

Site Documentation: Cold Lake South Continuous Monitoring Station

General Site Information

Item	Description
Site ID (CASA ID)	LICA01
Station Name	Cold Lake South Continuous Monitoring Station (CLS)
General Description	The CLS monitoring station is located in the City of Cold Lake’s south service yard in Cold Lake South near CFB’s 4-Wing Air Force Base.
Community	City of Cold Lake
Station Address	62 nd Street & 50 th Avenue
Coordinates	N542450 W1101359
Station Type	Urban Regional
Area Land Use	Residential
Angle of elevation to nearby building in area	<15 degrees, water storage tank to the north and bungalow to the east.
Airflow Restrictions (yes/no)	North: No East: No South: No West: No
Nearest Tree	Tree stands 80 – 100 meters away in the north, west, and south
Sample Manifold Type	Glass
Meteorological Tower Information	Height: 10 meters Type: Crank Position: Attached to south side of monitoring shelter
Station Install Date	Original installation: November 2005 Shelter replaced: June 2006
Station Origin	Alberta Environment and Parks (AWP) Owned
Site Preparation	Open grassy area

Site Influences

Localized Sources (within 20 meters of station)

Type	Distance	Description
Automobile	To the east	Residential Streets
Home heating	To the east	Residences

Road Way Sources

Name	Type	Traffic Volume	Distance (m)	Description
60, 61, 62 – Street	Residential Street	Unknown – Minimal	Within 400 meters	Side Street
50, 51, 52 – Avenue	Residential Street	Unknown – Minimal	Within 400 meters	Side Street
Central Avenue / Kingsway / 48 Avenue	Artery Road	Unknown – Moderate	300 meters	Access Road to CFB Cold Lake – 4-Wing

Major Point/Area Sources

Name	Type	Major Emissions	Distance (m)	Direction
CFB Cold Lake	Air Force Base	NOx, PM, HC, TRS (asphalt plant)	3km to aircraft Hangars	West
City of Cold Lake (Cold Lake South)	City	NOx, PM, HC	1.5km to City center	East



Figure 1: Satellite image showing CLS Continuous Monitoring Station Location

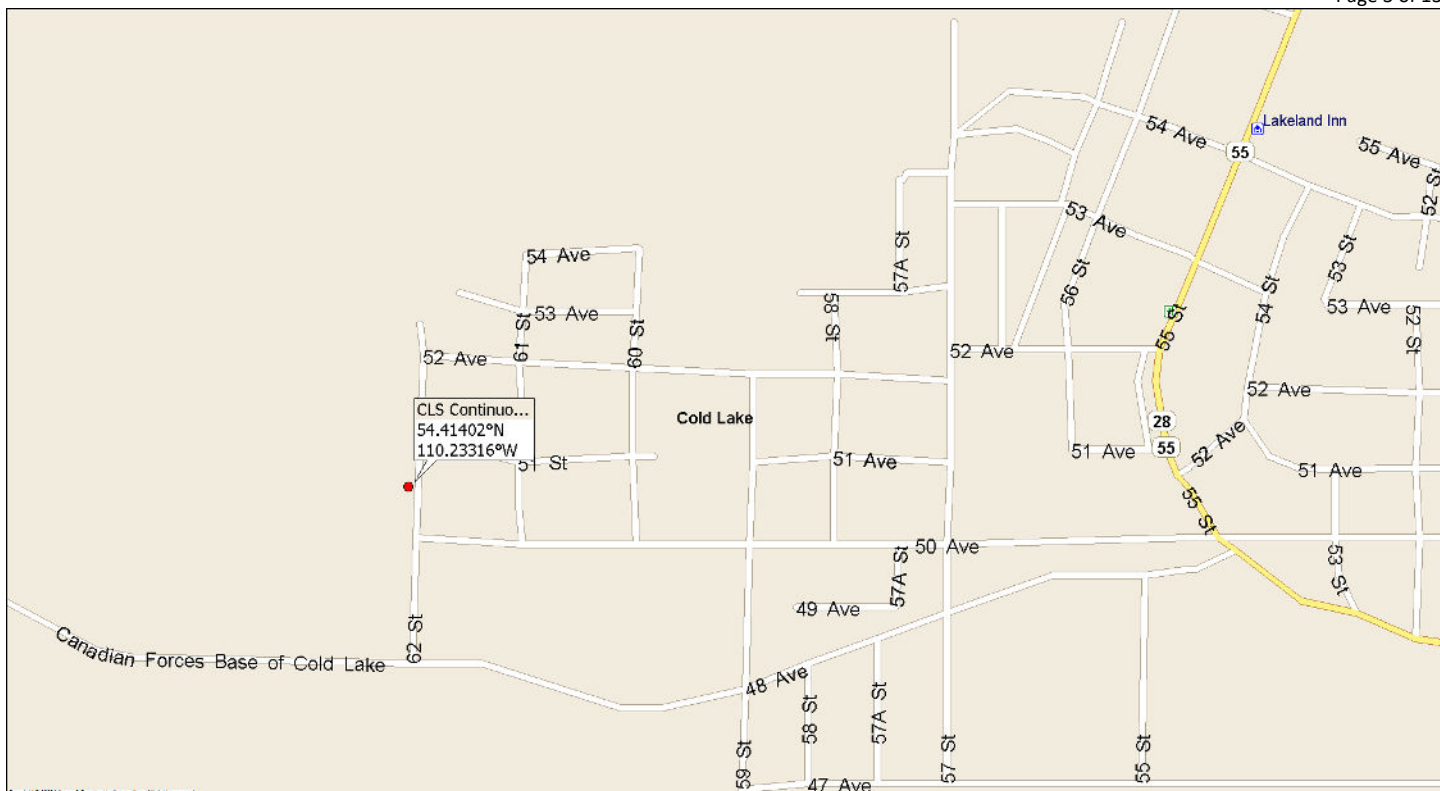


Figure 2: Road Map showing CLS Continuous Monitoring Station Location

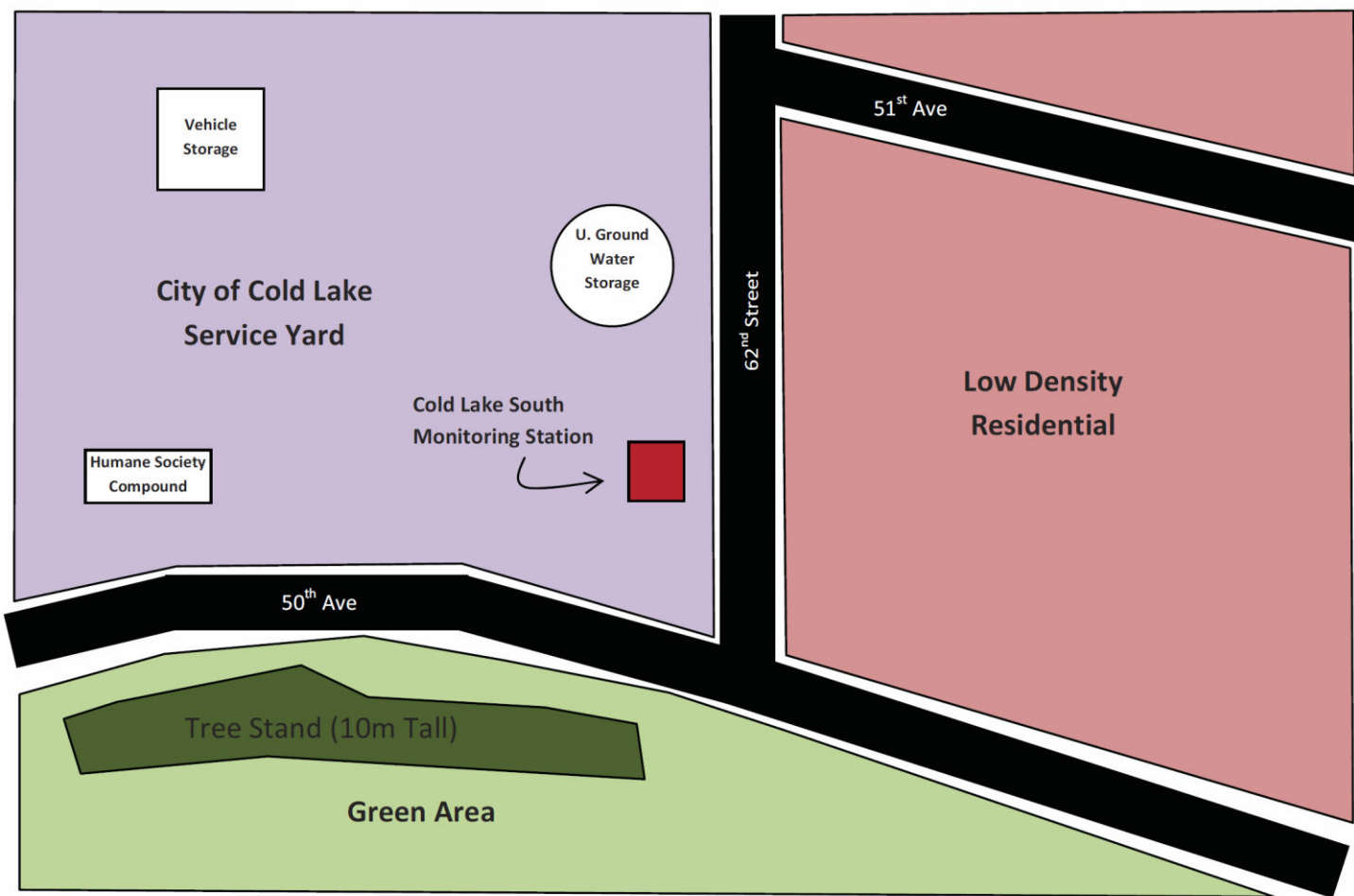
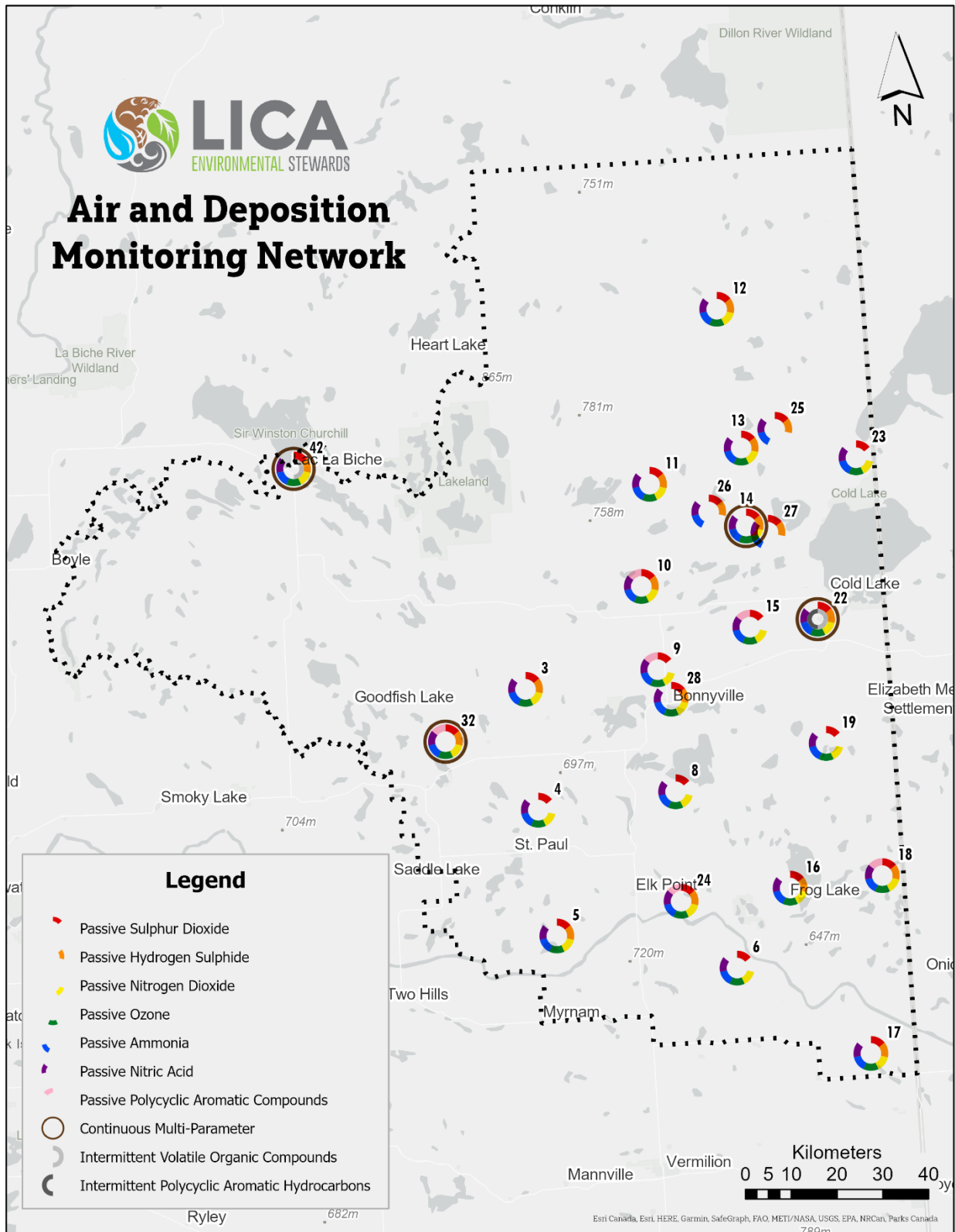
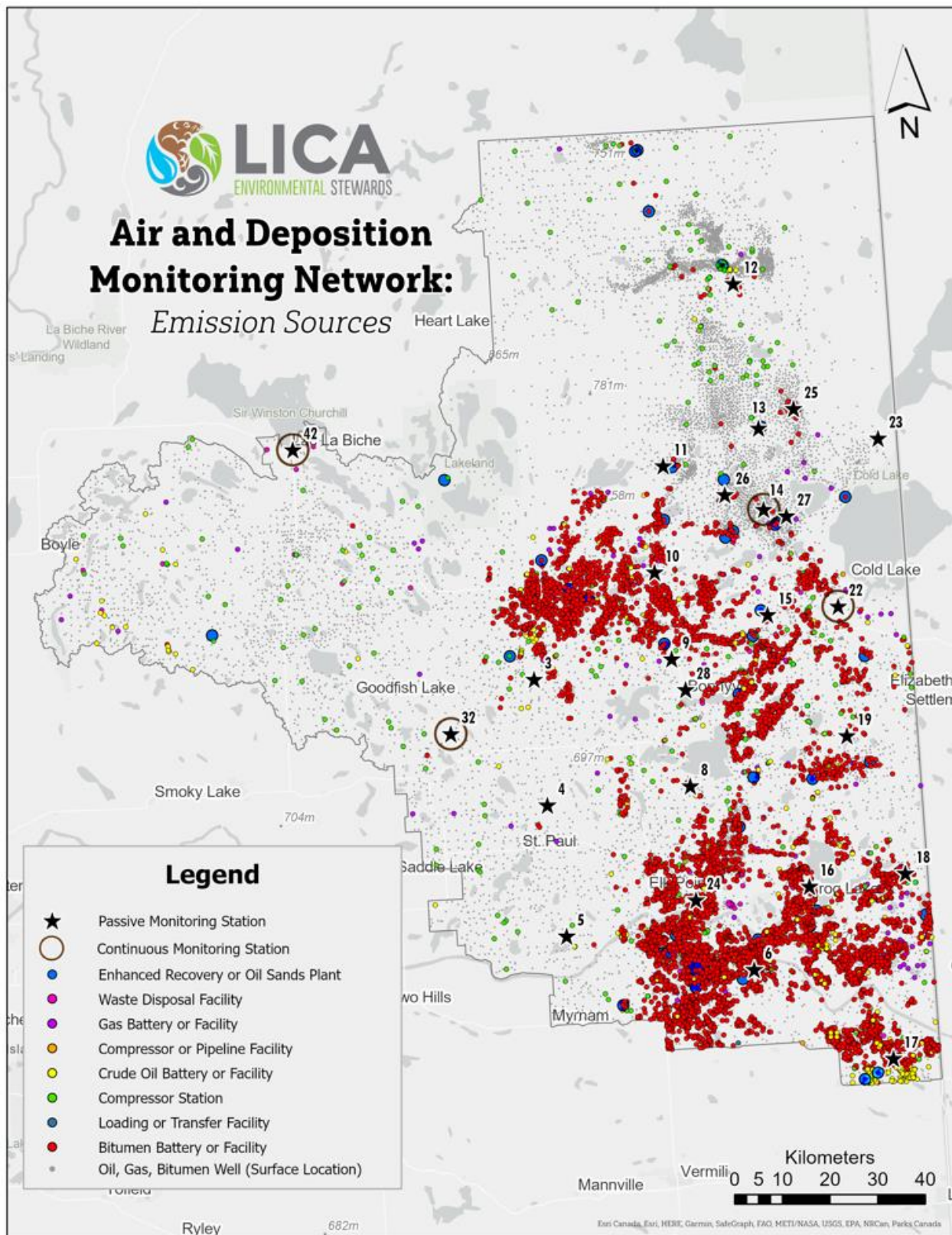


Figure 3: Schematic showing CLS Continuous Monitoring Station and surrounding features.





LICA Network Map



LICA Network Map – Emission Sources



Site Photographs – Cardinal Directions

North	East
 A photograph taken from the North looking towards the site. The foreground is covered in snow with utility poles and power lines. In the middle ground, there is a white rectangular structure and a larger white dome-shaped structure. The background shows a line of trees and a clear blue sky.	 A photograph taken from the East looking towards the site. A white rectangular structure is in the immediate foreground. Behind it is a fence and a snow-covered area. In the background, there are residential houses, trees, and utility poles under a clear blue sky.
South	West
 A photograph taken from the South looking towards the site. The foreground is snow-covered with utility poles and power lines. A dense line of evergreen trees is visible in the background under a clear blue sky.	 A photograph taken from the West looking towards the site. A white rectangular structure is in the foreground. Behind it is a fence and a snow-covered area. In the background, there are buildings, utility poles, and a cloudy sky.

Site Photographs – Monitoring Station

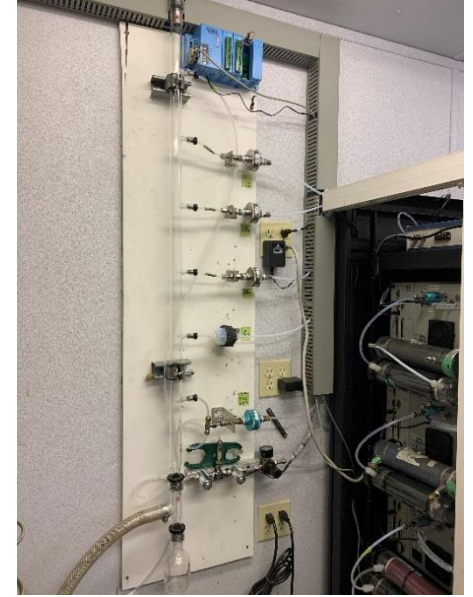
Exterior (AQM Shelter)



Interior (Instrument Rack)



Interior (Intake Manifold)



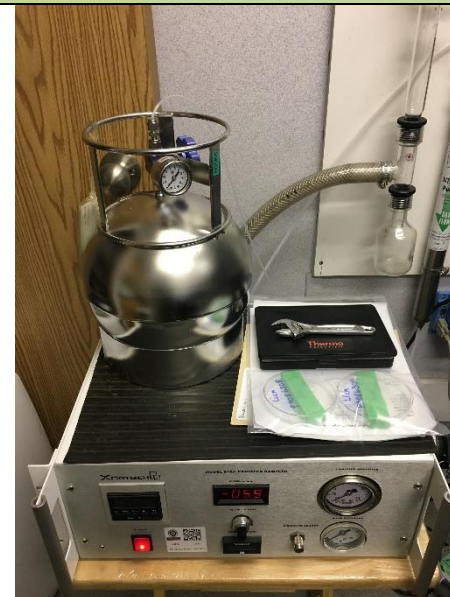
Interior (Gas Cylinders)



Interior (modem and communications connections)



Interior (VOC canister system)



Exterior (PUF Sampler)



Exterior (Partisol Sampler)

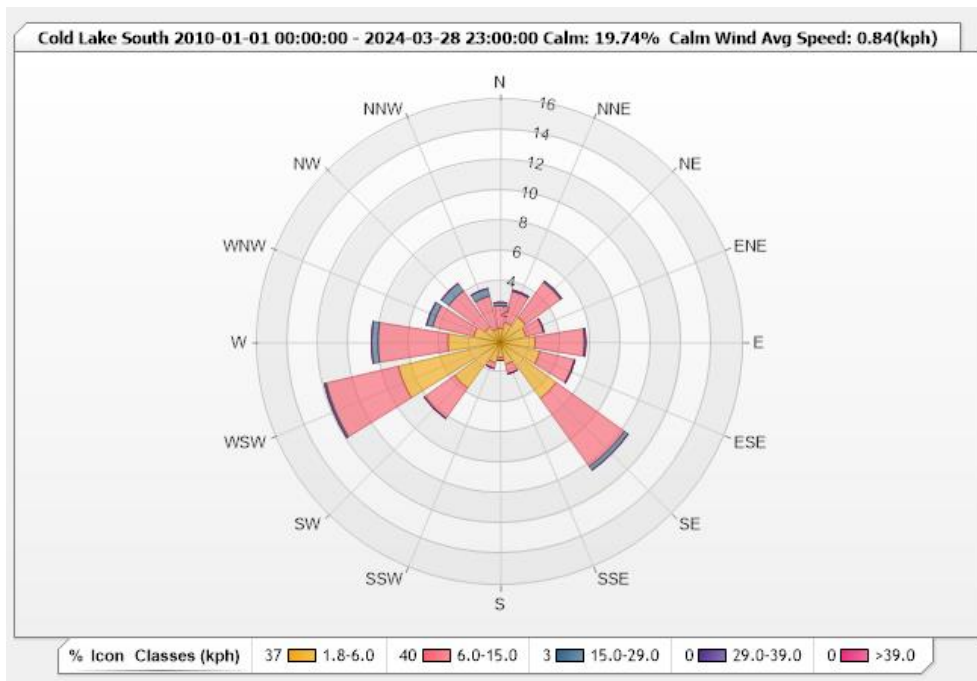


Exterior (PM Manifold / Sample Inlet)

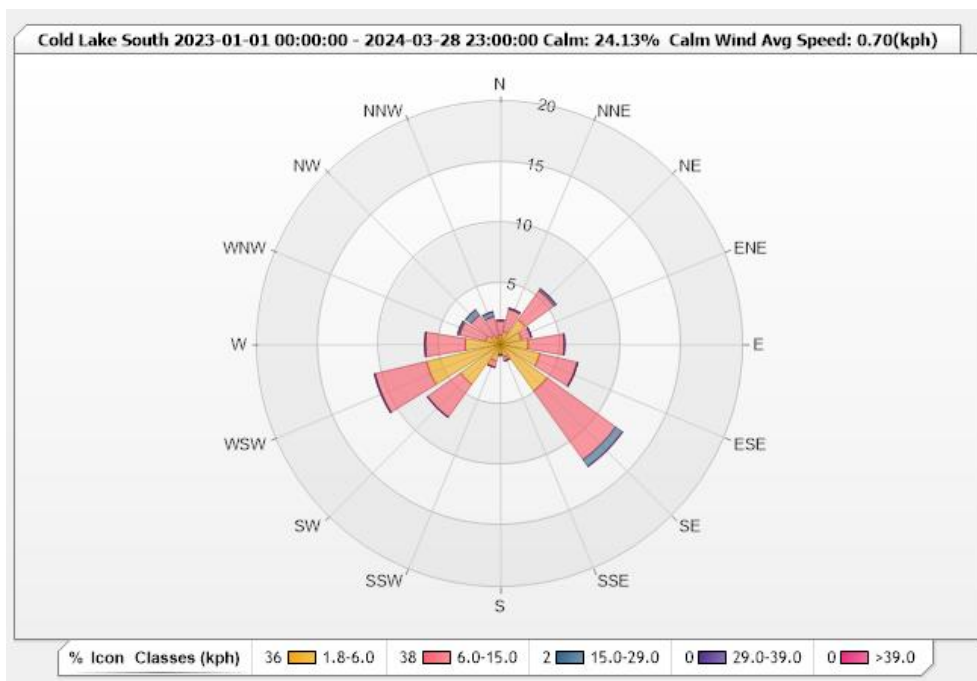


Wind Rose Diagram

Wind Speed / Direction Frequency Distribution



Data range: January 1, 2010 – March 28, 2024



Data range: January 1, 2023 – March 28, 2024

Cold Lake South Continuous Monitoring Station Equipment Inventory

Air Quality

Parameter	Make/Model	Serial Number	Sampling Height (m)	Equipment Owner
Analytical Systems				
Total Reduced Sulphur	Thermo / 450i	812728560	4	Alberta EPA
Sulphur Dioxide	Thermo / 43i-TLE	11800260018	4	Alberta EPA
Oxides of Nitrogen	Thermo / 42i	1505664393	4	Alberta EPA
Ozone	Thermo/ 49iQ	12208316585	4	LICA
Particulate Matter ≤2.5µm	Teledyne T640	575	5	LICA
Hydrocarbons	Thermo / 55i	1236656107/1180930025	4	LICA/Alberta EPA
Volatile Organic Compounds	Xontech 910a	6200	5	LICA
Polycyclic Aromatic Hydrocarbons	Tisch PUF+	100-1020	5	LICA
Partisol	Partisol 2000i-D	200DIW202441804	5	LICA
Meteorological Systems				
Wind Speed	RM Young 05305AQ	177354	10	LICA
Wind Direction	RM Young 05305AQ	177354	10	LICA
Ambient Temperature	Rotronic HC2A-S3	20257103	4	LICA
Relative Humidity	Rotronic HC2A-S3	20257103	4	LICA
Barometric Pressure	Met One / Part 092	Y23368	4	LICA
Support Systems				
Datalogger	Ultimate IPC-510	KMA3518733	N/A	LICA
Trailer Temperature	COMET	N/A	N/A	Alberta EPA
Thermal Oxidizer	CD Nova CDN 101	250	N/A	Alberta EPA
Air Dryer	Bendix 8833	54357-91/KD42150	N/A	Alberta EPA
Auto Zero / Span	Environmental Devices 200	43	N/A	Alberta EPA
Auto Zero / Span	Environmental Devices 200	34	N/A	Alberta EPA
Trailer	National Trailer	2N9MF63843	N/A	Alberta EPA
Portable Ozone Synthesizer	Monitor Labs 8500	2055	N/A	Alberta EPA
Zero Air Generator	Teledyne API 701	1108	N/A	LICA
Hydrogen Generator	AMA HG300	210567071	N/A	LICA

Owner/Approval Holder

Item	Description
Name of owner/approval holder	Alberta Environment and Park (AEP)
Address	Main Floor, Great West Life Building 9920 108 Street Edmonton Alberta Canada T5K 2M4
Contact name	Mike Bisaga
Phone number	(780) 266-7068
Email address	monitoring@lica.ca
Approval number	N/A

Operator

Item	Description
Name of operating agency	Bureau Veritas Canada
Address	#1 2080 39 th Ave NE Calgary, AB T2E 6P7
Contact name	Alexander Yakupov
Title	Field technician, Emission Services
Phone number	(780) 545-9363
Email address	Alexander.yakupov@bvlabs.com
Contact name	Chris Wesson
Title	Senior Project Manager, Emission Services / Oil & Gas Division
Phone number	(780) 446-2724
Email address	Christopher.wesson@bvlabs.com

Revisions

Document Revision History

Revision No.	Date	Reason for Revision	Prepared By	Approved By
1	March 2008	Original Issue	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
2	November 2008	Updated equipment list after new Alberta Environment analyzers were installed. Added document revision history table to site documentation.	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
3	January 2009	Updated equipment list after TEOM FDMS was installed	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
4	May 2009	Added box plot and elevation map	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
5	June 2013	Update trailer equipment list, wind rose diagram	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
6	September 2015	Update trailer equipment list, serial numbers, wind rose diagram, AEMERA ownership	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
7	July 2017	Updated trailer equipment list, serial numbers, wind rose diagram Added Owner/operator info	M. Bisaga, Airshed Program Manager	M. Bisaga, Airshed Program Manager
8	May 2018	Added LICA Network Map, updated wind rose diagram, operator contact info	L. Lin, Data & Reporting Specialist	L. Lin, Data & Reporting Specialist
9	February 2019	Updated trailer equipment list and serial numbers	L. Lin, Data & Reporting Specialist	L. Lin, Data & Reporting Specialist
10	March 2020	Updated trailer equipment list, serial numbers, site photos, operator contact info and wind rose diagrams	L. Lin, Data & Reporting Specialist	L. Lin, Data & Reporting Specialist
11	January 2021	Updated trailer equipment list, serial numbers, site photos and wind rose diagrams	L. Lin, Data & Reporting Specialist	L. Lin, Data & Reporting Specialist
12	March 2022	Updated trailer equipment list, serial numbers, site photos, network map and wind rose diagrams	L. Lin, Data & Reporting Specialist	L. Lin, Data & Reporting Specialist
13	March 2023	Updated trailer equipment list, serial numbers, network map and wind rose diagrams	L. Lin, Data & Reporting Specialist	M. Bisaga, Airshed Program Manager
14	March 2024	Updated trailer equipment list, serial numbers, and wind rose diagrams	L. Lin, Data & Reporting Specialist	M. Bisaga, Airshed Program Manager