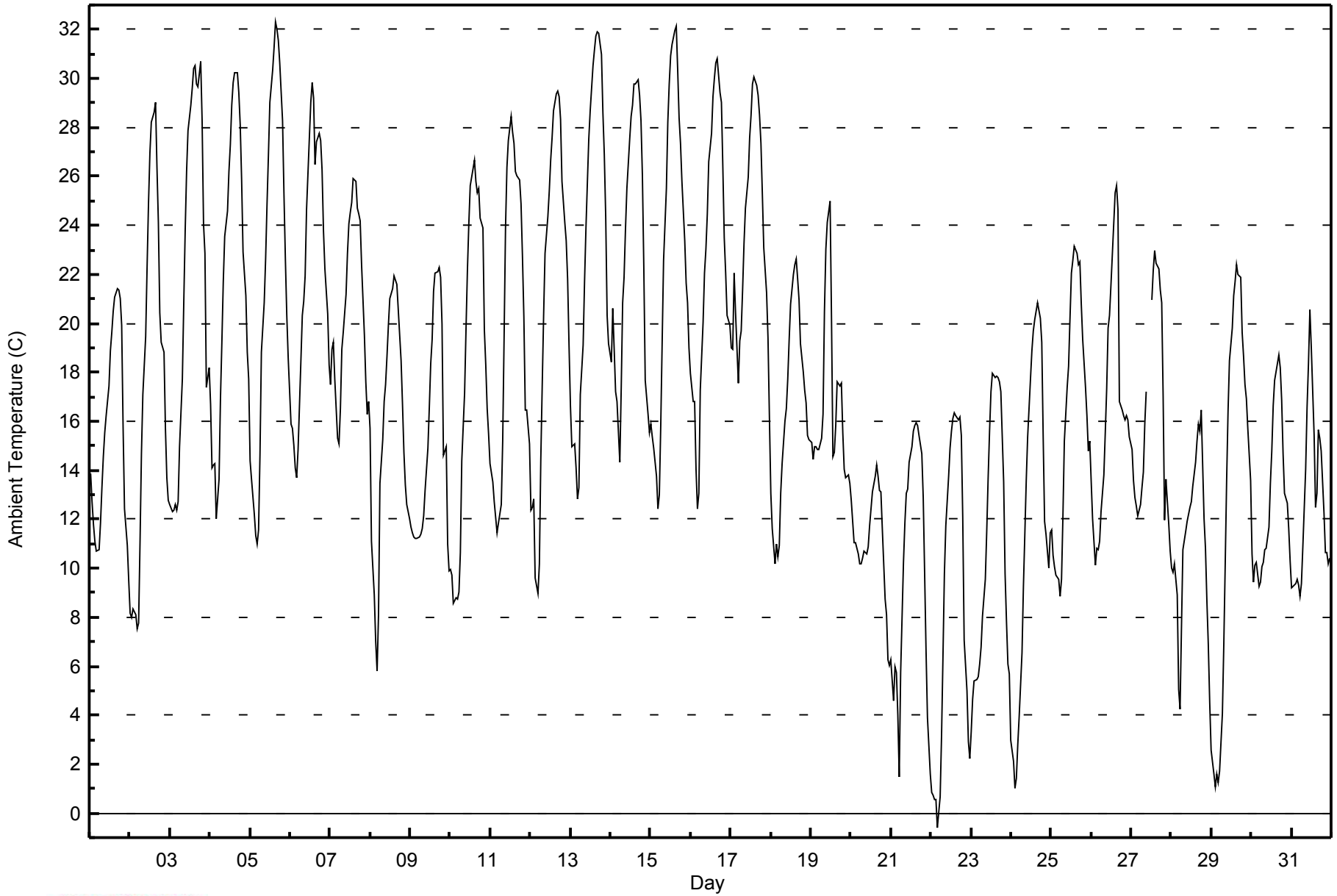
M - Maintenance

WBEA

Hourly Averages

Ambient Temperature (AT) - C

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	1	0.13	0.13
0 - 10	98	13.21	13.34
10 - 20	391	52.70	66.04
> 20	252	33.96	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Maximum Value: 5.6 mm on Aug 26 19:00

Maximum Daily Total: 14.0 mm on Aug 30

Minimum Value: 0.0 mm on Aug 1 01:00

Minimum Daily Total: 0.0 mm on Aug 1

Maximum Diurnal Total: 5.6 mm at hour 14

Minimum Diurnal Total: 0.0 mm at hour 12

Monthly Total: 48.77 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} = 2.8

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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.5	1.5	3.8	1.5
9-Aug	1.8	1.3	1.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	1.8
10-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	4.3	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	10.2	4.3
20-Aug	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
21-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	1.8	5.6	0.0	0.0	1.5	0.0	0.0	11.7	5.6
27-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	M	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.8
28-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.8	2.5	2.8	4.3	3.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	4.3
31-Aug	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	1.3	0.5	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.5	1.3
	1.8	1.3	1.0	1.3	0.8	0.8	2.5	2.8	4.3	3.0	0.5	0.0	4.3	5.6	4.3	0.5	0.0	1.8	5.6	0.0	0.3	3.0	1.8	1.5	Diurnal Average	
	1.8	1.3	1.0	0.8	0.8	0.8	2.5	2.8	4.3	3.0	0.5	0.0	2.8	4.3	3.8	0.3	0.0	1.8	5.6	0.0	0.3	1.5	1.5	1.5	Diurnal Maximum	

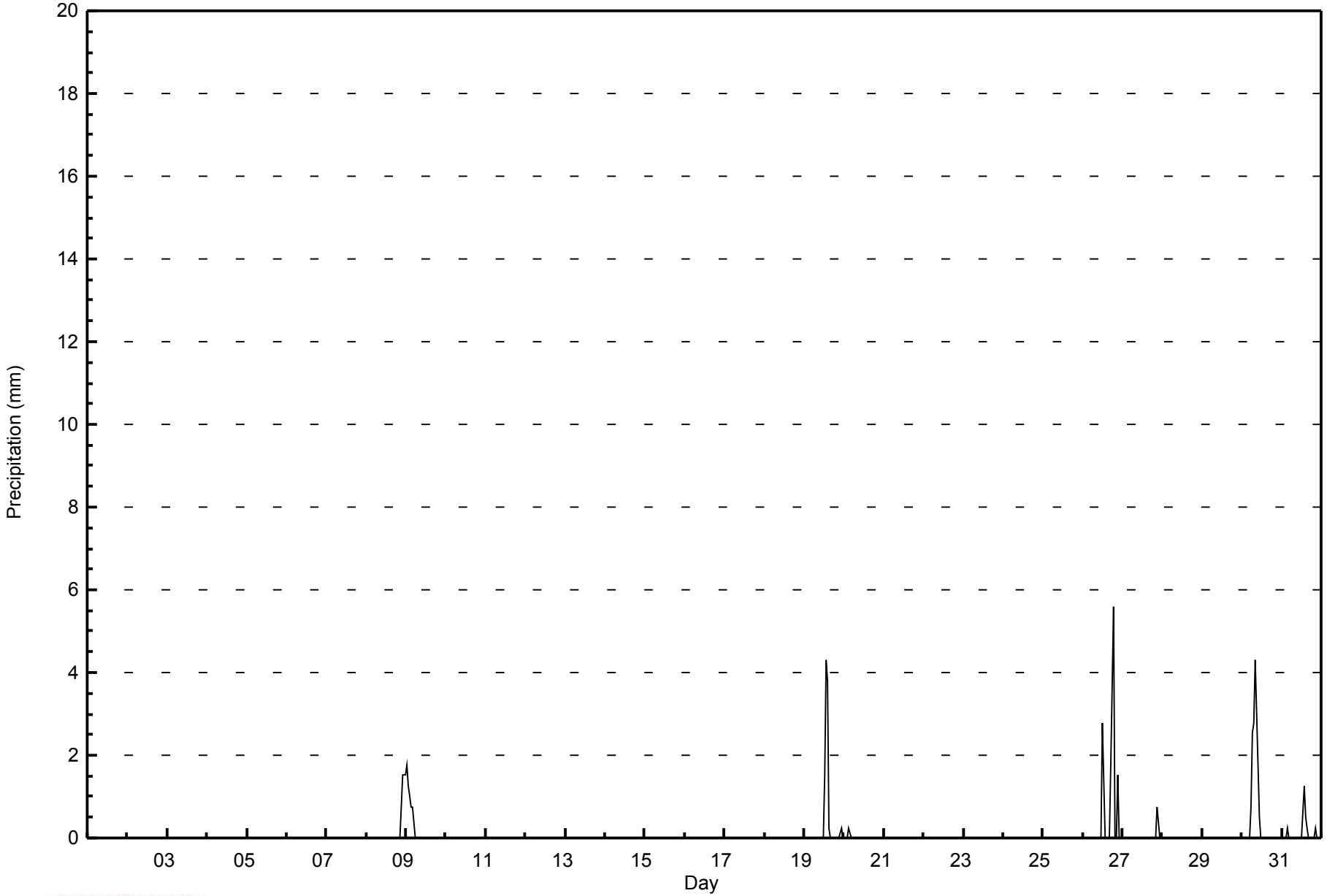
M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

CNRL Horizon - August 2014

Maximum Value: 99 % on Aug 27 04:00

Maximum Daily Average: 87.2 % on Aug 30

Minimum Value: 19 % on Aug 17 15:00

Minimum Daily Average: 42.5 % on Aug 17

Maximum Diurnal Average: 90.9 % at hour 5

Minimum Diurnal Average: 42.8 % at hour 16

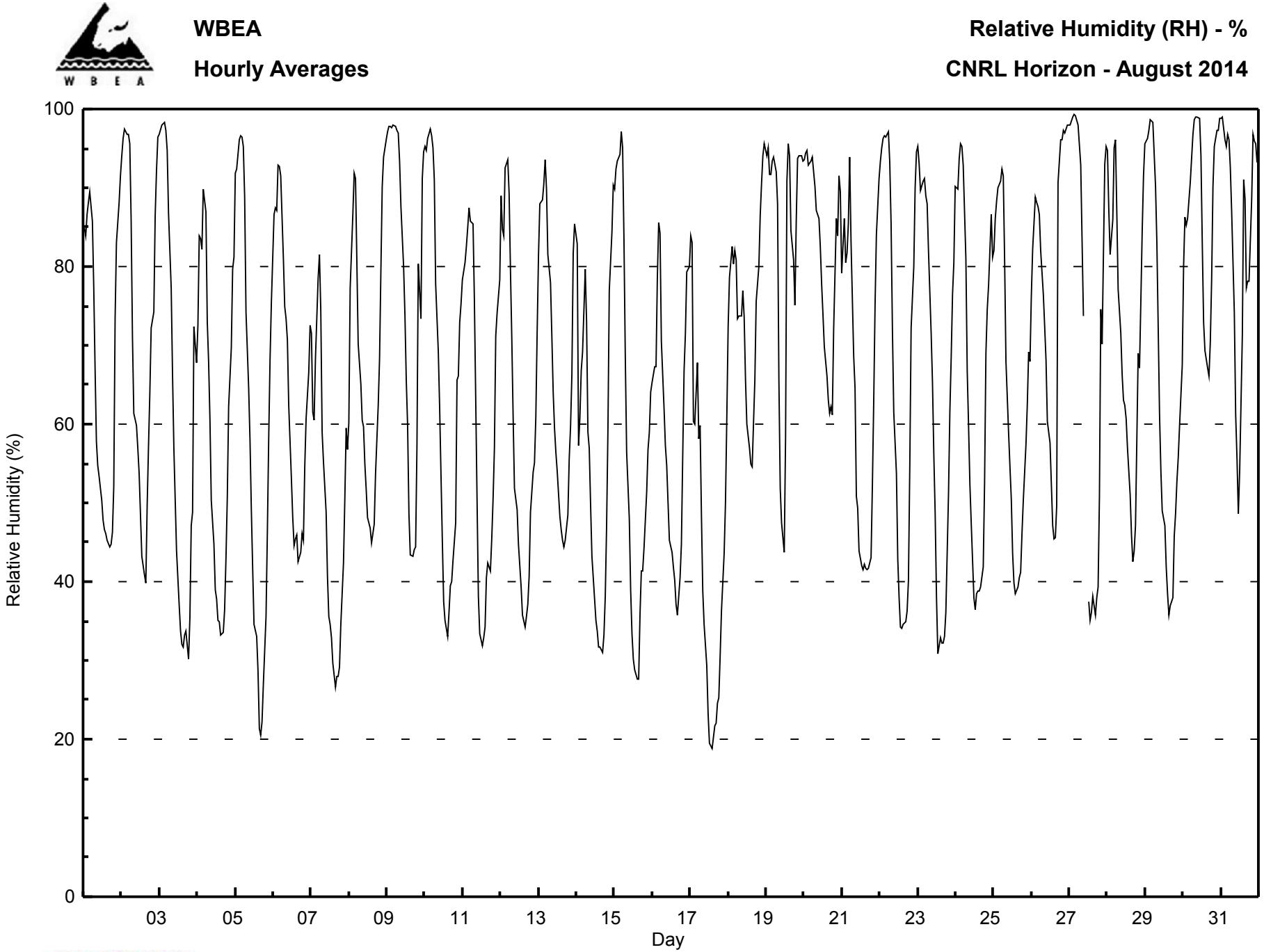
Monthly Average: 66.7 %

Percentiles: P_1 = 22 P_{10} = 36 Q_1 = 47 Median = 68 Q_3 = 87 P_{90} = 95 P_{99} = 99

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-Aug	85	84	87	88	89	86	77	67	58	55	53	50	48	47	46	45	44	45	46	52	73	83	88	91	66.2	91
2-Aug	94	96	97	97	97	96	86	71	61	60	57	54	48	43	41	40	50	57	64	72	74	86	92	96	72.1	97
3-Aug	97	98	98	98	97	95	87	77	66	57	50	44	37	34	32	32	33	34	30	35	47	49	72	68	61.2	98
4-Aug	73	84	84	82	90	87	73	68	61	50	45	39	38	35	35	33	34	36	43	51	62	70	80	81	59.7	90
5-Aug	92	92	96	97	96	95	89	74	65	58	49	42	35	33	29	21	20	22	27	36	46	58	68	75	59.0	97
6-Aug	87	87	87	93	93	91	81	75	73	71	62	53	48	45	45	46	43	44	46	45	55	61	67	73	65.4	93
7-Aug	71	62	61	68	78	81	74	59	55	49	41	36	34	33	30	27	28	28	29	35	42	50	59	57	49.5	81
8-Aug	60	77	87	92	91	81	70	65	61	60	55	52	48	47	45	46	47	54	62	68	80	90	94	96	67.8	96
9-Aug	97	98	98	98	98	98	97	97	93	88	80	74	66	60	49	43	43	44	44	57	80	73	91	95	77.5	98
10-Aug	95	95	96	97	97	95	91	78	69	62	54	45	37	35	33	36	39	40	43	48	66	66	73	75	65.2	97
11-Aug	78	80	83	85	87	86	85	76	63	50	38	33	32	33	34	40	42	41	45	50	57	71	74	78	60.2	87
12-Aug	89	85	84	93	93	89	80	71	61	52	49	45	42	39	36	34	36	37	41	49	54	55	61	72	60.2	93
13-Aug	81	88	88	90	94	90	82	78	71	64	60	56	54	48	47	45	44	45	48	56	60	66	82	85	67.6	94
14-Aug	83	57	61	67	69	80	73	59	57	50	43	38	35	34	32	32	31	33	38	47	59	77	84	90	55.4	90
15-Aug	90	92	93	94	97	95	83	68	56	48	39	33	30	29	28	28	36	41	41	44	51	57	59	64	58.3	97
16-Aug	65	67	67	79	86	84	70	62	57	55	50	45	44	42	40	37	36	41	45	56	67	72	79	80	59.4	86
17-Aug	84	83	60	60	68	58	60	48	39	35	29	23	19	19	19	22	22	25	25	30	36	43	50	61	42.5	84
18-Aug	72	79	83	80	82	81	73	74	74	77	74	66	60	57	55	55	60	66	76	80	86	91	94	96	74.5	96
19-Aug	94	95	92	92	93	94	92	88	66	52	48	44	58	91	96	94	85	81	75	86	94	94	94	93	82.9	96
20-Aug	94	94	95	93	93	94	92	90	87	86	83	78	74	70	66	63	61	62	61	72	86	84	92	90	81.6	95
21-Aug	79	86	81	82	85	94	83	69	65	51	49	44	42	42	42	42	42	42	43	52	63	75	84	91	63.6	94
22-Aug	93	95	96	97	96	97	93	85	72	61	54	43	38	34	34	35	35	36	40	55	72	80	90	95	67.8	97
23-Aug	95	93	90	91	91	89	88	82	71	65	56	49	38	31	33	32	32	33	36	51	62	68	77	81	63.9	95
24-Aug	90	90	94	96	95	93	81	67	60	52	47	38	36	38	39	39	39	42	53	69	75	78	87	81	65.7	96
25-Aug	82	86	88	90	91	92	92	81	68	59	55	51	43	40	38	39	41	41	46	50	57	62	69	68	63.8	92
26-Aug	76	82	89	88	88	87	82	76	72	68	60	59	58	47	45	46	50	91	96	96	97	97	97	98	76.9	98
27-Aug	98	98	99	99	99	98	95	93	83	74	M	M	37	35	36	38	36	38	39	51	75	70	93	95	71.9	99
28-Aug	95	87	82	86	95	96	87	77	72	66	63	62	61	57	51	46	43	44	47	69	67	76	84	92	71.0	96
29-Aug	96	96	97	99	99	98	90	83	72	61	54	49	47	42	38	36	37	38	46	49	53	56	60	67	65.1	99
30-Aug	80	86	85	86	91	94	97	99	99	99	99	94	83	73	69	67	66	70	78	90	95	97	97	99	87.2	99
31-Aug	99	99	96	95	97	96	92	87	74	61	56	49	54	71	91	89	77	78	78	89	97	96	96	93	83.7	99
	86.0	86.9	86.8	88.7	90.9	90.0	83.8	75.6	67.8	61.1	55.0	49.6	46.0	44.6	43.7	42.8	43.0	46.1	49.4	57.7	67.4	72.6	80.2	83.1	Diurnal Average	
	99	99	99	99	99	98	97	99	99	99	99	94	83	91	96	94	85	91	96	96	97	97	97	99	Diurnal Maximum	

M - Maintenance


WBEA
Hourly Averages
Relative Humidity (RH) - %
CNRL Horizon - August 2014
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	3	0.40	0.40
20 - 40	109	14.69	15.09
40 - 60	193	26.01	41.11
60 - 80	167	22.51	63.61
80 - 100	270	36.39	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

CNRL Horizon - August 2014

Maximum Value: 649 W/m2 on Aug 11 13:00

Maximum Daily Average: 221.2 W/m2 on Aug 1

Minimum Value: 0 W/m2 on Aug 29 03:00

Minimum Daily Average: 61.9 W/m2 on Aug 20

Maximum Diurnal Average: 452.0 W/m2 at hour 12

Minimum Diurnal Average: 0.0 W/m2 at hour 24

Monthly Average: 153.6 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 56 $Q_3 = 276$ $P_{90} = 464$ $P_{99} = 574$

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-Aug	0	0	0	0	5	41	145	260	371	464	523	581	600	539	529	444	360	255	141	42	8	0	0	0	221.2	600
2-Aug	0	0	0	0	6	36	124	235	336	430	509	552	587	534	482	438	97	59	26	37	19	0	0	0	187.7	587
3-Aug	0	0	0	0	6	55	144	259	368	458	530	575	585	570	516	372	194	174	145	34	9	0	0	0	208.1	585
4-Aug	0	0	0	0	6	47	144	244	276	309	378	430	471	493	463	376	290	174	94	34	5	0	0	0	176.4	493
5-Aug	0	0	0	0	3	29	87	173	262	338	411	474	500	484	424	409	306	198	99	37	5	0	0	0	176.6	500
6-Aug	0	0	0	0	4	35	131	149	174	192	474	532	491	445	249	263	285	205	112	47	5	0	0	0	158.1	532
7-Aug	0	0	0	0	3	40	133	259	342	416	525	550	541	466	573	431	207	143	119	42	4	0	0	0	199.8	573
8-Aug	0	0	0	0	5	59	147	252	355	424	505	551	533	428	353	227	185	111	42	12	0	0	0	0	174.6	551
9-Aug	0	0	0	0	1	12	13	34	49	220	446	397	486	437	538	431	269	225	114	47	3	0	0	0	155.0	538
10-Aug	0	0	0	0	5	34	103	244	352	446	520	563	576	515	504	206	141	162	74	70	3	0	0	0	188.3	576
11-Aug	0	0	0	0	2	38	41	223	342	444	527	528	649	443	274	151	310	231	98	21	2	0	0	0	180.1	649
12-Aug	0	0	0	0	2	35	112	219	328	424	440	533	519	500	464	403	317	221	92	27	3	0	0	0	193.3	533
13-Aug	0	0	0	0	1	29	124	138	242	330	390	449	452	484	444	370	268	187	76	25	2	0	0	0	167.1	484
14-Aug	0	0	0	0	1	29	116	221	294	400	478	540	569	462	473	345	317	170	79	30	2	0	0	0	188.5	569
15-Aug	0	0	0	0	1	33	122	229	325	418	489	537	555	523	503	393	195	148	92	32	1	0	0	0	191.6	555
16-Aug	0	0	0	0	2	34	99	180	217	260	348	465	393	486	402	385	250	102	79	20	1	0	0	0	155.2	486
17-Aug	0	0	0	0	1	24	120	233	341	427	485	543	546	541	489	348	313	195	83	13	0	0	0	0	195.9	546
18-Aug	0	0	0	0	0	19	57	78	56	133	202	341	323	271	233	148	72	51	27	14	1	0	0	0	84.4	341
19-Aug	0	0	0	0	0	5	21	101	322	418	438	555	98	15	78	135	322	188	72	15	0	0	0	0	116.0	555
20-Aug	0	0	0	0	0	5	28	59	86	93	92	197	168	221	197	185	38	42	55	16	0	0	0	0	61.9	221
21-Aug	0	0	0	0	0	26	105	216	324	370	354	483	554	542	492	408	318	208	77	20	0	0	0	0	187.4	554
22-Aug	0	0	0	0	0	11	51	96	165	233	380	243	284	326	263	206	150	176	64	16	0	0	0	0	111.0	380
23-Aug	0	0	0	0	0	11	28	57	100	175	254	361	455	459	215	181	162	99	78	14	0	0	0	0	110.4	459
24-Aug	0	0	0	0	0	5	45	136	192	231	235	542	524	506	456	392	248	117	48	8	0	0	0	0	153.5	542
25-Aug	0	0	0	0	0	9	40	139	308	404	355	460	443	348	281	224	136	151	45	11	0	0	0	0	139.8	460
26-Aug	0	0	0	0	0	14	69	152	194	200	355	217	240	432	383	151	159	21	17	15	0	0	0	0	109.1	432
27-Aug	0	0	0	0	0	15	60	80	219	207	M	M	419	500	377	208	194	114	64	6	0	0	0	0	112.0	500
28-Aug	0	0	0	0	0	17	105	204	178	207	229	203	194	210	300	311	275	125	65	8	0	0	0	0	109.6	311
29-Aug	0	0	0	0	0	13	94	194	305	393	463	498	442	365	347	257	163	127	29	4	0	0	0	0	153.9	498
30-Aug	0	0	0	0	0	1	6	16	18	34	78	182	220	388	392	323	255	129	49	5	0	0	0	0	87.3	392
31-Aug	0	0	0	0	0	13	67	152	297	390	463	480	152	30	12	110	226	49	51	3	0	0	0	0	104.0	480
	0.0	0.0	0.0	0.0	1.8	25.0	86.5	168.7	249.6	318.9	395.9	452.0	437.7	418.2	377.7	297.8	226.6	147.0	74.4	23.4	2.4	0.0	0.0	0.0	Diurnal Average	
	0	0	0	0	6	59	147	260	371	464	530	581	649	570	573	444	360	255	145	70	19	0	0	0	Diurnal Maximum	

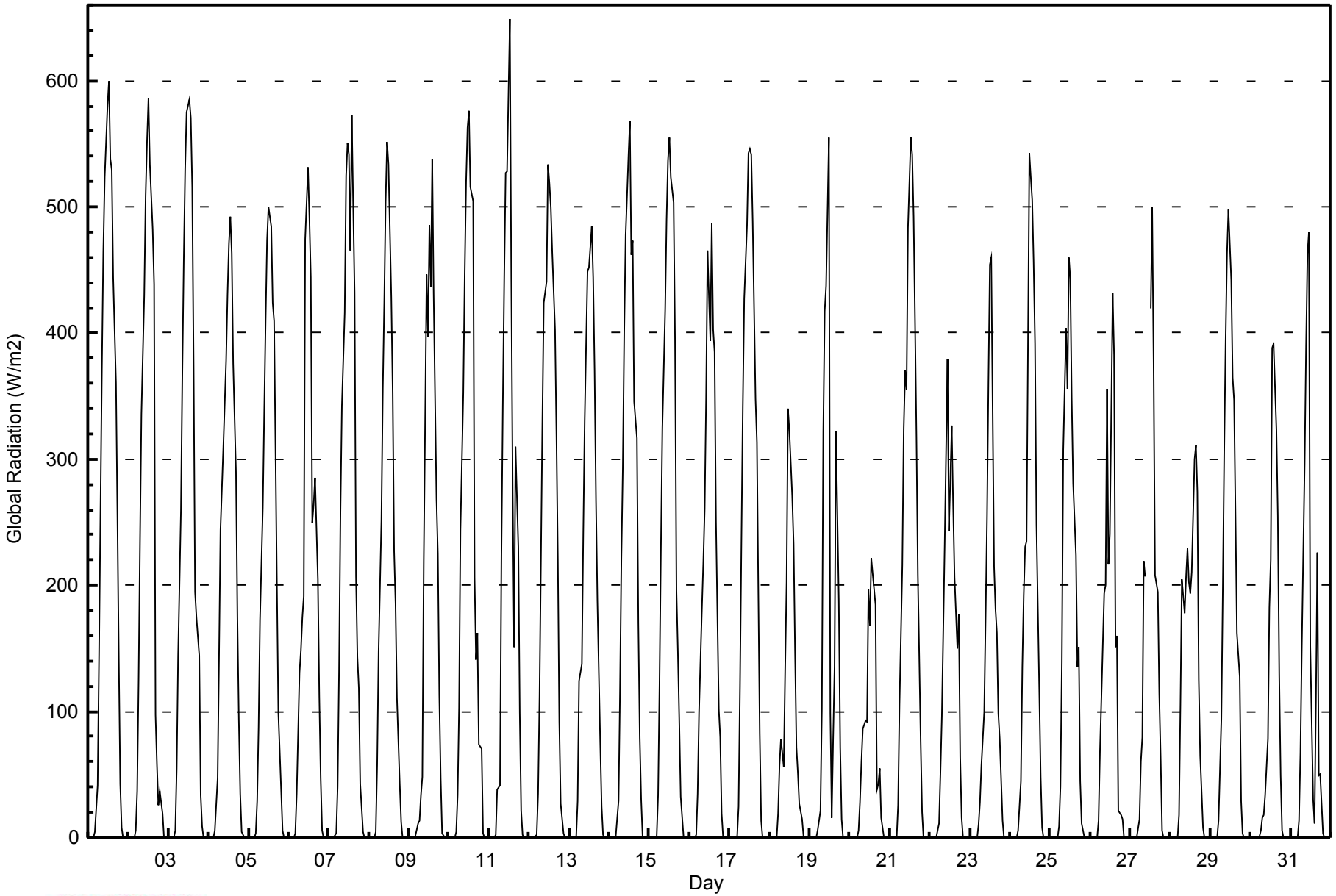
M - Maintenance

WBEA

Hourly Averages

Global Radiation (GR) - W/m2

CNRL Horizon - August 2014



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Summary of Hour Averages

Wind Speed (WS) - km/h

CNRL Horizon - August 2014

Maximum Speed: 22 km/h on Aug 17 16:00

Maximum Daily Speed Average: 11.5 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 11 10:00

Minimum Daily Speed Average: 0.4 km/h on Aug 24

Maximum Diurnal Speed Average: 3.7 km/h at hour 24

Minimum Diurnal Speed Average: 0.5 km/h at hour 17

Monthly Average Velocity: 1.9 km/h 232.9 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 5 Median = 6 Q_3 = 9 P_{90} = 11 P_{99} = 17

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	N14	N11	N10	N8	N8	N8	N10	N9	NNE10	NNE10	NNE6	NNW2	SW1	NNW2	E8	ESE8	SE8	ESE8	ESE8	ESE5	SE4	S5	S3	SW3	NNE3.8	N14
2-Aug	SW6	SSW6	SSW7	SSW6	SW4	SSW5	SSW5	SSW5	SSW7	S9	S10	S10	S11	S14	S14	S14	S14	NNW2	NNE9	ESE3	WSW4	SW2	WSW3	SW6	SSW6.0	S14
3-Aug	SW7	SSW9	S10	S11	S10	S9	SSW7	S5	SSE5	SSE6	SSE8	SSE10	SSE8	SSE8	SSE9	SSE11	SSE9	E8	E0	W6	WNW6	WNW7	WSW4	WSW7	S5.5	SSE11
4-Aug	WSW5	SSW4	S7	SSW5	S4	SSW7	SSW1	NE5	NNE5	NNE8	NE8	NNE9	NE7	NE8	NE8	NNE8	NNE9	NNE9	NNE7	NE7	N5	NW5	NW5	WNW5	NNE3.0	NNE9
5-Aug	WNW3	N2	WSW2	SW3	SSE2	S3	W3	SSE2	S4	S6	S7	SSE7	SSE7	S7	SSE9	S10	SSE9	SE6	ESE4	ESE5	SE6	S6	SSW6	SW6	S4.0	S10
6-Aug	S5	SSW6	SW5	SSW6	SSW4	S5	S6	S8	S9	S9	S10	S13	S14	SW13	SW12	NW10	N5	SSE7	SSE6	SSW8	SSW9	SW10	WSW7	W6	SSW6.3	S14
7-Aug	WSW10	WSW9	W11	WSW11	SW9	SW9	SW10	WSW15	W13	WSW12	WSW16	WSW17	W17	W16	WSW17	W18	W14	W14	W11	WSW7	WSW7	WNW8	WNW8	W10	WSW11.5	W18
8-Aug	W7	NNE2	SW4	W4	W2	SSW1	NNE1	E3	SSE4	NNE5	NE7	ENE7	ENE9	ENE9	E7	ENE10	ENE9	NNE11	N14	N14	NW11	NNE6	N4	N6	NNE4.1	N14
9-Aug	N5	N7	N6	N6	N6	NNW6	NW4	WSW4	NNE1	E3	N2	W4	WNW6	WNW8	NW11	NW13	WNW10	W10	NW7	ENE3	SSW5	W6	WSW4	WSW4	NW4.1	NW13
10-Aug	SW6	SW6	S4	SSW7	SSW4	S6	SSW7	SSW5	S6	S6	S7	S9	SSW10	SSW9	SSW9	SSW8	SW6	SSW5	S6	S6	SSW7	SW7	WSW7	SW10	SSW6.5	SW10
11-Aug	SW11	SW11	SW11	SW12	SSW12	SSW10	S9	SSW10	S8	SE0	NW10	WNW17	WNW17	WNW17	WNW16	NNW11	NNE13	NNE12	NNE12	N9	N6	NW4	NW6	NW4	WNW4.7	WNW17
12-Aug	NW4	NW5	NW5	WSW1	S1	SSE1	NNE3	N2	ENE3	SSW3	ESE4	ESE8	ESE8	ESE10	SE8	SSE9	SSE9	SSE9	SE8	SE6	SE7	SE7	SSE6	ESE1	SE3.4	ESE10
13-Aug	SSW1	SW3	SSW6	SSW5	W3	SW4	SSW5	S6	S8	S8	SSW8	SW8	SW9	SW11	SW13	SW11	SW11	SW8	SW6	WSW7	WNW9	NW6	NNW1	SSW6	SW5.9	SW13
14-Aug	W5	WNW9	NW6	WNW7	WNW7	S3	SSE1	NNE2	NNE7	NNE5	NNE3	SSW3	S2	ESE4	SE8	ESE8	SE8	SSE8	SSE5	NW2	NNW4	WSW3	SW6	SSW6	SW0.7	WNW9
15-Aug	SSW4	SSW6	SSW7	SSW5	S5	SSW6	S7	SSW5	SSE6	S7	SSW6	SSW5	SW5	WSW5	NW4	W6	N12	N17	N16	N11	N7	N7	N7	N5	WNW1.2	N17
16-Aug	N6	NW5	NNW5	N3	N1	NNW2	NNE3	NE2	SSE2	NNE4	NNE4	SSE5	SE6	SSE8	SSE8	SSW8	WSW9	WSW6	SSW5	S6	SSW6	WSW6	SW8	SW8	SW2.0	WSW9
17-Aug	SSW6	WNW5	WNW10	WNW6	WNW6	WNW8	NW5	NW7	NNW5	N5	N4	WNW10	WNW11	WNW17	WNW19	WNW22	NW18	WNW18	WNW13	WNW8	WNW7	WNW7	WSW7	SW5	WNW8.7	WNW22
18-Aug	SSE3	WSW5	SW4	SSW7	SW6	SSW7	SSW3	NNE5	NNE2	N5	NNE5	N5	ENE3	SW5	W6	NNW4	NE6	NE4	NNE9	N8	N7	NNE4	WNW3	W5	NNW1.4	NNE9
19-Aug	WSW5	SW6	SW7	SW7	SSW9	SSW8	SW5	SSW5	SSW8	SSW7	S10	SSE11	WNW12	WSW12	SW4	SW4	NNE5	ENE9	NE6	WNW3	N6	NNE4	NNW8	N10	SW2.8	WSW12
20-Aug	NNE12	N11	N12	N13	NNE14	NNE12	NNE11	NNE12	NNE13	NNE12	NNE12	NNE10	NNE9	N9	NNW8	NE8	NNE8	NNE10	NNE7	N3	WNW5	WNW6	WNW3	NW5	NNE8.6	NNE14
21-Aug	NW6	WNW6	WNW8	WNW7	WNW6	WSW3	NW2	NNW4	N9	NNW10	N9	N9	N8	NNE7	NE11	NNE11	NE12	NNE12	NNE10	N8	NNW6	WNW6	W3	W4	N5.8	NE12
22-Aug	WSW4	SW4	SSW6	SW8	SW8	SW7	SSW6	SSW3	SSW1	N4	N4	NE6	N4	NW6	NNE5	NNE5	NNE4	NNE7	NNE6	ENE4	ESE3	W3	SW5	WSW5	WNW0.9	SW8
23-Aug	SSW3	S5	SW3	S2	S3	SSW2	S2	SSE2	SSE3	SSE3	S4	SSE6	SE7	ESE9	SSE6	SE5	E3	E3	E6	E5	ESE5	SE3	WNW5	NW5	SE2.7	ESE9
24-Aug	WNW5	NW4	NNE1	SSW1	NNW3	NNW3	N5	NNW4	NNW5	N5	NE5	NE4	ESE6	SE7	SE5	W5	S3	SSE2	WSW2	ENE2	SE3	S6	S6	SSE7	ESE0.4	SE7
25-Aug	S4	SW2	SSE2	SW2	SSE2	SSW4	SSW5	S7	S10	S12	S11	SSE11	S12	S15	S15	S16	S16	S15	S12	SSE10	SSE9	S7	S7	S6	S8.8	S16
26-Aug	S0	SSW3	SW4	SSW7	S7	S10	S12	S12	S8	S11	S10	SSW8	SSW9	S10	S10	SSE10	WSW10	N11	SSW6	SSW6	S6	SW8	SSW10	SW8	SSW6.7	S12
27-Aug	SW7	SW6	SSW6	S8	SSW8	SW11	SW10	SSW7	SSW6	SW6	M	WSW7	W10	W9	SW10	W9	WNW12	WNW11	WNW11	NW6	SW4	WNW13	SSW7	SSW6	WSW6.6	WNW13
28-Aug	SW8	W10	W10	WSW8	WNW5	W5	SW5	SW6	NW9	NW13	NW12	NW10	NW10	NW8	WNW10	NW10	NW6	N4	SSW2	NNW3	N6	N5	NW4	WNW5	WNW5.8	NW13
29-Aug	NNE2	S2	SSW4	SSW5	S6	SSW6	SSW5	SSW7	S8	S9	SSE8	SSE7	SE8	SSE9	SE11	SSE11	SE8	SE8	SE7	SE7	SSE8	SSE7	SSE6	SSE5	SSE6.1	SSE11
30-Aug	SSW3	NNW4	NW5	NNW4	SSW2	SW4	E2	SE5	SSW7	SSW4	WSW4	SW5	WSW3	SSW5	SSE5	SE6	ESE5	ENE6	NE6	N5	NNW5	NNW4	W5	WSW5	SW0.8	SSW7
31-Aug	SSW2	SSW7	SW10	SW7	SSW7	SSW7	SSW8	SSW7	S4	SSE4	SSE5	S6	SW7	N8	SW7	SSW9	W5	W5	W7	W2	S5	SW7	SSW6	SW9	SSW5.1	SW10
	WSW2.8	WSW3.1	WSW3.4	SW3.4	SW2.8	SW3.5	SSW2.5	SSW2.3	SSW1.7	S1.1	S1.1	SSW2.2	SW2.3	SW2.9	SSW3.3	SW2.0	W0.5	NNE1.6	NNE1.4	N0.9	W1.2	W2.8	WSW3.1	WSW3.7	Diurnal Average	
	N14	SW11	N12	N13	NNE14	NNE12	S12	WSW15	W13	NW13	WSW16	WNW17	W17	WNW17	WNW19	WNW22	NW18	WNW18	N16	N14	NW11	WNW13	SSW10	N10	Diurnal Maximum	

M - Maintenance

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 Aug 27 22:00

Minimum Value: 0 km/h on Aug 22 05:00

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

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

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

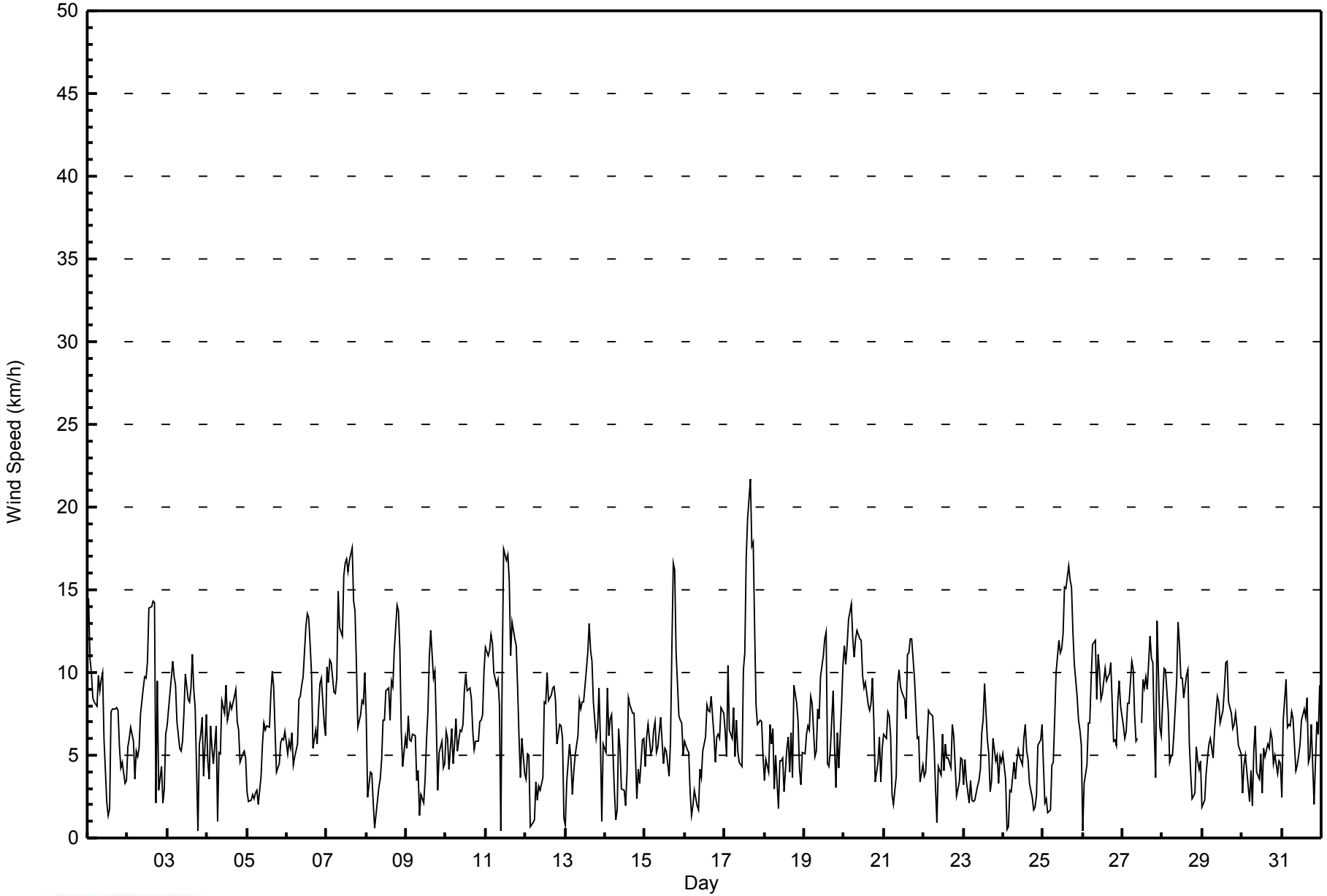
M - Maintenance

WBEA

Hourly Averages

Wind Speed (WS) - km/h

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	275	37.01	37.01
6 - 11	399	53.70	90.71
12 - 19	68	9.15	99.87
20 - 28	1	0.13	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

CNRL Horizon - August 2014

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	23	23	5	5	7	10	7	20	24	41	26	20	16	11	18	19	275
6 - 11	32	26	12	7	4	9	20	37	56	62	49	16	16	29	18	6	399
12 - 19	8	11	1	0	0	0	0	0	16	2	3	6	6	11	4	0	68
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	63	60	18	12	11	19	27	57	96	105	78	42	38	52	40	25	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

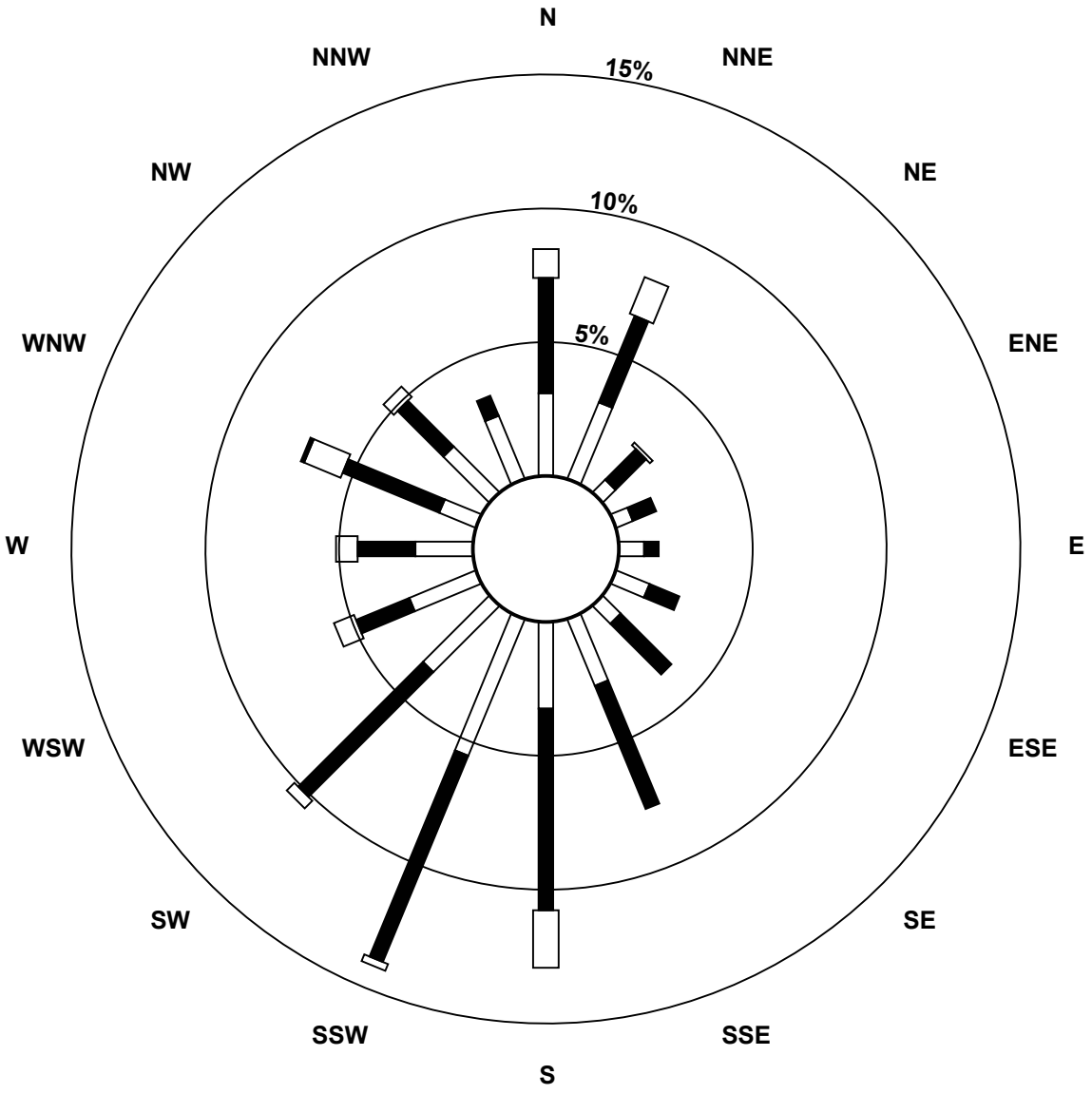
AURORA
ATMOSPHERICS INC.

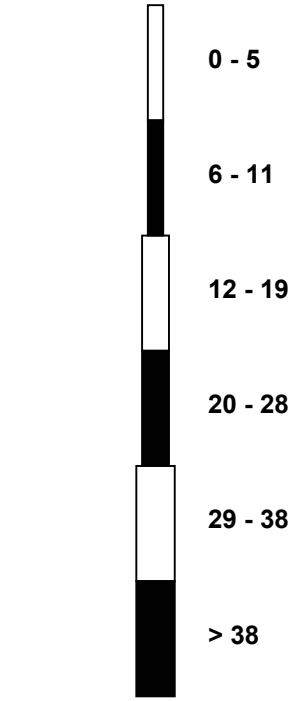
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

CNRL Horizon (AMS 15)





Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

CNRL Horizon - August 2014

Direction of Maximum Speed: 301 deg on Aug 17 16:00
Direction of Maximum Daily Speed Average: 258.3 deg on Aug 7

Direction of Minimum Speed: 126 deg on Aug 11 10:00

Direction of Minimum Daily Speed Average: 0.4 deg on Aug 24

Monthly Average Direction: 240.0 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	358	2	3	0	357	5	2	2	14	15	19	344	218	335	95	104	126	115	118	111	127	171	188	226	31.8
2-Aug	217	212	212	208	228	207	201	194	193	185	179	184	176	188	187	185	191	332	25	111	255	225	258	221	195.1
3-Aug	229	198	188	187	187	184	192	177	165	158	157	163	155	155	165	158	152	88	96	274	286	292	258	240	182.8
4-Aug	239	205	188	212	179	195	201	50	20	30	38	21	34	41	41	26	22	21	19	36	349	323	306	293	19.6
5-Aug	303	356	244	225	157	181	268	159	189	180	177	153	153	190	168	171	147	137	117	103	143	188	196	219	171.5
6-Aug	187	199	218	203	201	186	187	175	182	183	176	182	190	215	214	326	358	150	158	213	210	219	248	268	201.5
7-Aug	238	257	260	247	221	230	233	255	259	249	247	254	269	266	251	279	275	272	260	243	247	282	301	280	258.3
8-Aug	260	18	216	261	264	210	25	95	152	30	45	60	65	68	79	65	66	25	10	7	322	15	10	358	29.3
9-Aug	4	3	4	2	3	347	306	258	18	80	3	278	299	297	321	304	292	266	305	64	206	272	242	243	310.8
10-Aug	219	216	178	200	201	179	203	195	179	171	173	180	206	208	207	206	215	198	176	180	195	226	245	226	200.8
11-Aug	222	222	221	217	211	202	191	197	190	126	314	291	293	302	296	344	28	18	13	9	7	309	308	326	282.2
12-Aug	312	315	307	248	173	168	14	360	78	192	111	108	109	112	141	162	150	147	144	130	136	144	153	120	133.4
13-Aug	197	230	193	197	268	233	210	188	174	187	193	225	231	220	219	224	230	215	216	249	283	304	327	202	220.4
14-Aug	260	293	312	302	300	189	160	33	16	21	22	208	171	111	133	121	130	149	160	318	333	252	216	211	223.7
15-Aug	195	201	198	198	183	193	181	195	168	180	196	202	232	252	309	264	2	10	8	6	360	351	351	359	292.2
16-Aug	351	312	335	1	360	331	32	43	150	23	21	150	145	159	167	213	238	258	210	184	202	237	228	232	219.6
17-Aug	199	296	296	299	290	296	322	314	329	9	356	283	289	291	290	301	305	298	288	286	282	284	258	222	293.6
18-Aug	157	246	219	209	218	206	203	33	13	7	19	1	70	222	271	348	38	45	21	11	6	18	291	264	334.4
19-Aug	241	224	230	217	210	212	219	200	206	195	180	166	286	251	228	233	20	60	45	301	351	20	331	8	235.5
20-Aug	30	11	9	8	13	19	22	17	22	32	28	13	24	360	338	34	31	19	31	9	300	294	303	311	12.8
21-Aug	305	302	298	298	288	253	314	336	3	341	353	5	3	18	43	30	34	21	16	1	347	300	271	264	350.5
22-Aug	258	225	206	217	222	218	213	203	201	3	5	52	351	322	16	28	31	29	28	59	118	263	236	254	287.4
23-Aug	200	189	229	180	189	195	180	147	150	151	183	155	126	117	150	126	101	101	79	95	114	139	302	319	143.8
24-Aug	300	311	30	211	346	329	1	339	345	350	34	55	112	141	143	265	190	165	238	78	128	172	170	168	114.9
25-Aug	190	224	157	218	168	203	194	188	184	172	179	168	173	177	178	180	180	182	174	163	164	185	181	190	178.6
26-Aug	187	213	231	202	188	182	184	190	188	181	184	210	204	187	171	151	258	358	202	210	187	229	197	218	196.9
27-Aug	234	220	198	191	196	220	219	212	213	219	M	250	279	276	223	261	291	290	294	307	229	282	212	210	244.8
28-Aug	235	260	270	257	283	267	223	229	318	321	324	319	317	306	297	314	315	354	212	342	10	0	321	297	298.7
29-Aug	28	190	206	197	189	193	196	193	182	175	164	153	141	155	140	162	140	139	128	138	153	149	149	155	160.4
30-Aug	195	345	321	328	195	234	100	144	201	213	242	230	240	192	151	129	120	58	41	356	328	348	266	241	222.1
31-Aug	198	208	216	219	202	203	204	207	175	165	157	188	219	2	218	205	259	275	259	274	185	217	211	221	213.5
	250.1	256.4	246.2	234.7	225.8	215.8	213.1	206.7	196.9	184.6	181.2	205.0	225.0	226.3	207.6	224.9	267.0	14.4	15.1	3.6	259.2	261.6	248.0	245.8	
	Diurnal Average																								

M - Maintenance
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 Aug 1 13:00

Minimum Value: 4 deg on Aug 22 05:00

Percentiles: P_1 = 9 P_{10} = 13 Q_1 = 18 Median = 25 Q_3 = 39 P_{90} = 55 P_{99} = 93

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Aug	20	18	16	14	15	16	19	24	25	27	55	96	99	97	39	42	38	28	22	14	9	14	23	15	99
2-Aug	9	13	10	9	36	17	18	26	24	25	27	31	36	27	27	26	22	83	34	82	46	61	41	20	83
3-Aug	12	11	13	13	14	14	20	26	32	34	36	30	38	39	38	30	27	36	94	24	12	9	48	20	94
4-Aug	28	38	14	22	13	13	88	26	30	20	23	24	39	32	25	28	22	18	17	16	18	16	11	34	88
5-Aug	57	39	47	64	43	41	30	66	37	29	30	37	41	42	33	25	25	27	19	7	19	24	22	15	66
6-Aug	25	17	18	16	22	23	19	20	19	20	28	26	29	28	27	48	48	28	31	19	16	16	27	20	48
7-Aug	16	19	20	18	17	21	24	23	28	29	28	30	27	27	27	25	24	23	24	17	12	24	13	17	30
8-Aug	18	52	39	25	36	85	54	54	70	51	42	52	37	35	43	22	20	26	20	21	21	19	26	16	85
9-Aug	27	20	20	17	19	18	31	22	77	54	96	65	61	44	29	26	29	26	42	55	18	39	27	31	96
10-Aug	17	22	23	12	20	9	17	29	29	33	37	32	39	41	38	23	20	22	13	10	11	24	19	13	41
11-Aug	13	13	13	13	13	17	15	19	22	98	43	22	27	22	20	39	21	22	20	17	13	39	14	32	98
12-Aug	45	15	20	73	84	72	15	45	55	82	62	34	46	33	42	35	32	25	21	14	14	18	18	68	84
13-Aug	91	40	24	10	38	13	14	18	18	27	31	33	31	30	27	31	25	24	18	26	15	43	75	16	91
14-Aug	42	13	15	9	8	54	41	85	25	45	80	80	93	77	38	35	30	26	16	74	13	35	12	9	93
15-Aug	20	10	15	19	18	15	14	29	31	29	44	71	70	84	87	66	60	21	19	18	15	12	14	9	87
16-Aug	13	7	15	29	62	38	23	40	74	32	51	55	46	42	40	39	32	23	29	10	14	22	12	19	74
17-Aug	23	40	15	18	35	19	37	24	48	57	69	34	29	27	21	18	21	20	18	15	16	13	15	31	69
18-Aug	46	23	33	10	17	9	51	31	85	36	39	45	79	53	42	47	26	29	20	17	17	27	29	15	85
19-Aug	30	15	16	17	15	15	30	22	25	35	34	30	52	25	53	46	52	22	20	23	20	43	28	31	53
20-Aug	18	18	18	21	19	19	21	19	18	17	19	24	22	26	33	39	22	21	18	32	21	11	52	31	52
21-Aug	13	12	11	11	13	49	90	71	23	25	29	36	41	53	31	28	23	23	21	16	23	6	37	20	90
22-Aug	18	19	14	9	4	5	9	23	79	35	54	48	63	52	52	48	52	29	23	25	29	48	29	26	79
23-Aug	47	36	47	57	38	94	40	38	27	36	46	35	37	37	42	46	70	46	17	10	10	37	41	16	94
24-Aug	9	40	96	92	28	51	17	28	26	29	29	56	56	44	61	66	75	46	27	74	40	15	10	19	96
25-Aug	23	55	26	49	69	10	13	20	23	25	23	25	24	21	25	21	18	20	15	15	11	13	9	15	69
26-Aug	79	9	19	12	17	12	14	17	21	17	22	24	25	26	28	25	59	55	41	45	23	38	14	21	79
27-Aug	17	13	12	15	35	16	16	18	20	25	M	44	35	33	35	32	23	17	20	10	35	29	38	20	44
28-Aug	19	18	17	18	20	17	28	33	33	20	21	30	26	28	27	29	39	49	38	49	11	15	28	13	49
29-Aug	59	50	10	13	12	14	15	24	20	24	30	41	33	31	26	28	24	22	12	18	17	18	20	17	59
30-Aug	67	12	11	34	65	26	80	24	19	53	42	28	58	45	65	41	44	36	25	27	33	35	21	33	80
31-Aug	65	19	16	21	14	16	17	18	40	43	42	49	41	66	44	26	58	40	18	65	42	12	16	17	66
	91	55	96	92	84	94	90	85	85	98	96	96	99	97	87	66	75	83	94	82	46	61	75	68	
	Diurnal Maximum																								

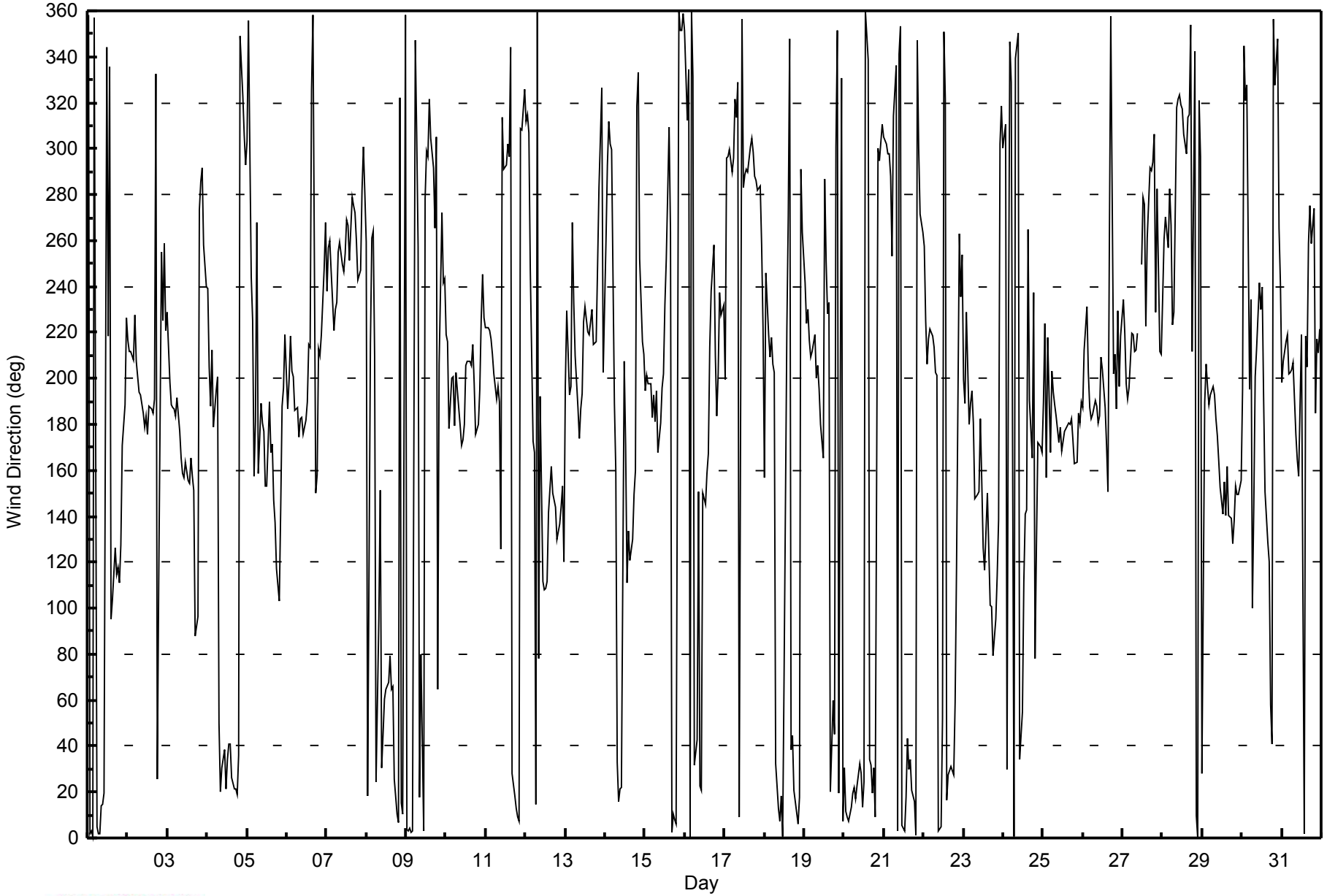
M - Maintenance

WBEA

Hourly Averages

Wind Direction (WD) - deg

CNRL Horizon - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL	Station Number	15
Reason:	Routine		
Start Time (MST)	9:05	End Time (MST)	13:10
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	11/6/2014
Gas Cert Reference	LL107945		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	1850
DACS voltage range	0-5000mV	DACS channel #	Diff 1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-648	-648
Analyzer Range (mv)	5000	5000	Lamp voltage	760	765
Calculated slope	1.010867	1.011165	Chamber temp.	45.3	45.2
Calculated intercept	-0.061794	0.248485	Pressure (mmHg)	707.0	713.6
Analyzer Background	12.5	12.5	Flow (lpm)	0.428	0.435
Analyzer Coefficient	1.006	1.006	Intensity	88	88

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	818.4	1.012
calibrator zero	5000	0.0	0.0	-0.5	NA
high point	5000	82.3	827.9	818.4	1.012
second point	5000	41.2	414.5	409.8	1.011
third point	5000	20.6	207.2	205.0	1.011
calibrator zero	5000	0.0	0.0	-0.5	NA
as left zero	5000	0.0	0.0	-0.2	NA
as left span	5000	82.3	827.9	822.7	1.006
				Average Correction Factor	1.011

Corrected As found	818.9	Previous response	819.1	% change	0.0%

Notes:

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

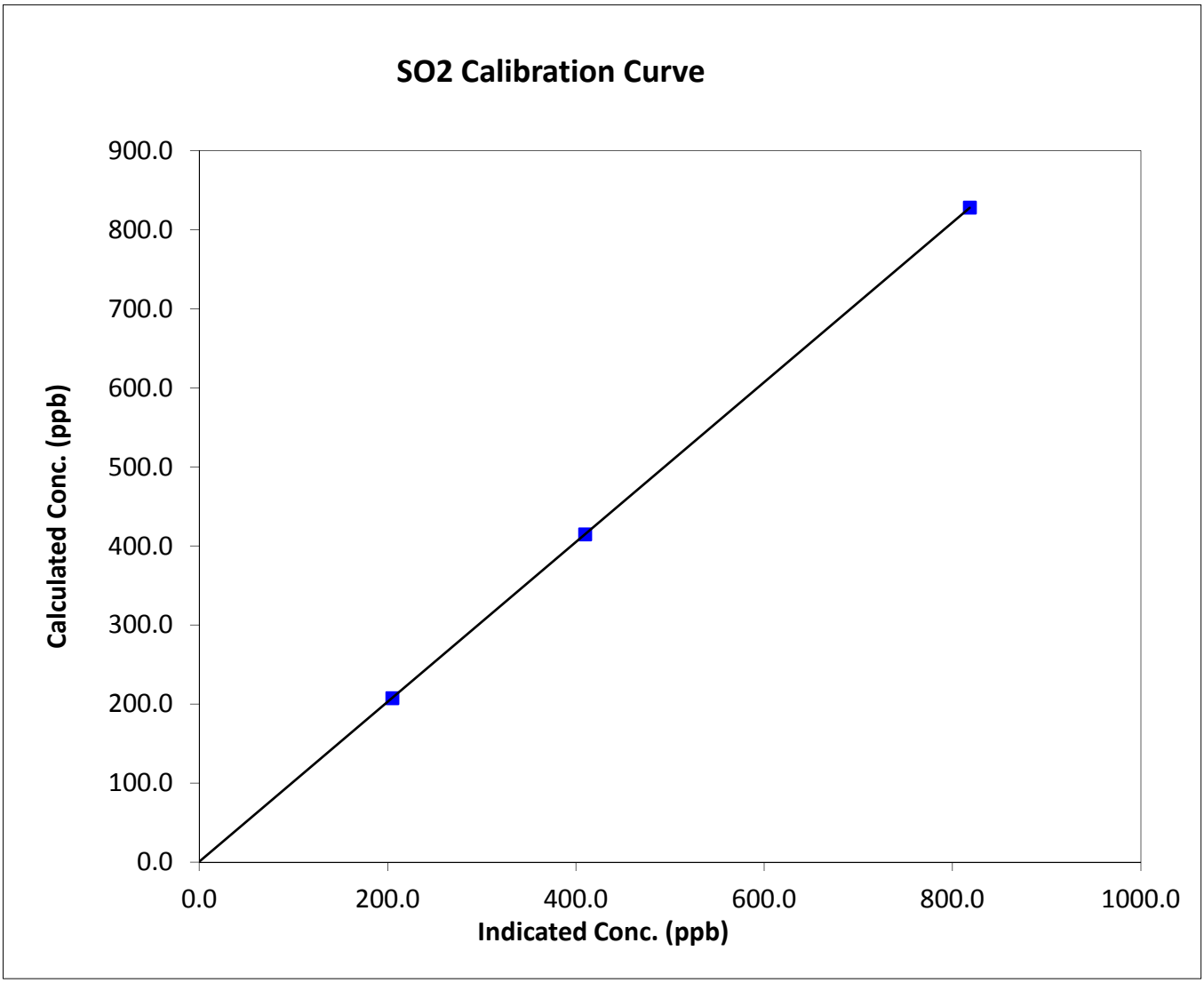
SO_2 Calibration Summary

Station Information

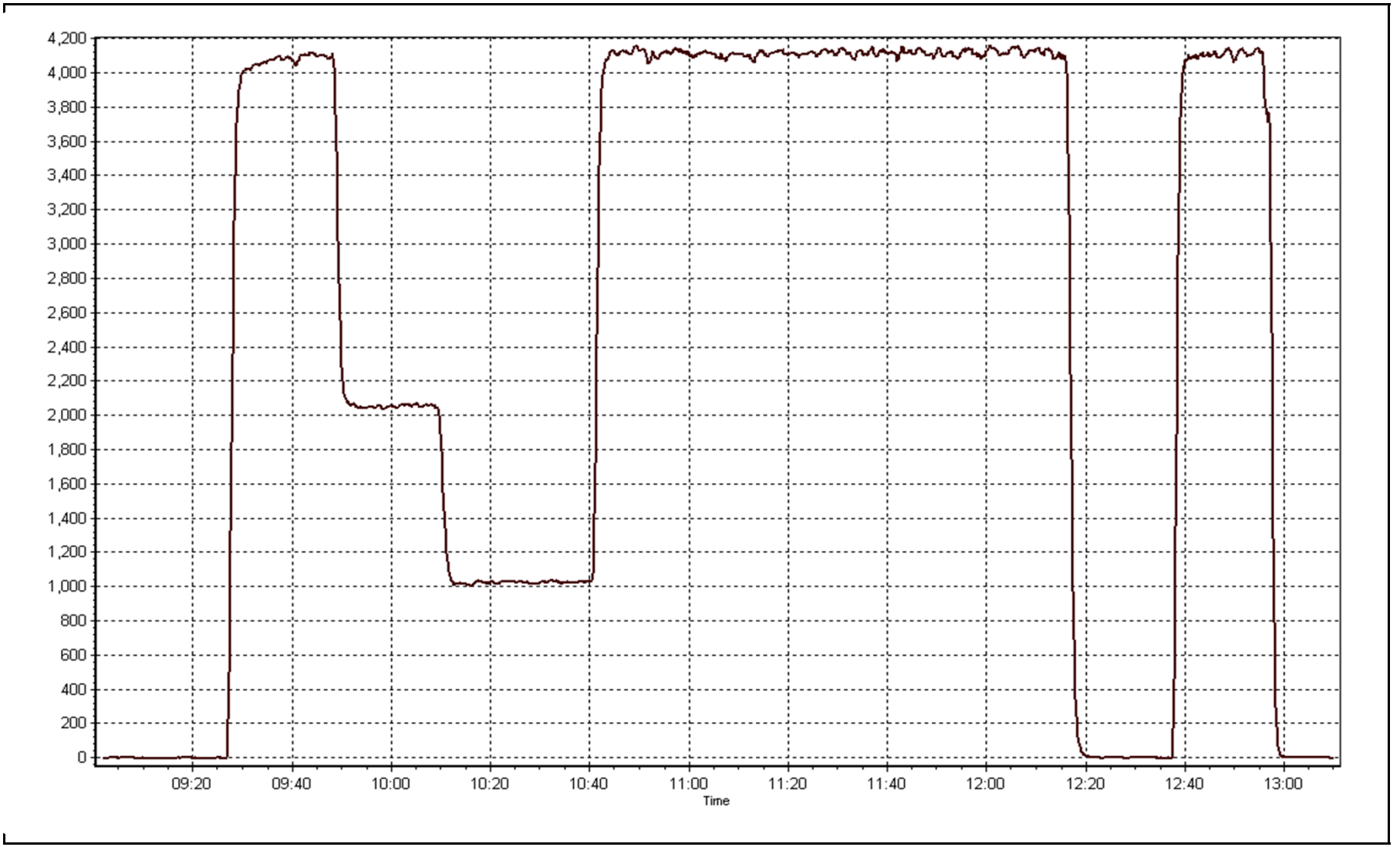
Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL	Station Number	15
Start Time (MST)	9:05	End Time (MST)	13:10
Analyzer make	43i	Analyzer serial #	10710321322

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999999
827.9	818.4	1.0117		
414.5	409.8	1.0114	Slope	1.011165
207.2	205.0	1.0109		
			Intercept	0.248485



SO2 Calibration Plot Date: August 26, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	August 27, 2014	Previous Calibration	July 17, 2014
Station Name	CNRL Horizon	Station Number	15
Reason:	Routine		
Start Time (MST)	9:40	End Time (MST)	12:00
Barometric Pressure	728.5 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	-673
Analyzer Range (input)	5000	5000	Lamp voltage	759	756
Calculated slope	1.007406	1.009324	Chamber temp.	45	45
Calculated intercept	-0.474707	-0.465136	Pressure	684.0	687.6
Analyzer Background	9	9	Flow	0.417	0.419
Analyzer Coefficient	0.934	0.934	Intensity	90	91
			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	0.3	NA
as found span	5000	38.5	80.1	79.7	1.005
SO2 scrubber check	5000	20.6	207.2	0.3	NA
calibrator zero	5000	0.0	0.0	0.3	NA
high point	5000	38.5	80.1	79.7	1.005
second point	5000	19.2	39.9	40.3	0.992
third point	5000	9.6	20.0	20.3	0.982
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	38.5	80.1	80.3	0.997
				Average Correction Factor	0.993

Corrected As found	79.4	Previous response	80.0	% change	0.7%

Notes:

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

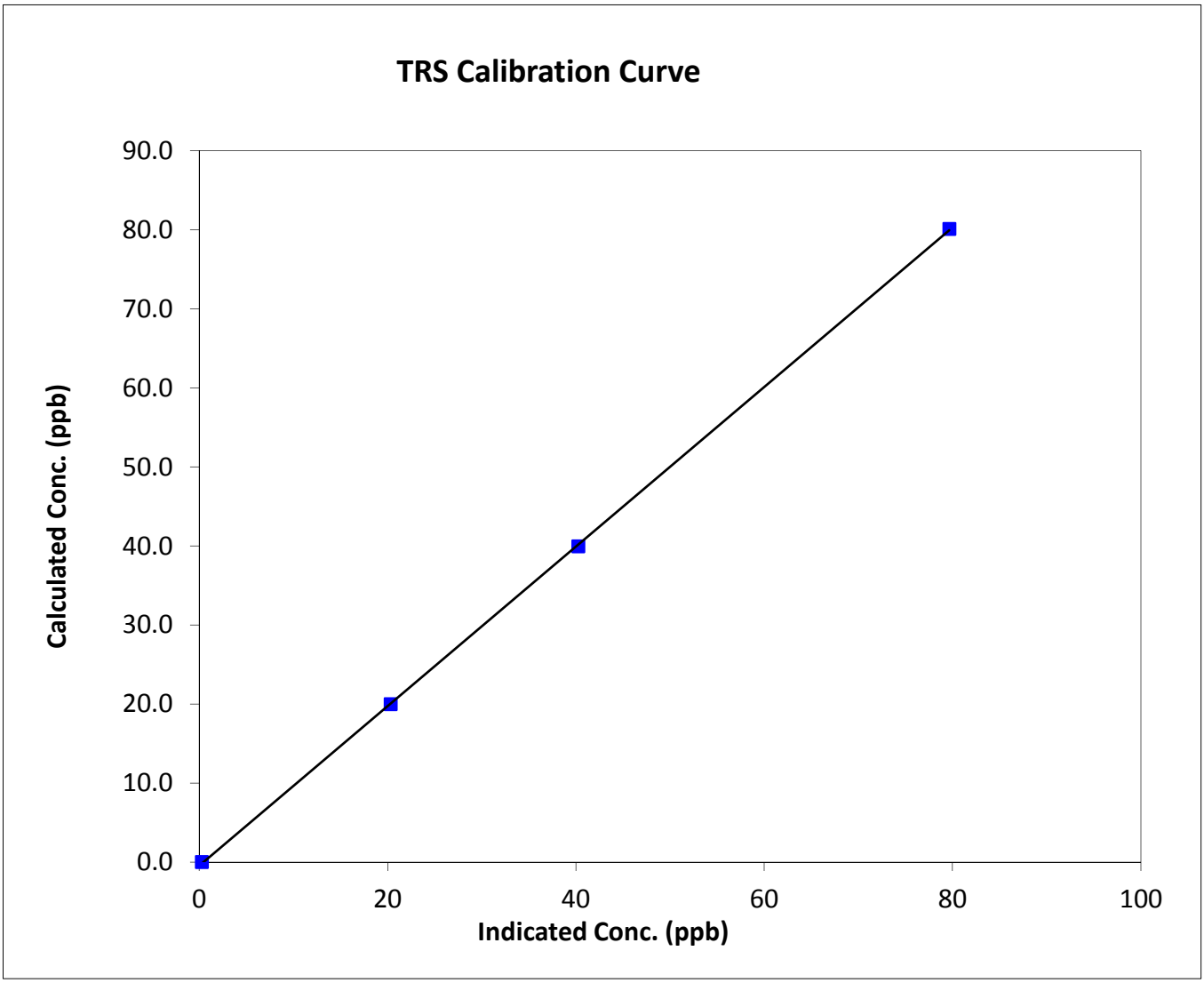
TRS Calibration Summary

Station Information

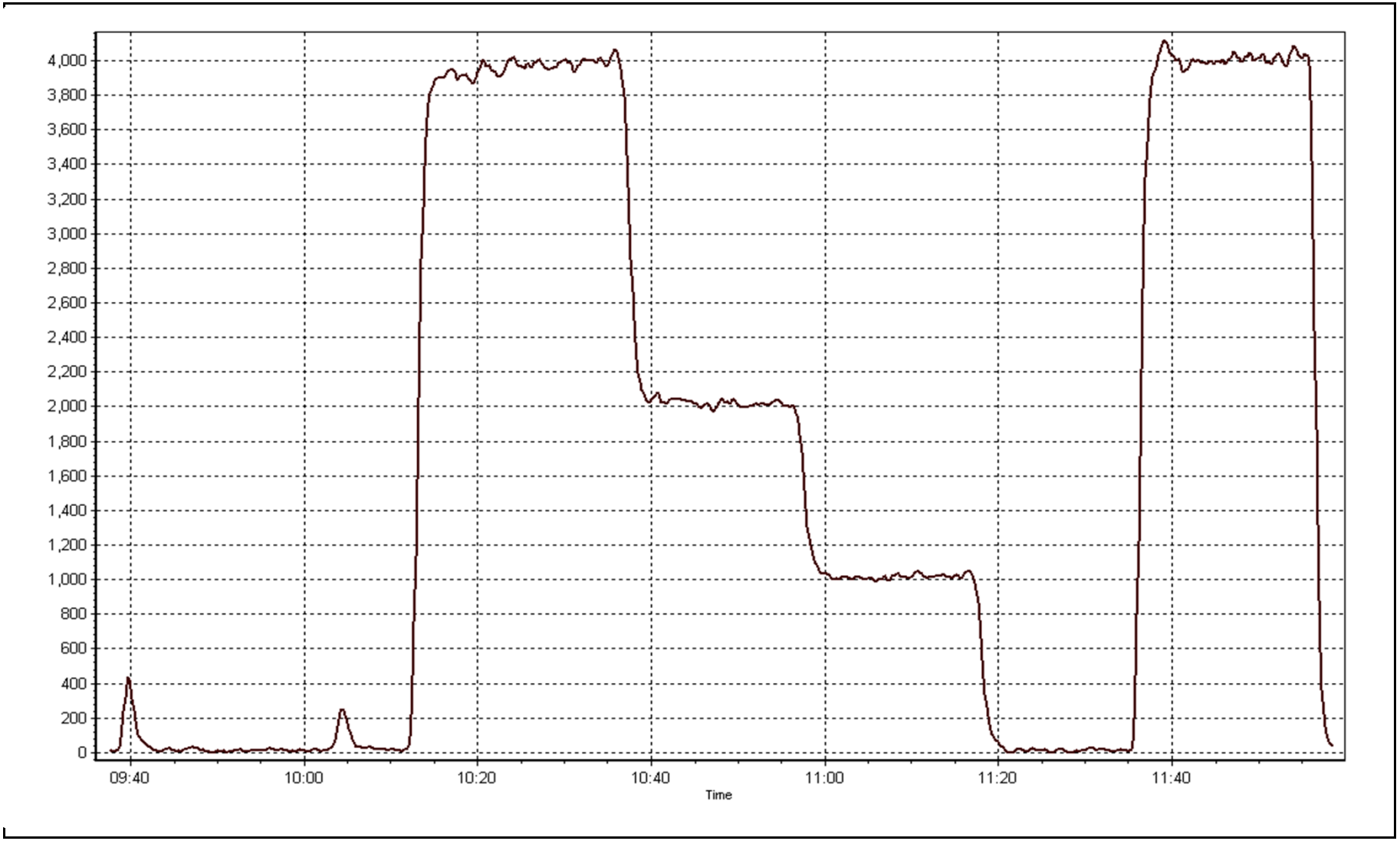
Calibration Date	August 27, 2014	Previous Calibration	July 17, 2014
Station Name	CNRL Horizon	Station Number	15
Start Time (MST)	9:40	End Time (MST)	12:00
Analyzer make	TEI 43I	Analyzer serial #	0710321323

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999966
80.1	79.7	1.0053		
39.9	40.3	0.9920	Slope	1.009324
20.0	20.3	0.9817		
			Intercept	-0.465136



TRS Calibration Plot Date: August 27, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Reason:	Routine		
Start Time (MST)	9:05	End Time (MST)	13:10
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	11/6/2014
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.	2582
DACS voltage range	0-5000mV	DACS channel #	SE 3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	6.0	6.0
Analyzer Range (mv)	5000	5000	Air or Bypass press	20.0	20.0
Calculated slope	0.998000	0.995639	Fuel Pressure	18.0	18.0
Calculated intercept	0.041926	0.064503			

Analyzer make	TEI 51C-LT	Analyzer serial #	76232382

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	82.3	17.48	17.50	0.999
calibrator zero	5000	0.0	0.00	-0.06	N/A
high point	5000	82.3	17.48	17.50	0.999
second point	5000	41.2	8.75	8.71	1.005
third point	5000	20.6	4.38	4.33	1.010
calibrator zero	5000	0.0	0.00	-0.06	N/A
as left zero	5000	0.0	0.00	-0.07	N/A
as left span	5000	82.3	17.48	17.37	1.006
				Average Correction Factor	1.005

Corrected As found	17.56	Previous response	17.47	% change	-0.5%

Notes:

No adjustments required

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

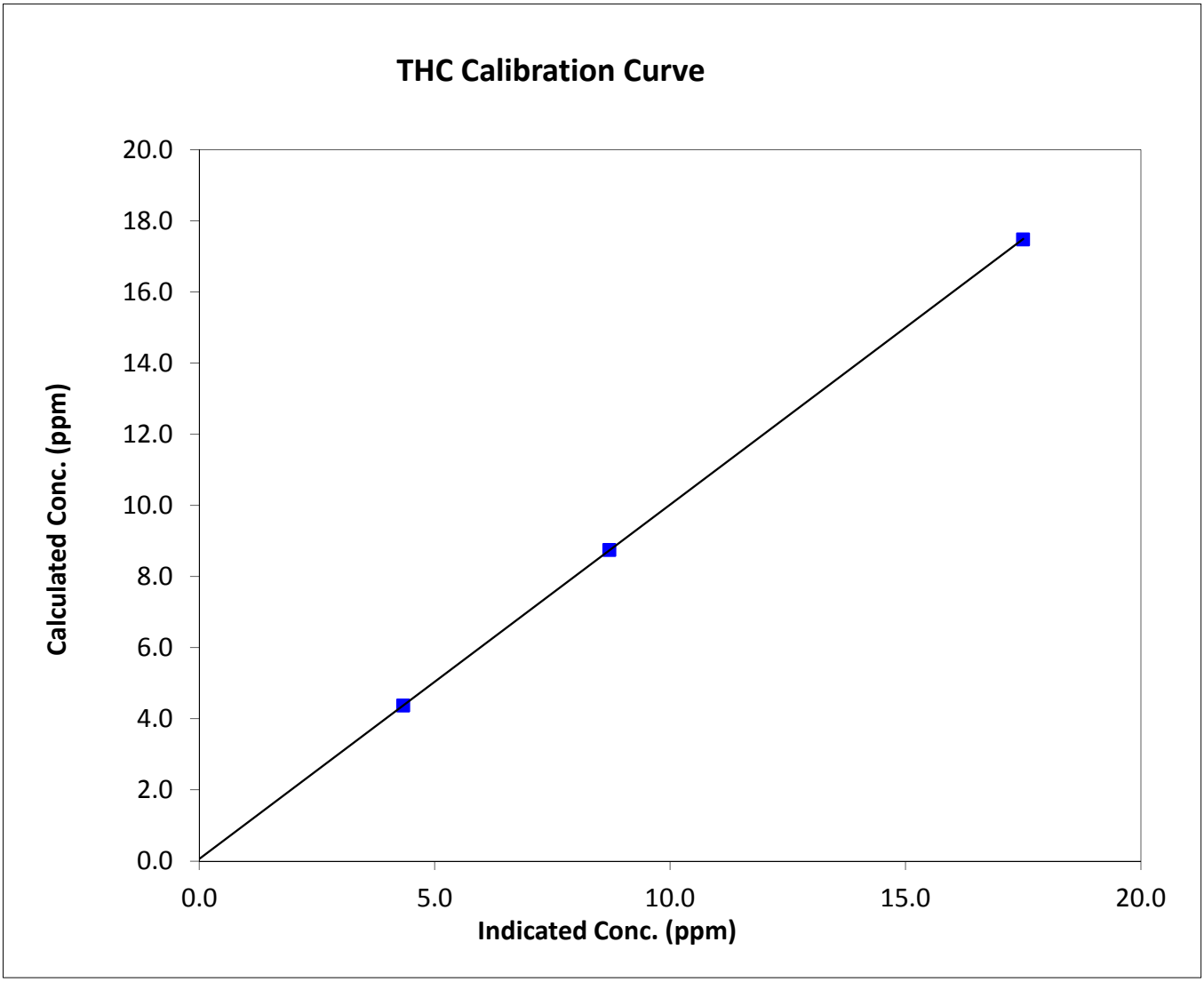
THC Calibration Summary

Station Information

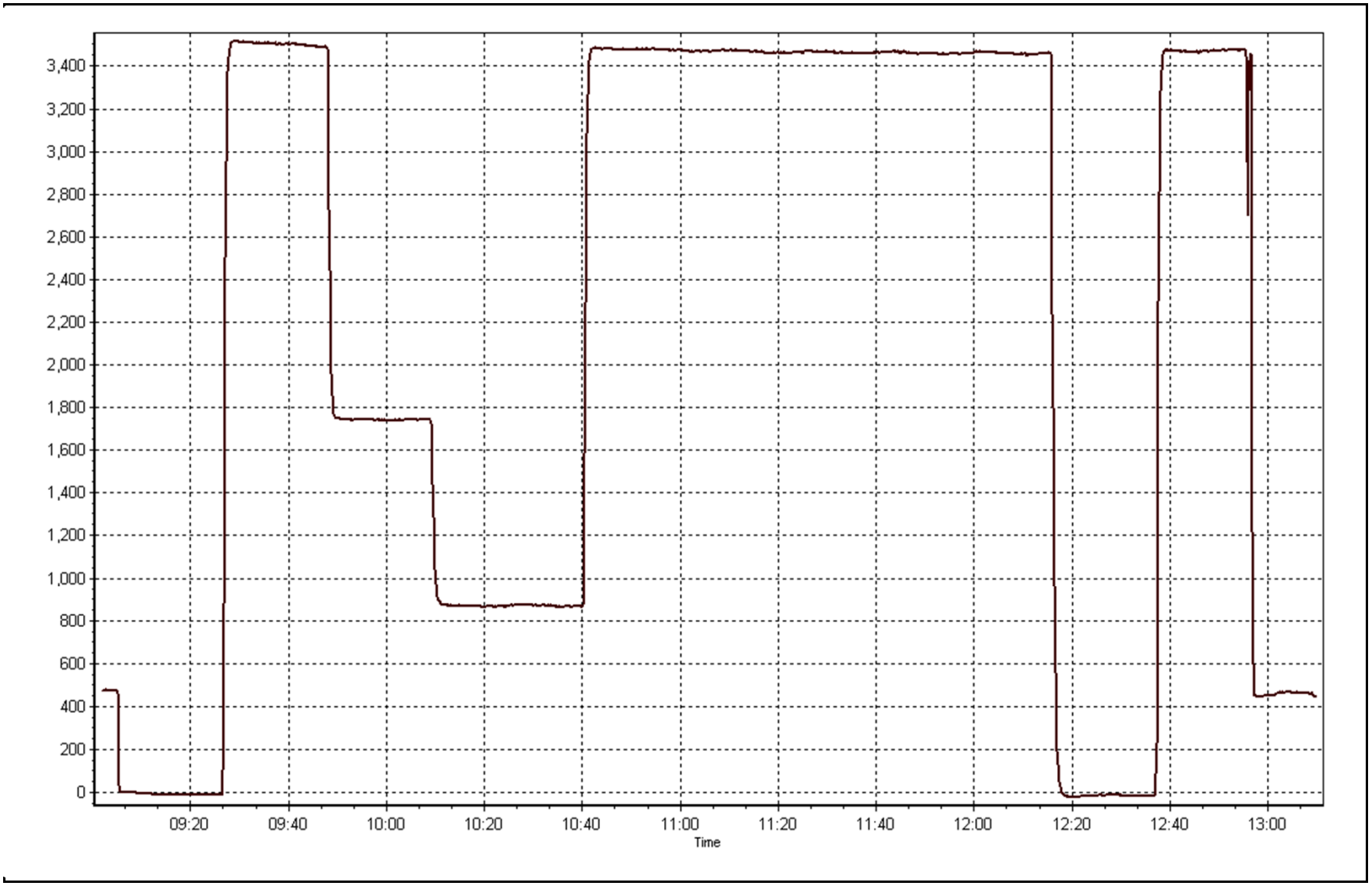
Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:05	End Time (MST)	13:10
Analyzer make	TEI 51C-LT	Analyzer serial #	76232382

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.06	N/A	Correlation Coefficient	0.999998
17.48	17.50	0.9989		
8.75	8.71	1.0048	Slope	0.995639
4.38	4.33	1.0105		
			Intercept	0.064503



THC Calibration Plot Date: August 26, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Reason:	Routine		
Start Time (MST)	9:05	End Time (MST)	13:10
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)	5000	5000	5000
Before	Data Slope	1.001270	0.999265	0.999486
	Data Offset	-1.506776	-0.679006	-1.060022
After	Data Slope	0.982734	0.981714	0.997134
	Data Offset	-1.528111	-0.795321	-0.791651
Channel #		Diff 3	Diff 4	Diff 5
Voltage Range		0-5000mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model	42i	Analyzer serial #	710321429

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.923	ppb	0.923	ppb
NOX coefficient	1.000	ppb	1.000	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	11.5		11.2	
NOX bkgrnd	11.7		11.4	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	325.0	Deg C	325.0	Deg C
PMT Temp	-3.0	Deg C	-3.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	168.0	mmHg	178.8	mmHg
Sample Flow	0.613	ccm	0.662	ccm

Notes:

no adjustments required.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 26, 2014 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	1.0	0.2	0.2	N/A	N/A
as found span	5000	82.3	800.0	800.0	0.0	814.7	814.6	1.4	0.9819	0.9820
calibrator zero	5000	0.0	0.0	0.0	0.0	1.0	0.2	0.2	N/A	N/A
high point	5000	82.3	800.0	800.0	0.0	814.7	814.6	1.4	0.9819	0.9820
second point	5000	41.2	400.5	400.5	0.0	410.5	410.5	0.8	0.9756	0.9756
third point	5000	20.6	200.2	200.2	0.0	205.9	205.3	0.7	0.9723	0.9751
calibrator zero	5000	0.0	0.0	0.0	0.0	1.0	0.2	0.2	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	1.9	1.3	0.1	N/A	N/A
as left span	5000	82.3	800.0	459.4	340.6	818.4	462.7	357.4	0.9774	0.9928
							Average Correction Factor		0.9766	0.9776

Corrcted As found NO_X= 813.7 NO= 814.5 Percent Change NO_X= -1.6% NO= -1.6%

Previous Response NO_X= 800.4 NO= 801.2

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			0.2			N/A	
1st NO2 (300)	N/A	459.4	358.2	817.6	459.4	359.8	0.9626	1.0000	0.9954	100.5%
2nd NO2 (200)	N/A	595.4	222.1	817.7	595.4	223.6	0.9624	1.0000	0.9936	100.6%
3rd NO2 (100)	N/A	730.5	87.1	818.2	730.5	88.9	0.9618	1.0000	0.9800	102.0%
4th NO2 (0)	817.6	N/A	-0.8	816.8	817.6	0.5	0.9636	1.0000	N/A	N/A
					Average Correction Factor		0.9626	1.0000	0.9897	101.0%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

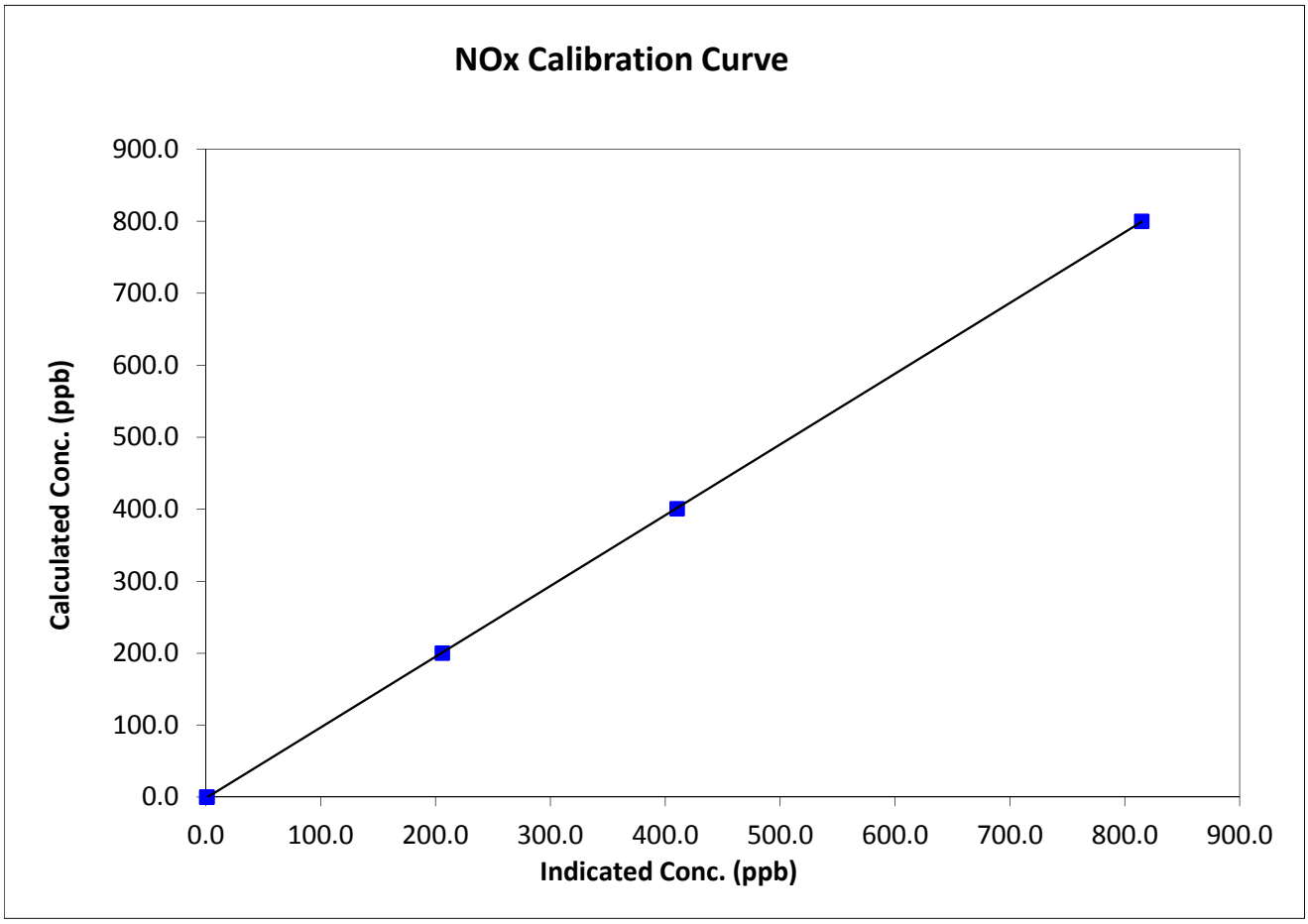
NO_X Calibration Summary

Station Information

Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:05	End Time (MST)	13:10
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	1.0	N/A	Correlation Coefficient	0.999992
800.0	814.7	0.9819		
400.5	410.5	0.9756	Slope	0.982734
200.2	205.9	0.9723		
0.0	1.0	0.0000	Intercept	-1.528111



Wood Buffalo Environmental Association

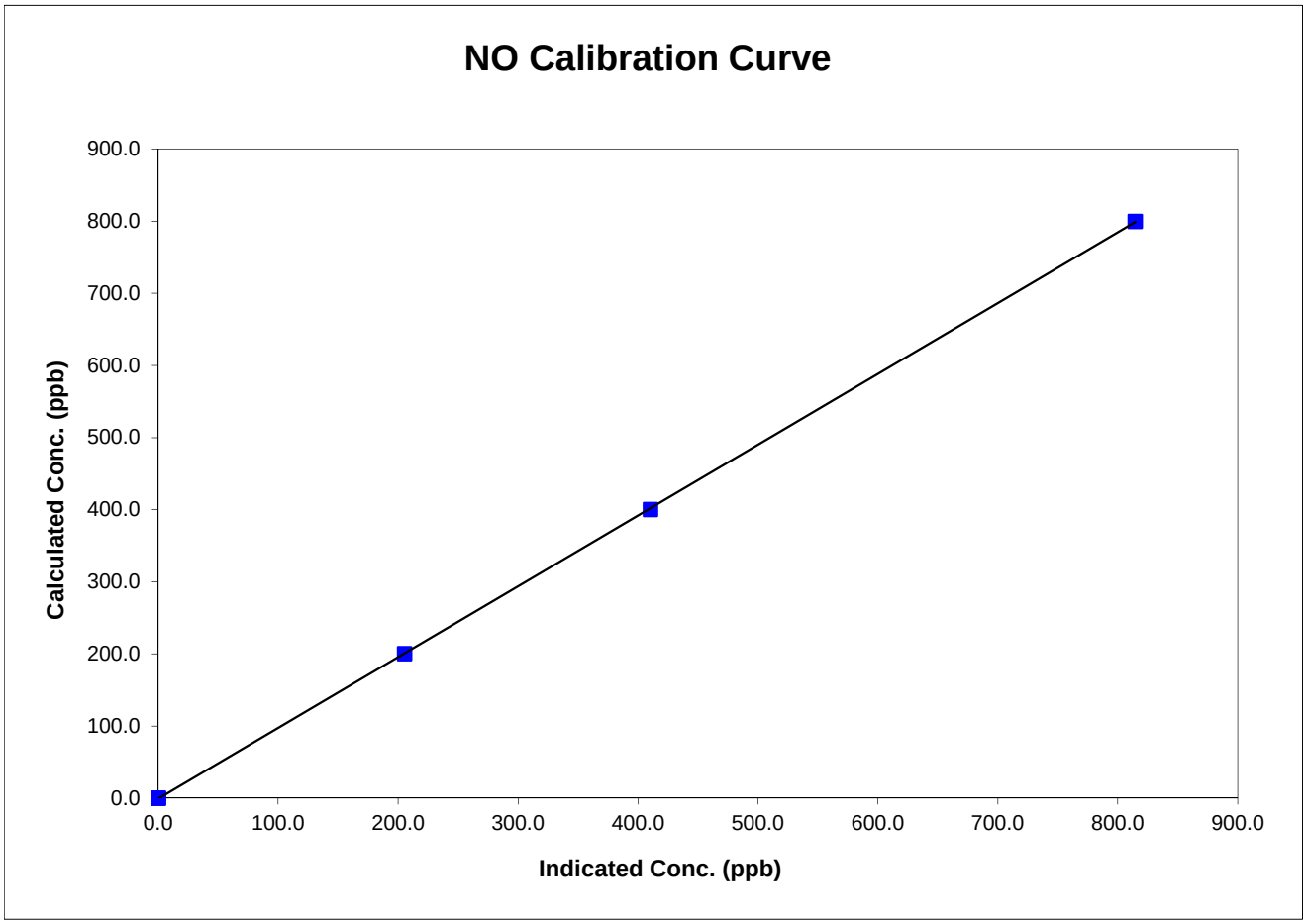
NO Calibration Summary

Station Information

Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:05	End Time (MST)	13:10
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	0.999989
800.0	814.6	0.9820		
400.5	410.5	0.9756	Slope	0.981714
200.2	205.3	0.9751		
0.0	0.2	0.0000	Intercept	-0.795321



Wood Buffalo Environmental Association

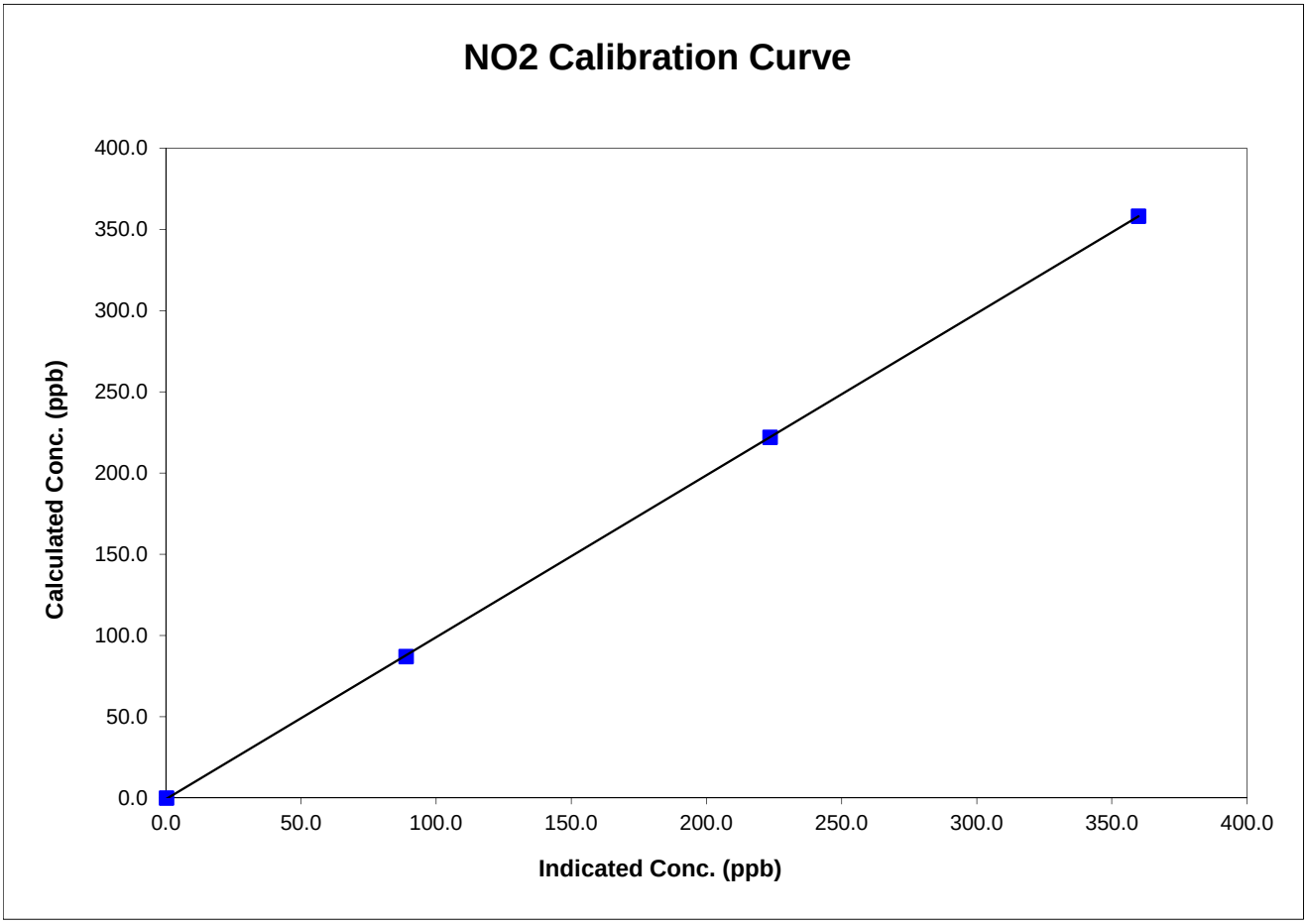
NO_2 Calibration Summary

Station Information

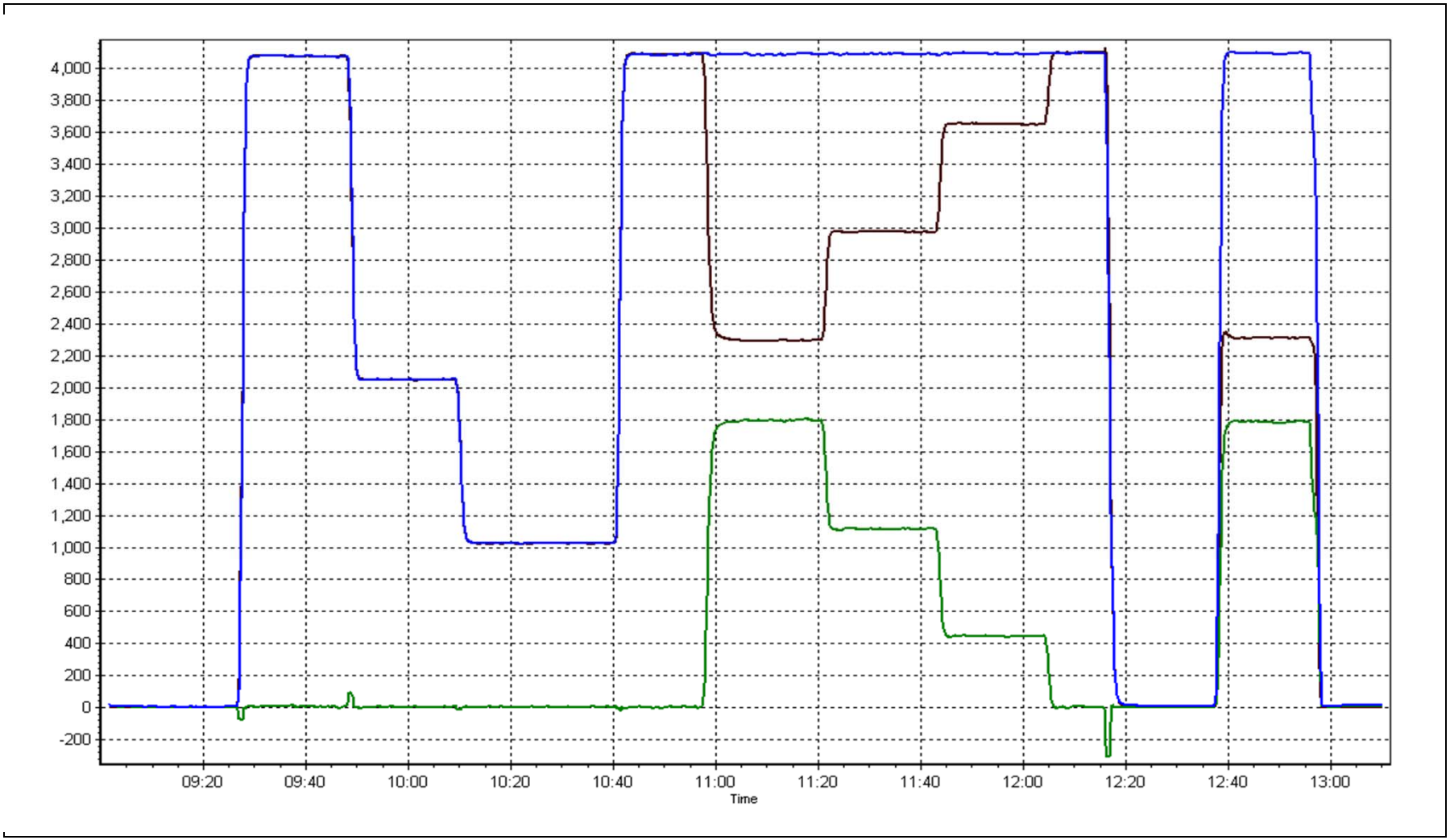
Calibration Date	August 26, 2014	Previous Calibration	July 15, 2014
Station Number	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:05	End Time (MST)	13:10
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999988
358.2	359.8	0.9954		
222.1	223.6	0.9936	Slope	0.997134
87.1	88.9	0.9800		
			Intercept	-0.791651



NOx, NO & NO_2 Calibration Plot Date: August 26, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 16
SHELL MUSKEG RIVER
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
AUGUST 2014

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	31	0	6	0
THC (ppm) Average	697	38	47	98.79	4.9	-	3.1	-
NO2 (ppb) Average	706	38	38	100.00	39	0	16	-
NO (ppb) Average	706	38	38	100.00	146	-	20	-
NOX (ppb) Average	706	38	38	100.00	183	-	31	-
PM2.5 (ug/m3) Average	738	0	6	99.19	491.2	-	139.3	2
Temperature 2 m (C) Average	741	0	3	99.60	31.1	-	23.7	-
Relative Humidity (%) Average	731	0	13	98.25	99	-	-	-
Barometric Pressure (inHg) Average	731	0	13	98.25	29.3	-	-	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	25	-	-	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
AUGUST 2014

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	1.6	4	-	0	0	0	0	1	4	31
THC (ppm) Average	697	2.41	0.4	-	1.8	2.1	2.2	2.4	2.6	2.8	4.9
NO2 (ppb) Average	706	7.4	7	-	0	1	2	6	10	17	39
NO (ppb) Average	706	5.1	12	-	0	0	0	1	6	15	146
NOX (ppb) Average	706	12.5	17	-	0	1	3	6	18	31	183
PM2.5 (ug/m3) Average	738	18.44	38.2	-	0	2.3	4.5	8.8	16.2	33	491.2
Temperature 2 m (C) Average	741	17.13	6.5	-	1.5	9.6	12.6	16.4	21.6	26.7	31.1
Relative Humidity (%) Average	731	68.9	20	-	22	41	51	71	87	95	99
Barometric Pressure (inHg) Average	731	28.86	0.2	-	28.5	28.6	28.7	28.9	29	29.2	29.3
Wind Speed 10 m (km/h) Average	740	8.1	4	-	1	3	5	7	10	14	25
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC	13 Aug 2014 00:00	13 Aug 2014 00:00	1	Intermittent unstable operation - baseline drift
THC	13 Aug 2014 02:00	13 Aug 2014 06:00	5	Intermittent unstable operation - baseline drift
THC	17 Aug 2014 11:00	17 Aug 2014 11:00	1	Intermittent unstable operation - baseline drift
THC	28 Aug 2014 07:00	28 Aug 2014 08:00	2	Intermittent unstable operation - baseline drift
PM2.5	18 Aug 2014 14:00	18 Aug 2014 15:00	2	Maintenance - Flow and zero check, sample head cleaning
PM2.5	19 Aug 2014 11:00	19 Aug 2014 14:00	4	Maintenance - replace analyzer due to suspected water leak
Temperature 2 m	28 Aug 2014 11:00	28 Aug 2014 13:00	3	Maintenance - sensor calibration
Relative Humidity	01 Aug 2014 01:00	01 Aug 2014 10:00	10	DAS collection error - invalid program uploaded
Relative Humidity	28 Aug 2014 11:00	28 Aug 2014 13:00	3	Maintenance - sensor calibration
Barometric Pressure	01 Aug 2014 01:00	01 Aug 2014 10:00	10	DAS collection error - invalid program uploaded
Barometric Pressure	28 Aug 2014 11:00	28 Aug 2014 13:00	3	Maintenance - sensor calibration
Wind Speed, Wind Direction	23 Aug 2014 18:00	23 Aug 2014 18:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	28 Aug 2014 11:00	28 Aug 2014 13:00	3	Maintenance - sensor calibration

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 31 ppb on Aug 29 12:00 Maximum Daily Average: 5.9 ppb on Aug 29

Minimum Value: 0 ppb on Aug 5 02:00 Minimum Daily Average: 0.2 ppb on Aug 7
Maximum Diurnal Average: 5.7 ppb at hour 12 Minimum Diurnal Average: 0.3 ppb at hour 6
Monthly Average: 1.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 25$

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-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	1	1	0	0	0	0	0	0.6	3
2-Aug	Z	0	0	0	0	0	1	2	21	16	9	16	8	6	7	5	3	2	1	1	0	0	0	0	4.4	21
3-Aug	Z	0	0	0	0	0	0	0	25	11	6	2	1	1	2	3	12	17	11	7	3	1	1	0	4.6	25
4-Aug	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.6	1
5-Aug	Z	0	0	0	0	0	0	0	1	4	4	12	5	1	2	0	2	3	1	0	0	0	0	0	1.6	12
6-Aug	Z	3	3	3	5	3	4	8	14	13	9	8	13	2	1	0	0	0	0	1	0	0	0	0	4.0	14
7-Aug	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	1
8-Aug	Z	1	0	0	0	0	0	0	0	1	4	8	8	2	1	1	0	0	0	1	0	0	0	0	1.3	8
9-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	10	11	5	8	5	1	1	1	0	0	0	0	2.0	11
10-Aug	Z	0	0	0	0	0	0	1	2	12	1	5	1	1	0	0	0	0	0	0	0	0	0	0	1.2	12
11-Aug	Z	0	0	0	0	0	0	0	0	5	10	11	4	2	0	0	1	1	1	1	1	1	1	0	1.8	11
12-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	2	1	0	0	0	0	0	0.5	3
13-Aug	Z	0	0	0	0	0	0	0	3	14	25	23	12	2	2	2	1	1	1	1	1	1	1	1	4.1	25
14-Aug	Z	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	3	3	3	5	2	2	2	1.4	5
15-Aug	Z	2	2	1	1	1	1	1	3	8	2	1	3	1	1	1	1	1	1	1	0	0	0	1	1.4	8
16-Aug	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	4	7	1	1	1	1	1	0	1	0	0.9	7
17-Aug	Z	1	1	0	0	0	0	0	0	0	2	2	1	0	0	0	0	1	0	0	0	0	0	0	0.5	2
18-Aug	Z	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	3	1	1	0	0	0	0	0	--	3
19-Aug	Z	0	0	0	0	0	0	0	0	0	1	5	7	1	0	0	0	0	0	0	0	0	0	0	0.7	7
20-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0.4	1
21-Aug	Z	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	0	0	0.4	1
22-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
23-Aug	Z	0	0	0	0	0	0	0	0	2	26	26	10	2	1	7	7	5	5	4	2	1	1	0	4.4	26
24-Aug	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-Aug	Z	0	0	0	0	0	0	1	1	1	4	5	5	4	3	6	4	8	2	1	2	2	5	6	2.5	8
26-Aug	Z	4	4	3	2	1	1	2	2	1	4	7	5	3	14	12	1	1	0	0	0	0	0	0	2.9	14
27-Aug	Z	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
28-Aug	Z	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
29-Aug	Z	0	0	0	0	0	0	2	19	27	30	31	9	6	2	2	2	1	1	1	1	0	0	0	5.9	31
30-Aug	Z	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
31-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
	--	0.5	0.5	0.4	0.4	0.3	0.4	0.8	3.2	4.0	4.8	5.7	3.6	1.7	1.8	2.1	1.8	1.7	1.1	0.9	0.7	0.5	0.5	0.5	Diurnal Average	
	--	4	4	3	5	3	4	8	25	27	30	31	13	11	14	12	12	17	11	7	5	2	5	6	Diurnal Maximum	

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

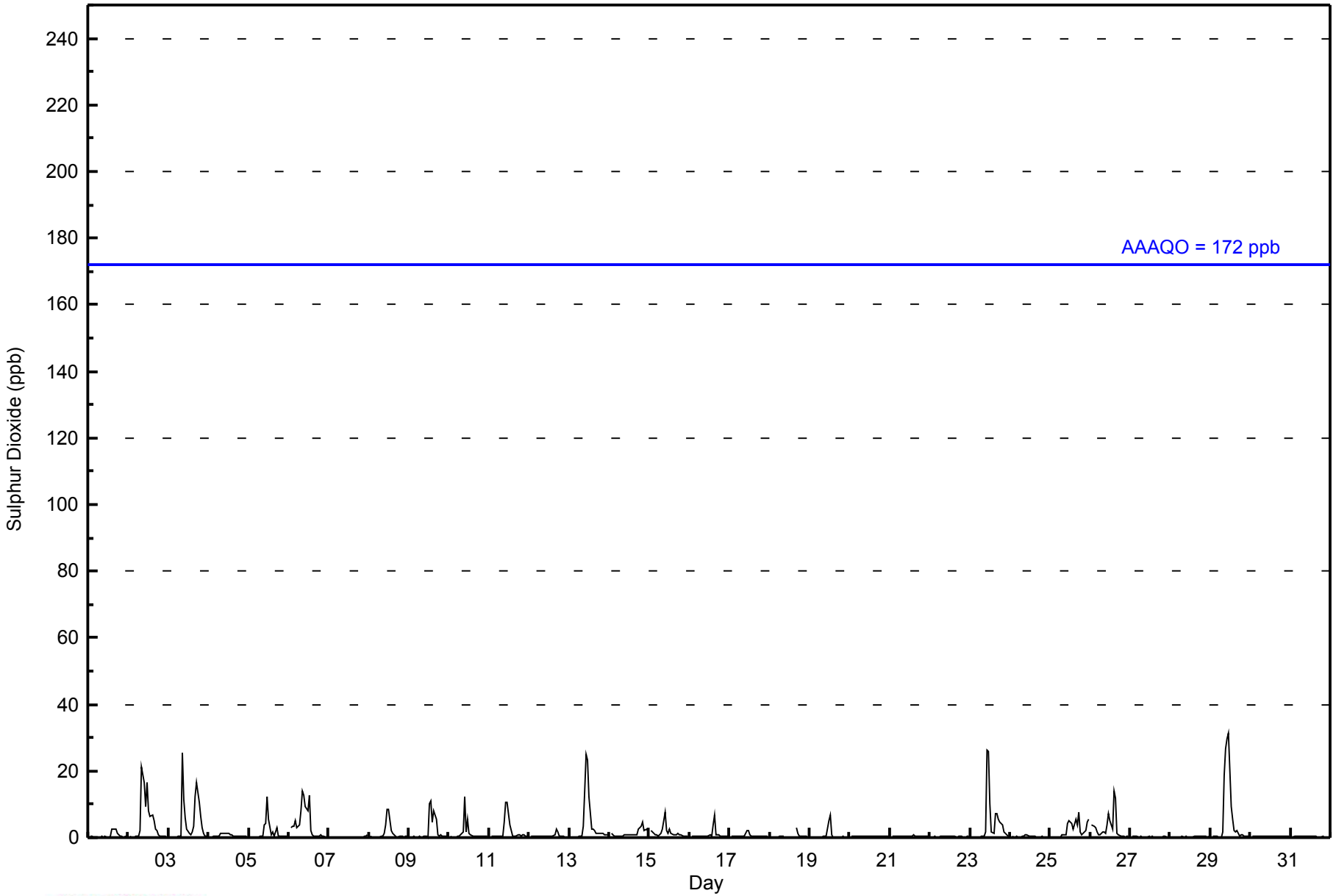
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	679	96.18	96.18
11 - 20	18	2.55	98.73
21 - 60	9	1.27	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - August 2014

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 10	16	23	35	19	17	13	20	37	48	218	72	46	33	38	29	11	675
11 - 20	0	0	0	0	0	0	0	0	1	11	4	0	2	0	0	0	18
21 - 60	0	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	23	35	19	17	13	20	37	49	235	79	46	35	38	29	11	702

Wind Direction

Total Number of Valid Hours: 702

Total Number of Hours: 744

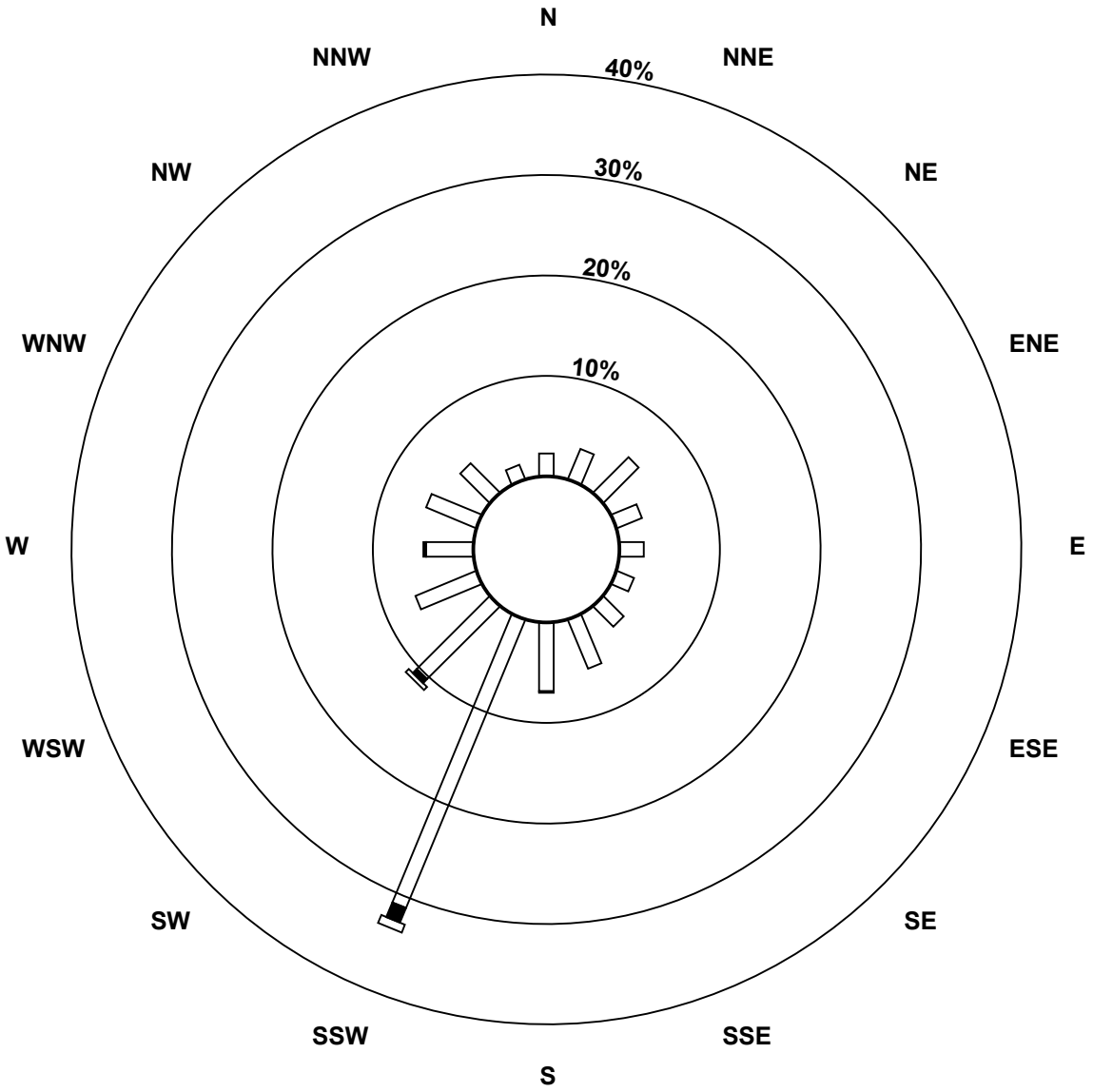
AURORA ATMOSPHERICS INC.

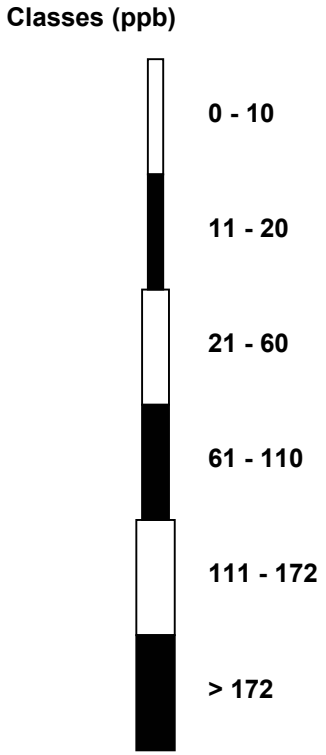
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River (AMS 16)





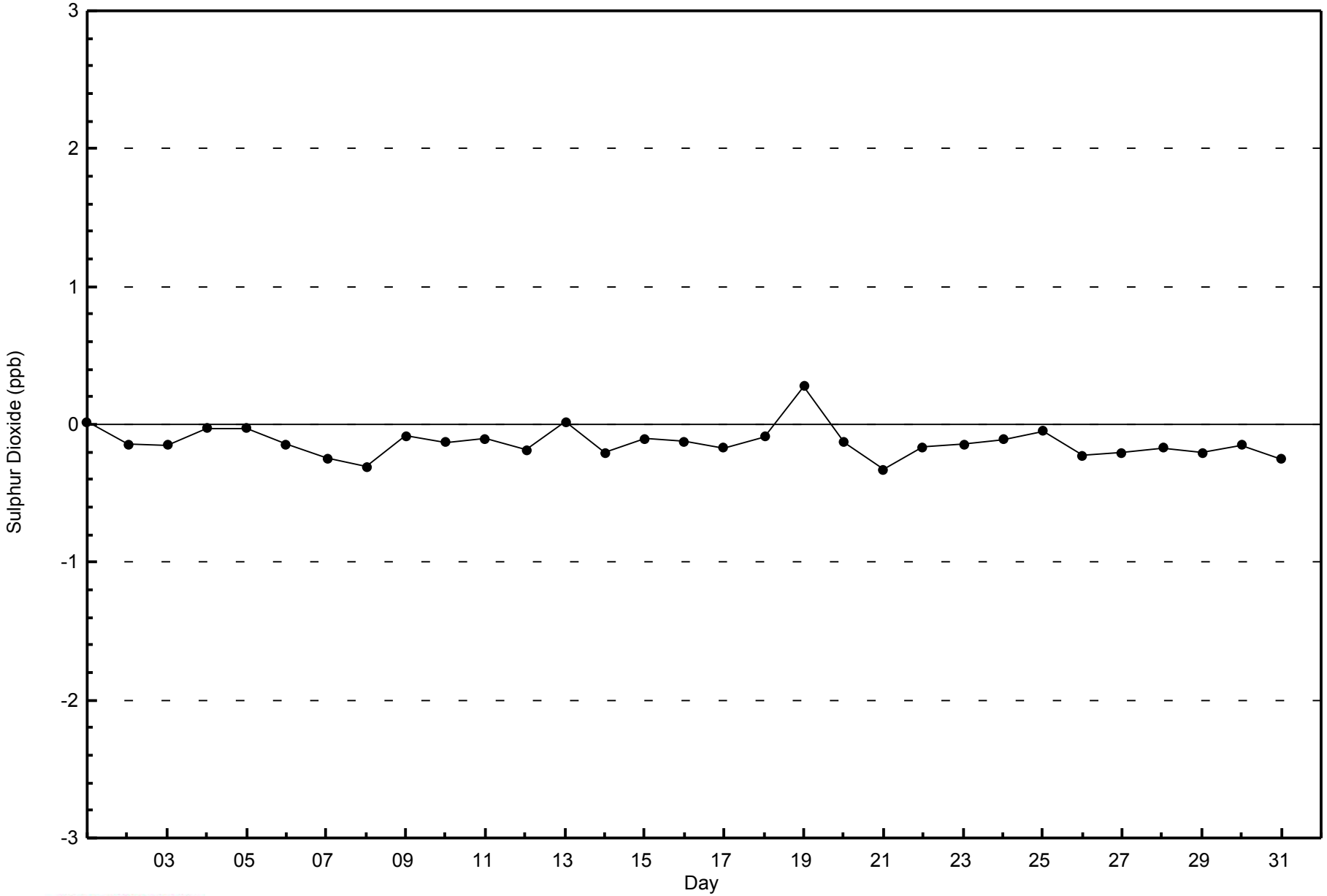
Total Number of Valid Hours: 702

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - August 2014



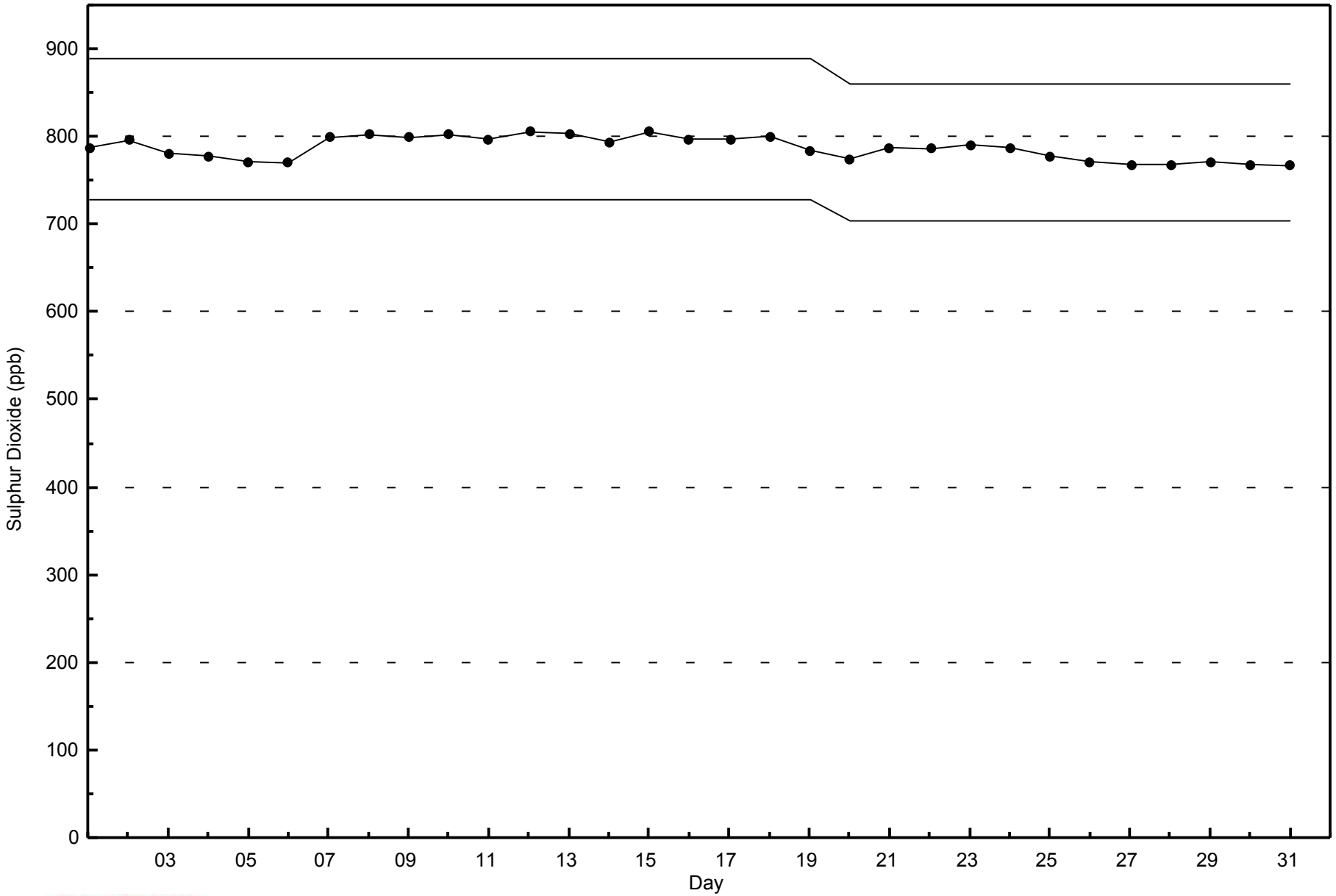
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - August 2014

Maximum Value: 4.9 ppm on Aug 24 10:00

Maximum Daily Average: 3.1 ppm on Aug 4

Minimum Value: 1.8 ppm on Aug 28 09:00

Minimum Daily Average: 2.0 ppm on Aug 17

Maximum Diurnal Average: 2.6 ppm at hour 22

Minimum Diurnal Average: 2.3 ppm at hour 7

Monthly Average: 2.41 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.1 Q_1 = 2.2 Median = 2.4 Q_3 = 2.6 P_{90} = 2.8 P_{99} = 3.7

Hours in Service:	744
Hours of Data:	697
Hours of Missing Data:	47
Hours of Calibration:	38
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-Aug	Z	2.9	2.8	2.7	2.6	2.6	2.4	2.4	2.2	2.1	2.2	2.3	2.4	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.4	2.5	2.6	2.9
2-Aug	Z	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.2	2.4	2.5	2.6	2.6	2.7	2.8	2.8	2.8	2.8	2.6	2.5	2.4	2.3	2.2	2.4	2.8
3-Aug	Z	2.2	2.1	2.2	2.4	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.6	2.7	2.8	2.9	2.9	2.9	2.9	2.8	2.9	2.9	3.1	2.5	3.1
4-Aug	Z	2.6	2.8	2.7	2.7	2.8	2.6	2.9	3.3	3.3	3.4	3.8	3.7	3.5	3.1	3.0	2.9	3.0	3.2	3.1	3.1	3.3	3.3	3.0	3.1	3.8
5-Aug	Z	3.1	2.8	2.8	2.5	2.7	2.3	1.9	2.0	2.4	2.4	2.4	2.5	2.5	2.7	2.6	2.6	2.7	2.7	2.7	2.6	2.6	2.7	2.6	2.6	3.1
6-Aug	Z	2.4	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.5	2.7	2.8	2.9	3.1	3.6	3.8	3.2	3.1	2.8	2.7	3.5	3.5	2.5	2.7	3.8
7-Aug	Z	2.2	2.3	2.3	2.3	2.4	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.9	2.4	2.2	2.9
8-Aug	Z	2.7	2.6	2.4	2.5	2.6	2.3	2.1	2.3	2.4	2.5	2.4	2.5	2.2	2.1	2.1	2.1	2.2	2.2	2.6	2.5	2.4	2.7	2.5	2.4	2.7
9-Aug	Z	2.9	2.8	2.5	2.0	2.2	2.2	2.0	1.9	2.2	2.4	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.4	2.3	2.4	2.2	2.6	2.4	2.3	2.9
10-Aug	Z	2.1	2.0	2.2	2.3	2.2	2.1	2.5	2.7	2.7	2.4	2.3	2.2	2.1	2.1	2.2	2.3	2.4	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.7
11-Aug	Z	2.3	2.2	2.2	2.2	2.3	2.4	2.5	2.3	2.0	2.1	2.3	2.0	2.0	2.3	2.5	2.5	2.3	2.2	2.5	2.7	2.8	2.2	2.1	2.3	2.8
12-Aug	Z	2.5	2.6	2.4	2.4	2.6	2.5	2.5	2.1	1.9	2.0	2.1	2.0	2.1	2.2	2.3	2.3	2.3	2.4	2.3	2.2	2.0	1.9	UO	2.3	2.6
13-Aug	Z	UO	UO	UO	UO	UO	1.8	1.8	1.9	1.9	2.1	2.2	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.5	2.7	2.8	3.5	2.9	2.4	3.5
14-Aug	Z	1.9	2.1	2.5	2.6	2.3	2.1	2.1	2.0	2.3	2.2	2.2	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.5	2.1	2.2	2.2	2.6
15-Aug	Z	2.0	2.2	2.2	2.1	2.2	2.3	2.6	2.8	2.3	2.1	2.3	2.1	2.1	2.2	2.3	2.2	2.5	2.4	2.3	2.6	3.0	4.4	3.7	2.5	4.4
16-Aug	Z	2.9	2.6	2.5	2.4	2.4	2.1	2.1	2.1	1.9	1.9	1.9	2.2	1.9	1.9	2.0	2.0	2.1	2.3	2.5	2.4	2.3	2.1	2.3	2.2	2.9
17-Aug	Z	2.0	2.1	2.2	2.0	1.9	2.0	1.8	2.1	1.9	UO	1.8	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.0	2.3
18-Aug	Z	2.2	1.9	1.9	2.0	2.1	2.1	2.1	2.2	C	C	C	C	C	C	C	3.2	2.9	2.6	2.5	2.6	2.5	2.2	2.4	--	3.2
19-Aug	Z	2.4	2.5	2.4	2.3	2.4	2.7	2.7	2.7	2.4	2.4	2.3	2.4	2.3	2.1	2.2	2.3	2.2	2.1	2.1	2.7	3.3	2.7	2.7	2.4	3.3
20-Aug	Z	2.4	2.4	2.4	2.5	2.4	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.8	2.6	2.7	2.9	2.6	2.5	2.4	2.4	2.9
21-Aug	Z	2.1	2.1	2.2	2.3	2.4	2.3	2.5	2.8	2.4	2.5	2.5	2.6	2.7	2.6	2.6	2.7	2.6	2.7	3.1	3.3	3.6	3.4	2.9	2.7	3.6
22-Aug	Z	2.4	2.3	2.4	2.3	2.4	2.4	2.4	2.6	3.3	3.4	3.1	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.6	2.5	2.5	2.4	2.6	3.4
23-Aug	Z	2.3	2.3	2.5	2.5	2.5	2.4	2.5	2.6	2.5	2.6	2.7	2.5	2.6	2.5	2.6	2.6	2.6	2.6	2.5	2.7	3.0	2.7	2.6	2.5	3.0
24-Aug	Z	2.5	2.7	2.7	2.6	2.4	2.4	2.4	3.7	4.9	4.5	2.8	2.6	2.4	2.5	2.5	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.2	2.7	4.9
25-Aug	Z	2.2	2.2	2.1	2.2	2.2	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2
26-Aug	Z	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.6	2.5	2.4	2.4	2.3	2.8	2.7	2.2	2.2	2.1	2.2	2.2	2.4	2.8
27-Aug	Z	2.7	2.6	2.5	2.3	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.8	3.1	2.7	2.2	2.1	2.3	3.1
28-Aug	Z	2.0	2.0	1.9	1.9	1.8	UO	UO	1.8	2.0	2.0	2.2	2.3	2.1	2.1	2.2	2.4	2.3	2.2	2.1	2.2	2.4	2.4	2.4	2.1	2.4
29-Aug	Z	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.3	2.4	2.6
30-Aug	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.5	2.5	2.3	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.5	2.5	2.7	2.9	2.5	2.4	2.9
31-Aug	Z	2.4	2.4	2.6	2.2	2.2	2.4	2.4	2.6	3.0	3.0	2.6	2.5	2.8	2.7	2.3	2.2	2.2	2.2	2.5	2.3	2.1	2.1	2.0	2.4	3.0
	--	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.5	Diurnal Average	
	--	3.1	2.8	2.8	2.7	2.8	2.7	2.9	3.7	4.9	4.5	3.8	3.7	3.5	3.1	3.6	3.8	3.2	3.2	3.1	3.3	3.6	4.4	3.7	Diurnal Maximum	

Z - zerospan C - Calibration UO - Unstable Operation

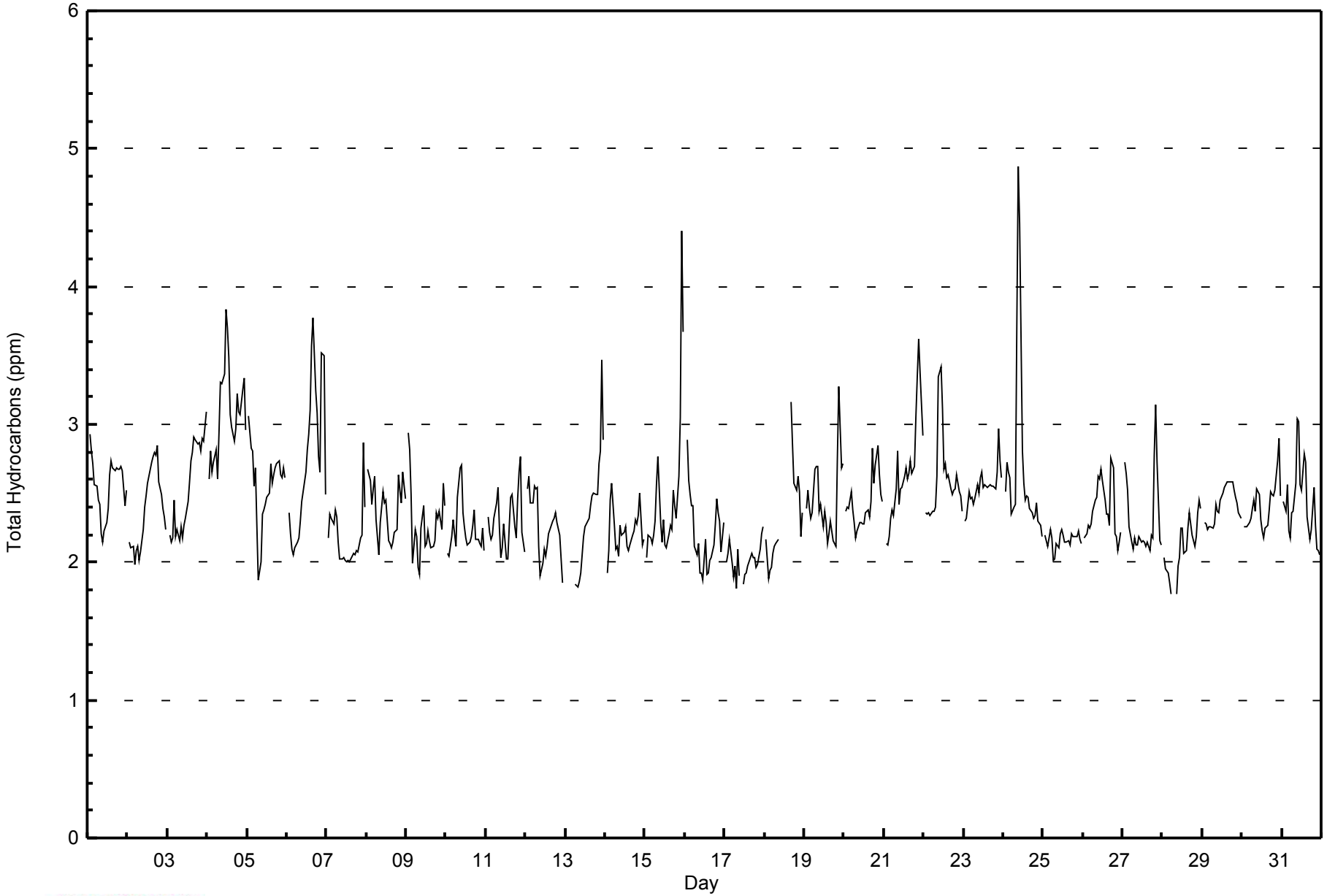
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - August 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	67	9.61	9.61
2.1 - 3.0	593	85.08	94.69
3.1 - 10.0	37	5.31	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 697

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - August 2014

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	1	0	1	0	2	19	8	8	6	14	6	0	66
2.1 - 3.0	15	21	34	12	10	12	18	36	44	209	65	34	26	22	23	9	590
3.1 - 10.0	1	2	1	6	6	1	1	1	3	4	3	4	1	1	0	2	37
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	23	35	19	17	13	20	37	49	232	76	46	33	37	29	11	693

Total Number of Valid Hours: 693

Total Number of Hours: 744

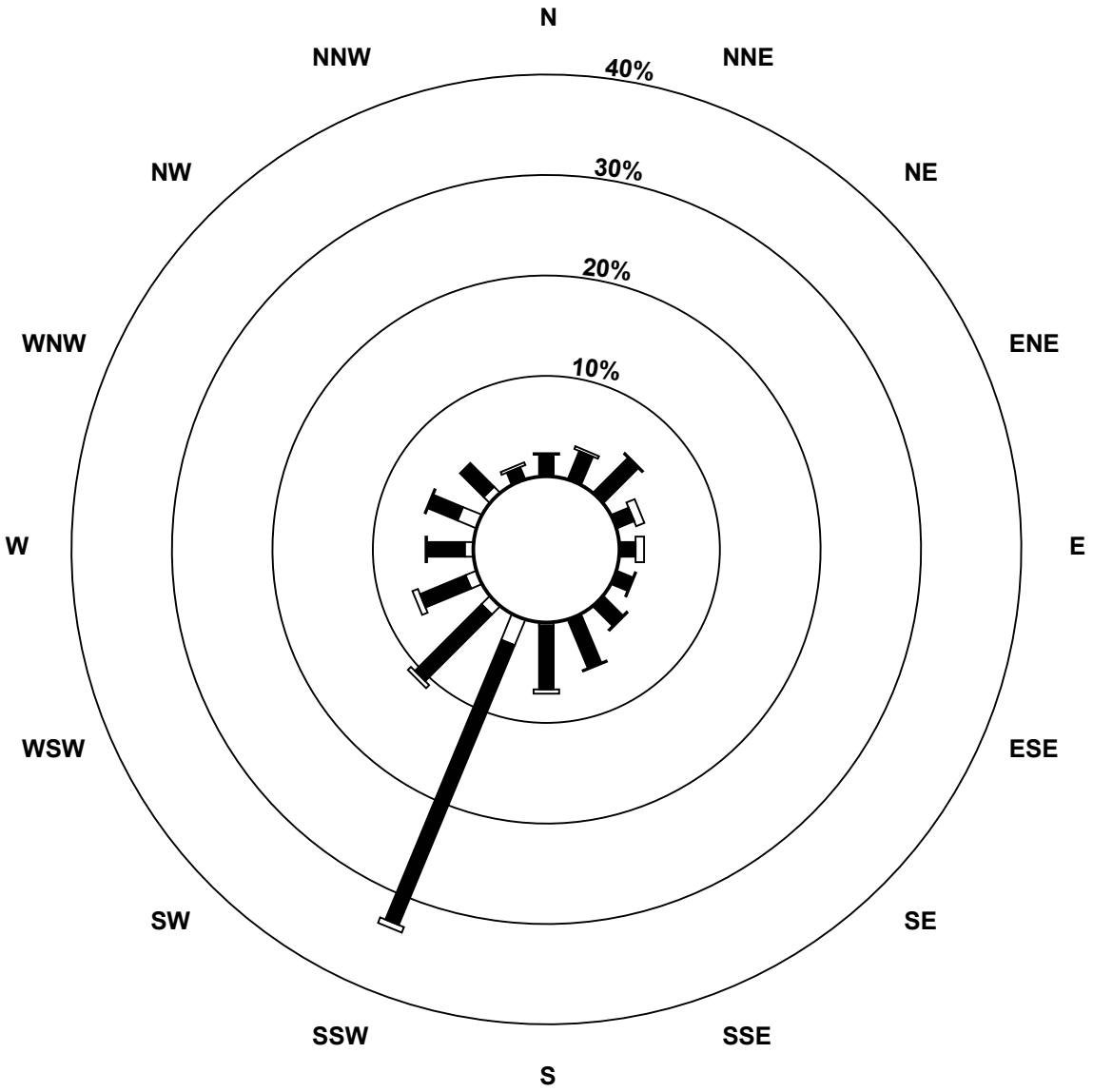
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

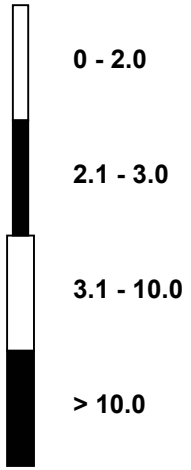
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Shell Muskeg River (AMS 16)



Classes (ppm)



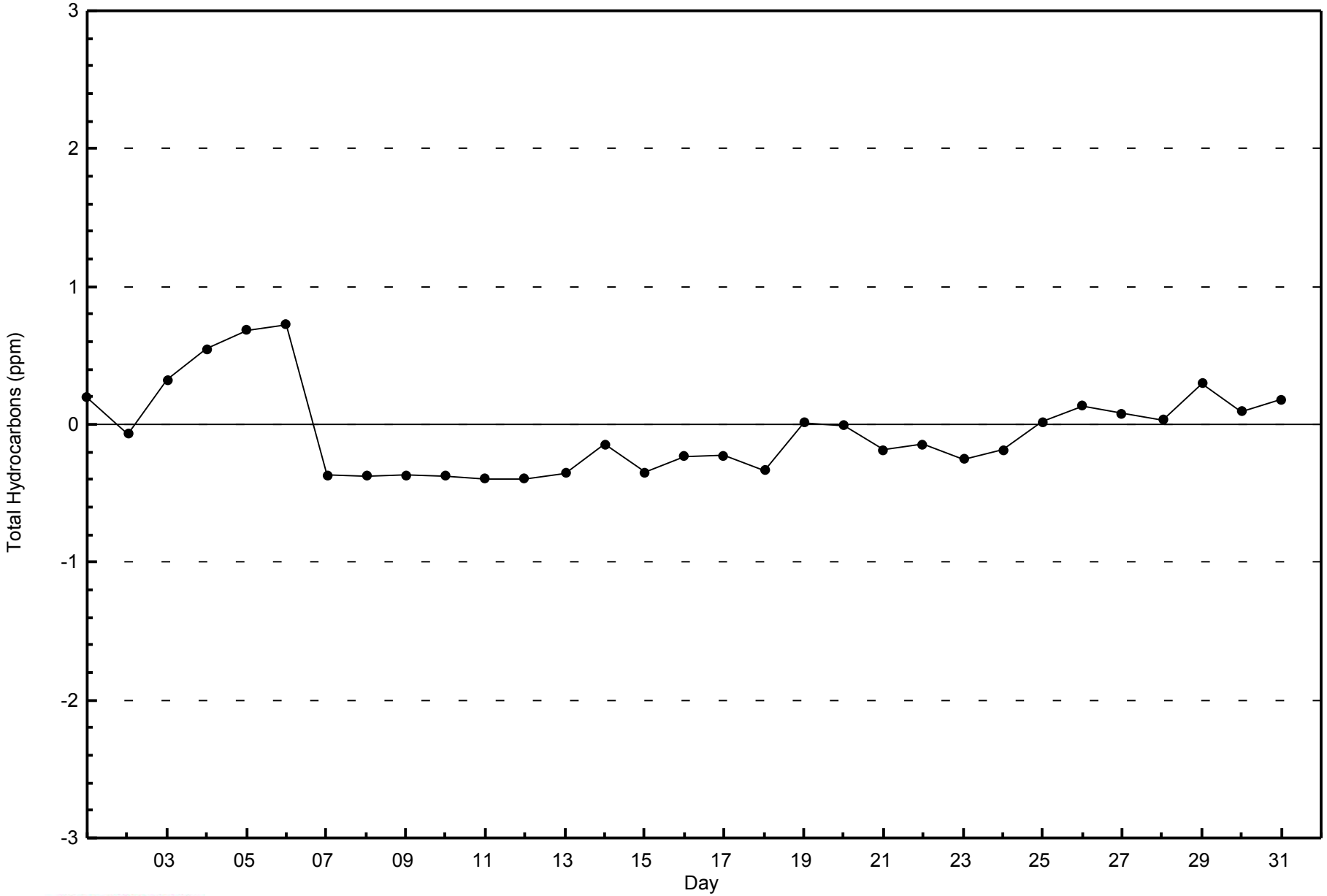
Total Number of Valid Hours: 693

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - August 2014



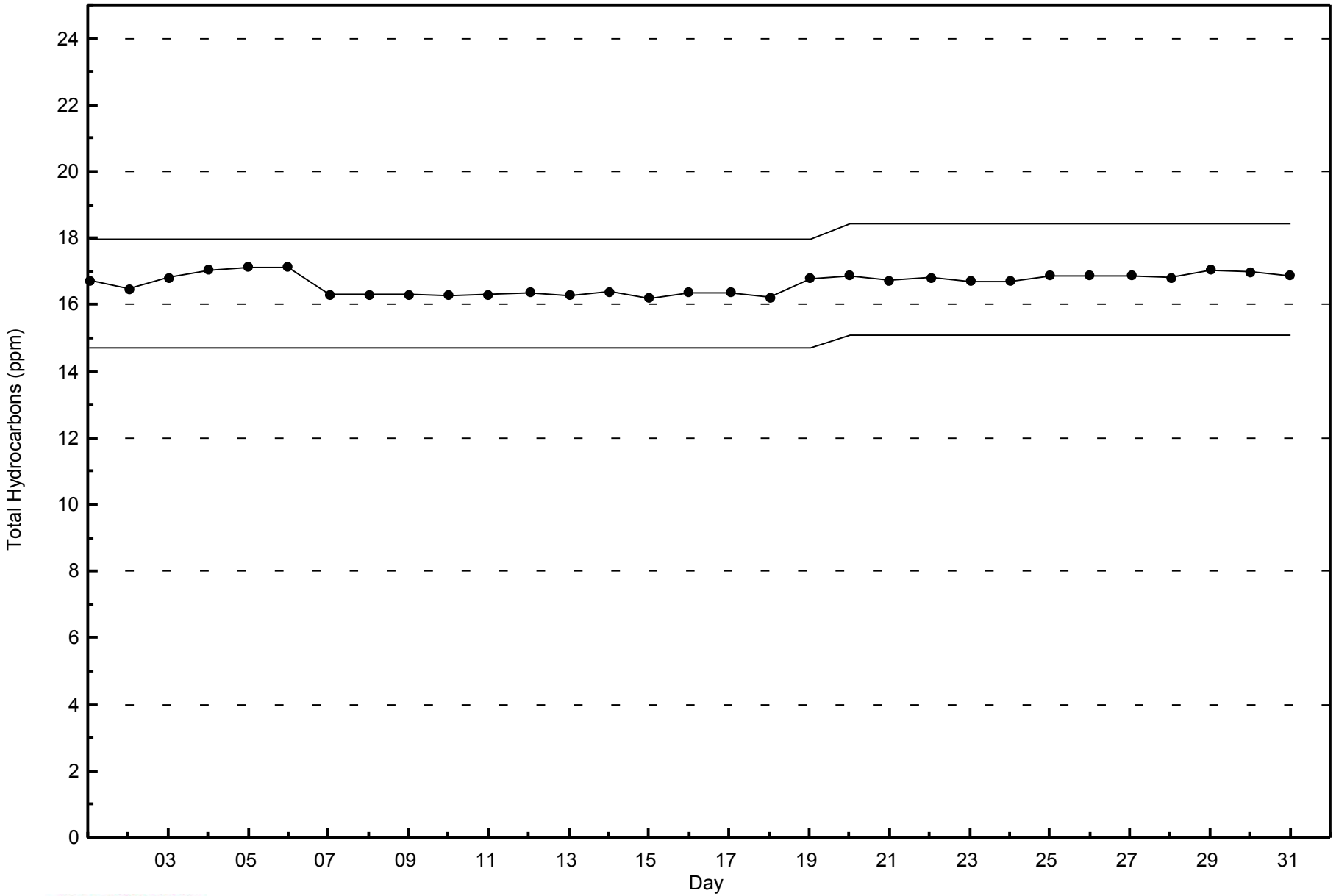
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Shell Muskeg River - August 2014

Maximum Value: 146 ppb on Aug 24 10:00

Maximum Daily Average: 20.0 ppb on Aug 24

Minimum Value: 0 ppb on Aug 1 22:00

Minimum Daily Average: 0.4 ppb on Aug 5

Maximum Diurnal Average: 13.2 ppb at hour 9

Minimum Diurnal Average: 1.6 ppb at hour 16

Monthly Average: 5.1 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 6$ $P_{90} = 15$ $P_{99} = 48$

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-Aug	Z	23	29	22	25	21	18	17	18	11	16	5	6	11	6	2	2	1	0	0	0	0	0	0	10.2	29
2-Aug	Z	0	0	0	4	14	7	8	6	2	1	1	0	0	0	0	0	0	9	0	0	0	0	0	2.4	14
3-Aug	Z	0	0	0	1	1	1	1	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	2
4-Aug	Z	0	0	1	6	35	27	32	43	15	3	5	7	1	1	0	0	0	0	0	0	0	0	1	7.7	43
5-Aug	Z	0	0	0	0	0	1	1	2	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3
6-Aug	Z	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	4	1	0	0	0	0	0	0	0.5	4
7-Aug	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	18	1.7	20
8-Aug	Z	10	2	0	1	2	2	7	5	11	9	6	9	3	1	0	0	0	3	23	5	8	11	12	5.7	23
9-Aug	Z	8	11	14	2	14	10	3	2	13	15	2	1	1	1	1	1	1	4	4	0	0	1	2	4.8	15
10-Aug	Z	0	1	6	15	10	7	12	6	3	2	1	1	0	0	0	0	0	0	0	0	0	1	4	3.0	15
11-Aug	Z	2	2	1	1	1	4	8	10	3	2	2	1	1	2	9	11	13	22	11	21	23	3	0	6.5	23
12-Aug	Z	0	0	4	6	16	23	25	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3.6	25
13-Aug	Z	0	0	0	0	1	1	1	2	1	1	0	1	0	0	0	0	0	0	0	0	4	45	20	3.3	45
14-Aug	Z	0	11	38	49	26	18	16	14	30	14	6	2	1	0	0	0	0	0	0	0	0	0	0	9.9	49
15-Aug	Z	0	2	2	3	13	22	13	4	3	1	1	0	0	0	0	0	5	19	19	27	10	18	20	7.9	27
16-Aug	Z	41	22	16	10	11	6	11	21	10	5	4	7	1	0	0	0	0	0	0	0	0	0	0	7.1	41
17-Aug	Z	0	0	3	6	5	5	2	7	3	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1.5	7
18-Aug	Z	0	0	0	1	7	12	22	14	C	C	C	C	C	C	C	6	1	7	8	14	6	0	1	--	22
19-Aug	Z	0	0	1	1	0	3	5	7	4	3	1	1	0	1	2	4	2	0	0	16	12	12	33	4.7	33
20-Aug	Z	9	19	15	8	11	14	24	13	9	17	16	17	21	12	12	9	10	12	6	13	31	14	13	14.2	31
21-Aug	Z	0	0	0	0	2	4	14	29	5	3	9	5	10	14	9	10	9	7	4	23	52	35	19	11.5	52
22-Aug	Z	2	1	2	1	1	3	15	28	60	57	27	14	4	6	5	1	0	0	0	0	0	0	0	9.9	60
23-Aug	Z	0	0	1	1	0	1	8	22	8	10	10	4	0	1	0	0	0	0	0	0	8	2	1	3.4	22
24-Aug	Z	1	2	1	1	1	7	13	114	146	139	17	8	3	6	1	0	0	0	0	0	0	0	0	20.0	146
25-Aug	Z	0	0	0	2	5	0	3	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1.0	6
26-Aug	Z	0	0	0	0	1	4	7	3	3	2	2	2	2	1	1	0	6	1	0	0	0	0	0	1.6	7
27-Aug	Z	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	9	25	8	0	0	2.1	25
28-Aug	Z	0	0	0	0	1	2	1	0	2	1	1	1	0	0	1	4	1	0	0	0	0	1	2	0.8	4
29-Aug	Z	0	0	0	0	0	0	4	23	16	10	11	2	1	0	0	0	0	0	0	0	0	0	0	2.9	23
30-Aug	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	9	9	2	1.1	9
31-Aug	Z	3	1	0	0	0	4	4	3	1	1	0	0	3	7	0	1	0	0	2	0	0	0	0	1.4	7
	--	3.3	3.4	4.1	4.7	6.4	6.6	9.0	13.2	12.2	10.6	4.4	3.0	2.1	2.0	1.6	1.8	1.8	2.9	2.9	4.7	5.5	5.6	4.8	Diurnal Average	
	--	41	29	38	49	35	27	32	114	146	139	27	17	21	14	12	11	13	22	23	27	52	45	33	Diurnal Maximum	

Z - zerospan C - Calibration

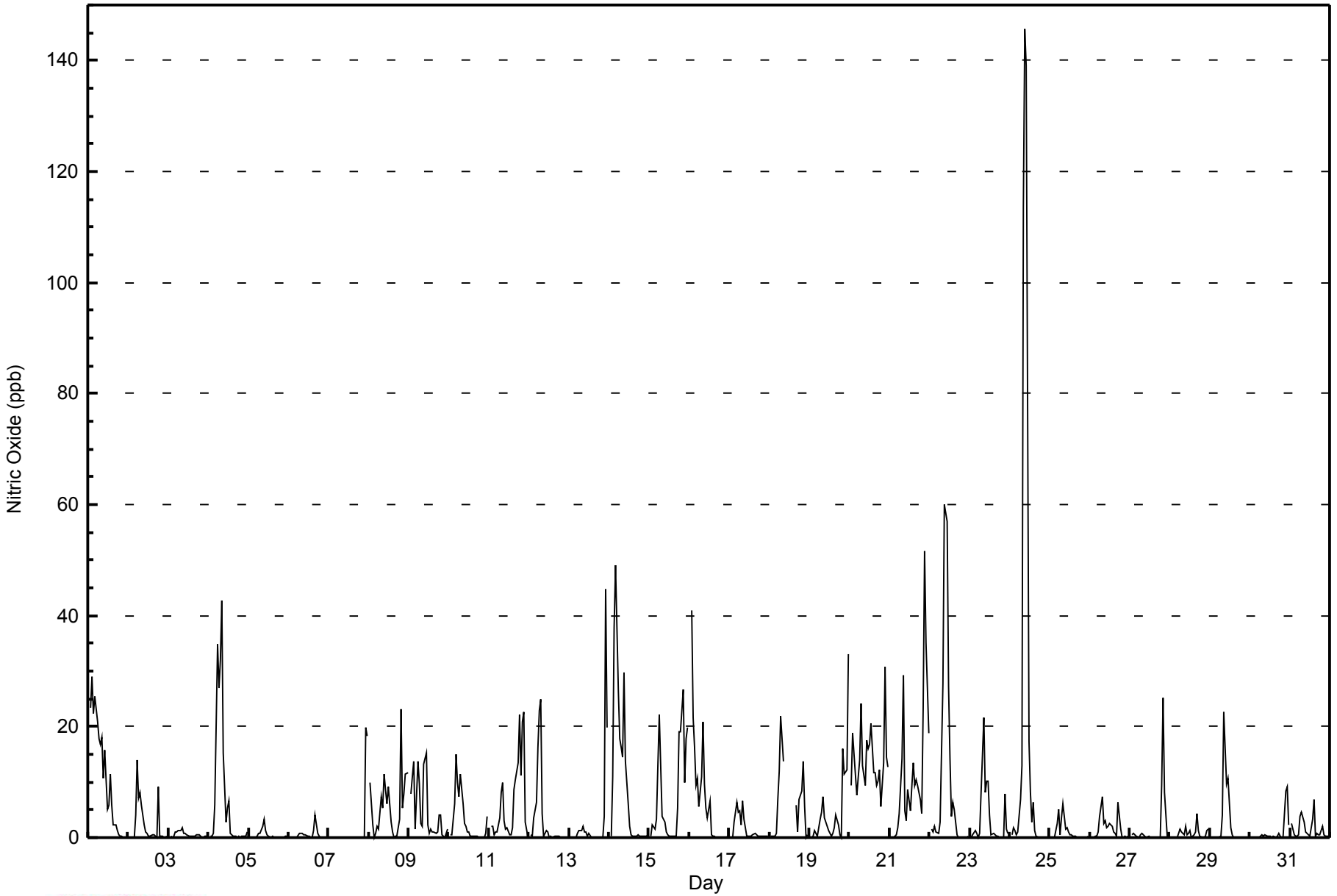
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	662	93.77	93.77
21 - 40	34	4.82	98.58
11 - 80	7	0.99	99.58
81 - 159	3	0.42	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Shell Muskeg River - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	12	21	28	18	16	12	19	37	48	221	77	44	34	37	26	8	658
21 - 40	4	2	7	1	0	1	1	0	1	10	1	2	0	1	2	1	34
11 - 80	0	0	0	0	1	0	0	0	0	2	0	0	1	0	1	2	7
81 - 159	0	0	0	0	0	0	0	0	0	2	1	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	16	23	35	19	17	13	20	37	49	235	79	46	35	38	29	11	702

Total Number of Valid Hours: 702

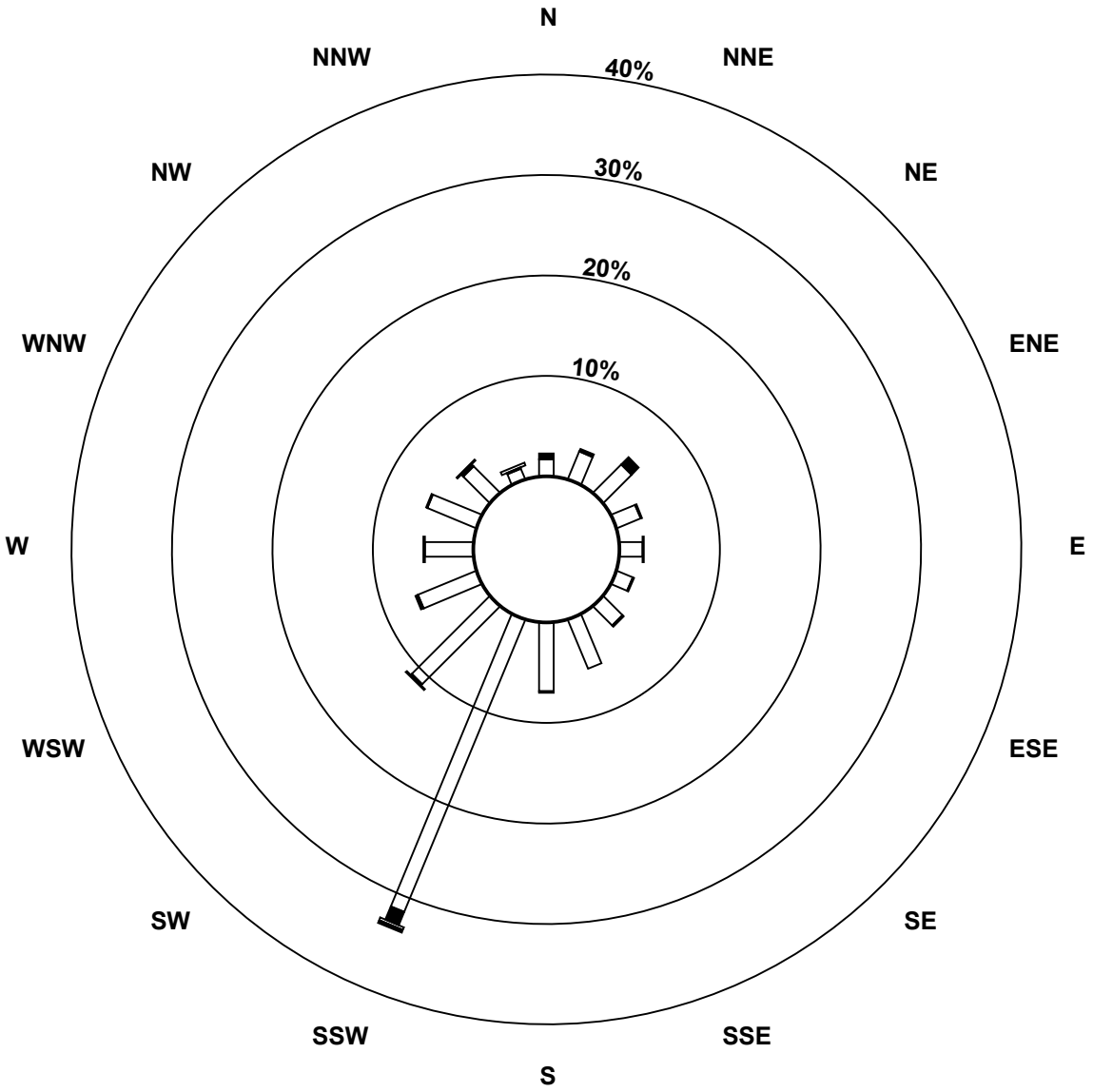
Total Number of Hours: 744

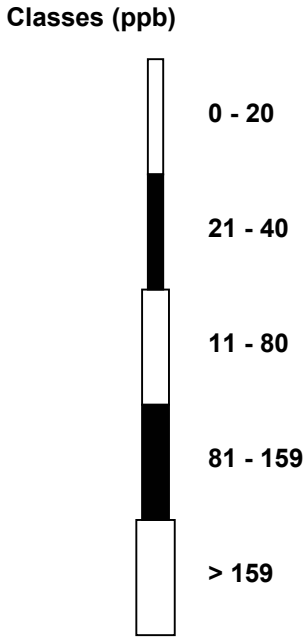
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Shell Muskeg River (AMS 16)





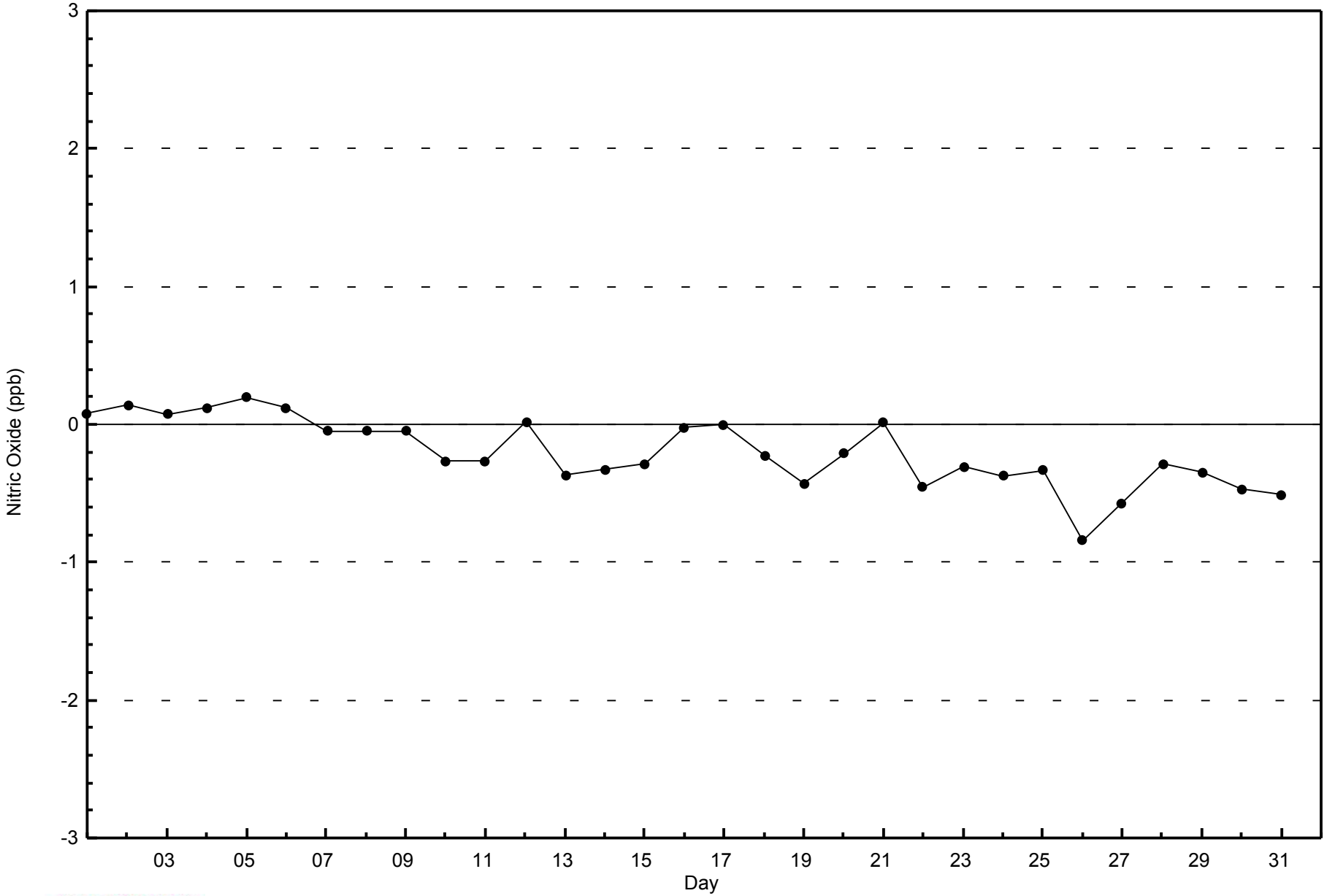
Total Number of Valid Hours: 702

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Shell Muskeg River - August 2014



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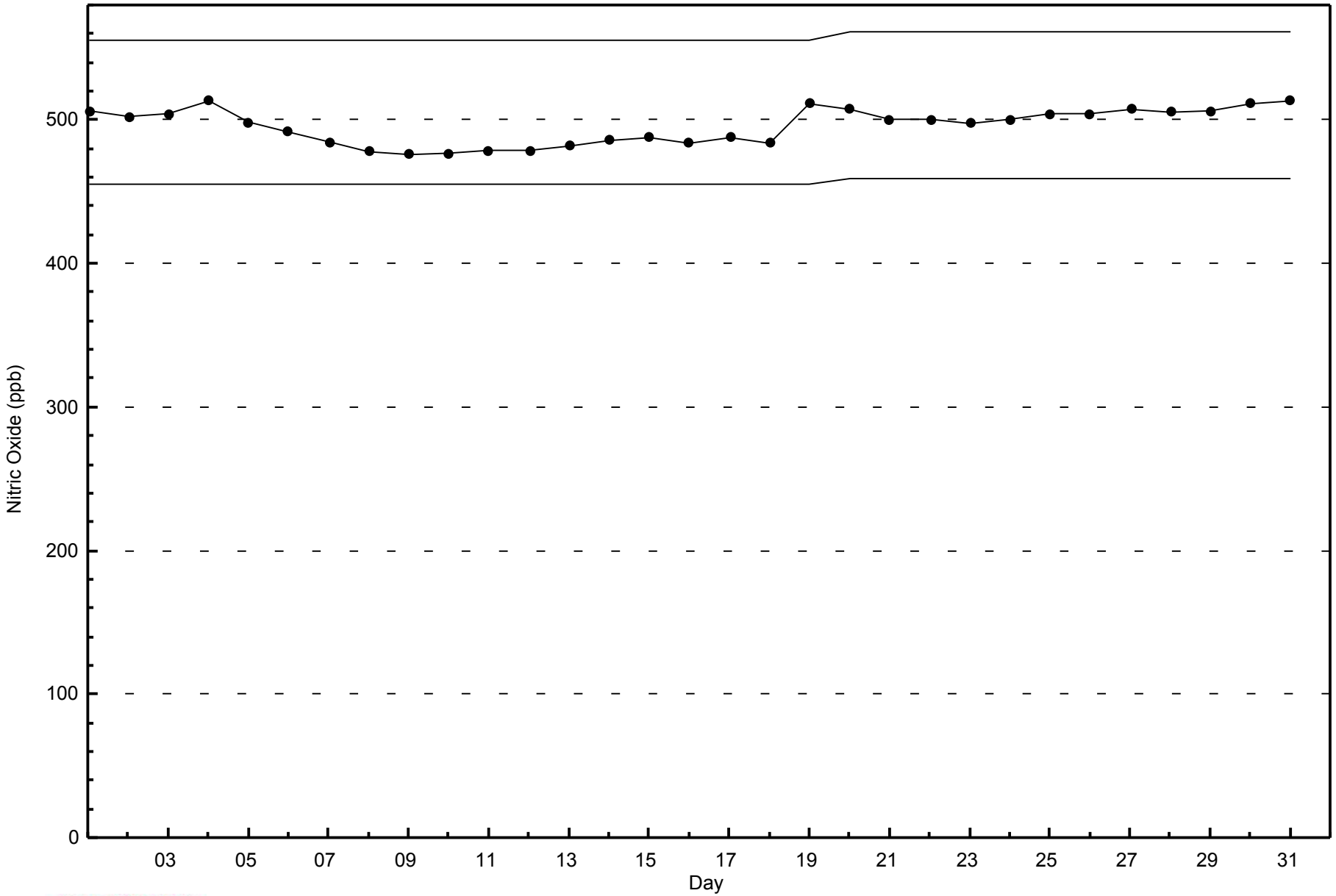
WBEA

Span Responses

Nitric Oxide (NO) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 39 ppb on Aug 4 10:00 Maximum Daily Average: 15.6 ppb on Aug 4

Minimum Value: 0 ppb on Aug 7 10:00 Minimum Daily Average: 2.1 ppb on Aug 7
Maximum Diurnal Average: 10.7 ppb at hour 9 Minimum Diurnal Average: 3.9 ppb at hour 16
Monthly Average: 7.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 6 $Q_3 = 10$ $P_{90} = 17$ $P_{99} = 31$

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-Aug	Z	16	17	16	17	16	14	13	12	8	11	7	9	15	13	9	10	6	4	3	5	6	2	5	10.1	17
2-Aug	Z	2	5	9	14	15	10	10	9	6	5	5	3	2	2	2	2	2	13	4	4	2	1	2	5.6	15
3-Aug	Z	6	6	10	13	9	6	5	6	5	6	3	2	2	2	2	4	5	4	3	2	4	4	4	4.9	13
4-Aug	Z	7	6	10	12	14	14	21	34	39	28	36	28	15	9	5	3	3	10	6	8	8	27	16	15.6	39
5-Aug	Z	5	5	3	4	3	6	8	13	18	13	12	8	4	4	2	2	3	3	2	2	4	12	12	6.4	18
6-Aug	Z	13	7	5	6	6	7	6	7	6	5	4	5	3	2	10	20	6	3	2	2	2	2	2	5.6	20
7-Aug	Z	1	2	1	1	2	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	20	18	2.1	20
8-Aug	Z	17	10	7	9	6	3	5	5	10	10	10	14	6	3	1	2	2	4	14	8	10	13	12	7.7	17
9-Aug	Z	12	14	10	2	9	10	6	3	9	10	3	1	3	2	2	2	3	9	14	6	3	4	4	6.2	14
10-Aug	Z	4	6	7	7	6	5	7	7	5	4	4	3	2	1	1	2	1	1	2	4	4	8	12	4.4	12
11-Aug	Z	16	13	9	10	7	9	11	10	5	5	5	2	1	4	9	9	8	10	11	18	26	11	3	9.1	26
12-Aug	Z	6	6	10	7	7	10	14	8	2	4	5	1	1	1	1	2	2	2	2	1	1	0	1	4.1	14
13-Aug	Z	0	1	1	1	6	5	5	9	6	7	6	4	3	2	1	1	1	1	2	6	18	28	19	5.8	28
14-Aug	Z	5	15	26	24	17	15	17	20	31	25	22	12	4	2	1	1	3	4	4	6	6	7	8	11.9	31
15-Aug	Z	12	24	23	23	19	18	18	13	12	8	7	4	2	1	1	1	11	17	19	23	21	23	22	14.0	24
16-Aug	Z	18	14	11	10	10	7	12	20	19	16	15	26	6	4	5	2	2	2	2	2	3	3	6	9.3	26
17-Aug	Z	3	2	9	15	18	14	7	14	10	2	3	3	2	1	2	2	2	2	4	5	7	6	4	5.9	18
18-Aug	Z	6	2	3	4	11	10	15	15	C	C	C	C	C	C	C	31	18	15	12	16	10	1	4	--	31
19-Aug	Z	3	3	4	4	3	5	5	7	6	7	4	3	2	3	9	9	5	2	2	18	20	13	16	6.6	20
20-Aug	Z	6	11	10	9	10	9	10	8	8	10	9	9	11	8	10	10	17	15	15	22	22	18	15	11.7	22
21-Aug	Z	4	3	8	6	5	6	11	19	8	7	9	7	10	11	10	11	9	9	12	26	29	17	10	10.6	29
22-Aug	Z	6	5	7	5	4	4	8	11	20	23	22	17	8	8	10	3	1	0	0	2	2	2	4	7.4	23
23-Aug	Z	4	6	9	7	3	4	9	13	10	14	14	8	3	3	4	3	3	3	3	7	26	24	18	8.6	26
24-Aug	Z	8	12	9	7	8	13	15	29	37	37	23	14	6	10	5	2	2	2	2	2	2	2	1	10.7	37
25-Aug	Z	5	9	4	10	13	3	9	10	4	5	3	3	2	2	2	2	2	1	1	4	6	7	7	4.9	13
26-Aug	Z	8	9	12	15	15	15	13	8	9	7	10	12	8	6	6	2	15	9	3	3	1	1	3	8.2	15
27-Aug	Z	14	12	10	5	2	3	2	2	1	1	1	1	1	0	0	0	3	3	21	29	20	2	2	5.8	29
28-Aug	Z	1	1	1	2	5	6	2	2	5	3	4	5	1	2	4	8	6	4	2	6	9	8	9	4.1	9
29-Aug	Z	4	1	2	2	2	2	4	12	13	12	13	5	3	2	2	2	1	1	1	1	1	1	2	3.8	13
30-Aug	Z	2	1	2	2	3	7	6	5	6	4	2	3	2	2	2	2	5	5	4	5	17	17	11	4.9	17
31-Aug	Z	6	4	3	3	4	8	6	4	3	2	1	1	7	15	2	2	1	3	10	7	3	1	2	4.2	15
	--	7.1	7.3	8.0	8.3	8.2	7.9	9.0	10.7	10.7	9.7	8.7	7.0	4.5	4.1	3.9	5.0	4.7	5.3	5.9	8.0	9.4	9.2	8.1	Diurnal Average	
	--	18	24	26	24	19	18	21	34	39	37	36	28	15	15	10	31	18	17	21	29	29	28	22	Diurnal Maximum	

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

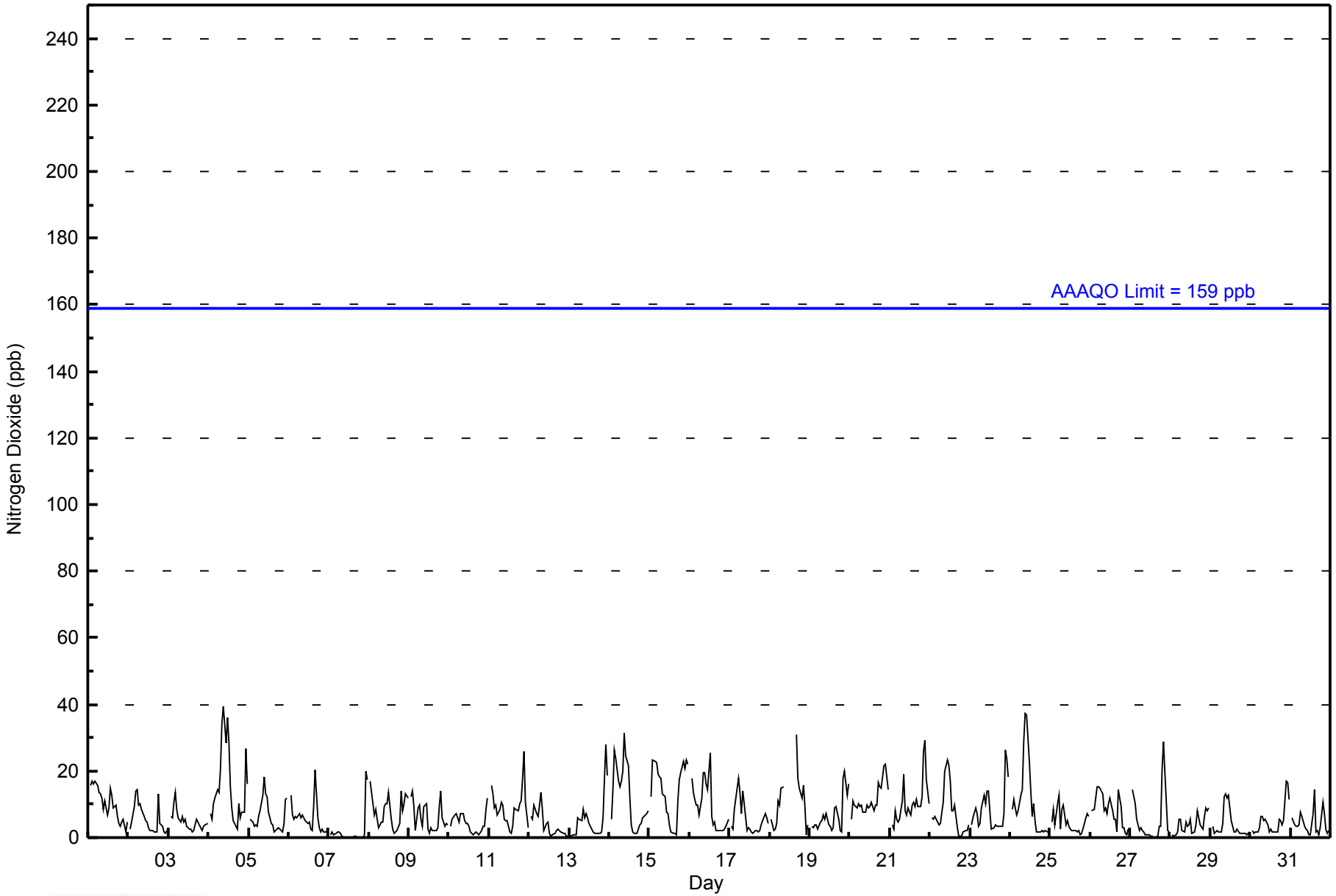
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	669	94.76	94.76
21 - 40	37	5.24	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

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	23	33	11	16	13	17	36	46	229	76	45	35	37	25	8	665
21 - 40	1	0	2	8	1	0	3	1	3	6	3	1	0	1	4	3	37
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	16	23	35	19	17	13	20	37	49	235	79	46	35	38	29	11	702

Total Number of Valid Hours: 702

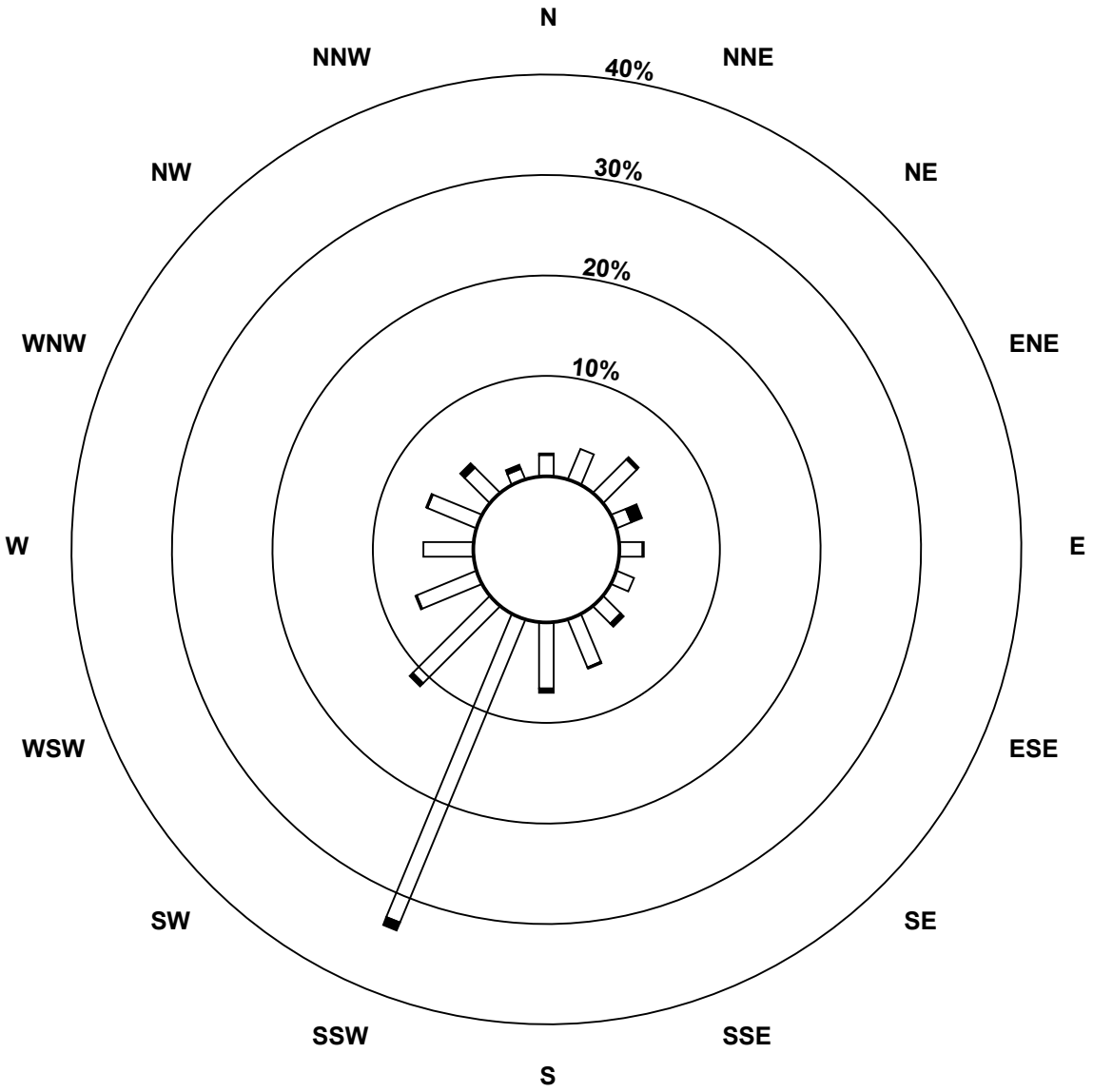
Total Number of Hours: 744

Wood Buffalo Environmental Association

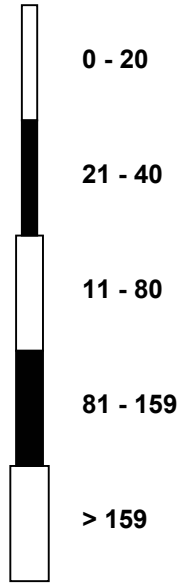
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



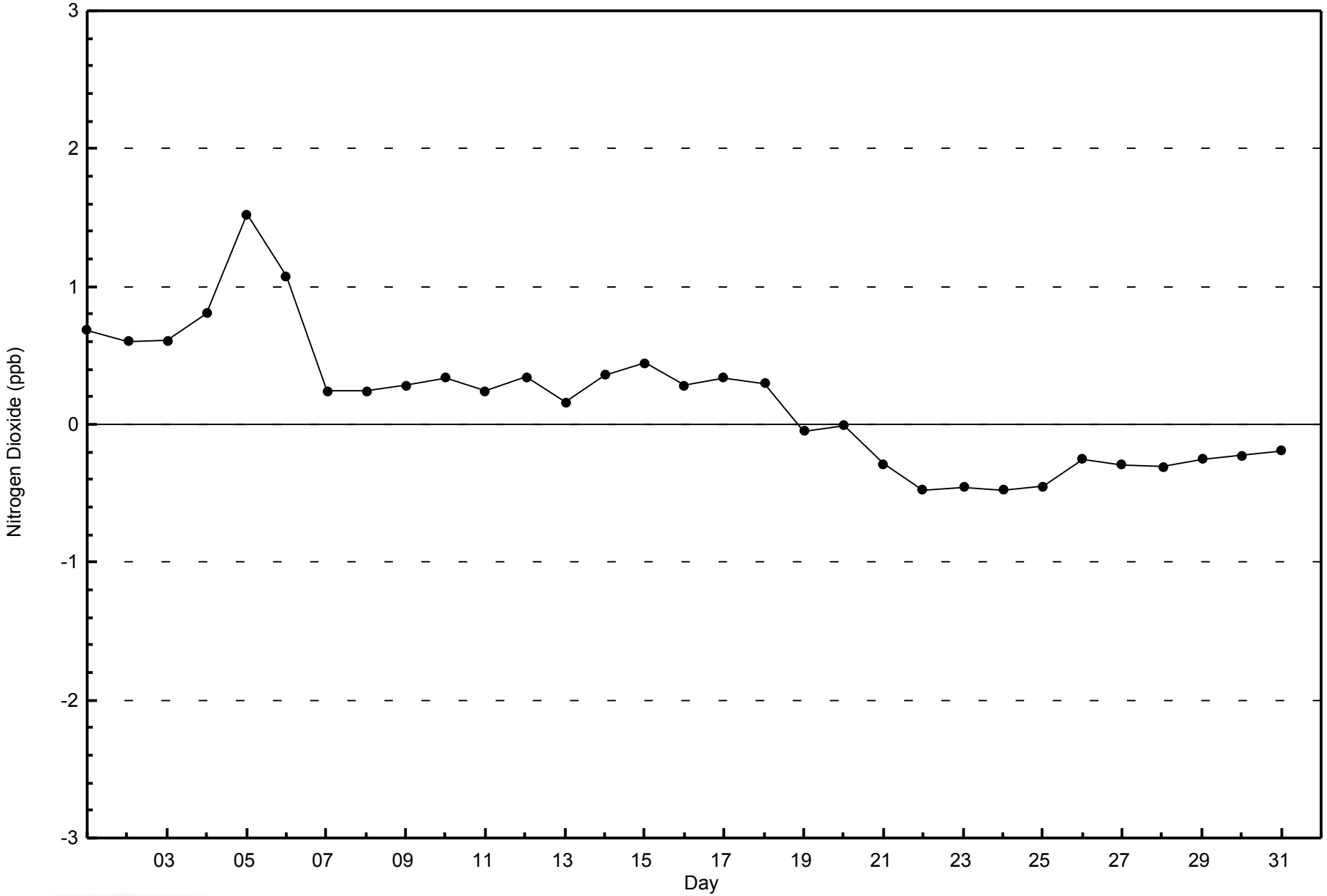
Total Number of Valid Hours: 702

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - August 2014



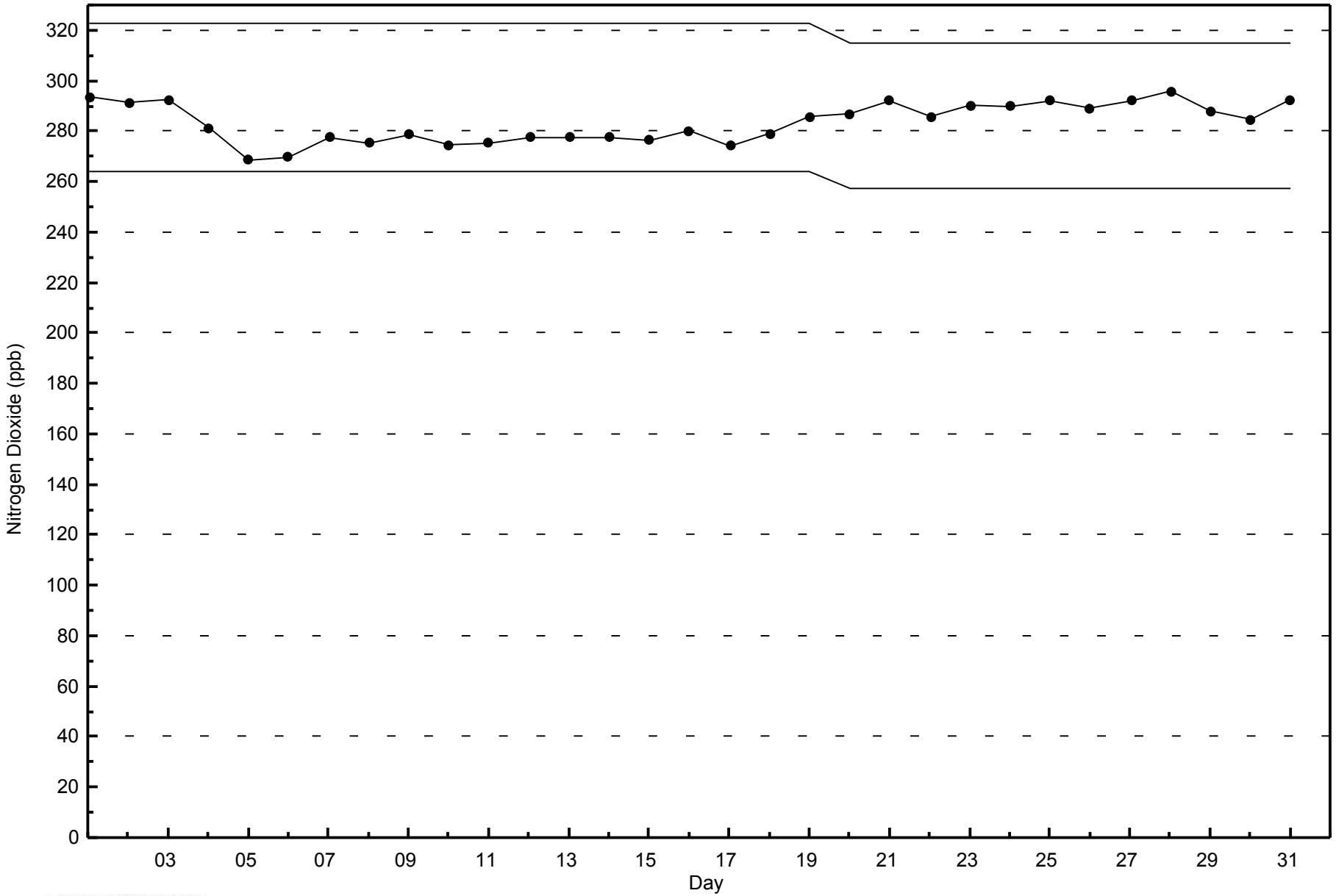
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 183 ppb on Aug 24 10:00

Maximum Daily Average: 30.7 ppb on Aug 24

Minimum Value: 0 ppb on Aug 7 10:00

Minimum Daily Average: 3.8 ppb on Aug 7

Maximum Diurnal Average: 23.9 ppb at hour 9

Minimum Diurnal Average: 5.5 ppb at hour 16

Monthly Average: 12.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 6 $Q_3 = 18$ $P_{90} = 31$ $P_{99} = 75$

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-Aug	Z	39	46	39	42	37	32	30	30	19	27	12	15	26	19	11	12	7	5	4	5	5	2	5	20.3	46
2-Aug	Z	2	4	10	18	28	17	18	14	9	6	5	3	3	3	2	2	2	22	4	4	2	1	2	8.0	28
3-Aug	Z	6	6	11	14	10	7	6	8	5	6	4	3	3	2	2	4	6	4	3	2	4	4	4	5.4	14
4-Aug	Z	7	6	11	18	49	40	53	77	54	31	41	35	16	10	5	3	3	11	6	8	8	27	17	23.3	77
5-Aug	Z	5	5	3	4	4	7	9	15	22	14	13	8	4	4	2	2	3	3	2	2	4	12	12	6.9	22
6-Aug	Z	13	7	5	6	6	8	7	7	7	6	4	5	3	2	11	24	7	3	2	2	2	1	2	6.1	24
7-Aug	Z	1	2	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	40	36	3.8	40
8-Aug	Z	27	12	7	9	7	4	12	10	21	19	16	23	8	4	1	2	2	7	37	13	18	25	24	13.5	37
9-Aug	Z	20	25	23	3	22	19	8	6	22	25	5	2	5	3	3	3	4	13	18	6	4	5	5	10.9	25
10-Aug	Z	4	6	13	22	16	12	19	13	7	6	5	4	2	1	1	2	1	1	2	4	4	9	16	7.4	22
11-Aug	Z	18	15	10	11	8	12	19	20	8	7	7	2	2	5	18	19	22	32	22	39	48	13	3	15.6	48
12-Aug	Z	7	6	13	14	23	32	38	13	2	6	5	1	1	1	1	3	3	2	2	1	1	0	1	7.7	38
13-Aug	Z	0	1	1	1	6	7	6	11	7	8	6	5	3	2	1	1	1	1	2	6	22	73	38	9.1	73
14-Aug	Z	6	25	64	73	43	33	33	34	61	38	28	14	4	2	2	2	3	4	4	6	6	7	8	21.9	73
15-Aug	Z	12	26	24	26	32	40	31	17	15	9	8	4	2	1	1	1	16	36	38	49	31	41	42	21.9	49
16-Aug	Z	59	35	28	19	20	13	23	41	29	22	18	32	7	4	5	2	2	2	2	2	3	3	6	16.4	59
17-Aug	Z	3	2	11	21	22	18	10	20	13	3	3	3	2	2	3	3	2	2	4	5	8	6	4	7.5	22
18-Aug	Z	6	3	3	5	18	22	37	29	C	C	C	C	C	C	C	37	19	22	20	29	15	1	4	--	37
19-Aug	Z	3	3	5	5	3	8	10	14	9	10	5	4	3	3	11	13	8	3	2	34	32	25	49	11.4	49
20-Aug	Z	15	30	25	17	21	23	34	21	17	27	25	26	31	20	21	19	27	28	21	35	53	33	27	25.9	53
21-Aug	Z	4	3	8	6	6	10	25	48	13	9	18	11	19	24	19	22	18	16	16	49	81	52	29	22.1	81
22-Aug	Z	8	6	9	6	5	7	23	38	80	80	49	31	12	15	15	3	1	0	0	2	2	2	4	17.3	80
23-Aug	Z	4	6	10	8	3	5	17	34	18	24	24	12	3	4	4	4	4	3	3	7	34	26	19	12.0	34
24-Aug	Z	9	13	10	7	9	20	27	143	183	176	40	22	9	17	6	2	2	2	2	1	2	2	1	30.7	183
25-Aug	Z	5	9	4	13	18	3	12	16	5	7	5	3	3	2	3	2	2	1	1	4	6	7	7	5.9	18
26-Aug	Z	8	9	12	16	16	19	20	11	12	9	12	14	10	7	7	2	21	11	3	3	1	1	3	9.8	21
27-Aug	Z	15	13	11	5	2	3	3	2	1	1	1	1	1	0	0	0	3	3	30	54	28	2	2	7.9	54
28-Aug	Z	1	0	1	1	6	7	3	2	7	4	5	7	1	2	5	12	7	4	2	6	9	9	11	5.0	12
29-Aug	Z	3	1	2	2	2	2	8	35	29	22	24	7	4	2	2	2	1	1	1	1	1	1	2	6.7	35
30-Aug	Z	2	1	1	2	3	7	7	5	6	4	2	3	2	2	2	2	6	5	4	5	25	26	14	5.9	26
31-Aug	Z	8	4	3	3	4	11	11	6	4	3	1	1	11	21	2	3	1	3	13	8	3	1	2	5.7	21
	--	10.4	10.7	12.2	12.9	14.6	14.5	18.0	23.9	22.9	20.3	13.1	10.1	6.6	6.1	5.5	6.8	6.5	8.2	8.8	12.7	14.9	14.8	12.9	Diurnal Average	
	--	59	46	64	73	49	40	53	143	183	176	49	35	31	24	21	37	27	36	38	54	81	73	49	Diurnal Maximum	

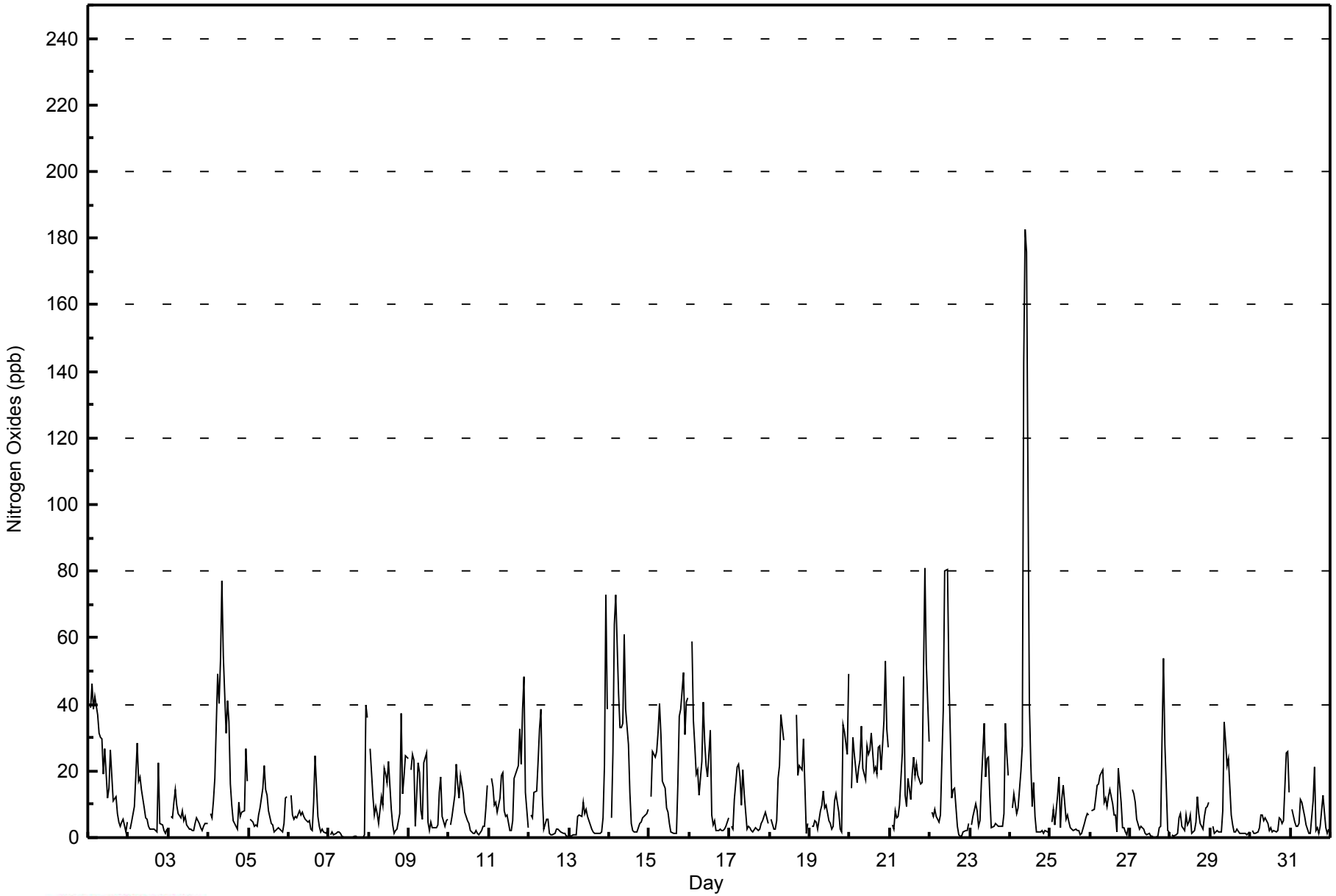
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	562	79.60	79.60
21 - 40	113	16.01	95.61
11 - 80	27	3.82	99.43
81 - 159	1	0.14	99.58
> 159	2	0.28	99.86

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - August 2014

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	10	9	8	15	11	15	35	44	205	71	44	31	33	14	7	558
21 - 40	8	12	24	6	1	2	4	2	5	23	6	0	3	4	12	1	113
11 - 80	2	1	2	5	1	0	1	0	0	5	1	2	1	1	3	2	27
81 - 159	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Totals	16	23	35	19	17	13	20	37	49	235	79	46	35	38	29	10	701

Total Number of Valid Hours: 702

Total Number of Hours: 744

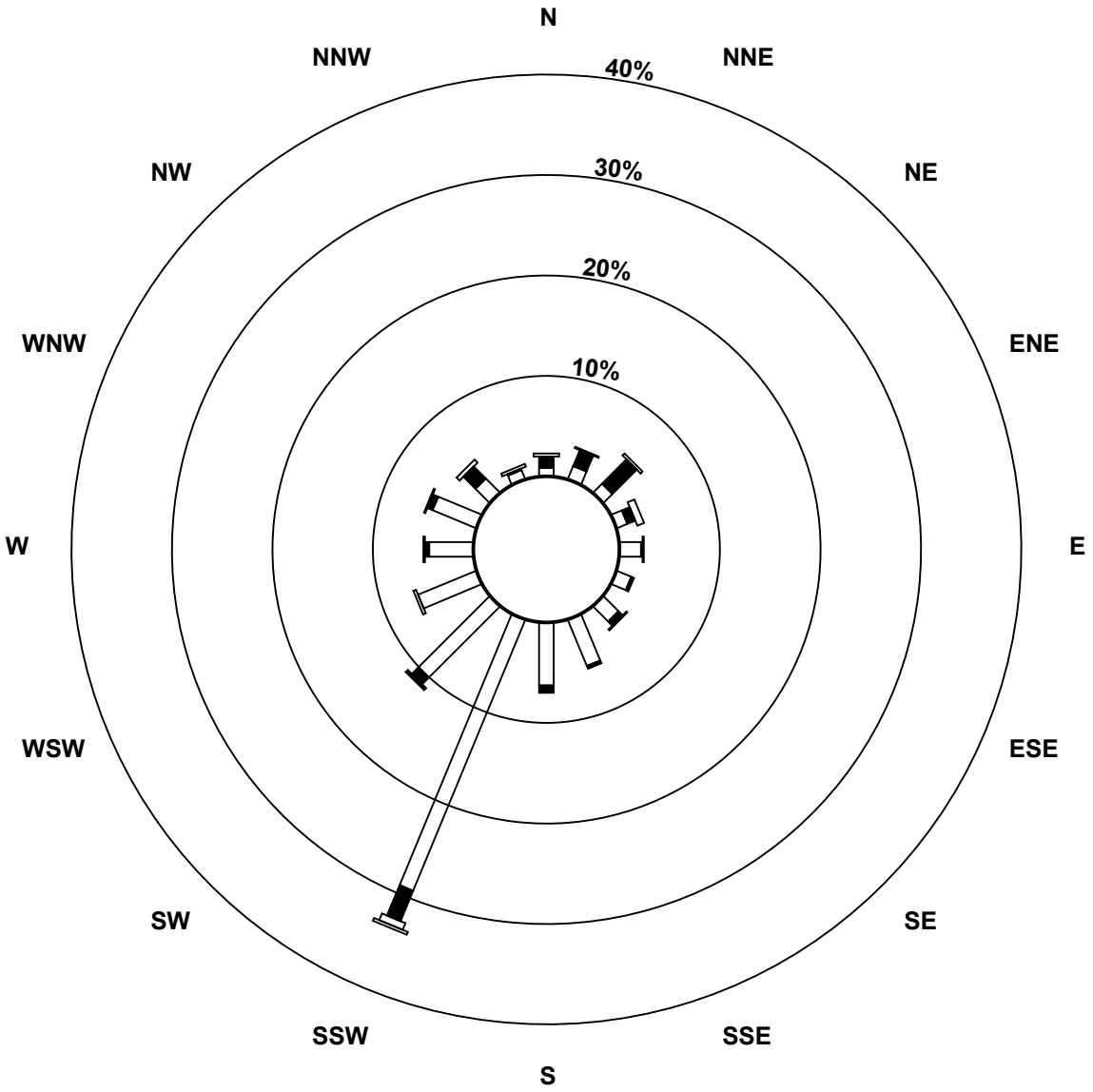
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

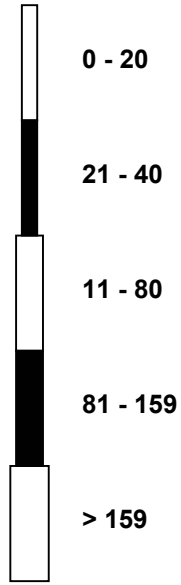
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River (AMS 16)



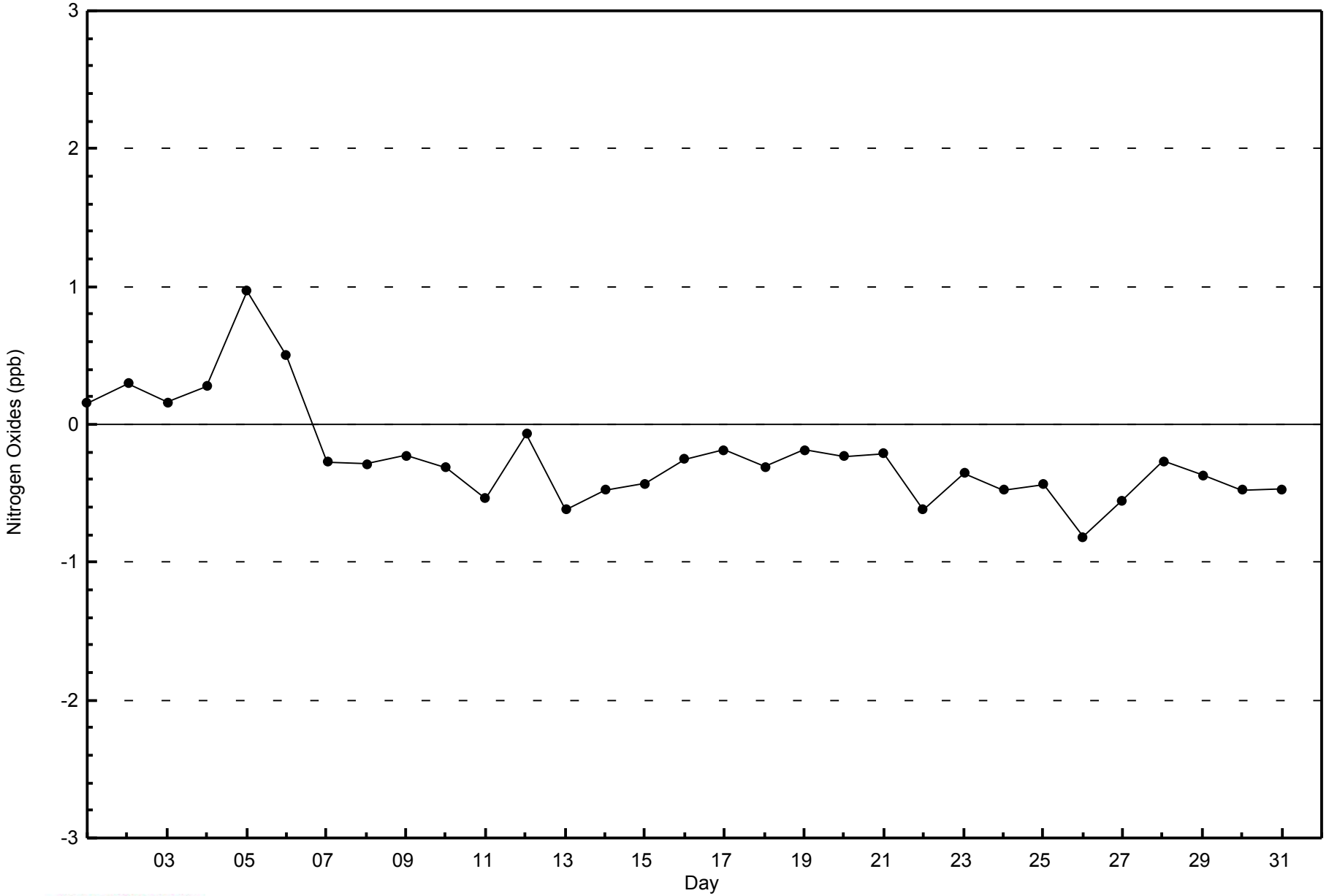
Classes (ppb)



Total Number of Valid Hours: 702

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Shell Muskeg River - August 2014



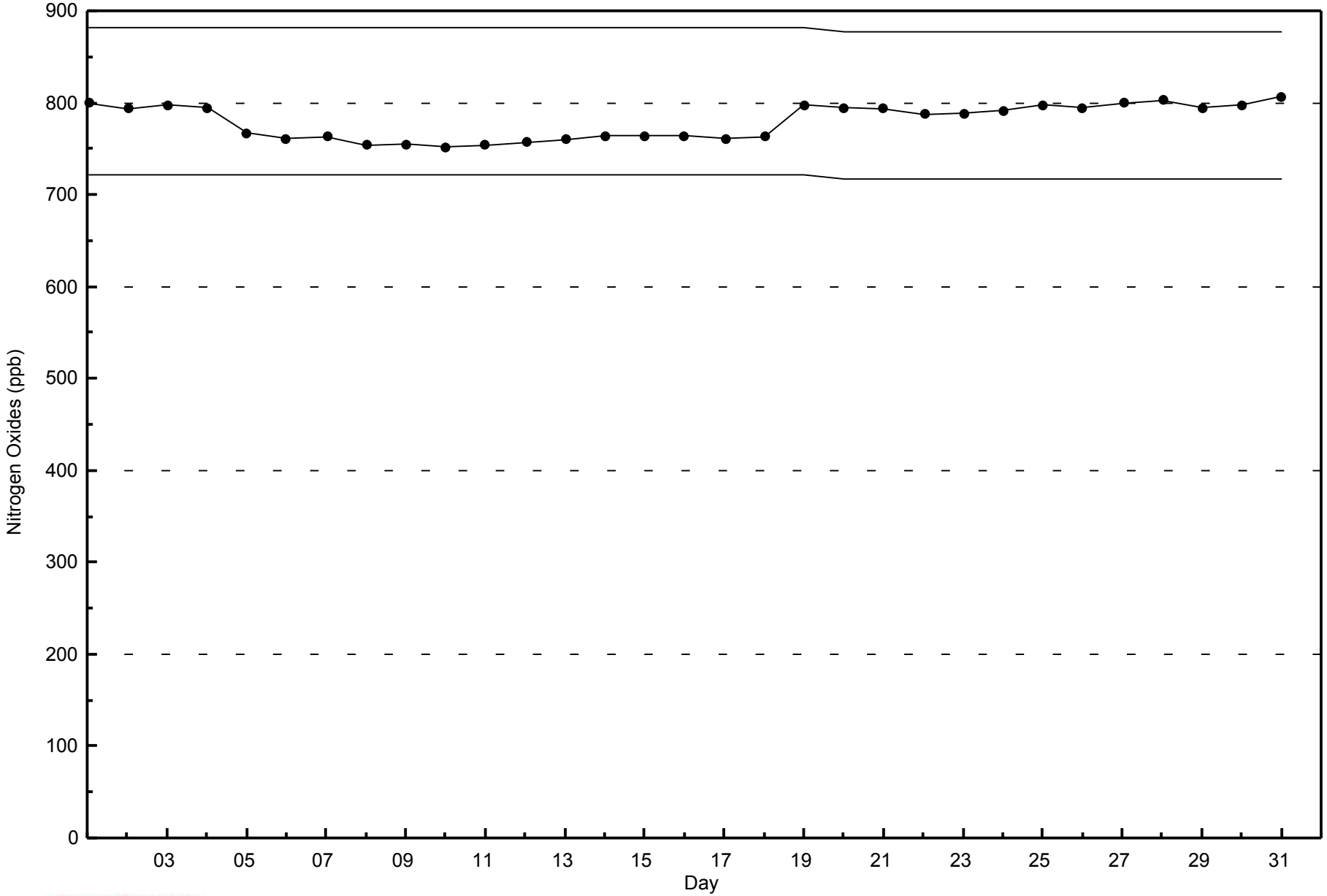
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - August 2014



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 - August 2014

Number of Exceedences (AAAQO): 24-hr: 2

Maximum Value: 491.2 $\mu g/m^3$ on Aug 4 12:00

Maximum Daily Average: 139.3 $\mu g/m^3$ on Aug 4

Minimum Value: 0.0 $\mu g/m^3$ on Aug 27 13:00

Minimum Daily Average: 3.1 $\mu g/m^3$ on Aug 28

Maximum Diurnal Average: 32.8 $\mu g/m^3$ at hour 12

Minimum Diurnal Average: 14.9 $\mu g/m^3$ at hour 4

Monthly Average: 18.44 $\mu g/m^3$

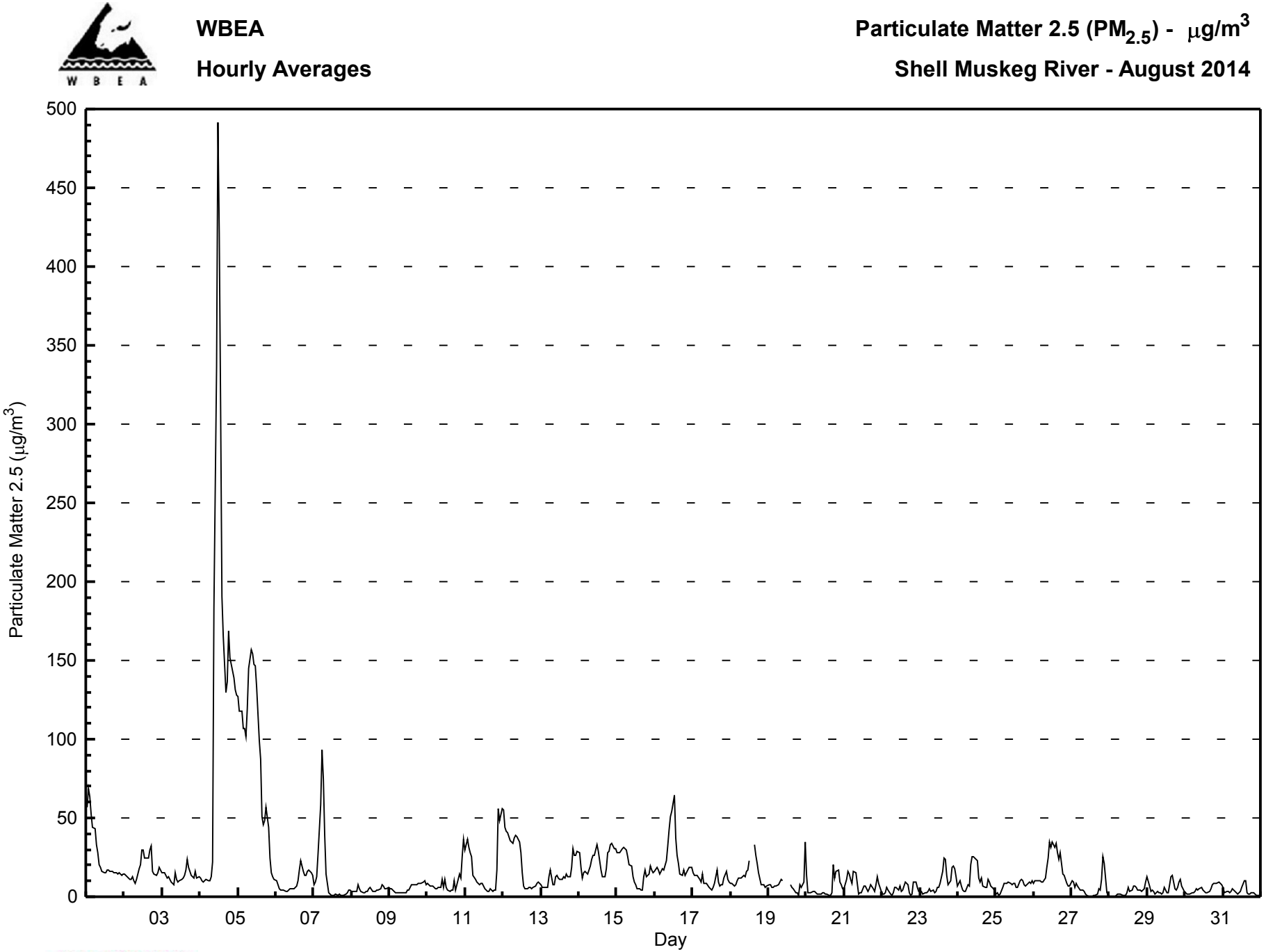
Percentiles: P_1 = 0.6 P_{10} = 2.3 Q_1 = 4.5 Median = 8.8 Q_3 = 16.2 P_{90} = 33.0 P_{99} = 155.6

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	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	57.2	68.3	63.5	52.6	44.5	42.9	33.1	27.6	20.3	18.4	16.2	15.3	15.5	16.6	16.9	16.2	16.0	15.6	15.1	15.0	14.7	15.1	13.6	14.1	26.8	68.3
2-Aug	14.2	13.2	12.6	11.3	11.2	12.8	10.4	8.3	11.4	17.4	20.5	29.4	29.8	25.0	24.9	24.4	29.5	32.5	15.8	14.0	13.3	15.4	18.9	17.1	18.1	32.5
3-Aug	15.4	15.0	13.4	12.3	12.5	10.7	9.4	7.8	15.7	10.8	9.3	10.0	11.2	11.5	13.3	17.1	23.5	19.0	13.8	12.7	11.7	15.8	12.0	12.9	13.2	23.5
4-Aug	11.8	9.8	9.5	10.0	11.1	10.5	10.3	13.1	22.5	183.2	336.5	491.2	421.5	313.1	190.6	165.5	129.4	136.9	168.5	151.8	147.1	138.9	131.6	128.3	139.3	491.2
5-Aug	126.9	117.5	117.8	107.0	106.9	102.1	119.9	144.8	157.0	154.0	147.8	146.9	132.8	98.7	87.2	50.8	45.5	48.1	56.6	43.9	24.4	15.1	13.0	11.1	90.7	157.0
6-Aug	10.4	7.9	5.5	4.5	4.1	3.9	3.7	3.5	4.3	5.3	5.0	5.2	6.1	7.1	10.3	17.1	23.0	16.5	13.8	13.7	15.8	16.8	14.8	13.2	9.6	23.0
7-Aug	7.7	9.5	12.3	27.3	58.7	92.8	75.0	38.9	14.6	2.6	1.6	1.1	1.0	0.8	1.4	0.9	1.4	0.9	0.8	0.9	1.9	2.9	4.1	3.9	15.1	92.8
8-Aug	3.4	3.7	3.8	3.3	7.2	5.5	3.1	2.7	2.5	3.1	3.7	5.0	5.6	3.8	3.5	3.4	3.8	4.6	5.3	7.4	6.5	5.4	5.4	5.6	4.5	7.4
9-Aug	5.0	4.8	4.4	3.6	2.8	2.8	2.4	2.4	2.6	2.5	2.6	4.0	4.6	5.7	7.7	7.5	7.8	8.0	8.4	8.4	8.8	9.0	10.3	8.0	5.6	10.3
10-Aug	8.1	7.2	6.8	6.6	5.8	5.4	5.1	5.9	5.9	11.3	6.1	11.0	5.9	4.4	3.5	4.2	4.5	10.2	4.5	11.4	14.8	11.7	25.5	36.1	9.2	36.1
11-Aug	29.5	36.0	31.3	28.2	25.0	13.2	11.3	9.6	8.9	7.7	8.3	8.4	5.4	4.5	3.6	3.8	4.9	3.7	3.9	4.2	16.8	55.7	48.2	56.0	17.8	56.0
12-Aug	55.3	44.2	41.3	40.6	35.8	35.1	33.6	37.6	39.2	38.5	34.7	28.4	15.1	6.4	5.3	5.2	6.1	5.9	5.4	6.0	6.6	8.1	9.1	8.4	23.0	55.3
13-Aug	7.3	6.3	6.1	5.9	6.2	12.5	17.3	7.3	7.7	12.3	13.9	11.7	11.1	11.3	12.3	12.1	14.4	12.5	13.1	19.0	30.1	26.6	26.3	28.7	13.8	30.1
14-Aug	27.6	18.5	11.7	15.6	16.5	14.6	16.9	19.4	24.0	26.4	26.5	32.9	29.0	22.8	17.3	12.6	12.5	17.7	27.5	28.9	33.3	33.7	30.4	30.2	22.8	33.7
15-Aug	27.6	27.6	27.6	30.2	31.4	30.5	29.3	25.4	20.5	19.3	13.0	9.6	7.6	5.1	4.8	4.4	4.5	12.4	16.7	13.1	14.5	19.8	17.4	15.2	17.8	31.4
16-Aug	16.4	18.4	16.8	14.8	16.2	17.9	17.1	22.7	32.0	42.0	51.1	54.0	64.3	36.9	26.0	21.3	14.6	13.4	16.7	14.0	15.5	17.3	18.7	18.6	24.9	64.3
17-Aug	15.1	13.4	13.6	13.9	11.4	9.5	14.2	8.8	8.3	8.5	5.6	4.8	4.4	5.8	8.2	16.5	9.7	6.8	8.0	7.8	12.2	15.9	11.2	9.0	10.1	16.5
18-Aug	8.7	8.4	7.1	7.4	9.8	11.8	11.9	12.2	13.5	12.3	16.3	17.1	23.0	M	M	33.3	26.6	21.0	15.5	7.7	7.6	7.4	6.3	6.4	13.2	33.3
19-Aug	7.3	7.6	6.3	6.2	6.4	6.9	8.0	9.2	11.4	10.1	M	M	M	M	7.2	6.3	5.1	2.5	2.3	1.0	7.5	5.9	9.7	35.0	8.1	35.0
20-Aug	13.9	2.7	2.3	2.8	3.1	3.1	2.7	1.9	2.0	1.7	2.5	2.9	2.0	1.8	0.7	1.2	2.1	20.3	12.0	16.0	17.0	9.0	7.9	5.3	5.7	20.3
21-Aug	5.0	11.2	15.8	14.6	11.1	8.6	16.0	15.5	8.2	1.8	2.5	2.9	6.6	6.5	5.1	3.2	5.2	7.5	5.2	3.4	7.3	12.5	8.7	3.5	7.8	16.0
22-Aug	1.8	1.3	2.6	5.7	4.5	1.7	1.2	2.9	6.0	6.3	4.4	6.9	3.4	4.0	6.6	9.0	7.8	2.9	1.0	1.9	9.1	9.3	5.6	3.2	4.5	9.3
23-Aug	3.0	3.6	2.1	2.2	2.2	3.4	4.7	3.4	3.9	2.9	3.3	5.6	6.1	8.3	16.4	24.9	23.4	13.7	7.3	10.4	18.3	19.2	18.1	12.7	9.1	24.9
24-Aug	7.1	10.4	6.7	4.1	3.1	3.4	7.6	6.4	20.5	25.8	25.6	23.6	22.9	12.2	9.6	11.6	6.9	6.1	6.0	11.4	9.5	6.9	4.9	3.4	10.7	25.8
25-Aug	1.9	2.3	1.2	1.5	6.1	8.3	8.5	8.7	9.2	8.2	7.3	8.2	8.9	6.1	6.3	10.2	11.4	10.2	7.3	7.1	8.9	9.6	8.1	10.1	7.3	11.4
26-Aug	8.5	10.3	10.5	10.2	9.8	9.4	9.6	12.2	18.7	25.0	34.6	31.6	34.9	31.5	33.6	27.6	23.7	27.6	14.7	13.2	11.3	8.2	7.2	6.6	17.9	34.9
27-Aug	10.0	9.0	6.3	8.2	7.2	4.6	4.4	4.0	3.1	1.7	1.2	0.4	0.0	0.1	0.6	1.1	1.9	4.8	4.3	11.0	25.8	21.0	2.3	1.7	5.6	25.8
28-Aug	0.4	0.2	0.0	0.0	0.7	1.3	1.4	1.6	0.8	1.2	1.0	2.3	5.7	3.7	4.4	6.7	6.9	5.7	4.5	3.9	3.6	4.1	4.9	9.0	3.1	9.0
29-Aug	12.4	6.4	3.1	4.6	3.6	1.9	3.5	2.5	2.2	1.9	2.7	5.7	2.4	2.3	7.7	13.1	13.3	4.9	3.9	6.1	9.2	11.4	6.7	3.8	5.6	13.3
30-Aug	2.2	1.4	1.3	1.9	2.5	2.9	3.7	4.9	4.5	5.5	5.6	4.6	3.3	2.4	2.7	3.1	5.3	7.7	8.6	8.4	8.2	9.5	8.3	7.5	4.8	9.5
31-Aug	5.6	2.8	3.8	3.4	2.9	3.3	5.4	4.2	2.3	1.6	2.1	3.5	6.0	10.3	10.0	2.5	1.7	1.8	2.1	2.4	1.9	1.0	0.8	0.7	3.4	10.3
	17.0	16.1	15.1	14.9	15.5	15.9	16.1	15.3	16.2	21.6	27.1	32.8	29.9	23.1	18.3	17.3	15.9	16.2	15.8	15.4	17.2	18.0	16.5	16.9	Diurnal Average	
	126.9	117.5	117.8	107.0	106.9	102.1	119.9	144.8	157.0	183.2	336.5	491.2	421.5	313.1	190.6	165.5	129.4	136.9	168.5	151.8	147.1	138.9	131.6	128.3	Diurnal Maximum	

M - Maintenance

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


WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$
Shell Muskeg River - August 2014
Particulate Matter 2.5 ($\mu g/m^3$)
500
450
400
350
300
250
200
150
100
50
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	211	28.59	28.59
6 - 15	307	41.60	70.19
16 - 25	85	11.52	81.71
26 - 80	84	11.38	93.09
> 81.0	31	4.20	97.29

Total Number of Valid Hours: 738

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Shell Muskeg River - August 2014

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	3	13	17	7	6	7	7	6	15	58	10	17	13	15	10	5	209
6 - 15	5	6	10	6	3	1	4	20	23	121	40	19	10	18	15	4	305
16 - 25	2	3	5	3	2	2	4	3	5	22	18	2	7	2	4	1	85
26 - 80	6	3	3	0	1	1	3	7	7	36	7	4	1	3	1	1	84
> 81.0	0	0	0	4	6	2	1	2	4	5	6	1	0	0	0	0	31
Totals	16	25	35	20	18	13	19	38	54	242	81	43	31	38	30	11	714

Total Number of Valid Hours: 734

Total Number of Hours: 744

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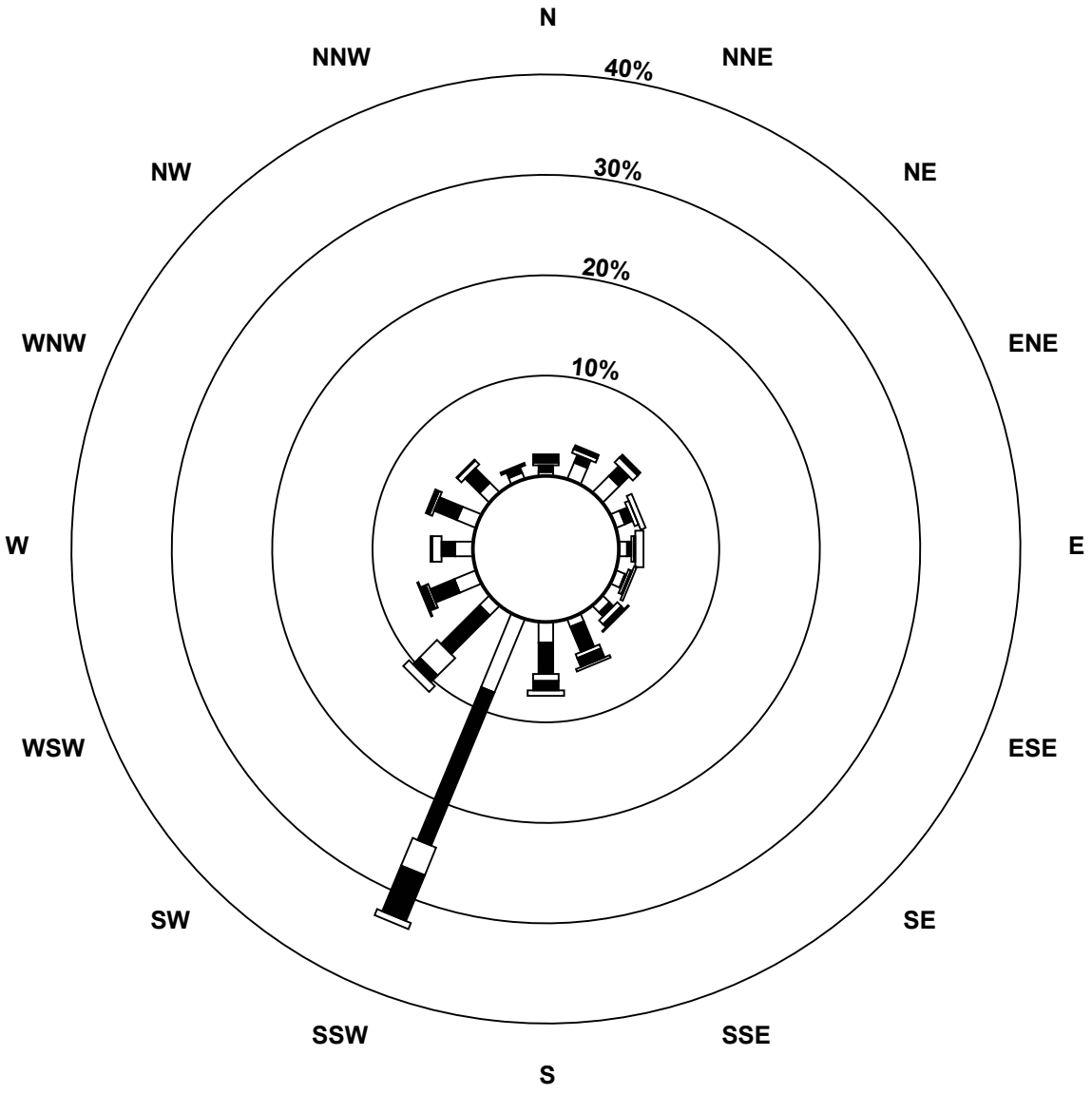
ATMOSPHERICS INC.

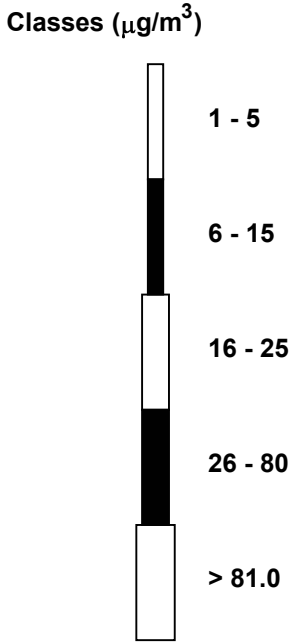
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Shell Muskeg River (AMS 16)





Total Number of Valid Hours: 734

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Shell Muskeg River - August 2014

Maximum Value: 99 % on Aug 27 04:00

Maximum Daily Average: 86.0 % on Aug 30

Minimum Value: 22 % on Aug 17 15:00

Minimum Daily Average: 50.1 % on Aug 17

Maximum Diurnal Average: 90.6 % at hour 5

Minimum Diurnal Average: 45.3 % at hour 16

Monthly Average: 68.9 %

Percentiles: P_1 = 29 P_{10} = 41 Q_1 = 51 Median = 71 Q_3 = 87 P_{90} = 95 P_{99} = 98

Hours in Service:	744
Hours of Data:	731
Hours of Missing Data:	13
Hours of Calibration:	0
Percent Operational Time:	98.3

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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	55	51	48	45	44	44	44	43	48	58	70	79	84	90	--	90
2-Aug	87	85	89	91	85	88	83	73	64	61	59	56	53	46	45	45	51	58	62	72	73	74	84	86	69.5	91
3-Aug	90	94	96	98	98	96	89	81	71	63	57	46	40	33	31	32	37	37	40	51	61	75	83	89	66.3	98
4-Aug	91	91	93	91	92	87	83	69	60	55	52	46	44	41	37	36	35	40	46	46	54	69	76	80	63.0	93
5-Aug	82	92	92	95	95	94	88	72	63	61	55	51	45	37	35	30	29	36	44	54	63	66	71	74	63.5	95
6-Aug	77	80	82	84	87	88	80	72	71	70	65	55	50	47	45	49	76	71	69	73	80	75	79	81	71.0	88
7-Aug	68	68	78	82	85	82	75	68	62	56	50	42	39	38	35	33	31	33	37	42	46	53	58	63	55.3	85
8-Aug	68	70	86	90	93	90	79	73	69	63	58	55	50	48	48	50	51	52	54	62	73	87	88	89	68.5	93
9-Aug	93	94	94	95	96	96	96	96	94	88	83	76	70	65	57	49	45	48	48	61	83	90	95	97	79.5	97
10-Aug	98	97	97	97	98	97	94	85	75	69	60	55	44	41	38	39	44	53	57	66	76	79	84	83	71.8	98
11-Aug	79	81	85	88	89	87	82	79	67	59	51	44	36	35	36	40	42	42	45	48	49	53	68	75	60.9	89
12-Aug	80	91	92	94	96	95	81	73	60	53	50	46	41	37	37	37	39	42	47	60	62	67	66	67	63.1	96
13-Aug	71	76	79	84	89	87	83	75	70	63	60	56	51	47	47	48	48	49	56	68	68	63	69	84	66.3	89
14-Aug	77	71	67	67	74	84	80	70	61	51	46	42	36	34	33	34	35	40	55	61	69	81	82	83	59.6	84
15-Aug	83	78	82	85	89	89	82	77	68	57	49	42	37	33	33	33	34	38	41	42	49	53	54	57	57.8	89
16-Aug	70	82	88	90	94	93	82	74	64	58	53	52	49	44	42	41	43	49	55	70	78	79	80	86	67.4	94
17-Aug	81	82	85	85	71	69	68	54	45	38	35	30	26	23	22	23	26	27	29	34	44	60	67	79	50.1	85
18-Aug	78	85	85	85	89	88	83	75	73	76	67	62	60	60	61	57	62	84	86	83	82	87	91	95	77.3	95
19-Aug	97	97	98	99	99	98	98	97	92	74	62	50	47	73	93	93	91	82	82	85	89	88	87	87	85.8	99
20-Aug	90	90	89	90	90	89	89	89	90	88	85	80	77	72	69	67	58	60	59	62	73	78	81	83	79.0	90
21-Aug	79	79	87	87	95	97	93	81	68	57	50	46	43	42	43	42	41	43	45	48	54	59	81	90	64.6	97
22-Aug	93	95	95	96	97	97	95	89	80	69	61	49	42	40	39	39	41	46	49	55	74	80	91	92	71.0	97
23-Aug	93	92	89	88	89	86	82	81	76	65	58	51	38	32	32	33	41	49	48	59	60	76	82	82	66.0	93
24-Aug	78	89	91	89	89	86	81	75	68	65	61	45	42	44	45	44	45	51	63	70	79	85	88	88	69.2	91
25-Aug	84	88	88	89	88	90	88	87	83	69	58	51	45	45	44	40	41	44	53	60	60	62	65	62	66.0	90
26-Aug	63	69	75	79	82	84	80	77	70	66	60	60	59	50	45	45	47	77	90	97	95	93	98	98	73.3	98
27-Aug	98	98	99	99	98	97	93	90	86	78	76	60	52	42	42	42	43	46	48	55	70	73	87	95	73.7	99
28-Aug	95	95	96	96	97	94	87	84	78	76	M	M	M	58	55	52	49	49	56	79	77	89	92	94	78.5	97
29-Aug	94	96	96	97	97	97	95	86	72	60	54	49	44	38	37	38	43	44	54	62	68	69	73	73	68.1	97
30-Aug	75	80	84	80	84	89	96	98	99	99	98	96	88	81	75	69	68	70	76	85	91	94	96	96	86.0	99
31-Aug	98	99	99	96	96	97	96	93	85	72	64	55	55	57	75	81	79	72	84	86	93	93	93	93	83.9	99
	83.6	86.1	88.6	89.5	90.6	90.4	86.1	79.7	72.8	66.0	59.6	53.3	48.3	46.1	45.8	45.3	47.1	50.8	55.8	63.1	69.8	75.1	80.4	83.6	Diurnal Average	
	98	99	99	99	99	98	98	98	99	99	98	96	88	81	93	93	91	84	90	97	95	94	98	98	Diurnal Maximum	

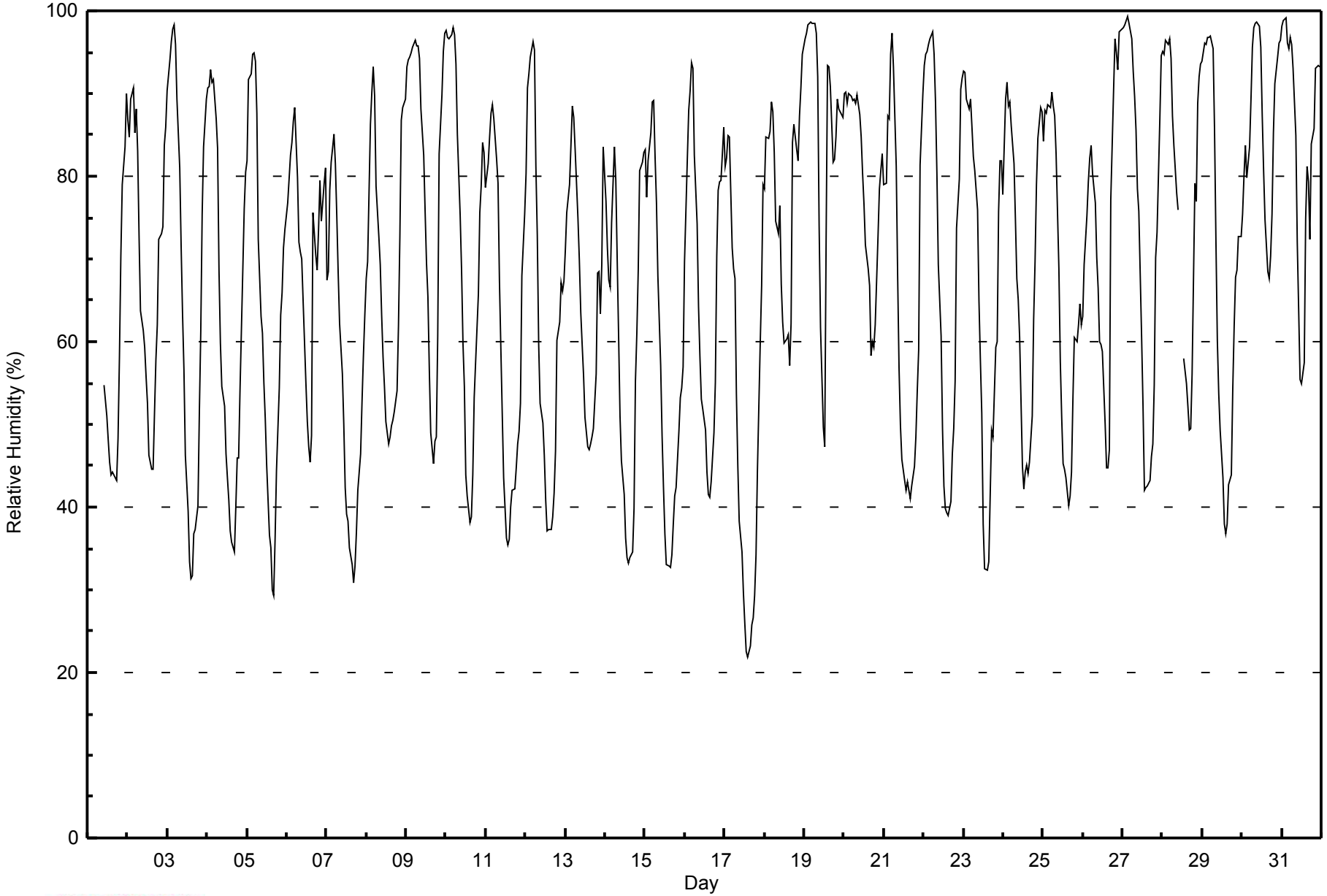
M - Maintenance AF - Analyzer Failure

WBEA

Hourly Averages

Relative Humidity (RH) - %

Shell Muskeg River - August 2014



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Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	65	8.89	8.89
40 - 60	199	27.22	36.11
60 - 80	187	25.58	61.70
80 - 100	280	38.30	100.00

Total Number of Valid Hours: 731

Total Number of Hours: 744

Maximum Value: 31.1 C on Aug 15 16:00

Maximum Daily Average: 23.7 C on Aug 13

Minimum Value: 1.5 C on Aug 22 05:00

Minimum Daily Average: 9.1 C on Aug 22

Maximum Diurnal Average: 23.3 C at hour 16

Minimum Diurnal Average: 10.9 C at hour 5

Monthly Average: 17.13 C

Percentiles: P_1 = 3.1 P_{10} = 9.6 Q_1 = 12.6 Median = 16.4 Q_3 = 21.6 P_{90} = 26.7 P_{99} = 30.4

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.9	13.9	13.4	12.4	11.7	11.5	12.3	13.5	14.4	15.1	16.1	17.2	18.1	19.0	19.9	20.6	20.8	21.7	21.6	19.7	16.3	13.7	12.3	11.1	15.9	21.7
2-Aug	10.8	10.4	9.7	9.3	9.7	10.4	12.6	14.3	17.3	19.2	21.8	24.3	26.1	27.1	27.7	27.9	25.9	24.3	21.3	19.4	18.9	18.2	16.2	15.4	18.3	27.9
3-Aug	14.5	13.7	12.8	12.6	12.6	13.6	15.4	17.6	20.2	22.7	24.9	27.3	28.3	29.1	29.2	29.9	29.0	28.9	28.3	25.4	22.3	19.1	17.3	16.0	21.3	29.9
4-Aug	15.0	14.7	14.3	14.5	13.7	14.8	16.5	19.9	22.2	23.4	24.6	25.7	26.4	27.8	28.8	29.5	29.1	28.6	27.6	26.2	24.4	20.7	18.3	16.8	21.8	29.5
5-Aug	15.8	13.8	13.1	12.4	12.0	12.1	14.3	17.3	19.4	21.2	23.8	25.6	27.9	29.9	30.1	30.8	30.6	30.2	29.0	26.3	22.8	21.6	19.9	18.7	21.6	30.8
6-Aug	18.1	18.7	18.3	17.4	16.8	16.6	18.8	20.7	21.2	21.9	23.9	27.0	28.3	28.8	29.3	26.4	22.9	24.8	24.7	22.2	20.1	19.8	18.4	17.1	21.8	29.3
7-Aug	18.7	17.9	15.8	14.9	14.1	15.2	16.5	17.7	18.8	19.9	21.5	22.9	23.4	23.4	24.5	24.1	23.9	23.3	22.5	20.6	18.7	17.0	17.0	16.1	19.5	24.5
8-Aug	15.1	14.0	10.9	9.7	8.6	9.7	12.4	14.0	15.1	16.5	17.7	18.7	19.8	21.0	21.3	20.8	20.8	20.6	20.2	18.5	16.0	13.7	13.3	13.0	15.9	21.3
9-Aug	12.5	12.1	12.0	12.2	12.0	11.9	11.9	11.9	12.2	13.1	14.1	16.0	17.2	18.4	20.1	21.1	21.8	21.2	21.5	19.1	15.3	13.7	11.9	10.9	15.2	21.8
10-Aug	10.8	10.6	10.0	9.5	9.7	10.2	11.5	14.3	16.8	18.6	20.5	22.6	24.2	25.1	25.8	25.5	24.7	23.8	22.5	21.0	18.6	16.5	15.0	14.7	17.6	25.8
11-Aug	14.4	13.4	12.5	12.1	11.6	12.6	14.8	15.7	18.4	21.1	23.6	26.0	26.8	27.3	27.6	26.4	25.7	25.5	24.8	23.7	22.5	21.2	17.4	15.4	20.0	27.6
12-Aug	14.6	12.4	11.4	10.9	10.3	10.7	14.0	16.6	19.5	22.0	23.6	25.3	26.8	28.2	28.6	28.9	28.7	28.8	28.0	23.9	22.0	20.5	20.0	19.5	20.6	28.9
13-Aug	18.8	17.7	17.0	16.2	15.3	15.9	17.3	20.0	22.5	24.4	25.9	27.6	29.0	30.2	30.5	30.7	30.6	30.2	29.4	26.2	25.5	25.1	23.3	20.0	23.7	30.7
14-Aug	20.4	20.4	19.2	18.8	17.0	15.0	16.4	19.7	21.9	23.8	24.9	26.5	27.7	28.1	28.9	29.0	29.2	28.2	25.6	23.6	20.8	18.7	17.5	16.5	22.4	29.2
15-Aug	16.4	16.5	15.8	14.9	13.9	14.0	15.9	18.3	21.0	23.9	26.4	28.1	29.2	30.2	30.7	31.1	30.4	29.5	27.9	26.8	24.9	23.8	23.5	22.4	23.1	31.1
16-Aug	19.2	16.3	15.0	14.3	13.2	13.5	16.0	18.2	20.6	22.5	24.2	25.3	27.0	29.1	29.8	29.6	29.7	28.8	27.3	24.8	22.5	21.2	20.6	19.2	22.0	29.8
17-Aug	20.1	19.9	19.1	18.2	18.5	18.0	18.5	20.4	22.3	23.7	24.8	26.2	27.4	28.6	28.9	29.3	28.4	27.9	26.6	24.1	20.9	18.1	16.2	14.2	22.5	29.3
18-Aug	14.6	12.7	12.4	11.9	11.4	11.5	13.4	15.5	16.7	17.1	18.8	20.0	20.9	21.6	21.7	22.3	21.8	19.3	18.6	18.4	18.1	17.6	16.2	15.3	17.0	22.3
19-Aug	15.3	14.6	13.9	14.0	14.1	14.2	14.5	15.6	16.6	20.2	22.2	23.7	24.4	17.9	15.4	15.9	16.6	17.5	17.5	15.6	15.4	15.7	15.5	15.1	16.7	24.4
20-Aug	13.9	13.5	12.6	12.1	11.5	10.9	10.8	10.7	10.5	10.6	10.8	11.5	12.2	13.0	13.5	13.6	14.3	13.6	13.3	12.7	10.7	9.8	9.2	8.4	11.8	14.3
21-Aug	7.9	7.0	5.2	5.5	3.1	2.3	4.6	8.2	11.1	12.8	13.2	13.8	14.4	15.1	15.2	15.4	15.7	15.2	14.7	13.6	12.1	10.8	6.6	4.4	10.3	15.7
22-Aug	3.8	3.5	2.8	2.0	1.5	2.2	3.8	5.7	8.2	10.9	13.3	14.8	15.2	15.8	15.9	15.8	15.9	15.2	14.5	12.8	8.8	7.1	5.0	4.0	9.1	15.9
23-Aug	3.1	3.9	4.8	5.1	5.0	5.7	6.7	7.8	9.5	11.7	13.6	15.5	17.0	17.4	17.7	18.0	17.3	16.6	16.0	13.0	11.7	8.3	6.6	6.1	10.8	18.0
24-Aug	5.9	3.7	4.2	5.4	6.1	6.7	7.9	9.4	12.0	13.2	14.8	16.9	18.1	19.2	19.4	20.1	20.4	19.7	17.2	14.9	12.8	10.8	9.3	9.5	12.4	20.4
25-Aug	11.1	10.7	10.6	10.4	10.2	9.6	10.8	11.5	13.0	15.6	18.1	20.2	21.8	22.0	22.7	23.0	22.6	21.5	19.1	17.0	16.4	16.0	15.6	15.9	16.1	23.0
26-Aug	15.8	14.6	13.4	12.4	11.4	10.8	12.1	13.8	15.8	17.5	20.0	20.6	21.5	24.1	25.1	25.9	25.1	18.8	17.2	16.2	16.2	16.5	15.8	15.1	17.3	25.9
27-Aug	14.4	13.5	12.3	12.5	12.4	12.2	13.6	14.4	15.1	16.3	16.7	18.8	20.2	21.3	21.8	22.4	21.6	20.4	20.1	17.5	14.1	13.8	12.4	10.8	16.2	22.4
28-Aug	10.1	9.4	8.1	7.2	6.7	7.4	8.8	9.9	10.8	11.1	M	M	M	13.3	14.0	14.4	15.0	15.5	14.8	10.5	10.0	7.2	6.0	5.3	10.3	15.5
29-Aug	4.6	3.8	3.1	3.1	3.1	2.8	4.1	7.7	11.3	14.5	16.9	19.0	20.6	21.5	22.1	22.3	21.4	21.5	19.0	16.5	14.7	13.8	13.0	12.7	13.0	22.3
30-Aug	12.2	11.4	11.2	12.0	11.5	11.2	11.4	11.5	11.6	11.6	11.8	12.6	13.9	15.0	16.6	17.9	18.1	18.1	16.9	15.0	13.8	13.1	12.5	11.4	13.4	18.1
31-Aug	10.2	9.5	9.0	9.6	9.3	8.3	9.0	9.9	11.8	14.7	16.8	18.9	19.1	17.3	14.5	13.0	14.2	15.6	14.3	13.4	11.3	10.7	10.6	10.4	12.6	19.1
	13.3	12.5	11.7	11.4	10.9	11.0	12.5	14.3	16.1	17.8	19.6	21.3	22.4	22.8	23.1	23.3	23.0	22.4	21.4	19.3	17.4	15.9	14.6	13.6	Diurnal Average	
	20.4	20.4	19.2	18.8	18.5	18.0	18.8	20.7	22.5	24.4	26.4	28.1	29.2	30.2	30.7	31.1	30.6	30.2	29.4	26.8	25.5	25.1	23.5	22.4	Diurnal Maximum	

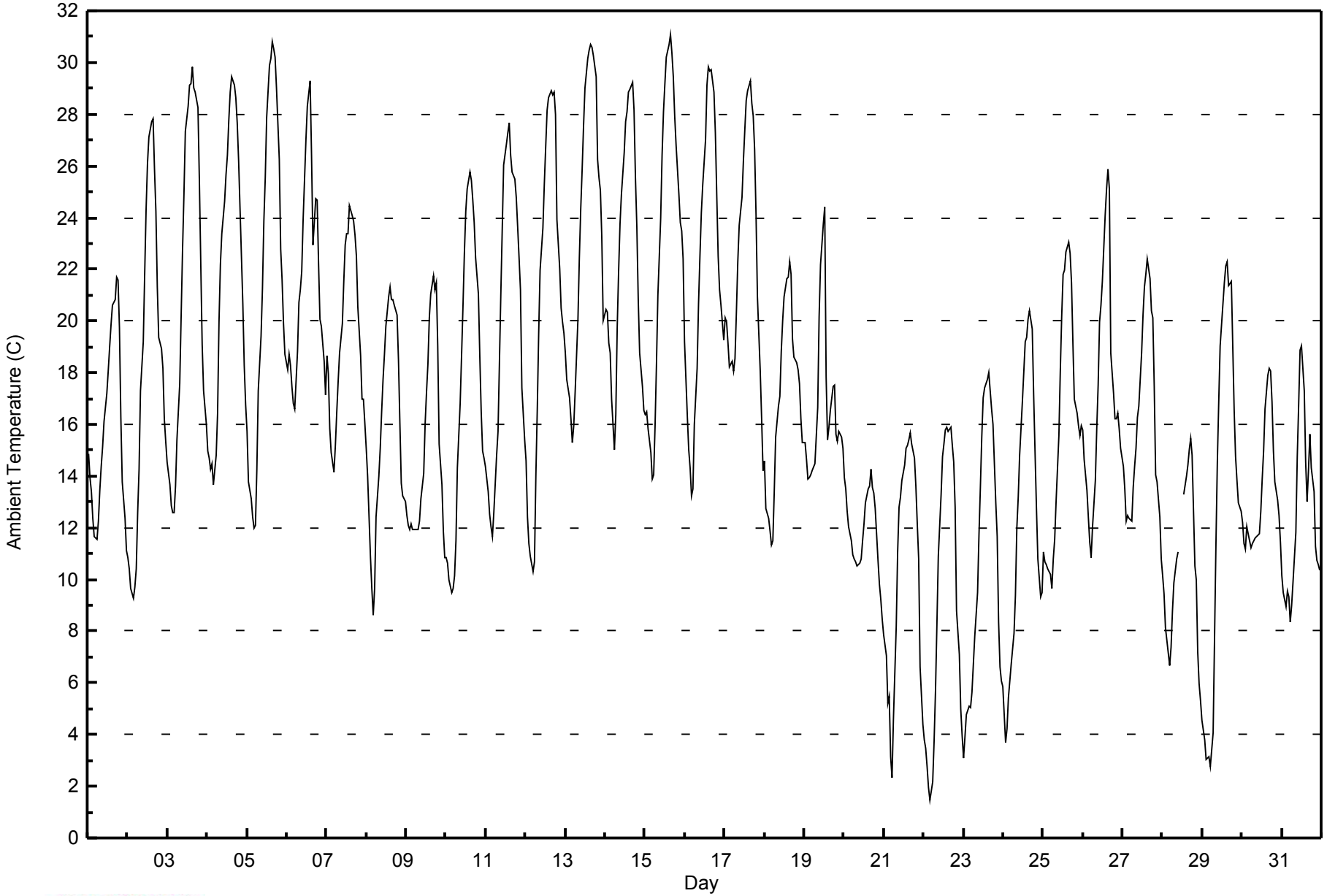
M - Maintenance

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	84	11.34	11.34
10 - 20	418	56.41	67.75
> 20	239	32.25	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

Shell Muskeg River - August 2014

Maximum Value: 29.3 inHg on Aug 23 02:00

Maximum Daily Average: 29.3 inHg on Aug 22

Minimum Value: 28.5 inHg on Aug 30 17:00

Minimum Daily Average: 28.5 inHg on Aug 30

Maximum Diurnal Average: 28.9 inHg at hour 11

Minimum Diurnal Average: 28.8 inHg at hour 19

Monthly Average: 28.86 inHg

Percentiles: P_1 = 28.5 P_{10} = 28.6 Q_1 = 28.7 Median = 28.9 Q_3 = 29.0 P_{90} = 29.2 P_{99} = 29.3

Hours in Service:	744
Hours of Data:	731
Hours of Missing Data:	13
Hours of Calibration:	0
Percent Operational Time:	98.3

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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	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
2-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
3-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
4-Aug	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0
5-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0
6-Aug	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.8
7-Aug	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.7	28.8
8-Aug	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
9-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
10-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
11-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
12-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0
13-Aug	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8
14-Aug	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.8	28.9
15-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
16-Aug	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8
17-Aug	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.8	28.7	28.7	28.7	28.7	28.7	28.8
18-Aug	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	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.5	28.6	28.7
19-Aug	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	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	28.7	28.6	28.7
20-Aug	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	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	28.8	29.0
21-Aug	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2
22-Aug	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3
23-Aug	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3
24-Aug	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	29.0	29.0	29.0	29.0	29.1	29.2
25-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.9	29.0
26-Aug	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7
27-Aug	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
28-Aug	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	M	M	M	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.9
29-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.8	28.9
30-Aug	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6
31-Aug	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.6
	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	Diurnal Average	
	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	Diurnal Maximum	

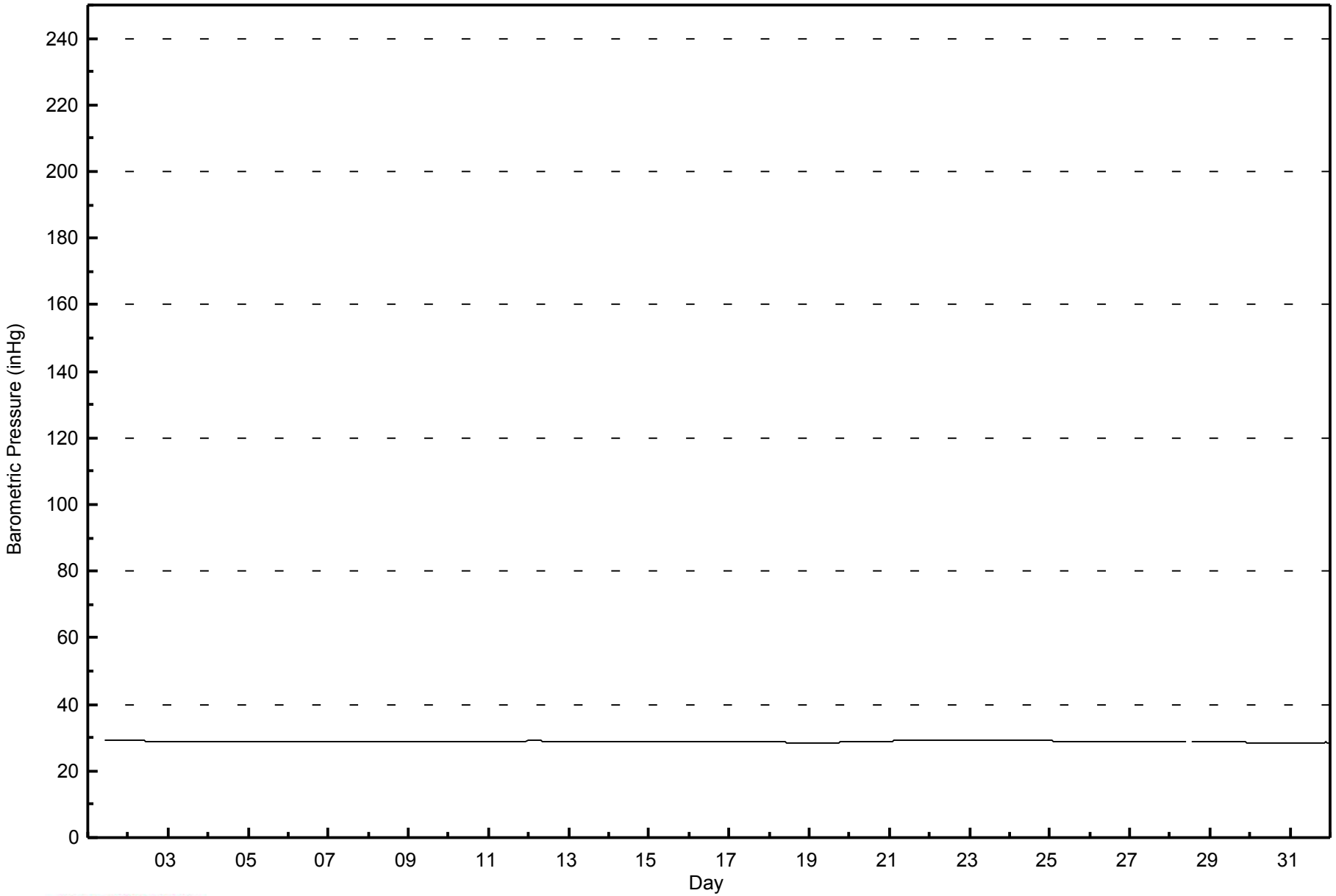
M - Maintenance AF - Analyzer Failure

WBEA

Hourly Averages

Barometric Pressure (BP) - inHg

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Shell Muskeg River - August 2014

Maximum Speed: 25 km/h on Aug 7 12:00

Maximum Daily Speed Average: 15.1 km/h on Aug 7

Minimum Speed Value: 1 km/h on Aug 27 21:00

Minimum Daily Speed Average: 1.5 km/h on Aug 18

Maximum Diurnal Speed Average: 5.1 km/h at hour 14

Minimum Diurnal Speed Average: 1.2 km/h at hour 18

Monthly Average Velocity: 2.9 km/h 225.9 deg

Percentiles: P_1 = 2 P_{10} = 3 Q_1 = 5 Median = 7 Q_3 = 10 P_{90} = 14 P_{99} = 22

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	NNE17	NNE15	NNE15	N14	N15	N15	N14	N10	NNE11	N12	NNE11	N8	ENE3	NE4	NW3	SSE5	SSE5	S3	SSE4	SE6	SSE5	S5	SSW4	SSW5	NNE5.3	NNE17
2-Aug	SSW5	SSW7	SSW6	SSW8	SW6	SW5	SSW5	SSW7	SW8	SW9	SSW9	SSW11	SSW12	SSW14	SSW13	SSW13	SSW14	SSW9	NE20	SE10	SSE7	SSW7	SSW5	SW7	SSW7.0	NE20
3-Aug	SSW6	SSW7	SSW7	SSW7	SSW8	SSW6	SW6	SSW5	SSW6	SW7	SW7	SSW6	S5	SSW5	SSW5	SSW7	SSW10	SSW11	SSW8	SSW7	SSW5	SSW5	SSW5	SW5	SSW6.5	SSW11
4-Aug	SSW5	SSW7	SSW7	S6	S5	SSW6	SSW7	SW3	E3	ENE8	ENE9	ENE10	ENE10	E6	E10	ESE7	ESE9	E8	E11	E12	E13	SE5	SSE3	SSW5	ESE4.7	E13
5-Aug	SSW1	S4	SSW4	SSW6	SSW5	S4	S3	SW4	SW6	SW7	SW7	SW5	S4	S3	SW6	SSW7	S7	S5	S5	SSE7	S8	SSW7	SSW7	SSW9	SSW5.2	SSW9
6-Aug	S8	SSW10	SSW8	SSW7	SSW6	SSW6	S7	S10	SSW9	S8	SSW7	SSW13	SSW14	SW15	SW21	W12	ESE3	S6	S6	SSW6	SW8	WSW14	WSW11	SW13	SSW8.6	SW21
7-Aug	WSW16	W12	SSW7	SSW7	SSW7	WSW16	WSW19	WSW21	W24	WSW19	WSW22	WSW25	W24	W23	W22	W22	W21	W18	W11	W11	W12	W11	NNW8	NW7	W15.1	WSW25
8-Aug	W4	WNW7	SSW4	SE5	SSE3	SE3	E7	ENE9	ENE10	ENE4	NNE2	E9	ENE10	ESE7	ESE8	ESE12	E13	ENE15	ENE17	NE18	NNW13	NNW12	NNE13	NE13	ENE5.8	NE18
9-Aug	NNE10	N12	N11	NE10	ENE10	NW3	WNW7	WNW8	WNW8	NW5	WNW6	WNW9	WNW7	W7	WNW10	NW11	WNW10	W12	NW3	WSW3	SSW5	SSW5	SSW7	SW7	NW4.5	N12
10-Aug	SW8	SSW7	SSW6	S6	SSW5	SSW6	SSW7	SSW6	SSW6	SSW7	SW9	SSW9	SSW9	SSW10	SSW10	SW10	SW7	SW6	SSW6	SSW5	SW7	SW7	SW6	SSW9	SSW7.2	SW10
11-Aug	SSW9	SSW7	SSW7	SSW8	SSW8	SSW7	SSW6	SW9	SW10	SSW6	SW4	W4	NW19	WNW21	NW13	NNE13	NNE16	NE16	NE19	NE16	NE15	NE11	SSE3	ESE6	NNW1.7	WNW21
12-Aug	E2	SSE4	SSE3	SSW3	SSW2	SSW3	S3	SSW2	SSW3	SSW3	SE2	SSE3	S3	S6	SSW7	SSW8	SSW9	S9	S8	SSE7	SSE5	SSW6	SSW7	SSW10	S4.6	SSW10
13-Aug	SSW10	SSW7	SW6	SW4	SSW5	SW5	SW4	SSW6	SSW8	SSW10	SSW9	SSW10	SW14	SW16	WSW20	WSW16	WSW16	WSW16	SW9	SW7	WNW9	NW11	NNW6	W5	SW8.4	WSW20
14-Aug	WNW9	WNW9	NW8	NNW9	NW3	SSW4	SSW3	SE2	E3	SE2	SE3	S3	WSW4	W6	SW5	SW5	SW5	SW6	SW5	SSE5	SSE5	SSW6	S5	S7	SW2.6	WNW9
15-Aug	SSW7	SSW7	SW6	SSW6	SSW5	SSW6	SSW6	SW6	SW7	SSW8	SW5	SW6	SSW3	SSW5	SSW6	SW8	SW5	NNE11	NE22	NE19	ENE13	ENE13	ENE12	ENE10	SE1.7	NE22
16-Aug	ENE8	W3	SSW3	S4	SSW4	SSW3	SSW3	SSW3	SSW2	SSW2	SSW3	S3	SSW2	SW7	SW7	SW9	WSW8	WSW7	W7	SW7	SW7	SW8	WSW7	SSW6	SW4.1	SW9
17-Aug	WSW8	WSW7	WSW5	WNW5	NW10	NW8	WNW6	NW11	NW9	WNW7	W6	WSW5	W8	WNW16	WNW22	NW21	NW20	NW19	WNW16	WNW11	WNW8	W4	WNW4	SW7	WNW9.3	WNW22
18-Aug	SSW4	SSW6	SSW6	SSW7	SSW7	SSW6	SSW3	ESE2	SSE3	S3	SSE5	SW4	SW7	WSW8	W9	WNW6	NE6	SSW4	NE6	NE14	NE13	NE9	SSE3	WSW6	SSW1.5	NE14
19-Aug	W7	SW3	SSW5	SSW5	SSW6	SW4	SSW5	SW6	SW6	SSW9	SW11	SW10	SSW12	WNW20	WNW9	S5	SE6	E10	ESE7	SE5	NNE11	NNE12	NNE8	NE15	SW1.9	WNW20
20-Aug	NE18	NE16	NE18	NE16	NNE18	NNE18	NE19	NE20	NE16	NNE14	NNE18	NNE12	NE13	NE15	NE13	NE13	NE13	N15	NE15	NNE9	NW8	NW8	NW8	NW9	NNE12.9	NE20
21-Aug	NW11	WNW10	W4	WNW6	W4	WSW5	W4	NW4	NW7	NNW10	NNW10	N11	N10	NNE11	NE12	NNE12	NNE11	NE15	NE14	NNE10	N9	NNW8	WSW3	W4	N6.0	NE15
22-Aug	SW4	SSW5	SSW5	SSW4	SSW5	SSW4	SSW4	SSW4	SSW3	SSW3	SSW3	WNW5	ENE8	NW6	E7	NW4	SSE4	SE7	ESE8	ESE8	SSE3	SSW4	SW6	S5	S2.5	ESE8
23-Aug	SSW6	SSW6	S5	S5	S4	S4	S3	SSW3	SSW4	SSW3	SW5	SW5	SSE5	SSE5	SE5	SSW6	SW3	AF	SSW2	SE4	SE10	SE7	S4	SSW3	S4.0	ESE10
24-Aug	S3	S3	SSE5	SSE4	S3	SE3	SSE2	SSW3	SW2	SSW2	SSW3	S4	SE4	SE5	NNE4	SSW5	S6	S5	S4	SSE5	S6	S5	S6	S7	S3.5	S7
25-Aug	SSW9	SSW8	SSW6	SSW5	SW6	SW6	SSW7	SSW10	SSW11	SSW11	SSW12	SSW14	SSW15	SSW16	SSW16	SSW15	SSW15	SSW14	SSW11	SSW11	SSW11	SSW11	SSW11	SSW12	SSW10.9	SSW16
26-Aug	SSW11	SSW8	SSW7	SSW7	SSW7	SSW8	SSW10	SSW7	SW9	SSW8	SSW8	SW8	SW7	SSW9	SSW9	SSW10	SW18	N19	NE1	SSW7	SW10	WSW14	SSW6	SSW7	SW7.2	N19
27-Aug	SW6	SSW4	SSW7	SSW9	SSW9	WSW12	WSW15	WSW15	WSW14	WSW14	WSW15	WSW12	WSW12	W12	WSW12	WSW13	W13	WNW10	WNW10	NW8	WSW1	WNW11	WSW6	SW6	WSW9.1	WSW15
28-Aug	WSW9	SSW6	SW5	WSW7	WSW6	WNW10	WNW10	W10	WNW10	WNW9	M	M	M	NW14	NW11	NNW8	N4	WSW2	SSW4	SSW3	E5	ESE5	SE4	SSE4	W4.1	NW14
29-Aug	S3	SSW6	SSW7	SSW6	SSW7	SSW7	SSW6	SSW6	SSW7	SSW9	SSW10	SSW8	SSW11	SSW12	SSW12	S11	S10	SSE10	SSE9	SSE9	SSE10	SSE9	SSE8	SSW6	S7.8	SSW12
30-Aug	S9	S8	SSE9	WSW4	SSW6	S6	SSW5	SSE5	S4	W7	WNW4	W9	WNW7	N2	SE2	SSW4	E3	E6	ENE11	E12	ENE6	N3	WNW2	WNW4	S1.5	E12
31-Aug	SW2	SSW7	SSW8	WSW8	SSW6	SSW7	SSW6	SSW6	SW4	WSW5	SW6	WSW6	W9	NNW9	W8	SW12	W9	WNW12	WSW10	NE4	SSW7	SW10	SSW8	SSW7	SW5.9	WNW12
	SW3.2	SW3.5	SSW3.3	SSW3.1	SSW3.2	SW3.5	SW3.5	SW3.4	SW3.6	SW3.7	SW3.9	SW4.3	SW3.8	WSW5.1	WSW4.7	WSW4.5	SW3.1	W1.2	E1.7	ESE2.1	S1.3	WSW2.3	SSW2.6	SSW3.5	Diurnal Average	
	NE18	NE16	NE18	NE16	NNE18	NNE18	WSW19	WSW21	W24	WSW19	WSW22	WSW25	W24	W23	WNW22	W22	W21	N19	NE22	NE19	NE15	WSW14	NNE13	NE15	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

Shell Muskeg River - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 10 km/h on Aug 27 22:00

Minimum Value: 1 km/h on Aug 16 04:00

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:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

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

M - Maintenance AF - Analyzer Failure

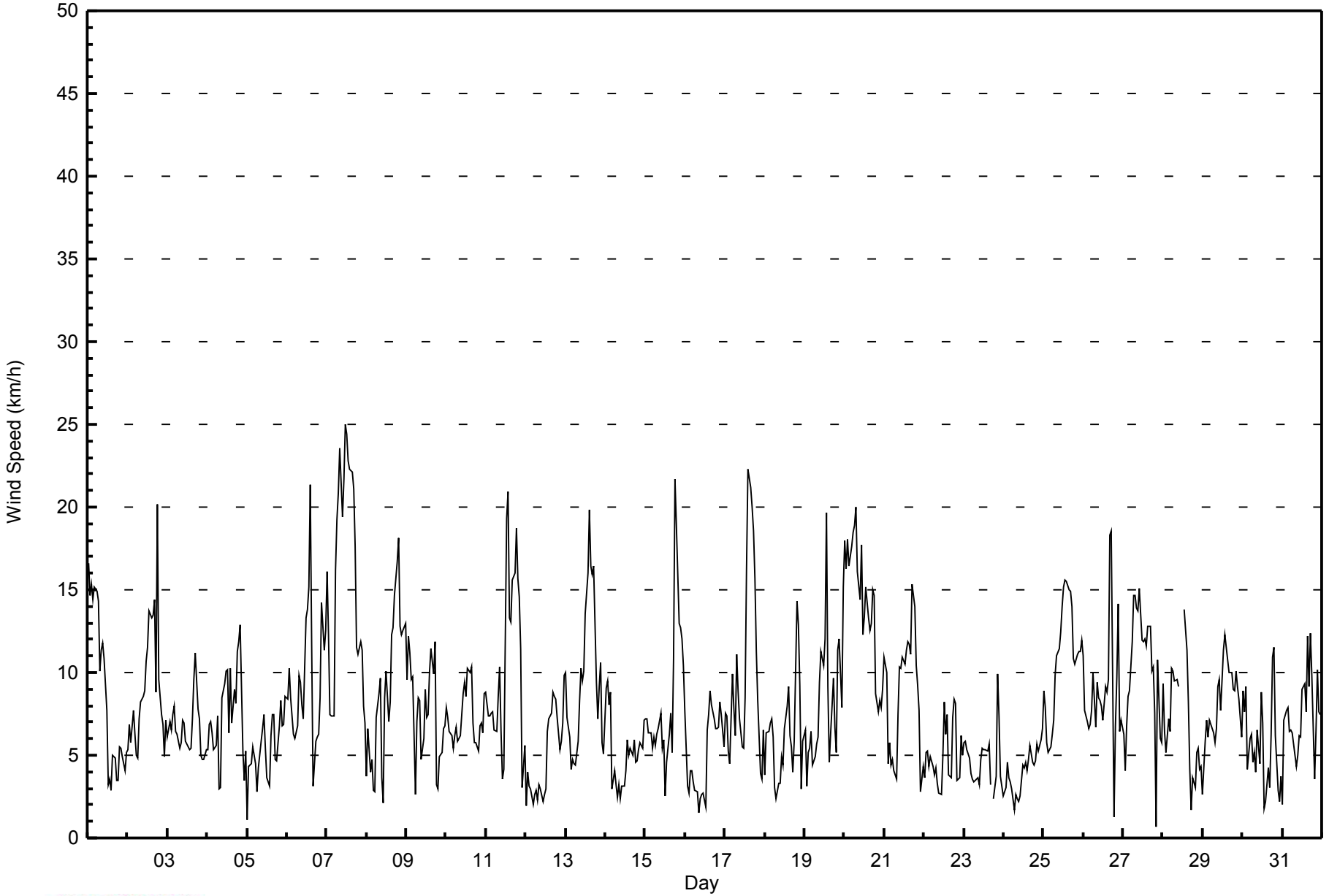
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	226	30.54	30.54
6 - 11	379	51.22	81.76
12 - 19	116	15.68	97.43
20 - 28	19	2.57	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Shell Muskeg River - August 2014

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	2	5	3	15	27	34	74	26	10	9	6	7	1	226
6 - 11	6	10	5	13	9	9	5	11	20	153	53	16	16	28	17	8	379
12 - 19	8	13	25	5	4	1	0	0	0	19	5	20	7	3	4	2	116
20 - 28	0	0	3	0	0	0	0	0	0	0	1	4	6	3	2	0	19
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	25	36	20	18	13	20	38	54	246	85	50	38	40	30	11	740

Total Number of Valid Hours: 740

Total Number of Hours: 744

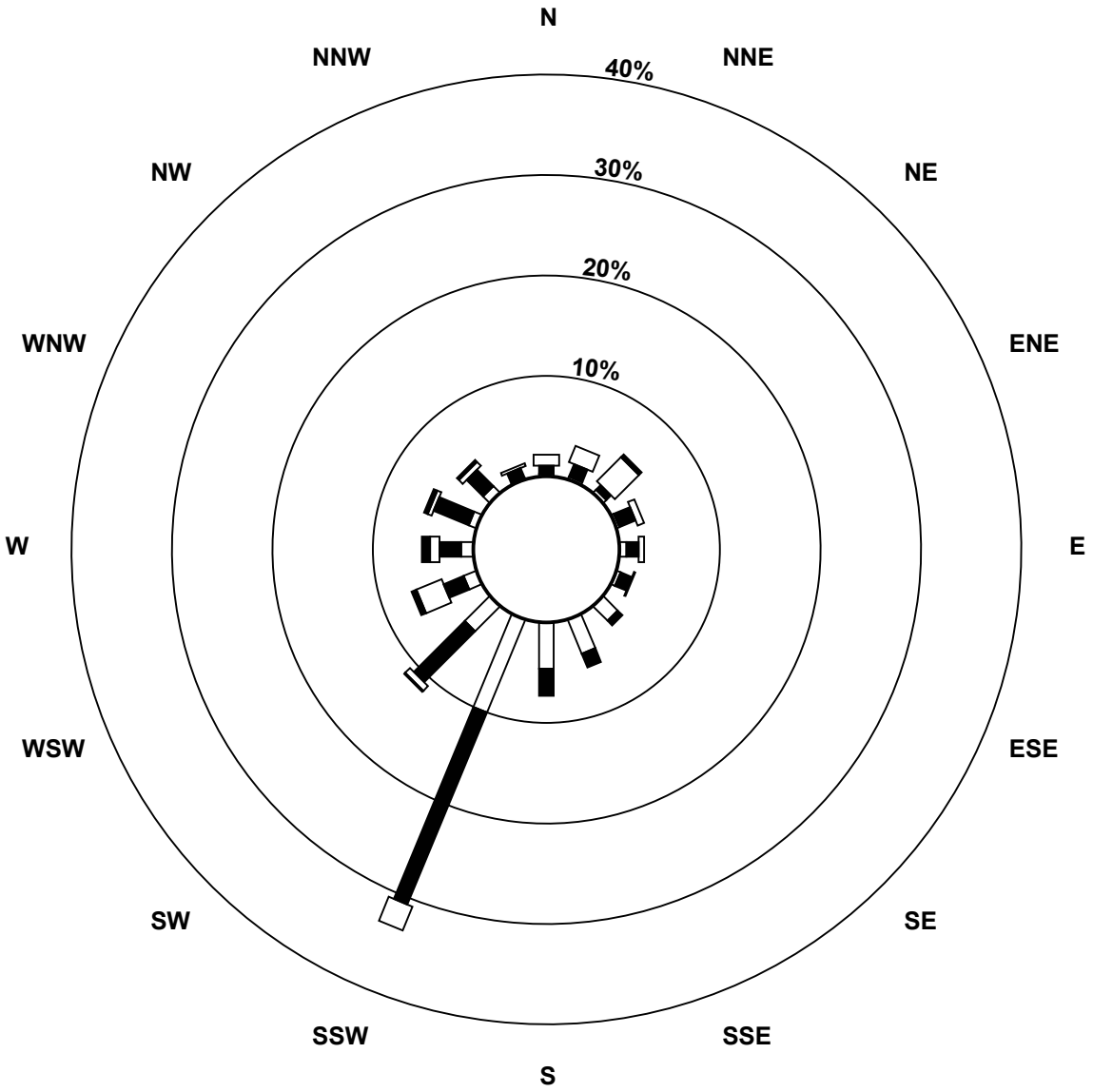
AURORA
ATMOSPHERICS INC.

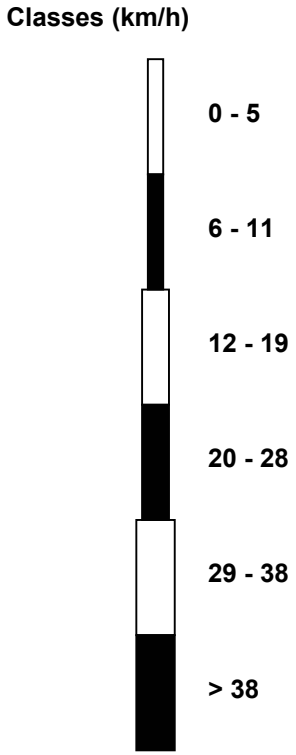
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Shell Muskeg River (AMS 16)





Total Number of Valid Hours: 740

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Shell Muskeg River - August 2014

Direction of Maximum Speed: 253 deg on Aug 7 12:00
Direction of Maximum Daily Speed Average: 260.3 deg on Aug 7

Direction of Minimum Speed: 238 deg on Aug 27 21:00

Direction of Minimum Daily Speed Average: 1.5 deg on Aug 18

Monthly Average Direction: 224.6 deg

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	17	21	30	7	4	7	8	3	28	0	20	358	74	44	306	168	151	178	168	133	148	181	200	199	20.8
2-Aug	213	206	203	200	225	220	197	208	216	218	205	206	212	212	204	201	209	206	54	126	168	206	193	217	200.5
3-Aug	209	199	201	204	202	208	217	211	200	219	220	194	187	194	205	198	202	199	203	202	200	203	207	230	204.5
4-Aug	199	195	202	190	169	192	200	232	89	68	70	71	72	97	81	119	104	101	83	87	92	140	167	213	114.8
5-Aug	204	187	197	207	196	171	183	227	216	218	230	215	169	185	232	194	191	189	172	156	174	195	200	195	196.6
6-Aug	191	193	195	199	196	193	191	191	196	189	194	197	205	219	233	279	116	174	178	197	216	240	239	236	210.1
7-Aug	251	260	200	199	201	247	250	254	262	253	249	253	263	277	265	278	276	268	263	259	260	273	342	312	260.3
8-Aug	280	301	195	133	155	144	97	63	57	69	32	81	70	108	102	102	88	70	65	36	328	329	20	39	58.8
9-Aug	13	6	8	39	71	304	297	298	289	316	289	298	297	271	284	306	295	281	325	257	197	193	204	217	306.0
10-Aug	227	212	192	191	201	207	209	197	211	205	214	205	213	212	207	226	217	226	197	195	215	224	227	201	210.3
11-Aug	202	202	206	205	201	194	207	221	227	213	228	279	307	297	324	16	33	46	52	37	42	43	168	122	338.7
12-Aug	89	155	167	213	209	198	183	204	197	201	139	164	183	190	209	207	200	189	176	168	168	194	211	202	189.4
13-Aug	198	207	215	216	209	235	218	210	211	206	210	213	219	229	238	238	244	239	231	228	283	324	339	259	231.8
14-Aug	285	298	323	331	321	192	198	142	96	132	125	189	248	276	232	234	234	221	215	162	165	193	183	187	232.2
15-Aug	196	210	215	203	199	196	203	223	215	202	218	236	195	211	210	221	228	26	45	46	70	72	67	66	138.5
16-Aug	78	274	208	190	192	195	195	193	199	198	196	173	201	220	214	227	237	241	263	220	223	232	239	200	218.0
17-Aug	242	246	241	285	307	316	289	314	309	296	269	255	281	288	295	311	315	307	296	288	282	275	283	219	292.1
18-Aug	211	194	202	205	201	197	205	108	166	175	156	219	227	238	277	298	50	201	55	52	38	54	168	253	194.3
19-Aug	269	227	204	200	206	216	206	214	216	208	217	216	209	289	303	176	137	83	119	129	26	15	33	36	222.2
20-Aug	51	52	38	35	12	18	38	41	41	28	32	32	39	34	42	50	49	10	38	14	312	311	313	315	29.0
21-Aug	309	303	271	291	261	244	276	316	325	338	339	9	357	29	42	30	18	51	51	28	353	327	255	269	354.3
22-Aug	235	203	207	205	206	199	206	205	211	199	212	294	74	304	79	313	167	133	119	116	165	202	217	186	181.2
23-Aug	212	197	175	181	181	177	184	208	200	207	222	222	162	159	140	213	221	AF	198	129	124	143	179	194	179.9
24-Aug	174	178	152	165	170	133	159	205	220	201	199	184	140	130	15	197	176	171	184	162	176	178	181	189	173.1
25-Aug	203	194	206	202	217	215	195	204	197	194	206	198	200	204	197	213	211	212	202	199	207	205	198	199	203.1
26-Aug	201	204	203	202	200	209	209	206	215	211	209	220	219	208	205	208	233	358	53	196	223	250	201	203	216.5
27-Aug	219	212	210	198	210	238	255	256	250	253	251	252	251	266	245	249	272	296	298	309	238	298	257	218	253.5
28-Aug	238	212	221	250	251	292	284	271	284	300	M	M	M	309	313	335	357	238	208	192	84	109	131	165	274.8
29-Aug	190	204	194	196	197	194	194	200	198	204	210	203	194	192	193	178	169	154	155	148	152	157	163	196	183.1
30-Aug	188	169	160	244	211	184	207	167	183	275	282	266	300	349	127	199	92	82	68	81	75	356	282	300	179.1
31-Aug	226	196	210	240	208	196	203	206	226	244	227	238	259	327	279	234	259	282	247	37	208	235	203	195	235.6
	226.6	218.9	202.2	211.8	212.3	222.5	225.2	232.0	233.1	234.1	229.0	229.4	232.7	253.3	246.8	241.1	232.3	258.9	85.6	105.7	170.5	240.2	212.8	211.2	
	Diurnal Average																								

M - Maintenance 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

Shell Muskeg River - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 102 deg on Aug 1 13:00

Minimum Value: 5 deg on Aug 7 00:00

Percentiles: P_1 = 7 P_{10} = 11 Q_1 = 15 Median = 21 Q_3 = 33 P_{90} = 51 P_{99} = 89

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
	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-Aug	27	28	27	28	27	26	30	45	45	41	48	59	102	90	93	39	42	26	22	26	21	18	13	12	102
2-Aug	17	13	12	13	19	20	17	17	19	18	22	22	24	22	21	21	21	22	32	28	23	27	12	14	32
3-Aug	12	9	17	16	14	14	14	17	18	19	21	33	28	35	44	24	18	16	15	11	16	12	13	25	44
4-Aug	35	11	11	14	9	10	15	47	67	25	17	25	26	45	22	29	18	20	13	10	15	32	27	17	67
5-Aug	75	14	16	17	15	17	22	16	13	17	19	33	41	42	35	20	16	16	12	11	15	16	14	14	75
6-Aug	13	14	15	15	13	13	17	18	17	19	20	22	22	21	14	59	68	15	13	12	15	7	6	5	68
7-Aug	11	9	27	16	19	12	9	10	14	15	13	16	19	16	19	14	15	13	12	9	5	22	36	39	39
8-Aug	51	31	37	38	48	44	37	29	32	94	89	42	36	48	40	16	22	22	17	24	41	36	40	19	94
9-Aug	32	31	29	33	41	88	35	16	15	68	42	33	41	34	27	35	33	26	77	57	10	8	9	10	88
10-Aug	9	14	11	12	15	13	14	17	20	23	23	23	22	24	25	22	18	21	13	11	12	12	17	9	25
11-Aug	9	10	11	11	10	12	15	15	16	25	56	57	21	18	43	38	31	25	18	21	19	26	50	36	57
12-Aug	75	34	42	10	65	10	19	10	24	45	77	71	67	47	30	27	18	17	15	12	13	20	15	15	77
13-Aug	14	16	16	11	11	14	11	15	16	18	21	20	19	19	15	15	11	9	11	9	29	30	60	41	60
14-Aug	16	15	30	31	70	26	12	71	63	72	71	59	43	39	31	36	21	31	13	19	18	13	23	13	72
15-Aug	10	13	12	10	14	11	13	12	20	20	24	34	70	52	32	34	26	74	16	15	18	9	13	21	74
16-Aug	45	36	25	8	9	21	14	12	11	13	17	60	84	28	25	22	22	23	24	12	12	10	13	30	84
17-Aug	30	16	19	46	13	18	41	22	32	41	47	53	40	21	16	27	28	21	14	8	7	44	43	11	53
18-Aug	34	15	11	16	9	13	10	69	33	30	36	28	27	23	18	38	76	56	76	18	31	53	55	8	76
19-Aug	9	7	11	10	12	13	18	14	15	18	20	21	23	26	30	49	29	28	30	43	47	32	57	36	57
20-Aug	30	29	23	27	27	29	25	28	28	32	30	39	38	35	42	38	41	34	28	43	25	15	25	25	43
21-Aug	15	14	31	20	28	17	38	71	43	39	43	53	55	51	50	56	53	34	35	38	35	26	37	33	71
22-Aug	32	7	10	9	9	6	7	11	13	21	40	68	47	62	63	81	53	22	24	23	43	19	8	14	81
23-Aug	10	9	16	29	26	25	19	11	13	13	18	25	45	46	56	49	40	AF	8	59	13	13	29	47	59
24-Aug	55	32	31	27	25	47	46	23	20	23	11	30	57	69	84	51	37	22	12	16	13	12	14	21	84
25-Aug	15	11	12	12	19	13	13	17	15	17	20	19	19	20	18	20	20	18	15	13	15	14	13	15	20
26-Aug	16	14	13	14	14	12	14	16	16	17	19	19	18	21	21	24	19	44	88	15	16	29	23	16	88
27-Aug	12	9	10	13	23	18	8	7	8	9	8	14	17	20	19	20	17	13	11	36	86	36	51	33	86
28-Aug	21	14	16	11	9	18	21	13	20	27	M	M	M	19	28	40	65	88	20	46	29	31	69	18	88
29-Aug	56	17	16	16	15	16	19	27	32	26	28	35	27	28	26	24	22	20	17	15	15	16	18	23	56
30-Aug	19	18	17	54	20	19	28	25	30	31	57	14	24	82	92	43	76	24	18	19	25	71	89	43	92
31-Aug	64	21	20	50	34	18	18	25	27	34	32	38	49	56	59	25	30	13	12	80	16	19	16	18	80
	75	36	42	54	70	88	46	71	67	94	89	71	102	90	93	81	76	88	88	80	86	71	89	47	
	Diurnal Maximum																								

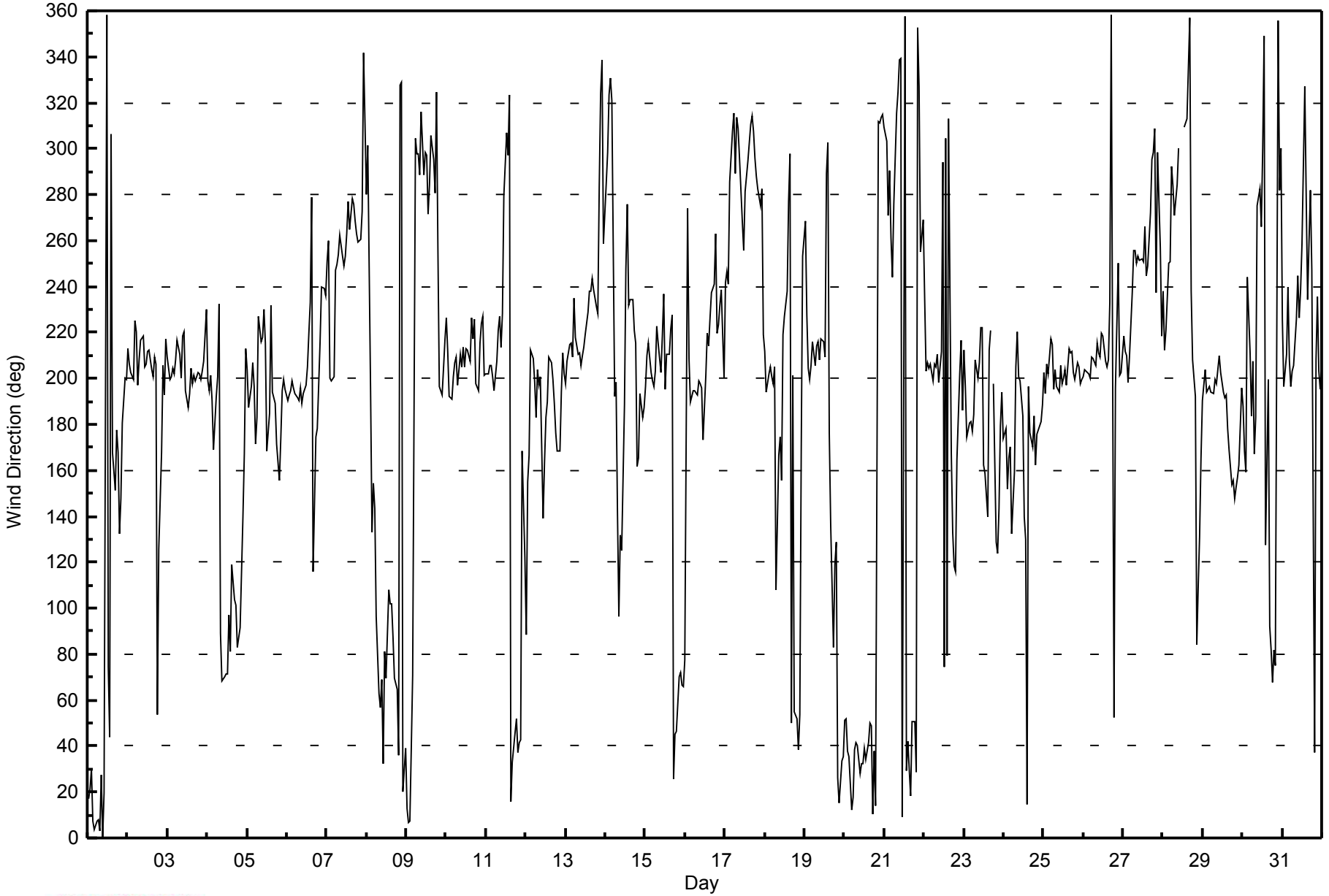
M - Maintenance AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Shell Muskeg River - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16

Reason: Routine

Start Time (MST)	9:45	End Time (MST)	15:30
Barometric Pressure	726 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.	3492
DACS voltage range	0-5 v	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-710	-710
Analyzer Range (mv)	5000	5000	Lamp voltage	786	787
Calculated slope	0.998287	0.998087	Chamber temp.	45.2	45.0
Calculated intercept	2.007311	3.970092	Pressure (mmHg)	704.2	705.4
Analyzer Background	6.3	6.2	Flow (lpm)	0.451	0.452
Analyzer Coefficient	1.297	1.262	Intensity	90	91

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	816.4	0.979
calibrator zero	5000	0.0	0.0	-0.2	NA
high point	5000	78.7	799.6	800.1	0.999
second point	5000	39.4	400.3	391.8	1.022
third point	5000	19.7	200.2	195.2	1.025
calibrator zero	5000	0.0	0.0	-0.2	NA
as left zero	5000	0.0	0.0	0.3	NA
as left span	5000	78.1	793.5	791.0	1.003
				Average Correction Factor	1.016

Corrected As found	816.6	Previous response	799.0	% change	-2.2%

Notes:

Inlet filter changed. Adjusted span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

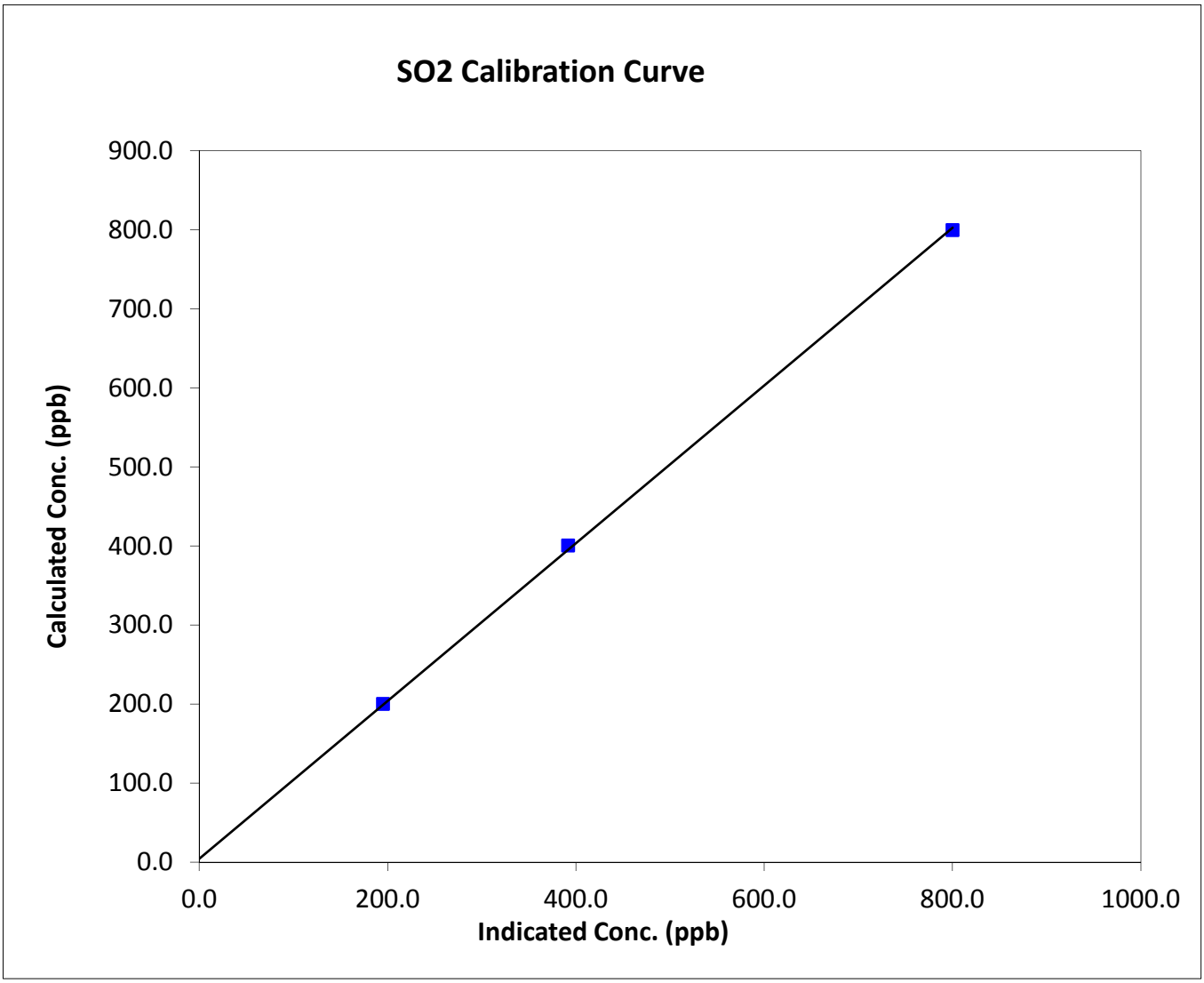
SO_2 Calibration Summary

Station Information

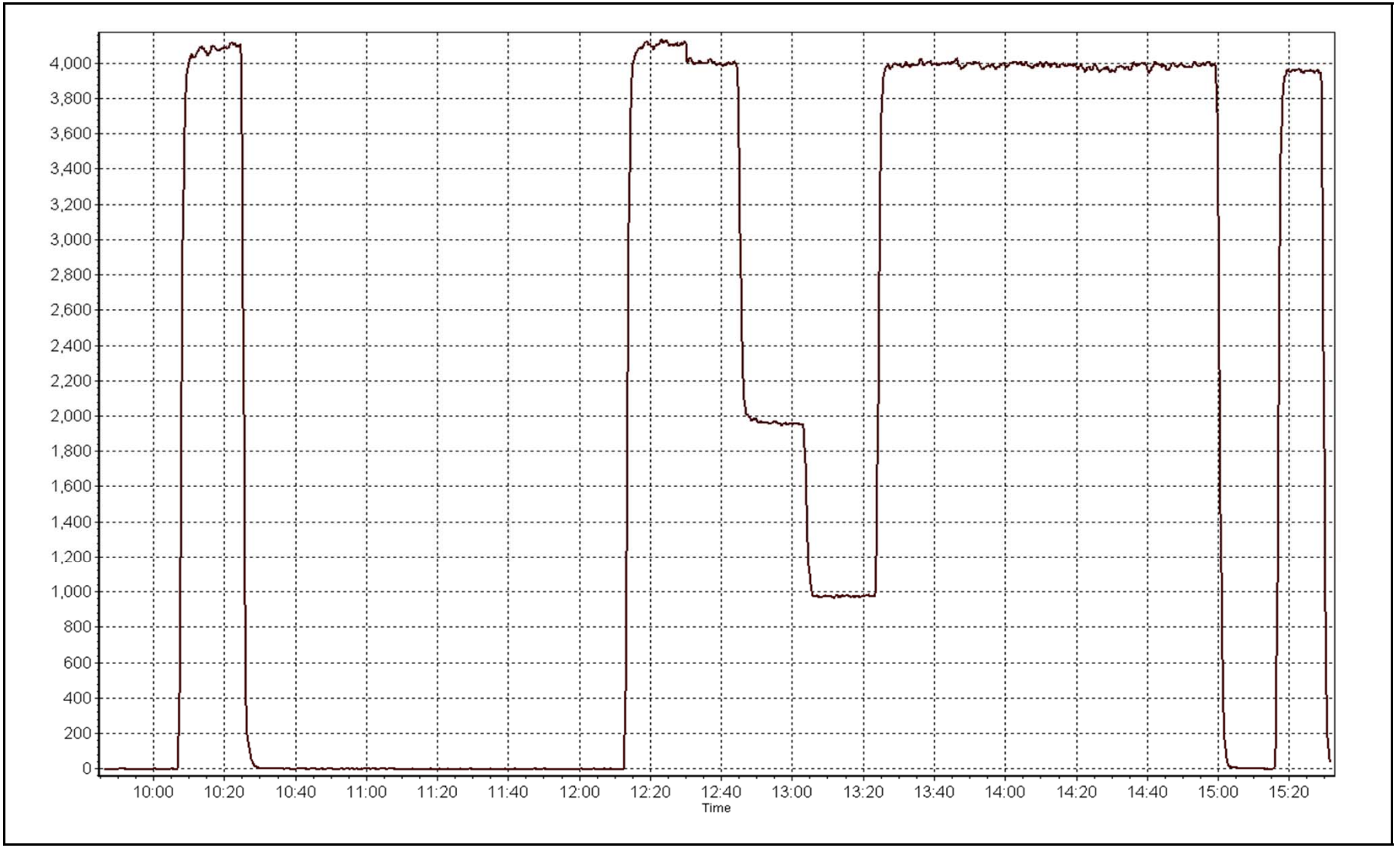
Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	9:45	End Time (MST)	15:30
Analyzer make	Thermo 43i	Analyzer serial #	1118148498

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999851
799.6	800.1	0.9994		
400.3	391.8	1.0217	Slope	0.998087
200.2	195.2	1.0254		
			Intercept	3.970092



SO2 Calibration Plot Date: August 18, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Monday, August 18, 2014	Previous Calibration	Tuesday, July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Reason:	Routine		
Start Time (MST)	9:45	End Time (MST)	15:30
Barometric Pressure	726 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.	3492
DACS voltage range	0-5 VDC	DACS channel #	DIFF 4

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	34.9	34.9
Calculated slope	1.005976	0.999143	Fuel Pressure	24.2	24.2
Calculated intercept	-0.124907	-0.039014			

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	-0.39	N/A
as found span	5000	78.7	16.98	13.35	1.272
calibrator zero	5000	0.0	0.00	0.08	N/A
high point	5000	78.7	16.98	17.06	0.995
second point	5000	39.4	8.50	8.51	0.999
third point	5000	19.7	4.25	4.27	0.995
calibrator zero	5000	0.0	0.00	0.08	N/A
as left zero	5000	0.0	0.00	0.08	N/A
as left span	5000	78.7	16.98	16.96	1.001
				Average Correction Factor	0.997

Corrected As found	13.74	Previous response	17.00	% change	23.8%

Notes:

changed inlet filter and pump. Adjusted zero and span (due to forest fire)

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

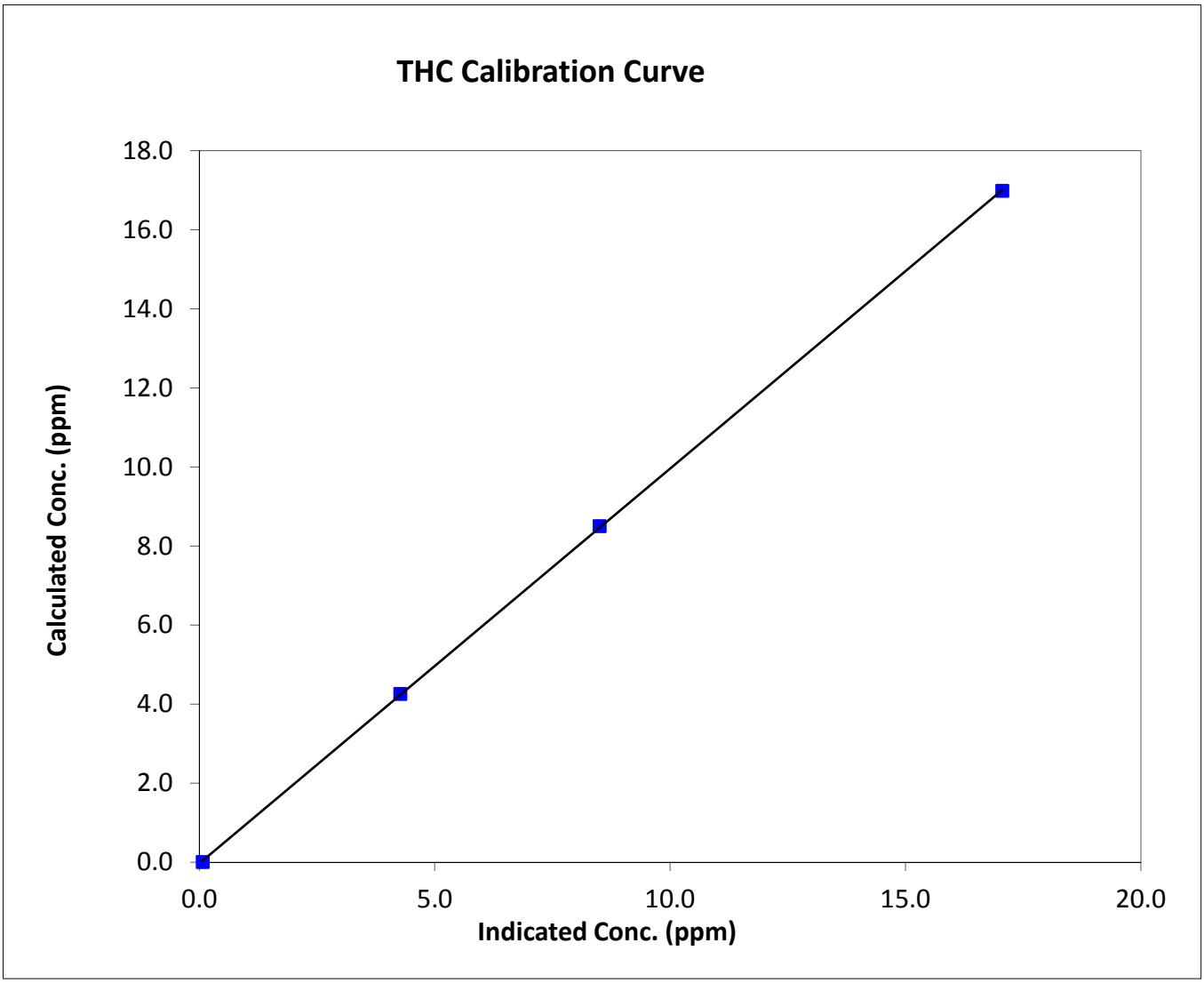
THC Calibration Summary

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	9:45	End Time (MST)	15:30
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	0.08	N/A	Correlation Coefficient	0.999973
16.98	17.06	0.9953		
8.50	8.51	0.9995	Slope	0.999143
4.25	4.27	0.9950		
			Intercept	-0.039014



THC Calibration Plot Date: August 18, 2014

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Reason:	Routine		
Start Time (MST)	9:45	End Time (MST)	15:30
Barometric Pressure	726 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.	8346

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.999212	0.993312	1.010856
	Data Offset	3.405107	4.936362	-0.218384
After	Data Slope	0.997477	0.996282	1.019865
	Data Offset	1.963179	2.289396	0.054763
Channel #		3	2	1
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	API T200	Analyzer serial #	724

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	1.339	ppb	1.404	ppb
NOX coefficient	1.332	ppb	1.398	ppb
NO2 coefficient	n/a	ppb	n/a	ppb
NO bkgrnd	0.5		-0.2	
NOX bkgrnd	1.2		0.2	
Nt coefficient	n/a		n/a	
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	317.0	Deg C	314.7	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	86.0	ccm	85.0	ccm
R Cell Press	3.0	mmHg	2.9	mmHg
Sample Flow	492.000	ccm	486.000	ccm

Notes:

Zero and span adjusted. Inlet filter changed

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 18, 2014 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	5000	0.0	0.0	0.0	0.0	-0.3	-0.1	0.4	N/A	N/A
as found span	5000	78.7	807.5	805.9	1.6	773.9	775.8	-1.2	1.0434	1.0388
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	N/A	N/A
high point	5000	78.7	807.5	805.9	1.6	809.9	809.6	0.2	0.9970	0.9954
second point	5000	39.4	404.2	403.5	0.8	399.6	397.8	0.5	1.0115	1.0143
third point	5000	19.7	202.1	201.7	0.4	198.4	197.8	-0.5	1.0188	1.0200
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	0.5	0.5	-0.3	N/A	N/A
as left span	5000	78.1	801.3	514.9	286.4	797.1	513.2	282.9	1.0052	1.0033
								Average Correction Factor	1.0091	1.0099

Corrcted As found NO_X= 774.2 NO= 775.9 Percent Change NO_X= 3.9% NO= 3.9%

Previous Response NO_X= 804.7 NO= 806.4

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	514.9	295.8	805.5	514.9	289.4	0.9869	1.0000	1.0220	97.9%
2nd NO2 (200)	N/A	608.6	202.1	808.6	608.6	199.2	0.9831	1.0000	1.0145	98.6%
3rd NO2 (100)	N/A	705.5	105.1	808.4	705.5	102.4	0.9834	1.0000	1.0266	97.4%
4th NO2 (0)	810.7	N/A	-1.5	809.1	810.7	-1.7	0.9825	1.0000	N/A	N/A
					Average Correction Factor		0.9840	1.0000	1.0210	97.9%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

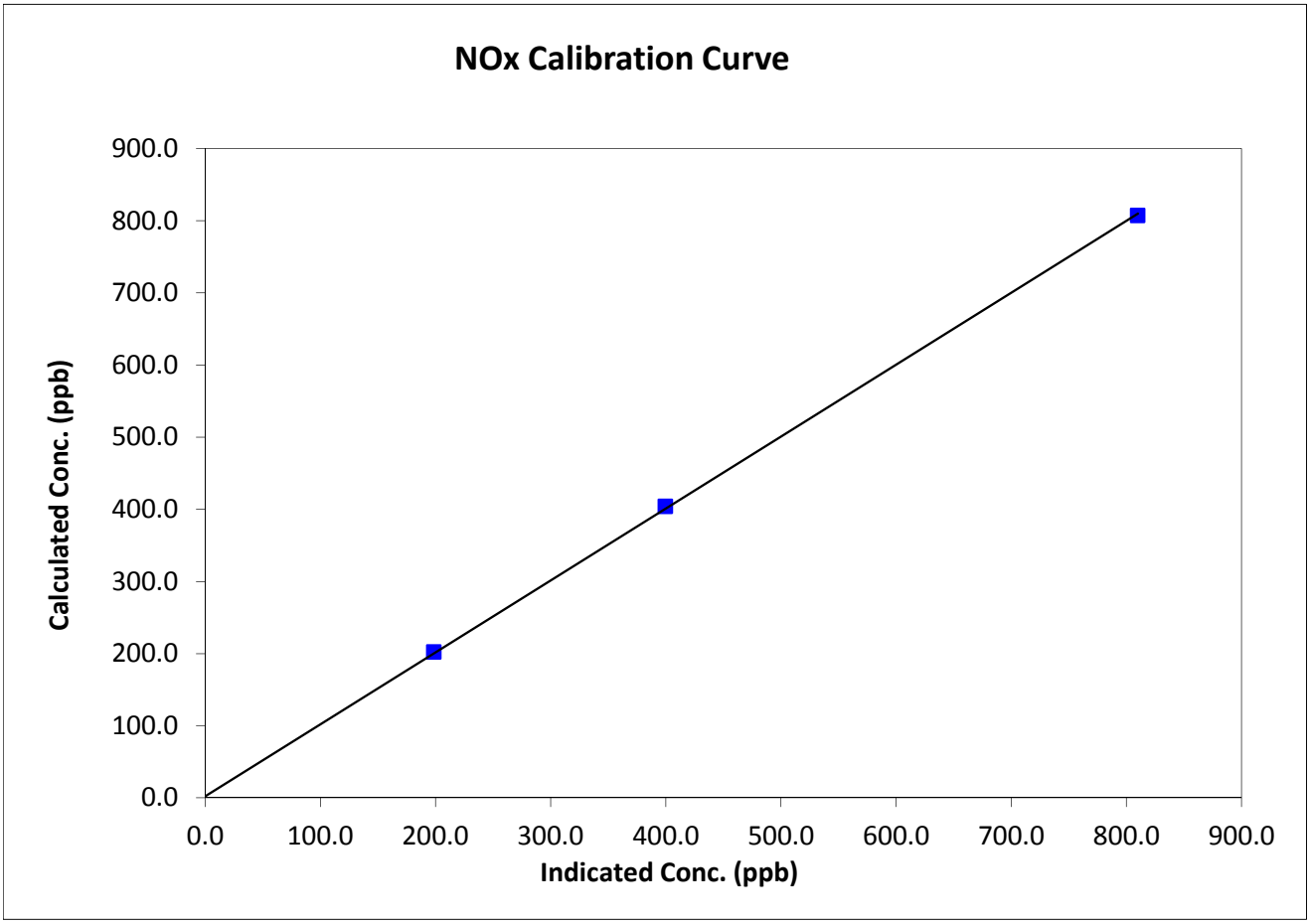
NO_X Calibration Summary

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	9:45	End Time (MST)	15:30
Analyzer make	API T200	Analyzer serial #	724

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999933
807.5	809.9	0.9970		
404.2	399.6	1.0115	Slope	0.997477
202.1	198.4	1.0188		
0.0	-0.2	0.0000	Intercept	1.963179



Wood Buffalo Environmental Association

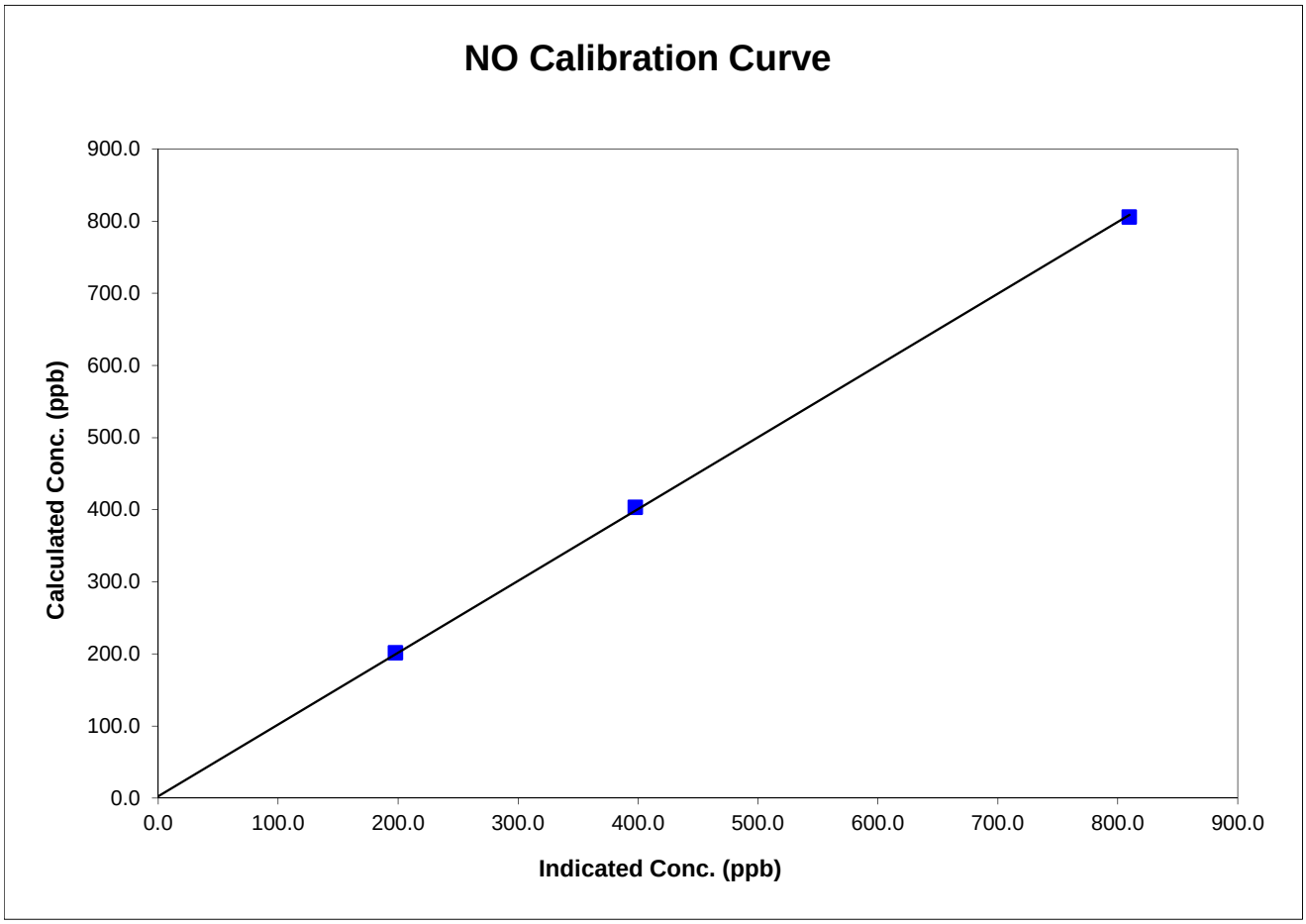
NO Calibration Summary

Station Information

Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	9:45	End Time (MST)	15:30
Analyzer make	API T200	Analyzer serial #	724

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999895
805.9	809.6	0.9954		
403.5	397.8	1.0143	Slope	0.996282
201.7	197.8	1.0200		
0.0	-0.1	0.0000	Intercept	2.289396



Wood Buffalo Environmental Association

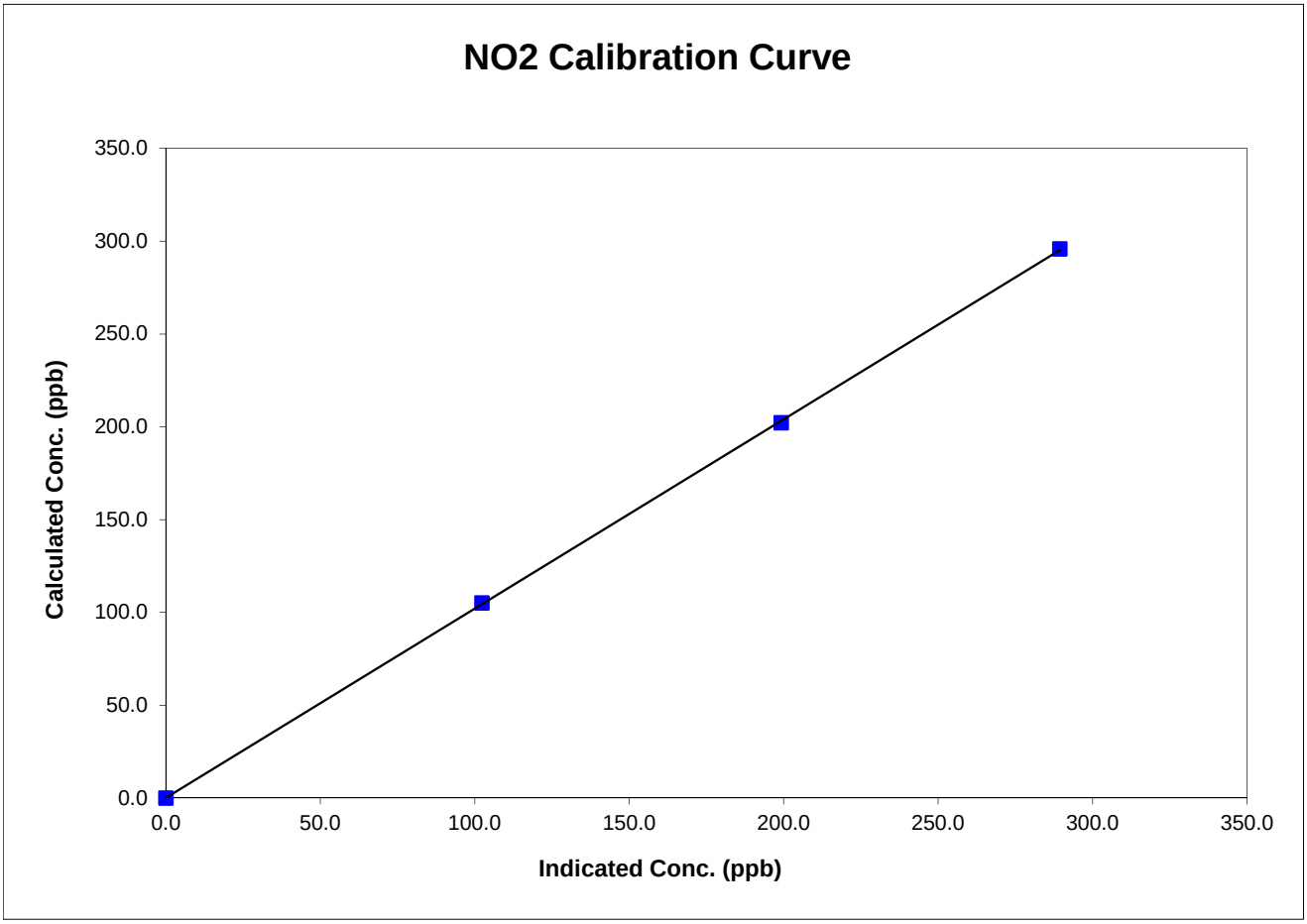
NO_2 Calibration Summary

Station Information

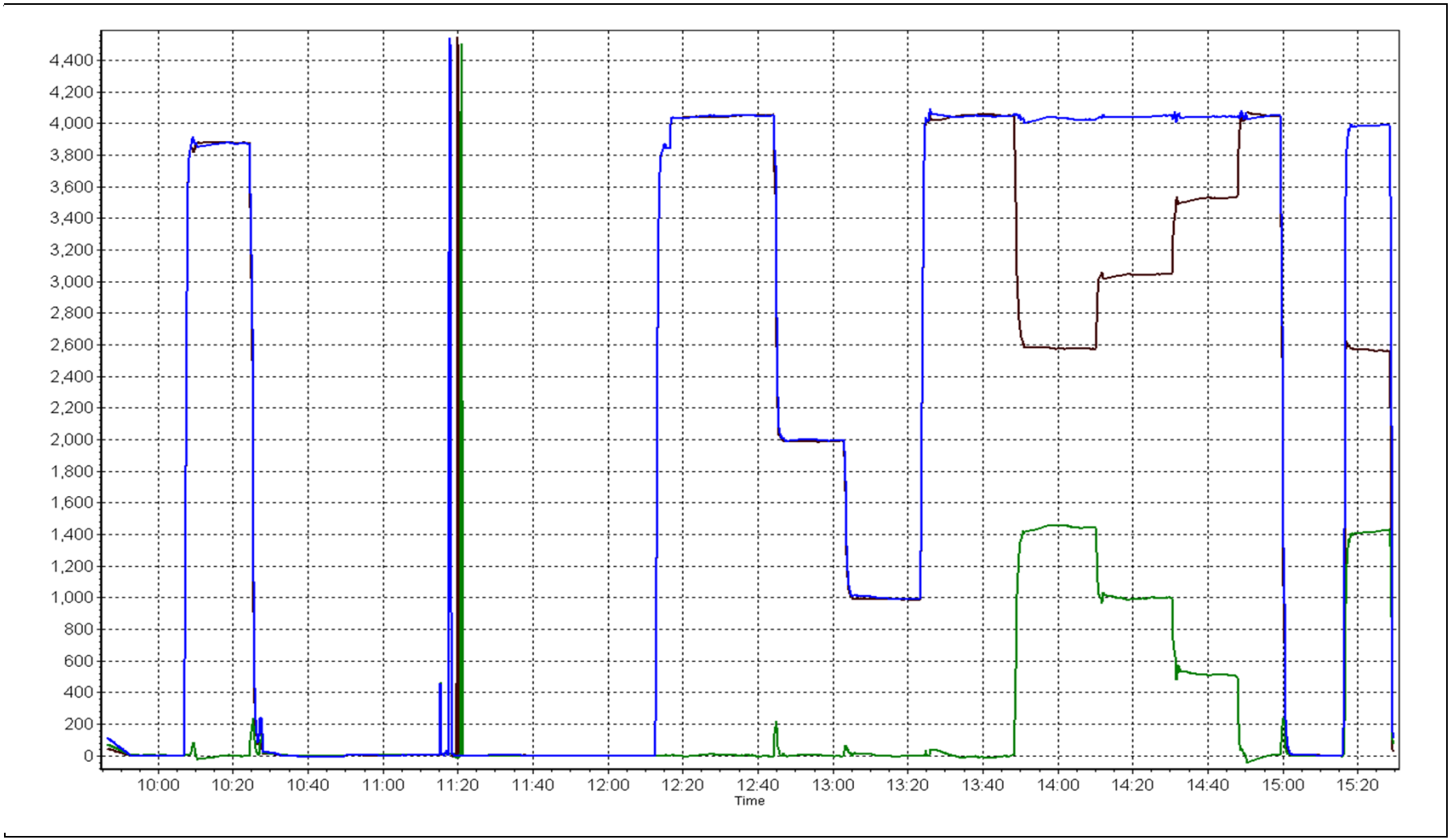
Calibration Date	August 18, 2014	Previous Calibration	July 29, 2014
Station Number	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	9:45	End Time (MST)	15:30
Analyzer make	API T200	Analyzer serial #	724

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999959
295.8	289.4	1.0220		
202.1	199.2	1.0145	Slope	1.019865
105.1	102.4	1.0266		
			Intercept	0.054763



NOx, NO & NO_2 Calibration Plot Date: August 18, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 17
WAPASU
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
AUGUST 2014

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	34	38	99.46	24	0	4	0
H2S (ppb) Average	705	35	39	99.46	1	0	1	0
THC (ppm) Average	706	34	38	99.46	3	-	2.4	-
O3 (ppb) Average	704	35	40	99.33	109	11	64	-
NO2 (ppb) Average	704	37	40	99.60	22	0	5	-
NO (ppb) Average	704	37	40	99.60	12	-	2	-
NOX (ppb) Average	704	37	40	99.60	24	-	7	-
PM2.5 (ug/m3) Average	740	0	4	99.46	347	-	107.9	3
Temperature 2 m (C) Average	744	0	0	100.00	29.9	-	24.0	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	19	-	-	-
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 - WAPASU (AMS 17)
AUGUST 2014

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	2	-	0	0	0	0	1	2	24
H2S (ppb) Average	705	0.4	0	-	0	0	0	0	0	1	1
THC (ppm) Average	706	2.17	0.1	-	1.9	2	2.1	2.1	2.2	2.3	3
O3 (ppb) Average	704	26.2	17	-	1	6	15	24	34	47	109
NO2 (ppb) Average	704	2.1	3	-	0	0	0	1	3	5	22
NO (ppb) Average	704	0.7	1	-	0	0	0	1	1	1	12
NOX (ppb) Average	704	2.8	3	-	0	1	1	2	3	6	24
PM2.5 (ug/m3) Average	740	17.64	35.6	-	0.8	2.2	3.9	7.7	14.1	34.3	347
Temperature 2 m (C) Average	744	16.08	6.7	-	-1.7	8.5	11.6	15.7	20.7	25.7	29.9
Relative Humidity (%) Average	744	66.1	21	-	22	39	49	64	84	95	99
Wind Speed 10 m (km/h) Average	744	6.9	3	-	0	3	4	7	9	11	19
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	28 Aug 2014 12:00	28 Aug 2014 14:00	3	Station power failure
SO2	06 Aug 2014 08:00	06 Aug 2014 08:00	1	Maintenance - cleaned glass manifold
H2S	06 Aug 2014 08:00	06 Aug 2014 08:00	1	Maintenance - cleaned glass manifold
THC	06 Aug 2014 08:00	06 Aug 2014 08:00	1	Maintenance - cleaned glass manifold
O3	01 Aug 2014 09:00	01 Aug 2014 09:00	1	Maintenance - verified analyzer response to daily span target
O3	06 Aug 2014 08:00	06 Aug 2014 08:00	1	Maintenance - cleaned glass manifold
PM2.5	07 Aug 2014 08:00	07 Aug 2014 08:00	1	Maintenance - Flow and zero check, sample head cleaning

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 24 ppb on Aug 19 11:00 Maximum Daily Average: 3.5 ppb on Aug 10

Minimum Value: 0 ppb on Aug 27 01:00 Minimum Daily Average: 0.1 ppb on Aug 28
Maximum Diurnal Average: 1.7 ppb at hour 11 Minimum Diurnal Average: 0.4 ppb at hour 23
Monthly Average: 1.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 10$

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-Aug	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
2-Aug	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0.3	1
3-Aug	0	Z	0	0	1	1	5	4	7	2	1	2	3	1	1	0	1	2	7	7	5	5	3	2	2.6	7
4-Aug	2	Z	2	5	6	4	6	11	8	2	1	1	1	1	1	0	0	0	0	0	0	0	0	2	2.4	11
5-Aug	1	Z	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
6-Aug	0	Z	1	0	0	0	0	M	1	1	1	1	1	2	1	5	0	0	0	0	0	1	1	1	0.8	5
7-Aug	2	Z	1	1	1	0	1	1	0	0	C	C	C	0	0	0	2	1	1	1	0	0	0	0	0.8	2
8-Aug	0	Z	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
9-Aug	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
10-Aug	0	Z	0	0	0	10	8	1	0	0	0	7	5	6	11	8	6	8	5	2	1	1	0	1	3.5	11
11-Aug	2	Z	4	4	4	8	11	10	11	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	2.9	11
12-Aug	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
13-Aug	0	Z	0	1	1	1	1	0	1	1	1	1	1	1	1	2	8	8	6	2	1	1	1	0	1.7	8
14-Aug	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
15-Aug	0	Z	0	1	2	4	3	2	1	1	1	1	5	4	6	2	1	1	1	0	0	0	0	0	1.6	6
16-Aug	0	Z	2	5	2	2	2	1	1	0	0	0	0	0	0	0	4	5	4	3	1	1	1	1	1.6	5
17-Aug	1	Z	1	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.5	1
18-Aug	0	Z	0	0	0	0	0	0	0	0	1	0	2	4	5	9	2	2	1	0	0	0	0	0	1.3	9
19-Aug	0	Z	0	0	0	0	0	1	6	9	24	15	6	2	1	0	0	0	0	0	0	0	0	0	3.0	24
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	0	Z	0	0	0	0	0	0	0	0	0	1	1	2	1	1	1	1	1	1	0	0	0	0	0.6	2
24-Aug	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
25-Aug	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
26-Aug	0	Z	1	0	0	0	1	2	6	8	10	5	10	5	4	0	0	1	0	0	0	0	0	0	2.4	10
27-Aug	0	Z	0	1	2	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	4
28-Aug	0	Z	0	0	0	0	0	0	0	0	0	PF	PF	PF	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Aug	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
30-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
31-Aug	1	Z	0	0	0	0	1	3	3	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.5	3
	0.5	--	0.6	0.8	0.8	1.2	1.5	1.4	1.6	1.2	1.7	1.4	1.4	1.1	1.2	1.2	1.0	1.1	1.0	0.7	0.5	0.5	0.4	0.4	Diurnal Average	
	2	--	4	5	6	10	11	11	11	9	24	15	10	6	11	9	8	8	7	7	5	5	3	2	Diurnal Maximum	

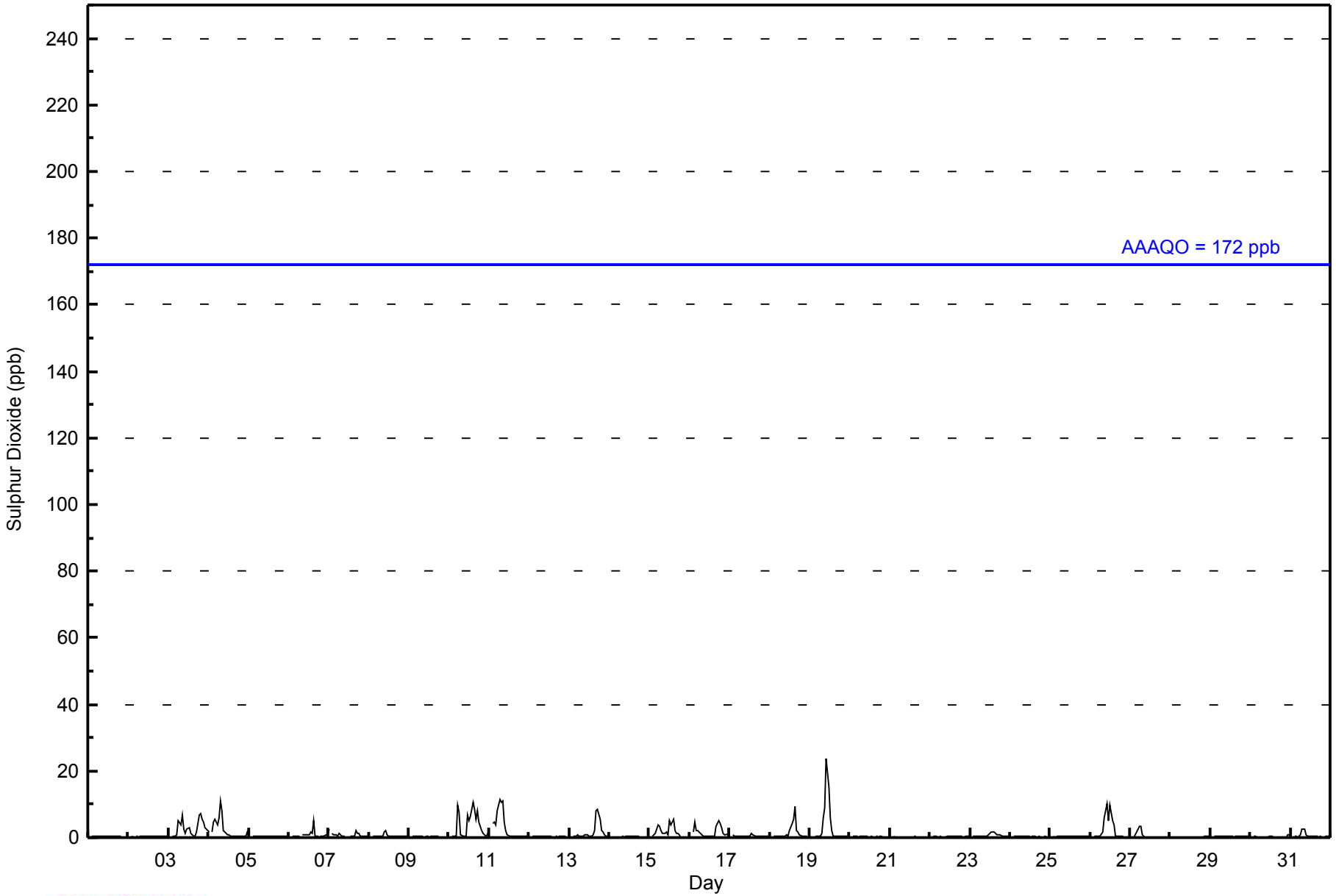
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	700	99.15	99.15
11 - 20	5	0.71	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: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Wapasu - August 2014

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	14	7	5	4	8	18	38	14	14	10	4	8	5	5	16	184
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	14	14	7	5	4	8	18	38	14	14	10	4	8	5	6	16	185

Total Number of Valid Hours: 185

Total Number of Hours: 744

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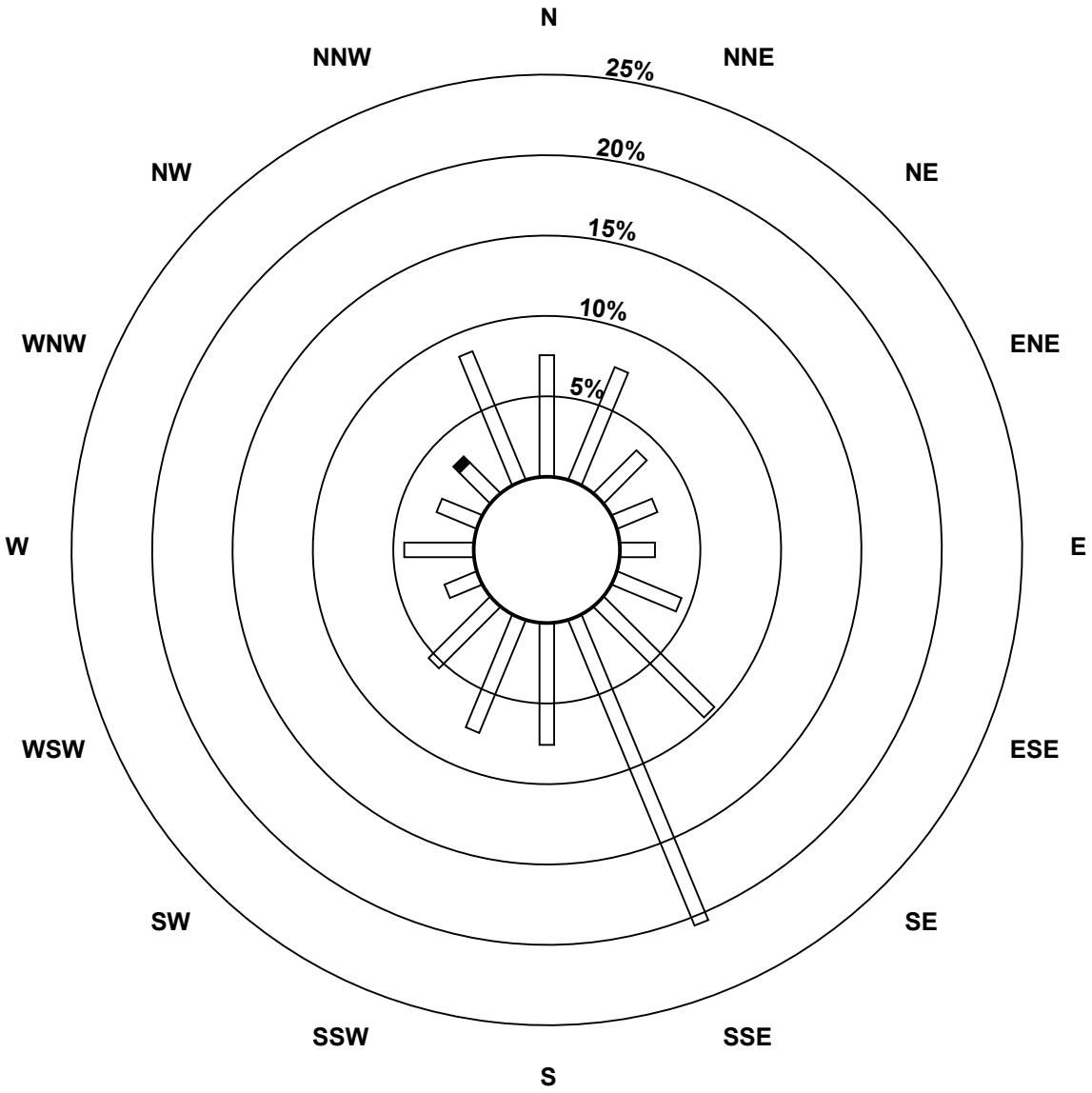
Wood Buffalo Environmental Association

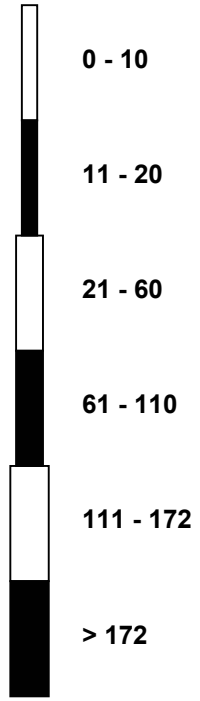
Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Wapasu (AMS 17)



Classes (ppb)



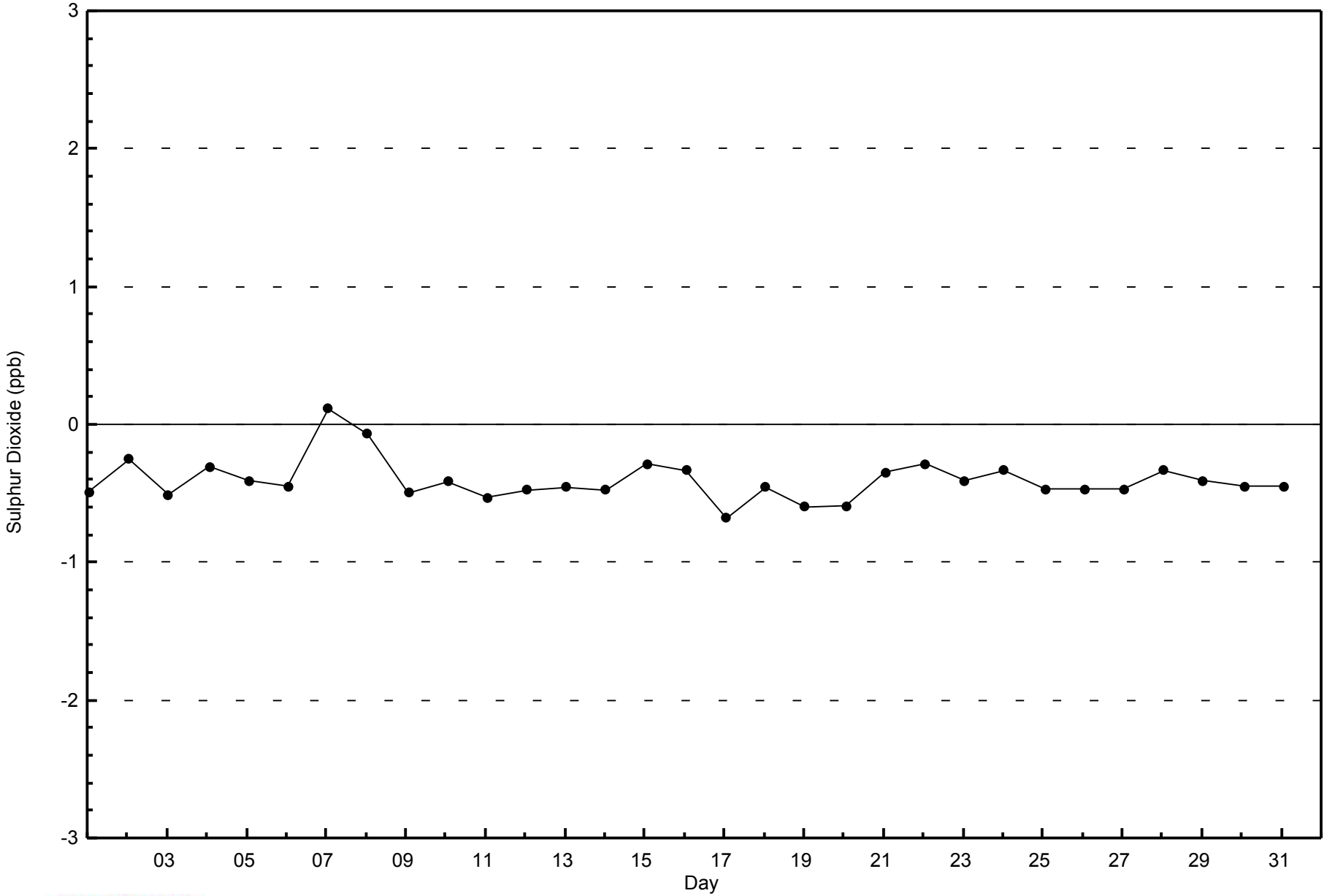
Total Number of Valid Hours: 185

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - August 2014



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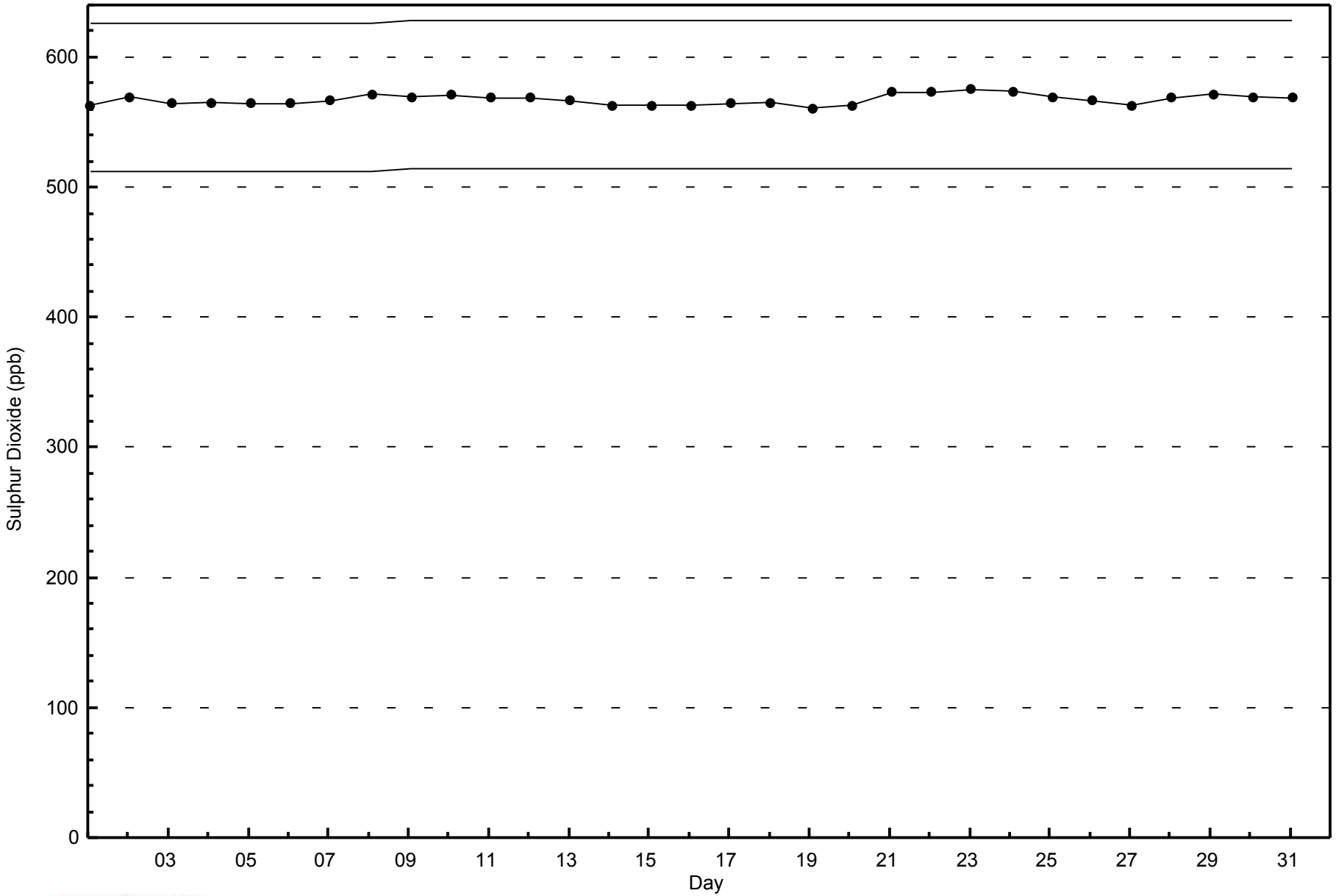
Span Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - August 2014



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Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 1 ppb on Aug 19 09:00 Maximum Daily Average: 0.7 ppb on Aug 4

Minimum Value: 0 ppb on Aug 6 20:00 Minimum Daily Average: 0.2 ppb on Aug 6
Maximum Diurnal Average: 0.5 ppb at hour 4 Minimum Diurnal Average: 0.3 ppb at hour 17
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:	705
Hours of Missing Data:	39
Hours of Calibration:	35
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-Aug	0	1	Z	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
2-Aug	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-Aug	0	0	Z	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
4-Aug	0	0	Z	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0.7	1
5-Aug	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
6-Aug	0	0	Z	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
7-Aug	0	0	Z	0	0	0	1	C	C	C	C	0	0	0	0	0	0	0	0	0	0	1	1	1	0.4	1
8-Aug	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
9-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
10-Aug	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.5	1
11-Aug	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Aug	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
13-Aug	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
14-Aug	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
15-Aug	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
16-Aug	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0.5	1
17-Aug	1	1	Z	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
18-Aug	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0.4	1
19-Aug	0	0	Z	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Aug	0	0	Z	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0.3	1
21-Aug	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
22-Aug	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
23-Aug	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
24-Aug	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
25-Aug	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-Aug	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
27-Aug	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
28-Aug	0	1	Z	1	0	1	0	0	0	0	0	PF	PF	PF	0	0	0	0	0	0	0	0	0	0	0.3	1
29-Aug	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
30-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
31-Aug	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0.6	1
	0.4	0.4	--	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	Diurnal Average	
	1	1	--	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

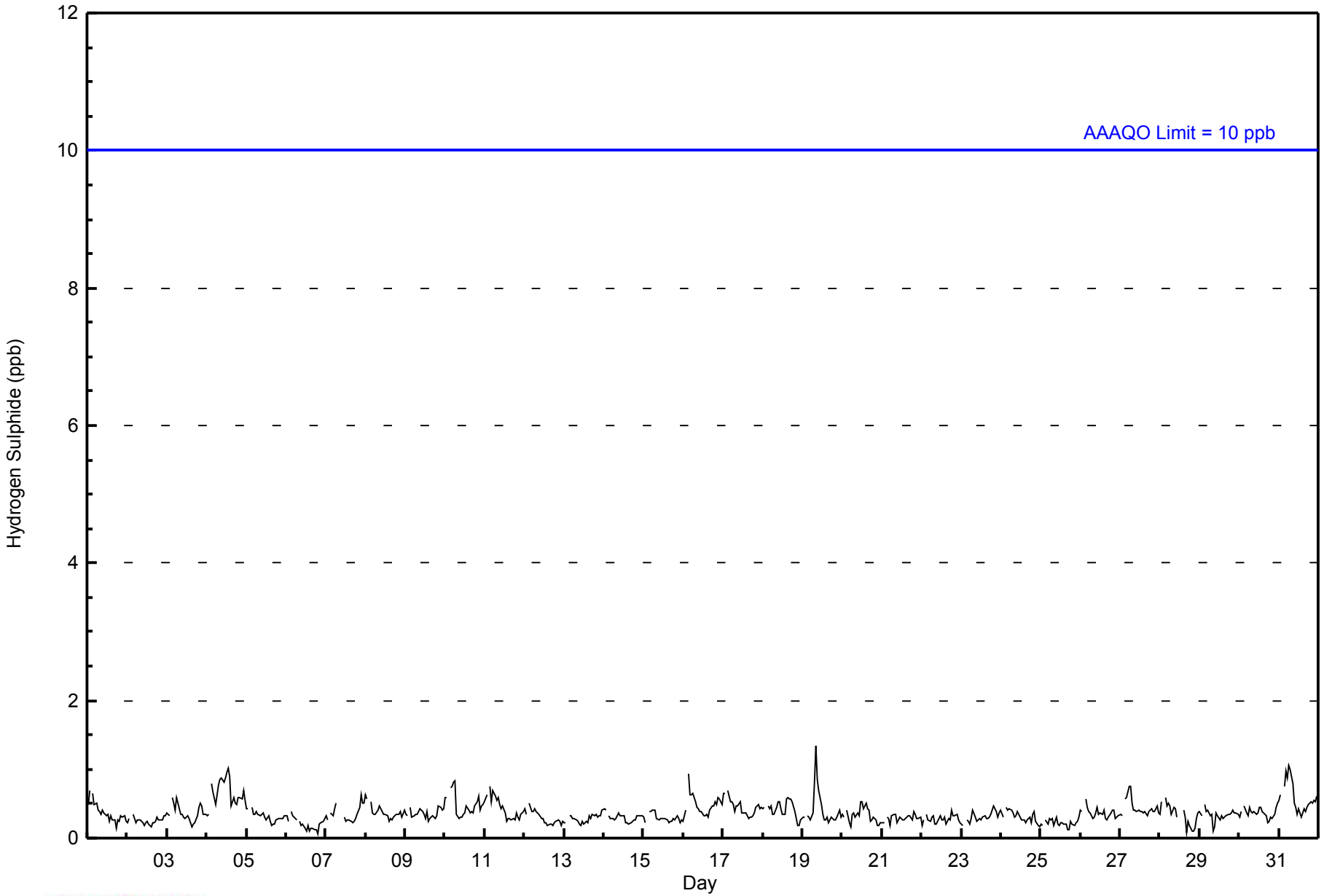
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	705	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Wapasu - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	13	15	7	5	3	8	19	37	15	13	11	5	6	5	6	16	184
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	15	7	5	3	8	19	37	15	13	11	5	6	5	6	16	184

Total Number of Valid Hours: 184

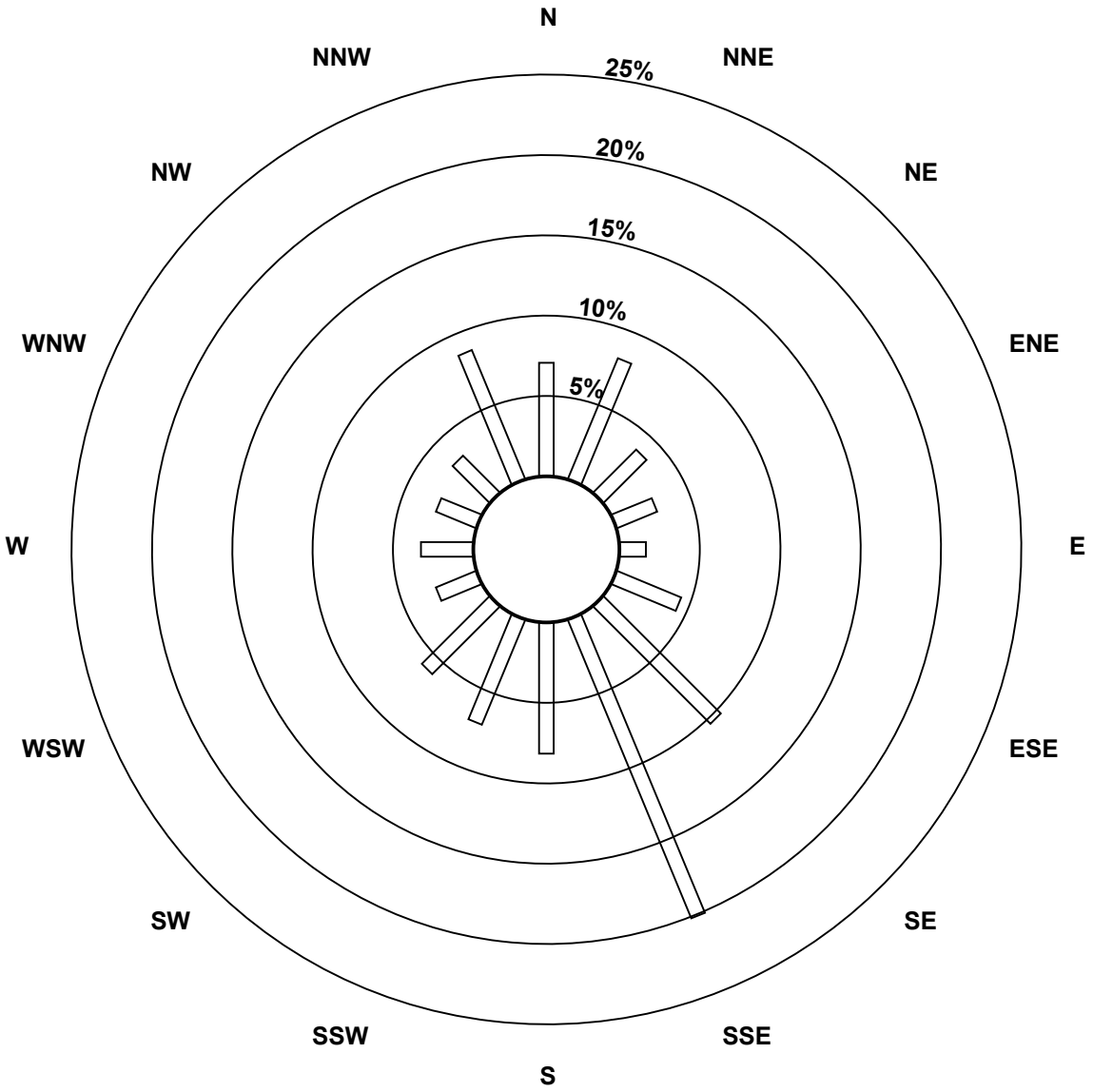
Total Number of Hours: 744

Wood Buffalo Environmental Association

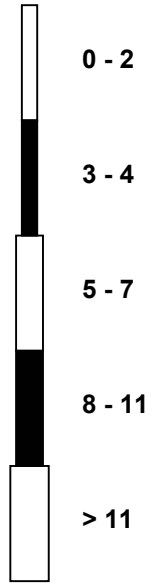
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Wapasu (AMS 17)



Classes (ppb)



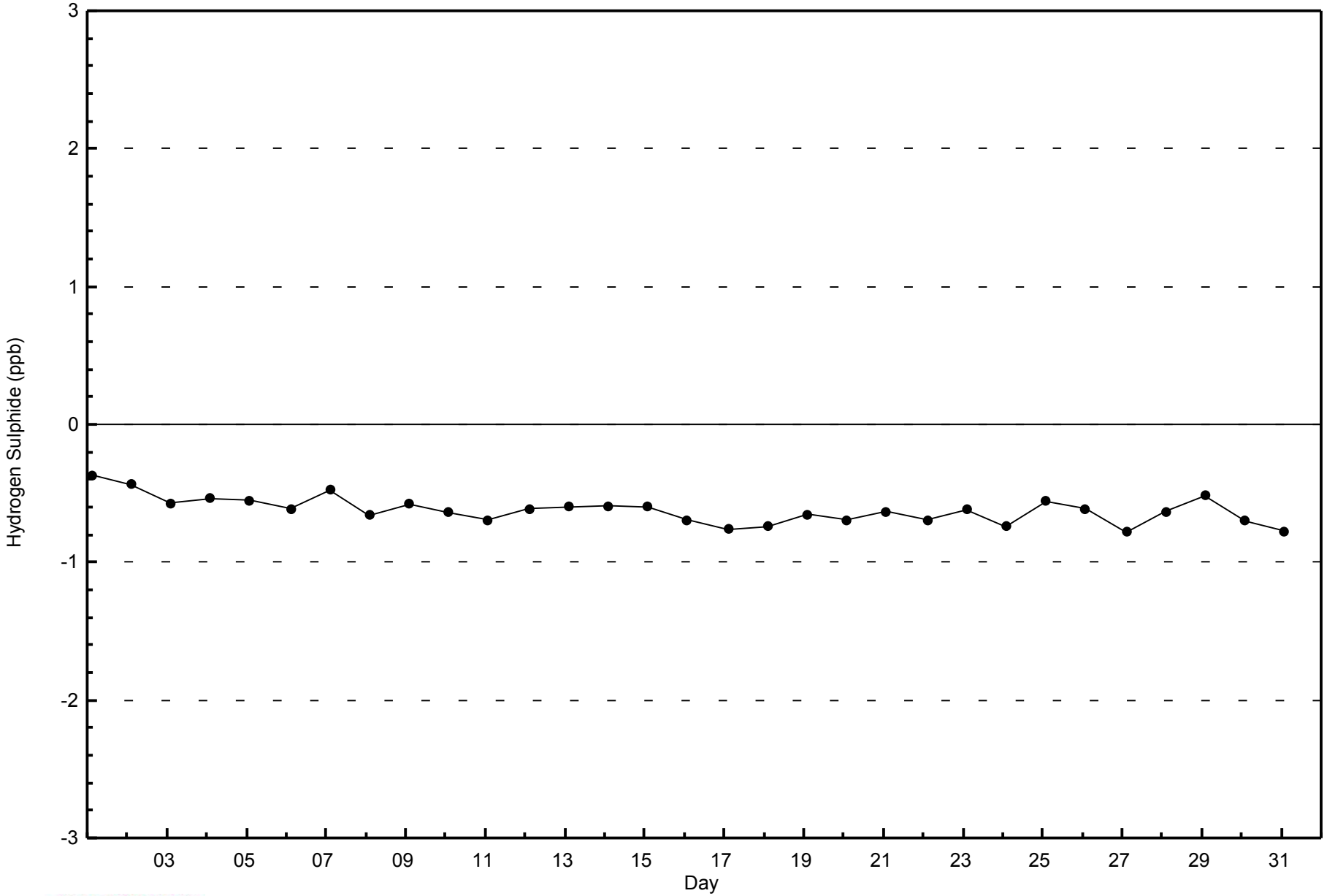
Total Number of Valid Hours: 184

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - August 2014



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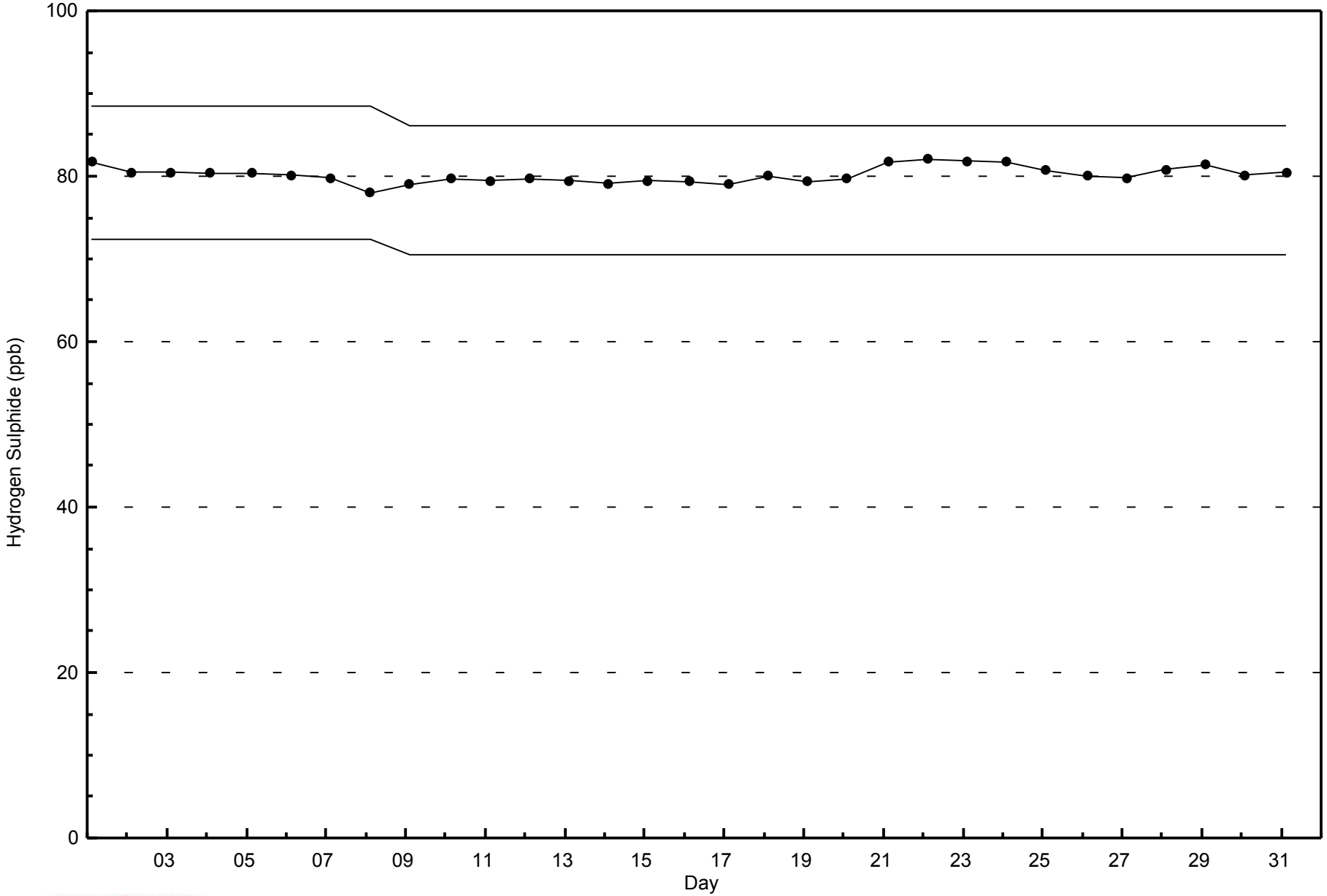
ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Wapasu - August 2014

Maximum Value: 3.0 ppm on Aug 31 05:00

Maximum Daily Average: 2.4 ppm on Aug 4

Minimum Value: 1.9 ppm on Aug 12 18:00

Minimum Daily Average: 2.1 ppm on Aug 12

Maximum Diurnal Average: 2.2 ppm at hour 4

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.17 ppm

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

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

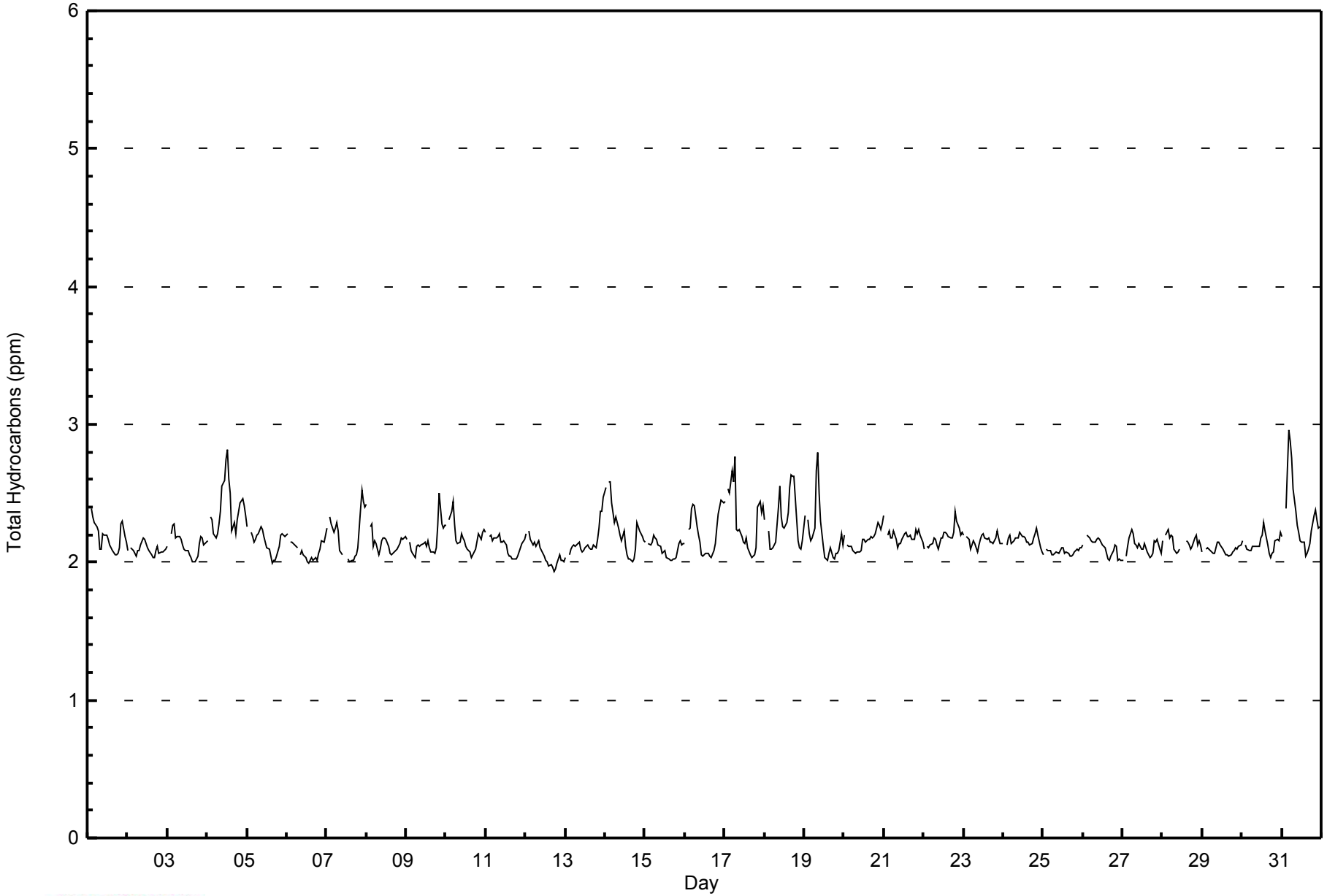
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Wapasu - August 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	85	12.04	12.04
2.1 - 3.0	621	87.96	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Wapasu - August 2014

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	1	0	1	0	0	1	4	5	5	1	1	5	4	0	0	28
2.1 - 3.0	14	13	7	4	4	8	17	34	9	9	9	3	3	1	6	16	157
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	14	14	7	5	4	8	18	38	14	14	10	4	8	5	6	16	185

Total Number of Valid Hours: 185

Total Number of Hours: 744

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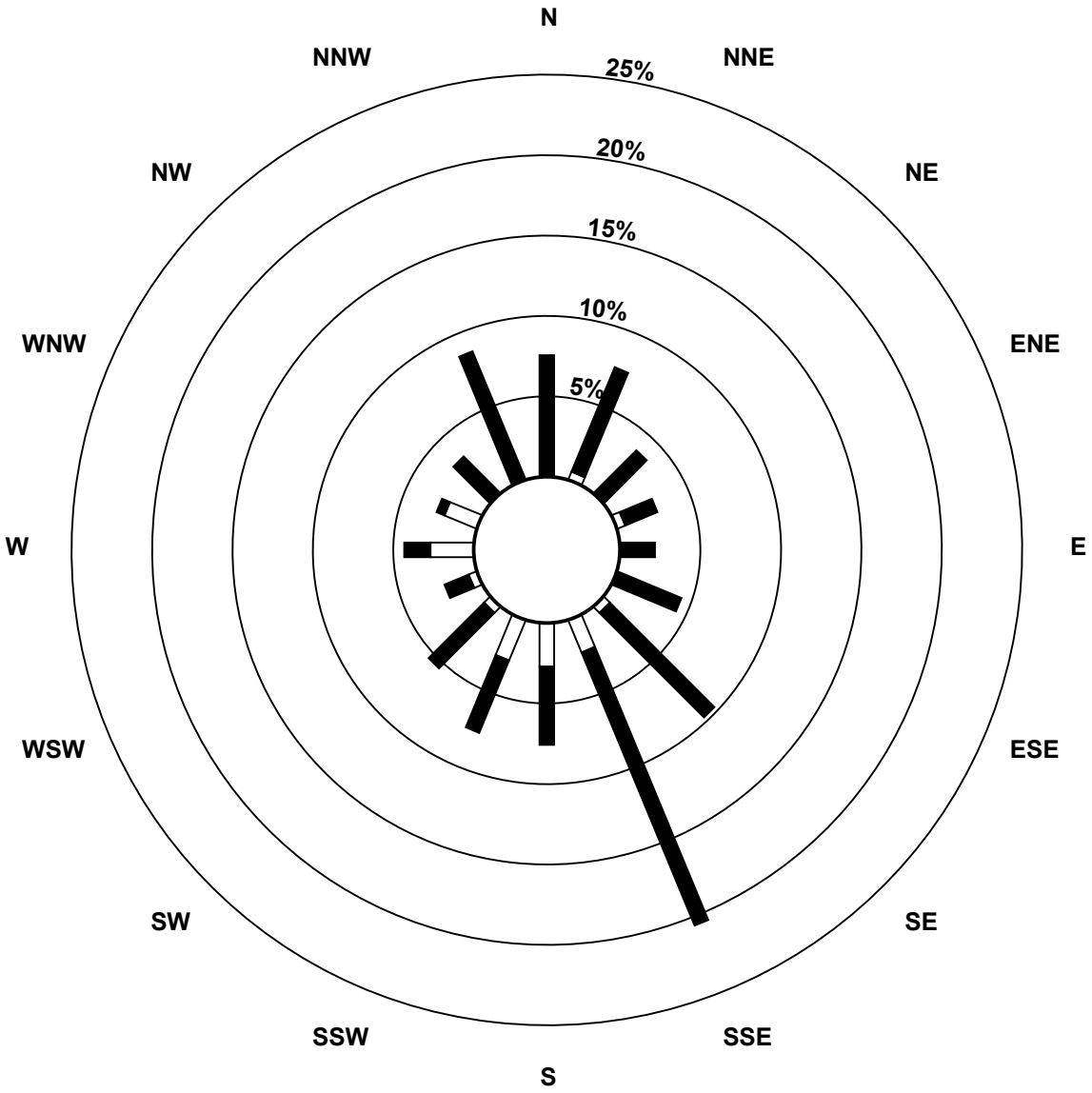
Wood Buffalo Environmental Association

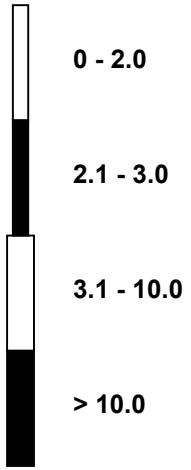
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Wapasu (AMS 17)



Classes (ppm)



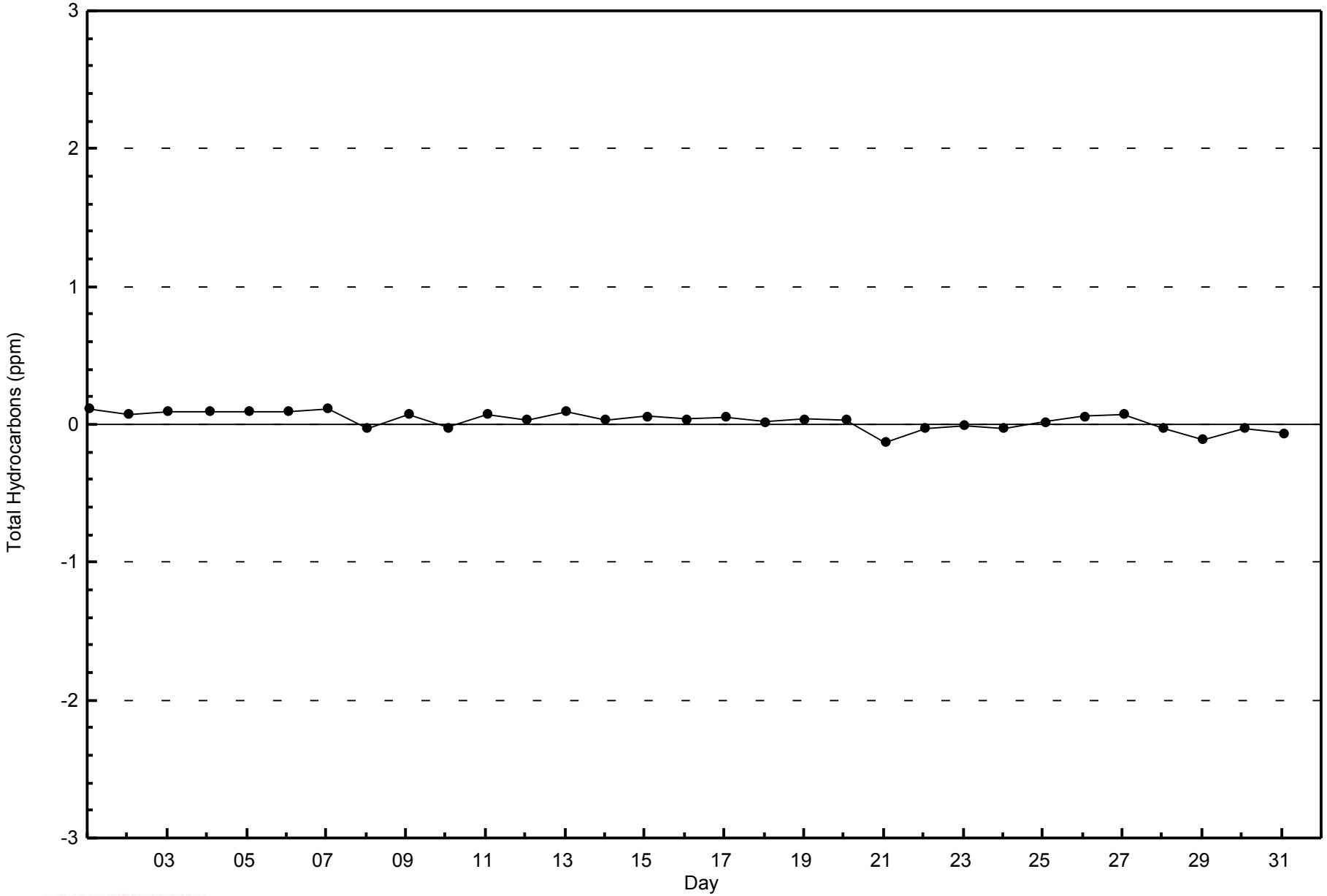
Total Number of Valid Hours: 185

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Wapasu - August 2014



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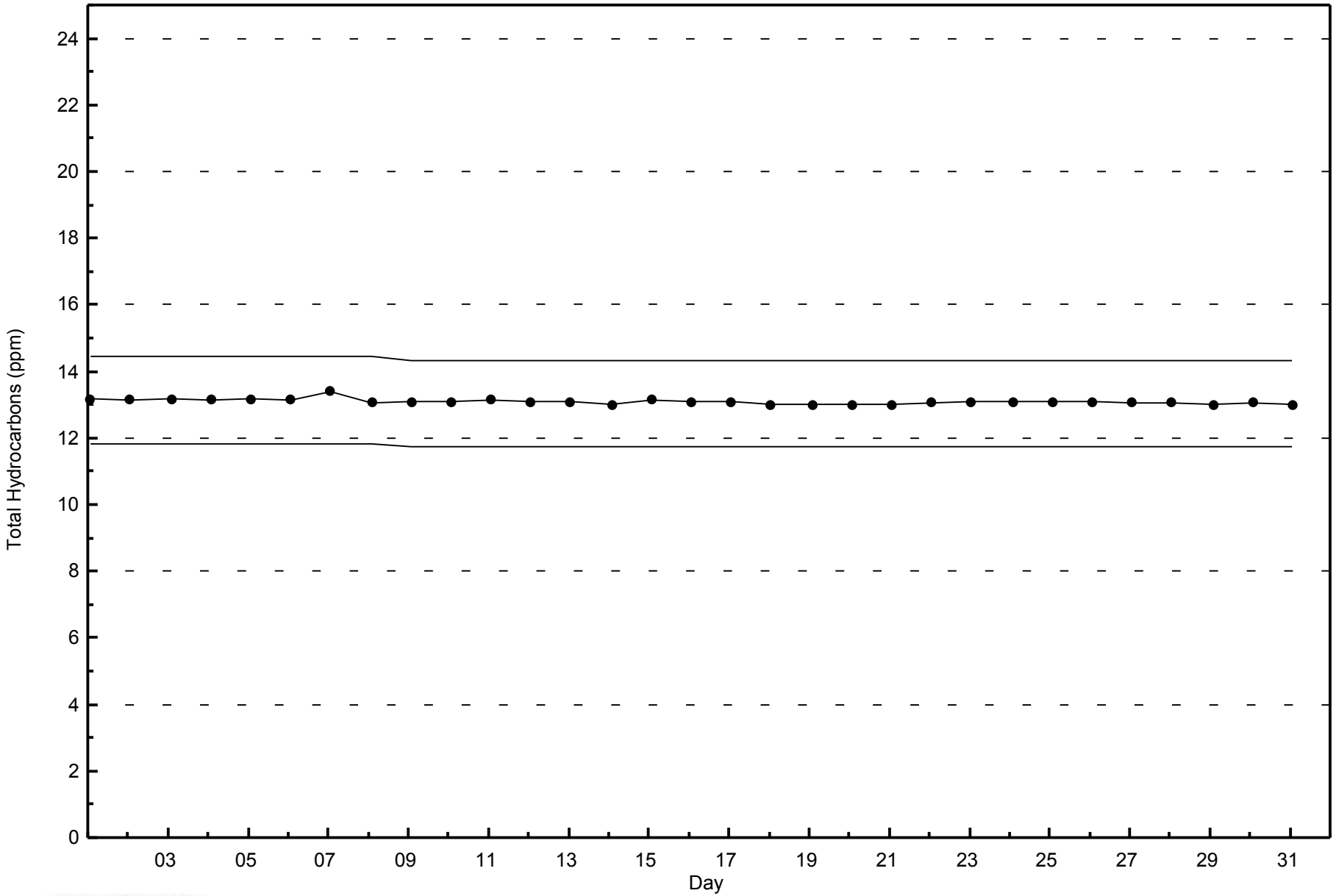
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Wapasu - August 2014

Number of Exceedences (AAAQO): 1-hr: 11 24-hr: 0
Maximum Value: 109 ppb on Aug 3 12:00 Maximum Daily Average: 64.2 ppb on Aug 3

Minimum Value: 1 ppb on Aug 10 05:00 Minimum Daily Average: 12.6 ppb on Aug 9
Maximum Diurnal Average: 37.2 ppb at hour 14 Minimum Diurnal Average: 16.7 ppb at hour 5
Monthly Average: 26.2 ppb Percentiles: $P_1 = 1$ $P_{10} = 6$ $Q_1 = 15$ Median = 24 $Q_3 = 34$ $P_{90} = 47$ $P_{99} = 86$

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	35
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	15	17	17	Z	17	16	19	23	M	28	30	32	33	34	33	32	32	33	33	29	17	16	23	27	25.4	34
2-Aug	31	33	35	Z	35	34	33	31	32	38	44	46	51	55	57	60	58	56	87	91	87	87	89	90	54.8	91
3-Aug	86	81	79	Z	52	58	60	71	83	96	100	109	C	C	C	C	48	50	53	47	38	39	37	33	64.2	109
4-Aug	29	23	17	Z	17	19	19	22	38	52	68	78	81	67	67	58	62	59	49	45	34	33	51	51	45.2	81
5-Aug	53	52	52	Z	48	44	39	43	43	48	49	52	54	55	52	51	56	56	48	36	27	25	30	31	45.3	56
6-Aug	32	32	33	Z	33	32	31	M	37	36	40	49	55	59	53	53	41	29	24	23	23	19	20	18	35.1	59
7-Aug	13	15	10	Z	17	19	20	24	27	27	27	27	30	30	30	31	31	30	29	25	15	7	5	5	21.5	31
8-Aug	6	5	5	Z	4	4	10	14	16	21	26	28	29	29	27	25	23	20	18	16	15	11	9	6	15.9	29
9-Aug	7	7	7	Z	9	9	9	9	11	11	15	18	21	20	22	24	24	22	20	13	3	2	2	4	12.6	24
10-Aug	5	4	4	Z	1	4	10	15	19	19	20	28	34	40	42	43	41	36	30	22	21	19	14	11	20.9	43
11-Aug	10	11	11	Z	12	11	12	18	22	28	30	34	38	31	23	21	21	21	20	17	13	12	17	19	19.6	38
12-Aug	15	12	18	Z	14	20	22	25	29	29	28	27	25	24	24	22	21	22	21	19	14	21	21	21	21.5	29
13-Aug	20	20	20	Z	22	24	23	27	30	32	36	37	39	43	47	49	52	51	46	37	35	24	18	9	32.2	52
14-Aug	3	2	6	Z	1	3	13	21	27	29	37	49	46	40	41	41	43	44	38	22	19	11	27	25	25.6	49
15-Aug	34	37	36	Z	40	43	42	38	34	30	31	38	57	50	57	50	47	47	30	27	25	24	23	25	37.6	57
16-Aug	26	24	20	Z	18	18	24	27	30	30	29	31	30	31	28	32	42	42	36	22	20	24	20	21	27.2	42
17-Aug	19	13	9	Z	2	5	8	25	31	35	35	36	44	55	47	40	37	36	34	30	16	10	8	6	25.3	55
18-Aug	2	1	6	Z	21	23	23	22	16	13	22	24	28	38	37	39	42	37	26	17	14	16	13	8	21.2	42
19-Aug	4	1	3	Z	6	6	5	4	4	13	24	35	39	35	28	26	25	25	30	24	19	12	3	8	16.5	39
20-Aug	7	9	10	Z	11	12	13	13	13	13	13	13	13	14	17	21	25	27	24	16	5	3	6	9	13.3	27
21-Aug	2	1	2	Z	2	2	3	11	21	26	30	31	32	32	31	32	33	31	30	18	8	4	3	2	16.8	33
22-Aug	2	2	3	Z	4	3	3	12	19	27	27	32	30	32	33	32	30	30	23	11	5	5	4	2	16.2	33
23-Aug	3	2	4	Z	5	5	8	17	25	22	28	37	39	42	43	43	45	45	44	34	18	21	27	24	25.3	45
24-Aug	21	23	23	Z	24	23	25	25	30	30	27	26	26	27	28	29	28	26	23	18	11	17	20	19	23.9	30
25-Aug	20	20	21	Z	20	20	20	21	21	23	28	32	34	35	34	36	39	39	35	34	31	30	31	30	28.4	39
26-Aug	30	30	29	Z	26	25	24	23	23	24	27	30	31	34	35	37	36	31	25	16	15	23	24	18	26.8	37
27-Aug	18	21	20	Z	10	6	11	14	14	19	25	27	35	36	38	39	35	35	31	21	11	5	20	16	22.1	39
28-Aug	10	5	6	Z	3	1	4	10	12	21	27	PF	PF	PF	28	29	29	29	25	10	4	8	12	17	14.5	29
29-Aug	19	19	21	Z	22	19	19	21	24	27	27	29	30	32	33	34	33	34	32	30	25	24	26	27	26.2	34
30-Aug	28	28	26	Z	24	23	21	18	15	14	12	14	20	23	30	35	34	32	23	10	9	6	11	11	20.3	35
31-Aug	8	5	3	Z	1	1	5	10	14	20	25	29	32	34	31	23	22	20	18	5	2	11	13	10	15.0	34
	18.6	17.9	18.0	--	16.7	17.0	18.6	21.7	25.3	28.5	31.9	36.0	36.4	37.2	36.5	36.2	36.6	35.3	32.5	25.3	19.4	18.3	20.2	19.5	Diurnal Average	
	86	81	79	--	52	58	60	71	83	96	100	109	81	67	67	60	62	59	87	91	87	87	89	90	Diurnal Maximum	

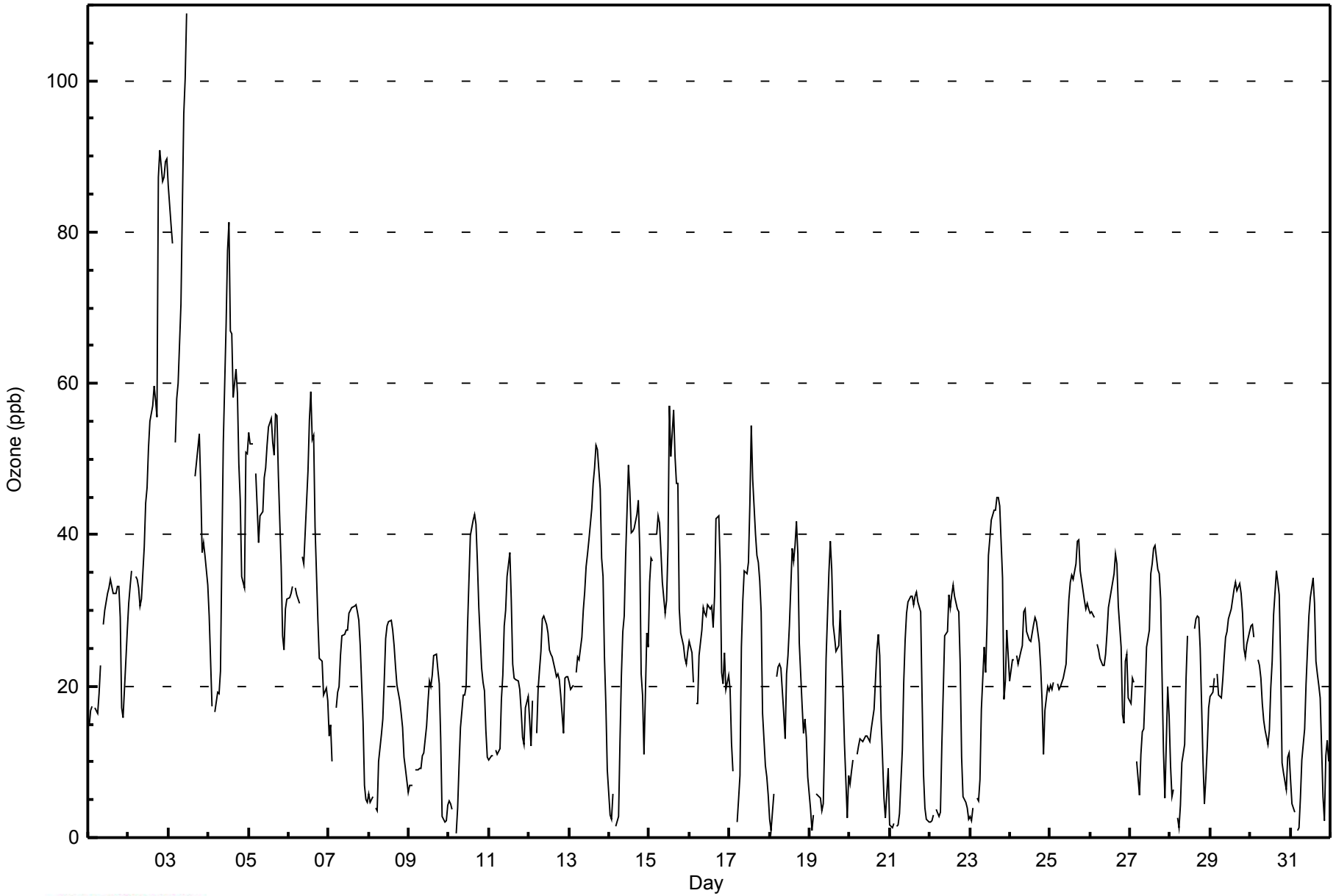
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA

Hourly Averages

Ozone (O_3) - ppb

Wapasu - August 2014



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ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	263	37.36	37.36
21 - 50	387	54.97	92.33
51 - 82	43	6.11	98.44
> 83	11	1.56	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Wapasu - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	4	10	2	4	2	2	2	4	4	2	3	2	0	0	1	3	45
21 - 50	4	3	4	1	1	1	11	27	2	5	3	4	7	3	3	10	89
51 - 82	5	0	1	0	0	3	5	5	6	4	5	0	1	0	0	3	38
> 83	1	0	0	0	1	1	1	2	2	2	0	0	0	0	1	0	11
Totals	14	13	7	5	4	7	19	38	14	13	11	6	8	3	5	16	183

Total Number of Valid Hours: 183

Total Number of Hours: 744

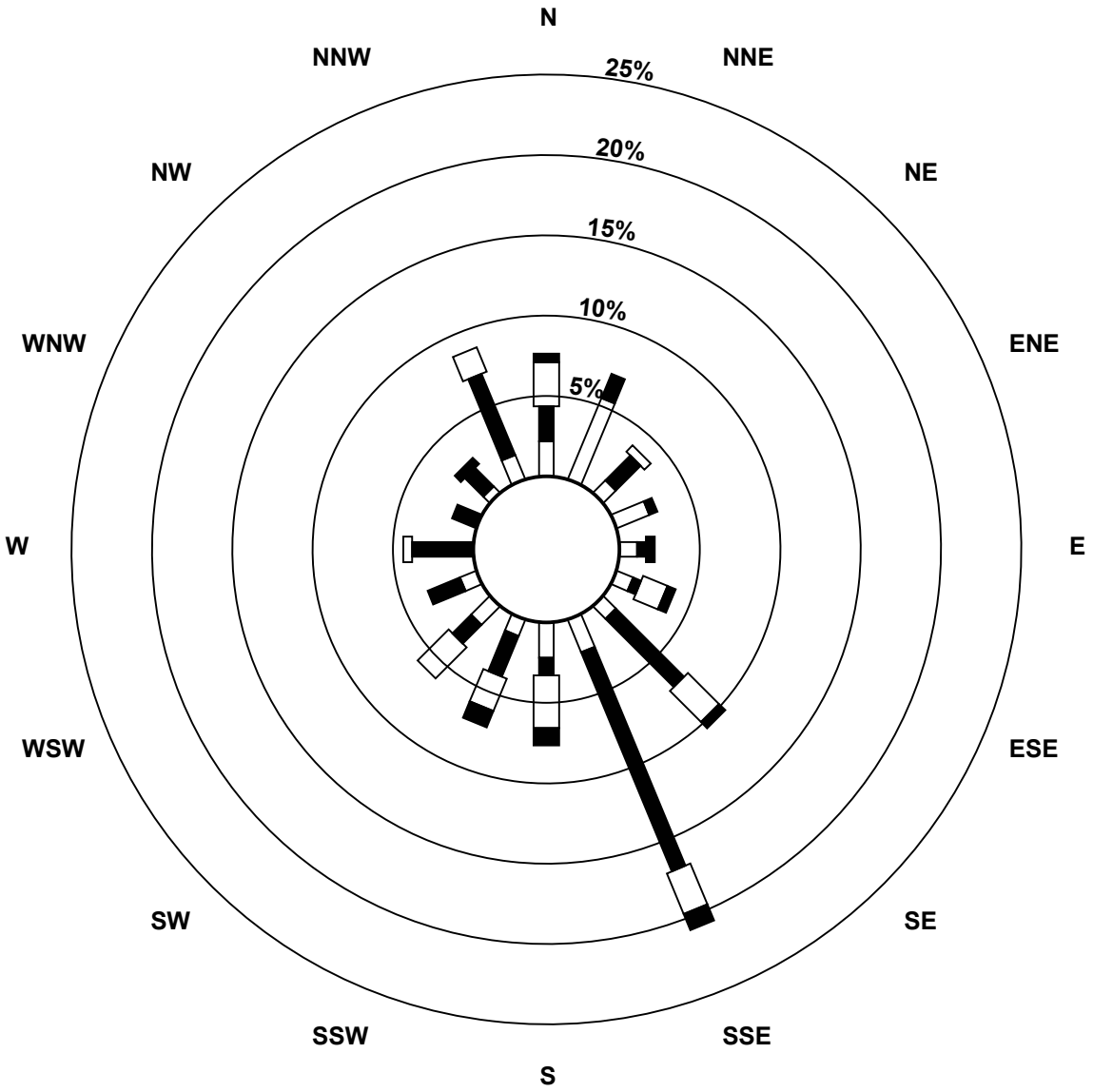
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Aug 2014

Ozone (O_3) - ppb

Wapasu (AMS 17)



Classes (ppb)

0 - 20

21 - 50

51 - 82

> 83

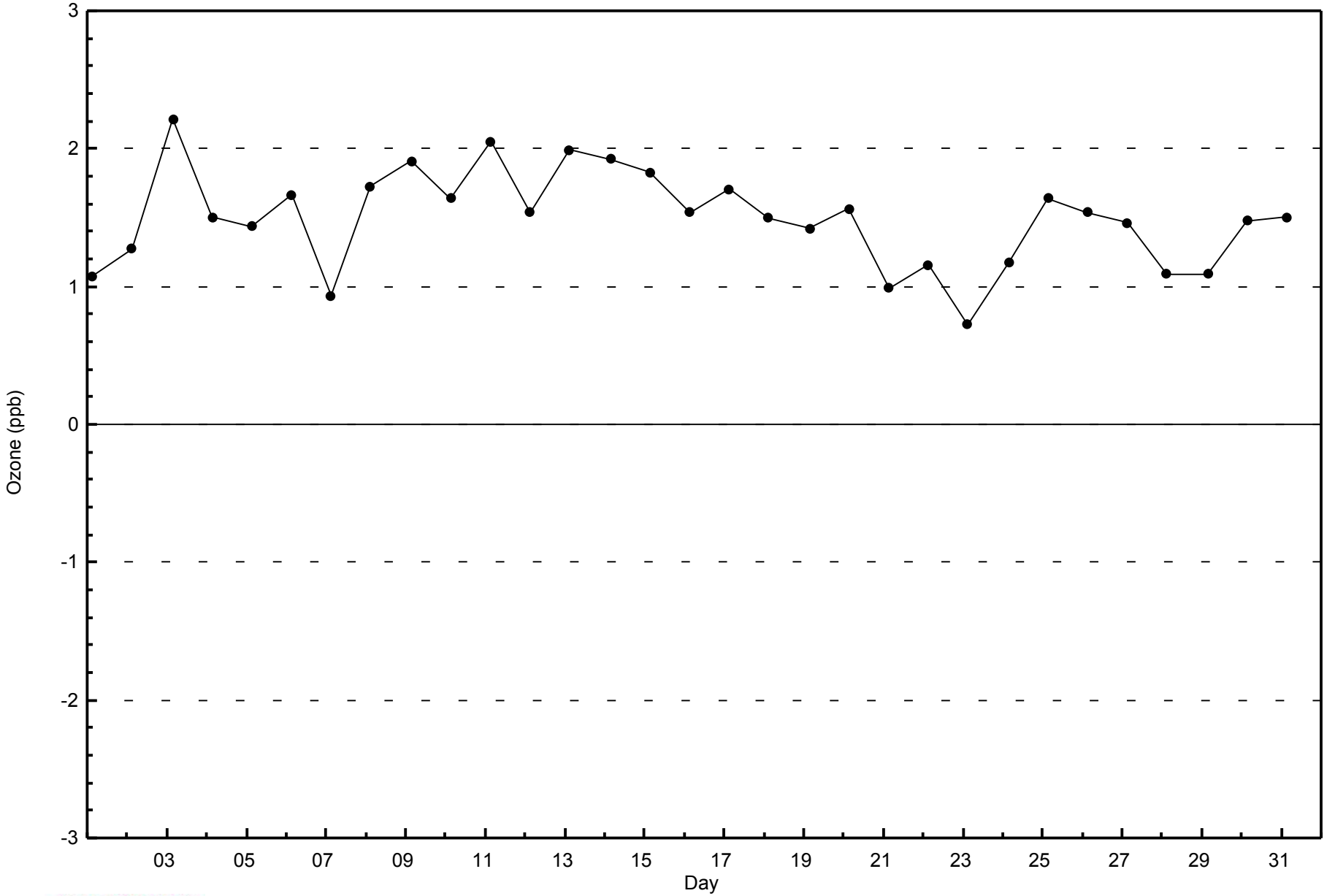
Total Number of Valid Hours: 183

WBEA

Zero Responses

Ozone (O_3) - ppb

Wapasu - August 2014



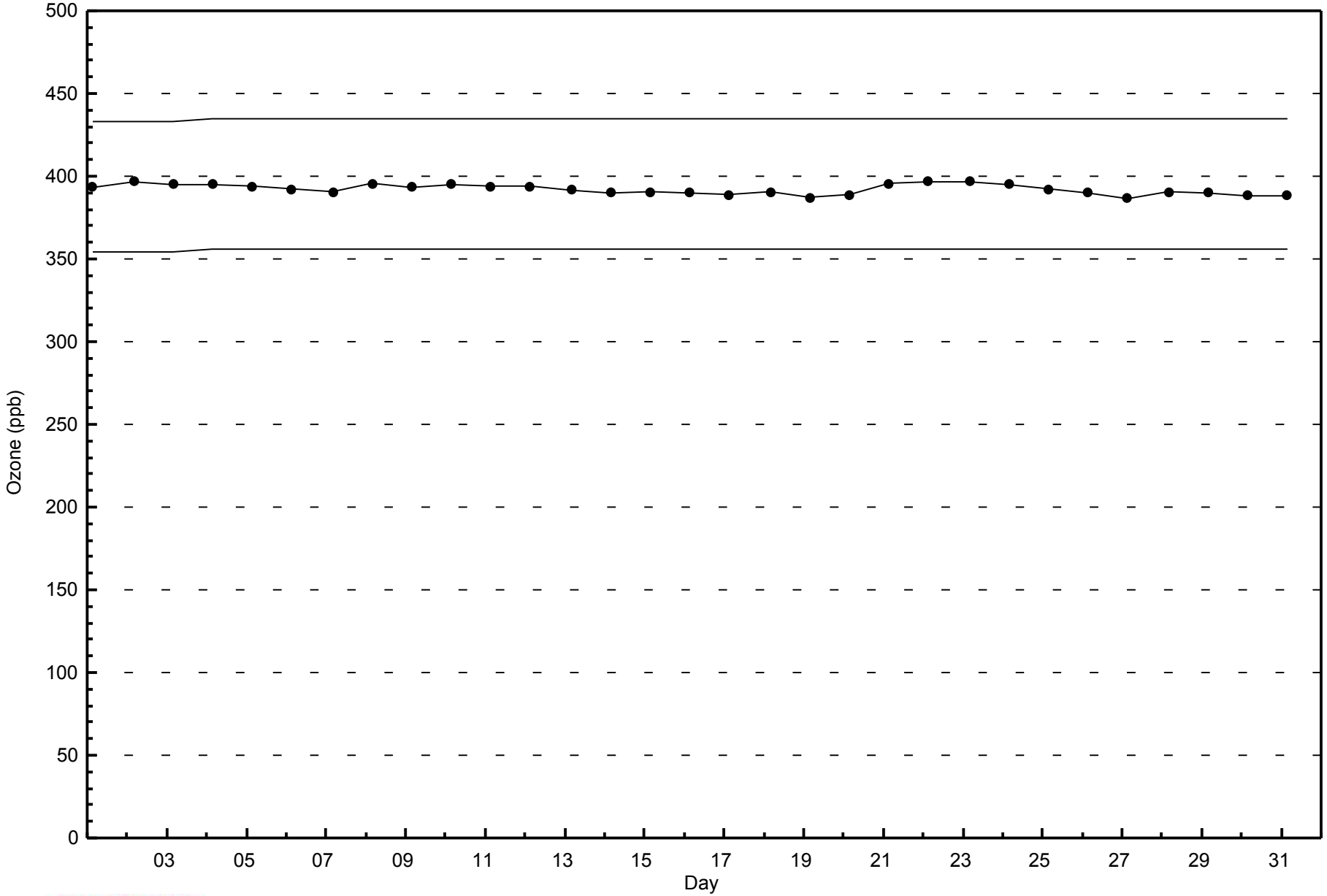
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Wapasu - August 2014

Maximum Value: 12 ppb on Aug 10 05:00

Maximum Daily Average: 1.8 ppb on Aug 10

Minimum Value: 0 ppb on Aug 24 17:00

Minimum Daily Average: 0.3 ppb on Aug 24

Maximum Diurnal Average: 1.4 ppb at hour 9

Minimum Diurnal Average: 0.5 ppb at hour 24

Monthly Average: 0.7 ppb

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

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-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0.7	1
2-Aug	0	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
3-Aug	1	Z	1	1	1	1	2	2	2	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	0.9	2
4-Aug	1	Z	1	1	1	1	1	3	2	1	1	1	1	0	1	1	1	0	1	0	1	0	1	0	0.8	3
5-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0.6	1
6-Aug	1	Z	1	1	1	1	1	C	C	C	C	C	C	0	1	0	1	1	1	1	0	1	1	1	--	1
7-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0.6	1
8-Aug	0	Z	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0.6	1
9-Aug	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
10-Aug	1	Z	1	2	12	8	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.8	12
11-Aug	1	Z	1	1	1	1	4	2	3	2	1	1	1	1	1	1	0	1	0	1	0	1	0	0	1.0	4
12-Aug	0	Z	0	0	1	1	1	1	0	1	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0.5	1
13-Aug	1	Z	0	0	0	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	0	0.5	1
14-Aug	0	Z	0	1	0	0	1	1	0	1	0	1	0	0	1	0	1	0	0	0	0	2	0	0	0.5	2
15-Aug	0	Z	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0.4	1
16-Aug	0	Z	0	0	0	1	1	0	0	1	0	0	0	1	0	1	0	1	1	1	0	1	1	1	0.5	1
17-Aug	0	Z	1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1	0	1	1	1	1	0.6	1
18-Aug	1	Z	2	1	0	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	2
19-Aug	1	Z	1	1	1	1	1	3	10	6	4	2	1	1	1	1	1	1	0	0	1	0	1	1	1.6	10
20-Aug	0	Z	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
21-Aug	1	Z	1	1	1	1	2	6	2	1	1	1	1	1	1	1	1	0	1	0	1	0	0	1	1.0	6
22-Aug	1	Z	0	1	0	1	1	1	1	0	1	1	0	0	1	0	0	0	1	1	0	1	0	0	0.6	1
23-Aug	1	Z	1	0	0	0	2	3	1	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0.8	3
24-Aug	0	Z	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
25-Aug	0	Z	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0.4	1
26-Aug	0	Z	0	0	0	0	0	1	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0.6	2
27-Aug	0	Z	0	0	0	2	2	1	1	2	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0.7	2
28-Aug	0	Z	0	0	0	1	2	2	1	0	0	PF	PF	PF	0	0	0	0	0	0	0	0	1	0	0.5	2
29-Aug	0	Z	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0.4	1
30-Aug	0	Z	0	0	0	0	0	0	0	1	1	1	1	2	2	1	1	0	0	0	1	1	0	0	0.6	2
31-Aug	0	Z	0	3	4	3	4	6	6	3	2	1	1	1	0	0	0	1	1	0	0	0	0	0	1.6	6
	0.5	--	0.5	0.6	1.0	0.9	1.1	1.4	1.4	1.1	1.0	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	Diurnal Average	
	1	--	2	3	12	8	4	6	10	6	4	2	1	2	2	1	1	1	1	1	1	2	1	1	Diurnal Maximum	

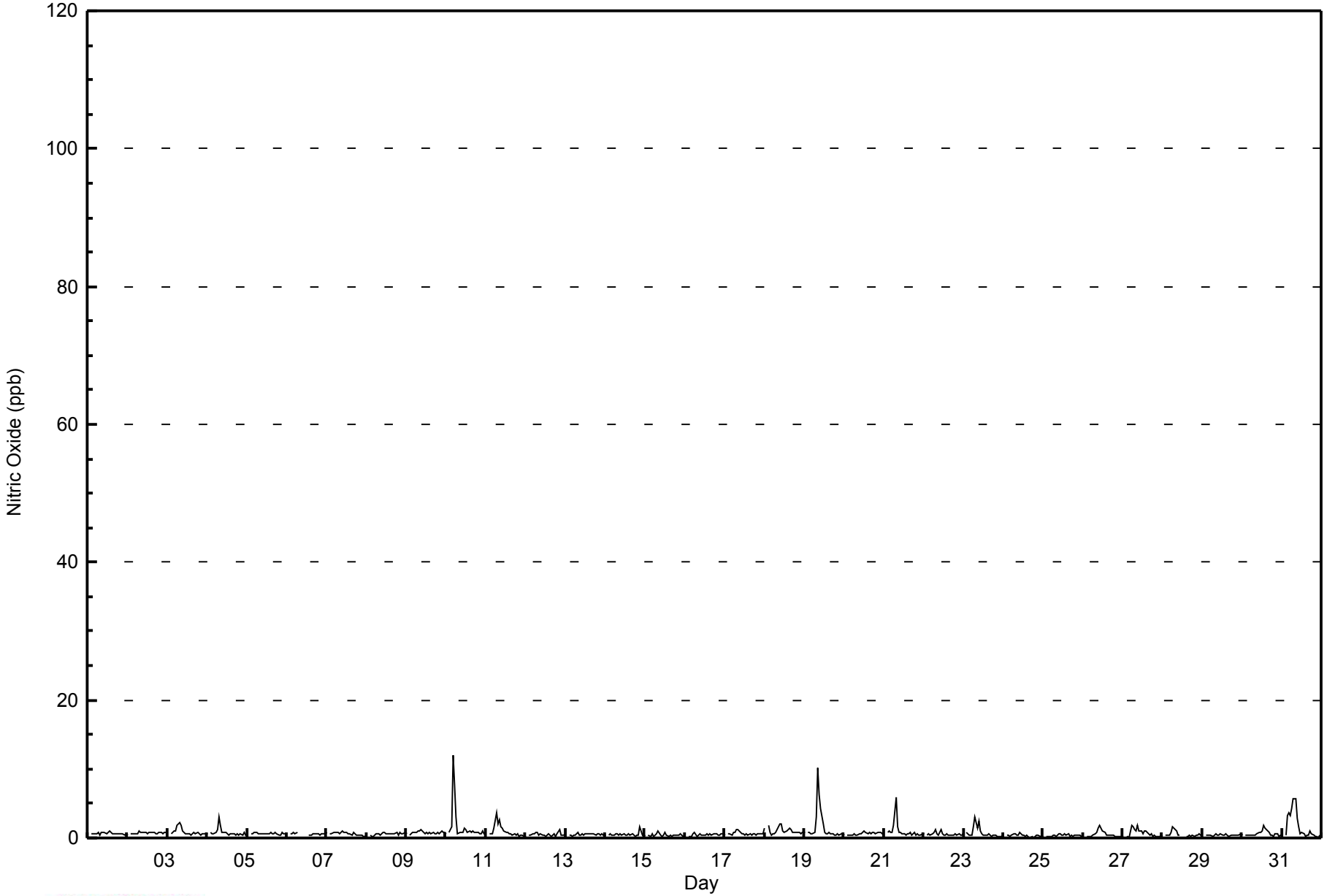
Z - zerospan C - Calibration PF - Power Failure

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

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

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Wapasu - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	14	14	7	5	4	8	18	38	14	10	9	7	8	5	6	16	183
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	14	7	5	4	8	18	38	14	10	9	7	8	5	6	16	183

Total Number of Valid Hours: 183

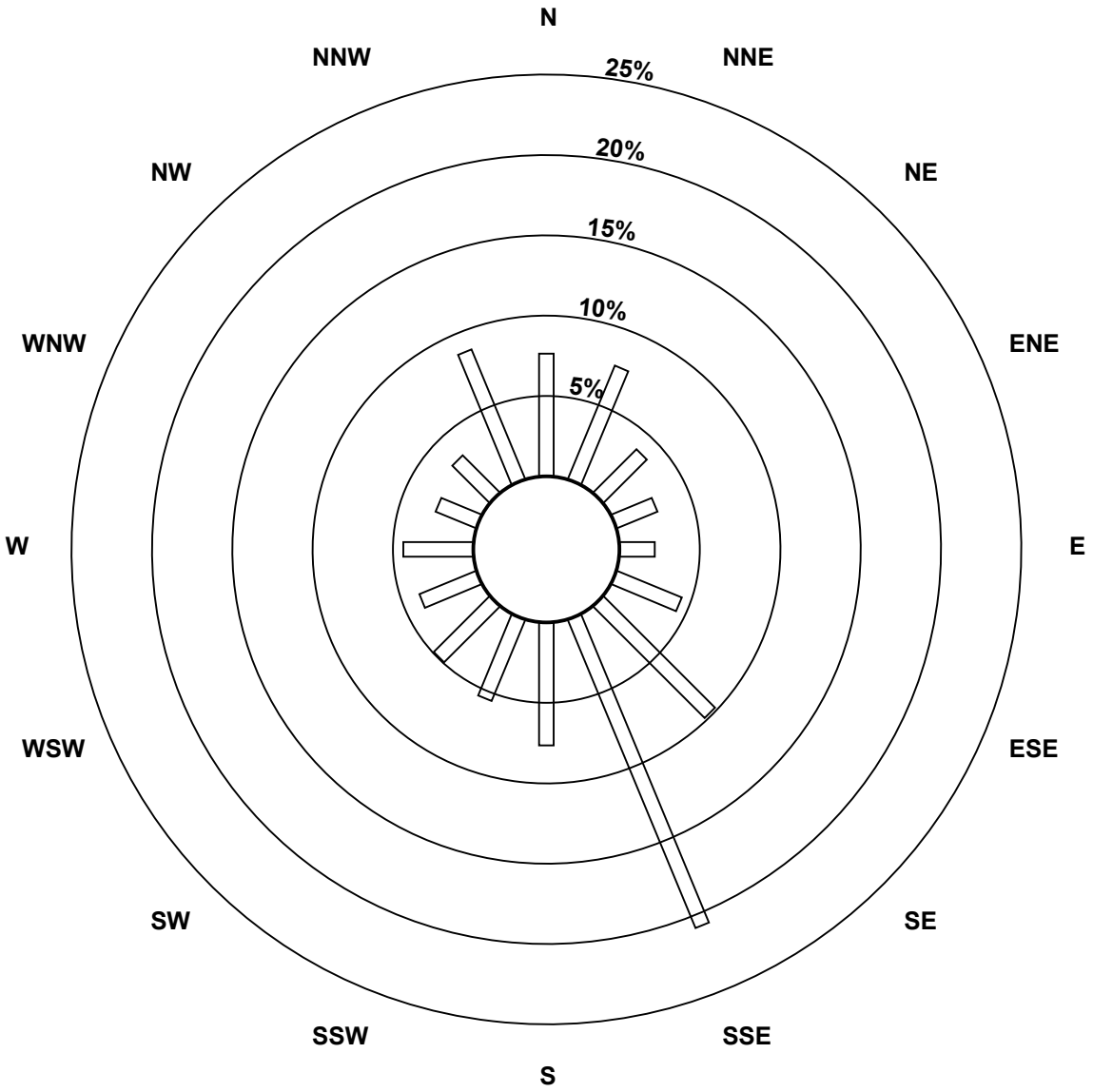
Total Number of Hours: 744

Wood Buffalo Environmental Association

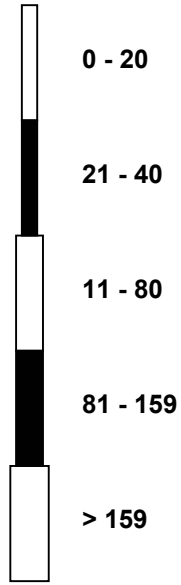
Wind Rose Aug 2014

Nitric Oxide (NO) - ppb

Wapasu (AMS 17)



Classes (ppb)



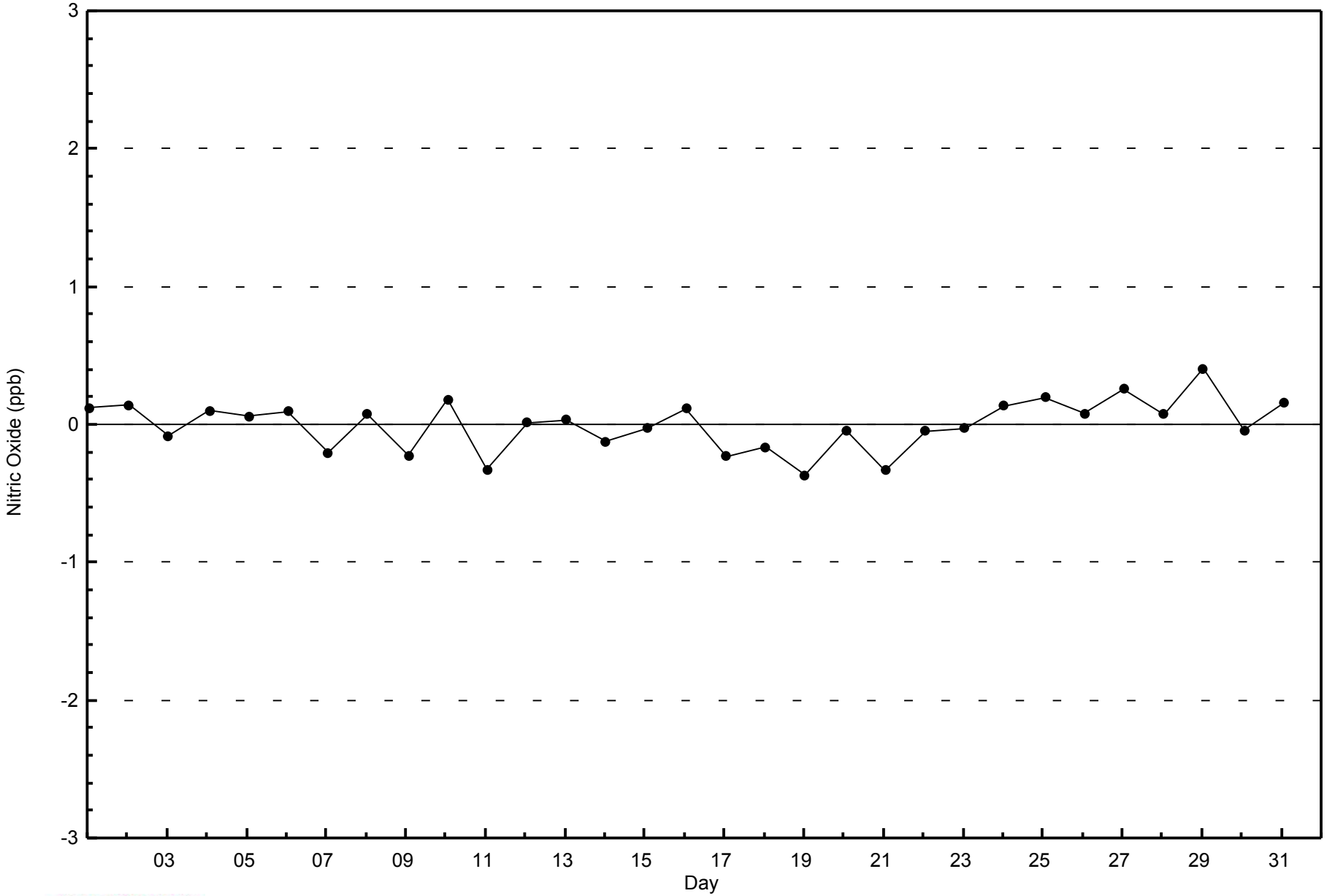
Total Number of Valid Hours: 183

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Wapasu - August 2014



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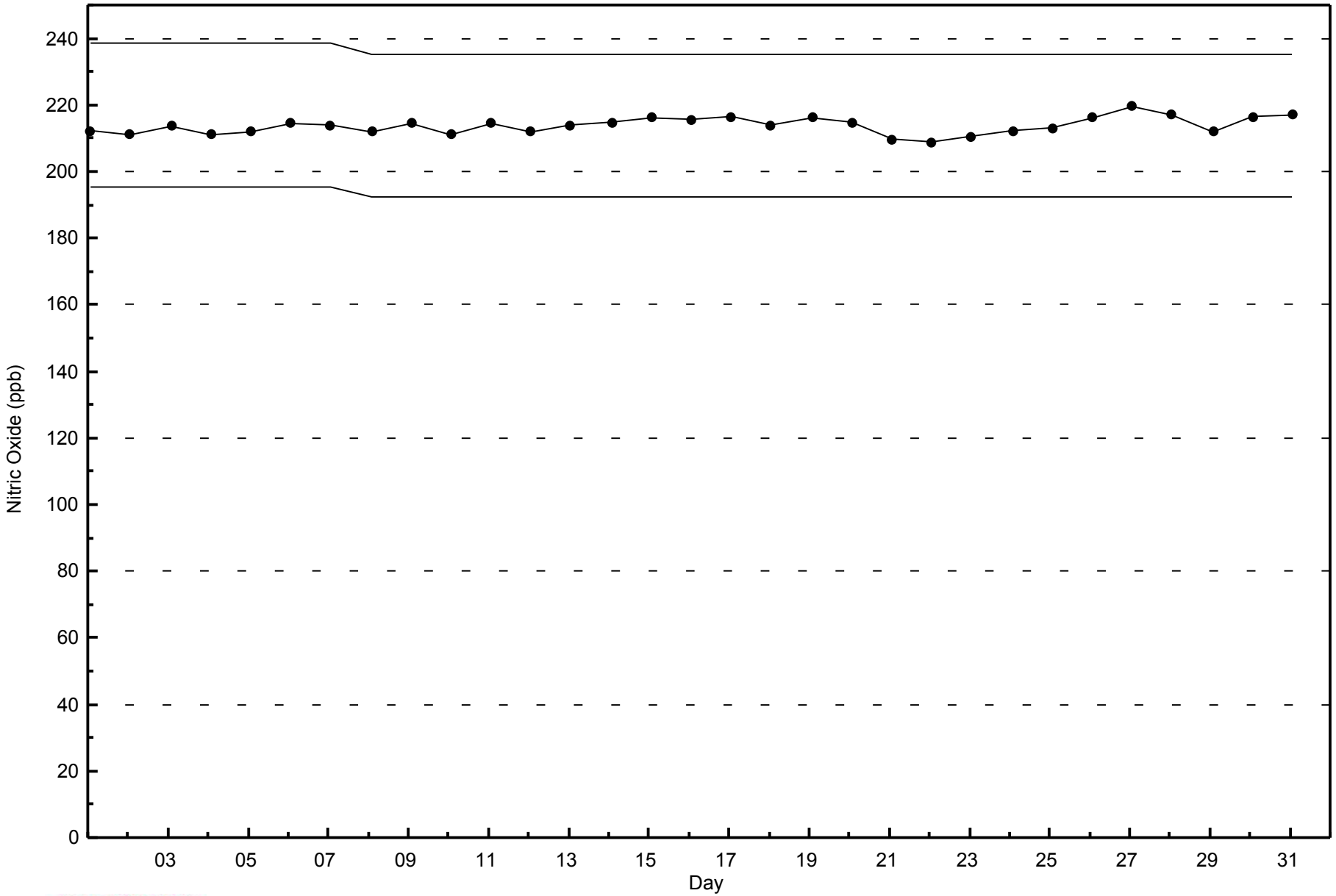
ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 22 ppb on Aug 14 22:00 Maximum Daily Average: 5.3 ppb on Aug 31

Minimum Value: 0 ppb on Aug 1 07:00 Minimum Daily Average: 0.5 ppb on Aug 29
Maximum Diurnal Average: 3.1 ppb at hour 5 Minimum Diurnal Average: 1.1 ppb at hour 16
Monthly Average: 2.1 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 3$ $P_{90} = 5$ $P_{99} = 13$

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-Aug	1	Z	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	2	2	0.5	2
2-Aug	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	0	1	0.8	2
3-Aug	3	Z	5	5	5	3	5	7	5	2	1	1	1	1	0	0	1	1	2	4	3	2	1	1	2.6	7
4-Aug	1	Z	6	7	5	3	4	8	6	4	6	6	7	5	4	2	3	2	2	2	2	2	3	4	4.2	8
5-Aug	3	Z	2	3	3	3	5	3	2	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1	1.8	5
6-Aug	1	Z	1	1	1	1	2	C	C	C	C	C	C	2	1	2	1	1	1	1	1	2	2	2	--	2
7-Aug	8	Z	14	10	7	3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	3	3	5	4	2.8	14
8-Aug	2	Z	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	2	5	0.6	5
9-Aug	3	Z	4	1	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0.8	4
10-Aug	4	Z	6	5	7	10	5	0	0	0	0	2	2	1	2	1	2	2	2	2	2	1	3	6	2.8	10
11-Aug	6	Z	5	6	4	6	8	5	6	3	3	2	2	1	0	0	0	0	0	0	0	0	0	0	2.5	8
12-Aug	0	Z	1	3	9	6	3	3	1	1	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1.4	9
13-Aug	0	Z	0	1	1	1	1	1	1	1	1	1	1	2	2	3	3	4	4	5	3	5	5	3	2.1	5
14-Aug	4	Z	2	0	0	1	0	0	0	0	1	2	1	0	0	0	1	1	1	1	8	22	9	11	2.8	22
15-Aug	4	Z	1	1	2	3	2	3	3	1	1	1	3	2	2	2	1	1	1	0	0	0	0	0	1.4	4
16-Aug	0	Z	7	9	13	13	11	4	3	2	1	1	1	1	0	1	2	3	2	10	7	5	11	7	4.9	13
17-Aug	8	Z	9	5	3	2	1	3	4	2	1	1	1	2	2	1	0	0	1	1	1	1	2	2	2.2	9
18-Aug	6	Z	9	4	3	2	2	2	7	11	6	2	2	5	6	8	10	12	13	4	1	0	0	1	5.0	13
19-Aug	1	Z	1	1	1	1	3	6	10	9	8	5	2	1	0	1	1	1	1	0	1	1	0	3	2.6	10
20-Aug	2	Z	0	0	0	0	0	1	0	0	0	1	1	1	1	1	1	1	2	2	0	0	0	1	0.5	2
21-Aug	0	Z	1	0	1	0	2	7	2	1	1	0	0	1	1	1	1	0	0	0	0	0	0	2	0.8	7
22-Aug	2	Z	1	1	1	2	1	2	1	1	2	1	1	1	1	1	0	1	1	1	0	0	0	1	1.0	2
23-Aug	2	Z	2	1	2	2	3	7	3	5	2	1	1	1	1	1	1	1	1	1	1	0	0	1	1.8	7
24-Aug	4	Z	1	2	3	5	4	4	3	2	4	1	1	1	0	0	0	0	1	1	5	4	0	0	2.0	5
25-Aug	0	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	1	0	0	1	1	0.9	3
26-Aug	1	Z	1	1	1	1	1	2	3	4	4	4	4	4	2	1	2	4	3	4	3	3	1	1	2.4	4
27-Aug	0	Z	1	3	5	12	7	3	2	3	3	3	2	3	3	3	1	1	1	0	0	0	2	1	2.5	12
28-Aug	1	Z	5	5	5	3	2	3	2	0	0	PF	PF	PF	1	0	0	0	0	0	0	0	2	4	1.5	5
29-Aug	3	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0.5	3
30-Aug	0	Z	0	0	0	0	0	0	0	1	2	2	2	6	5	3	2	1	2	1	2	5	4	3	1.8	6
31-Aug	3	Z	7	14	13	10	8	8	9	5	3	1	2	2	1	1	2	5	6	3	2	7	4	8	5.3	14
	2.3	--	3.0	2.9	3.1	3.0	2.7	2.9	2.5	2.1	1.8	1.5	1.4	1.5	1.2	1.1	1.3	1.5	1.6	1.5	1.8	2.2	2.0	2.5	Diurnal Average	
	8	--	14	14	13	13	11	8	10	11	8	6	7	6	6	8	10	12	13	10	8	22	11	11	Diurnal Maximum	

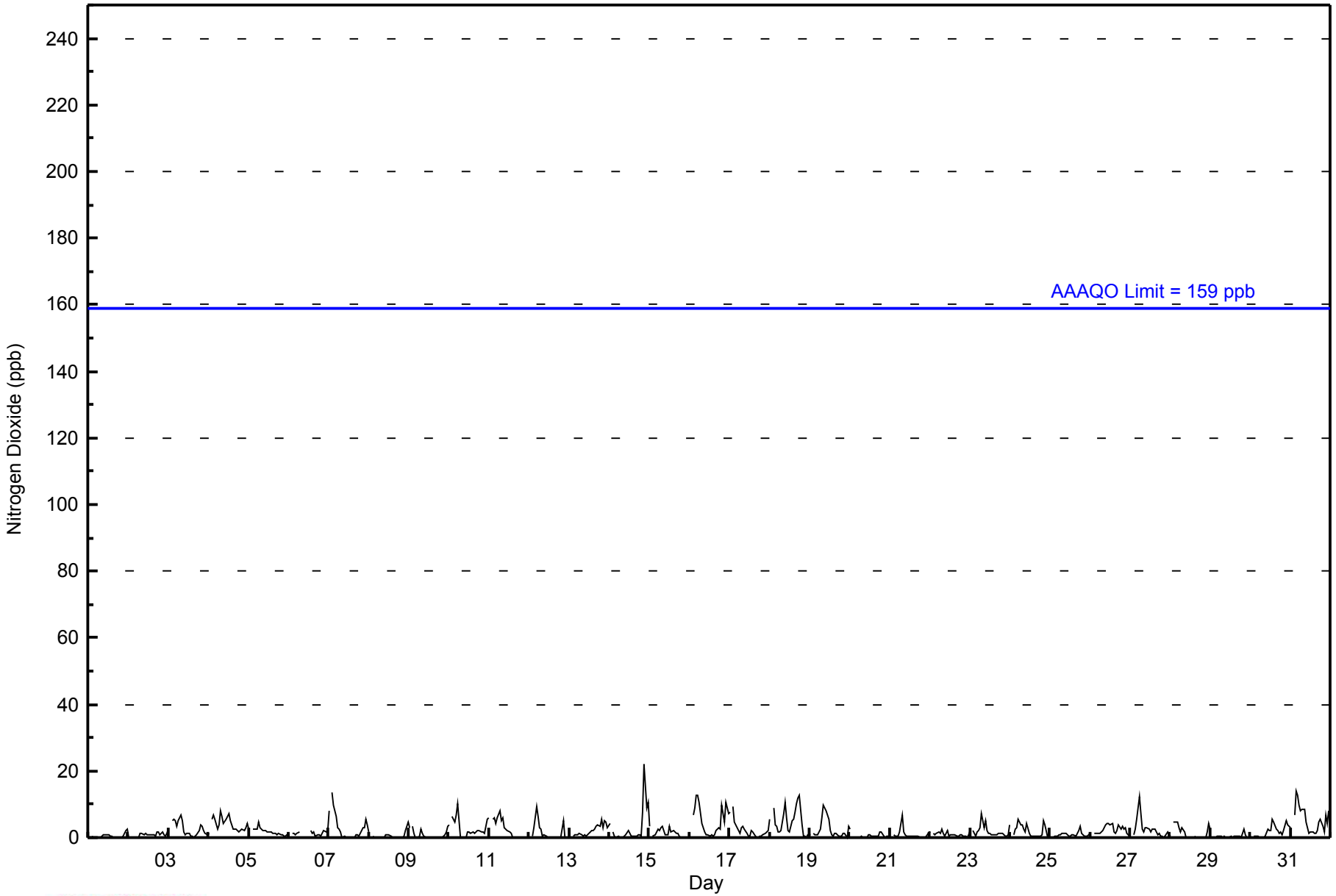
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Wapasu - August 2014

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	14	7	5	4	8	18	38	14	10	9	7	8	5	6	16	183
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	14	7	5	4	8	18	38	14	10	9	7	8	5	6	16	183

Total Number of Valid Hours: 183

Total Number of Hours: 744

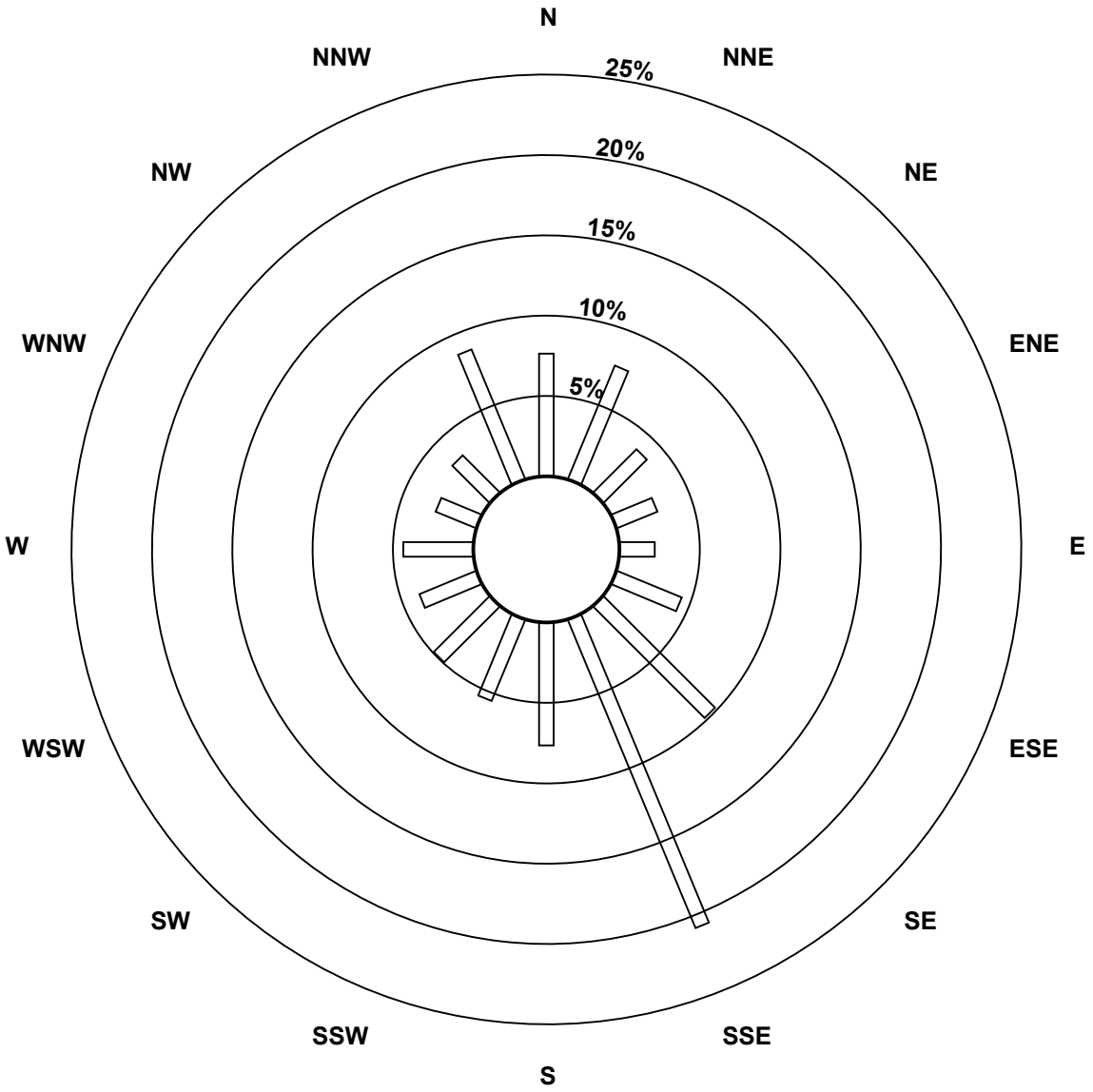
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

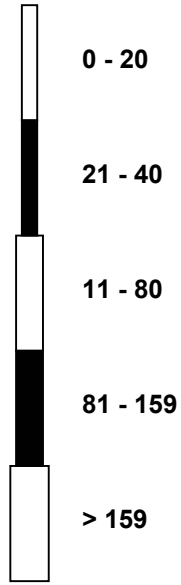
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Wapasu (AMS 17)



Classes (ppb)



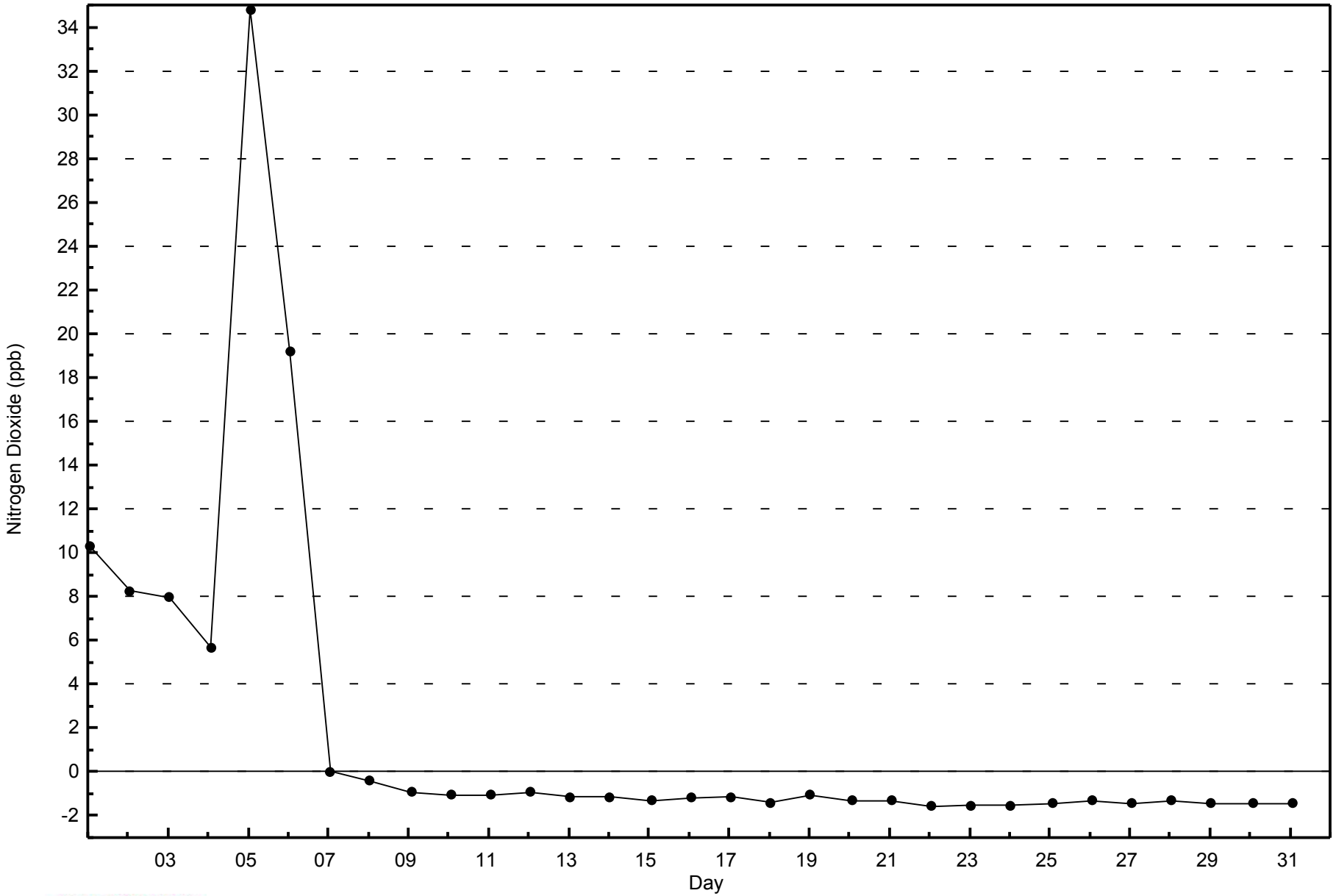
Total Number of Valid Hours: 183

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - August 2014



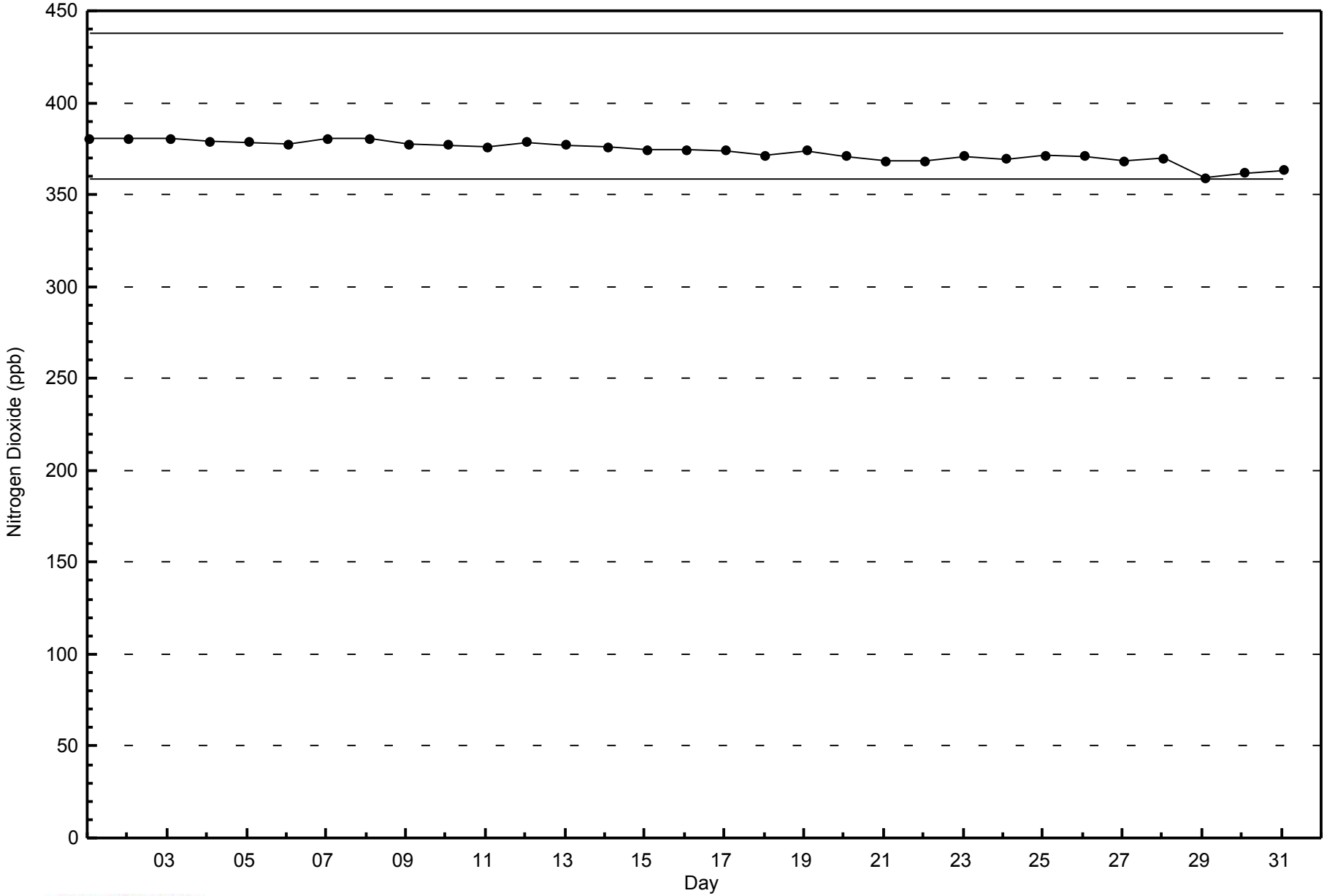
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - August 2014

Maximum Value: 24 ppb on Aug 14 22:00

Maximum Daily Average: 6.9 ppb on Aug 31

Minimum Value: 0 ppb on Aug 25 01:00

Minimum Daily Average: 0.9 ppb on Aug 29

Maximum Diurnal Average: 4.3 ppb at hour 8

Minimum Diurnal Average: 1.7 ppb at hour 16

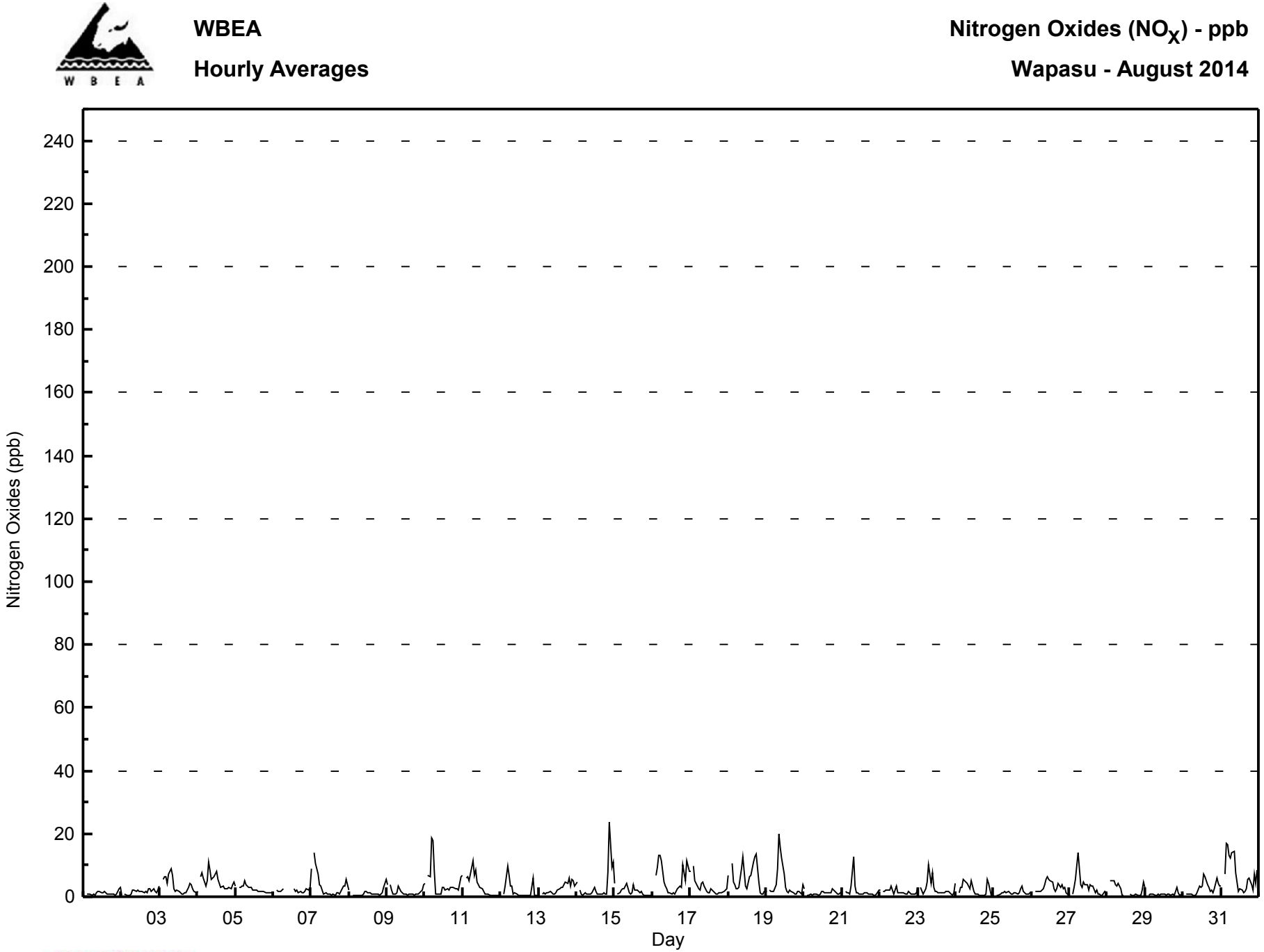
Monthly Average: 2.8 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 6$ $P_{99} = 15$

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-Aug	2	Z	1	1	1	1	1	1	1	2	2	1	1	2	1	1	1	1	1	1	1	1	2	3	1.2	3
2-Aug	1	Z	1	1	1	1	1	2	2	2	2	2	1	1	1	2	1	3	3	2	3	2	1	2	1.5	3
3-Aug	3	Z	6	6	6	4	7	9	7	3	2	2	2	1	1	1	1	1	3	4	4	3	2	1	3.4	9
4-Aug	2	Z	6	7	6	4	5	11	8	5	7	7	8	6	4	3	3	3	2	2	3	3	4	5	5.0	11
5-Aug	3	Z	3	3	3	3	5	4	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	1	2.4	5
6-Aug	1	Z	2	2	2	2	2	C	C	C	C	C	C	3	2	2	1	2	1	1	2	3	2	3	--	3
7-Aug	9	Z	14	11	7	4	3	2	1	1	1	1	1	1	1	0	1	1	1	2	3	4	6	4	3.4	14
8-Aug	2	Z	1	0	0	0	1	1	0	1	2	2	1	1	1	1	1	1	1	0	1	1	3	5	1.1	5
9-Aug	4	Z	4	2	1	1	1	4	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	4	1.6	4
10-Aug	4	Z	7	6	19	18	8	1	1	1	1	3	3	2	3	2	3	3	3	3	3	2	4	6	4.6	19
11-Aug	7	Z	6	6	5	7	12	7	8	5	4	3	3	2	1	1	1	1	0	1	0	1	1	0	3.5	12
12-Aug	0	Z	1	3	10	7	3	3	1	1	1	1	0	0	1	0	0	1	0	1	6	0	0	0	1.8	10
13-Aug	1	Z	1	1	1	1	1	2	1	1	1	1	2	2	3	3	4	5	4	6	3	5	5	3	2.6	6
14-Aug	5	Z	2	1	1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1	8	24	9	11	3.4	24
15-Aug	4	Z	1	1	2	3	3	3	4	1	1	1	4	2	2	2	1	2	1	1	1	1	0	0	1.8	4
16-Aug	0	Z	7	9	13	13	12	4	3	2	1	1	1	1	1	2	3	3	3	10	8	5	11	8	5.4	13
17-Aug	8	Z	10	5	3	3	2	4	5	3	2	1	1	3	2	1	1	1	1	1	1	2	2	3	2.8	10
18-Aug	7	Z	11	5	4	2	2	3	9	13	8	3	2	6	7	9	11	13	13	5	1	1	1	2	6.0	13
19-Aug	2	Z	2	2	1	2	4	9	20	16	12	7	3	2	1	2	2	1	1	1	2	2	1	4	4.2	20
20-Aug	3	Z	1	0	1	1	1	1	1	1	1	2	2	1	1	1	1	1	2	2	1	1	1	1	1.2	3
21-Aug	1	Z	2	1	1	1	3	13	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.8	13
22-Aug	2	Z	2	2	2	2	2	4	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1.6	4
23-Aug	3	Z	3	1	2	3	5	10	4	8	3	2	2	1	1	1	1	1	2	2	1	1	1	1	2.5	10
24-Aug	4	Z	1	3	3	6	4	4	3	2	5	2	1	1	1	1	0	0	1	1	6	4	0	0	2.3	6
25-Aug	0	Z	0	1	1	1	1	2	1	2	1	1	1	1	1	1	1	2	3	2	1	1	1	1	1.2	3
26-Aug	1	Z	2	2	2	2	2	3	4	5	6	6	5	5	2	2	3	4	3	4	3	3	1	1	3.0	6
27-Aug	0	Z	1	3	5	14	9	4	3	5	4	4	2	4	3	3	1	2	1	1	0	1	2	1	3.2	14
28-Aug	1	Z	5	5	5	4	3	4	3	0	0	PF	PF	PF	1	0	0	0	1	0	0	1	2	5	2.1	5
29-Aug	3	Z	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	0.9	3
30-Aug	1	Z	1	1	1	1	1	1	1	1	3	3	3	7	6	4	3	2	2	1	3	6	4	4	2.5	7
31-Aug	3	Z	7	17	16	13	12	14	14	8	5	2	3	2	1	1	3	6	6	4	2	7	4	9	6.9	17
	2.8	--	3.5	3.5	4.0	4.0	3.8	4.3	3.9	3.2	2.8	2.3	2.1	2.1	1.8	1.7	1.8	2.1	2.1	2.0	2.3	2.8	2.5	3.0	Diurnal Average	
	9	--	14	17	19	18	12	14	20	16	12	7	8	7	7	9	11	13	13	10	8	24	11	11	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure


WBEA
Hourly Averages
Nitrogen Oxides (NO_X) - ppb
Wapasu - August 2014
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	703	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Wapasu - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	14	14	7	5	4	8	18	38	14	10	9	7	8	5	6	16	183
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	14	7	5	4	8	18	38	14	10	9	7	8	5	6	16	183

Total Number of Valid Hours: 183

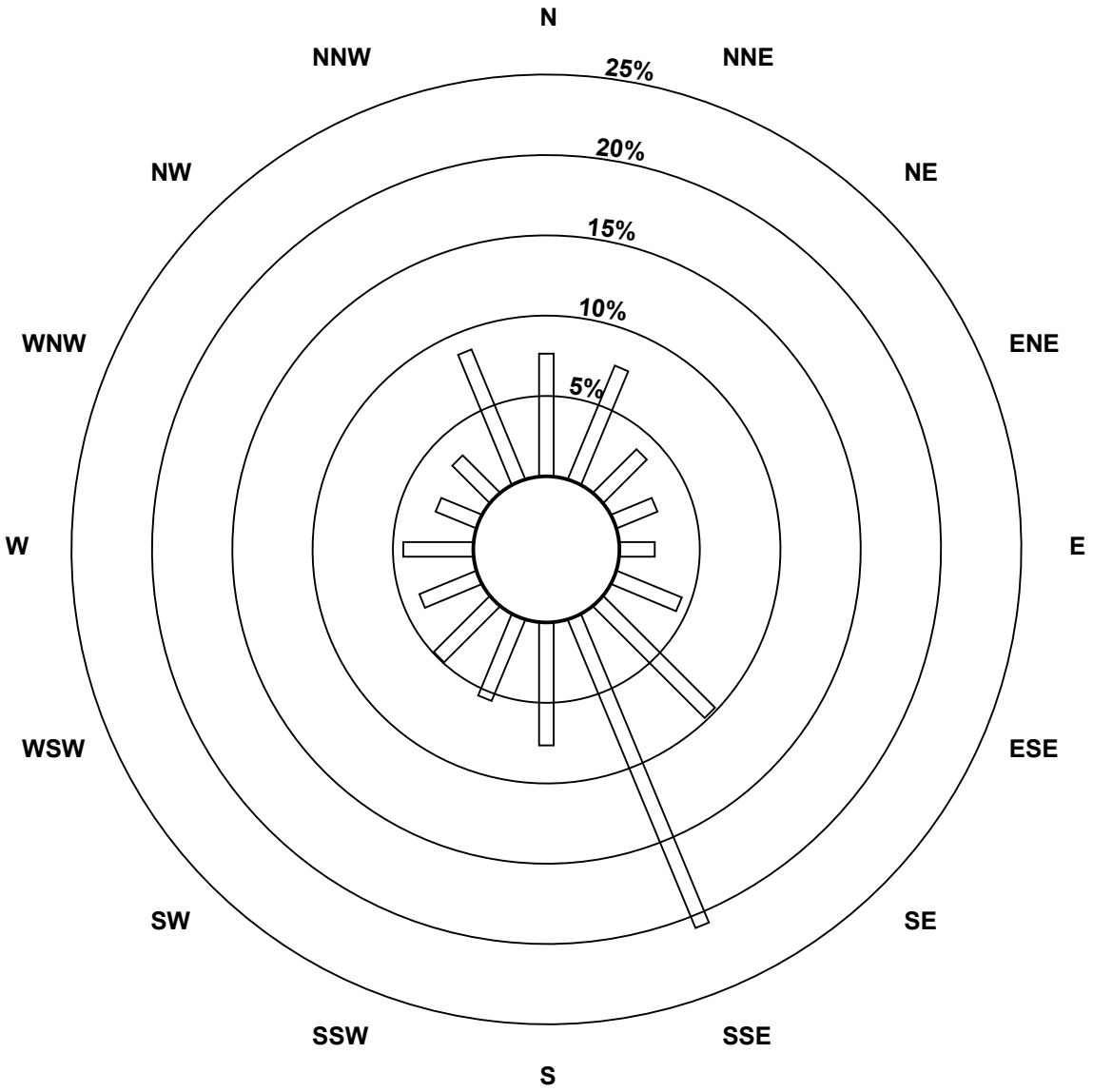
Total Number of Hours: 744

Wood Buffalo Environmental Association

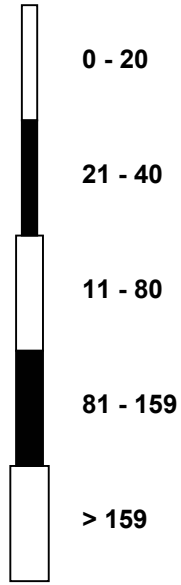
Wind Rose Aug 2014

Nitrogen Oxides (NO_X) - ppb

Wapasu (AMS 17)



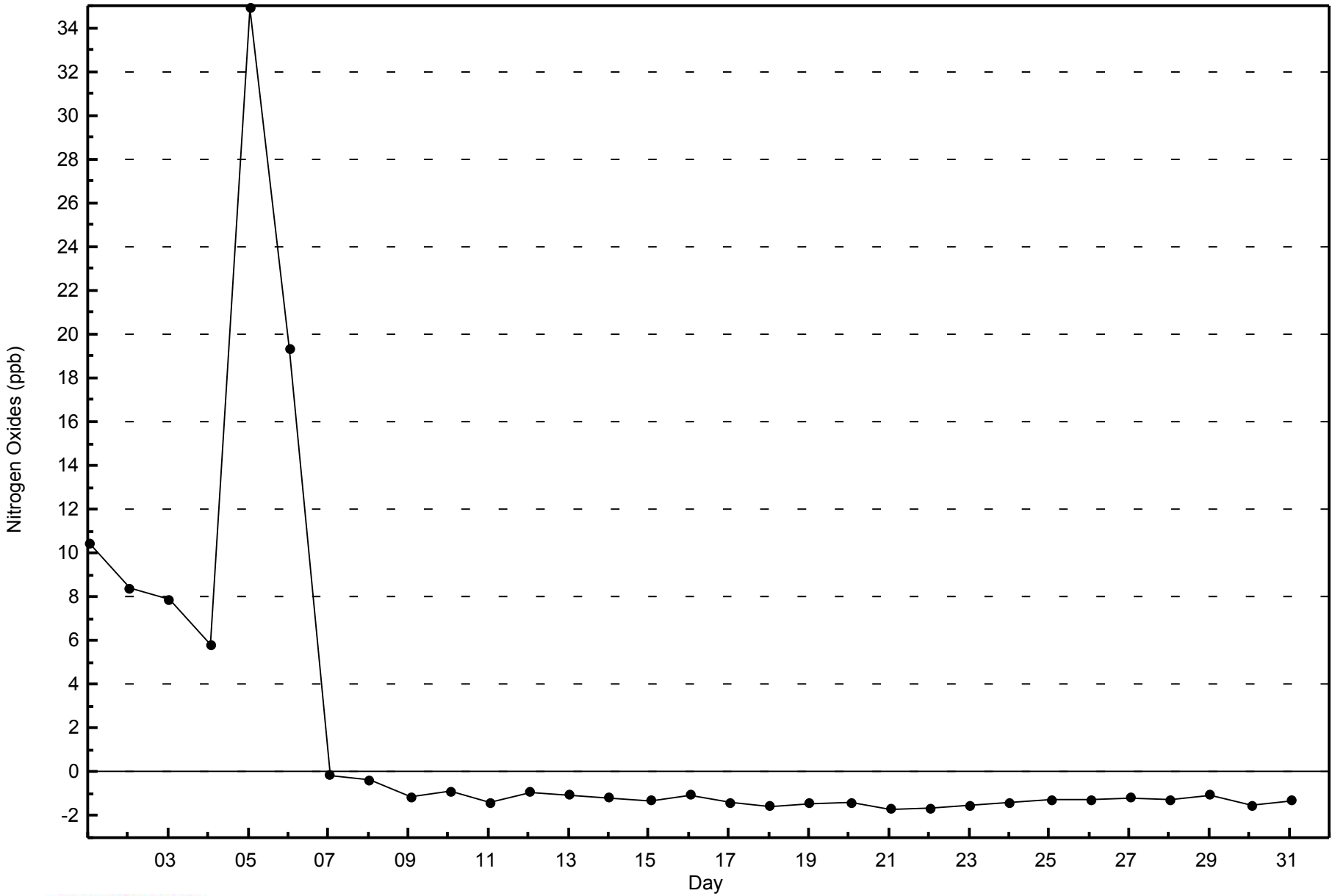
Classes (ppb)



Total Number of Valid Hours: 183

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Wapasu - August 2014



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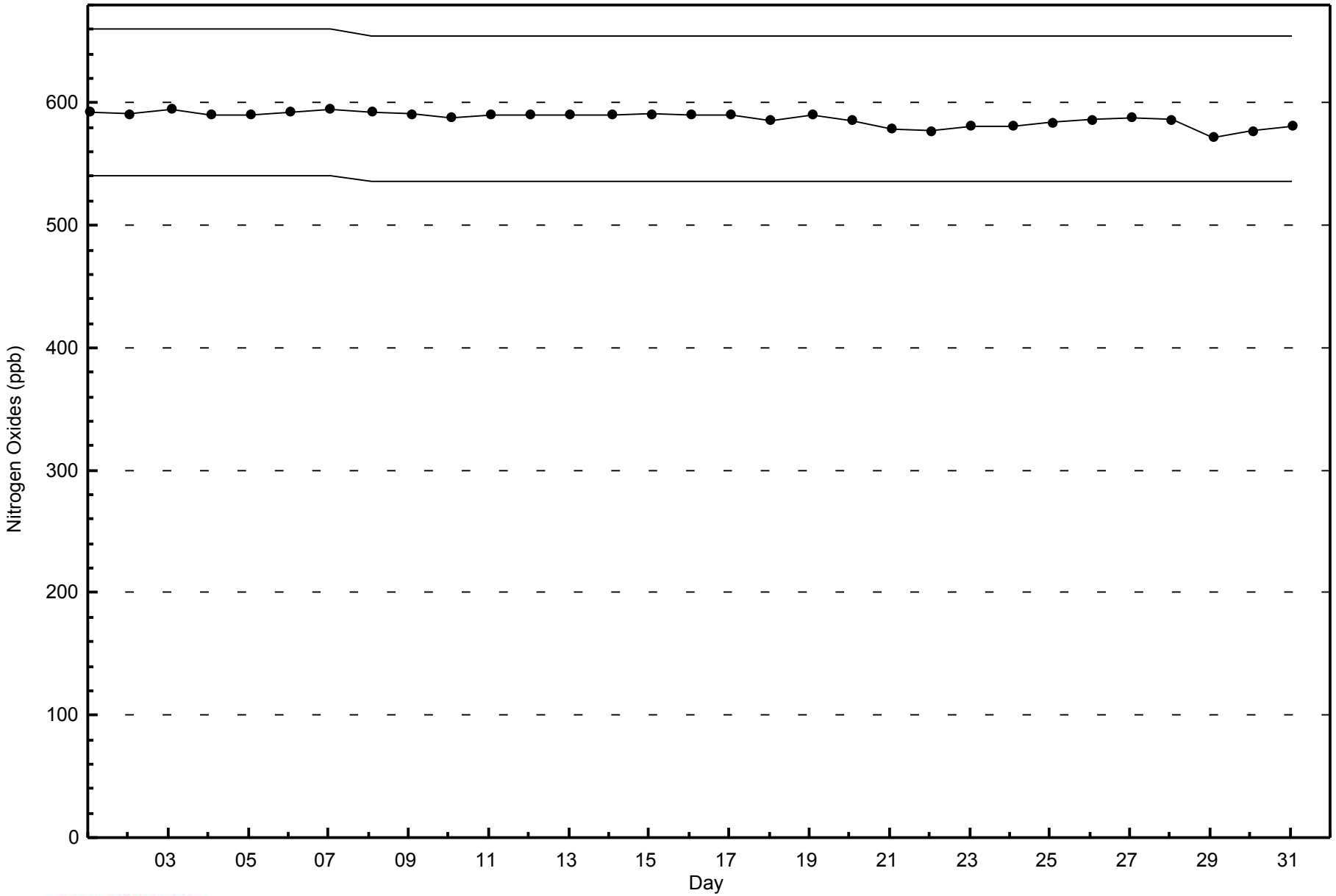
WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Wapasu - August 2014



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ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Wapasu - August 2014

Number of Exceedences (AAAQO): 24-hr: 3
Maximum Value: 347.0 $\mu g/m^3$ on Aug 16 06:00
Maximum Daily Average: 107.9 $\mu g/m^3$ on Aug 4

Minimum Value: 0.8 $\mu g/m^3$ on Aug 8 09:00
Maximum Diurnal Average: 29.3 $\mu g/m^3$ at hour 6
Monthly Average: 17.64 $\mu g/m^3$

Minimum Daily Average: 2.3 $\mu g/m^3$ on Aug 29
Minimum Diurnal Average: 11.6 $\mu g/m^3$ at hour 20
Percentiles: P_1 = 1.2 P_{10} = 2.2 Q_1 = 3.9 Median = 7.7 Q_3 = 14.1 P_{90} = 34.3 P_{99} = 189.6

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-Aug	33.8	80.3	84.3	65.5	56.7	51.0	37.4	27.3	19.7	22.1	24.2	21.6	17.7	14.1	14.7	14.2	14.0	13.9	13.7	13.9	11.1	9.3	11.8	12.8	28.5	84.3
2-Aug	11.7	10.8	9.3	8.4	8.3	8.5	8.3	12.6	16.6	15.6	21.1	25.7	28.4	34.5	29.6	28.0	31.4	22.2	17.2	10.8	10.9	12.0	14.2	13.2	17.1	34.5
3-Aug	13.4	15.0	16.1	16.9	14.6	11.5	9.5	8.8	11.1	10.9	10.8	12.6	12.3	10.5	7.7	6.9	9.7	11.3	14.8	14.9	13.0	14.3	14.0	14.0	12.3	16.9
4-Aug	15.3	17.4	19.0	16.5	15.8	18.0	17.9	16.3	49.8	198.7	180.4	230.5	275.4	239.1	209.0	89.5	111.8	100.8	98.5	110.9	112.4	128.7	163.1	155.8	107.9	275.4
5-Aug	138.5	145.6	138.8	117.1	98.8	96.6	111.3	111.3	110.8	124.0	117.5	85.0	80.1	72.9	52.4	36.8	53.0	52.1	45.2	36.5	25.0	17.9	12.5	10.4	78.8	145.6
6-Aug	8.5	5.5	4.5	4.4	4.5	4.1	4.0	3.6	3.4	3.4	3.4	3.7	5.0	6.0	6.1	10.1	9.0	9.7	8.6	7.5	10.8	16.8	18.1	16.6	7.4	18.1
7-Aug	18.2	15.3	16.0	20.7	63.9	112.7	104.8	M	30.8	13.7	5.0	2.2	1.5	1.3	1.5	1.2	2.0	1.9	1.6	1.6	2.4	2.8	3.0	2.9	18.6	112.7
8-Aug	2.6	2.0	1.6	2.0	2.9	3.7	2.8	0.8	0.8	1.9	3.6	4.5	5.1	4.9	4.4	4.5	4.7	5.3	3.9	4.0	5.6	3.9	2.2	3.8	3.4	5.6
9-Aug	4.3	5.4	4.9	2.4	2.7	3.4	1.9	1.8	2.9	3.0	2.6	4.1	7.8	7.9	7.7	8.6	8.9	8.1	7.1	3.9	2.3	4.4	6.8	9.9	5.1	9.9
10-Aug	12.0	8.1	8.3	9.4	11.0	19.4	6.6	3.4	4.2	5.8	7.9	9.1	6.6	9.2	11.1	11.4	11.5	12.5	8.3	6.5	4.1	4.8	6.0	9.3	8.6	19.4
11-Aug	16.1	19.4	19.2	22.2	13.0	13.4	13.6	10.9	12.5	10.6	8.9	8.5	7.9	4.9	3.9	2.8	2.6	2.8	2.7	1.3	1.4	5.9	34.9	54.1	12.2	54.1
12-Aug	55.8	52.7	41.4	38.4	40.3	50.7	40.4	35.0	39.1	28.7	23.1	19.4	12.7	11.5	9.0	5.8	4.9	4.1	4.4	3.9	5.4	10.2	9.9	9.1	23.2	55.8
13-Aug	6.8	7.2	7.2	6.2	7.4	7.2	6.4	7.1	6.5	7.0	6.4	7.1	8.0	8.3	9.5	8.4	10.4	13.1	10.5	10.0	12.5	12.9	14.9	16.3	9.1	16.3
14-Aug	15.8	15.6	11.8	12.1	12.6	19.3	23.7	17.2	21.8	23.5	31.4	44.2	30.5	18.9	22.5	21.6	24.6	27.6	48.2	39.6	40.7	48.8	51.8	53.2	28.2	53.2
15-Aug	47.9	50.4	47.7	40.3	37.4	34.3	26.9	17.8	11.2	9.2	7.7	7.5	9.2	9.8	14.1	11.1	9.1	8.9	8.6	13.6	17.3	19.3	17.6	13.4	20.4	50.4
16-Aug	15.6	23.0	23.6	113.0	325.2	347.0	306.9	132.9	79.8	46.8	26.1	30.9	21.0	20.3	14.6	9.9	8.2	9.1	7.8	7.1	7.1	9.7	11.7	10.0	67.0	347.0
17-Aug	9.4	10.8	11.2	11.1	11.7	10.9	9.4	7.4	11.0	21.7	25.8	12.9	8.9	5.7	4.2	3.1	3.1	4.1	5.6	5.1	5.1	4.3	4.7	6.1	8.9	25.8
18-Aug	8.8	11.1	10.9	9.4	8.2	8.1	7.0	3.1	4.3	8.3	9.5	14.8	20.1	30.1	34.1	35.1	30.8	32.3	26.5	10.2	8.5	8.8	8.6	7.1	14.8	35.1
19-Aug	6.6	7.1	6.2	5.2	4.9	5.2	8.0	10.5	11.0	13.8	19.1	13.0	12.9	10.3	4.0	3.7	3.2	3.0	3.0	2.7	3.5	3.4	2.7	8.1	7.1	19.1
20-Aug	11.0	5.5	5.4	7.5	11.7	11.9	10.4	10.2	5.9	3.0	3.3	3.8	4.2	3.6	2.8	3.4	3.3	2.2	2.1	2.5	2.8	3.0	3.4	4.0	5.3	11.9
21-Aug	3.7	4.4	5.0	4.8	5.1	5.3	5.3	3.2	1.8	1.4	1.1	1.3	1.7	2.2	3.0	3.2	4.0	3.7	2.2	2.3	2.9	3.1	3.6	4.4	3.3	5.3
22-Aug	4.1	3.9	3.8	3.5	2.9	2.8	1.8	1.8	1.5	1.3	1.6	1.6	2.5	4.6	5.4	5.5	5.3	5.3	5.5	5.8	6.0	6.3	6.4	7.0	4.0	7.0
23-Aug	8.9	8.5	7.5	7.0	6.4	6.3	5.6	2.2	1.9	2.1	1.9	3.1	4.6	6.1	6.6	6.9	6.2	6.2	6.6	7.6	9.6	11.1	8.9	6.7	6.2	11.1
24-Aug	7.3	7.4	7.3	8.0	7.7	7.2	7.1	8.0	10.9	19.0	31.9	14.8	7.9	7.9	7.7	8.3	9.8	13.2	11.7	10.3	13.1	9.7	6.7	8.2	10.5	31.9
25-Aug	6.8	7.1	13.0	19.0	20.5	13.9	12.8	13.0	11.3	9.9	7.7	5.5	4.2	4.4	4.7	5.2	6.1	7.5	7.4	7.9	7.1	6.4	6.4	5.9	8.9	20.5
26-Aug	5.8	6.1	6.1	6.2	6.6	6.7	4.8	4.7	8.4	11.8	15.5	16.2	14.1	14.7	18.2	18.8	18.6	16.8	12.0	7.6	6.8	6.3	7.2	6.0	10.2	18.8
27-Aug	4.9	7.3	11.1	9.9	9.4	12.0	7.6	5.3	5.7	4.8	3.8	3.6	2.5	2.5	2.5	2.6	2.3	2.3	1.9	2.2	2.3	2.8	3.0	1.2	4.7	12.0
28-Aug	1.2	2.0	3.3	4.6	4.5	5.0	5.6	2.5	1.2	1.0	1.1	PF	PF	PF	1.8	1.9	1.8	1.8	1.9	1.9	1.9	2.0	2.4	2.6	2.5	5.6
29-Aug	2.3	2.2	2.2	2.5	3.0	2.8	2.4	2.1	1.9	1.7	1.6	1.4	1.4	1.5	1.7	3.0	2.7	2.8	3.0	3.2	2.6	2.2	2.1	2.5	2.3	3.2
30-Aug	2.4	2.5	3.6	3.8	2.3	2.9	3.5	2.2	1.9	1.6	2.1	1.2	1.8	2.5	3.1	3.3	4.6	3.9	2.9	2.8	4.6	7.7	11.9	9.9	3.7	11.9
31-Aug	5.0	5.4	8.0	10.9	9.4	7.1	9.4	7.2	4.0	4.2	4.1	4.6	4.6	4.9	3.6	2.4	0.8	1.1	1.7	2.5	3.1	6.6	1.9	2.3	4.8	10.9
	16.3	18.2	18.0	19.6	26.8	29.3	26.5	16.3	16.2	20.3	19.7	20.5	20.7	19.2	16.8	12.2	13.5	13.2	12.7	11.6	11.7	13.1	15.2	15.7	Diurnal Average	
	138.5	145.6	138.8	117.1	325.2	347.0	306.9	132.9	110.8	198.7	180.4	230.5	275.4	239.1	209.0	89.5	111.8	100.8	98.5	110.9	112.4	128.7	163.1	155.8	Diurnal Maximum	

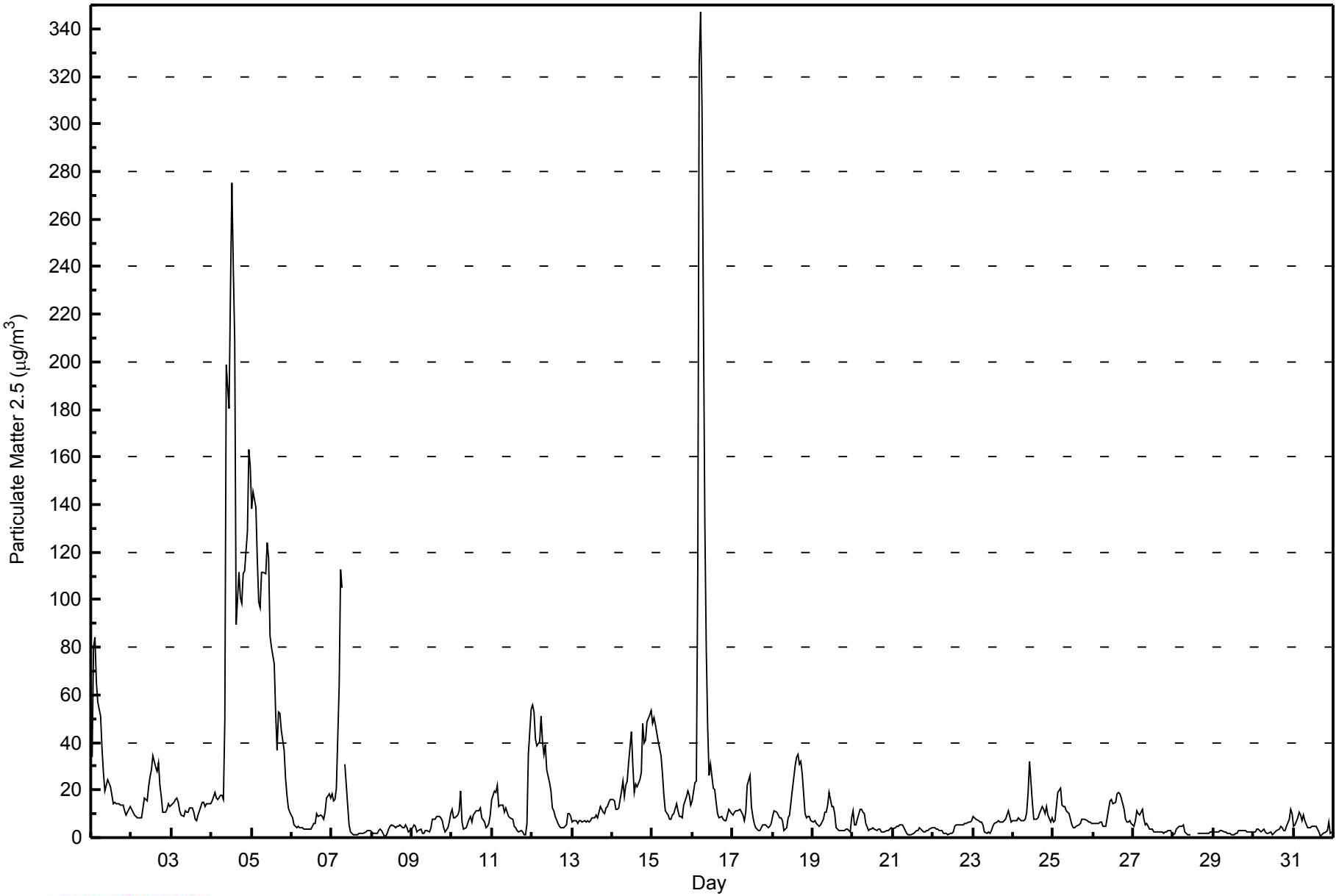
M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	268	36.22	36.22
6 - 15	302	40.81	77.03
16 - 25	67	9.05	86.08
26 - 80	65	8.78	94.86
> 81.0	35	4.73	99.59

Total Number of Valid Hours: 740

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Wapasu - August 2014

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	4	7	3	4	1	2	1	5	3	4	1	4	4	3	1	6	53
6 - 15	1	1	1	1	2	2	6	23	5	6	1	1	3	2	3	3	61
16 - 25	2	0	0	0	0	0	2	8	4	4	2	0	0	0	1	4	27
26 - 80	2	5	0	0	0	0	2	3	4	0	6	0	1	0	1	0	24
> 81.0	6	0	3	0	1	4	9	2	0	0	1	1	0	0	0	3	30
Totals	15	13	7	5	4	8	20	41	16	14	11	6	8	5	6	16	195

Total Number of Valid Hours: 197

Total Number of Hours: 744

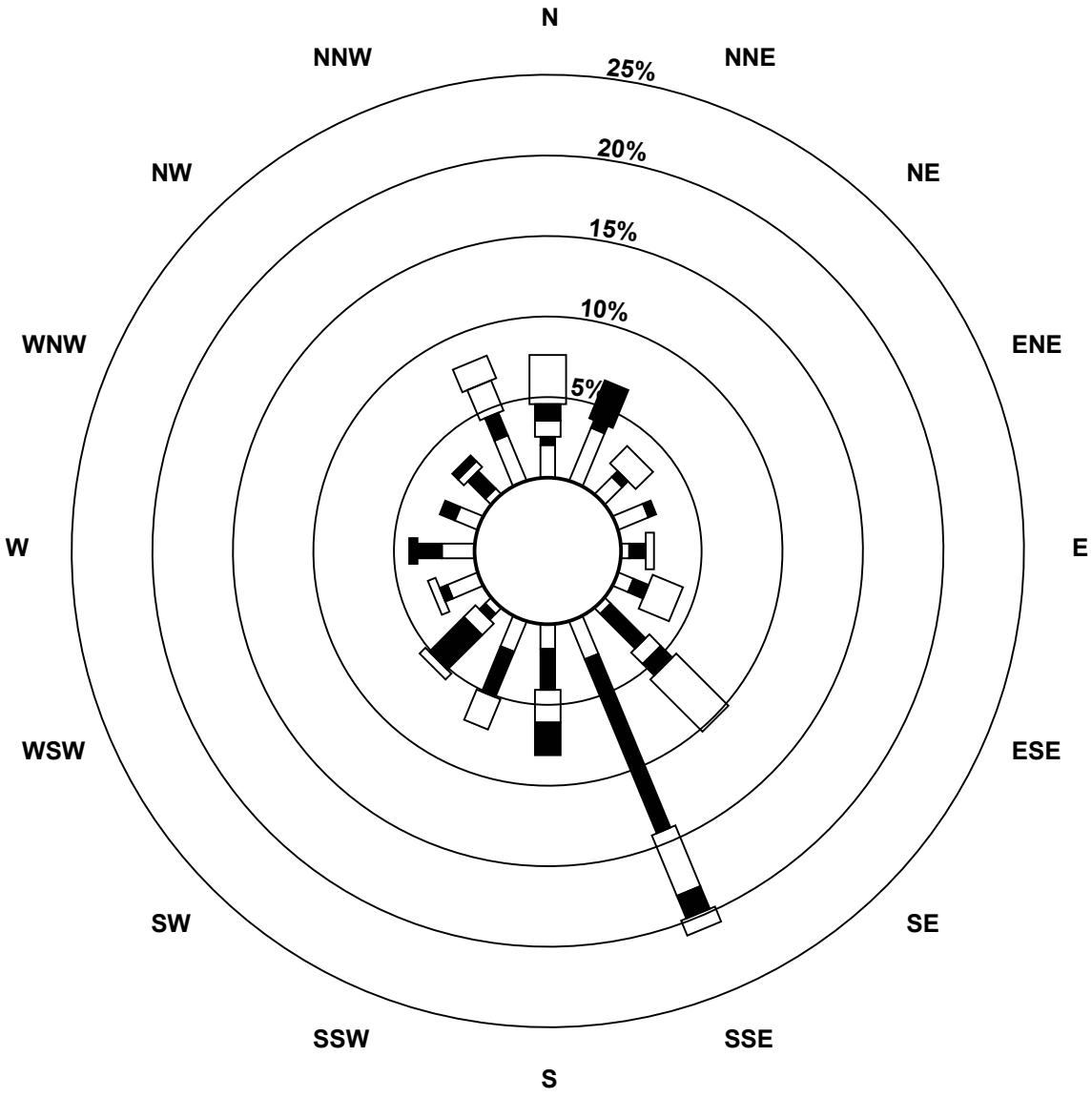
AURORA
ATMOSPHERICS INC.

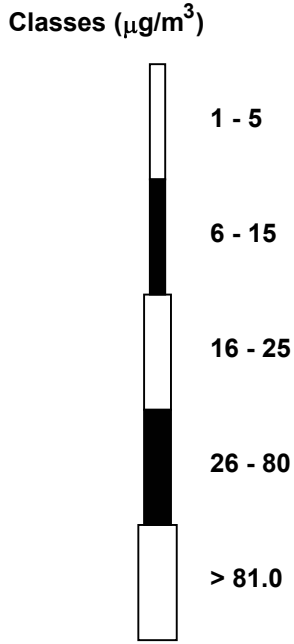
Wood Buffalo Environmental Association

Wind Rose Aug 2014

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

Wapasu (AMS 17)





Total Number of Valid Hours: 197

Maximum Value: 29.9 C on Aug 5 16:00

Maximum Daily Average: 23.7 C on Aug 5

Minimum Value: 4.2 C on Aug 8 05:00

Minimum Daily Average: 13.6 C on Aug 8

Maximum Diurnal Average: 25.1 C at hour 16

Minimum Diurnal Average: 12.5 C at hour 5

Monthly Average: 18.61 C

Percentiles: P_1 = 5.4 P_{10} = 10.5 Q_1 = 14.7 Median = 18.4 Q_3 = 22.7 P_{90} = 26.9 P_{99} = 29.7

Hours in Service:	744
Hours of Data:	198
Hours of Missing Data:	546
Hours of Calibration:	0
Percent Operational Time:	26.6

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-Aug	13.4	12.0	10.6	9.7	9.1	8.7	9.6	11.7	12.8	13.7	14.5	15.3	16.4	17.4	18.2	18.7	19.1	19.3	19.0	17.5	12.8	10.2	11.2	11.4	13.8	19.3
2-Aug	12.2	12.6	13.0	12.9	13.0	13.5	14.4	16.3	17.8	20.7	22.1	23.1	24.4	25.4	26.0	26.5	25.2	23.5	20.7	15.8	16.0	15.7	15.7	15.9	18.4	26.5
3-Aug	15.5	14.9	13.6	13.1	12.7	13.5	16.2	18.8	20.6	23.7	24.6	25.4	25.7	26.7	27.8	28.2	28.2	28.1	27.6	24.9	20.7	19.8	19.0	17.4	21.1	28.2
4-Aug	16.6	15.6	15.5	15.5	15.2	16.1	18.5	21.1	22.5	23.9	25.5	26.5	27.1	28.1	28.4	29.0	28.6	27.9	26.9	23.7	19.3	16.7	19.2	19.0	21.9	29.0
5-Aug	19.7	19.0	18.2	18.0	17.4	17.0	18.2	20.7	23.1	25.8	26.5	27.6	28.5	29.2	29.7	29.9	29.6	29.1	28.2	26.1	23.4	22.0	21.7	20.7	23.7	29.9
6-Aug	19.8	19.1	18.4	17.5	17.2	17.4	18.5	20.8	22.6	22.9	23.7	26.0	26.9	26.9	25.8	26.2	18.9	20.3	21.5	20.2	18.8	18.3	18.1	17.2	20.9	26.9
7-Aug	16.9	16.5	15.1	14.7	14.2	14.4	15.1	16.2	17.3	18.0	19.1	20.2	21.4	22.3	22.7	22.3	22.7	21.7	21.3	20.2	16.1	12.0	10.5	8.5	17.5	22.7
8-Aug	8.9	8.3	6.1	4.8	4.2	5.6	11.1	13.1	14.2	15.3	16.2	17.4	18.5	19.5	20.0	19.9	19.6	18.8	17.7	16.5	15.1	13.2	11.5	10.8	13.6	20.0
9-Aug	10.5	10.2	10.1	10.0	9.9	9.9	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	10.5
10-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
11-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
12-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
13-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
14-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
15-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
16-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
17-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
18-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
19-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
20-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
21-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
22-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
23-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
24-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
25-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
26-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
27-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
28-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
29-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
30-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
31-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
	14.8	14.3	13.4	12.9	12.5	12.9	15.2	17.3	18.9	20.5	21.5	22.7	23.6	24.4	24.8	25.1	24.0	23.6	22.8	20.6	17.8	16.0	15.9	15.1	Diurnal Average	
	19.8	19.1	18.4	18.0	17.4	17.4	18.5	21.1	23.1	25.8	26.5	27.6	28.5	29.2	29.7	29.9	29.6	29.1	28.2	26.1	23.4	22.0	21.7	20.7	Diurnal Maximum	

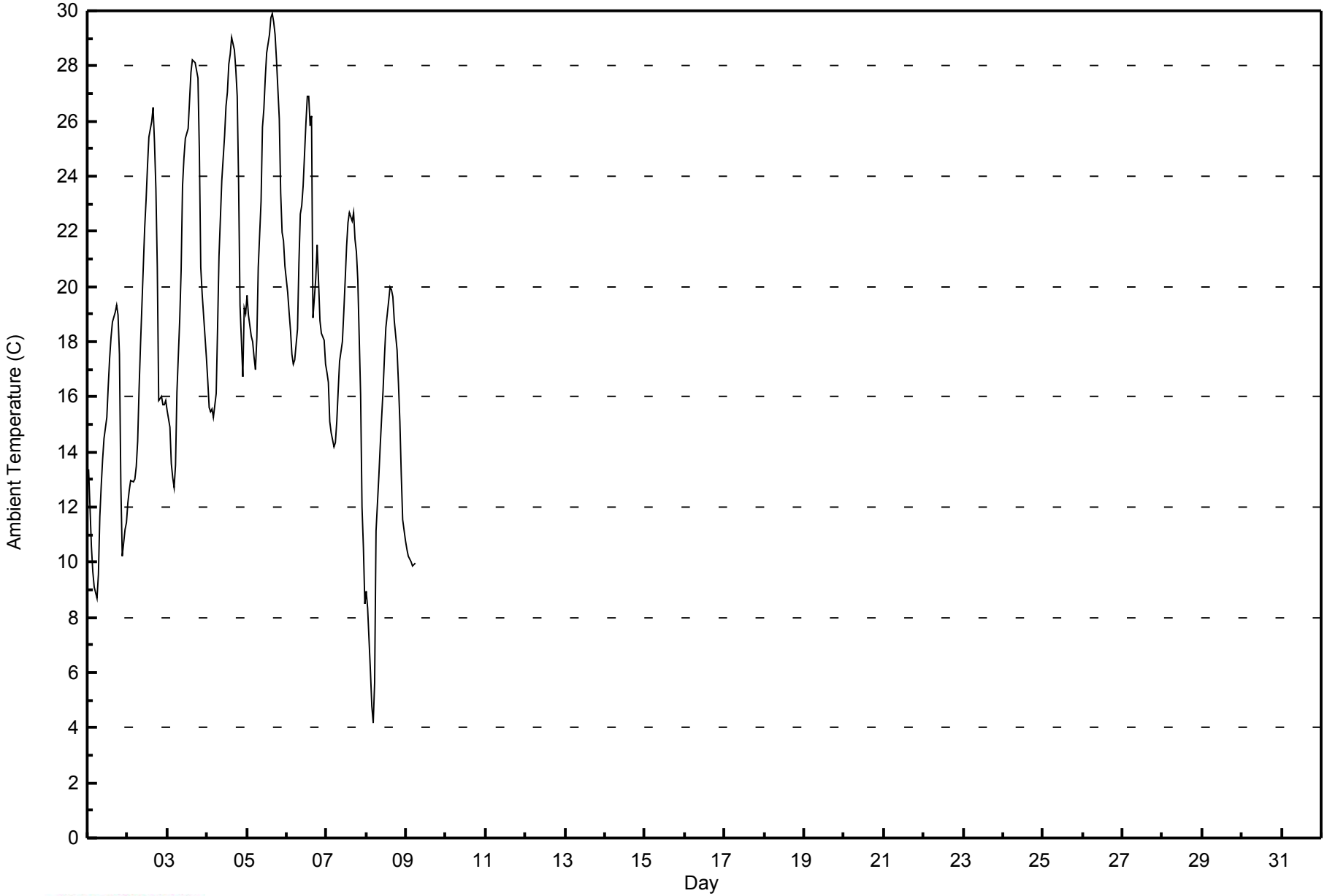
NF - Not Flagged

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Wapasu - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	13	6.57	6.57
10 - 20	111	56.06	62.63
> 20	74	37.37	100.00

Total Number of Valid Hours: 198

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Wapasu - August 2014

Maximum Value: 99 % on Aug 9 02:00

Maximum Daily Average: 71.7 % on Aug 8

Minimum Value: 22 % on Aug 5 16:00

Minimum Daily Average: 43.9 % on Aug 5

Maximum Diurnal Average: 80.0 % at hour 5

Minimum Diurnal Average: 35.8 % at hour 16

Monthly Average: 61.2 %

Percentiles: P_1 = 25 P_{10} = 35 Q_1 = 46 Median = 58 Q_3 = 78 P_{90} = 90 P_{99} = 98

Hours in Service:	744
Hours of Data:	198
Hours of Missing Data:	546
Hours of Calibration:	0
Percent Operational Time:	26.6

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-Aug	86	86	88	90	92	94	87	69	61	59	55	52	48	44	43	43	43	43	44	53	79	87	77	71	66.3	94
2-Aug	64	60	56	54	52	53	53	56	62	60	56	55	49	43	40	40	46	53	63	88	82	80	78	79	59.2	88
3-Aug	82	86	91	94	94	90	81	71	63	53	48	46	43	35	27	26	27	31	33	43	57	55	55	60	58.0	94
4-Aug	63	68	70	71	72	69	64	56	52	49	46	44	45	38	34	28	31	31	38	51	66	71	56	53	52.7	72
5-Aug	49	52	55	55	56	59	56	51	46	39	38	33	30	28	25	22	25	27	31	43	54	60	58	61	43.9	61
6-Aug	68	72	73	76	78	78	73	64	60	61	60	52	48	47	52	47	75	78	77	80	82	83	80	81	68.5	83
7-Aug	78	73	77	77	80	81	79	72	63	60	54	50	41	38	36	35	33	34	35	39	57	75	79	85	59.7	85
8-Aug	87	91	93	96	98	96	79	72	66	62	58	54	50	46	45	46	48	54	60	66	73	90	95	97	71.7	98
9-Aug	98	99	98	98	98	98	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	99
10-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
11-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
12-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
13-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
14-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
15-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
16-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
17-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
18-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
19-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
20-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
21-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
22-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
23-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
24-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
25-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
26-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
27-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
28-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
29-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
30-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
31-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--	--
	75.1	76.2	78.0	79.1	80.0	79.6	71.4	63.8	59.4	55.4	52.0	48.3	44.2	39.7	37.7	35.8	41.0	43.7	47.7	57.9	68.7	75.0	72.2	73.4	Diurnal Average	
	98	99	98	98	98	98	87	72	66	62	60	55	50	47	52	47	75	78	77	88	82	90	95	97	Diurnal Maximum	

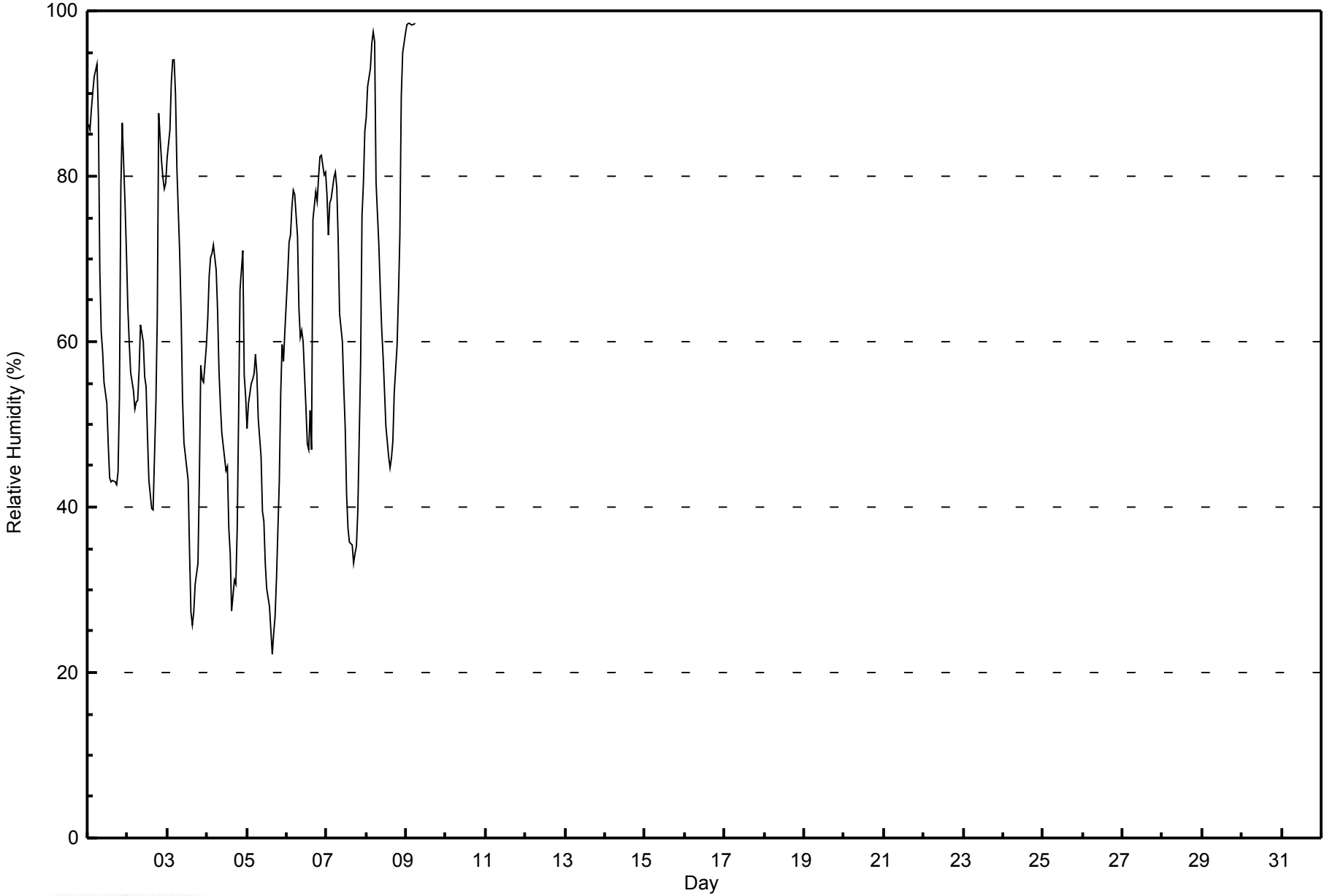
NF - Not Flagged

WBEA

Hourly Averages

Relative Humidity (RH) - %

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	31	15.66	15.66
40 - 60	76	38.38	54.04
60 - 80	53	26.77	80.81
80 - 100	38	19.19	100.00

Total Number of Valid Hours: 198

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Wapasu - August 2014

Maximum Speed: 19 km/h on Aug 7 13:00

Maximum Daily Speed Average: 8.7 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 8 22:00

Minimum Daily Speed Average: 2.0 km/h on Aug 4

Maximum Diurnal Speed Average: 5.6 km/h at hour 16

Minimum Diurnal Speed Average: 0.4 km/h at hour 19

Monthly Average Velocity: 2.1 km/h 182.8 deg

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 7 $Q_3 = 10$ $P_{90} = 12$ $P_{99} = 16$

Hours in Service:	744
Hours of Data:	198
Hours of Missing Data:	546
Percent Operational Time:	26.6

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-Aug	N9	N10	N10	NNE8	NNE8	NNE6	NNE7	NNE10	N12	NNW12	NNW11	NW10	NNW9	NNW9	NNW9	NW8	NNW7	N4	NNE4	NE2	SE3	SE4	SE7	SE9	N5.5	NNW12
2-Aug	SSE10	SSE10	SSE11	SSE13	SSE13	SSE14	SSE14	S12	S10	SSW12	SW14	SW13	SW12	SW12	SW13	SW12	S12	SW10	N7	E11	SE12	SE10	SSE9	SSE7	S8.7	SSE14
3-Aug	S6	S5	SSE5	SSE6	SSE6	SSE6	SSE6	SSW5	SSW5	S2	SSW4	NW4	NW4	WNW4	WSW5	WNW5	W4	SSW6	SSW6	SSE4	SE5	SSE6	SSE6	SSE7	S3.4	SSE7
4-Aug	SSE7	SSE7	SSE7	SSE6	SSE7	SSE7	SSE7	NW3	NW5	NNW6	N6	NNW7	N8	N8	N7	NNW7	N6	NE6	NE4	NE4	E4	ESE6	ESE9	ESE10	ENE2.0	ESE10
5-Aug	ESE13	SE13	SE12	SE11	SE9	SE7	SE8	SE10	SE10	SSE7	SSE9	SE7	SE6	SE7	SSE9	S8	S7	S7	SSE6	SSE5	SE6	SE8	SSE10	SSE9	SE8.0	ESE13
6-Aug	SSE10	SSE10	SSE9	S9	SSE10	SSE10	SSE9	S10	SSW9	SW8	SSW9	SSW11	SSW12	S12	SSW9	W12	ENE2	SE6	SSE6	SSE7	SSE7	S6	S6	S5	S7.5	S12
7-Aug	SSW6	SW6	SSW5	SSW6	SW7	SW9	WSW10	WSW13	W16	W15	WSW15	WSW17	WSW19	W16	W17	W14	WNW13	WNW10	W8	W5	WSW3	S2	NNE2	ESE2	WSW8.7	WSW19
8-Aug	NNW2	SE1	E3	ESE3	ENE3	ENE3	ENE4	NNE5	NNE6	N5	NNW6	NNW7	NNW8	N6	NNE6	N6	NE6	NE6	NNE5	NE6	E3	ENE0	NNW7	NW4	NNE3.7	NNW8
9-Aug	NNW6	NNE6	N6	NNE5	NNE4	NNE3	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	NNE6
10-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
11-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
12-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
13-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
14-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
15-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
16-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
17-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
18-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
19-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
20-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
21-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
22-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
23-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
24-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
25-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
26-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
27-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
28-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
29-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
30-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
31-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	----	----
	SE3.5	SE3.8	SE4.1	SE4.7	SSE4.4	SSE4.4	SSE4.7	S2.8	SW2.4	W3.8	WSW4.2	WSW4.3	W4.8	W3.6	WSW4.4	W5.6	WNW1.7	SW1.5	N0.4	ESE2.8	SE4.5	SE5.1	SE4.5	SSE5.3	Diurnal Average	
	ESE13	SE13	SE12	SSE13	SSE13	SSE14	SSE14	WSW13	W16	W15	WSW15	WSW17	WSW19	W16	W17	WNW14	WNW13	WNW10	W8	E11	ESE12	SE10	SSE10	ESE10	Diurnal Maximum	

NF - Not Flagged

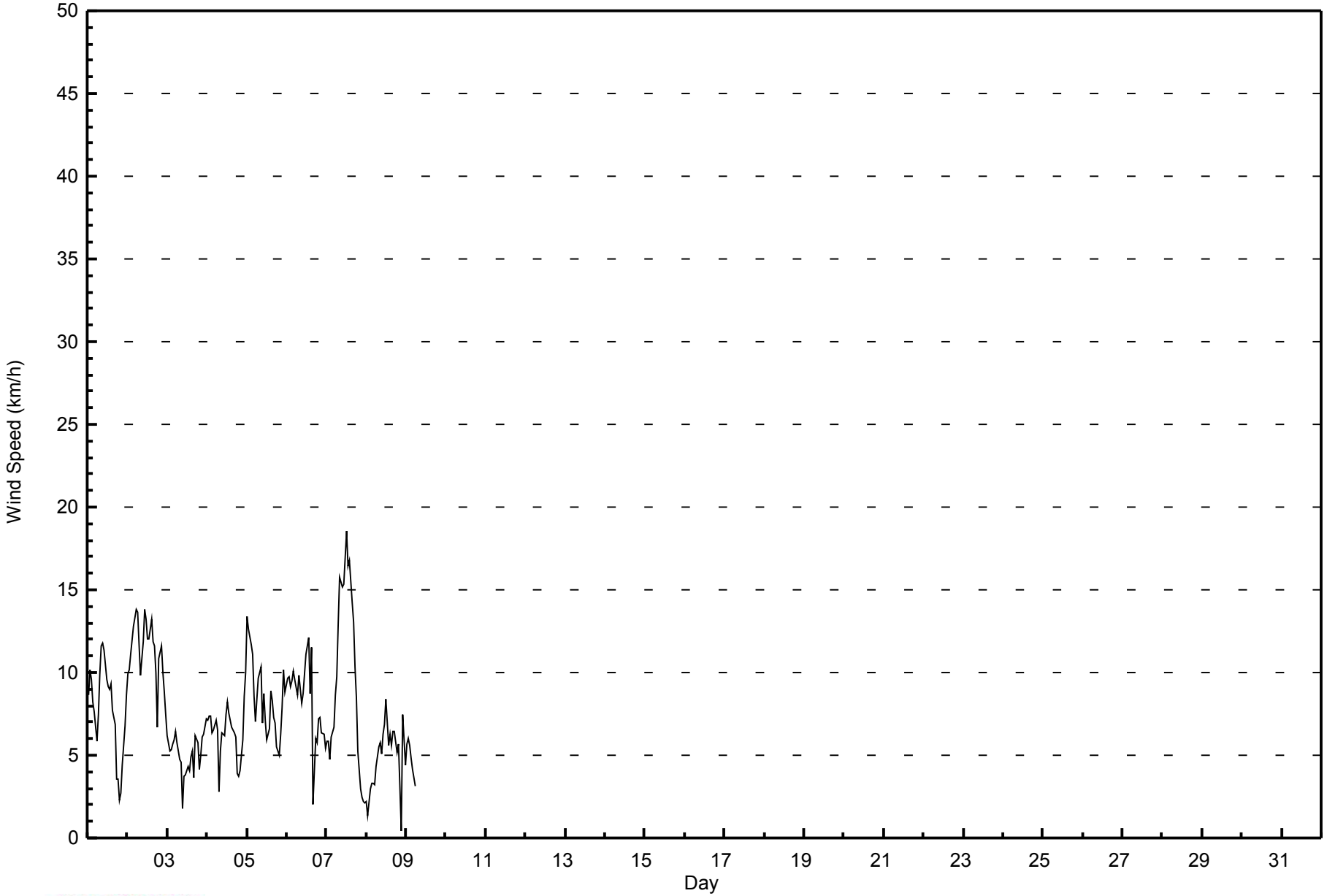
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Wapasu - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	49	24.75	24.75
6 - 11	117	59.09	83.84
12 - 19	32	16.16	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: 198

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Wapasu - August 2014

Wind Speed	**Wind Direction**																
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	2	7	3	5	3	3	3	3	4	4	0	2	2	2	5	1	49
6 - 11	12	8	4	0	1	3	15	34	9	8	5	1	1	1	1	14	117
12 - 19	1	0	0	0	0	2	2	4	3	2	6	4	5	2	0	1	32
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	15	15	7	5	4	8	20	41	16	14	11	7	8	5	6	16	198

Total Number of Valid Hours: 198

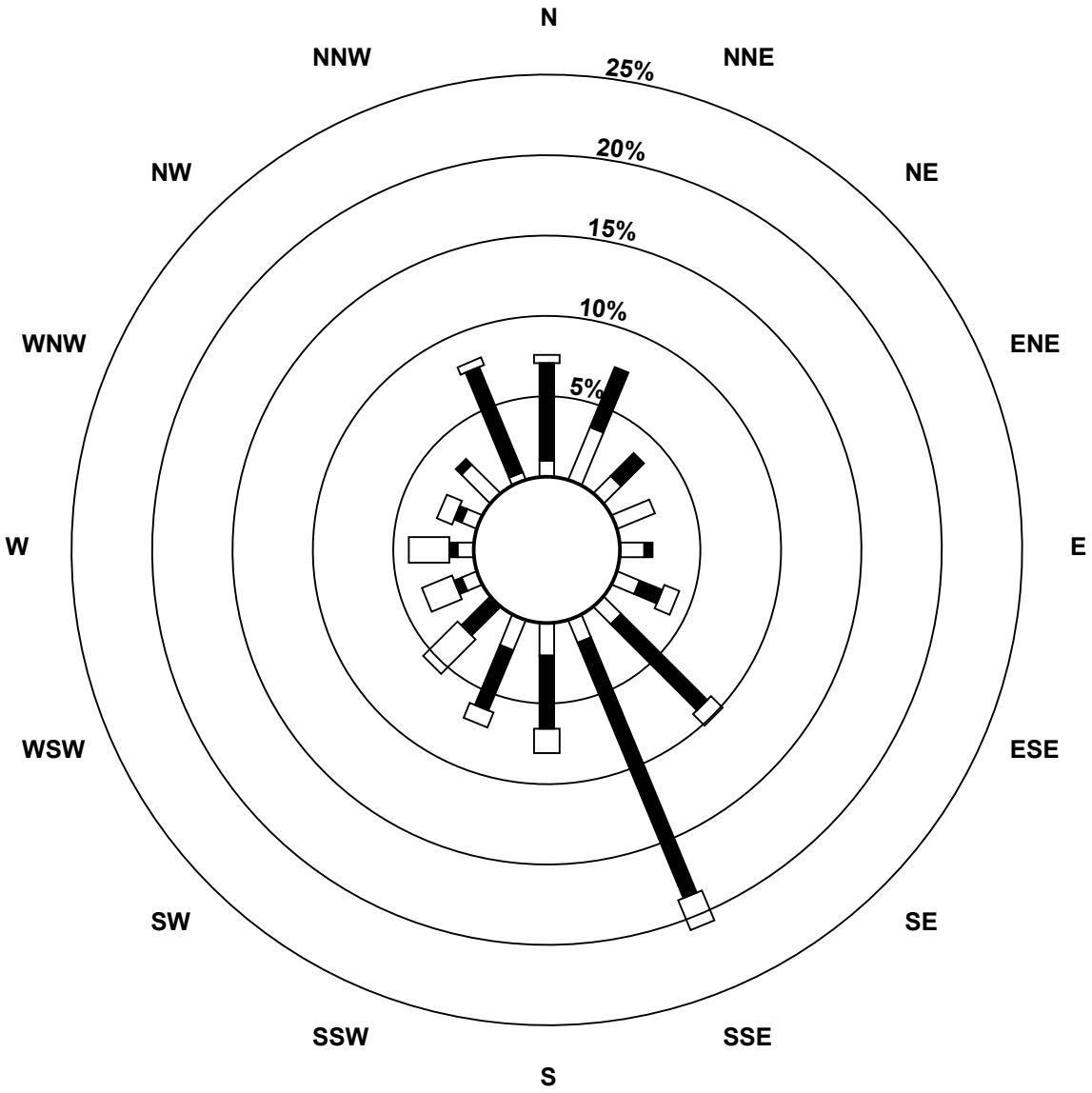
Total Number of Hours: 744

Wood Buffalo Environmental Association

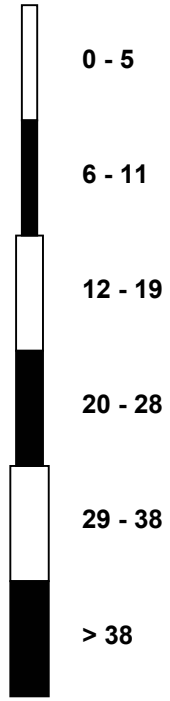
Wind Rose Aug 2014

Wind Speed (WS) - km/h

Wapasu (AMS 17)



Classes (km/h)



Total Number of Valid Hours: 198

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

Maximum Value: 6 km/h on Aug 7 13:00

Minimum Value: 0 km/h on Aug 8 06:00

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

Hours in Service:	744
Hours of Data:	198
Hours of Missing Data:	546
Hours of Calibration:	0
Percent Operational Time:	26.6

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

NF - Not Flagged

Direction of Maximum Speed: 258 deg on Aug 7 13:00
Direction of Maximum Daily Speed Average: 257.7 deg on Aug 7

Direction of Minimum Speed: 66 deg on Aug 8 22:00

Direction of Minimum Daily Speed Average: 2.0 deg on Aug 4

Monthly Average Direction: 219.9 deg

Hours in Service:	744
Hours of Data:	198
Hours of Missing Data:	546
Percent Operational Time:	26.6

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-Aug	357	8	11	18	19	26	18	26	4	345	335	326	334	330	327	317	327	349	21	56	124	130	136	146	359.8
2-Aug	147	152	159	156	159	161	159	171	190	211	223	216	220	219	225	218	173	225	357	88	124	138	151	164	178.3
3-Aug	176	189	164	164	161	155	165	205	205	186	196	323	306	297	250	288	265	212	205	160	139	157	150	148	187.7
4-Aug	147	149	150	151	153	149	160	318	318	340	354	348	354	356	0	348	351	35	43	54	91	114	115	120	68.2
5-Aug	121	132	132	134	132	137	133	136	138	168	161	145	127	132	166	187	183	182	161	148	143	144	152	162	146.1
6-Aug	158	161	165	170	165	163	167	180	193	227	195	194	208	186	193	265	74	144	147	155	161	170	179	176	179.7
7-Aug	203	217	202	210	218	232	237	244	262	271	256	253	258	270	270	281	298	289	277	272	243	176	17	105	257.7
8-Aug	333	129	88	108	78	74	61	30	14	11	344	343	338	7	12	9	40	51	33	42	94	66	340	310	19.9
9-Aug	334	13	10	32	22	17	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
10-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
11-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
12-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
13-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
14-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
15-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
16-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
17-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
18-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
19-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
20-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
21-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
22-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
23-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
24-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
25-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
26-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
27-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
28-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
29-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
30-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
31-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
	144.6	143.6	139.1	144.1	146.5	152.8	157.2	179.8	234.6	266.8	250.1	257.4	269.8	263.8	258.3	274.7	289.2	227.5	10.2	106.9	134.2	143.8	140.3	149.9	
	Diurnal Average																								

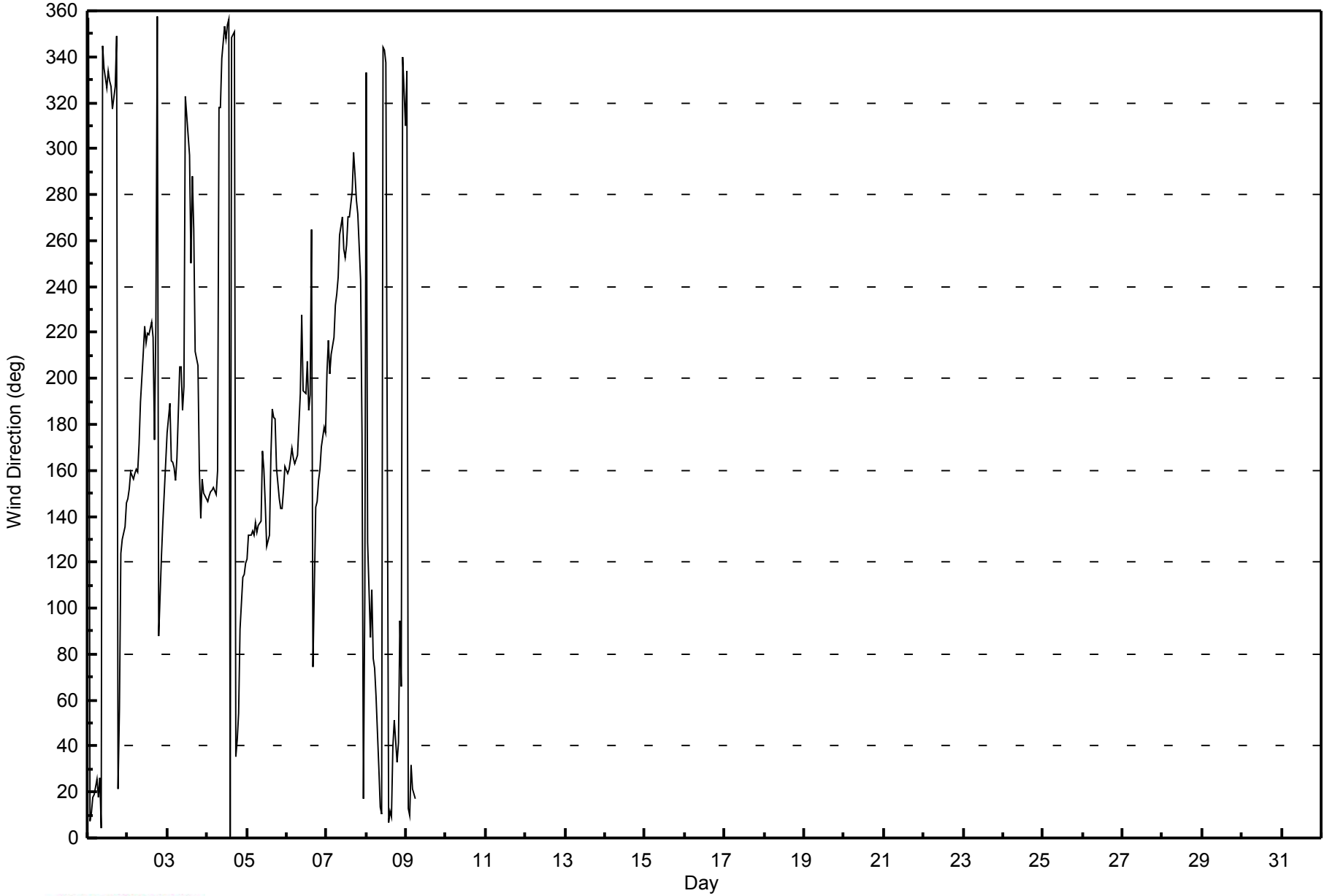
NF - Not Flagged
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Direction (WD) - deg

Wapasu - August 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Aug 3 17:00

Minimum Value: 6 deg on Aug 4 00:00

Percentiles: P_1 = 7 P_{10} = 13 Q_1 = 22 Median = 31 Q_3 = 40 P_{90} = 56 P_{99} = 83

Hours in Service:	744
Hours of Data:	198
Hours of Missing Data:	546
Hours of Calibration:	0
Percent Operational Time:	26.6

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-Aug	39	38	37	34	34	39	41	39	36	36	36	34	41	46	39	46	42	72	49	26	18	7	9	13	72
2-Aug	16	19	22	22	24	24	23	30	37	38	34	36	36	41	37	38	33	31	71	24	20	15	19	22	71
3-Aug	24	32	13	13	16	13	23	39	50	84	60	86	75	76	63	60	95	43	42	23	13	11	10	6	95
4-Aug	8	7	9	11	10	10	19	80	39	38	50	40	35	43	42	43	44	37	21	17	12	14	16	15	80
5-Aug	20	17	17	16	15	30	15	16	20	34	34	40	54	47	39	40	45	29	22	13	11	13	18	25	54
6-Aug	22	22	24	26	25	23	27	33	37	38	36	39	41	43	47	35	82	25	19	22	21	23	33	20	82
7-Aug	31	26	22	30	32	32	28	25	27	30	29	29	28	30	30	26	28	28	27	29	45	39	60	66	66
8-Aug	59	76	32	25	12	9	28	40	45	61	57	54	43	72	54	42	36	30	31	29	55	87	29	23	87
9-Aug	26	42	39	35	33	32	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	42
10-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
11-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
12-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
13-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
14-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
15-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
16-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
17-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
18-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
19-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
20-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
21-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
22-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
23-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
24-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
25-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
26-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
27-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
28-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
29-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
30-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
31-Aug	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
	59	76	39	35	34	39	41	80	50	84	60	86	75	76	63	60	95	72	71	29	55	87	60	66	
	Diurnal Maximum																								

NF - Not Flagged

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 3, 2014
Station Name	Wapasu	Station Number	AMS 17

Reason: Routine

Start Time (MST)	10:10	End Time (MST)	12:36
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	852	852
Calculated slope	1.003540	1.006115	Chamber temp.	45.2	45.2
Calculated intercept	0.067046	0.495669	Pressure (mmHg)	680.2	680.2
Analyzer Background	8.3	8.3	Flow (lpm)	0.447	0.447
Analyzer Coefficient	0.808	0.808	Intensity	83	83

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	-0.6	NA
as found span	5000	60.4	577.4	573.1	1.008
calibrator zero	5000	0.0	0.0	-0.2	NA
high point	5000	60.4	577.4	573.7	1.006
second point	5000	30.2	288.7	285.9	1.010
third point	5000	15.1	144.4	143.0	1.009
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	570.9	1.011
				Average Correction Factor	1.009

Corrected As found	573.7	Previous response	575.3	% change	0.3%

Notes:

No Maintance Done, Filter changed out, No adjustments made

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

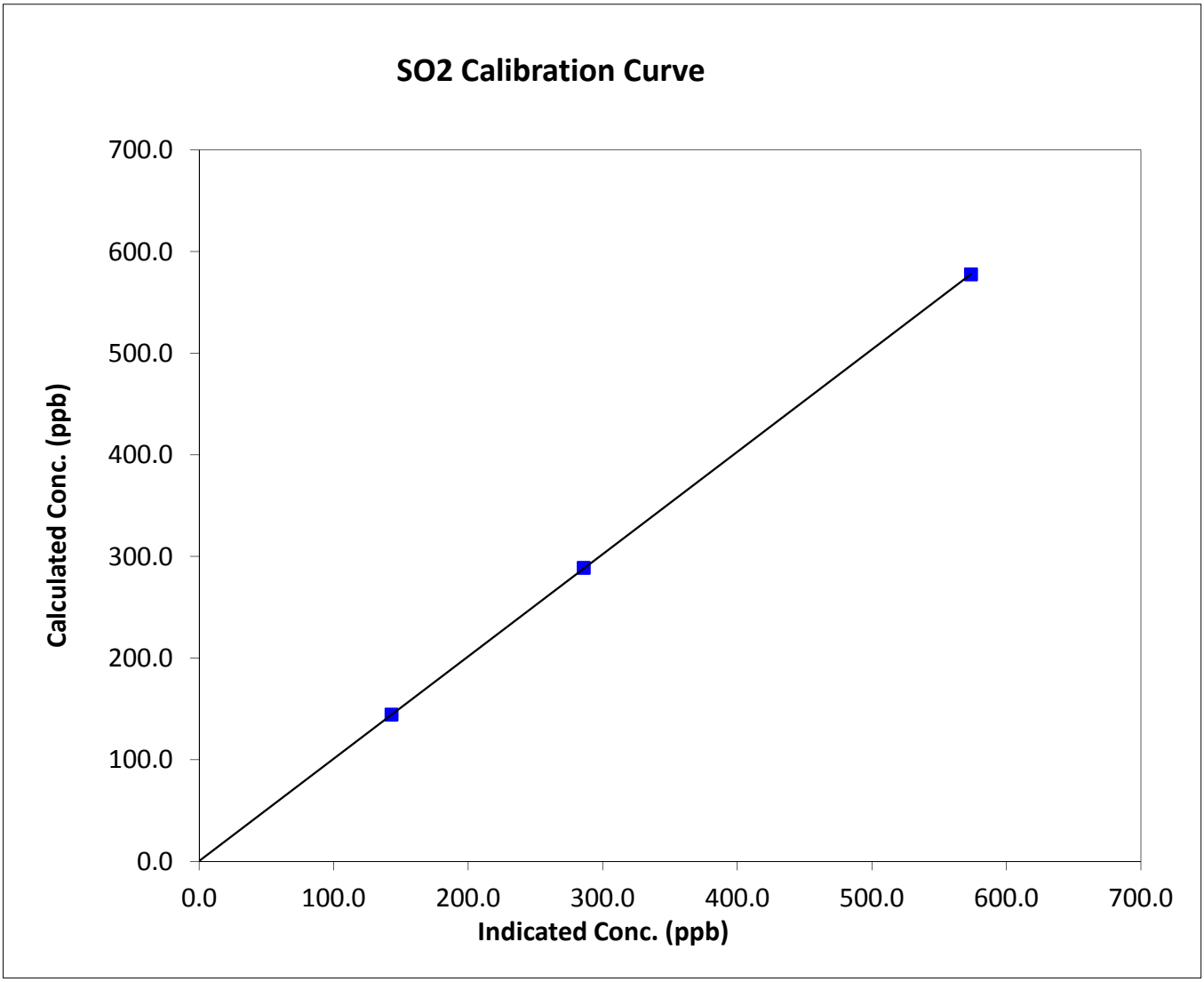
SO_2 Calibration Summary

Station Information

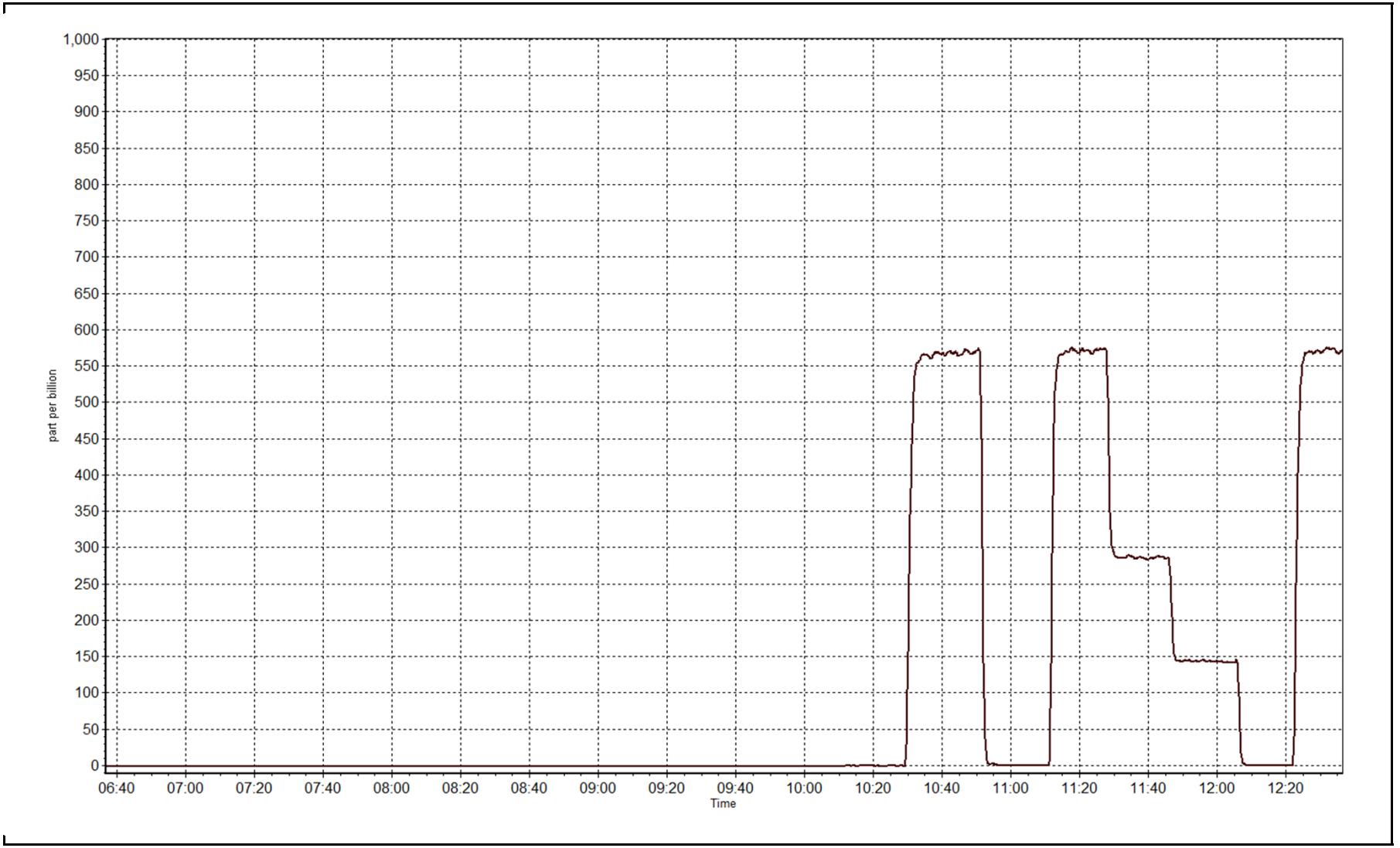
Calibration Date	August 7, 2014	Previous Calibration	July 3, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	10:10	End Time (MST)	12:36
Analyzer make	Thermo 43i	Analyzer serial #	1218153459

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999997
577.4	573.7	1.0065		
288.7	285.9	1.0098	Slope	1.006115
144.4	143.0	1.0095		
			Intercept	0.495669



SO2 Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 7, 2014	Previous Calibration	July 15, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	7:00	End Time (MST)	10:12
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial number	997
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	30-May-13
Gas Cert Reference	SA5558	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	804	804
Calculated slope	0.977210	0.997492	Chamber temp.	45	45
Calculated intercept	0.141042	0.224073	Pressure	552.5	552.5
Analyzer Background	11.8	11.8	Flow	0.950	0.950
Analyzer Coefficient	0.837	0.830	Intensity	91	91
			Converter temp.	340	340

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	-0.1	NA
as found span	5000	39.3	80.2	80.2	1.000
SO2 scrubber check	5000	80.5	769.6	1.1	NA
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5000	39.3	80.2	80.2	1.000
second point	5000	19.6	40.0	39.8	1.005
third point	6000	11.8	20.1	19.8	1.013
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			80.1	
				Average Correction Factor	1.006

Corrected As found	80.3	Previous response	81.9	% change	2.0%

Notes:

Scrubber checked before the as founds, Span adjusted, No Maintenance Done, filter changed

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

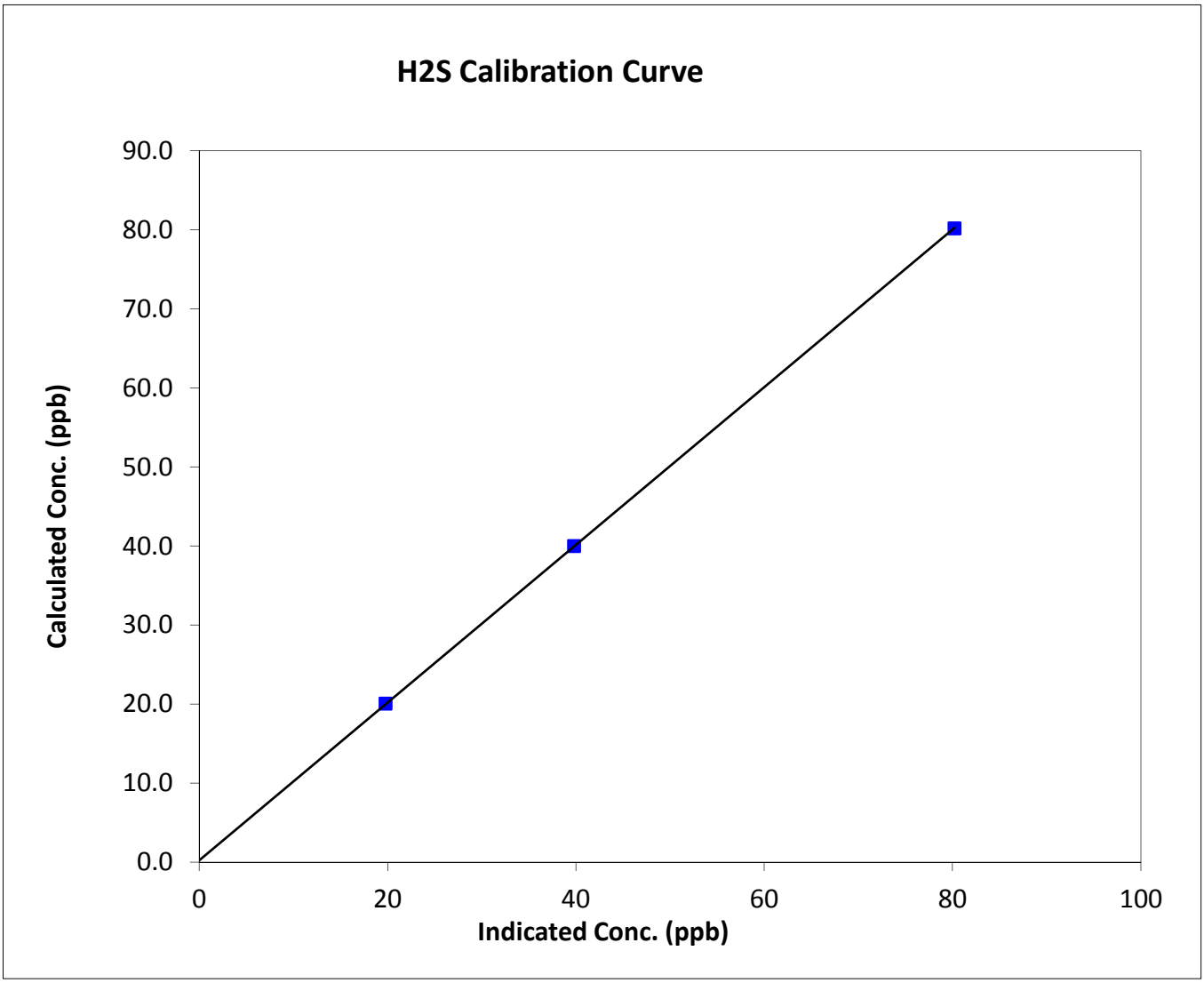
H2S Calibration Summary

Station Information

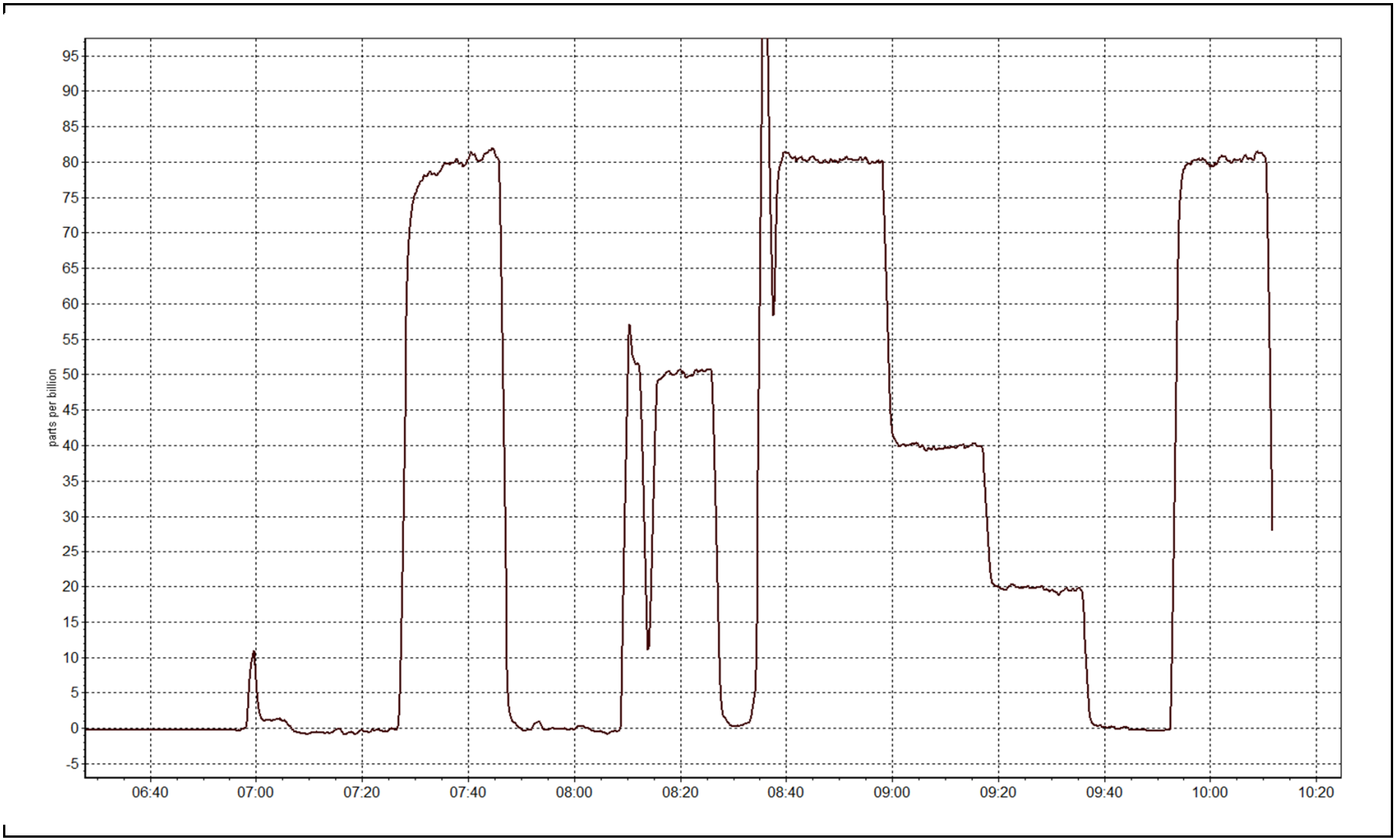
Calibration Date	August 7, 2014	Previous Calibration	July 15, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:00	End Time (MST)	10:12
Analyzer make	450i	Analyzer serial #	1218153583

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999994
80.2	80.2	0.9997		
40.0	39.8	1.0046	Slope	0.997492
20.1	19.8	1.0131		
			Intercept	0.224073



H2S Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, August 07, 2014	Previous Calibration	Thursday, July 03, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	10:10	End Time (MST)	12:36
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	40.5	40.6
Calculated slope	1.005476	1.005980	Fuel Pressure	24.8	24.8
Calculated intercept	-0.034082	-0.047055		2.6	2.5
				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	0.06	N/A
as found span	5000	60.4	13.19	13.01	1.014
calibrator zero	5000	0.0	0.00	-0.04	N/A
high point	5000	60.4	13.19	13.11	1.006
second point	5000	30.2	6.60	6.67	0.989
third point	5000	15.1	3.30	3.40	0.970
calibrator zero	5000	0.0	0.00	0.05	N/A
as left zero	5000	0.0	0.00	0.05	N/A
as left span	5000	60.4	13.19	13.04	1.012
				Average Correction Factor	0.989

Corrected As found	12.95	Previous response	13.16	% change	1.6%

Notes:

Filter changed, zero adjusted, no maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

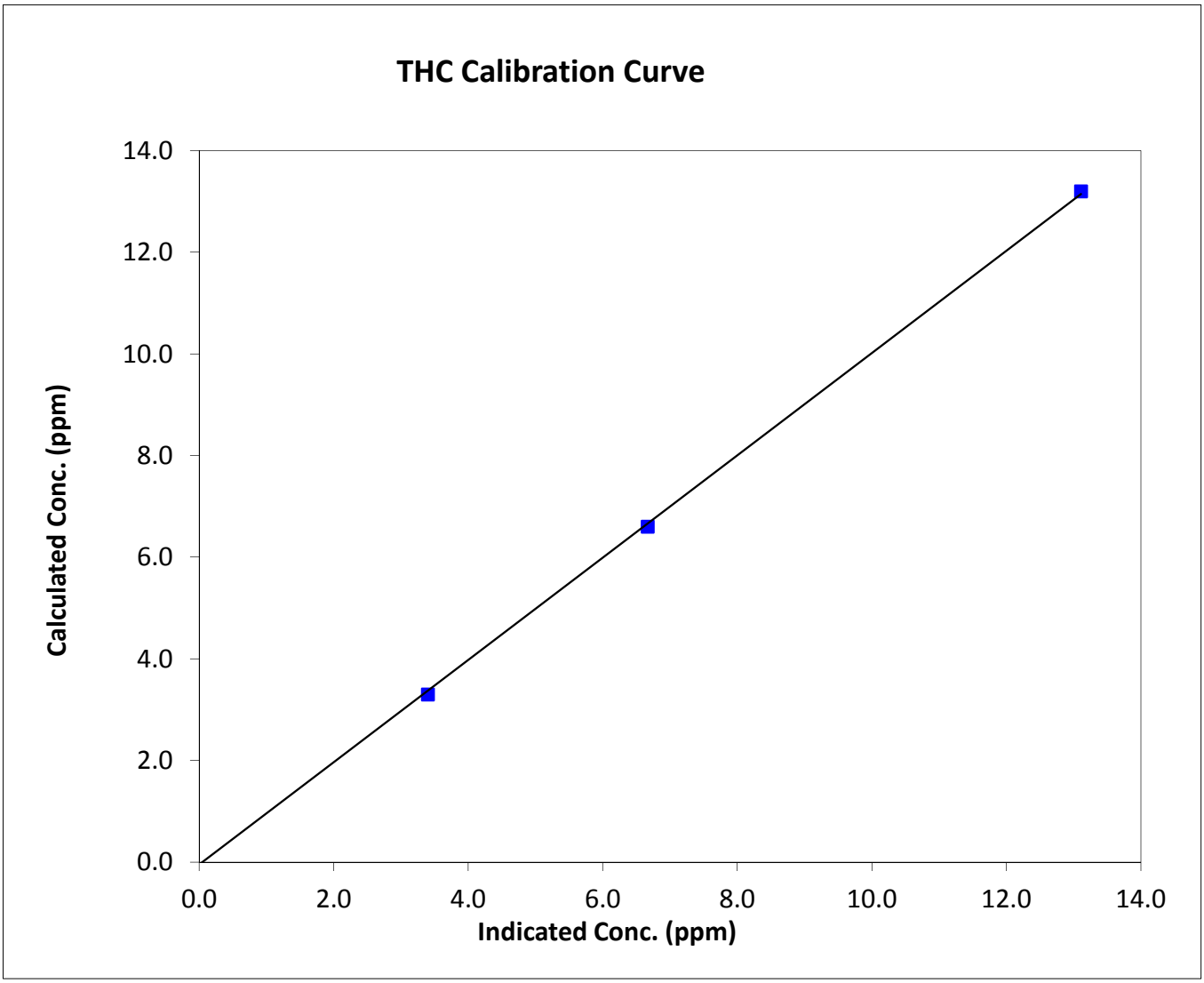
THC Calibration Summary

Station Information

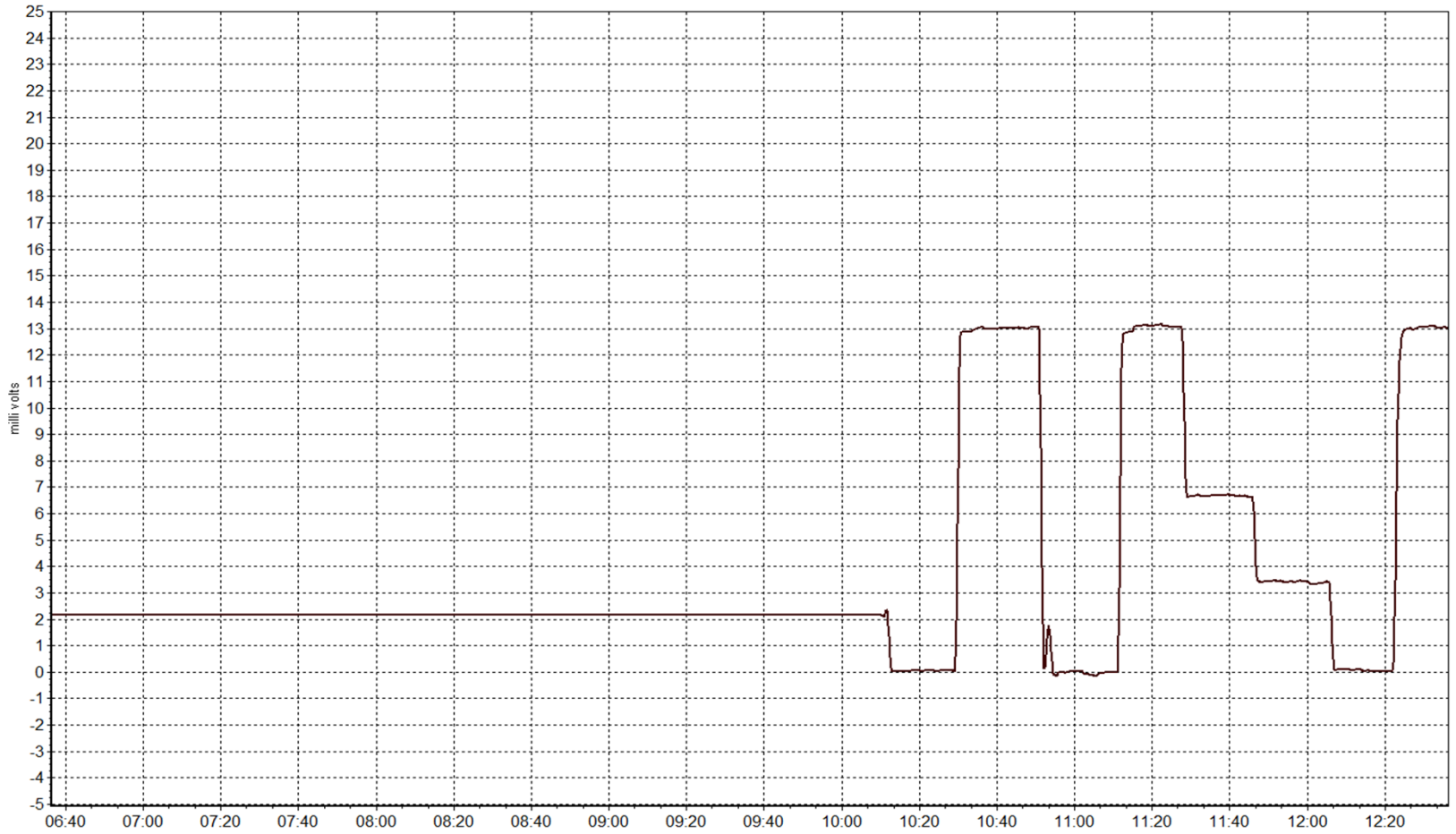
Calibration Date	August 7, 2014	Previous Calibration	July 3, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	10:10	End Time (MST)	12:36
Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153352

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.04	N/A	Correlation Coefficient	0.999787
13.19	13.11	1.0064		
6.60	6.67	0.9891	Slope	1.005980
3.30	3.40	0.9702		
			Intercept	-0.047055



THC Calibration Plot Date: August 7, 2014



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	August 3, 2014	Previous Calibration	July 15, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	12:25	End Time (MST)	15:30
Barometric Pressure	23 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	T700	Serial Number	997
NO2 calibration used	Thursday, July 03, 2014	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.	27.8	23.8
Analyzer Range (input)	500	500	Photo Lamp Temp.	58.0	58.0
Calculated slope	0.986666	0.991266	Pressure	26.1	26.0
Calculated intercept	1.018369	-1.149505	Flow	677	725
Analyzer Background	1.436	2.776			
Analyzer Coefficient	1.016	1.016			

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	0.0	0.0	43.2	N/A
as found span	5000	932.0	389.7	526.8	0.740
calibrator zero	5000	0.0	0.0	1.9	N/A
high point	5000	932.0	389.7	394.3	0.988
second point	5000	495.5	264.4	268.6	0.984
third point	5000	260.7	138.3	139.2	0.993
calibrator zero	5000	0.0	0.0	1.9	N/A
as left zero					
as left span					
				Average Correction Factor	0.989

Corrected As found	483.6	Previous response	393.9	% change	-18.5%

Notes:

Filter was changed after as founds. This filter was found to have caused the elevated zero readings. Internal pump was bypassed and an external pump is now being used. No adjustments were made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

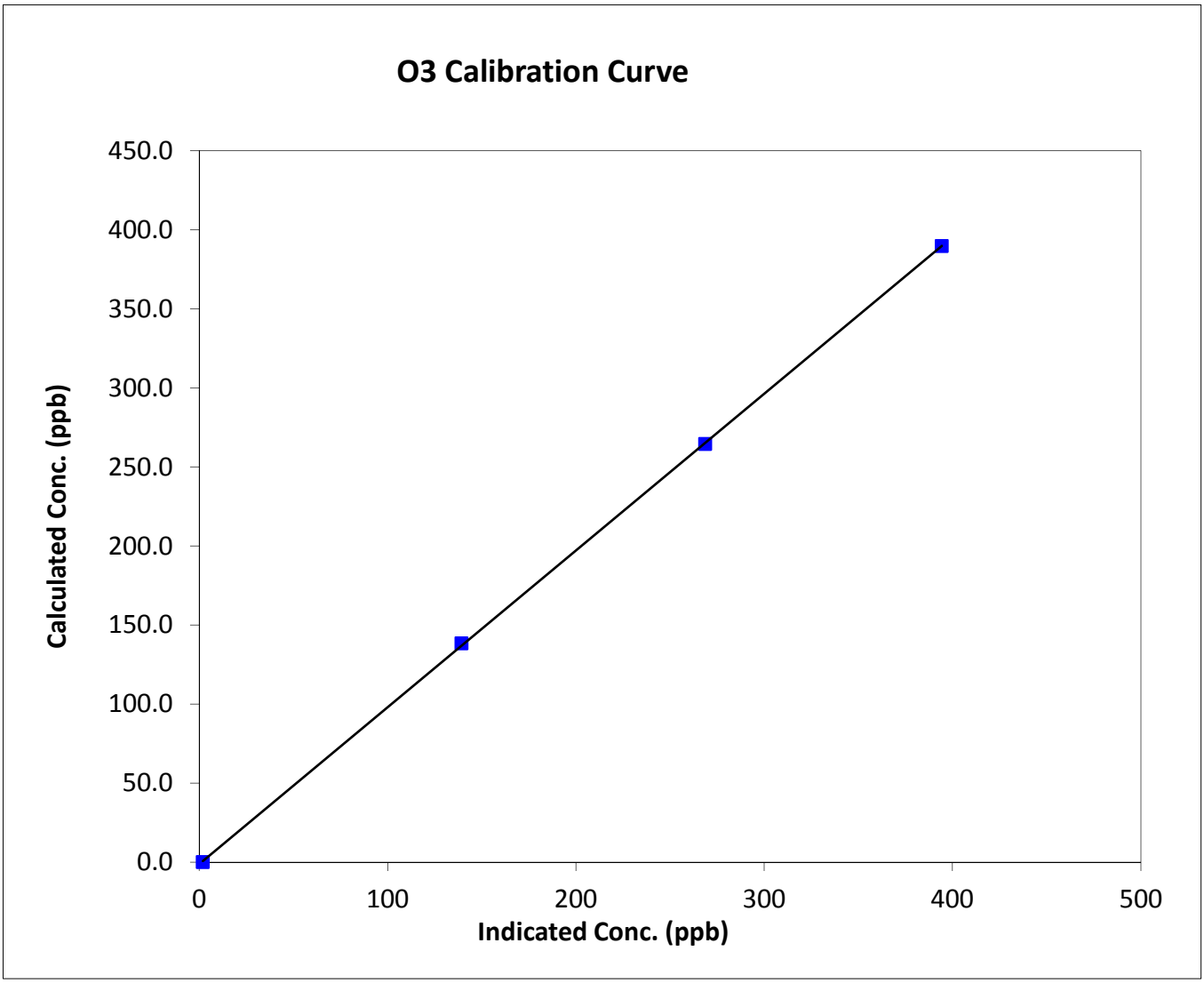
O_3 Calibration Summary

Station Information

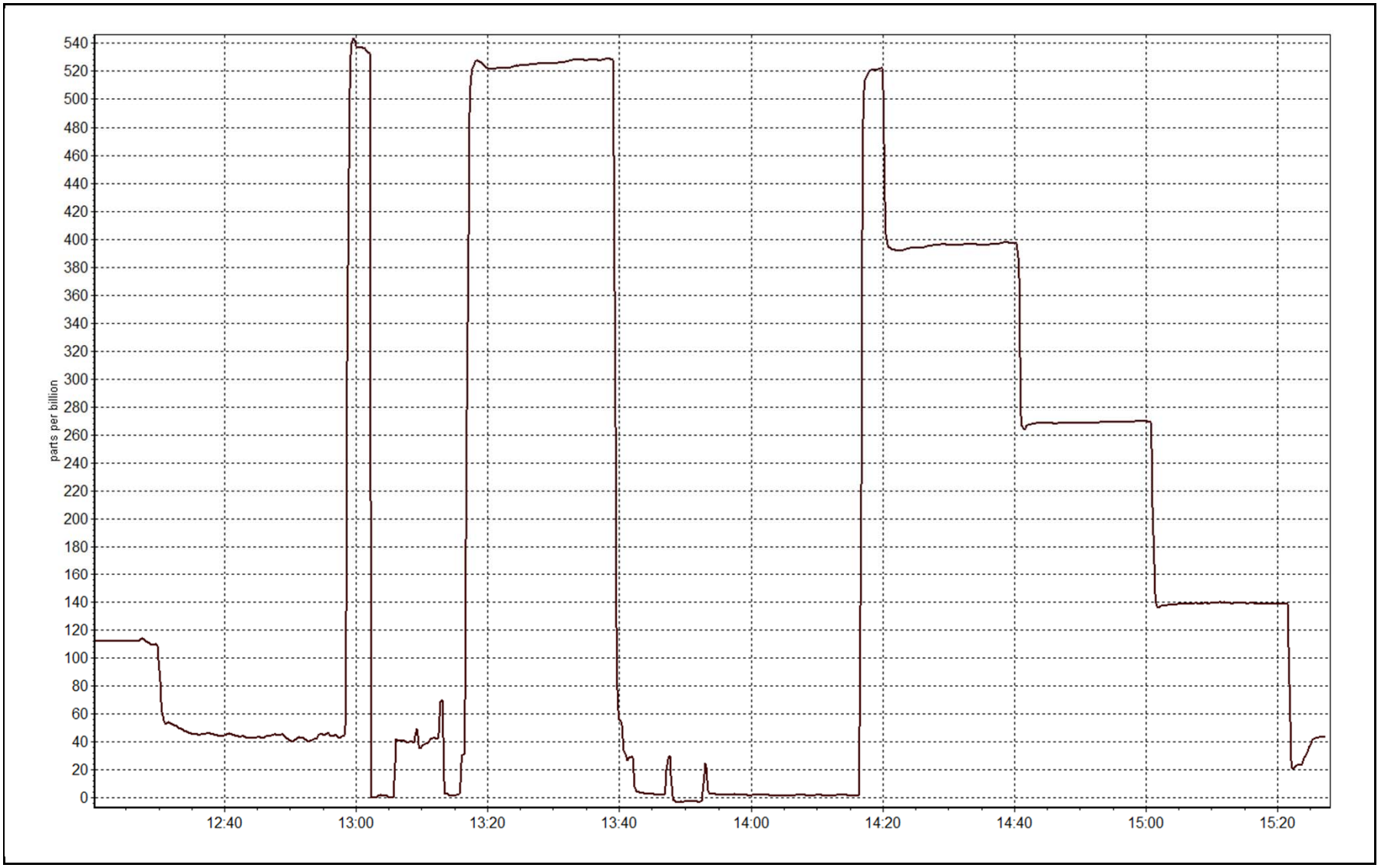
Calibration Date	Sunday, August 03, 2014	Previous Calibration	July 15, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	12:25	End Time (MST)	15:30
Analyzer make	T400	Analyzer serial #	824

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	1.9	N/A	Correlation Coefficient	0.999963
389.7	394.3	0.9883		
264.4	268.6	0.9843	Slope	0.991266
138.3	139.2	0.9933		
			Intercept	-1.149505



O3 Calibration Plot Date: August 3, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 3, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	7:22	End Time (MST)	12:46
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	0.988955	0.992499	1.006418
	Data Offset	0.022135	0.011633	-0.584437
After	Data Slope	0.997778	0.999028	1.012945
	Data Offset	0.324901	0.131933	0.698805
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	0.960	ppb	0.972	ppb
NOX coefficient	0.961	ppb	0.975	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	-0.6		-0.1	
NOX bkgrnd	1.7		3.6	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	315.0	Deg C	315.0	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	71.0	ccm	71.0	ccm
R Cell Press	5.5	mmHg	5.5	mmHg
Sample Flow	444-437	ccm	444-437	ccm

Notes:

Filter changed, Moly converter changed out, zero and span adjusted

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 6, 2014 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	11.8	0.2	11.6	N/A	N/A
as found span	5000	60.4	600.4	600.4	0.0	596.0	592.0	4.1	1.0073	1.0141
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	N/A	N/A
high point	5000	60.4	600.4	600.4	0.0	601.1	600.5	0.6	0.9988	0.9998
second point	5000	30.2	300.2	300.2	0.0	301.6	301.5	0.1	0.9953	0.9956
third point	5000	15.1	150.1	150.1	0.0	149.1	149.1	0.0	1.0067	1.0067
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	N/A	N/A
as left span	5000	60.4	600.4	217.8	382.6	597.9	216.6	379.5	1.0041	1.0055
								Average Correction Factor	1.0003	1.0007

Corrcted As found NO_X= 584.2 NO= 591.8 Percent Change NO_X= 3.9% NO= 2.2%

Previous Response NO_X= 607.1 NO= 604.9

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			-0.2			N/A	
1st NO2 (300)	N/A	217.8	383.3	594.6	217.8	377.8	0.9977	1.0000	1.0146	98.6%
2nd NO2 (200)	N/A	340.5	260.6	597.2	340.5	256.9	0.9933	1.0000	1.0144	98.6%
3rd NO2 (100)	N/A	464.8	136.3	597.9	464.8	133.0	0.9922	1.0000	1.0248	97.6%
4th NO2 (0)	601.1	N/A	1.4	602.5	601.1	1.3	0.9846	1.0000	N/A	N/A
					Average Correction Factor		0.9919	1.0000	1.0179	98.2%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

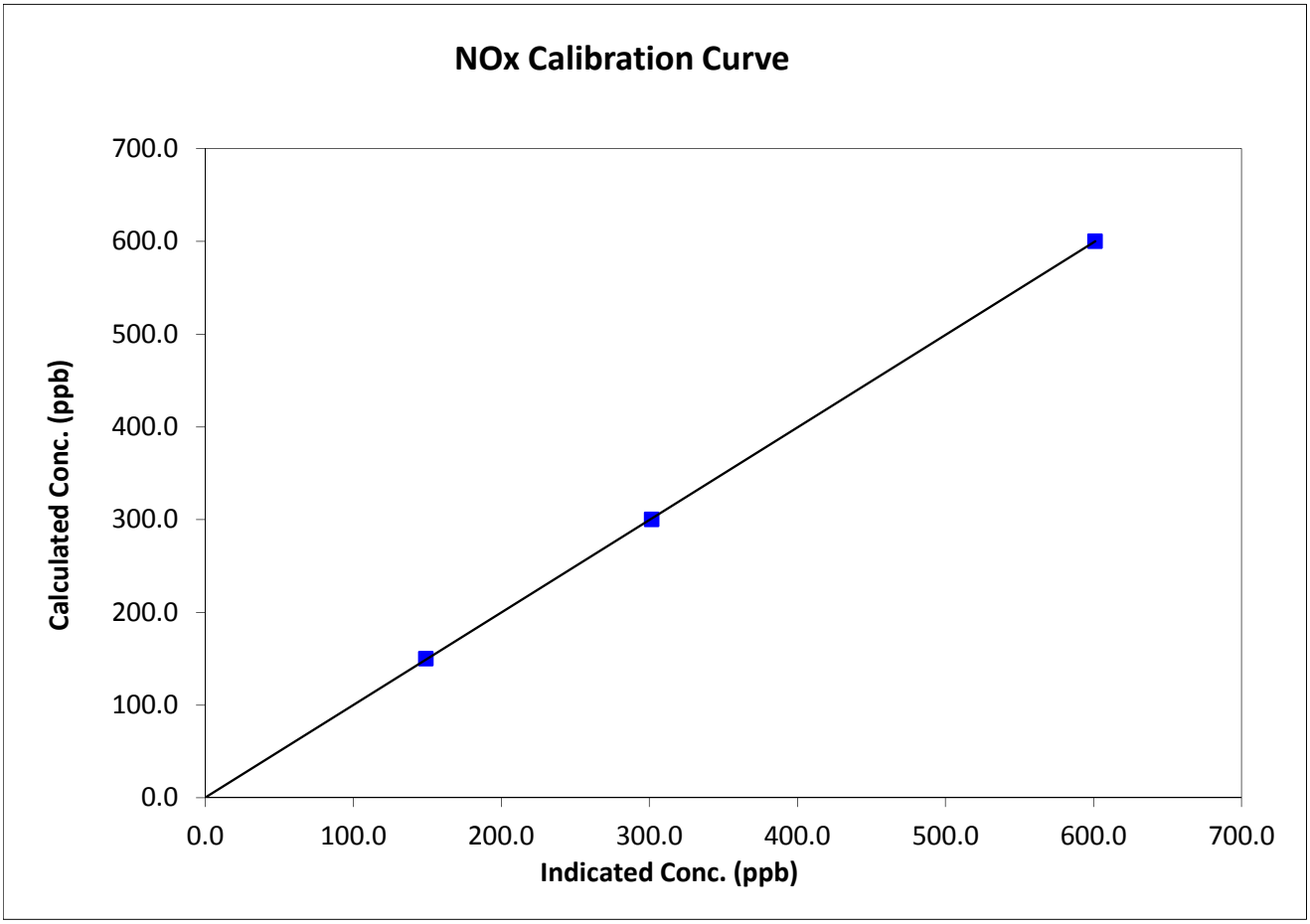
NO_X Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 3, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:22	End Time (MST)	12:46
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	-0.2	N/A	Correlation Coefficient	0.999991
600.4	601.1	0.9988		
300.2	301.6	0.9953	Slope	0.997778
150.1	149.1	1.0067		
0.0	-0.2	0.0000	Intercept	0.324901



Wood Buffalo Environmental Association

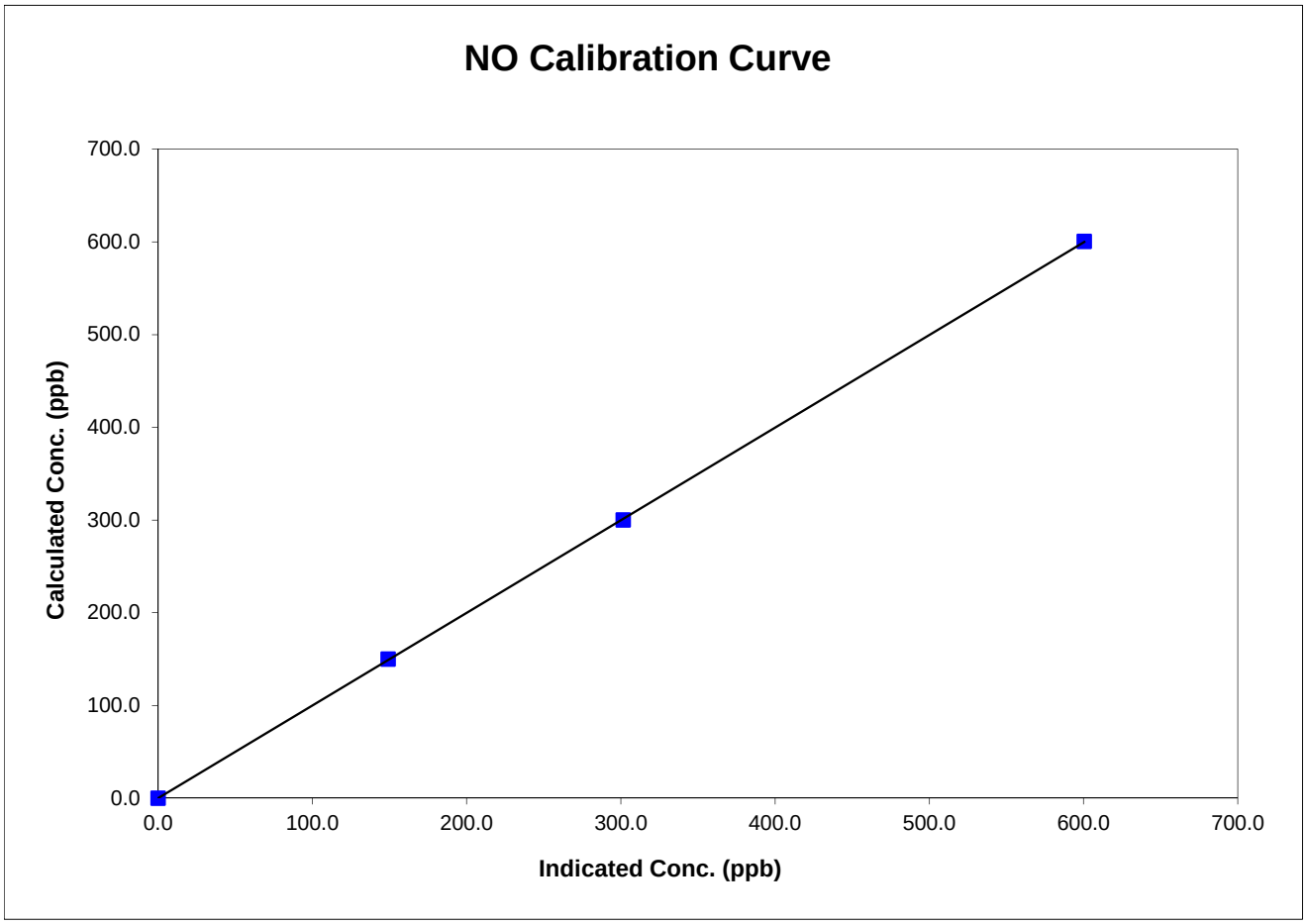
NO Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	July 3, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:22	End Time (MST)	12:46
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	0.0	N/A	Correlation Coefficient	0.999990
600.4	600.5	0.9998		
300.2	301.5	0.9956	Slope	0.999028
150.1	149.1	1.0067		
0.0	-0.1	0.0000	Intercept	0.131933



Wood Buffalo Environmental Association

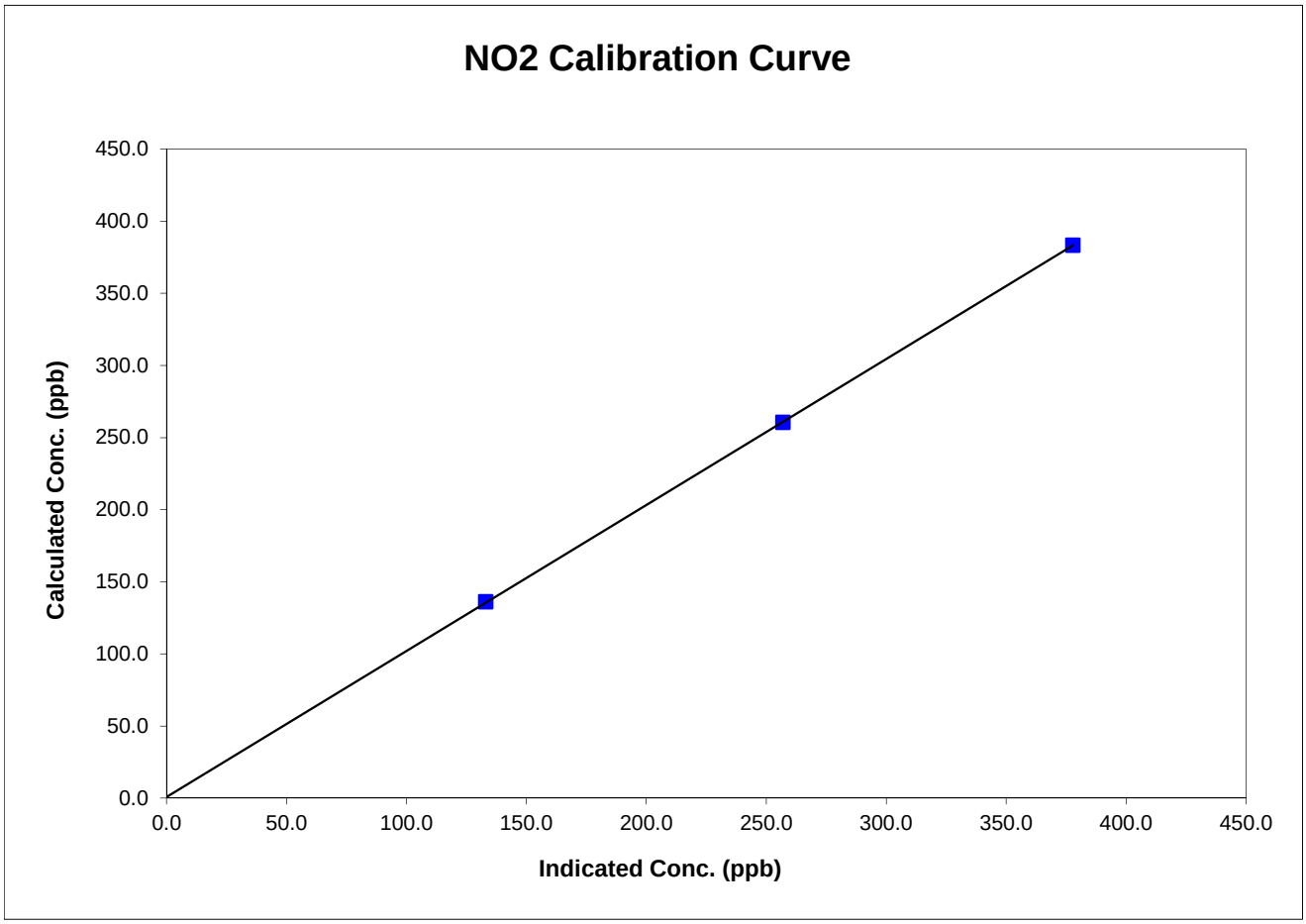
NO_2 Calibration Summary

Station Information

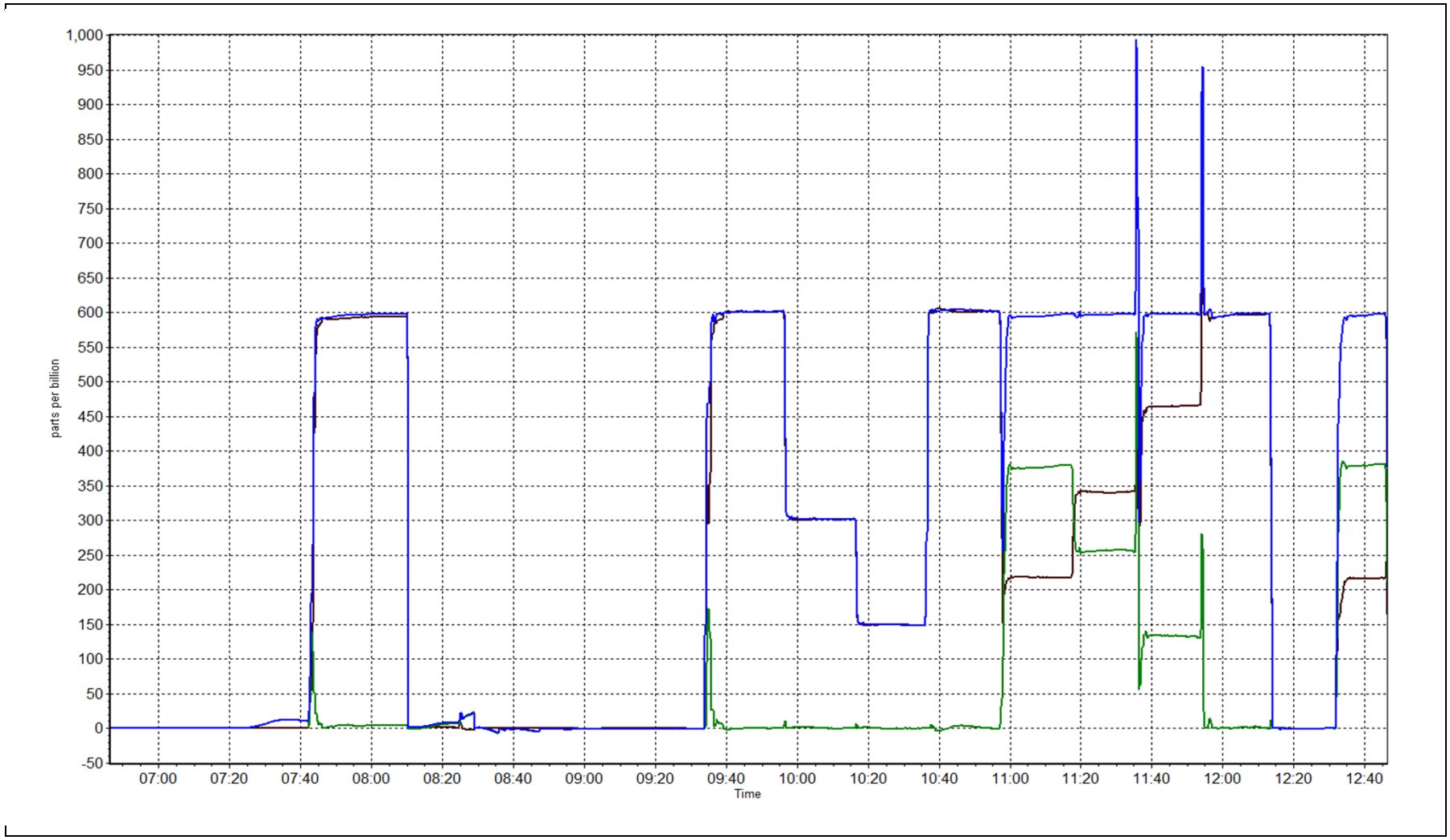
Calibration Date	August 6, 2014	Previous Calibration	July 3, 2014
Station Number	Wapasu	Station Number	AMS 17
Start Time (MST)	7:22	End Time (MST)	12:46
Analyzer make	API T200	Analyzer serial #	833

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999986
383.3	377.8	1.0146		
260.6	256.9	1.0144	Slope	1.012945
136.3	133.0	1.0248		
			Intercept	0.698805



NOx, NO & NO_2 Calibration Plot Date: August 6, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 19
FIREBAG
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
AUGUST 2014

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	708	36	36	100.00	44	0	6	0
H2S (ppb) Average	706	37	38	99.87	3	0	1	0
THC (ppm) Average	708	36	36	100.00	3.1	-	2.5	-
NO2 (ppb) Average	708	36	36	100.00	32	0	6	-
NO (ppb) Average	708	36	36	100.00	92	-	7	-
NOX (ppb) Average	708	36	36	100.00	120	-	13	-
Temperature 2 m (C) Average	744	0	0	100.00	28.6	-	23.7	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	31	-	-	-
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 - FIREBAG (AMS 19)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	1	3	-	0	0	0	0	1	2	44
H2S (ppb) Average	706	0.3	0	-	0	0	0	0	0	1	3
THC (ppm) Average	708	2.25	0.1	-	2	2.1	2.2	2.2	2.3	2.4	3.1
NO2 (ppb) Average	708	3.4	4	-	0	1	1	2	5	9	32
NO (ppb) Average	708	1.5	6	-	0	0	0	0	0	2	92
NOX (ppb) Average	708	4.9	9	-	0	1	1	2	5	10	120
Temperature 2 m (C) Average	744	16.25	5.8	-	2.3	9	11.9	16	20.3	24.8	28.6
Relative Humidity (%) Average	744	63.5	19	-	21	40	48	61	79	91	99
Wind Speed 10 m (km/h) Average	744	11.6	5	-	0	5	8	11	15	18	31
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	25 Aug 2014 21:00	25 Aug 2014 21:00	1	Unstable operation - baseline collapse

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 44 ppb on Aug 19 11:00 Maximum Daily Average: 6.1 ppb on Aug 19

Minimum Value: 0 ppb on Aug 1 01:00 Minimum Daily Average: 0.0 ppb on Aug 1
Maximum Diurnal Average: 2.0 ppb at hour 11 Minimum Diurnal Average: 0.4 ppb at hour 22
Monthly Average: 1.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 15$

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-Aug	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
2-Aug	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.2	1
3-Aug	Z	0	0	0	1	1	5	6	2	0	1	0	1	1	1	0	0	1	2	6	6	5	3	2	2.0	6
4-Aug	1	Z	2	7	9	8	15	12	7	2	1	1	1	0	0	0	1	0	0	1	1	1	1	1	3.2	15
5-Aug	0	0	Z	0	0	0	1	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
6-Aug	0	0	0	Z	0	0	0	1	1	1	1	1	1	1	1	2	1	0	0	0	0	0	1	1	0.7	2
7-Aug	3	3	2	1	Z	0	1	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0.7	3
8-Aug	0	0	0	0	0	Z	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	1	1	0	0.3	2
9-Aug	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	2
10-Aug	1	Z	1	1	2	15	13	1	0	0	0	0	1	5	8	6	4	4	5	3	2	0	0	1	3.2	15
11-Aug	2	2	Z	8	5	14	15	6	9	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2.9	15
12-Aug	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
13-Aug	0	0	0	0	Z	0	0	C	C	C	C	C	1	1	1	1	3	6	8	3	1	1	1	1	1.5	8
14-Aug	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
15-Aug	Z	0	0	1	2	2	3	2	6	5	2	1	0	2	4	4	2	1	1	0	0	0	0	0	1.7	6
16-Aug	0	Z	4	2	1	1	1	3	0	0	0	0	0	0	0	0	1	5	4	3	2	1	1	1	1.3	5
17-Aug	1	2	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	2
18-Aug	0	0	0	Z	0	1	0	0	0	0	1	0	0	1	1	13	4	2	1	0	0	0	0	0	1.1	13
19-Aug	0	0	0	0	Z	0	0	1	13	31	44	27	18	2	1	0	0	0	0	0	0	0	0	0	6.1	44
20-Aug	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
21-Aug	Z	0	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
22-Aug	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
23-Aug	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0.3	1
24-Aug	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
25-Aug	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
26-Aug	0	0	0	0	0	Z	0	0	4	10	5	3	5	1	0	0	0	0	0	0	0	0	0	0	1.4	10
27-Aug	Z	0	0	1	2	4	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	5
28-Aug	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
29-Aug	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
30-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	2	0.3	2
31-Aug	1	1	1	0	Z	0	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3
	0.5	0.4	0.5	0.9	1.0	1.9	2.0	1.3	1.6	2.0	2.0	1.3	1.0	0.6	0.7	1.0	0.6	0.7	0.8	0.7	0.5	0.4	0.4	0.4	Diurnal Average	
	3	3	4	8	9	15	15	12	13	31	44	27	18	5	8	13	4	6	8	6	6	5	3	2	Diurnal Maximum	

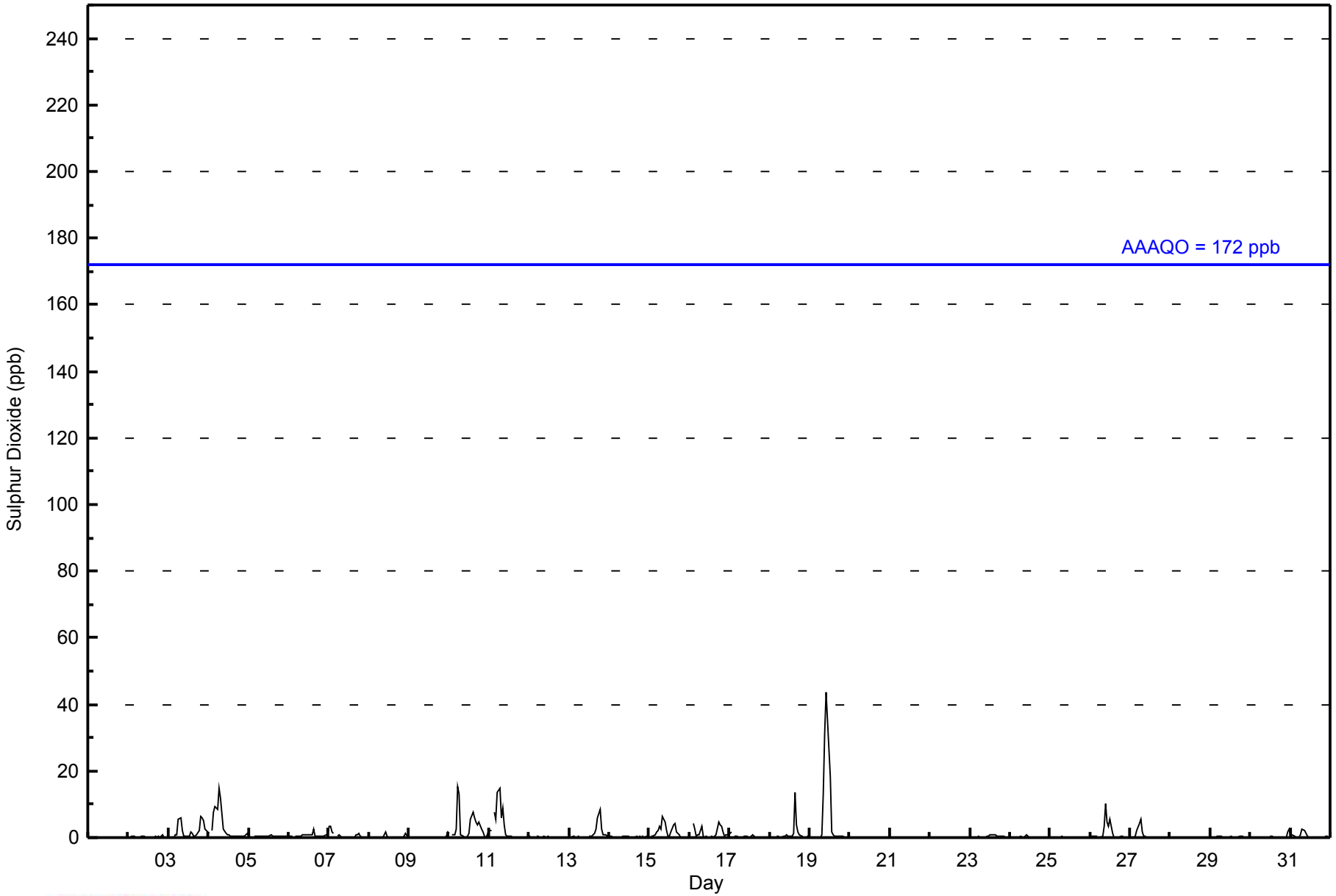
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Firebag - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	696	98.31	98.31
11 - 20	9	1.27	99.58
21 - 60	3	0.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Firebag - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	55	41	17	12	11	27	42	48	81	80	44	48	31	38	66	55	696
11 - 20	0	0	0	0	0	0	0	2	0	2	2	1	2	0	0	0	9
21 - 60	0	0	0	0	0	0	0	0	0	2	1	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	55	41	17	12	11	27	42	50	81	84	47	49	33	38	66	55	708

Total Number of Valid Hours: 708

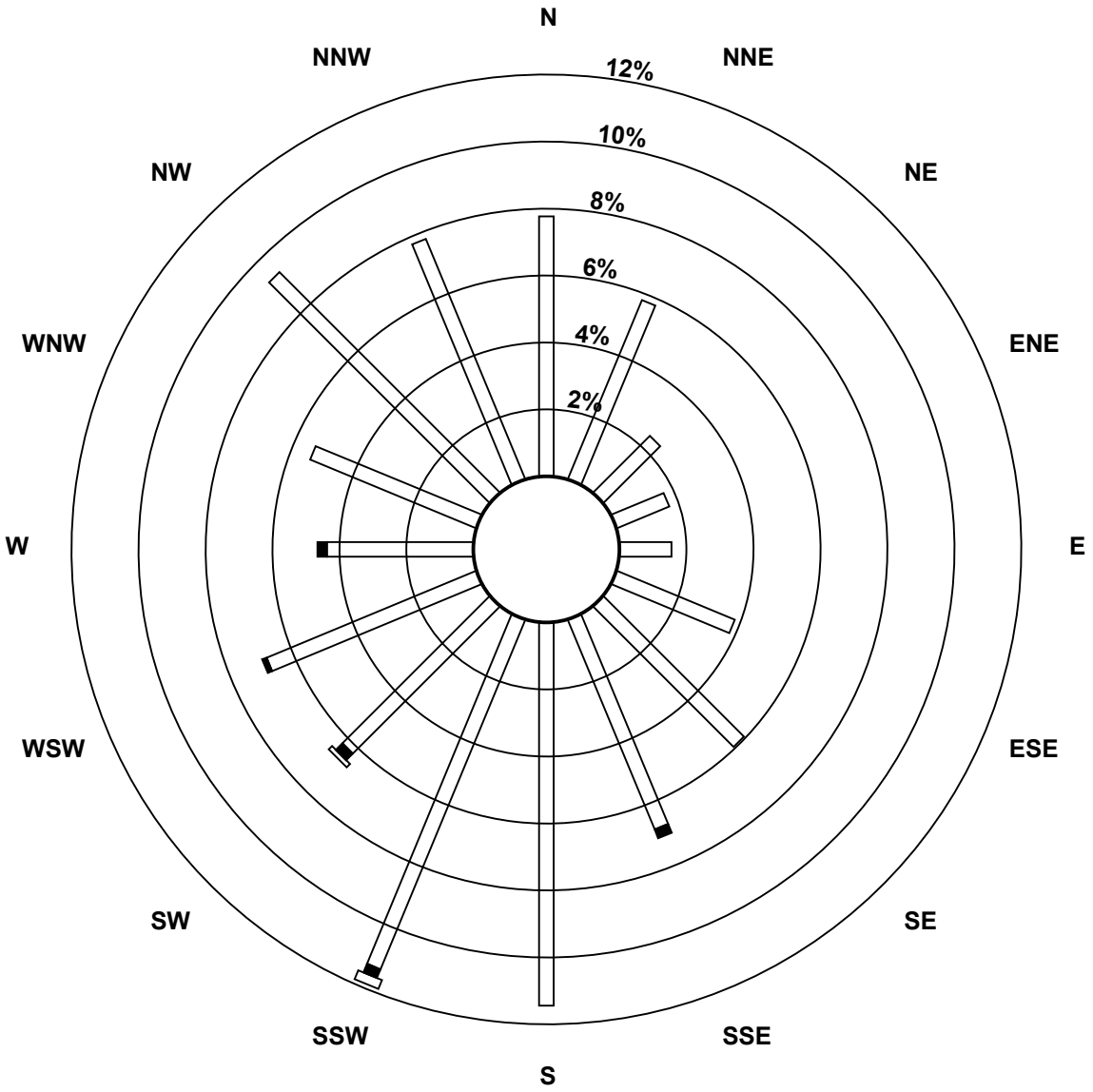
Total Number of Hours: 744

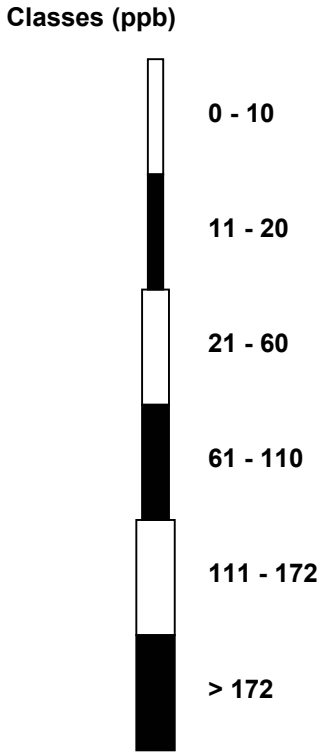
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Firebag (AMS 19)





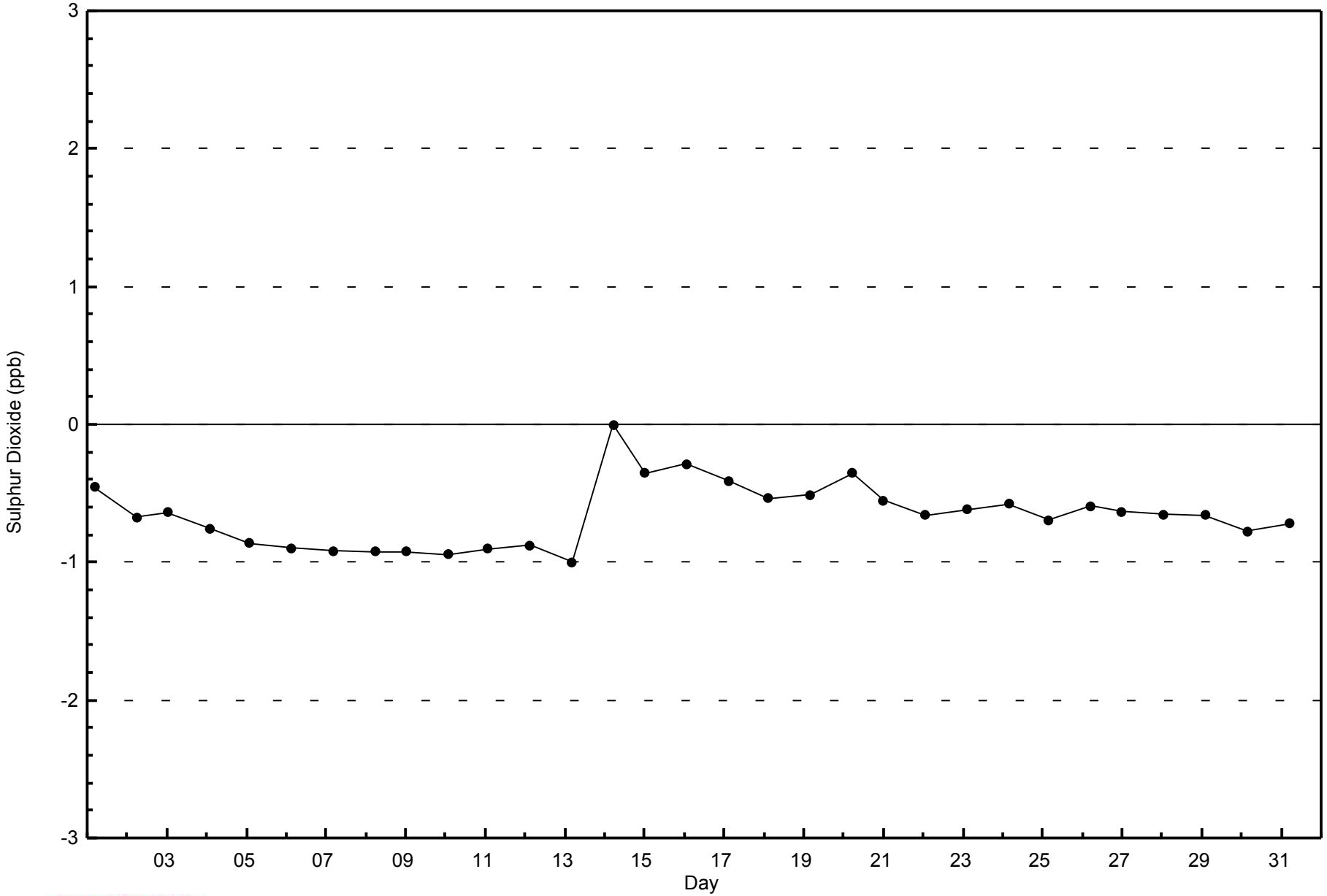
Total Number of Valid Hours: 708

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Firebag - August 2014



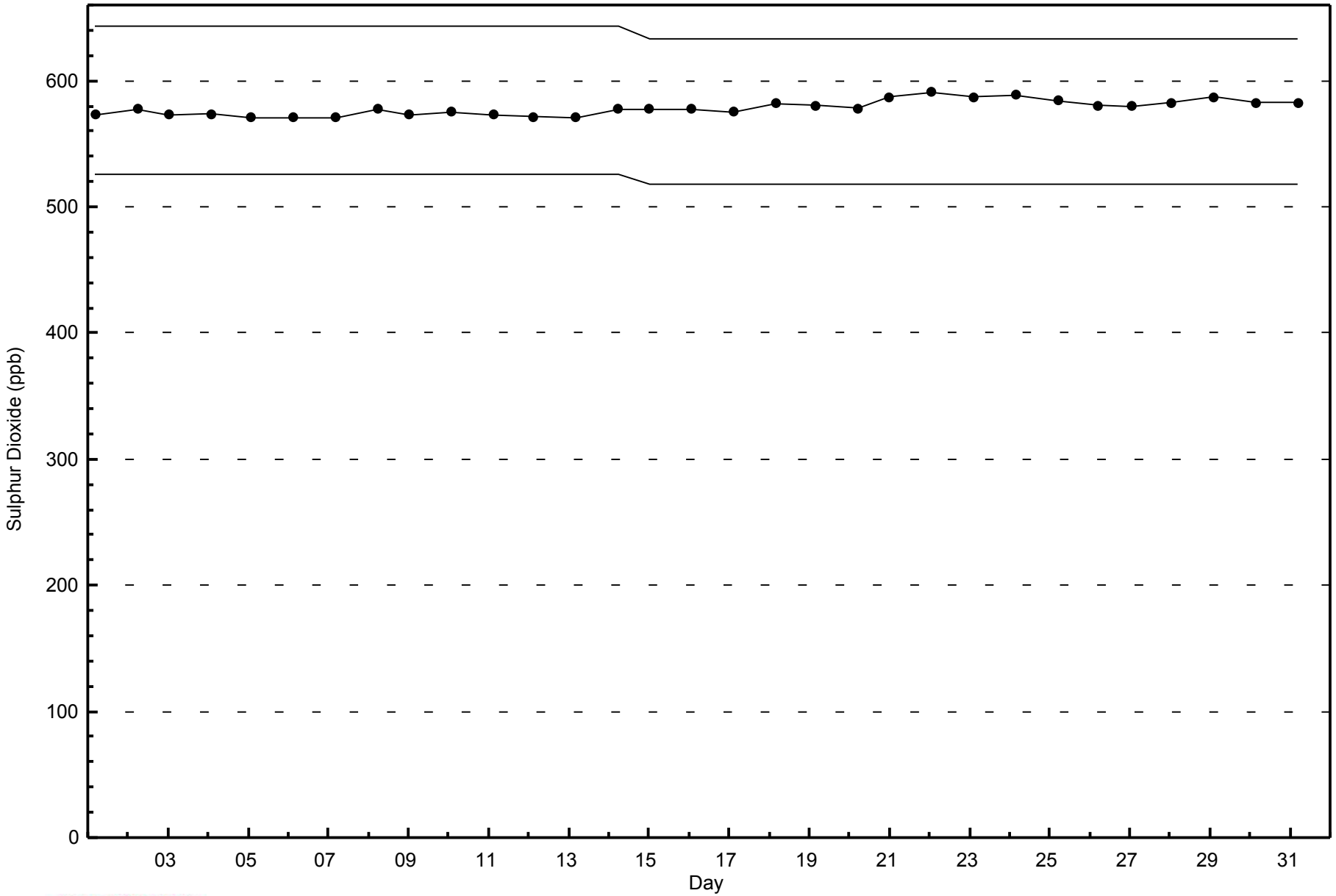
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Firebag - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Firebag - August 2014

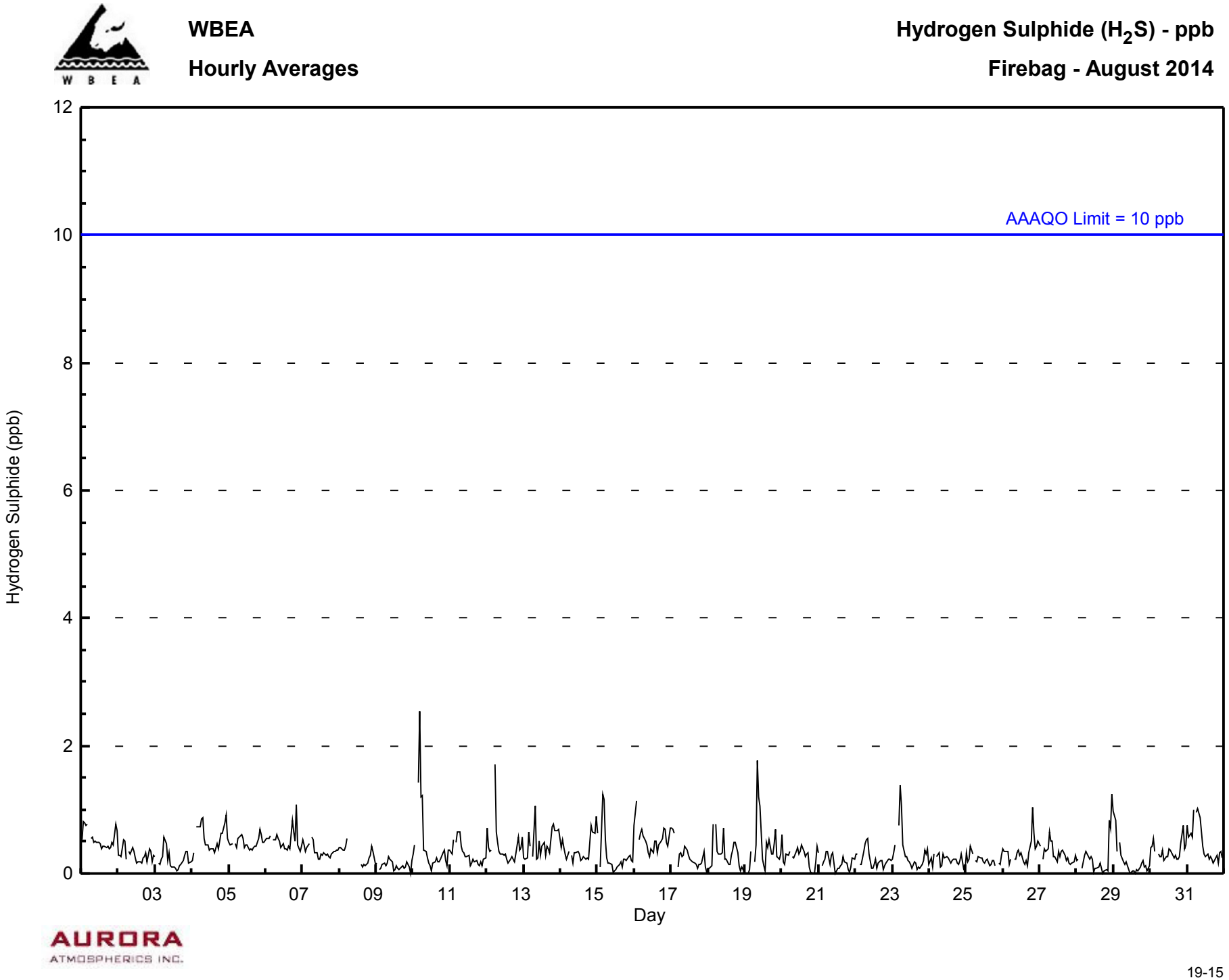
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Aug 10 05:00 Maximum Daily Average: 0.5 ppb on Aug 4

Minimum Value: 0 ppb on Aug 19 01:00 Minimum Daily Average: 0.1 ppb on Aug 9
Maximum Diurnal Average: 0.5 ppb at hour 6 Minimum Diurnal Average: 0.2 ppb at hour 12
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:	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-Aug	1	1	1	1	1	Z	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.5	1
2-Aug	0	0	0	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
3-Aug	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
4-Aug	0	0	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0.5	1
5-Aug	0	0	0	Z	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.5	1
6-Aug	1	1	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0.5	1
7-Aug	1	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
8-Aug	0	0	0	0	0	1	Z	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	--	1
9-Aug	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
10-Aug	0	0	Z	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3
11-Aug	0	0	1	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
12-Aug	1	0	0	0	Z	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.4	2
13-Aug	0	0	0	1	0	Z	0	1	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0.5	1
14-Aug	0	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1
15-Aug	1	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Aug	1	1	Z	1	1	1	1	1	0	0	0	0	0	1	1	0	0	1	1	1	1	0	0	1	0.5	1
17-Aug	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
18-Aug	0	0	0	1	Z	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
19-Aug	0	0	0	0	0	Z	0	0	2	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0.4	2
20-Aug	1	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	1
21-Aug	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
22-Aug	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
23-Aug	0	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Aug	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
25-Aug	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UO	0	0	0	0.2	0
26-Aug	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0.3	1
27-Aug	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.3	1
29-Aug	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
30-Aug	0	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
31-Aug	1	1	1	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
	0.4	0.4	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	Diurnal Average	
	1	1	1	1	3	2	1	1	2	1	1	0	0	1	1	0	1	1	1	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 - August 2014
AAAQO Limit = 10 ppb
Hydrogen Sulphide (ppb)
0
2
4
6
8
10
12
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 - 2	705	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: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Firebag - August 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	55	40	16	12	11	27	44	48	79	88	47	50	33	39	64	52	705
3 - 4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	40	16	12	11	27	44	49	79	88	47	50	33	39	64	52	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

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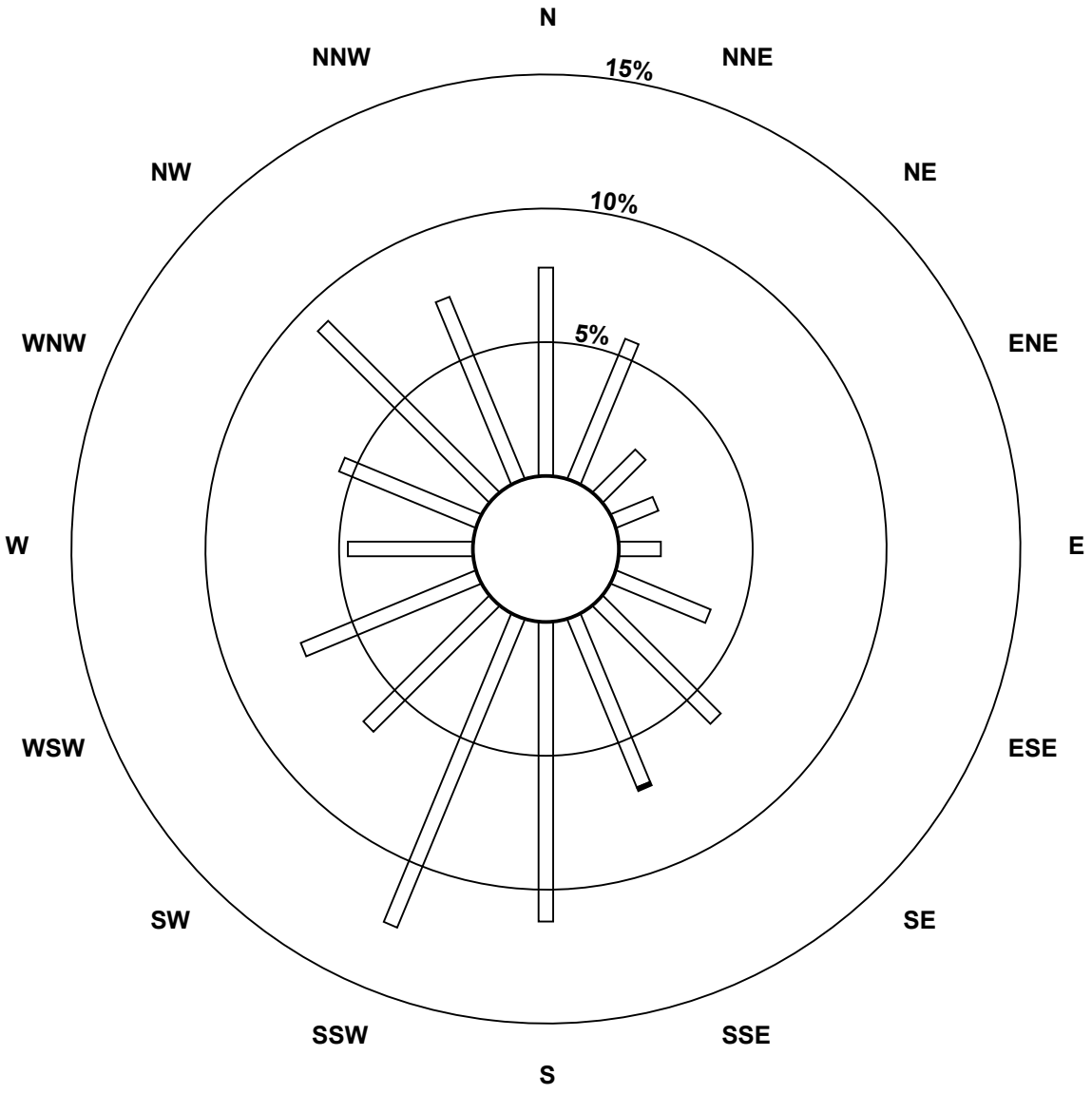
Wood Buffalo Environmental Association

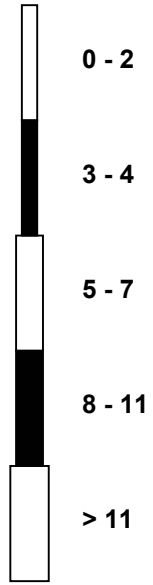
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Firebag (AMS 19)



Classes (ppb)



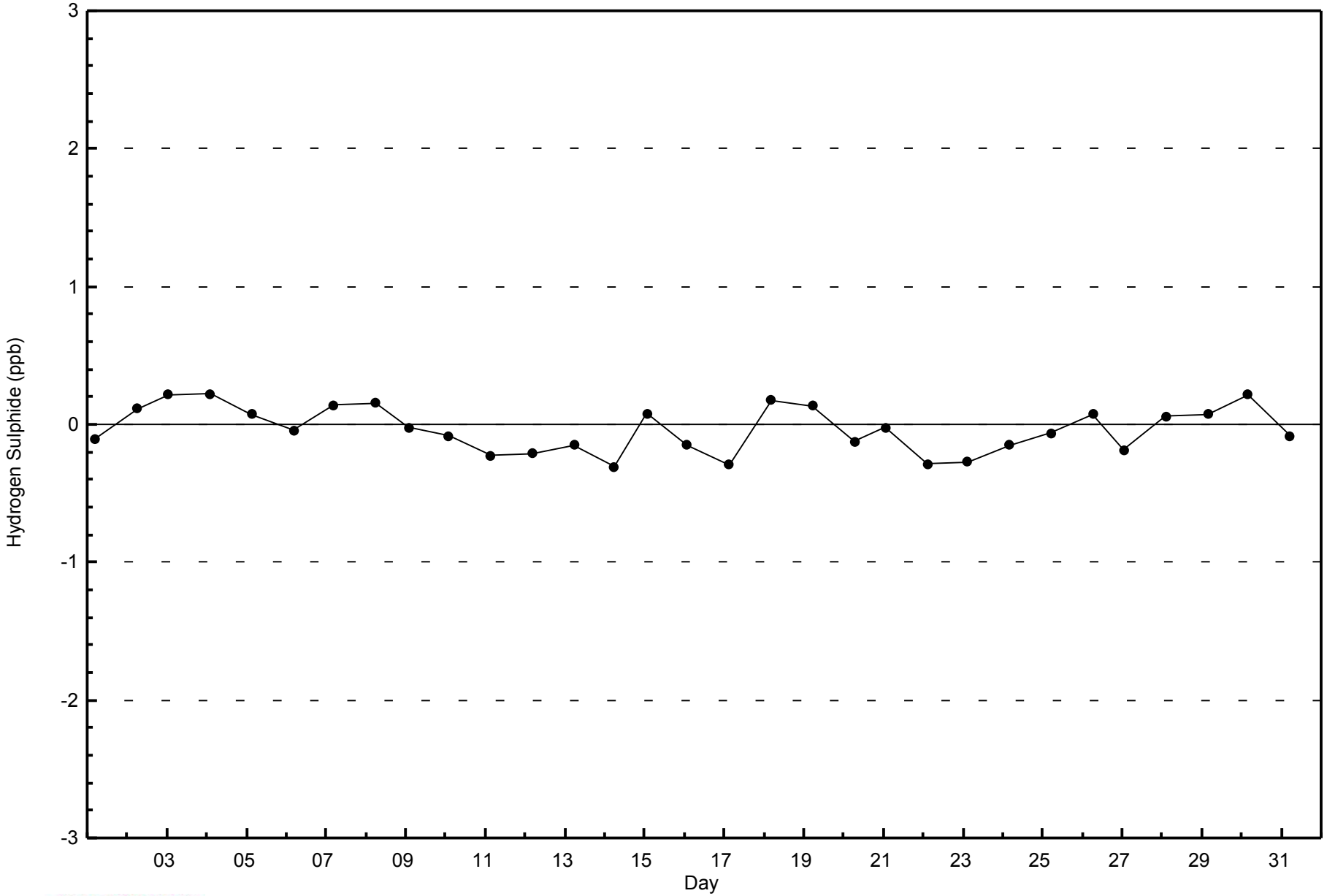
Total Number of Valid Hours: 706

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Firebag - August 2014



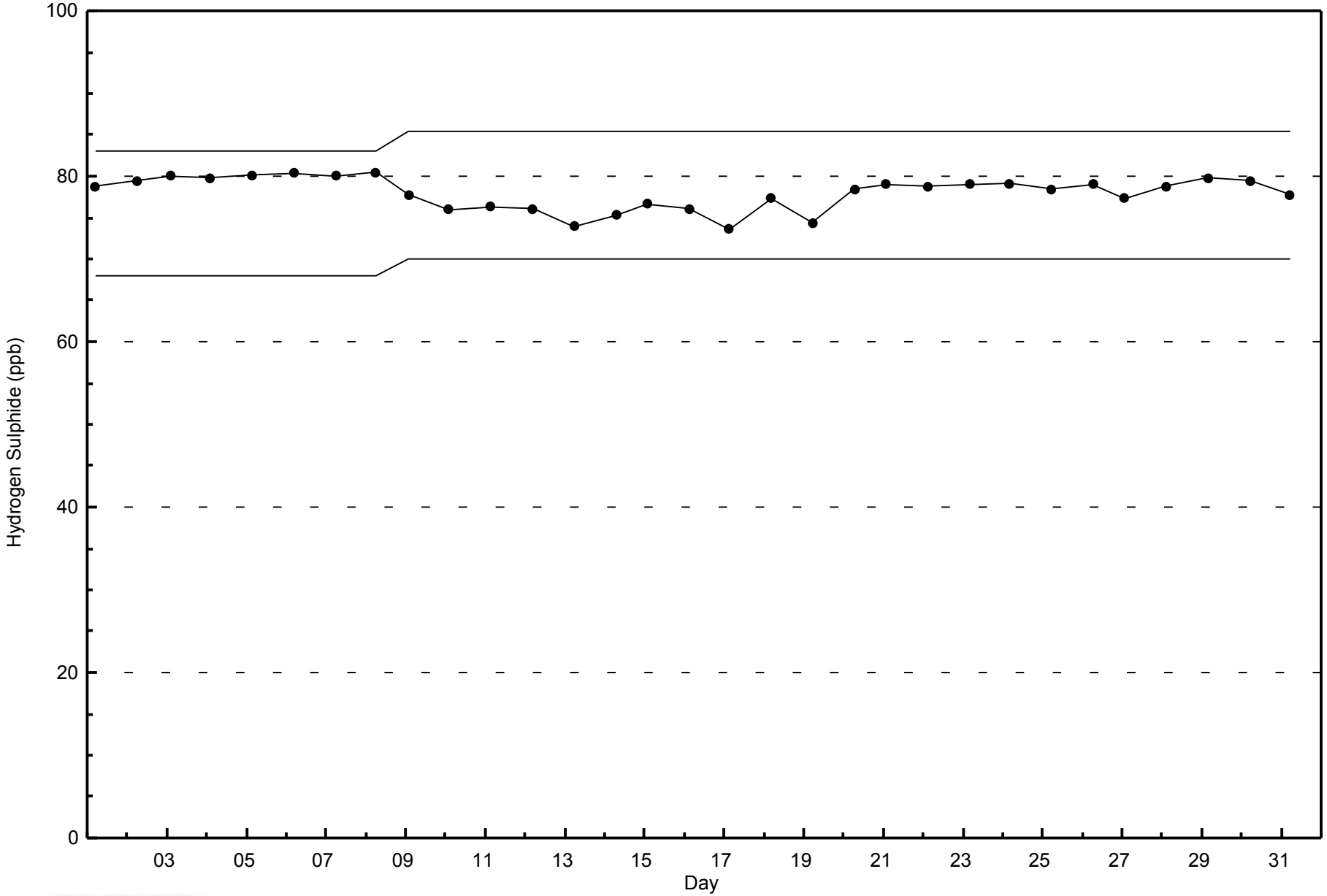
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Firebag - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Firebag - August 2014

Maximum Value: 3.1 ppm on Aug 18 01:00

Maximum Daily Average: 2.5 ppm on Aug 18

Minimum Value: 2.0 ppm on Aug 12 16:00

Minimum Daily Average: 2.1 ppm on Aug 6

Maximum Diurnal Average: 2.3 ppm at hour 1

Minimum Diurnal Average: 2.2 ppm at hour 16

Monthly Average: 2.25 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.2 Q_3 = 2.3 P_{90} = 2.4 P_{99} = 2.7

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

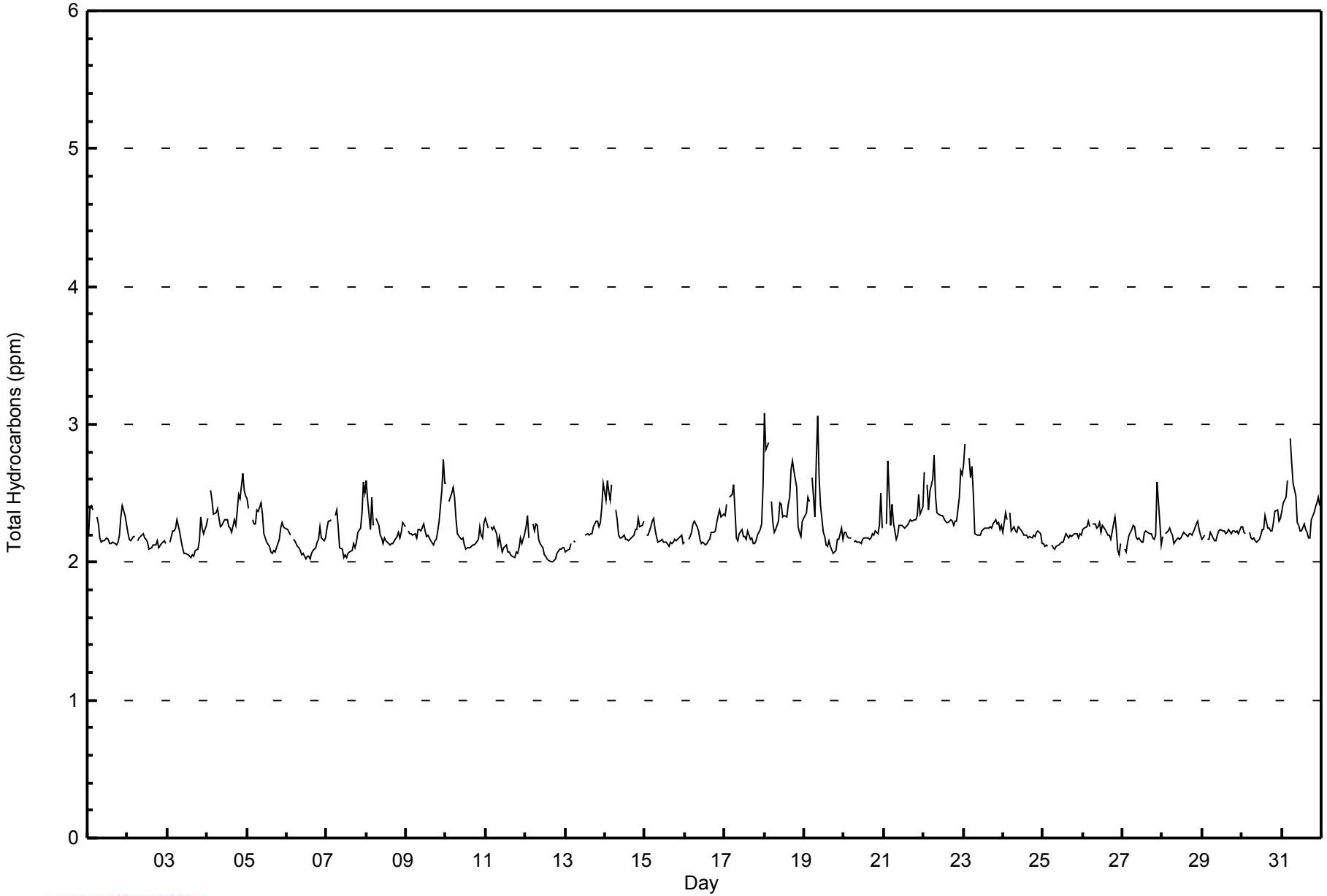
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Firebag - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	18	2.54	2.54
2.1 - 3.0	688	97.18	99.72
3.1 - 10.0	2	0.28	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Firebag - August 2014

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	2	0	0	0	0	0	2	4	5	0	0	3	1	1	0	18
2.1 - 3.0	55	39	17	12	11	27	42	48	77	77	47	49	30	37	65	55	688
3.1 - 10.0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	41	17	12	11	27	42	50	81	84	47	49	33	38	66	55	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

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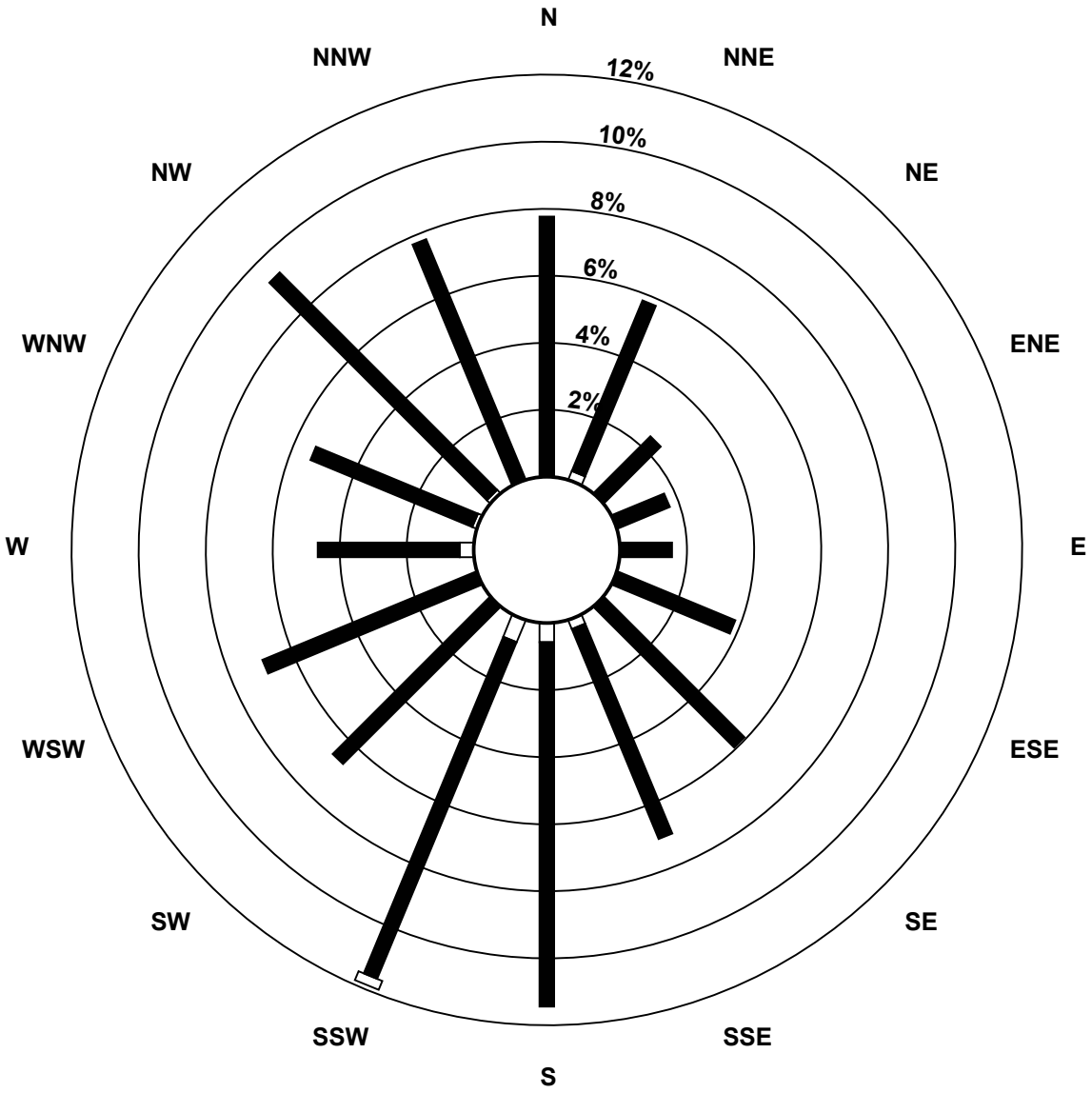
Wood Buffalo Environmental Association

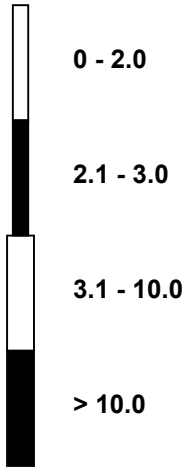
Wind Rose Aug 2014

Total Hydrocarbons (THC) - ppm

Firebag (AMS 19)



Classes (ppm)



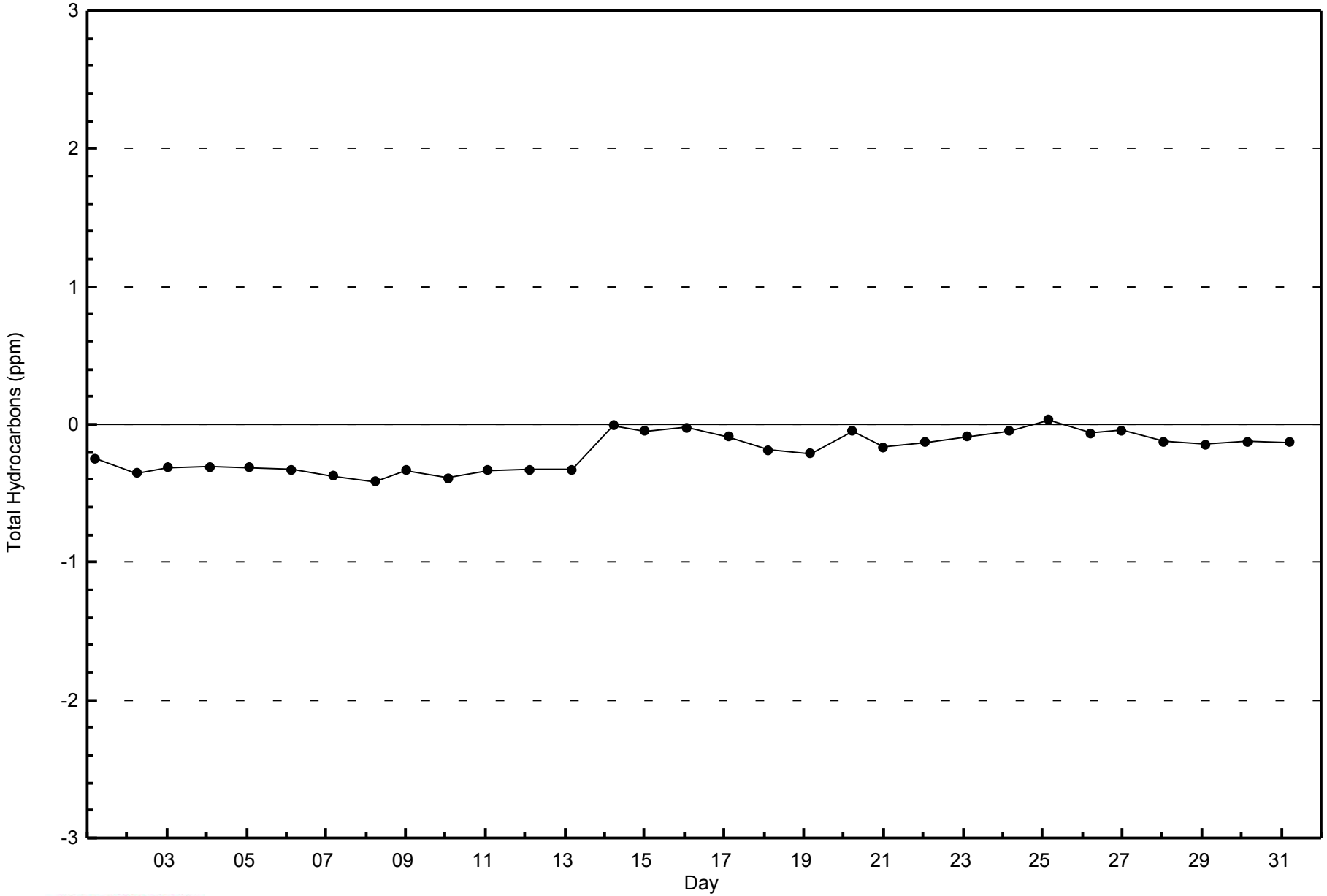
Total Number of Valid Hours: 708

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Firebag - August 2014



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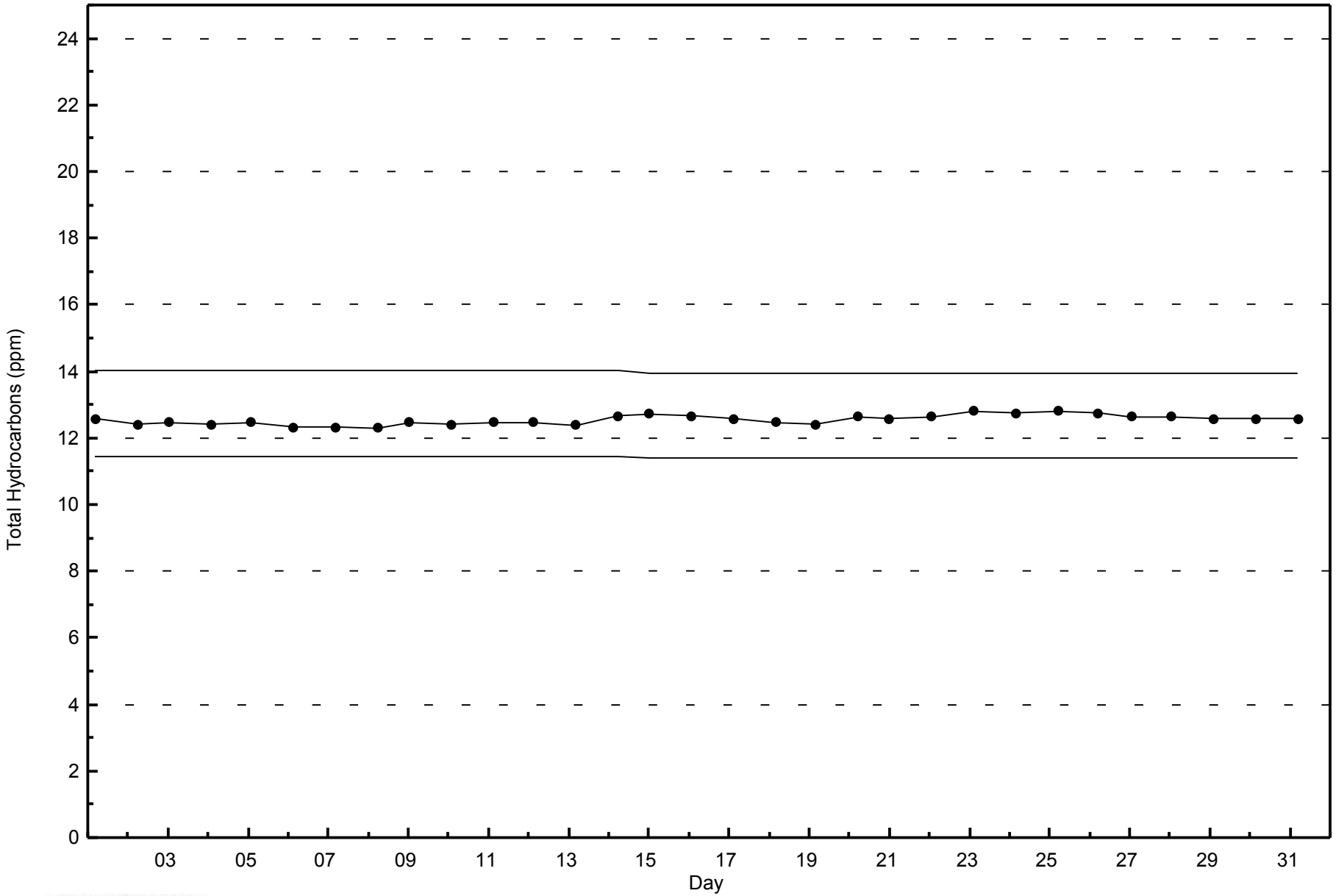
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Firebag - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

Firebag - August 2014

Maximum Value: 92 ppb on Aug 10 05:00

Maximum Daily Average: 7.4 ppb on Aug 10

Minimum Value: 0 ppb on Aug 10 22:00

Minimum Daily Average: 0.0 ppb on Aug 17

Maximum Diurnal Average: 8.3 ppb at hour 5

Minimum Diurnal Average: 0.2 ppb at hour 15

Monthly Average: 1.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 2$ $P_{99} = 22$

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-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	13	1.5	21
2-Aug	0	0	1	10	8	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	1.1	10
3-Aug	Z	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
4-Aug	0	Z	0	0	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
5-Aug	0	0	Z	1	3	2	1	1	2	0	1	1	0	0	1	1	0	0	0	1	9	4	0	0	1.3	9
6-Aug	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	9	0	0	0	0.8	9
7-Aug	0	0	0	0	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
8-Aug	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
9-Aug	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
10-Aug	0	Z	1	34	92	24	17	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7.4	92
11-Aug	0	0	Z	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
12-Aug	0	2	0	Z	13	38	6	4	1	1	0	0	1	0	0	1	1	1	0	6	11	4	6	9	4.6	38
13-Aug	1	0	0	20	Z	2	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	1.3	20
14-Aug	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	9	0.6	9
15-Aug	Z	0	0	19	23	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0	23
16-Aug	1	Z	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0.2	1
17-Aug	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
18-Aug	0	0	0	Z	21	11	2	2	1	1	2	2	0	0	0	1	0	0	0	0	0	0	0	0	1.9	21
19-Aug	0	0	0	0	Z	0	0	2	14	11	8	3	1	0	0	0	0	0	0	0	2	0	0	0	1.9	14
20-Aug	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
21-Aug	Z	0	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
22-Aug	0	Z	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0.4	2
23-Aug	1	2	Z	9	21	46	24	7	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4.9	46
24-Aug	1	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	3	0	0	0	2	10	0	0	1.0	10
25-Aug	6	0	0	9	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	9
26-Aug	0	0	0	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	6	5	0	0	2	0.7	6
27-Aug	Z	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0.4	1
28-Aug	0	Z	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	10	36	2.3	36
29-Aug	30	20	Z	13	9	7	4	1	0	0	0	0	0	0	0	0	1	3	6	4	3	4	2	7	5.0	30
30-Aug	13	11	18	Z	15	4	1	1	6	0	0	0	1	1	1	1	0	0	0	0	3	23	0	0	4.4	23
31-Aug	0	0	0	0	Z	1	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	3
	2.0	1.4	0.8	4.5	8.3	5.5	2.3	1.1	1.2	0.8	0.6	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.8	1.6	1.8	1.4	2.5	Diurnal Average	
	30	20	18	34	92	46	24	7	14	11	8	3	1	1	1	1	3	3	6	6	11	23	21	36	Diurnal Maximum	

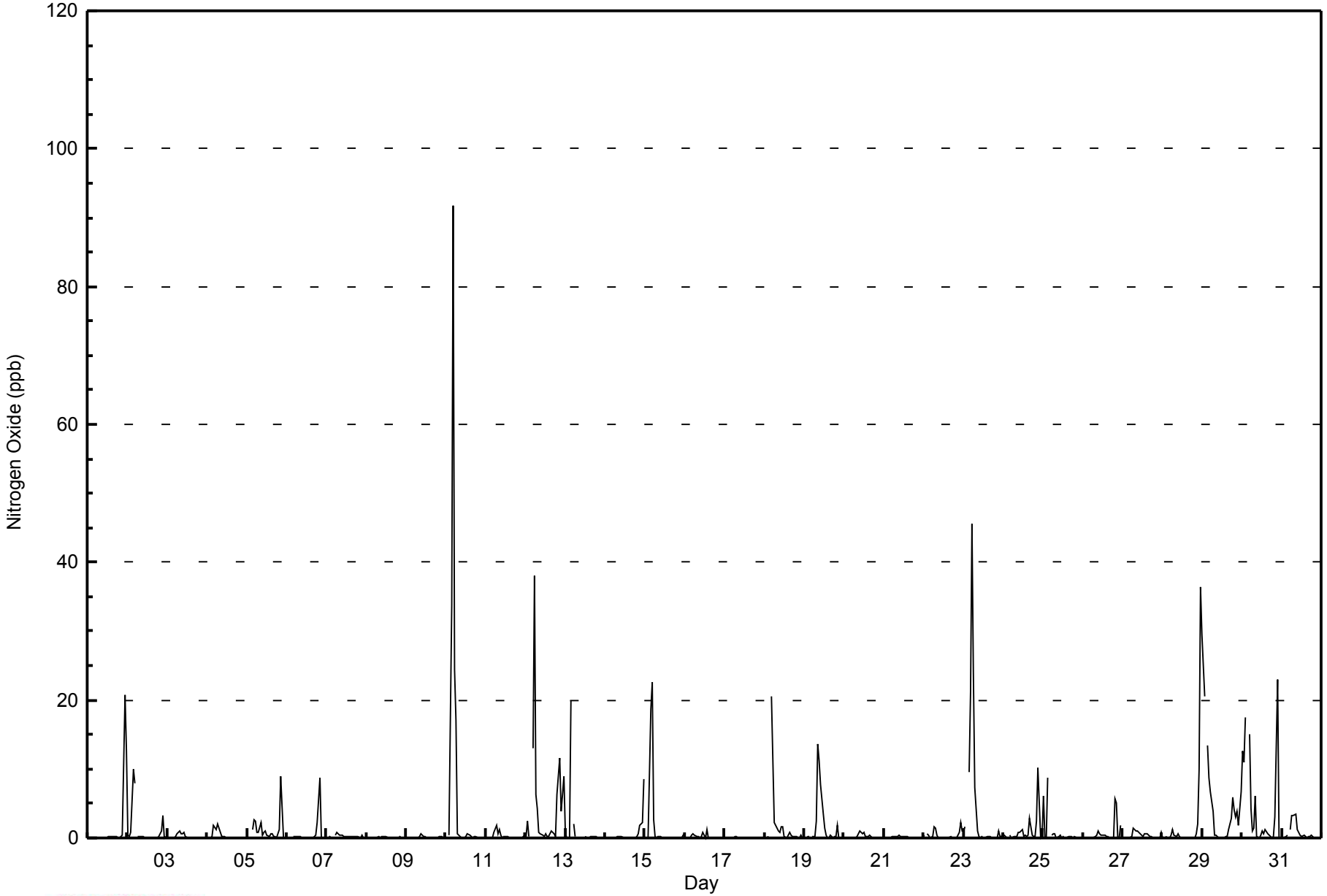
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxide (NO) - ppb

Firebag - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	98.16	98.16
21 - 40	11	1.55	99.72
11 - 80	1	0.14	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxide (NO) - ppb

Firebag - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	55	41	17	12	11	27	40	41	79	84	47	49	33	38	66	55	695
21 - 40	0	0	0	0	0	0	2	7	2	0	0	0	0	0	0	0	11
11 - 80	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	1	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	55	41	17	12	11	27	42	50	81	84	47	49	33	38	66	55	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

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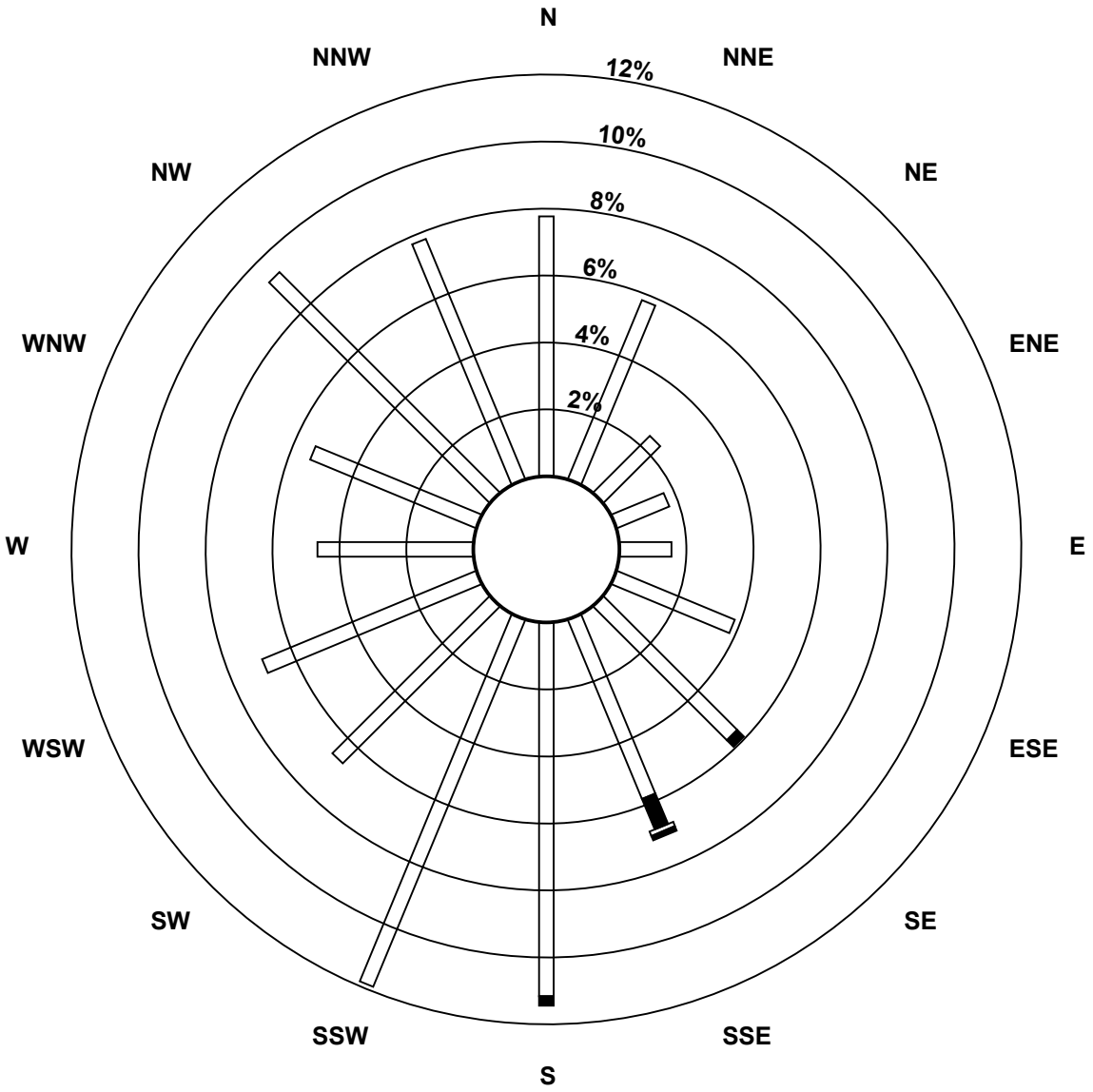
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

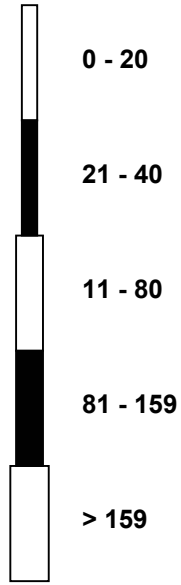
Wind Rose Aug 2014

Nitrogen Oxide (NO) - ppb

Firebag (AMS 19)



Classes (ppb)



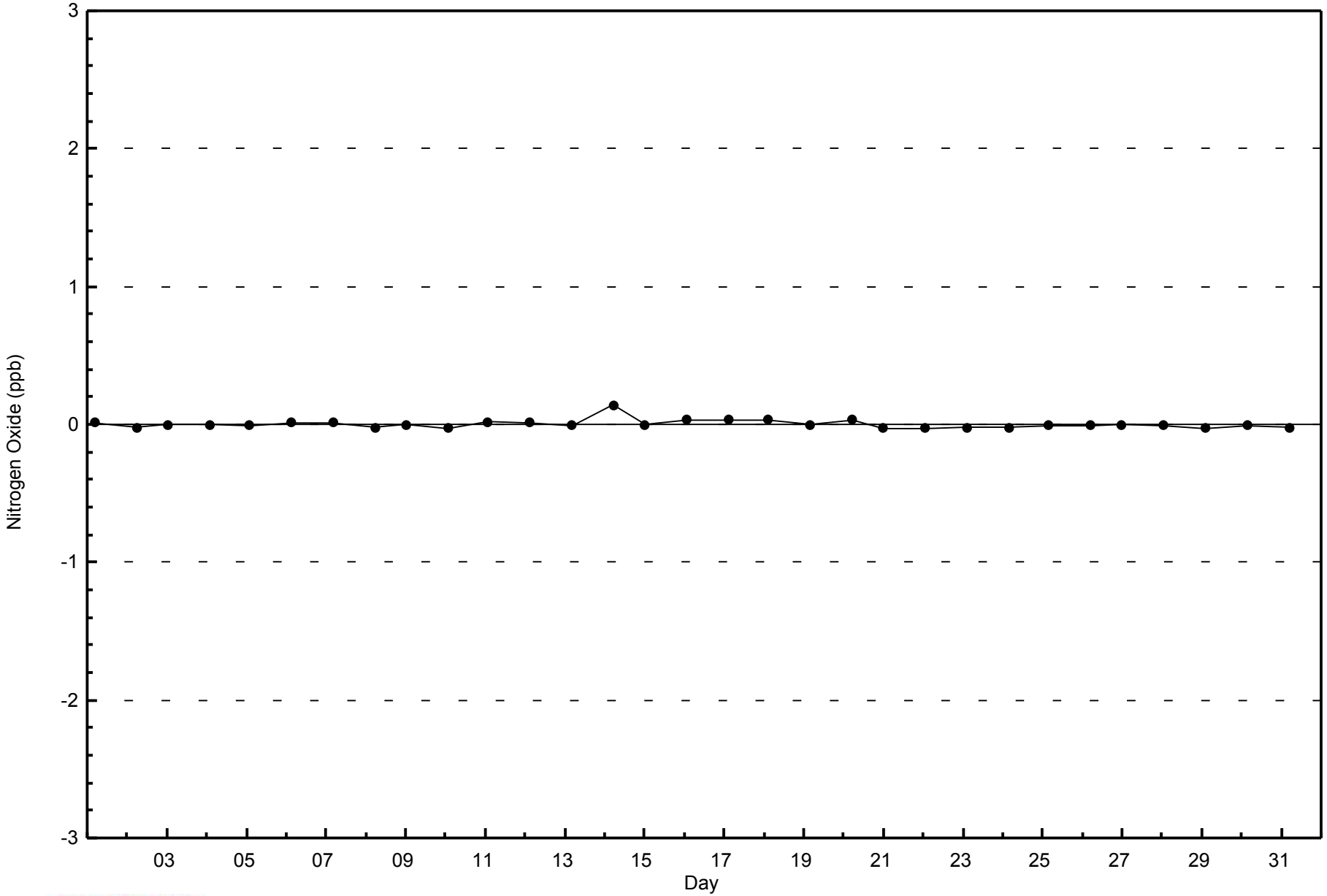
Total Number of Valid Hours: 708

WBEA

Zero Responses

Nitrogen Oxide (NO) - ppb

Firebag - August 2014



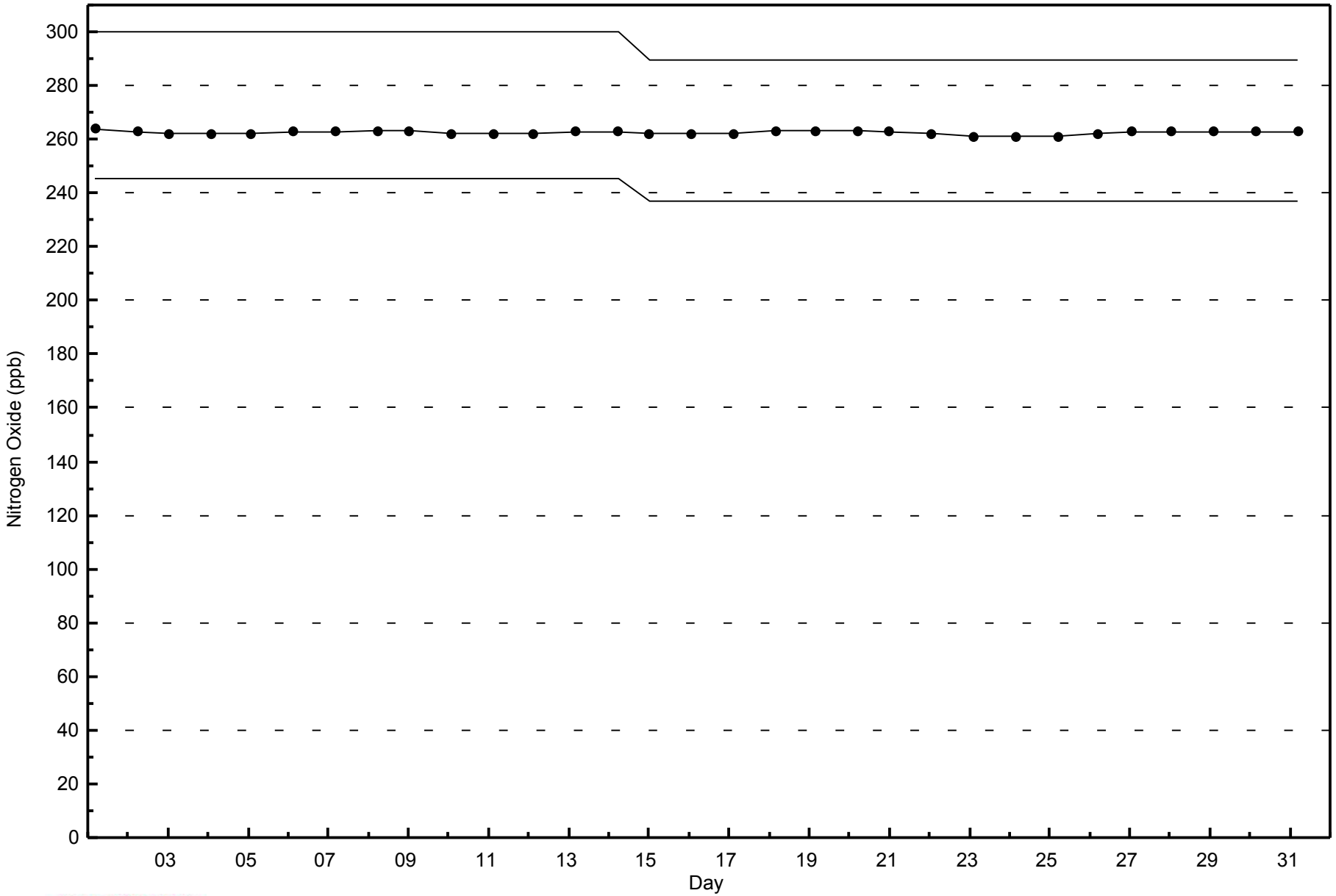
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxide (NO) - ppb

Firebag - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Firebag - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 32 ppb on Aug 15 05:00 Maximum Daily Average: 6.3 ppb on Aug 29

Minimum Value: 0 ppb on Aug 21 20:00 Minimum Daily Average: 0.8 ppb on Aug 20
Maximum Diurnal Average: 8.7 ppb at hour 5 Minimum Diurnal Average: 1.2 ppb at hour 14
Monthly Average: 3.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 5$ $P_{90} = 9$ $P_{99} = 21$

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-Aug	0	1	1	1	Z	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	3	5	18	10	2.1	18
2-Aug	3	1	2	12	11	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	10	1	2	2.7	12
3-Aug	Z	1	1	2	3	4	4	5	4	3	4	1	1	1	1	1	1	1	1	3	5	3	2	3	2.3	5
4-Aug	4	Z	10	14	13	9	8	6	5	3	3	3	3	2	2	1	2	1	1	2	2	6	4	2	4.5	14
5-Aug	2	2	Z	9	15	10	6	5	7	3	3	4	3	2	2	3	2	2	1	4	13	8	1	2	4.7	15
6-Aug	1	1	1	Z	2	2	2	1	1	1	1	1	1	1	2	2	2	5	9	13	12	2	2	3	3.0	13
7-Aug	5	7	7	5	Z	5	4	3	2	1	1	1	1	1	1	1	1	1	1	2	5	13	9	5	3.5	13
8-Aug	2	2	2	1	1	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	2	3	1	1.0	3
9-Aug	Z	1	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	2	3	3	9	1.2	9
10-Aug	9	Z	10	18	28	17	11	1	1	1	1	1	2	3	3	2	2	2	3	3	4	2	2	6	5.7	28
11-Aug	7	6	Z	7	6	7	6	3	4	2	1	1	2	2	1	1	0	0	0	0	0	0	1	3	2.6	7
12-Aug	3	6	3	Z	16	24	9	7	2	2	1	1	1	1	1	1	1	1	1	7	11	5	8	8	5.1	24
13-Aug	1	1	1	14	Z	5	1	C	C	C	C	C	1	1	1	2	3	4	5	3	2	2	5	6	3.2	14
14-Aug	3	4	4	6	2	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	3	8	11	11	23	3.8	23
15-Aug	Z	1	2	24	32	18	3	2	2	2	1	1	1	2	2	2	2	2	1	1	1	1	1	2	4.6	32
16-Aug	4	Z	6	4	5	6	5	3	2	1	1	3	1	3	1	1	2	3	3	3	3	6	5	4	3.3	6
17-Aug	4	7	Z	5	4	5	3	2	1	2	2	1	1	1	2	1	1	1	1	1	6	6	2	2	2.5	7
18-Aug	4	4	7	Z	22	15	8	5	4	7	7	4	1	1	4	6	8	10	10	8	1	1	2	2	6.2	22
19-Aug	2	7	7	5	Z	4	3	7	14	14	11	8	5	2	1	2	3	1	2	2	5	1	1	1	4.6	14
20-Aug	2	0	0	0	0	Z	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	1	4	5	0.8	5
21-Aug	Z	3	4	5	3	4	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	1	3	5	1.5	5
22-Aug	6	Z	5	3	1	4	7	3	1	1	0	0	0	0	0	0	0	0	1	1	2	6	8	8	2.5	8
23-Aug	8	7	Z	14	14	21	20	11	3	1	1	1	1	1	1	2	1	1	1	1	2	6	3	3	5.3	21
24-Aug	5	4	3	Z	3	2	3	2	2	3	2	3	1	1	1	1	5	2	2	3	4	9	1	1	2.7	9
25-Aug	6	1	1	11	Z	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1.7	11
26-Aug	1	1	1	2	2	Z	1	2	2	4	3	2	3	2	1	1	1	1	4	10	9	1	1	8	2.6	10
27-Aug	Z	1	1	3	6	7	6	3	3	2	3	2	1	2	2	3	1	1	1	1	1	3	2	3	2.4	7
28-Aug	2	Z	10	2	4	7	6	1	1	2	1	1	0	0	0	0	1	0	0	1	3	7	8	21	3.4	21
29-Aug	20	18	Z	17	14	9	6	1	1	1	1	1	1	0	1	1	2	5	10	10	6	11	5	8	6.3	20
30-Aug	15	14	18	Z	12	5	2	2	6	1	1	1	3	3	4	2	2	2	2	3	7	15	4	4	5.5	18
31-Aug	6	7	10	14	Z	13	10	7	5	3	2	1	1	2	1	1	1	2	5	6	5	7	8	5	5.3	14
	4.8	4.0	4.5	7.5	8.7	7.8	4.4	3.0	2.6	2.2	1.9	1.5	1.3	1.2	1.3	1.3	1.6	1.7	2.2	3.1	4.2	5.0	4.1	5.3	Diurnal Average	
	20	18	18	24	32	24	20	11	14	14	11	8	5	3	4	6	8	10	10	13	13	15	18	23	Diurnal Maximum	

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

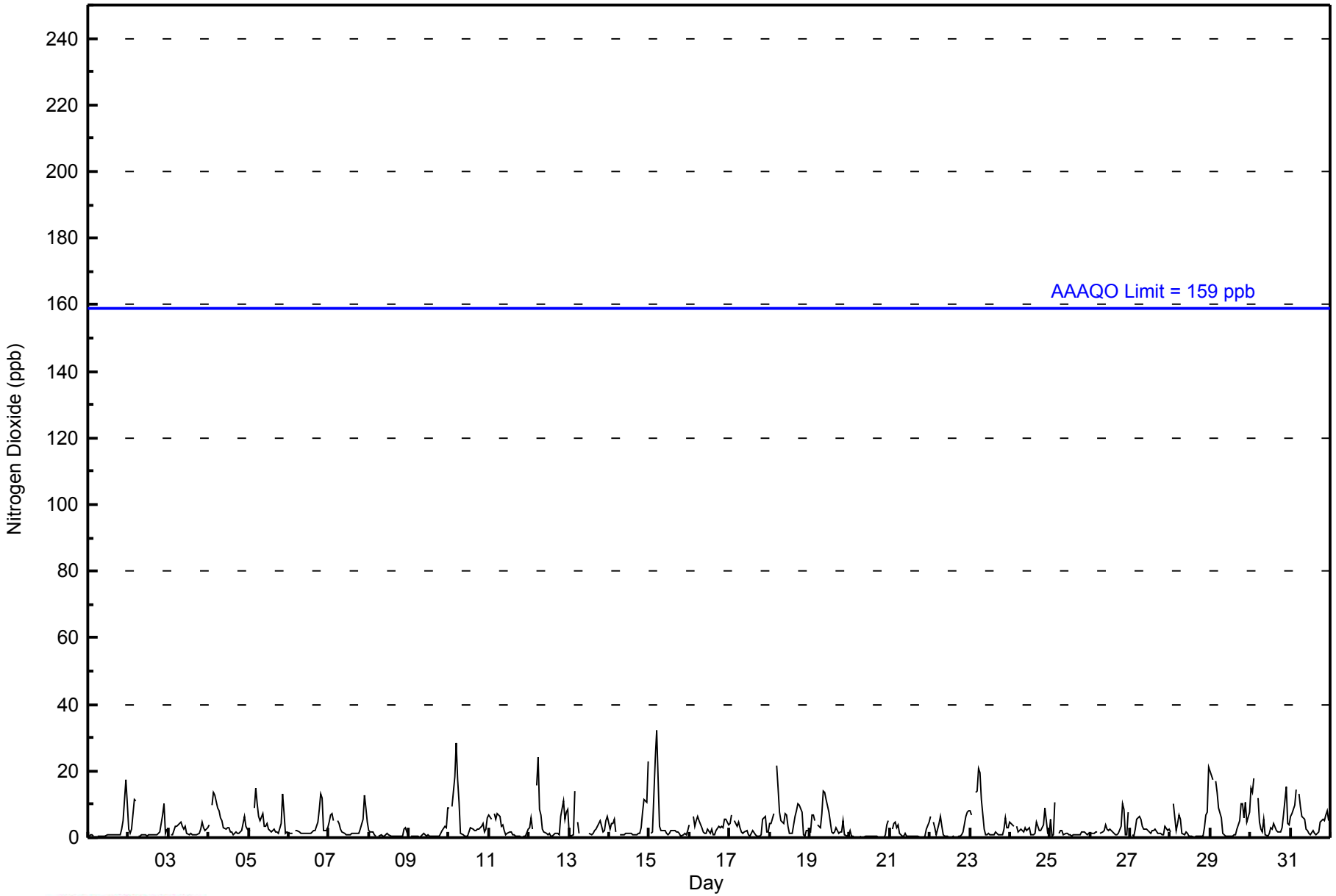
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Firebag - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	98.87	98.87
21 - 40	8	1.13	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Firebag - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	55	41	17	12	11	27	42	44	79	84	47	49	33	38	66	55	700
21 - 40	0	0	0	0	0	0	0	6	2	0	0	0	0	0	0	0	8
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	41	17	12	11	27	42	50	81	84	47	49	33	38	66	55	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

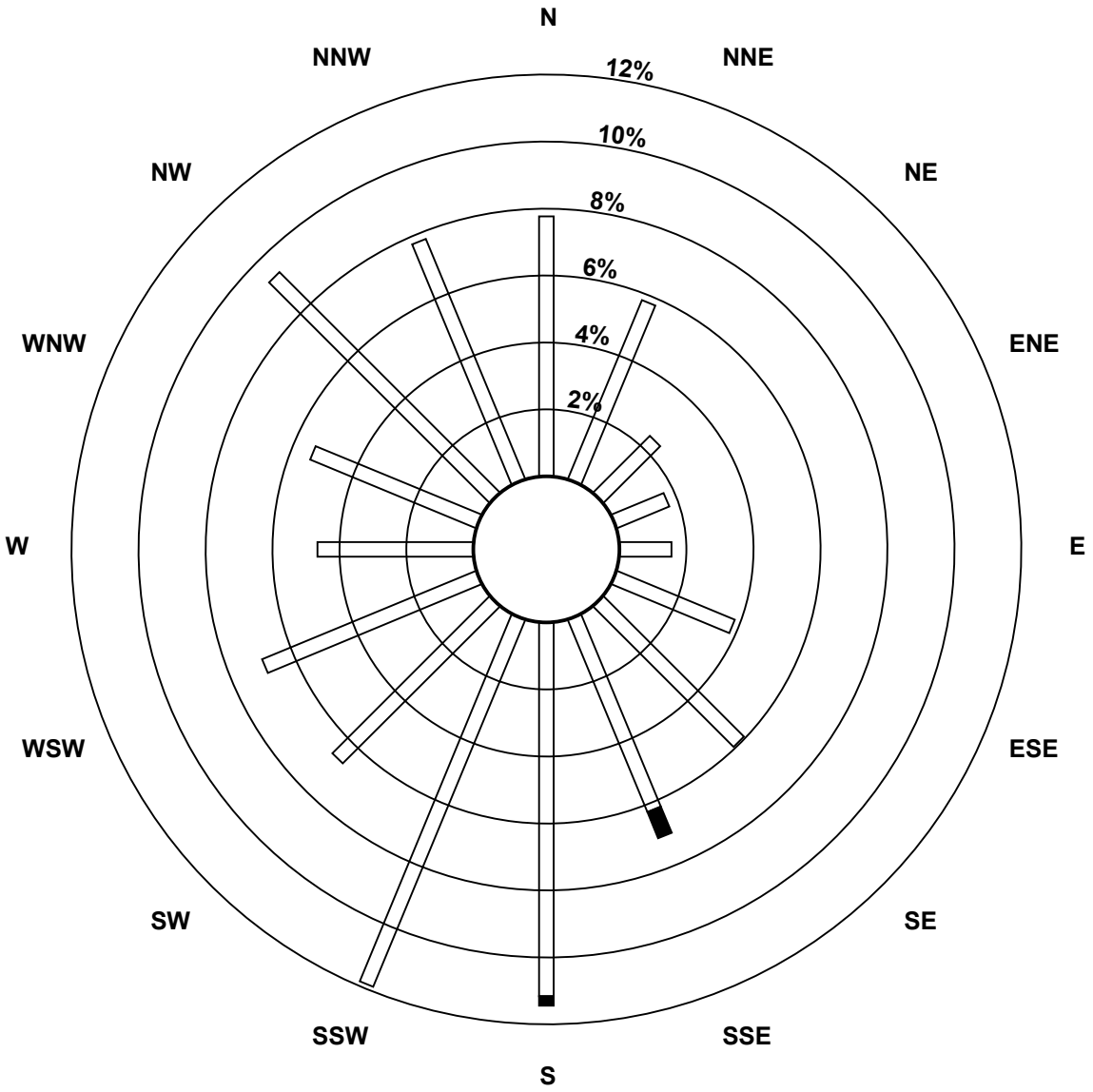
AURORA ATMOSPHERICS INC.

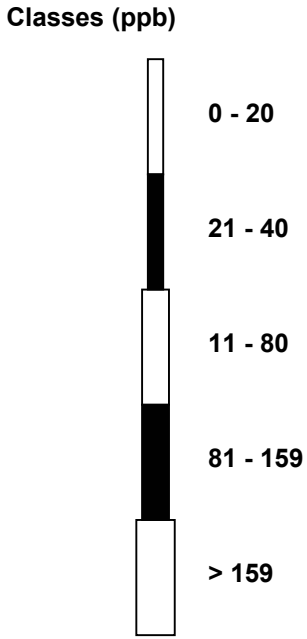
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Firebag (AMS 19)





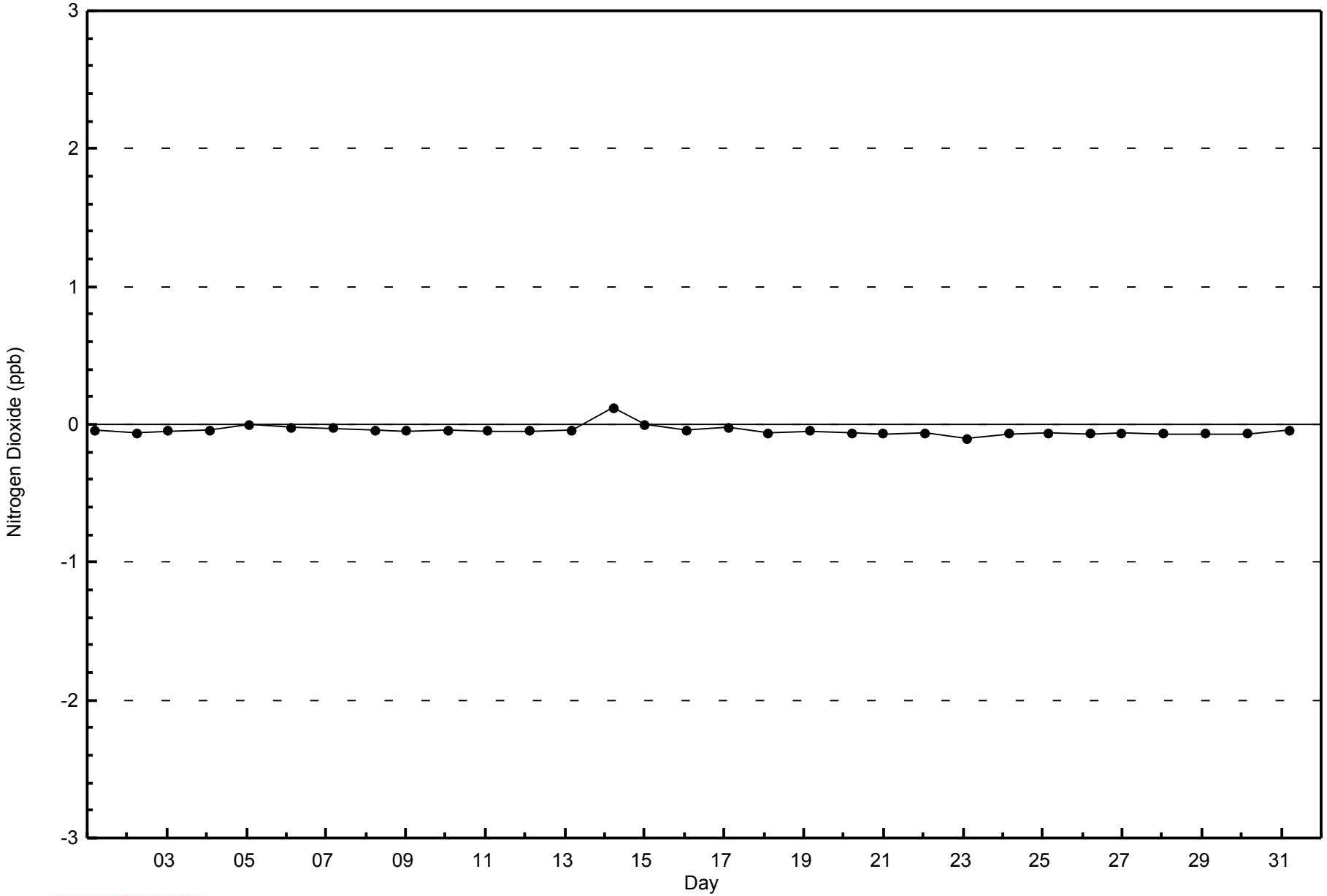
Total Number of Valid Hours: 708

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Firebag - August 2014



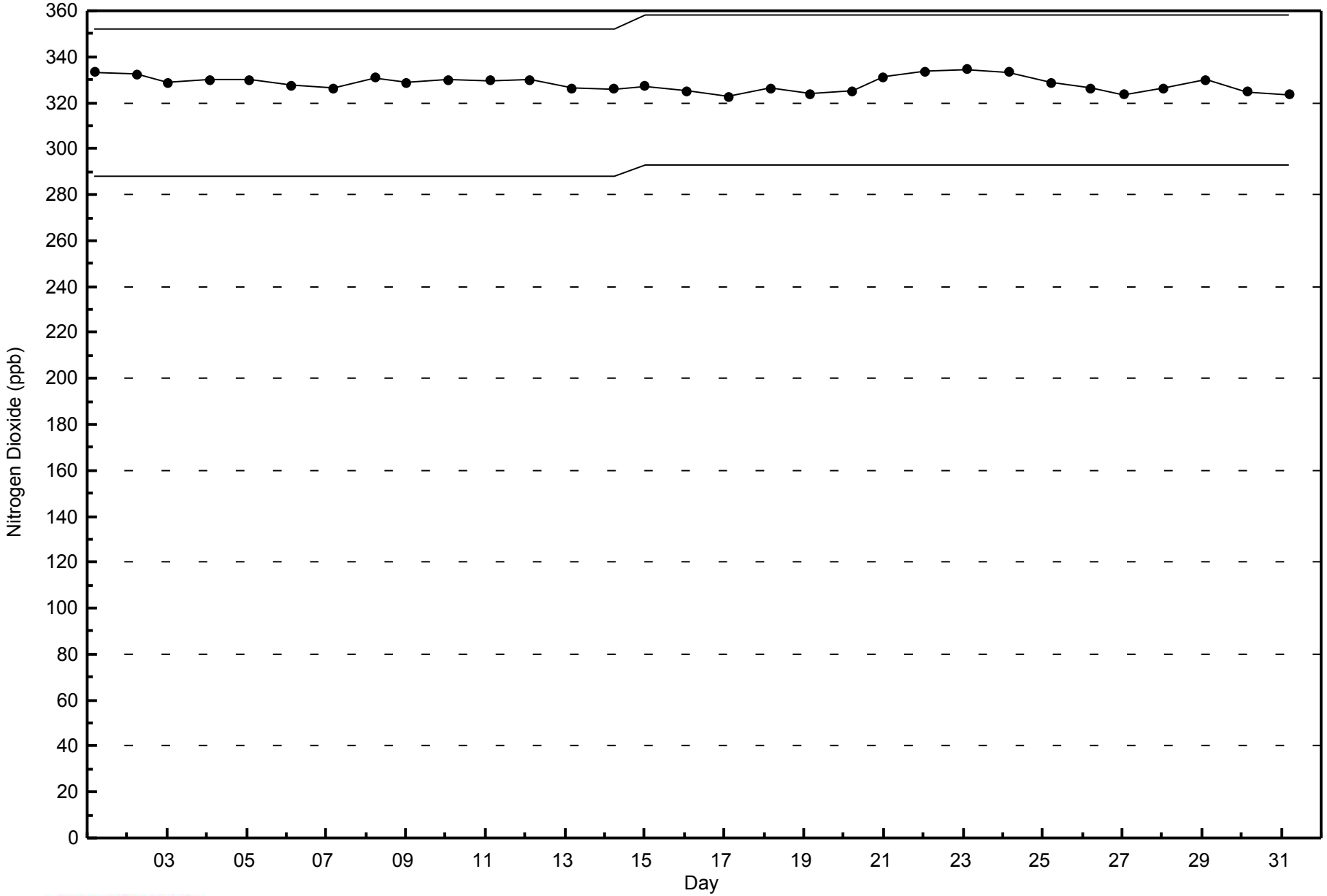
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Firebag - August 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 120 ppb on Aug 10 05:00

Maximum Daily Average: 13.1 ppb on Aug 10

Minimum Value: 0 ppb on Aug 21 20:00

Minimum Daily Average: 1.0 ppb on Aug 20

Maximum Diurnal Average: 16.9 ppb at hour 5

Minimum Diurnal Average: 1.5 ppb at hour 14

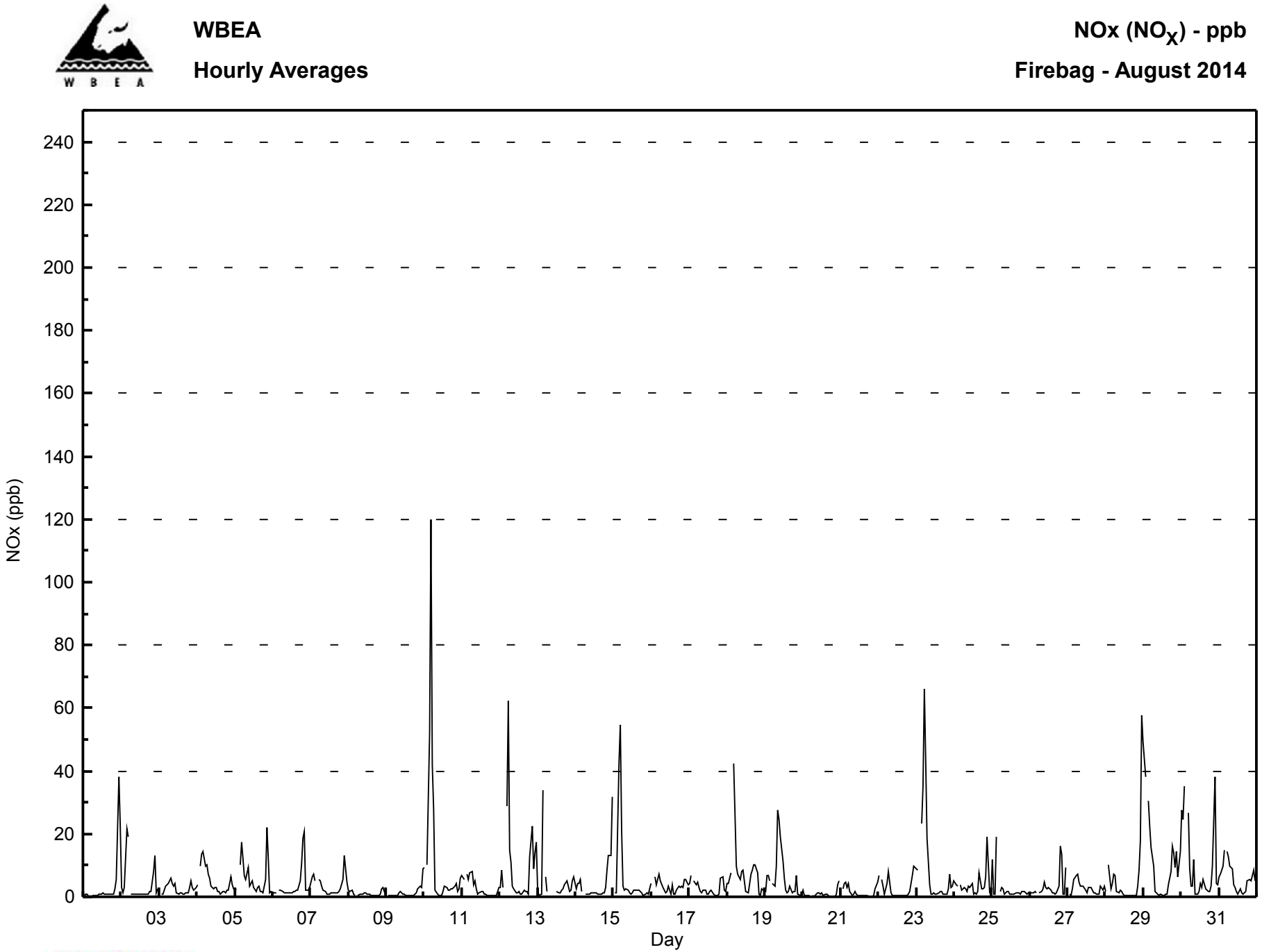
Monthly Average: 4.9 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 5$ $P_{90} = 10$ $P_{99} = 48$

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-Aug	0	1	1	1	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	3	6	38	23	3.6	38
2-Aug	3	1	3	22	19	Z	1	1	1	1	1	1	1	1	1	1	1	1	2	2	8	13	1	3	3.8	22
3-Aug	Z	1	1	2	3	4	4	6	4	3	4	1	1	1	1	1	1	1	1	3	5	3	2	3	2.5	6
4-Aug	4	Z	10	14	14	10	10	7	6	3	3	3	3	2	2	1	2	2	1	2	2	6	4	2	4.9	14
5-Aug	2	2	Z	10	17	12	7	6	9	4	4	5	3	2	3	3	2	2	1	5	22	12	1	1	6.0	22
6-Aug	1	1	1	Z	2	2	2	1	1	1	1	1	1	2	2	2	2	5	11	19	21	2	2	3	3.8	21
7-Aug	5	7	7	5	Z	5	5	3	2	2	1	1	1	1	1	1	1	1	2	3	5	13	9	5	3.8	13
8-Aug	2	2	2	1	1	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	2	3	0	1.0	3
9-Aug	Z	0	0	0	0	0	0	1	1	2	1	1	0	0	0	0	1	1	1	1	2	4	3	9	1.3	9
10-Aug	9	Z	10	52	120	42	28	2	1	1	1	1	2	3	3	2	2	3	3	3	4	2	2	6	13.1	120
11-Aug	7	5	Z	7	6	8	8	4	5	3	1	1	2	2	1	1	0	0	0	0	0	0	1	3	2.8	8
12-Aug	3	8	3	Z	29	62	15	11	3	2	1	1	2	1	1	2	2	2	1	13	23	9	14	17	9.8	62
13-Aug	2	1	1	34	Z	6	2	C	C	C	C	C	2	1	1	2	3	4	5	3	2	2	5	6	4.5	34
14-Aug	2	4	4	6	2	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	3	8	13	13	32	4.4	32
15-Aug	Z	1	1	43	55	21	4	2	3	2	1	1	1	2	2	2	2	2	1	1	1	1	1	2	6.6	55
16-Aug	4	Z	6	4	6	7	5	3	2	1	1	3	1	4	1	1	2	3	3	3	3	6	5	4	3.5	7
17-Aug	4	7	Z	5	4	5	3	2	1	2	2	1	1	2	2	1	1	1	1	1	6	6	2	2	2.5	7
18-Aug	4	4	8	Z	42	26	10	7	5	8	8	5	2	1	4	7	8	10	10	8	1	1	3	2	8.1	42
19-Aug	2	7	7	5	Z	4	3	10	28	25	19	11	6	2	1	2	3	1	2	2	7	1	1	1	6.5	28
20-Aug	2	1	0	0	0	Z	0	0	0	1	1	1	1	0	1	1	1	0	0	0	0	1	4	5	1.0	5
21-Aug	Z	3	4	5	3	4	2	1	1	2	1	1	1	1	1	0	0	0	0	0	0	1	3	5	1.6	5
22-Aug	7	Z	5	3	1	4	8	5	1	1	0	0	0	0	0	0	0	0	0	1	2	7	10	9	2.9	10
23-Aug	9	8	Z	23	35	66	44	19	4	1	1	1	1	1	1	2	2	1	1	1	2	7	3	3	10.2	66
24-Aug	5	4	3	Z	4	2	3	2	2	4	3	4	1	1	1	2	7	3	2	3	6	19	1	1	3.6	19
25-Aug	12	1	1	19	Z	2	3	3	1	2	2	1	1	1	1	1	1	1	1	2	2	1	1	1	2.5	19
26-Aug	1	1	1	2	1	Z	1	2	3	5	3	2	3	2	1	1	1	1	4	16	14	1	1	9	3.3	16
27-Aug	Z	1	0	3	6	7	7	5	4	3	3	2	1	3	3	3	1	1	1	1	1	3	2	4	2.8	7
28-Aug	2	Z	10	2	4	7	7	2	1	2	2	1	1	0	0	1	1	0	0	1	3	9	18	57	5.7	57
29-Aug	49	38	Z	30	22	16	10	2	1	1	0	1	1	0	1	1	4	8	16	14	9	15	6	14	11.3	49
30-Aug	28	25	35	Z	27	9	3	3	12	1	1	2	4	3	5	3	2	2	2	3	10	38	4	4	9.8	38
31-Aug	6	7	10	15	Z	14	13	10	9	4	3	2	1	2	1	1	1	2	5	6	5	7	8	5	6.0	15
	6.8	5.4	5.3	12.0	16.9	13.3	6.7	4.0	3.8	2.9	2.5	1.9	1.5	1.5	1.5	1.5	1.9	1.9	2.5	3.9	5.8	6.8	5.5	7.8	Diurnal Average	
	49	38	35	52	120	66	44	19	28	25	19	11	6	4	5	7	8	10	16	19	23	38	38	57	Diurnal Maximum	

Z - zerospan C - Calibration


WBEA
Hourly Averages
NOx (NO_X) - ppb
Firebag - August 2014
NOx (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	673	95.06	95.06
21 - 40	24	3.39	98.45
11 - 80	10	1.41	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

NOx (NO_X) - ppb

Firebag - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	55	41	17	12	11	27	40	28	72	83	46	49	33	38	66	55	673
21 - 40	0	0	0	0	0	0	1	15	6	1	1	0	0	0	0	0	24
11 - 80	0	0	0	0	0	0	1	6	3	0	0	0	0	0	0	0	10
81 - 159	0	0	0	0	0	0	0	1	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	55	41	17	12	11	27	42	50	81	84	47	49	33	38	66	55	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

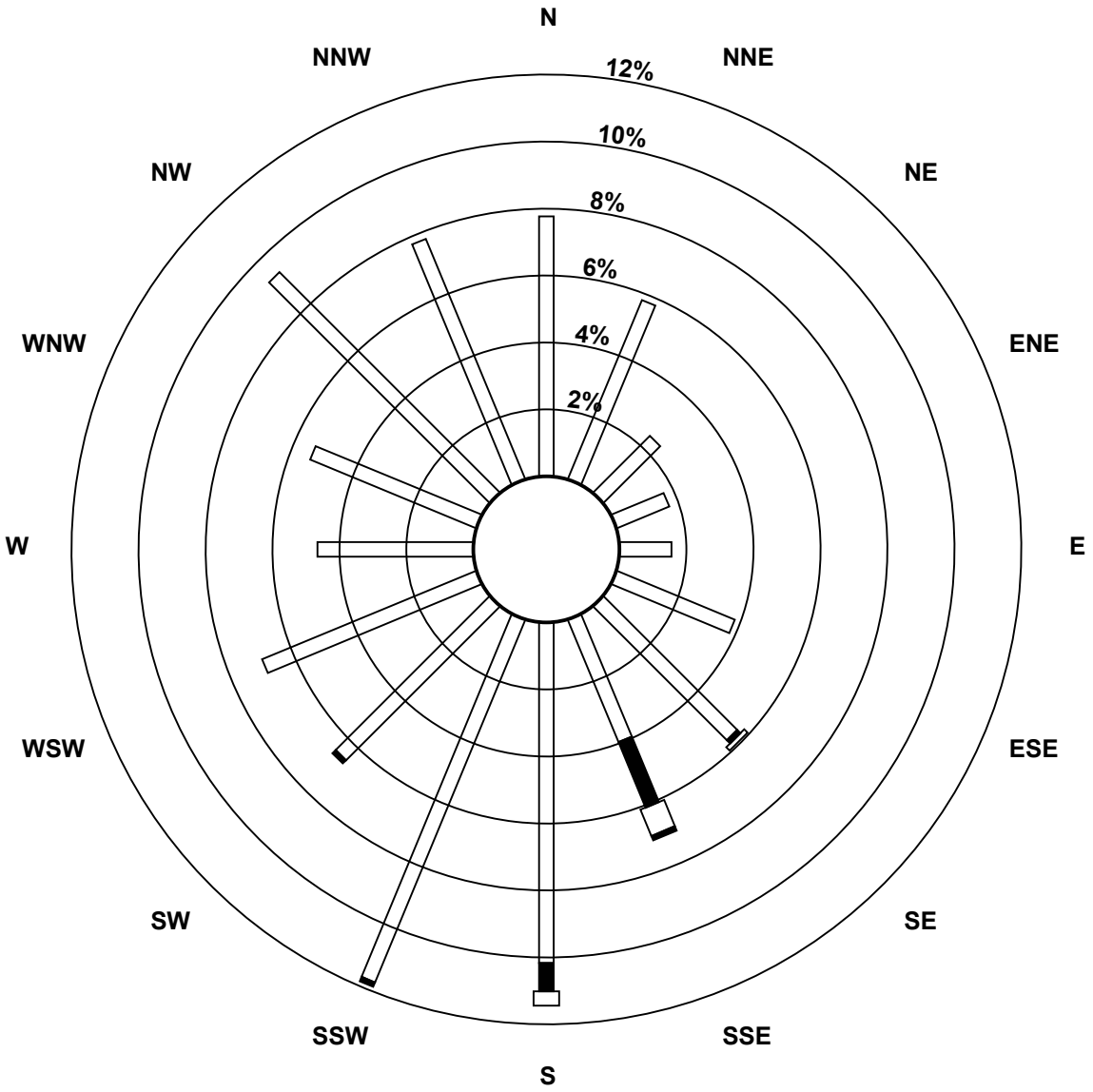
AURORA ATMOSPHERICS INC.

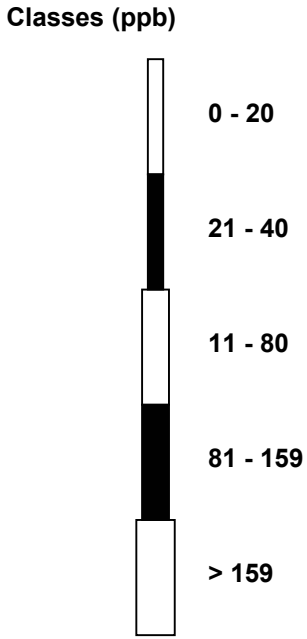
Wood Buffalo Environmental Association

Wind Rose Aug 2014

NOx (NO_X) - ppb

Firebag (AMS 19)





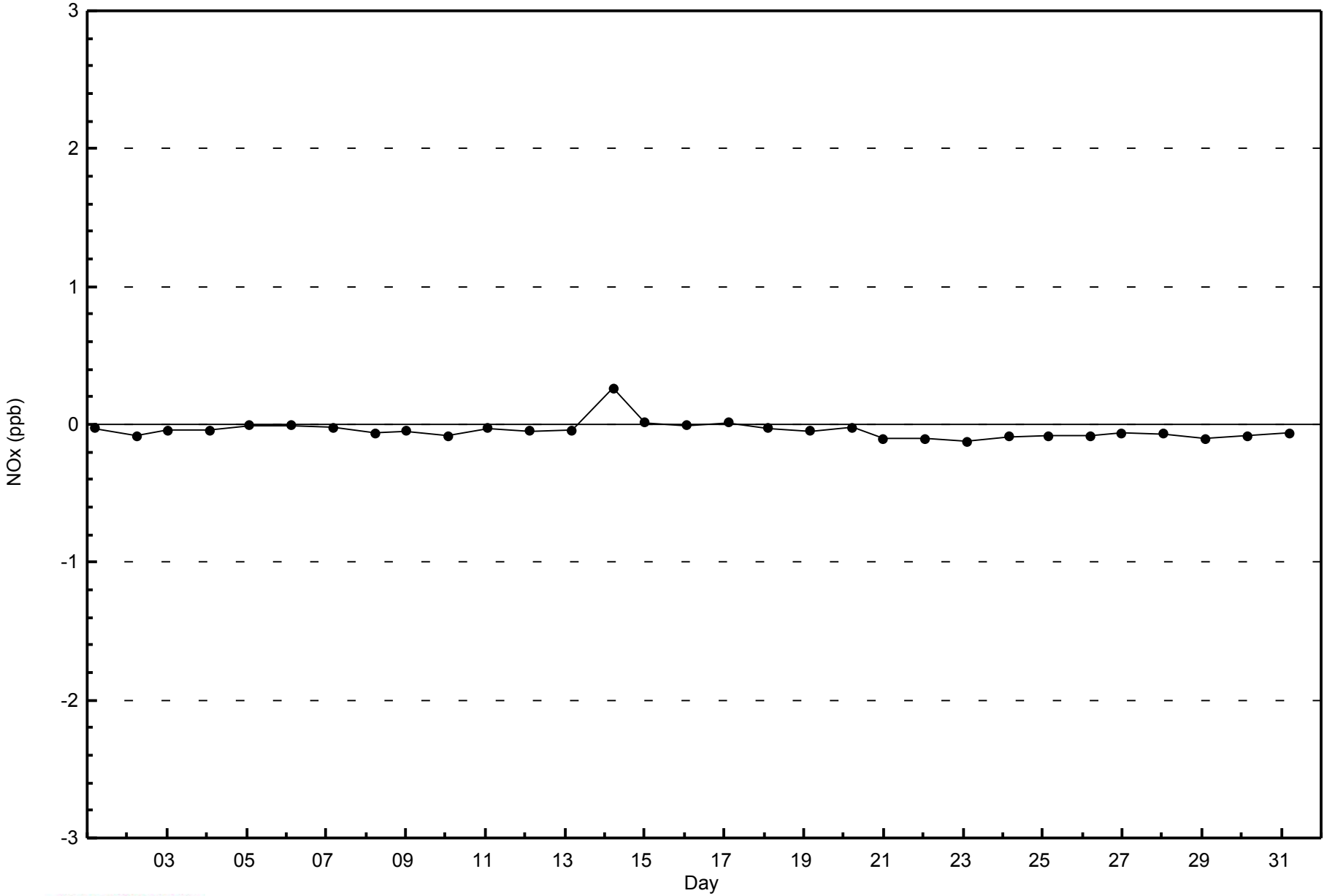
Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

NOx (NO_X) - ppb

Firebag - August 2014



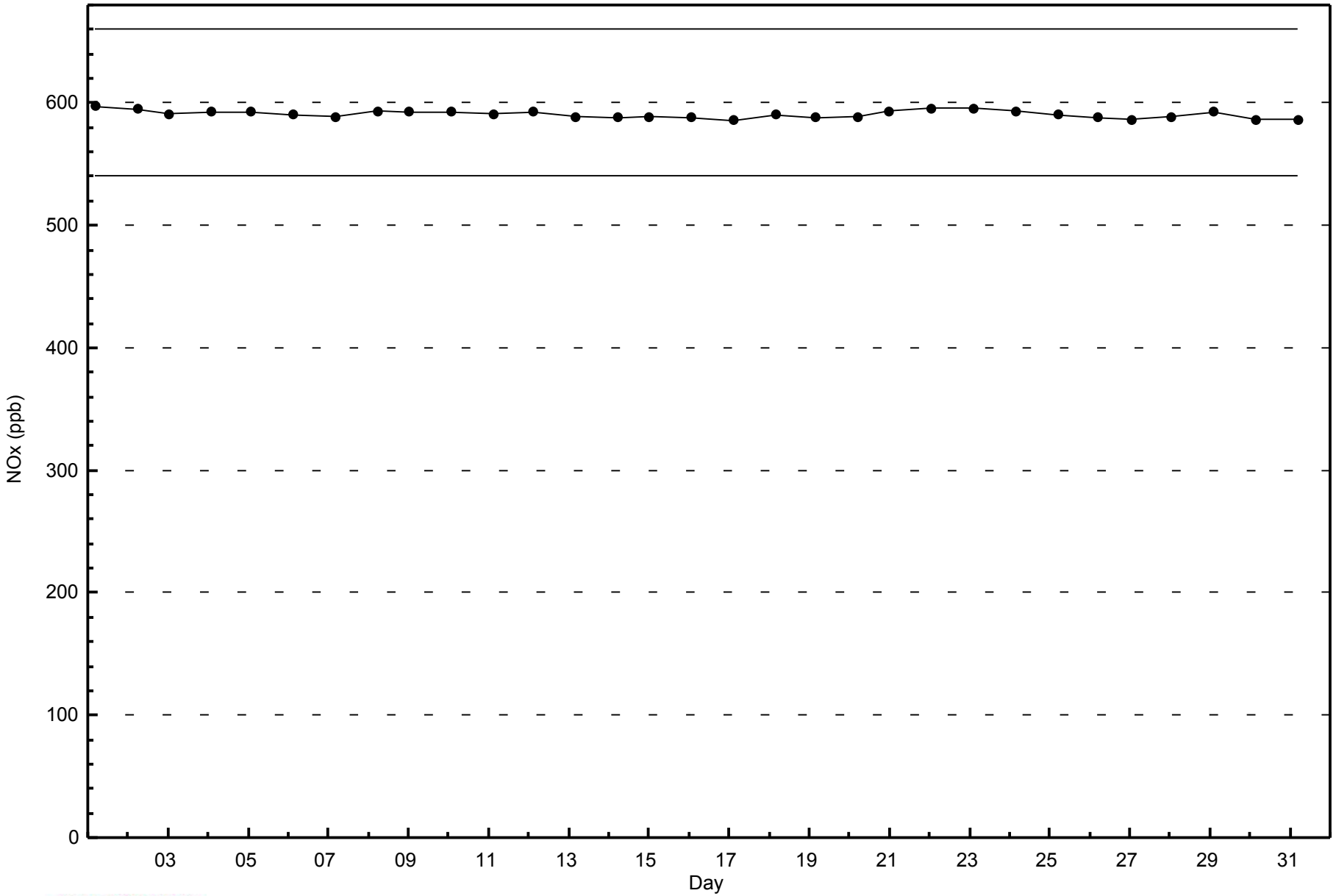
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

NOx (NO_X) - ppb

Firebag - August 2014



AURORA
ATMOSPHERICS INC.

Maximum Value: 28.6 C on Aug 5 16:00

Maximum Daily Average: 23.7 C on Aug 13

Minimum Value: 2.3 C on Aug 21 03:00

Minimum Daily Average: 7.8 C on Aug 21

Maximum Diurnal Average: 20.3 C at hour 16

Minimum Diurnal Average: 12.0 C at hour 5

Monthly Average: 16.25 C

Percentiles: P_1 = 3.9 P_{10} = 9.0 Q_1 = 11.9 Median = 16.0 Q_3 = 20.3 P_{90} = 24.8 P_{99} = 28.4

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

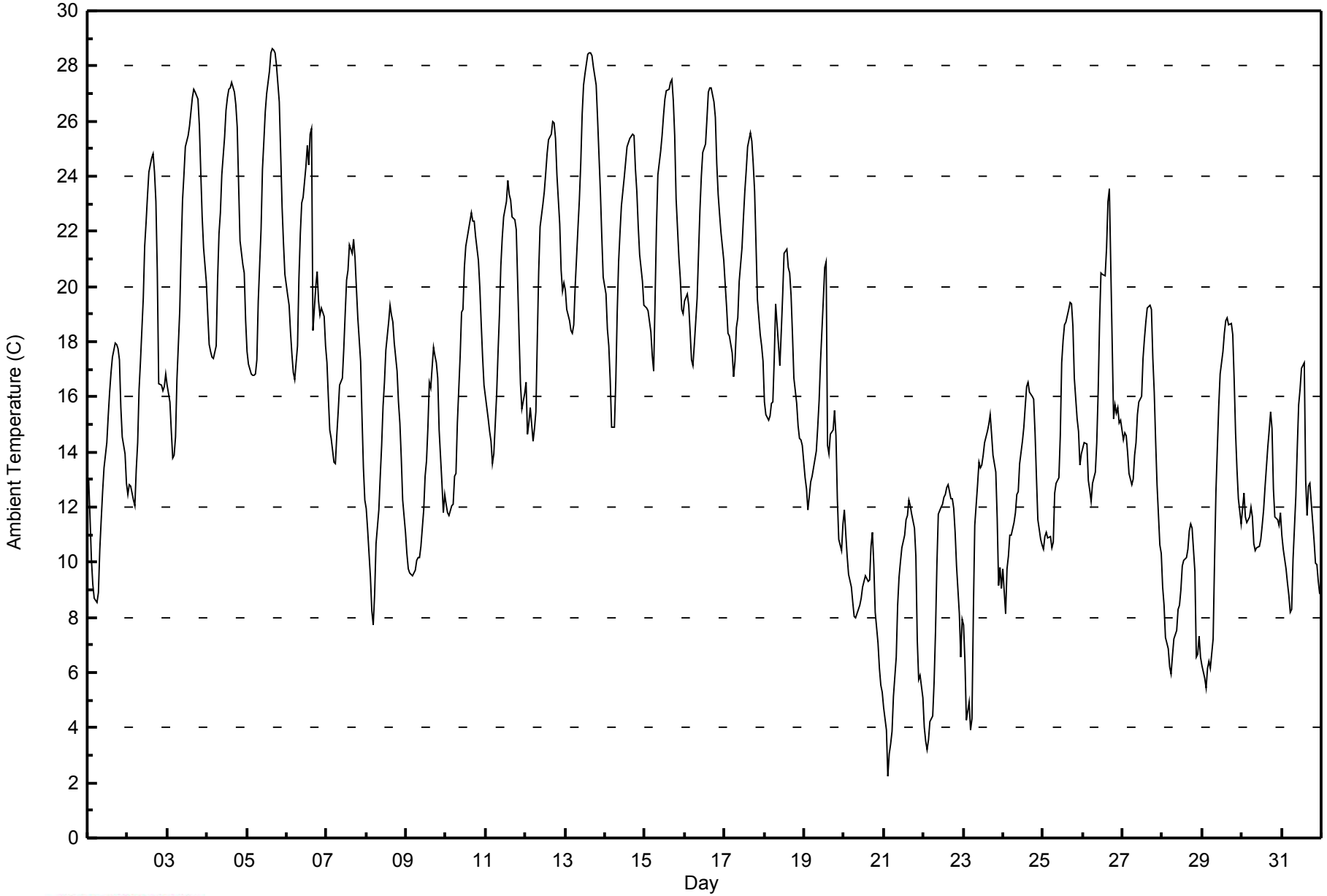
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	13.0	11.7	10.1	9.2	8.7	8.5	8.9	10.5	11.5	12.6	13.4	14.3	15.3	16.2	16.9	17.4	17.9	17.9	17.7	17.3	15.6	14.5	13.9	12.8	13.6	17.9
2-Aug	12.4	12.8	12.8	12.2	12.0	13.4	14.3	16.3	17.3	19.6	21.5	22.3	23.3	24.2	24.7	24.8	24.1	23.1	20.5	16.5	16.4	16.2	16.4	16.8	18.1	24.8
3-Aug	16.4	15.8	14.7	13.8	13.9	14.5	16.6	19.1	21.3	23.1	24.0	25.1	25.5	25.8	26.3	26.9	27.1	27.0	26.8	25.8	24.2	22.5	21.4	20.2	21.6	27.1
4-Aug	19.0	17.9	17.7	17.4	17.4	17.9	20.2	21.9	22.7	24.0	25.4	26.4	26.8	27.2	27.2	27.4	27.0	26.6	25.8	23.7	21.6	20.8	20.5	18.8	22.6	27.4
5-Aug	17.6	17.2	16.8	16.8	16.8	16.8	17.4	19.5	22.1	24.3	25.2	26.3	27.0	27.8	28.5	28.6	28.6	28.5	28.0	26.7	24.8	22.9	21.6	20.5	22.9	28.6
6-Aug	19.7	19.3	18.3	17.5	16.9	16.6	17.8	20.3	21.9	23.0	23.2	24.4	25.1	24.4	25.5	25.7	18.4	20.0	20.5	19.5	19.0	19.2	18.9	17.9	20.6	25.7
7-Aug	17.2	16.0	14.8	14.5	13.6	13.6	14.6	15.5	16.4	16.7	17.7	19.0	20.3	20.6	21.5	21.2	21.7	21.0	19.9	18.9	17.3	15.3	13.4	12.2	17.2	21.7
8-Aug	11.9	11.2	9.5	8.3	7.7	8.9	10.7	11.9	13.1	14.2	15.7	16.5	17.7	18.7	19.3	19.0	18.7	18.0	16.9	15.8	15.1	13.8	12.2	11.1	14.0	19.3
9-Aug	10.3	9.7	9.6	9.5	9.5	9.7	10.1	10.2	10.2	10.6	11.9	13.1	13.7	14.9	16.5	16.3	17.8	17.5	17.3	16.7	14.8	12.9	11.8	12.5	12.8	17.8
10-Aug	12.1	11.8	11.7	12.0	12.1	13.1	13.2	15.1	17.5	19.1	19.2	20.7	21.5	21.8	22.4	22.7	22.4	22.4	21.8	21.0	20.0	18.7	17.4	16.4	17.7	22.7
11-Aug	16.0	15.2	14.7	14.4	13.6	13.9	16.0	17.6	19.0	20.7	21.8	22.5	23.1	23.8	23.3	23.1	22.5	22.4	22.1	20.2	18.3	16.5	15.6	16.1	18.8	23.8
12-Aug	16.5	14.6	15.1	15.6	14.4	14.9	15.4	18.0	20.5	22.2	23.0	23.4	24.1	24.8	25.3	25.5	26.0	25.9	25.4	24.1	22.3	20.6	19.9	20.1	20.7	26.0
13-Aug	19.9	19.2	18.8	18.4	18.3	18.6	20.0	22.1	23.1	24.5	26.2	27.3	27.7	28.4	28.5	28.5	28.4	27.9	27.3	26.1	24.8	23.5	21.8	20.3	23.7	28.5
14-Aug	19.7	18.5	17.8	16.6	14.9	14.9	16.6	19.1	20.9	22.0	23.0	23.9	24.5	25.1	25.2	25.4	25.5	25.5	24.2	23.4	22.2	21.1	20.2	19.3	21.2	25.5
15-Aug	19.3	19.2	19.1	18.4	17.5	16.9	19.5	22.2	24.0	24.9	25.5	26.2	26.8	27.1	27.2	27.4	27.5	26.8	25.5	23.2	21.0	20.3	19.2	19.0	22.7	27.5
16-Aug	19.5	19.7	19.3	18.4	17.4	17.2	17.9	19.6	21.2	22.8	24.0	24.8	25.1	26.1	27.1	27.2	27.2	26.7	26.1	24.5	23.3	22.6	22.0	21.0	22.5	27.2
17-Aug	20.1	19.3	18.3	18.2	17.6	16.7	17.3	18.5	18.9	20.2	21.4	22.5	23.4	24.2	25.1	25.6	25.3	24.5	23.4	21.5	19.5	18.3	17.9	17.3	20.6	25.6
18-Aug	15.8	15.3	15.2	15.3	15.8	15.8	17.4	19.3	17.9	17.1	18.4	19.7	21.2	21.3	20.7	20.5	19.7	18.2	16.7	15.8	15.0	14.5	14.4	14.2	17.3	21.3
19-Aug	13.0	12.7	11.9	12.4	12.9	13.1	13.7	14.0	14.9	15.9	17.3	19.5	20.7	20.9	14.2	13.9	14.6	14.8	15.5	14.6	12.3	10.8	10.4	11.4	14.4	20.9
20-Aug	11.9	11.0	10.2	9.5	9.1	8.5	8.0	8.0	8.1	8.5	8.7	9.1	9.3	9.5	9.3	9.4	10.6	11.1	9.9	8.2	7.1	6.2	5.6	5.3	8.8	11.9
21-Aug	4.7	3.9	2.3	3.0	3.4	3.8	5.1	6.5	8.4	9.5	10.0	10.5	11.0	11.6	11.7	12.3	12.0	11.8	11.2	10.2	7.2	5.8	5.9	5.1	7.8	12.3
22-Aug	4.0	3.5	3.2	3.6	4.2	4.4	5.7	7.5	9.9	11.8	12.0	12.1	12.4	12.4	12.7	12.8	12.3	12.3	11.9	11.1	9.9	8.2	6.6	7.9	8.8	12.8
23-Aug	7.7	6.4	4.3	4.9	3.9	4.3	8.2	11.4	12.8	13.6	13.4	13.5	13.9	14.3	14.7	15.0	15.3	14.7	13.9	13.3	11.6	9.2	9.8	9.1	10.8	15.3
24-Aug	9.8	8.2	9.8	10.2	11.0	11.0	11.4	11.8	12.5	12.6	13.6	14.4	14.9	15.7	16.3	16.5	16.2	16.0	15.9	14.7	13.1	11.5	10.8	10.6	12.9	16.5
25-Aug	10.5	10.9	11.1	10.9	10.9	10.5	10.7	12.5	12.9	13.1	14.6	17.3	18.1	18.6	18.7	19.2	19.4	19.4	18.6	16.7	15.2	14.7	13.5	13.9	14.7	19.4
26-Aug	14.1	14.3	14.3	13.0	12.6	12.2	12.9	13.3	14.3	16.1	18.7	20.5	20.5	20.4	21.4	23.1	23.5	20.7	15.2	15.7	15.4	15.6	15.1	15.2	16.6	23.5
27-Aug	14.4	14.7	14.6	14.0	13.2	12.8	13.0	13.9	14.3	15.3	15.8	16.0	17.4	18.1	18.7	19.2	19.3	19.2	17.4	16.2	14.4	12.8	10.6	10.3	15.2	19.3
28-Aug	9.1	8.4	7.3	6.9	6.2	5.9	6.6	7.2	7.5	8.3	8.4	9.0	9.9	10.1	10.2	10.5	11.1	11.4	11.3	9.7	6.6	6.7	7.3	6.6	8.4	11.4
29-Aug	6.3	5.8	5.4	6.2	6.4	6.2	7.2	10.0	12.6	14.2	15.7	16.9	17.7	18.3	18.8	18.9	18.6	18.6	18.3	16.6	14.7	13.4	12.3	11.4	12.9	18.9
30-Aug	12.0	12.5	11.7	11.4	11.7	12.0	11.6	10.7	10.4	10.5	10.6	10.8	11.3	11.9	12.7	14.2	14.8	15.5	14.8	12.7	11.6	11.5	11.4	11.8	12.1	15.5
31-Aug	11.0	10.5	9.8	9.2	8.8	8.2	8.3	10.1	12.4	14.1	15.7	16.3	17.0	17.2	12.9	11.7	12.8	12.9	12.2	10.8	10.0	9.9	9.3	8.9	11.7	17.2
	13.7	13.1	12.6	12.3	12.0	12.1	13.1	14.6	15.8	16.9	17.9	18.9	19.6	20.0	20.1	20.3	20.2	19.9	19.1	17.8	16.3	15.2	14.4	14.0	Diurnal Average	
	20.1	19.7	19.3	18.4	18.3	18.6	20.2	22.2	24.0	24.9	26.2	27.3	27.7	28.4	28.5	28.6	28.6	28.5	28.0	26.7	24.8	23.5	22.0	21.0	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Firebag - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	106	14.25	14.25
10 - 20	441	59.27	73.52
> 20	197	26.48	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Firebag - August 2014

Maximum Value: 99 % on Aug 20 06:00

Maximum Daily Average: 87.4 % on Aug 20

Minimum Value: 21 % on Aug 5 16:00

Minimum Daily Average: 44.8 % on Aug 5

Maximum Diurnal Average: 78.9 % at hour 5

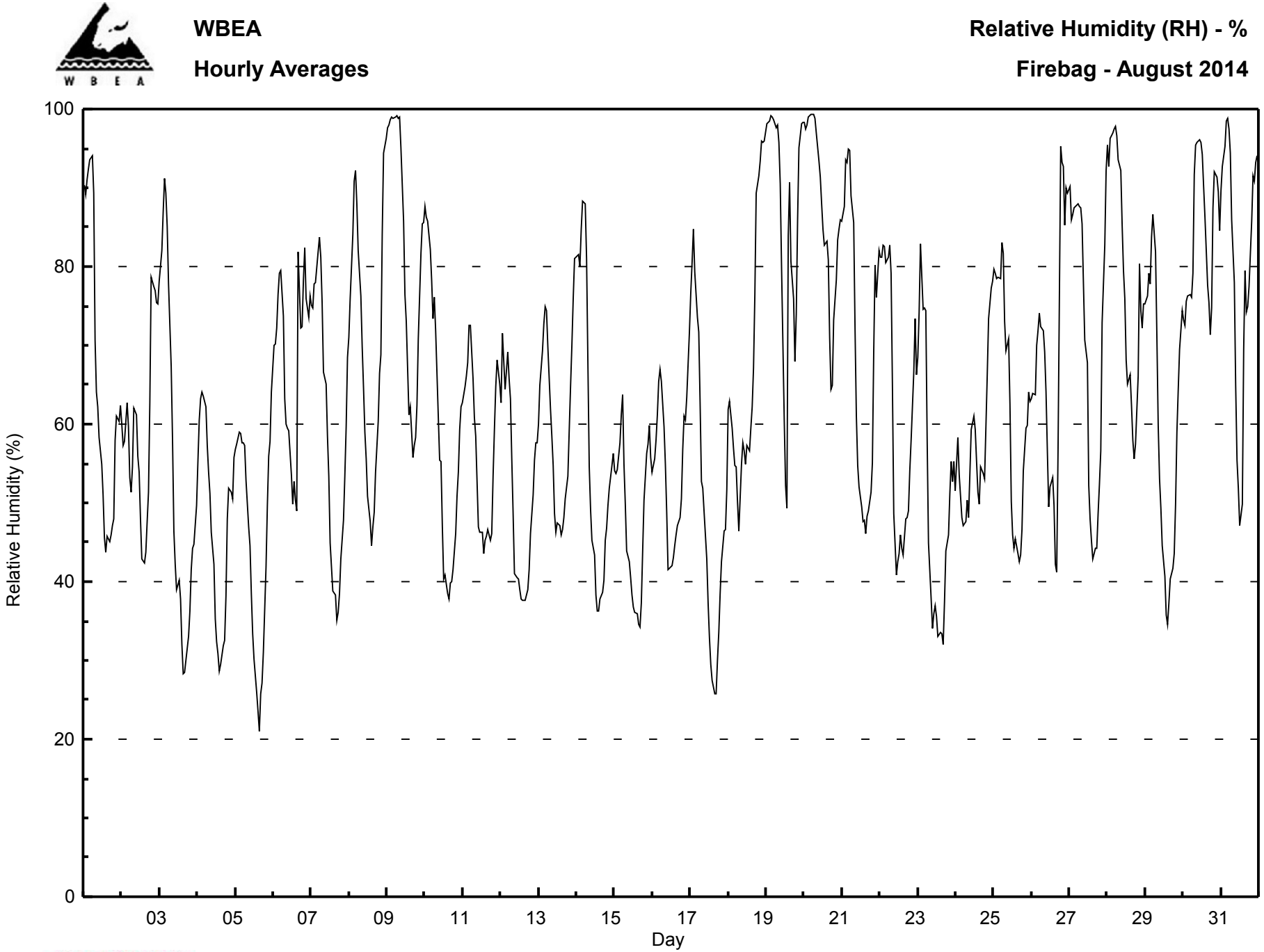
Minimum Diurnal Average: 47.2 % at hour 14

Monthly Average: 63.5 %

Percentiles: P_1 = 27 P_{10} = 40 Q_1 = 48 Median = 61 Q_3 = 79 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-Aug	90	89	91	92	94	94	89	71	64	62	58	55	51	46	44	46	45	46	47	48	58	61	60	62	65.2	94
2-Aug	60	57	58	63	60	53	51	55	62	61	56	54	48	43	42	44	48	51	63	79	77	77	75	75	58.8	79
3-Aug	78	82	87	91	89	85	78	67	58	46	42	39	40	38	32	28	28	30	33	36	41	44	45	50	53.7	91
4-Aug	55	61	63	64	63	62	57	54	51	46	42	35	32	31	29	29	32	32	38	48	52	51	50	56	47.4	64
5-Aug	57	57	59	59	58	58	57	53	47	45	38	33	30	26	23	21	26	27	31	42	50	56	58	64	44.8	64
6-Aug	70	70	72	76	79	79	74	63	60	59	59	54	50	53	50	49	82	72	72	78	82	76	74	76	68.0	82
7-Aug	75	75	78	78	82	84	81	75	67	65	59	53	45	42	39	38	35	36	38	43	48	53	60	68	59.1	84
8-Aug	71	76	84	91	92	88	82	76	70	65	59	56	51	48	45	47	49	54	60	66	69	84	94	96	69.7	96
9-Aug	98	98	99	99	99	99	99	99	99	95	86	76	73	67	61	62	56	57	58	62	71	82	85	86	81.9	99
10-Aug	88	86	86	82	78	73	76	72	61	55	55	47	40	41	38	38	40	40	42	46	51	54	59	62	58.8	88
11-Aug	63	65	66	68	73	73	66	61	58	53	47	46	46	44	45	46	47	45	46	53	59	65	68	65	57.0	73
12-Aug	63	72	68	64	69	66	63	56	49	41	40	40	39	38	38	38	38	39	42	46	51	55	58	58	51.2	72
13-Aug	60	65	69	73	75	74	70	62	58	55	49	46	48	47	46	47	48	50	53	59	65	70	76	81	60.3	81
14-Aug	81	82	80	85	88	88	81	68	55	49	45	43	38	36	36	38	39	40	45	47	50	52	55	56	57.4	88
15-Aug	54	54	54	58	61	64	55	50	44	43	40	38	37	36	36	35	34	37	44	50	56	58	60	56	48.1	64
16-Aug	54	56	58	61	65	67	65	60	55	49	42	42	42	43	45	46	47	48	50	57	61	60	63	72	54.5	72
17-Aug	77	80	85	79	73	72	63	53	52	49	43	37	33	30	28	26	26	30	34	38	43	46	47	52	49.7	85
18-Aug	62	63	59	57	55	55	50	46	55	58	57	55	57	57	59	62	67	76	89	92	93	96	96	96	67.2	96
19-Aug	98	98	98	99	99	99	98	98	96	91	80	61	52	49	84	91	81	76	68	74	86	95	98	98	86.1	99
20-Aug	98	97	98	99	99	99	99	99	97	93	91	88	85	83	83	81	71	64	65	73	78	83	85	86	87.4	99
21-Aug	86	88	94	93	95	95	89	86	72	61	55	52	49	48	48	46	48	49	51	55	69	80	76	82	69.4	95
22-Aug	81	81	83	83	81	81	83	79	65	49	41	43	44	46	44	43	48	48	49	54	58	67	73	66	62.0	83
23-Aug	68	74	83	75	75	74	58	45	38	34	36	37	36	33	34	33	32	37	44	46	51	55	53	55	50.3	83
24-Aug	52	58	54	51	48	47	48	50	48	54	59	61	59	55	51	50	55	54	53	60	66	73	77	78	56.7	78
25-Aug	80	79	79	79	78	83	82	73	69	71	62	50	46	44	45	43	43	43	47	54	60	60	64	63	62.4	83
26-Aug	63	64	64	70	72	74	72	72	69	64	57	49	52	53	50	42	41	57	95	93	93	85	90	89	68.0	95
27-Aug	90	86	87	87	88	88	88	87	85	78	71	68	52	48	45	43	44	44	49	52	57	73	83	92	70.2	92
28-Aug	95	93	96	97	98	98	97	93	92	85	80	76	68	65	66	62	58	56	57	66	80	74	72	75	79.2	98
29-Aug	75	76	79	78	84	87	82	71	60	53	49	45	41	36	35	37	40	42	44	50	59	64	70	74	59.6	87
30-Aug	73	73	76	76	76	76	79	92	96	96	96	96	94	90	86	78	75	71	75	88	92	91	89	85	84.1	96
31-Aug	90	93	95	98	99	97	94	86	78	65	55	52	47	50	70	80	74	75	78	86	92	91	93	94	80.5	99
	74.4	75.7	77.4	78.2	78.9	78.5	75.0	70.0	65.5	60.9	56.4	52.5	49.2	47.2	47.7	47.4	48.3	49.3	53.6	59.4	65.1	68.8	71.2	73.2	Diurnal Average	
	98	98	99	99	99	99	99	99	99	96	96	96	94	90	86	91	82	76	95	93	93	96	98	98	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity (RH) - %
Firebag - August 2014
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	73	9.81	9.81
40 - 60	291	39.11	48.92
60 - 80	209	28.09	77.02
80 - 100	171	22.98	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 - August 2014

Maximum Speed: 31 km/h on Aug 7 13:00

Maximum Daily Speed Average: 18.6 km/h on Aug 25

Minimum Speed Value: 0 km/h on Aug 22 22:00

Minimum Daily Speed Average: 1.4 km/h on Aug 15

Maximum Diurnal Speed Average: 7.9 km/h at hour 15

Minimum Diurnal Speed Average: 1.2 km/h at hour 20

Monthly Average Velocity: 3.1 km/h 228.9 deg

Percentiles: P_1 = 2 P_{10} = 5 Q_1 = 8 Median = 11 Q_3 = 15 P_{90} = 18 P_{99} = 26

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-Aug	N18	N23	N19	NNE17	N19	NNE17	NNE16	NNE20	N23	N20	NNW16	NNW13	NNW14	NNW15	NNW14	NW11	NNW8	NNW8	NNW6	NNW4	E2	SE6	SSE10	SSE15	N10.8	N23
2-Aug	S15	S16	S17	S16	S18	S20	S22	S22	SSW20	SW23	SW26	SW21	SSW20	SSW22	SSW21	SSW22	S24	SSW16	NNW8	ENE17	SE15	SSE14	S13	SSW14	SSW15.4	SW26
3-Aug	SSW13	SW11	SW10	SW10	SW8	SW7	SSW6	WSW6	WSW4	E6	SE3	ENE1	NW8	WNW7	NW5	NW5	W7	WSW8	SW9	SSW7	S7	SSW9	SSW10	SSW9	SW5.5	SSW13
4-Aug	SSW6	SSW7	SSW7	SSW8	SSW5	SSW6	SW7	W4	NW9	N10	N9	NNE11	NNE12	NNE11	N11	N11	NNE11	NNE10	NNE9	NE10	ENE7	ESE6	ESE11	SE13	NNE3.0	SE13
5-Aug	SE14	SE13	SE12	SE12	SE12	SE12	SE11	SE12	SE13	SE10	S15	SSE11	ESE11	ESE11	S14	S14	S13	S15	S14	S12	SSE12	SSE12	S15	S15	SSE11.7	S15
6-Aug	S16	S17	S16	SSW16	S16	S15	S14	SSW18	SSW17	SW18	SSW20	SSW23	SSW22	S26	SSW23	WSW15	NW14	SSE3	SSE12	SSE13	SSE12	SSW14	SW14	SW13	SSW14.4	S26
7-Aug	SW14	WSW13	WSW12	WSW15	WSW14	WSW15	W18	W22	W27	W26	W28	WSW27	W31	W26	W28	W23	WNW22	WNW17	WNW14	W9	W6	W6	NNW8	N6	W16.8	W31
8-Aug	NW7	NW5	NE7	NNE5	NNE6	N6	NNE7	NNE7	NNW7	NW8	NW9	N8	NNW10	NNW8	NNW8	N8	NE10	NE12	NNE10	NE10	ENE10	SSW8	NNW6	N6	N6.2	NE12
9-Aug	NNW10	N13	N13	N13	N12	N10	N11	NNW14	NNW16	NNW16	NNW15	NW17	NW16	NW16	WNW18	NW14	NW15	NNW10	NNW9	WSW5	WSW5	SSW3	SSW5	SSW7	NNW9.5	WNW18
10-Aug	SSW7	SW8	SSW9	S4	SSE4	SSE8	SSE12	S13	S15	SSW15	SSW14	WSW14	W13	W12	WSW12	WSW11	WSW11	WSW12	WSW8	SSW7	S8	SSW11	SSW10	SW11	SW8.7	S15
11-Aug	SW11	SSW11	SW10	SSW11	SSW12	SW12	WSW10	WSW10	WSW11	WNW11	NNW15	NW16	NW16	NW18	NNW15	NNW17	NNE15	NNE15	N16	N10	NNE8	NNE8	NE8	ENE10	NW5.5	NW18
12-Aug	ESE7	SE4	SE10	SE11	SSE12	SSE11	SE10	SSE10	SSE8	SE6	ESE5	SSE6	SSE8	SSE6	SSW8	S11	S8	SSW13	S15	SSE11	SSE12	SE15	SSE15	SSE20	SSE9.3	SSE20
13-Aug	S21	S19	S17	S17	S17	S17	S16	SSW19	SSW21	SSW21	SSW24	SSW26	SSW27	SW23	WSW24	SW22	SW19	WSW18	WSW14	SW10	SSW11	WSW10	N5	WSW1	SSW15.5	SSW27
14-Aug	NW5	NW10	NW8	NNE8	NNE9	NE9	NE9	NE7	NNE9	N8	NNW7	NW10	NW12	NW10	NW10	NW9	NW7	NW5	NNE7	E6	SE6	SE9	SE10	SSE10	N3.9	NW12
15-Aug	SSE12	S12	S9	S9	S9	S7	SSW10	SW11	SW9	WSW10	W9	WNW7	WNW8	WNW8	NW9	NW8	NW9	NW10	NNE14	NNE14	NE11	ENE10	ENE10	ENE9	WSW1.4	NNE14
16-Aug	E11	ESE12	ESE10	ESE12	ESE12	ESE12	ESE13	ESE16	ESE14	ESE13	SE15	SE16	ESE15	SSE13	SSW15	SW14	WSW16	W15	WSW11	SW9	SW9	SW10	SW11	SW9	SSE7.5	SE16
17-Aug	SW9	SW10	WNW7	NNW8	NNW10	NNW10	NNW13	NNW17	N15	NW9	WNW11	WNW12	NW12	WNW16	WNW17	NW20	NNW24	NW20	NW13	WNW8	W7	WNW6	NW7	WNW4	NW10.4	NNW24
18-Aug	SSW3	S4	S4	S5	SSE6	S8	S10	S9	NE7	ENE8	ESE11	SE13	SSW12	SW14	WSW14	W15	WNW12	WNW6	WSW6	N6	N8	NNE10	E3	SSW5	SSW2.5	W15
19-Aug	W6	WSW5	WSW5	SW4	SW4	SW4	SW8	SSW8	SSW9	SW12	SSW14	SW12	SSW12	SW14	NNW21	NNE12	E11	ENE11	ENE11	ESE7	NNE5	NE4	N6	N8	WSW2.0	NNW21
20-Aug	N15	NE14	NNE15	N17	N17	N16	N18	N16	N17	N19	N19	N18	N17	N18	NNW17	NNW16	N15	N18	NNW17	N9	NNW7	NW8	NW8	NNW8	N14.4	N19
21-Aug	NNW7	NNW5	NW7	NNW8	NNW7	NW7	NW8	NNW11	NNW15	N19	NNW17	N16	NNW17	NNW16	NNW16	N15	NNE18	NNE16	NNE8	N5	NW5	NW6	NW4	NW4	NNW10.2	N19
22-Aug	NNW3	NNE3	NE4	NE5	N3	NNW6	N2	NNE6	NNE9	NNE14	N11	N11	N13	N12	N10	NNE12	N12	N7	NNW7	NNW4	NNW3	NE0	SSW2	S3	N6.0	NNE14
23-Aug	S2	S2	S1	SSE4	SE3	SSE4	SE6	SE9	S9	W4	NW7	WNW5	WNW2	WSW2	NE3	ESE1	S5	NNE7	N4	N2	E2	ENE7	E7	ESE8	SE1.5	S9
24-Aug	SE9	SE4	ESE4	ESE7	ESE7	ESE8	ESE9	ESE7	ESE7	E6	SE6	SSE7	ESE5	SE6	ESE6	SSE5	SSE11	SE8	SE8	SE8	SE10	SSE14	S12	S14	SE7.1	SSE14
25-Aug	SSE15	S15	S17	S16	S15	S20	S18	SSW18	SSW19	S18	S19	SSW23	SSW25	SSW25	SSW22	SSW23	SSW21	SSW20	SSW18	S13	S15	S19	S18	S21	S18.6	SSW25
26-Aug	S22	S20	SSW17	SSW16	SSW17	SSW17	SSW19	SSW18	SW16	SW11	WSW9	WSW8	SW12	SSW14	SSW14	SSW14	SSW21	SW14	NNE11	SE8	SSE12	SW14	WSW13	S9	SSW12.4	S22
27-Aug	S11	SSW15	SSW15	SW15	SW15	SW16	WSW15	W15	WNW12	WNW14	WNW14	WNW14	W17	WNW17	WNW16	W16	WNW15	WNW13	NNW11	WNW4	NW4	SSW3	NW14	S9	W9.9	WNW17
28-Aug	WSW3	WSW8	WSW11	W10	W9	WNW9	NW11	NW12	NW15	NNW18	NW16	NW15	NW18	NW17	NW16	NW14	NW13	NW11	NW7	NNE2	E2	E8	SE8	SSE11	NW8.0	NNW18
29-Aug	SSE12	SSE13	SSE14	S15	S16	SSE12	S12	S13	S16	SSW18	SSW18	SSW21	SSW17	SSW13	SSW14	S16	S18	SSE18	SSE17	SE13	SE14	SE14	SE12	SSE12	S13.9	SSW21
30-Aug	SSE14	SSE16	SSE14	SE14	SSE14	S14	S15	S14	SSE13	S11	SSW8	W6	W8	W11	W13	WNW11	WNW8	WNW7	NW6	NE5	SE5	SSE7	SSW7	SSW8	S5.9	SSE16
31-Aug	WSW8	WSW8	SW7	WSW9	WSW9	SW6	SW8	WSW8	WSW9	WNW8	WNW10	NW13	NW13	NNW13	NW20	NW10	W8	WNW8	W6	WNW4	WSW3	WSW12	WSW11	WSW11	W7.7	NW20
	S4.7	S4.8	S4.4	S4.1	S3.9	S4.3	S4.2	SSW4.1	SW3.1	W3.3	WSW4.6	W5.4	W5.9	W6.6	W7.9	W6.6	W5.2	WNW4.1	NW2.2	ESE1.2	SSE3.0	S4.4	S3.6	S5.6	Diurnal Average	
	S22	N23	N19	N17	N19	S20	S22	W22	W27	W26	W28	WSW27	W31	W26	W28	SSW23	S24	SSW20	SSW18	ENE17	S15	S19	S18	S21	Diurnal Maximum	

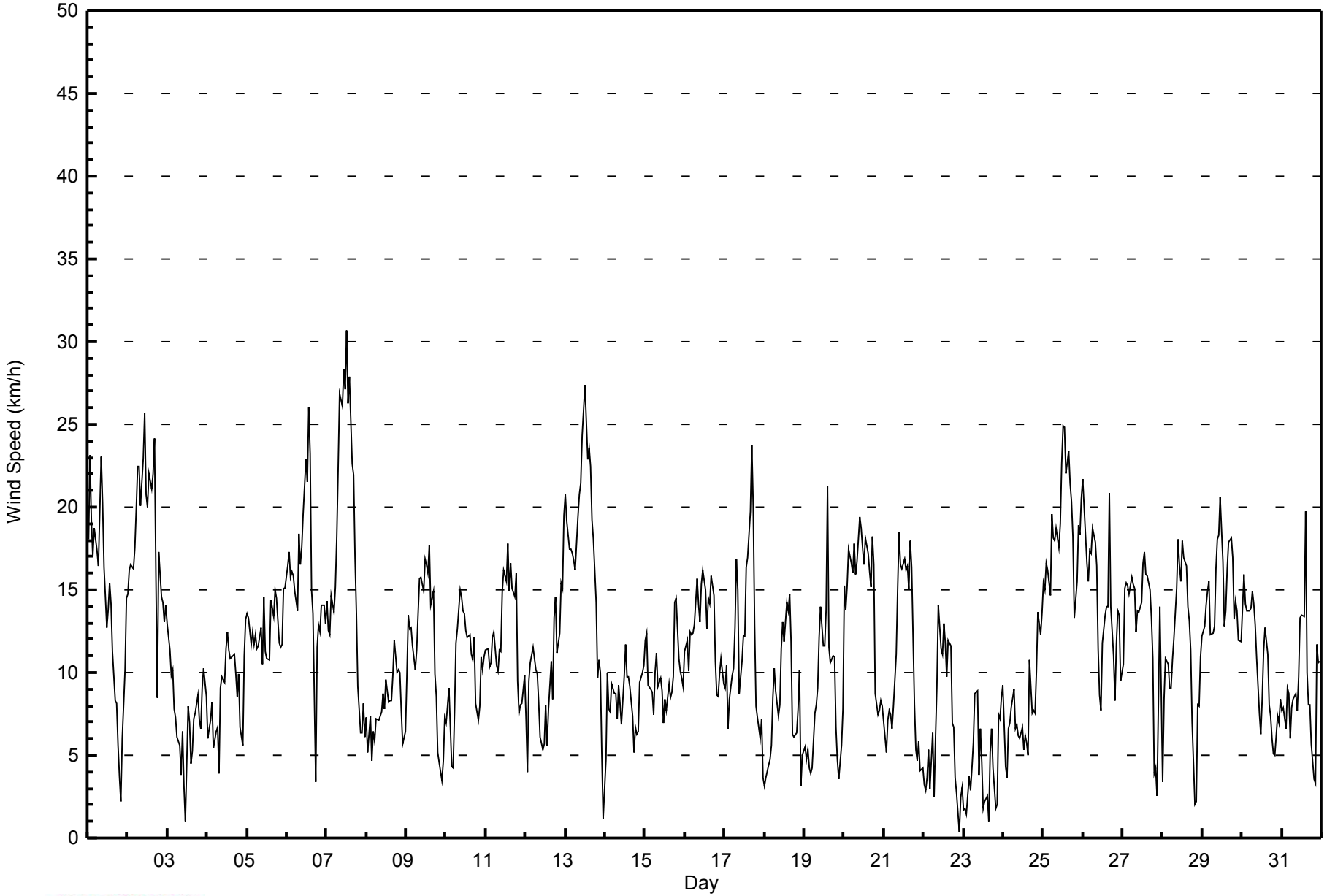
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Firebag - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	84	11.29	11.29
6 - 11	304	40.86	52.15
12 - 19	297	39.92	92.07
20 - 28	58	7.80	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

Firebag - August 2014

Wind Speed	**Wind Direction**																
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	5	5	6	1	4	4	5	5	9	7	3	9	2	5	9	5	84
6 - 11	22	21	10	10	7	16	21	17	15	27	26	24	14	18	30	26	304
12 - 19	28	15	2	1	0	9	19	29	53	36	16	17	9	15	24	24	297
20 - 28	3	1	0	0	0	0	0	2	9	23	5	2	7	1	3	2	58
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	58	42	18	12	11	29	45	53	86	93	50	52	33	39	66	57	744

Total Number of Valid Hours: 744

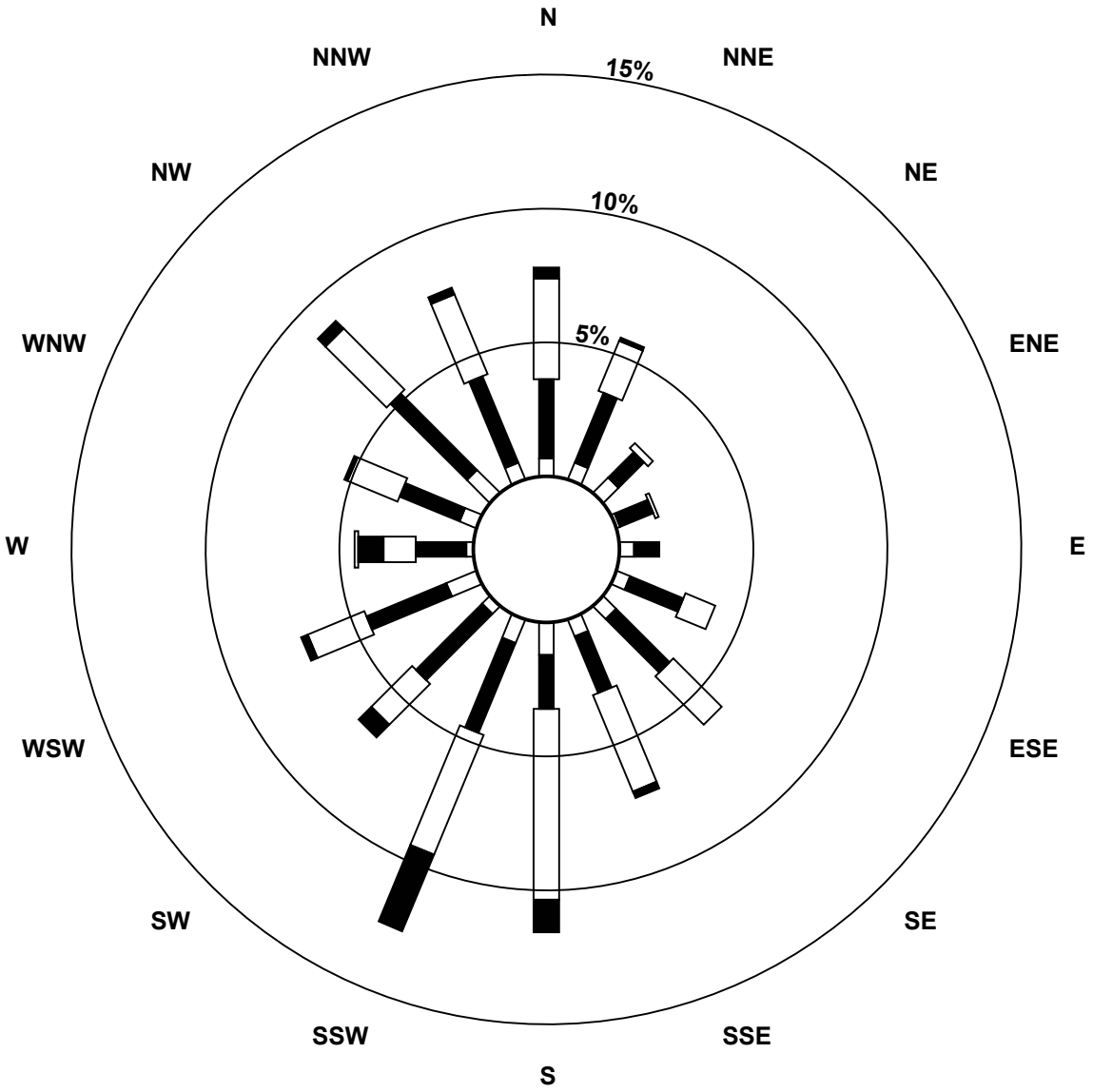
Total Number of Hours: 744

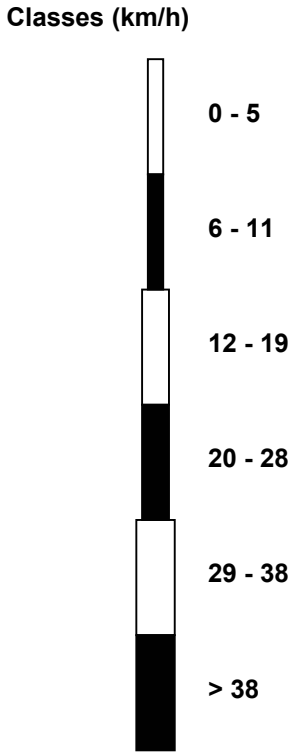
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Firebag (AMS 19)





Total Number of Valid Hours: 744

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 km/h on Aug 26 23:00

Minimum Value: 0 km/h on Aug 22 02:00

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

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

Direction of Maximum Speed: 261 deg on Aug 7 13:00
Direction of Maximum Daily Speed Average: 187.9 deg on Aug 25

Direction of Minimum Speed: 52 deg on Aug 22 22:00

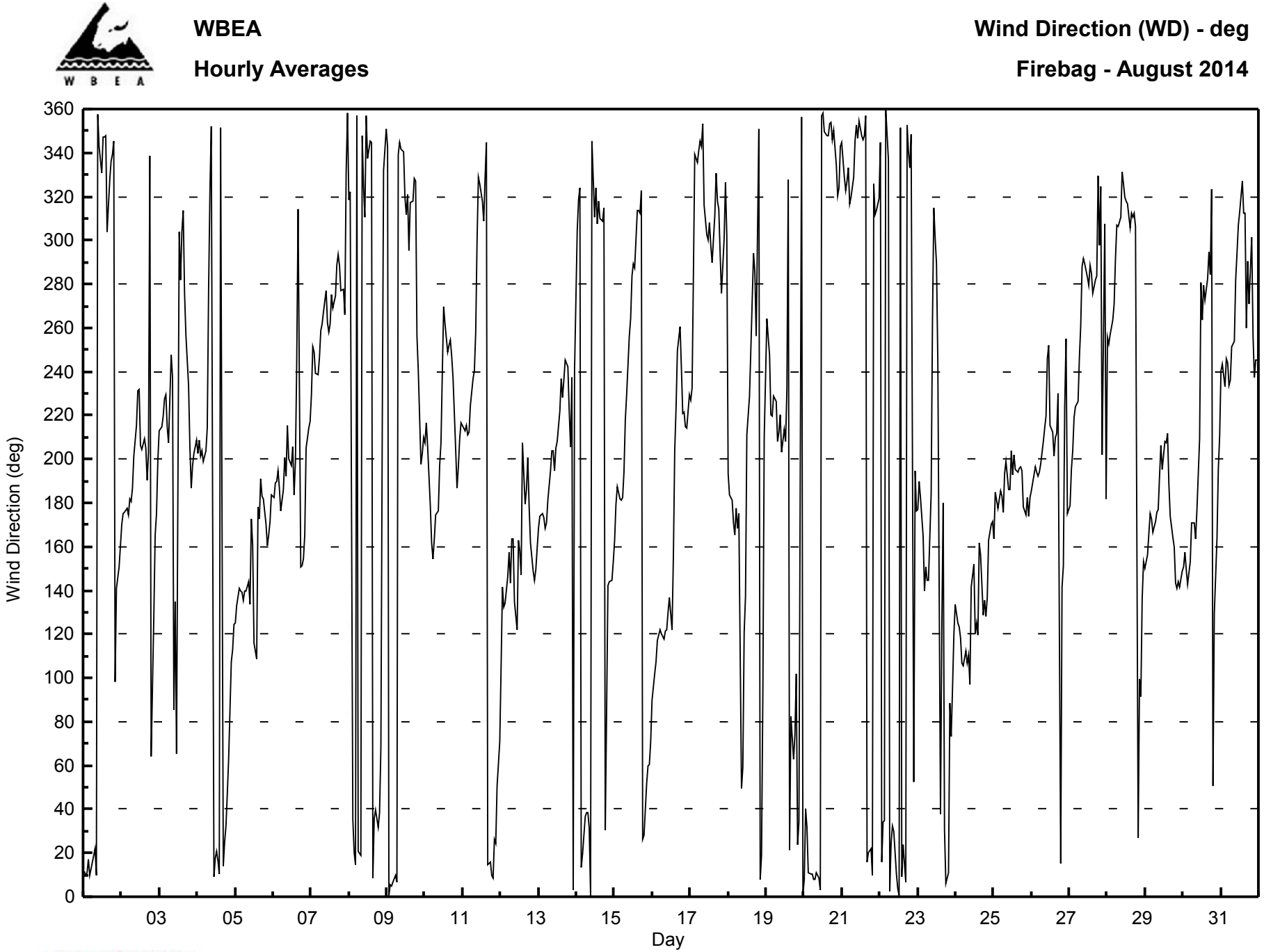
Direction of Minimum Daily Speed Average: 1.4 deg on Aug 15

Monthly Average Direction: 256.9 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-Aug	11	10	11	17	10	16	19	22	10	357	343	331	347	347	348	304	328	336	339	345	98	141	151	161	3.3
2-Aug	170	175	176	177	175	182	181	187	202	216	231	232	206	204	209	205	190	203	339	64	129	165	175	200	192.2
3-Aug	213	215	220	227	230	215	208	248	237	85	135	66	304	282	304	314	276	257	234	205	186	197	203	209	227.1
4-Aug	203	209	201	204	199	204	214	277	322	352	9	17	21	17	10	351	14	25	32	47	63	108	113	124	28.2
5-Aug	125	133	141	140	139	135	139	140	144	134	173	161	116	109	178	173	191	183	182	170	160	165	172	184	155.6
6-Aug	182	189	190	195	187	176	186	201	192	215	200	197	206	183	199	245	314	151	152	154	165	205	214	217	195.7
7-Aug	230	251	249	239	239	246	259	262	267	277	263	258	261	275	269	275	289	294	288	277	278	266	331	358	267.2
8-Aug	319	322	35	20	15	357	21	19	348	325	310	357	337	345	345	8	36	39	32	39	69	211	332	351	4.2
9-Aug	343	1	5	5	7	10	7	339	345	342	340	319	312	321	295	318	318	329	327	256	240	198	203	210	331.6
10-Aug	208	217	206	179	161	154	163	175	177	197	207	240	269	262	249	252	254	247	237	204	187	196	209	216	214.3
11-Aug	215	213	216	211	212	225	237	241	258	300	329	326	318	309	328	345	15	16	10	8	26	25	50	71	313.1
12-Aug	105	142	132	134	147	157	143	164	163	135	122	163	158	147	208	179	186	201	178	162	149	145	149	160	157.1
13-Aug	169	174	175	173	169	171	182	195	204	204	194	205	208	222	237	228	236	245	242	222	206	237	3	241	204.4
14-Aug	304	318	324	14	20	37	38	38	31	1	346	310	324	308	318	310	309	315	30	85	142	144	145	153	355.5
15-Aug	163	179	187	182	182	182	194	218	230	256	264	284	289	287	313	314	313	323	26	28	52	60	60	71	256.4
16-Aug	89	102	107	117	120	122	120	118	121	122	130	137	122	156	204	224	250	261	242	221	222	215	214	229	157.3
17-Aug	227	233	285	339	335	341	346	343	353	316	303	300	308	298	290	311	331	318	314	294	276	301	326	302	313.0
18-Aug	194	184	181	171	166	177	169	175	49	59	121	137	211	229	250	272	294	285	256	351	8	19	94	210	207.2
19-Aug	264	255	248	221	220	229	226	208	212	220	203	214	208	232	328	22	82	63	74	102	24	34	357	1	237.0
20-Aug	8	40	32	11	10	10	8	8	11	8	3	357	358	350	348	348	353	354	346	350	334	320	324	343	0.6
21-Aug	345	329	323	327	333	317	319	329	345	353	347	354	348	346	348	357	16	20	22	10	326	312	313	319	347.3
22-Aug	345	16	34	35	360	337	2	24	33	30	11	3	1	351	9	24	7	352	340	333	348	52	194	176	8.1
23-Aug	177	190	182	165	140	151	144	144	184	264	315	301	289	244	38	123	180	31	6	11	89	74	95	120	131.5
24-Aug	134	125	123	118	107	105	112	107	110	97	142	152	120	125	119	162	156	129	136	128	137	163	170	171	135.3
25-Aug	164	185	181	178	186	183	176	194	199	186	186	204	193	202	195	194	196	197	195	178	175	182	174	183	187.9
26-Aug	185	189	196	194	192	194	198	208	214	219	246	252	215	213	201	210	212	230	16	142	151	224	255	175	204.5
27-Aug	179	195	204	219	224	226	247	261	288	292	289	283	280	289	285	276	282	284	329	298	325	202	308	182	262.3
28-Aug	256	253	257	264	271	292	307	306	311	331	326	320	318	317	306	313	311	312	306	27	99	91	136	153	305.5
29-Aug	150	156	166	175	173	167	172	176	177	192	206	195	208	207	212	188	174	164	160	143	141	144	142	149	174.0
30-Aug	151	158	149	143	153	171	171	171	163	177	209	281	264	279	272	282	295	284	324	51	129	163	195	211	188.6
31-Aug	240	243	233	246	244	234	236	251	254	282	294	307	313	327	312	312	260	290	271	302	256	237	245	245	273.0
	180.2	191.1	189.4	185.4	184.1	186.1	189.8	211.5	235.7	269.5	257.6	261.6	268.0	270.2	274.4	275.4	280.0	287.0	314.6	107.6	147.3	178.1	182.9	178.7	
	Diurnal Average																								

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


WBEA
Hourly Averages
Wind Direction (WD) - deg
Firebag - August 2014
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.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 103 deg on Aug 23 16:00

Minimum Value: 5 deg on Aug 4 21:00

Percentiles: P_1 = 6 P_{10} = 8 Q_1 = 10 Median = 13 Q_3 = 21 P_{90} = 35 P_{99} = 82

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-Aug	12	12	11	10	12	9	11	13	14	17	21	28	29	22	24	34	40	30	28	21	47	12	8	9	47
2-Aug	7	7	7	8	8	8	8	9	10	14	13	15	18	14	20	15	11	15	63	19	25	9	8	9	63
3-Aug	8	8	9	6	10	11	14	23	42	42	71	98	41	50	84	62	55	43	14	16	7	7	6	7	98
4-Aug	10	10	8	7	14	10	11	57	19	19	26	25	24	29	19	24	21	14	8	12	5	32	9	11	57
5-Aug	11	11	12	13	11	9	10	10	11	17	16	26	26	25	30	21	18	15	12	9	9	8	7	8	30
6-Aug	8	6	6	6	9	9	10	10	12	15	11	14	13	12	20	20	35	71	15	11	11	9	8	8	71
7-Aug	8	11	8	7	10	9	10	11	13	14	16	13	13	14	14	19	17	13	11	8	25	13	29	11	29
8-Aug	18	32	7	33	12	12	20	25	28	46	38	47	38	44	40	32	15	9	10	8	23	22	45	20	47
9-Aug	11	13	12	12	10	10	12	12	12	13	15	17	18	17	17	15	21	26	15	14	57	15	8	8	57
10-Aug	9	9	11	13	13	13	12	11	10	17	18	18	26	31	23	22	23	14	13	13	7	5	8	8	31
11-Aug	8	8	8	8	8	7	12	13	16	18	22	20	23	23	22	20	14	15	12	9	10	10	6	8	23
12-Aug	19	24	11	10	7	9	10	13	21	41	54	58	55	72	51	29	43	20	12	10	10	10	10	9	72
13-Aug	9	7	7	7	7	8	11	9	11	10	10	11	10	17	12	14	15	13	9	11	7	26	61	69	69
14-Aug	42	10	11	16	12	8	10	13	15	22	35	32	23	27	24	28	29	41	13	16	22	8	8	7	42
15-Aug	8	9	7	7	5	6	6	10	19	21	26	44	37	61	34	51	32	17	10	10	13	12	9	10	61
16-Aug	12	11	11	9	9	10	10	10	11	14	16	15	14	26	21	21	19	13	18	8	6	9	8	9	26
17-Aug	7	11	34	9	6	7	8	10	15	32	20	25	27	19	17	19	13	13	11	10	7	9	7	26	34
18-Aug	18	8	7	10	12	8	7	10	67	17	12	25	30	19	12	14	21	35	32	28	13	11	59	20	67
19-Aug	10	23	16	21	12	13	10	11	9	10	12	24	25	33	20	19	16	11	12	34	68	28	19	14	68
20-Aug	16	25	10	12	11	12	13	13	13	14	16	15	15	15	20	12	16	16	9	9	6	6	12	5	25
21-Aug	10	14	8	6	6	8	11	17	16	15	22	20	20	27	16	22	19	19	19	18	13	9	16	14	27
22-Aug	11	18	27	31	63	21	26	17	15	21	28	31	33	32	33	24	12	14	13	8	35	86	33	33	86
23-Aug	59	61	60	23	28	7	10	10	24	74	57	60	93	93	86	103	57	31	39	81	71	8	12	9	103
24-Aug	11	20	21	17	11	14	9	12	13	15	27	26	39	48	42	52	14	16	13	10	11	9	7	7	52
25-Aug	8	12	10	8	11	10	8	11	8	12	10	12	15	13	12	16	14	15	9	9	9	8	7	9	16
26-Aug	8	8	14	12	8	7	7	9	8	13	22	28	17	11	16	16	17	40	42	32	23	14	50	13	50
27-Aug	10	5	9	9	9	8	12	11	13	17	17	18	17	18	21	20	17	18	11	31	35	21	38	14	38
28-Aug	38	9	9	9	8	8	11	12	14	14	13	13	18	18	14	26	22	16	11	41	43	12	16	8	43
29-Aug	8	7	6	8	7	7	8	8	11	12	15	13	21	25	26	18	13	11	10	10	9	9	9	15	26
30-Aug	10	9	9	10	13	9	8	9	9	10	15	32	40	13	15	20	25	18	14	26	44	15	5	14	44
31-Aug	7	8	14	10	18	14	11	10	18	27	30	24	24	21	12	29	13	19	32	30	44	9	9	8	44
	59	61	60	33	63	21	26	57	67	74	71	98	93	93	86	103	57	71	63	81	71	86	61	69	
	Diurnal Maximum																								

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Firebag	Station Number	19

Reason: Routine

Start Time (MST)	7:03	End Time (MST)	11:15
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	996
Cal Gas Concentration	50 ppm	Cal Gas Expiry Date	12/12/2016
Gas Cert Reference	SA130123A		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	9037
DACS voltage range		DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-606	-606
Analyzer Range (mv)	1000	1000	Lamp voltage	776	776
Calculated slope	1.000748	0.999138	Chamber temp.	45.2	45.2
Calculated intercept	-0.661238	-0.454282	Pressure (mmHg)	685.6	685.6
Analyzer Background	10.3	9.8	Flow (lpm)	0.460	0.460
Analyzer Coefficient	0.982	0.996	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	-1.0	NA
as found span	5000	58.3	583.0	570.8	1.021
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5000	58.3	583.0	583.1	1.000
second point	5000	29.1	291.0	293.7	0.991
third point	5000	14.7	147.0	147.0	1.000
calibrator zero	5000	0.0	0.0	-0.2	0.000
as left zero	5000	0.0	0.0	-0.2	NA
as left span	5000	58.3	583.0	581.8	NA
				Average Correction Factor	0.997

Corrected As found	571.8	Previous response	583.2	% change	2.0%

Notes:

Filter changed out, No maintenance done, zero and span adjusted

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

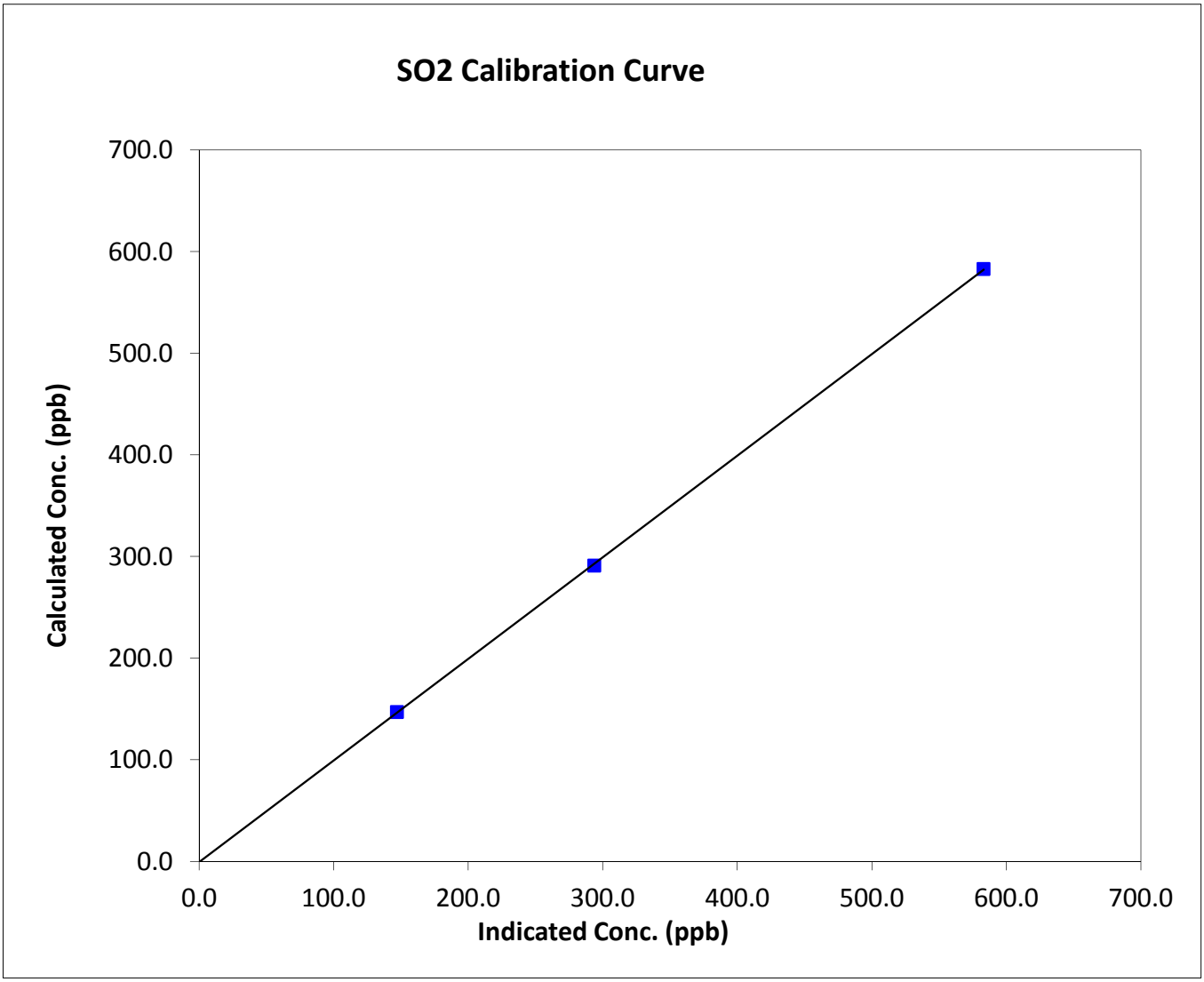
SO_2 Calibration Summary

Station Information

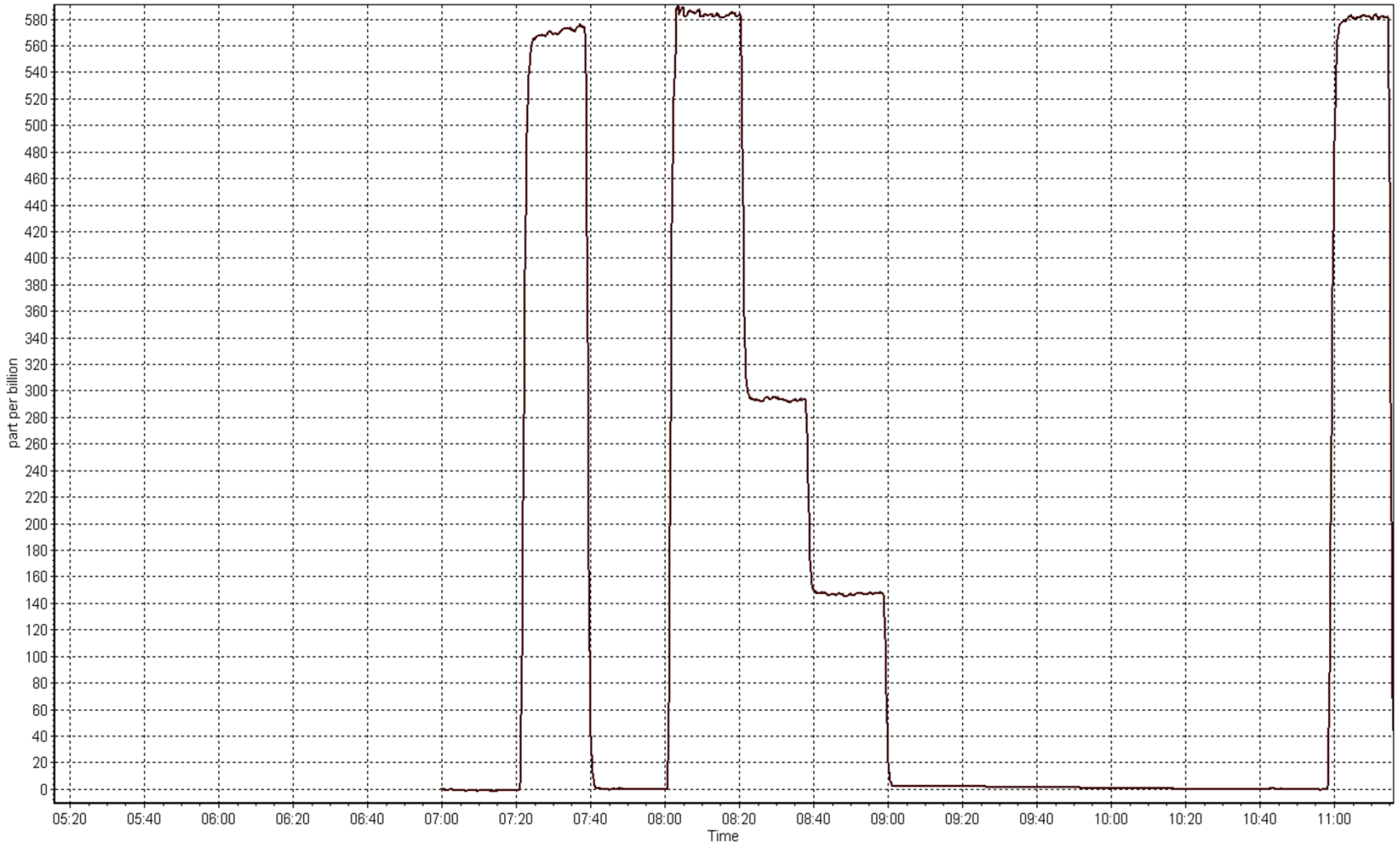
Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Firebag	Station Number	19
Start Time (MST)	7:03	End Time (MST)	11:15
Analyzer make	Thermo 43i	Analyzer serial #	1410661308

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999971
583.0	583.1	0.9998		
291.0	293.7	0.9908	Slope	0.999138
147.0	147.0	1.0000		
			Intercept	-0.454282



SO2 Calibration Plot Date: August 13, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 8, 2014	Previous Calibration	July 9, 2014
Station Name	Firebag	Station Number	19
Reason:	Routine		
Start Time (MST)	8:15	End Time (MST)	12:20
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	996
Cal Gas Concentration	4.85 ppm H2S	Cal Gas Expiry Date	6/10/2014
Gas Cert Reference	ALM066720	SO2 gas conc.	49.3 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	
DACS voltage range		DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	23	23
Analyzer Range (mv)	100	100	Lamp voltage	2750	2750
Calculated slope	1.004173	1.008530	Chamber temp.	33	33
Calculated intercept	0.555179	0.149297	Pressure	22.6	23.5
Analyzer Background	26.8	28.8	Flow	557.000	559.000
Analyzer Coefficient	0.768	0.76	Intensity	68	68
			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	-0.2	N/A
as found span	5000	83.3	80.8	81.9	0.987
SO2 scrubber check	5000	29.2	287.9	5.8	N/A
calibrator zero	5000	0.0	0.0	0.0	N/A
high point	5000	83.3	80.8	80.1	1.009
second point	5000	41.7	40.4	39.7	1.020
third point	5000	21.0	20.4	20.1	1.013
calibrator zero	5000	0.0	0.0	-0.1	N/A
as left zero	5000	0.0	0.0	-0.1	N/A
as left span	5000	83.3	80.8	80.8	1.000
				Average Correction Factor	1.014

Corrected As found	82.1	Previous response	80.6	% change	-1.8%

Notes:

Scrubber changed out

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

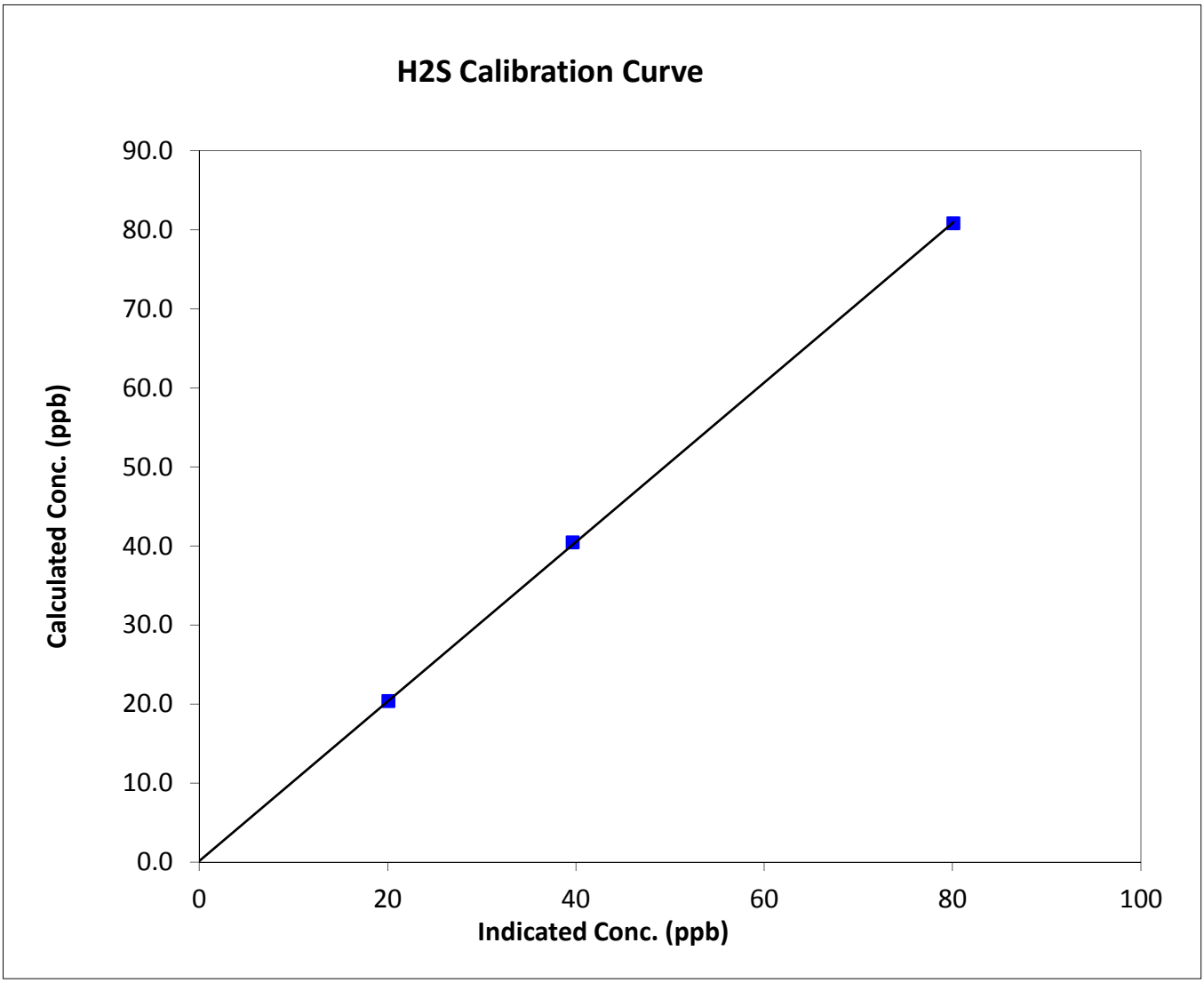
H2S Calibration Summary

Station Information

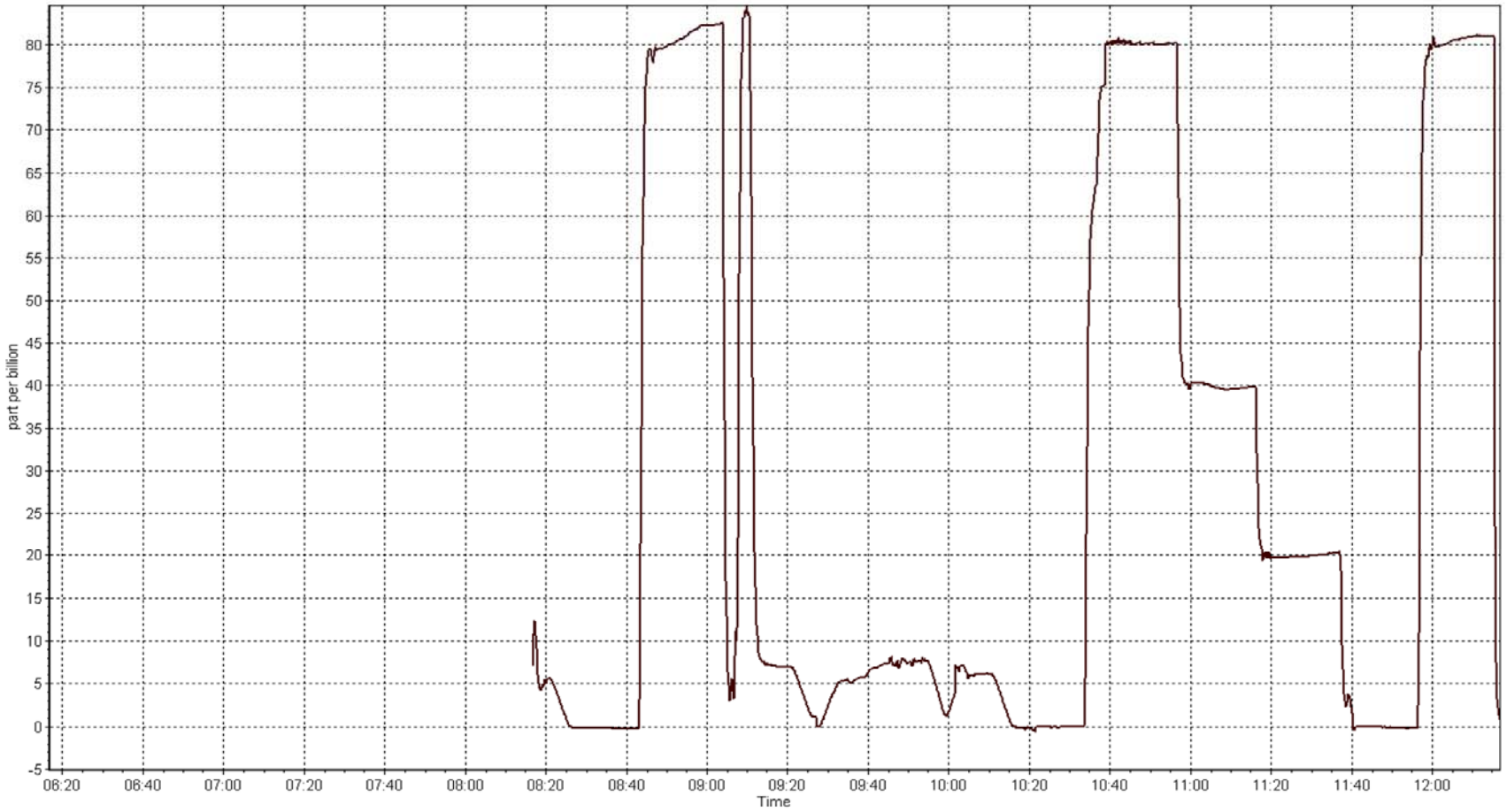
Calibration Date	August 8, 2014	Previous Calibration	July 9, 2014
Station Name	Firebag	Station Number	19
Start Time (MST)	8:15	End Time (MST)	12:20
Analyzer make	API H2S T101	Analyzer serial #	158

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999967
80.8	80.1	1.0088		
40.4	39.7	1.0196	Slope	1.008530
20.4	20.1	1.0134		
			Intercept	0.149297



H2S Calibration Plot Date: Friday, August 08, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Wednesday, August 13, 2014	Previous Calibration	Thursday, July 10, 2014
Station Name	Firebag	Station Number	19
Reason:	Routine		
Start Time (MST)	7:03	End Time (MST)	11:15
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	996
Gas Cert Reference	SA130123A	Cal Gas Expiry Date	12/12/2016
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		DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.5	8.5
Analyzer Range (mv)	25	25	Air or Bypass press	35.0	35.0
Calculated slope	1.008328	1.001638	Fuel Pressure	23.0	23.0
Calculated intercept	-0.015245	-0.053268	Coef	4.2	3.9
			BKG	3.415	3.407

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 NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.32	N/A
as found span	5000	58.3	12.74	12.42	1.025
calibrator zero	5000	0.0	0.00	0.04	N/A
high point	5000	58.3	12.74	12.75	0.999
second point	5000	29.1	6.36	6.44	0.987
third point	5000	14.7	3.21	3.25	0.988
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	12.74	1.000
				Average Correction Factor	0.991

Corrected As found	12.74	Previous response	12.86	% change	0.9%

Notes:

Filter changed out, No maintenance done, zero and span adjusted

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

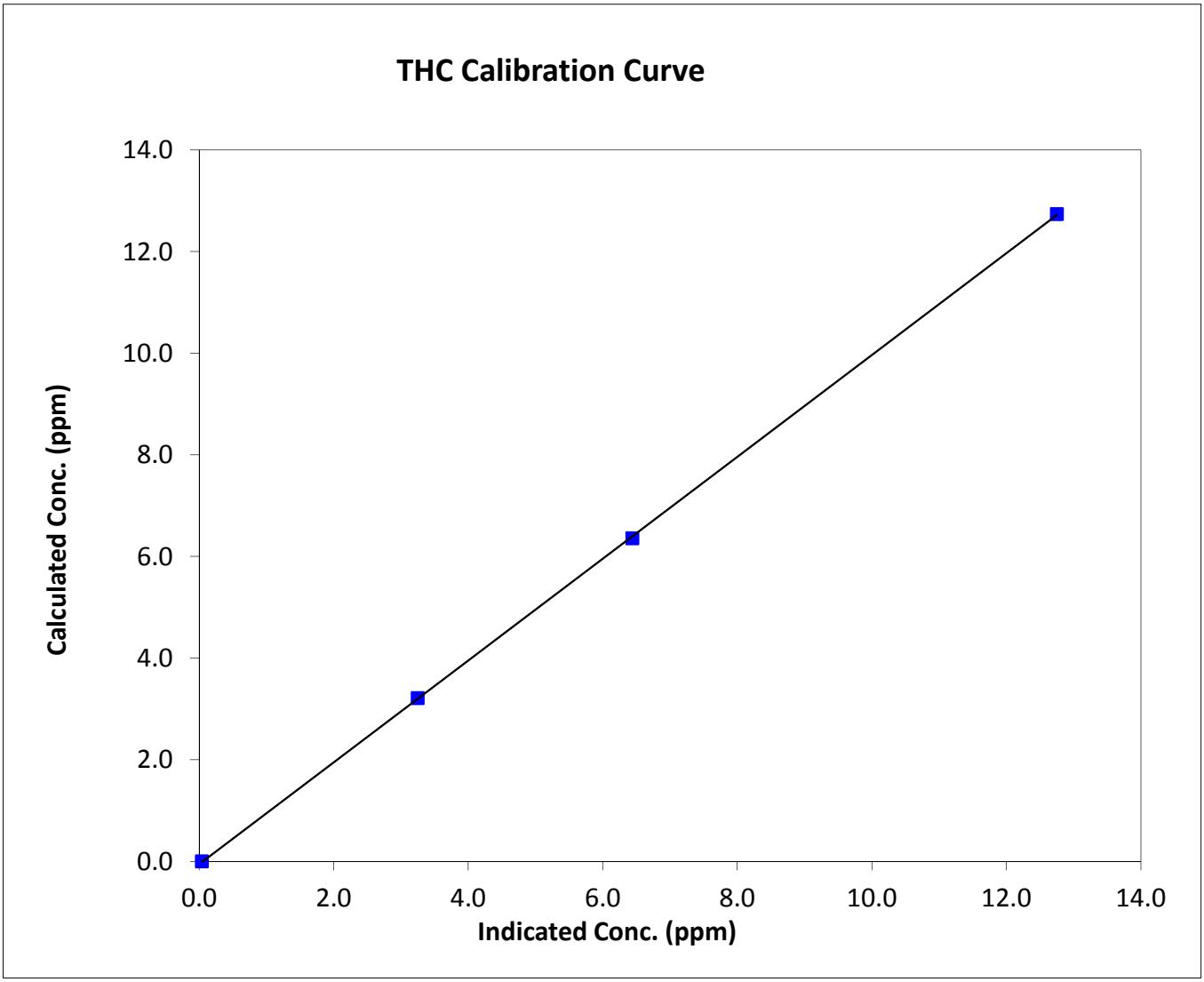
THC Calibration Summary

Station Information

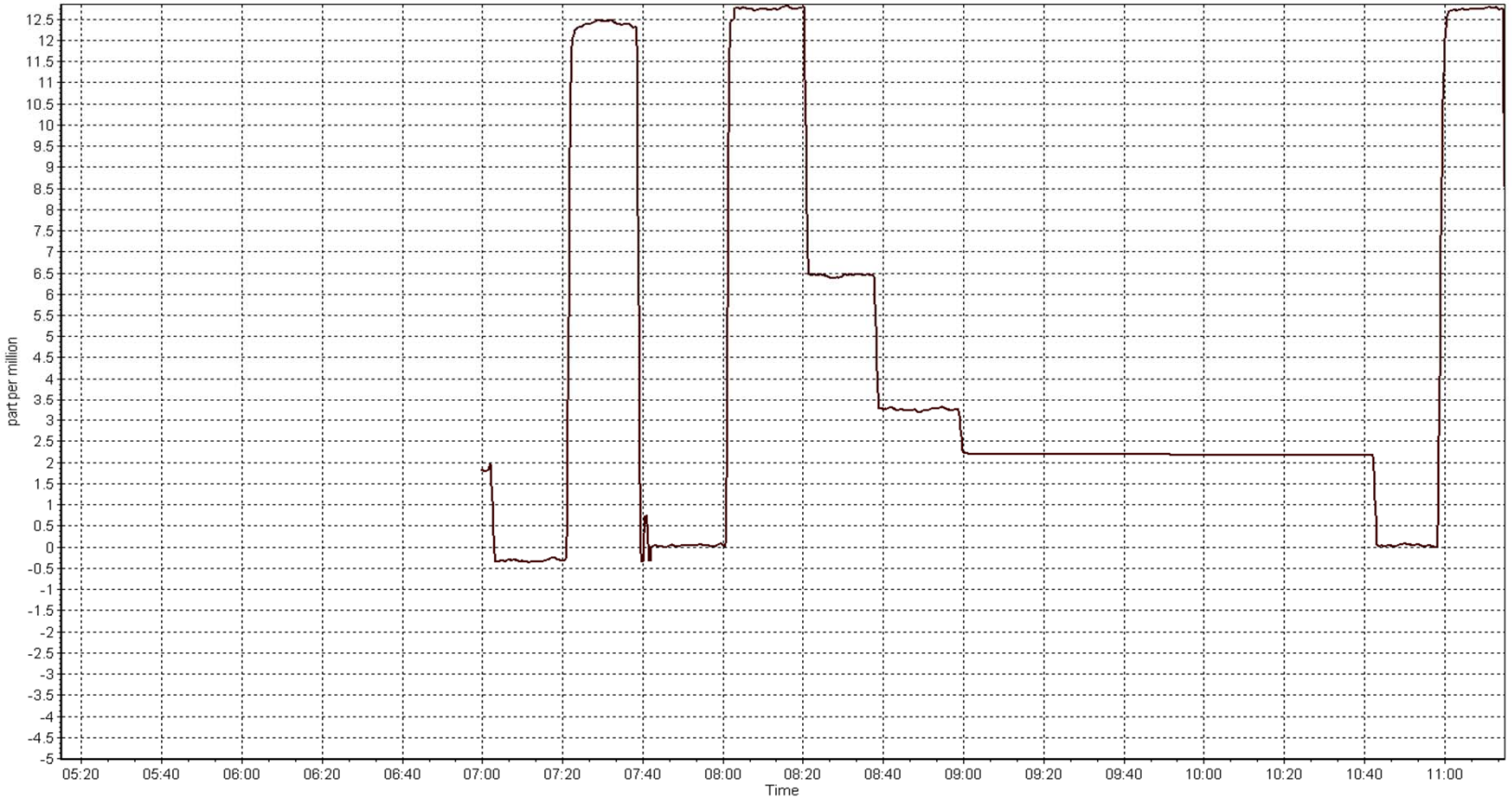
Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Firebag	Station Number	19
Start Time (MST)	7:03	End Time (MST)	11:15
Analyzer make	Thermo 51i-LT	Analyzer serial #	1336160089

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999975
12.7	12.8	0.9989		
6.4	6.4	0.9871	Slope	1.001638
3.2	3.3	0.9881		
			Intercept	-0.053268



THC Calibration Plot **Date:** August 13, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Firebag	Station Number	19
Reason:	Routine		
Start Time (MST)	7:03	End Time (MST)	11:15
Barometric Pressure	mmHg	Station Temperature	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.	9037

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.992249	0.992536	1.002901
	Data Offset	-0.536914	-0.524301	0.314143
After	Data Slope	1.009565	1.009604	1.002580
	Data Offset	-0.703285	-0.430762	0.282867
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	0.824	ppb	0.824	ppb
NOX coefficient	0.998	ppb	0.998	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	3.5		3.5	
NOX bkgrnd	3.6		3.6	
Nt coefficient	N/A		N/A	
Chamber Temp	50.6	Deg C	50.6	Deg C
Moly Temp	326.0	Deg C	326.0	Deg C
PMT Temp	-3.0	Deg C	-3.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	161.1	mmHg	161.1	mmHg
Sample Flow	0.645	ccm	0.645	ccm

Notes:

Filter changed out, No maintenance and adjustments made

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 13, 2014 Station Number: 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	594.7	593.3	1.4	1.0097	1.0121
calibrator zero	5000	0.0	0.0	0.0	0.0	0.2	0.1	0.1	N/A	N/A
high point	5000	58.3	600.5	600.5	0.0	594.4	594.3	0.1	1.0102	1.0104
second point	5000	29.1	299.7	299.7	0.0	299.8	299.4	0.5	0.9998	1.0011
third point	5000	14.7	151.4	151.4	0.0	150.6	149.8	0.8	1.0054	1.0107
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	N/A	N/A
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	58.3	600.5	268.6	331.9	588.7	265.7	320.8	1.0200	1.0109
								Average Correction Factor	1.0051	1.0074

Corrcted As found NO_X= 594.6 NO= 593.3 Percent Change NO_X= 1.9% NO= 2.1%

Previous Response NO_X= 605.7 NO= 605.5

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	268.6	325.0	592.8	268.6	324.2	1.0013	1.0000	1.0025	99.8%
2nd NO2 (200)	N/A	374.4	219.2	592.6	374.4	218.1	1.0016	1.0000	1.0050	99.5%
3rd NO2 (100)	N/A	480.4	113.2	592.5	480.4	112.2	1.0018	1.0000	1.0089	99.1%
4th NO2 (0)	593.6	N/A	-0.3	593.3	593.6	-0.6	1.0005	1.0000	N/A	N/A
					Average Correction Factor		1.0013	1.0000	1.0055	99.5%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

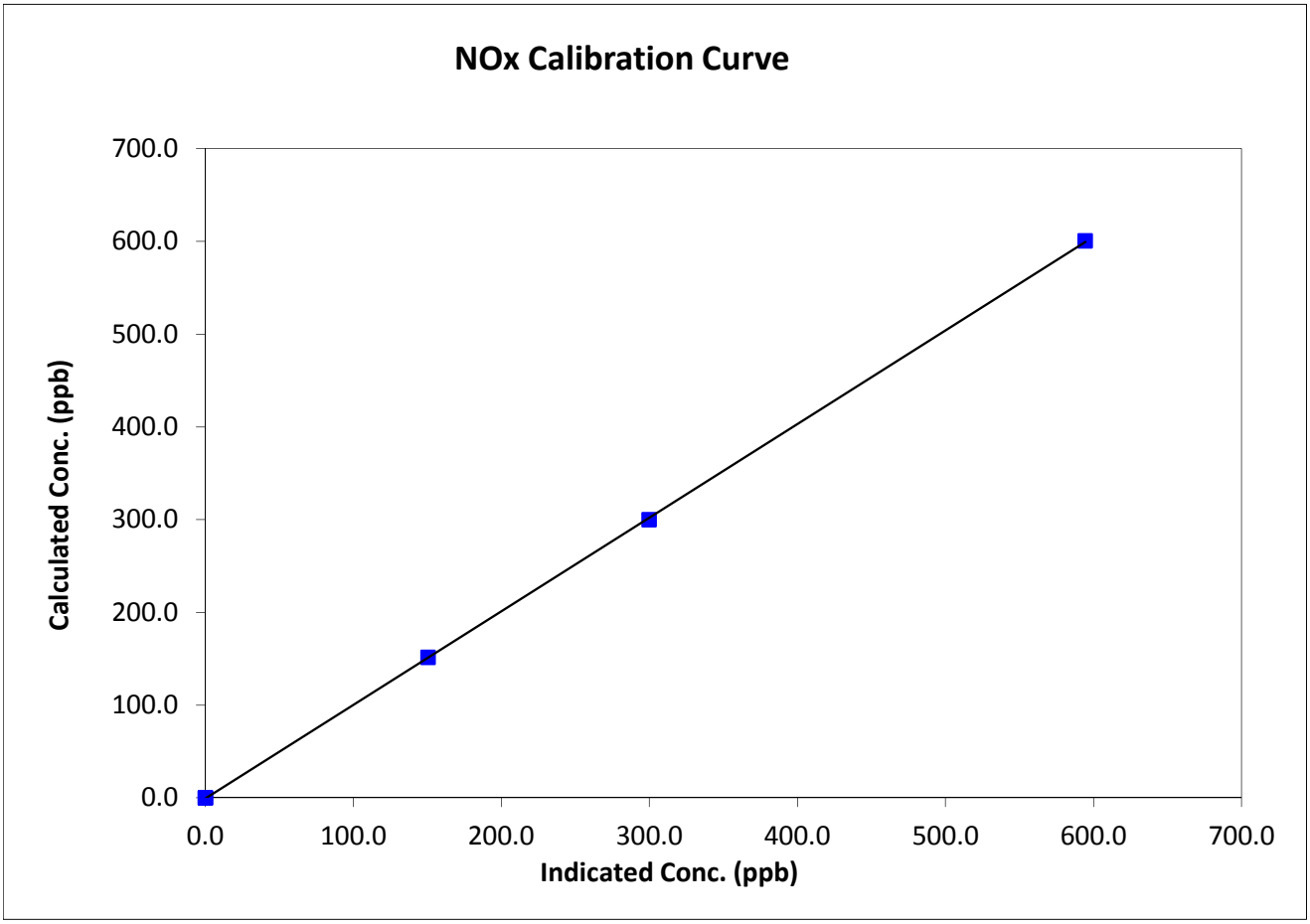
NO_X Calibration Summary

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Firebag	Station Number	19
Start Time (MST)	7:03	End Time (MST)	11:15
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	0.999973
600.5	594.4	1.0102		
299.7	299.8	0.9998	Slope	1.009565
151.4	150.6	1.0054		
0.0	0.1	0.0000	Intercept	-0.703285



Wood Buffalo Environmental Association

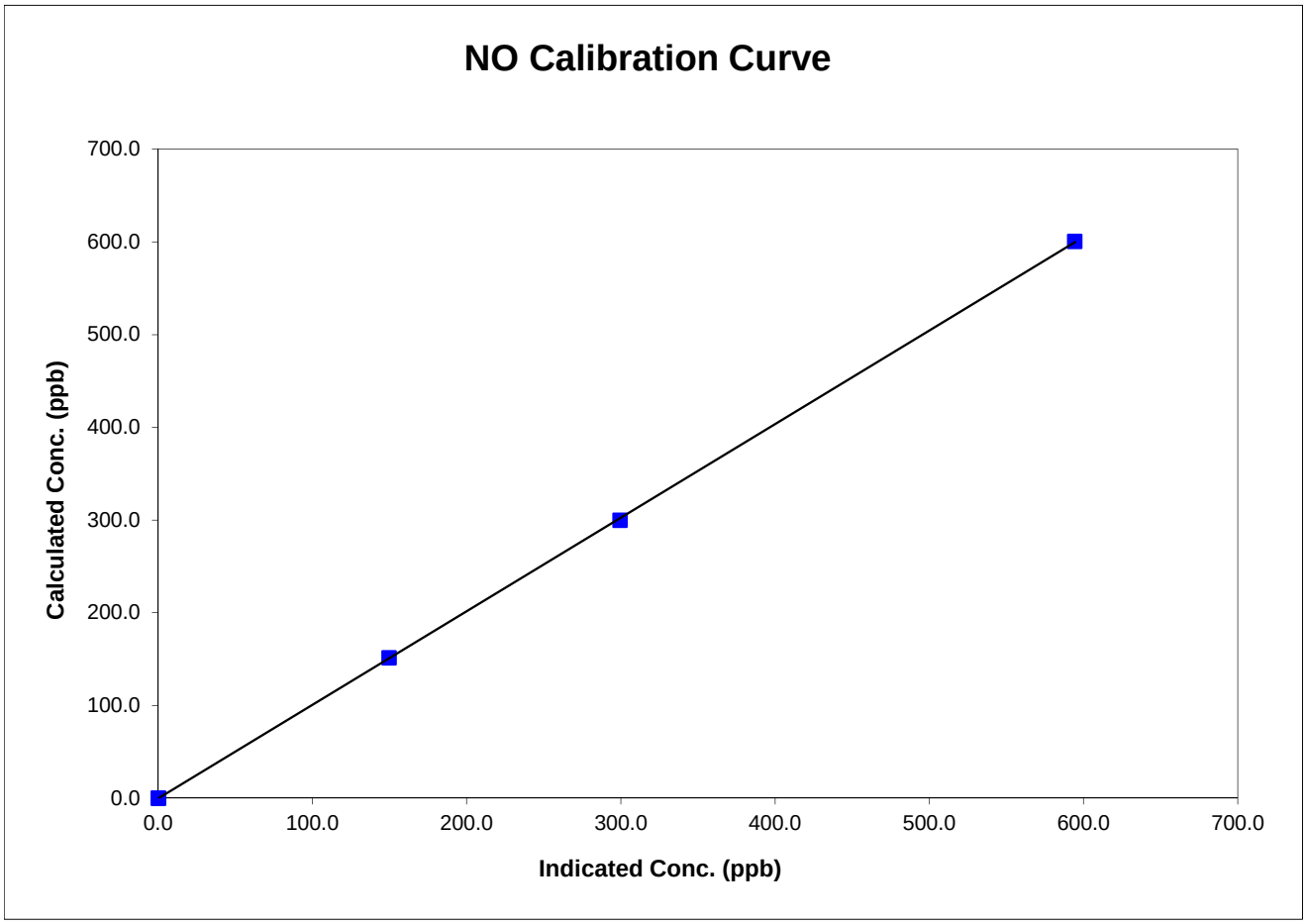
NO Calibration Summary

Station Information

Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Name	Firebag	Station Number	19
Start Time (MST)	7:03	End Time (MST)	11:15
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	0.999977
600.5	594.3	1.0104		
299.7	299.4	1.0011	Slope	1.009604
151.4	149.8	1.0107		
0.0	0.1	0.0000	Intercept	-0.430762



Wood Buffalo Environmental Association

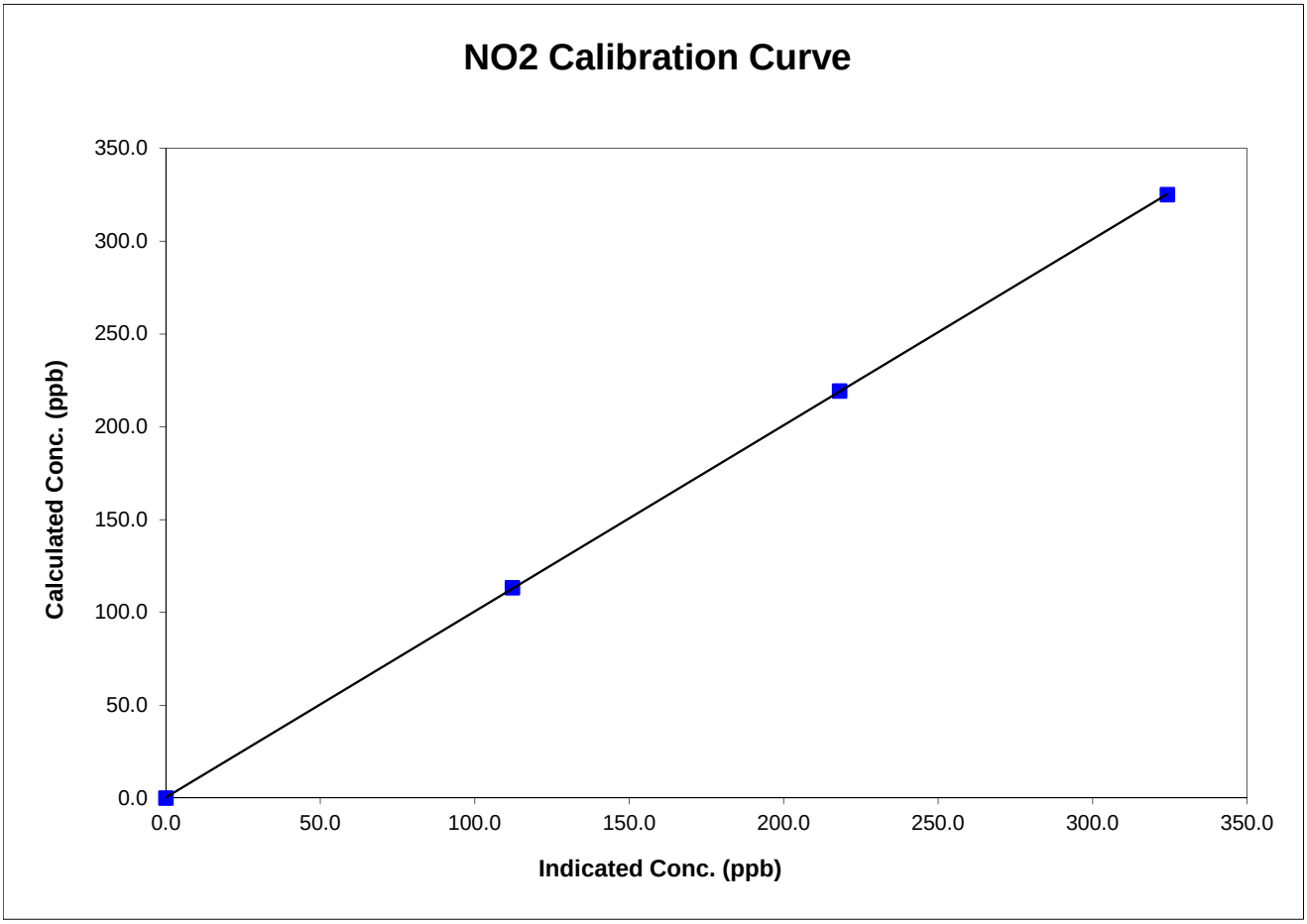
NO_2 Calibration Summary

Station Information

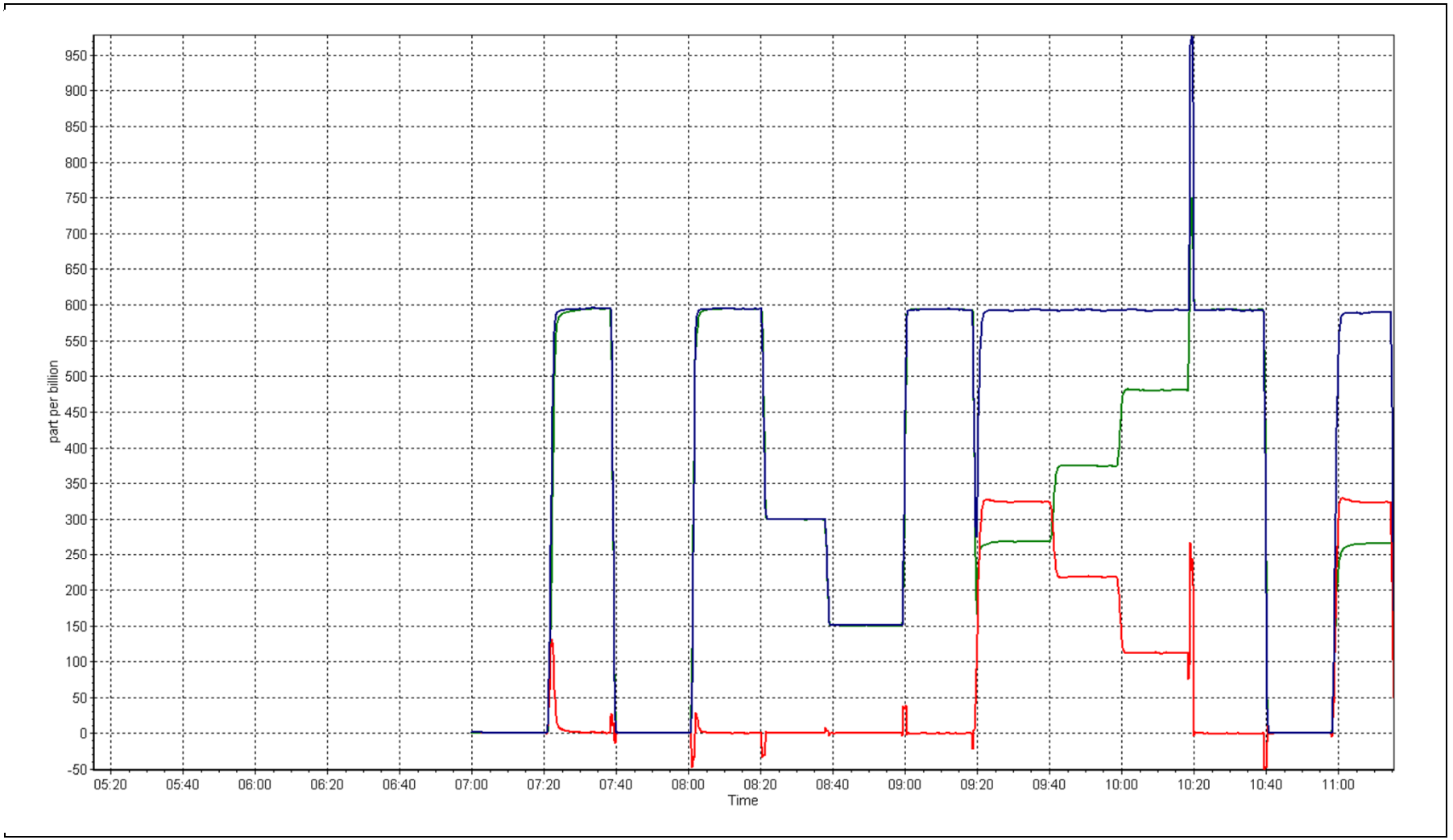
Calibration Date	August 13, 2014	Previous Calibration	July 10, 2014
Station Number	Firebag	Station Number	19
Start Time (MST)	7:03	End Time (MST)	11:15
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999992
325.0	324.2	1.0025		
219.2	218.1	1.0050	Slope	1.002580
113.2	112.2	1.0089		
			Intercept	0.282867



NOx, NO & NO_2 Calibration Plot Date: August 13, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 501
STATOIL LEISMER
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STATOIL LEISMER (AMS 501)
AUGUST 2014

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	665	38	79	94.49	6	0	1	0
H2S (ppb) Average	700	35	44	98.79	1	0	0	0
NO2 (ppb) Average	696	38	48	98.66	12	0	3	0
NO (ppb) Average	696	38	48	98.66	26	-	3	-
NOX (ppb) Average	696	38	48	98.66	39	-	5	-
Temperature 2 m (C) Average	744	0	0	100.00	28.5	-	22.1	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	725	0	19	97.45	23	-	-	-
Wind Direction 10 m (deg) Average	725	0	19	97.45	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STATOIL LEISMER (AMS 501)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	665	0.5	1	-	0	0	0	0	0	1	6
H2S (ppb) Average	700	0.2	0	-	0	0	0	0	0	0	1
NO2 (ppb) Average	696	1.2	1	-	0	0	0	1	2	3	12
NO (ppb) Average	696	1	2	-	0	0	0	0	1	2	26
NOX (ppb) Average	696	2.1	3	-	0	0	1	1	3	5	39
Temperature 2 m (C) Average	744	16.49	5.6	-	3.4	9.7	12.4	16.3	20.3	25	28.5
Relative Humidity (%) Average	744	66.4	18	-	24	42	51	67	82	90	99
Wind Speed 10 m (km/h) Average	725	8.1	5	-	0	3	4	7	11	15	23
Wind Direction 10 m (deg) Average	725	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STATOIL LEISMER (AMS 501)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	01 Aug 2014 17:00	02 Aug 2014 00:00	8	Station power failure
SO2	01 Aug 2014 01:00	31Aug 2014 24:00	31	Stabilization after daily span
SO2	11 Aug 2014 14:00	11 Aug 2014 14:00	1	Maintenance - cleaned glass manifold
SO2	12 Aug 2014 13:00	12 Aug 2014 13:00	1	Maintenance - repair glass manifold
H2S	12 Aug 2014 13:00	12 Aug 2014 13:00	1	Maintenance - repair glass manifold
NO2, NO, NOX	11 Aug 2014 14:00	11 Aug 2014 14:00	1	Maintenance - cleaned glass manifold
NO2, NO, NOX	12 Aug 2014 13:00	12 Aug 2014 13:00	1	Maintenance - repair glass manifold
Wind Speed, Wind Direction	03 Aug 2014 22:00	03 Aug 2014 23:00	2	Flatline in sensor output signal
Wind Speed, Wind Direction	04 Aug 2014 06:00	04 Aug 2014 06:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	07 Aug 2014 21:00	07 Aug 2014 21:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	07 Aug 2014 23:00	07 Aug 2014 23:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	09 Aug 2014 21:00	09 Aug 2014 21:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	14 Aug 2014 20:00	14 Aug 2014 20:00	1	Flatline in sensor output signal
Wind Speed, Wind Direction	15 Aug 2014 21:00	15 Aug 2014 22:00	2	Flatline in sensor output signal
Wind Speed, Wind Direction	17 Aug 2014 21:00	17 Aug 2014 23:00	3	Flatline in sensor output signal
Wind Speed, Wind Direction	28 Aug 2014 22:00	29 Aug 2014 04:00	7	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Statoil - Leismer - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 ppb on Aug 17 12:00 Maximum Daily Average: 1.1 ppb on Aug 17

Minimum Value: 0 ppb on Aug 26 01:00 Minimum Daily Average: 0.2 ppb on Aug 24
Maximum Diurnal Average: 0.9 ppb at hour 12 Minimum Diurnal Average: 0.3 ppb at hour 20
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	665
Hours of Missing Data:	79
Hours of Calibration:	38
Percent Operational Time:	94.5

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-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	1	0	PF	PF	PF	PF	PF	PF	PF	PF	--	1
2-Aug	1	Z	RE	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
3-Aug	0	Z	RE	0	0	0	0	1	1	1	1	1	1	1	2	0	0	0	0	1	0	0	0	0	0.6	2
4-Aug	0	Z	RE	0	1	1	1	1	1	1	1	0	2	1	1	0	0	0	0	0	0	1	1	1	0.6	2
5-Aug	0	Z	RE	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0.5	1
6-Aug	0	Z	RE	0	0	0	0	0	1	1	1	C	C	C	C	C	C	C	0	0	0	0	0	0	--	1
7-Aug	0	Z	RE	0	0	0	0	0	1	2	2	1	0	1	1	1	1	1	0	0	0	0	0	0	0.6	2
8-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
9-Aug	0	Z	RE	0	0	1	1	2	1	1	1	2	1	2	1	0	0	0	0	0	0	0	0	0	0.7	2
10-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.3	1
11-Aug	0	Z	RE	0	0	0	0	0	0	0	0	1	1	M	1	0	0	0	0	0	0	0	0	1	0.5	1
12-Aug	1	Z	RE	0	0	0	0	0	0	1	1	0	M	0	0	0	0	0	0	0	0	0	0	0	0.3	1
13-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
14-Aug	0	Z	RE	0	0	0	0	0	2	2	1	0	2	1	1	0	0	0	0	0	0	0	0	0	0.6	2
15-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0.4	1
16-Aug	0	Z	RE	0	0	0	0	0	0	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0.6	2
17-Aug	0	Z	RE	0	0	0	0	0	1	1	2	6	4	2	1	1	2	1	0	0	0	0	0	0	1.1	6
18-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
19-Aug	0	Z	RE	0	0	1	0	0	0	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0.5	2
20-Aug	0	Z	RE	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	4	4	2	2	1.0	4
21-Aug	1	Z	RE	0	0	0	0	0	1	1	1	0	1	0	2	1	2	1	0	0	0	1	1	0	0.7	2
22-Aug	0	Z	RE	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
23-Aug	0	Z	RE	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
24-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
27-Aug	0	Z	RE	0	0	0	0	0	1	2	1	2	1	1	1	1	0	0	0	0	0	0	0	1	0.7	2
28-Aug	0	Z	RE	0	0	2	1	0	1	3	2	2	2	1	2	2	2	1	1	0	0	0	0	0	1.1	3
29-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	3	0	1	1	0	0	0	0	0	0	0	0.4	3
31-Aug	0	Z	RE	0	0	0	0	0	0	1	0	1	2	0	0	0	0	1	0	0	0	0	0	0	0.4	2
	0.3	--	--	0.4	0.4	0.4	0.4	0.4	0.6	0.8	0.7	0.9	0.9	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.3	0.3	Diurnal Average	
	1	--	--	1	1	2	1	2	2	3	2	6	4	3	2	2	2	1	2	2	4	4	2	2	Diurnal Maximum	

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

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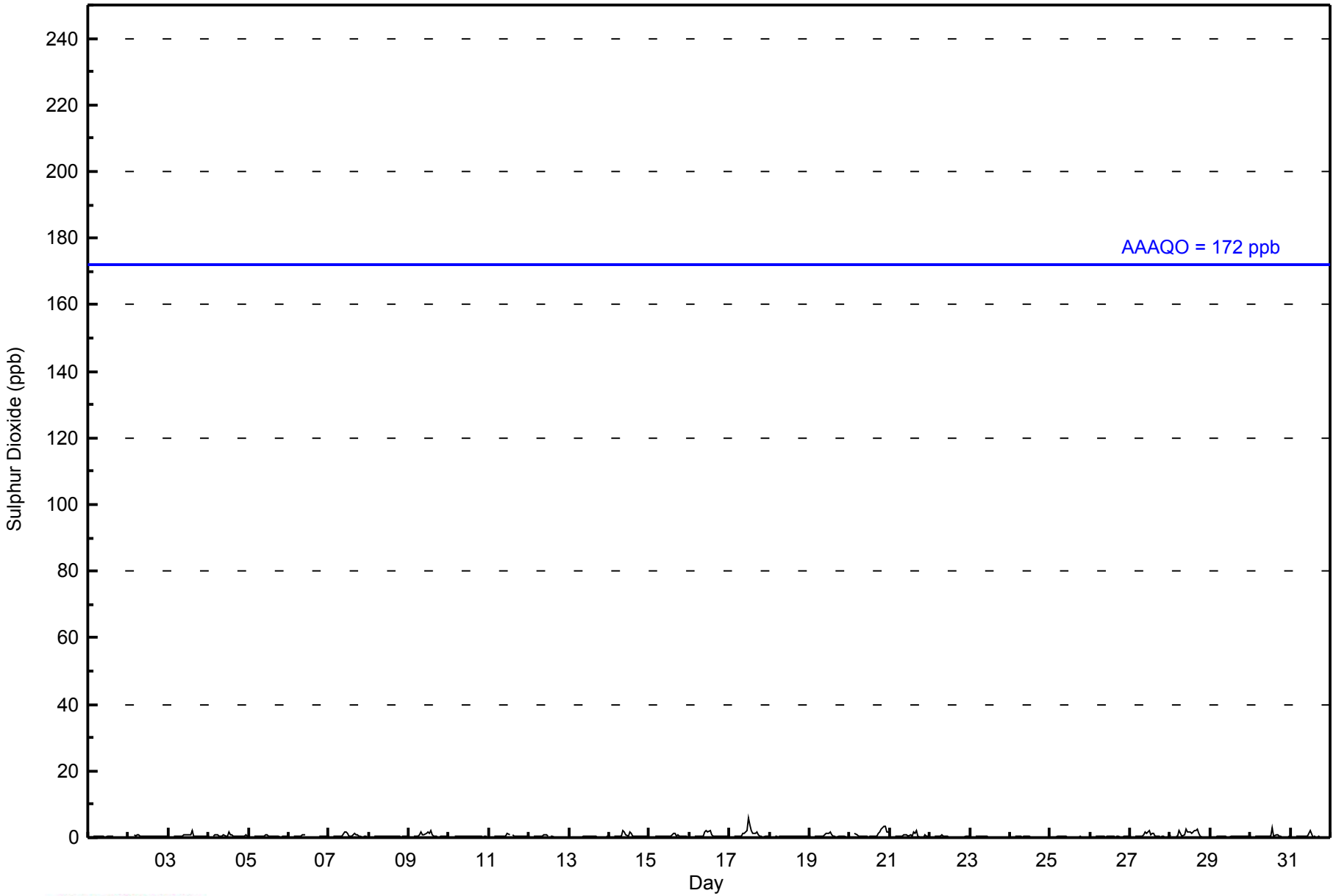
Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Statoil - Leismer - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	665	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: 665

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Statoil - Leismer - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	25	29	20	20	31	39	46	58	44	26	11	34	97	35	68	65	648
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	29	20	20	31	39	46	58	44	26	11	34	97	35	68	65	648

Total Number of Valid Hours: 648

Total Number of Hours: 744

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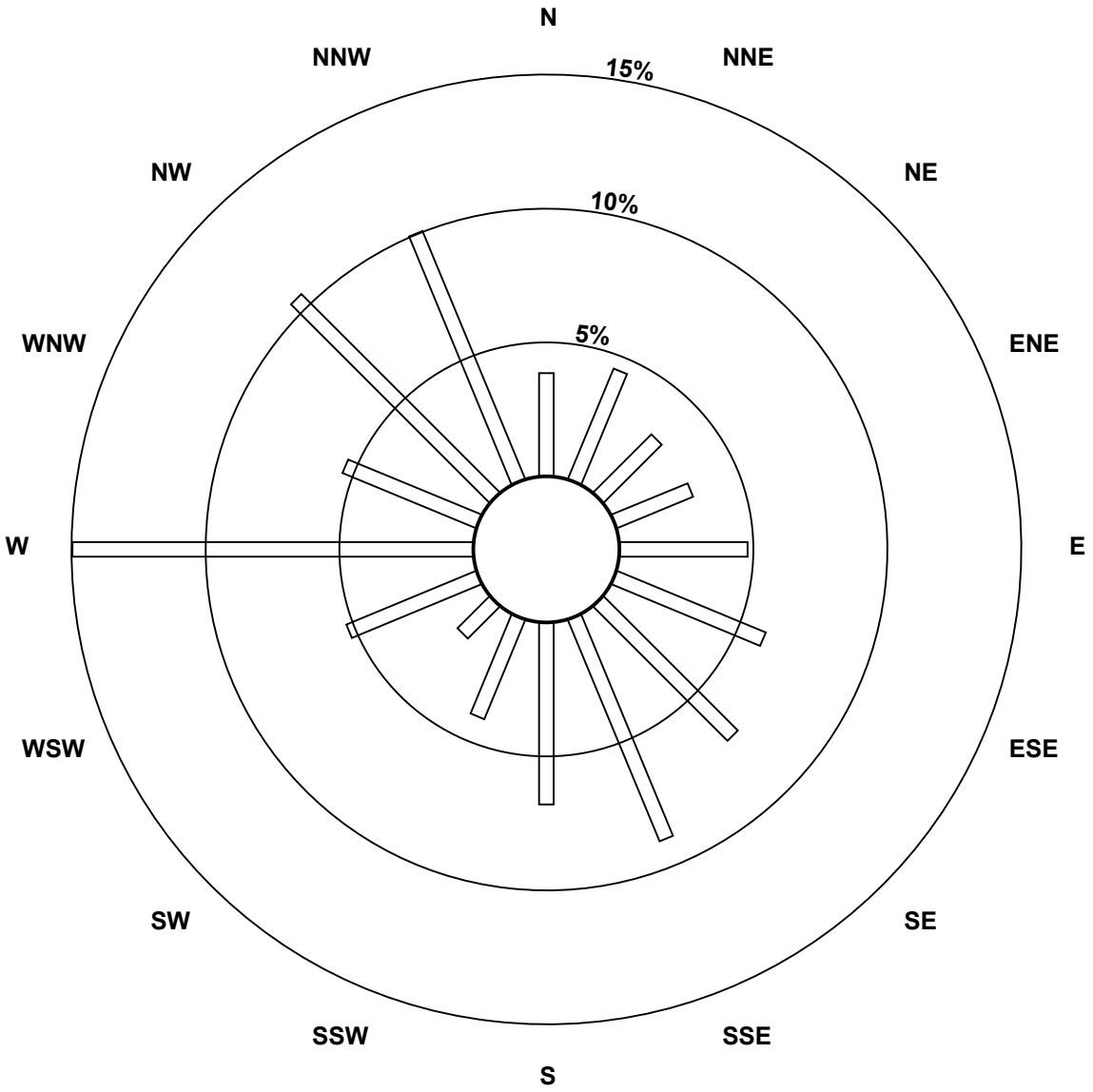
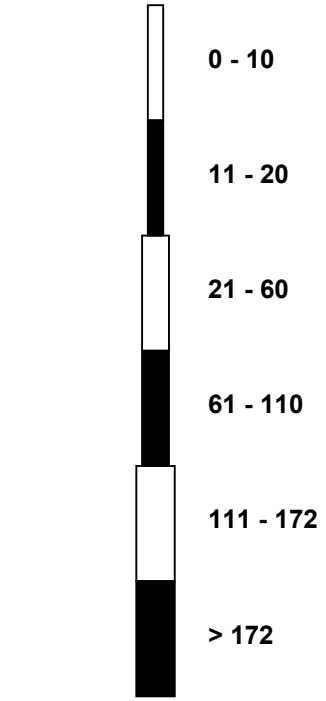
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

Statoil - Leismer (AMS501)





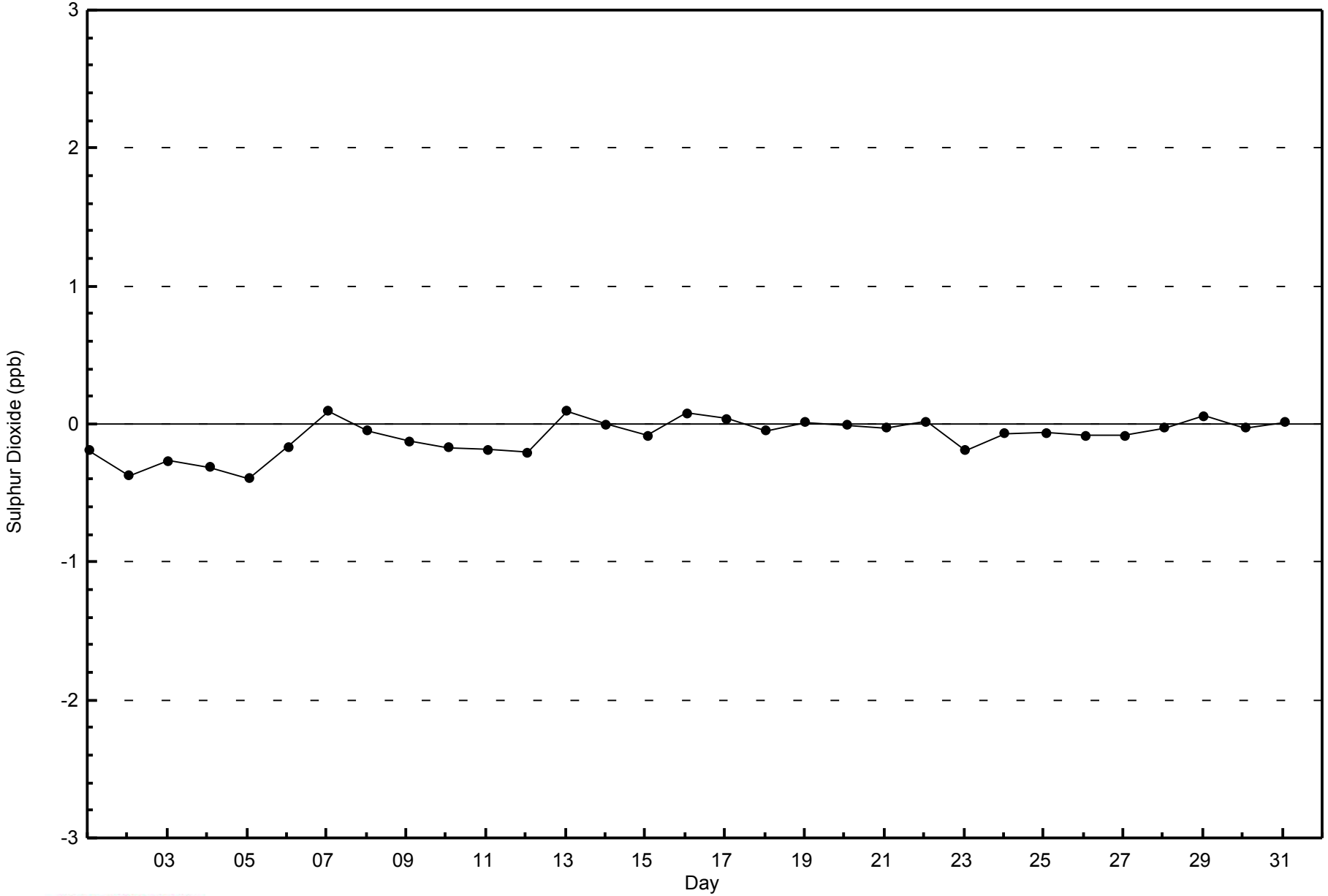
Total Number of Valid Hours: 648

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Statoil - Leismer - August 2014



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501-12

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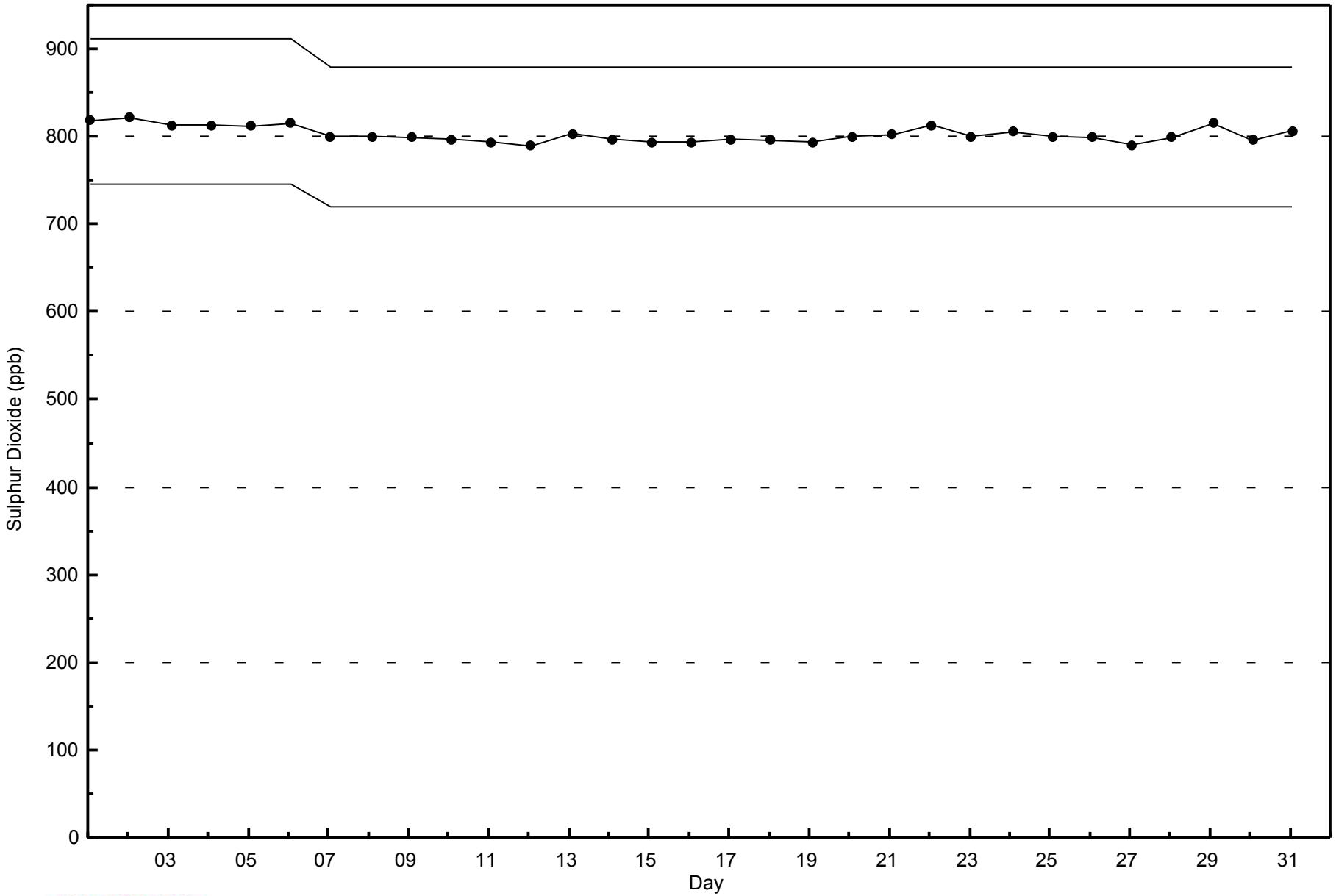
Span Responses

Sulphur Dioxide (SO_2) - ppb

Statoil - Leismer - August 2014



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501-13

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Statoil - Leismer - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 1 ppb on Aug 27 15:00 Maximum Daily Average: 0.3 ppb on Aug 27

Minimum Value: 0 ppb on Aug 20 02:00 Minimum Daily Average: 0.1 ppb on Aug 23
Maximum Diurnal Average: 0.3 ppb at hour 8 Minimum Diurnal Average: 0.2 ppb at hour 2
Monthly Average: 0.2 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	35
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-Aug	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	PF	--	1
2-Aug	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-Aug	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
4-Aug	1	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
5-Aug	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
6-Aug	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
7-Aug	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
8-Aug	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-Aug	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
10-Aug	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
11-Aug	0	0	Z	0	0	0	0	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0.2	0
12-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Aug	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
14-Aug	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
15-Aug	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-Aug	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
17-Aug	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
18-Aug	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
19-Aug	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
20-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1
21-Aug	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-Aug	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
23-Aug	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
24-Aug	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
25-Aug	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
26-Aug	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-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.3	1
28-Aug	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
29-Aug	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
30-Aug	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
31-Aug	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
	0.2	0.2	--	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
	1	1	--	0	1	0	1	1	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	Diurnal Maximum	

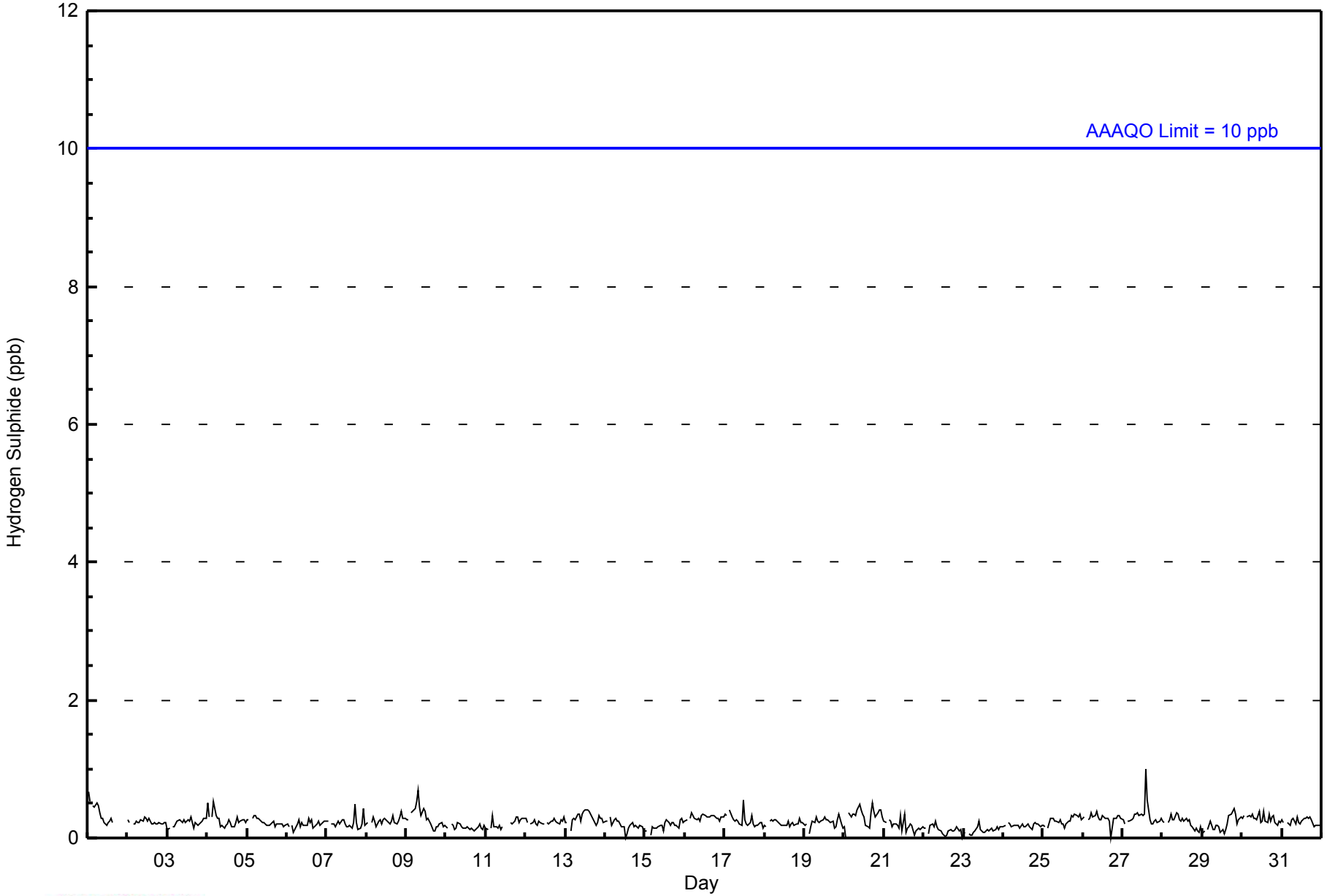
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Statoil - Leismer - August 2014



AURORA ATMOSPHERICS INC.

Hydrogen Sulphide (H_2S) - ppb
Statoil - Leismer - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	700	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Statoil - Leismer - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	26	31	22	22	32	43	49	60	46	27	14	36	102	35	67	70	682
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	31	22	22	32	43	49	60	46	27	14	36	102	35	67	70	682

Total Number of Valid Hours: 682

Total Number of Hours: 744

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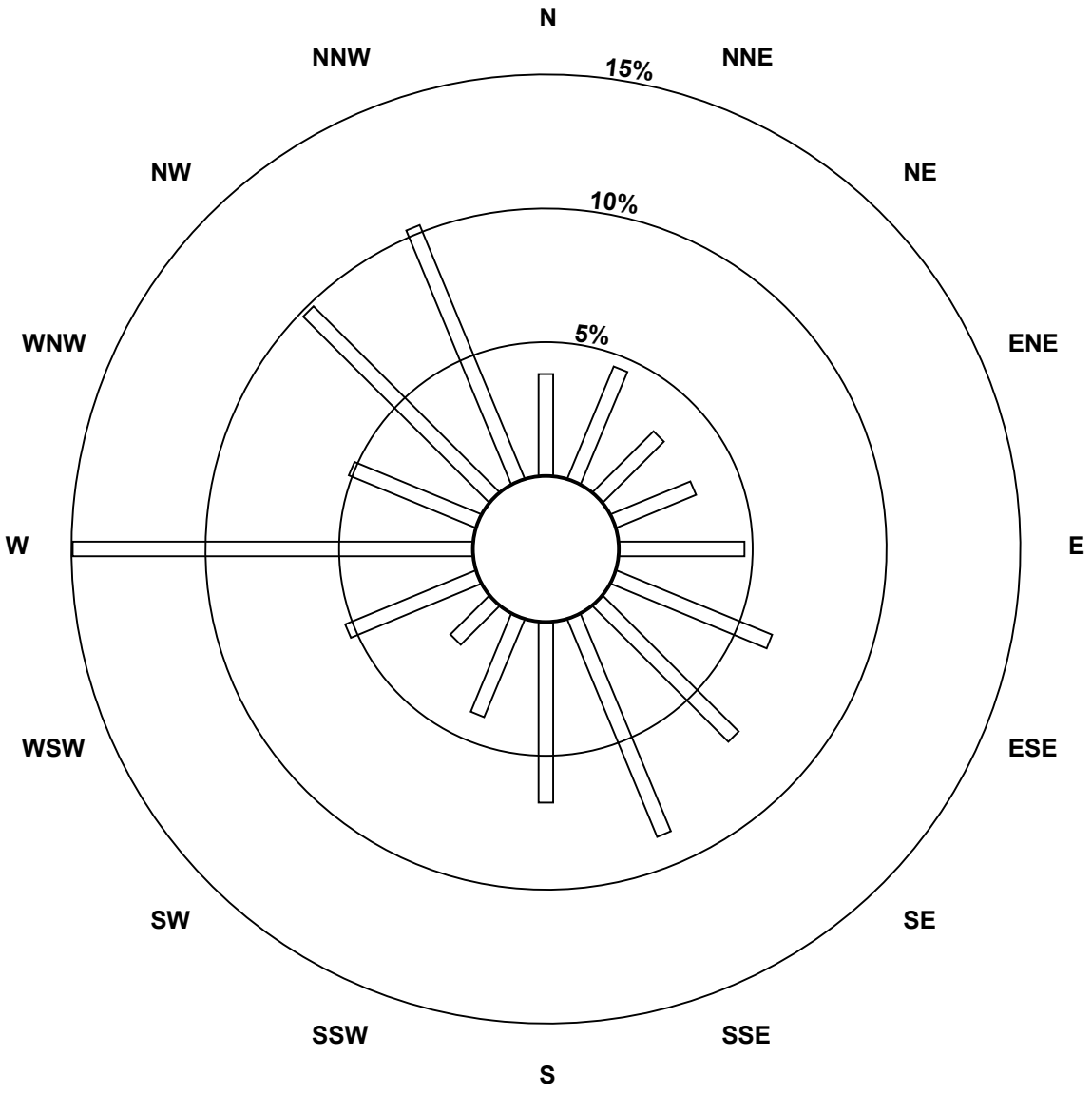
Wood Buffalo Environmental Association

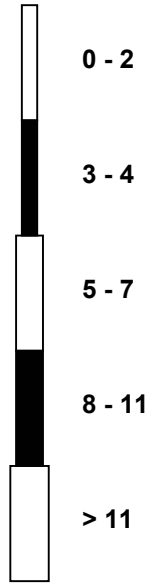
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

Statoil - Leismer (AMS501)



Classes (ppb)



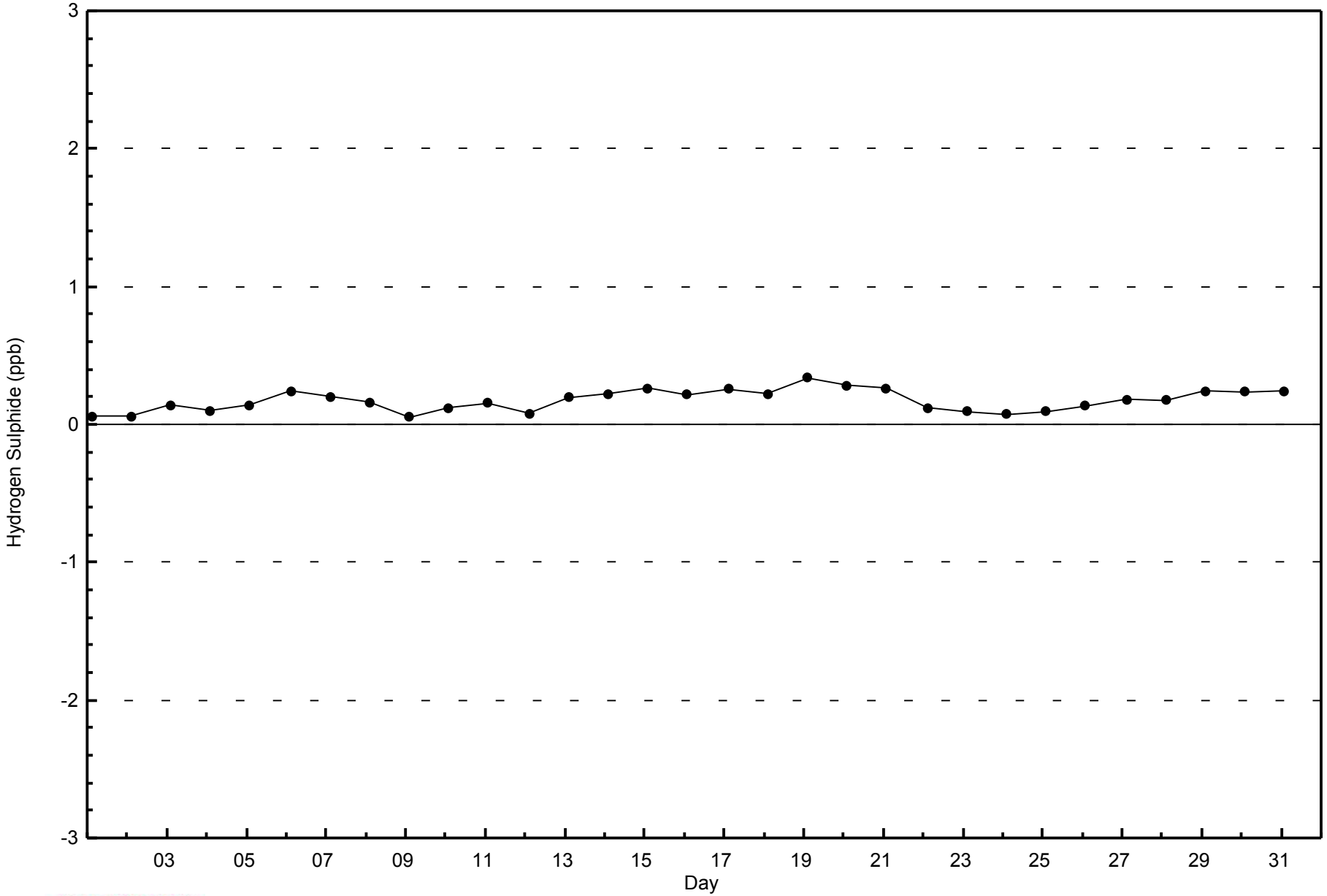
Total Number of Valid Hours: 682

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Statoil - Leismer - August 2014



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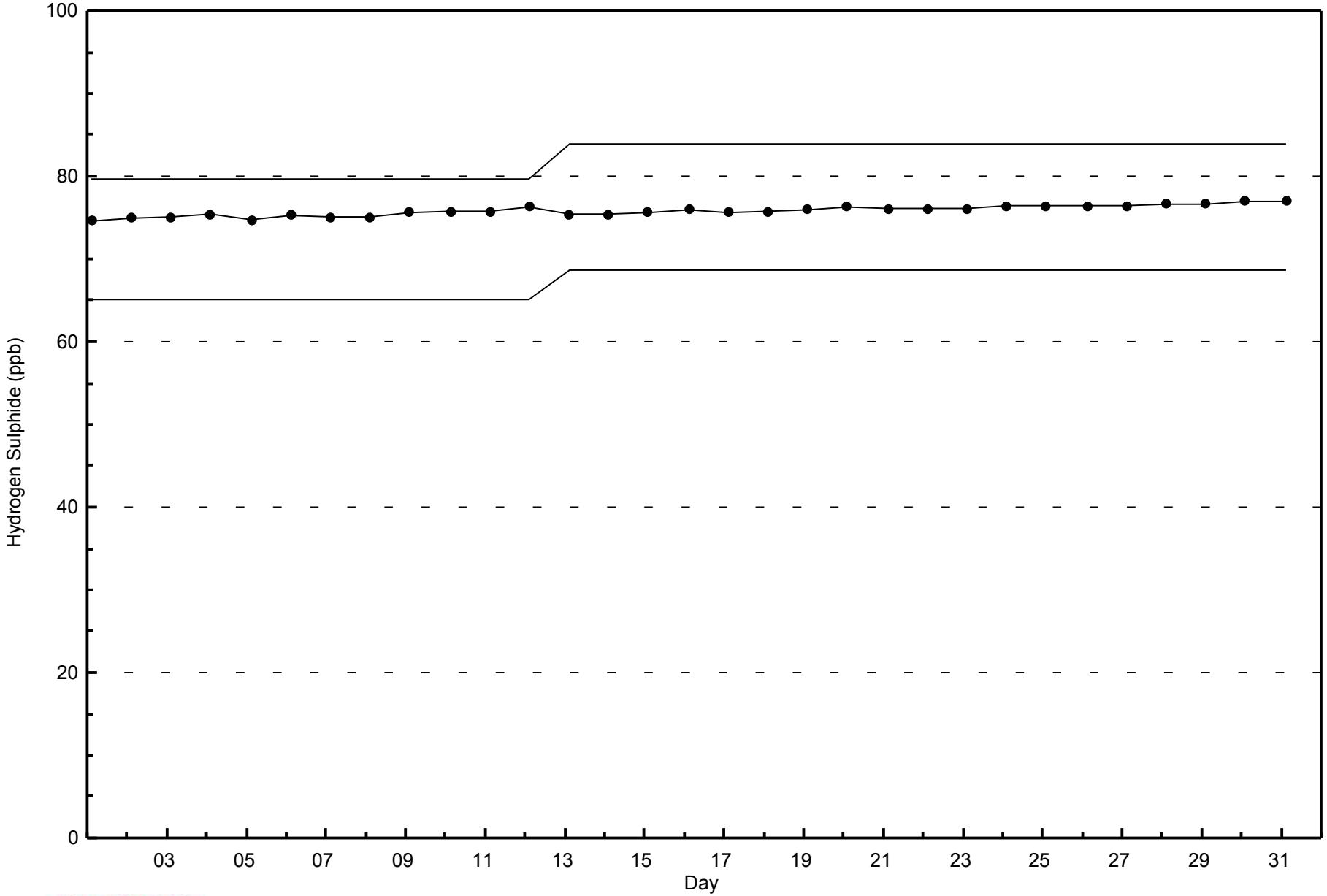
WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Statoil - Leismer - August 2014



AURORA
ATMOSPHERICS INC.

501-20

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

Statoil - Leismer - August 2014

Maximum Value: 26 ppb on Aug 27 15:00

Maximum Daily Average: 2.8 ppb on Aug 27

Minimum Value: 0 ppb on Aug 13 19:00

Minimum Daily Average: 0.2 ppb on Aug 13

Maximum Diurnal Average: 2.1 ppb at hour 5

Minimum Diurnal Average: 0.3 ppb at hour 1

Monthly Average: 1.0 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 8$

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	38
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-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	PF	PF	PF	PF	PF	PF	PF	PF	--	1
2-Aug	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	1
3-Aug	0	Z	0	0	2	2	1	2	1	1	1	1	1	1	2	1	2	1	1	0	0	0	1	0	0.9	2
4-Aug	0	Z	0	0	9	3	1	1	1	0	0	1	2	1	1	1	1	1	1	1	1	0	0	0	1.1	9
5-Aug	1	Z	1	1	5	4	3	1	0	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	0.9	5
6-Aug	0	Z	1	0	0	0	1	0	1	1	0	C	C	C	C	C	C	C	0	0	0	0	0	0	--	1
7-Aug	0	Z	0	0	0	0	1	2	2	4	3	2	1	1	1	2	1	1	1	1	1	1	1	0	1.1	4
8-Aug	1	Z	1	0	4	4	1	3	1	1	1	0	1	1	1	1	0	0	1	0	0	0	0	0	1.0	4
9-Aug	0	Z	0	0	1	1	1	1	2	2	2	1	1	3	1	1	1	1	1	0	1	1	1	1	1.0	3
10-Aug	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	2	0	0	0	0.7	2
11-Aug	0	Z	1	0	7	1	1	0	1	0	0	2	2	M	2	1	2	3	3	2	1	0	1	1	1.4	7
12-Aug	0	Z	0	1	2	1	0	0	1	1	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0.5	2
13-Aug	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
14-Aug	0	Z	0	0	1	2	1	1	1	1	1	0	2	1	1	0	2	1	2	0	0	0	0	0	0.8	2
15-Aug	0	Z	0	0	10	2	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	0	1.1	10
16-Aug	0	Z	0	0	5	1	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0.6	5
17-Aug	0	Z	0	0	0	1	1	3	2	1	2	13	5	4	2	4	6	1	1	0	0	0	0	0	2.1	13
18-Aug	0	Z	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0.4	1
19-Aug	0	Z	0	0	1	1	1	5	2	2	1	1	2	2	1	1	1	1	0	0	4	7	1	1	1.4	7
20-Aug	0	Z	0	1	2	2	2	1	1	1	1	2	1	1	1	1	2	1	1	1	0	1	1	1	1.1	2
21-Aug	1	Z	1	1	2	3	2	2	1	1	11	3	9	1	2	2	4	2	0	0	0	0	0	0	2.2	11
22-Aug	0	Z	0	0	3	3	2	2	1	0	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0.8	3
23-Aug	0	Z	0	0	1	0	0	0	2	3	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0.6	3
24-Aug	0	Z	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0.4	1
25-Aug	0	Z	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3
26-Aug	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
27-Aug	0	Z	0	0	0	1	0	2	2	4	3	4	4	2	26	10	1	0	0	0	0	0	1	3	2.8	26
28-Aug	0	Z	0	0	1	5	3	3	3	6	4	4	5	3	5	5	4	2	1	0	1	1	0	0	2.4	6
29-Aug	0	Z	0	0	5	6	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0.9	6
30-Aug	0	Z	0	0	1	0	0	0	0	0	0	0	1	5	0	1	1	0	0	0	0	0	0	0	0.6	5
31-Aug	0	Z	0	0	0	0	1	1	1	1	1	2	4	2	2	1	0	3	0	0	0	0	0	0	0.9	4
	0.3	--	0.4	0.4	2.1	1.5	1.0	1.2	1.0	1.2	1.3	1.4	1.5	1.2	1.8	1.3	1.2	0.8	0.6	0.4	0.6	0.6	0.4	0.5	Diurnal Average	
	1	--	1	1	10	6	3	5	3	6	11	13	9	5	26	10	6	3	3	2	4	7	1	3	Diurnal Maximum	

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

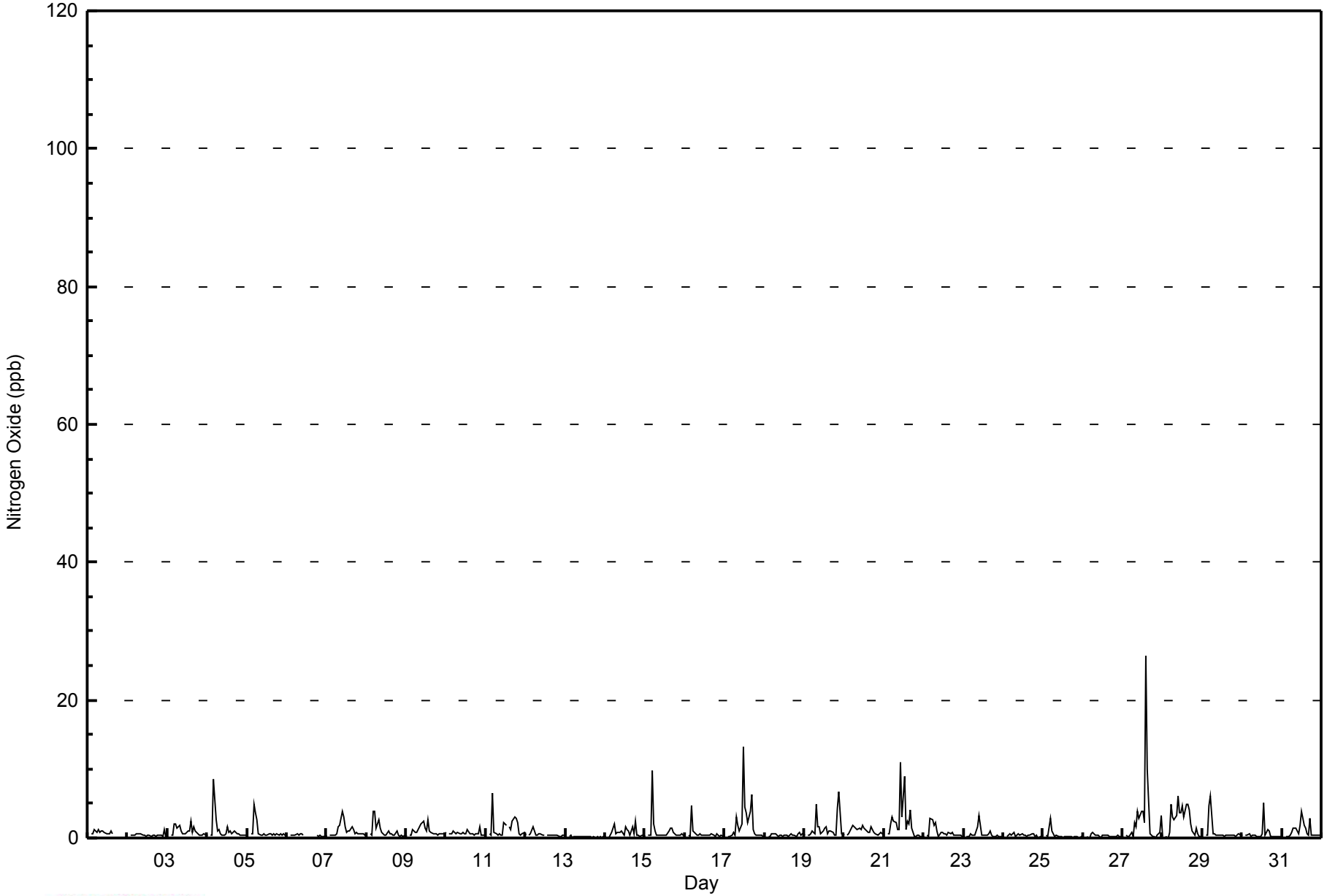
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Oxide (NO) - ppb

Statoil - Leismer - August 2014



AURORA ATMOSPHERICS INC.

501-22

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	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: 696

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxide (NO) - ppb

Statoil - Leismer - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	28	31	22	21	33	40	50	59	44	26	14	35	100	36	70	68	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	31	22	21	33	40	50	59	44	26	14	35	101	36	70	68	678

Total Number of Valid Hours: 678

Total Number of Hours: 744

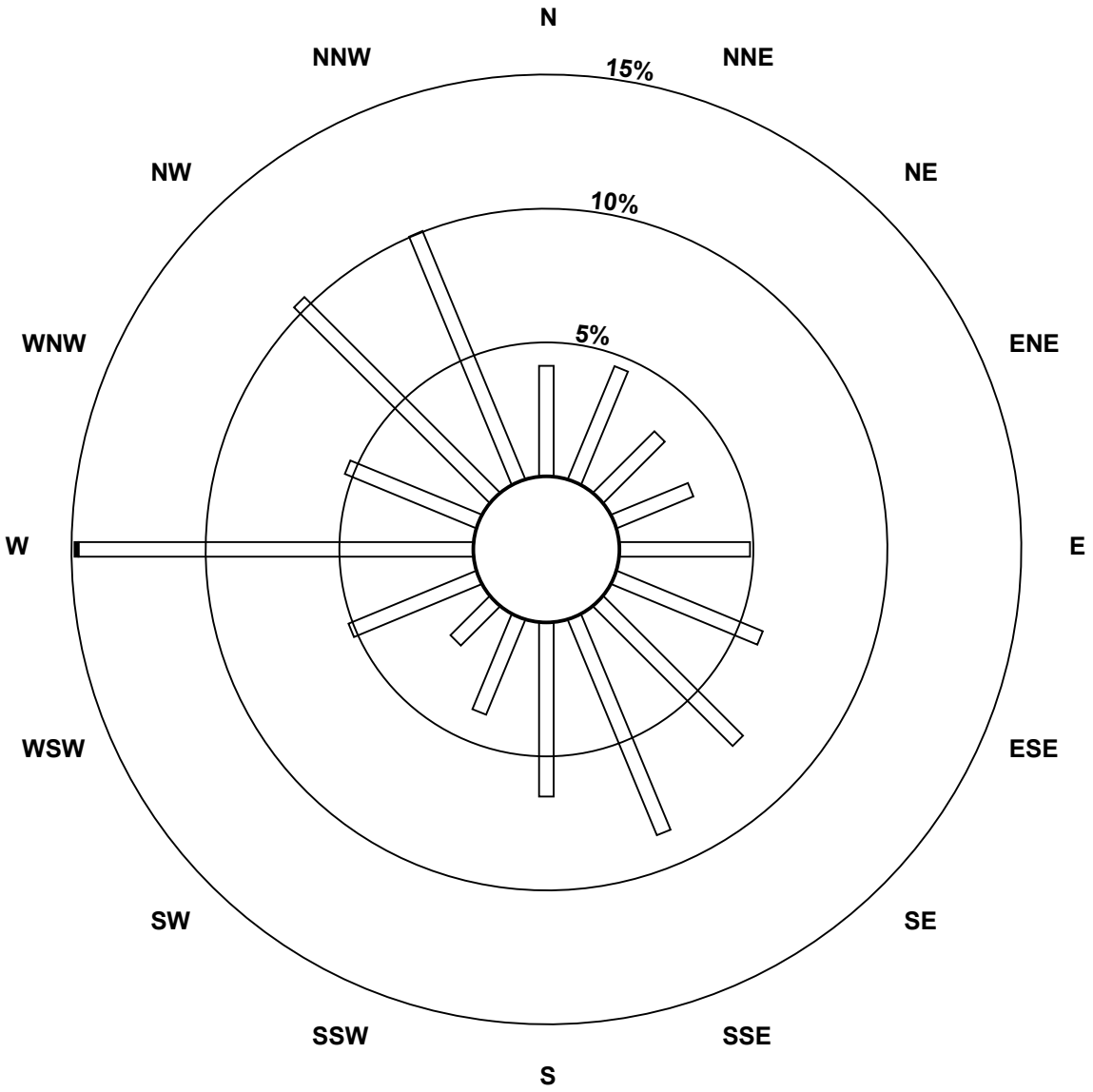
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

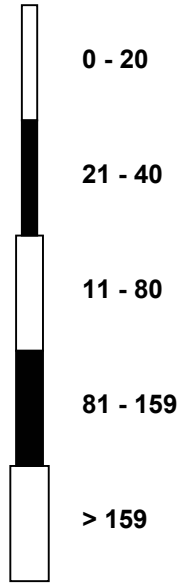
Wind Rose Aug 2014

Nitrogen Oxide (NO) - ppb

Statoil - Leismer (AMS501)



Classes (ppb)



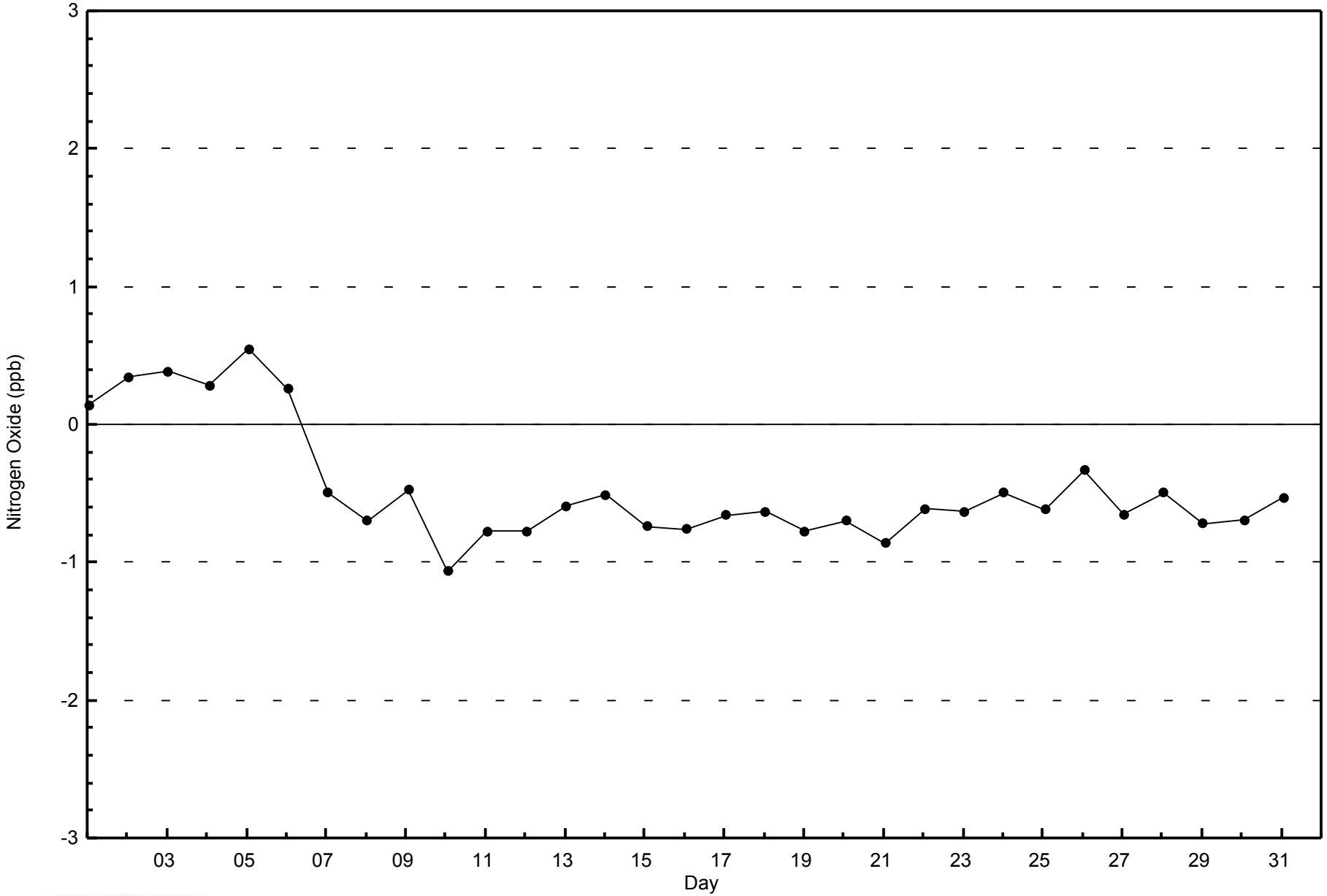
Total Number of Valid Hours: 678

WBEA

Zero Responses

Nitrogen Oxide (NO) - ppb

Statoil - Leismer - August 2014



AURORA
ATMOSPHERICS INC.

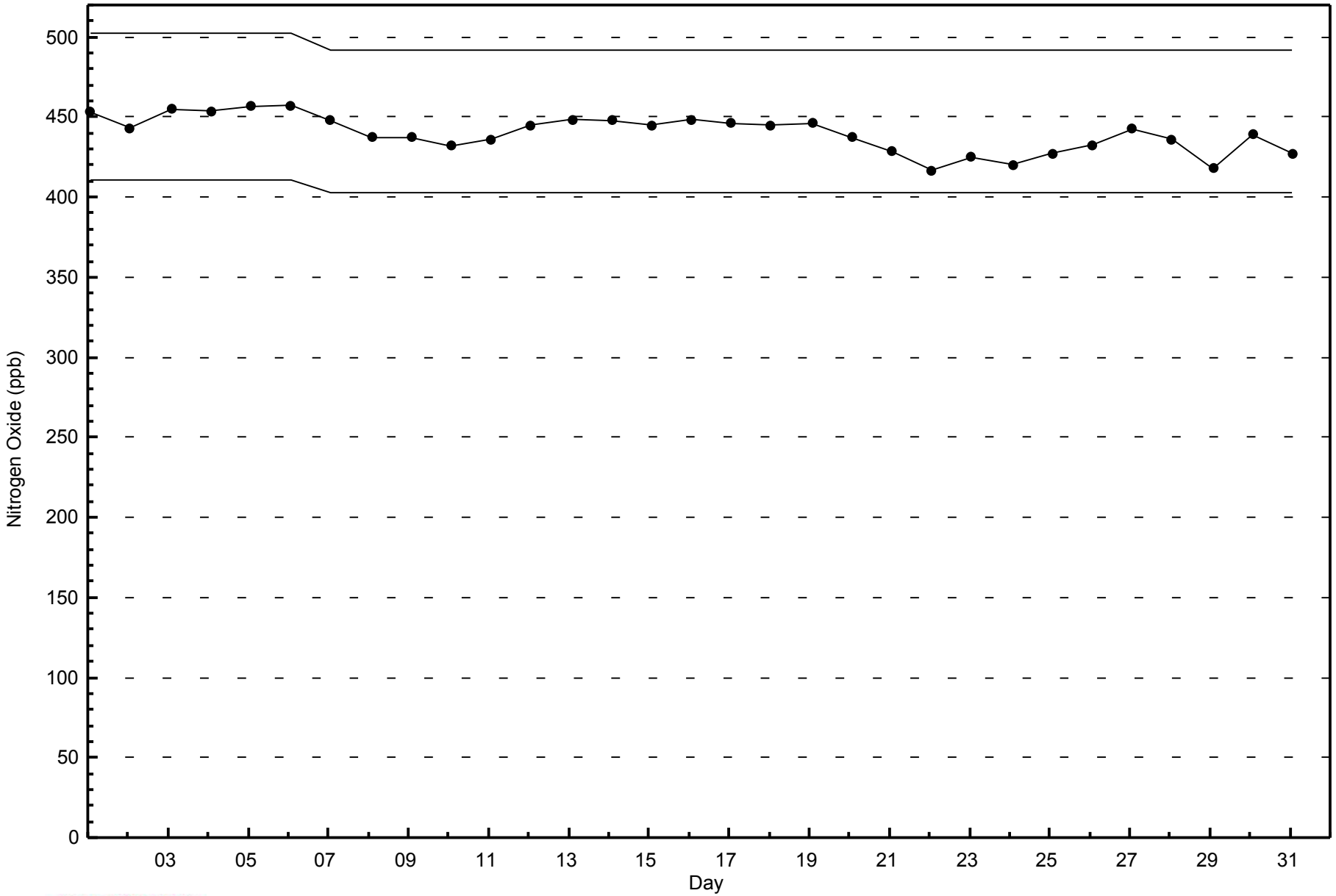
501-26

WBEA

Span Responses

Nitrogen Oxide (NO) - ppb

Statoil - Leismer - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Statoil - Leismer - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 ppb on Aug 27 15:00 Maximum Daily Average: 2.5 ppb on Aug 28

Minimum Value: 0 ppb on Aug 1 10:00
Maximum Diurnal Average: 2.3 ppb at hour 6
Monthly Average: 1.2 ppb

Minimum Daily Average: 0.2 ppb on Aug 12
Minimum Diurnal Average: 0.5 ppb at hour 20
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 2$ $P_{90} = 3$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	38
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-Aug	1	Z	0	0	1	1	1	1	0	0	0	0	0	1	1	1	PF	PF	PF	PF	PF	PF	PF	PF	--	1
2-Aug	1	Z	2	1	2	2	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0.7	2
3-Aug	1	Z	1	0	2	3	4	4	3	2	2	1	1	1	4	1	1	1	0	0	0	0	0	0	1.3	4
4-Aug	1	Z	2	1	6	4	2	2	1	0	0	0	2	1	1	0	0	0	1	0	5	1	0	2	1.4	6
5-Aug	1	Z	1	4	5	5	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	5
6-Aug	0	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	--	0
7-Aug	0	Z	0	0	0	0	1	2	2	4	3	1	0	1	1	1	1	1	1	1	0	1	3	1	1.1	4
8-Aug	1	Z	1	2	4	3	2	4	2	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1.5	4
9-Aug	1	Z	2	2	3	4	4	4	2	2	3	3	1	3	1	1	0	0	0	0	0	0	0	0	1.6	4
10-Aug	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	3	1	1	1	0.7	3
11-Aug	1	Z	1	1	4	2	1	1	1	1	0	2	2	M	2	1	1	2	2	3	0	0	2	6	1.5	6
12-Aug	1	Z	0	0	1	0	0	0	0	0	1	0	M	0	0	0	0	0	0	0	0	0	0	0	0.2	1
13-Aug	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	0.6	2
14-Aug	1	Z	1	1	2	4	2	1	1	1	1	0	2	1	1	0	1	1	1	0	2	2	2	1	1.1	4
15-Aug	1	Z	1	1	2	1	1	1	0	1	1	1	1	0	2	3	2	2	1	1	0	0	1	1	1.0	3
16-Aug	1	Z	2	1	4	5	3	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	1.0	5
17-Aug	0	Z	1	0	0	1	0	1	1	1	2	9	5	3	1	2	4	1	0	0	2	1	0	0	1.5	9
18-Aug	0	Z	0	0	1	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.6	4
19-Aug	0	Z	0	0	1	2	1	2	1	1	1	2	2	1	1	1	0	0	0	0	2	5	0	2	1.2	5
20-Aug	1	Z	2	4	2	2	2	2	2	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	1.9	4
21-Aug	5	Z	1	1	2	2	2	2	1	1	7	4	7	1	3	2	4	2	0	0	1	1	1	5	2.4	7
22-Aug	2	Z	1	1	2	2	1	2	2	0	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1.2	2
23-Aug	0	Z	0	0	1	1	0	1	1	3	2	1	0	0	0	1	1	0	0	0	0	0	0	1	0.6	3
24-Aug	0	Z	1	2	1	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0.5	2
25-Aug	1	Z	1	1	4	2	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0.6	4
26-Aug	1	Z	1	1	1	3	5	2	1	1	1	1	1	1	1	1	0	0	0	0	2	0	0	0	0.9	5
27-Aug	0	Z	0	0	0	1	0	2	1	3	2	4	4	3	12	6	1	0	0	0	0	0	2	3	2.0	12
28-Aug	1	Z	0	0	2	6	4	2	2	4	3	3	3	3	4	5	4	2	1	0	2	2	1	5	2.5	6
29-Aug	1	Z	1	1	4	7	2	1	1	1	0	0	1	1	1	1	1	1	2	1	1	2	2	2	1.4	7
30-Aug	1	Z	1	1	1	1	1	1	1	0	0	0	1	5	0	1	1	0	0	0	0	0	1	1	0.9	5
31-Aug	1	Z	1	1	1	1	2	3	2	2	1	2	4	3	2	1	0	2	1	1	1	0	0	1	1.4	4
	0.8	--	0.8	0.9	1.9	2.3	1.7	1.5	1.0	1.1	1.2	1.3	1.5	1.2	1.4	1.1	1.0	0.7	0.6	0.5	1.0	0.8	0.9	1.3	Diurnal Average	
	5	--	2	4	6	7	5	4	3	4	7	9	7	5	12	6	4	2	3	3	5	5	3	6	Diurnal Maximum	

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

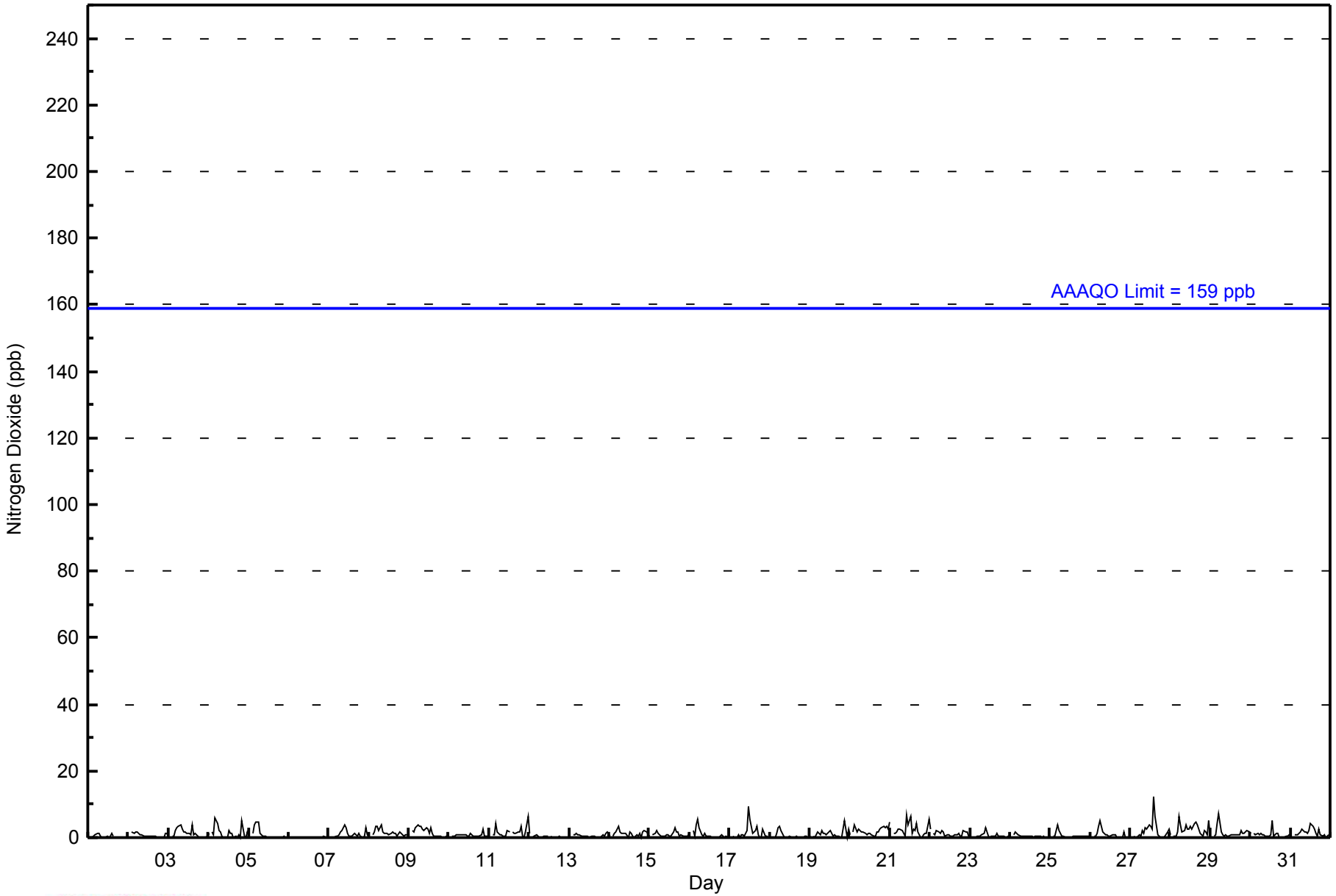
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Statoil - Leismer - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Statoil - Leismer - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	28	31	22	21	33	40	50	59	44	26	14	35	101	36	70	68	678
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	31	22	21	33	40	50	59	44	26	14	35	101	36	70	68	678

Total Number of Valid Hours: 678

Total Number of Hours: 744

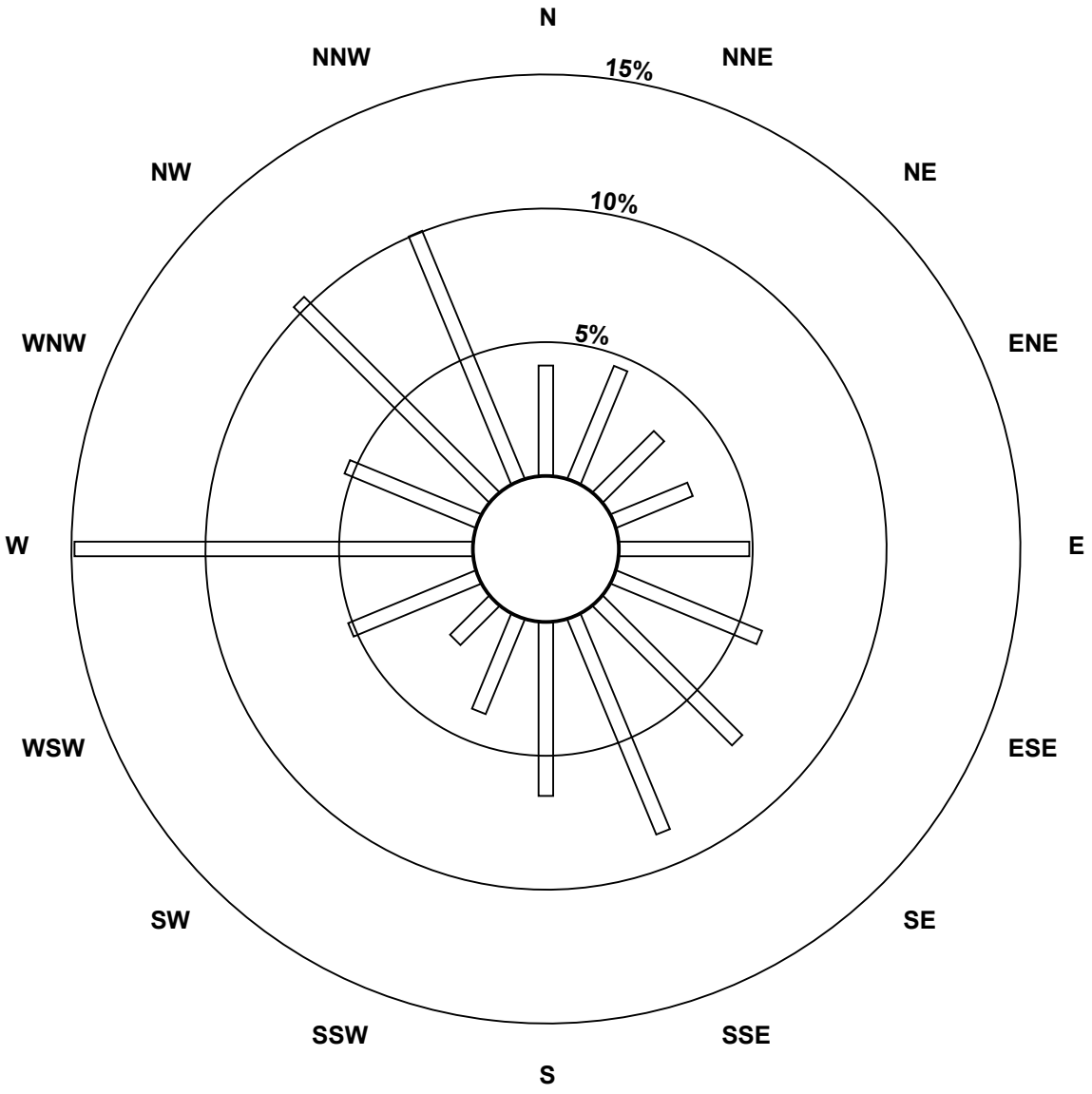
AURORA ATMOSPHERICS INC.

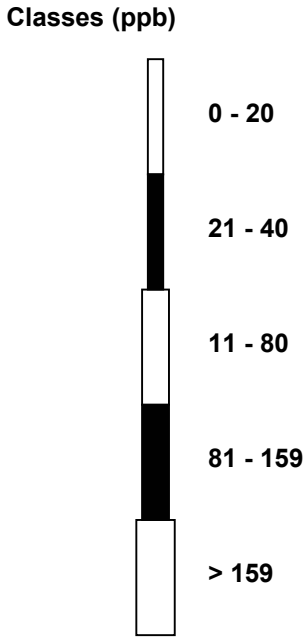
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

Statoil - Leismer (AMS501)





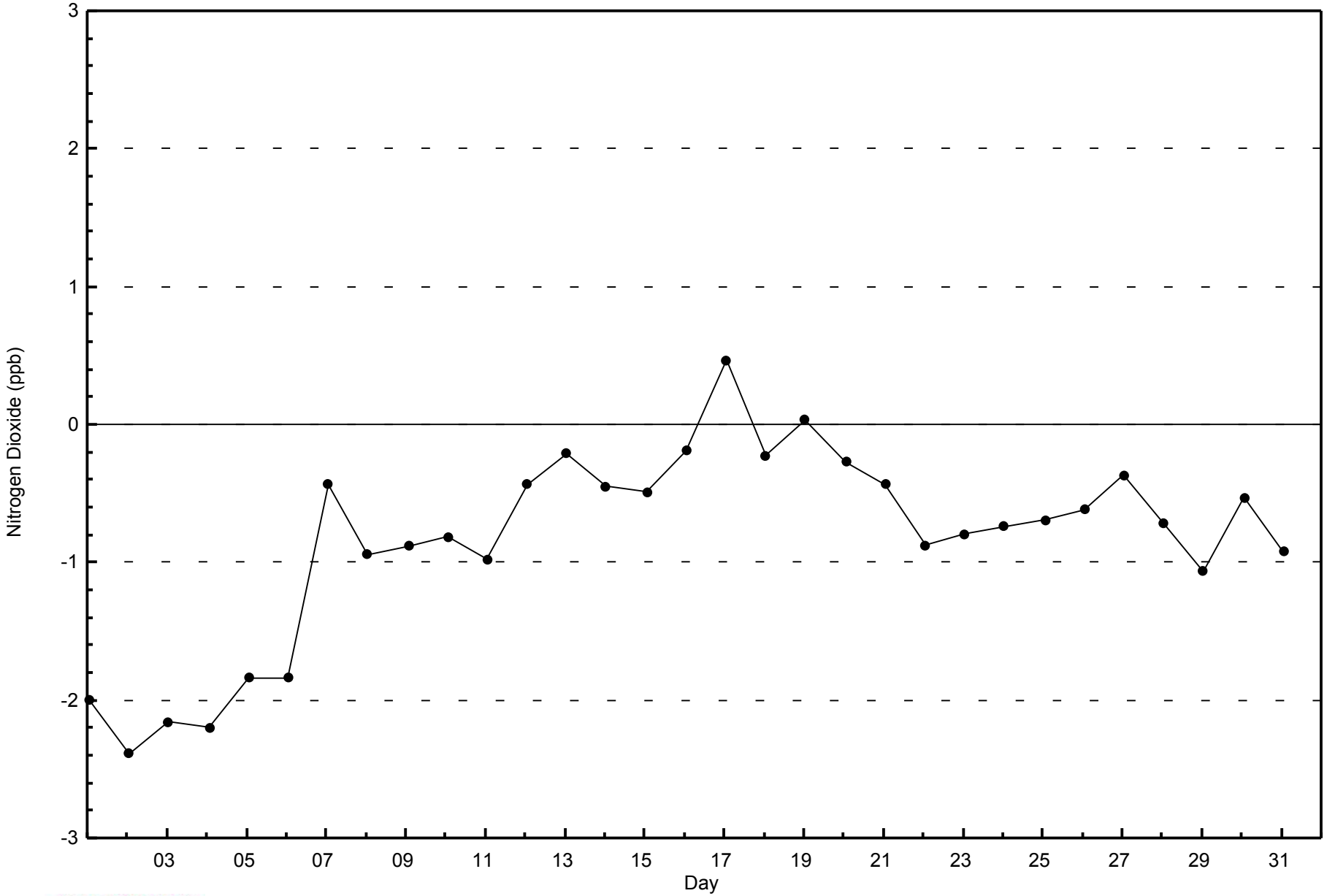
Total Number of Valid Hours: 678

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Statoil - Leismer - August 2014



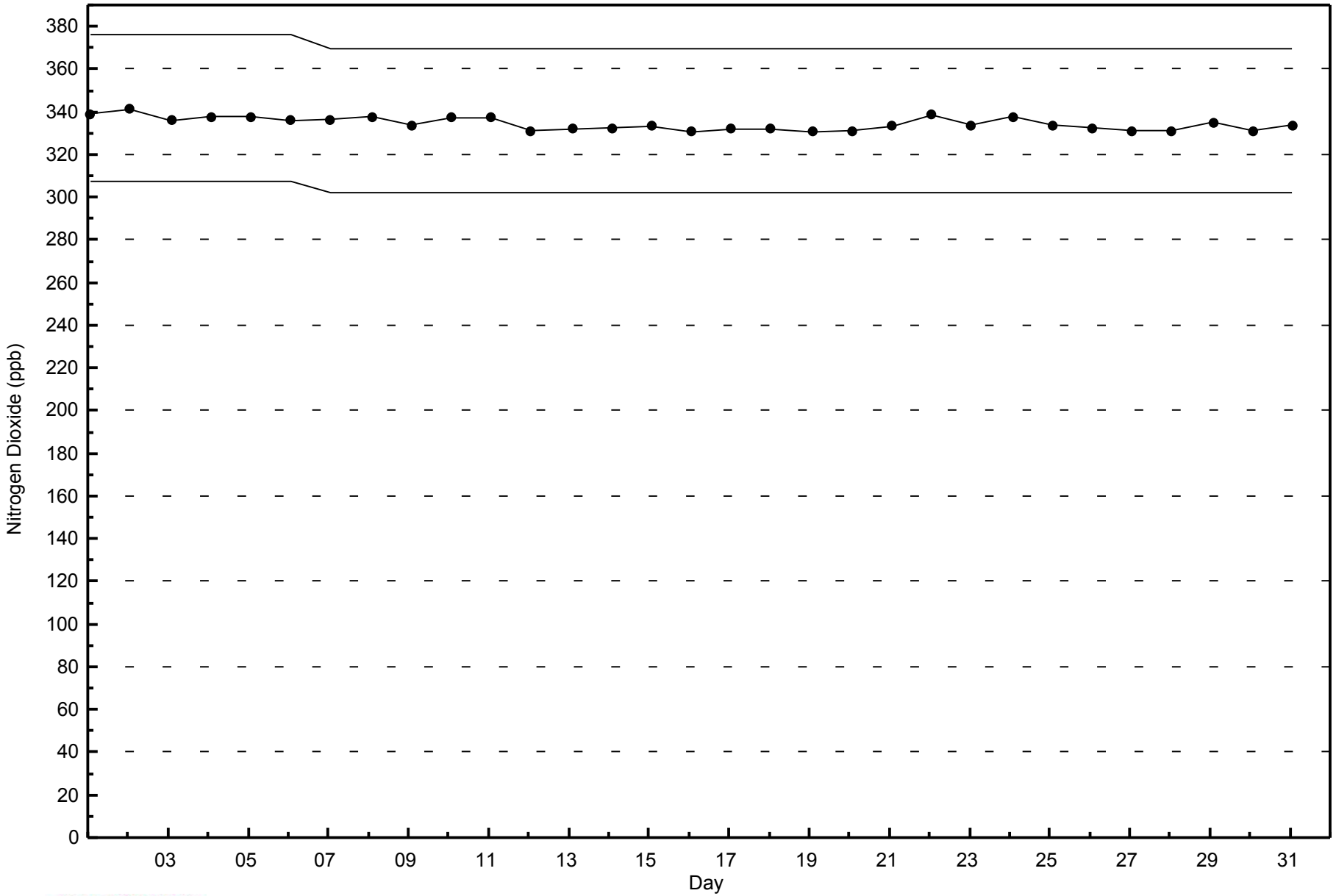
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Statoil - Leismer - August 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

NOx (NO_X) - ppb

Statoil - Leismer - August 2014

Maximum Value: 39 ppb on Aug 27 15:00

Maximum Daily Average: 5.0 ppb on Aug 28

Minimum Value: 0 ppb on Aug 13 19:00

Minimum Daily Average: 0.7 ppb on Aug 12

Maximum Diurnal Average: 4.0 ppb at hour 5

Minimum Diurnal Average: 0.9 ppb at hour 20

Monthly Average: 2.1 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 3$ $P_{90} = 5$ $P_{99} = 13$

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	38
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-Aug	2	Z	1	1	2	2	3	1	1	1	1	1	1	1	2	1	PF	PF	PF	PF	PF	PF	PF	PF	--	3
2-Aug	1	Z	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1	1.1	2
3-Aug	1	Z	1	1	4	5	5	6	4	2	2	2	2	2	6	2	3	2	1	0	0	0	1	1	2.3	6
4-Aug	2	Z	2	2	15	7	3	3	1	0	0	1	3	2	2	1	1	1	1	1	6	1	0	2	2.5	15
5-Aug	1	Z	2	4	10	8	7	2	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	0	2.0	10
6-Aug	0	Z	1	0	1	1	1	0	1	1	0	C	C	C	C	C	C	C	1	1	1	1	1	1	--	1
7-Aug	0	Z	1	1	1	1	1	3	4	8	6	3	1	2	2	3	2	1	2	1	1	1	4	1	2.1	8
8-Aug	1	Z	1	2	7	7	3	7	3	2	2	1	2	2	2	2	1	1	3	1	1	1	1	1	2.5	7
9-Aug	1	Z	2	2	4	4	4	5	4	4	5	4	2	6	2	1	1	1	1	1	1	1	1	1	2.6	6
10-Aug	1	Z	1	1	2	2	1	1	1	1	2	1	1	3	1	1	1	1	1	2	4	1	1	1	1.4	4
11-Aug	1	Z	1	1	11	2	1	1	1	1	1	4	4	M	3	2	4	5	5	5	1	0	2	7	3.0	11
12-Aug	1	Z	0	1	2	1	0	0	1	1	1	1	M	1	0	0	0	0	1	0	0	0	0	0	0.7	2
13-Aug	1	Z	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	2	0.7	2
14-Aug	1	Z	1	1	3	6	2	2	2	2	2	1	3	3	1	0	3	1	4	0	2	3	2	1	2.0	6
15-Aug	1	Z	2	2	12	3	2	1	1	1	1	1	1	1	3	4	3	2	1	1	1	1	1	1	2.0	12
16-Aug	2	Z	2	1	9	6	4	1	1	2	1	1	1	0	0	0	1	0	1	1	1	0	1	0	1.6	9
17-Aug	0	Z	1	0	1	2	1	4	3	1	4	22	10	7	3	6	10	2	1	0	3	1	1	0	3.6	22
18-Aug	0	Z	1	0	2	3	4	3	1	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1.0	4
19-Aug	1	Z	1	1	1	3	1	7	3	3	2	3	4	3	1	2	1	1	0	1	7	12	1	3	2.6	12
20-Aug	1	Z	2	4	3	4	4	3	3	3	2	3	3	2	1	1	3	3	3	3	4	4	4	3	3.0	4
21-Aug	5	Z	2	2	4	5	5	4	2	2	18	7	15	2	5	4	8	3	1	0	1	2	2	6	4.6	18
22-Aug	3	Z	2	1	5	4	3	4	3	1	2	2	1	1	1	2	1	2	1	1	2	2	2	1	2.0	5
23-Aug	0	Z	0	0	1	1	1	1	3	6	4	1	1	1	1	1	2	1	1	1	1	0	0	1	1.2	6
24-Aug	0	Z	1	2	2	1	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	0	0	1	0.9	2
25-Aug	1	Z	1	1	7	3	2	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	1.0	7
26-Aug	1	Z	1	1	1	4	6	2	1	1	1	1	1	1	1	1	0	0	0	0	2	0	0	0	1.2	6
27-Aug	0	Z	1	0	1	1	1	5	3	7	5	8	8	5	39	16	2	1	0	0	0	1	3	6	4.8	39
28-Aug	1	Z	1	0	3	11	7	4	5	10	6	6	8	6	9	10	8	4	2	1	3	3	1	5	5.0	11
29-Aug	1	Z	1	1	9	13	2	1	1	1	1	1	1	1	1	1	1	1	3	2	1	2	3	2	2.3	13
30-Aug	2	Z	2	1	2	1	2	1	1	1	1	1	1	10	1	3	3	0	0	0	0	1	1	1	1.5	10
31-Aug	1	Z	1	1	1	2	2	4	3	3	2	4	8	5	4	2	1	5	1	1	1	1	1	1	2.4	8
	1.1	--	1.2	1.3	4.0	3.9	2.7	2.7	2.0	2.2	2.4	2.7	2.9	2.4	3.2	2.4	2.2	1.5	1.2	0.9	1.6	1.4	1.3	1.8	Diurnal Average	
	5	--	2	4	15	13	7	7	5	10	18	22	15	10	39	16	10	5	5	5	7	12	4	7	Diurnal Maximum	

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

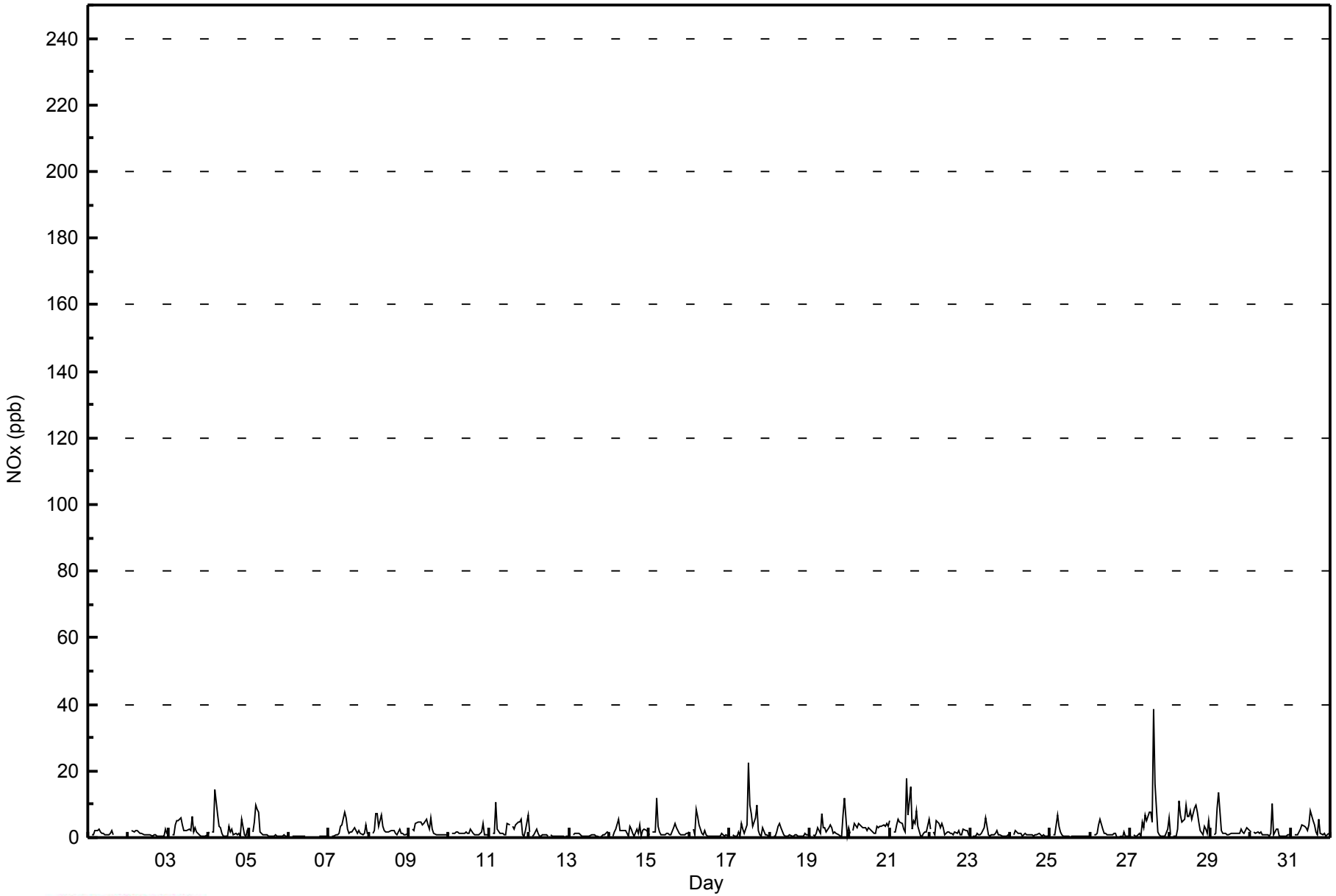
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

NOx (NO_X) - ppb

Statoil - Leismer - August 2014



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	694	99.71	99.71
21 - 40	2	0.29	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

WBEA

Frequency Distribution

NOx (NO_X) - ppb

Statoil - Leismer - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	28	31	22	21	33	40	50	59	44	26	14	35	100	35	70	68	676
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	31	22	21	33	40	50	59	44	26	14	35	101	36	70	68	678

Total Number of Valid Hours: 678

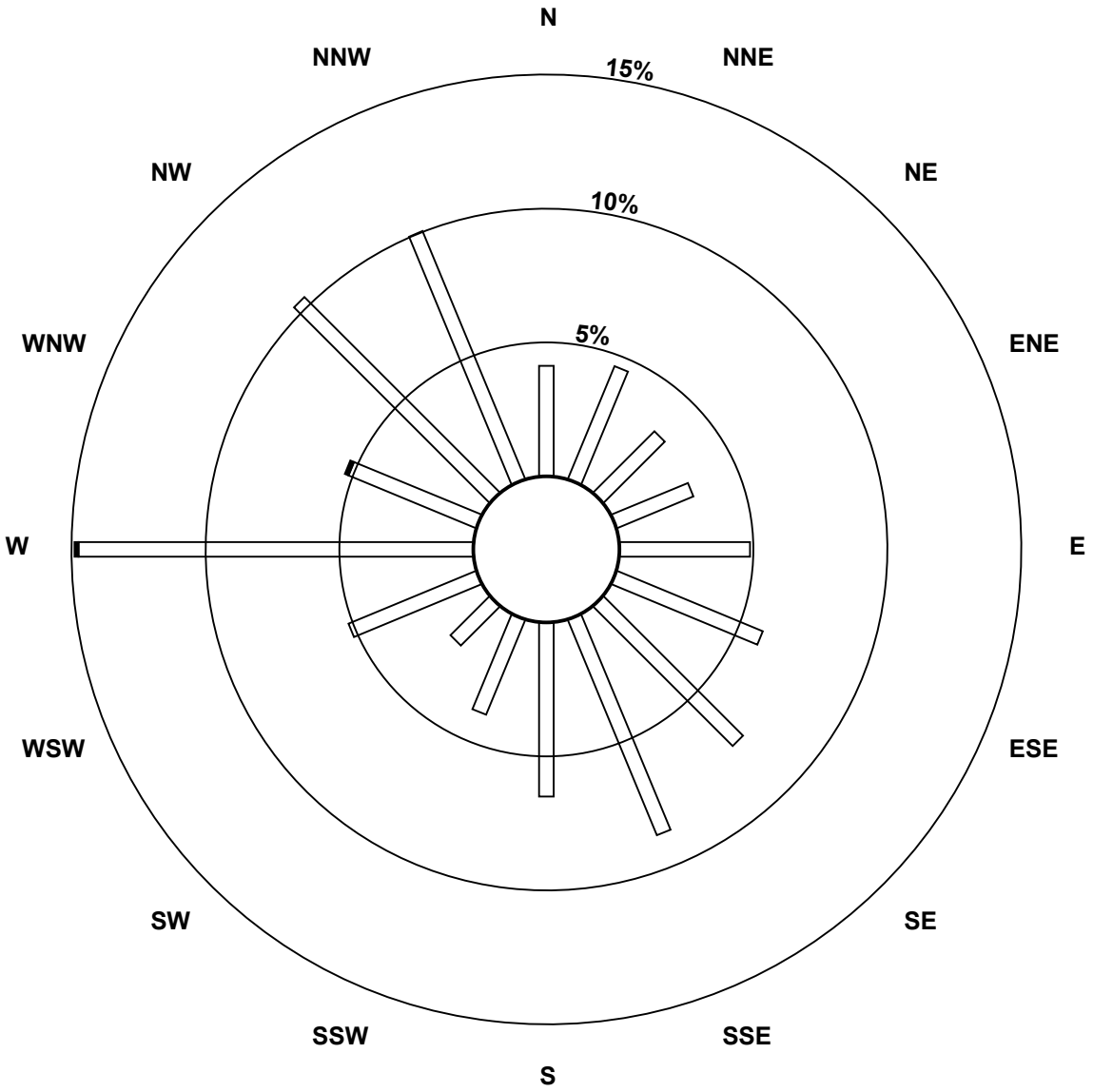
Total Number of Hours: 744

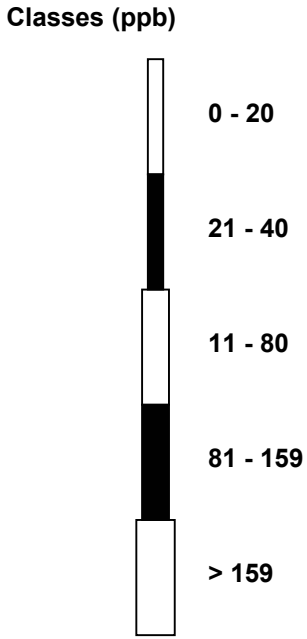
Wood Buffalo Environmental Association

Wind Rose Aug 2014

NOx (NO_X) - ppb

Statoil - Leismer (AMS501)





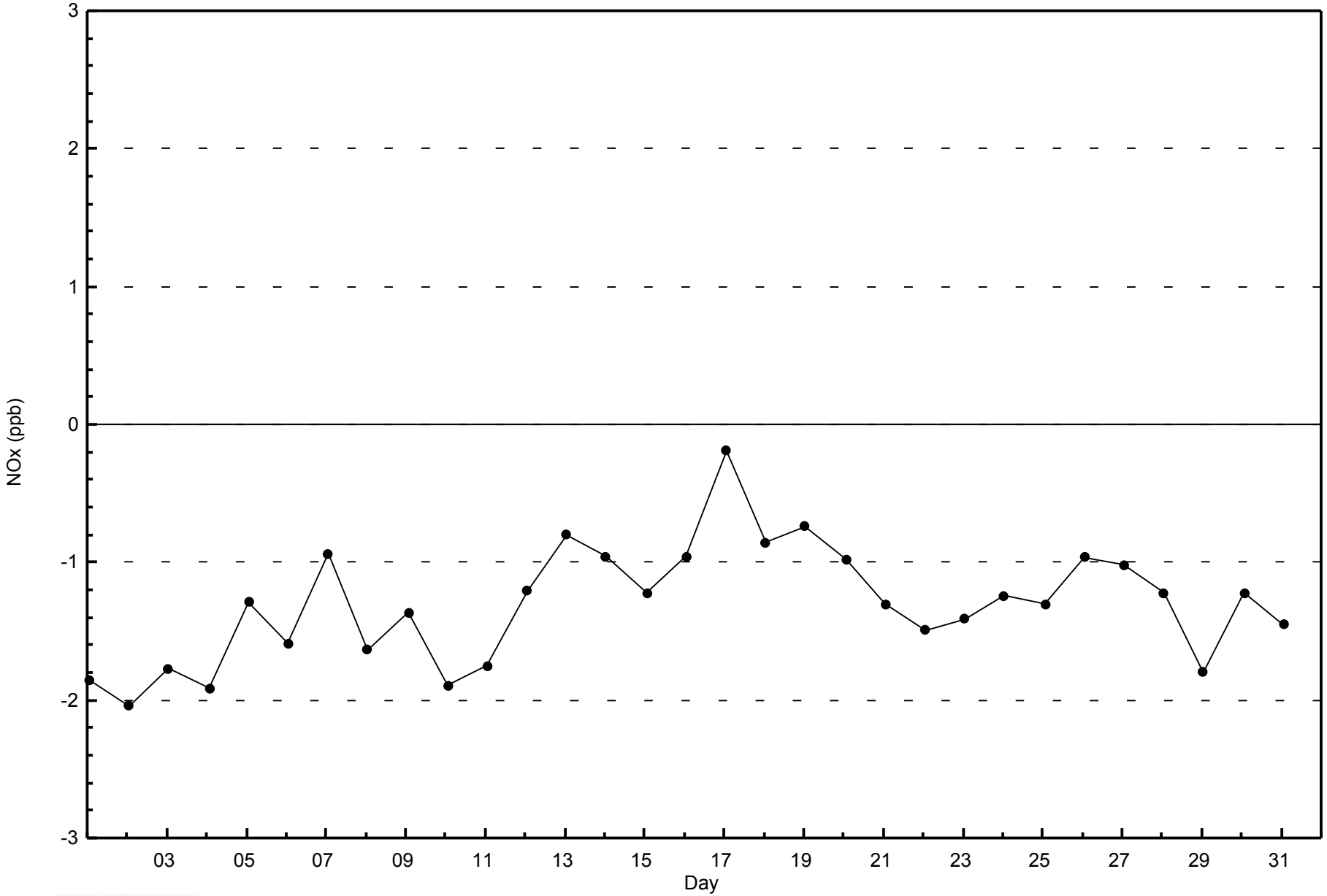
Total Number of Valid Hours: 678

Wood Buffalo Environmental Association

Zero Responses

NOx (NO_X) - ppb

Statoil - Leismer - August 2014



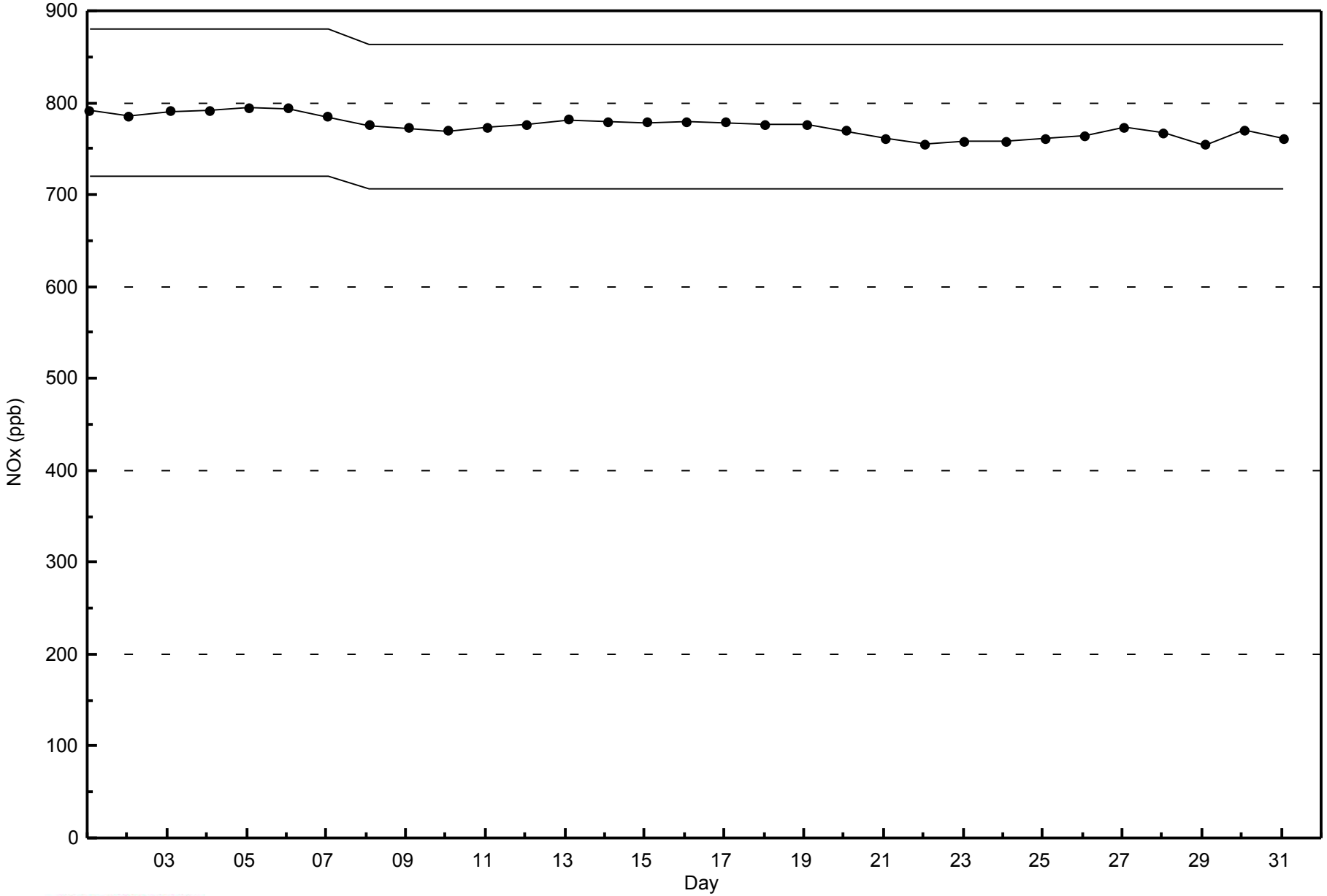
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

NOx (NO_X) - ppb

Statoil - Leismer - August 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Statoil - Leismer - August 2014

Maximum Value: 28.5 C on Aug 4 16:00

Maximum Daily Average: 22.1 C on Aug 4

Minimum Value: 3.4 C on Aug 22 06:00

Minimum Daily Average: 9.7 C on Aug 22

Maximum Diurnal Average: 21.3 C at hour 16

Minimum Diurnal Average: 11.5 C at hour 6

Monthly Average: 16.49 C

Percentiles: P_1 = 5.1 P_{10} = 9.7 Q_1 = 12.4 Median = 16.3 Q_3 = 20.3 P_{90} = 25.0 P_{99} = 27.8

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-Aug	14.3	14.6	14.2	13.6	13.2	12.8	12.2	12.1	13.1	14.4	15.6	16.6	17.9	19.1	19.8	20.8	20.9	20.9	20.0	17.8	16.0	15.0	14.5	12.7	15.9	20.9
2-Aug	11.3	11.5	11.9	11.8	11.5	11.0	12.0	13.9	16.9	19.2	19.5	18.8	17.7	16.5	15.9	17.1	18.4	19.2	19.2	18.3	16.3	15.9	16.2	14.8	15.6	19.5
3-Aug	14.0	13.3	12.6	12.3	11.3	12.1	14.6	17.9	20.9	22.0	23.1	24.5	25.5	26.3	26.5	26.5	26.5	26.3	26.0	24.3	20.8	18.6	16.6	15.6	19.9	26.5
4-Aug	15.3	15.0	15.3	13.9	15.0	16.3	17.9	21.4	24.6	25.6	26.9	27.5	27.9	27.8	28.0	28.5	27.5	26.3	25.4	22.9	20.9	20.6	20.3	19.9	22.1	28.5
5-Aug	19.9	19.0	17.6	14.2	13.8	13.6	15.4	19.0	21.1	23.7	24.9	25.9	26.9	27.1	27.4	27.7	26.8	26.0	24.8	20.8	19.7	17.8	16.6	16.3	21.1	27.7
6-Aug	15.7	15.5	15.4	14.6	13.8	13.7	15.1	17.5	20.3	22.2	23.5	24.0	24.2	25.2	26.0	26.3	26.1	25.2	24.8	23.7	21.6	20.1	19.1	17.9	20.5	26.3
7-Aug	17.3	16.8	16.0	15.6	15.1	14.2	15.1	16.8	18.3	19.2	20.1	20.6	21.2	21.7	21.9	22.4	22.2	22.2	21.9	20.8	17.7	15.0	14.3	14.1	18.4	22.4
8-Aug	13.3	12.7	11.5	10.9	10.3	9.5	11.5	13.9	16.4	18.5	19.7	20.4	21.2	21.3	19.2	18.1	16.1	13.9	13.5	12.9	12.7	12.7	12.4	12.0	14.8	21.3
9-Aug	11.5	11.3	11.2	11.2	10.8	10.7	10.6	10.7	10.6	11.0	11.9	11.9	13.5	15.2	16.6	17.3	17.6	17.7	17.5	16.6	14.3	13.3	12.2	12.3	13.2	17.7
10-Aug	11.6	11.1	11.3	11.3	11.5	12.1	13.0	14.2	16.1	18.5	20.1	21.0	21.1	21.1	21.6	21.9	22.4	22.5	21.7	20.7	17.2	16.4	15.1	14.6	17.0	22.5
11-Aug	14.3	13.7	13.4	12.5	11.7	12.3	14.2	17.3	20.2	22.7	24.1	24.6	24.7	25.0	25.1	25.0	24.6	24.2	23.8	22.1	19.4	18.2	16.8	17.7	19.5	25.1
12-Aug	17.4	16.7	17.3	16.3	16.3	16.4	16.5	16.8	18.8	21.3	22.9	24.1	25.0	25.9	26.4	27.0	26.7	26.5	25.3	23.2	20.6	19.9	19.2	18.8	21.1	27.0
13-Aug	18.7	18.3	17.3	16.7	16.7	16.8	17.7	19.7	22.4	24.1	25.4	26.4	27.4	27.5	27.1	26.7	26.8	25.7	24.3	22.7	20.9	19.6	18.8	18.1	21.9	27.5
14-Aug	17.9	17.7	17.5	18.0	17.8	16.8	17.3	18.4	21.3	23.7	25.2	25.3	25.3	25.3	25.5	25.6	25.0	23.9	21.9	20.9	19.0	17.4	16.4	15.6	20.8	25.6
15-Aug	14.3	13.8	13.1	13.0	12.6	12.1	13.8	18.0	19.8	21.6	23.8	25.5	26.7	27.4	27.8	28.0	27.9	27.6	26.0	23.0	21.0	19.7	19.8	19.9	20.7	28.0
16-Aug	18.8	16.6	17.5	17.9	17.0	15.5	16.3	17.4	20.3	23.3	25.3	25.6	26.5	27.3	27.5	26.9	26.4	25.9	25.0	22.8	21.3	20.4	19.5	19.7	21.7	27.5
17-Aug	19.3	18.2	17.9	17.9	17.3	18.3	18.3	18.8	19.8	22.1	23.6	24.6	25.5	26.0	26.2	26.3	26.2	25.8	24.7	20.8	19.1	18.4	17.4	17.3	21.2	26.3
18-Aug	17.0	16.3	15.8	15.6	15.3	14.1	13.8	14.8	17.7	19.4	22.2	22.4	22.5	24.0	23.9	23.6	23.4	22.2	21.2	20.1	19.1	18.1	16.2	14.9	18.9	24.0
19-Aug	14.2	13.9	14.2	13.9	14.0	14.5	14.5	15.4	16.0	16.7	17.3	18.9	20.0	21.4	20.7	20.2	17.5	16.2	16.4	15.7	13.7	12.3	12.2	11.7	15.9	21.4
20-Aug	11.5	11.2	11.0	10.0	8.5	8.0	9.2	10.7	12.1	13.4	13.6	13.5	13.9	14.5	14.8	15.3	14.3	12.5	11.5	10.6	10.3	9.9	9.7	9.5	11.6	15.3
21-Aug	9.2	8.6	7.5	6.8	6.0	5.9	6.1	7.8	9.7	11.2	11.4	11.8	11.9	11.7	13.0	13.2	13.5	13.0	12.7	11.2	10.1	8.7	7.0	6.3	9.8	13.5
22-Aug	5.5	4.4	3.8	4.0	3.6	3.4	4.9	7.8	11.0	12.2	11.8	13.1	13.1	14.0	13.9	14.1	13.9	13.4	12.6	11.9	10.9	10.5	10.0	9.8	9.7	14.1
23-Aug	9.5	9.1	8.7	8.5	8.2	8.2	8.0	8.5	9.7	12.0	13.7	14.1	14.3	14.6	15.2	15.2	15.3	14.8	13.9	12.4	11.0	10.4	9.4	9.2	11.4	15.3
24-Aug	9.0	8.7	6.3	6.3	8.1	8.7	9.3	9.8	10.9	12.3	13.8	15.2	15.9	16.1	16.5	16.8	16.8	16.4	15.1	12.9	12.4	11.4	10.1	10.9	12.1	16.8
25-Aug	9.5	8.4	7.8	7.4	7.6	7.2	7.8	9.9	12.8	15.0	16.6	17.0	18.4	19.3	19.1	18.7	18.2	17.8	16.9	14.4	13.7	13.2	13.1	12.3	13.4	19.3
26-Aug	11.7	10.6	10.1	10.0	10.0	9.7	10.6	12.7	16.2	19.6	21.0	22.1	23.4	24.0	23.2	23.3	23.4	22.5	21.3	19.1	17.6	17.7	17.7	17.4	17.3	24.0
27-Aug	17.1	16.0	15.4	15.0	14.2	13.8	14.1	16.3	17.4	17.8	18.9	19.7	19.3	19.5	20.3	20.9	20.7	20.3	19.3	17.5	15.7	14.3	13.6	13.4	17.1	20.9
28-Aug	11.9	11.2	10.4	10.2	9.4	8.4	8.3	9.6	11.4	12.7	12.9	12.4	13.2	14.1	14.7	15.1	15.0	14.8	14.1	12.2	9.7	7.8	6.8	6.1	11.4	15.1
29-Aug	5.7	5.7	5.4	5.6	5.1	4.4	6.3	8.9	12.1	14.7	17.1	18.3	19.3	19.4	19.1	19.2	18.6	18.0	16.9	15.3	14.7	14.2	13.3	13.1	12.9	19.4
30-Aug	12.5	12.0	11.4	10.5	10.3	10.0	9.8	10.3	11.0	12.4	13.9	15.3	16.8	17.3	17.9	18.7	18.0	18.1	17.2	15.1	13.2	11.3	10.5	10.0	13.5	18.7
31-Aug	9.0	8.4	7.9	7.3	6.9	7.4	8.4	10.0	11.7	13.4	14.6	16.0	17.1	15.3	14.4	12.9	13.8	12.5	10.7	9.7	8.6	7.8	7.1	7.0	10.7	17.1
	13.5	12.9	12.5	12.0	11.7	11.5	12.3	14.1	16.1	17.9	19.2	19.9	20.6	21.0	21.1	21.3	21.0	20.4	19.5	17.8	16.1	15.1	14.3	13.8	Diurnal Average	
	19.9	19.0	17.9	18.0	17.8	18.3	18.3	21.4	24.6	25.6	26.9	27.5	27.9	27.8	28.0	28.5	27.9	27.6	26.0	24.3	21.6	20.6	20.3	19.9	Diurnal Maximum	

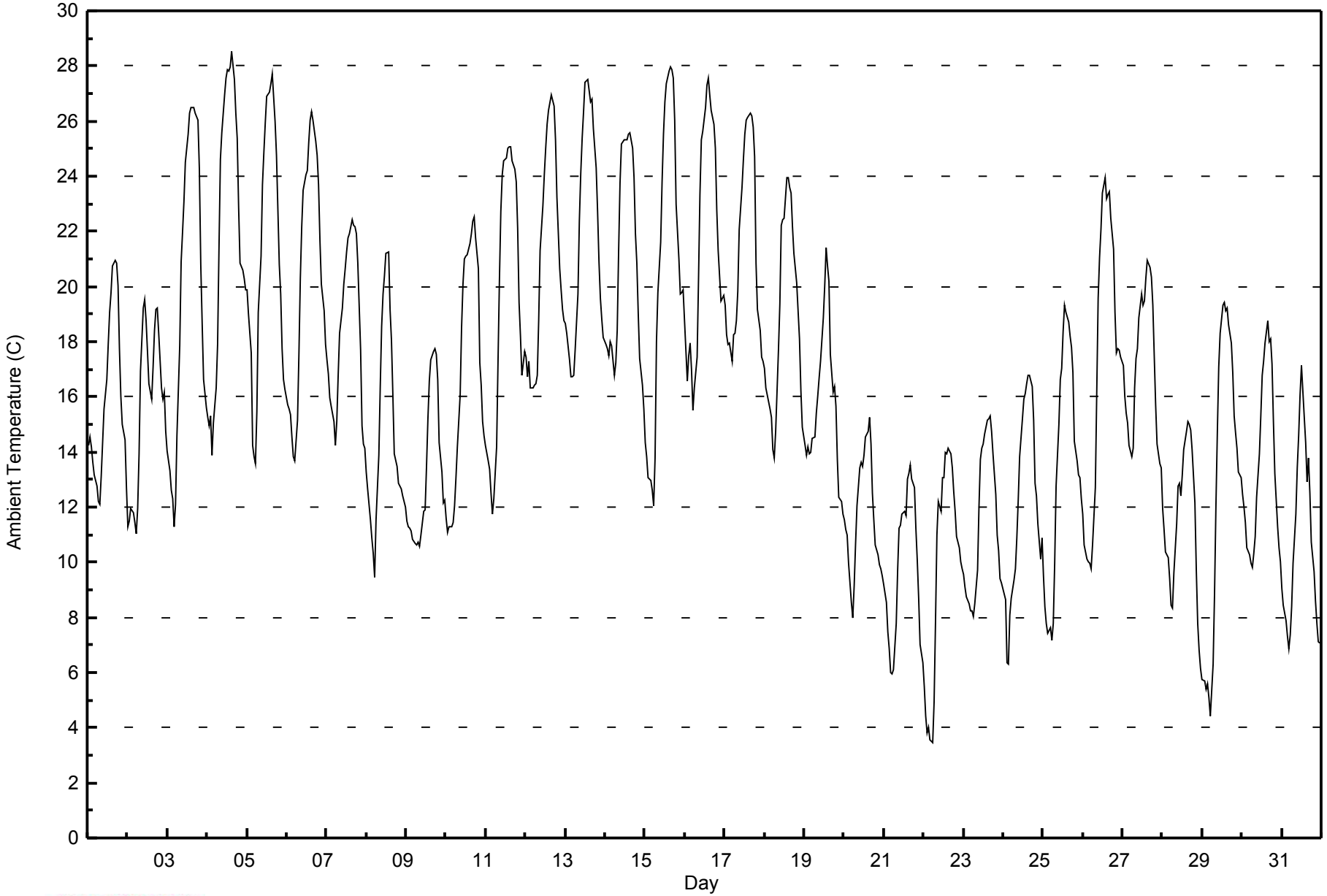
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Statoil - Leismer - August 2014



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Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	90	12.10	12.10
10 - 20	459	61.69	73.79
> 20	195	26.21	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Statoil - Leismer - August 2014

Maximum Value: 99 % on Aug 20 06:00

Maximum Daily Average: 84.3 % on Aug 20

Minimum Value: 24 % on Aug 17 14:00

Minimum Daily Average: 51.9 % on Aug 4

Maximum Diurnal Average: 85.7 % at hour 6

Minimum Diurnal Average: 47.3 % at hour 16

Monthly Average: 66.4 %

Percentiles: $P_1 = 30$ $P_{10} = 42$ $Q_1 = 51$ Median = 67 $Q_3 = 82$ $P_{90} = 90$ $P_{99} = 97$

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

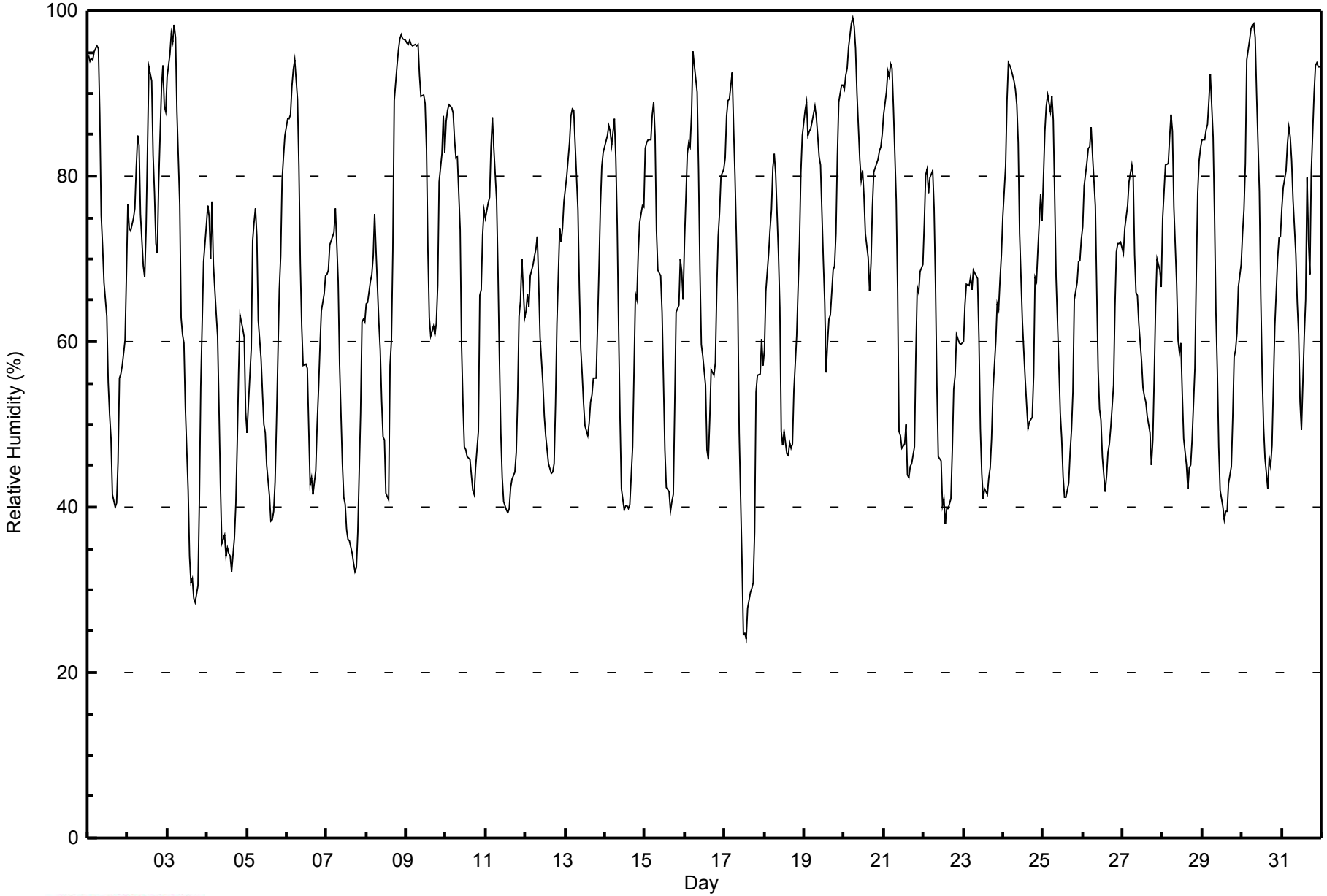
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	95	94	94	94	95	96	95	87	75	72	67	63	55	51	48	41	40	41	45	56	56	57	60	68	68.6	96
2-Aug	77	74	73	75	76	81	85	84	75	69	68	74	83	93	92	83	78	72	71	79	91	93	88	88	80.1	93
3-Aug	92	95	97	96	98	97	88	77	63	61	60	52	42	34	31	31	29	28	31	41	55	62	70	74	62.6	98
4-Aug	76	75	70	77	69	63	61	52	43	36	37	34	35	34	34	32	36	40	48	56	63	62	60	52	51.9	77
5-Aug	49	52	59	72	74	76	73	63	58	54	50	49	45	41	38	38	39	43	50	66	70	80	82	85	58.7	85
6-Aug	87	87	87	91	93	94	89	81	69	62	57	57	57	50	43	43	42	44	50	54	59	64	66	68	66.5	94
7-Aug	68	69	72	72	73	76	72	67	57	45	41	40	37	36	36	34	33	32	33	37	51	62	63	62	53.0	76
8-Aug	65	65	67	68	70	75	71	62	59	53	48	48	42	41	57	60	71	89	93	95	97	97	97	96	70.3	97
9-Aug	96	96	96	96	96	96	96	96	92	90	90	89	83	71	63	61	62	61	62	67	79	83	87	83	82.9	96
10-Aug	87	88	89	88	88	84	82	82	74	60	53	47	47	46	46	44	42	42	45	49	66	66	73	76	65.1	89
11-Aug	75	77	77	84	87	83	77	68	58	49	44	41	40	39	40	42	43	44	47	53	63	65	70	63	59.6	87
12-Aug	64	66	64	68	69	70	71	73	67	60	55	51	49	47	45	44	44	45	52	62	74	72	74	77	61.0	77
13-Aug	78	80	84	87	88	88	84	76	66	59	56	53	50	49	50	53	54	56	56	62	69	76	81	83	68.2	88
14-Aug	84	85	86	85	84	87	82	74	62	51	42	40	40	40	40	40	47	57	66	65	71	74	76	76	64.8	87
15-Aug	83	84	84	84	87	89	85	73	69	68	64	55	47	42	42	39	41	41	52	64	64	70	68	65	65.1	89
16-Aug	72	83	84	84	88	95	93	90	81	69	60	58	55	47	46	51	57	56	57	66	73	76	80	81	70.8	95
17-Aug	82	87	89	89	92	86	80	73	65	49	33	25	25	24	28	30	30	31	37	54	56	56	60	57	55.8	92
18-Aug	59	66	71	74	76	81	83	80	71	64	49	47	49	46	46	48	47	48	54	61	66	72	81	85	63.5	85
19-Aug	88	89	85	85	86	87	88	87	85	82	81	70	65	56	60	63	63	69	69	73	82	89	91	91	78.5	91
20-Aug	91	92	93	96	98	99	98	95	90	82	79	81	78	73	70	66	70	76	81	81	82	83	84	85	84.3	99
21-Aug	88	90	93	92	94	93	88	77	66	49	49	47	48	50	44	44	45	45	47	58	67	66	69	69	65.7	94
22-Aug	74	80	81	78	80	81	76	67	55	46	46	40	41	38	40	40	41	47	54	56	61	60	60	60	58.4	81
23-Aug	60	64	67	67	68	66	69	68	68	60	50	44	41	42	42	43	45	48	54	60	65	64	68	70	58.0	70
24-Aug	75	81	89	94	93	93	92	91	89	84	73	62	59	55	52	49	50	51	56	68	67	71	78	75	72.8	94
25-Aug	80	85	89	90	88	90	87	78	68	57	51	48	44	41	41	43	47	49	54	65	67	70	70	72	65.5	90
26-Aug	74	79	82	83	84	86	83	76	66	57	52	50	46	42	44	47	48	50	55	64	71	72	72	72	64.7	86
27-Aug	71	74	75	76	79	81	80	70	66	66	62	58	54	53	53	51	49	45	48	56	64	70	69	67	64.1	81
28-Aug	75	78	81	82	85	87	85	76	67	60	59	60	54	48	45	42	45	45	48	57	68	78	82	83	66.3	87
29-Aug	84	84	86	86	89	92	85	75	64	56	47	42	40	38	40	39	43	45	51	58	59	61	67	69	62.6	92
30-Aug	73	76	82	94	97	98	98	98	97	90	78	66	56	50	46	42	46	45	47	55	62	70	73	73	71.2	98
31-Aug	76	79	81	84	86	85	82	77	71	65	61	53	49	61	65	80	72	68	81	90	93	94	93	93	76.6	94
	77.3	79.8	81.5	83.6	84.9	85.7	83.1	77.3	69.5	62.1	56.8	53.0	50.2	47.8	47.3	47.3	48.3	50.1	54.6	62.2	68.7	72.1	74.5	74.8	Diurnal Average	
	96	96	97	96	98	99	98	98	97	90	90	89	83	93	92	83	78	89	93	95	97	97	97	96	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Statoil - Leismer - August 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	46	6.18	6.18
40 - 60	232	31.18	37.37
60 - 80	258	34.68	72.04
80 - 100	208	27.96	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

Statoil - Leismer - August 2014

Maximum Speed: 23 km/h on Aug 7 10:00

Maximum Daily Speed Average: 15.1 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 19 12:00

Minimum Daily Speed Average: 1.3 km/h on Aug 15

Maximum Diurnal Speed Average: 5.5 km/h at hour 17

Minimum Diurnal Speed Average: 0.8 km/h at hour 20

Monthly Average Velocity: 2.1 km/h 288.2 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 4 Median = 7 Q_3 = 11 P_{90} = 15 P_{99} = 22

Hours in Service:	744
Hours of Data:	725
Hours of Missing Data:	19
Percent Operational Time:	97.5

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-Aug	NNW11	N9	N11	N14	N12	N13	N14	N13	N11	NNW9	NNW12	N10	N8	NNW10	NNW9	NNW7	NW11	NNW8	NE6	ENE7	ENE7	ENE7	E8	ESE5	N8.0	N14
2-Aug	ESE3	ESE5	ESE6	ESE8	ESE7	SE7	SE7	SE9	SSE10	SSE12	SSE13	SE10	SSE3	SSE10	S8	S7	SSE11	SSE11	SSE10	SE7	ESE3	E2	NW11	NNW4	SE6.1	SSE13
3-Aug	SSE2	NNE2	NNW1	SSW1	ESE4	E2	NW2	NW1	NNW1	N2	NW2	WSW1	NW6	WNW12	NW14	NNW15	NW13	NW12	NW9	NNW7	N4	AF	AF	NNE2	NW4.3	NNW15
4-Aug	NNW2	NNW3	N2	N2	NW3	AF	NW3	W3	WSW5	W10	W11	W10	W10	NW8	NW9	NNW8	NNE7	NNE5	NNW6	N4	N6	NNE8	NNE7	NNE8	NW4.1	W11
5-Aug	NE7	NE7	NE4	N6	NNE4	NNE3	NNE3	SSE4	E5	E6	ESE9	SSE10	S8	SSE11	SSE11	SE11	SE12	S7	SSE13	SSE10	S1	SE6	SE5	SE5	SE4.8	SSE13
6-Aug	SE5	SE6	SE5	SE7	SE6	SE6	SSE6	SSE7	S9	S11	S11	S12	SSW11	SW11	WSW12	WSW13	W16	W15	WSW10	WSW4	SSW2	W7	W9	W11	SSW5.9	W16
7-Aug	W12	W11	W10	W15	W14	W12	W14	W14	W21	WNW23	W22	W22	W23	W22	W20	W16	W19	W18	W15	WNW10	AF	ESE2	AF	WSW3	W15.1	WNW23
8-Aug	W5	W4	SW2	NW3	NNW5	NNW4	NNE2	NNW8	N4	ENE4	SE6	SE9	SE4	E4	ESE4	W2	W7	SW5	WNW9	N8	N6	N6	NNW9	NNW13	NNW2.2	NNW13
9-Aug	NNW13	NNW15	NNW14	NNW13	NNW13	NNW11	NW12	NW11	NW9	NW12	WNW11	NW11	W11	WNW12	WNW11	W12	WSW11	WSW10	W10	WSW4	AF	SSW2	W2	W2	WNW8.6	NNW15
10-Aug	SE2	SE2	SSE2	SSE3	SE3	SSE3	S4	SSE2	SW2	WSW7	WSW7	WSW9	WSW9	W10	WSW9	WSW10	W11	W12	WSW9	SW3	SSE2	SSE2	W1	WNW3	WSW3.9	W12
11-Aug	WNW3	WNW4	W4	W2	WNW3	WSW3	W5	W9	W8	W10	W12	W17	WNW16	WNW15	NW14	WNW13	NW12	NW9	NNW8	N6	NE3	NE5	NNE5	NE6	WNW6.4	W17
12-Aug	NE7	ENE6	ENE8	ENE7	ENE8	ENE9	E7	E6	ESE7	E7	SE10	SE10	ESE10	SE11	SE10	SE9	SE9	SE10	E7	E4	ESE5	SE7	SE9	SE7	ESE7.1	SE11
13-Aug	ESE7	ESE7	SE7	SE8	SE9	SE10	SE8	SE9	SSE10	SSE15	S15	S13	S15	SSW15	SSW15	SSW11	S10	S9	S9	SSW7	S5	S4	S5	S4	SSE8.6	S15
14-Aug	S3	W4	W7	NW10	NNW8	NW5	NW9	NW11	NW9	NW10	NW12	NW13	NW13	NW13	NW12	NW10	N7	NNE4	NE3	AF	NE2	NNE2	ENE1	NE2	NW6.4	NW13
15-Aug	NNE3	NE4	NNE4	N1	NE1	NNE1	NE3	SE4	SSE5	SSE7	S5	S5	SSW5	SSW7	W7	WNW11	NW7	WNW9	NNW5	NE1	AF	AF	WNW3	WNW2	WSW1.3	WNW11
16-Aug	NNW3	SE3	NW3	WNW1	SSW0	SSE3	SSE2	SSE3	SSE3	S5	S6	S7	S9	S9	S10	S7	SW4	SSW7	S5	SSE3	SE1	SSE3	SSE3	W3	S3.5	S10
17-Aug	W4	SSE2	WSW3	W6	WSW4	NW12	NNW16	NW16	NW11	NW13	NW16	WNW19	WNW20	NW21	NW21	NW19	NW19	NW15	NNW7	ENE2	AF	AF	AF	W3	NW11.0	NW21
18-Aug	W3	W3	W4	W4	W3	SSE3	SSE3	S3	SSW3	SSW6	WSW9	WSW9	WSW8	WSW9	WSW9	W12	W18	W22	W18	W12	WNW9	NW10	WSW2	WSW1	W6.6	W22
19-Aug	SSW2	S2	WNW3	SW2	W6	W6	W4	NNW5	ENE3	E6	E5	NW0	ESE4	NNW3	ENE4	NNW3	NW22	N14	N9	NNW7	NNW5	NNW4	NNW7	NNW7	NNW3.4	NW22
20-Aug	NNW8	NNW10	N8	NW5	NW3	WNW5	NNW10	NNW10	NNW13	NW14	NW16	NNW14	NNW13	NNW13	NNW15	NNW16	NNW15	NNW16	NNW17	NNW15	N10	NNW8	NNW8	NNW8	NNW11.1	NNW17
21-Aug	NNW7	NNW8	NNW8	NNW9	NNW7	NNW9	NNW10	NNW10	NNW11	NNW16	NNW16	NW15	NNW11	NW13	WNW14	WNW12	WNW14	NW11	NW10	NNW6	NNE4	NNE6	NNE6	NNE7	NNW9.3	NNW16
22-Aug	NNE5	NNE5	NNE6	NNE6	NNE7	NNE7	NNE7	NNE6	E5	ENE5	ENE5	NNE4	NNE5	NE6	ESE6	NE4	E3	ENE4	ENE4	NE4	NNE5	NNE6	NE6	NE7	NE4.8	NNE7
23-Aug	ENE6	E6	E7	ENE5	E6	E7	ESE5	E7	E8	ESE7	ESE9	E10	SE9	ESE8	E6	E9	E7	E8	ENE6	ENE6	NE6	NE7	NE7	ENE8	E6.6	E10
24-Aug	ENE9	ENE8	NE5	NE5	ENE9	ENE9	E9	E8	E8	SE7	ESE8	ESE9	ESE8	E8	ESE9	ESE10	ESE10	ESE9	E5	E6	E9	ESE5	ESE3	ESE5	E7.1	ESE10
25-Aug	ESE5	ESE4	E3	ESE3	ESE4	SE4	SE5	SSE8	SSE8	S11	SSE13	SSE14	SSE13	S13	S11	S11	SSE10	S8	SSE8	SE7	SE8	SSE9	SSE8	SSE8	SSE7.7	SSE14
26-Aug	SSE7	SSE7	SE5	SE4	SSE4	SSE3	S3	SSW3	SW4	SSW4	S7	S8	SW8	SSW9	SSW7	SSW9	SSW10	SSW9	SSW9	S5	S4	SSW6	SSW4	S3	S5.5	SSW10
27-Aug	SW4	SW3	SW3	W6	SW2	WSW3	WSW4	W16	W18	WNW14	W12	WNW15	NW16	WNW10	W9	WSW9	WSW10	W15	W11	SW3	SSW2	SSE2	W3	WNW10	W7.5	W18
28-Aug	NNW14	NNW9	NW7	NW10	NW13	NW14	NW13	NW14	NW16	WNW20	NW22	WNW22	NW21	WNW20	NW19	WNW21	NW19	NW16	NW13	NNW7	N3	AF	AF	AF	NW14.6	NW22
29-Aug	AF	AF	AF	AF	ESE4	ESE4	SE5	SSE5	SSE7	SE11	SSE14	SSE15	S11	S11	S12	SSE13	SSE15	SSE13	SE7	ESE6	ESE7	ESE8	ESE9	ESE9	SE8.6	SSE15
30-Aug	ESE8	ESE8	SE3	E2	ESE1	SE3	WSW4	W8	W9	W12	W14	W18	W19	WNW19	W18	W18	W16	W17	W12	W7	WSW3	SW1	W4	W5	W7.5	W19
31-Aug	W3	SW2	SW3	WSW5	WSW4	W7	W10	W10	W12	W14	W11	W16	W15	W11	W14	W11	W12	NW15	WSW4	W3	SW2	WSW3	W5	W5	W7.7	W16
	N1.6	NNE1.5	N1.4	NNW1.9	N1.6	NNW1.4	NW1.9	WNW2.3	W2.1	W3.0	WSW3.6	WSW4.3	W4.7	W5.0	W5.1	W5.2	W5.5	W4.9	WNW3.2	NNW0.8	NE1.6	ENE1.4	N1.0	N1.2	Diurnal Average	
	NNW14	NNW15	NNW14	W15	W14	NW14	NNW16	NW16	W21	WNW23	NW22	W22	W23	W22	NW21	WNW21	NW22	W22	W18	NNW15	N10	NW10	NW11	NNW13	Diurnal Maximum	

AF - Analyzer Failure

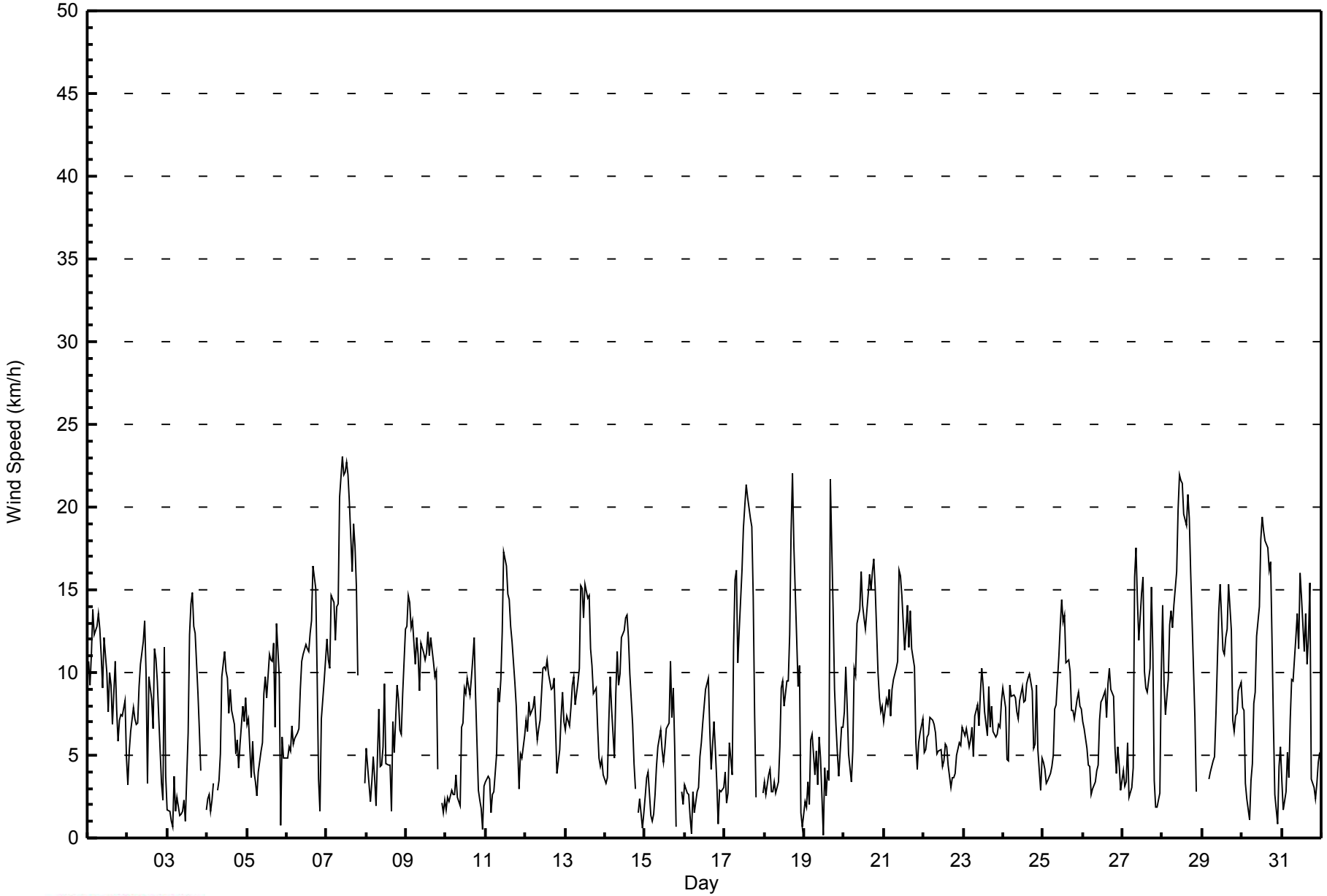
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Statoil - Leismer - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	247	34.07	34.07
6 - 11	324	44.69	78.76
12 - 19	136	18.76	97.52
20 - 28	18	2.48	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 725

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Statoil - Leismer - August 2014

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	8	19	14	10	11	20	18	24	17	12	15	18	27	9	11	14	247
6 - 11	15	14	11	16	24	26	34	25	23	13	2	17	34	10	22	38	324
12 - 19	6	0	0	0	0	0	1	12	6	2	0	2	39	13	33	22	136
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	7	6	5	0	18
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	29	33	25	26	35	46	53	61	46	27	17	37	107	38	71	74	725

Total Number of Valid Hours: 725

Total Number of Hours: 744

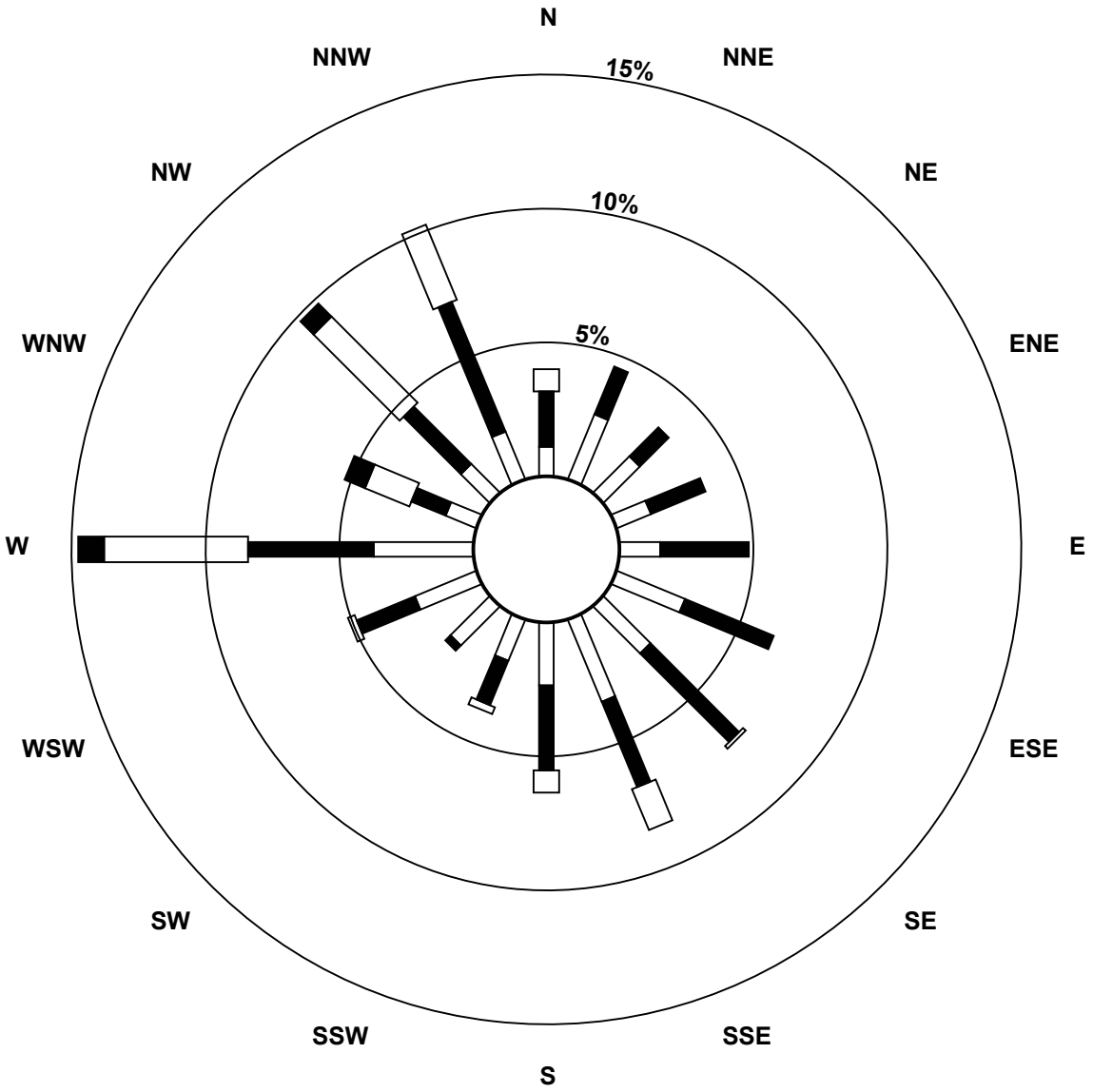
AURORA
ATMOSPHERICS INC.

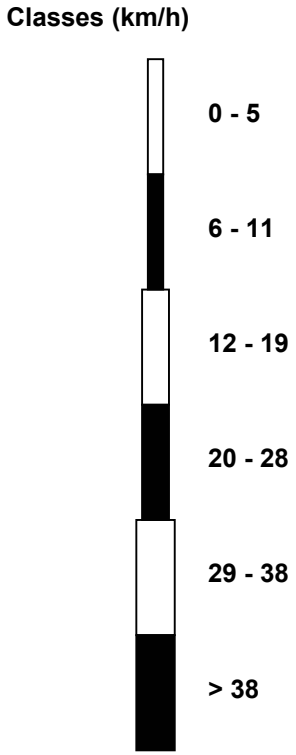
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

Statoil - Leismer (AMS501)





Total Number of Valid Hours: 725

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Statoil - Leismer - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 km/h on Aug 2 23:00

Minimum Value: 0 km/h on Aug 15 02:00

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

Hours in Service:	744
Hours of Data:	725
Hours of Missing Data:	19
Hours of Calibration:	0
Percent Operational Time:	97.5

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

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Statoil - Leismer - August 2014

Direction of Maximum Speed: 282 deg on Aug 7 10:00
Direction of Maximum Daily Speed Average: 274.4 deg on Aug 7

Direction of Minimum Speed: 315 deg on Aug 19 12:00
Direction of Minimum Daily Speed Average: 1.3 deg on Aug 15

Monthly Average Direction: 286.7 deg

Hours in Service:	744
Hours of Data:	725
Hours of Missing Data:	19
Percent Operational Time:	97.5

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-Aug	346	359	355	350	355	352	353	353	0	346	337	351	9	333	347	341	317	340	38	74	77	78	84	104	359.9
2-Aug	114	121	112	108	115	128	134	144	157	162	155	146	162	164	173	172	151	155	155	145	121	88	315	329	146.2
3-Aug	167	23	327	197	113	95	324	319	341	4	319	240	312	298	305	332	323	324	324	331	357	AF	AF	28	323.0
4-Aug	333	329	358	8	319	AF	320	281	254	261	269	267	273	310	324	336	14	30	341	8	7	24	24	26	324.1
5-Aug	52	50	55	4	27	14	13	149	95	93	122	158	169	151	148	141	137	177	162	163	173	133	138	130	130.9
6-Aug	134	127	142	134	140	139	155	168	176	176	183	184	195	221	243	254	264	264	257	237	199	267	268	269	213.7
7-Aug	271	272	273	278	278	273	269	272	276	282	279	275	274	271	271	269	274	275	279	283	AF	113	AF	253	274.4
8-Aug	271	262	227	323	339	342	19	343	353	76	127	142	136	89	113	264	259	234	303	357	358	1	341	340	337.8
9-Aug	341	339	338	342	333	332	311	315	325	307	283	304	273	293	283	273	257	254	259	244	AF	202	275	278	303.4
10-Aug	146	138	159	147	145	152	172	153	233	246	247	247	257	274	256	258	262	269	258	226	151	161	276	288	243.6
11-Aug	284	286	266	271	288	249	261	266	263	259	266	281	286	294	307	299	322	324	333	355	36	35	31	39	297.3
12-Aug	55	57	76	66	64	76	88	99	104	97	124	127	106	132	135	137	145	129	100	101	111	131	132	124	108.1
13-Aug	119	122	125	129	130	132	133	145	162	165	174	183	181	196	195	193	190	185	184	193	182	174	182	179	168.2
14-Aug	178	264	271	310	338	321	322	322	314	319	323	315	309	312	319	323	358	16	34	AF	56	30	59	37	320.7
15-Aug	23	38	31	4	53	31	52	142	154	162	174	191	196	212	266	285	304	288	336	55	AF	AF	293	287	258.6
16-Aug	336	144	317	287	196	151	150	152	168	175	186	178	170	174	174	186	214	197	191	162	137	166	158	270	180.5
17-Aug	268	163	248	267	257	321	327	322	325	313	308	301	296	313	315	311	306	314	331	63	AF	AF	AF	275	309.6
18-Aug	281	261	281	264	265	160	154	170	199	204	244	246	243	238	245	261	267	269	276	274	297	317	247	249	260.4
19-Aug	198	170	295	231	259	271	266	329	60	86	82	315	106	348	59	342	324	355	356	328	346	343	336	331	338.0
20-Aug	340	336	352	322	315	297	342	335	339	322	320	332	337	343	336	340	341	346	342	347	353	348	338	336	337.3
21-Aug	346	334	333	336	336	333	336	336	334	332	336	323	329	312	293	300	299	312	319	345	14	20	21	30	329.4
22-Aug	12	22	26	32	24	25	20	22	85	74	70	22	22	46	108	40	96	70	66	55	30	19	36	51	41.3
23-Aug	67	82	82	78	85	96	102	80	93	111	111	96	127	116	79	101	90	100	78	60	49	55	40	68	87.0
24-Aug	70	76	47	54	69	71	85	85	97	128	120	117	107	98	109	120	113	114	92	84	94	104	114	108	96.1
25-Aug	118	112	100	113	120	130	139	147	160	169	163	157	165	169	184	180	160	177	156	133	133	149	152	151	154.9
26-Aug	159	148	146	137	155	156	171	200	217	193	183	180	218	205	212	210	199	205	206	186	178	194	199	188	189.3
27-Aug	232	219	225	260	232	238	251	265	276	282	281	293	319	301	274	251	253	265	265	228	202	147	280	299	272.6
28-Aug	337	330	316	326	318	311	317	322	311	301	307	303	306	301	304	296	306	304	317	339	8	AF	AF	AF	311.0
29-Aug	AF	AF	AF	AF	107	119	141	159	158	144	151	147	172	177	172	168	156	155	132	114	114	113	109	110	146.2
30-Aug	108	102	139	88	109	136	251	263	260	264	263	268	274	288	274	269	279	267	266	260	252	229	275	277	267.1
31-Aug	272	233	229	258	250	281	264	260	268	280	264	279	275	261	270	270	270	322	250	270	216	250	268	271	271.3
	1.2	22.1	352.6	341.0	356.3	348.1	322.6	302.3	279.4	264.0	255.1	257.9	264.6	268.4	269.4	271.7	277.2	280.3	286.3	328.9	55.1	67.7	9.4	356.1	
	Diurnal Average																								

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

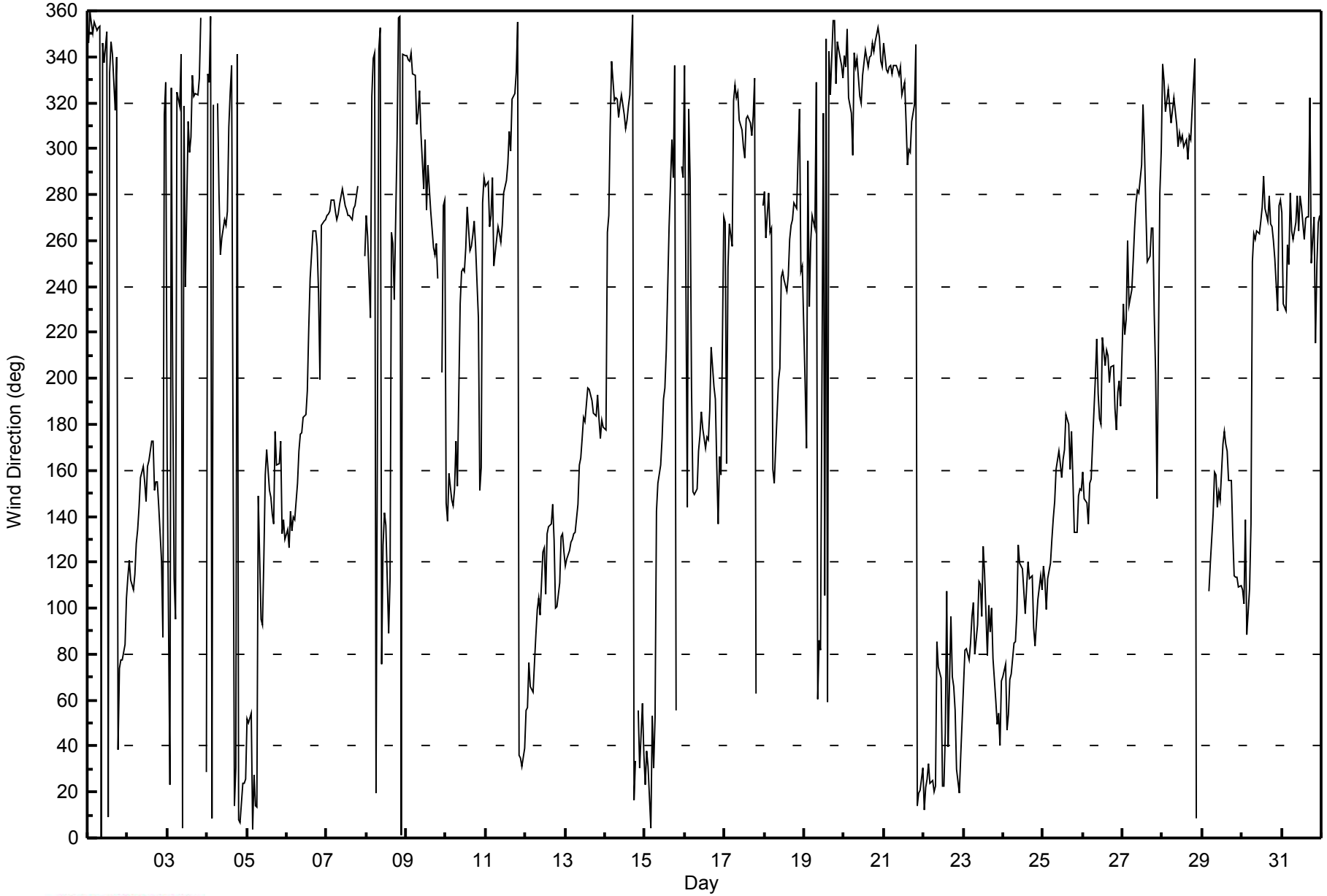
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Direction (WD) - deg

Statoil - Leismer - August 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Statoil - Leismer - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 105 deg on Aug 19 12:00

Minimum Value: 7 deg on Aug 13 06:00

Percentiles: P_1 = 8 P_{10} = 12 Q_1 = 16 Median = 22 Q_3 = 33 P_{90} = 51 P_{99} = 90

Hours in Service:	744
Hours of Data:	725
Hours of Missing Data:	19
Hours of Calibration:	0
Percent Operational Time:	97.5

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-Aug	14	26	18	16	17	16	16	18	22	31	20	33	44	39	32	50	26	39	52	19	17	17	17	33	52
2-Aug	21	15	16	15	14	13	11	13	17	20	18	16	71	16	19	26	16	13	12	11	44	37	88	93	93
3-Aug	88	78	91	80	35	82	27	67	58	92	81	95	69	34	27	19	21	21	15	14	18	AF	AF	42	95
4-Aug	41	39	41	57	27	AF	32	36	31	18	22	29	52	49	32	37	51	36	35	25	15	10	14	19	57
5-Aug	24	22	64	19	44	39	48	39	26	27	28	29	37	26	28	30	19	24	20	20	74	18	14	15	74
6-Aug	14	14	13	9	10	12	20	22	23	23	28	27	31	39	38	29	22	15	23	44	80	35	11	13	80
7-Aug	10	10	10	12	11	11	11	14	15	17	16	16	18	21	20	29	18	16	16	23	AF	52	AF	26	52
8-Aug	8	20	52	47	23	23	64	14	45	38	46	29	80	48	19	92	26	36	30	17	17	19	15	15	92
9-Aug	15	11	10	12	11	14	11	11	14	11	20	21	19	23	30	19	31	30	21	32	AF	44	47	45	47
10-Aug	80	25	40	14	28	48	28	33	78	38	50	36	40	37	32	34	26	19	18	36	52	34	79	22	80
11-Aug	23	21	28	46	31	48	27	13	18	21	25	19	18	20	21	24	13	14	15	19	21	26	23	27	48
12-Aug	22	22	19	20	21	18	21	25	22	23	25	26	28	33	37	37	27	20	18	19	13	8	7	12	37
13-Aug	13	14	12	9	8	7	9	13	23	18	22	23	22	24	22	22	24	21	18	19	16	12	16	16	24
14-Aug	17	43	9	24	11	20	10	8	13	18	17	19	12	13	14	20	17	27	17	AF	28	62	66	42	66
15-Aug	25	10	7	39	49	29	23	21	23	26	43	54	46	41	50	28	47	26	54	40	AF	AF	19	27	54
16-Aug	69	28	42	65	83	16	56	21	32	27	38	40	30	28	27	32	59	21	19	16	31	16	23	53	83
17-Aug	39	53	46	18	37	10	9	10	10	15	14	15	18	16	14	15	15	15	20	39	AF	AF	AF	53	53
18-Aug	27	47	23	29	56	29	17	26	30	26	35	31	33	35	35	20	15	13	12	11	27	12	73	80	80
19-Aug	67	51	34	64	18	23	41	39	52	31	32	105	63	96	56	85	15	18	16	17	26	32	20	17	105
20-Aug	11	12	17	27	33	34	16	18	16	15	14	17	17	19	18	17	17	15	13	16	17	16	14	12	34
21-Aug	15	10	15	9	15	9	10	11	20	21	18	18	30	13	22	25	19	17	12	24	17	14	15	19	30
22-Aug	19	11	11	12	10	9	9	16	42	64	43	70	62	61	52	54	46	20	22	14	21	16	24	24	70
23-Aug	22	22	18	21	22	20	29	18	25	27	29	28	25	36	41	27	38	25	20	19	23	23	21	21	41
24-Aug	16	17	24	26	18	19	19	20	19	27	27	29	32	34	27	26	26	22	20	12	12	32	53	18	53
25-Aug	26	17	20	25	18	17	31	18	22	21	22	19	22	24	29	24	18	20	13	9	9	8	7	7	31
26-Aug	9	11	10	28	9	25	26	40	40	48	29	33	42	36	34	33	26	26	23	16	19	24	28	54	54
27-Aug	57	66	66	45	63	58	57	15	17	21	24	21	15	35	27	39	31	14	11	31	55	37	37	20	66
28-Aug	13	17	15	8	11	9	11	11	14	17	15	17	17	20	18	20	19	17	12	11	40	AF	AF	AF	40
29-Aug	AF	AF	AF	AF	17	19	12	22	20	20	18	19	27	24	22	20	15	13	21	14	15	16	16	17	27
30-Aug	17	16	39	49	89	20	28	11	16	16	19	19	16	20	15	17	15	15	14	32	43	66	28	23	89
31-Aug	45	60	47	17	36	13	13	23	15	15	22	23	27	19	23	13	13	24	73	47	40	38	16	31	73
	88	78	91	80	89	82	64	67	78	92	81	105	80	96	56	92	59	39	73	47	80	66	88	93	
	Diurnal Maximum																								

AF - Analyzer Failure

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 6, 2014	Previous Calibration	June 27, 2014
Station Name	Statoil	Station Number	AMS 103
Reason:	Routine		
Start Time (MST)	10:55	End Time (MST)	16:48
Barometric Pressure	mmHg	Station temp.	24 Deg C
Calibrator Make/Model	API T700	Serial Number	451
Cal Gas Concentration	49.4 ppm	Cal Gas Expiry Date	10/6/2016
Gas Cert Reference	EY0000359		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8203
DACS voltage range	0-5v	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	14	14
Analyzer Range (mv)	1000	1000	Lamp voltage	3003	2992
Calculated slope	1.000614	0.981343	Chamber temp.	50.0	50.0
Calculated intercept	-3.466221	-1.269454	Pressure ("Hg)	24.8	24.7
Analyzer Background	14.4	14.2	Flow (ccpm)	631	620
Analyzer Coefficient	1.115	1.086	Intensity	74	75

Analyzer make	API T100	Analyzer serial #	720

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	0.000
as found span	5079.5	79.5	773.2	800.0	0.966
calibrator zero	5000	0.0	0.0	0.0	0.000
high point	5079.5	79.5	773.2	788.3	0.981
second point	5039.8	39.8	390.1	399.9	0.975
third point	5020	20.0	196.8	202.9	0.970
calibrator zero					
as left zero	5000	0.0	0.0	0.6	NA
as left span	5000	79.5	785.5	789.8	NA
				Average Correction Factor	0.975

Corrected As found	800.2	Previous response	776.2	% change	-3.0%

Notes:

Minor adjustments performed.

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

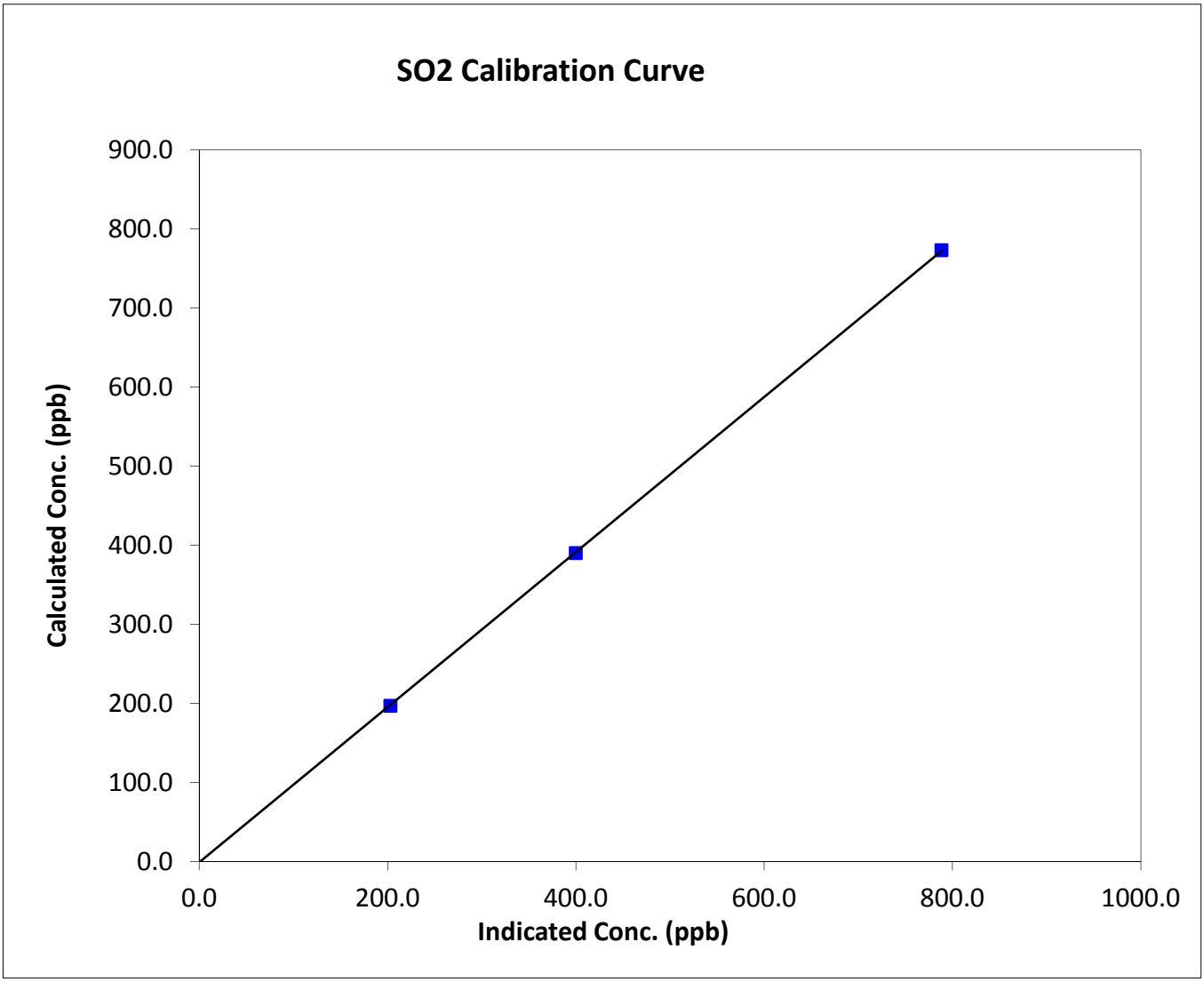
SO_2 Calibration Summary

Station Information

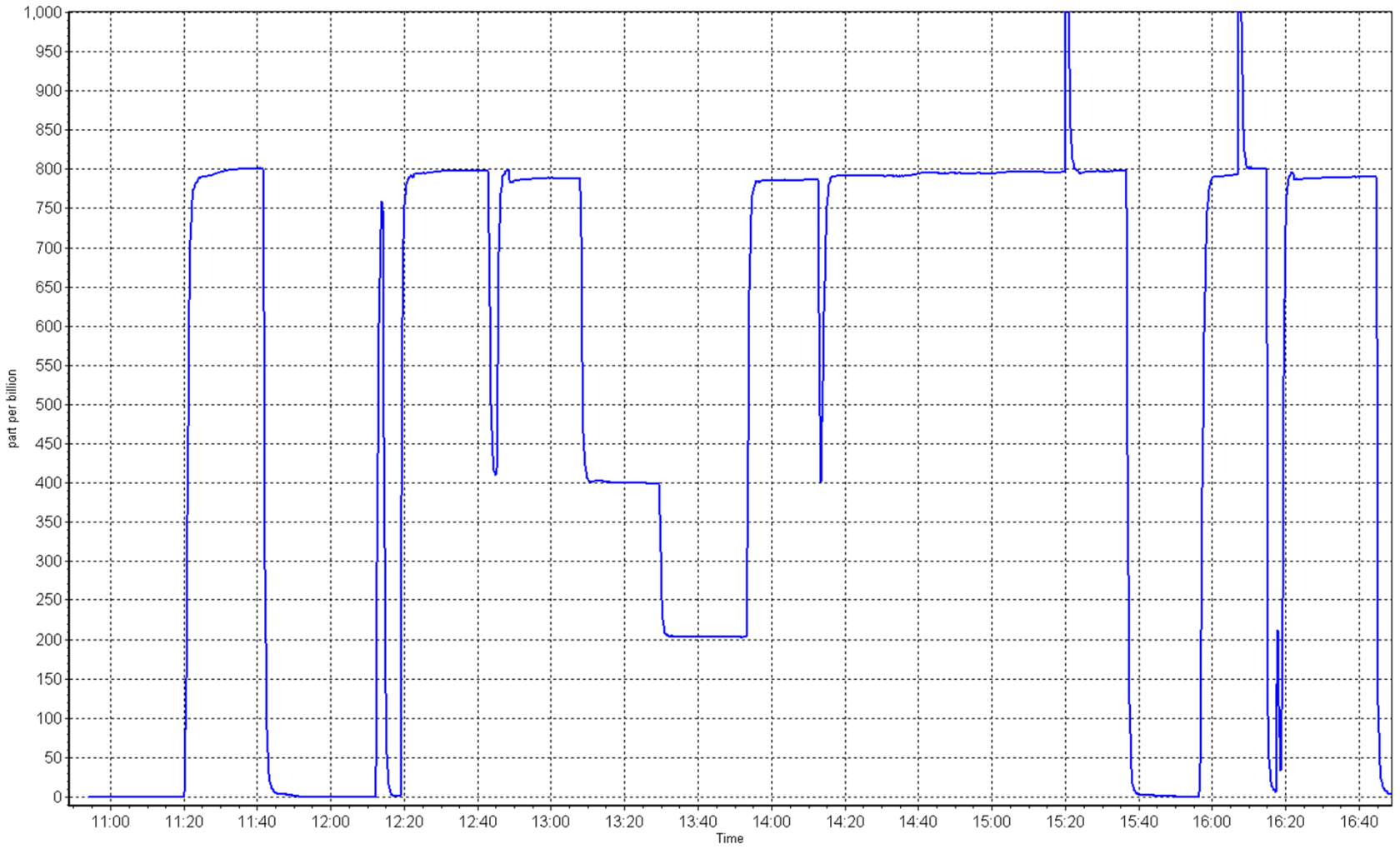
Calibration Date	August 6, 2014	Previous Calibration	June 27, 2014
Station Name	Statoil	Station Number	AMS 103
Start Time (MST)	10:55	End Time (MST)	16:48
Analyzer make	API T100	Analyzer serial #	720

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999986
773.2	788.3	0.9808		
390.1	399.9	0.9755	Slope	0.981343
196.8	202.9	0.9700		
			Intercept	-1.269454



SO2 Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 11, 2014	Previous Calibration	June 18, 2014
Station Name	Statoil	Station Number	AMS 103
Reason:	Routine		
Start Time (MST)	11:10	End Time (MST)	14:00
Barometric Pressure	NA mmHg	Station temp.	24 Deg C
Calibrator Make/Model	API T700	Serial number	451
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	5/30/2016
Gas Cert Reference	LL23598	SO2 gas conc.	49.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8203
DACS voltage range		DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	18.4	18.6
Analyzer Range (mv)	100	100	Lamp voltage	2229	2223
Calculated slope	0.991499	0.992095	Chamber temp.	50	50
Calculated intercept	-0.270855	-0.398783	Pressure	23.4	23.3
Analyzer Background	17.9	17.9	Flow	565	560
Analyzer Coefficient	0.986	0.986	Intensity	55	59
			Converter temp.	315	314

Analyzer make/model	API T101	Analyzer serial #	157
Converter make/model	Internal	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	0.1	NA
as found span	5000	36.8	75.1	75.9	0.990
SO2 scrubber check	5000	30.4	300.4	6.4	NA
calibrator zero	5000	0.0	0.0	0.1	NA
high point	5000	36.8	75.1	75.9	0.990
second point	5000	19.6	40.0	41.0	0.975
third point	5000	10.3	21.0	21.8	0.964
calibrator zero					
as left zero	5000	0.0	0.0	0.2	NA
as left span	5000	36.8	75.1	76.9	0.976
				Average Correction Factor	0.976

Corrected As found	75.7	Previous response	76.0	% change	0.3%

Notes:

As founds used for calibrator zero and high point. Scrubber check before as founds. Filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

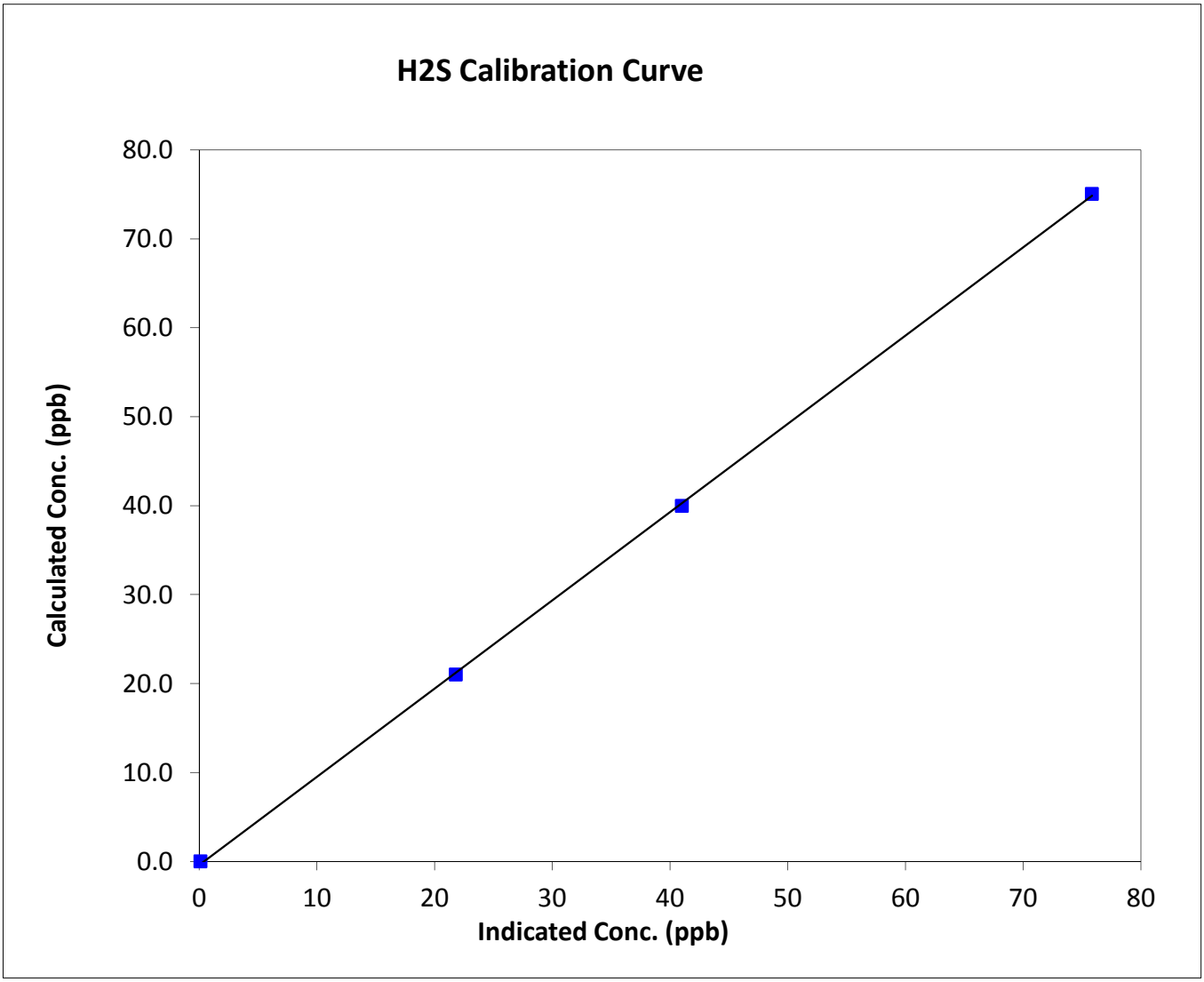
H2S Calibration Summary

Station Information

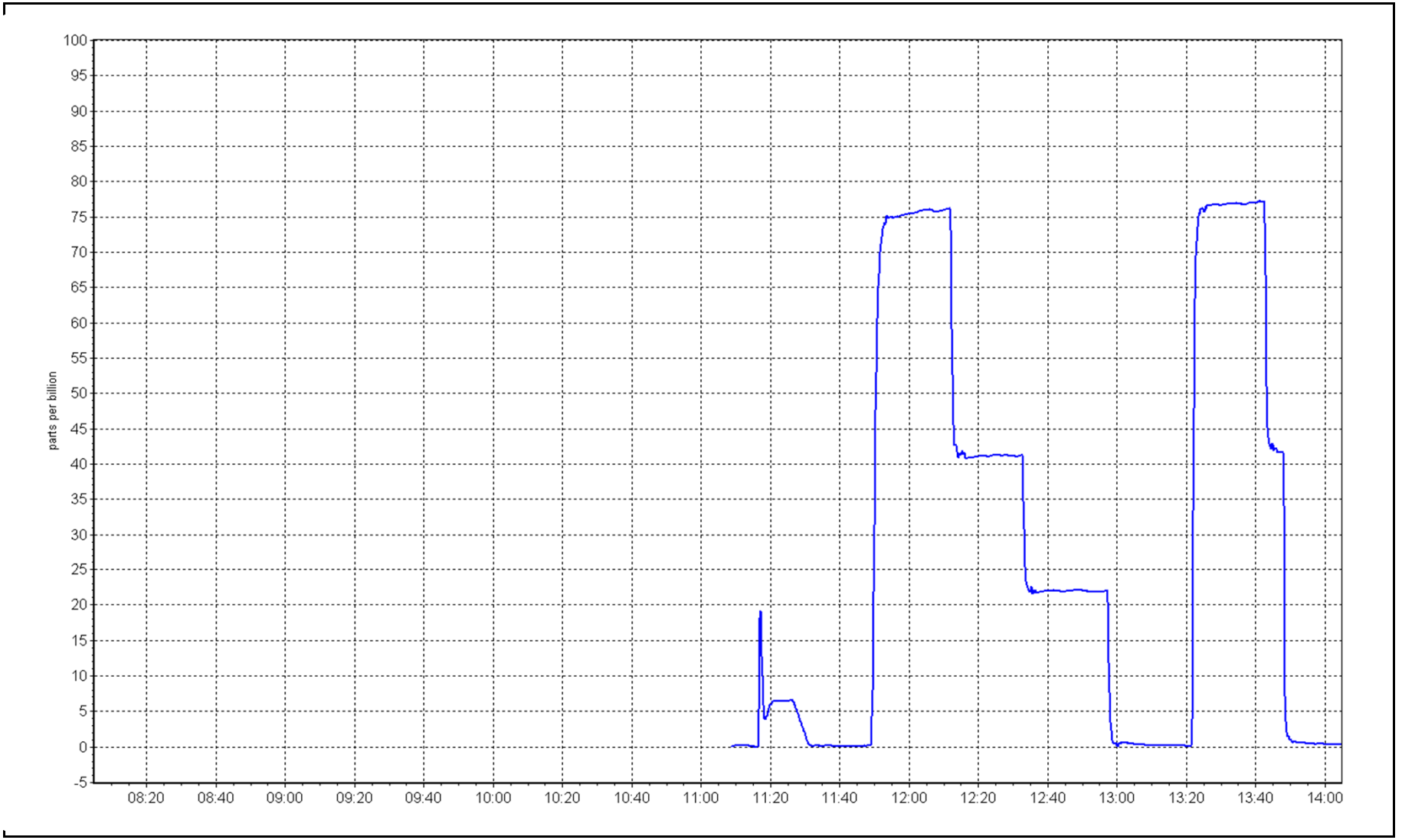
Calibration Date	August 11, 2014	Previous Calibration	June 18, 2014
Station Name	Statoil	Station Number	AMS 103
Start Time (MST)	11:10	End Time (MST)	14:00
Analyzer make	API T101	Analyzer serial #	157

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999913
75.1	75.9	0.9897		
40.0	41.0	0.9752	Slope	0.992095
21.0	21.8	0.9639		
			Intercept	-0.398783



H2S Calibration Plot Date: August 11, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Wednesday, August 06, 2014	Previous Calibration	Friday, July 18, 2014
Station Name	Statoil	Station Number	AMS 103
Reason:	Routine		
Start Time (MST)	10:55	End Time (MST)	16:46
Barometric Pressure	mmHg	Station temp.	25 Deg C
Calibrator Make/Model	API T700	Serial Number	451
Gas Cert Reference	EY0000359	Cal Gas Expiry Date	10/6/2016
CH4 Cal Gas Conc.	517 ppm	CH4 Equiv Conc.	1075.3 ppm
C3H8 Cal Gas Conc.	203 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	
DACS voltage range	0-5	DACS channel #	8203

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	50	50	Sample Pressure	8.6	8.6
Analyzer Range (mv)	50	50	Air or Bypass press	35.2	35.2
Calculated slope	0.996129	0.982174	Fuel Pressure	21.8	21.8
Calculated intercept	0.080014	-0.014376			
BKG	0.7	0.3			
COEF	4.165	3.957			

Analyzer make	TE 51-LT	Analyzer serial #	1410661330

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	-0.47	N/A
as found span	5000	79.5	17.10	17.27	0.990
calibrator zero	5000	0.0	0.00	-0.03	N/A
high point	5079.5	79.5	16.83	17.13	0.982
second point	5039.8	39.8	8.49	8.67	0.979
third point	5020	20.0	4.28	4.43	0.967
calibrator zero					
as left zero	5000	0.0	0.00	0.02	N/A
as left span	5000	79.5	17.10	17.04	1.003
				Average Correction Factor	0.976

Corrected As found	17.74	Previous response	17.08	% change	-3.7%

Notes:

Minor adjustments performed.

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

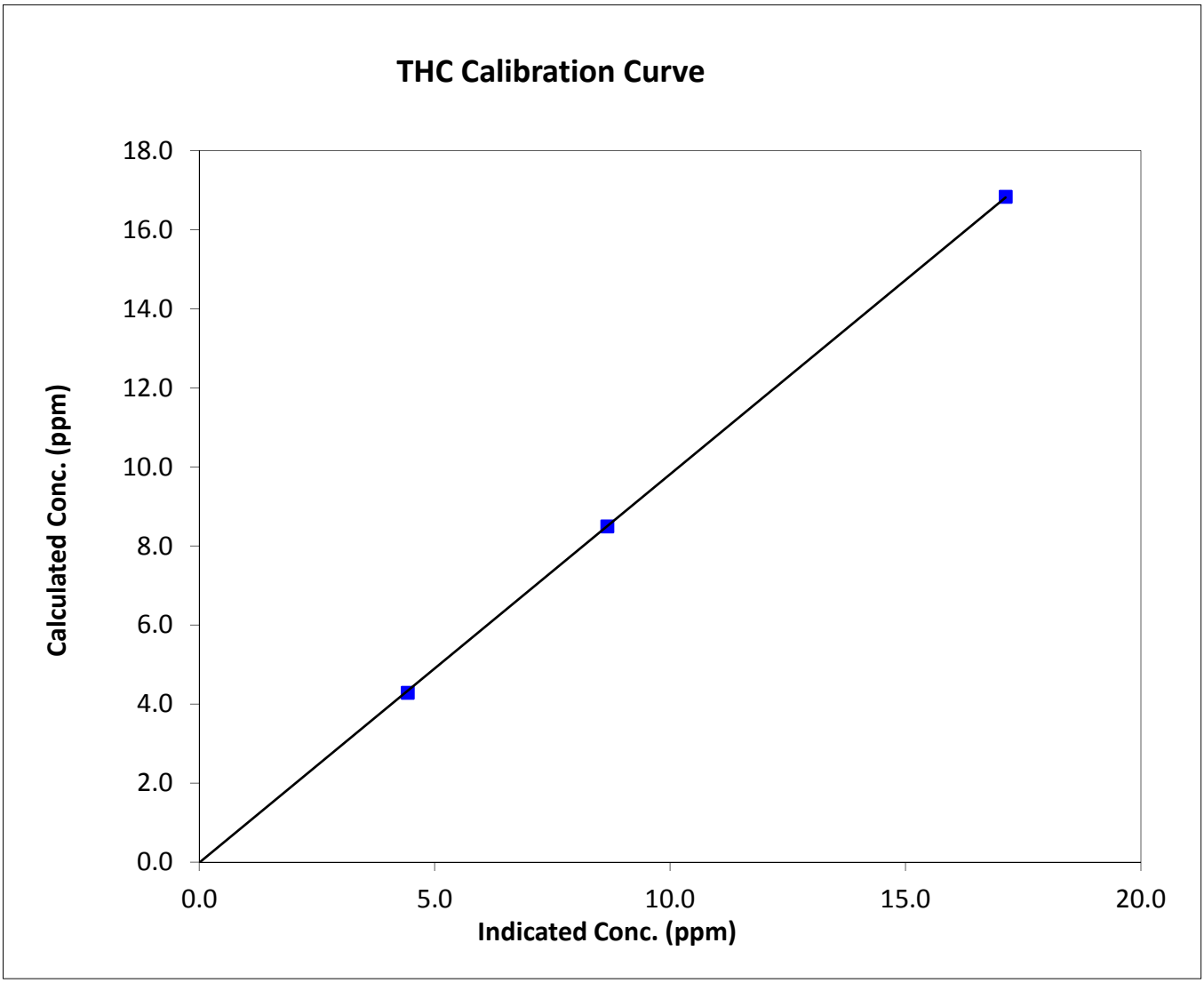
THC Calibration Summary

Station Information

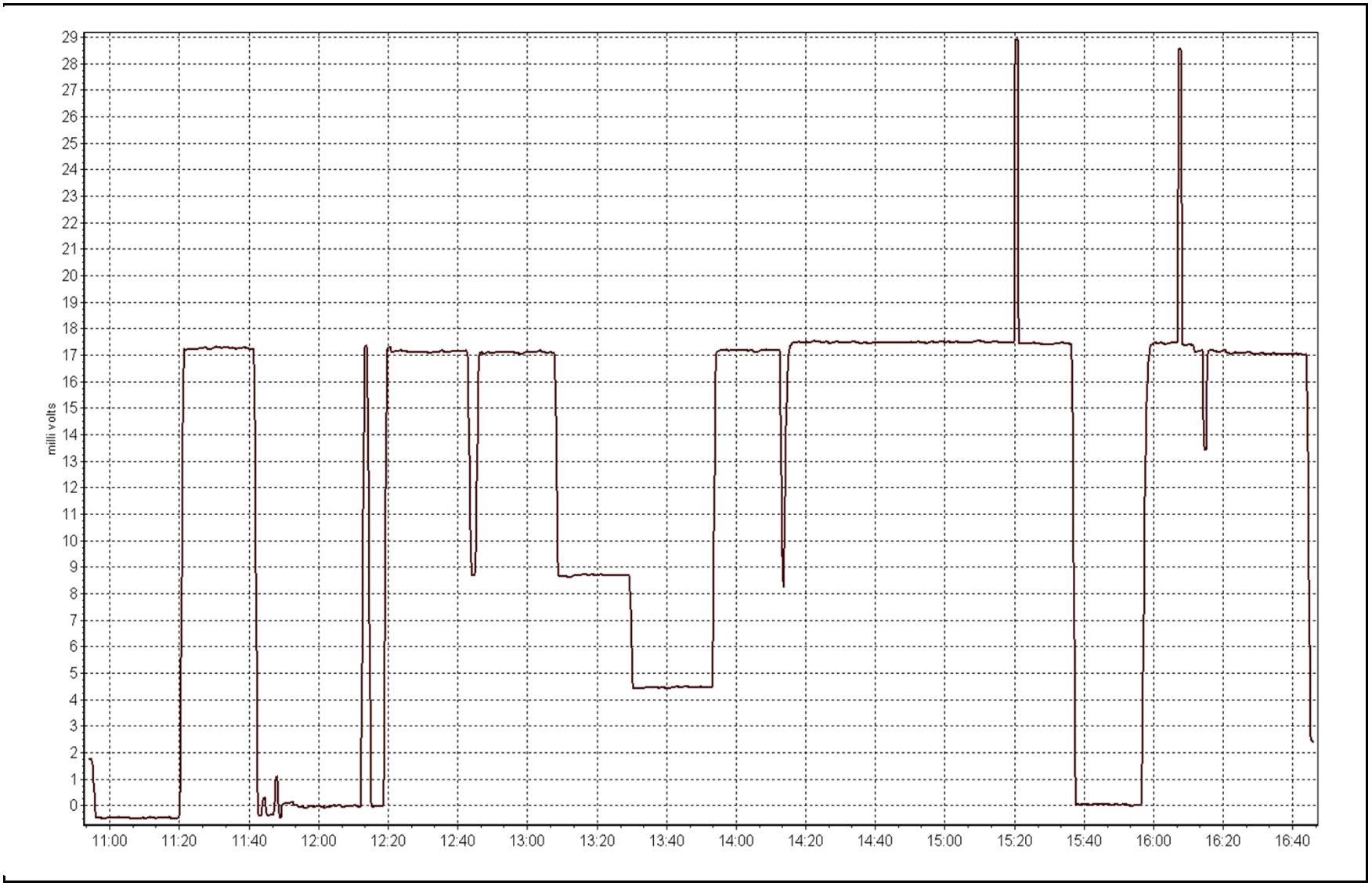
Calibration Date	August 6, 2014	Previous Calibration	July 18, 2014
Station Name	Statoil	Station Number	AMS 103
Start Time (MST)	10:55	End Time (MST)	16:46
Analyzer make	TE 51-LT	Analyzer serial #	1410661330

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.03	N/A	Correlation Coefficient	0.999967
16.83	17.13	0.9824		
8.49	8.67	0.9794	Slope	0.982174
4.28	4.43	0.9670		
			Intercept	-0.014376



THC Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 6, 2014	Previous Calibration	June 27, 2014
Station Name	Statoil	Station Number	AMS 103
Reason:	Routine		
Start Time (MST)	10:55	End Time (MST)	16:48
Barometric Pressure	mmHg	Station Temperature	24.0 Deg C
Calibrator	API T700	Serial Number	451
NO Cal Gas Conc	50.3 ppm	Cal Gas Expiry Date	October 6, 2016
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	EY0000359

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.: 8203

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.991718	0.995710	0.994228
	Data Offset	-1.498582	-0.960900	-1.746006
After	Data Slope	0.982683	0.980857	1.001923
	Data Offset	-0.951565	-1.033586	-1.685349
Channel #				
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model: Teledyne T200 — Analyzer serial #: 722

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	0.981	ppb	0.953	ppb
NOX coefficient	0.975	ppb	0.961	ppb
		ppb		ppb
NO bkgrnd	-0.8	mv	1.1	mv
NOX bkgrnd	5.7	mv	4.5	mv
Nt coefficient	N/A		NA	
Chamber Temp	31.7	Deg C	31.1	Deg C
Moly Temp	314.3	Deg C	315.0	Deg C
PMT Temp	6.8	Deg C	6.8	Deg C
O3 flow	83.0	ccm	83.0	ccm
R Cell Press	5.0	"Hg	4.9	"Hg
Sample Flow	452	ccm	449	ccm

Notes:

Minor adjustments performed.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 6, 2014 Station Number: AMS 103

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	-1.8	0.3	-2.2	N/A	N/A
as found span	5079.5	79.5	791.9	787.3	4.7	793.9	795.3	-1.4	0.9975	0.9898
calibrator zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	N/A	N/A
high point	5079.5	79.5	791.9	787.3	4.7	806.3	803.1	3.2	0.982	0.980
second point	5039.8	39.8	399.6	397.2	2.4	408.4	406.6	1.8	0.978	0.977
third point	5020	20.0	201.6	200.4	1.2	206.9	206.6	0.3	0.974	0.970
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	-1.8	-0.4	-1.4	N/A	N/A
as left span	5000	79.5	804.5	414.8	389.8	806.2	796.6	9.6	0.9979	0.5207
								Average Correction Factor	0.9783	0.9758

Corrcted As found NO_X= 795.7 NO= 795.0 Percent Change NO_X= 0.5% NO= -0.4%

Previous Response NO_X= 800.1 NO= 791.6

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 79.50 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 (400)	N/A	414.8	405.7	820.3	414.8	405.5	0.965	1.000	1.000	100.0%
2nd NO2 (200)	N/A	610.6	209.8	823.2	610.6	212.6	0.962	1.000	0.987	101.3%
3rd NO2 (100)	N/A	712.6	107.8	823.1	712.6	110.5	0.962	1.000	0.976	102.5%
4th NO2 (0)	820.4	N/A	3.1	823.5	820.4	3.1	0.962	1.000	N/A	N/A
					Average Correction Factor		0.963	1.000	0.988	101.3%

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

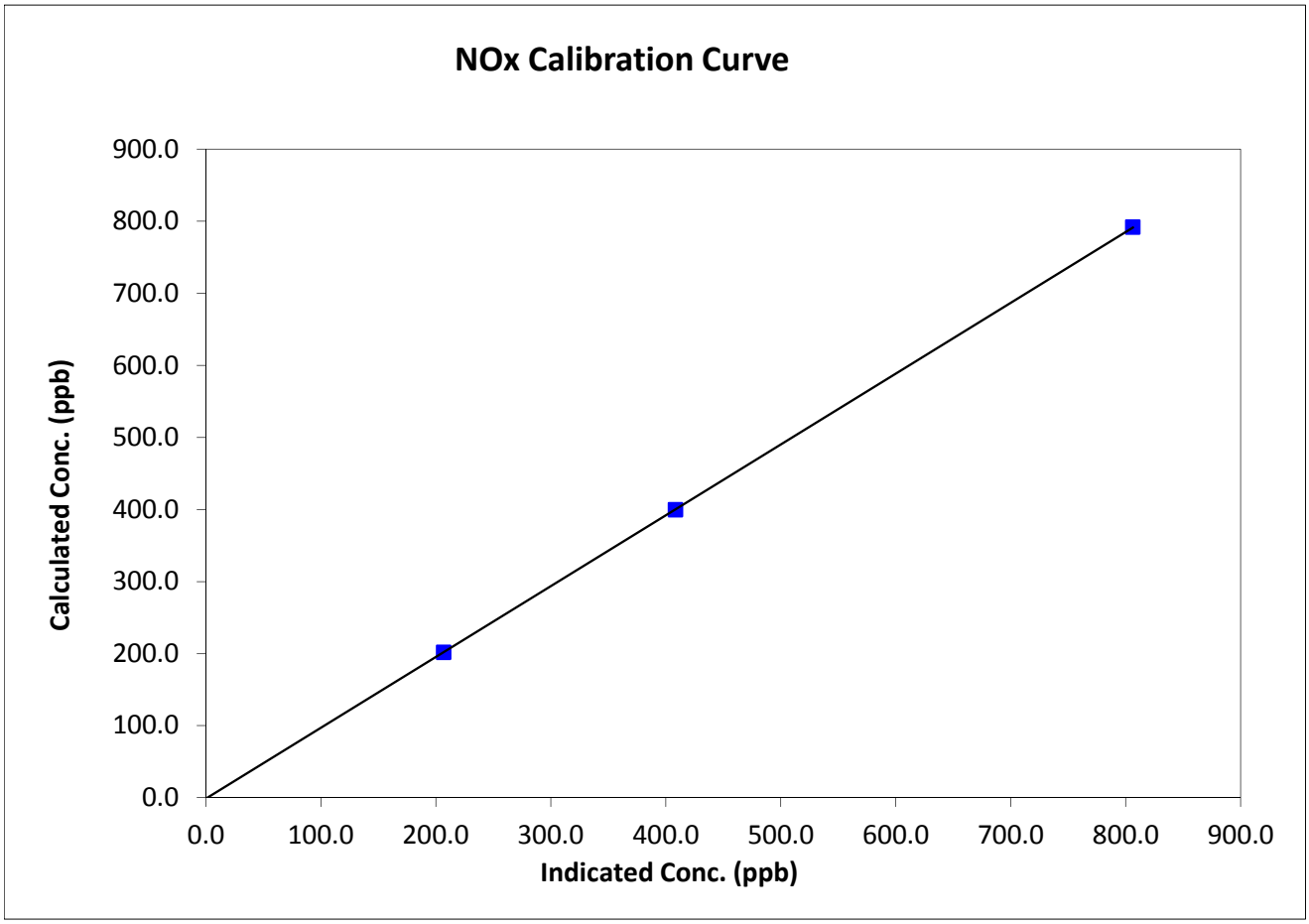
NO_X Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	June 27, 2014
Station Name	Statoil	Station Number	AMS 103
Start Time (MST)	10:55	End Time (MST)	16:48
Analyzer make	Teledyne T200	Analyzer serial #	722

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
791.9	806.3	0.9823		
399.6	408.4	0.9784	Slope	0.982683
201.6	206.9	0.9743		
			Intercept	-0.951565



Wood Buffalo Environmental Association

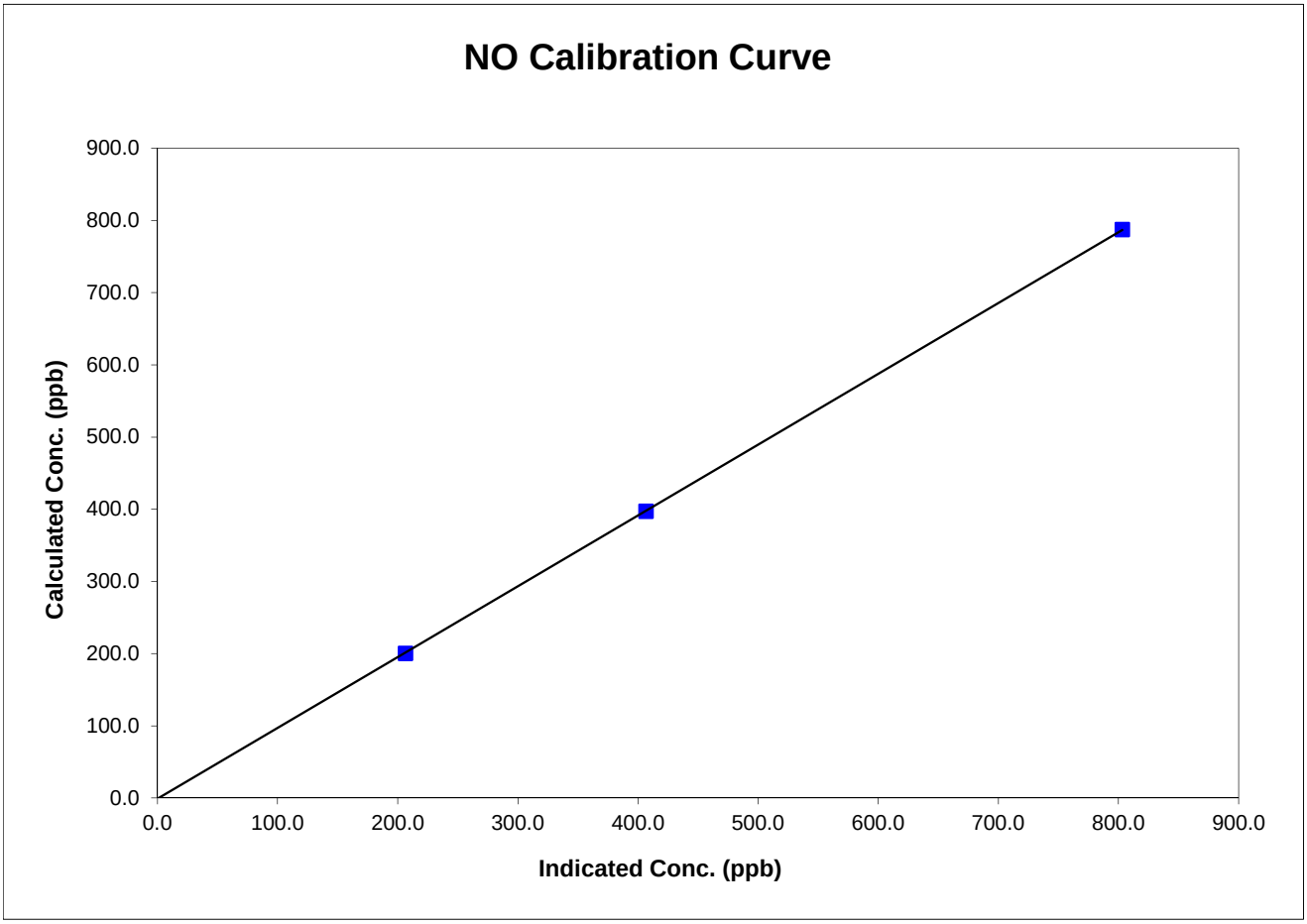
NO Calibration Summary

Station Information

Calibration Date	August 6, 2014	Previous Calibration	June 27, 2014
Station Name	Statoil	Station Number	AMS 103
Start Time (MST)	10:55	End Time (MST)	16:48
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999990
787.3	803.1	0.9803		
397.2	406.6	0.9770	Slope	0.980857
200.4	206.6	0.9700		
			Intercept	-1.033586



Wood Buffalo Environmental Association

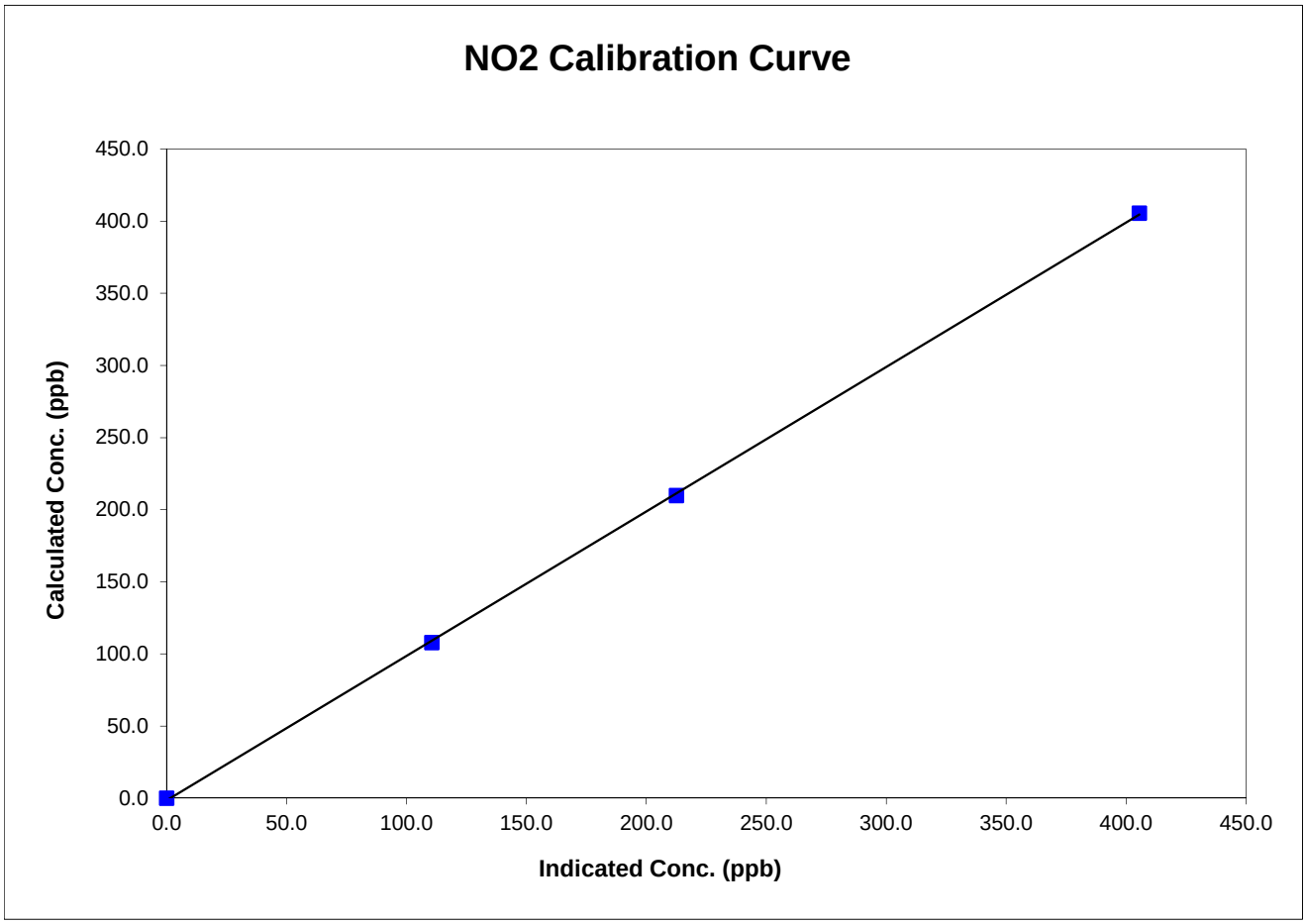
NO_2 Calibration Summary

Station Information

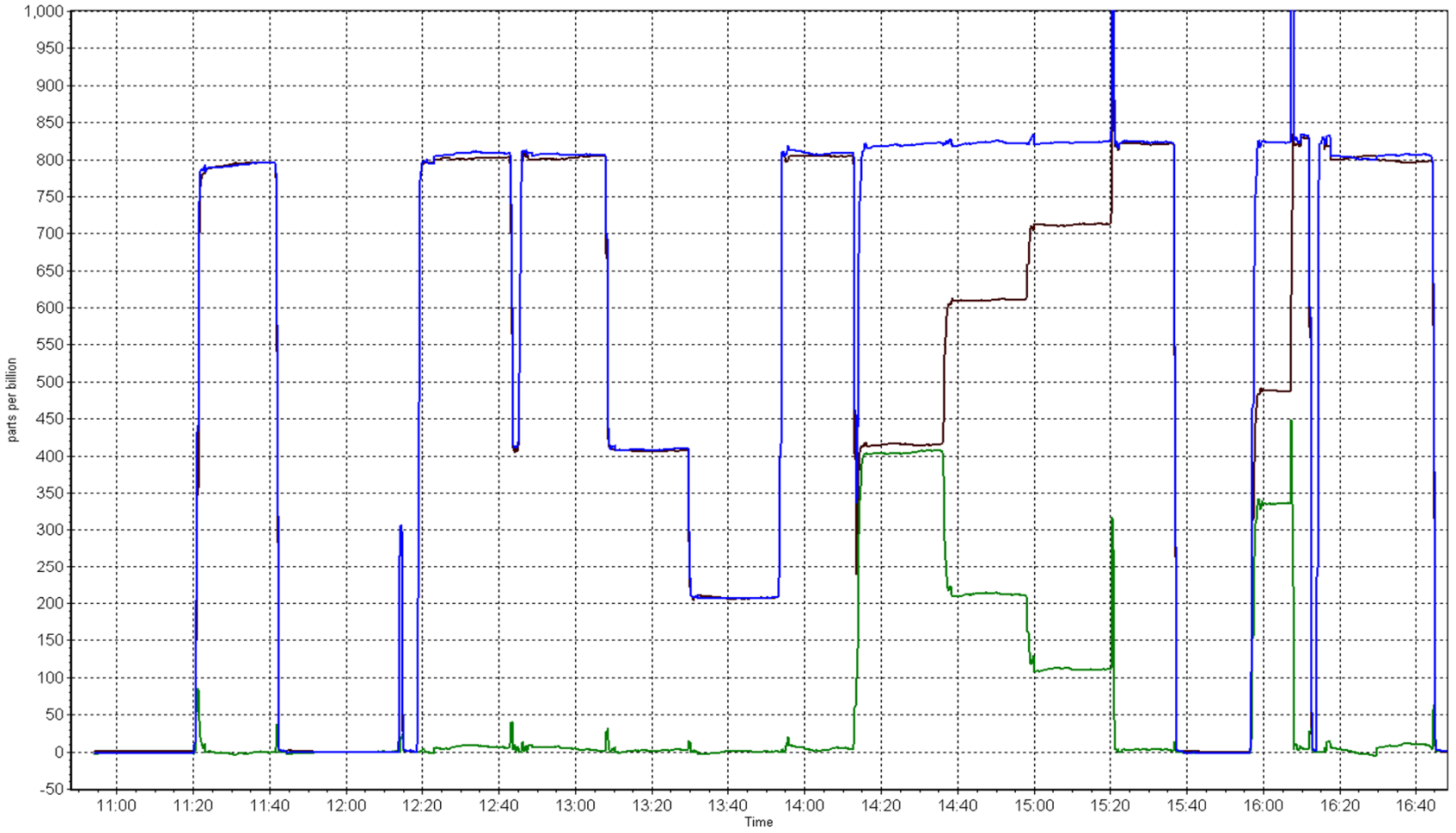
Calibration Date	August 6, 2014	Previous Calibration	June 27, 2014
Station Number	Statoil	Station Number	AMS 103
Start Time (MST)	10:55	End Time (MST)	16:48
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999919
405.7	405.5	1.0004		
209.8	212.6	0.9873	Slope	1.001923
107.8	110.5	0.9756		
			Intercept	-1.685349



NOx, NO & NO_2 Calibration Plot Date: August 6, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 502
CONOCOPHILLIPS SURMONT
AUGUST 2014

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

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

September 29, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONOCOPHILLIPS SURMONT (AMS 502)
AUGUST 2014

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	676	37	68	95.83	12	0	4	0
H2S (ppb) Average	704	39	40	99.87	3	0	2	0
NO2 (ppb) Average	682	39	62	96.91	26	0	7	0
NO (ppb) Average	682	39	62	96.91	26	-	6	-
NOX (ppb) Average	682	39	62	96.91	40	-	10	-
Temperature 2 m (C) Average	743	0	1	99.87	28.8	-	24.2	-
Relative Humidity (%) Average	743	0	1	99.87	100	-	-	-
Wind Speed 10 m (km/h) Average	741	0	3	99.60	28	-	-	-
Wind Direction 10 m (deg) Average	741	0	3	99.60	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONOCOPHILLIPS SURMONT (AMS 502)
AUGUST 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	676	0.9	2	-	0	0	0	0	1	2	12
H2S (ppb) Average	704	0.5	1	-	0	0	0	0	1	1	3
NO2 (ppb) Average	682	3.5	3	-	0	1	2	3	5	7	26
NO (ppb) Average	682	2.5	3	-	0	0	0	2	4	6	26
NOX (ppb) Average	682	6	5	-	0	1	3	5	8	12	40
Temperature 2 m (C) Average	743	17.3	5.3	-	5.6	10.6	13.1	17.4	21.1	25	28.8
Relative Humidity (%) Average	743	61.9	16	-	25	41	49	61	73	83	100
Wind Speed 10 m (km/h) Average	741	11.9	5	-	0	5	8	11	15	19	28
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONOCOPHILLIPS SURMONT (AMS 502)
AUGUST 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	01 Aug 2014 09:00	01 Aug 2014 11:00	3	DAS collection interrupted - new program uploaded
SO2	01 Aug 2014 01:00	31Aug 2014 24:00	28	Stabilization after daily span
H2S	01 Aug 2014 09:00	01 Aug 2014 09:00	1	DAS collection interrupted - new program uploaded
NO2, NO, NOX	01 Aug 2014 09:00	01 Aug 2014 09:00	1	DAS collection interrupted - new program uploaded
NO2, NO, NOX	04 Aug 2014 10:00	04 Aug 2014 10:00	1	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	04 Aug 2014 12:00	04 Aug 2014 12:00	1	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	04 Aug 2014 15:00	04 Aug 2014 17:00	3	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	04 Aug 2014 19:00	05 Aug 2014 02:00	8	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	05 Aug 2014 04:00	05 Aug 2014 05:00	2	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	05 Aug 2014 10:00	05 Aug 2014 14:00	5	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	06 Aug 2014 18:00	06 Aug 2014 18:00	1	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	06 Aug 2014 20:00	06 Aug 2014 20:00	1	Intermittent unstable operation - excessive baseline drift
Temperature 2 m	01 Aug 2014 09:00	01 Aug 2014 09:00	1	DAS collection interrupted - new program uploaded
Relative Humidity	01 Aug 2014 09:00	01 Aug 2014 09:00	1	DAS collection interrupted - new program uploaded
Wind Speed, Wind Direction	01 Aug 2014 09:00	01 Aug 2014 09:00	1	DAS collection interrupted - new program uploaded
Wind Speed, Wind Direction	12 Aug 2014 02:00	12 Aug 2014 03:00	2	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 ppb on Aug 17 16:00 Maximum Daily Average: 4.2 ppb on Aug 17

Minimum Value: 0 ppb on Aug 18 16:00 Minimum Daily Average: 0.0 ppb on Aug 24
Maximum Diurnal Average: 1.8 ppb at hour 13 Minimum Diurnal Average: 0.3 ppb at hour 23
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:	676
Hours of Missing Data:	68
Hours of Calibration:	37
Percent Operational Time:	95.8

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-Aug	0	1	0	0	Z	0	0	0	M	M	M	4	1	1	1	5	9	7	4	2	1	2	1	1	2.0	9
2-Aug	1	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
3-Aug	Z	RE	0	0	0	0	0	0	1	3	1	0	0	2	2	1	6	2	2	1	1	1	1	1	1.2	6
4-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	1	0	0	1	4	7	2	1	1	1	1	0	0.9	7
5-Aug	0	0	Z	RE	1	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.5	1
6-Aug	0	0	0	Z	RE	0	0	1	0	0	1	1	1	1	1	0	0	0	1	1	0	0	1	1	0.5	1
7-Aug	0	0	0	0	Z	RE	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0.3	1
8-Aug	0	0	0	1	2	Z	RE	C	C	C	C	C	C	2	2	1	0	0	0	0	0	0	0	0	--	2
9-Aug	Z	RE	0	0	0	0	1	1	3	2	5	9	2	1	1	1	0	1	0	0	0	0	0	0	1.4	9
10-Aug	0	Z	RE	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.1	1
11-Aug	0	0	Z	RE	0	0	0	0	0	0	2	2	9	1	5	3	1	0	0	0	1	1	2	1	1.3	9
12-Aug	1	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	1
13-Aug	0	1	1	1	Z	RE	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0.5	1
14-Aug	0	0	1	3	2	Z	RE	6	7	6	4	1	1	3	1	1	1	1	1	1	1	2	1	1	2.0	7
15-Aug	Z	1	2	1	1	2	2	1	1	1	0	1	1	1	1	1	1	1	1	0	0	1	1	0	0.9	2
16-Aug	0	Z	RE	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.6	1
17-Aug	0	0	Z	RE	0	1	2	4	10	7	6	10	11	7	7	12	11	2	0	0	0	0	0	0	4.2	12
18-Aug	0	0	0	Z	RE	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
19-Aug	0	0	0	0	Z	1	1	2	4	2	1	0	0	0	0	0	6	4	2	1	1	1	0	0	1.2	6
20-Aug	1	2	1	1	0	Z	RE	0	0	1	1	1	0	1	1	1	2	3	1	1	0	0	0	0	0.9	3
21-Aug	Z	RE	0	0	0	1	5	7	2	2	3	3	4	6	6	2	2	2	3	2	1	1	1	1	2.4	7
22-Aug	2	Z	RE	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.4	2
23-Aug	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
24-Aug	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-Aug	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Aug	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
27-Aug	Z	RE	0	0	0	0	0	0	0	2	7	5	7	6	1	0	0	1	0	0	0	0	0	2	1.5	7
28-Aug	0	Z	RE	1	0	0	1	2	10	8	6	11	8	5	7	7	2	4	3	0	0	0	0	0	3.5	11
29-Aug	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
30-Aug	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
31-Aug	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
	0.4	0.3	0.4	0.5	0.5	0.4	0.6	1.0	1.5	1.3	1.4	1.7	1.8	1.3	1.3	1.3	1.6	1.3	0.7	0.4	0.4	0.4	0.3	0.4	Diurnal Average	
	2	2	2	3	2	2	5	7	10	8	7	11	11	7	7	12	11	7	4	2	1	2	2	2	Diurnal Maximum	

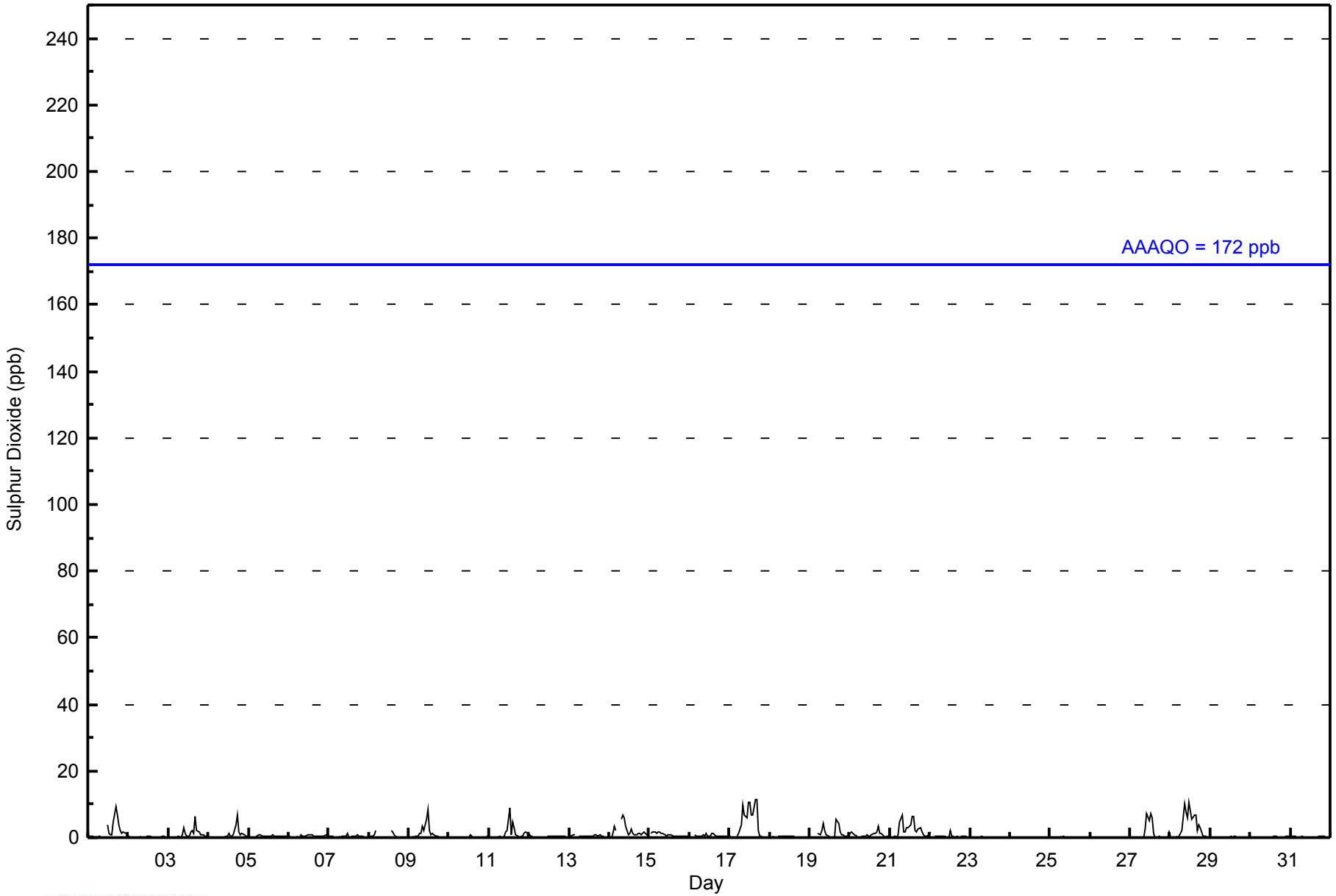
Z - zerospan C - Calibration M - Maintenance RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	672	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: 676

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	47	54	32	14	2	7	11	28	56	52	41	41	63	101	71	50	670
11 - 20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	51	54	32	14	2	7	11	28	56	52	41	41	63	101	71	50	674

Total Number of Valid Hours: 674

Total Number of Hours: 744

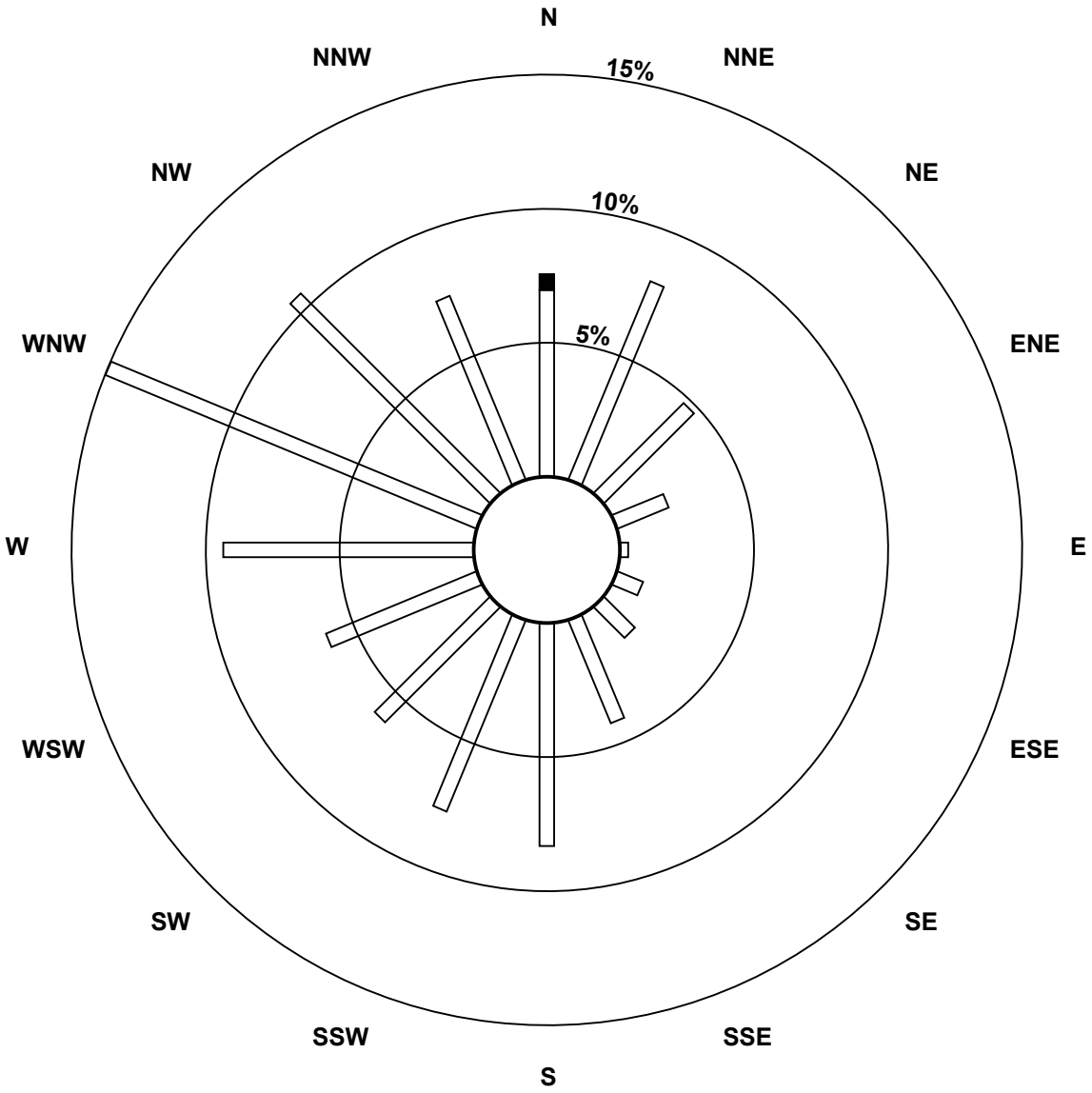
AURORA
ATMOSPHERICS INC.

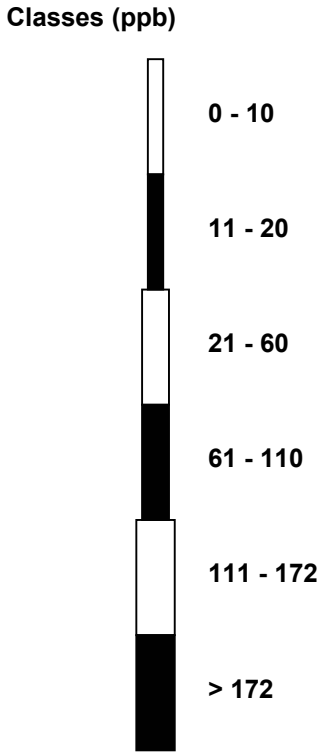
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont (AMS502)





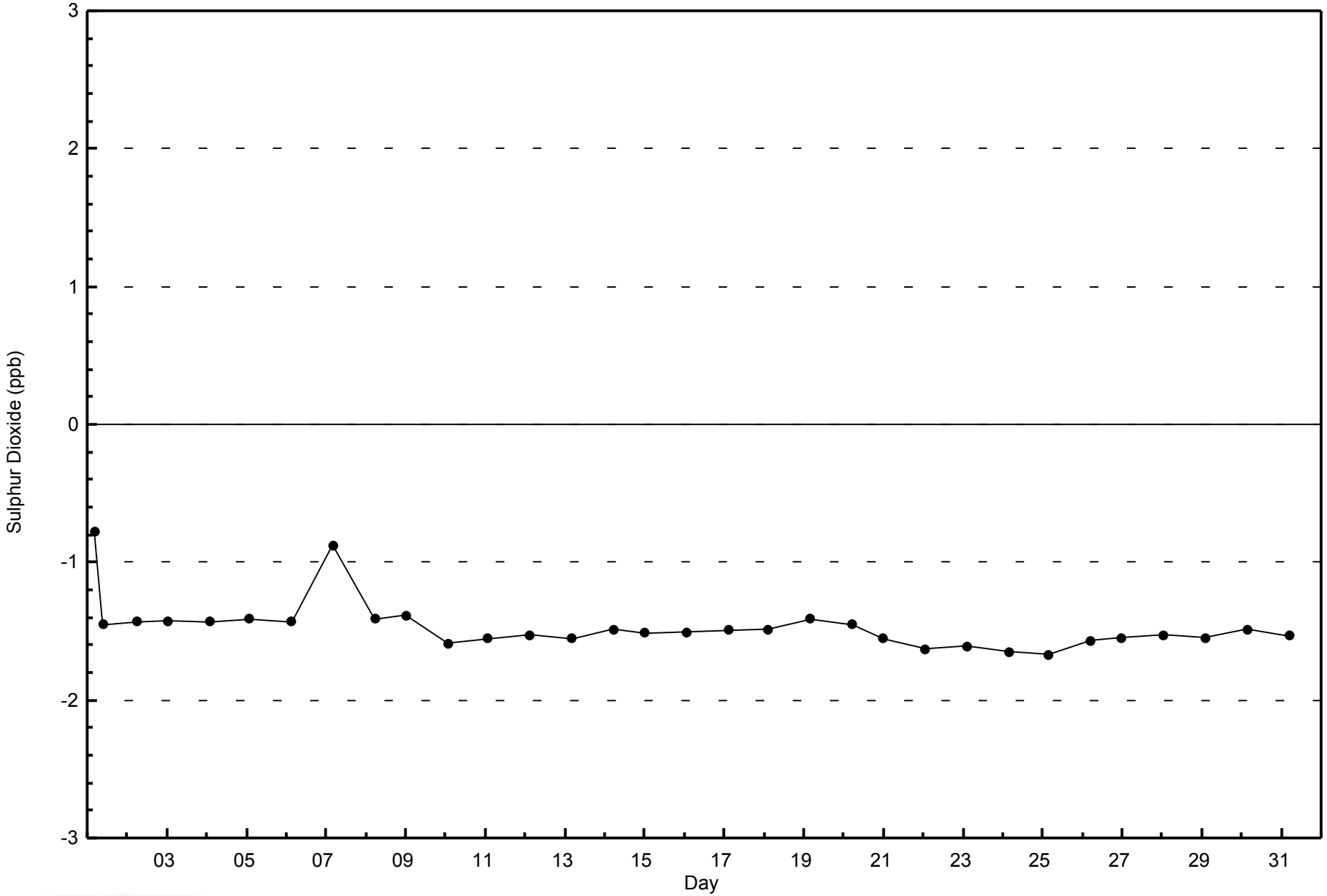
Total Number of Valid Hours: 674

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - August 2014



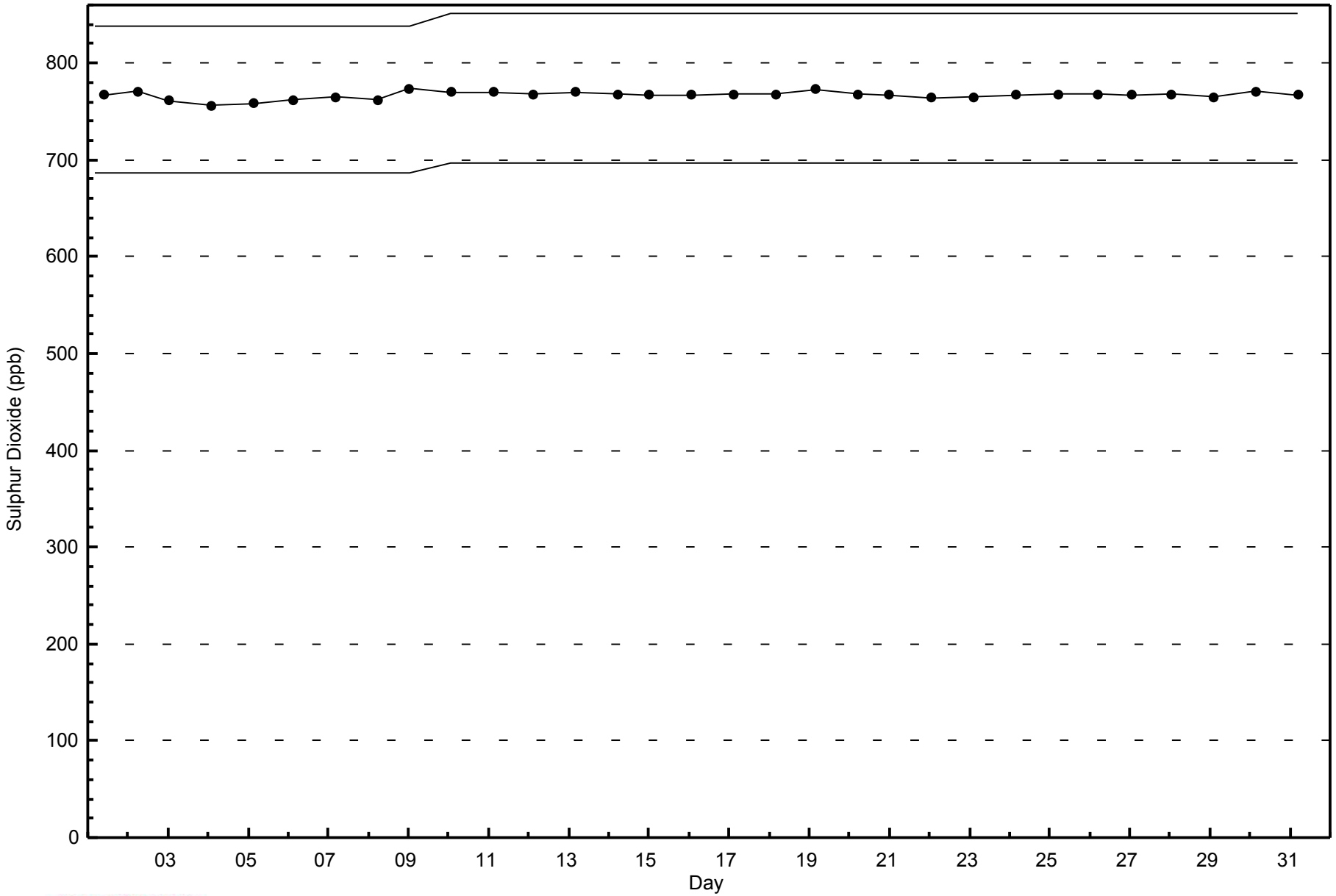
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Aug 12 01:00 Maximum Daily Average: 1.5 ppb on Aug 20

Minimum Value: 0 ppb on Aug 18 02:00 Minimum Daily Average: 0.1 ppb on Aug 24
Maximum Diurnal Average: 0.6 ppb at hour 8 Minimum Diurnal Average: 0.4 ppb at hour 24
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:	39
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-Aug	1	1	1	1	1	Z	2	1	M	1	Z	1	0	0	0	1	1	1	0	0	0	0	0	0	0.7	2
2-Aug	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
3-Aug	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.2	1
4-Aug	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	1	0	0.4	2
5-Aug	0	0	0	Z	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
6-Aug	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0.4	1
7-Aug	1	1	1	2	2	Z	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1.2	2
8-Aug	0	0	1	1	1	1	Z	2	1	1	0	0	0	0	0	0	0	1	1	1	1	3	2	1	0.9	3
9-Aug	2	Z	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1.2	3
10-Aug	0	0	Z	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Aug	0	0	0	Z	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
12-Aug	3	1	0	0	Z	0	0	0	0	C	C	C	C	C	C	C	1	0	0	0	0	0	0	0	--	3
13-Aug	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
14-Aug	0	1	1	1	1	0	Z	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0.5	1
15-Aug	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
16-Aug	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
17-Aug	0	0	0	Z	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0.5	1
18-Aug	0	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0.5	1
19-Aug	1	0	0	1	1	Z	2	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0.6	2
20-Aug	1	1	2	2	1	2	Z	2	2	2	2	1	1	1	1	1	2	2	2	2	1	2	2	1	1.5	2
21-Aug	0	Z	0	1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	2	1	0.7	2
22-Aug	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0.4	2
23-Aug	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
24-Aug	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
25-Aug	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
26-Aug	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Aug	0	Z	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	0	0	1	0.3	1
28-Aug	1	0	Z	0	0	0	0	0	1	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0.5	1
29-Aug	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
30-Aug	0	0	0	0	Z	0	0	0	0	0	1	1	1	2	2	3	1	1	0	0	0	0	0	0	0.6	3
31-Aug	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.3	1
	0.5	0.4	0.5	0.6	0.5	0.4	0.5	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	Diurnal Average	
	3	1	3	3	3	3	3	2	2	2	2	1	1	2	2	3	2	2	2	2	2	3	2	1	Diurnal Maximum	

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

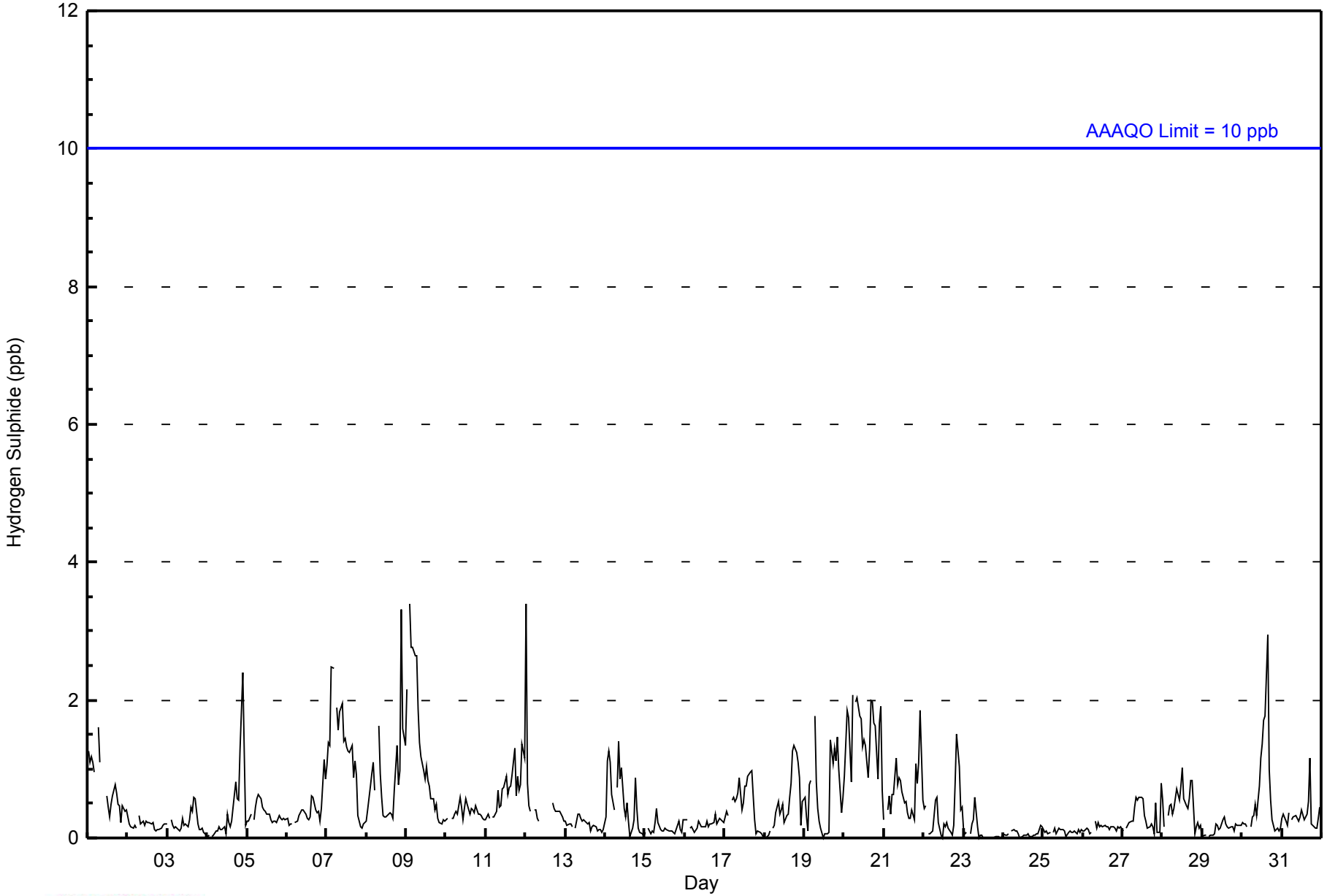
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

502-15

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - August 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	696	98.86	98.86
3 - 4	8	1.14	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: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	51	48	35	14	3	8	14	25	55	53	45	43	67	103	77	53	694
3 - 4	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	55	35	14	3	8	14	25	55	53	45	43	67	103	77	53	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

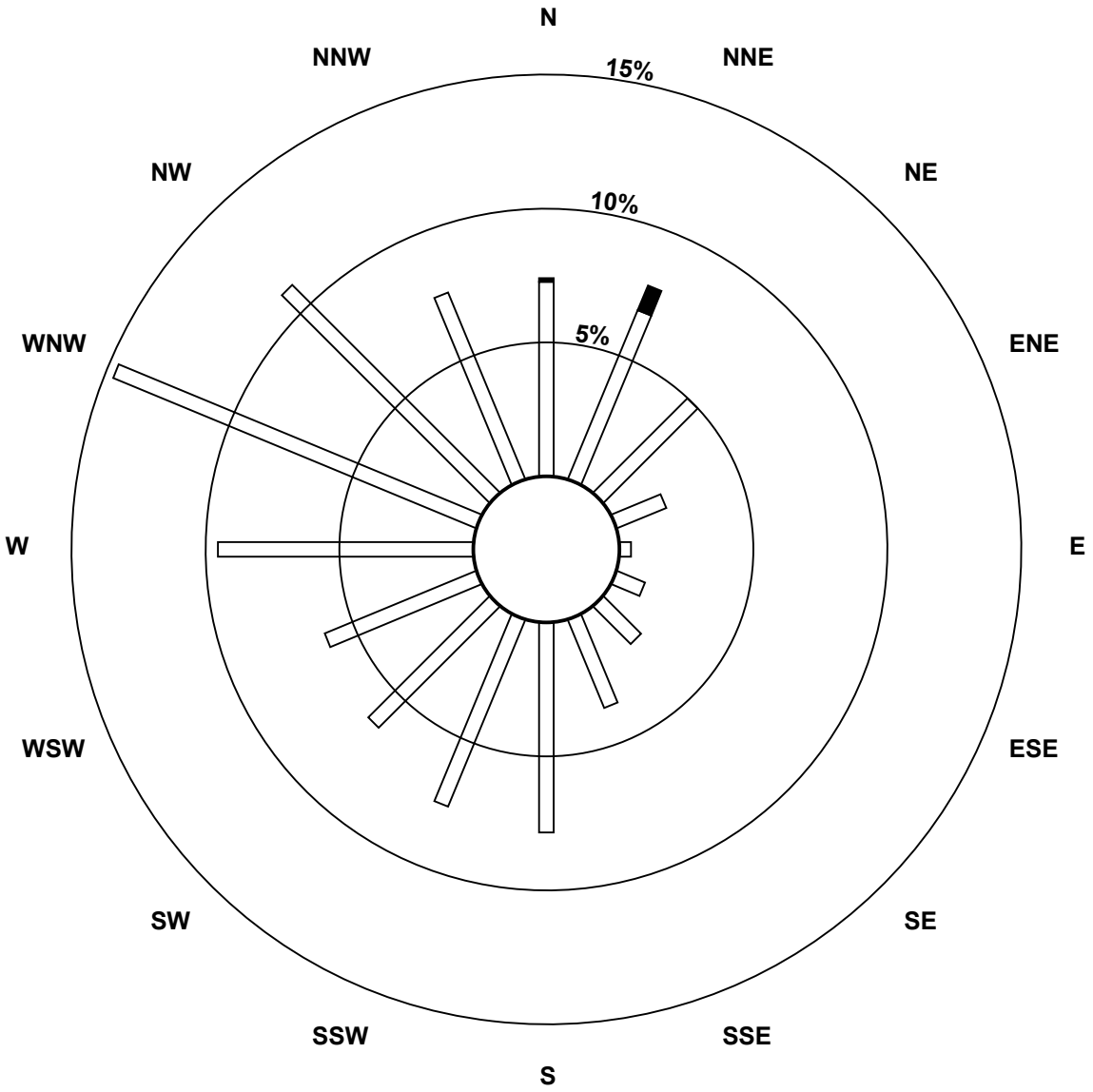
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

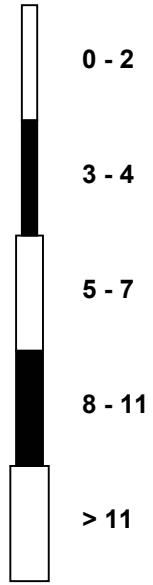
Wind Rose Aug 2014

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



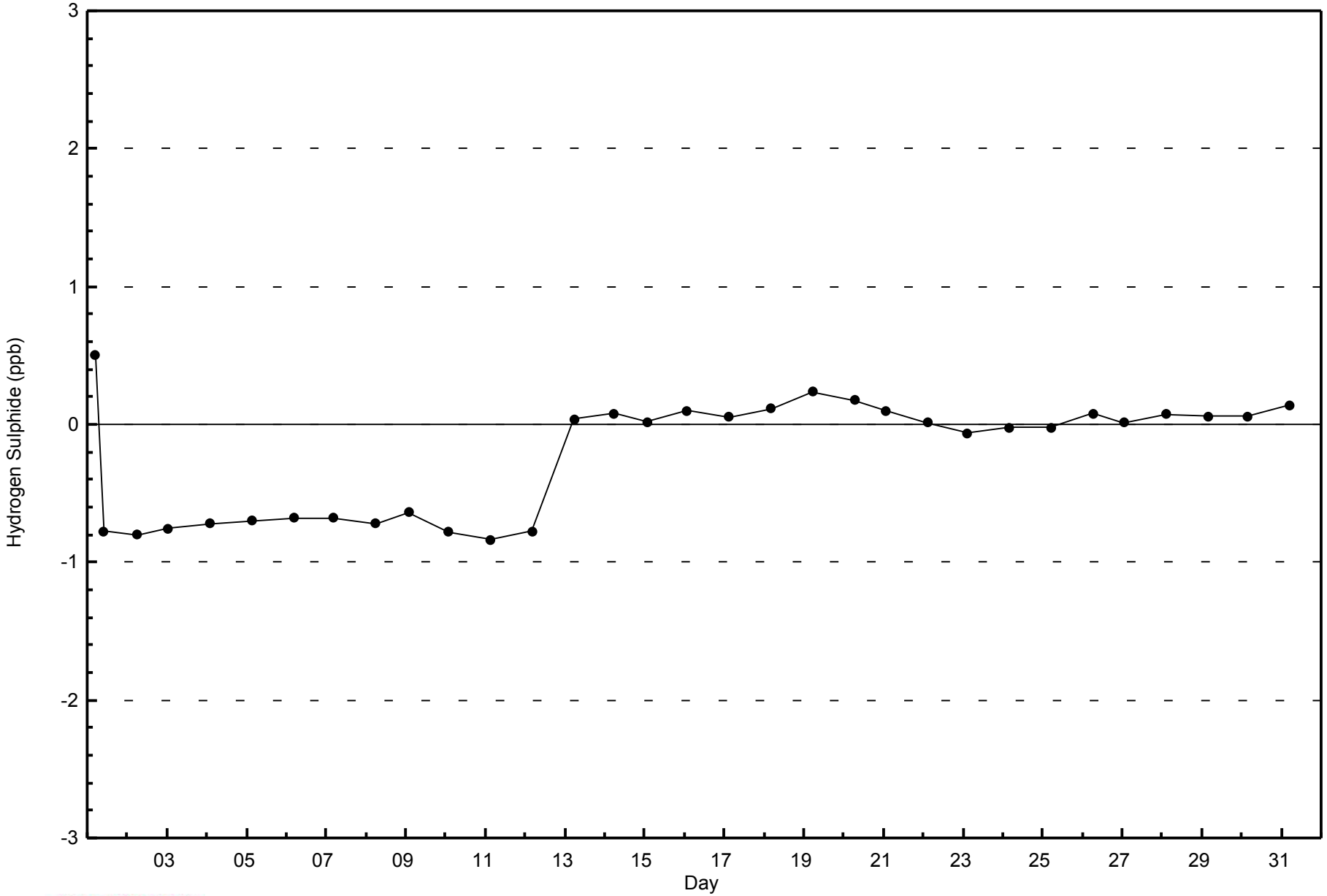
Total Number of Valid Hours: 702

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - August 2014



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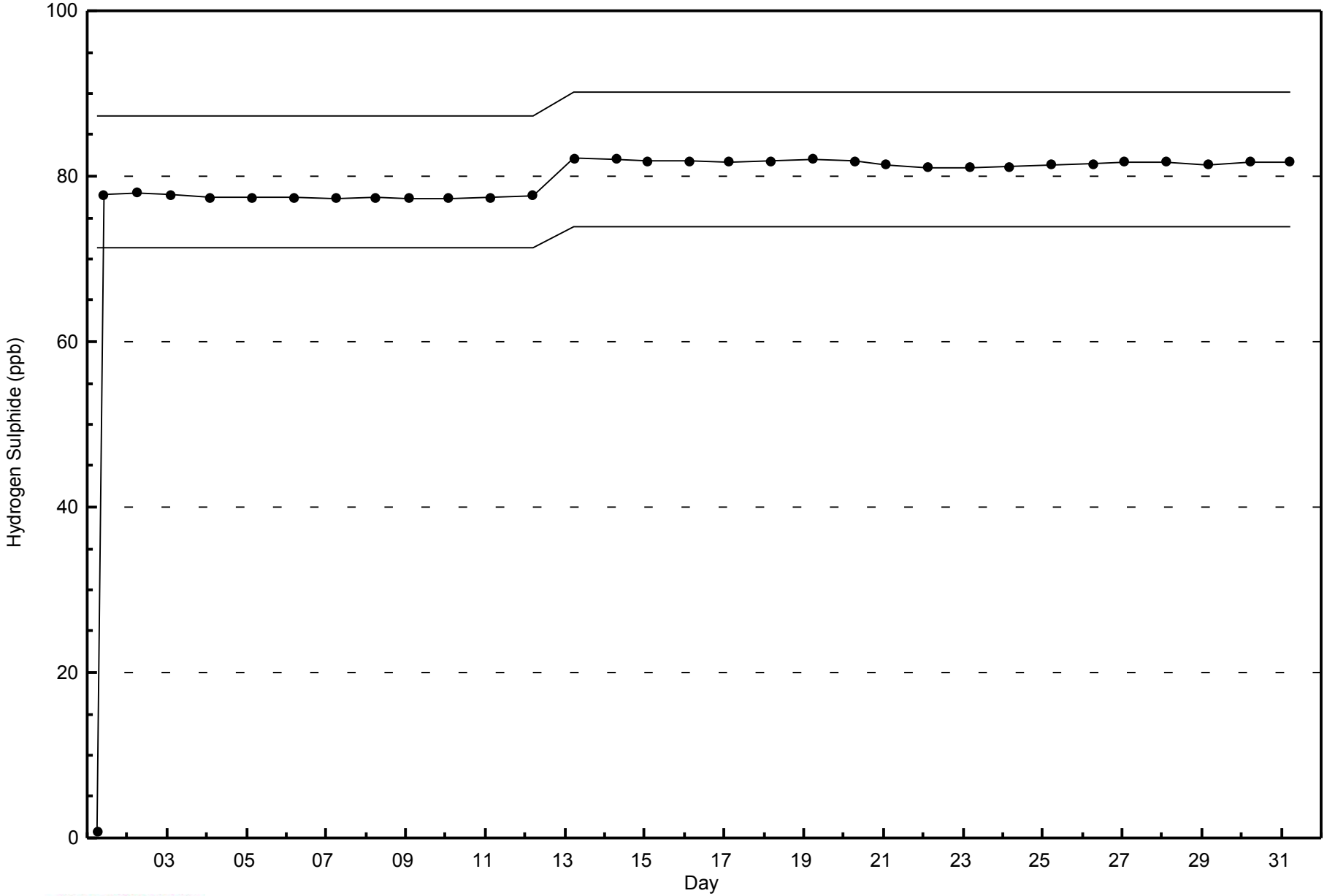
WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

502-20

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - August 2014

Maximum Value: 26 ppb on Aug 1 22:00

Maximum Daily Average: 5.9 ppb on Aug 9

Minimum Value: 0 ppb on Aug 1 04:00

Minimum Daily Average: 0.6 ppb on Aug 30

Maximum Diurnal Average: 5.0 ppb at hour 9

Minimum Diurnal Average: 0.9 ppb at hour 4

Monthly Average: 2.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 2 $Q_3 = 4$ $P_{90} = 6$ $P_{99} = 13$

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	39
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-Aug	5	3	1	0	Z	0	0	1	M	Z	3	6	3	4	6	3	10	5	4	4	7	26	9	11	5.2	26
2-Aug	8	1	1	2	3	Z	10	10	6	5	5	4	4	3	2	3	2	2	4	3	4	4	3	3	4.0	10
3-Aug	Z	4	3	3	4	5	4	4	6	6	4	4	2	3	5	2	5	1	2	1	1	2	0	1	3.1	6
4-Aug	2	Z	1	2	3	4	3	4	4	UO	6	UO	5	6	UO	UO	UO	7	UO	UO	UO	UO	UO	UO	--	7
5-Aug	UO	UO	Z	UO	UO	6	5	3	4	UO	UO	UO	UO	UO	C	12	10	10	9	8	8	6	8	7	--	12
6-Aug	4	2	2	Z	2	3	2	5	5	7	3	3	1	1	2	0	0	UO	0	UO	1	1	1	1	2.2	7
7-Aug	0	1	2	2	Z	1	2	0	1	2	2	3	0	0	3	4	1	2	2	2	3	4	4	4	1.9	4
8-Aug	3	2	2	3	3	Z	6	C	C	C	C	C	C	5	6	5	5	4	3	4	3	2	3	3	--	6
9-Aug	Z	3	3	3	3	3	6	6	12	7	11	12	6	4	6	7	6	5	6	6	5	5	5	7	5.9	12
10-Aug	5	Z	3	2	2	2	2	6	5	2	2	4	2	1	2	1	1	0	0	0	1	1	1	0	2.0	6
11-Aug	0	0	Z	0	0	0	0	0	3	0	3	2	9	1	5	4	2	1	1	0	0	0	0	0	1.5	9
12-Aug	1	1	3	Z	5	5	3	4	4	3	2	2	2	2	3	2	2	1	0	0	0	1	1	1	1.9	5
13-Aug	1	1	1	0	Z	1	3	7	5	4	3	2	2	1	2	1	0	0	0	0	0	0	0	0	1.4	7
14-Aug	0	0	1	2	0	Z	2	5	5	4	2	1	0	9	5	0	3	0	0	0	0	0	0	0	1.8	9
15-Aug	Z	1	0	0	0	1	7	10	6	4	2	1	1	2	2	1	1	1	0	0	0	0	0	0	1.8	10
16-Aug	0	Z	0	0	1	0	0	5	3	3	1	0	1	3	1	1	1	0	0	0	0	0	0	0	1.0	5
17-Aug	0	0	Z	0	0	1	2	5	8	6	4	8	11	6	7	13	11	2	0	0	0	0	0	0	3.7	13
18-Aug	0	0	0	Z	0	1	3	15	22	10	6	2	3	4	3	6	2	0	0	0	0	0	0	0	3.4	22
19-Aug	0	0	0	0	Z	1	3	3	2	3	2	1	2	1	1	2	5	1	0	0	0	0	0	0	1.2	5
20-Aug	1	1	0	0	0	Z	4	4	3	2	3	1	1	3	4	2	2	5	0	0	0	0	0	1	1.7	5
21-Aug	Z	0	1	1	1	2	6	10	2	5	6	6	4	6	7	2	3	1	0	0	0	0	0	0	2.8	10
22-Aug	0	Z	0	0	0	4	2	2	3	3	1	1	4	1	3	1	1	0	0	0	0	0	0	0	1.3	4
23-Aug	0	1	Z	1	1	5	10	15	4	2	2	1	1	1	2	1	1	1	1	0	0	0	0	0	2.3	15
24-Aug	0	0	0	Z	0	3	5	3	4	3	1	1	1	1	2	3	3	2	0	1	1	1	1	1	1.7	5
25-Aug	1	1	1	0	Z	0	2	4	3	5	3	5	3	2	2	3	2	0	0	0	0	0	0	0	1.6	5
26-Aug	0	0	0	0	0	Z	3	7	3	6	5	1	1	2	1	1	1	0	0	0	0	0	0	0	1.4	7
27-Aug	Z	0	0	0	0	3	0	0	0	4	9	6	7	6	1	1	0	1	0	0	0	1	0	3	1.9	9
28-Aug	0	Z	0	1	0	1	3	4	15	10	8	15	9	8	8	7	4	4	3	0	3	6	3	4	5.1	15
29-Aug	1	1	Z	0	0	1	1	2	5	5	4	5	10	13	6	2	2	0	1	0	0	0	0	0	2.6	13
30-Aug	0	0	0	Z	0	0	2	1	0	0	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0.6	2
31-Aug	0	0	0	0	Z	3	2	1	1	1	1	1	1	2	1	1	2	4	1	1	0	0	0	0	0.9	4
	1.3	1.0	1.0	0.9	1.2	2.2	3.2	5.0	5.0	4.1	3.5	3.5	3.4	3.5	3.4	3.1	2.9	2.0	1.3	1.1	1.3	2.1	1.4	1.6	Diurnal Average	
	8	4	3	3	5	6	10	15	22	10	11	15	11	13	8	13	11	10	9	8	8	26	9	11	Diurnal Maximum	

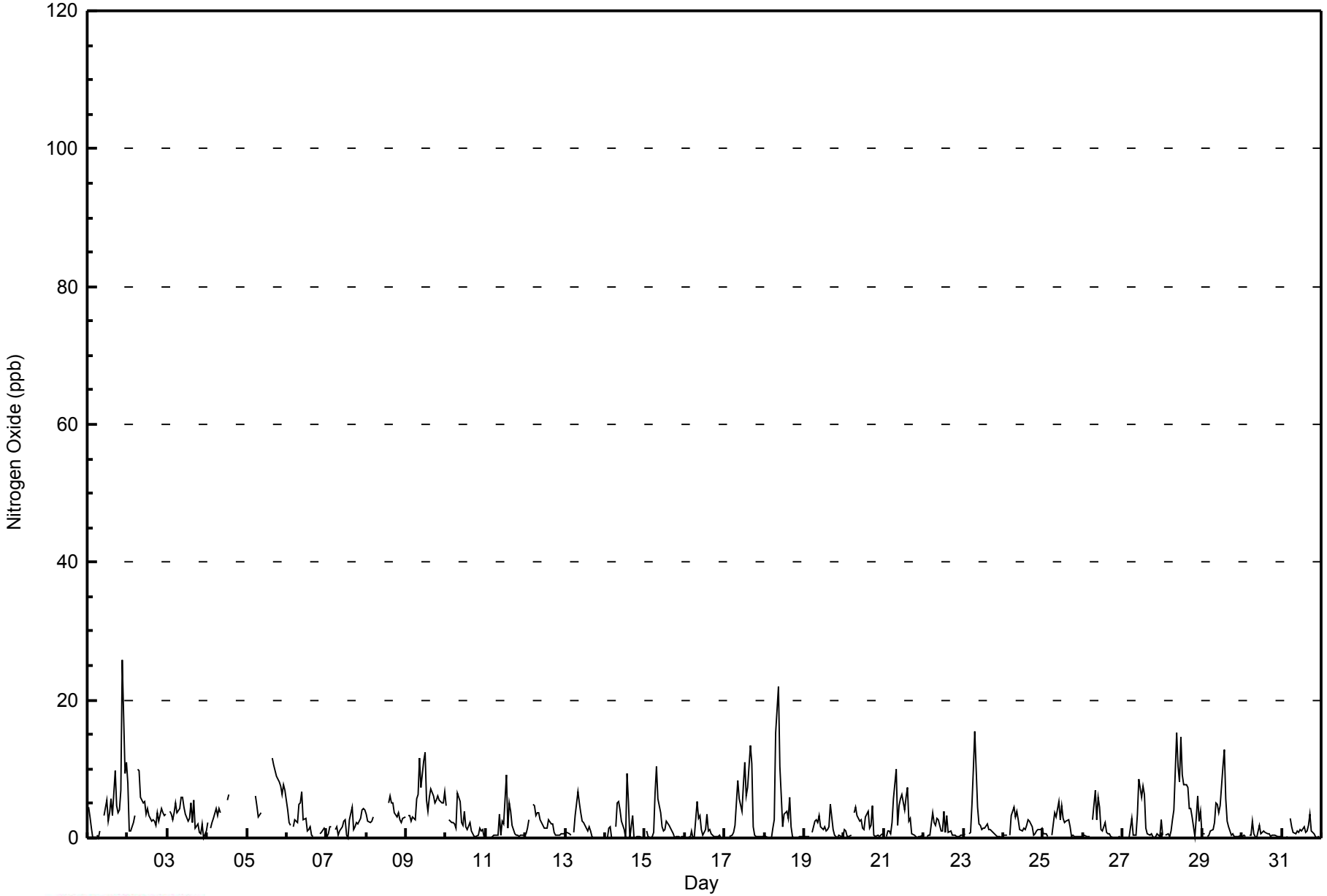
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

WBEA

Hourly Averages

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

502-22

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	680	99.71	99.71
21 - 40	2	0.29	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: 682

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - August 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	48	55	32	14	2	5	10	23	56	53	44	44	63	102	73	54	678
21 - 40	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	55	32	14	2	5	10	23	56	53	44	45	63	103	73	54	680

Total Number of Valid Hours: 680

Total Number of Hours: 744

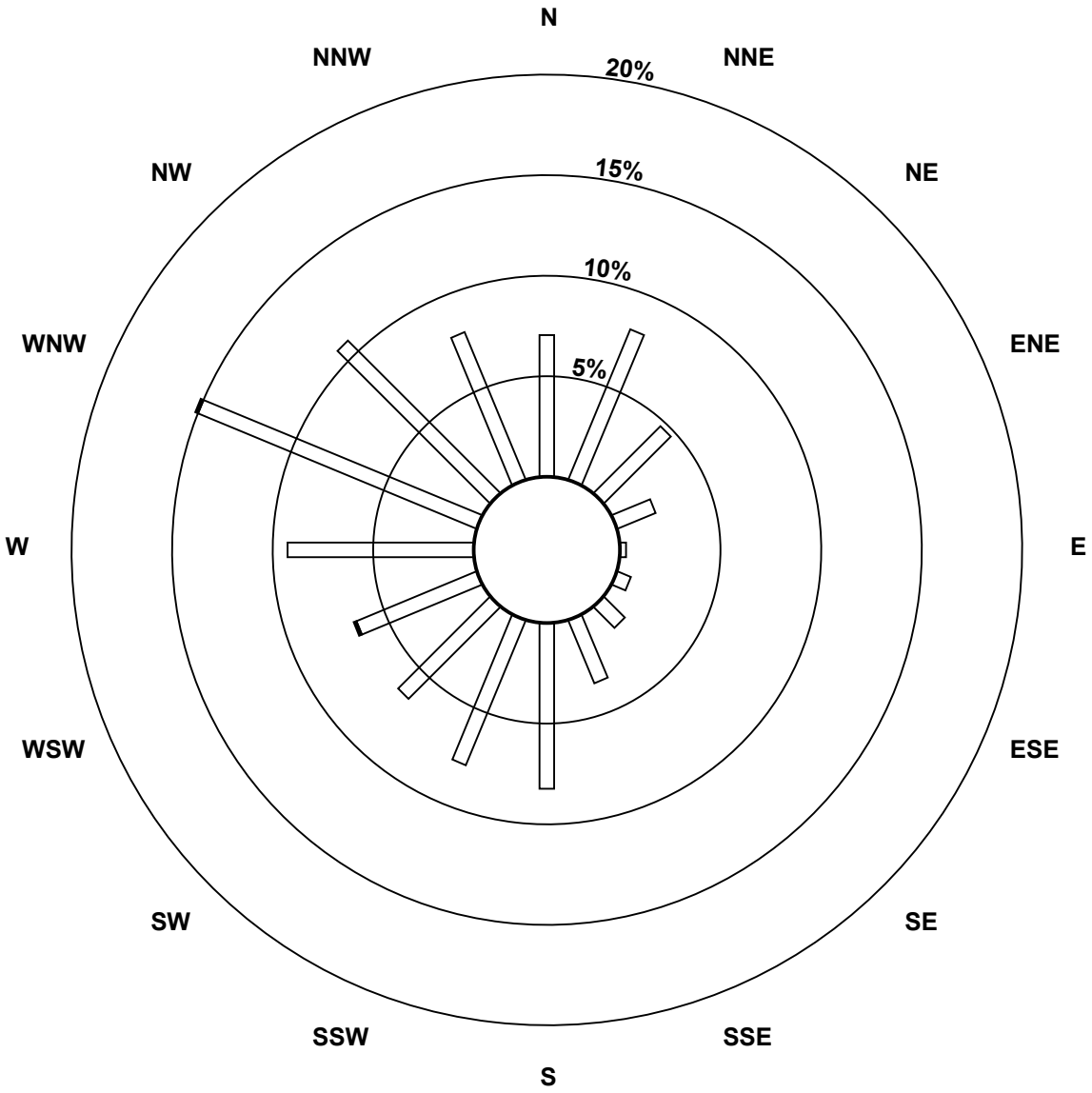
AURORA
ATMOSPHERICS INC.

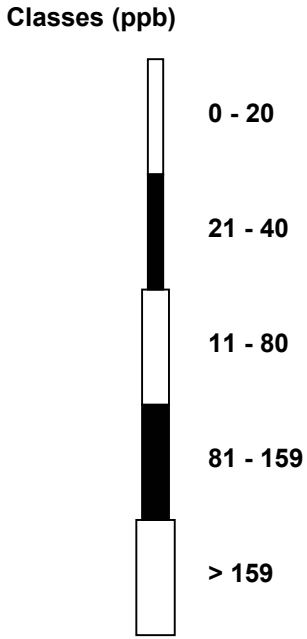
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont (AMS502)





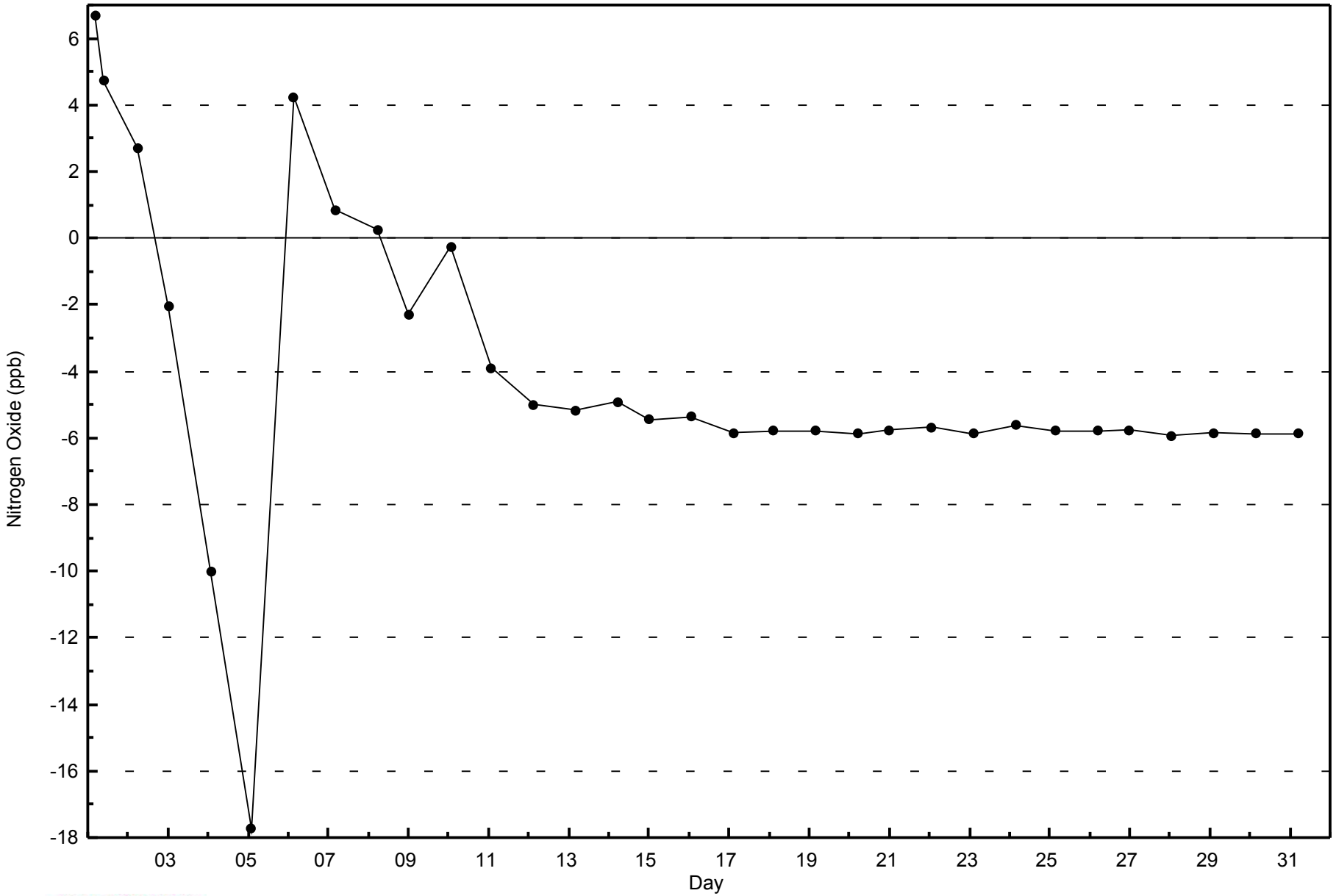
Total Number of Valid Hours: 680

WBEA

Zero Responses

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - August 2014



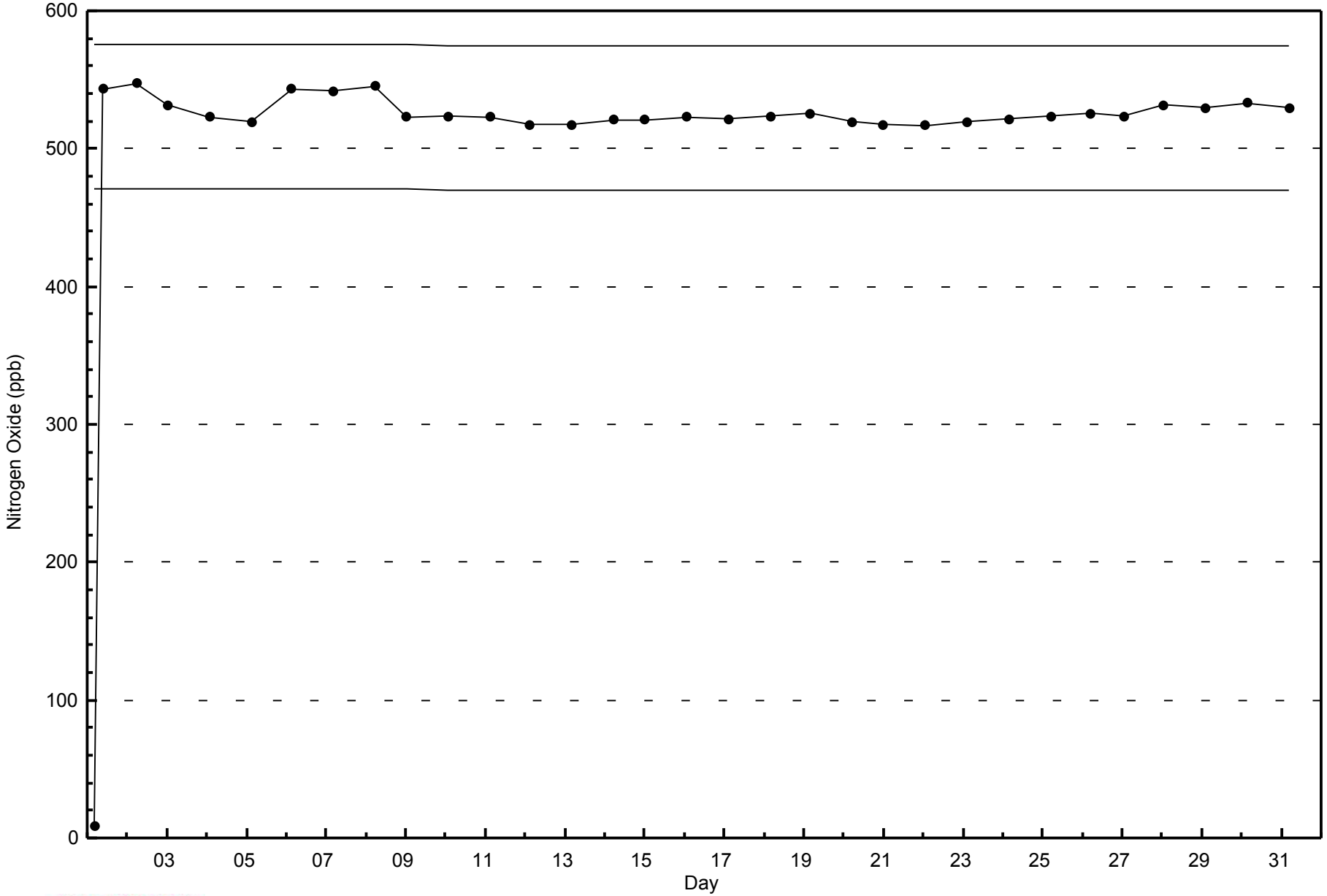
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 26 ppb on Aug 2 00:00 Maximum Daily Average: 6.5 ppb on Aug 15

Minimum Value: 0 ppb on Aug 1 01:00 Minimum Daily Average: 1.1 ppb on Aug 7
Maximum Diurnal Average: 5.3 ppb at hour 8 Minimum Diurnal Average: 2.2 ppb at hour 20
Monthly Average: 3.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 5$ $P_{90} = 7$ $P_{99} = 15$

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	39
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-Aug	0	0	0	0	Z	0	0	2	M	Z	2	3	2	3	5	4	7	5	4	2	3	14	21	26	4.9	26
2-Aug	18	11	6	5	4	Z	8	9	6	4	4	3	5	5	5	5	2	2	2	2	4	10	3	1	5.3	18
3-Aug	Z	7	5	4	4	8	2	3	3	7	6	3	3	4	6	4	5	3	2	2	5	6	3	4	4.3	8
4-Aug	3	Z	1	0	2	2	0	0	0	UO	0	UO	0	0	UO	UO	UO	0	UO	UO	UO	UO	UO	UO	--	3
5-Aug	UO	UO	Z	UO	UO	10	7	0	1	UO	UO	UO	UO	UO	C	0	0	0	0	0	0	0	3	6	--	10
6-Aug	6	3	3	Z	2	3	3	8	4	7	6	6	6	5	5	2	2	UO	0	UO	1	1	1	1	3.5	8
7-Aug	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.1	2
8-Aug	2	2	3	4	6	Z	8	C	C	C	C	C	C	6	9	8	8	3	2	1	2	2	3	3	--	9
9-Aug	Z	3	3	2	1	2	3	3	5	5	5	6	2	2	1	2	1	1	1	1	1	1	1	1	2.1	6
10-Aug	1	Z	1	1	1	2	1	3	3	2	3	2	2	1	2	1	0	1	0	1	2	1	1	1	1.5	3
11-Aug	1	2	Z	2	2	2	2	1	3	1	2	1	6	2	3	2	2	2	2	2	3	2	3	3	2.1	6
12-Aug	2	8	14	Z	13	12	4	5	4	3	2	2	2	2	2	2	3	2	1	1	1	2	3	3	4.0	14
13-Aug	5	7	6	6	Z	4	8	11	8	6	5	5	5	4	5	3	2	2	3	2	2	1	1	1	4.4	11
14-Aug	1	1	3	3	3	Z	5	7	6	5	3	2	2	6	4	2	5	4	3	3	2	2	1	1	3.1	7
15-Aug	Z	16	4	4	6	8	15	22	13	7	4	4	4	3	6	4	5	3	3	4	7	3	2	2	6.5	22
16-Aug	3	Z	3	4	14	2	2	8	9	8	7	3	4	6	5	6	6	3	3	3	2	3	1	1	4.6	14
17-Aug	1	1	Z	2	2	3	4	5	7	3	4	6	8	5	5	8	8	2	1	1	1	2	1	1	3.6	8
18-Aug	2	1	1	Z	1	2	3	9	11	7	7	3	4	5	4	5	2	1	1	1	1	1	1	1	3.1	11
19-Aug	1	2	1	1	Z	5	5	6	7	6	2	2	2	2	2	4	5	6	4	3	3	3	3	3	3.3	7
20-Aug	3	6	6	3	4	Z	4	5	3	2	2	2	2	3	4	3	4	5	3	3	2	1	2	1	3.1	6
21-Aug	Z	1	2	5	4	6	7	6	2	4	4	4	5	6	6	3	4	3	4	5	3	3	3	4	4.0	7
22-Aug	4	Z	2	2	3	6	5	3	5	4	2	2	4	2	3	3	3	2	3	3	3	3	6	5	3.3	6
23-Aug	4	9	Z	7	10	13	13	13	8	2	2	2	2	3	2	2	3	2	3	2	3	5	2	2	5.0	13
24-Aug	8	8	10	Z	6	9	6	5	4	2	2	1	2	2	3	4	1	2	2	3	9	10	12	9	5.2	12
25-Aug	6	7	4	3	Z	3	6	7	5	5	3	3	4	3	3	5	3	2	3	5	5	3	4	4	4.2	7
26-Aug	2	3	3	2	3	Z	5	6	4	6	5	2	2	4	2	2	2	2	1	1	1	1	1	1	2.8	6
27-Aug	Z	1	1	1	1	2	1	1	1	3	6	4	6	4	1	1	1	1	1	1	1	6	3	3	2.2	6
28-Aug	2	Z	2	2	1	2	2	3	4	5	4	6	5	4	4	5	3	3	3	2	15	16	10	10	4.9	16
29-Aug	3	4	Z	2	2	2	3	4	7	5	3	5	9	10	8	7	3	4	5	6	4	4	5	5	4.8	10
30-Aug	4	4	2	Z	4	3	10	3	1	1	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1.9	10
31-Aug	1	1	1	1	Z	2	2	1	1	2	1	2	3	3	2	2	3	9	5	4	2	1	1	1	2.0	9
	3.4	4.3	3.4	2.6	4.1	4.2	4.6	5.3	4.7	4.1	3.3	3.1	3.6	3.5	3.8	3.4	3.2	2.5	2.2	2.2	3.0	3.6	3.4	3.6	Diurnal Average	
	18	16	14	7	14	13	15	22	13	8	7	6	9	10	9	8	8	9	5	6	15	16	21	26	Diurnal Maximum	

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

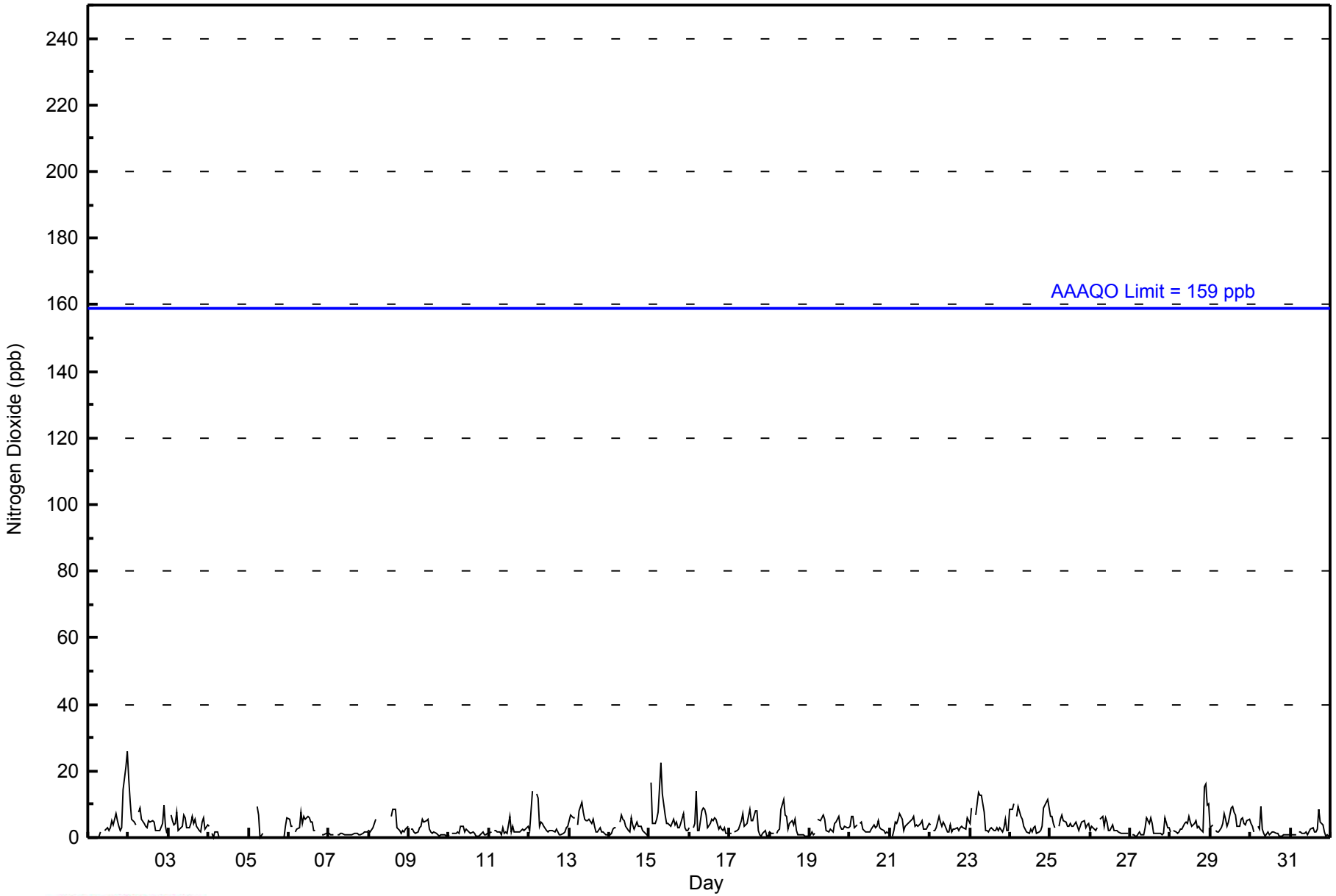
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	679	99.56	99.56
21 - 40	3	0.44	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: 682

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - August 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	48	55	32	14	2	5	10	23	55	52	44	44	63	103	73	54	677
21 - 40	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	3
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	55	32	14	2	5	10	23	56	53	44	45	63	103	73	54	680

Total Number of Valid Hours: 680

Total Number of Hours: 744

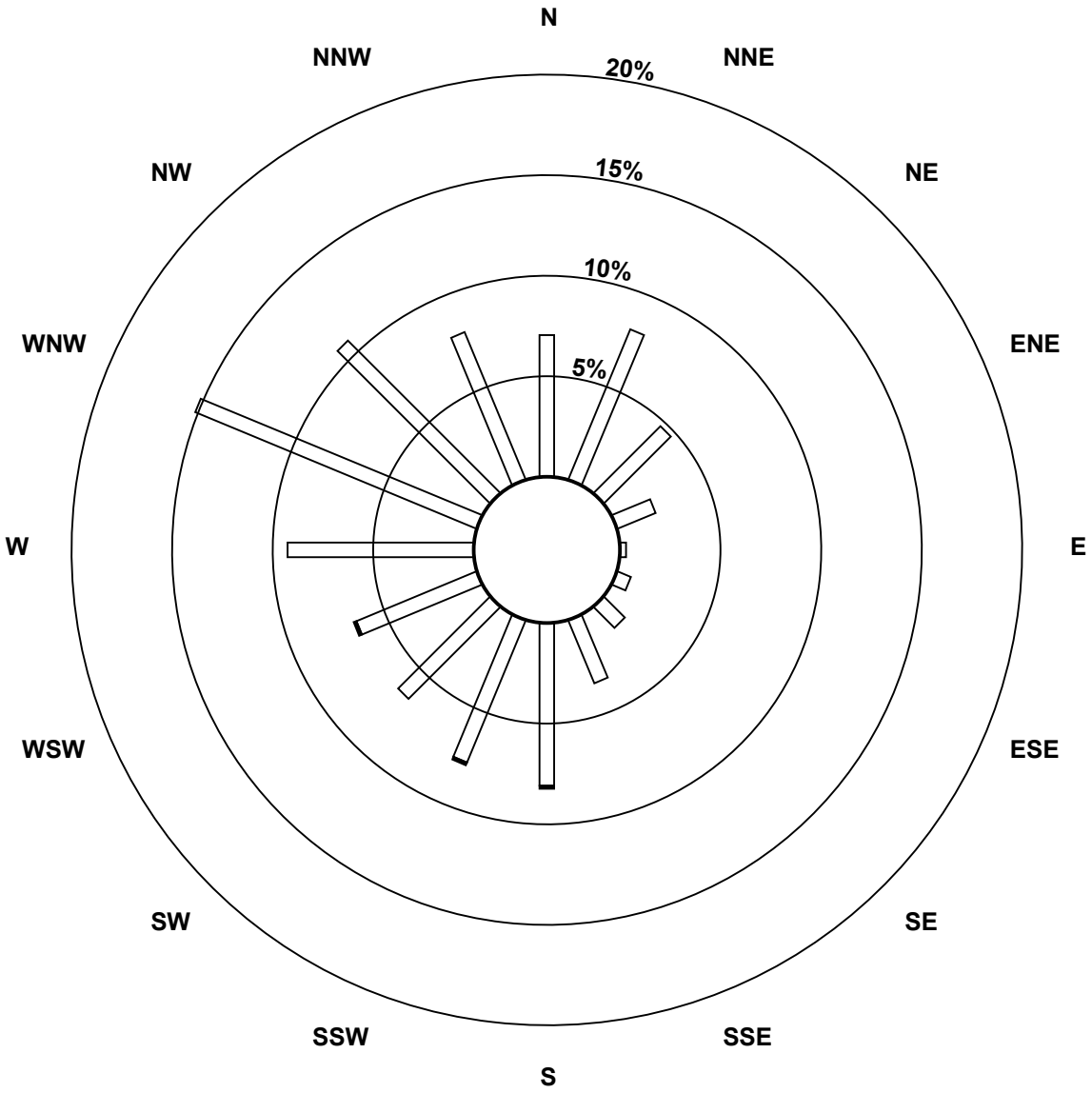
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

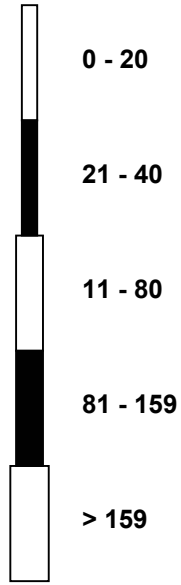
Wind Rose Aug 2014

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



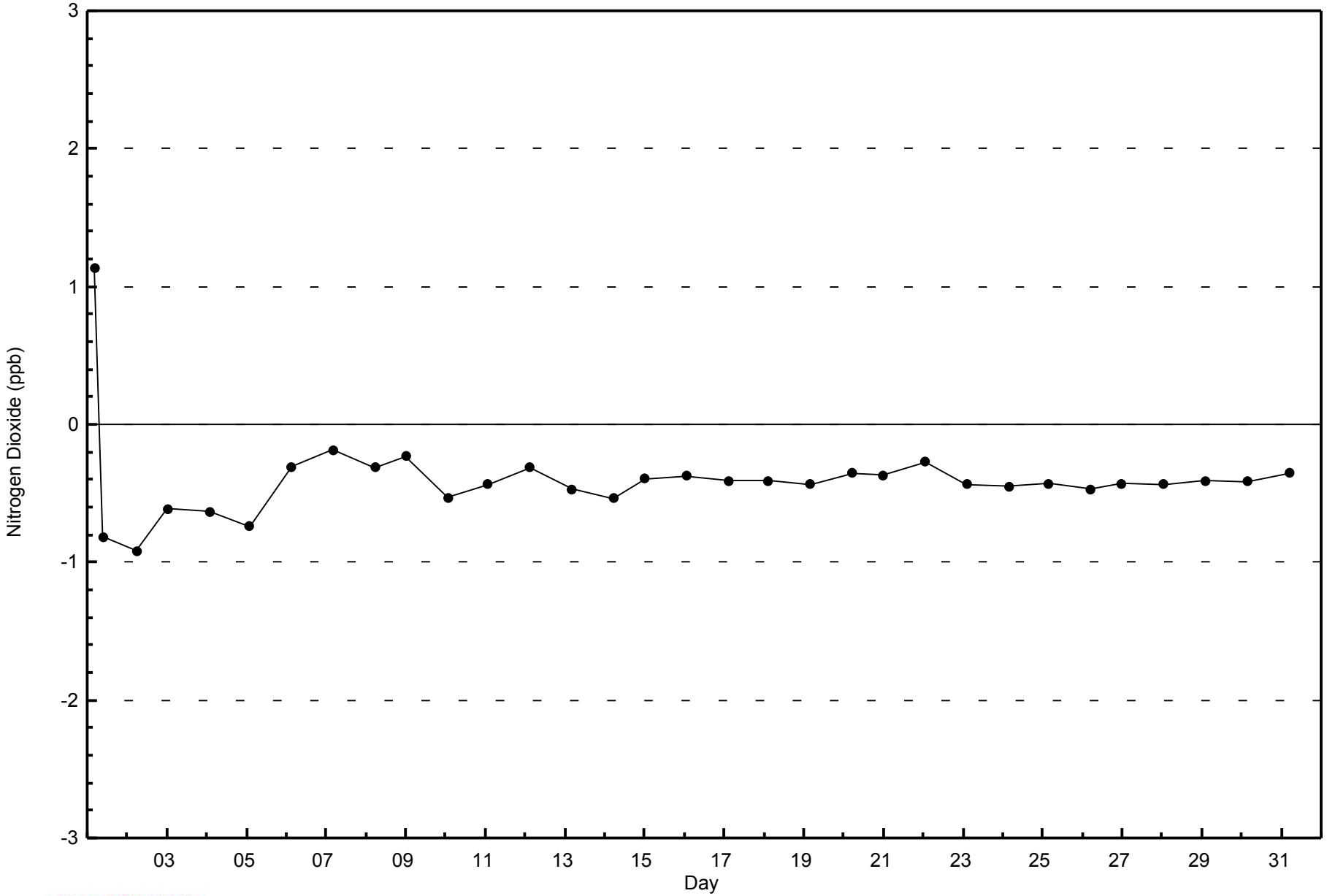
Total Number of Valid Hours: 680

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - August 2014



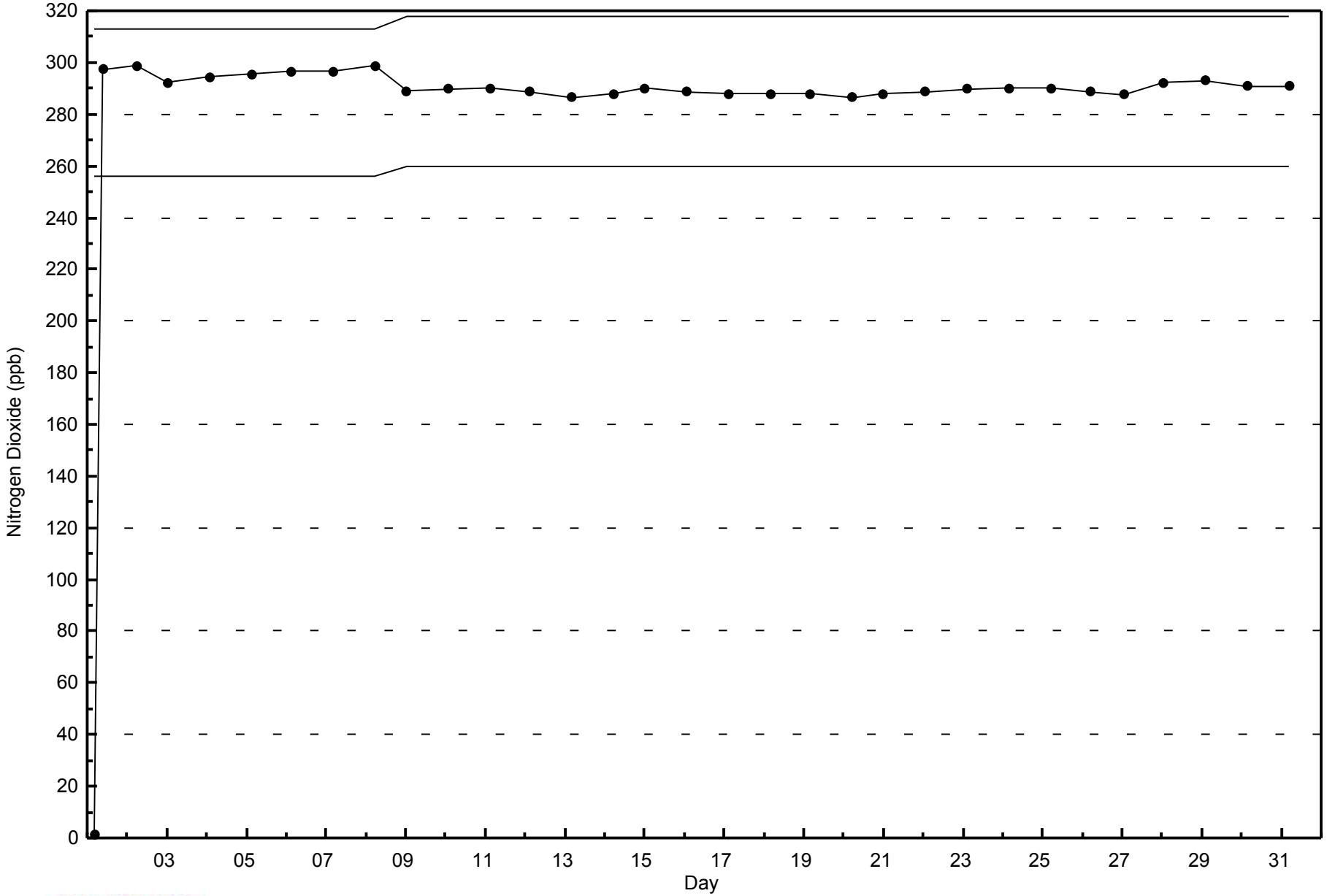
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

NOx (NO_X) - ppb

ConocoPhillips - Surmont - August 2014

Maximum Value: 40 ppb on Aug 1 22:00

Maximum Daily Average: 10.1 ppb on Aug 1

Minimum Value: 0 ppb on Aug 1 04:00

Minimum Daily Average: 2.5 ppb on Aug 30

Maximum Diurnal Average: 10.2 ppb at hour 8

Minimum Diurnal Average: 3.3 ppb at hour 20

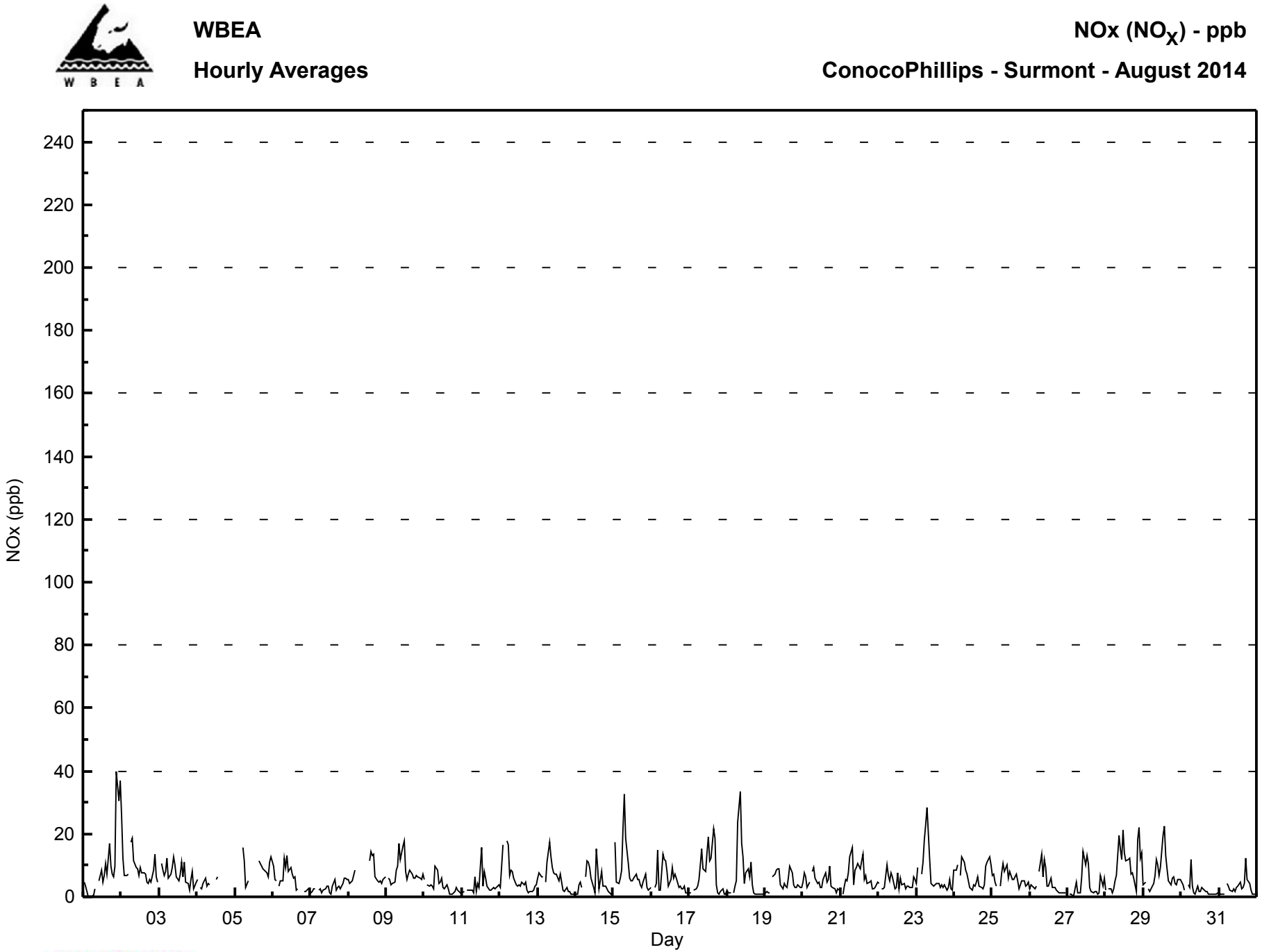
Monthly Average: 6.0 ppb

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 3$ Median = 5 $Q_3 = 8$ $P_{90} = 12$ $P_{99} = 25$

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	39
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-Aug	5	3	2	0	Z	0	0	3	M	Z	5	8	5	7	11	7	17	10	7	6	10	40	30	37	10.1	40
2-Aug	26	12	7	7	7	Z	18	19	12	9	9	7	9	8	8	7	5	4	6	5	9	13	7	5	9.4	26
3-Aug	Z	11	8	7	8	12	6	7	9	13	10	6	5	7	11	6	11	5	4	2	5	8	3	5	7.4	13
4-Aug	6	Z	3	2	4	6	3	4	4	UO	6	UO	5	6	UO	UO	UO	7	UO	UO	UO	UO	UO	UO	--	7
5-Aug	UO	UO	Z	UO	UO	16	11	3	5	UO	UO	UO	UO	UO	C	12	10	10	9	8	8	6	11	13	--	16
6-Aug	10	6	5	Z	3	5	5	13	9	13	8	9	7	6	6	2	2	UO	0	UO	2	2	3	2	5.7	13
7-Aug	1	2	3	2	Z	2	2	1	2	2	3	3	1	1	4	6	2	3	3	3	4	6	6	6	3.0	6
8-Aug	6	4	5	7	9	Z	14	C	C	C	C	C	C	11	15	13	13	7	5	5	5	4	5	6	--	15
9-Aug	Z	6	6	4	4	4	9	10	17	12	16	18	8	5	7	9	7	6	6	7	6	6	6	7	8.1	18
10-Aug	6	Z	4	3	4	4	3	10	9	4	5	6	3	2	4	2	1	1	1	2	3	2	2	1	3.5	10
11-Aug	1	2	Z	2	2	2	2	1	6	2	4	3	15	3	8	6	3	2	2	3	3	3	3	4	3.6	15
12-Aug	3	10	17	Z	18	16	7	8	8	6	4	3	4	4	5	4	5	2	1	1	2	2	4	4	5.9	18
13-Aug	6	8	7	6	Z	5	11	18	13	9	8	7	7	5	7	5	2	2	3	2	2	1	1	1	5.8	18
14-Aug	1	1	4	5	3	Z	6	12	11	9	6	3	1	15	9	2	8	4	3	3	2	2	1	1	4.9	15
15-Aug	Z	18	4	4	6	9	22	33	19	10	6	5	5	6	7	5	6	4	3	5	7	3	2	2	8.3	33
16-Aug	3	Z	3	4	15	2	2	14	12	12	8	4	6	9	6	7	6	3	4	3	2	3	1	1	5.6	15
17-Aug	1	1	Z	2	3	3	6	10	15	9	8	14	19	11	12	21	19	4	1	1	2	2	1	1	7.3	21
18-Aug	2	1	1	Z	1	3	5	24	33	17	13	4	8	9	7	11	4	1	1	1	1	1	1	1	6.6	33
19-Aug	1	2	1	1	Z	6	7	9	9	9	4	3	4	3	3	6	10	8	4	3	3	4	3	3	4.6	10
20-Aug	4	7	6	3	5	Z	8	9	6	4	5	3	3	6	8	5	5	10	3	3	3	1	2	2	4.9	10
21-Aug	Z	1	3	6	5	8	13	16	4	8	9	11	9	12	14	6	7	4	4	5	3	3	3	5	6.8	16
22-Aug	4	Z	2	2	3	10	7	5	7	6	3	3	7	3	6	4	4	3	3	3	3	3	7	6	4.6	10
23-Aug	4	9	Z	7	11	18	23	28	12	4	4	3	4	4	4	3	4	3	4	2	3	5	2	2	7.2	28
24-Aug	9	9	10	Z	7	13	11	8	7	5	3	2	4	3	5	6	4	3	2	4	10	11	13	10	6.9	13
25-Aug	7	7	5	3	Z	4	7	11	8	10	6	8	7	6	6	7	5	2	4	5	5	3	4	5	5.8	11
26-Aug	3	4	3	2	3	Z	8	13	6	12	9	3	3	6	3	3	3	2	1	1	1	1	1	1	4.1	13
27-Aug	Z	1	1	1	1	5	1	1	1	7	14	10	13	11	3	2	1	2	1	1	1	7	3	6	4.0	14
28-Aug	2	Z	2	2	1	3	5	7	19	15	12	21	14	11	12	12	7	8	6	2	18	22	12	14	10.0	22
29-Aug	4	4	Z	3	2	3	4	7	12	10	7	9	19	22	13	9	5	4	6	6	4	4	6	6	7.4	22
30-Aug	4	4	2	Z	4	3	12	3	1	1	3	2	2	3	3	2	2	1	1	1	1	1	1	1	2.5	12
31-Aug	1	1	1	1	Z	4	3	2	2	3	2	3	4	4	3	3	4	12	6	4	2	1	1	1	2.9	12
	4.8	5.3	4.4	3.5	5.3	6.4	7.8	10.2	9.6	8.2	6.9	6.5	7.0	7.0	7.2	6.5	6.1	4.5	3.5	3.3	4.3	5.7	4.8	5.3	Diurnal Average	
	26	18	17	7	18	18	23	33	33	17	16	21	19	22	15	21	19	12	9	8	18	40	30	37	Diurnal Maximum	

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


WBEA
Hourly Averages
NOx (NO_X) - ppb
ConocoPhillips - Surmont - August 2014
NOx (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	668	97.95	97.95
21 - 40	14	2.05	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: 682

Total Number of Hours: 744

WBEA

Frequency Distribution

NOx (NO_X) - ppb

ConocoPhillips - Surmont - August 2014

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	55	32	14	2	3	10	23	55	50	44	42	62	101	73	54	666
21 - 40	2	0	0	0	0	2	0	0	1	3	0	3	1	2	0	0	14
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	55	32	14	2	5	10	23	56	53	44	45	63	103	73	54	680

Total Number of Valid Hours: 680

Total Number of Hours: 744

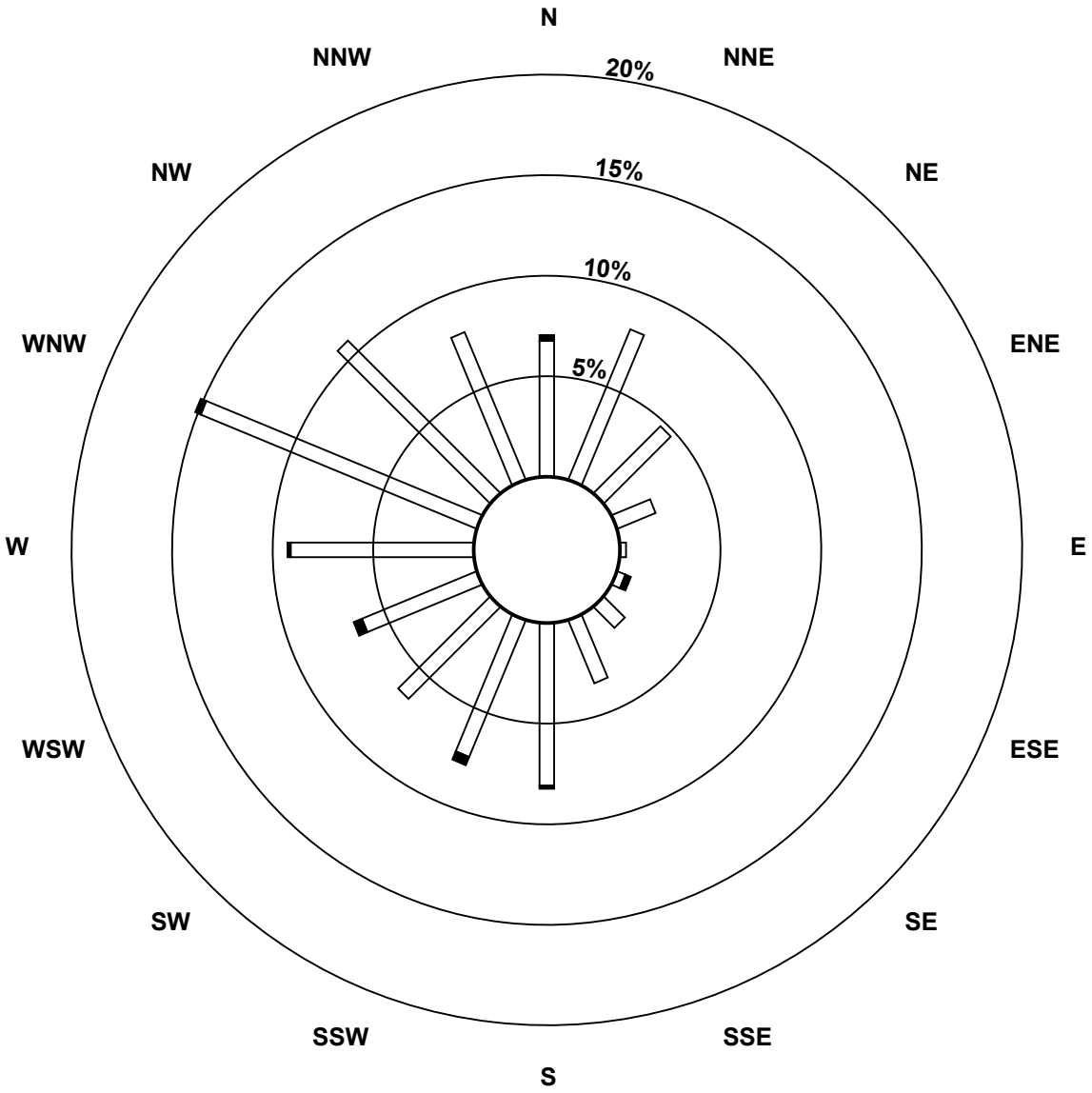
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

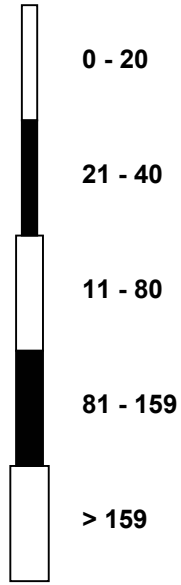
Wind Rose Aug 2014

NOx (NO_X) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



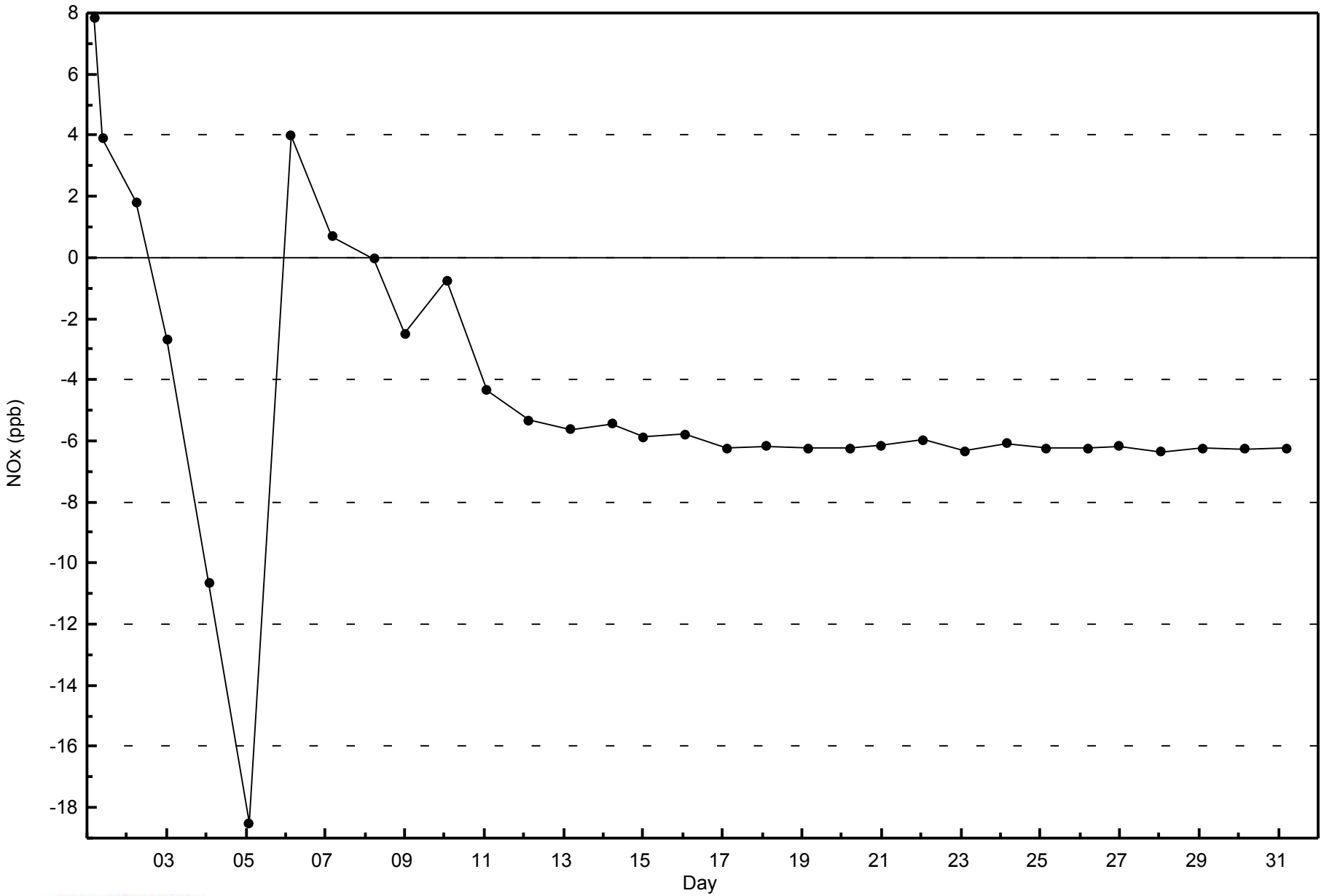
Total Number of Valid Hours: 680

Wood Buffalo Environmental Association

Zero Responses

NOx (NO_X) - ppb

ConocoPhillips - Surmont - August 2014



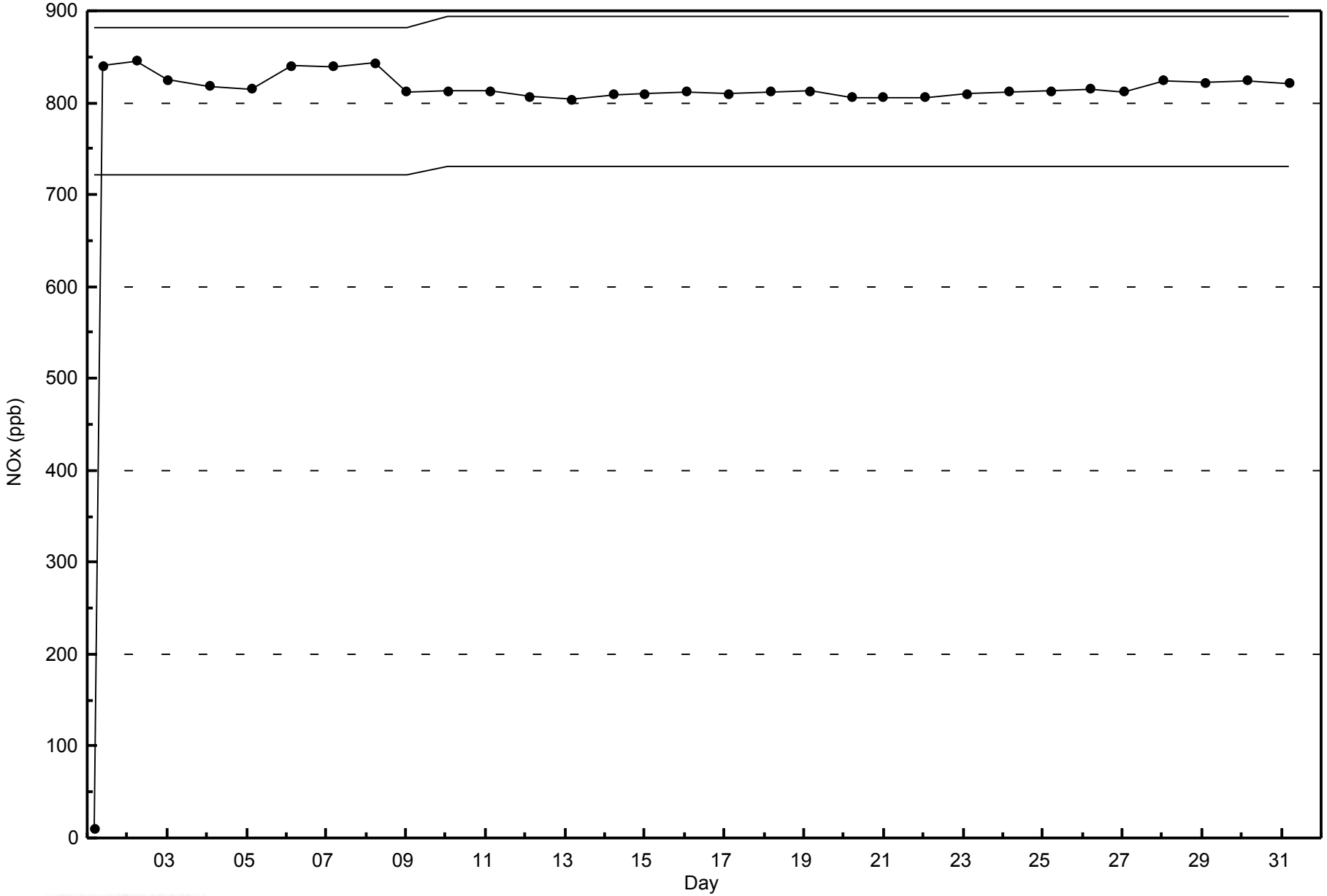
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

NOx (NO_X) - ppb

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

ConocoPhillips - Surmont - August 2014

Maximum Value: 28.8 C on Aug 4 16:00

Maximum Daily Average: 24.2 C on Aug 4

Minimum Value: 5.6 C on Aug 22 06:00

Minimum Daily Average: 9.7 C on Aug 21

Maximum Diurnal Average: 21.4 C at hour 16

Minimum Diurnal Average: 13.6 C at hour 6

Monthly Average: 17.30 C

Percentiles: P_1 = 6.6 P_{10} = 10.6 Q_1 = 13.1 Median = 17.4 Q_3 = 21.1 P_{90} = 25.0 P_{99} = 28.0

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

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Aug	14.6	14.0	13.5	13.0	12.5	11.9	10.9	11.1	M	12.3	13.3	14.8	16.4	17.5	18.4	19.0	19.2	19.0	18.9	17.9	15.1	14.2	13.8	14.5	15.0	19.2
2-Aug	14.1	13.9	13.5	13.4	13.3	13.1	13.5	16.1	18.1	19.1	20.0	21.2	21.9	20.9	21.2	21.6	21.7	20.9	20.2	19.3	18.2	17.6	17.4	17.6	17.8	21.9
3-Aug	17.0	15.6	15.3	14.7	13.9	14.8	16.2	18.8	20.7	22.2	23.4	24.2	25.5	26.1	26.4	26.6	26.7	26.8	26.4	24.6	23.0	21.0	20.0	20.0	21.2	26.8
4-Aug	19.3	19.1	19.4	19.6	19.2	19.4	20.7	22.8	24.8	26.1	26.8	27.7	27.3	25.9	28.6	28.8	28.8	28.6	27.8	25.6	24.8	24.3	23.4	22.3	24.2	28.8
5-Aug	21.0	19.6	19.9	18.9	19.7	19.0	18.7	19.2	20.9	22.9	24.1	24.8	25.8	26.7	27.6	27.9	27.7	26.8	26.1	24.0	22.3	21.6	20.0	18.8	22.7	27.9
6-Aug	18.0	17.9	17.2	16.5	16.6	16.8	18.1	19.5	18.4	21.8	23.5	24.5	25.0	25.6	25.8	26.2	25.5	25.3	24.0	23.0	21.5	21.0	20.5	19.5	21.3	26.2
7-Aug	18.5	18.0	17.5	16.9	16.2	15.7	15.7	17.2	18.4	18.6	19.6	20.3	20.9	21.2	21.7	21.8	21.8	21.7	21.1	19.8	17.4	16.4	15.8	15.3	18.7	21.8
8-Aug	14.5	14.0	13.7	13.3	13.8	13.1	14.2	15.6	16.7	18.3	19.2	20.1	21.2	20.8	20.6	20.2	19.6	16.9	14.0	13.4	13.1	12.8	12.2	11.9	16.0	21.2
9-Aug	11.7	11.6	11.4	11.0	10.8	10.7	10.8	10.8	11.1	11.2	12.3	14.1	14.0	14.8	16.3	17.5	17.5	17.5	16.8	16.0	14.1	13.8	13.6	13.1	13.4	17.5
10-Aug	12.9	12.8	12.9	13.0	13.3	14.0	14.5	14.5	16.6	18.9	19.4	20.8	21.3	21.3	22.7	22.4	22.2	22.3	22.0	20.4	17.9	17.2	16.6	15.7	17.7	22.7
11-Aug	15.5	15.1	14.9	14.6	14.2	14.4	15.8	18.7	21.2	23.1	24.0	24.3	24.7	24.7	25.1	25.2	24.9	24.1	23.5	22.4	20.3	20.9	20.4	19.6	20.5	25.2
12-Aug	19.3	18.1	17.1	17.0	16.0	17.0	17.6	17.6	18.2	19.5	21.3	22.5	23.7	24.6	25.2	25.6	25.8	25.6	24.8	23.6	21.7	20.6	19.6	19.6	20.9	25.8
13-Aug	19.3	19.5	19.2	18.8	17.9	17.5	17.6	19.2	21.4	23.3	25.6	27.0	28.1	28.0	28.5	28.2	27.3	26.9	26.0	24.6	23.0	22.4	21.7	21.3	23.0	28.5
14-Aug	21.0	20.5	20.8	20.4	19.8	19.2	19.0	20.4	23.0	24.4	24.9	25.6	26.1	26.5	26.6	26.2	25.7	25.2	24.4	22.2	20.4	20.5	20.1	19.9	22.6	26.6
15-Aug	19.6	19.4	18.9	18.3	18.5	18.3	18.9	20.6	22.7	24.1	24.7	25.1	25.7	26.5	27.2	27.6	27.7	27.6	26.8	25.1	22.7	22.2	21.6	20.9	22.9	27.7
16-Aug	19.4	18.7	18.5	18.2	18.8	18.7	20.2	21.1	21.8	22.9	24.7	25.4	26.4	27.2	27.2	27.3	26.0	23.3	22.5	22.5	22.3	22.0	21.8	21.3	22.4	27.3
17-Aug	21.2	20.7	20.4	20.4	19.9	19.1	19.0	19.6	20.8	21.9	22.7	24.1	25.1	25.8	26.1	26.3	26.4	25.5	24.8	22.7	20.7	19.6	18.7	18.5	22.1	26.4
18-Aug	18.7	17.9	17.4	17.1	16.5	16.2	16.9	17.9	18.4	19.1	21.7	22.7	23.4	23.2	23.5	23.1	22.6	22.1	21.3	20.3	18.5	17.7	17.3	16.9	19.6	23.5
19-Aug	16.5	16.2	15.8	16.0	15.8	15.4	15.2	15.2	15.5	16.3	17.6	18.9	19.8	20.7	21.1	20.7	16.9	16.3	14.5	14.6	14.4	13.8	13.5	13.0	16.4	21.1
20-Aug	13.1	12.5	12.3	12.2	11.6	11.1	11.2	11.1	10.5	10.3	10.5	11.7	12.6	12.7	13.2	13.4	12.6	11.7	11.0	10.4	9.9	9.7	9.6	8.1	11.4	13.4
21-Aug	7.2	6.6	6.8	6.1	5.6	5.6	6.3	7.5	8.9	10.0	10.6	11.5	12.0	12.6	13.2	13.7	13.7	13.4	12.8	11.8	10.7	9.7	8.8	8.4	9.7	13.7
22-Aug	8.5	8.4	6.8	5.7	6.0	5.6	7.5	8.6	9.6	11.8	12.0	12.6	13.8	13.8	14.5	13.8	14.7	14.5	13.6	12.0	11.5	11.1	10.8	10.6	10.7	14.7
23-Aug	10.2	9.6	9.8	9.8	9.6	9.7	9.0	9.4	9.9	11.3	12.6	13.9	14.2	14.3	15.0	14.9	14.9	14.8	13.9	12.6	11.7	11.2	10.9	11.0	11.8	15.0
24-Aug	10.1	10.8	10.4	10.2	10.1	10.0	10.4	10.8	12.0	13.4	14.3	15.3	15.6	16.2	16.2	16.4	16.4	16.1	15.4	13.8	12.8	11.7	11.7	10.7	13.0	16.4
25-Aug	11.0	10.6	10.6	10.9	10.9	10.7	11.0	12.4	13.1	15.3	16.5	17.3	17.8	18.4	18.7	18.5	18.8	18.4	17.6	16.5	15.0	14.4	14.0	14.0	14.7	18.8
26-Aug	14.1	13.9	13.2	12.8	12.3	12.2	13.4	14.6	17.2	20.0	21.8	22.9	23.2	23.7	24.0	24.0	23.4	22.2	20.5	19.6	18.7	18.1	18.5	18.7	18.5	24.0
27-Aug	18.2	17.7	16.9	15.9	15.7	15.6	15.6	16.4	16.5	17.4	18.7	18.6	19.0	19.6	19.6	20.6	20.9	20.1	19.4	16.9	15.0	13.0	12.3	12.7	17.2	20.9
28-Aug	11.4	10.7	11.3	11.4	10.1	9.1	9.0	10.4	11.3	12.0	11.7	11.7	11.3	12.1	12.6	13.0	13.3	13.4	13.2	11.0	9.5	8.5	8.0	7.8	11.0	13.4
29-Aug	7.3	7.3	6.8	7.1	7.7	8.3	9.6	11.8	14.1	14.9	16.1	17.1	17.9	18.6	18.9	18.8	19.1	18.3	17.5	16.3	15.5	14.6	14.3	13.8	13.8	19.1
30-Aug	13.3	12.5	11.9	11.6	11.2	10.8	10.4	10.5	11.4	11.9	13.7	14.9	15.9	16.8	17.4	17.8	18.8	18.2	17.2	14.2	13.3	12.7	12.0	11.6	13.8	18.8
31-Aug	11.3	10.8	10.2	9.6	9.2	8.9	8.9	11.0	13.3	13.6	14.2	15.1	15.9	17.5	17.4	16.0	14.9	10.9	10.7	10.4	10.4	10.1	10.0	9.3	12.1	17.5
	15.1	14.6	14.3	14.0	13.8	13.6	14.1	15.2	16.6	17.7	18.8	19.7	20.4	20.8	21.3	21.4	21.2	20.5	19.6	18.3	16.9	16.3	15.8	15.4	Diurnal Average	
	21.2	20.7	20.8	20.4	19.9	19.4	20.7	22.8	24.8	26.1	26.8	27.7	28.1	28.0	28.6	28.8	28.8	28.6	27.8	25.6	24.8	24.3	23.4	22.3	Diurnal Maximum	

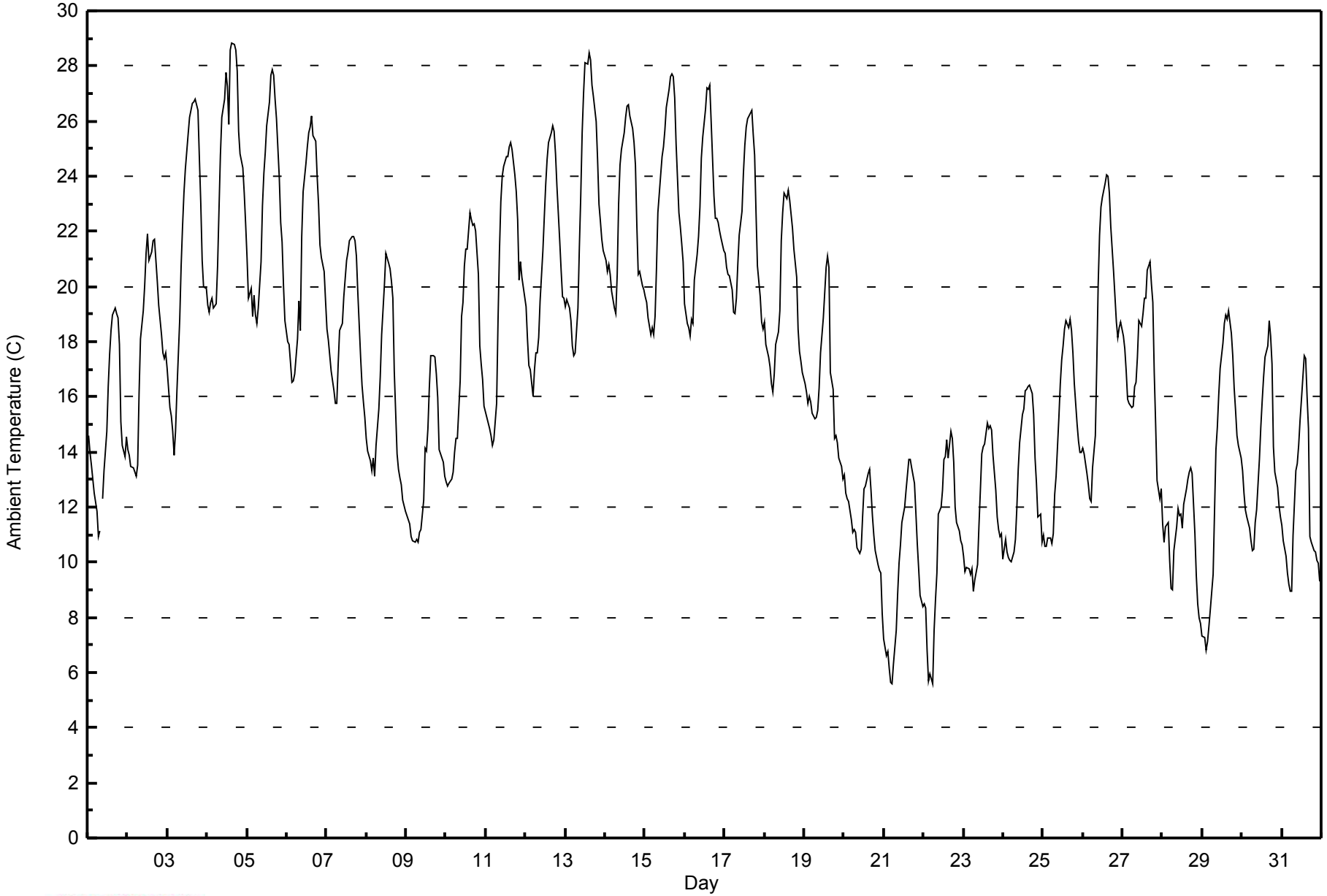
M - Maintenance

WBEA

Hourly Averages

Ambient Temperature (AT) - C

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	54	7.27	7.27
10 - 20	454	61.10	68.37
> 20	235	31.63	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

ConocoPhillips - Surmont - August 2014

Maximum Value: 100 % on Aug 20 10:00

Maximum Daily Average: 87.6 % on Aug 20

Minimum Value: 25 % on Aug 17 14:00

Minimum Daily Average: 42.5 % on Aug 4

Maximum Diurnal Average: 75.1 % at hour 6

Minimum Diurnal Average: 45.2 % at hour 16

Monthly Average: 61.9 %

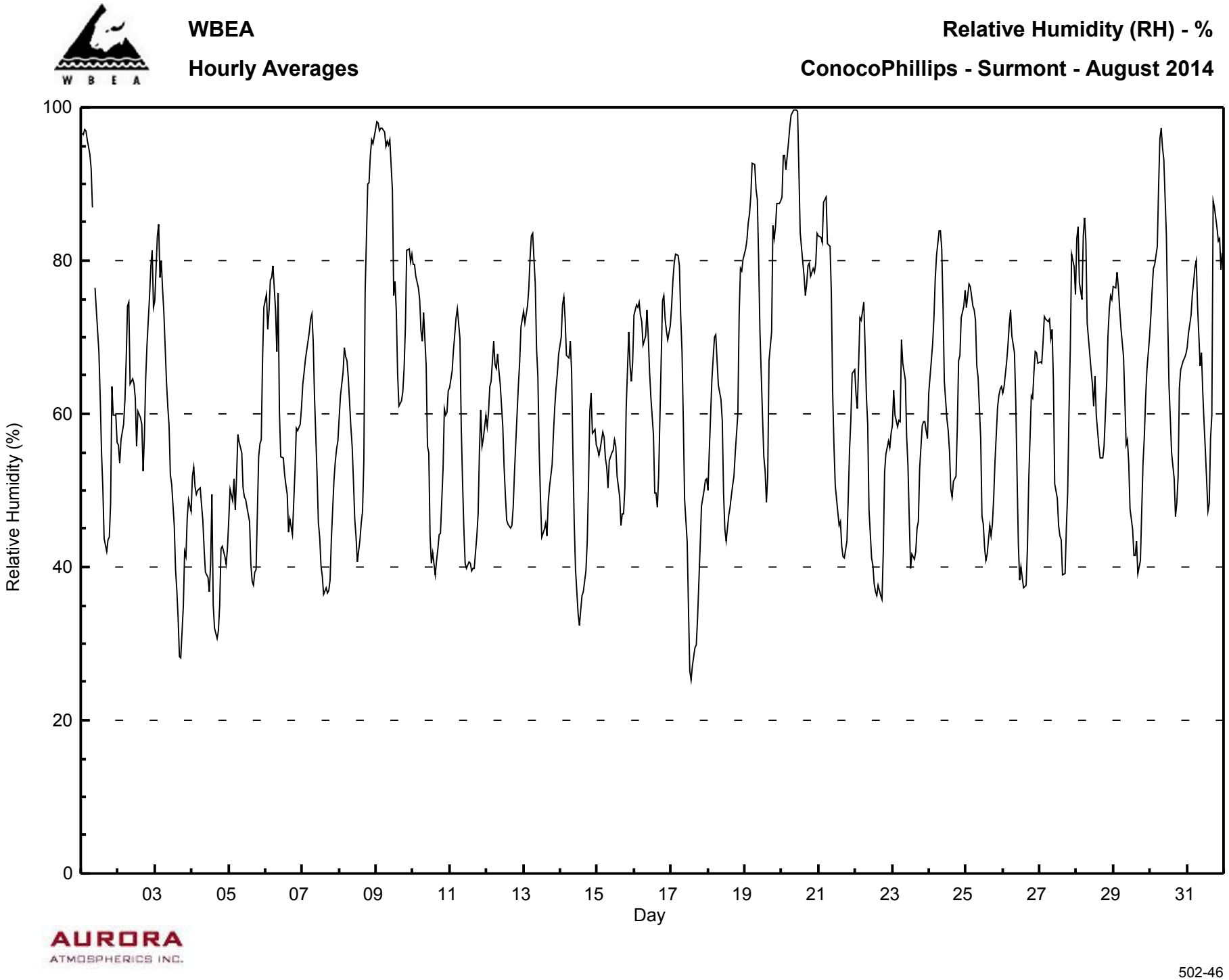
Percentiles: P_1 = 31 P_{10} = 41 Q_1 = 49 Median = 61 Q_3 = 73 P_{90} = 83 P_{99} = 98

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-Aug	97	96	97	97	96	94	92	87	M	76	74	68	62	55	50	44	42	44	44	48	64	60	60	56	69.6	97
2-Aug	56	54	57	59	62	67	74	75	64	65	64	62	56	60	59	59	53	57	65	69	75	79	81	74	64.3	81
3-Aug	75	83	85	78	80	76	73	64	61	59	52	51	45	40	37	33	28	28	35	42	41	46	49	47	54.5	85
4-Aug	52	53	51	49	50	50	48	46	42	39	39	37	40	50	35	32	31	32	35	42	43	41	40	42	42.5	53
5-Aug	46	50	49	51	48	52	57	56	55	50	49	49	48	46	40	38	38	39	40	54	56	57	67	74	50.4	74
6-Aug	76	71	74	78	78	79	74	68	76	60	54	54	52	51	49	45	46	44	49	53	58	58	59	61	61.0	79
7-Aug	64	66	67	68	71	72	73	70	62	52	46	44	40	39	36	37	37	37	38	44	51	54	56	56	53.3	73
8-Aug	59	62	65	69	67	67	65	58	56	51	46	44	41	43	46	47	54	76	90	90	94	96	95	97	65.8	97
9-Aug	98	98	97	97	97	97	95	96	95	96	89	75	77	73	65	61	62	63	66	71	81	82	80	81	83.0	98
10-Aug	80	79	78	76	75	71	69	73	66	56	55	44	40	42	39	41	42	44	44	53	61	60	60	63	58.9	80
11-Aug	63	66	68	70	73	74	70	58	51	45	41	40	41	40	39	40	40	44	47	55	61	56	57	60	54.1	74
12-Aug	58	60	64	64	70	66	66	68	66	64	58	53	49	46	46	45	45	48	52	56	64	67	71	72	59.1	72
13-Aug	73	72	74	76	80	83	84	77	68	65	55	49	44	45	46	44	48	51	53	57	61	63	65	68	62.6	84
14-Aug	70	74	75	72	68	67	69	65	55	46	40	34	32	34	36	37	40	43	51	60	63	58	58	56	54.3	75
15-Aug	55	55	55	58	57	54	53	50	54	55	55	57	56	52	49	45	47	47	50	61	71	66	64	67	55.6	71
16-Aug	73	74	74	75	73	72	69	70	74	70	66	62	57	50	50	48	52	67	75	75	72	71	70	72	67.1	75
17-Aug	74	77	80	81	81	79	73	68	59	49	43	34	26	25	27	29	30	33	38	43	48	50	51	52	52.2	81
18-Aug	50	55	64	67	70	70	67	64	62	59	50	45	43	47	48	49	51	52	55	60	73	79	79	80	60.0	80
19-Aug	82	83	85	86	88	93	93	89	88	80	71	60	54	52	49	52	67	71	85	83	84	87	87	88	77.3	93
20-Aug	88	94	94	92	95	98	99	99	100	100	99	92	84	82	78	75	77	79	80	78	79	78	80	84	87.6	100
21-Aug	83	83	82	88	88	88	82	82	76	63	56	51	47	45	46	43	41	41	43	49	55	59	65	66	63.5	88
22-Aug	63	61	66	73	72	75	69	62	59	47	41	40	38	37	36	38	36	36	42	52	55	56	56	58	52.8	75
23-Aug	58	63	60	58	59	59	70	67	64	57	53	46	40	42	41	42	45	46	53	59	59	59	58	57	54.8	70
24-Aug	63	67	69	73	78	81	84	84	81	74	64	59	58	55	50	49	51	52	58	67	68	73	74	76	67.0	84
25-Aug	74	75	77	77	74	73	72	66	65	57	47	46	43	41	42	45	44	46	49	54	61	62	63	63	59.0	77
26-Aug	63	64	67	69	72	73	70	68	62	52	43	38	40	37	37	38	43	51	62	62	65	68	68	67	57.5	73
27-Aug	67	67	69	73	72	72	72	70	71	64	51	49	45	44	44	39	39	45	50	60	68	81	79	76	61.2	81
28-Aug	83	84	77	75	83	86	82	72	68	66	64	61	65	60	56	54	54	54	56	64	70	73	75	75	69.1	86
29-Aug	77	76	78	77	74	71	68	62	56	57	53	48	45	42	42	43	39	41	47	54	57	62	66	70	58.5	78
30-Aug	73	76	79	79	82	90	96	97	95	93	83	73	64	60	55	52	47	48	52	63	66	67	67	68	71.8	97
31-Aug	69	70	73	76	77	79	80	74	66	68	63	59	55	47	48	57	60	88	87	84	83	83	79	81	71.1	88
	69.7	71.3	72.6	73.5	74.5	75.1	74.4	71.2	67.2	62.4	56.9	52.3	49.3	47.8	45.9	45.2	46.1	49.9	54.5	60.1	64.7	66.2	67.1	67.9	Diurnal Average	
	98	98	97	97	97	98	99	99	100	100	99	92	84	82	78	75	77	88	90	90	94	96	95	97	Diurnal Maximum	

M - Maintenance

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Relative Humidity (RH) - %
ConocoPhillips - Surmont - August 2014
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	59	7.94	7.94
40 - 60	296	39.84	47.78
60 - 80	288	38.76	86.54
80 - 100	100	13.46	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - August 2014

Maximum Speed: 28 km/h on Aug 27 08:00

Maximum Daily Speed Average: 19.4 km/h on Aug 7

Minimum Speed Value: 0 km/h on Aug 23 01:00

Minimum Daily Speed Average: 2.9 km/h on Aug 8

Maximum Diurnal Speed Average: 8.0 km/h at hour 2

Minimum Diurnal Speed Average: 3.1 km/h at hour 11

Monthly Average Velocity: 5.4 km/h 299.7 deg

Percentiles: $P_1 = 1$ $P_{10} = 5$ $Q_1 = 8$ Median = 11 $Q_3 = 15$ $P_{90} = 19$ $P_{99} = 25$

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

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Aug	N19	N19	N18	N17	N15	N19	N19	N17	M	N17	N15	N15	N12	NNE13	NNE14	N12	NNW13	NNW11	N6	WNW2	W5	WSW5	SSW6	S7	N11.2	N19
2-Aug	SSW9	SSW11	SSW14	SSW13	SSW12	SSW15	SSW14	SSW13	SSW17	S17	S16	S15	SSW16	S16	SSW17	SSW14	SW14	SSW12	SSW13	S10	S7	SSW7	WSW12	W11	SSW12.4	SSW17
3-Aug	SE2	WSW0	NW1	WSW4	SW5	SW8	WSW7	WSW7	W4	NNW1	SE5	SE5	WSW4	NW7	N11	N12	N13	N9	WNW7	W3	WSW5	WSW9	WSW10	WSW10	WNW2.9	N13
4-Aug	WSW11	WSW11	WSW12	W14	W16	W15	W16	W14	W13	W11	W13	WNW12	NW10	WSW8	W2	N7	N11	NNW12	NW7	NW7	N8	N6	NE4	SE3	WNW7.7	W16
5-Aug	SSE2	S3	S5	SSW7	SSW5	S4	ESE3	SE4	SE4	ESE5	ESE7	SSE9	SSE10	SSE11	SSE10	S12	S14	S13	S9	SSW15	SW11	SSW8	SSW12	SSW11	S7.2	SSW15
6-Aug	SSW9	SSW10	SW10	SW10	SW12	SW9	SW8	SSW8	S13	SSW15	SSW15	SSW13	SSW16	SW16	W15	WNW20	WNW19	WNW17	WNW16	W12	W10	WNW15	WNW21	WNW20	WSW10.9	WNW21
7-Aug	WNW21	WNW22	WNW24	WNW26	NW20	WNW23	WNW22	WNW19	NW22	NW26	NW23	NW25	NW27	NW26	NW25	NW23	NW19	NW19	NW15	WNW9	WNW11	W10	W11	W12	WNW19.4	NW27
8-Aug	W13	WNW14	NW9	NNW10	NNW7	NW5	NNW4	NE8	NE6	E5	ESE6	SE5	SE6	SSE8	SSE8	S8	S6	NW10	NW12	NW10	N5	NNE12	NE15	NE15	N2.9	NE15
9-Aug	NE17	NNE18	NNE20	NNE21	NNE20	NNE17	NNE15	NNE14	NNW15	NNW14	N12	NNW16	NNW20	NW18	NNW18	NW16	NW13	NW10	NW13	WNW9	WNW12	WNW13	WNW14	WNW15	NNW12.3	NNE21
10-Aug	W15	W15	W18	WNW18	WNW18	WNW18	WNW20	WNW18	WNW15	WNW9	W10	WNW17	NW15	NW12	WNW12	WNW12	WNW12	WNW11	NW10	W8	W10	W11	W13	W13	WNW13.5	WNW20
11-Aug	W14	WNW16	W15	W15	WNW17	WNW18	WNW17	WNW17	WNW11	NW13	NW18	NW18	NNW17	NW17	NNW15	N13	NNE14	NNE11	NE8	N7	NNW7	N10	NNE9	NNE6	NW10.7	NW18
12-Aug	NNE5	AF	AF	S4	SSW4	S5	SSE7	S9	S9	S9	S10	S12	SSE12	SSE11	SSE11	S12	S12	S10	S9	S8	SSE9	S10	S9	SSW10	S8.3	S12
13-Aug	SW10	SW11	SW12	SW10	SW10	SW11	SW11	SSW13	SSW15	SSW15	SSW19	SW20	WSW21	WSW20	WSW17	W22	W18	W12	WSW9	WSW12	W12	W18	WNW23	WNW24	WSW13.5	WNW24
14-Aug	WNW23	NW18	NNW18	NNW15	NNW11	NNW13	NNW12	NNW11	NNE11	NNE13	NNE16	NE14	NE12	NE10	ENE9	ENE10	ENE9	NE7	NE4	WNW2	WNW8	W9	W8	WSW7	N7.7	WNW23
15-Aug	WSW8	WSW7	WSW6	WSW9	WSW8	WSW7	WSW6	WSW6	SW6	SW7	S9	S11	S10	SSE10	SSE8	SE7	ENE8	ENE7	ENE7	WNW1	WNW3	NW4	W5	WNW7	SW3.4	S11
16-Aug	NW7	NW8	NW5	WNW3	SW4	W7	W8	W4	NNE1	ESE5	SSE6	S10	S13	S13	S13	SSW8	SSW11	SSE7	SW1	W7	W8	W9	WNW11	WNW14	WSW4.2	WNW14
17-Aug	WNW19	WNW19	NW15	NW14	NNW15	NNW15	NNW14	NNW15	N14	NNE15	NE11	N15	N19	NNE20	NNE22	N21	N17	NNW18	NW12	NW10	WNW4	WSW2	W11	W11	NNW12.3	NNE22
18-Aug	W9	WNW13	WNW18	WNW18	WNW19	WNW19	WNW19	WNW19	WNW20	WNW20	WNW20	WNW15	W12	WNW15	WNW20	WNW21	WNW22	NW21	NW19	NW19	NW21	NW12	WNW13	WNW14	WNW17.0	WNW22
19-Aug	NW10	NW8	WNW9	NW8	NE9	NE11	NE10	NE7	ENE6	ESE6	S7	S8	SSW9	SE6	SSE5	ENE6	NNE21	NNE14	NE11	NNE14	NNE13	NNE10	NNW7	NNW8	NNE4.8	NNE21
20-Aug	N13	N14	NNE17	NNE15	N7	NNE15	NE12	NNE16	NNE18	NE15	NNE16	NE16	NE17	NNE16	NNE14	NE18	NNE20	NNE17	NNE17	NE15	NE11	NE12	NNE11	NNW11	NNE14.4	NNE20
21-Aug	NW8	NW8	NNW11	NNW9	NW10	NNW11	NNW12	N14	NE14	NE15	NNE16	NE16	NNE15	NNE12	NNE12	NNE11	NE13	NE14	NE12	NNE10	NNE11	NNE9	NNE7	N7	NNE10.1	NNE16
22-Aug	N5	NNW6	NNW5	NW5	NW5	NW4	N7	NE11	NE8	ENE7	E7	E7	NNE6	NE9	ENE10	ENE8	ENE9	ENE8	NNE7	NNE6	NNE8	NNE7	ENE5	NE4	NE5.6	NE11
23-Aug	SSE0	WSW3	SW5	SW5	SW4	S4	ESE1	ESE3	SE5	S7	S8	S11	S9	SSE7	SE6	SSE6	S8	S8	SSE6	SE5	SE6	SSE4	SSE6	S6	S4.9	S11
24-Aug	SW5	S4	SW3	S5	S4	S4	S4	S6	SSW9	S11	S11	SSE9	SSE10	SSE11	SSE10	S10	S11	S9	S7	S7	SSW6	WSW7	SW6	WSW8	S6.7	S11
25-Aug	SW8	SW9	WSW9	WSW10	WSW11	WSW11	WSW10	WSW11	WSW13	SW14	SW17	SSW17	SW15	WSW15	SW15	SSW12	SSW12	SW12	SW10	SW10	SW9	SW12	SW13	SW13	SW11.7	SSW17
26-Aug	SW13	WSW12	WSW12	W14	W13	W12	WNW16	WNW18	WNW11	WNW11	W13	WNW14	WNW12	W11	WNW12	WNW13	W12	WSW11	WNW11	WNW10	W10	W11	WNW14	WNW17	W12.1	WNW18
27-Aug	WNW18	WNW20	WNW20	WNW23	WNW22	WNW21	WNW23	NW28	NNW22	NNW20	NNW17	N17	N14	NNW15	NNW13	NW14	NW11	NW11	NW10	WNW10	NW13	W9	W10	N13	NW15.0	NW28
28-Aug	NNW10	NNW10	NNW12	NNW16	NNW17	NNW17	NNW17	NNW19	N21	N20	N21	N20	N17	N18	N17	N17	NE15	NNE13	NNE9	NW7	W4	W9	W9	W10	NNW12.7	N21
29-Aug	W11	WNW10	W10	W10	W12	W11	W11	W10	WSW9	SSW11	SSW14	SSW16	SSW15	SSW15	SSW14	SSW14	SW14	SW12	SW10	SSW8	SSW10	SSW11	SW12	SW12	SW10.0	SSW16
30-Aug	SSW11	SSW11	SSW12	SW10	WSW7	WSW9	WSW6	WNW8	NNW8	NW11	NW19	NW22	NNW21	N18	N18	N15	NW15	NW11	NW12	WNW12	WNW13	WNW16	WNW17	NW19	NW9.6	NW22
31-Aug	NW21	NW21	NW20	NW19	NW20	NW18	NW17	NW13	NNW14	NNW13	NW14	NNW14	NNW16	N15	NNW18	NNW12	NNW17	NNE10	WNW9	WNW10	WNW14	NW16	NW16	NW17	NW14.6	NW21
	WNW7.4	WNW8.0	WNW7.7	WNW7.7	WNW7.6	WNW7.2	WNW7.3	NW6.6	NW4.8	NW3.6	WNW3.1	WNW3.4	WNW4.1	NW3.7	NW3.8	NW4.6	NNW4.7	NNW4.4	NW4.2	WNW4.5	WNW4.9	WNW5.7	W6.9	WNW7.7	Diurnal Average	
	WNW23	WNW22	WNW24	WNW26	WNW22	WNW23	WNW23	NW28	NW22	NW26	NW23	NW25	NW27	NW26	NW25	NW23	WNW22	NW21	NW19	NW19	NW21	W18	WNW23	WNW24	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure

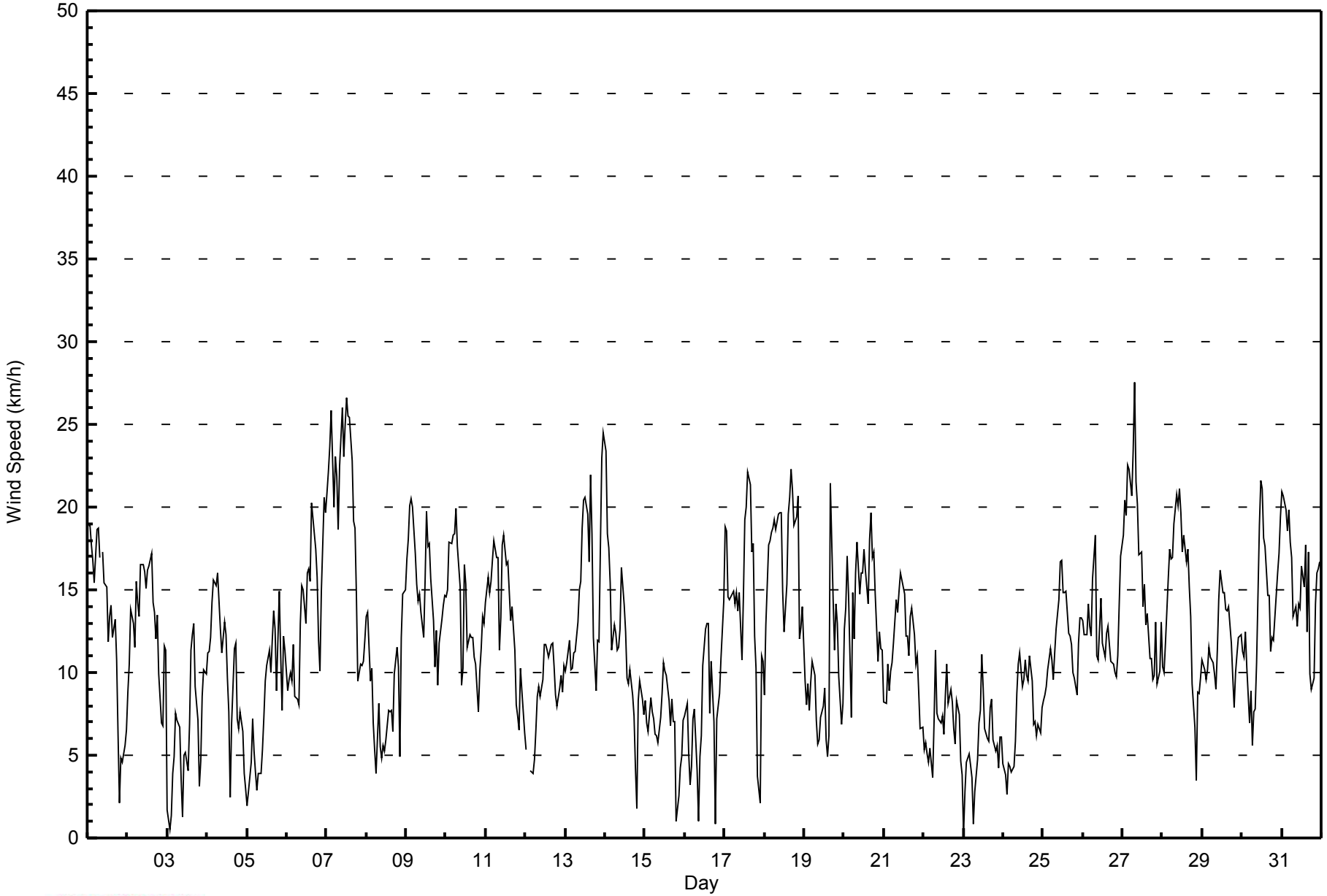
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - August 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	78	10.53	10.53
6 - 11	294	39.68	50.20
12 - 19	307	41.43	91.63
20 - 28	62	8.37	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - August 2014

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	1	1	5	9	4	11	2	8	7	7	6	7	3	78
6 - 11	12	18	15	13	2	3	5	23	35	22	22	31	32	22	23	16	294
12 - 19	35	29	19	0	0	0	0	1	14	32	17	8	30	54	34	34	307
20 - 28	5	7	0	0	0	0	0	0	0	0	1	2	1	25	17	4	62
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	54	56	37	14	3	8	14	28	60	56	48	48	70	107	81	57	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

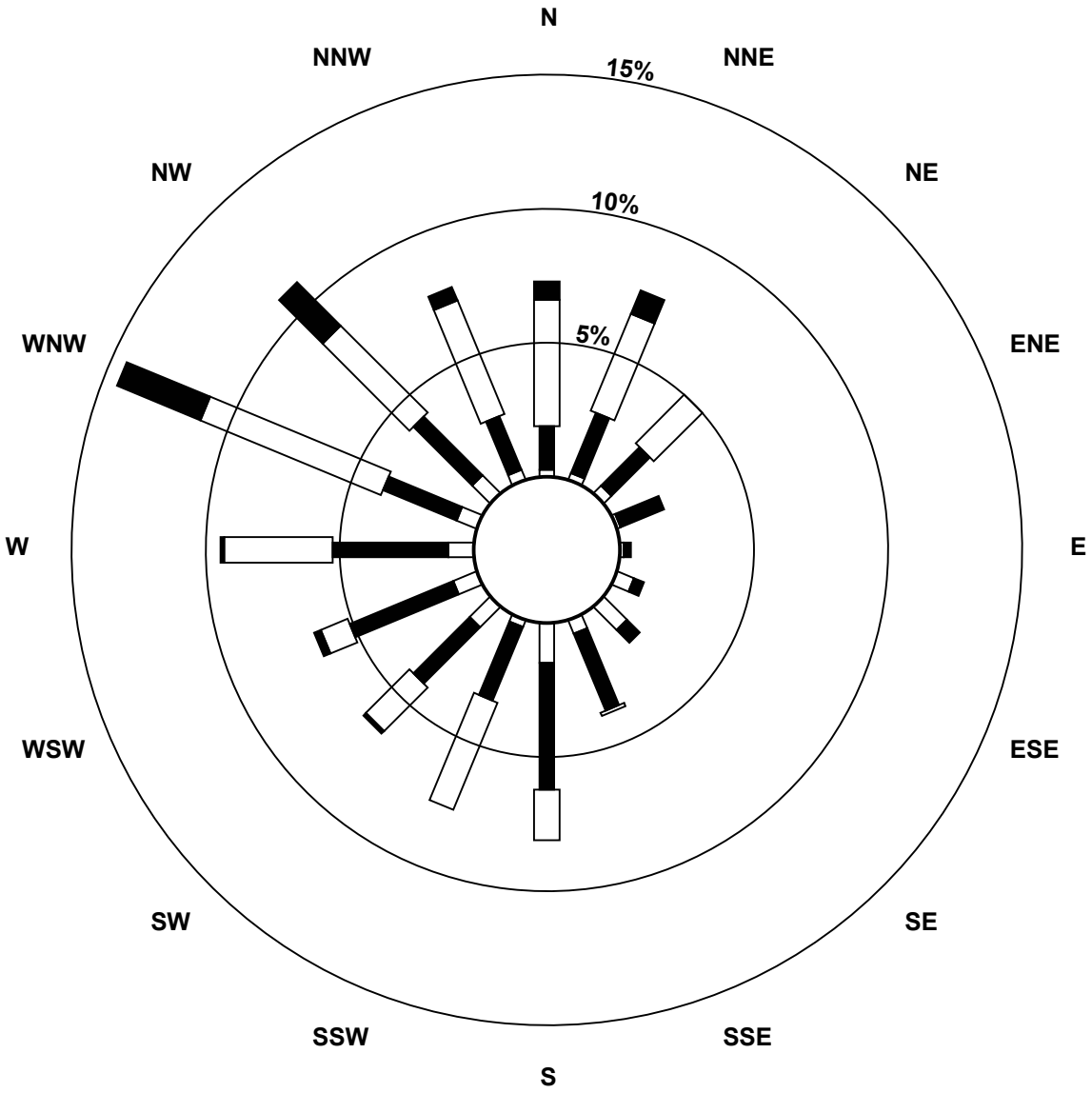
AURORA ATMOSPHERICS INC.

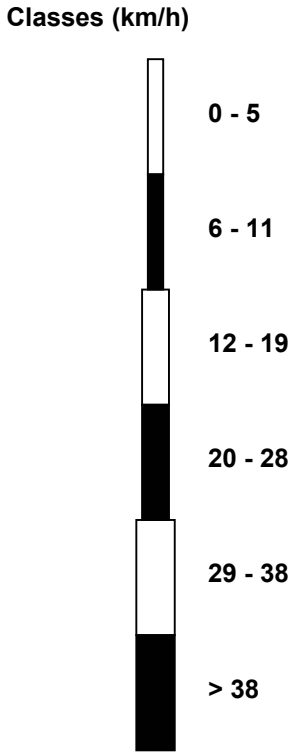
Wood Buffalo Environmental Association

Wind Rose Aug 2014

Wind Speed (WS) - km/h

ConocoPhillips - Surmont (AMS502)





Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Aug 19 16:00

Minimum Value: 0 km/h on Aug 15 01:00

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

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

M - Maintenance AF - Analyzer Failure

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

ConocoPhillips - Surmont - August 2014

Direction of Maximum Speed: 310 deg on Aug 27 08:00
Direction of Maximum Daily Speed Average: 303.0 deg on Aug 7

Direction of Minimum Speed: 152 deg on Aug 23 01:00
Direction of Minimum Daily Speed Average: 2.9 deg on Aug 8

Monthly Average Direction: 283.0 deg

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

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Aug	360	360	1	5	7	0	360	6	M	8	4	357	5	14	16	8	347	346	4	290	280	238	194	191	359.9
2-Aug	200	196	204	205	199	204	208	208	207	185	176	176	199	180	204	212	217	199	193	179	169	211	242	264	200.8
3-Aug	138	243	305	248	235	225	241	247	277	345	124	142	256	326	11	8	357	2	299	275	258	245	246	245	286.1
4-Aug	242	246	256	262	262	265	270	272	267	269	264	288	309	250	281	10	3	344	314	323	352	358	35	132	283.4
5-Aug	152	188	184	206	193	176	121	132	130	122	123	155	159	167	158	176	184	183	183	204	222	210	197	210	179.6
6-Aug	213	213	214	215	235	218	229	192	175	203	212	206	213	234	264	285	292	287	282	280	277	285	289	284	248.7
7-Aug	283	291	289	301	305	301	299	303	312	315	315	314	307	309	307	317	307	320	316	298	285	272	272	273	303.0
8-Aug	278	288	315	338	338	320	328	38	55	98	123	132	143	159	152	178	176	323	321	311	4	25	36	40	352.9
9-Aug	35	26	23	24	22	25	18	15	345	335	353	342	332	326	329	317	320	317	304	285	284	289	288	283	343.4
10-Aug	281	280	280	284	287	289	287	283	295	297	267	292	306	322	289	302	297	291	304	280	279	280	280	278	288.5
11-Aug	280	282	280	279	282	283	288	301	293	319	326	322	341	324	334	1	30	31	41	8	343	11	18	14	320.7
12-Aug	32	AF	AF	181	202	190	151	179	182	179	175	171	167	167	168	172	171	174	169	169	165	178	187	201	173.8
13-Aug	215	219	220	220	225	227	225	212	210	200	204	218	242	248	242	261	265	266	250	255	267	277	283	287	242.4
14-Aug	293	313	336	341	336	344	337	343	17	27	27	43	47	39	62	57	63	52	43	287	283	281	266	251	352.5
15-Aug	251	247	239	246	252	243	241	243	235	214	187	173	179	161	151	138	73	59	62	284	291	320	277	287	214.5
16-Aug	314	324	315	300	233	276	276	275	29	112	150	177	187	186	183	213	200	155	229	275	278	278	285	287	239.1
17-Aug	297	297	309	324	330	339	339	342	354	16	35	351	358	21	17	3	355	333	325	307	292	249	278	275	338.8
18-Aug	271	285	287	291	291	288	292	290	289	289	294	300	276	287	291	294	301	311	314	311	305	312	299	303	295.4
19-Aug	313	311	291	321	44	44	44	47	62	122	176	190	199	141	160	70	24	29	38	27	29	15	346	339	25.7
20-Aug	1	7	26	25	352	33	35	33	30	34	32	34	34	27	31	35	31	22	31	36	44	38	14	345	26.9
21-Aug	320	320	342	332	318	329	336	0	41	35	28	37	31	19	19	33	44	47	46	33	23	25	21	5	15.9
22-Aug	349	335	335	322	326	319	9	38	35	70	83	83	27	53	59	62	76	68	32	14	27	25	58	34	36.2
23-Aug	152	238	218	222	231	182	119	121	143	175	172	176	170	161	135	150	172	179	148	137	137	152	168	176	169.0
24-Aug	218	191	217	174	180	173	170	172	193	185	177	162	168	154	155	181	169	172	175	177	203	239	217	244	182.3
25-Aug	234	236	240	242	243	238	240	245	237	215	228	209	228	242	218	203	212	230	224	225	233	232	229	230	228.7
26-Aug	236	242	258	270	274	273	286	293	283	286	281	302	288	273	296	287	274	252	286	282	277	276	282	286	277.6
27-Aug	290	295	292	293	296	297	296	310	328	338	347	351	358	337	334	318	312	322	320	301	315	273	276	1	314.0
28-Aug	344	327	342	346	341	347	346	347	354	352	350	1	3	349	359	353	39	26	20	323	266	264	267	271	348.3
29-Aug	281	282	273	281	278	268	268	271	238	210	198	200	203	205	202	192	219	222	216	212	202	210	221	225	228.2
30-Aug	213	204	199	215	237	247	244	297	329	311	325	323	338	357	359	1	326	318	319	299	296	303	302	304	307.8
31-Aug	308	307	306	306	309	312	308	324	337	339	323	336	346	351	338	329	344	32	289	289	295	304	314	316	320.2
	288.6	290.6	292.9	295.0	294.5	296.4	300.4	310.0	309.0	313.1	302.8	302.2	303.7	308.0	317.7	319.9	326.4	327.7	316.2	292.3	290.8	287.8	280.8	283.8	
	Diurnal Average																								

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

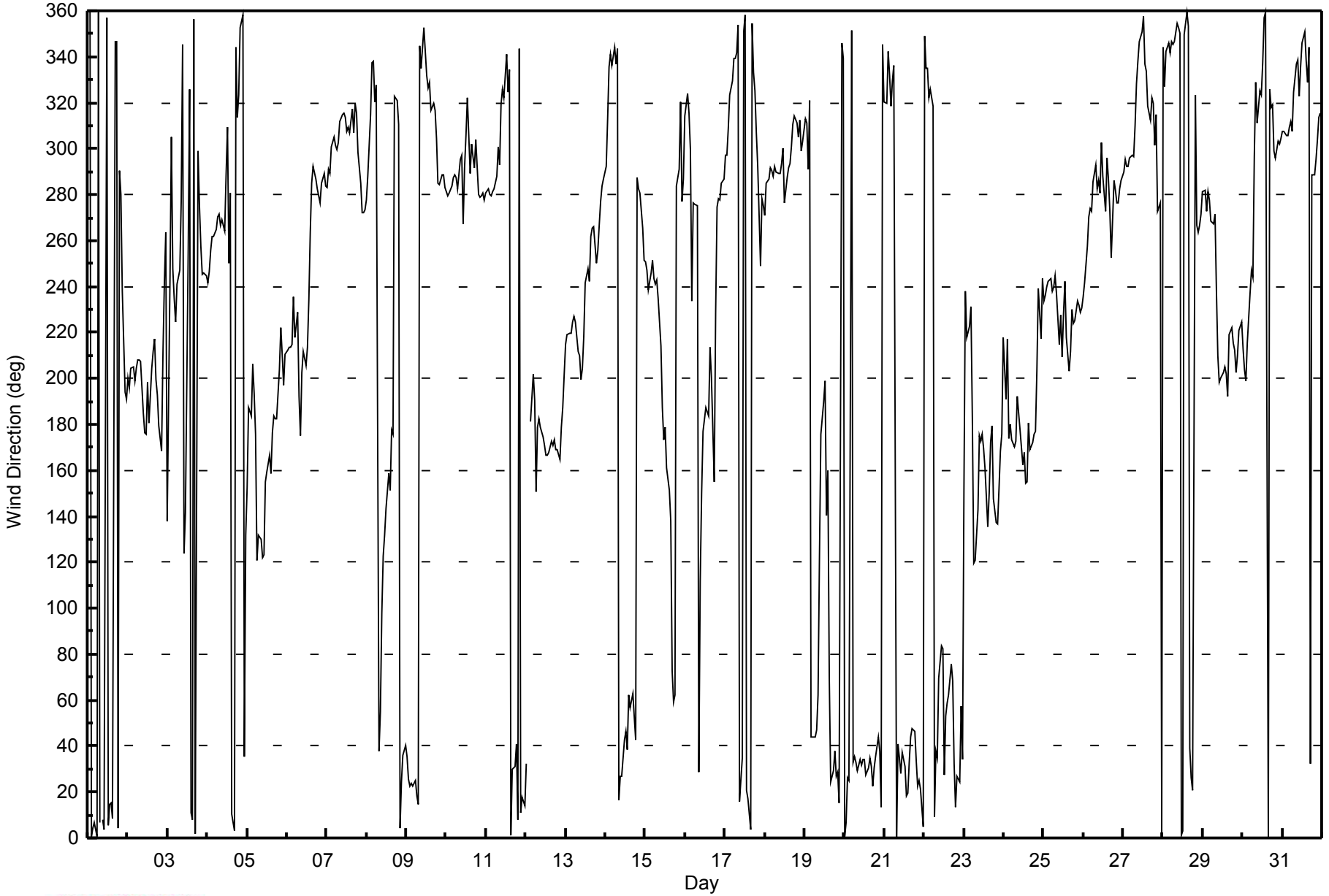
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Direction (WD) - deg

ConocoPhillips - Surmont - August 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

ConocoPhillips - Surmont - August 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Aug 3 10:00

Minimum Value: 4 deg on Aug 15 01:00

Percentiles: P_1 = 6 P_{10} = 8 Q_1 = 11 Median = 16 Q_3 = 22 P_{90} = 32 P_{99} = 90

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
	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-Aug	15	17	17	17	17	16	15	16	M	19	20	24	28	21	21	26	26	27	40	74	17	21	14	10	74
2-Aug	10	12	12	12	13	13	14	16	18	17	16	17	25	17	23	25	21	24	17	17	11	16	25	39	39
3-Aug	94	98	94	34	19	11	11	15	59	100	37	67	64	56	32	25	23	31	24	51	21	10	6	5	100
4-Aug	8	12	10	7	7	8	8	8	11	17	18	19	25	38	75	82	27	26	26	31	16	15	38	27	82
5-Aug	46	57	13	8	10	28	27	20	21	25	23	18	20	22	22	22	16	13	13	27	17	29	14	15	57
6-Aug	15	16	15	17	16	22	23	36	19	19	23	25	24	23	20	16	13	10	9	8	7	9	8	8	36
7-Aug	10	8	8	10	9	9	9	10	12	13	16	18	17	16	16	16	15	15	11	8	10	8	9	9	18
8-Aug	9	14	10	13	22	30	47	24	39	51	45	49	59	25	15	18	13	13	12	9	51	11	12	13	59
9-Aug	15	12	12	11	11	11	16	22	14	11	24	19	13	13	14	17	14	14	9	11	8	8	8	7	24
10-Aug	7	8	9	7	7	8	8	9	10	23	24	18	21	17	20	18	12	16	11	13	6	8	7	10	24
11-Aug	9	7	8	8	7	8	9	8	16	19	15	13	20	15	22	32	16	12	19	27	28	19	11	14	32
12-Aug	13	AF	AF	14	9	15	18	11	14	17	18	17	20	22	18	20	16	12	10	9	10	12	10	10	22
13-Aug	13	12	12	13	13	14	15	13	13	15	17	20	21	19	25	20	18	21	21	17	16	14	11	10	25
14-Aug	10	13	12	8	8	12	8	16	21	21	17	18	19	32	17	14	12	12	42	75	8	5	7	6	75
15-Aug	4	8	7	6	9	8	13	14	20	26	21	17	23	20	23	28	22	21	11	91	43	13	27	43	91
16-Aug	13	10	52	44	45	12	13	63	80	31	28	17	17	16	16	45	16	56	96	10	12	12	11	9	96
17-Aug	9	9	12	10	9	8	7	11	20	22	28	30	24	21	21	23	23	11	10	7	83	65	11	8	83
18-Aug	8	8	7	8	8	8	8	9	9	9	11	15	20	15	13	12	11	11	10	10	11	10	8	9	20
19-Aug	15	13	11	42	13	11	13	17	19	37	31	37	31	53	58	69	19	25	19	15	12	25	24	11	69
20-Aug	18	19	8	9	23	9	15	13	12	15	13	13	13	16	21	15	11	18	12	12	14	11	22	12	23
21-Aug	14	6	12	10	8	8	10	22	14	18	20	23	24	33	36	34	21	18	12	13	11	10	18	21	36
22-Aug	29	26	35	24	22	20	30	11	16	37	35	47	77	44	41	25	55	22	48	31	12	16	26	48	77
23-Aug	91	50	23	22	42	36	87	19	21	21	28	24	27	28	51	47	31	16	13	10	10	17	9	12	91
24-Aug	24	14	33	11	10	12	12	17	17	17	19	31	22	21	24	19	19	17	12	14	23	14	17	11	33
25-Aug	14	17	13	15	14	15	16	17	17	17	20	19	24	23	26	17	23	23	17	13	13	13	13	16	26
26-Aug	16	16	16	15	13	14	12	10	14	16	19	17	27	21	16	17	19	19	16	12	14	14	13	10	27
27-Aug	8	8	9	8	8	9	10	10	14	15	19	22	28	18	15	20	19	14	11	10	22	16	10	45	45
28-Aug	30	12	11	12	11	12	11	13	18	18	15	20	24	22	25	21	19	24	30	14	25	5	13	8	30
29-Aug	10	11	8	15	13	12	13	17	21	17	17	16	18	17	15	13	20	14	13	13	11	12	13	11	21
30-Aug	12	9	8	13	20	25	28	22	13	14	13	16	18	21	16	21	17	13	10	6	6	7	6	7	28
31-Aug	7	7	7	8	8	9	9	14	11	14	10	18	15	26	13	13	31	56	13	13	12	9	8	9	56
	94	98	94	44	45	36	87	63	80	100	45	67	77	56	75	82	55	56	96	91	83	65	38	48	
	Diurnal Maximum																								

M - Maintenance AF - Analyzer Failure

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	August 8, 2014	Previous Calibration	June 30, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502

Reason: Routine

Start Time (MST)	7:30	End Time (MST)	12:20
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	5/29/2014
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	938	517
Analyzer Range (mv)	1000	1000	Lamp voltage	3045	3020
Calculated slope	0.993496	0.998752	Chamber temp.	50.0	50.0
Calculated intercept	0.814280	1.136453	Pressure (mmHg)	22.9	22.8
Analyzer Background	18.7	18.7	Flow (lpm)	0.587	0.579
Analyzer Coefficient	1.013	1.023	Intensity	75	75

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	-0.8	NA
as found span	5000	76.7	783.9	781.7	1.003
calibrator zero	5000	0.0	0.0	-0.8	NA
high point	5000	76.7	783.9	784.2	1.000
second point	5000	38.4	392.4	390.7	1.005
third point	5000	19.2	196.2	195.6	1.003
calibrator zero	5000	0.0	0.0	-0.8	NA
as left zero	5000	0.0	0.0	-1.0	NA
as left span	6000	92.0	783.5	780.4	1.004
				Average Correction Factor	1.002

Corrected As found	782.5	Previous response	788.2	% change	0.7%

Notes:

Filter changed after as founds. Adjusted span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

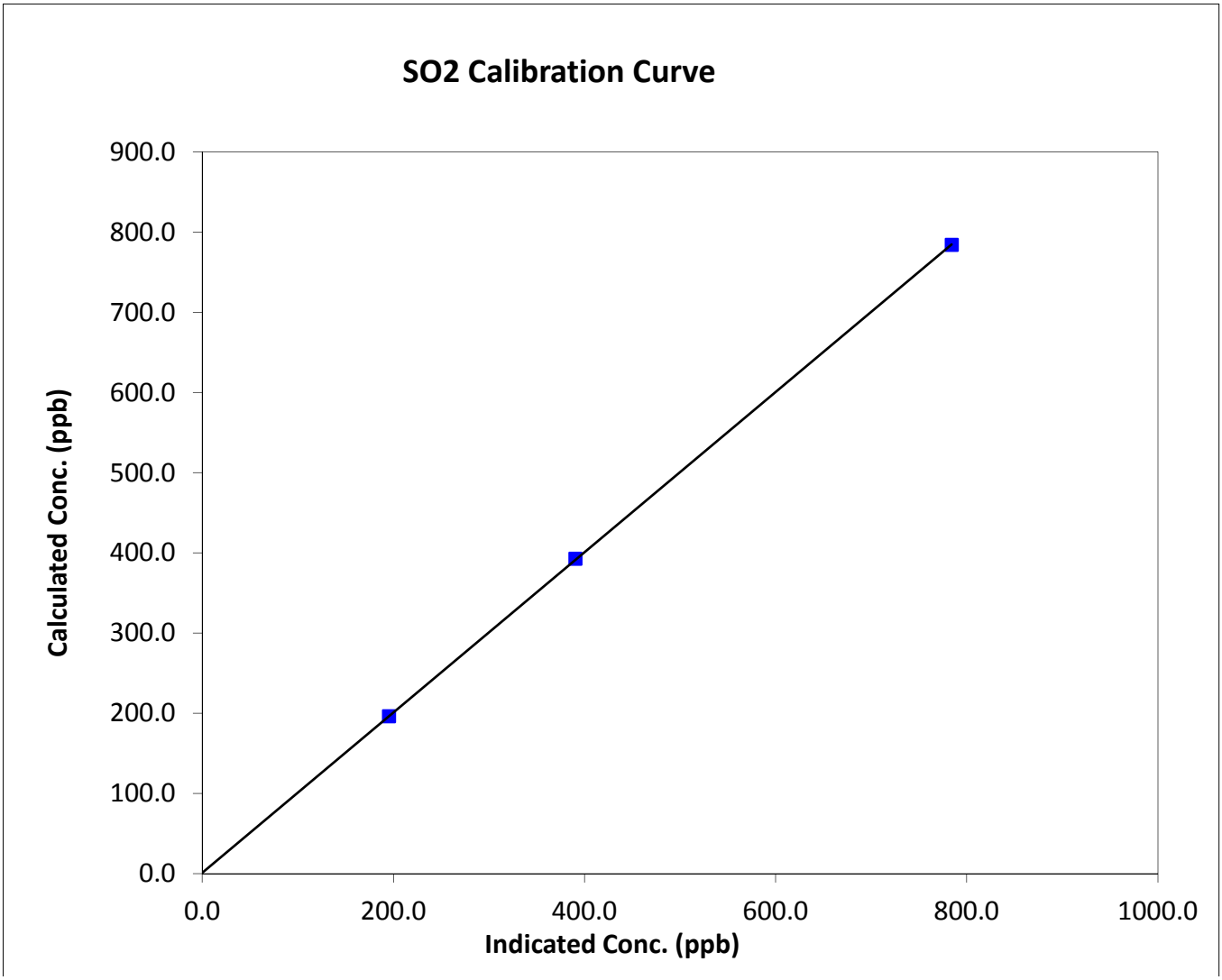
SO_2 Calibration Summary

Station Information

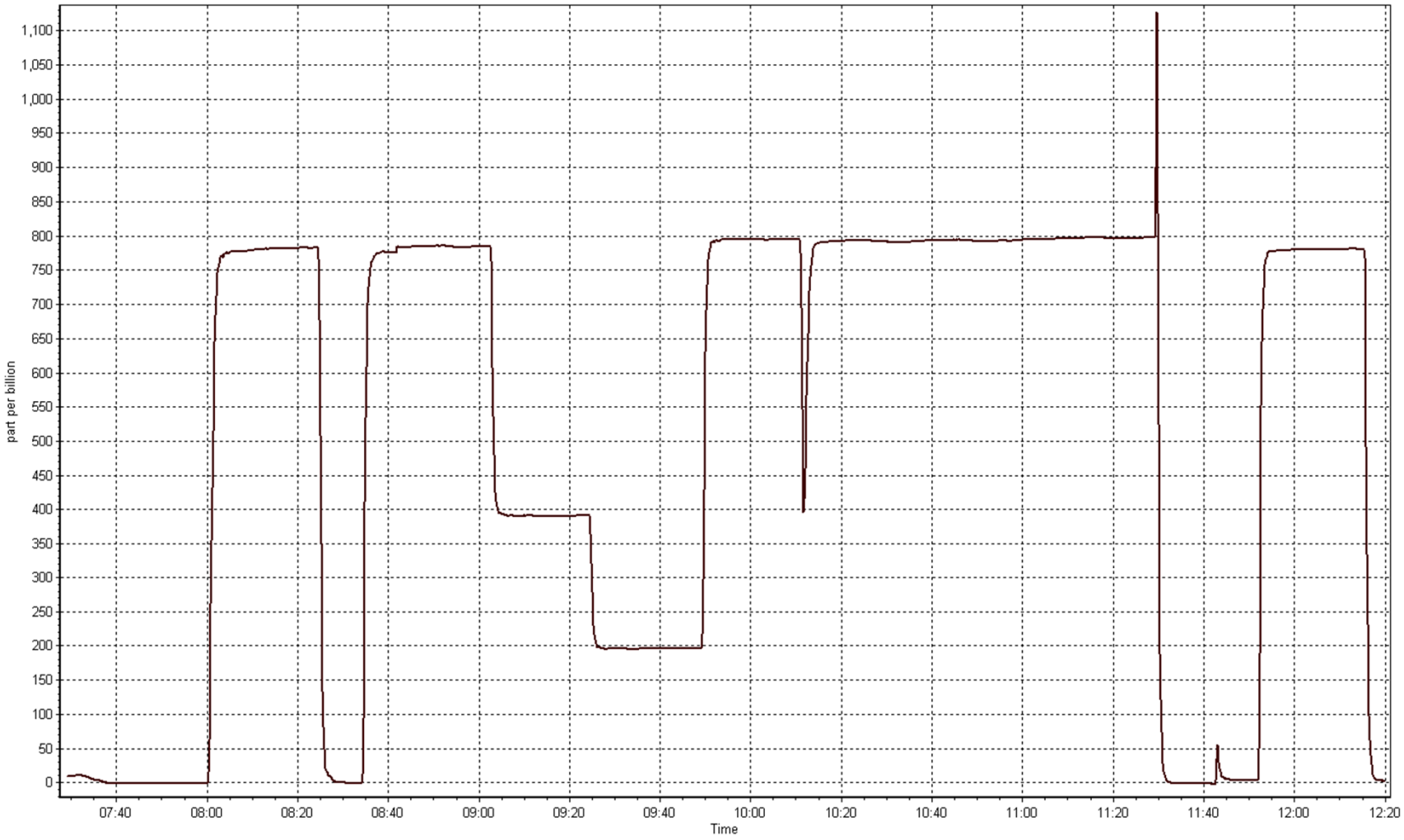
Calibration Date	August 8, 2014	Previous Calibration	June 30, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Start Time (MST)	7:30	End Time (MST)	12:20
Analyzer make	API T100	Analyzer serial #	598

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.8	N/A	Correlation Coefficient	0.999995
783.9	784.2	0.9996		
392.4	390.7	1.0045	Slope	0.998752
196.2	195.6	1.0032		
			Intercept	1.136453



SO2 Calibration Plot Date: August 8, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	August 12, 2014	Previous Calibration	June 30, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Reason:	Routine		
Start Time (MST)	9:25	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	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	57	125
Analyzer Range (mv)	100	100	Lamp voltage	4685	4033
Calculated slope	0.993013	0.994933	Chamber temp.	50	50
Calculated intercept	0.266873	-0.024248	Pressure	22.9	23.1
Analyzer Background	19.7	18	Flow	0.569	0.569
Analyzer Coefficient	0.928	0.97	Intensity	104	90
			Converter temp.	315	317

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	78.8	1.017
SO2 scrubber check	5000	19.6	200.3	3.2	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	38.5	80.1	80.4	0.996
second point	5000	19.3	40.1	40.6	0.990
third point	5000	12.1	25.2	25.3	0.997
calibrator zero	5000	0.0	0.0	0.0	NA
as left zero	5000	0.0	0.0	0.5	NA
as left span	5000	38.5	80.1	78.5	1.020
				Average Correction Factor	0.994

Corrected As found	79.2	Previous response	80.4	% change	1.5%

Notes:

Changed filter after as founds. Adjusted zero and span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

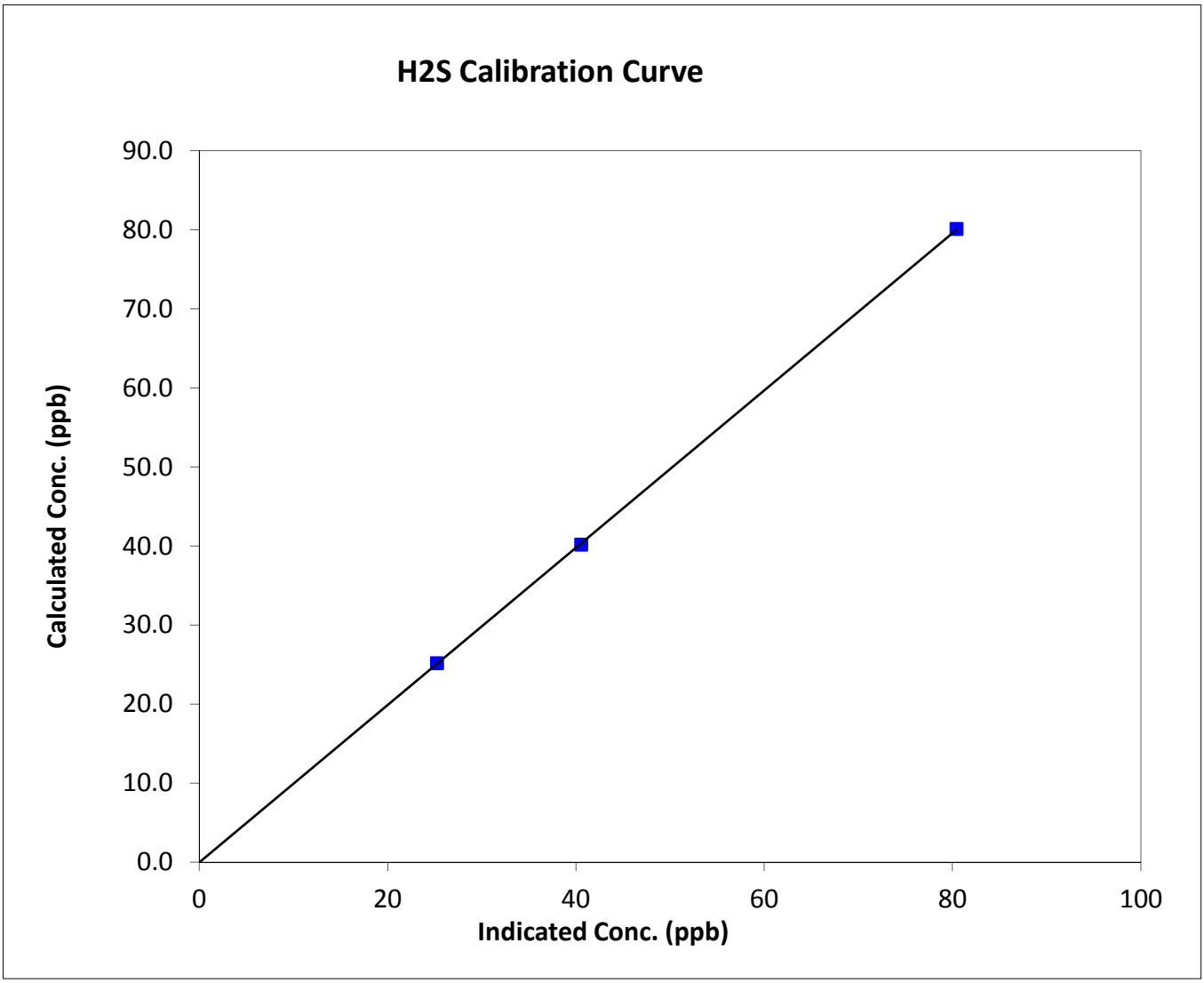
H2S Calibration Summary

Station Information

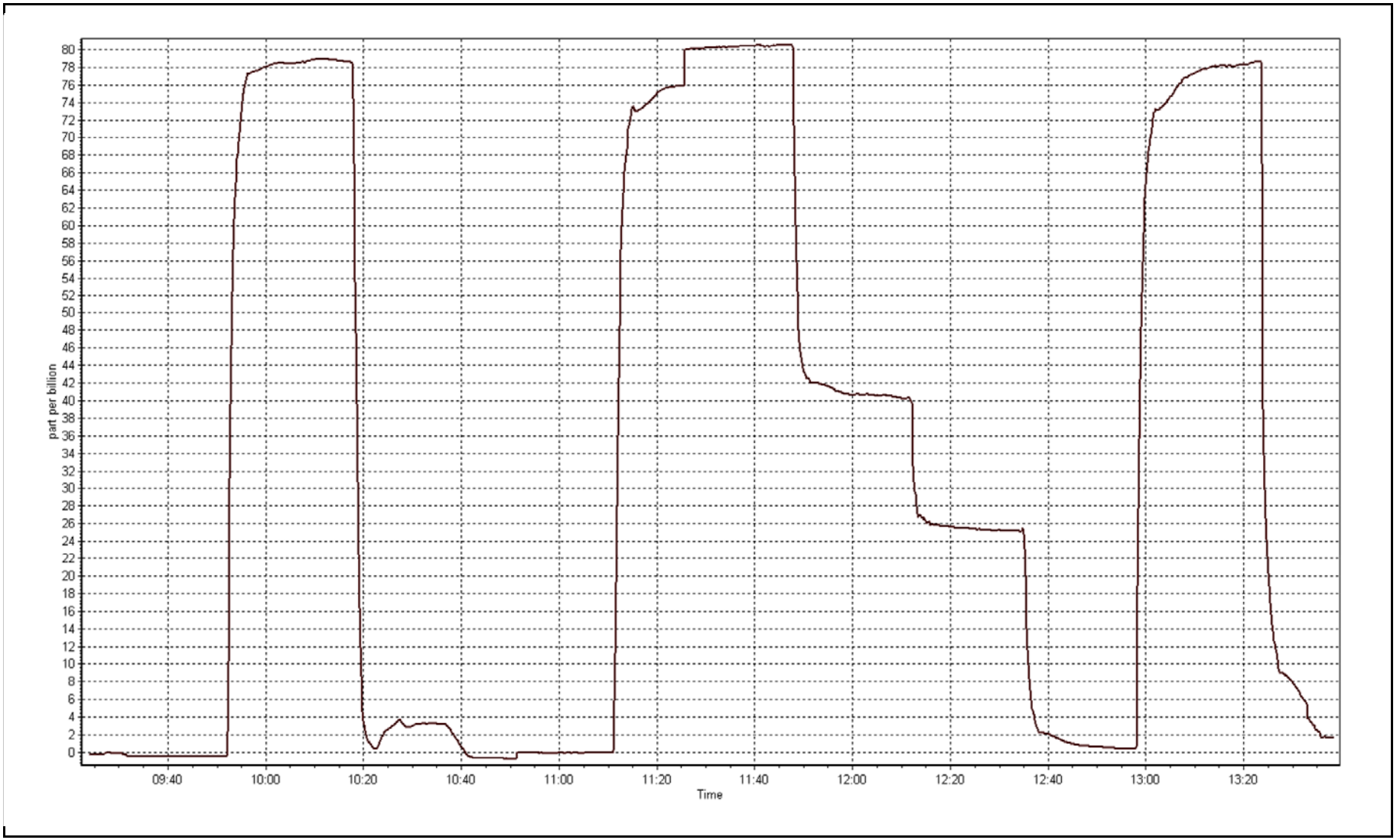
Calibration Date	August 12, 2014	Previous Calibration	June 30, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Start Time (MST)	9:25	End Time (MST)	13:40
Analyzer make	API T101	Analyzer serial #	197

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999986
80.1	80.4	0.9955		
40.1	40.6	0.9897	Slope	0.994933
25.2	25.3	0.9968		
			Intercept	-0.024248



H2S Calibration Plot Date: August 12, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Wednesday, August 06, 2014	Previous Calibration	Saturday, July 26, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Reason:	Routine		
Start Time (MST)	9:15	End Time (MST)	13:30
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	622
Gas Cert Reference	LL110503	Cal Gas Expiry Date	4/16/2016
CH4 Cal Gas Conc.	513 ppm	CH4 Equiv Conc.	1068.5 ppm
C3H8 Cal Gas Conc.	202 ppm		
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 (ppm)	25	25	Sample Pressure	8.7	8.7
Analyzer Range (mv)	25	25	Air or Bypass press	21.9	21.9
Calculated slope	1.006459	1.003455	Fuel Pressure	42.5	42.5
Calculated intercept	-0.063981	-0.039862		157.6	157.7

Analyzer make	Thermo 51i-LT	Analyzer serial #	1317958220

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	-0.25	N/A
as found span	5000	76.7	16.39	14.68	1.117
calibrator zero	5000	0.0	0.00	0.04	N/A
high point	5000	76.7	16.39	16.37	1.001
second point	5000	38.4	8.21	8.23	0.997
third point	5000	19.2	4.10	4.12	0.996
calibrator zero	5000	0.0	0.00	0.04	N/A
as left zero	5000	0.0	0.00	0.02	N/A
as left span	6000	92.0	16.38	16.53	0.991
				Average Correction Factor	0.998

Corrected As found	14.93	Previous response	16.35	% change	9.5%

Notes:

Changed filter after as founds; large as found change due to inlet filter loading. Adjusted zero.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

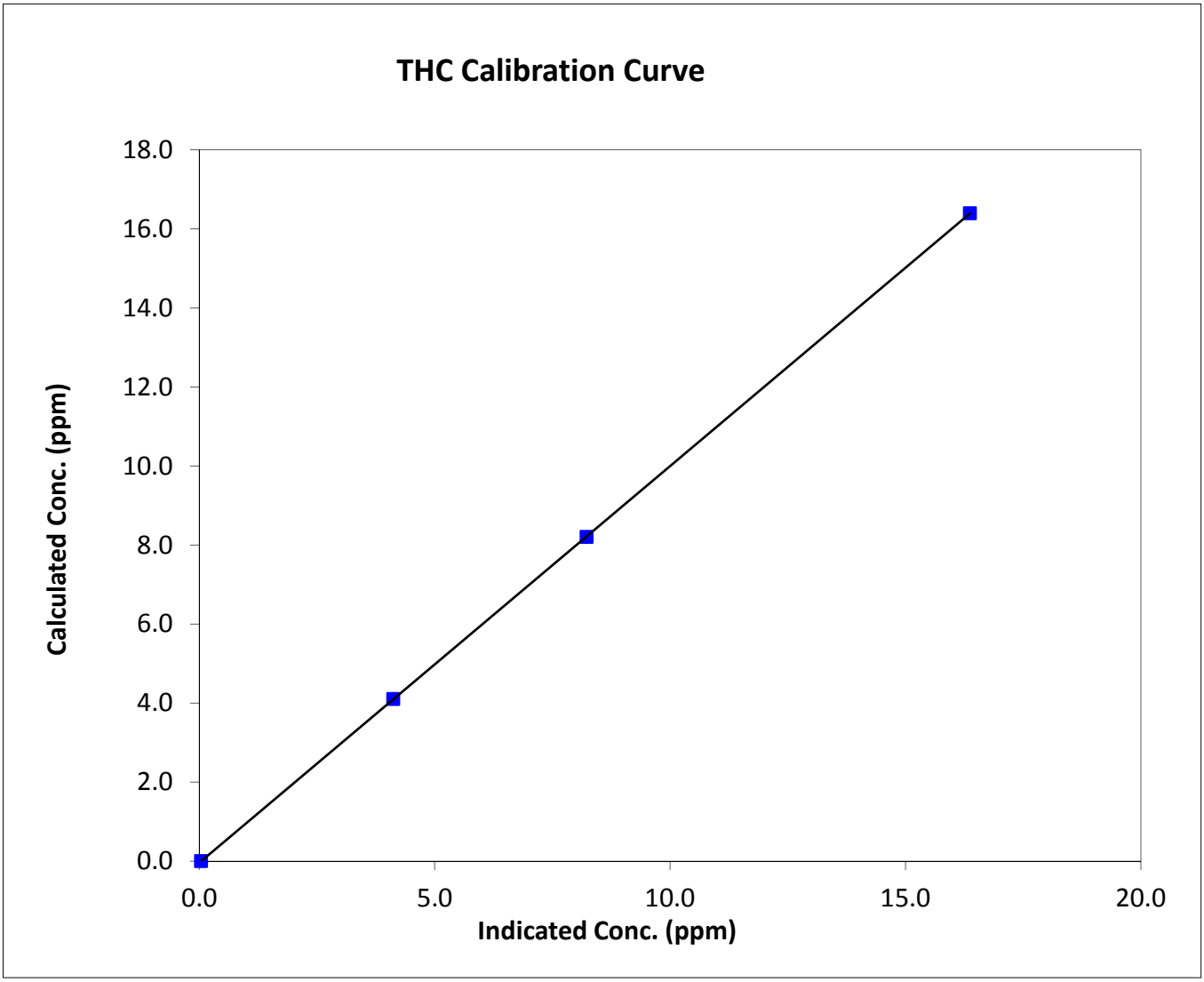
THC Calibration Summary

Station Information

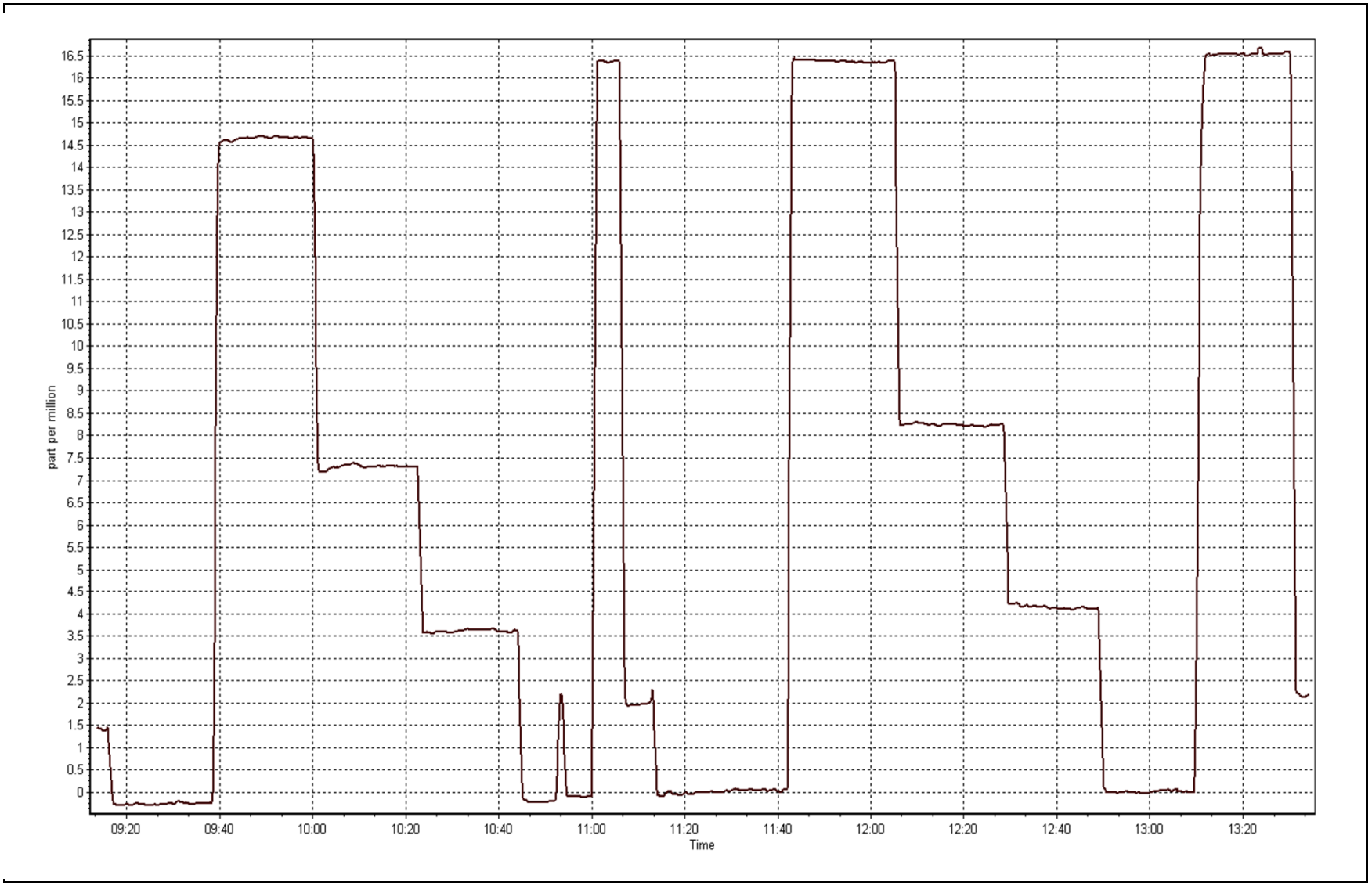
Calibration Date	August 6, 2014	Previous Calibration	July 26, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Start Time (MST)	9:15	End Time (MST)	13:30
Analyzer make	Thermo 51i-LT	Analyzer serial #	1317958220

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.04	N/A	Correlation Coefficient	0.999998
16.39	16.37	1.0013		
8.21	8.23	0.9971	Slope	1.003455
4.10	4.12	0.9959		
			Intercept	-0.039862



THC Calibration Plot Date: August 6, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	August 8, 2014		Previous Calibration	August 5, 2014	
Station Name	ConocoPhillips		Station Number	AMS 102	
Reason:	Routine				
Start Time (MST)	7:30		End Time (MST)	12:15	
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	0.996448	0.995315	0.990519
	Data Offset	-1.149937	-1.241764	3.409672
After	Data Slope	1.002296	1.000136	0.996791
	Data Offset	-0.569285	0.136344	-1.177567
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	0.793	ppb	0.763	ppb
NOX coefficient	0.997	ppb	0.997	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	10.0		9.7	
NOX bkgrnd	10.5		10.1	
HVPS	-940.911		-940.500	
Chamber Temp	50.2	Deg C	50.3	Deg C
Moly Temp	322.4	Deg C	322.9	Deg C
Cooler Temp		Deg C	-3.0	Deg C
O3 flow		ccm		ccm
Chamber Press	194.2	mmHg	194.2	mmHg
Sample Flow	0.510	ccm	0.516	ccm

Notes:

Filter changed after as founds. Adjusted span.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: August 8, 2014 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	1.0	0.3	0.6	N/A	N/A
as found span	5000	76.7	800.7	800.7	0.0	826.9	827.9	-1.0	0.9684	0.9672
calibrator zero	5000	0.0	0.0	0.0	0.0	1.0	0.3	0.6	N/A	N/A
high point	5000	76.7	800.7	800.7	0.0	799.9	801.0	-1.0	1.0010	0.9997
second point	5000	38.4	400.9	400.9	0.0	400.0	400.3	-0.3	1.0023	1.0015
third point	5000	19.2	200.4	200.4	0.0	199.8	199.3	0.6	1.0031	1.0059
calibrator zero	5000	0.0	0.0	0.0	0.0	1.0	0.3	0.6	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	-2.1	-1.8	-0.3	N/A	N/A
as left span	6000	92.0	800.4	519.0	281.4	820.0	529.0	290.0	0.9761	0.9811
								Average Correction Factor	1.0021	1.0024

Corrcted As found NO_X= 825.9 NO= 827.6 Percent Change NO_X= -2.6% NO= -2.6%

Previous Response NO_X= 804.8 NO= 805.8

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			0.6			N/A	
1st NO2 (300)	N/A	519.0	288.6	809.4	519.0	290.4	0.9743	1.0000	0.9937	100.6%
2nd NO2 (200)	N/A	608.6	199.0	809.2	608.6	200.7	0.9746	1.0000	0.9914	100.9%
3rd NO2 (100)	N/A	703.5	104.1	809.6	703.5	106.5	0.9741	1.0000	0.9772	102.3%
4th NO2 (0)	807.6	N/A	-1.5	806.0	807.6	-1.5	0.9784	1.0000	N/A	N/A
					Average Correction Factor		0.9754	1.0000	0.9874	101.3%

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

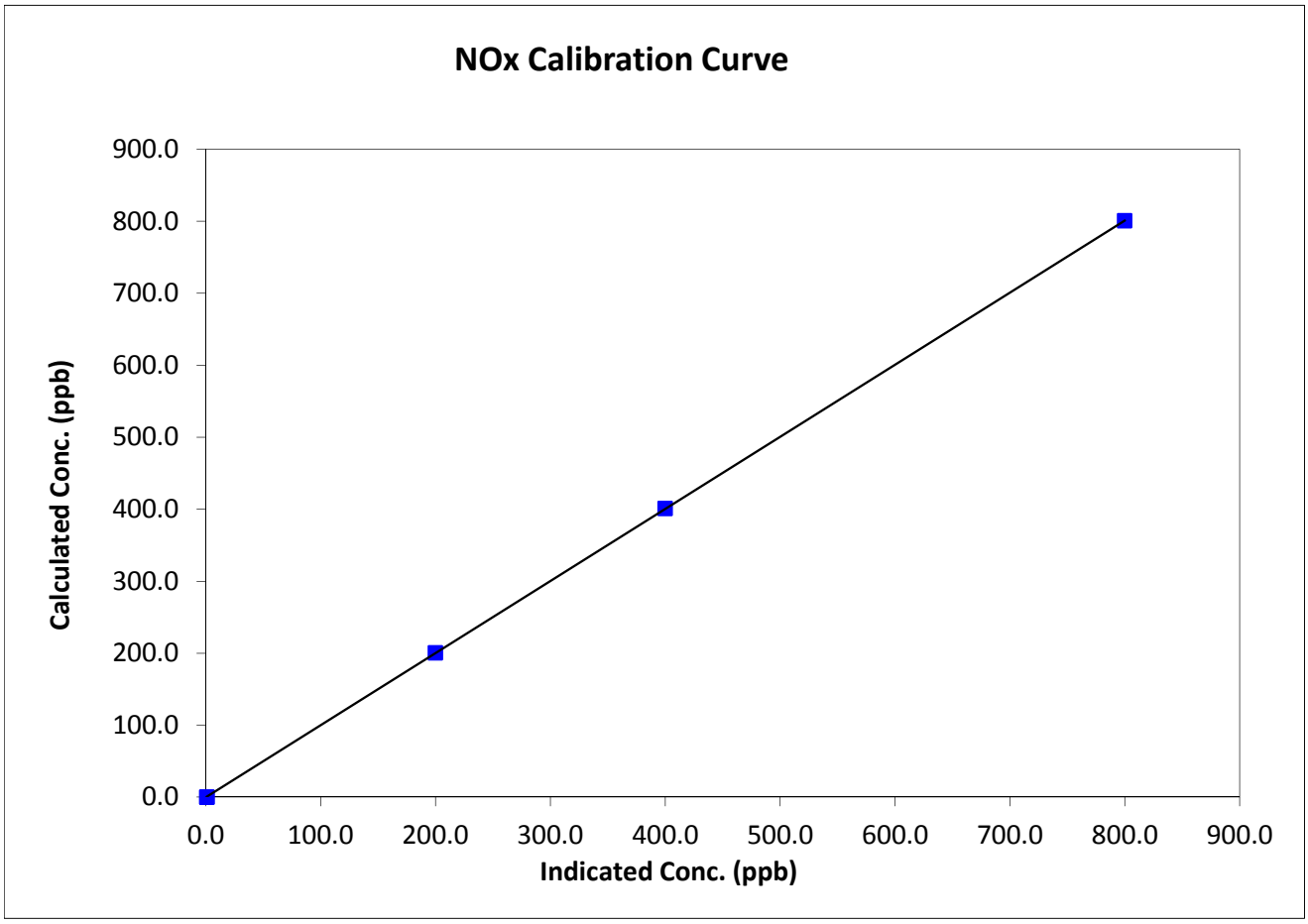
NO_X Calibration Summary

Station Information

Calibration Date	August 8, 2014	Previous Calibration	August 5, 2014
Station Name	ConocoPhillips	Station Number	AMS 102
Start Time (MST)	7:30	End Time (MST)	12:15
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	1.0	N/A	Correlation Coefficient	0.999997
800.7	799.9	1.0010		
400.9	400.0	1.0023	Slope	1.002296
200.4	199.8	1.0031		
0.0	1.0	0.0000	Intercept	-0.569285



Wood Buffalo Environmental Association

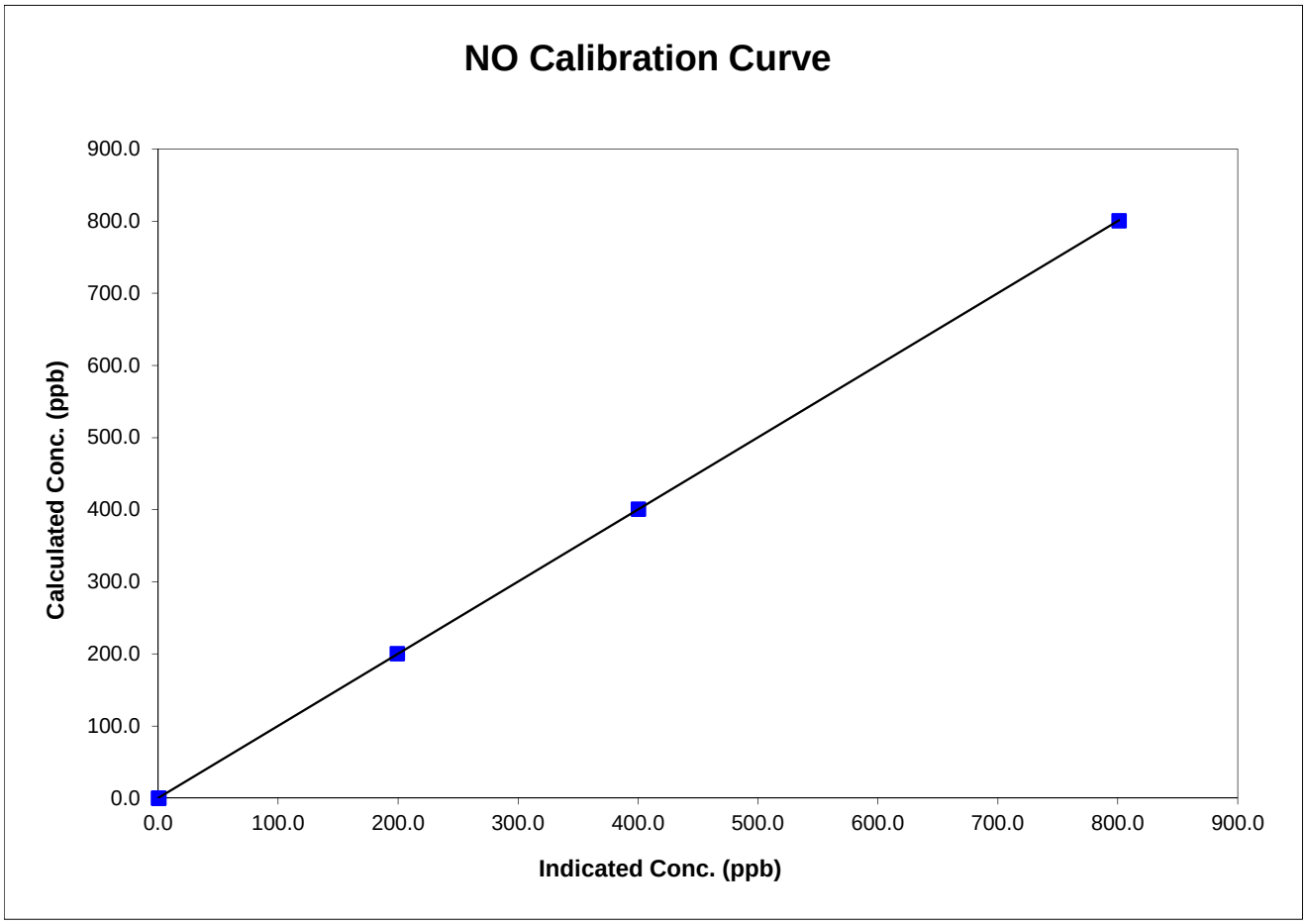
NO Calibration Summary

Station Information

Calibration Date	August 8, 2014	Previous Calibration	August 5, 2014
Station Name	ConocoPhillips	Station Number	AMS 102
Start Time (MST)	7:30	End Time (MST)	12:15
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	0.999996
800.7	801.0	0.9997		
400.9	400.3	1.0015	Slope	1.000136
200.4	199.3	1.0059		
0.0	0.3	0.0000	Intercept	0.136344



Wood Buffalo Environmental Association

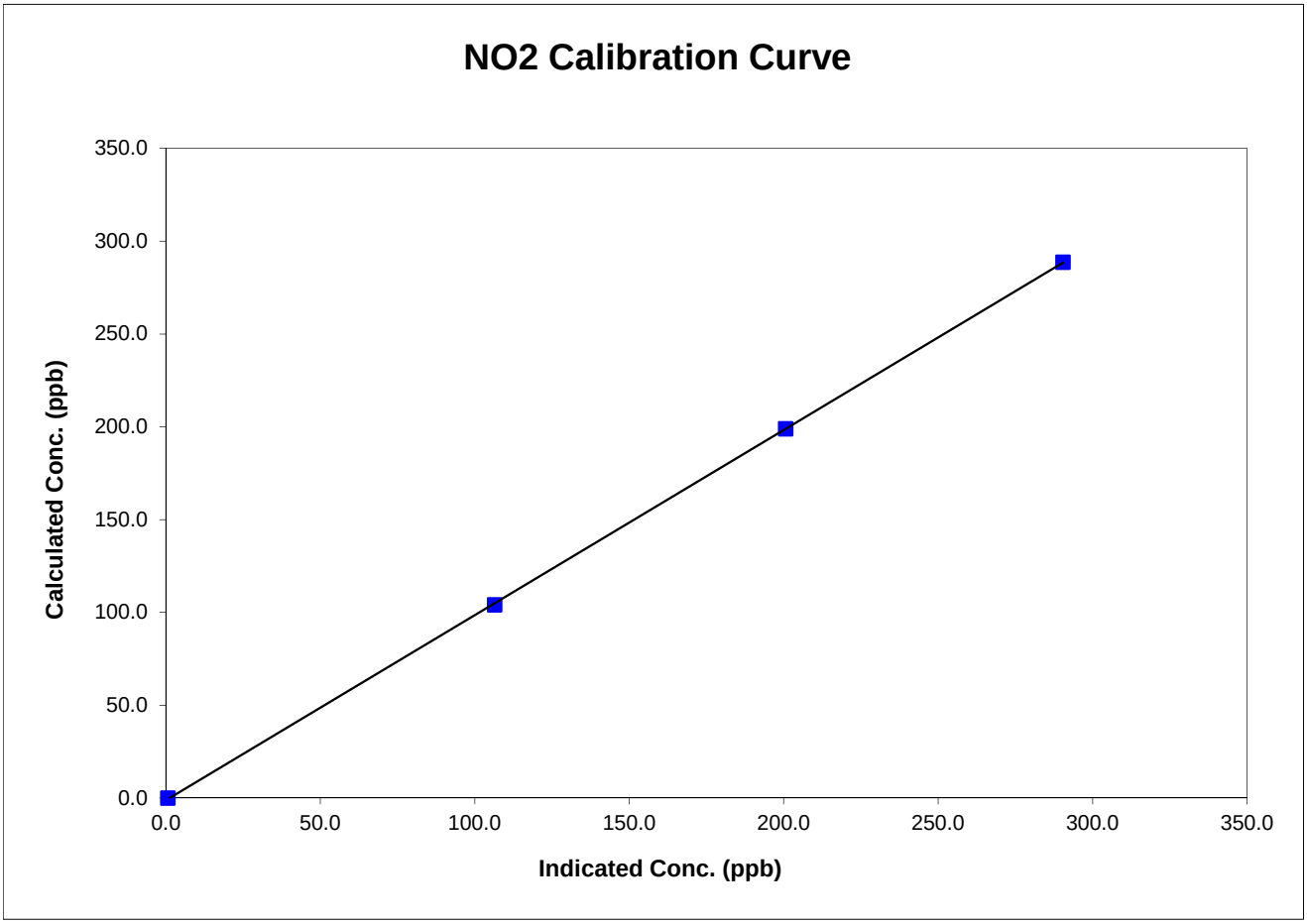
NO_2 Calibration Summary

Station Information

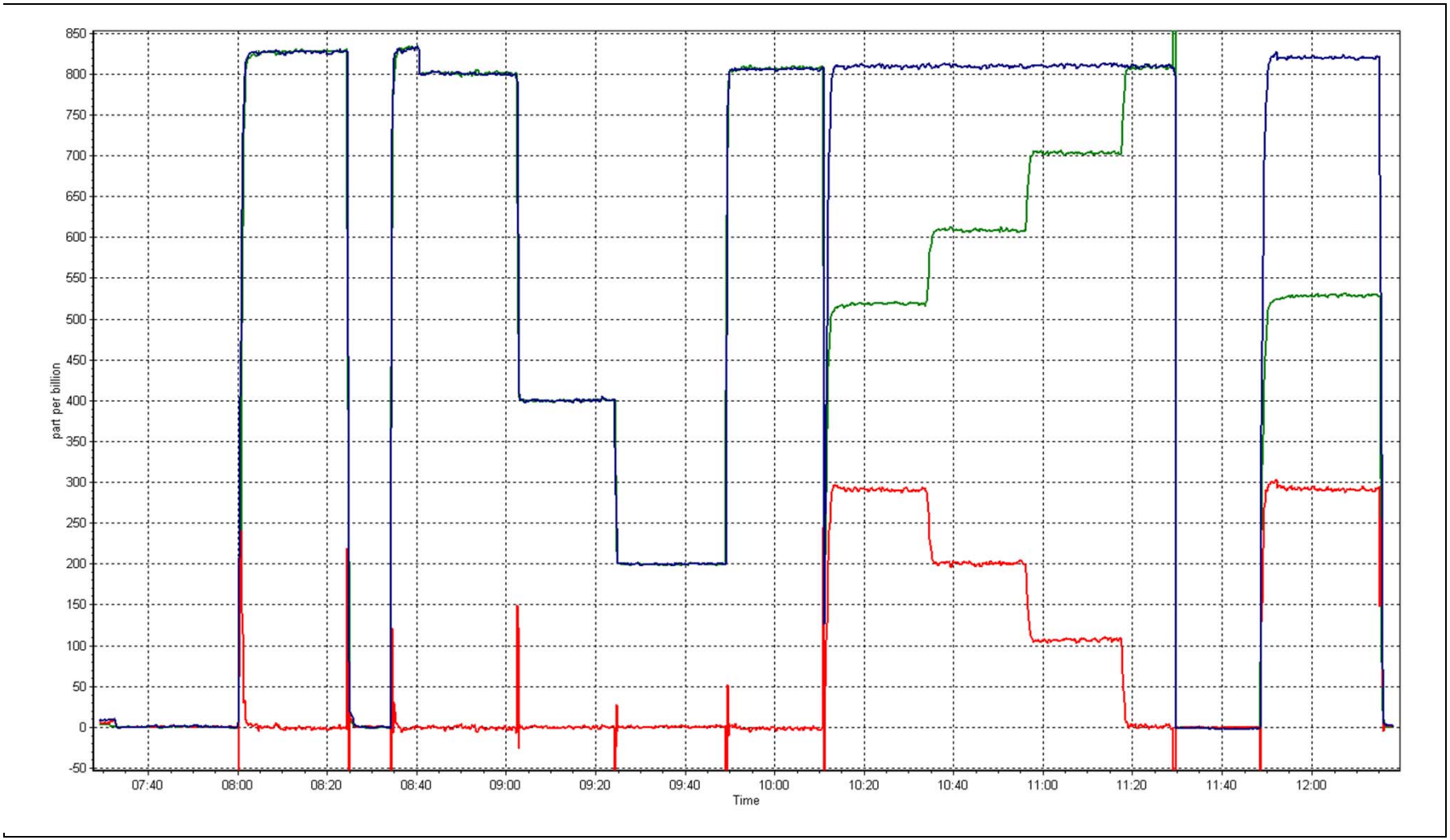
Calibration Date	August 8, 2014	Previous Calibration	August 5, 2014
Station Number	ConocoPhillips	Station Number	AMS 102
Start Time (MST)	7:30	End Time (MST)	12:15
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.6	N/A	Correlation Coefficient	0.999974
288.6	290.4	0.9937		
199.0	200.7	0.9914	Slope	0.996791
104.1	106.5	0.9772		
			Intercept	-1.177567



NOx, NO & NO_2 Calibration Plot Date: August 8, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
MONTHLY REPORT

DATA SUMMARY
MAY - AUGUST 2014

Prepared
September 29, 2014

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

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 1 Repeat Fort McKay**
Compound Name	**05-May**	**05-May**	**05-May**	**05-May**	**05-May**	**05-May**	**05-May**
Naphthalene	8.68	33.1	18.6	10.4	0.006	0.453	9.26
Acenaphthylene	0.222	0.048	0.086	0.024	0.001	0.028	0.258
Acenaphthene	0.702	0.368	0.281	1.95	0.001	0.035	0.75
Fluorene	0.672	0.648	0.782	2.08	0.001	0.018	0.711
Phenanthrene	1.3	0.856	1.37	3.11	0.002	0.029	1.56
Anthracene	0.096	0.055	0.103	3.14	0.001	0.009	0.111
Acridine	0.383	0.149	0.138	0.051	0.001	0.014	0.408
Fluoranthene	0.107	0.138	0.22	0.205	0.001	0.015	0.112
Pyrene	0.089	0.135	0.239	0.107	0.001	0.014	0.096
Benzo(c)phenanthrene	0.021	0.004	0.038	0.011	0.001	<0.001	0.024
Benz(a)anthracene	0.025	0.026	0.033	0.009	0.001	0.006	0.028
Chrysene	0.028	0.029	0.038	0.011	0.001	0.007	0.032
7,12-Dimethylbenz(a)anthracene	0.05	0.036	0.037	0.052	0.001	0.012	0.046
Benzo(b)fluoranthene	0.045	0.057	0.057	0.049	0.001	0.01	0.053
Benzo(k)fluoranthene	0.051	0.064	0.064	0.056	0.001	0.012	0.055
Benzo(a)pyrene	0.03	0.061	0.026	0.021	0.001	0.005	0.031
3-Methylcholanthrene	0.067	0.023	0.057	0.081	0.001	0.01	0.066
Indeno(123-cd)pyrene	0.089	0.074	0.055	0.076	0.001	0.015	0.093
Dibenz(a,h)anthracene	0.067	0.08	0.06	0.081	0.001	0.009	0.067
Benzo(ghi)perylene	0.08	0.082	0.07	0.059	0.001	0.012	0.087
Dibenzo(a,l)pyrene	0.031	0.088	0.068	0.052	0.005	0.005	0.036
Dibenzo(a,i)pyrene	0.019	0.08	0.031	0.054	0.003	0.005	0.02
Dibenzo(a,h)pyrene	0.026	0.071	0.061	0.057	0.005	0.006	0.024

	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	**11-May**	**11-May**	**11-May**	**11-May**	**11-May**	**11-May**	**11-May**
Naphthalene	5.24	12.7	8.84	18.2	0.006	0.247	12.9
Acenaphthylene	0.351	0.478	0.17	0.097	0.001	0.003	0.412
Acenaphthene	0.795	0.349	0.387	5.26	0.001	0.006	0.328
Fluorene	0.351	0.435	0.547	3.4	0.002	0.002	0.428
Phenanthrene	1.19	0.602	0.952	3.87	0.002	0.037	0.579
Anthracene	0.153	0.084	0.1	0.324	0.001	0.004	0.079
Acridine	0.326	0.069	0.127	0.097	0.001	0.002	0.066
Fluoranthene	0.086	0.155	0.147	0.244	0.001	0.004	0.166
Pyrene	0.051	0.125	0.142	0.087	0.001	0.003	0.131
Benzo(c)phenanthrene	0.012	0.016	0.01	0.006	0.001	0.003	0.015
Benz(a)anthracene	0.015	0.036	0.029	0.011	0.001	<0.001	0.03
Chrysene	0.018	0.044	0.034	0.01	0.001	<0.001	0.049
7,12-Dimethylbenz(a)anthracene	0.209	0.405	0.277	0.086	0.003	0.004	0.451
Benzo(b)fluoranthene	0.24	0.493	0.26	0.162	0.002	0.006	0.411
Benzo(k)fluoranthene	0.301	0.6	0.29	0.184	0.002	0.005	0.537
Benzo(a)pyrene	0.016	0.089	0.054	0.005	0.001	<0.001	0.078
3-Methylcholanthrene	0.019	0.062	0.083	0.021	0.001	0.002	0.064
Indeno(123-cd)pyrene	0.024	0.051	0.064	0.047	0.002	0.002	0.051
Dibenz(a,h)anthracene	0.048	0.113	0.112	0.041	0.002	0.003	0.105
Benzo(ghi)perylene	0.011	0.062	0.053	0.023	0.003	<0.001	0.065
Dibenzo(a,l)pyrene	0.05	0.047	0.059	0.077	0.005	0.002	0.046
Dibenzo(a,i)pyrene	0.073	0.052	0.049	0.064	0.004	0.003	0.047
Dibenzo(a,h)pyrene	0.052	0.012	0.041	0.037	0.002	<0.001	0.013

	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	**17-May**	**17-May**	**17-May**	**17-May**	**17-May**	**17-May**	**17-May**
Naphthalene	0.304	21.3	8.49	8.52	0.006	0.27	8.41
Acenaphthylene	0.173	1.18	0.167	0.078	0.001	0.003	0.167
Acenaphthene	0.671	0.497	0.439	3.65	0.001	0.001	0.447
Fluorene	0.439	1.53	0.854	2.87	0.002	0.008	0.891
Phenanthrene	0.725	4.11	1.82	3.17	0.002	0.032	1.78
Anthracene	0.058	0.561	0.113	0.182	0.001	0.005	0.115
Acridine	0.248	0.329	0.169	0.057	0.001	0.004	0.151
Fluoranthene	0.064	0.842	0.33	0.222	0.001	0.004	0.327
Pyrene	0.067	0.619	0.287	0.103	0.001	0.002	0.283
Benzo(c)phenanthrene	0.02	0.032	0.016	0.054	0.001	0.002	0.016
Benz(a)anthracene	0.036	0.183	0.082	0.005	0.001	0.001	0.073
Chrysene	0.042	0.21	0.093	0.007	0.001	<0.001	0.083
7,12-Dimethylbenz(a)anthracene	0.592	0.705	0.363	0.206	0.003	0.017	0.378
Benzo(b)fluoranthene	0.562	0.632	0.428	0.568	0.002	0.019	0.417
Benzo(k)fluoranthene	0.623	0.709	0.492	0.637	0.002	0.01	0.408
Benzo(a)pyrene	0.029	0.1	0.062	0.016	0.001	<0.001	0.059
3-Methylcholanthrene	0.026	0.009	0.025	0.037	0.001	<0.001	0.021
Indeno(123-cd)pyrene	0.068	0.064	0.062	0.052	0.002	0.007	0.07
Dibenz(a,h)anthracene	0.097	0.038	0.023	0.103	0.002	0.006	0.029
Benzo(ghi)perylene	0.025	0.052	0.041	0.04	0.003	0.022	0.041
Dibenzo(a,l)pyrene	0.014	0.071	0.042	0.03	0.005	0.003	0.037
Dibenzo(a,i)pyrene	0.006	0.037	0.005	0.032	0.004	<0.001	0.005
Dibenzo(a,h)pyrene	0.009	0.004	0.015	0.019	0.002	<0.001	0.019

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Polycyclic Aromatic Hydrocarbons (PAHs) **Indicated Sites and Dates**

	Results (ng/m3)						
	AMS 1	**AMS 6**	**AMS 7**	**AMS 14**	**Lab Blank**	**Field Blank**	**AMS 14 Repeat**
	Fort McKay	**Patricia McInnes**	**Athabasca Valley**	**Anzac**			**Anzac**
Compound Name	**23-May**	**23-May**	**23-May**	**23-May**	**23-May**	**23-May**	**23-May**
Naphthalene	1.43	11.1	9.22	17.5	0.006	0.075	18.1
Acenaphthylene	0.051	0.232	0.266	0.101	0.001	0.006	0.109
Acenaphthene	0.562	0.366	0.56	13.5	0.001	0.005	13.8
Fluorene	0.741	1.06	1.2	10.9	0.002	0.002	11.1
Phenanthrene	1.51	3.26	1.97	21.6	0.002	0.053	21.9
Anthracene	0.164	0.546	0.209	0.738	0.001	0.008	0.717
Acridine	0.417	0.306	0.241	0.285	0.001	0.006	0.268
Fluoranthene	0.105	0.721	0.304	1.83	0.001	0.008	1.85
Pyrene	0.111	0.504	0.29	0.588	0.001	0.008	0.533
Benzo(c)phenanthrene	0.008	0.025	0.013	0.014	0.001	0.007	0.015
Benz(a)anthracene	0.037	0.051	0.035	0.013	0.001	<0.001	0.012
Chrysene	0.043	0.058	0.04	0.016	0.001	<0.001	0.014
7,12-Dimethylbenz(a)anthracene	0.375	0.383	0.365	0.155	0.003	0.012	0.205
Benzo(b)fluoranthene	0.432	0.52	0.428	0.192	0.002	0.022	0.199
Benzo(k)fluoranthene	0.493	0.584	0.471	0.209	0.002	0.028	0.22
Benzo(a)pyrene	0.011	0.025	0.025	0.011	0.001	0.005	0.011
3-Methylcholanthrene	0.022	0.004	0.014	0.014	0.001	0.002	0.016
Indeno(123-cd)pyrene	0.035	0.029	0.048	0.014	0.002	0.002	0.015
Dibenz(a,h)anthracene	0.016	0.024	0.021	0.01	0.002	0.002	0.011
Benzo(ghi)perylene	0.024	0.042	0.056	0.025	0.003	<0.001	0.024
Dibenzo(a,l)pyrene	0.064	0.08	0.036	0.03	0.005	0.002	0.037
Dibenzo(a,i)pyrene	0.01	0.002	0.018	0.016	0.004	<0.001	0.017
Dibenzo(a,h)pyrene	0.02	0.013	0.037	0.023	0.002	<0.001	0.024

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 1 Repeat Fort McKay**
Compound Name	**29-May**	**29-May**	**29-May**	**29-May**	**29-May**	**29-May**	**29-May**
Naphthalene	1.05	15.8	10.7	6.54	0.006	0.075	1.14
Acenaphthylene	0.218	0.248	0.235	0.055	0.001	0.004	0.207
Acenaphthene	0.646	0.841	0.935	2.43	0.001	0.005	0.652
Fluorene	0.498	0.686	0.726	1.8	0.002	0.004	0.51
Phenanthrene	0.094	1.37	1.35	3.33	0.002	0.044	1.1
Anthracene	0.07	0.154	0.156	0.255	0.001	0.005	0.081
Acridine	0.315	0.219	0.323	0.111	0.001	0.004	0.298
Fluoranthene	0.098	0.192	0.186	0.307	0.001	0.004	0.089
Pyrene	0.074	0.155	0.172	0.111	0.001	0.003	0.071
Benzo(c)phenanthrene	0.007	0.007	0.008	0.019	0.001	<0.001	0.006
Benz(a)anthracene	0.009	0.02	0.018	0.006	0.001	<0.001	0.007
Chrysene	0.011	0.024	0.02	0.008	0.001	<0.001	0.008
7,12-Dimethylbenz(a)anthracene	0.286	0.573	0.142	0.092	0.003	0.008	0.264
Benzo(b)fluoranthene	0.402	1.08	0.246	0.154	0.002	0.023	0.396
Benzo(k)fluoranthene	0.451	1.21	0.273	0.175	0.002	0.028	0.44
Benzo(a)pyrene	0.04	0.022	0.005	0.012	0.001	<0.001	0.037
3-Methylcholanthrene	0.01	0.045	0.025	0.041	0.001	<0.001	0.008
Indeno(123-cd)pyrene	0.04	0.04	0.017	0.022	0.002	0.002	0.04
Dibenz(a,h)anthracene	0.181	0.028	0.019	0.046	0.002	0.002	0.19
Benzo(ghi)perylene	0.025	0.029	0.016	0.012	0.003	0.002	0.026
Dibenzo(a,l)pyrene	0.028	0.051	0.051	0.034	0.005	<0.001	0.033
Dibenzo(a,i)pyrene	0.028	0.071	0.056	0.036	0.004	<0.001	0.025
Dibenzo(a,h)pyrene	0.017	0.086	0.082	0.057	0.002	<0.001	0.019

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	**04-Jun**	**04-Jun**	**04-Jun**	**04-Jun**	**04-Jun**	**04-Jun**	**04-Jun**
Naphthalene	1.02	5.87	5.14	1.42	0.006	0.07	5.99
Acenaphthylene	0.047	0.294	0.28	0.083	0.001	0.005	0.268
Acenaphthene	0.27	1.57	1.22	0.561	0.001	0.002	1.5
Fluorene	0.414	1.06	0.953	0.575	0.002	0.002	0.991
Phenanthrene	0.671	0.898	1.41	1.25	0.002	0.042	0.867
Anthracene	0.084	0.188	0.144	0.091	0.001	0.002	0.166
Acridine	0.111	0.293	0.369	0.126	0.001	0.004	0.276
Fluoranthene	0.046	0.089	0.097	0.133	0.001	0.007	0.085
Pyrene	0.047	0.073	0.092	0.077	0.001	0.006	0.067
Benzo(c)phenanthrene	0.01	0.006	0.006	0.022	0.001	<0.001	0.005
Benz(a)anthracene	0.004	0.015	0.01	0.004	0.001	<0.001	0.014
Chrysene	0.006	0.018	0.012	0.005	0.001	<0.001	0.017
7,12-Dimethylbenz(a)anthracene	0.865	0.389	0.442	0.321	0.003	0.007	0.394
Benzo(b)fluoranthene	1.34	0.656	0.654	0.525	0.002	0.022	0.615
Benzo(k)fluoranthene	1.51	0.722	0.744	0.609	0.002	0.024	0.705
Benzo(a)pyrene	0.033	0.019	0.023	0.015	0.001	0.005	0.018
3-Methylcholanthrene	0.03	0.049	0.001	0.047	0.001	0.002	0.043
Indeno(123-cd)pyrene	0.003	0.038	0.014	0.034	0.002	0.004	0.035
Dibenz(a,h)anthracene	0.039	0.031	0.032	0.069	0.002	0.002	0.034
Benzo(ghi)perylene	0.023	0.011	0.017	0.015	0.003	<0.001	0.014
Dibenzo(a,l)pyrene	0.036	0.043	0.042	0.022	0.005	<0.001	0.042
Dibenzo(a,i)pyrene	0.054	0.062	0.036	0.019	0.004	<0.001	0.065
Dibenzo(a,h)pyrene	0.079	0.075	0.045	0.016	0.002	<0.001	0.078

	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	**10-Jun**	**10-Jun**	**10-Jun**	**10-Jun**	**10-Jun**	**10-Jun**	**10-Jun**
Naphthalene	5.58	7.55	7.23	14.8	0.004	0.051	7.32
Acenaphthylene	0.093	0.216	0.417	0.058	0.002	0.002	0.287
Acenaphthene	1.39	0.908	0.478	10.8	0.001	0.001	0.824
Fluorene	0.346	0.292	0.191	2.36	0.001	0.002	0.252
Phenanthrene	1.15	0.662	0.616	3.29	0.001	0.002	0.599
Anthracene	0.109	0.069	0.06	0.33	0.002	0.002	0.068
Acridine	0.396	0.12	0.121	0.143	0.001	0.003	0.129
Fluoranthene	0.083	0.074	0.077	0.188	0.001	<0.001	0.075
Pyrene	0.099	0.085	0.096	0.107	0.001	<0.001	0.07
Benzo(c)phenanthrene	0.003	0.003	0.004	0.067	0.001	<0.001	0.004
Benz(a)anthracene	0.004	0.004	0.003	0.005	0.001	<0.001	0.003
Chrysene	0.007	0.008	0.013	0.007	0.001	<0.001	0.006
7,12-Dimethylbenz(a)anthracene	<0.001	<0.001	<0.001	0.034	0.001	<0.001	<0.001
Benzo(b)fluoranthene	0.002	0.04	<0.001	0.006	0.001	<0.001	0.041
Benzo(k)fluoranthene	0.002	0.041	0.004	0.011	0.001	<0.001	0.03
Benzo(a)pyrene	0.01	0.007	0.008	0.009	0.001	<0.001	0.009
3-Methylcholanthrene	0.002	0.003	0.009	0.009	0.001	<0.001	0.002
Indeno(123-cd)pyrene	0.004	0.004	0.004	0.004	0.001	<0.001	0.003
Dibenz(a,h)anthracene	0.003	0.002	0.003	0.003	0.001	<0.001	0.002
Benzo(ghi)perylene	0.004	0.002	0.003	<0.001	0.001	<0.001	0.003
Dibenzo(a,l)pyrene	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Dibenzo(a,i)pyrene	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001
Dibenzo(a,h)pyrene	0.002	<0.001	<0.001	0.001	0.001	<0.001	<0.001

	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	**16-Jun**	**16-Jun**	**16-Jun**	**16-Jun**	**16-Jun**	**16-Jun**	**16-Jun**
Naphthalene	8.26	23.9	33.3	95.7	0.004	0.043	36.7
Acenaphthylene	0.092	0.284	1.33	0.147	0.002	0.003	1.36
Acenaphthene	0.931	1.92	1.21	31.5	0.001	0.008	1.15
Fluorene	0.303	0.79	1.12	9.3	0.001	0.003	1.07
Phenanthrene	1.04	1.7	2.52	16	0.001	0.002	2.33
Anthracene	0.096	0.272	0.303	1.12	0.002	0.001	0.348
Acridine	0.382	0.121	0.216	0.265	0.001	0.003	0.206
Fluoranthene	0.054	0.02	0.462	0.758	0.001	<0.001	0.433
Pyrene	0.1	0.41	0.519	0.375	0.001	0.001	0.489
Benzo(c)phenanthrene	0.01	0.023	0.038	0.022	0.001	0.001	0.035
Benz(a)anthracene	0.064	0.028	0.07	0.01	0.001	<0.001	0.069
Chrysene	0.037	0.044	0.083	0.01	0.001	<0.001	0.078
7,12-Dimethylbenz(a)anthracene	0.022	0.097	0.015	0.034	0.001	0.004	0.016
Benzo(b)fluoranthene	0.051	0.221	0.063	0.167	0.001	0.001	0.063
Benzo(k)fluoranthene	0.035	0.077	0.044	0.07	0.001	0.002	0.052
Benzo(a)pyrene	0.009	0.022	0.035	0.013	0.001	0.002	0.034
3-Methylcholanthrene	0.003	0.008	0.01	0.009	0.001	0.004	0.012
Indeno(123-cd)pyrene	0.004	0.01	0.016	0.004	0.001	<0.001	0.016
Dibenz(a,h)anthracene	0.003	0.004	0.004	0.006	0.001	<0.001	0.005
Benzo(ghi)perylene	0.01	0.031	0.008	0.005	0.001	<0.001	0.011
Dibenzo(a,l)pyrene	<0.001	0.005	0.006	<0.001	0.001	<0.001	0.008
Dibenzo(a,i)pyrene	<0.001	<0.001	0.002	<0.001	0.001	<0.001	0.002
Dibenzo(a,h)pyrene	0.003	<0.001	0.004	<0.001	0.001	<0.001	0.005

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Polycyclic Aromatic Hydrocarbons (PAHs) **Indicated Sites and Dates**

	Results (ng/m3)						
	AMS 1	**AMS 6**	**AMS 7**	**AMS 14**	**Lab Blank**	**Field Blank**	**AMS 14 Repeat**
	Fort McKay	**Patricia McInnes**	**Athabasca Valley**	**Anzac**			**Anzac**
Compound Name	**22-Jun**	**22-Jun**	**22-Jun**	**22-Jun**	**22-Jun**	**22-Jun**	**22-Jun**
Naphthalene	2.9	10.2	0.978	45.7	0.004	0.07	45.4
Acenaphthylene	0.283	0.452	0.007	0.377	0.002	0.002	0.397
Acenaphthene	0.748	0.698	0.08	13.2	0.001	0.007	13.3
Fluorene	0.331	0.512	0.046	3.67	0.001	0.005	3.82
Phenanthrene	1.24	1.54	0.021	8.65	0.001	0.003	9.04
Anthracene	0.147	0.243	0.01	1.13	0.002	0.002	1.18
Acridine	0.254	0.256	0.003	0.408	0.001	0.009	0.341
Fluoranthene	0.098	0.242	0.006	0.684	0.001	0.009	0.691
Pyrene	0.109	0.241	0.006	0.424	0.001	0.004	0.435
Benzo(c)phenanthrene	0.034	0.024	<0.001	0.041	0.001	<0.001	0.049
Benz(a)anthracene	0.027	0.014	0.003	0.024	0.001	<0.001	0.029
Chrysene	0.015	0.026	0.001	0.011	0.001	<0.001	0.013
7,12-Dimethylbenz(a)anthracene	0.061	0.046	0.003	0.107	0.001	0.006	0.043
Benzo(b)fluoranthene	0.199	0.065	0.003	0.09	0.001	0.001	0.088
Benzo(k)fluoranthene	0.577	0.173	0.01	0.257	0.001	<0.001	0.25
Benzo(a)pyrene	0.009	0.011	0.003	0.009	0.001	<0.001	0.01
3-Methylcholanthrene	0.008	0.018	0.002	0.008	0.001	0.002	0.008
Indeno(123-cd)pyrene	0.006	0.005	0.003	0.005	0.001	<0.001	0.005
Dibenz(a,h)anthracene	0.011	0.005	0.002	0.003	0.001	<0.001	0.004
Benzo(ghi)perylene	0.015	0.013	0.002	0.003	0.001	<0.001	0.003
Dibenzo(a,l)pyrene	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Dibenzo(a,i)pyrene	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Dibenzo(a,h)pyrene	0.002	<0.001	<0.001	<0.001	0.001	<0.001	<0.001

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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 1 Repeat Fort McKay**
Compound Name	**28-Jun**	**28-Jun**	**28-Jun**	**28-Jun**	**28-Jun**	**28-Jun**	**28-Jun**
Naphthalene	18.7	18.2	29		0.004	0.089	19.4
Acenaphthylene	1.35	0.447	3.94	0.47	0.002	0.004	1.22
Acenaphthene	1.46	1.51	1.56	36.7	0.001	0.009	1.51
Fluorene	0.967	1.08	2.27	16.1	0.001	0.006	0.964
Phenanthrene	2.48	2.88	5.5	39.4	0.001	0.007	2.29
Anthracene	0.416	0.707	0.819	5.83	0.002	0.002	0.443
Acridine	0.625	0.836	0.678	1.27	0.001	0.002	0.601
Fluoranthene	0.134	0.393	0.64	1.96	0.001	0.001	0.116
Pyrene	0.207	0.347	0.658	0.985	0.001	<0.001	0.198
Benzo(c)phenanthrene	0.003	0.024	0.033	0.01	0.001	<0.001	0.003
Benz(a)anthracene	0.036	0.021	0.123	0.015	0.001	<0.001	0.033
Chrysene	0.021	0.028	0.108	0.025	0.001	<0.001	0.019
7,12-Dimethylbenz(a)anthracene	0.007	0.044	0.047	0.049	0.001	<0.001	0.005
Benzo(b)fluoranthene	0.039	0.14	0.102	0.101	0.001	0.002	0.043
Benzo(k)fluoranthene	0.126	0.397	0.339	0.387	0.001	<0.001	0.107
Benzo(a)pyrene	0.012	0.01	0.043	0.01	0.001	<0.001	0.011
3-Methylcholanthrene	0.013	0.004	0.008	0.009	0.001	0.002	0.016
Indeno(123-cd)pyrene	0.02	0.004	0.044	0.005	0.001	<0.001	0.017
Dibenz(a,h)anthracene	0.059	0.121	0.072	0.007	0.001	<0.001	0.061
Benzo(ghi)perylene	0.004	0.009	0.081	0.007	0.001	0.001	0.004
Dibenzo(a,l)pyrene	<0.001	0.001	0.005	0.007	0.001	<0.001	<0.001
Dibenzo(a,i)pyrene	<0.001	<0.001	0.005	0.002	0.001	<0.001	<0.001
Dibenzo(a,h)pyrene	<0.001	<0.001	0.003	0.002	0.001	<0.001	<0.001

Results (ng/m3)

Compound Name	AMS 1 Fort McKay 04-Jul	AMS 6 Patricia McInnes 04-Jul	AMS 7 Athabasca Valley 04-Jul	AMS 14 Anzac 04-Jul	Lab Blank 04-Jul	Field Blank 04-Jul	AMS 6 Repeat Patricia McInnes 04-Jul
Naphthalene	8.97	11.4	4.97	49.3	0.004	0.017	12.4
Acenaphthylene	0.248	0.124	0.155	0.125	0.002	0.003	0.129
Acenaphthene	0.405	0.224	0.249	16.9	0.001	0.008	0.228
Fluorene	0.37	0.263	0.242	6.82	0.001	0.01	0.267
Phenanthrene	0.961	1.01	0.781	9.45	0.001	0.007	1
Anthracene	0.167	0.127	0.128	1.17	0.002	0.003	0.146
Acridine	0.166	0.061	0.189	0.666	0.001	0.005	0.055
Fluoranthene	0.129	0.146	0.089	0.372	0.001	0.005	0.144
Pyrene	0.171	0.112	0.106	0.284	0.001	<0.001	0.121
Benzo(c)phenanthrene	0.002	0.012	0.027	0.003	0.001	<0.001	0.012
Benz(a)anthracene	0.012	0.019	0.024	0.008	0.001	<0.001	0.02
Chrysene	0.012	0.017	0.014	0.011	0.001	<0.001	0.017
7,12-Dimethylbenz(a)anthracene	0.101	0.065	<0.001	<0.001	0.001	<0.001	0.07
Benzo(b)fluoranthene	0.029	0.045	0.01	0.03	0.001	<0.001	0.045
Benzo(k)fluoranthene	0.072	0.149	0.038	0.093	0.001	<0.001	0.138
Benzo(a)pyrene	0.011	0.01	0.009	0.006	0.001	<0.001	0.009
3-Methylcholanthrene	0.015	0.004	0.008	0.006	0.001	<0.001	0.005
Indeno(123-cd)pyrene	0.005	0.005	0.004	0.006	0.001	<0.001	0.005
Dibenz(a,h)anthracene	0.06	0.094	0.004	0.054	0.001	<0.001	0.101
Benzo(ghi)perylene	0.014	0.006	0.004	0.007	0.001	<0.001	0.007
Dibenzo(a,l)pyrene	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001
Dibenzo(a,i)pyrene	<0.001	0.002	<0.001	<0.001	0.001	<0.001	0.003
Dibenzo(a,h)pyrene	<0.001	0.003	0.002	0.001	0.001	0.002	0.004

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	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	**10-Jul**	**10-Jul**	**10-Jul**	**10-Jul**	**10-Jul**	**10-Jul**	**10-Jul**
Naphthalene	23.5	19	7.63	16.1	0.056	0.207	18.4
Acenaphthylene	2.44	0.103	0.166	0.117	0.01	0.05	0.1
Acenaphthene	0.705	1.66	0.202	0.874	0.006	0.013	1.92
Fluorene	3.14	3.17	1.27	2.3	0.013	<0.001	3.15
Phenanthrene	4.36	2.4	2.28	5.17	0.009	0.005	2.48
Anthracene	0.228	0.202	0.196	0.331	0.003	<0.001	0.174
Acridine	0.629	0.211	0.401	0.578	0.001	0.003	0.215
Fluoranthene	0.233	0.138	0.206	0.439	0.002	<0.001	0.131
Pyrene	0.207	0.084	0.203	0.375	0.002	<0.001	0.091
Benzo(c)phenanthrene	0.015	0.008	0.007	0.008	0.001	<0.001	0.008
Benz(a)anthracene	0.033	0.018	0.017	0.021	0.001	0.001	0.02
Chrysene	0.025	0.013	0.016	0.016	0.001	<0.001	0.014
7,12-Dimethylbenz(a)anthracene	0.113	0.115	0.086	0.097	0.003	<0.001	0.12
Benzo(b)fluoranthene	0.081	0.028	0.06	0.038	0.001	0.001	0.033
Benzo(k)fluoranthene	0.091	0.046	0.067	0.047	0.001	0.002	0.047
Benzo(a)pyrene	0.022	0.013	0.011	0.013	0.001	<0.001	0.012
3-Methylcholanthrene	0.156	0.174	0.549	0.089	0.001	0.001	0.202
Indeno(123-cd)pyrene	0.039	0.021	0.016	0.014	0.001	<0.001	0.018
Dibenz(a,h)anthracene	0.023	0.018	0.014	0.012	0.001	<0.001	0.018
Benzo(ghi)perylene	0.017	0.02	0.027	0.012	0.001	<0.001	0.02
Dibenzo(a,l)pyrene	0.016	0.013	0.011	0.013	0.002	0.002	0.012
Dibenzo(a,i)pyrene	0.008	0.012	0.014	0.007	0.001	<0.001	0.011
Dibenzo(a,h)pyrene	0.007	0.009	0.006	0.004	0.001	<0.001	0.009

	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	**16-Jul**	**16-Jul**	**16-Jul**	**16-Jul**	**16-Jul**	**16-Jul**	**16-Jul**
Naphthalene	32.6	14.7	30	31	0.056	0.277	33.5
Acenaphthylene	4.5	1.13	2.29	1.94	0.01	0.005	2.19
Acenaphthene	3.3	0.946	3.8	15.6	0.006	0.017	3.62
Fluorene	5.62	2.95	7.41	16.3	0.013	0.027	7.09
Phenanthrene	13.1	6.96	13.5	30.2	0.009	0.031	13.2
Anthracene	0.845	0.551	0.766	2.04	0.003	0.002	0.737
Acridine	2.44	0.572	1.99	0.778	0.001	<0.001	1.78
Fluoranthene	0.659	0.669	1.01	1.43	0.002	0.001	0.949
Pyrene	0.661	0.596	0.985	0.864	0.002	<0.001	0.92
Benzo(c)phenanthrene	0.122	0.03	0.079	0.089	0.001	<0.001	0.085
Benz(a)anthracene	0.069	0.036	0.074	0.016	0.001	0.001	0.066
Chrysene	0.079	0.059	0.082	0.016	0.001	0.001	0.084
7,12-Dimethylbenz(a)anthracene	0.238	0.117	0.287	0.143	0.003	<0.001	0.264
Benzo(b)fluoranthene	0.145	0.076	0.182	0.066	0.001	0.002	0.16
Benzo(k)fluoranthene	0.163	0.086	0.206	0.074	0.001	0.001	0.18
Benzo(a)pyrene	0.026	0.018	0.031	0.025	0.001	0.001	0.029
3-Methylcholanthrene	0.575	0.106	0.12	0.165	0.001	0.009	0.112
Indeno(123-cd)pyrene	0.038	0.02	0.03	0.015	0.001	<0.001	0.025
Dibenz(a,h)anthracene	0.033	0.01	0.033	0.02	0.001	<0.001	0.028
Benzo(ghi)perylene	0.053	0.039	0.11	0.033	0.001	<0.001	0.112
Dibenzo(a,l)pyrene	0.017	0.006	0.028	0.013	0.002	<0.001	0.022
Dibenzo(a,i)pyrene	0.01	0.004	0.012	0.005	0.001	<0.001	0.01
Dibenzo(a,h)pyrene	0.004	0.001	0.005	0.005	0.001	<0.001	0.005

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	Results (ng/m3)						
	AMS 1	**AMS 6**	**AMS 7**	**AMS 14**	**Lab Blank**	**Field Blank**	**AMS 14 Repeat**
	Fort McKay	**Patricia McInnes**	**Athabasca Valley**	**Anzac**			**Anzac**
Compound Name	**22-Jul**	**22-Jul**	**22-Jul**	**22-Jul**	**22-Jul**	**22-Jul**	**22-Jul**
Naphthalene	24.4	27	37.4		0.056	0.706	
Acenaphthylene	1.57	0.829	2.17	1.62	0.01	0.015	1.4
Acenaphthene	3.05	1.66	2.31	79.9	0.006	0.014	73
Fluorene	4.53	4.96	4.99	60	0.013	0.091	54.6
Phenanthrene	9.05	7.78	9.69	87.8	0.009	0.047	86.1
Anthracene	0.638	0.634	0.58	4.36	0.003	0.007	4.31
Acridine	2.33	0.526	0.661	2.92	0.001	0.023	2.32
Fluoranthene	0.478	0.845	0.887	3.77	0.002	0.006	3.52
Pyrene	0.608	0.684	0.94	1.85	0.002	0.006	1.73
Benzo(c)phenanthrene	0.047	0.042	0.228	0.028	0.001	<0.001	0.024
Benz(a)anthracene	0.06	0.044	0.056	0.028	0.001	0.001	0.03
Chrysene	0.077	0.058	0.079	0.035	0.001	0.002	0.033
7,12-Dimethylbenz(a)anthracene	0.199	0.077	0.09	0.143	0.003	0.004	0.125
Benzo(b)fluoranthene	0.113	0.13	0.132	0.047	0.001	0.007	0.049
Benzo(k)fluoranthene	0.121	0.146	0.149	0.053	0.001	0.004	0.056
Benzo(a)pyrene	0.052	0.047	0.051	0.02	0.001	<0.001	0.022
3-Methylcholanthrene	0.296	0.206	0.241	0.13	0.001	0.01	0.129
Indeno(123-cd)pyrene	0.027	0.044	0.042	0.017	0.001	<0.001	0.018
Dibenz(a,h)anthracene	0.045	0.028	0.03	0.029	0.001	<0.001	0.024
Benzo(ghi)perylene	0.139	0.101	0.115	0.015	0.001	0.004	0.012
Dibenzo(a,l)pyrene	0.022	0.036	0.026	0.011	0.002	0.002	0.009
Dibenzo(a,i)pyrene	0.008	0.006	0.005	0.009	0.001	<0.001	0.008
Dibenzo(a,h)pyrene	0.009	0.006	0.007	0.005	0.001	<0.001	0.005

	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	**28-Jul**	**28-Jul**	**28-Jul**	**28-Jul**	**28-Jul**	**28-Jul**	**28-Jul**
Naphthalene	19.5	30.4	21.5		0.056	0.321	17.7
Acenaphthylene	1.93	0.384	1.82	1.52	0.01	0.012	2.12
Acenaphthene	7.12	1.87	1.92	82.8	0.006	0.003	7.5
Fluorene	7.62	3.87	3.47	62.7	0.013	0.03	8.02
Phenanthrene	11.3	8.97	7.2	99.5	0.009	0.024	12.9
Anthracene	0.855	0.694	0.759	5.51	0.003	0.001	0.819
Acridine	1.68	0.594	0.748	1.51	0.001	<0.001	1.4
Fluoranthene	0.388	1.18	0.72	3.55	0.002	<0.001	0.363
Pyrene	0.559	0.959	0.922	1.82	0.002	<0.001	0.586
Benzo(c)phenanthrene	0.02	0.035	0.074	0.015	0.001	<0.001	0.028
Benz(a)anthracene	0.026	0.041	0.046	0.018	0.001	<0.001	0.025
Chrysene	0.036	0.053	0.06	0.023	0.001	<0.001	0.038
7,12-Dimethylbenz(a)anthracene	0.183	0.226	0.132	0.056	0.003	<0.001	1.88
Benzo(b)fluoranthene	0.117	0.144	0.12	0.029	0.001	<0.001	0.126
Benzo(k)fluoranthene	0.132	0.163	0.136	0.033	0.001	<0.001	0.142
Benzo(a)pyrene	0.025	0.031	0.027	0.015	0.001	<0.001	0.029
3-Methylcholanthrene	0.447	0.081	0.09	0.103	0.001	0.01	0.461
Indeno(123-cd)pyrene	0.016	0.016	0.026	0.004	0.001	<0.001	0.015
Dibenz(a,h)anthracene	0.013	0.026	0.03	0.012	0.001	<0.001	0.01
Benzo(ghi)perylene	0.025	0.038	0.082	0.002	0.001	<0.001	0.026
Dibenzo(a,l)pyrene	0.008	0.013	0.015	0.006	0.002	<0.001	0.01
Dibenzo(a,i)pyrene	0.005	0.006	0.005	0.005	0.001	<0.001	0.005
Dibenzo(a,h)pyrene	0.006	0.008	0.005	0.005	0.001	<0.001	0.007

	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	**03-Aug**	**03-Aug**	**03-Aug**	**03-Aug**	**03-Aug**	**03-Aug**	**03-Aug**
Naphthalene	14.1	30.7	29.2		0.056	0.172	29.1
Acenaphthylene	1.29	0.788	2.44	3.13	0.01	0.004	0.735
Acenaphthene	2.63	1.25	1.85		0.006	0.006	1.16
Fluorene	4.59	4.28	4.74	77.6	0.013	0.002	4.03
Phenanthrene	10.4	10.7	11.3	77.5	0.009	0.003	10.3
Anthracene	0.574	0.869	1.44	5.38	0.003	0.002	0.822
Acridine	1.57	0.423	1.02	2.11	0.001	0.003	0.468
Fluoranthene	0.416	1.07	0.801	2.19	0.002	<0.001	1.02
Pyrene	0.639	0.872	0.859	1	0.002	<0.001	0.844
Benzo(c)phenanthrene	0.004	0.069	0.053	0.036	0.001	<0.001	0.074
Benz(a)anthracene	0.039	0.06	0.054	0.064	0.001	<0.001	0.052
Chrysene	0.045	0.07	0.064	0.086	0.001	<0.001	0.057
7,12-Dimethylbenz(a)anthracene	0.116	0.132	0.091	0.128	0.003	<0.001	0.127
Benzo(b)fluoranthene	0.048	0.11	0.131	0.101	0.001	0.002	0.104
Benzo(k)fluoranthene	0.054	0.124	0.148	0.114	0.001	0.002	0.119
Benzo(a)pyrene	0.028	0.054	0.036	0.08	0.001	<0.001	0.049
3-Methylcholanthrene	0.33	0.282	0.135	0.099	0.001	0.006	0.269
Indeno(123-cd)pyrene	0.009	0.041	0.016	0.028	0.001	<0.001	0.036
Dibenz(a,h)anthracene	0.015	0.03	0.019	0.018	0.001	<0.001	0.031
Benzo(ghi)perylene	0.009	0.065	0.077	0.062	0.001	0.001	0.059
Dibenzo(a,l)pyrene	0.009	0.02	0.029	0.034	0.002	<0.001	0.022
Dibenzo(a,i)pyrene	0.004	0.004	0.004	0.005	0.001	<0.001	0.004
Dibenzo(a,h)pyrene	0.004	0.004	0.004	0.005	0.001	<0.001	0.004

Results (ng/m3)

Compound Name	AMS 1 Fort McKay 09-Aug	AMS 6 Patricia McInnes 09-Aug	AMS 7 Athabasca Valley 09-Aug	AMS 14 Anzac 09-Aug	Lab Blank 09-Aug	Field Blank 09-Aug	AMS 6 Repeat Patricia McInnes 09-Aug
Naphthalene	2.59	11.8	39.1	14.6	0.009	0.032	11.1
Acenaphthylene	1.54	1.45	4.73	1.06	0.001	0.005	1.6
Acenaphthene	0.29	0.609	1.39	4.68	0.002	<0.001	0.65
Fluorene	1.18	0.924	3.26	4.43	0.002	0.002	1.27
Phenanthrene	2.04	1.75	5.31	4.58	0.003	<0.001	1.79
Anthracene	0.231	0.213	1.04	0.407	0.001	<0.001	0.217
Acridine	0.191	0.196	0.503	0.035	0.001	<0.001	0.205
Fluoranthene	0.135	0.148	0.624	0.265	0.001	0.003	0.15
Pyrene	0.127	0.126	0.633	0.225	0.001	0.002	0.13
Benzo(c)phenanthrene	0.002	0.005	0.031	0.003	0.001	0.003	0.005
Benz(a)anthracene	0.011	0.004	0.028	0.005	0.001	<0.001	0.005
Chrysene	0.013	0.009	0.057	0.008	0.001	<0.001	0.01
7,12-Dimethylbenz(a)anthracene	0.034	0.02	0.035	0.009	0.002	<0.001	0.021
Benzo(b)fluoranthene	0.038	0.029	0.087	0.031	0.001	<0.001	0.034
Benzo(k)fluoranthene	0.042	0.033	0.072	0.035	0.001	<0.001	0.038
Benzo(a)pyrene	0.006	0.013	0.062	0.007	0.001	<0.001	0.011
3-Methylcholanthrene	0.069	0.057	0.093	0.223	0.001	<0.001	0.063
Indeno(123-cd)pyrene	0.003	0.004	0.029	0.003	0.001	<0.001	0.003
Dibenz(a,h)anthracene	0.006	0.006	0.017	0.006	0.001	<0.001	0.006
Benzo(ghi)perylene	0.009	0.011	0.102	0.006	0.001	<0.001	0.013
Dibenzo(a,l)pyrene	0.003	0.004	0.018	0.005	0.001	<0.001	0.003
Dibenzo(a,i)pyrene	0.002	0.002	0.015	0.002	0.001	<0.001	0.002
Dibenzo(a,h)pyrene	0.002	0.002	0.003	0.003	0.002	<0.001	0.002

	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	**15-Aug**	**15-Aug**	**15-Aug**	**15-Aug**	**15-Aug**	**15-Aug**	**15-Aug**
Naphthalene	11.1	15	7.53	24.7	0.009	0.026	7.93
Acenaphthylene	0.849	0.836	0.604	1.03	0.001	0.005	0.533
Acenaphthene	2.62	0.968	1.1	72.1	0.002	<0.001	1.15
Fluorene	2.57	2.06	1.92	42.7	0.002	0.002	1.91
Phenanthrene	4.77	4.17	2.96	51.2	0.003	<0.001	3.1
Anthracene	0.606	0.368	0.299	3.61	0.001	<0.001	0.321
Acridine	0.125	0.289	0.079	0.716	0.001	<0.001	0.076
Fluoranthene	0.288	0.569	0.296	2.65	0.001	0.002	0.309
Pyrene	0.356	0.532	0.389	1.26	0.001	0.002	0.394
Benzo(c)phenanthrene	0.011	0.061	0.011	0.013	0.001	<0.001	0.012
Benz(a)anthracene	0.017	0.019	0.018	0.031	0.001	<0.001	0.016
Chrysene	0.038	0.027	0.025	0.027	0.001	<0.001	0.024
7,12-Dimethylbenz(a)anthracene	0.095	0.063	0.026	0.028	0.002	<0.001	0.022
Benzo(b)fluoranthene	0.088	0.031	0.025	0.023	0.001	<0.001	0.022
Benzo(k)fluoranthene	0.099	0.047	0.027	0.028	0.001	<0.001	0.023
Benzo(a)pyrene	0.015	0.02	0.011	0.009	0.001	<0.001	0.011
3-Methylcholanthrene	0.062	0.221	0.098	0.145	0.001	0.02	0.097
Indeno(123-cd)pyrene	0.005	0.015	0.014	0.006	0.001	<0.001	0.017
Dibenz(a,h)anthracene	0.011	0.013	0.009	0.008	0.001	<0.001	0.009
Benzo(ghi)perylene	0.018	0.038	0.037	0.012	0.001	<0.001	0.039
Dibenzo(a,l)pyrene	0.006	0.008	0.007	0.003	0.001	<0.001	0.007
Dibenzo(a,i)pyrene	<0.001	0.001	0.002	0.002	0.001	<0.001	0.002
Dibenzo(a,h)pyrene	0.003	0.002	0.006	0.002	0.002	<0.001	0.005

Results (ng/m3)

Compound Name	AMS 6 Patricia McInnes 21-Aug	AMS 7 Athabasca Valley 21-Aug	AMS 14 Anzac 21-Aug	Lab Blank 21-Aug	Field Blank 21-Aug	AMS 14 Repeat Anzac 21-Aug
Naphthalene	3.03	8.58	3.94	0.009	0.029	3.92
Acenaphthylene	3.89	0.351	0.921	0.001	0.005	0.897
Acenaphthene	3.03	0.554	0.598	0.002	<0.001	0.6
Fluorene	0.904	1.23	0.381	0.002	<0.001	0.375
Phenanthrene	5.67	2.25	3.28	0.003	<0.001	3.3
Anthracene	1.76	0.265	0.171	0.001	<0.001	0.153
Acridine	0.846	0.322	0.79	0.001	<0.001	0.758
Fluoranthene	0.282	0.25	0.176	0.001	<0.001	0.172
Pyrene	0.081	0.393	0.132	0.001	<0.001	0.151
Benzo(c)phenanthrene	0.135	0.012	0.004	0.001	<0.001	0.004
Benz(a)anthracene	<0.001	0.022	0.03	0.001	<0.001	0.029
Chrysene	<0.001	0.028	0.034	0.001	<0.001	0.037
7,12-Dimethylbenz(a)anthracene	0.058	0.011	0.037	0.002	<0.001	0.042
Benzo(b)fluoranthene	0.135	0.1	1.04	0.001	<0.001	1.04
Benzo(k)fluoranthene	0.102	0.112	0.106	0.001	<0.001	0.106
Benzo(a)pyrene	<0.001	0.017	0.029	0.001	<0.001	0.029
3-Methylcholanthrene	<0.001	0.036	0.074	0.001	0.002	0.075
Indeno(123-cd)pyrene	<0.001	0.005	0.02	0.001	<0.001	0.022
Dibenz(a,h)anthracene	<0.001	0.009	0.037	0.001	<0.001	0.033
Benzo(ghi)perylene	<0.001	0.05	0.034	0.001	<0.001	0.03
Dibenzo(a,l)pyrene	<0.001	0.008	0.008	0.001	<0.001	0.008
Dibenzo(a,i)pyrene	<0.001	0.003	0.021	0.001	<0.001	0.02
Dibenzo(a,h)pyrene	<0.001	0.002	0.015	0.002	<0.001	0.018

	Results (ng/m3)					
	AMS 6 Patricia McInnes	**AMS 7 Athabasca Valley**	**AMS 14 Anzac**	**Lab Blank**	**Field Blank**	**AMS 6 Repeat Patricia McInnes**
Compound Name	**27-Aug**	**27-Aug**	**27-Aug**	**27-Aug**	**27-Aug**	**27-Aug**
Naphthalene	6.06	13.5	17.4	0.009	0.024	5.88
Acenaphthylene	0.485	1.13	0.435	0.001	0.006	0.474
Acenaphthene	0.258	0.48	8.1	0.002	<0.001	0.259
Fluorene	0.601	1.06	6.06	0.002	0.003	0.574
Phenanthrene	1.08	2	6.61	0.003	<0.001	0.954
Anthracene	0.07	0.221	0.501	0.001	<0.001	0.06
Acridine	0.11	0.223	0.18	0.001	<0.001	0.12
Fluoranthene	0.141	0.251	0.352	0.001	0.001	0.133
Pyrene	0.136	0.343	0.213	0.001	<0.001	0.119
Benzo(c)phenanthrene	0.01	0.01	0.002	0.001	<0.001	0.012
Benz(a)anthracene	0.017	0.025	0.007	0.001	<0.001	0.015
Chrysene	0.02	0.028	0.008	0.001	<0.001	0.017
7,12-Dimethylbenz(a)anthracene	0.055	0.055	0.036	0.002	<0.001	0.048
Benzo(b)fluoranthene	0.096	0.122	0.112	0.001	<0.001	0.089
Benzo(k)fluoranthene	0.108	0.138	0.126	0.001	<0.001	0.1
Benzo(a)pyrene	0.014	0.012	0.009	0.001	<0.001	0.013
3-Methylcholanthrene	0.064	0.263	0.221	0.001	<0.001	0.059
Indeno(123-cd)pyrene	0.007	0.006	0.006	0.001	<0.001	0.009
Dibenz(a,h)anthracene	0.008	0.009	0.008	0.001	<0.001	0.008
Benzo(ghi)perylene	0.021	0.034	0.005	0.001	<0.001	0.019
Dibenzo(a,l)pyrene	0.01	0.005	0.003	0.001	<0.001	0.009
Dibenzo(a,i)pyrene	0.002	0.002	0.002	0.001	0.002	0.003
Dibenzo(a,h)pyrene	0.002	0.002	0.002	0.002	<0.001	0.002

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	5-May	5-May	5-May	5-May			5-May
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	25.037	24	24	24			24.001
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	107	74	230	60			8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0444	0.0565	0.261	0.102	0.2	0.539424572	0.0326
Arsenic	0.000415	<0.000208	<0.000208	0.000533	0.005	<	<0.000208
Barium	0.000774	0.00125	0.00449	0.00100	0.005	0.009879594	0.000357
Beryllium	<0.000200	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0139	0.0197	0.0173	0.0176	0.2	0.354740503	0.0151
Cadmium	<0.000200	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00162	0.00230	0.00343	0.00194	0.02	0.062542425	0.00247
Cobalt	0.000256	0.000148	0.000407	0.000336	0.002	0.00805425	0.000228
Copper	0.0280	0.0170	0.00599	0.0139	0.01	0.101244356	0.00334
Lead	0.000518	0.000609	0.000905	0.00250	0.005	0.009552144	0.000329
Manganese	0.00676	0.00647	0.0164	0.00889	0.002	0.132866991	0.00282
Molybdenum	0.00145	<0.0000833	<0.0000833	0.00143	0.002	0.027635634	0.000632
Nickel	0.00115	<0.000833	0.00129	0.00201	0.02	0.024149878	<0.000833
Silver	<0.0000799	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000444	0.000416	0.00180	0.000537	0.005	0.006673375	0.000248
Titanium	0.00132	<0.000833	0.00961	0.00198	0.02	<	<0.000833
Uranium	<0.0000799	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000799	<0.000833	0.00117	<0.000833	0.02	<	<0.000833
Zinc	0.0711	0.0237	0.0176	0.0548	0.02	0.473747475	0.0230
Iron	0.0994	0.144	0.817	0.134	0.2	1.516509638	0.0737
Phosphorus	<0.200	<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	5-May	5-May	5-May	5-May	5-May	5-May	5-May	5-May	5-May
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	22.6	23.5	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)	263	214	547	55	199	251	221	273	1
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.216	0.224	0.606	0.0456	0.229	0.221	0.207	0.166	0.0174
Arsenic	0.000303	<0.000208	0.000324	<0.000213	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Barium	0.00227	0.00480	0.0107	0.00109	0.00239	0.00246	0.00310	0.00236	<0.000208
Beryllium	<0.000208	<0.000208	<0.000221	<0.000213	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0164	0.0226	0.0211	0.0168	0.0210	0.0166	0.0126	0.0143	0.0111
Cadmium	<0.000208	<0.000208	<0.000221	<0.000213	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00301	0.00272	0.00299	0.00210	0.00293	0.00263	0.00217	0.00231	0.00151
Cobalt	0.000377	0.000274	0.00140	0.000239	0.000398	0.000369	0.000316	0.000332	0.000109
Copper	0.0733	0.0353	0.00512	0.0110	0.00633	0.0110	0.00947	0.00366	0.000804
Lead	0.00109	0.000867	0.000994	0.00106	0.000760	0.000685	0.000598	0.000598	0.000243
Manganese	0.0181	0.0124	0.0334	0.00512	0.00677	0.0133	0.347	0.0131	0.00215
Molybdenum	<0.0000833	<0.0000833	<0.0000885	<0.0000851	0.000230	0.000138	<0.0000833	0.000221	0.000550
Nickel	0.00178	<0.000833	0.00145	<0.000851	0.00115	0.00120	0.00104	0.00117	<0.000833
Silver	0.000149	<0.0000833	<0.0000885	<0.0000851	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00168	0.00157	0.00372	0.000330	0.00147	0.00152	0.000951	0.00160	<0.000208
Titanium	0.00770	0.00710	0.0194	0.00147	0.00646	0.00728	0.00764	0.00827	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000885	<0.0000851	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00119	0.00107	0.00220	<0.000851	0.00178	0.00141	0.00102	0.00118	<0.000833
Zinc	0.0595	0.0339	0.0171	0.0200	0.0225	0.0244	0.0237	0.0126	0.00788
Iron	0.507	0.585	2.10	0.223	0.346	0.497	0.562	0.656	0.0327

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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	11-May	11-May	11-May	11-May			11-May
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)	58	92	91	63			20
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0625	0.0550	0.0505	0.0294	0.2	0.539424572	0.0305
Arsenic	0.000417	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.000695	0.000889	0.00130	0.000343	0.005	0.009879594	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0145	0.0182	0.0159	0.00991	0.2	0.354740503	0.0118
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00166	0.00237	0.00167	0.00118	0.02	0.062542425	0.00172
Cobalt	0.000567	0.000180	0.000140	0.000134	0.002	0.00805425	0.000394
Copper	0.0245	0.00269	0.0135	0.0189	0.01	0.101244356	0.00200
Lead	0.00108	0.000692	0.000424	0.000399	0.005	0.009552144	0.000274
Manganese	0.0125	0.00523	0.00308	0.00297	0.002	0.132866991	0.00193
Molybdenum	0.00223	0.000470	0.000478	0.000186	0.002	0.027635634	0.00104
Nickel	0.00492	<0.000833	<0.000833	<0.000833	0.02	0.024149878	0.00395
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000412	0.000432	0.000367	0.000247	0.005	0.006673375	<0.000208
Titanium	0.00175	0.00167	0.00117	0.00173	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000833	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.0385	0.0227	0.0125	0.0174	0.02	0.473747475	0.00879
Iron	0.280	0.144	0.102	0.0414	0.2	1.516509638	0.0297
Phosphorus	<0.208	<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	11-May	11-May	11-May	11-May	11-May	11-May	11-May	11-May	11-May
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	213	314	251	113	264	128	82	328	11
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.133	0.284	0.264	0.0544	0.254	0.0837	0.0711	0.276	0.0176
Arsenic	0.000296	0.000289	0.000209	<0.000208	<0.000208	<0.000208	<0.000208	0.000293	<0.000208
Barium	0.00168	0.00455	0.00464	0.000892	0.00302	0.00107	0.000892	0.00358	0.000282
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0145	0.0143	0.0109	0.0110	0.0125	0.0120	0.0130	0.0116	0.0138
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00165	0.00305	0.00160	0.00118	0.00166	0.00199	0.00150	0.00190	0.00170
Cobalt	0.00247	0.000363	0.000301	0.000148	0.000336	0.000214	0.000166	0.000770	0.000209
Copper	0.0917	0.00722	0.0102	0.0115	0.00375	0.0114	0.00210	0.00363	0.00106
Lead	0.000746	0.00106	0.000846	0.000350	0.000670	0.000436	0.000451	0.000754	<0.000208
Manganese	0.0492	0.0188	0.0102	0.00509	0.0112	0.00501	0.00497	0.0183	0.00537
Molybdenum	0.000259	0.000645	0.000244	0.000286	0.000405	0.000154	0.000312	0.000427	0.00151
Nickel	0.00147	0.00118	0.00152	<0.000833	0.00101	<0.000833	0.000914	0.00118	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00201	0.00220	0.00140	0.000374	0.00152	0.000649	0.000626	0.00197	<0.000208
Titanium	0.00529	0.00912	0.00739	0.00135	0.00718	0.00282	0.00157	0.0115	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	<0.000833	0.000961	0.00114	<0.000833	0.00159	<0.000833	<0.000833	0.00119	<0.000833
Zinc	0.0330	0.0312	0.0207	0.0219	0.0136	0.0645	0.00980	0.0238	0.00374
Iron	0.299	0.773	0.565	0.0908	0.442	0.210	0.179	0.901	0.0427

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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	17-May	17-May	17-May	17-May			17-May
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.42	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	175	185	195	113			47
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0627	0.0686	0.111	0.0468	0.2	0.539424572	0.0369
Arsenic	0.000403	0.000648	0.000373	<0.000208	0.005	<	<0.000208
Barium	0.00129	0.00148	0.00285	0.000553	0.005	0.009879594	0.000486
Beryllium	<0.000205	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0167	0.0160	0.0211	0.0173	0.2	0.354740503	0.0133
Cadmium	<0.000205	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00203	0.00175	0.00249	0.00228	0.02	0.062542425	0.00249
Cobalt	0.000256	0.000211	0.000355	0.000263	0.002	0.00805425	0.000375
Copper	0.0147	0.0110	0.0134	0.00962	0.01	0.101244356	0.00998
Lead	0.000904	0.00380	0.00149	0.000840	0.005	0.009552144	0.000326
Manganese	0.00848	0.00745	0.00782	0.00559	0.002	0.132866991	0.00540
Molybdenum	0.00253	0.000326	0.000324	0.000525	0.002	0.027635634	0.000527
Nickel	0.000894	0.000932	0.00135	<0.000833	0.02	0.024149878	0.00218
Silver	<0.0000819	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000591	0.000452	0.000760	0.000348	0.005	0.006673375	<0.000208
Titanium	0.00175	0.00756	0.00362	<0.000833	0.02	<	<0.000833
Uranium	<0.0000819	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	0.00206	<0.000833	0.000992	<0.000833	0.02	<	<0.000833
Zinc	0.0157	0.0241	0.0189	0.0163	0.02	0.473747475	0.0190
Iron	0.254	0.153	0.291	0.0939	0.2	1.516509638	0.122
Phosphorus	<0.205	<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
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River
Sample Date	17-May	17-May	17-May	17-May	17-May	17-May	17-May	17-May
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24.01	24	24	24	22.6
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	698	523	494	223	1482	518	179	849
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Aluminum	0.454	0.458	0.298	0.105	1.26	0.357	0.129	0.537
Arsenic	0.000486	0.00102	0.000439	<0.000208	0.000944	0.000322	<0.000208	0.000388
Barium	0.00690	0.00859	0.00803	0.00196	0.0151	0.00490	0.00195	0.00787
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000221
Boron	0.0163	0.0201	0.0137	0.0123	0.0177	0.0146	0.0177	0.0144
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000221
Chromium	0.00271	0.00306	0.00206	0.00291	0.00399	0.00245	0.0106	0.0100
Cobalt	0.000548	0.000508	0.000389	0.000410	0.00133	0.000506	0.000260	0.000669
Copper	0.0152	0.0186	0.0123	0.0594	0.00709	0.0115	0.00498	0.00702
Lead	0.00160	0.00487	0.00128	0.00138	0.00192	0.00124	0.000860	0.00127
Manganese	0.0358	0.0302	0.0180	0.00931	0.0321	0.0231	0.0102	0.0459
Molybdenum	0.000800	0.000276	0.000346	0.000250	0.000321	0.000532	0.000367	0.000506
Nickel	0.00580	0.00190	0.00107	0.00214	0.00321	0.00218	0.000984	0.00265
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000885
Strontium	0.00450	0.00279	0.00230	0.000893	0.00998	0.00290	0.00101	0.00517
Titanium	0.0191	0.0157	0.0116	0.00787	0.0351	0.0120	0.00398	0.0223
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	0.000111	<0.0000833	<0.0000833	<0.0000885
Vanadium (corr)	0.00367	0.00186	0.00162	0.000907	0.00493	0.00429	0.00102	0.00225
Zinc	0.0294	0.0363	0.0251	0.0154	0.0234	0.0309	0.0139	0.0191
Iron	1.64	1.21	1.07	0.348	2.18	0.975	0.510	2.45

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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	23-May	23-May	23-May	23-May			23-May
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)	258	157	164	142			8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.148	0.0899	0.110	0.0888	0.2	0.539424572	0.0137
Arsenic	0.000553	0.000504	<0.000208	0.000234	0.005	<	<0.000208
Barium	0.00330	0.00274	0.00684	0.00166	0.005	0.009879594	0.000316
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0183	0.0125	0.00982	0.0119	0.2	0.354740503	<0.00833
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00413	0.00373	0.00402	0.00441	0.02	0.062542425	0.00323
Cobalt	0.000344	0.000226	0.000256	0.000547	0.002	0.00805425	0.000449
Copper	0.00342	0.00720	0.00791	0.00604	0.01	0.101244356	0.00157
Lead	0.000653	0.000781	0.000782	0.000886	0.005	0.009552144	0.000315
Manganese	0.0157	0.00891	0.00878	0.00699	0.002	0.132866991	0.00632
Molybdenum	0.000926	0.000173	0.000220	0.000680	0.002	0.027635634	0.000366
Nickel	0.00164	<0.000833	0.000838	0.00229	0.02	0.024149878	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.00173	0.000890	0.00105	0.000862	0.005	0.006673375	0.000292
Titanium	0.00471	0.00195	0.00174	0.000886	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	0.00426	0.00107	0.00123	0.00121	0.02	<	<0.000833
Zinc	0.0196	0.0179	0.0135	0.0155	0.02	0.473747475	0.0171
Iron	0.513	0.219	0.311	0.193	0.2	1.516509638	0.0507
Phosphorus	<0.208	<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	23-May	23-May	23-May	23-May	23-May	23-May	23-May	23-May	23-May
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24.007	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)	1085	540	740	380	1631	894	186	1223	11
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.700	0.473	0.614	0.285	1.43	0.527	0.137	0.740	0.0188
Arsenic	0.000800	0.000870	0.000586	0.000395	0.00102	0.000666	<0.000208	0.000767	0.000880
Barium	0.0150	0.0143	0.0199	0.00650	0.0213	0.0103	0.00220	0.0145	0.000534
Beryllium	0.000249	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	0.00108
Boron	0.0180	0.0167	0.0131	<0.00833	0.0147	0.00962	<0.00833	0.00877	<0.00833
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	0.00199
Chromium	0.00514	0.00525	0.00537	0.00371	0.00664	0.00438	0.00325	0.00472	0.00546
Cobalt	0.00103	0.000561	0.000760	0.000673	0.00182	0.000917	0.000397	0.00178	0.00324
Copper	0.0101	0.0162	0.0230	0.0187	0.00754	0.0116	0.00332	0.00602	0.00344
Lead	0.00148	0.00122	0.00178	0.00110	0.00221	0.00130	0.000563	0.00124	0.00111
Manganese	0.0513	0.0304	0.0391	0.0204	0.0602	0.0331	0.00870	0.0550	0.0107
Molybdenum	0.000873	0.000501	0.000570	0.000479	0.000672	0.000745	0.000257	0.000611	0.000747
Nickel	0.00293	0.00178	0.00237	0.00167	0.00466	0.00467	0.000957	0.00286	0.00219
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00860	0.00443	0.00541	0.00224	0.0143	0.00561	0.00153	0.00818	0.00464
Titanium	0.0250	0.0163	0.0232	0.0102	0.0423	0.0197	0.00328	0.0291	<0.000833
Uranium	0.000139	0.0000958	0.000149	<0.0000833	0.000224	0.000110	<0.0000833	0.000122	0.00128
Vanadium (corr)	0.00739	0.00232	0.00301	0.00169	0.00660	0.00663	0.00112	0.00479	0.00347
Zinc	0.0216	0.0264	0.0353	0.0182	0.0244	0.0190	0.00979	0.0302	0.0247
Iron	2.84	1.54	2.21	0.817	3.32	1.72	0.427	2.99	0.0415

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Particulate Matter - Metals

2014

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	29-May	29-May	29-May	29-May			29-May
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.665	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	82	106	85	57			13
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0263	0.0313	0.0219	0.0149	0.2	0.539424572	0.0257
Arsenic	0.000595	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.000726	0.00202	0.00112	0.000288	0.005	0.009879594	0.000398
Beryllium	<0.000203	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0159	0.0135	0.0148	0.0131	0.2	0.354740503	0.0110
Cadmium	<0.000203	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00445	0.00463	0.00364	0.00335	0.02	0.062542425	0.00288
Cobalt	0.000510	0.000606	0.000149	0.000301	0.002	0.00805425	0.000181
Copper	0.0227	0.0124	0.00263	0.00501	0.01	0.101244356	0.0114
Lead	0.00175	0.000699	0.000509	0.000551	0.005	0.009552144	0.000361
Manganese	0.00832	0.0174	0.00531	0.00526	0.002	0.132866991	0.00274
Molybdenum	0.000829	0.000347	0.000226	0.000206	0.002	0.027635634	0.000325
Nickel	0.00191	0.00112	<0.000833	0.00492	0.02	0.024149878	<0.000833
Silver	<0.0000811	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000366	0.000915	0.000278	<0.000208	0.005	0.006673375	<0.000208
Titanium	<0.000811	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Uranium	<0.0000811	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000811	0.00120	0.000993	<0.000833	0.02	<	<0.000833
Zinc	0.0189	0.0156	0.0111	0.0152	0.02	0.473747475	0.0151
Iron	0.129	0.234	0.126	0.0535	0.2	1.516509638	0.0503
Phosphorus	<0.203	<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	29-May	29-May	29-May	29-May	29-May	29-May	29-May	29-May	29-May
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	146	182	150	69	166	162	161	295	4.333333333
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0539	0.109	0.0690	0.0161	0.0876	0.0580	0.100	0.181	0.0170
Arsenic	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Barium	0.00177	0.00396	0.00305	0.000410	0.00134	0.00181	0.00170	0.00359	0.000531
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0134	0.0111	0.0115	0.0131	0.0105	0.0129	0.0121	0.0141	0.0104
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00395	0.00656	0.00321	0.00364	0.00301	0.00324	0.00335	0.00522	0.00390
Cobalt	0.000303	0.000522	0.000191	0.000179	0.000284	0.000279	0.000208	0.000411	0.00154
Copper	0.0662	0.0211	0.0140	0.0153	0.00144	0.0253	0.00150	0.00644	0.000687
Lead	0.000673	0.000740	0.000756	0.000722	0.000471	0.000949	0.000532	0.000855	0.00217
Manganese	0.0101	0.0109	0.00929	0.00947	0.00536	0.00772	0.00774	0.0211	0.00748
Molybdenum	0.000343	0.000318	0.000214	0.000337	0.00101	0.000234	0.000279	0.000500	0.000610
Nickel	0.00300	0.00139	0.000882	0.000870	0.000888	0.000976	0.000875	0.00279	0.00214
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.000861	0.000959	0.000663	0.000254	0.000734	0.000703	0.000913	0.00196	<0.000208
Titanium	<0.000833	0.00264	0.00137	<0.000833	0.00240	<0.000833	0.00139	0.00627	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.000917	0.00134	0.000906	0.000988	0.000992	<0.000833	0.000989	0.00158	<0.000833
Zinc	0.0159	0.0156	0.0131	0.0251	0.0129	0.0150	0.0219	0.0156	0.0160
Iron	0.415	0.423	0.216	0.0585	0.264	0.324	0.366	1.14	0.0524

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	4-Jun	4-Jun	4-Jun	4-Jun			4-Jun
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.474	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	59	151	102	77			11.7
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	<0.00817	0.0183	0.0306	0.0110	0.2	<	<0.00833
Arsenic	0.000228	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.00135	0.00116	0.000729	<0.000208	0.005	0.0133763	0.000536
Beryllium	<0.000204	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0230	0.0229	0.0207	0.0211	0.2	0.535474481	0.0203
Cadmium	<0.000204	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00197	0.00191	0.00148	0.00136	0.02	0.046762491	0.00119
Cobalt	0.000277	0.000328	0.000279	0.000271	0.002	0.01326975	0.000286
Copper	0.0179	0.00256	0.00223	0.00439	0.01	0.038678359	0.00219
Lead	0.000443	0.000740	0.000490	0.000673	0.005	0.015378044	0.000292
Manganese	0.00228	0.00843	0.00449	0.00105	0.002	0.168331294	0.00555
Molybdenum	<0.0000817	<0.0000833	<0.0000833	<0.0000833	0.002	0.026513788	0.000321
Nickel	<0.000817	0.000958	<0.000833	<0.000833	0.02	<	0.00112
Silver	<0.0000817	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	<0.000204	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Titanium	<0.000817	0.000865	0.00220	<0.000833	0.02	<	<0.000833
Uranium	<0.0000817	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000817	<0.000833	0.00134	<0.000833	0.02	<	<0.000833
Zinc	0.00767	0.0168	0.0174	0.0107	0.02	0.767759109	0.00932
Iron	0.0548	0.190	0.119	0.0552	0.2	1.460660578	0.121
Phosphorus	<0.204	<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	4-Jun	4-Jun	4-Jun	4-Jun	4-Jun	4-Jun	4-Jun	4-Jun
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	128	237	218	150	100	111	440	34
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0275	0.0928	0.135	0.162	0.0373	0.0878	0.453	<0.00833
Arsenic	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	0.000262	<0.000208
Barium	0.000594	0.00207	0.00328	0.000417	0.00157	0.00123	0.00496	0.000266
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0209	0.0200	0.0197	0.0216	0.0188	0.0214	0.0224	0.0261
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00167	0.00155	0.00369	0.00187	0.00116	0.00137	0.00347	0.00237
Cobalt	0.000535	0.000439	0.000491	0.000276	0.000314	0.000358	0.00111	0.000370
Copper	0.0698	0.00508	0.00611	0.00592	0.00735	0.00121	0.00276	0.00161
Lead	0.000729	0.000569	0.00159	0.000601	0.000875	0.000540	0.000949	0.000502
Manganese	0.00714	0.0104	0.00752	0.00535	0.00479	0.00706	0.0308	0.00296
Molybdenum	<0.0000833	<0.0000833	<0.0000833	0.000432	<0.0000833	<0.0000833	<0.0000833	0.000840
Nickel	0.00193	0.00234	0.00114	0.00115	<0.000833	<0.000833	0.00154	0.000881
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	0.00191	<0.000208
Titanium	0.00200	0.00544	0.00536	<0.000833	0.00146	0.00258	0.0176	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	<0.000833	0.000919	0.00166	<0.000833	<0.000833	<0.000833	0.00142	<0.000833
Zinc	0.0147	0.0133	0.0443	0.00784	0.0194	0.0207	0.0272	0.0135
Iron	0.148	0.407	0.490	0.0960	0.184	0.348	1.37	0.108

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Particulate Matter - Metals

2014

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	10-Jun	10-Jun	10-Jun	10-Jun			10-Jun
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.975	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	108	144	125	103			12.7
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0471	0.0326	0.0653	0.0286	0.2	<	<0.00833
Arsenic	0.000467	0.000445	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.00172	0.000664	0.00133	0.000923	0.005	0.0133763	<0.000208
Beryllium	<0.000209	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0260	0.0251	0.0256	0.0200	0.2	0.535474481	0.0193
Cadmium	<0.000209	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00193	<0.000833	<0.000833	<0.000833	0.02	0.046762491	<0.000833
Cobalt	0.000505	0.000280	0.000309	0.000236	0.002	0.01326975	0.000411
Copper	0.00958	0.00316	0.00991	0.00439	0.01	0.038678359	0.00142
Lead	0.000618	0.000585	0.000894	0.000597	0.005	0.015378044	0.000226
Manganese	0.00740	0.0144	0.00264	0.000681	0.002	0.168331294	0.00163
Molybdenum	0.00284	0.000400	<0.0000833	<0.0000833	0.002	0.026513788	0.000275
Nickel	<0.000834	<0.000833	<0.000833	<0.000833	0.02	<	0.00136
Silver	<0.0000834	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	<0.000209	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Titanium	0.00140	0.00150	0.00199	0.00102	0.02	<	<0.000833
Uranium	<0.0000834	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000834	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.0164	0.0180	0.00954	0.0122	0.02	0.767759109	0.00587
Iron	0.137	0.116	0.142	0.101	0.2	1.460660578	0.0483
Phosphorus	<0.209	<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	10-Jun	10-Jun	10-Jun	10-Jun	10-Jun	10-Jun	10-Jun	10-Jun	10-Jun
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	328	340	483	255	309	357	256	555	4.67
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.191	0.249	0.422	0.0990	0.212	0.280	0.171	0.396	<0.00833
Arsenic	0.000302	0.000823	0.000384	<0.000208	<0.000208	<0.000208	<0.000208	0.000362	<0.000208
Barium	0.00233	0.00448	0.00775	0.00140	0.00241	0.00251	0.00226	0.00556	0.000236
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0241	0.0257	0.0271	0.0262	0.0248	0.0280	0.0259	0.0261	0.0218
Cadmium	<0.000208	0.00138	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00210	0.00122	0.00145	0.00106	0.00147	0.00135	0.00104	0.00152	0.000864
Cobalt	0.000540	0.000461	0.000661	0.000617	0.000578	0.000448	0.000349	0.000656	0.000223
Copper	0.0475	0.00815	0.0197	0.0251	0.00137	0.0258	0.0237	0.00185	0.000652
Lead	0.000923	0.00256	0.00144	0.00108	0.000995	0.000850	0.000875	0.000931	0.000262
Manganese	0.0108	0.0186	0.0328	0.00561	0.00947	0.00847	0.00912	0.0227	<0.0000833
Molybdenum	0.000541	0.000195	0.000125	<0.0000833	0.000420	0.000443	<0.0000833	0.000256	0.000816
Nickel	0.00112	<0.000833	0.00120	<0.000833	0.00123	<0.000833	0.00685	0.00113	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00113	0.00109	0.00191	0.000516	0.000999	0.00111	0.000724	0.00263	<0.000208
Titanium	0.0175	0.00894	0.0136	0.00480	0.00628	0.00706	0.00686	0.0159	0.000942
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00110	0.000958	0.00138	<0.000833	0.000946	0.000847	<0.000833	0.00157	<0.000833
Zinc	0.0113	0.0186	0.0235	0.00903	0.0186	0.0108	0.0226	0.0158	0.00446
Iron	0.631	0.747	1.20	0.266	0.609	0.542	0.578	1.49	0.0467

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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	16-Jun	16-Jun	16-Jun	16-Jun			16-Jun
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)	210	156	203	95			8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.111	0.0726	0.165	0.0461	0.2	<	<0.00833
Arsenic	0.000363	0.000288	0.000330	<0.000208	0.005	<	<0.000208
Barium	0.00216	0.00176	0.00535	0.000475	0.005	0.0133763	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0261	0.0260	0.0304	0.0243	0.2	0.535474481	0.0243
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00105	0.00121	0.00121	0.000930	0.02	0.046762491	0.00105
Cobalt	0.000501	0.000223	0.000454	0.000346	0.002	0.01326975	0.000270
Copper	0.0223	0.00977	0.0157	0.0136	0.01	0.038678359	0.00127
Lead	0.000720	0.000797	0.00123	0.000405	0.005	0.015378044	<0.000208
Manganese	0.00871	0.00281	0.00717	0.00206	0.002	0.168331294	0.000928
Molybdenum	0.00112	0.000429	0.000287	0.000767	0.002	0.026513788	0.000816
Nickel	0.000983	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000588	<0.000208	0.000535	<0.000208	0.005	<	<0.000208
Titanium	0.00450	0.00376	0.00616	0.00152	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	0.00106	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.0153	0.0102	0.0373	0.00969	0.02	0.767759109	0.00649
Iron	0.396	0.248	0.593	0.0912	0.2	1.460660578	0.0451
Phosphorus	<0.208	<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	16-Jun	16-Jun	16-Jun	16-Jun	16-Jun	16-Jun	16-Jun	16-Jun	16-Jun
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24.009	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)	1022	595	1032	243	3516	716	1270	1320	15.3
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.912	0.667	1.22	0.108	4.15	0.562	1.17	1.18	<0.00833
Arsenic	0.000567	0.000596	0.000983	<0.000208	0.00208	0.000293	0.000761	0.000734	<0.000208
Barium	0.0125	0.0133	0.0259	0.00209	0.0410	0.00736	0.0183	0.0167	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.000309	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0323	0.0270	0.0286	0.0273	0.0343	0.0274	0.0277	0.0264	0.0234
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00222	0.00210	0.00335	0.000881	0.00818	0.00135	0.00274	0.00275	<0.000833
Cobalt	0.000991	0.000633	0.00123	0.000295	0.00384	0.000656	0.00204	0.00136	0.000172
Copper	0.0721	0.0169	0.0261	0.0664	0.0102	0.0128	0.00264	0.00277	<0.000417
Lead	0.00138	0.00156	0.00238	0.000430	0.00371	0.000819	0.00129	0.00126	<0.000208
Manganese	0.0431	0.0293	0.0660	0.00757	0.0817	0.0221	0.0674	0.0885	0.00153
Molybdenum	0.000638	0.000231	0.000431	0.000222	0.000848	0.000339	0.000394	0.000272	0.00212
Nickel	0.00198	0.00103	0.00263	<0.000833	0.00851	0.00145	0.00258	0.00244	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00838	0.00444	0.00663	0.000220	0.0272	0.00401	0.00759	0.00819	<0.000208
Titanium	0.0284	0.0246	0.0388	0.00534	0.109	0.0189	0.0411	0.0483	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.000314	<0.0000833	0.000101	0.0000963	<0.0000833
Vanadium (corr)	0.00412	0.00205	0.00383	<0.000833	0.0137	0.00265	0.00450	0.00447	<0.000833
Zinc	0.0196	0.0286	0.0457	0.0211	0.0472	0.0114	0.0149	0.0200	0.0130
Iron	2.49	1.95	4.14	0.387	5.42	1.40	4.17	5.30	0.0371

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **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	22-Jun	22-Jun		22-Jun			22-Jun
PM Size(µm)	2.5	2.5		2.5			2.5
Total Air Volume (m3)	23.835	24		24			24
Units	µg/M3	µg/M3		µg/M3			µg/M3
Particulate Matter (µg)	145	279		200			6
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg)	(µg)	(µg)
Aluminum	<0.00839	0.0132		<0.00833	0.2	<	<0.00833
Arsenic	0.000295	<0.000208		<0.000208	0.005	<	<0.000208
Barium	0.000652	0.00175		0.000509	0.005	0.0133763	<0.000208
Beryllium	<0.000210	<0.000208		<0.000208	0.005	<	<0.000208
Boron	0.0243	0.0258		0.0205	0.2	0.535474481	0.0234
Cadmium	<0.000210	<0.000208		<0.000208	0.005	<	<0.000208
Chromium	0.00166	0.00187		0.00148	0.02	0.046762491	0.00223
Cobalt	0.000507	0.000528		0.000224	0.002	0.01326975	0.000258
Copper	0.0170	0.00375		0.0119	0.01	0.038678359	0.00206
Lead	0.000284	0.000466		0.000246	0.005	0.015378044	0.00156
Manganese	0.00268	0.00150		0.000862	0.002	0.168331294	0.000654
Molybdenum	<0.0000839	<0.0000833		<0.0000833	0.002	0.026513788	0.000292
Nickel	<0.000839	<0.000833		<0.000833	0.02	<	<0.000833
Silver	<0.0000839	<0.0000833		<0.0000833	0.002	<	<0.0000833
Strontium	<0.000210	<0.000208		<0.000208	0.005	<	<0.000208
Titanium	0.000923	<0.000833		<0.000833	0.02	<	<0.000833
Uranium	<0.0000839	<0.0000833		<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000839	0.00148		<0.000833	0.02	<	<0.000833
Zinc	0.00311	0.00717		0.0167	0.02	0.767759109	0.00977
Iron	0.0537	0.0781		0.0416	0.2	1.460660578	0.0441
Phosphorus	<0.210	<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	22-Jun	22-Jun	22-Jun	22-Jun	22-Jun	22-Jun	22-Jun	22-Jun	22-Jun
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	291	462	560	356	384	318	273	575	3.67
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0603	0.114	0.198	0.0162	0.103	0.0337	0.0377	0.422	<0.00833
Arsenic	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	0.000214	<0.000208
Barium	0.000783	0.00358	0.00613	0.000760	0.00633	0.00649	0.000731	0.00445	0.00249
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0262	0.0254	0.0262	0.0248	0.0264	0.0261	0.0272	0.0289	0.0212
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00233	0.00230	0.00245	0.00206	0.00244	0.00213	0.00175	0.00253	0.00162
Cobalt	0.000421	0.000400	0.000289	0.00597	0.000339	0.000172	0.000241	0.000576	0.000143
Copper	0.107	0.00866	0.00462	0.0653	0.00515	0.0142	0.00155	0.00186	<0.000417
Lead	0.000427	0.000676	0.000605	0.000597	0.000546	0.000307	0.000378	0.000741	<0.000208
Manganese	0.00283	0.00888	0.00905	0.00184	0.00759	0.00383	0.00331	0.0216	<0.0000833
Molybdenum	<0.0000833	<0.0000833	<0.0000833	0.000273	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.000217
Nickel	<0.000833	<0.000833	<0.000833	0.000878	<0.000833	<0.000833	<0.000833	0.00100	<0.000833
Silver	0.000749	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.000119	<0.0000833
Strontium	<0.000208	0.000258	0.000938	<0.000208	0.00105	<0.000208	<0.000208	0.00189	<0.000208
Titanium	0.00162	0.00641	0.00767	0.000932	0.00365	0.00358	0.00134	0.0158	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	<0.000833	0.00193	0.00233	0.00109	0.000852	<0.000833	<0.000833	0.00172	<0.000833
Zinc	0.00813	0.0100	0.0289	0.00603	0.0147	0.00833	0.00749	0.0176	0.00437
Iron	0.228	0.433	0.682	0.0878	0.381	0.139	0.154	1.35	0.0263

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **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	28-Jun	28-Jun		28-Jun			28-Jun
PM Size(µm)	2.5	2.5		2.5			2.5
Total Air Volume (m3)	24	24		24			24
Units	µg/M3	µg/M3		µg/M3			µg/M3
Particulate Matter (µg)	149	288		264			3.67
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg)	(µg)	(µg)
Aluminum	<0.00833	0.0393		0.0131	0.2	<	<0.00833
Arsenic	0.000329	0.000219		0.000277	0.005	<	<0.000208
Barium	0.000341	0.00125		0.00118	0.005	0.0133763	<0.000208
Beryllium	<0.000208	<0.000208		<0.000208	0.005	<	<0.000208
Boron	0.00984	0.0316		0.0221	0.2	0.535474481	0.0246
Cadmium	<0.000208	<0.000208		<0.000208	0.005	<	<0.000208
Chromium	<0.000833	0.00173		0.00132	0.02	0.046762491	0.00185
Cobalt	0.000205	0.000182		0.000283	0.002	0.01326975	0.000293
Copper	0.0124	0.00533		0.00253	0.01	0.038678359	0.00134
Lead	0.000245	0.000421		0.000353	0.005	0.015378044	0.000291
Manganese	<0.0000833	0.00240		0.00160	0.002	0.168331294	0.00226
Molybdenum	0.000652	0.000365		0.000280	0.002	0.026513788	0.000780
Nickel	<0.000833	<0.000833		<0.000833	0.02	<	<0.000833
Silver	<0.0000833	<0.0000833		<0.0000833	0.002	<	<0.0000833
Strontium	<0.000208	<0.000208		<0.000208	0.005	<	<0.000208
Titanium	0.00106	0.00164		0.00122	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833		<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000833	0.00148		0.000873	0.02	<	<0.000833
Zinc	0.00641	0.0164		0.0105	0.02	0.767759109	0.0129
Iron	0.0549	0.152		0.102	0.2	1.460660578	0.0265
Phosphorus	<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	28-Jun	28-Jun	28-Jun	28-Jun	28-Jun	28-Jun	28-Jun	28-Jun	28-Jun
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	464	827	700	516	644	346	694	1039	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.187	0.597	0.437	0.174	0.300	0.0888	0.418	0.795	<0.00833
Arsenic	0.000273	0.000537	0.00149	0.000501	0.000269	<0.000208	0.000351	0.000639	<0.000208
Barium	0.00253	0.00922	0.00978	0.00554	0.00503	0.00196	0.00584	0.00936	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0273	0.0299	0.0285	0.0263	0.0281	0.0278	0.0286	0.0326	0.0245
Cadmium	<0.000208	<0.000208	<0.000208	0.000473	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00209	0.00282	0.00267	0.00201	0.00236	0.00173	0.00168	0.00316	0.00111
Cobalt	0.000440	0.000591	0.00139	0.000402	0.00103	0.000255	0.000686	0.000928	0.000525
Copper	0.127	0.0133	0.0224	0.00199	0.00206	0.0106	0.00186	0.00293	0.000616
Lead	0.000479	0.00113	0.00118	0.00126	0.000822	0.000378	0.000683	0.00134	<0.000208
Manganese	0.0108	0.0425	0.0210	0.0144	0.0202	0.00696	0.0163	0.0448	<0.0000833
Molybdenum	0.000361	0.000522	0.000573	0.000513	0.000611	0.000302	0.000348	0.000633	0.00125
Nickel	<0.000833	0.00176	0.00152	<0.000833	0.00444	<0.000833	0.00110	0.00167	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00110	0.00338	0.00236	0.000546	0.00204	<0.000208	0.00193	0.00492	<0.000208
Titanium	0.00506	0.0223	0.0184	0.00793	0.0132	0.00308	0.0128	0.0293	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.000875	0.00373	0.00356	0.00177	0.00332	<0.000833	0.00171	0.00316	<0.000833
Zinc	0.0101	0.0371	0.127	0.0116	0.0213	0.0112	0.0187	0.0230	0.00503
Iron	0.562	1.71	1.33	0.831	1.23	0.315	1.21	2.55	0.0143

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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	4-Jul	4-Jul	4-Jul	4-Jul			4-Jul
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.283	24	20	24.01			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	119	48	91	67			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0261	0.0283	0.0952	0.0252	0.2	0.492881028	0.0152
Arsenic	0.000405	0.000583	0.000312	<0.000208	0.005	<	<0.000208
Barium	0.00105	0.00121	0.00431	0.000507	0.005	0.023986219	0.00154
Beryllium	<0.000215	<0.000208	<0.000250	<0.000208	0.005	<	<0.000208
Boron	0.0251	0.0207	0.0248	0.0210	0.2	0.525314456	0.0231
Cadmium	<0.000215	<0.000208	<0.000250	<0.000208		<	<0.000208
Chromium	0.00243	0.00230	0.00254	0.00209	0.02	0.065752941	0.00293
Cobalt	0.000376	0.000230	0.000344	0.000186	0.002	0.015243694	0.000401
Copper	0.00498	0.00104	0.0524	0.00601	0.01	0.058138322	0.000854
Lead	0.000308	0.000219	0.000911	0.000284	0.005	0.011884572	0.000317
Manganese	0.00719	0.00431	0.00791	0.00270	0.002	0.112937784	0.00592
Molybdenum	<0.0000859	<0.0000833	<0.000100	<0.0000833	0.002	0.037960181	<0.0000833
Nickel	0.00137	0.00105	0.00507	<0.000833	0.02	0.054066209	0.00178
Silver	<0.0000859	<0.0000833	<0.000100	<0.0000833	0.002	<	<0.0000833
Strontium	0.000380	0.000314	0.000752	<0.000208	0.005	0.011256406	0.000389
Titanium	<0.000859	<0.000833	0.00293	<0.000833	0.02	<	<0.000833
Uranium	<0.0000859	<0.0000833	<0.000100	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000859	<0.000833	<0.00100	<0.000833	0.02	<	<0.000833
Zinc	0.0132	0.0119	0.0122	0.00604	0.02	0.282249263	0.0162
Iron	0.0643	0.0608	0.339	0.0863	0.2	1.138935572	0.0348
Phosphorus	<0.215	<0.208	<0.250	<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	4-Jul	4-Jul	4-Jul	4-Jul	4-Jul	4-Jul	4-Jul	4-Jul	4-Jul
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	20	24	24.01	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)	213	180	265	248	303	157	166	837	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0875	0.149	0.177	0.177	0.159	0.152	0.0602	0.445	<0.00833
Arsenic	0.000242	0.000867	0.000260	<0.000208	<0.000208	<0.000208	<0.000208	0.000517	<0.000208
Barium	0.00160	0.00373	0.00673	0.00371	0.00340	0.00235	0.00329	0.00826	0.000217
Beryllium	<0.000208	<0.000250	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0227	0.0270	0.0222	0.0247	0.0232	0.0226	0.0241	0.0268	0.0166
Cadmium	<0.000208	<0.000250	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00249	0.00352	0.00255	0.00373	0.00264	0.00247	0.00261	0.00321	0.00199
Cobalt	0.000305	0.000479	0.000372	0.000332	0.000371	0.000659	0.000276	0.000895	0.000168
Copper	0.0316	0.00423	0.0102	0.0304	0.00480	0.0111	0.00188	0.00334	0.00108
Lead	0.000272	0.000506	0.000648	0.000440	0.000383	0.000281	0.000299	0.00103	<0.000208
Manganese	0.00634	0.0160	0.0108	0.0126	0.0124	0.00727	0.00625	0.0395	0.00246
Molybdenum	<0.0000833	<0.000100	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.0000899	<0.0000833
Nickel	0.00339	0.00505	0.00251	0.00150	0.00216	0.00159	0.00120	0.00343	<0.000833
Silver	<0.0000833	<0.000100	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.000690	0.00146	0.00139	0.00116	0.00140	0.00115	0.000587	0.00411	<0.000208
Titanium	0.00373	0.00389	0.00620	0.00599	0.00422	0.00364	0.00169	0.0189	<0.000833
Uranium	<0.0000833	<0.000100	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	<0.000833	0.00107	0.000986	0.00112	<0.000833	0.000934	<0.000833	0.00258	<0.000833
Zinc	0.0116	0.0181	0.0155	0.0120	0.0128	0.0103	0.0107	0.0261	0.00630
Iron	0.222	0.462	0.521	0.646	0.515	0.247	0.166	2.02	0.0179

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	10-Jul	10-Jul	10-Jul	10-Jul			10-Jul
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)	173	388	413	222			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.437	0.0347	0.0500	1.29	0.2	0.492881028	0.0127
Arsenic	0.000446	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.000880	0.00103	0.00154	0.00136	0.005	0.023986219	0.000388
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0261	0.0289	0.0288	0.0251	0.2	0.525314456	0.0207
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208		<	<0.000208
Chromium	0.00323	0.00185	0.00162	0.00279	0.02	0.065752941	0.00210
Cobalt	0.000320	0.000308	0.000405	0.000310	0.002	0.015243694	0.000233
Copper	0.0105	0.00150	0.00225	0.0618	0.01	0.058138322	0.000447
Lead	0.000383	0.000333	0.000275	0.00890	0.005	0.011884572	<0.000208
Manganese	0.00456	0.00443	0.00364	0.0131	0.002	0.112937784	0.00130
Molybdenum	0.00135	0.000118	0.000103	<0.0000833	0.002	0.037960181	0.000954
Nickel	0.00160	0.00151	0.00189	0.00145	0.02	0.054066209	0.00111
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000361	0.000502	0.000411	0.000332	0.005	0.011256406	<0.000208
Titanium	<0.000833	0.000904	0.00152	0.00148	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000833	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.0176	0.0272	0.0263	0.0288	0.02	0.282249263	0.0115
Iron	0.0843	0.186	0.414	0.0818	0.2	1.138935572	0.0284
Phosphorus	<0.208	<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	10-Jul	10-Jul	10-Jul	10-Jul	10-Jul	10-Jul	10-Jul	10-Jul	10-Jul
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	18.5	24	24	24	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)	646	759	404	299	726	325	546	719	5
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.518	0.418	0.211	0.0654	0.288	0.0274	0.259	0.329	<0.00833
Arsenic	0.000733	0.000389	0.000219	<0.000208	0.000263	<0.000208	0.000300	0.000340	<0.000208
Barium	0.00878	0.0108	0.00455	0.00153	0.00512	0.00117	0.00480	0.00579	<0.000208
Beryllium	<0.000270	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0337	0.0239	0.0228	0.0254	0.0273	0.0227	0.0290	0.0307	0.0227
Cadmium	<0.000270	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00270	0.00232	0.00432	0.00160	0.00199	0.00130	0.00217	0.00200	0.00201
Cobalt	0.00101	0.000414	0.000488	0.000363	0.000598	0.000359	0.000441	0.000612	0.000137
Copper	0.0695	0.00122	0.00390	0.0178	0.00223	0.0137	0.00390	0.00131	<0.000417
Lead	0.00186	0.000597	0.000397	0.000327	0.000748	0.000331	0.000508	0.000823	0.000610
Manganese	0.0376	0.0205	0.0127	0.00683	0.0180	0.00638	0.0157	0.0280	0.00130
Molybdenum	0.000436	0.000142	0.000362	0.000121	0.000423	0.000125	0.000320	0.000231	0.00166
Nickel	0.00377	0.00165	0.0229	0.00246	0.00202	0.00201	0.00149	0.00203	0.00115
Silver	<0.000108	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00340	0.00543	0.00121	0.000589	0.00289	0.000539	0.00179	0.00291	<0.000208
Titanium	0.0192	0.0135	0.00549	0.00246	0.00966	0.000904	0.00770	0.0128	<0.000833
Uranium	<0.000108	<0.0000833	0.0000895	0.0000847	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00219	0.00142	<0.000833	<0.000833	0.00247	<0.000833	0.00118	0.00150	<0.000833
Zinc	0.0196	0.0190	0.0320	0.0110	0.0138	0.0133	0.0133	0.0182	0.00469
Iron	1.34	1.07	0.544	0.141	0.948	0.0470	0.773	1.54	0.0240

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	16-Jul	16-Jul	16-Jul	16-Jul			16-Jul
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)	572	503	526	475			9
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0973	0.0782	0.0819	0.0688	0.2	0.492881028	0.0133
Arsenic	0.000557	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.00277	0.00269	0.00408	0.00259	0.005	0.023986219	0.000803
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0290	0.0380	0.0336	0.0301	0.2	0.525314456	0.0174
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208		<	<0.000208
Chromium	0.00202	0.00250	0.00373	0.00586	0.02	0.065752941	0.00172
Cobalt	0.000436	0.000551	0.00441	0.000337	0.002	0.015243694	0.000407
Copper	0.0167	0.00252	0.00474	0.0102	0.01	0.058138322	0.00130
Lead	0.00139	0.00115	0.00159	0.000551	0.005	0.011884572	<0.000208
Manganese	0.00772	0.00620	0.0121	0.0131	0.002	0.112937784	0.00698
Molybdenum	0.00146	0.000360	0.000925	0.000906	0.002	0.037960181	0.000422
Nickel	0.00192	0.00146	0.0160	0.00280	0.02	0.054066209	0.00187
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.00123	0.000865	0.000988	0.000833	0.005	0.011256406	0.000403
Titanium	0.00479	0.00491	0.00399	0.00258	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000833	0.00105	0.00162	0.00104	0.02	<	<0.000833
Zinc	0.0146	0.0147	0.0240	0.0246	0.02	0.282249263	0.0141
Iron	0.194	0.185	0.220	0.193	0.2	1.138935572	0.0200
Phosphorus	<0.208	<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	16-Jul	16-Jul	16-Jul	16-Jul	16-Jul	16-Jul	16-Jul	16-Jul	16-Jul
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	21.4	24	24	24.01	22.8	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)	897	1209	1151	735	1401	748	774	1277	26
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.379	0.806	0.625	0.337	0.764	0.255	0.248	0.570	0.00941
Arsenic	0.000580	0.000579	0.000720	0.000336	0.000572	0.000402	0.000353	0.000587	<0.000208
Barium	0.00707	0.0229	0.0182	0.00686	0.0131	0.00550	0.00663	0.0107	0.000486
Beryllium	<0.000234	<0.000208	<0.000208	<0.000208	<0.000219	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0347	0.0312	0.0279	0.0286	0.0376	0.0357	0.0392	0.0342	0.0196
Cadmium	0.00166	<0.000208	<0.000208	<0.000208	<0.000219	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00293	0.00305	0.00356	0.00276	0.00781	0.00575	0.00407	0.00315	0.00147
Cobalt	0.000616	0.000707	0.000895	0.000463	0.00123	0.000767	0.000435	0.000940	0.000662
Copper	0.115	0.00358	0.0120	0.0368	0.00362	0.0143	0.00101	0.00537	0.000567
Lead	0.00151	0.00128	0.00142	0.000769	0.00244	0.000643	0.000494	0.00162	<0.000208
Manganese	0.0251	0.0411	0.0379	0.0396	0.0450	0.0249	0.0225	0.0572	0.00369
Molybdenum	0.000287	0.000158	0.000543	0.000237	0.000851	0.000855	0.000768	0.000305	0.000984
Nickel	0.00288	0.00247	0.00375	0.00216	0.00327	0.00187	0.00143	0.00330	0.00120
Silver	<0.0000935	<0.0000833	<0.0000833	<0.0000833	<0.0000877	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00413	0.00892	0.00495	0.00193	0.00692	0.00230	0.00230	0.00565	<0.000208
Titanium	0.0126	0.0300	0.0214	0.0103	0.0234	0.00817	0.00912	0.0226	<0.000833
Uranium	<0.0000935	<0.0000833	<0.0000833	<0.0000833	<0.0000877	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00227	0.00314	0.00293	0.00170	0.00377	0.00142	0.00129	0.00260	<0.000833
Zinc	0.0185	0.0268	0.0326	0.0332	0.0264	0.0255	0.0309	0.0457	0.00943
Iron	1.28	2.29	1.97	0.742	2.36	0.743	0.847	2.41	<0.00833

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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	22-Jul	22-Jul	22-Jul	22-Jul			22-Jul
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.021	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	892	410	734	762			32
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0754	0.0399	0.0663	0.0732	0.2	0.492881028	0.0133
Arsenic	0.000848	0.000469	0.000680	0.000452	0.005	<	<0.000208
Barium	0.00341	0.00423	0.00390	0.00266	0.005	0.023986219	0.00103
Beryllium	<0.000217	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0433	0.0362	0.0401	0.0338	0.2	0.525314456	0.0235
Cadmium	<0.000217	<0.000208	<0.000208	<0.000208		<	<0.000208
Chromium	0.00385	0.00310	0.00273	0.00265	0.02	0.065752941	0.00190
Cobalt	0.000993	0.000438	0.000392	0.000408	0.002	0.015243694	0.000434
Copper	0.00478	0.00202	0.00333	0.0163	0.01	0.058138322	0.000470
Lead	0.00121	0.00103	0.000924	0.000959	0.005	0.011884572	0.000656
Manganese	0.00631	0.00254	0.00369	0.00446	0.002	0.112937784	0.00122
Molybdenum	0.00138	0.000334	0.000571	0.000460	0.002	0.037960181	0.000933
Nickel	0.00156	<0.000833	0.000912	0.000891	0.02	0.054066209	<0.000833
Silver	<0.0000869	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.00108	0.000834	0.00104	0.00152	0.005	0.011256406	0.000356
Titanium	0.00235	<0.000833	0.00211	0.00195	0.02	<	<0.000833
Uranium	<0.0000869	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	0.00313	<0.000833	0.000896	0.000911	0.02	<	<0.000833
Zinc	0.0160	0.00814	0.0123	0.0136	0.02	0.282249263	0.00411
Iron	0.322	0.100	0.182	0.227	0.2	1.138935572	0.0274
Phosphorus	<0.217	<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	22-Jul	22-Jul	22-Jul	22-Jul	22-Jul	22-Jul	22-Jul	22-Jul	22-Jul
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	1675	2264	1388	1491	2395	1379	1319	1427	5
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.657	0.312	0.551	0.646	1.03	0.384	0.421	0.378	<0.00833
Arsenic	0.00103	0.000770	0.000847	0.000996	0.00118	0.000664	0.000710	0.000647	0.000235
Barium	0.0130	0.00911	0.0172	0.0143	0.0176	0.00881	0.00773	0.00798	0.000456
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0436	0.0354	0.0344	0.0312	0.0474	0.0378	0.0384	0.0383	0.0222
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00496	0.00370	0.00406	0.00342	0.00527	0.00310	0.00325	0.00319	0.00265
Cobalt	0.00105	0.000480	0.000758	0.00112	0.00164	0.000735	0.000846	0.000723	0.000358
Copper	0.0464	0.0120	0.00971	0.0600	0.00320	0.0105	0.00256	0.00228	0.000658
Lead	0.00197	0.00181	0.00191	0.00220	0.00388	0.00168	0.00125	0.00101	0.000360
Manganese	0.0432	0.0211	0.0324	0.0472	0.0599	0.0266	0.0229	0.0295	0.000578
Molybdenum	0.00129	0.000662	0.000697	0.000457	0.00126	0.000837	0.000795	0.00102	0.00269
Nickel	0.00453	0.00138	0.00207	0.00228	0.00364	0.00239	0.00220	0.00192	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00691	0.00269	0.00432	0.00401	0.0114	0.00403	0.00529	0.00518	<0.000208
Titanium	0.0228	0.0111	0.0212	0.0257	0.0434	0.0157	0.0128	0.0204	<0.000833
Uranium	0.0000844	<0.0000833	<0.0000833	<0.0000833	0.000131	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00821	0.00216	0.00272	0.00325	0.00650	0.00625	0.00483	0.00505	0.000847
Zinc	0.0244	0.0207	0.0275	0.0173	0.0245	0.0222	0.0140	0.0137	0.00441
Iron	2.62	1.23	2.04	2.50	3.53	1.64	1.45	1.75	0.0290

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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	28-Jul	28-Jul	28-Jul	28-Jul			28-Jul
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)	279	186	174	145			6
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0435	0.0227	0.0357	0.0195	0.2	0.492881028	0.0113
Arsenic	0.000627	<0.000208	0.000272	0.000232	0.005	<	0.000246
Barium	0.000976	0.00104	0.00270	0.000606	0.005	0.023986219	0.000452
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0250	0.0258	0.0281	0.0239	0.2	0.525314456	0.0220
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208		<	<0.000208
Chromium	0.00199	0.00215	0.00220	0.00196	0.02	0.065752941	0.00202
Cobalt	0.000320	0.000273	0.000208	0.000192	0.002	0.015243694	0.000319
Copper	0.0259	0.00344	0.00325	0.0322	0.01	0.058138322	0.00273
Lead	0.000288	0.000827	0.000864	0.000434	0.005	0.011884572	0.000288
Manganese	0.00286	0.00164	0.00211	0.00164	0.002	0.112937784	0.00415
Molybdenum	0.000541	0.000325	0.000395	0.000397	0.002	0.037960181	0.000691
Nickel	<0.000833	0.00111	<0.000833	<0.000833	0.02	0.054066209	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000319	0.000317	0.000707	<0.000208	0.005	0.011256406	<0.000208
Titanium	0.00100	<0.000833	0.000900	<0.000833	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000833	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.00711	0.00443	0.00472	0.00293	0.02	0.282249263	0.00364
Iron	0.169	0.0820	0.114	0.0681	0.2	1.138935572	0.0152
Phosphorus	<0.208	<0.208	<0.208	<0.208	5	<	<0.208

Station #	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	28-Jul	28-Jul	28-Jul	28-Jul	28-Jul	28-Jul	28-Jul	28-Jul
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	420	524	334	713	575	326	966	10
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.194	0.279	0.126	0.402	0.332	0.122	0.492	<0.00833
Arsenic	0.000263	0.000423	0.000334	0.000512	0.000479	0.000240	0.000589	0.000232
Barium	0.00565	0.0114	0.00315	0.00680	0.00556	0.00217	0.00930	0.00192
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0255	0.0281	0.0265	0.0292	0.0254	0.0259	0.0288	0.0207
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00266	0.00313	0.00235	0.00374	0.00254	0.00214	0.00321	0.00173
Cobalt	0.000257	0.000749	0.000222	0.000820	0.000442	0.000195	0.000717	0.000542
Copper	0.00541	0.00814	0.147	0.00184	0.00508	<0.000417	0.00230	<0.000417
Lead	0.000475	0.00161	0.000317	0.000851	0.00117	0.000254	0.00100	<0.000208
Manganese	0.0140	0.0210	0.00967	0.0253	0.0109	0.00724	0.0401	0.000754
Molybdenum	0.000263	0.000537	0.000357	0.000605	0.000350	0.000348	0.000728	0.00103
Nickel	0.00107	0.00149	<0.000833	0.00198	0.00126	<0.000833	0.00229	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00197	0.00219	0.000756	0.00400	0.00303	0.00126	0.00494	<0.000208
Titanium	0.00704	0.0105	0.00395	0.0134	0.00817	0.00328	0.0192	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00117	0.00145	0.000905	0.00245	0.00180	<0.000833	0.00452	<0.000833
Zinc	0.0114	0.0208	0.00631	0.0162	0.00801	0.00244	0.00796	<0.000833
Iron	0.887	1.00	0.574	1.45	0.785	0.437	2.35	0.0121

Station #	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	3-Aug	3-Aug	3-Aug			3-Aug
PM Size(µm)	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24			24
Units	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	303	259	295			6
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0679	0.0459	<0.00833	0.2	0.370513472	0.00612
Arsenic	0.000347	0.000766	<0.000208	0.005	<	<0.000111
Barium	0.00173	0.00357	<0.000208	0.005	0.010437563	0.00109
Beryllium	<0.000208	<0.000208	<0.000208	0.005	<	<0.000111
Boron	0.0285	0.0290	<0.00833	0.2	0.601646194	0.00972
Cadmium	<0.000208	<0.000208	<0.000208	0.005	<	<0.000111
Chromium	0.00149	0.00133	<0.000833	0.02	0.0538554	<0.000442
Cobalt	0.000558	0.000834	<0.0000833	0.002	0.008453616	0.000697
Copper	0.00515	0.00763	0.000912	0.01	0.1110726	0.000526
Lead	0.00213	0.00297	<0.000208	0.005	0.006639906	0.000127
Manganese	0.00491	0.00705	0.00154	0.002	0.054753075	0.00151
Molybdenum	<0.0000833	0.000170	<0.0000833	0.002	<	0.000256
Nickel	0.00123	0.00116	<0.000833	0.02	<	0.000686
Silver	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000442
Strontium	0.000912	0.000751	<0.000208	0.005	0.008354466	0.000192
Titanium	0.00219	0.00210	<0.000833	0.02	<	<0.000442
Uranium	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000442
Vanadium	<0.000833	<0.000833	<0.000833	0.02	<	<0.000442
Zinc	0.0124	0.0200	0.00353	0.02	0.457031128	0.00548
Iron	0.152	0.104	<0.00833	0.2	1.22705325	<0.00442
Phosphorus	<0.208	<0.208	<0.208	5	<	<0.111

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	
Sample Date	3-Aug	3-Aug	3-Aug	3-Aug	3-Aug	3-Aug	3-Aug	3-Aug
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	988	572	572	469	1709	596	812	7
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.434	0.263	0.308	0.171	0.832	0.222	0.433	0.0117
Arsenic	0.000562	0.000516	0.00110	0.000386	0.000594	0.000230	0.000467	<0.000208
Barium	0.00835	0.00647	0.0136	0.00745	0.0156	0.00411	0.00846	0.000403
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0375	0.0276	0.0365	0.0284	0.0262	0.0302	0.0331	0.0167
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00519	0.00175	0.00260	0.00257	0.00277	0.00167	0.00281	<0.000833
Cobalt	0.00274	0.000655	0.00105	0.000902	0.00214	0.00120	0.000595	0.000446
Copper	0.0458	0.0419	0.0123	0.209	0.00397	0.0107	0.00283	0.00115
Lead	0.00113	0.00239	0.00388	0.000848	0.00146	0.000500	0.000743	<0.000208
Manganese	0.0269	0.0220	0.0185	0.0172	0.0505	0.0137	0.0264	0.00266
Molybdenum	0.000679	0.000192	0.000658	0.000835	0.000711	0.000475	0.00246	0.000615
Nickel	0.00643	0.00303	0.00179	0.00214	0.00336	0.00195	0.00172	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00571	0.00313	0.00281	0.00132	0.0106	0.00246	0.00459	0.000297
Titanium	0.0474	0.00922	0.0109	0.00494	0.0276	0.00619	0.0123	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.000100	<0.0000833	<0.0000833	<0.0000833
Vanadium	0.00472	0.00168	0.00248	0.00175	0.00570	0.00296	0.00260	<0.000833
Zinc	0.0240	0.0181	0.0313	0.0202	0.0308	0.0104	0.0167	0.00873
Iron	1.50	0.894	0.958	1.00	2.86	0.575	1.23	<0.00833

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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	9-Aug	9-Aug	9-Aug	9-Aug			9-Aug
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)	144	138	222	120			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0176	0.0167	0.0509	0.0214	0.2	0.370513472	0.0140
Arsenic	0.000378	<0.000208	0.000796	0.000249	0.005	<	<0.000208
Barium	0.000599	0.000974	0.00296	0.000961	0.005	0.010437563	0.000383
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0253	0.0289	0.0256	0.0272	0.2	0.601646194	0.0251
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00139	0.00155	0.00203	0.00232	0.02	0.0538554	0.00228
Cobalt	0.000204	0.000183	0.000194	0.000316	0.002	0.008453616	0.000423
Copper	0.0192	0.00122	0.00333	0.00314	0.01	0.1110726	0.000937
Lead	0.000546	0.000413	0.000648	0.000386	0.005	0.006639906	<0.000208
Manganese	0.00400	0.00166	0.00479	0.00212	0.002	0.054753075	0.00501
Molybdenum	0.000222	0.000421	0.000273	0.000573	0.002	<	0.00105
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	0.000302	0.000256	0.000566	0.000366	0.005	0.008354466	0.000327
Titanium	<0.000830	<0.000833	0.00132	<0.000833	0.02	<	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium	<0.000830	0.000951	0.00140	<0.000833	0.02	<	<0.000833
Zinc	0.00999	0.00760	0.0165	0.00894	0.02	0.457031128	0.0159
Iron	<0.00830	0.0531	0.139	0.0570	0.2	1.22705325	0.0378
Phosphorus	<0.207	<0.208	<0.208	<0.208	5	<	<0.208

Station #	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	9-Aug	9-Aug	9-Aug	9-Aug	9-Aug	9-Aug	9-Aug	9-Aug
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	202	659	186	363	229	254	524	13
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0585	0.341	0.0487	0.104	0.0234	0.0727	0.197	0.0134
Arsenic	<0.000208	0.00106	0.000226	<0.000208	<0.000208	<0.000208	0.000296	<0.000208
Barium	0.00189	0.0132	0.00114	0.00220	0.000806	0.00148	0.00406	0.000506
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0276	0.0262	0.0251	0.0281	0.0280	0.0296	0.0320	0.0225
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00230	0.00266	0.00307	0.00222	0.00178	0.00183	0.00214	0.00145
Cobalt	0.000263	0.000439	0.000274	0.000315	0.000446	0.000286	0.000618	0.000447
Copper	0.00281	0.00686	0.0133	0.00170	0.0125	0.00130	0.00236	0.00113
Lead	0.000469	0.000953	0.000260	0.00101	0.000255	0.000250	0.000396	<0.000208
Manganese	0.0129	0.0209	0.00281	0.00706	0.00299	0.00654	0.0177	0.00250
Molybdenum	0.000300	0.000469	0.000301	0.000517	0.000238	0.000397	0.000563	0.00248
Nickel	0.00108	0.00223	0.00126	0.00172	<0.000833	0.00216	0.00178	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.000676	0.00315	0.000390	0.00118	0.000441	0.000988	0.00280	0.000318
Titanium	0.00115	0.0119	0.00130	0.00507	<0.000833	0.00162	0.00692	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium	0.00131	0.00301	<0.000833	0.00324	<0.000833	<0.000833	0.00137	<0.000833
Zinc	0.0157	0.0257	0.00885	0.0106	0.00670	0.0109	0.0146	0.00841
Iron	0.139	1.18	0.0984	0.333	0.0630	0.207	0.779	0.0335

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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	15-Aug	15-Aug	15-Aug	15-Aug			15-Aug
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)	342	317	429	304			4
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0745	0.0639	0.0819	0.0377	0.2	0.370513472	0.0155
Arsenic	0.000318	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.00164	0.00194	0.00355	0.00264	0.005	0.010437563	0.000557
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	0.0311	0.0287	0.0300	0.0308	0.2	0.601646194	0.0215
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00205	0.00219	0.00244	0.00285	0.02	0.0538554	0.00225
Cobalt	0.000550	0.000168	0.000195	0.000184	0.002	0.008453616	0.000377
Copper	0.0323	0.00134	0.00451	0.00307	0.01	0.1110726	0.00105
Lead	0.000376	0.000283	0.00161	0.000409	0.005	0.006639906	<0.000208
Manganese	0.00441	0.00638	0.0233	0.00411	0.002	0.054753075	0.00414
Molybdenum	0.000229	0.000116	0.000278	0.000208	0.002	<	0.000391
Nickel	<0.000833	<0.000833	0.000995	<0.000833	0.02	<	0.000926
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000793	0.000707	0.000890	0.00176	0.005	0.008354466	0.000363
Titanium	0.00143	0.00100	0.00196	<0.000833	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium	<0.000833	0.000914	0.00137	0.000869	0.02	<	<0.000833
Zinc	0.00776	0.0190	0.0162	0.0135	0.02	0.457031128	0.00709
Iron	0.238	0.140	0.269	0.149	0.2	1.22705325	0.0264
Phosphorus	<0.208	<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	15-Aug	15-Aug	15-Aug	15-Aug	15-Aug	15-Aug	15-Aug	15-Aug	15-Aug
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	938	1046	1230	527	2554	850	533	2066	2
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.584	0.593	0.721	0.173	1.06	0.481	0.198	0.891	0.0116
Arsenic	0.000556	0.000430	0.000617	0.000268	0.000759	0.000488	0.000228	0.000729	<0.000208
Barium	0.0106	0.0180	0.0225	0.00637	0.0190	0.00977	0.00467	0.0193	0.000999
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0304	0.0273	0.0345	0.0310	0.0317	0.0301	0.0325	0.0355	0.0203
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00282	0.00327	0.00488	0.00249	0.00434	0.00333	0.00232	0.00402	<0.000833
Cobalt	0.000617	0.000467	0.000866	0.000295	0.00183	0.000954	0.000810	0.00151	0.000131
Copper	0.125	0.00506	0.00851	0.00347	0.00368	0.0126	0.00194	0.00365	0.000901
Lead	0.00103	0.000820	0.00315	0.000550	0.00177	0.000889	0.000607	0.00154	<0.000208
Manganese	0.0253	0.0259	0.0450	0.0122	0.0701	0.0228	0.0259	0.0834	0.00259
Molybdenum	0.000250	0.000269	0.000792	0.000249	0.000585	0.000320	0.000365	0.000635	0.00110
Nickel	0.00234	0.00144	0.00291	0.000893	0.00419	0.00397	0.00137	0.00353	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00598	0.00822	0.00664	0.00290	0.0133	0.00529	0.00217	0.0103	0.000256
Titanium	0.0224	0.0186	0.0247	0.00543	0.0354	0.0147	0.00505	0.0357	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.000131	0.000106	<0.0000833	0.000148	<0.0000833
Vanadium	0.00264	0.00262	0.00445	0.00139	0.00601	0.00269	0.00125	0.00547	<0.000833
Zinc	0.0139	0.0180	0.0338	0.0126	0.0219	0.0146	0.0123	0.0260	0.00651
Iron	1.68	1.27	2.70	0.588	3.88	1.41	1.06	3.76	0.0263

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Particulate Matter - Metals **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	21-Aug	21-Aug		21-Aug			21-Aug
PM Size(µm)	2.5	2.5		2.5			2.5
Total Air Volume (m3)	24	24		24			24
Units	µg/M3	µg/M3		µg/M3			µg/M3
Particulate Matter (µg)	57	158		147			<
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0354	0.0355		0.0240	0.2	0.370513472	0.0146
Arsenic	0.000603	0.000498		0.000363	0.005	<	0.000411
Barium	0.00127	0.000340		<0.000208	0.005	0.010437563	<0.000208
Beryllium	<0.000208	<0.000208		<0.000208	0.005	<	<0.000208
Boron	0.0239	0.0243		0.0198	0.2	0.601646194	0.0177
Cadmium	<0.000208	<0.000208		<0.000208	0.005	<	<0.000208
Chromium	0.00238	0.00309		0.00246	0.02	0.0538554	0.00169
Cobalt	0.000506	0.000220		0.000183	0.002	0.008453616	0.000328
Copper	0.116	0.00303		0.000917	0.01	0.1110726	0.00286
Lead	0.000619	0.000491		0.000447	0.005	0.006639906	0.000302
Manganese	0.00679	0.00231		0.00161	0.002	0.054753075	0.000581
Molybdenum	0.000537	<0.0000833		<0.0000833	0.002	<	<0.0000833
Nickel	0.00990	<0.000833		<0.000833	0.02	<	<0.000833
Silver	<0.0000833	<0.0000833		<0.0000833	0.002	<	<0.0000833
Strontium	0.000638	0.000412		0.000360	0.005	0.008354466	0.000231
Titanium	<0.000833	<0.000833		<0.000833	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833		<0.0000833	0.002	<	<0.0000833
Vanadium	<0.000833	0.00120		0.000921	0.02	<	<0.000833
Zinc	0.0321	0.0251		0.0225	0.02	0.457031128	0.0314
Iron	0.137	0.0790		0.0234	0.2	1.22705325	<0.00833
Phosphorus	<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	21-Aug	21-Aug	21-Aug	21-Aug	21-Aug	21-Aug	21-Aug	21-Aug	21-Aug
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	24	24	24	21.6	24
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	233	490	742	265	717	172	323	510	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0986	0.295	0.529	0.107	0.379	0.0713	0.193	0.325	0.0239
Arsenic	0.000576	0.000709	0.000889	0.000369	0.000475	0.000338	0.000665	0.000596	0.000446
Barium	0.00156	0.00605	0.0136	0.00199	0.00534	0.00111	0.00375	0.00704	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000231	<0.000208
Boron	0.0237	0.0171	0.0217	0.0213	0.0213	0.0190	0.0254	0.0257	0.0173
Cadmium	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000231	<0.000208
Chromium	0.00270	0.00258	0.00306	0.00258	0.00294	0.00218	0.00492	0.00364	0.00177
Cobalt	0.000274	0.000569	0.000601	0.000322	0.000518	0.000438	0.000509	0.00105	0.000649
Copper	0.00134	0.0285	0.00348	0.00125	0.00136	0.00341	0.00296	0.00198	0.000710
Lead	0.000362	0.000903	0.00145	0.000597	0.000645	0.000290	0.000573	0.000839	0.000264
Manganese	0.00700	0.0185	0.0302	0.00685	0.0199	0.00579	0.0198	0.0306	0.00113
Molybdenum	0.000194	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.000810	<0.0000926	0.000771
Nickel	<0.000833	0.00319	0.00182	0.000969	0.00233	<0.000833	0.00120	0.00145	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000926	<0.0000833
Strontium	0.00172	0.00293	0.00386	0.000939	0.00467	0.000783	0.00278	0.00373	0.000228
Titanium	0.00255	0.0103	0.0160	0.00231	0.00853	0.00106	0.00832	0.0119	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000926	<0.0000833
Vanadium	0.000851	0.00204	0.00356	0.00122	0.00192	<0.000833	0.00144	0.00204	<0.000833
Zinc	0.0174	0.0284	0.0362	0.0368	0.0414	0.0248	0.0326	0.0424	0.0431
Iron	0.325	0.960	1.67	0.364	0.977	0.237	0.926	1.40	0.00878

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **Indicated Sites and Dates**

Station #	AMS 1	AMS 6			MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes					
Sample Date	27-Aug	27-Aug					27-Aug
PM Size(µm)	2.5	2.5					2.5
Total Air Volume (m3)	24.1	24					24
Units	µg/M3	µg/M3					µg/M3
Particulate Matter (µg)	-40	106					<
Unit	(µg/m3)	(µg/m3)			(µg)	(µg)	(µg)
Aluminum	0.0807	0.0485			0.2	0.370513472	0.0192
Arsenic	0.000248	0.000294			0.005	<	<0.000208
Barium	<0.000207	0.000777			0.005	0.010437563	<0.000208
Beryllium	<0.000207	<0.000208			0.005	<	<0.000208
Boron	0.0292	0.0260			0.2	0.601646194	0.0187
Cadmium	<0.000207	<0.000208			0.005	<	<0.000208
Chromium	0.00183	0.00552			0.02	0.0538554	0.00170
Cobalt	0.000242	0.000648			0.002	0.008453616	0.000235
Copper	0.00705	0.00303			0.01	0.1110726	0.000851
Lead	0.000234	0.000420			0.005	0.006639906	<0.000208
Manganese	0.00183	0.00231			0.002	0.054753075	0.000758
Molybdenum	0.000727	0.000226			0.002	<	0.000441
Nickel	0.00129	<0.000833			0.02	<	<0.000833
Silver	<0.0000830	<0.0000833			0.002	<	<0.0000833
Strontium	0.000329	0.000539			0.005	0.008354466	0.000242
Titanium	<0.000830	<0.000833			0.02	<	<0.000833
Uranium	<0.0000830	<0.0000833			0.002	<	<0.0000833
Vanadium	<0.000830	0.00103			0.02	<	<0.000833
Zinc	0.0355	0.0372			0.02	0.457031128	0.0249
Iron	0.191	0.128			0.2	1.22705325	0.0116
Phosphorus	<0.207	<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	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	23.996	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)	327	489	795	160	<	300	447	295	3
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.124	0.375	0.614	0.191	0.0159	0.0433	0.329	0.286	0.0181
Arsenic	<0.000207	0.000353	0.000442	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Barium	0.00177	0.00856	0.0182	0.00264	<0.000208	0.000399	0.00544	0.00600	<0.000208
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	0.0229	0.0183	0.0194	0.0159	0.0183	0.0214	0.0282	0.0279	0.0204
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00242	0.00268	0.00313	0.00201	0.00180	0.00194	0.00365	0.00434	0.00190
Cobalt	0.000277	0.000308	0.000630	0.000324	0.000323	0.000546	0.000673	0.000589	0.000293
Copper	0.0183	0.00816	0.00808	0.00423	0.00252	0.0733	0.00218	0.00233	0.000777
Lead	0.000298	0.000529	0.000966	0.000489	0.000241	0.000234	0.000548	0.000615	0.000219
Manganese	0.00570	0.0391	0.0309	0.00684	0.00316	0.00501	0.0153	0.0217	0.000936
Molybdenum	0.000365	0.000212	0.000421	0.000510	0.000159	0.000140	0.000434	0.000669	0.00101
Nickel	0.00148	0.00106	0.00213	0.000903	<0.000833	0.00341	0.00154	0.00184	0.000881
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00151	0.00462	0.00424	0.000864	0.000244	0.000482	0.00310	0.00322	<0.000208
Titanium	0.00201	0.0113	0.0177	0.00335	<0.000833	<0.000833	0.00687	0.00917	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium	0.00105	0.00170	0.00254	<0.000833	<0.000833	<0.000833	0.00188	0.00205	<0.000833
Zinc	0.0322	0.0299	0.0482	0.0281	0.0276	0.0195	0.0352	0.0525	0.0293
Iron	0.291	1.03	1.76	0.324	0.0647	0.292	0.631	1.21	0.0396

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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	5-May	5-May	5-May	5-May			5-May
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	25.037	24	24	24			24.001
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	107	74	230	60			8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0160	<0.0167	0.0416	0.0179	0.4	<	<0.0167
Nitrate	0.0421	0.0427	0.0972	0.0676	0.2	<	0.0103
Sulphate	1.06	0.585	0.454	0.497	1	<	<0.0417
Ammonium (as N)	0.285	0.178	0.123	0.132	0.5	<	<0.0208
Calcium	<0.0799	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Magnesium	<0.0399	<0.0417	0.0421	<0.0417	1	<	<0.0417
Potassium	0.0176	0.0137	0.0192	0.0223	0.2	0.2445163	0.00893

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	41764	41764	41764	41764	41764	41764	41764	41764	41764
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	22.6	23.5	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)	263	214	547	55	199	251	221	273	1
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	<0.0167	0.0279	0.101	<0.0170	<0.0167	<0.0167	<0.0167	0.0246	<0.0167
Nitrate	0.106	0.117	0.0932	0.0283	0.0668	0.0901	0.0751	0.0925	<0.00833
Sulphate	1.08	0.646	0.461	0.499	0.675	1.15	0.687	0.871	<0.0417
Ammonium (as N)	0.283	0.184	0.139	0.166	0.199	0.341	0.217	0.281	<0.0208
Calcium	<0.0833	<0.0833	0.163	<0.0851	0.130	0.109	<0.0833	0.311	<0.0833
Magnesium	<0.0417	<0.0417	<0.0442	<0.0426	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0165	0.0197	0.0211	0.0148	0.0148	0.0140	0.0148	0.0154	0.00955

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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	11-May	11-May	11-May	11-May			11-May
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)	58	92	91	63			20
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0243	<0.0167	<0.0167	<0.0167	0.4	<	<0.0167
Nitrate	0.0632	0.0308	0.0336	0.0213	0.2	<	<0.00833
Sulphate	0.458	0.514	0.711	0.522	1	<	<0.0417
Ammonium (as N)	0.123	0.153	0.228	0.169	0.5	<	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	0.0281	0.0210	0.0148	0.0119	0.2	0.2445163	0.00857

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	41770	41770	41770	41770	41770	41770	41770	41770	41770
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	213	314	251	113	264	128	82	328	11
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.153	0.0468	0.0530	<0.0167	0.0266	<0.0167	0.0167	0.0293	<0.0167
Nitrate	0.466	0.0688	0.0557	0.0451	0.0850	0.0407	0.0530	0.0458	<0.00833
Sulphate	1.65	0.503	0.587	0.613	0.652	0.375	0.408	0.457	<0.0417
Ammonium (as N)	0.264	0.155	0.174	0.174	0.222	0.114	0.114	0.120	<0.0208
Calcium	0.155	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.104	0.0216	0.0193	0.0127	0.0216	0.0124	0.0136	0.0387	0.00848

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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	17-May	17-May	17-May	17-May			17-May
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.42	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	175	185	195	113			47
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0164	<0.0167	0.0184	0.0230	0.4	<	0.0235
Nitrate	0.0365	0.0348	0.0498	0.0249	0.2	<	0.0411
Sulphate	0.955	0.954	1.07	0.923	1	<	0.0523
Ammonium (as N)	0.290	0.282	0.297	0.267	0.5	<	<0.0208
Calcium	<0.0819	0.170	<0.0833	0.122	2	<	0.0877
Magnesium	<0.0410	<0.0417	0.0418	<0.0417	1	<	<0.0417
Potassium	0.0144	0.0257	0.0226	0.0130	0.2	0.2445163	0.0105

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River
Sample Date	41776	41776	41776	41776	41776	41776	41776	41776
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24.01	24	24	24	22.6
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	698	523	494	223	1482	518	179	849
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Chloride	0.0247	0.0451	0.0462	<0.0167	0.0799	0.0198	<0.0167	0.0549
Nitrate	0.158	0.118	0.0992	0.0600	0.230	0.107	0.0466	0.134
Sulphate	1.19	0.959	1.05	0.965	1.17	1.18	0.589	0.751
Ammonium (as N)	0.300	0.260	0.292	0.262	0.232	0.329	0.170	0.172
Calcium	0.345	0.198	0.0854	0.0968	0.284	0.187	0.0961	0.461
Magnesium	0.0473	<0.0417	0.0453	<0.0416	<0.0417	0.0459	<0.0417	0.0549
Potassium	0.0197	0.0338	0.0232	0.0157	0.0311	0.0242	0.0133	0.0184

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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	23-May	23-May	23-May	23-May			23-May
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)	258	157	164	142			8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	<0.0167	<0.0167	<0.0167	0.4	<	<0.0167
Nitrate	0.195	0.0470	0.142	0.0553	0.2	<	0.00949
Sulphate	1.17	0.398	0.411	0.479	1	<	0.0559
Ammonium (as N)	0.325	0.103	0.101	0.149	0.5	<	<0.0208
Calcium	<0.0833	0.164	<0.0833	0.161	2	<	0.140
Magnesium	<0.0417	<0.0417	0.0439	<0.0417	1	<	<0.0417
Potassium	0.0271	0.0149	0.0164	0.0163	0.2	0.2445163	0.0608

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	41782	41782	41782	41782	41782	41782	41782	41782	41782
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24.007	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)	1085	540	740	380	1631	894	186	1223	11
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0549	0.0623	0.0991	0.0207	0.0630	0.0350	<0.0167	0.0496	<0.0167
Nitrate	0.156	0.134	0.134	0.143	0.108	0.196	0.0660	0.242	0.0798
Sulphate	1.29	0.409	0.442	0.620	0.725	1.49	0.223	1.19	<0.0417
Ammonium (as N)	0.342	0.106	0.112	0.153	0.109	0.388	0.0405	0.209	<0.0208
Calcium	0.423	0.213	0.171	0.166	0.735	0.467	0.0840	0.669	0.119
Magnesium	0.0560	<0.0417	0.0514	<0.0417	0.0622	<0.0417	<0.0417	0.0626	<0.0417
Potassium	0.0281	0.0218	0.0268	0.0234	0.0280	0.0408	0.0172	0.0265	0.0110

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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	29-May	29-May	29-May	29-May			29-May
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.665	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	82	106	85	57			13
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0162	<0.0167	<0.0167	<0.0167	0.4	<	<0.0167
Nitrate	0.0277	0.0660	0.0968	<0.00833	0.2	<	0.0372
Sulphate	0.442	0.531	0.580	0.315	1	<	<0.0417
Ammonium (as N)	0.113	0.136	0.205	0.0875	0.5	<	<0.0208
Calcium	<0.0811	<0.0833	<0.0833	<0.0833	2	<	0.127
Magnesium	<0.0405	<0.0417	0.0471	<0.0417	1	<	<0.0417
Potassium	0.0129	0.0263	0.0200	0.0109	0.2	0.2445163	0.0129

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	41788	41788	41788	41788	41788	41788	41788	41788	41788
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	146	182	150	69	166	162	161	295	4.333333333
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	<0.0167	0.0211	0.0217	<0.0167	0.0223	<0.0167	0.0246	0.0231	<0.0167
Nitrate	0.0162	0.0344	0.0522	0.0134	0.0269	0.0269	0.147	0.0873	0.0490
Sulphate	0.352	0.576	0.567	0.287	0.525	0.338	0.240	0.388	0.165
Ammonium (as N)	0.0914	0.152	0.136	0.0722	0.118	0.0787	<0.0208	0.0748	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0149	0.0180	0.0218	0.0146	0.0258	0.0187	0.541	0.443	1.20

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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	4-Jun	4-Jun	4-Jun	4-Jun			4-Jun
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.474	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	59	151	102	77			11.7
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0232	0.0241	<0.0167	0.0171	0.4	1.1095633	0.0179
Nitrate	0.0647	0.0759	0.0506	0.0526	0.2	1.765192693	0.0707
Sulphate	0.117	1.14	1.26	0.874	1	3.3270656	0.0472
Ammonium (as N)	0.0260	0.364	0.397	0.282	0.5	0	<0.0208
Calcium	<0.0817	0.0837	<0.0833	<0.0833	2	0	0.204
Magnesium	<0.0409	<0.0417	<0.0417	<0.0417	1	0	<0.0417
Potassium	0.0138	0.0190	0.0120	0.00955	0.2	0	0.00902

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	41794	41794	41794	41794	41794	41794	41794	41794
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	128	237	218	150	100	111	440	34
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0250	0.0229	0.0244	0.0233	0.0229	0.0223	0.0390	0.0204
Nitrate	0.101	0.106	0.117	0.0964	0.0881	0.0794	0.107	0.0632
Sulphate	0.166	1.24	1.37	0.934	0.146	0.311	0.162	0.0473
Ammonium (as N)	0.0300	0.388	0.407	0.297	0.0344	0.0857	0.0247	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	<0.0833	0.260	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0273	0.0345	0.0288	0.0371	0.0263	0.0162	0.0233	0.0105

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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	10-Jun	10-Jun	10-Jun	10-Jun			10-Jun
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.975	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	108	144	125	103			12.7
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0231	0.0172	0.0179	0.0196	0.4	1.1095633	0.0392
Nitrate	0.0768	0.0656	0.0672	0.0901	0.2	1.765192693	0.0656
Sulphate	1.51	0.681	0.588	0.458	1	3.3270656	0.0433
Ammonium (as N)	0.122	0.194	0.177	0.137	0.5	0	<0.0208
Calcium	0.119	0.244	0.138	0.0995	2	0	0.155
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	0	<0.0417
Potassium	0.0236	0.0364	0.0241	0.0243	0.2	0	0.0100

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	41800	41800	41800	41800	41800	41800	41800	41800	41800
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	328	340	483	255	309	357	256	555	4.67
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0307	0.0505	0.0348	0.0274	0.0278	0.0305	0.0309	0.0420	0.0213
Nitrate	0.133	0.226	0.170	0.176	0.197	0.132	0.135	0.154	0.0755
Sulphate	0.595	0.745	0.603	0.495	0.818	0.565	0.652	0.759	0.0468
Ammonium (as N)	0.157	0.218	0.145	0.136	0.202	0.154	0.173	0.164	<0.0208
Calcium	0.774	0.585	0.664	0.233	0.711	0.428	0.578	1.31	0.0851
Magnesium	<0.0417	0.0529	0.0457	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0386	0.0492	0.0368	0.0555	0.0358	0.0418	0.0324	0.0416	<0.00833

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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	16-Jun	16-Jun	16-Jun	16-Jun			16-Jun
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)	210	156	203	95			8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	<0.0167	<0.0167	0.0531	0.4	1.1095633	0.0174
Nitrate	0.111	0.0790	0.0636	0.0652	0.2	1.765192693	0.0502
Sulphate	0.665	0.236	0.289	0.322	1	3.3270656	<0.0417
Ammonium (as N)	0.134	0.0679	0.0755	0.0965	0.5	0	<0.0208
Calcium	0.344	0.152	0.263	0.121	2	0	0.194
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	0	<0.0417
Potassium	0.0360	0.0291	0.0217	0.0201	0.2	0	0.0152

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	41806	41806	41806	41806	41806	41806	41806	41806	41806
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24.009	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)	1022	595	1032	243	3516	716	1270	1320	15.3
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0563	0.114	0.134	0.0182	0.150	0.0413	0.0783	0.0755	<0.0167
Nitrate	0.277	0.125	0.155	0.0841	0.204	0.208	0.308	0.279	0.0289
Sulphate	0.642	0.444	0.327	0.333	1.05	0.607	0.675	0.496	0.0559
Ammonium (as N)	0.108	0.0925	0.0636	0.101	0.0852	0.155	0.120	0.0557	<0.0208
Calcium	2.73	1.30	1.71	0.334	2.47	1.38	2.36	3.12	<0.0833
Magnesium	0.0754	0.0491	0.0968	<0.0417	0.266	<0.0417	0.127	0.0912	<0.0417
Potassium	0.0213	0.290	0.0426	0.0328	0.0922	0.0627	0.0470	0.0246	0.00991

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Station #	AMS 1	AMS 6	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Anzac			
Sample Date	22-Jun	22-Jun	22-Jun			22-Jun
PM Size(µm)	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.835	24	24			24
	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	145	279	200			6
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0168	<0.0167	0.0198	0.4	1.1095633	<0.0167
Nitrate	0.0848	0.0806	0.170	0.2	1.765192693	0.0537
Sulphate	0.397	2.86	1.78	1	3.3270656	<0.0417
Ammonium (as N)	0.129	0.857	0.557	0.5	0	<0.0208
Calcium	0.148	0.104	<0.0833	2	0	0.0989
Magnesium	<0.0420	<0.0417	<0.0417	1	0	<0.0417
Potassium	0.0423	0.0212	0.0363	0.2	0	<0.00833

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	41812	41812	41812	41812	41812	41812	41812	41812	41812
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	291	462	560	356	384	318	273	575	3.67
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0181	0.0286	0.0235	0.0200	0.0196	0.0182	0.0299	0.0249	<0.0167
Nitrate	0.244	0.186	0.256	0.132	0.245	0.100	0.118	0.126	0.0494
Sulphate	0.441	3.14	2.32	1.88	0.695	0.390	0.433	0.460	<0.0417
Ammonium (as N)	0.139	0.896	0.667	0.568	0.224	0.114	0.143	0.110	<0.0208
Calcium	0.267	0.363	0.416	0.0937	0.174	0.106	0.151	1.12	<0.0833
Magnesium	<0.0417	<0.0417	0.0449	<0.0417	<0.0417	<0.0417	<0.0417	0.0555	<0.0417
Potassium	0.165	0.0581	0.0937	0.111	0.172	0.122	0.0765	0.0588	<0.00833

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Station #	AMS 1	AMS 6		AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes		Anzac			
Sample Date	28-Jun	28-Jun		28-Jun			28-Jun
PM Size(µm)	2.5	2.5		2.5			2.5
Total Air Volume (m3)	24	24		24			24
	µg/M3	µg/M3		µg/M3			µg/M3
Particulate Matter (µg)	149	288		264			3.67
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	0.0187		<0.0167	0.4	1.1095633	<0.0167
Nitrate	0.0783	0.113		0.137	0.2	1.765192693	0.0790
Sulphate	0.514	2.33		1.81	1	3.3270656	0.0427
Ammonium (as N)	0.176	0.702		0.582	0.5	0	<0.0208
Calcium	0.131	0.0943		0.0863	2	0	0.115
Magnesium	<0.0417	<0.0417		<0.0417	1	0	<0.0417
Potassium	0.0304	0.0440		0.0589	0.2	0	<0.00833

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	41818	41818	41818	41818	41818	41818	41818	41818	41818
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	464	827	700	516	644	346	694	1039	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0185	0.0515	0.0177	0.0192	0.0320	<0.0167	0.0302	0.0328	<0.0167
Nitrate	0.133	0.377	0.208	0.229	0.303	0.153	0.201	0.230	0.0743
Sulphate	0.566	2.30	1.04	1.77	1.61	0.653	1.02	0.672	0.0585
Ammonium (as N)	0.165	0.651	0.294	0.530	0.464	0.163	0.276	0.142	<0.0208
Calcium	1.00	0.944	0.511	0.490	1.12	0.320	0.611	1.92	0.0941
Magnesium	<0.0417	0.0709	<0.0417	0.0594	<0.0417	<0.0417	0.0845	0.0491	<0.0417
Potassium	0.143	0.0507	0.0384	0.0381	0.0436	0.0618	0.0657	0.0588	<0.00833

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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	3-Jul	3-Jul	3-Jul	3-Jul			3-Jul
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.283	24	20	24.01			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	119	48	91	67			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0172	<0.0167	<0.0200	0.0531	0.4	0.612591857	0.0755
Nitrate	0.194	0.174	0.258	0.171	0.2	2.840812528	0.149
Sulphate	0.502	0.184	<0.0500	<0.0416	1	2.1016401	<0.0417
Ammonium (as N)	0.315	0.103	0.138	0.179	0.5	0.659925058	<0.0208
Calcium	<0.0859	<0.0833	0.315	<0.0833		3.265932	<0.0833
Magnesium	<0.0429	<0.0417	<0.0500	<0.0416	1	<	<0.0417
Potassium	0.0517	0.0106	0.0251	0.0100	0.2	0.380025333	<0.00833

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	41823	41823	41823	41823	41823	41823	41823	41823	41823
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	20	24	24.01	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)	213	180	265	248	303	157	166	837	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0227	0.0305	0.134	0.0182	0.150	0.0413	0.0783	<0.0167	0.0174
Nitrate	0.196	0.253	0.210	0.211	0.234	0.234	0.210	<0.00833	0.177
Sulphate	0.321	0.228	<0.0417	<0.0416	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Ammonium (as N)	0.210	0.136	0.153	0.164	0.202	0.114	0.174	0.186	<0.0208
Calcium	0.252	0.499	0.716	0.762	0.895	0.149	0.292	2.23	<0.0833
Magnesium	<0.0417	<0.0500	<0.0417	<0.0416	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0631	0.0341	0.0327	0.0198	0.0466	0.0251	0.0530	0.0256	<0.00833

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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	9-Jul	9-Jul	9-Jul	9-Jul			9-Jul
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)	173	388	413	222			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	<0.0167	<0.0167	0.0198	0.4	0.612591857	<0.0167
Nitrate	0.720	0.126	0.0806	0.0601	0.2	2.840812528	0.0399
Sulphate	0.159	0.359	0.386	0.209	1	2.1016401	<0.0417
Ammonium (as N)	0.155	0.272	0.288	0.0988	0.5	0.659925058	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0833		3.265932	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	0.0118	0.0229	0.0201	<0.00833	0.2	0.380025333	<0.00833

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	41829	41829	41829	41829	41829	41829	41829	41829	41829
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	18.5	24	24	24	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)	646	759	404	299	726	325	546	719	5
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0235	0.0286	0.0235	0.0200	0.0196	0.0182	0.0299	0.0249	<0.0167
Nitrate	0.256	0.110	0.128	0.101	0.138	0.108	0.0866	0.117	0.0352
Sulphate	0.326	0.435	0.303	0.220	1.38	0.247	0.289	0.402	<0.0417
Ammonium (as N)	0.120	0.293	0.165	0.137	0.535	0.154	0.107	0.166	<0.0208
Calcium	1.96	1.43	0.657	0.158	1.25	<0.0833	0.726	1.72	<0.0833
Magnesium	<0.0541	0.0856	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0299	0.0587	0.0265	0.0195	0.0127	0.0241	0.0146	0.0243	<0.00833

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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	15-Jul	15-Jul	15-Jul	15-Jul			15-Jul
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)	572	503	526	475			9
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	0.0187	0.0222	<0.0167	0.4	0.612591857	<0.0167
Nitrate	0.0605	0.0968	0.110	0.0960	0.2	2.840812528	0.0502
Sulphate	0.720	1.23	0.991	0.890	1	2.1016401	0.0582
Ammonium (as N)	0.415	0.596	0.490	0.533	0.5	0.659925058	<0.0208
Calcium	0.383	0.191	0.236	0.0930		3.265932	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	0.0538	0.0327	0.0589	0.0520	0.2	0.380025333	<0.00833

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	41835	41835	41835	41835	41835	41835	41835	41835	41835
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	21.4	24	24	24.01	22.8	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)	897	1209	1151	735	1401	748	774	1277	26
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0207	0.0515	0.0177	0.0192	0.0336	<0.0167	0.0302	0.0328	<0.0167
Nitrate	0.168	0.312	0.355	0.157	0.361	0.155	0.136	0.268	0.0233
Sulphate	0.790	1.54	1.23	0.971	1.12	0.651	0.591	0.661	0.0417
Ammonium (as N)	0.401	0.566	0.625	0.432	0.355	0.308	0.268	0.229	<0.0208
Calcium	3.41	3.13	3.03	1.13	5.07	1.05	1.42	3.74	<0.0833
Magnesium	0.0472	0.165	<0.0417	<0.0416	<0.0439	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.0616	0.0259	0.124	0.0349	0.0683	0.0652	0.0507	0.0728	<0.00833

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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	21-Jul	21-Jul	21-Jul	21-Jul			21-Jul
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	23.021	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	892	410	734	762			32
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0174	0.0187	0.0222	<0.0167	0.4	0.612591857	<0.0167
Nitrate	0.133	0.0838	0.0790	0.280	0.2	2.840812528	0.0304
Sulphate	3.29	0.994	1.04	1.17	1	2.1016401	0.0537
Ammonium (as N)	1.76	0.681	<0.0208	0.793	0.5	0.659925058	<0.0208
Calcium	0.546	0.186	<0.0833	0.736		3.265932	<0.0833
Magnesium	<0.0434	<0.0417	<0.0417	0.0577	1	<	<0.0417
Potassium	0.126	0.0931	<0.00833	0.133	0.2	0.380025333	<0.00833

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	41841	41841	41841	41841	41841	41841	41841	41841	41841
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	1675	2264	1388	1491	2395	1379	1319	1427	5
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0185	0.0515	0.0177	0.0192	0.0320	<0.0167	0.0302	0.0328	<0.0167
Nitrate	0.330	0.350	0.208	0.181	0.264	0.262	0.225	0.253	0.0419
Sulphate	3.15	1.26	1.24	1.04	1.95	2.68	2.23	2.42	0.0465
Ammonium (as N)	1.46	0.700	0.715	0.736	0.792	1.15	1.13	1.18	0.0272
Calcium	4.69	2.12	3.18	3.74	6.68	3.53	3.12	4.11	<0.0833
Magnesium	0.137	0.149	0.190	0.185	0.150	0.131	0.0913	0.132	<0.0417
Potassium	0.161	0.129	0.152	0.131	0.155	0.141	0.127	0.145	<0.00833

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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	28-Jul	28-Jul	28-Jul	28-Jul			28-Jul
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)	279	186	174	145			6
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	0.0187	0.0222	<0.0167	0.4	0.612591857	<0.0167
Nitrate	0.0407	0.0648	0.0454	0.0786	0.2	2.840812528	0.0395
Sulphate	1.28	0.365	0.416	0.411	1	2.1016401	0.0550
Ammonium (as N)	0.731	0.248	0.272	0.271	0.5	0.659925058	<0.0208
Calcium	0.251	<0.0833	0.736	0.736		3.265932	0.736
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	0.0479	0.0332	0.0336	0.0178	0.2	0.380025333	0.00973

Station #	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	41848	41848	41848	41848	41848	41848	41848	41848
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	420	524	334	713	575	326	966	10
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0515	0.0177	0.0192	0.0320	<0.0167	0.0302	0.0328	<0.0167
Nitrate	0.0826	0.116	0.0703	0.209	0.118	0.0743	0.210	0.0249
Sulphate	0.396	0.506	0.415	0.620	1.15	0.411	2.30	<0.0417
Ammonium (as N)	0.257	0.263	0.258	0.314	0.608	0.271	1.08	<0.0208
Calcium	1.20	0.736	0.736	0.736	0.736	0.736	0.736	0.736
Magnesium	0.0751	0.0816	<0.0417	0.0643	0.0519	<0.0417	0.105	<0.0417
Potassium	0.0436	0.0653	0.0490	0.0563	0.0825	0.0471	0.0890	<0.00833

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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	3-Aug	3-Aug	3-Aug	3-Aug			3-Aug
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	45.2	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	3102	303	259	295			6
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0260	0.0229	0.0444	0.0329	0.4	0.5906108	0.0166
Nitrate	0.975	0.204	0.235	0.205	0.2	4.278766382	0.101
Sulphate	2.11	0.910	0.990	0.880	1	2.2518644	0.0561
Ammonium (as N)	0.928	0.352	0.369	0.357	0.5	<	<0.0111
Calcium	0.0550	<0.0833	<0.0833	<0.0833	2	<	<0.0442
Magnesium	<0.0221	<0.0417	<0.0417	<0.0417	1	<	<0.0221
Potassium	0.229	0.0305	0.0507	0.0638	0.2	0.3632385	<0.00442

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	
Sample Date	41854	41854	41854	41854	41854	41854	41854	41854
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	988	572	572	469	1709	596	812	7
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0374	0.0569	0.0454	0.0465	0.171	0.0447	0.0404	0.0309
Nitrate	0.304	0.221	0.219	0.216	0.340	0.287	0.239	0.181
Sulphate	2.42	1.00	0.857	0.947	1.98	2.11	1.39	0.0923
Ammonium (as N)	0.789	0.344	0.308	0.360	0.495	0.722	0.479	<0.0208
Calcium	1.56	0.587	0.181	<0.0833	3.28	0.241	0.508	<0.0833
Magnesium	0.0705	0.103	0.0618	<0.0417	0.137	<0.0417	0.0630	<0.0417
Potassium	0.0966	0.0493	0.0576	0.0738	0.103	0.117	0.0838	<0.00833

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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	9-Aug	9-Aug	9-Aug	9-Aug			9-Aug
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)	144	138	222	120			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0203	<0.0167	0.0202	0.0189	0.4	0.5906108	0.0194
Nitrate	0.187735794	0.184	0.203	0.194	0.2	4.278766382	0.197
Sulphate	0.616	0.876	1.34	0.686	1	2.2518644	0.113
Ammonium (as N)	0.236	0.347	0.494	0.261	0.5	<	<0.0208
Calcium	<0.0830	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Magnesium	<0.0415	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	0.0308	0.0363	0.0528	0.0338	0.2	0.3632385	0.0471

Station #	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	41860	41860	41860	41860	41860	41860	41860	41860
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	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)	202	659	186	363	229	254	524	13
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0228	0.0624	0.0252	0.0250	0.0279	0.0214	0.0288	0.0337
Nitrate	0.205	0.235	0.214	0.238	0.212	0.211	0.253	0.203
Sulphate	0.885	1.36	0.714	2.12	0.568	0.464	1.02	0.0798
Ammonium (as N)	0.313	0.447	0.250	0.731	0.187	0.155	0.360	<0.0208
Calcium	<0.0833	0.538	<0.0833	<0.0833	<0.0833	<0.0833	0.643	<0.0833
Magnesium	<0.0417	0.0928	<0.0417	<0.0417	<0.0417	<0.0417	0.0633	<0.0417
Potassium	0.0526	0.0915	0.0551	0.112	0.0666	0.0334	0.0683	<0.00833

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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	15-Aug	15-Aug	15-Aug	15-Aug			15-Aug
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)	342	317	429	304			4
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0547	0.0612	0.0563	0.0654	0.4	0.5906108	0.0563
Nitrate	0.187332379	0.211	0.201	0.187	0.2	4.278766382	0.167
Sulphate	0.710	0.993	1.72	0.935	1	2.2518644	0.0798
Ammonium (as N)	0.296	0.403	0.642	0.403	0.5	<	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	0.0536	0.0655	0.0817	0.107	0.2	0.3632385	<0.00833

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	41866	41866	41866	41866	41866	41866	41866	41866	41866
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	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)	938	1046	1230	527	2554	850	533	2066	2
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0763	0.110	0.0958	0.0629	0.139	0.0713	0.0663	0.0917	0.0514
Nitrate	0.277	0.251	0.315	0.197	0.374	0.259	0.187	0.366	0.163
Sulphate	1.03	1.34	1.94	0.812	2.36	0.966	0.390	2.25	0.0789
Ammonium (as N)	0.315	0.463	0.628	0.335	0.501	0.331	0.141	0.665	<0.0208
Calcium	1.21	1.23	1.48	0.138	5.16	0.619	0.476	2.55	<0.0833
Magnesium	0.0878	0.205	0.139	0.0643	0.218	0.0879	0.0550	0.129	<0.0417
Potassium	0.0707	0.0862	0.110	0.106	0.0971	0.0548	0.0575	0.123	<0.00833

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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	21-Aug	21-Aug	21-Aug	21-Aug			21-Aug
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)	57	158	212	147			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	<0.0167	<0.0167	<0.0167	<0.0167	0.4	0.5906108	<0.0167
Nitrate	0.167083333	0.179	0.168	0.168	0.2	4.278766382	0.153
Sulphate	0.234	0.985	1.17	0.995	1	2.2518644	0.0764
Ammonium (as N)	0.0437	0.388	0.450	0.395	0.5	<	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Potassium	<0.00833	0.0459	0.0598	0.0292	0.2	0.3632385	<0.00833

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	41872	41872	41872	41872	41872	41872	41872	41872	41872
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24	24	24	24	21.6	24
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	233	490	742	265	717	172	323	510	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0202	0.0612	0.0392	0.0230	0.0669	0.0197	0.0305	0.0519	0.0201
Nitrate	0.183	0.237	0.247	0.223	0.266	0.182	0.182	0.208	0.175
Sulphate	0.302	1.06	1.13	1.10	0.553	0.219	0.265	0.400	0.0766
Ammonium (as N)	0.0371	0.367	0.384	0.410	0.110	0.0418	0.0394	0.0484	<0.0208
Calcium	0.644	0.414	0.680	<0.0833	2.03	<0.0833	0.844	0.801	<0.0833
Magnesium	<0.0417	0.0780	0.0976	<0.0417	0.101	<0.0417	0.0714	0.0741	<0.0417
Potassium	<0.00833	0.0634	0.0518	0.0669	0.0338	0.0162	<0.00833	0.0185	<0.00833

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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	27-Aug	27-Aug	27-Aug	27-Aug			27-Aug
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.1	24	24	1			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	-40	106	60	<			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Chloride	0.0224	<0.0167	<0.0167	<0.400	0.4	0.5906108	0.0480
Nitrate	0.173858921	0.175	0.166	3.66	0.2	4.278766382	0.221
Sulphate	0.507	0.279	0.245	1.77	1	2.2518644	0.0980
Ammonium (as N)	0.191	0.0461	0.0426	<0.500	0.5	<	<0.0208
Calcium	<0.0830	<0.0833	<0.0833	<2.00	2	<	<0.0833
Magnesium	<0.0415	<0.0417	<0.0417	<1.00	1	<	<0.0417
Potassium	<0.00830	<0.00833	0.0144	<0.200	0.2	0.3632385	<0.00833

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	41878	41878	41878	41878	41878	41878	41878	41878	41878
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	23.996	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)	327	489	795	160	<	300	447	295	3
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0183	0.0800	0.0625	<0.0167	<0.0167	<0.0167	0.0379	0.0304	<0.0167
Nitrate	0.181	0.189	0.201	0.172	0.154	0.174	0.194	0.197	0.175
Sulphate	0.455	0.378	0.368	0.243	0.0793	0.294	0.382	0.666	0.0877
Ammonium (as N)	0.157	0.0769	0.110	0.0643	<0.0208	0.0934	0.117	0.202	<0.0208
Calcium	<0.0830	0.526	0.775	<0.0833	<0.0833	<0.0833	<0.0833	0.499	<0.0833
Magnesium	<0.0415	0.112	0.105	<0.0417	<0.0417	<0.0417	<0.0417	0.0638	<0.0417
Potassium	0.0476	0.00946	0.0424	0.0150	0.0316	0.0379	0.0445	0.0378	<0.00833

May 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	28-Apr-14	30-May-14	Sample	1.6	29.6	1.8
			Sample	1.9	29.0	5.6
			Sample	2	27.2	2.6
			Average	**1.8**	**28.6**	**3.3**
AMS 2 - Mildred Lake	28-Apr-14	30-May-14	Sample	3.3	30.1	5.4
			Sample	2.9	28.4	2.2
			Sample	2.8	25.3	4.1
			Average	**3.0**	**28.0**	**3.9**
AMS 6 - Patricia McInnes	28-Apr-14	30-May-14	Sample	1.6	32.7	2.5
			Sample	1.5		1.1
			Sample	1.2	31.8	2.4
			Average	**1.4**	**32.3**	**2.0**
AMS 8 - Fort Chipewyan	15-May-14	04-Jun-14	Sample	0.1	36.7	0.2
			Sample	<0.1	37.2	0.6
			Sample	<0.1	38.4	0.4
			Average	**0.1**	**37.4**	**0.4**
AMS 14 - Anzac	28-Apr-14	30-May-14	Sample	0.4	27.8	0.6
			Sample	0.3	29.5	2.1
			Sample	2	25.9	0.7
			Average	**0.9**	**27.7**	**1.1**

June 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-May-14	27-Jun-14	Sample	1.8	22.7	1.2
			Sample	2	23.1	1.1
			Sample	1.7	21.9	1.5
			Average	**1.8**	**22.6**	**1.3**
AMS 2 - Mildred Lake	30-May-14	27-Jun-14	Sample	3	23.9	1.5
			Sample	3	23.2	1.3
			Sample	2.8	22.7	1
			Average	**2.9**	**23.3**	**1.3**
AMS 6 - Patricia McInnes	30-May-14	27-Jun-14	Sample	1.5	28.4	0.8
			Sample	1.5	28.7	1.3
			Sample	1.7	28.2	0.7
			Average	**1.6**	**28.4**	**0.9**
AMS 8 - Fort Chipewyan	04-Jun-14	08-Jul-14	Sample	0.2	32.0	<0.1
			Sample	0.1	34.2	<0.1
			Sample	0.3	Damaged	<0.1
			Average	**0.2**	**33.1**	**<0.1**
AMS 14 - Anzac	30-May-14	27-Jun-14	Sample	0.4	25.1	0.3
			Sample	0.4	24.9	0.1
			Sample	0.4	24.2	0.5
			Average	**0.4**	**24.7**	**0.3**

July 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	27-Jun-14	29-Jul-14	Sample	MISSING	24.1	MISSING
			Sample	0.9	22.4	1.4
			Sample	1.2	23.6	1.1
			Average	**1.1**	**23.4**	**1.3**
AMS 2 - Mildred Lake	27-Jun-14	29-Jul-14	Sample	2.6	22.9	2.9
			Sample	3.6	22.5	2.6
			Sample	2.8	22.7	3
			Average	**3.0**	**22.7**	**2.8**
AMS 6 - Patricia McInnes	27-Jun-14	28-Jul-14	Sample	1.6	28.2	0.8
			Sample	1.1	29.4	0.7
			Sample	0.9	25.7	0.7
			Average	**1.2**	**27.8**	**0.7**
AMS 8 - Fort Chipewyan	08-Jul-14	07-Aug-14	Sample	0.3	27.8	0.4
			Sample	0.3	27.6	0.3
			Sample	0.5	26.7	0.2
			Average	**0.4**	**27.4**	**<0.1**
AMS 14 - Anzac	27-Jun-14	28-Jul-14	Sample	0.7	22.0	0.7
			Sample	0.6	22.8	0.6
			Sample	0.7	25.4	0.6
			Average	**0.7**	**23.4**	**0.6**

August 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	29-Jul-14	27-Aug-14	Sample	1.7	22.4	1.4
			Sample	1.7	20.8	1.4
			Sample	1.5	20.3	1.7
			Average	**1.6**	**21.2**	**1.5**
AMS 2 - Mildred Lake	29-Jul-14	27-Aug-14	Sample	3	19.8	2.2
			Sample	3.8	20.7	2.8
			Sample	3.2	19.9	2.5
			Average	**3.3**	**20.1**	**2.5**
AMS 6 - Patricia McInnes	28-Jul-14	28-Aug-14	Sample	1.2	22.4	1.2
			Sample	1.2	22.4	1.3
			Sample	1.5	28.8	1.6
			Average	**1.3**	**24.5**	**1.4**
AMS 8 - Fort Chipewyan	07-Aug-14	04-Sep-14	Sample	0.4	23.9	0.3
			Sample	0.3	24.0	0.2
			Sample	0.2	25.3	0.3
			Average	**0.3**	**24.4**	**0.3**
AMS 14 - Anzac	28-Jul-14	28-Aug-14	Sample	0.6	23.7	0.7
			Sample	0.5	25.1	0.9
			Sample	0.5	23.0	0.8
			Average	**0.5**	**23.9**	**0.8**

May 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Passive Monitoring Results

Remote Forestry and Lake Sites

Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
AH3	01-May-14	02-Jun-14	Sample	0.4	34.2	1.5
			Sample	0.5	32.0	2.7
			Average	**0.5**	**33.1**	**2.1**
AH7	01-May-14	05-Jun-14	Sample	0.8	30.4	1.2
			Sample	0.7	32.4	3.8
			Average	**0.8**	**31.4**	**2.5**
AH8-R	02-May-14	05-Jun-14	Sample	0.6	33.1	2.0
			Sample	0.7	28.0	0.4
			Average	**0.7**	**30.5**	**1.2**
BM7	01-May-14	05-Jun-14	**Sample**	**0.1**	**32.9**	**0.3**
BM10	01-May-14	05-Jun-14	**Sample**	**0.2**	**24.6**	**5.4**
BM11	01-May-14	03-Jun-14	**Sample**	**0.3**	**31.4**	**3.1**
JP101 (JPL1)	01-May-14	05-Jun-14	Sample	0.2	37.4	2.3
			Sample	0.3	30.9	0.4
			Average	**0.3**	**34.2**	**1.4**
JP102 (JPH2)	02-May-14	05-Jun-14	Sample	1.3	31.8	1.2
			Sample	1.4	27.4	3.5
			Average	**1.4**	**29.6**	**2.4**
JP104 (JPH4)	28-Apr-14	30-May-14	Sample	2.2	30.4	4.8
			Sample	1.7	33.6	4.4
			Average	**2.0**	**32.0**	**4.6**
JP107 (JPL7)	01-May-14	03-Jun-14	Sample	0.1	33.8	0.3
			Sample	0.4	37.7	0.3
			Average	**0.3**	**35.8**	**0.3**
JP108 (JPL8)	01-May-14	02-Jun-14	Sample	0.2	37.1	2.5
			Sample	0.1	35.8	<0.1
			Average	**<0.1**	**36.4**	**2.5**
JP205 (205)	01-May-14	03-Jun-14	Sample	0.4	36.0	1.9
			Sample	0.2	39.3	3.6
			Average	**0.3**	**37.7**	**2.8**
JP210 (210)	01-May-14	02-Jun-14	Sample	MISSING	33.8	3.0
			Sample	0.2	37.4	0.4
			Average	**<0.1**	**35.6**	**1.7**
JP212	01-May-14	05-Jun-14	**Sample**	**1.6**	**24.1**	**2.8**
JP213 (213)	01-May-14	02-Jun-14	Sample	<0.1	42.04	0.1
			Sample	0.1	42.7	0.2
			Average	**0.1**	**42.4**	**0.2**
NE7	01-May-14	03-Jun-14	**Sample**	**0.2**	**29.0**	**1.9**
NE10	01-May-14	06-Jun-14	**Sample**	**0.1**	**25.9**	**1.5**
NE11	01-May-14	03-Jun-14	**Sample**	**0.4**	**27.7**	**0.4**
R2	28-Apr-14	30-May-14	**Sample**	**1.6**	**22.5**	**2.4**
SM7	01-May-14	02-Jun-14	**Sample**	**0.2**	**29.7**	**2.6**
SM8	01-May-14	02-Jun-14	**Sample**	**0.5**	**26.1**	**3.6**
WF4	01-May-14	05-Jun-14	**Sample**	**0.9**	**21.3**	**1.7**
JP316	01-May-14	02-Jun-14	Sample	0.2	40.3	0.2
			Sample	0.3	37.6	0.9
			Average	**0.3**	**38.9**	**0.6**
JP201	02-May-14	05-Jun-14	Sample	0.3	34.8	2.7
			Sample	0.1	33.3	0.2
			Average	**<0.1**	**34.1**	**1.5**
JP311	01-May-14	05-Jun-14	Sample	0.4	35.9	0.6
			Sample	0.4	31.4	0.5
			Average	**0.4**	**33.7**	**0.6**
JE 306	01-May-14	03-Jun-14	**Sample**	<0.1	31.08	0.3
JE 308	02-Apr-14	05-Jun-14	**Sample**	0.2	26.36	2.6
JE 312	01-May-14	02-Jun-14	**Sample**	0.1	28.13	0.1
JE 316	01-May-14		**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 323	01-May-14		**Sample**	Could not collect, very wet landing. Working on building a landing pad.		

June 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Passive Monitoring Results

Remote Forestry and Lake Sites

Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
AH3	02-Jun-14	02-Jul-14	Sample	0.5	29.7	0.2
			Sample	0.4	26.6	0.4
			Average	**0.5**	**28.1**	**0.3**
AH7	05-Jun-14	03-Jul-14	Sample	0.6	31.4	1.1
			Sample	0.7	28.1	1.1
			Average	**0.7**	**29.8**	**1.1**
AH8-R	05-Jun-14	03-Jul-14	Sample	0.3	25.0	0.4
			Sample	0.5	26.7	0.5
			Average	**0.4**	**25.8**	**0.5**
BM7	05-Jun-14	04-Jul-14	**Sample**	**<0.1**	**27.3**	**<0.1**
BM10	05-Jun-14	03-Jul-14	**Sample**	**0.2**	**Damaged**	**0.7**
BM11	03-Jun-14	04-Jul-14	**Sample**	**0.1**	**23.2**	**0.3**
JP101 (JPL1)	05-Jun-14	02-Jul-14	Sample	0.2	29.6	0.1
			Sample	<0.1	32.0	0.2
			Average	**0.2**	**30.8**	**0.2**
JP102 (JPH2)	05-Jun-14	03-Jul-14	Sample	1.2	24.9	1.2
			Sample	1.0	26.4	1.5
			Average	**1.1**	**25.6**	**1.4**
JP104 (JPH4)	30-May-14	27-Jun-14	Sample	2.0	25.7	0.6
			Sample	2.3	26.4	0.6
			Average	**2.2**	**26.1**	**0.6**
JP107 (JPL7)	03-Jun-14	04-Jul-14	Sample	0.3	31.5	0.7
			Sample	0.1	28.0	0.2
			Average	**0.2**	**29.7**	**0.5**
JP108 (JPL8)	02-Jun-14	02-Jul-14	Sample	<0.1	23.1	<0.1
			Sample	<0.1	26.1	<0.1
			Average	**<0.1**	**24.6**	**<0.1**
JP205 (205)	03-Jun-14	03-Jul-14	Sample	<0.1	28.5	<0.1
			Sample	<0.1	28.5	0.2
			Average	**<0.1**	**28.5**	**0.1**
JP210 (210)	02-Jun-14	02-Jul-14	Sample	<0.1	28.2	0.1
			Sample	0.1	27.9	0.2
			Average	**0.1**	**28.1**	**0.2**
JP212	05-Jun-14	03-Jul-14	**Sample**	**2.4**	**18.5**	**1.3**
JP213 (213)	02-Jun-14	03-Jul-14	Sample	<0.1	32.36	0.1
			Sample	<0.1	29.3	<0.1
			Average	**<0.1**	**30.8**	**0.1**
NE7	03-Jun-14	02-Jul-14	**Sample**	**0.2**	**24.1**	**0.2**
NE10	06-Jun-14	02-Jul-14	**Sample**	**<0.1**	**20.6**	**0.2**
NE11	03-Jun-14	02-Jul-14	**Sample**	**0.3**	**18.9**	**0.3**
R2	30-May-14	27-Jun-14	**Sample**	**1.4**	**21.1**	**0.6**
SM7	02-Jun-14	02-Jul-14	**Sample**	**0.1**	**24.1**	**<0.1**
SM8	02-Jun-14	02-Jul-14	**Sample**	**0.4**	**24.7**	**0.2**
WF4	05-Jun-14	03-Jul-14	**Sample**	**0.8**	**19.4**	**2.3**
JP316	02-Jun-14	02-Jul-14	Sample	0.1	31.3	<0.1
			Sample	<0.1	27.5	<0.1
			Average	**0.1**	**29.4**	**<0.1**
JP201	05-Jun-14	04-Jul-14	Sample	0.2	30.0	<0.1
			Sample	<0.1	27.6	0.1
			Average	**0.1**	**28.8**	**0.1**
JP311	05-Jun-14	02-Jul-14	Sample	0.2	32.5	0.5
			Sample	0.3	34.1	0.3
			Average	**0.3**	**33.3**	**0.4**
JE 306	03-Jun-14	03-Jul-14	**Sample**	0.1	25.69	0.7
JE 308	05-Jun-14		**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 312	02-Jun-14	02-Jul-14	**Sample**	<0.1	23.23	0.1
JE 316			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 323			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		

July 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Passive Monitoring Results

Remote Forestry and Lake Sites

Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
AH3	02-Jul-14	30-Jul-14	Sample	0.5	30.1	0.3
			Sample	0.3	29.3	0.3
			Average	**0.4**	**29.7**	**0.3**
AH7	03-Jul-14	01-Aug-14	Sample	0.6	24.3	0.6
			Sample	0.5	30.3	0.5
			Average	**0.6**	**27.3**	**0.6**
AH8-R	03-Jul-14	01-Aug-14	Sample	0.4	24.6	0.4
			Sample	0.2	23.0	0.4
			Average	**0.3**	**23.8**	**0.4**
BM7	04-Jul-14		**Sample**	**Could not retrieve samples because of forest fires**		
BM10	03-Jul-14	31-Jul-14	**Sample**	**0.2**	**19.3**	**0.3**
BM11	04-Jul-14	31-Jul-14	**Sample**	**0.2**	**21.0**	**0.1**
JP101 (JPL1)	02-Jul-14	01-Aug-14	Sample	0.2	26.7	0.2
			Sample	<0.1	30.5	0.2
			Average	**0.1**	**28.6**	**0.2**
JP102 (JPH2)	03-Jul-14	01-Aug-14	Sample	0.7	26.9	1.1
			Sample	1.3	22.8	1.1
			Average	**1.0**	**24.8**	**1.1**
JP104 (JPH4)	27-Jun-14	29-Jul-14	Sample	2.3	26.2	2.4
			Sample	1.8	28.1	2.3
			Average	**2.1**	**27.2**	**2.4**
JP107 (JPL7)	04-Jul-14	31-Jul-14	Sample	0.5	28.9	0.4
			Sample	0.3	28.9	0.5
			Average	**0.4**	**28.9**	**0.5**
JP108 (JPL8)	02-Jul-14	30-Jul-14	Sample	<0.1	21.8	<0.1
			Sample	<0.1	25.6	0.3
			Average	**<0.1**	**23.7**	**0.2**
JP205 (205)	03-Jul-14	31-Jul-14	Sample	<0.1	29.0	0.5
			Sample	<0.1	27.8	0.7
			Average	**<0.1**	**28.4**	**0.6**
JP210 (210)	02-Jul-14	30-Jul-14	Sample	<0.1	27.2	0.3
			Sample	0.1	27.3	0.3
			Average	**0.1**	**27.3**	**0.3**
JP212	03-Jul-14	01-Aug-14	**Sample**	**2.0**	**15.9**	**1.2**
JP213 (213)	03-Jul-14	30-Jul-14	Sample	<0.1	31.52	0.3
			Sample	<0.1	26.7	0.4
			Average	**<0.1**	**29.1**	**0.4**
NE7	02-Jul-14	31-Jul-14	**Sample**	**0.4**	**24.7**	**0.4**
NE10	02-Jul-14	30-Jul-14	**Sample**	**<0.1**	**21.4**	**<0.1**
NE11	02-Jul-14	31-Jul-14	**Sample**	**0.5**	**17.0**	**0.5**
R2	27-Jun-14	29-Jul-14	**Sample**	**2.0**	**16.4**	**1.9**
SM7	02-Jul-14	30-Jul-14	**Sample**	**0.2**	**25.2**	**<0.1**
SM8	02-Jul-14	30-Jul-14	**Sample**	**0.3**	**18.5**	**0.1**
WF4	03-Jul-14	01-Aug-14	**Sample**	**0.4**	**14.0**	**3.5**
JP316	02-Jul-14	30-Jul-14	Sample	0.1	26.3	0.3
			Sample	<0.1	30.2	0.7
			Average	**0.1**	**28.3**	**0.5**
JP201	04-Jul-14	01-Aug-14	Sample	0.1	24.59	<0.1
			Sample	<0.1	21.95	<0.1
			Average	**0.1**	**23.27**	**<0.1**
JP311	02-Jul-14	01-Aug-14	Sample	0.4	28.3	0.6
			Sample	0.2	29.3	1.0
			Average	**0.3**	**28.8**	**0.8**
JE 306	03-Jul-14	31-Jul-14	**Sample**	0.2	24.74	0.4
JE 308			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 312	02-Jul-14	31-Jul-14	**Sample**	**0.2**	**21.72**	**0.1**
JE 316			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 323			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		

August 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Passive Monitoring Results

Remote Forestry and Lake Sites

Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
AH3	30-Jul-14	02-Sep-14	Sample	0.4	30.2	0.8
			Sample	0.5	31.0	0.8
			Average	**0.5**	**30.6**	**0.8**
AH7	01-Aug-14	04-Sep-14	Sample	0.7	27.0	1.5
			Sample	0.6	26.5	1.7
			Average	**0.7**	**26.8**	**1.6**
AH8-R	01-Aug-14	05-Sep-14	Sample	0.4	21.6	0.3
			Sample	0.2	20.9	0.3
			Average	**0.3**	**21.3**	**0.3**
BM7	04-Jul-14	03-Sep-14	**Sample**	**0.2**	**22.5**	**0.1**
BM10	31-Jul-14	05-Sep-14	**Sample**	**0.2**	**14.7**	**0.2**
BM11	31-Jul-14	05-Sep-14	**Sample**	**0.2**	**16.2**	**0.3**
JP101 (JPL1)	01-Aug-14	04-Sep-14	Sample	0.2	26.4	0.4
			Sample	0.3	26.7	0.2
			Average	**0.3**	**26.5**	**0.3**
JP102 (JPH2)	01-Aug-14	04-Sep-14	Sample	1.0	22.4	2.1
			Sample	1.4	21.6	2.1
			Average	**1.2**	**22.0**	**2.1**
JP104 (JPH4)	29-Jul-14	27-Aug-14	Sample	3.2	23.4	2.2
			Sample	2.7	25.7	1.9
			Average	**3.0**	**24.5**	**2.1**
JP107 (JPL7)	31-Jul-14	03-Sep-14	Sample	0.6	27.7	0.8
			Sample	0.5	26.3	0.7
			Average	**0.6**	**27.0**	**0.8**
JP108 (JPL8)	30-Jul-14	02-Sep-14	Sample	0.1	23.4	0.3
			Sample	0.2	19.9	0.2
			Average	**0.2**	**21.6**	**0.3**
JP205 (205)	31-Jul-14	03-Sep-14	Sample	0.3	24.7	0.2
			Sample	0.2	25.7	0.2
			Average	**0.3**	**25.2**	**0.2**
JP210 (210)	30-Jul-14	02-Sep-14	Sample	0.2	21.4	0.2
			Sample	0.2	22.0	0.2
			Average	**0.2**	**21.7**	**0.2**
JP212	01-Aug-14	05-Sep-14	**Sample**	**2.1**	**15.1**	**1.4**
JP213 (213)	30-Jul-14	02-Sep-14	Sample	0.2	28.77	0.2
			Sample	0.3	28.3	0.3
			Average	**0.3**	**28.6**	**0.3**
NE7	31-Jul-14	03-Sep-14	**Sample**	**0.5**	**19.5**	**0.8**
NE10	30-Jul-14	02-Sep-14	**Sample**	**0.2**	**17.4**	**0.1**
NE11	31-Jul-14	03-Sep-14	**Sample**	**0.8**	**13.8**	**0.9**
R2	29-Jul-14	27-Aug-14	**Sample**	**2.0**	**16.1**	**<0.1**
SM7	30-Jul-14	04-Sep-14	**Sample**	**0.3**	**21.8**	**0.2**
SM8	30-Jul-14	04-Sep-14	**Sample**	**0.2**	**21.6**	**0.4**
WF4	01-Aug-14	05-Sep-14	**Sample**	**0.4**	**12.4**	**1.5**
JP316	30-Jul-14	02-Sep-14	Sample	0.2	26.4	0.2
			Sample	0.2	24.3	0.2
			Average	**0.2**	**25.4**	**0.2**
JP201	01-Aug-14	05-Sep-14	Sample	0.1	25.3	0.2
			Sample	0.2	21.1	0.2
			Average	**0.2**	**23.2**	**0.2**
JP311	01-Aug-14	04-Sep-14	Sample	0.2	26.6	0.5
			Sample	0.3	28.7	0.7
			Average	**0.3**	**27.6**	**0.6**
JE 306	31-Jul-14	03-Sep-14	**Sample**	**MISSING**	**20.95**	**0.2**
JE 308			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 312	31-Jul-14	02-Sep-14	**Sample**	**0.2**	**19.93**	**0.4**
JE 316			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		
JE 323			**Sample**	Could not collect, very wet landing. Working on building a landing pad.		

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 05-May	AMS 12 Millennium Mine 05-May	AMS 13 Fort McKay South 05-May	AMS 15 CNRL Horizon 05-May
	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				
	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	1.02			
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	0.43			
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03		2.16	2.16	2.92
	Acetone	0.03	4.2	3.02	3.96	3.33
	alpha-Pinene	0.03				
	Benzene	0.03	0.21	0.2	0.28	0.22
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	0.59			
	Isopentane	0.03	3.19		0.45	1.56
	Isoprene	0.03				
	Isopropyl alcohol	0.03	0.8			
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.12			
	Methanol	0.03	11.1	1.71	5.27	3.56
	Methyl ethyl ketone	0.03	0.81			
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03	0.25			
	n-Butane	0.03	1.45	0.59	0.63	
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03	1.01			
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03	3.13			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03	0.12			
	Styrene	0.03				
	Toluene	0.03	0.63		0.12	0.08
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 05-May	AMS 6 Patricia McInnes 05-May	AMS 7 Athabasca Valley 05-May	AMS 14 Anzac 05-May
	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				
	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				
	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	2.36	1.56	2.55	2.44
	Acetone	0.03	2.93	2.02	3.25	2.48
	alpha-Pinene	0.03				
	Benzene	0.03	0.19	0.14	0.19	0.21
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03		0.19	0.08	
	Isopentane	0.03	1.28	0.3		
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.06		
	Methanol	0.03	1.57	2.17	7.12	3.32
	Methyl ethyl ketone	0.03			0.71	
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	0.42	1.17	1.02	0.94
	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	0.94			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03	0.35			
	o-Xylene	0.03	0.1			
	Styrene	0.03				
	Toluene	0.03	0.09	0.07		0.07
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 11-May	AMS 12 Millennium Mine 11-May	AMS 13 Fort McKay South 11-May	AMS 15 CNRL Horizon 11-May
	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				
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03	0.73			0.81
	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	0.77			
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03				0.29
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	3.63	5.49	3.23	2.75
	Acetone	0.03	5.54	4.8	4.36	4.23
	alpha-Pinene	0.03			0.1	
	Benzene	0.03	0.28		0.14	0.14
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				1.22
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	2.53	0.56		10.3
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				0.08
	Methanol	0.03	11.3	2.79	6.35	3.89
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				0.68
	Methylcyclopentane	0.03				0.55
	n-Butane	0.03	1.44	0.75	0.72	2.36
	n-Decane	0.03				
	n-Dodecane	0.03		0.26	0.23	
	n-Heptane	0.03				
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03	2.1	0.98	0.58	
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03				0.06
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 11-May	AMS 6 Patricia McInnes 11-May	AMS 7 Athabasca Valley 11-May	AMS 14 Anzac 11-May
	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				
	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	0.54			
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	0.29			
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	4.94	4.07	3.15	4.63
	Acetone	0.03	3.96	4.24	5.24	4.88
	alpha-Pinene	0.03				
	Benzene	0.03	0.08	0.29	0.23	0.08
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	2.03			0.44
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03		3.93	3.37	6.16
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	0.52	1.56	1.63	
	n-Decane	0.03				
	n-Dodecane	0.03	0.2			0.21
	n-Heptane	0.03				
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03	2.59			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03		0.07	0.13	
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 17-May	AMS 12 Millennium Mine 17-May	AMS 13 Fort McKay South 17-May	AMS 15 CNRL Horizon 17-May
	1,2,4-Trimethylbenzene	0.03			0.07	
	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				0.47
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03				0.5
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	4.68	5.02	4.52	3.64
	Acetone	0.03	9.43	4.76	5.67	7.26
	alpha-Pinene	0.03			0.09	
	Benzene	0.03		0.12	0.07	
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	2.87		1.14	7.58
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	12.8	2.63	7.93	5.69
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				0.16
	Methylcyclopentane	0.03				
	n-Butane	0.03		0.69	0.81	1.77
	n-Decane	0.03				
	n-Dodecane	0.03		0.22	0.15	0.26
	n-Heptane	0.03				
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03	3.8		0.84	3.91
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.07		0.11	0.09
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 17-May	AMS 6 Patricia McInnes 17-May	AMS 7 Athabasca Valley 17-May	AMS 14 Anzac 17-May
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03	0.07			
	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	1.15			
	2-Methylpentane	0.03				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03	0.52			
	3-Methylpentane	0.03				
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	3.82	4.71	5.77	4.77
	Acetone	0.03	4.4	6.75	9.13	12.1
	alpha-Pinene	0.03	0.08			
	Benzene	0.03	0.13	0.07	0.09	0.15
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	3.25	1.11		
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	2.51	5.24	20.2	8.67
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	0.86	1.81		
	n-Decane	0.03				
	n-Dodecane	0.03	0.21	0.18		
	n-Heptane	0.03				
	n-Hexane	0.03	0.38			
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03	4.53			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.08	0.14	0.18	
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 23-May	AMS 12 Millennium Mine 23-May	AMS 13 Fort McKay South 23-May	AMS 15 CNRL Horizon 23-May
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03	1.47			
	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				
	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	9.95	6.01	7.45	7.1
	Acetone	0.03	14.7	8.54	12.2	12.5
	alpha-Pinene	0.03	0.33	0.12	0.43	0.29
	Benzene	0.03	0.09	0.13		
	beta-Pinene	0.03			5.52	
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03			1.26	4.46
	Isoprene	0.03	0.87	0.38	0.91	
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.08		0.13	
	Methanol	0.03	50.7	9.92	21.3	13.5
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				0.42
	Methylcyclopentane	0.03				
	n-Butane	0.03	3.41	1.84	2.01	2.84
	n-Decane	0.03				
	n-Dodecane	0.03			0.13	
	n-Heptane	0.03				
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03			1.27	
	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	0.16		0.15	0.12
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 23-May	AMS 6 Patricia McInnes 23-May	AMS 7 Athabasca Valley 23-May	AMS 14 Anzac 23-May
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03			0.68	0.46
	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				
	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	6.54	3.77	6.18	7.17
	Acetone	0.03	11.2	7.84	13.2	9.5
	alpha-Pinene	0.03	0.3	0.08	0.11	0.18
	Benzene	0.03	0.16	0.19	0.16	0.18
	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		3.06	5.43	
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	1.74	0.88	1.1	
	Isoprene	0.03		0.16		0.54
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.08			
	Methanol	0.03	9.02	10.5	48.7	13.6
	Methyl ethyl ketone	0.03		0.24	0.24	
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	2.11	1.78	2.57	2.2
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03	0.29			
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03	0.83			
	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	0.27	0.07	0.08	
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 29-May	AMS 12 Millennium Mine 29-May	AMS 13 Fort McKay South 29-May	AMS 15 CNRL Horizon 29-May
	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				
	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				
	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	6.24		6.49	4.85
	Acetone	0.03	10.8	2.08	5.9	9.86
	alpha-Pinene	0.03				
	Benzene	0.03		0.35	0.12	
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	3.7		1.91	9.24
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	27.7		12.9	4.35
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	1.47			
	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	3.68		2.43	
	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

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 29-May	AMS 6 Patricia McInnes 29-May	AMS 7 Athabasca Valley 29-May	AMS 14 Anzac 29-May
	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				
	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				
	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	3.44			
	Acetone	0.03	5.4	9.78	9.29	5.88
	alpha-Pinene	0.03				
	Benzene	0.03				0.23
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	2.25			
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	3.81		40.7	10.7
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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	2.03			
	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

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 04-Jun	AMS 13 Fort McKay South 04-Jun	AMS 15 CNRL Horizon 04-Jun
	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			
	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			
	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	4.15	4.74	5.08
	Acetone	0.03	6.04	4.46	4.3
	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			
	Cyclopentane	0.03			
	Cyclopentene	0.03			
	Ethanol	0.03			
	Ethylbenzene	0.03			
	Formaldehyde	0.03			
	Isobutane	0.03			
	Isopentane	0.03			
	Isoprene	0.03			
	Isopropyl alcohol	0.03			
	Isopropylbenzene	0.03			
	m,p-Xylene	0.03			
	Methanol	0.03	7.38	11.6	5.36
	Methyl ethyl ketone	0.03			
	Methyl isobutyl ketone	0.03			
	Methylcyclohexane	0.03			
	Methylcyclopentane	0.03			
	n-Butane	0.03			
	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			
	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

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 04-Jun	AMS 6 Patricia McInnes 04-Jun	AMS 7 Athabasca Valley 04-Jun	AMS 14 Anzac 04-Jun
	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				
	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	8.69			
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	16.6			
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03		2.18	1.99	
	Acetone	0.03	63.8	2.98	3.08	2.03
	alpha-Pinene	0.03				
	Benzene	0.03			0.29	0.27
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	2.13			
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	6.92			
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	31	3.19	16.8	4.56
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03	18.7			
	n-Butane	0.03	21.3			
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03	56.3			
	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	1.36			
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 10-Jun	AMS 12 Millennium Mine 10-Jun	AMS 13 Fort McKay South 10-Jun	AMS 15 CNRL Horizon 10-Jun
	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				
	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				
	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				
	Acetone	0.03	4.08	2.37	3.64	4.2
	alpha-Pinene	0.03				
	Benzene	0.03	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	1.26			3.09
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	9.73		5.8	
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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	1.87			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03			0.16	
	Styrene	0.03				
	Toluene	0.03				
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 10-Jun	AMS 6 Patricia McInnes 10-Jun	AMS 7 Athabasca Valley 10-Jun	AMS 14 Anzac 10-Jun
	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				
	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				
	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			2.78	
	Acetone	0.03	2.81	3.84	3.59	3.65
	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				
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03		3.79	16.3	6.11
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	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

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 16-Jun	AMS 12 Millennium Mine 16-Jun	AMS 13 Fort McKay South 16-Jun	AMS 15 CNRL Horizon 16-Jun
	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				
	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				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03				0.46
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	4.06	2.41	4.49	3.02
	Acetone	0.03	4.43	5.04	3.44	3.68
	alpha-Pinene	0.03		0.08	0.29	0.24
	Benzene	0.03			0.56	0.31
	beta-Pinene	0.03				1.05
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				0.46
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				2.52
	Isoprene	0.03		0.67	0.83	0.35
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03			0.16	
	Methanol	0.03	50.5		11.4	4.86
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03			0.21	0.2
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 16-Jun	AMS 6 Patricia McInnes 16-Jun	AMS 7 Athabasca Valley 16-Jun	AMS 14 Anzac 16-Jun
	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				
	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				
	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	3.27			3.73
	Acetone	0.03	3.07	3.08	5.31	5.7
	alpha-Pinene	0.03	0.24		0.08	0.14
	Benzene	0.03	0.2	0.66	0.29	0.41
	beta-Pinene	0.03	3.57			
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.22			
	Isoprene	0.03	1.06	0.95	0.7	0.51
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	4.3	8.96	30.7	13.8
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.14			
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 22-Jun	AMS 6 Patricia McInnes 22-Jun	AMS 7 Athabasca Valley 22-Jun	AMS 14 Anzac 22-Jun
	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				
	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				
	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	3.31			
	Acetone	0.03	2.85	6.35	6.93	8.39
	alpha-Pinene	0.03	0.23			0.32
	Benzene	0.03	0.18		0.14	
	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			4.85	
	Ethylbenzene	0.03		0.3		0.27
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.93		0.45	
	Isoprene	0.03			0.34	
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.99		0.69
	Methanol	0.03	9.88	9.02	197	8.62
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03		0.44		0.26
	Styrene	0.03				
	Toluene	0.03				
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 22-Jun	AMS 12 Millennium Mine 22-Jun	AMS 13 Fort McKay South 22-Jun	AMS 15 CNRL Horizon 22-Jun
	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				
	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				
	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				9.1
	Acetone	0.03	5.29	0.58	2.71	5.58
	alpha-Pinene	0.03			0.24	0.29
	Benzene	0.03		0.09		
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				2.35
	Isopentane	0.03	2.26	0.15	0.59	3.26
	Isoprene	0.03				
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	109	1.56	26.3	10.6
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	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

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 28-Jun	AMS 6 Patricia McInnes 28-Jun	AMS 7 Athabasca Valley 28-Jun	AMS 14 Anzac 28-Jun
	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				2.14
	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				
	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				1.34
	Acetone	0.03	2.96	5.88	7.37	3.75
	alpha-Pinene	0.03	0.62		0.28	0.93
	Benzene	0.03		0.54	0.18	0.14
	beta-Pinene	0.03				7.55
	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			4.97	
	Ethylbenzene	0.03				0.12
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	2.29	1.1	0.88	
	Isoprene	0.03	1.75	0.55	0.77	1.37
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03		10.1	136	
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03			1.17	
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03			0.33	
	n-Hexane	0.03				
	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				0.16
	Toluene	0.03	0.07	0.17	0.17	0.24
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 28-Jun	AMS 12 Millennium Mine 28-Jun	AMS 13 Fort McKay South 28-Jun	AMS 15 CNRL Horizon 28-Jun
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				1.8
	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				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03			3.12	
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03			6.19	22.1
	Acetone	0.03	4.31	4.45	3.91	
	alpha-Pinene	0.03	0.41	0.67	1.12	0.31
	Benzene	0.03	0.13	0.21	0.14	0.08
	beta-Pinene	0.03			6.22	
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				0.94
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03			0.07	
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	1.84	1.43	1.6	5.6
	Isoprene	0.03	0.9	0.62	1.67	1.14
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	91.9	7.21	19.7	
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03			0.28	0.9
	Methylcyclopentane	0.03			3.14	0.81
	n-Butane	0.03		1.33		
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				0.18
	n-Hexane	0.03			6.02	
	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	0.1	0.22	0.65	0.17
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 04-Jul	AMS 12 Millennium Mine 04-Jul	AMS 13 Fort McKay South 04-Jul	AMS 15 CNRL Horizon 04-Jul
	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				
	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				
	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				
	Acetone	0.03	3.51	3.01	7.14	2.51
	alpha-Pinene	0.03	0.43	0.5	0.55	0.57
	Benzene	0.03		0.11	0.08	
	beta-Pinene	0.03			5.27	
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				
	Isoprene	0.03	2.4	1.44	2.57	0.98
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	29.5			6.37
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03		0.09	0.07	
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 04-Jul	AMS 6 Patricia McInnes 04-Jul	AMS 7 Athabasca Valley 04-Jul	AMS 14 Anzac 04-Jul
	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				
	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				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03			0.98	
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				
	Acetone	0.03	2.58	4.91		2.87
	alpha-Pinene	0.03	0.35	0.22	0.38	0.16
	Benzene	0.03	0.1			
	beta-Pinene	0.03	3.43			
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				
	Isoprene	0.03	2.06	2.2	2.02	1.6
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03		9.67	13.7	
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03			6.16	
	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	0.09			0.21
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 10-Jul	AMS 12 Millennium Mine 10-Jul	AMS 13 Fort McKay South 10-Jul	AMS 15 CNRL Horizon 10-Jul
	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				
	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				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03		0.27		
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				
	Acetone	0.03	2.22	2.93	2.08	2.2
	alpha-Pinene	0.03				
	Benzene	0.03	0.27	0.34	0.53	0.7
	beta-Pinene	0.03			0.45	
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				2.3
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				2.05
	Isoprene	0.03			1.72	0.82
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.11	0.51	0.12	
	Methanol	0.03	31.5			
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03		0.22		
	Methylcyclopentane	0.03				0.52
	n-Butane	0.03				
	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	12.8			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03			0.12	0.07
	Styrene	0.03				
	Toluene	0.03		0.28	0.09	0.11
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 10-Jul	AMS 6 Patricia McInnes 10-Jul	AMS 7 Athabasca Valley 10-Jul	AMS 14 Anzac 10-Jul
	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				
	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				
	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				
	Acetone	0.03	2.77			1.79
	alpha-Pinene	0.03				
	Benzene	0.03	0.75	0.29	0.23	0.58
	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				
	Ethylbenzene	0.03		0.11		0.14
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				
	Isoprene	0.03	0.97	2.43		
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.13	0.11		0.13
	Methanol	0.03			39.2	
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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	6.21	17.8	13.2	
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03	0.08		0.09	
	Styrene	0.03				
	Toluene	0.03		0.11		0.12
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 16-Jul	AMS 12 Millennium Mine 16-Jul	AMS 13 Fort McKay South 16-Jul	AMS 15 CNRL Horizon 16-Jul
	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				
	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				
	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				
	Acetone	0.03	1.93	2.3	5.71	
	alpha-Pinene	0.03				
	Benzene	0.03	0.36	0.26	0.37	0.14
	beta-Pinene	0.03			1.07	
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03		0.56		
	Isoprene	0.03	3.33	1.82	2.63	0.88
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.08		
	Methanol	0.03	58.8	31	58.4	21.5
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03	0.1			
	Methylcyclopentane	0.03				0.14
	n-Butane	0.03		1.58	1.99	0.56
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03				0.65
	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	0.2	0.17	0.15	0.09
	trans-2-Butene	0.03		1.29		
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 16-Jul	AMS 6 Patricia McInnes 16-Jul	AMS 7 Athabasca Valley 16-Jul	AMS 14 Anzac 16-Jul
	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				
	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				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03		0.73		
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				
	Acetone	0.03	3.89	2.18	2.08	
	alpha-Pinene	0.03				
	Benzene	0.03	0.35	0.23	0.24	0.12
	beta-Pinene	0.03	0.67			
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.57	0.38	0.52	
	Isoprene	0.03	3.16	0.54	1.57	0.74
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.09	0.08	0.09	
	Methanol	0.03	39.6	35.2	88.9	25
	Methyl ethyl ketone	0.03	1.85	0.62		
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03		0.35		
	n-Butane	0.03	1.22	1.02	2.01	0.94
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03		3.74		
	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	0.25	0.11	0.17	0.17
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 22-Jul	AMS 6 Patricia McInnes 22-Jul	AMS 7 Athabasca Valley 22-Jul	AMS 14 Anzac 22-Jul
	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				
	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				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03				1.78
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				
	Acetone	0.03	2.31	2.21	2.47	3.43
	alpha-Pinene	0.03				
	Benzene	0.03	0.29	0.42	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				
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03	0.08			
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.44	0.42	0.44	
	Isoprene	0.03	2.07	0.67	1.98	1.63
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.19	0.14	0.1	
	Methanol	0.03	37.4	24.7	105	25
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03	0.24		0.08	
	Methylcyclopentane	0.03	0.12			1.51
	n-Butane	0.03	1.73	1.6	1.55	1.07
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03	0.33			
	n-Hexane	0.03				11.8
	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	0.48	0.31	0.19	0.26
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 22-Jul	AMS 12 Millennium Mine 22-Jul	AMS 13 Fort McKay South 22-Jul	AMS 15 CNRL Horizon 22-Jul
	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				
	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				
	Acetone	0.03	2.19	2.24	1.98	2.43
	alpha-Pinene	0.03				
	Benzene	0.03	0.3	0.34	0.26	0.29
	beta-Pinene	0.03			0.77	
	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				
	Ethylbenzene	0.03	0.08			
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.32	0.19	0.25	0.37
	Isoprene	0.03	1.37	1.35	2.05	1.07
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.18	0.1	0.15	0.06
	Methanol	0.03	103	32.9	47.4	27.5
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03	0.12		0.14	
	n-Butane	0.03	1.08		1.96	0.87
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03	0.45			
	n-Hexane	0.03	0.4			
	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	0.38	0.25	0.34	0.16
	trans-2-Butene	0.03		2.37		
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 28-Jul	AMS 6 Patricia McInnes 28-Jul	AMS 7 Athabasca Valley 28-Jul	AMS 14 Anzac 28-Jul
	1,2,4-Trimethylbenzene	0.03	0.07			
	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	0.52		0.1	
	2-Methylhexane	0.03				
	2-Methylpentane	0.03				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03	0.28	0.12	0.13	
	3-Methylhexane	0.03	0.45			
	3-Methylpentane	0.03				
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	7.15	5.36	11.3	7.39
	Acetone	0.03	11.9	13.5	18.6	9.11
	alpha-Pinene	0.03	0.4	0.27	0.22	0.55
	Benzene	0.03	0.34	0.54	0.43	0.21
	beta-Pinene	0.03	0.41	0.45	0.31	0.54
	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		10.5	72.6	
	Ethylbenzene	0.03	0.1			
	Formaldehyde	0.03				
	Isobutane	0.03	0.41	0.46	0.5	0.3
	Isopentane	0.03	0.88	1.03	1.35	0.47
	Isoprene	0.03	4.39	5.3	6.02	4.51
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.16			
	Methanol	0.03	25.9	27.2	145	17.8
	Methyl ethyl ketone	0.03	0.54			0.53
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03	0.44			
	Methylcyclopentane	0.03	0.14		0.08	
	n-Butane	0.03				
	n-Decane	0.03	0.25	0.15	0.15	0.17
	n-Dodecane	0.03				
	n-Heptane	0.03	0.62			
	n-Hexane	0.03	0.37		0.3	
	n-Nonane	0.03	0.35	0.07		
	n-Octane	0.03	1.86	0.5	0.59	0.48
	n-Pentane	0.03				
	n-Propylbenzene	0.03				
	n-Undecane	0.03	0.2	0.16	0.18	0.29
	Naphthalene	0.03				
	o-Xylene	0.03	0.07			
	Styrene	0.03				
	Toluene	0.03	0.47	0.13	0.21	0.26
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 28-Jul	AMS 12 Millennium Mine 28-Jul	AMS 13 Fort McKay South 28-Jul	AMS 15 CNRL Horizon 28-Jul
	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	0.78	0.71		
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03	2.88	3.28		
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03	0.39	0.07	0.46	0.11
	2-Methylhexane	0.03				
	2-Methylpentane	0.03	10.5	11.3		
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03	0.27	0.13	0.32	0.13
	3-Methylhexane	0.03	0.57		0.34	
	3-Methylpentane	0.03	22.1	22.9	0.32	0.1
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	6.02	9.39	6.5	3.53
	Acetone	0.03	28.4	31.7	11	27.6
	alpha-Pinene	0.03	0.38	0.25	0.79	0.58
	Benzene	0.03	0.55	0.38	0.54	0.33
	beta-Pinene	0.03	0.46	0.37	1.31	0.51
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	1.56	2.04		
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03	12.9		7.18	
	Ethylbenzene	0.03	0.11		0.1	
	Formaldehyde	0.03				
	Isobutane	0.03	0.63	0.54	0.38	0.33
	Isopentane	0.03	1.39	1.32	0.82	0.77
	Isoprene	0.03	5.21	3.73	7.34	5.22
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.32	0.1	0.19	
	Methanol	0.03	148	26.9	41.4	22.1
	Methyl ethyl ketone	0.03			0.52	
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03	0.43		0.41	
	Methylcyclopentane	0.03	21.1	24.3	0.28	
	n-Butane	0.03				
	n-Decane	0.03	0.4	0.24	0.25	0.24
	n-Dodecane	0.03	0.09	0.08		
	n-Heptane	0.03	0.61		0.51	0.17
	n-Hexane	0.03	116	137	1.49	
	n-Nonane	0.03	0.46	0.18	0.33	0.22
	n-Octane	0.03	1.85	1.12	2.01	1.1
	n-Pentane	0.03				
	n-Propylbenzene	0.03			0.06	
	n-Undecane	0.03	0.28	0.34	0.19	0.3
	Naphthalene	0.03	0.83			
	o-Xylene	0.03	0.11		0.06	
	Styrene	0.03				
	Toluene	0.03	0.71	0.53	0.41	0.36
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 03-Aug	AMS 6 Patricia McInnes 03-Aug	AMS 7 Athabasca Valley 03-Aug	AMS 14 Anzac 03-Aug
	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				
	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				
	2-Methylhexane	0.03				
	2-Methylpentane	0.03				
	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	5.17	4.37		5.17
	Acetone	0.03	5.54	7.41	5.79	5.54
	alpha-Pinene	0.03	0.53	0.51	0.58	0.53
	Benzene	0.03	0.24	0.23	0.19	0.24
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03		0.32		
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03		0.94		
	Isopentane	0.03	0.38	2.2	1.61	0.38
	Isoprene	0.03	2.43	3.45	3.37	2.43
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	8.43	7.52	23.4	8.43
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03		0.26	0.1	
	Methylcyclopentane	0.03		0.14		
	n-Butane	0.03			4.39	
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03		0.19	0.18	
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03			1.14	
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.27	0.23	0.26	0.27
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 03-Aug	AMS 12 Millennium Mine 03-Aug	AMS 13 Fort McKay South 03-Aug	AMS 15 CNRL Horizon 03-Aug
	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				
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03	0.23	0.23		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				
	2-Methylhexane	0.03				
	2-Methylpentane	0.03				
	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	3.35	3.35		4.37
	Acetone	0.03	6.03	6.03	5.79	7.41
	alpha-Pinene	0.03	0.31	0.31	0.58	0.51
	Benzene	0.03	0.17	0.17	0.19	0.23
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				0.32
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03	1.04	1.04		
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				0.94
	Isopentane	0.03	0.65	0.65	1.61	2.2
	Isoprene	0.03	3.63	3.63	3.37	3.45
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	48.8	48.8	23.4	7.52
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03	0.17	0.17	0.1	0.26
	Methylcyclopentane	0.03				0.14
	n-Butane	0.03			4.39	
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03	0.15	0.15	0.18	0.19
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03			1.14	
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.21	0.21	0.26	0.23
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 09-Aug	AMS 6 Patricia McInnes 09-Aug	AMS 7 Athabasca Valley 09-Aug	AMS 14 Anzac 09-Aug
	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				
	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				
	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				
	Acetone	0.03	3.27	4.5	4.35	3.98
	alpha-Pinene	0.03	0.17			0.1
	Benzene	0.03	0.26	0.27	0.39	0.21
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	0.26		0.24	
	Isopentane	0.03	0.17		0.44	
	Isoprene	0.03	0.91	0.75	0.52	0.59
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.11		
	Methanol	0.03	6.5	5.23	44.3	8.58
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.13	0.14	0.16	0.2
	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 09-Aug	AMS 12 Millennium Mine 09-Aug	AMS 13 Fort McKay South 09-Aug	AMS 15 CNRL Horizon 09-Aug
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03			9.59	
	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			1.78	
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03			0.96	
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				
	2-Methylhexane	0.03			1.04	
	2-Methylpentane	0.03				
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03			1.61	
	3-Methylpentane	0.03			4.33	
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				
	Acetone	0.03	3.28	3.51	2.2	3.41
	alpha-Pinene	0.03			0.19	0.15
	Benzene	0.03	0.27	0.34	0.48	0.24
	beta-Pinene	0.03			0.26	
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03			5.02	
	Cyclopentane	0.03			6.03	
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03			0.17	
	Formaldehyde	0.03				
	Isobutane	0.03	0.28	0.24	21.1	0.95
	Isopentane	0.03	0.27	0.44	21.8	1.38
	Isoprene	0.03	0.49	0.29	1.53	0.76
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.08	0.35	
	Methanol	0.03	26.5	8.61	15.2	12.8
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03			5.88	
	Methylcyclopentane	0.03			4.28	
	n-Butane	0.03			17.2	
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03			2.21	
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03			11.4	
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03			0.1	
	Styrene	0.03				
	Toluene	0.03	0.07	0.14	0.93	0.12
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03			1.81	
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 15-Aug	AMS 12 Millennium Mine 15-Aug	AMS 13 Fort McKay South 15-Aug	AMS 15 CNRL Horizon 15-Aug
	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		0.59		
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03		0.56		
	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				
	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		8.75	6.93	
	Acetone	0.03	8.01	7.3	4.63	3.63
	alpha-Pinene	0.03	0.31	0.16	0.66	0.28
	Benzene	0.03	0.3	0.23	0.16	0.25
	beta-Pinene	0.03	0.28		0.95	0.18
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	0.28			
	Isopentane	0.03	0.95	0.57	0.29	0.4
	Isoprene	0.03	3.79	2.96	6.87	4.43
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.06			
	Methanol	0.03	31	18.8	16.2	6.01
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.17	0.27	0.29	0.18
	trans-2-Butene	0.03		2.4		
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 15-Aug	AMS 6 Patricia McInnes 15-Aug	AMS 7 Athabasca Valley 15-Aug	AMS 14 Anzac 15-Aug
	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				
	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				
	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				
	Acetone	0.03	4.94	7.45	7.79	3.49
	alpha-Pinene	0.03	0.42	0.18	0.15	
	Benzene	0.03	0.21	0.23	0.23	0.14
	beta-Pinene	0.03	0.45	0.18	0.11	
	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		3.84		
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.37	0.64	0.82	
	Isoprene	0.03	4.03	5.44	4.42	0.55
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	8.23	14.2	42.4	5.4
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03	0.4			
	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	0.32		0.26	0.43
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 21-Aug	AMS 12 Millennium Mine 21-Aug	AMS 13 Fort McKay South 21-Aug	AMS 15 CNRL Horizon 21-Aug
	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		0.24		
	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				
	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				
	Acetone	0.03	3.64	2.76	2.84	3.11
	alpha-Pinene	0.03				
	Benzene	0.03	0.21	0.16	0.14	0.23
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03	0.29	0.47		0.47
	Isoprene	0.03		0.33	0.44	
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	7.96	9.09	11.5	5.16
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	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		0.61		
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 21-Aug	AMS 6 Patricia McInnes 21-Aug	AMS 7 Athabasca Valley 21-Aug
	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			
	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			
	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			
	Acetone	0.03	2.29	3.64	4.37
	alpha-Pinene	0.03			
	Benzene	0.03	0.12	0.1	0.17
	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			
	Ethylbenzene	0.03			
	Formaldehyde	0.03			
	Isobutane	0.03			
	Isopentane	0.03		0.23	0.91
	Isoprene	0.03	0.49	0.33	
	Isopropyl alcohol	0.03			
	Isopropylbenzene	0.03			
	m,p-Xylene	0.03			
	Methanol	0.03		2.37	15.1
	Methyl ethyl ketone	0.03			
	Methyl isobutyl ketone	0.03			
	Methylcyclohexane	0.03			
	Methylcyclopentane	0.03			
	n-Butane	0.03			
	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			
	n-Propylbenzene	0.03			
	n-Undecane	0.03			
	Naphthalene	0.03			
	o-Xylene	0.03			
	Styrene	0.03			
	Toluene	0.03			0.22
	trans-2-Butene	0.03			
	trans-2-Hexene	0.03			
	trans-2-Pentene	0.03			

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 27-Aug	AMS 6 Patricia McInnes 27-Aug	AMS 7 Athabasca Valley 27-Aug	AMS 14 Anzac 27-Aug
	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				
	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				
	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	5.37	4.55	5.4	5.18
	Acetone	0.03	3.68	3.88	4.79	4.81
	alpha-Pinene	0.03			0.47	0.21
	Benzene	0.03	0.19	0.23	0.47	0.28
	beta-Pinene	0.03				0.06
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				
	Isoprene	0.03	0.86	0.92	0.67	1.08
	Isopropyl alcohol	0.03				3.71
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.06		
	Methanol	0.03	8.26	5.05	27.2	11.1
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	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				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.25		0.12	0.48
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 27-Aug	AMS 12 Millennium Mine 27-Aug	AMS 13 Fort McKay South 27-Aug	AMS 15 CNRL Horizon 27-Aug
	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				
	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	0.1			
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				
	2-Methylhexane	0.03				
	2-Methylpentane	0.03				
	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	5.91	3.92	4.6	5.54
	Acetone	0.03	5.02	3.57	2.87	10.2
	alpha-Pinene	0.03			0.23	0.19
	Benzene	0.03	0.33	0.32	0.19	0.28
	beta-Pinene	0.03			0.24	
	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				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03				
	Isopentane	0.03				
	Isoprene	0.03	0.43	1.06	1.37	0.88
	Isopropyl alcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.21	0.09	
	Methanol	0.03	22.3	9.66	13.2	5.02
	Methyl ethyl ketone	0.03				
	Methyl isobutyl ketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03				
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03				
	n-Nonane	0.03				
	n-Octane	0.03		0.33		
	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	0.12	0.27	0.1	0.11
	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 05-May	AMS 12 Millennium Mine 05-May	AMS 13 Fort McKay South 05-May	AMS 15 CNRL Horizon 05-May
	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 05-May	AMS 6 Patricia McInnes 05-May	AMS 7 Athabasca Valley 05-May	AMS 14 Anzac 05-May
	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 11-May	AMS 12 Millennium Mine 11-May	AMS 13 Fort McKay South 11-May	AMS 15 CNRL Horizon 11-May
	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 11-May	AMS 6 Patricia McInnes 11-May	AMS 7 Athabasca Valley 11-May	AMS 14 Anzac 11-May
	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 17-May	AMS 12 Millennium Mine 17-May	AMS 13 Fort McKay South 17-May	AMS 15 CNRL Horizon 17-May
	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	0.8	0.6	0.7	0.6
	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 17-May	AMS 6 Patricia McInnes 17-May	AMS 7 Athabasca Valley 17-May	AMS 14 Anzac 17-May
	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	0.8		0.6	0.6
	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 23-May	AMS 12 Millennium Mine 23-May	AMS 13 Fort McKay South 23-May	AMS 15 CNRL Horizon 23-May
	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	1.4		0.9	0.8
	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 23-May	AMS 6 Patricia McInnes 23-May	AMS 7 Athabasca Valley 23-May	AMS 14 Anzac 23-May
	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	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 29-May	AMS 12 Millennium Mine 29-May	AMS 13 Fort McKay South 29-May	AMS 15 CNRL Horizon 29-May
	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 29-May	AMS 6 Patricia McInnes 29-May	AMS 7 Athabasca Valley 29-May	AMS 14 Anzac 29-May
	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 04-Jun	AMS 13 Fort McKay South 04-Jun	AMS 15 CNRL Horizon 04-Jun
	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 04-Jun	AMS 6 Patricia McInnes 04-Jun	AMS 7 Athabasca Valley 04-Jun	AMS 14 Anzac 04-Jun
	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 10-Jun	AMS 12 Millennium Mine 10-Jun	AMS 13 Fort McKay South 10-Jun	AMS 15 CNRL Horizon 10-Jun
	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 10-Jun	AMS 6 Patricia McInnes 10-Jun	AMS 7 Athabasca Valley 10-Jun	AMS 14 Anzac 10-Jun
	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 16-Jun	AMS 12 Millennium Mine 16-Jun	AMS 13 Fort McKay South 16-Jun	AMS 15 CNRL Horizon 16-Jun
	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				0.3
	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 16-Jun	AMS 6 Patricia McInnes 16-Jun	AMS 7 Athabasca Valley 16-Jun	AMS 14 Anzac 16-Jun
	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	0.3			
	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 22-Jun	AMS 6 Patricia McInnes 22-Jun	AMS 7 Athabasca Valley 22-Jun	AMS 14 Anzac 22-Jun
	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		0.2		0.4
	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 22-Jun	AMS 12 Millennium Mine 22-Jun	AMS 13 Fort McKay South 22-Jun	AMS 15 CNRL Horizon 22-Jun
	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	0.3		0.3	0.2
	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 28-Jun	AMS 6 Patricia McInnes 28-Jun	AMS 7 Athabasca Valley 28-Jun	AMS 14 Anzac 28-Jun
	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 28-Jun	AMS 12 Millennium Mine 28-Jun	AMS 13 Fort McKay South 28-Jun	AMS 15 CNRL Horizon 28-Jun
	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			0.6	
	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 04-Jul	AMS 12 Millennium Mine 04-Jul	AMS 13 Fort McKay South 04-Jul	AMS 15 CNRL Horizon 04-Jul
	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			0.2	
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 04-Jul	AMS 6 Patricia McInnes 04-Jul	AMS 7 Athabasca Valley 04-Jul	AMS 14 Anzac 04-Jul
	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				0.1
	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 10-Jul	AMS 12 Millennium Mine 10-Jul	AMS 13 Fort McKay South 10-Jul	AMS 15 CNRL Horizon 10-Jul
	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	0.1			
	Carbonyl sulphide	0.1	0.6			
	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 10-Jul	AMS 6 Patricia McInnes 10-Jul	AMS 7 Athabasca Valley 10-Jul	AMS 14 Anzac 10-Jul
	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	0.1	0.2	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 16-Jul	AMS 12 Millennium Mine 16-Jul	AMS 13 Fort McKay South 16-Jul	AMS 15 CNRL Horizon 16-Jul
	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 16-Jul	AMS 6 Patricia McInnes 16-Jul	AMS 7 Athabasca Valley 16-Jul	AMS 14 Anzac 16-Jul
	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 22-Jul	AMS 6 Patricia McInnes 22-Jul	AMS 7 Athabasca Valley 22-Jul	AMS 14 Anzac 22-Jul
	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	0.4		0.4	
	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 22-Jul	AMS 12 Millennium Mine 22-Jul	AMS 13 Fort McKay South 22-Jul	AMS 15 CNRL Horizon 22-Jul
	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	0.4	0.4	0.4	
	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 28-Jul	AMS 6 Patricia McInnes 28-Jul	AMS 7 Athabasca Valley 28-Jul	AMS 14 Anzac 28-Jul
	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	0.2		0.4	
	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 28-Jul	AMS 12 Millennium Mine 28-Jul	AMS 13 Fort McKay South 28-Jul	AMS 15 CNRL Horizon 28-Jul
	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	0.5	0.2	0.6	0.2
	Carbonyl sulphide	0.1			1.3	
	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 1 Fort McKay 03-Aug	AMS 6 Patricia McInnes 03-Aug	AMS 7 Athabasca Valley 03-Aug	AMS 14 Anzac 03-Aug
	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		2.3	0.8	
	Carbonyl sulphide	0.1		0.3		
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1		4		
	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 03-Aug	AMS 12 Millennium Mine 03-Aug	AMS 13 Fort McKay South 03-Aug	AMS 15 CNRL Horizon 03-Aug
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1	3.3	3.3		
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1	0.8	0.8	0.8	2.3
	Carbonyl sulphide	0.1				0.3
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				4
	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

Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 09-Aug	AMS 6 Patricia McInnes 09-Aug	AMS 7 Athabasca Valley 09-Aug	AMS 14 Anzac 09-Aug
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1			0.2	
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1		0.3	0.3	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			2	
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

Results (ppbv)

#	Compound Name	MDL	AMS 9 Barge Landing 09-Aug	AMS 12 Millennium Mine 09-Aug	AMS 13 Fort McKay South 09-Aug	AMS 15 CNRL Horizon 09-Aug
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1			1.6	
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1	1.2		0.8	
	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			1	

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 15-Aug	AMS 12 Millennium Mine 15-Aug	AMS 13 Fort McKay South 15-Aug	AMS 15 CNRL Horizon 15-Aug
	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	1.1			
	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 15-Aug	AMS 6 Patricia McInnes 15-Aug	AMS 7 Athabasca Valley 15-Aug	AMS 14 Anzac 15-Aug
	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 9 Barge Landing 21-Aug	AMS 12 Millennium Mine 21-Aug	AMS 13 Fort McKay South 21-Aug	AMS 15 CNRL Horizon 21-Aug
	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 21-Aug	AMS 6 Patricia McInnes 21-Aug	AMS 7 Athabasca Valley 21-Aug
	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 27-Aug	AMS 6 Patricia McInnes 27-Aug	AMS 7 Athabasca Valley 27-Aug	AMS 14 Anzac 27-Aug
	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 27-Aug	AMS 12 Millennium Mine 27-Aug	AMS 13 Fort McKay South 27-Aug	AMS 15 CNRL Horizon 27-Aug
	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				