



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 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), Total and Non-Methane Hydrocarbon (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 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, WS, WD, AT, RH. 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. 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 here site. These samples are collected every Tuesday at 12:00

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 hydrogen sulphide (H₂S), total reduced sulphur (TRS), sulphur dioxide (SO₂), nitrogen dioxide (NO₂), total hydrocarbons (THC), methane (CH₄), non-methane hydrocarbons (NMHC), ammonia (NH₃), carbon monoxide (CO), and carbon dioxide (CO₂). Sites are categorized as industrial or community, based on the setting in which they are located.

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	
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, relative humidity, wind speed, wind direction, vertical wind speed, solar radiation, precipitation, and leaf wetness

WBEA ID	TYPE	STATION NAME	Temperature	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				
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), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM _{2.5}	PM _{2.5}	PM ₁₀	PAH	PRECIP
					ECOC			
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	
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	
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	
23	COMPLIANCE	FORT HILLS	X			X		
30	COMPLIANCE	ELLS RIVER	X			X		

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



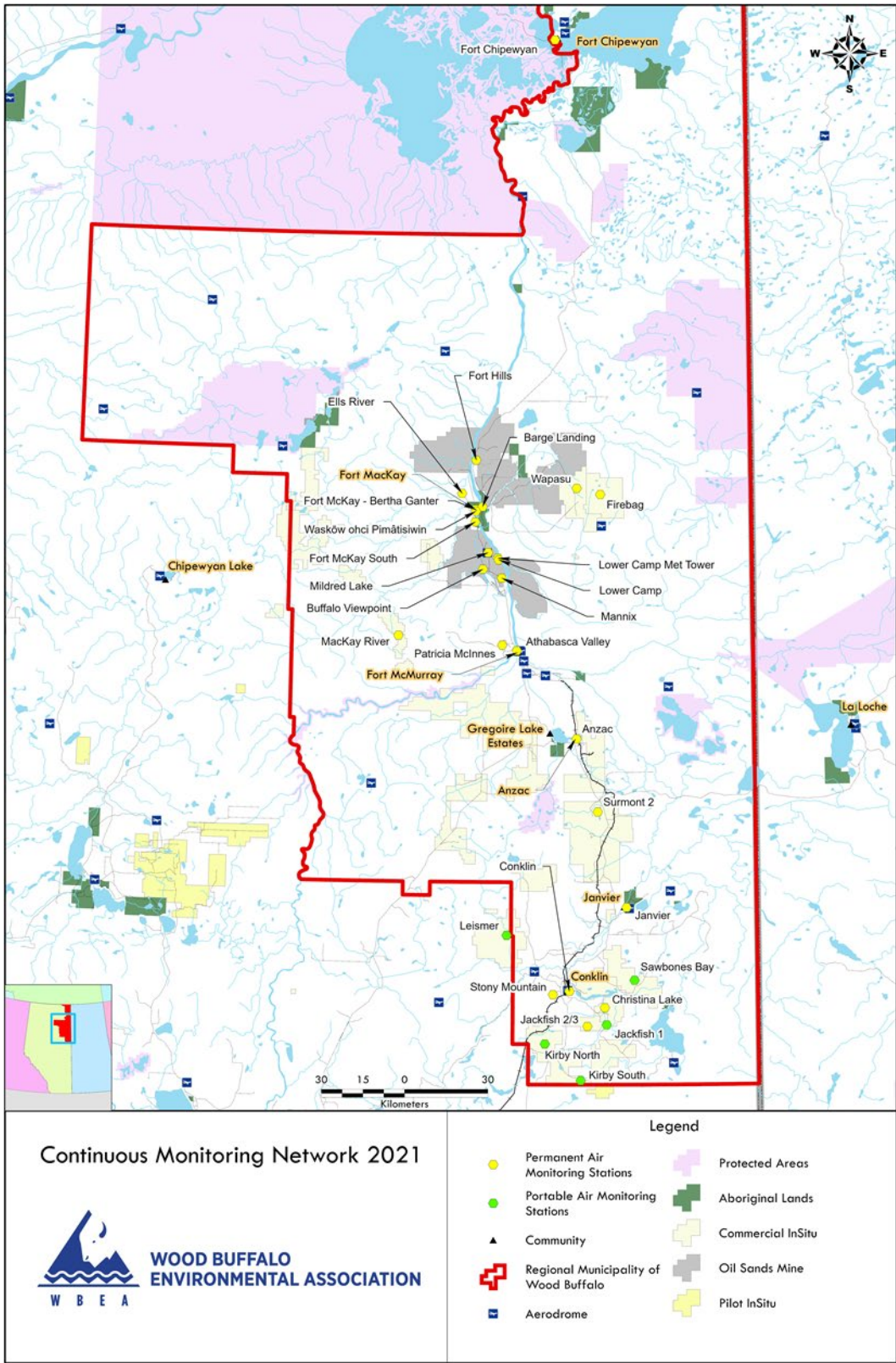


Figure 1.0 – WBEA Network Monitoring Sites General Site Information

Station

Station ID	AMS 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	55.632330
Longitude	-111.078877
UTM East	495034
UTM North	6165163
Elevation	559.9
Nearest community	Conklin
Community population	185
Census Year	2016

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
Shipping Container	20	SEA-CAN
Free-Standing Structure	20	Gazebo – made of wood.
Watercraft	20	Speed Boat

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



Station Equipment

Equipment Owner: WBEA

Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Environmental	43i	JC1428701363	2016
TRS	Thermo Environmental	43i-LTE	1236656116	2016
TRS	CD Nova	CDN-101	NA	2016
NO2	Thermo Environmental	42i	1501663731	2016
NMHC	Thermo Environmental	55i	1118148495	2021
O3	Thermo Environmental	49i	1501663734	2016
PM2.5	Teledyne/API	T640	1547	2022
PM2.5	Thermo Environmental	2000i	2000iW208842002	2020
PM2.5	Thermo Environmental	2000i	2000iW200822002	2020
PM10	Thermo Environmental	2000i	2000iW200812002	2020
PM10	Thermo Environmental	2000i	2000iW208832002	2020
VOC	Tisch Environmental	TE-123	1019	2020

Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	S3550333	3	2016
WD	Met One	010C-1	P22886	2	2020
WS	Met One	020C-1	J4337	2	2016

Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9628
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3810
Zero air generator	Zero Air Generator	Teledyne/API	T701H	691
Shelter / Building	Air monitoring portable	ITB	10x20 trailer	ITB-14-16423
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Tower	10 Tower	Aluma	T-135	AT-215036-AA-5-3
Deck	Wooden Deck	NA	10x20	NA



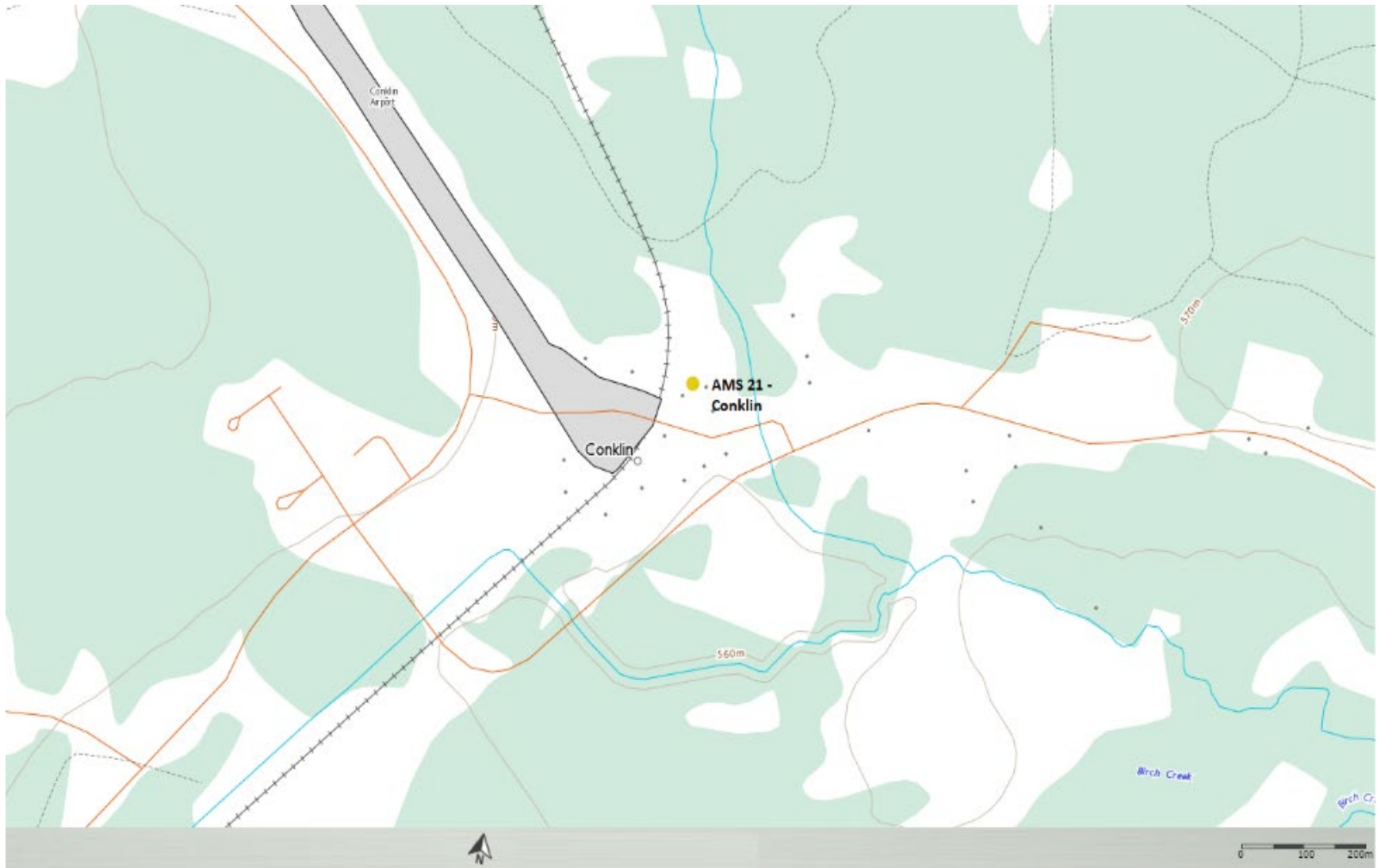


Figure 2.0 – Area Topographic map showing AMS 21

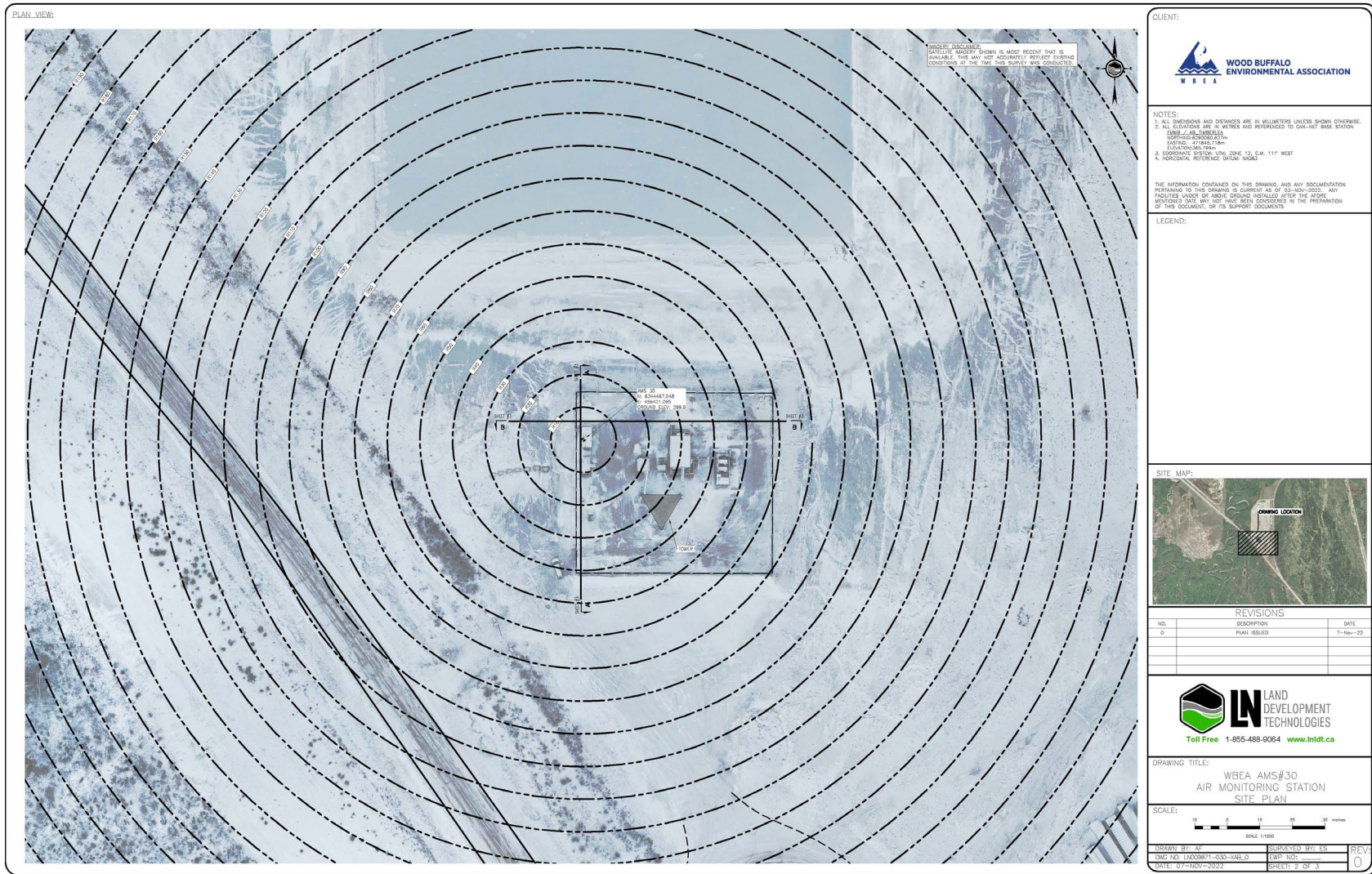


Figure 3.0 – Plan view sketch for AMS 21 site

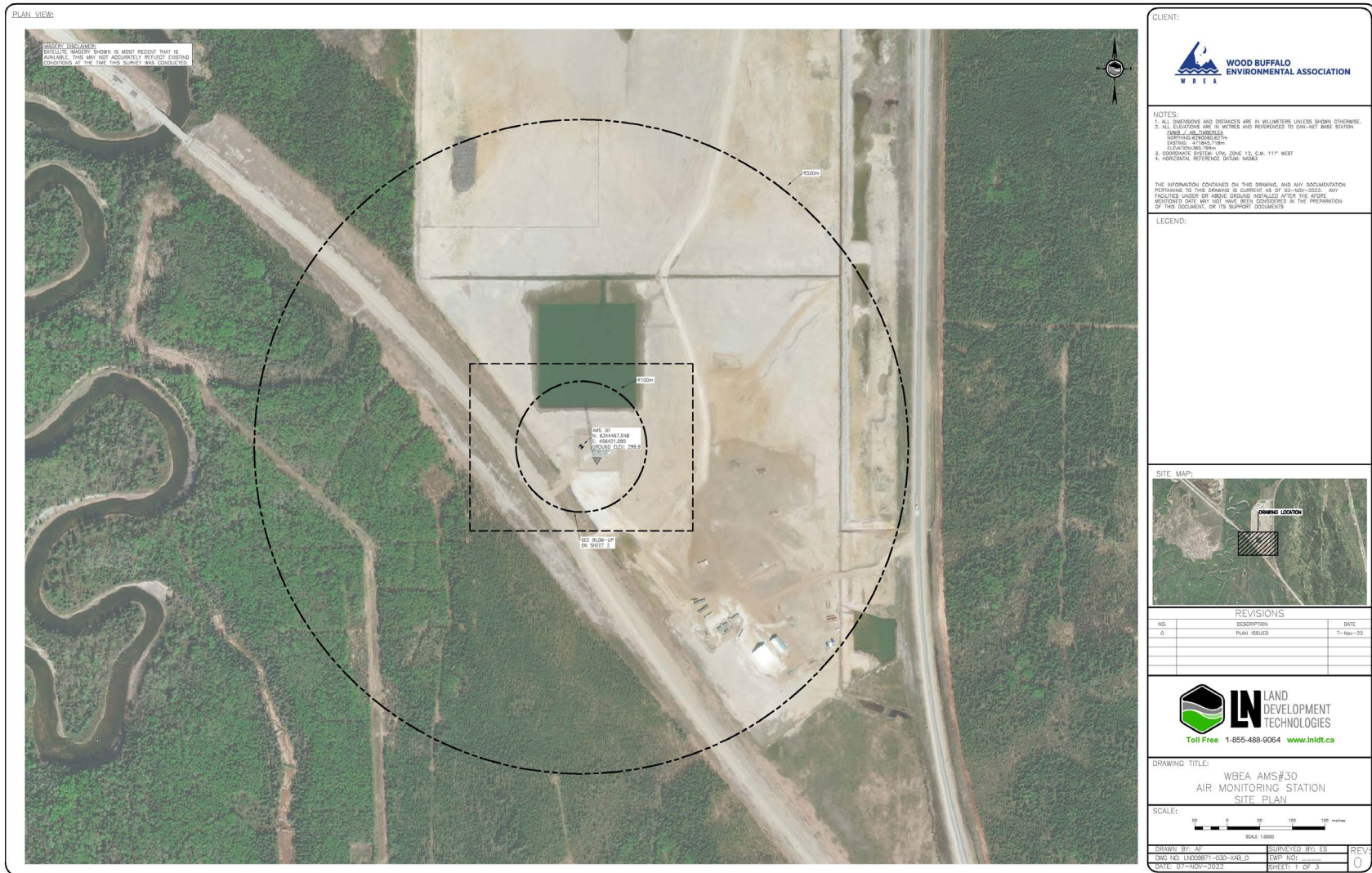


Figure 4.0 – Aerial photo showing AMS 21

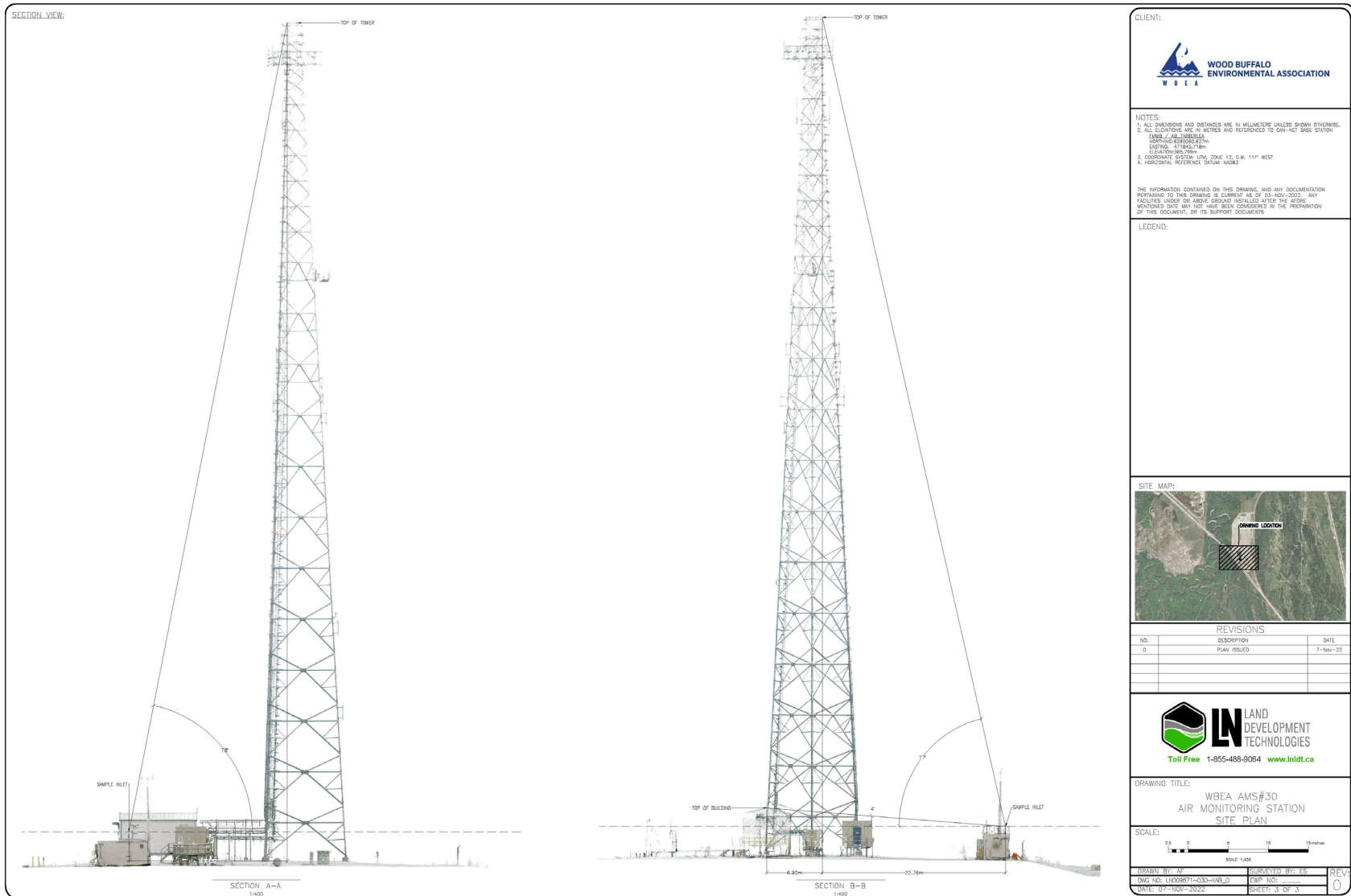


Figure 5.0 – Cross Section Elevation Drawing of AMS 21

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 front and back of instrument rack



Wood Buffalo Environmental Association
Wind Rose 2018 - 2022

Wind Speed (WS) - km/h
Conklin

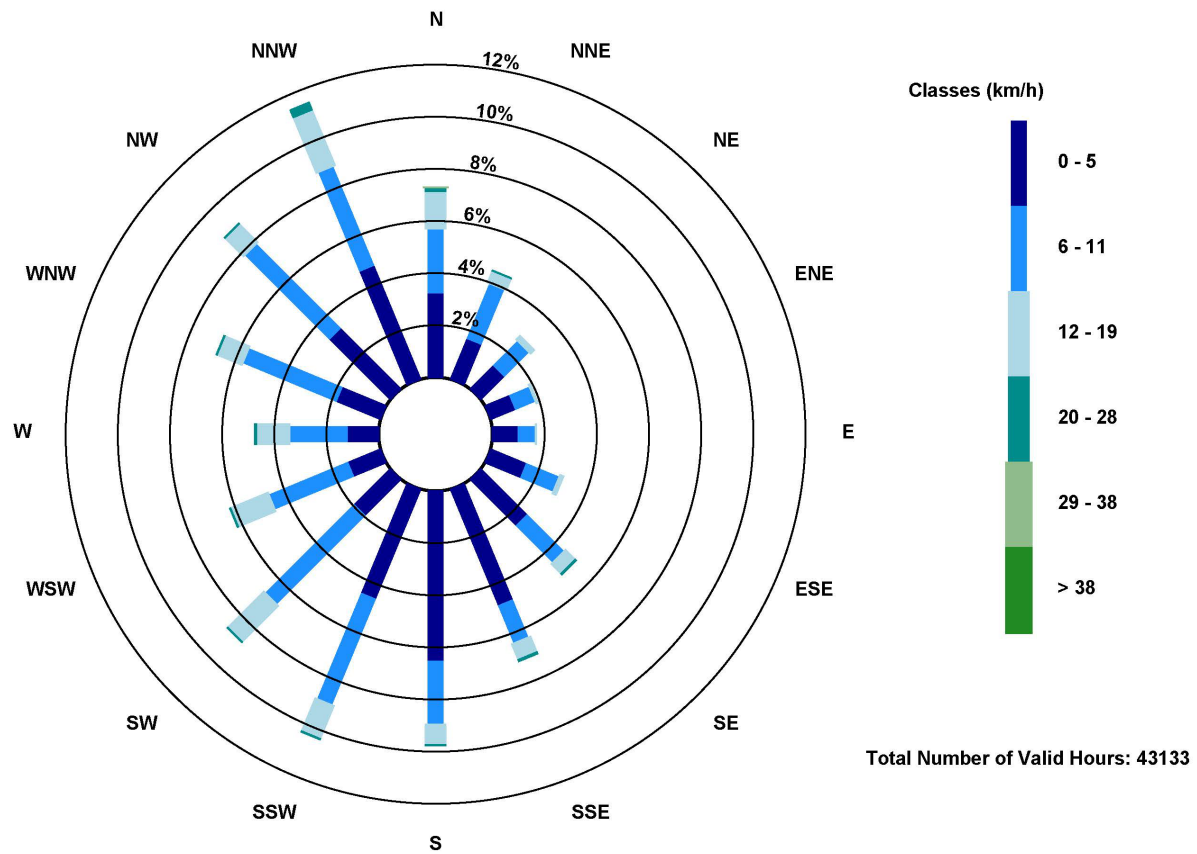


Figure 8.0 – Windrose (Five Year)