W B E A

Wood Buffalo Environmental Association

Ambient Air Monitoring Station Site Documentation

Conklin

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WBEA Monitoring Network

Vision

People are empowered to make informed decisions to ensure a safe and healthy environment.

Mission

The Wood Buffalo Environmental Association is a multi-stakeholder, consensus-based organization that leads in state of the art environmental monitoring to enable informed decision-making.

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 29 permanent continuous monitoring stations, each measuring various air quality parameters. The continuously measured air quality parameters include SO_2, H_2S, TRS, O_3, NO_X, NO, NO_2, NH_3, CO, CO_2, $PM_{2.5}$, THC, NMHC, and CH_4. All sites also measure ambient air temperature, wind speed, wind direction, and relative humidity. Selected sites measure barometric pressure, global radiation, precipitation, surface wetness, vertical wind speed, vertical temperature gradient, and visibility. The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates five portable monitoring stations. The configuration of these stations differs depending on their task. Three are configured for compliance monitoring and are equipped to measure SO_2, H_2S, NO_X, NO, NO_2, THC, wind speed, wind direction, temperature. One portable is equipped to monitor all these compliance parameters as well as $PM_{2.5}$. The last portable is set up to operate gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

Since 1998 WBEA has maintained time-integrated sampling for $PM_{2.5}$, PM_{10}, VOC and PAH. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods. Time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period. The time-integrated parameters for each station are summarized in Table 1.2.

WBEA ID	TYPE	STATION NAME	SO_2	$NO/NO_2/NO_X$	O_3	$PM_{2.5}$	TRS	H_2S	THC	Methane / NMHC	CO	CO_2	NH_3
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X		X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEORLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X					X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X			X			
501	COMPLIANCE	LEISMER	X	X				X	X				
505	COMPLIANCE	SAWBONES BAY	X	X				X	X				
506	COMPLIANCE	JACKFISH 1	X	X			X						
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				

Table 1.0 - Pollutant Parameters monitored in the WBEA network.

WBEA ID	TYPE	STATION NAME	Temperature	RH	BP	Wind Speed	Wind Direction	Vertical Wind Speed	Solar Radiation	Precipitation	Leaf Wetness
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEORLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X		X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network.

WBEA ID	TYPE	STATION NAME	VOC	$PM_{2.5}$ Mass, Metals and Ions	PM2.5 Mass, ECOC	PM_{10} Mass, Metals and Ions	PAH	PRECIP
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X	
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X	
9	ATTRIBUTION	BARGE LANDING	X					
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X			X		
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X	
17	COMPLIANCE	WAPASU			X			X
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X
21	COMMUNITY	CONKLIN	X	X		X	X	
22	COMMUNITY	JANVIER	X	X		X	X	
30	COMPLIANCE	ELLS RIVER	X			X		

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.

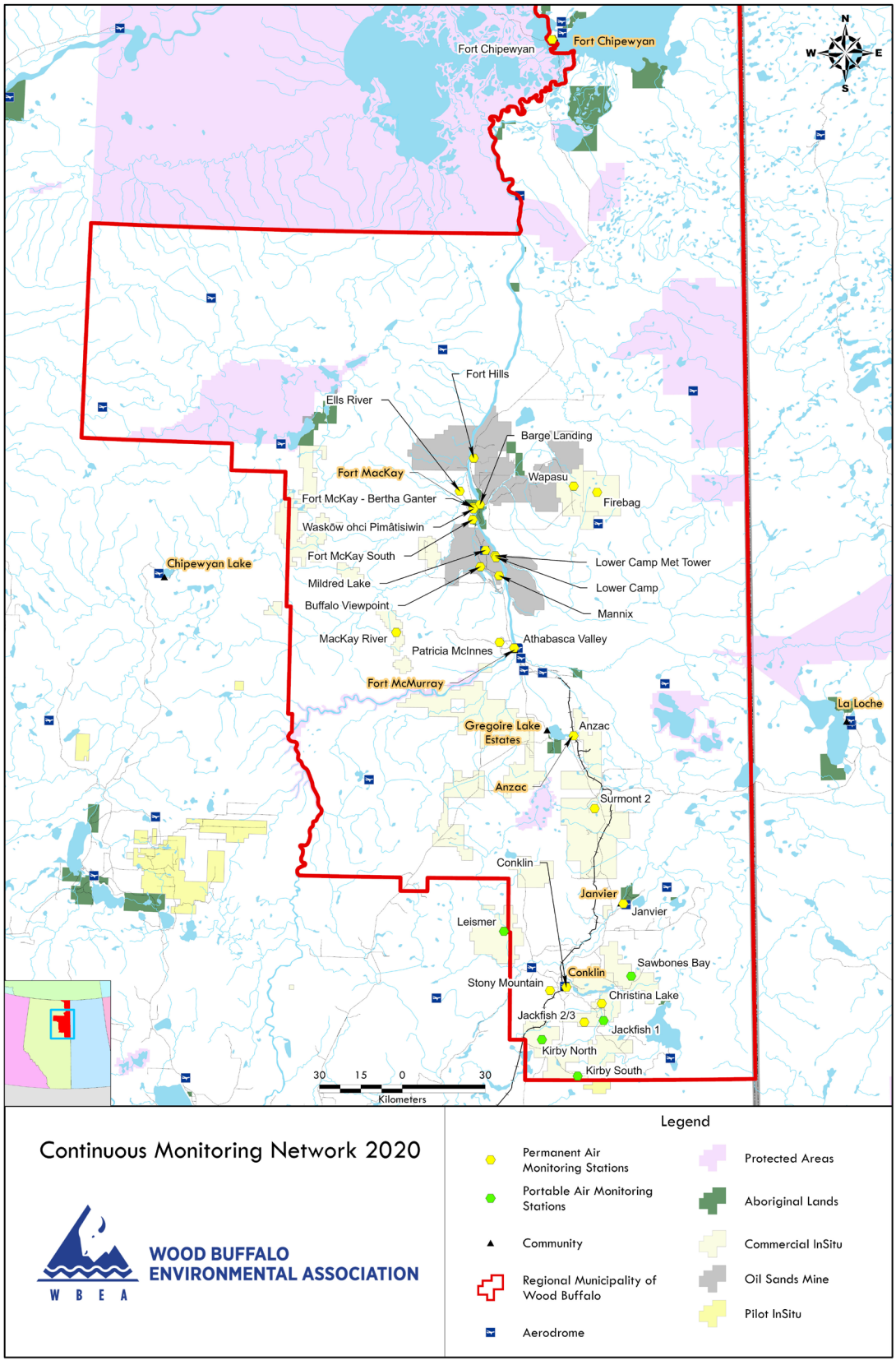


Figure 1.0 – WBEA Network Monitoring SitesGeneral Site Information

Station

Station ID	AMS 21
Station name	Conklin
Date station established	April 01, 2016

Location

Station street address	Father Mercredis Trail
Legal land description	15-31-076-07 W4
Latitude	55°37'56.39"N
Longitude	111° 4'43.84"W
UTM East	495034
UTM North	6165163
Nearest community	Conklin
Community population	190

Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Name of Approval Holder	NA
Approval number	NA
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3 – 805 Memorial Drive, Fort McMurray, AB
Phone number	780-799-4420
Email address	info@wbea.org

Site Description

Land use by sector	0 – 90 degrees	Forest and Residential
	91 – 180 degrees	Forest and Residential
	181 – 270 degrees	Forest and Residential
	271 – 360 degrees	Forest and Residential
Site elevation (above sea level)	562	
Angle of elevation to nearby buildings	Greatest angle	0 degree
	Building direction	South – CRDAC office
Airflow restrictions	North	Trees
	East	None
	South	None
	West	Conklin Rec center, about 2 km west
Sample manifold	Type	All glass
	Inlet height above roof	1 meter
Meteorological Sensors	Type	Cup and vane
	Height above ground	10 m

	Distance from station	Attached to north site of the station

Site Influences

Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Wetlands	20	Peat bog / Marshes – Variety of reeds and grasses.
Admin building	20	Conklin Resource Development Advisory Committee Office

Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel	Medium	50	Father Mercredis Trail – Access Road
Paved	Medium	200	Northland Drive

Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Meg Energy	Oil and Gas	210,000 bpd	25	NE
Cenovus Energy	Oil and Gas	50, 000 bpd	14	SE

Analytical Equipment

Parameter	Owner	Make	Model	Serial Number	Date Installed
Sulfur Dioxide	WBEA	Thermo Scientific	43i	1428701363	March 20, 2016
Total Reduce Sulfur	WBEA	Thermo Scientific	43i-TLE	1236656116	June 16, 2016
TRS converter	WBEA	CD Nova	CDN-101	NA	March 20, 2016
Ozone	WBEA	Thermo Scientific	49i	1501663734	March 20, 2016
Oxides of Nitrogen	WBEA	Thermo Scientific	42i	1501663731	March 20, 2016
Non-Methane Hydrocarbon	WBEA	Thermo Scientific	55i	1152430011	March 20, 2016
Particulate matter 2.5	WBEA	API	T640	871	March 20, 2016
Temperature/RH	WBEA	Vaisala	HMP155	K2870011 2014	March 20, 2016
Wind speed	WBEA	Met One	010C-1	Y18363	2020
Wind direction	WBEA	Met One	020C-1	P22886	March 20, 2016
Particulate Sampler	WBEA	Thermo	2000i	2000IW2 0881 2002	2020
Particulate Sampler	WBEA	Thermo	2000i	2000IW2 0884 2002	2020
Particulate Sampler	WBEA	Thermo	2000i	2000IW2 0882 2002	2020
Particulate Sampler	WBEA	Thermo	2000i	2000IW2 0883 2002	2020
VOC Sampler	WBEA	TISCH	TE-123	1019	2020
PUF Sampler	WBEA	Tisch Environmental	TE-PUFPLUSBL	1001100	2020

Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9628
Zero air generator	Zero Air Generator	Teledyne/API	701	263
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-14-16423
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	2658
Hydrogen generator	Hydrogen generator for THC analyzer	AMA	HG 300	16HMD0141
Nitrogen Generator	N2 Supply for NMHC	Peak Scientific	NG5000A	771056247

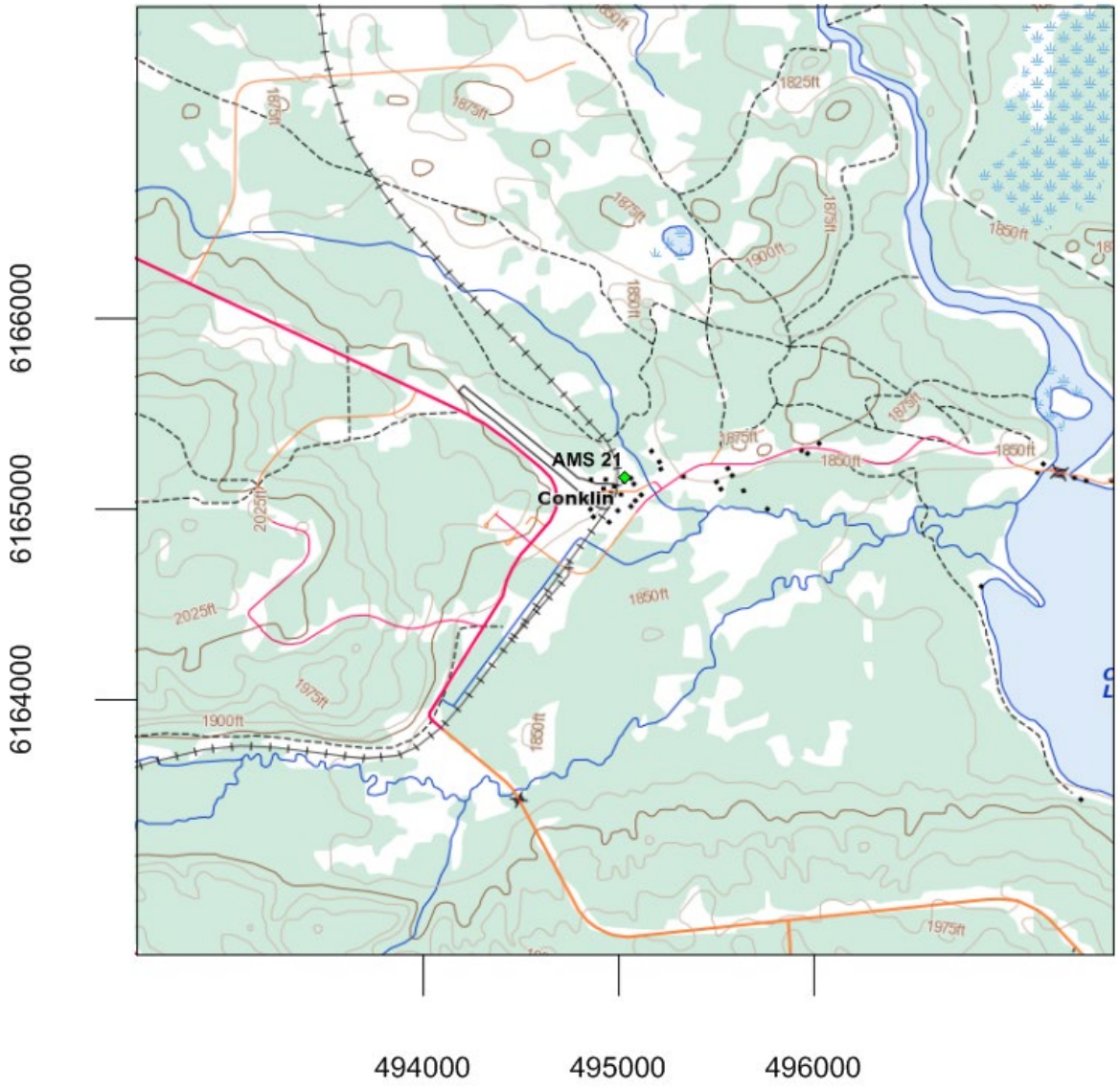
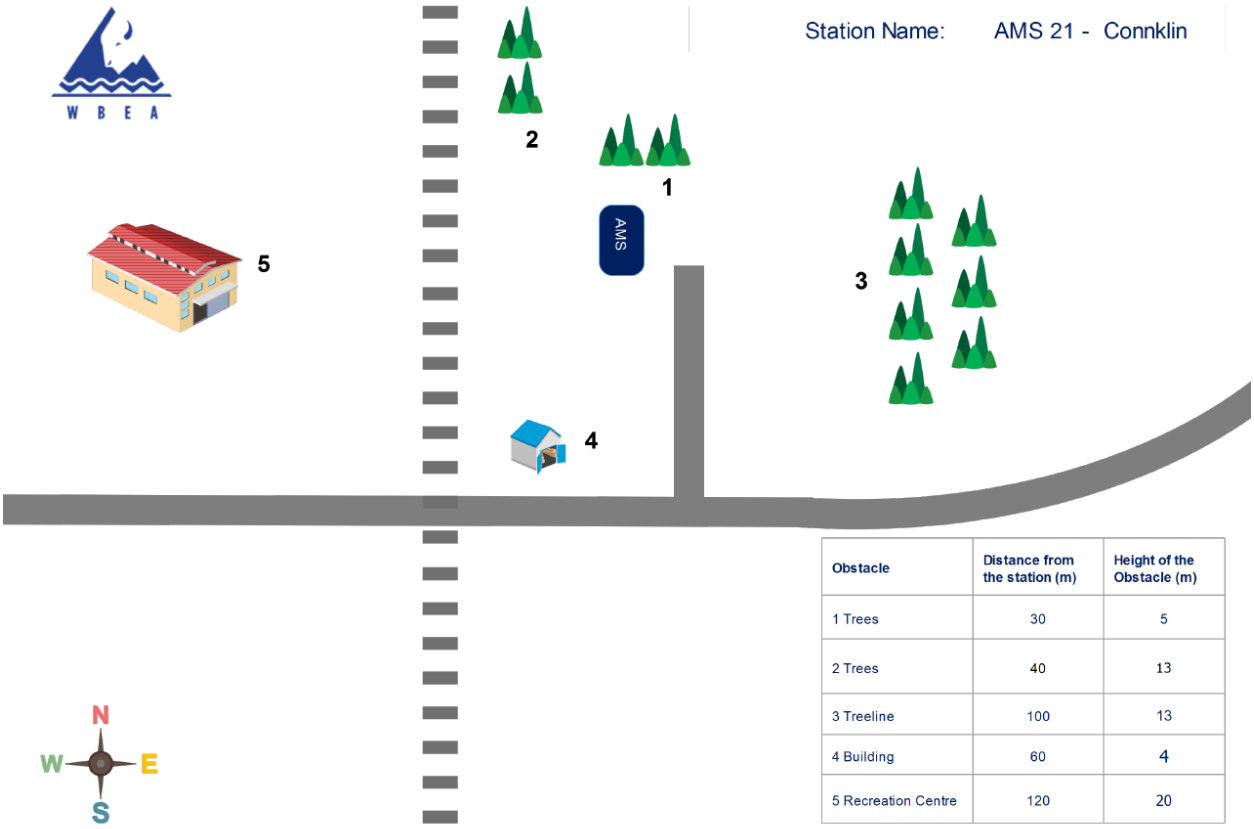


Figure 2.0 – Area Topographic map showing AMS 21



Obstacle	Distance from the station (m)	Height of the Obstacle (m)
1 Trees	30	5
2 Trees	40	13
3 Treeline	100	13
4 Building	60	4
5 Recreation Centre	120	20

Figure 3.0 – Plan view sketch for AMS 21 site

Figure 4.0 – Aerial photo showing AMS 21

Site photos

The following photos show the environment surrounding the monitoring station.

Figure 5.0 – Environ Looking North

Figure 5.1 – Environ Looking East

Figure 5.2 – Environ looking South

Figure 5.3 – Environ Looking West

Figure 5.4 – Meteorological Tower

Station Photos

The following photos show the monitoring station and instrumentation.

Figure 6.0 – Photo showing the inlet and sample manifold

Figure 6.1 – Curb shot of the monitoring station

Figure 6.2 –Photo of front and back of instrument rack

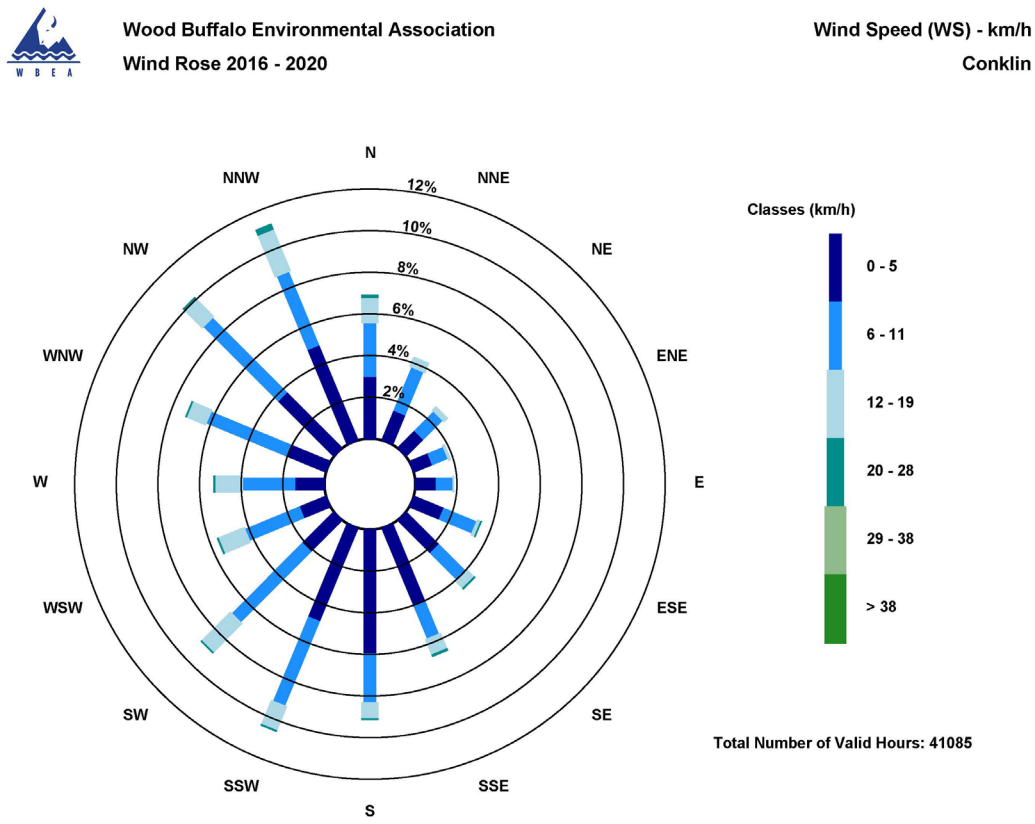


Figure 7.0 – Windrose (Five Year)