



Wood Buffalo Environmental Association
Ambient Air Monitoring Station
Site Documentation

Mildred Lake

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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 SO₂, H₂S, TRS, O₃, NO_x, NO, NO₂, NH₃, CO, CO₂, PM_{2.5}, THC, NMHC, and CH₄. 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 SO₂, H₂S, NO_x, NO, NO₂, 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}, PM₁₀, 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 ₂ S	THC	Methane	CO	CO ₂	NH ₃
										NMHC			
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/METEOROLOGICAL	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/METEOROLOGICAL	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,	PM _{2.5}	PM ₁₀ Mass,	PAH	PRECIP
				Metals and Ions	Mass, ECOC	Metals and Ions		
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



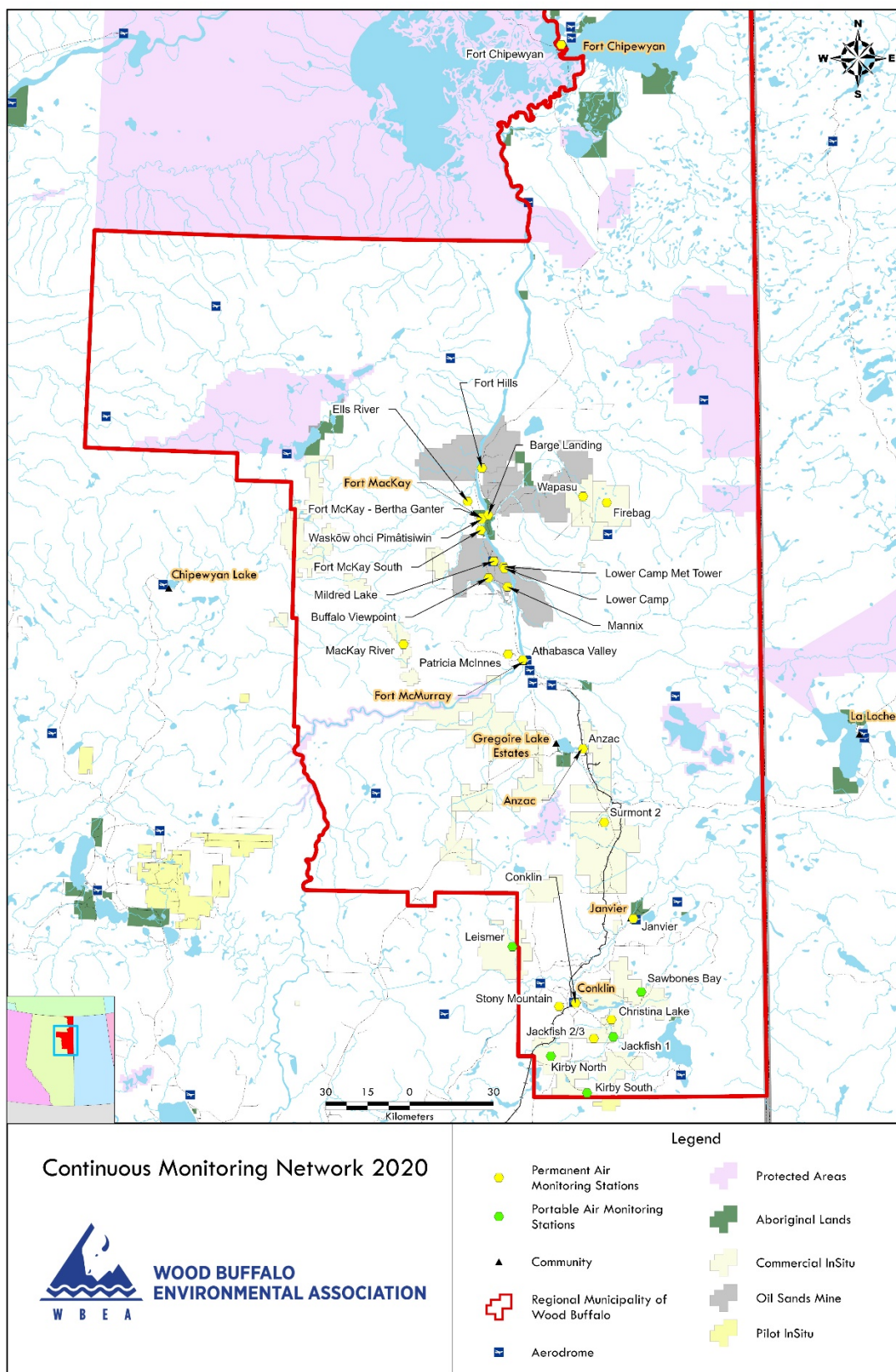


Figure 1.0 – WBEA Network monitoring sites



General Site Information

Station

Station ID	AMS 02
Station name	Mildred Lake
Date station established	June 1 st , 1979

Location

Station street address	Located at the south end of the Syncrude airstrip, 400m west of HWY 63
Legal land description	8-08-093-10 W4
Latitude	57° 2'59.79"North
Longitude	111°33'50.73" West
UTM East	465775
UTM North	6323094
Nearest community	Fort Mackay
Community population	742 (2016)

Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Name of Approval Holder	Syncrude Canada Limited
Approval number	026-02-00
Contact Name	Brooke Bennett
Address	Bag 4009, MD 4160, Fort McMurray, Alberta, T9H 3L1
Phone number	780-790-5692
Email address	Bennett.Brooke@syncrude.com

Site Description

Land use by sector	0 – 90 degrees	Quonset, airstrip waiting room trailers, washroom facilities, paved parking area, open field
	91 – 180 degrees	Air strip gate and access road
	181 – 270 degrees	Wooded area
	271 – 360 degrees	Airstrip waiting room trailers, Syncrude Air Strip
Site elevation (above sea level)	314 m	
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	North
Airflow restrictions	North	Yes
	East	No
	South	No



	West	No
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground	10 m
	Distance from station	0 m

Site Influences

Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Quonset	2	Airstrip building
Trailer	15	Airstrip Building #1489
Trailer	15	Toilet facilities
Trailer	20	Airstrip building #1722
Trailer	20	Airstrip Waiting Room
Airstrip	20	Syncrude Airstrip

Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access Road	Low	50	Paved secondary road for industrial access frequented by pick-up trucks, heavy equipment, and tractor trailers
Highway 63	Medium	300	Provincial highway frequented by tractor trailers, heavy equipment and light vehicles

Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Syncrude	Oil Sands Plant	350,000	5	West
Suncor	Oil Sands Plant	194,000	20	South East



Analytical Equipment

Parameter	Owner	Make	Model	Serial Number	Date Installed
Sulfur Dioxide	WBEA	Thermo	43i	JC1404901075	January 2015
Hydrogen Sulfide	WBEA	Thermo	450i	0815129107	N/A
Non-Methane Hydrocarbons	WBEA	Thermo	55i	1170050130	November 2019
Temperature/RH	WBEA	Vaisala	HMP155	N2910507	N/A
Wind speed	WBEA	Met One	010C-1	E5130	N/A
Wind direction	WBEA	Met One	020C-1	B1462	N/A

Support Equipment

Name	Description	Make	Model	Serial Number
Data Logger	Data Logger	Campbell Scientific	CR3000	8790
Zero Air Generator	Zero Air Generator	Teledyne API	T701	825
Hydrogen Generator	Support gas for NMHC	AMA	HG300	171067035
Mitsubishi Electric Mr Slim	Heating and air conditioning system. Wall mount unit	R410A	MUY-GE15NA	30025603T
Shelter / Building	Air monitoring portable	CNB	8 x 16 trailer	SBB81408
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	1185



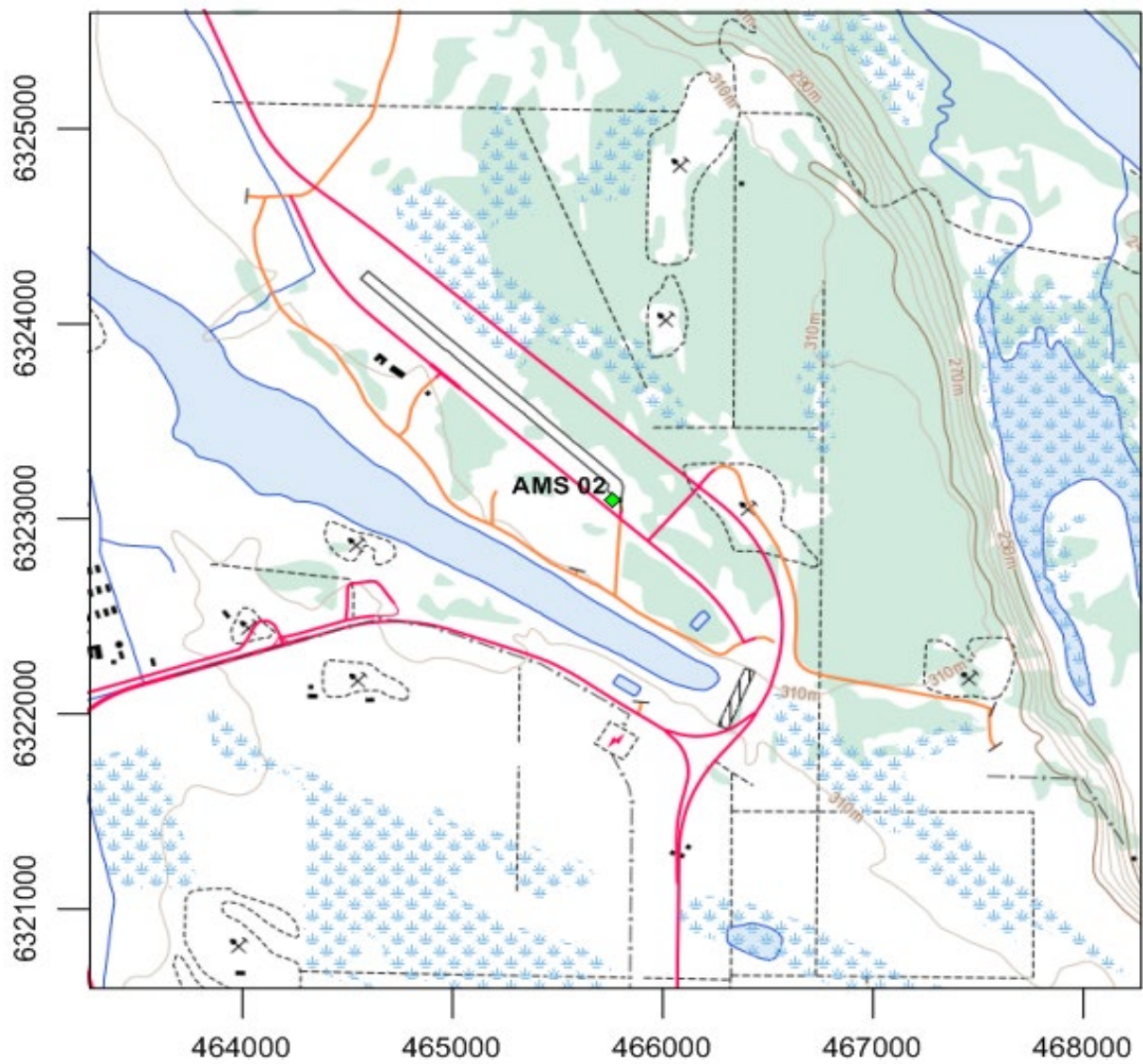


Figure 2.0 – Area topographic map showing AMS 02 – Mildred Lake



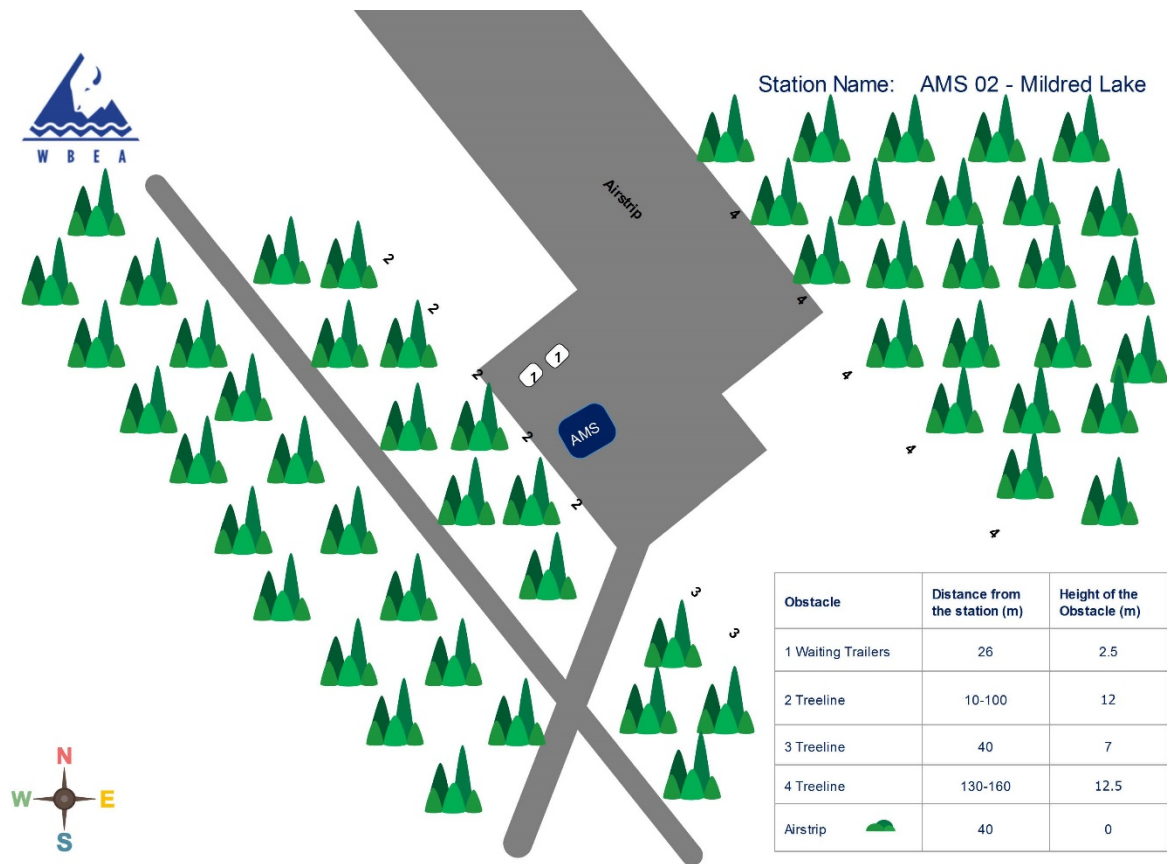


Figure 3.0 – Plan view sketch for AMS 02 – Mildred Lake





Figure 4.0 – Aerial photo showing AMS 02 – Mildred Lake



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 5.0 – Environment looking north



Figure 5.1 – Environment looking east





Figure 5.2 – Environment looking south



Figure 5.3 – Environment looking west





Figure 5.4 – Meteorological tower

Station Photos

The following photos show the monitoring station and instrumentation.



Figure 6.0 – Photos showing the inlet and sample manifold





Figure 6.1 – Curb shot of AMS 02 – Mildred Lake



Figure 6.2 –Photos of the front and back of the instrument rack





Wood Buffalo Environmental Association
Wind Rose 2016 - 2020

Wind Speed (WS) - km/h
Mildred Lake

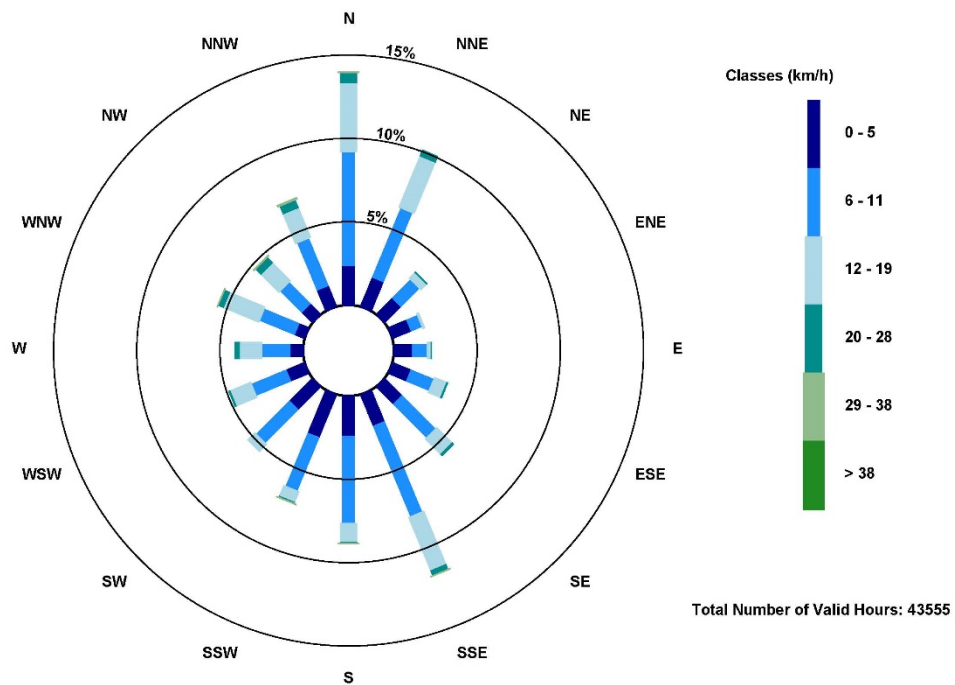


Figure 7.0 – Windrose (2016 – 2020)

