



Wood Buffalo Environmental Association
**Ambient Air Monitoring Station
Site Documentation**

Stony Mountain

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WBEA Monitoring Network

Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo (www.woodbuffalo.ab.ca) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO₂), Hydrogen Sulfide (H₂S), Total Reduced Sulphur (TRS), Ozone (O₃), Total Oxides of Nitrogen (NO_x), Nitric Oxide (NO), Nitrogen Dioxide (NO₂), Ammonia (NH₃), Carbon Monoxide (CO), Carbon Dioxide (CO₂), Particulate Matter less than 2.5µm (PM_{2.5}), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient (VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM_{2.5}, PM₁₀, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM₁₀ and PM_{2.5} time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All 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 WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO₂), nitrogen dioxide (NO₂), Ozone (O₃), particulate matter less than 2.5µm (PM_{2.5}), total reduced sulphur (TRS), hydrogen sulphide (H₂S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO₂), ammonia (NH₃). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO ₂	NO ₂	O ₃	PM _{2.5}	TRS	H ₂ S	THC	NMHC	CO	CO ₂	NH ₃
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	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	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	X			
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
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	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		X		
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM_{2.5}) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM₁₀) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM _{2.5}	PM _{2.5}	PM ₁₀	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	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		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

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

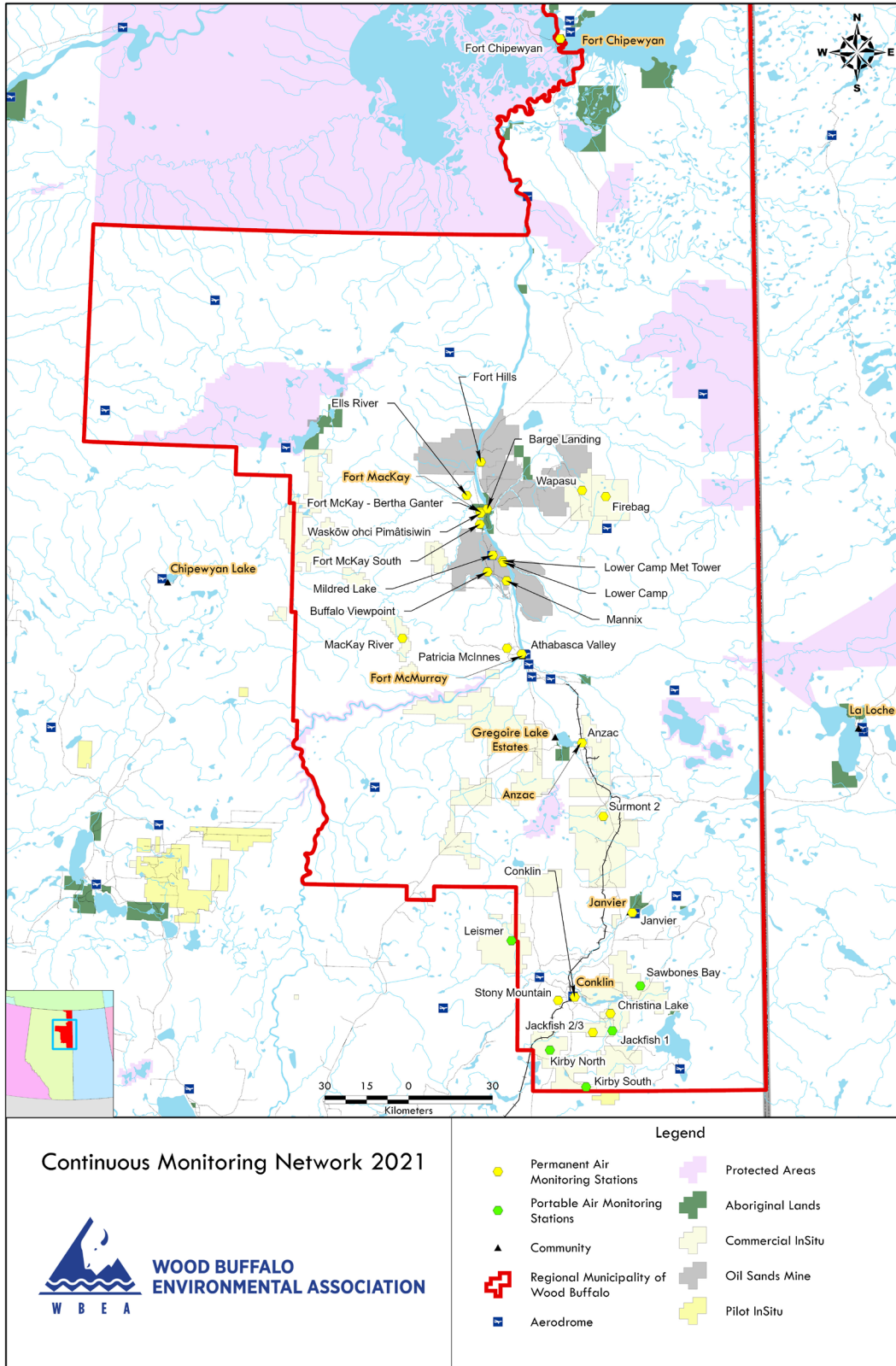


Figure 1.0 – WBEA Network Monitoring Sites

General Site Information

Station

Station ID	AMS 18
Station name	Stony Mountain
Date station established	June 2015

Location

Station street address	NA
Legal land description	1-33-076-08 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.621487
Longitude	-111.172798
UTM East	489125
UTM North	6163958
Nearest community	Conklin
Community population	229
Census Year	2018

Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	NA
Approval number	NA
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta, T9K 0K4
Phone number	780-799-4420
Email address	info@wbea.org

Site Description

Land use by sector	0 – 90 degrees	Trees
	91 – 180 degrees	Trees
	181 – 270 degrees	Trees
	271 – 360 degrees	Fire tower, trees
Site elevation (m) (above sea level)	673	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	None
	East	None
	South	None

	West	None
Distance to nearest trees (m)	North	30
	East	30
	West	30
	South	30
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	20
	Distance from station (m)	2

Site Influences

Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Fire watch tower	100 m NW of Station	Fire lookout tower, operated by the province of Alberta
Communication Tower	30 m E of Station	Cell tower

Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access road	Low	10	Dirt/sand road

Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Cenovus	SAGD	376,000	12.26	SE
CNRL	SAGD	105,000	15	SE

Station Equipment

Equipment Owner:

Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO ₂	Thermo Environmental	43i	1501301453	2015
TRS	Thermo Environmental	43i – TLE	1218153359	2021
NO ₂	Thermo Environmental	42i	1336160088	2016
THC	Thermo Environmental	55i	1426262594	2021
O ₃	Teledyne API	T400	825	2019
CO	Teledyne API	T300	3504	2021
CO ₂	Teledyne API	T360	283	2022
PM _{2.5}	Teledyne API	T640	1335	2022
BC	Magee Scientific	AE-33	327	2022
PC	N-CON Systems	00-120-2	60140	2018
EC/OC	Thermo Environmental	2000i-A-N	2000IW 20691 1702	2018

Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G0840106	3	2018
WS	Met One	010C-1	A1406	4	2022
WD	Met One	020C-1	NA	4	2022
PC	OTT	OTT Pluvio-2	363526	3	2016
LW	Decagon Devices	LWS-L	NA	N/A	2022
GR	Epply	8-48 Solar Rad	38007	N/A	2021

Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	12345
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	12345
Zero air generator	Zero Air Generator	Teledyne/API	701	12345
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	12345
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	12345

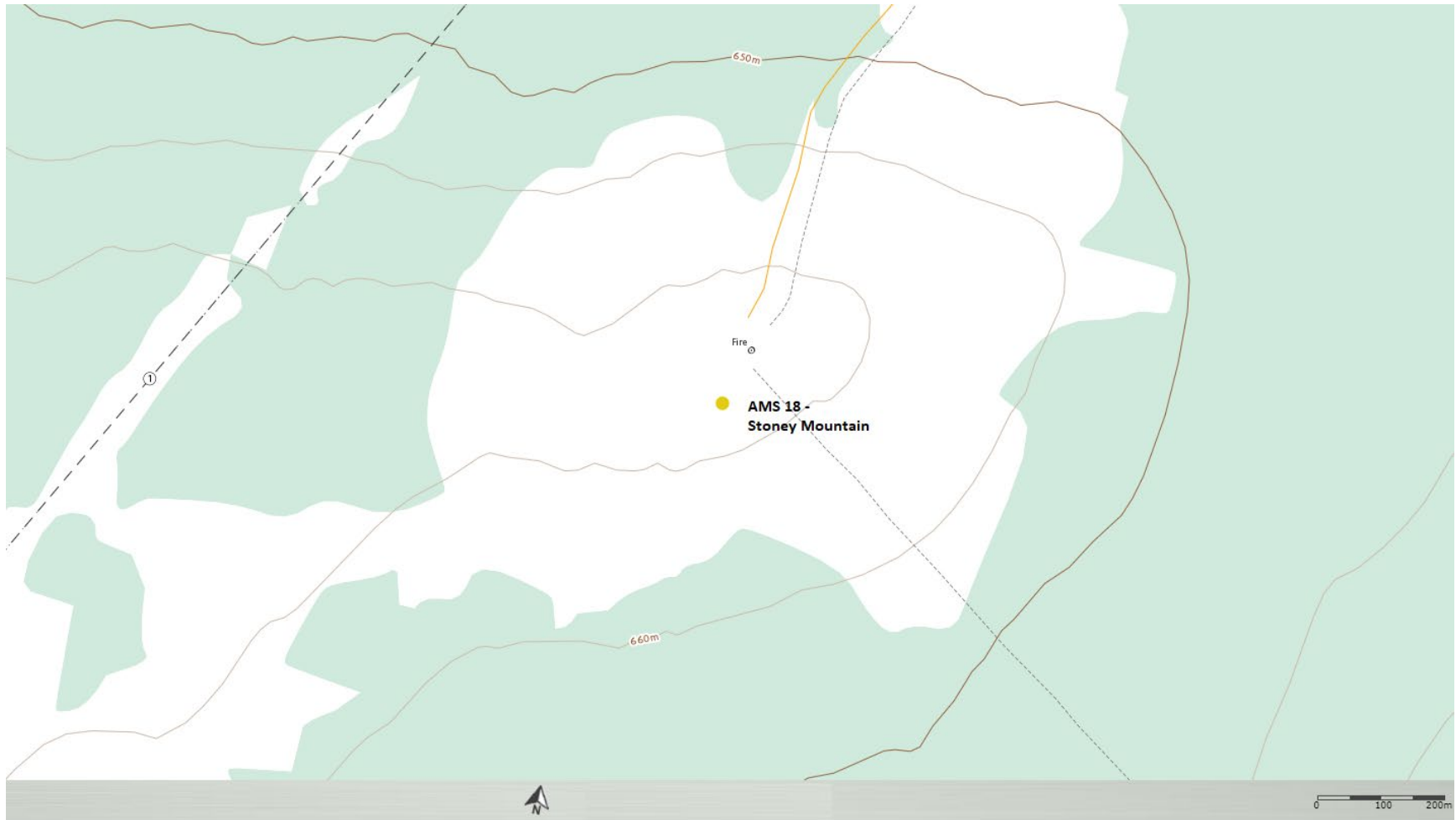


Figure 2.0 – Area topographic map showing AMS 18

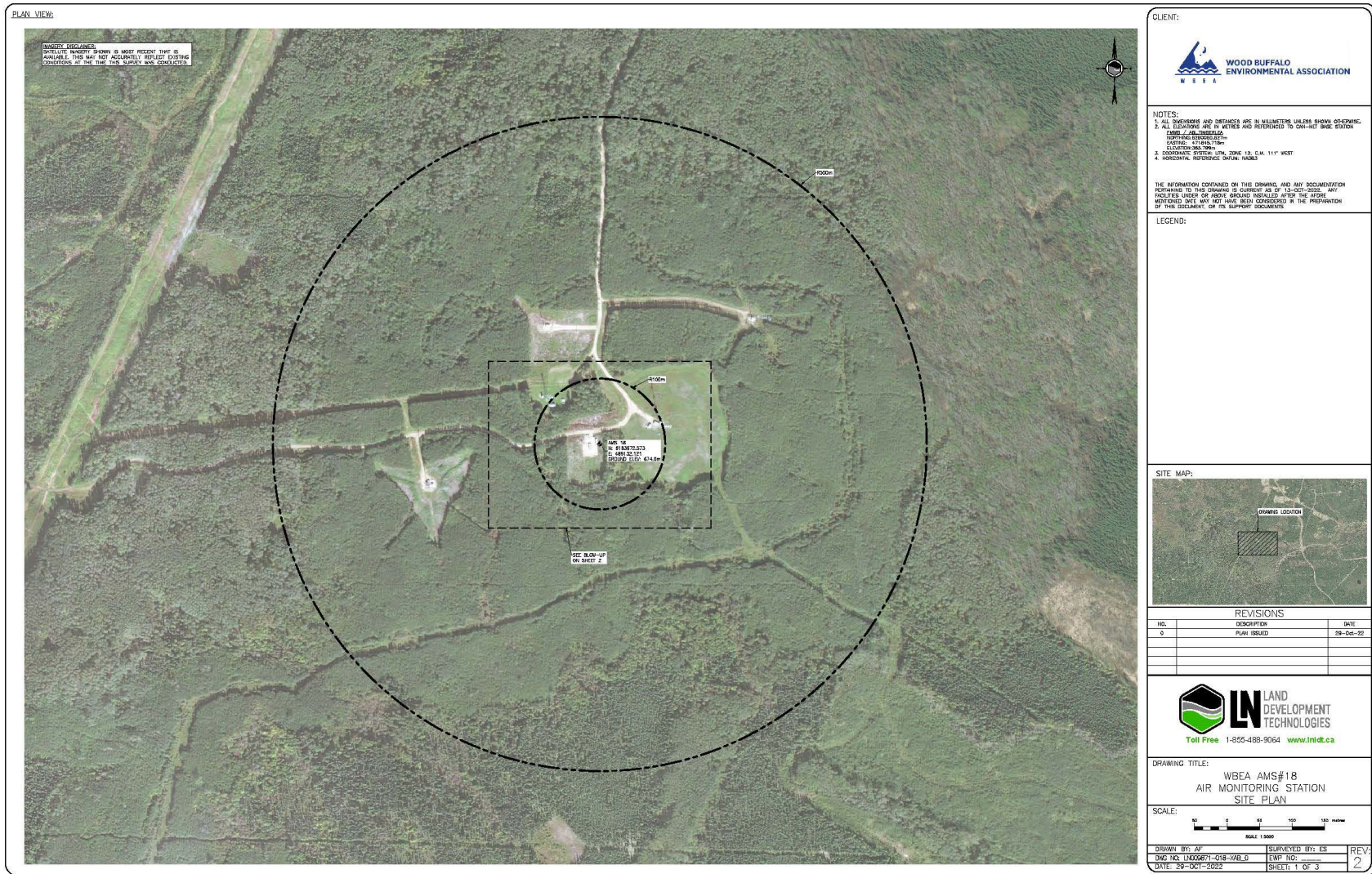


Figure 3.0 – Aerial photo showing AMS 18



Figure 4.0 – Plan view sketch for AMS 18 site

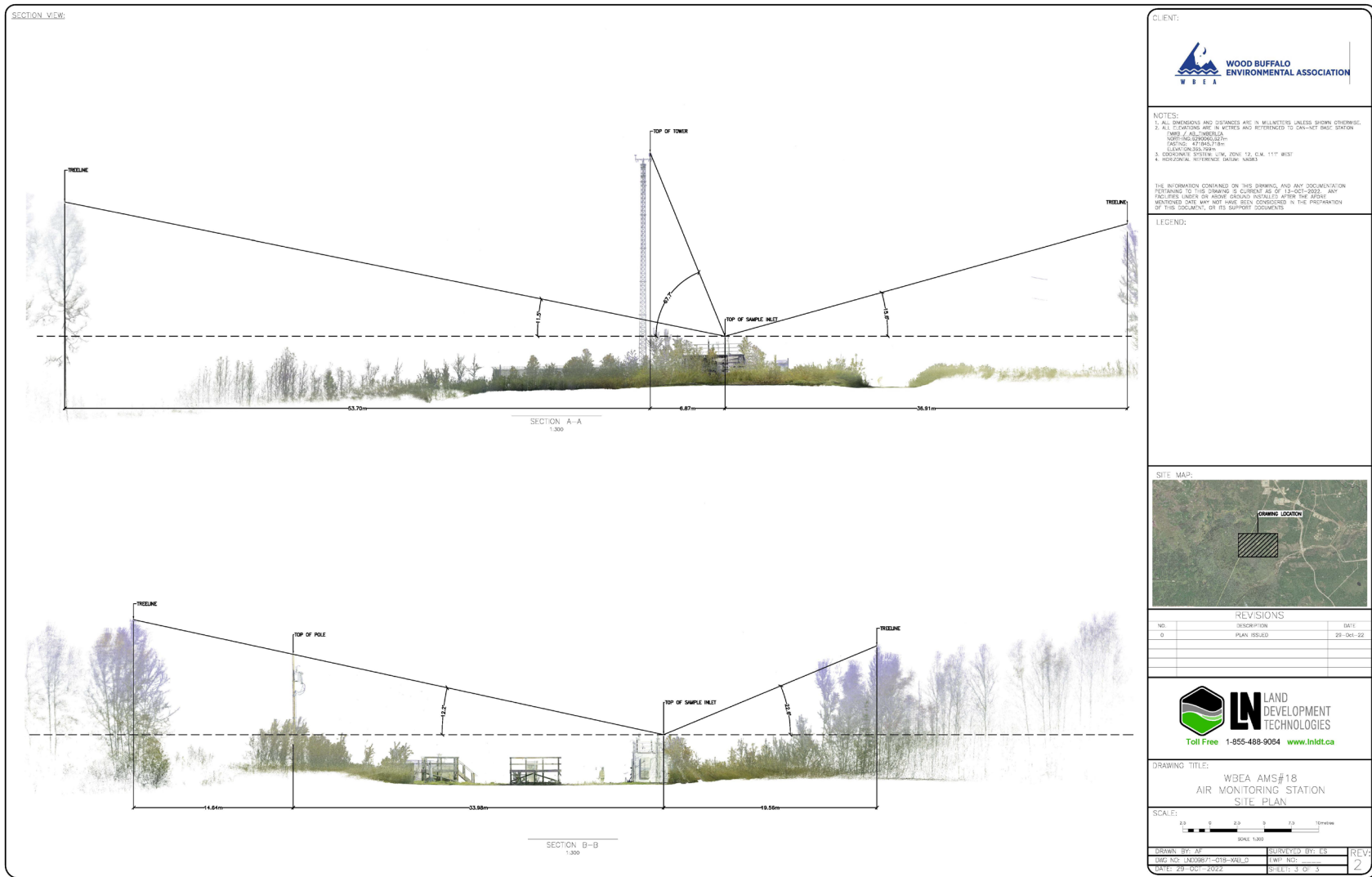


Figure 5.0 – Elevation view sketch for AMS 18 site

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East

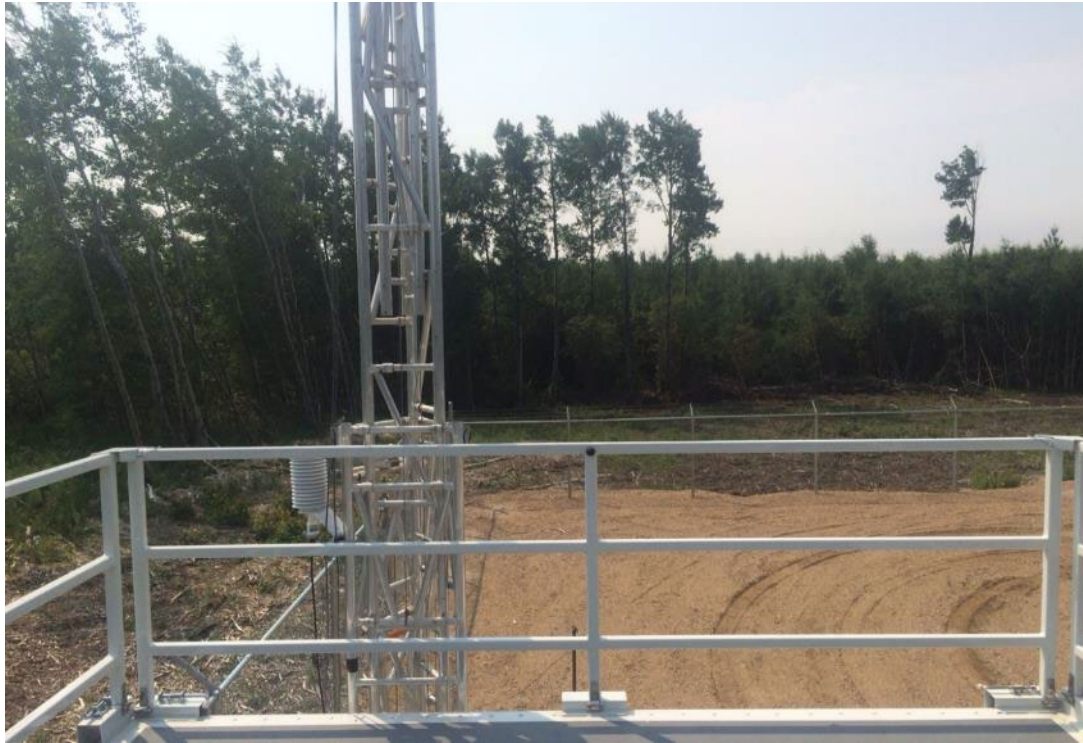


Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station

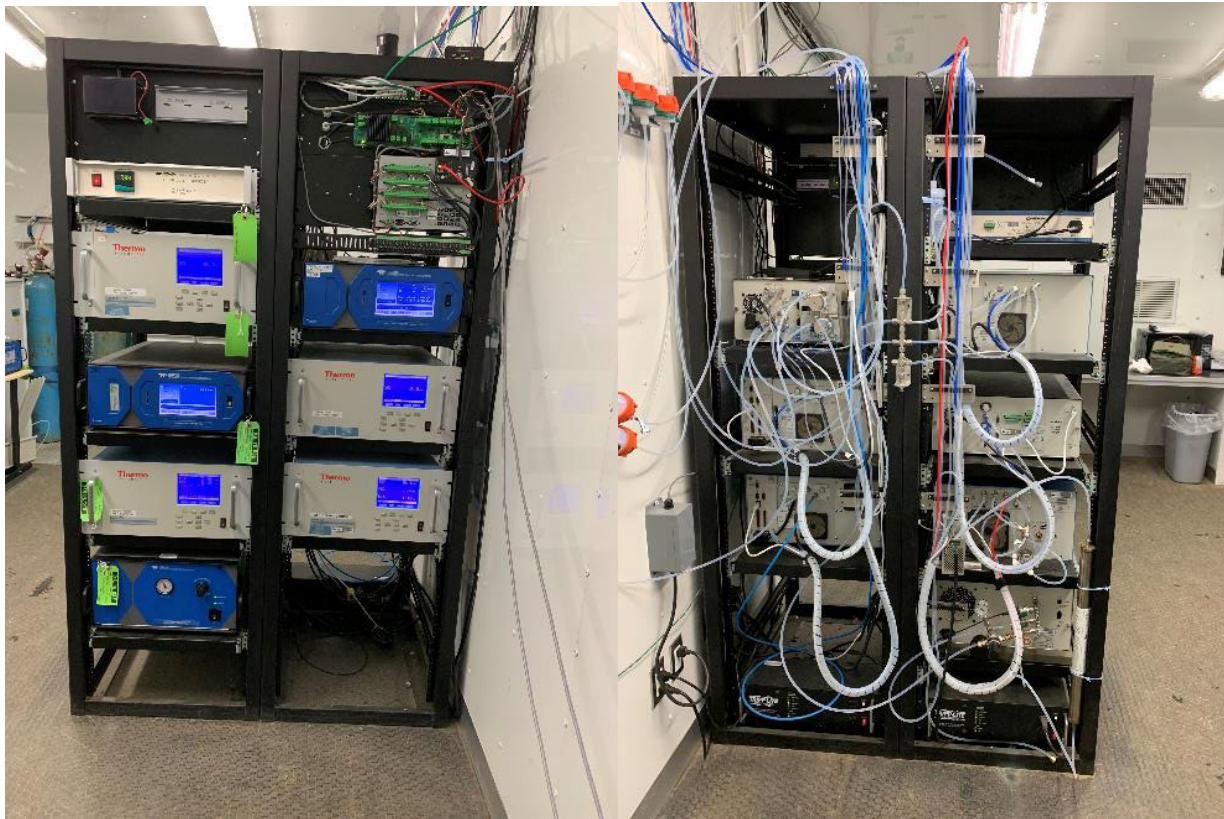




Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association
Wind Rose 2018 - 2022

Wind Speed 20 m (WS20m) - km/h
Stony Mountain

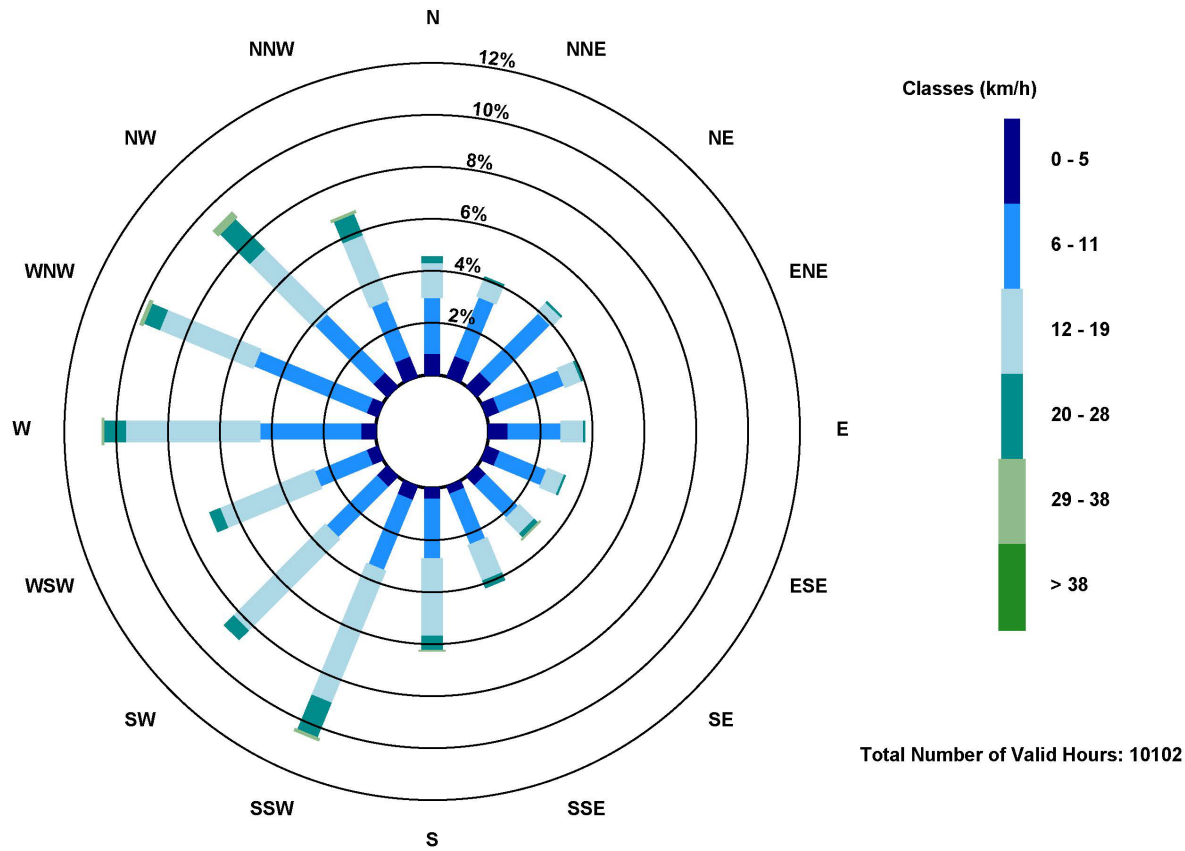


Figure 8.0 – Windrose (2018-2022)