

**TransAlta Utilities Corporation
Continuous Ambient Air Quality
Monitoring Program
Annual Summary for 2017**

Prepared by:



January 26, 2018

Attention: Mr. Ken Woollard
GBS Building
RR#1, Site 4, Box #2
Duffield Alberta
T0E 0N0

Dear Sir:

**Re: Annual Ambient Air Quality Monitoring Report January – December 2017.
For TransAlta Utilities Corporation**

The West Central Airshed Society (WCAS) presents the 2017 Annual Report containing ambient air quality and meteorological information from the following sites:

Network Stations are	AMS 907	Power
Identified as:	AMS 908	Meadows
	AMS 959	Wagner2

The following is a list of the reported ambient air and meteorological parameters measured at each site location:

AMS 907 (Power)

SO₂, NO/ NO₂/ NO_x, Particulate Matter (2.5 microns), Wind Speed and Direction, Relative Humidity, and External Temperature.

AMS 908 (Meadows)

SO₂, NO/ NO₂/ NO_x, Wind Speed and Direction, Relative Humidity, and External Temperature.

AMS 959 (Wagner2)

SO₂, NO/ NO₂/ NO_x, Wind Speed and Direction, Relative Humidity, and External Temperature.

If additional information is required, please call (587) 499-4900.

Sincerely,



Patrick Andersen
Environmental Scientist



Greg Swain
Senior Technologist



Jeff McClintock
Intermediate Technologist

Summary Report

Continuous air quality/meteorological monitoring measurements

West Central Airshed Society

TransAlta / Powers Station 907														
January to December 2017														
Parameter	Calibration Hours	Number of Data	Percent Uptime	Mean	Min	Max	-----Percentile-----					Exceedences		24 Hour Average Me (ppm)
							P10	Q1	Median	Q3	P90	1-hour	24-hour	
SO ₂ (ppb)	413	8241	98.8	0.4	0.0	36.0	0.0	0.0	0.1	0.3	0.7	0	0	0.006
NO (ppb)	424	8150	97.9	0.3	0.0	35.8	0.0	0.0	0.0	0.2	0.8	-	-	-
NO ₂ (ppb)	424	8150	97.9	2.2	0.0	34.4	0.3	0.7	1.5	2.8	4.8	0	0	0.013
NO _x (ppb)	424	8150	97.9	2.5	0.0	60.0	0.3	0.7	1.5	3.1	5.5	-	-	-
Particulate Matter 2.5 microns (µ/m ³)	0	8565	97.8	6.7	0.0	103.5	1.1	2.2	4.6	8.3	14.2	3	6	19.89 ug/m ³
Wind Speed (kph)	0	8647	98.7	11.6	0.1	42.1	4.2	7.0	10.9	15.3	19.9	-	-	-
Temperature (°C)	0	8709	99.4	4.3	-32.4	31.8	-13.1	-2.6	5.2	13.3	19.3	-	-	-
Relative Humidity (%)	0	8644	98.7	69.2	3.6	100.2	42.1	54.6	71.5	85.3	93.6	-	-	-
Std Dev Wind Direction (deg)	0	8647	98.7	17.3	1.0	100.6	8.1	10.1	12.9	18.8	31.2	-	-	-
Std Dev Wind Speed (kph)	0	8647	98.7	2.8	0.3	21.4	1.3	1.7	2.5	3.5	4.6	-	-	-

Summary Report

Continuous air quality/meteorological monitoring measurements

West Central Airshed Society

TransAlta / Meadows Station 908														
January to December 2017														
Parameter	Calibration Hours	Number of Data	Percent Uptime	Mean	Min	Max	-----Percentile-----					Exceedences		24 Hour Average Maximum (ppm)
							P10	Q1	Median	Q3	P90	1-hour	24-hour	
SO ₂ (ppb)	420	8320	99.8	0.5	0.0	36.7	0.0	0.0	0.1	0.3	1.0	0	0	0.009
NO (ppb)	434	8269	99.4	2.4	0.0	89.4	0.0	0.0	0.5	1.6	5.8	-	-	-
NO ₂ (ppb)	434	8269	99.4	5.8	0.0	41.4	0.7	1.7	3.8	7.8	13.6	0	0	0.022
NO _x (ppb)	434	8269	99.4	8.1	0.0	113.2	0.7	1.8	4.5	9.8	19.1	-	-	-
Wind Speed (kph)	0	8692	99.2	10.1	0.0	42.1	2.8	5.4	8.9	13.7	19.1	-	-	-
Temperature (°C)	0	8740	99.8	4.2	-31.0	30.9	-13.0	-3.3	4.7	13.7	19.4	-	-	-
Relative Humidity (%)	0	8740	99.8	70.0	20.2	99.7	43.7	58.0	72.4	83.4	92.8	-	-	-
Std Dev Wind Direction (deg)	0	8692	99.2	21.3	2.3	102.0	7.2	9.7	14.2	24.0	49.4	-	-	-
Std Dev Wind Speed (kph)	0	8692	99.2	2.6	0.0	19.2	1.2	1.6	2.3	3.3	4.5	-	-	-

Summary Report

Continuous air quality/meteorological monitoring measurements

West Central Airshed Society

TransAlta / Wagner2 Station 959													January to December 2017		
Parameter	Calibration Hours	Number of Data	Percent Uptime	Mean	Min	Max	Percentile					Exceedences		24 Hour Average Maximum (ppm)	
							P10	Q1	Median	Q3	P90	1-hour	24-hour		
SO ₂ (ppb)	417	8311	99.6	0.9	0.0	35.2	0.0	0.0	0.1	0.5	2.2	0	0	0.007	
NO (ppb)	430	8269	99.3	1.0	0.0	39.3	0.0	0.0	0.1	0.9	2.8	-	-	-	
NO ₂ (ppb)	430	8269	99.3	3.9	0.0	40.9	0.9	1.7	3.0	5.1	8.0	0	0	0.011	
NO _x (ppb)	430	8269	99.3	4.9	0.0	59.0	1.0	1.9	3.5	6.2	10.6	-	-	-	
Wind Speed (kph)	0	8570	97.8	4.1	0.0	26.0	0.3	0.9	2.7	6.3	10.1	-	-	-	
Temperature (°C)	0	8454	96.5	3.8	-32.0	32.3	-13.9	-4.7	4.1	13.4	20.4	-	-	-	
Relative Humidity (%)	0	8730	99.7	69.3	14.7	109.0	38.0	54.5	72.7	85.5	95.1	-	-	-	
Std Dev Wind Direction (deg)	0	8570	97.8	49.2	5.0	106.0	19.2	27.7	43.1	73.3	87.1	-	-	-	
Std Dev Wind Speed (kph)	0	8570	97.8	2.3	0.1	11.0	0.7	1.0	1.9	3.1	4.4	-	-	-	

**TransAlta Utilities Corporation
Frequency Distribution Charts
SO₂ Monthly Averages
Year 2017**

West Central Airshed Society - Power (AMS 907)
 Annual Summary for 2017
 SO2 (ppb)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)	Number 24-Hour Violations	Number 1-Hour Violations	Percent of Data in each Concentration Range (ppm)					
								<=0.02	>0.02-0.06	>0.06-0.11	>0.11-0.17	>0.17-0.34	>0.34
January	709	0.5	3.6	29.9	100.0	0	0	99.72	0.28	0.00	0.00	0.00	0.00
February	640	0.6	4.2	25.6	100.0	0	0	99.84	0.16	0.00	0.00	0.00	0.00
March	708	0.7	2.0	23.5	100.0	0	0	99.86	0.14	0.00	0.00	0.00	0.00
April	686	0.5	5.5	36.0	100.0	0	0	99.71	0.29	0.00	0.00	0.00	0.00
May	663	0.5	3.4	28.0	93.4	0	0	99.85	0.15	0.00	0.00	0.00	0.00
June	685	0.3	2.2	9.7	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	706	0.5	1.9	16.7	99.7	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	708	0.3	2.0	7.5	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	684	0.4	3.5	17.5	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	656	0.2	1.7	12.0	92.7	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	687	0.2	0.5	2.6	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	709	0.1	0.6	1.6	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8241	0.4	5.5	36.0	98.8	0	0	99.91	0.09	0.00	0.00	0.00	0.00

West Central Airshed Society - Meadows (AMS 908)
 Annual Summary for 2017
 SO2 (ppb)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)	Number 24-Hour Violations	Number 1-Hour Violations	Percent of Data in each Concentration Range (ppm)					
								<=0.02	>0.02-0.06	>0.06-0.11	>0.11-0.17	>0.17-0.34	>0.34
January	708	0.6	3.4	13.6	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	640	0.6	2.6	14.4	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	709	1.3	3.9	24.9	100.0	0	0	99.72	0.28	0.00	0.00	0.00	0.00
April	686	0.7	4.1	21.9	100.0	0	0	99.71	0.29	0.00	0.00	0.00	0.00
May	709	0.9	4.4	16.8	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
June	687	0.9	9.3	36.7	100.0	0	0	99.13	0.87	0.00	0.00	0.00	0.00
July	696	0.5	3.0	15.4	98.5	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	708	0.2	1.5	5.8	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	676	0.1	0.7	4.4	98.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	709	0.2	0.5	3.0	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	685	0.3	1.0	4.2	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	707	0.1	0.8	2.3	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8320	0.5	9.3	36.7	99.8	0	0	99.88	0.12	0.00	0.00	0.00	0.00

West Central Airshed Society - Wagner2 (AMS 959)
 Annual Summary for 2017
 SO2 (ppb)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operation Time (%)	Number 24-Hour Violations	Number 1-Hour Violation	Percent of Data in each Concentration Range (ppm)					
								<=0.02	>0.02-0.06	>0.06-0.11	>0.11-0.17	>0.17-0.34	>0.34
January	709	0.7	5.6	28.0	100.0	0	0	99.58	0.42	0.00	0.00	0.00	0.00
February	639	0.9	2.2	14.5	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	709	0.8	5.1	17.6	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
April	686	1.2	5.2	35.2	100.0	0	0	98.98	1.02	0.00	0.00	0.00	0.00
May	696	1.9	4.3	26.7	98.4	0	0	99.71	0.29	0.00	0.00	0.00	0.00
June	668	2.2	7.5	28.8	97.4	0	0	99.40	0.60	0.00	0.00	0.00	0.00
July	706	0.9	4.2	26.6	99.9	0	0	99.72	0.28	0.00	0.00	0.00	0.00
August	710	0.6	3.2	16.1	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	684	0.5	2.3	12.5	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	709	0.4	1.2	9.1	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	686	0.2	0.9	5.3	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	709	0.3	1.6	6.3	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8311	0.9	7.5	35.2	99.6	0	0	99.78	0.22	0.00	0.00	0.00	0.00

**TransAlta Utilities Corporation
Frequency Distribution Charts
NO₂ Monthly Averages
Year 2017**

West Central Airshed Society - Power (AMS 907)
 Annual Summary for 2017
 NO2 (ppb)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)	Number 24-Hour Violations	Number 1-Hour Violations	Percent of Data in each Concentration Range (ppm)			
								<=0.05	>0.05-0.11	>0.11-0.21	>0.21
January	708	3.8	9.1	24.3	100.0	0	0	100.00	0	0	0
February	639	3.1	12.7	34.4	100.0	0	0	100.00	0	0	0
March	651	3.3	9.8	19.3	92.2	0	0	100.00	0	0	0
April	684	2.0	4.9	14.0	100.0	0	0	100.00	0	0	0
May	662	1.8	4.2	16.4	93.4	0	0	100.00	0	0	0
June	664	1.5	3.8	8.0	96.9	0	0	100.00	0	0	0
July	704	1.6	3.2	12.6	99.6	0	0	100.00	0	0	0
August	708	1.2	3.1	11.7	100.0	0	0	100.00	0	0	0
September	682	1.6	6.8	22.4	100.0	0	0	100.00	0	0	0
October	655	1.4	4.3	12.4	92.7	0	0	100.00	0	0	0
November	685	2.8	8.1	15.6	100.0	0	0	100.00	0	0	0
December	708	2.0	4.8	12.8	100.0	0	0	100.00	0	0	0
Annual	8150	2.2	12.7	34.4	97.9	0	0	100.00	0	0	0

West Central Airshed Society - Meadows (AMS 908)
 Annual Summary for 2017
 NO2 (ppb)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)	Number 24-Hour Violations	Number 1-Hour Violations	Percent of Data in each Concentration Range (ppm)			
								<=0.05	>0.05-0.11	>0.11-0.21	>0.21
January	679	10.7	22.4	38.6	96.1	0	0	100.00	0	0	0
February	639	8.9	19.3	41.4	100.0	0	0	100.00	0	0	0
March	708	6.9	16.3	36.4	100.0	0	0	100.00	0	0	0
April	685	4.6	10.1	28.9	100.0	0	0	100.00	0	0	0
May	706	4.8	8.4	30.1	99.7	0	0	100.00	0	0	0
June	685	3.8	11.9	30.8	100.0	0	0	100.00	0	0	0
July	693	4.7	7.8	24.6	98.3	0	0	100.00	0	0	0
August	707	4.2	6.8	13.5	100.0	0	0	100.00	0	0	0
September	672	3.8	9.2	16.8	98.9	0	0	100.00	0	0	0
October	708	4.7	9.9	17.0	100.0	0	0	100.00	0	0	0
November	680	6.1	12.8	19.9	99.3	0	0	100.00	0	0	0
December	707	6.9	15.4	23.9	100.0	0	0	100.00	0	0	0
Annual	8269	5.8	22.4	41.4	99.4	0	0	100.00	0	0	0

West Central Airshed Society - Wagner2 (AMS 959)
 Annual Summary for 2017
 NO2 (ppb)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)	Number 24-Hour Violations	Number 1-Hour Violations	Percent of Data in each Concentration Range (ppm)			
								<=0.05	>0.05-0.11	>0.11-0.21	>0.21
January	708	5.6	8.9	29.9	100.0	0	0	100.00	0	0	0
February	639	5.6	10.9	40.9	100.0	0	0	100.00	0	0	0
March	708	4.4	10.6	24.4	100.0	0	0	100.00	0	0	0
April	685	4.3	8.4	24.1	100.0	0	0	100.00	0	0	0
May	667	4.7	7.9	27.0	94.5	0	0	100.00	0	0	0
June	666	4.8	8.4	29.2	97.2	0	0	100.00	0	0	0
July	706	3.3	7.5	19.3	100.0	0	0	100.00	0	0	0
August	709	2.3	5.7	14.4	100.0	0	0	100.00	0	0	0
September	681	2.1	5.6	17.9	100.0	0	0	100.00	0	0	0
October	708	2.8	5.7	14.8	100.0	0	0	100.00	0	0	0
November	685	4.1	7.8	17.8	100.0	0	0	100.00	0	0	0
December	707	3.2	5.2	16.8	100.0	0	0	100.00	0	0	0
Annual	8269	3.9	10.9	40.9	99.3	0	0	100.00	0	0	0

**TransAlta Utilities Corporation
Frequency Distribution Charts
PM Monthly Averages
Year 2017**

West Central Airshed Society - Power (AMS 907)
 Annual Summary for 2017
 PM_{2.5} (µg/m³)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)	Number 24-Hour Violations	Number 1-Hour Violations
January	714	5.8	19.3	41.4	96.0	0	0
February	622	5.9	23.8	38.6	92.6	0	0
March	741	9.6	32.5	58.9	99.6	2	0
April	720	4.3	9.2	31.6	100.0	0	0
May	696	5.3	12.2	49.0	93.6	0	0
June	719	5.5	12.5	54.9	99.9	0	0
July	740	11.2	49.9	78.4	99.5	2	0
August	737	11.2	33.8	103.5	99.1	2	3
September	719	6.9	28.6	51.8	99.9	0	0
October	693	2.6	6.5	14.9	93.2	0	0
November	720	8.0	22.9	29.5	100.0	0	0
December	744	4.0	10.3	19.4	100.0	0	0
Annual	8565	6.7	49.9	103.5	97.8	6	3

**TransAlta Utilities Corporation
Frequency Distribution Charts
Meteorological Measurements
Year 2017**

West Central Airshed Society - Power (AMS 907)
 Annual Summary for 2017
 External Temperature (°C)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)
January	744	-6.7	7.1	11.2	100.0
February	672	-6.0	10.2	17.2	100.0
March	744	-4.6	6.2	12.7	100.0
April	720	3.0	9.2	15.4	100.0
May	696	13.3	20.8	27.9	93.6
June	719	15.3	20.5	28.2	99.9
July	742	17.6	22.0	28.5	99.7
August	744	16.2	19.7	27.5	100.0
September	720	11.6	20.9	31.8	100.0
October	744	5.0	12.9	21.9	100.0
November	720	-6.7	2.6	5.9	100.0
December	744	-6.5	6.8	10.6	100.0
Annual	8709	4.3	22.0	31.8	99.4

West Central Airshed Society - Meadows (AMS 908)
 Annual Summary for 2017
 External Temperature (°C)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)
January	743	-7.9	4.2	7.5	99.9
February	672	-6.7	7.7	16.9	100.0
March	744	-4.8	5.5	13.9	100.0
April	720	3.0	8.0	14.5	100.0
May	744	13.2	21.1	26.9	100.0
June	720	15.9	20.7	26.3	100.0
July	733	17.8	21.8	28.1	98.5
August	744	16.4	20.0	26.7	100.0
September	712	11.8	18.9	30.9	98.9
October	744	5.1	12.3	23.3	100.0
November	720	-6.6	1.8	5.4	100.0
December	744	-7.0	4.9	10.3	100.0
Annual	8740	4.2	21.8	30.9	99.8

West Central Airshed Society - Wagner2 (AMS 959)
 Annual Summary for 2017
 External Temperature (°C)

Month	Number of Data	Mean	Maximum 24-Hour Value	Maximum 1-Hour Value	Operational Time (%)
January	734	-9.4	1.2	9.3	98.7
February	663	-7.2	4.9	19.5	98.7
March	741	-4.7	5.1	13.5	99.6
April	653	3.6	8.3	15.8	90.7
May	730	13.4	20.1	29.6	98.1
June	670	16.3	21.5	29.6	93.1
July	650	18.4	22.9	30.2	87.4
August	742	16.5	20.0	28.9	99.7
September	663	11.7	17.5	32.3	92.1
October	744	4.5	11.7	24.2	100.0
November	720	-7.1	0.9	6.9	100.0
December	744	-8.0	3.1	11.3	100.0
Annual	8454	3.8	22.9	32.3	96.5

**TransAlta Utilities Corporation
Frequency Distribution Charts
Wind Speed and Direction
Year 2017**

West Central Airshed Society - Power (AMS 907)
 Annual Summary for 2017
 Percentage Frequency Distribution of Wind

Speed (kph)							
Direction	>1 to 5	>5 to 11	>11 to 19	>19 to 28	>28 to 38	>38	Totals
N	58.00	183.00	168.00	38.00	3.00	0.00	450.00
NNE	90.00	170.00	94.00	10.00	0.00	0.00	364.00
NE	111.00	132.00	33.00	1.00	0.00	0.00	277.00
ENE	73.00	128.00	18.00	0.00	0.00	0.00	219.00
E	70.00	97.00	71.00	3.00	0.00	0.00	241.00
ESE	61.00	148.00	123.00	27.00	0.00	0.00	359.00
SE	86.00	254.00	339.00	114.00	10.00	0.00	803.00
SSE	75.00	263.00	277.00	77.00	3.00	0.00	695.00
S	107.00	224.00	85.00	0.00	0.00	0.00	416.00
SSW	95.00	167.00	188.00	20.00	0.00	0.00	470.00
SW	91.00	219.00	220.00	22.00	0.00	0.00	552.00
WSW	101.00	324.00	222.00	12.00	0.00	0.00	659.00
W	95.00	353.00	359.00	78.00	3.00	0.00	888.00
WNW	80.00	291.00	289.00	129.00	19.00	3.00	811.00
NW	79.00	206.00	291.00	202.00	45.00	6.00	829.00
NNW	58.00	153.00	227.00	92.00	20.00	0.00	550.00
Totals	1330.00	3312.00	3004.00	825.00	103.00	9.00	8583.00

Number of Data Values		8583
Hours in Time Period		8760

West Central Airshed Society - Meadows (AMS 908)
 Annual Summary for 2017
 Percentage Frequency Distribution of Wind

Speed (kph)							
Direction	>1 to 5	>5 to 11	>11 to 19	>19 to 28	>28 to 38	>38	Totals
N	72.00	129.00	75.00	4.00	3.00	0.00	283.00
NNE	91.00	129.00	47.00	0.00	0.00	0.00	267.00
NE	121.00	196.00	69.00	6.00	0.00	0.00	392.00
ENE	166.00	209.00	115.00	3.00	0.00	0.00	493.00
E	185.00	293.00	218.00	48.00	0.00	0.00	744.00
ESE	161.00	271.00	237.00	92.00	3.00	0.00	764.00
SE	80.00	75.00	123.00	63.00	9.00	0.00	350.00
SSE	39.00	46.00	20.00	0.00	0.00	0.00	105.00
S	59.00	55.00	15.00	0.00	0.00	0.00	129.00
SSW	91.00	88.00	52.00	26.00	2.00	0.00	259.00
SW	141.00	173.00	71.00	15.00	3.00	0.00	403.00
WSW	300.00	537.00	73.00	16.00	3.00	0.00	929.00
W	224.00	588.00	420.00	114.00	34.00	2.00	1382.00
WNW	107.00	242.00	304.00	170.00	41.00	1.00	865.00
NW	88.00	248.00	254.00	114.00	7.00	0.00	711.00
NNW	95.00	174.00	121.00	24.00	1.00	0.00	415.00
Totals	2020.00	3453.00	2214.00	695.00	106.00	3.00	8491.00

Number of Data Values	8491
Hours in Time Period	8760

West Central Airshed Society - Wagner2 (AMS 959)
 Annual Summary for 2017
 Percentage Frequency Distribution of Wind

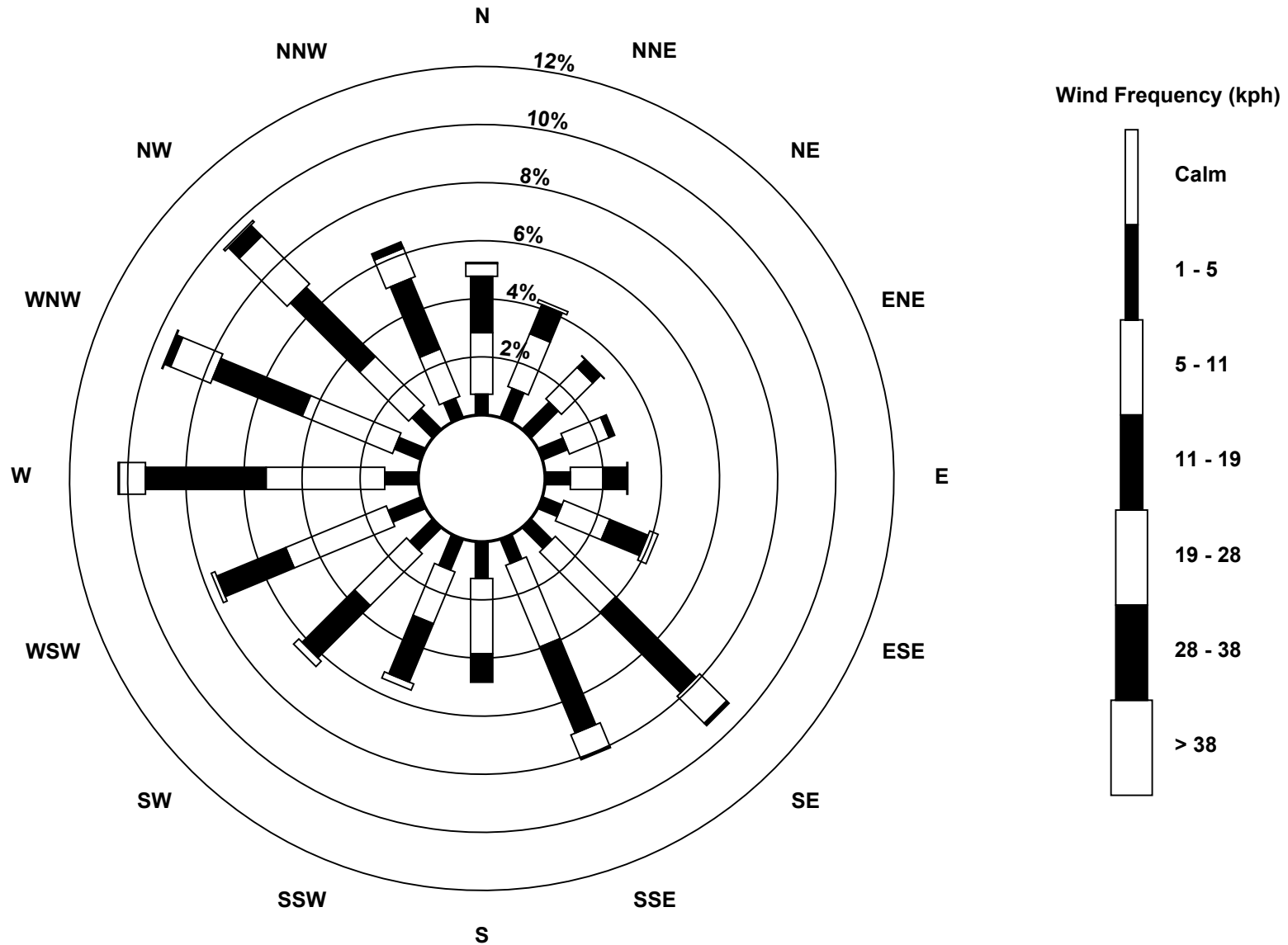
Speed (kph)							
Direction	>1 to 5	>5 to 11	>11 to 19	>19 to 28	>28 to 38	>38	Totals
N	245.00	25.00	0.00	0.00	0.00	0.00	270.00
NNE	180.00	26.00	0.00	0.00	0.00	0.00	206.00
NE	108.00	20.00	0.00	0.00	0.00	0.00	128.00
ENE	108.00	12.00	0.00	0.00	0.00	0.00	120.00
E	261.00	142.00	18.00	0.00	0.00	0.00	421.00
ESE	287.00	343.00	198.00	16.00	0.00	0.00	844.00
SE	184.00	151.00	81.00	3.00	0.00	0.00	419.00
SSE	164.00	34.00	37.00	2.00	0.00	0.00	237.00
S	123.00	60.00	7.00	0.00	0.00	0.00	190.00
SSW	57.00	9.00	0.00	0.00	0.00	0.00	66.00
SW	69.00	2.00	0.00	0.00	0.00	0.00	71.00
WSW	131.00	25.00	0.00	0.00	0.00	0.00	156.00
W	258.00	87.00	3.00	0.00	0.00	0.00	348.00
WNW	386.00	314.00	95.00	10.00	0.00	0.00	805.00
NW	530.00	466.00	107.00	2.00	0.00	0.00	1105.00
NNW	541.00	218.00	14.00	0.00	0.00	0.00	773.00
Totals	3632.00	1934.00	560.00	33.00	0.00	0.00	6159.00

Number of Data Values		6159
Hours in Time Period		8760

WCAS - Power
Wind Speed Rose



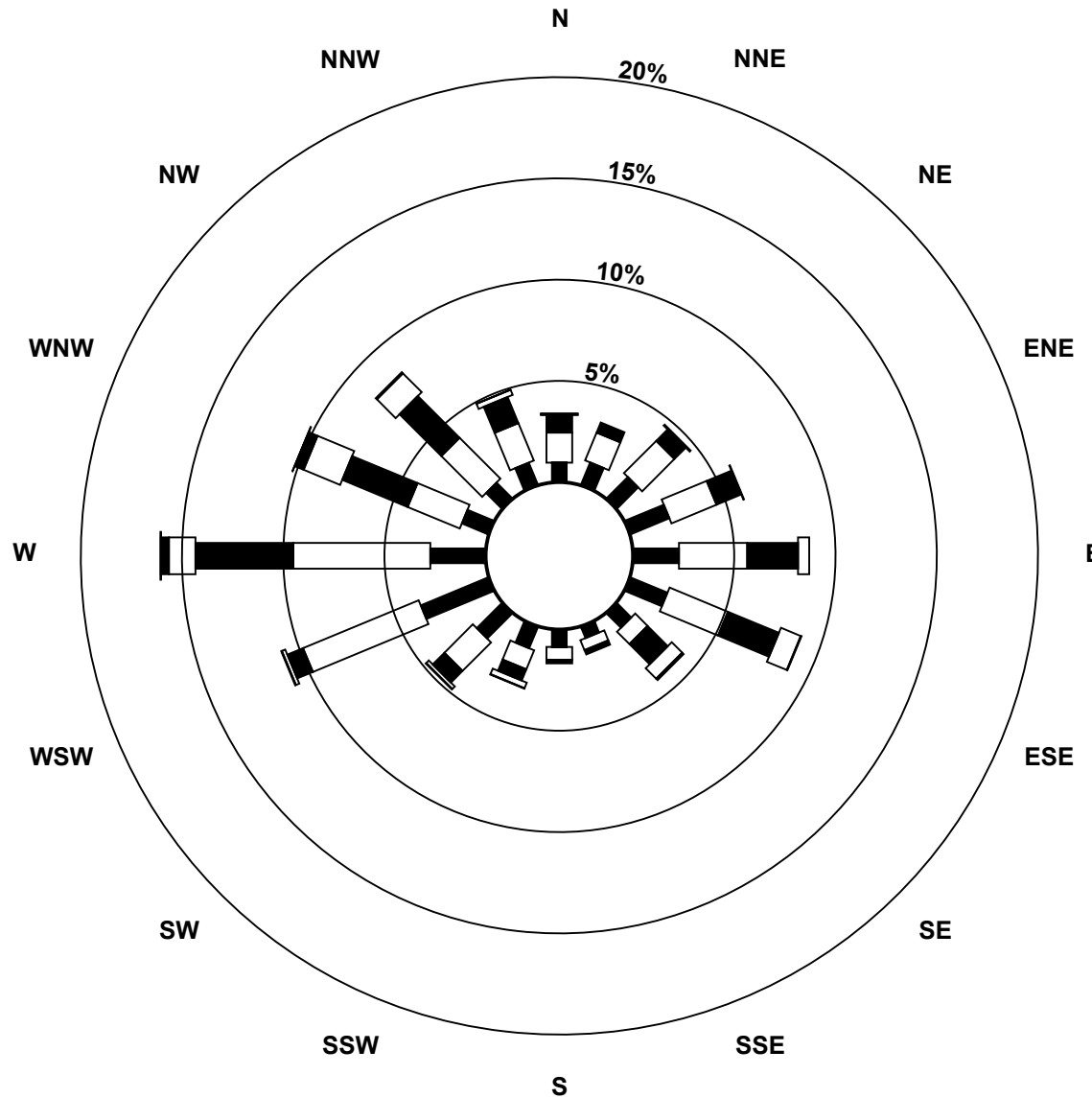
Wind Speed (WS) - kph
2017



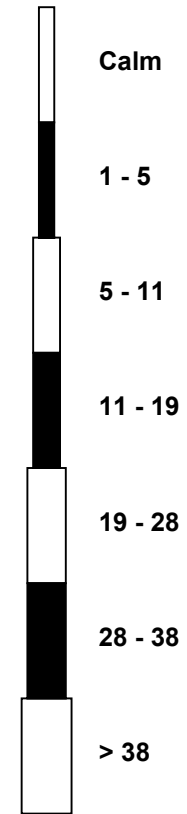
**WCAS - Meadows
Wind Speed Rose**



**Wind Speed (WS) - kph
2017**



Wind Frequency (kph)



WCAS - Wagner2
Wind Speed Rose



Wind Speed (WS) - kph
2017

