

May 2, 2025

File No(s). 2025 - 012A – 033A

Michael Bisaga  
Lakeland Industry and Community Association  
PO Box 8237  
Bonnyville, Alberta  
T9N 2J5

Mr. Bisaga:

**Subject: 2025 LICA Ambient Air Monitoring Network Audit Results**

Between the dates of April 22 – April 25, 2025, Alberta Environment and Protected Areas (AEPA) conducted an audit of the Lakeland Industry and Community Association (LICA) ambient air monitoring network. During this audit period, the Thermo 5030i PM2.5 samplers were not completed as the AEPA Standard Operating Procedure is under development.

The following is a station-by-station breakdown of the audit findings/observations.

**Lac La Biche Station:**

All audit results met AMD criteria.

**Cold Lake South Station:**

All audit results met AMD criteria.

**Tamarack Station:**

All audit results met AMD criteria.

**St. Lina Station:**

All audit results met AMD criteria with one exception. The non-methane response failed (>+/-10 %) at the low concentration point. AEPA tried to replicate the response in the office but came up with the proper response. AEPA is of the opinion based on compliance for slope, intercept and correlation, that the erratic low response noted may be due to an instrument issue at the time of the audit. AEPA is recommending maintenance be completed on the sampling mechanism inside the analyzer.

**Opportunities for improvement noted:**

The relative humidity sensor at Cold Lake South did not meet audit tolerances. It was outside the +/- 15% used for audit purposes.

The ambient temperature and relative humidity sensor at Tamarack did not meet audit tolerances. Audit tolerance for temperature sensors is +/- 1°C and +/- 15% for relative humidity. Recommend cleaning the sensor, cleaning the radiation shield, and recalibrating as required.

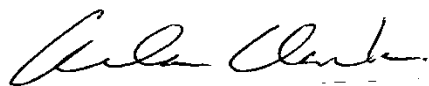
The shelter door at Cold Lake South needs repairs or replacement. The skin and bottom door frame are in very poor condition. See attached picture.

The temperature and relative humidity sensor radiation shield at Tamarack was inverted such that it was vertical but facing downwards. It was corrected at the time of notification by the operator, and it was also noted that moisture had collected on the bottom side of the radiation shield. Recommend proper fastening be completed. See attached picture.

The network site document audit did not meet AMD required elements according to Chapter 3, section 4, subsection 4-C. Recommend updating network site documentation to include all elements. See field sheets for missing elements. This is a carry over from the 2024 audits conducted.

LICA will be required to provide a response by May 30, 2025, that meets AMD Chapter 8 section 5.3 for all items noted in this audit cover letter. If you have any questions or comments, please contact the undersigned at 780-427-7888.

Yours truly,



Al Clark  
Monitoring Systems Auditor

Environment and Protected Areas  
Resource Stewardship Division  
Airshed & Watershed Stewardship Branch  
Air Monitoring  
4946 – 89 street  
Edmonton, Alberta T6E 5K1  
Office: 780.427.7888 Cell: 780.818.8945  
Fax: 780.422.2011  
[al.clark@gov.ab.ca](mailto:al.clark@gov.ab.ca)

Attachments:

Station Audit Reports  
Audit Summary Report  
Site pictures from CLS and Tamarack

cc: Marty Collins - Manager, AEPA  
Kristina Morris – Executive Director, LICA  
Prabal Roy – Senior Air Quality Specialist, AEPA  
[air.data@gov.ab.ca](mailto:air.data@gov.ab.ca)  
[air.reporting@gov.ab.ca](mailto:air.reporting@gov.ab.ca)



Cold Lake South shelter door



Tamarack temperature / relative humidity sensor orientation upon arrival.

# STATION AUDIT

File No. 2025 - 017A-022A

Date: April 23, 2025

Performed by: AI Clark

## Station

Name: Cold Lake South

Location: Town of Cold Lake

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 23.0 C

Barometric Press: 714 mmHg

## Location

Latitude N 54° 24' 50.3

Magnetic Declination 12° 14' E

Longitude W 110° 13' 58.6"

12° 14' E

Elevation 532 m

Status of Site Documentation Good

Status of Network Documentation Missing Elements

Status of QAP Good

Manifold Material Glass

Manifold Condition Good

## Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>12 kph / 331 degrees</u>	<u>10-15 kph / N</u>
Station Temperature	<u>23.3 C</u>	<u>23.0 C</u>
Relative Humidity	<u>34 %</u>	<u>29%</u>
Ambient Temperature	<u>12.6 C</u>	<u>13.1 C</u>
Barometric Pressure	<u>714 mmHg (953 mb)</u>	<u>715 mmHg</u>
Precipitation	<u>na</u>	<u>na</u>

## Remarks:

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# SO<sub>2</sub> ANALYZER AUDIT

File No. 2025 - 017A

Date: April 23, 2025

Performed by: AI Clark

## Station

Name: Cold Lake South

Location: Town of Cold Lake

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 22.8 C

Barometric Press. 714 mmHg

## Monitor

Make/Model: Thermo 43i TLE Serial No: 1180260018

Inlet flow (sccm): 444 Full Scale Range ppm: 0.5

Last cal. Date: April 7, 2025 Old Correction Factor: 1.001

Zero/Bkg 2.35

Span Coef 0.775

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T1XY16R AMU #: 2092

CGA Date: June 25, 2024 SO<sub>2</sub> Concentration PPM: 50.48

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4895		4895	0.0000	-0.0002		
4882	39.6	4922	0.4061	0.4062	0%	± 10%
4895	20.1	4915	0.2064	0.2082	1%	± 10%
4928	10.4	4938	0.1063	0.1080	2%	± 10%
Absolute Average Percent Difference					1%	

### Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 0.9997

b (Intercept as % of full scale)= 0.1759

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

### Remarks:

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# TRS ANALYZER AUDIT

File No. 2025 - 018A

Date: April 23, 2025

Performed by: AI Clark

## Station

Name: Cold Lake South

Location: Town of Cold Lake

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 22.8 C

Barometric Press. 714 mmHg

## Monitor

Make/Model: Thermo 450i Serial No: 0812728560

Inlet flow (sccm): 500 Full Scale Range ppm: 0.1

Last cal. Date: April 7, 2025 Old Correction Factor: 1.005

Zero/Bkg 34.7

Span Coef 0.959

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T3CH4GL AMU #: 2092

CGA Date: July 9, 2024 H<sub>2</sub>S Concentration PPM: 10.14

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4895		4895	0.0000	0.0005		
4882	40.2	4922	0.0828	0.0793	-5%	± 10%
4895	20.1	4915	0.0415	0.0404	-4%	± 10%
4928	9.9	4938	0.0203	0.0201	-4%	± 10%
Absolute Average Percent Difference					4%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 0.9510

b (Intercept as % of full scale)= 0.6916

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

## Remarks:

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# Non Methane Analyzer Audit

File No. 2025 - 019A

Date: April 23, 2025

Performed by: Al Clark

**Station:**

Name: Cold Lake South Location: Town of Cold Lake Operator: Bureau Veritas  
 Facility/Zone: LICA Temp. 25.4 C BP: 713 mmHg

**Monitor:**

Make/Model: Thermo 55i Serial No. 1180320044  
 Inlet flow (sccm): N/A CH<sub>4</sub> Range ppm: 20.0  
 Last cal. Date: April 8, 2025 Non CH<sub>4</sub> Range ppm: 20.0  
 THC Range ppm: 40.0  
 Old Correction Factor: CH<sub>4</sub>: 1.000  
 Non CH<sub>4</sub>: 0.998  
 THC: 0.997

**Calibration Method:**

Gas Dilution

**Calibrator:**

Make/Model Sabio 2010 AMU# 2270

HC cylinder # T30YBNP CH<sub>4</sub> conc. (ppm) 994.5 CH<sub>4</sub> Equiv (C3H8 only) (ppm) 827.2

CGA Date Oct 2024 C<sub>3</sub>H<sub>8</sub> conc. (ppm) 300.8 Total CH<sub>4</sub> Equiv. (ppm) 1821.2

Calibrator Flows			Calc. Conc.			Indicated Concentration			% Difference vs Audit Gas		
			CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	Limit ± 10%		
Air	Gas	Total							CH <sub>4</sub>	Non CH <sub>4</sub>	THC
4880		4880	0.00	0.00	0.00	0.00	0.00	0.00	<del>0%</del>	<del>0%</del>	<del>0%</del>
3850	68.7	3919	17.43	14.50	31.93	17.51	14.79	32.30	0%	2%	1%
3875	34.4	3909	8.75	7.28	16.03	8.75	7.40	16.25	0%	2%	1%
4890	9.7	4900	1.97	1.64	3.61	1.98	1.69	3.58	1%	3%	-1%
Absolute Average Percent Difference									0%	2%	1%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	<u>CH<sub>4</sub></u>	<u>Non CH<sub>4</sub></u>	<u>THC</u>	<u>LIMITS</u>
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>1.0039</u>	<u>1.0190</u>	<u>1.0129</u>	<b>0.90-1.10</b>
b (Intercept as % of FS)=	<u>-0.0313</u>	<u>0.0209</u>	<u>-0.0583</u>	<b>± 3% F.S.</b>

**Remarks:**

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# NO-NOx-NO2 Analyzer Audit

File No. 2025 - 020A

Date: April 23, 2025 Performed by: Al Clark

**Station:**

Name: Cold Lake South Location: Town of Cold Lake Operator: Bureau Veritas  
Facility/Zone: LICA Temp. 24.2 C BP: 715 mmHg

**Monitor:**

Make/Model: Thermo 42i Serial No. 1505664393  
Inlet flow (scm): 586 Range ppm: 0.5  
Last cal. Date: April 7, 2025 Old CF: NO: 1.004  
NOx: 1.002  
NO2: 0.995  
  
NO Bkg 5.3  
NOx Bkg 5.6  
NO Coef 1.192  
NOx Coef 1.009  
NO2 Coef 0.996

**Calibration Method:**

Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 2270  
NO cylinder # T1FE4LK NO conc. ppm 50.7 NOx conc. ppm 51.1  
CGA Date April 2025

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
			NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
Air	Gas	Total						
4869	0.0	4869	0.000	0.000	0.000	0.000	Limit ± 10%	
4837	39.4	4876	0.410	0.413	0.404	0.418	-1%	1%
4868	19.5	4887	0.202	0.204	0.202	0.206	0%	1%
4897	9.7	4907	0.100	0.101	0.100	0.102	0%	1%
Absolute Average Percent Difference							1%	1%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>0.9858</u>	<u>1.0124</u>	<u>1.0160</u>	<b>0.90-1.10</b>
b (Intercept as % of full scale)=	<u>0.1950</u>	<u>-0.0375</u>	<u>-0.9361</u>	<b>± 3% F.S.</b>

O <sub>3</sub> Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO <sub>2</sub> Increase	% Difference vs Audit Gas	
		NO	NOx	NO <sub>2</sub>				
0.000	4876	0.402	0.413	0.011	<del>0.283</del>	<del>0.283</del>	<del>0%</del>	<del>± 10%</del>
0.300	4876	0.119	0.412	0.294	0.283	0.283	0%	± 10%
0.200	4876	0.214	0.411	0.197	0.188	0.186	-1%	± 10%
0.100	4876	0.307	0.410	0.103	0.095	0.092	-3%	± 10%
Absolute Average Percent Difference							1%	

**Converter Efficiency**

Average Converter Efficiency 98.6%

**Remarks:**

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# O<sub>3</sub> ANALYZER AUDIT

File No. 2025 - 021A

Date: April 23, 2025

Performed by: AI Clark

## Station

Name: Cold Lake South

Location: Town of Cold Lake

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 24.2 C

Barometric Press. 715 mmHg

## Monitor

Make/Model: Thermo 49i Serial No: 1002240372

Inlet flow (sccm): 751 / 723 Full Scale Range ppm: 0.5

Last cal. Date: April 8, 2025 Old Correction Factor: 1.001

Zero/Bkg -0.1

Span Coeff. 1.067

## Calibrator

Calibration Method: Generator

Make/Model: Thermo 49i-PS AMU #: 2247

NO cylinder #: na NO concentration ppm: na

Ozone Setting PPB/Current	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0	na	<del>na</del>	na	0.000	0.002		
400	na	<del>na</del>	na	0.400	0.412	2%	± 10%
200	na	<del>na</del>	na	0.200	0.206	2%	± 10%
100	na	<del>na</del>	na	0.100	0.103	1%	± 10%
Absolute Average Percent Difference						2%	

### Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0260

b (Intercept as % of full scale)= 0.2400

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

### Remarks:

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# Teledyne API T-640 Instrument Audit

**Date:** April 23, 2025
**File No.** 2025 - 022A  
**Performed by:** Al Clark

**Station**

Name: <u>Lica</u>	Location: <u>Town of Cold Lake</u>
Site Name: <u>Cold Lake South</u>	Operator: <u>Bureau Veritas</u>
Station Temperature: <u>23.0 C</u>	Station Pressure: <u>714 mmHg</u>
Last Audit: <u>January 14, 2025</u>	

**Calibration Flowmeter Standard**

Make/Model: <u>Delta Cal</u>	<b>As-found Recordings</b>
Serial Number: <u>1002</u>	Flow (l/min) <u>5.00</u>
<b>Instrument Details</b>	PM2.5 (ug/m3) <u>2,7</u>
Make/Model: <u>Teledyne T640</u>	Pump PMW (%) <u>40</u>
AMU #: <u>na</u>	Sample RH (%) <u>14.1</u>
S/N #: <u>575</u>	Temp (°C) <u>9.6</u>
DOE #: <u>na</u>	Press (mmHg) <u>713 mmHg</u>

**Zero Test (Leak Check)**

PM2.5 Reading (ug/m3) <u>0.0</u>	Time to reach zero (min) <u>10 seconds</u>
(must read 0.0 for leak check to pass)	

**Ambient Temperature** (°C)

T640 Temp <u>12.4</u>	Acceptable (°C)	Result (°C)
Measured Temp <u>12.1</u>	<u>2.0</u>	<u>0.3</u>

**Ambient Pressure** (mmHg)

T640 Pressure <u>713</u>	Acceptable	Result
Measured Press <u>714.0</u>	<u>5%</u>	<u>0%</u>

**Flow Audit**

T640 Flow (l/min) <u>5.00</u>	Acceptable	
Measure Flow (l/min) <u>5.02</u>	<u>5.0 LPM ± 0.25LPM</u>	<u>0.02</u>

**PMT Performance Check**

Span Dust Lot # <u>100128-050-036</u>	Last Checked	July 12, 2024
Span Dust Peak at Channel <u>Not Available</u>	Peak Channel Reading	<u>Not Available</u>
Expiry Date <u>12-28-2023</u>	PMT Setting (V)	As-found    As-left
		<u>1432</u> <u>1432</u>

(Adjust PMT if reading > ± 0.5)

**Remarks:**

No span dust reading, only graphed display, Recommend cleaning optical chamber.

**Reviewed By:** \_\_\_\_\_

**Preventative Maintenance**

Sample Inlet Cleaning  
DFU Replacement  
Optical Chamber Cleaning

**Due**

April 20, 2025  
April 20, 2025  
January 14, 2025

### Station Performance Audit Summary

Company:           LICA          

Facility Name:           Town of Cold Lake          

Approval No.:           N/A          

Site Name:           Cold Lake South          

Region:           Lower Athabasca          

District:           Cold Lake          

Parameters audited:

TRS	X	SO <sub>2</sub>	X	NO <sub>x</sub>	X	NH <sub>3</sub>	
CO		CH <sub>4</sub>	X	NonCH <sub>4</sub>	X	THC	X
PM2.5	X	PM10		TSP		W. Speed	X
W. Direction	X	Amb Tmp	X	Stn. Temp	X	RH	X
O <sub>3</sub>	X	Ethylene		BTEX		SR	
Rainfall		Precip		VWS		BP	X
All parameters monitored as per approval:				Yes / No		N/A	X

*GENERAL*

	YES	NO	N/A
Has the location remained unchanged from previous audit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is site secure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are station operating conditions adequate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*DATA ACQUISITION*

Are strip charts in use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is a telemetry system for data acquisition in use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*SYSTEM COMPONENTS*

Is a glass sampling manifold installed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is sampling manifold clean?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a manifold trap in place?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are spare manifold ports capped	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is manifold oriented so it is not exactly horizontal?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are manifold ports situated to prevent water entering monitors?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is manifold pump properly installed and operative?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do sample lines extend at least 3/4" into manifold?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are monitor sampling lines connected to manifold?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are sampling lines clean?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are monitors properly mounted and secure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are monitors properly exhausted from room or scrubbed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are zero and span systems operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*WIND EQUIPMENT*

Is wind sensor properly oriented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does wind equipment appear to be functioning properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date of last calibration.	Date:	<u>          August 2024          </u>	<input type="checkbox"/>

*COMMENTS:*

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AUDITOR:           Al Clark          

DATE:           April 23, 2025          



## Station Site Documents Audit Checklist

<b>Station</b>	
Name: <u>          Cold Lake South          </u>	Location: <u>          Town of Cold Lake          </u>
Facility/Zone: <u>          LICA          </u>	Operator: <u>          Bureau Veritas          </u>

<p><b>Required Elements of AMD Chapter 3 SS 4-B</b> Do the Site Documents Contain the Following:</p> <p>(a) Name of Owner/ Approval Holder</p> <p>(b) Name of Operating Agency</p> <p>(c) Contact Information</p> <p>(d) Date the Site or Station was Established</p> <p>(e) Date the information was last updated</p> <p>(f) Location including Latitude and Longitude</p> <p>(g) Four Colour Photos Looking N, E, S, W From Manifold Inlet</p> <p>(h) Additional Photos/Sketches of AMD Standard Site Non-Conformance</p> <p>(i) List of Instruments Located at the Site</p> <p>(j) Site Description Including the following:</p> <p style="padding-left: 20px;">(i) Land Use By Sector</p> <p style="padding-left: 20px;">(ii) Site Elevation</p> <p style="padding-left: 20px;">(iii) Greatest Angle of Elevation &amp; Direction to Nearby Buildings</p> <p style="padding-left: 20px;">(iv) Average Building height in the area</p> <p style="padding-left: 20px;">(v) Distance to Nearest Trees</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>X</td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr style="background-color: #cccccc;"><td colspan="5"></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X					X					X					X					X					X					X							X			X										X					X					X					X					X				
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<p><b>Required Elements of AMD Chapter 3 SS 4-D</b> Do the Station Site Documents Contain the Following:</p> <p>(a) Recent Area Map Covering Approximately 1Km<sup>2</sup></p> <p>(b) Plan View Sketch</p> <p>(c) Cross-Sectional Sketch of Area Within 500 m Radius</p> <p>(d) Colour Photos Showing Sample Manifold/Inlet</p> <p>(e) Colour Photo of the Station</p> <p>(f) Additional Photos/Sketches of AMD Standard Station Non-Conformance</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X					X					X					X					X					X				
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COMMENTS: \_\_\_\_\_  
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AUDITOR:           Al Clark                                DATE:           April 23, 2025          



## Network Site Documents Audit Checklist

<b>Network</b>	
Name: <u>Cold Lake South</u>	Location: <u>Town of Cold Lake</u>
Facility/Zone: <u>LICA</u>	Operator: <u>Bureau Veritas</u>

<p><b>Required Elements of AMD Chapter 3 SS 4-C</b> Do the Network Site Documents Contain the Following:</p> <p>(a) A Recent Area Map Showing the Following:</p> <ul style="list-style-type: none"> <li>(i) Station Locations</li> <li>(ii) Roadways</li> <li>(iii) Railway Lines</li> <li>(iv) Airports</li> <li>(v) Lakes</li> <li>(vi) Rivers</li> <li>(vii) Human Settlements</li> <li>(viii) Locations of Identified Industrial &amp; Non-Industrial Pollutant Sources</li> <li>(ix) Other Significant Landmarks</li> </ul> <p>(b) A windrose for each Continuous Ambient Air Monitoring Station</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X						X					X					X				X					X					X					X					X					X				
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COMMENTS: Missing elements (ii) (iii) (iv)

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AUDITOR: Al Clark

DATE: April 23, 2025

### Station Checklist

**Station**

Name: Cold Lake South Location: Town of Cold Lake

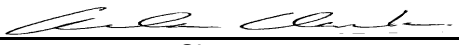
Facility/Zone: LICA Operator: Bureau Veritas

Yes      No      N/A

Are all Particulate Sampler Heads put back in the correct	X		
Has the existing or new TEOM filter been installed?			X
Has the flow bypass line on Teom Been reinstalled?			X
Has the Sharp Filter Tape been installed back on spool?			X
Has the BAM sampler been put back into the sample mode?			X
Have all intermittent particulate samplers been returned to an as found condition?			X
Have all sample lines been reconnected as found?	X		
Have all parameters that were marked down on the DAS been marked up?	X		
Are all ambient gas analyzers back in sample mode?	X		
Is everything left as it was at the start of the audit?	X		
Is the station properly secured upon departure?	X		

Auditor: AI Clark  
Print

Date: April 23, 2025

  
Signature

Operator: Alex Yakapov  
Print

Date: April 23, 2025

  
Signature

# STATION AUDIT

File No. 2025 - 023A-028A

Date: April 24, 2025

Performed by: AI Clark

## Station

Name: Tamarack

Location: Imperial Oil Resources

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 20.2 C

Barometric Press: 713 mmHg

## Location

Latitude N 54° 36' 18.4"

Magnetic Declination 12° 24'

Longitude W 110° 27' 09.9"

Elevation 616 m

Status of Site Documentation Good

Status of Network Documentation Mising Elements

Status of QAP Good

Manifold Material Glass

Manifold Condition Good

## Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>Calm / 316 degrees</u>	<u>0 kph / NW</u>
Station Temperature	<u>20.8 C</u>	<u>20.3 C</u>
Relative Humidity	<u>30.4 %</u>	<u>26.1%</u>
Ambient Temperature	<u>13.0 C</u>	<u>15.1 C</u>
Barometric Pressure	<u>712 mmHg (945mb)</u>	<u>713 mmHg</u>
Precipitation	<u>13 tips</u>	<u>11.3 mil</u>

## Remarks:

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# SO<sub>2</sub> ANALYZER AUDIT

File No. 2025 - 023A

Date: April 24, 2025

Performed by: AI Clark

## Station

Name: Tamarack

Location: Imperial Oil Resources

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 22.3 C

Barometric Press. 713 mmHg

## Monitor

Make/Model: Thermo 43i TLE Serial No: 1180930031

Inlet flow (sccm): 417 Full Scale Range ppm: 0.5

Last cal. Date: March 4, 2025 Old Correction Factor: 1.001

Zero/Bkg 2.98

Span Coef 1.043

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T1XY16R AMU #: 2092

CGA Date: October 2025 SO<sub>2</sub> Concentration PPM: 50.48

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4888	0.0	4888	0.000	0.000		
4874	39.4	4913	0.405	0.408	1%	± 10%
4884	20.0	4904	0.206	0.207	1%	± 10%
4929	10.3	4939	0.105	0.107	2%	± 10%
Absolute Average Percent Difference					1%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000  
m (Slope)= 1.0071  
b (Intercept as % of full scale)= 0.0405

**LIMITS**  
≥ **0.995**  
**0.90-1.10**  
± **3% F.S.**

## Remarks:

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# H<sub>2</sub>S ANALYZER AUDIT

File No. 2025 - 024A

Date: April 24, 2025

Performed by: AI Clark

## Station

Name: Tamarack

Location: Imperial Oil Resources

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 22.3 C

Barometric Press. 713 mmHg

## Monitor

Make/Model: Thermo 450i Serial No: CM17360005

Inlet flow (sccm): 1004 Full Scale Range ppm: 0.1

Last cal. Date: March 4, 2025 Old Correction Factor: 0.996

Zero/Bkg 43.6

Span Coef 0.839

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T3CH4GL AMU #: 2092

CGA Date: October 2024 H<sub>2</sub>S Concentration PPM: 10.14

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4888	0.0	4888	0.0000	0.0011		
4873	40.4	4913	0.0834	0.0847	0%	± 10%
4884	20.1	4904	0.0416	0.0432	1%	± 10%
4929	9.9	4939	0.0203	0.0222	4%	± 10%
Absolute Average Percent Difference					2%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0002

b (Intercept as % of full scale)= 1.4764

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

## Remarks:

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# Non Methane Analyzer Audit

File No. 2025 - 025A

Date: April 24, 2025

Performed by: Al Clark

**Station:**

Name: Tamarack Location: Imperial Oil Resources Operator: Bureau Veritas  
 Facility/Zone: LICA Temp. 20.3 C BP: 713 mmHg

**Monitor:**

Make/Model: Thermo 55i Serial No. 1433563329  
 Inlet flow (scm): N/A CH<sub>4</sub> Range ppm: 20  
 Last cal. Date: March 5, 2025 Non CH<sub>4</sub> Range ppm: 20  
 THC Range ppm: 40  
 Old Correction Factor: CH<sub>4</sub>: 0.997  
 Non CH<sub>4</sub>: 0.997  
 THC: 0.997

**Calibration Method:**

Gas Dilution

**Calibrator:**

Make/Model Sabio 2010 AMU# 2092

HC cylinder # T30Y8NP CH<sub>4</sub> conc. (ppm) 994.5 CH<sub>4</sub> Equiv (C3H8 only) (ppm) 827.2

CGA Date October 2024 C<sub>3</sub>H<sub>8</sub> conc. (ppm) 300.8 Total CH<sub>4</sub> Equiv. (ppm) 1821.7

Calibrator Flows			Calc. Conc.			Indicated Concentration			% Difference vs Audit Gas		
			CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	Limit ± 10%		
Air	Gas	Total							CH <sub>4</sub>	Non CH <sub>4</sub>	THC
4895	0.0	4895	0.00	0.00	0.00	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>
3856	68.7	3925	17.41	14.48	31.89	17.57	14.66	32.24	1%	1%	1%
3885	34.4	3919	8.73	7.26	15.99	8.82	7.37	16.19	1%	2%	1%
4889	9.8	4899	1.99	1.65	3.64	2.03	1.51	3.47	2%	-9%	-5%
Absolute Average Percent Difference									1%	2%	1%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	<u>CH<sub>4</sub></u>	<u>Non CH<sub>4</sub></u>	<u>THC</u>	<b>LIMITS</b>
Correlation Coeff.=	<u>1.0000</u>	<u>0.9999</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>1.0089</u>	<u>1.0181</u>	<u>1.0144</u>	<b>0.90-1.10</b>
b (Intercept as % of FS)=	<u>0.0566</u>	<u>-0.3483</u>	<u>-0.2267</u>	<b>± 3% F.S.</b>

**Remarks:**

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# NO-NOx-NO2 Analyzer Audit

File No. 2025 - 026A

Date: April 24, 2025

Performed by: Al Clark

**Station:**

Name: Tamarack Location: Imperial Oil Resources Operator: Bureau Veritas  
Facility/Zone: LICA Temp. 21.7 C BP: 713 mmHg

**Monitor:**

Make/Model: Thermo 42i Serial No. 1180930028  
Inlet flow (scm): 554 Range ppm: 0.5  
Last cal. Date: March 4, 2025 Old CF: NO: 1.000  
NOx: 1.002  
NO2: 0.997  
  
NO Bkg 2.8  
NOx Bkg 3.1  
NO Coef 1.624  
NOx Coef 1.008  
NO2 Coef 1.006

**Calibration Method:** Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 2270  
NO cylinder # T1FE4LK NO conc. ppm 50.7 NOx conc. ppm 51.1  
CGA Date April 2025

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
			NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
Air	Gas	Total						
4883	0.0	4883	0.000	0.000	0.000	0.000	Limit ± 10%	
4848	39.4	4887	0.409	0.412	0.405	0.413	-1%	0%
4873	19.4	4892	0.201	0.203	0.203	0.207	1%	2%
4909	9.7	4919	0.100	0.101	0.102	0.104	2%	3%
Absolute Average Percent Difference							1%	2%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coeff.=	<u>0.9999</u>	<u>0.9999</u>	<u>0.9997</u>	<b>≥ 0.995</b>
m (Slope)=	<u>0.9893</u>	<u>1.0010</u>	<u>0.9791</u>	<b>0.90-1.10</b>
b (Intercept as % of full scale)=	<u>0.3900</u>	<u>0.3962</u>	<u>0.1541</u>	<b>± 3% F.S.</b>

O <sub>3</sub> Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO <sub>2</sub> Increase	% Difference vs Audit Gas	
		NO	NOx	NO <sub>2</sub>				
0.000	4887	0.404	0.410	0.006	<del>0.292</del>	<del>0.288</del>	<del>-1%</del>	<del>± 10%</del>
0.300	4887	0.112	0.406	0.294	0.292	0.288	-1%	± 10%
0.200	4887	0.207	0.404	0.197	0.197	0.191	-3%	± 10%
0.100	4887	0.305	0.410	0.105	0.099	0.099	0%	± 10%
Absolute Average Percent Difference							1%	

**Converter Efficiency**

Average Converter Efficiency 98.5%

**Remarks:**

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\_\_\_\_\_



# O<sub>3</sub> ANALYZER AUDIT

File No. 2025 - 027A

Date: April 24, 2025

Performed by: AI Clark

## Station

Name: Tamarack

Location: Imperial Oil Resources

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 21.7 C

Barometric Press. 713 mmHg

## Monitor

Make/Model: Thermo 49iQ Serial No: 12208316585

Inlet flow (sccm): 1320 Full Scale Range ppm: 0.5

Last cal. Date: March 5, 2025 Old Correction Factor: 1.009

Zero/Bkg 2.8

Span Coeff. 1.350

## Calibrator

Calibration Method: Generator

Make/Model: Thermo 49i-PS AMU #: 2247

NO cylinder #: na NO concentration ppm: na

Ozone Setting PPB/Current	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0	na	<del>na</del>	na	0.000	0.002		
400	na	<del>na</del>	na	0.400	0.406	1%	± 10%
200	na	<del>na</del>	na	0.200	0.209	3%	± 10%
100	na	<del>na</del>	na	0.100	0.104	2%	± 10%
Absolute Average Percent Difference						2%	

### Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 0.9999  
m (Slope)= 1.0106  
b (Intercept as % of full scale)= 0.6800

**LIMITS**  
**≥ 0.995**  
**0.90-1.10**  
**± 3% F.S.**

### Remarks:

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# SHARP 5030 ANALYZER AUDIT

File No. 2025 - 028A

Date: April 24, 2025 Performed by: Al Clark

## Station

Name: Tamarack Location: Imperial Oil Resources  
Facility/Zone: LICA Operator: Bureau Veritas

## Monitor

Make/Model: Sharp 5030 Serial No: CM-2209

## Flow Audit Transfer Standard

Make/Model Delta Cal Cell s/n 1002  
AMU # 1858

## Foil Kit

Foil Set No. CM1608 Certificate Date November 2017

## Sample Flow

Set Pt.(LPH)	<u>1000</u>	Converted to LPM	<u>16.67</u>	Limit(+/-10%)	
Indicated	<u>1000</u>		<u>16.67</u>		<u>0.5%</u>
Conv Meas Flow	<u>1005</u>		<u>16.75</u>	Measured	<u>16.75</u>

## Leak Check

Starting value	<u>1005</u>	Lph	Flow	<u>16.75</u>	(LPM)
Leak Check	<u>1004</u>	Lph	Flow	<u>16.73</u>	(LPM)
Adapter			Flow	<u>-0.1%</u>	(LPM+/- 5.0% or 0.8lpm)

## Sensors

	Sharp	Audit	Difference	Tolerance
T1 - Amb Tmp°C	<u>13</u>	<u>13.3</u>	<u>0.3</u>	(+/- 2°C)
Amb Press(hPa)	<u>946</u>	<u>948</u>	<u>2</u>	(+/-13.33hPa)

## Background Zero

	Analog	Neph(µg/m³)	Limit	Conc
With Hepa	<u>174</u>	<u>0.8</u>	(<+/- 2 µg/m³)	<u>0.8</u>

## Mass Foil Audit (Sensitivity)

	Old Factor	New Factor	Difference	Limit
Span Value	<u>6977</u>	<u>7074</u>	<u>1%</u>	(+/- 5%)

Comments \_\_\_\_\_

### Station Performance Audit Summary

Company: LICA

Facility Name: Imperial Oil Resources

Approval No.: N/A

Site Name: Tamarack

Region: Lower Athabasca

District: Cold Lake

Parameters audited:

H <sub>2</sub> S	<input checked="" type="checkbox"/>	SO <sub>2</sub>	<input checked="" type="checkbox"/>	NO <sub>x</sub>	<input checked="" type="checkbox"/>	NH <sub>3</sub>	
CO		CH <sub>4</sub>	<input checked="" type="checkbox"/>	NonCH <sub>4</sub>	<input checked="" type="checkbox"/>	THC	<input checked="" type="checkbox"/>
PM2.5	<input checked="" type="checkbox"/>	PM10		TSP		W. Speed	<input checked="" type="checkbox"/>
W. Direction	<input checked="" type="checkbox"/>	Amb Tmp	<input checked="" type="checkbox"/>	Stn. Temp	<input checked="" type="checkbox"/>	RH	<input checked="" type="checkbox"/>
O <sub>3</sub>	<input checked="" type="checkbox"/>	Ethylene		BTEX		SR	
Rainfall		Precip	<input checked="" type="checkbox"/>	VWS		BP	<input checked="" type="checkbox"/>
All parameters monitored as per approval:				Yes / No		N/A	<input checked="" type="checkbox"/>

*GENERAL*

- Has the location remained unchanged from previous audit?
- Is site secure?
- Are station operating conditions adequate?

YES NO N/A

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*DATA ACQUISITION*

- Are strip charts in use?
- Is a telemetry system for data acquisition in use?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*SYSTEM COMPONENTS*

- Is a glass sampling manifold installed?
- Is sampling manifold clean?
- Is a manifold trap in place?
- Are spare manifold ports capped
- Is manifold oriented so it is not exactly horizontal?
- Are manifold ports situated to prevent water entering monitors?
- Is manifold pump properly installed and operative?
- Do sample lines extend at least 3/4" into manifold?
- Are monitor sampling lines connected to manifold?
- Are sampling lines clean?
- Are monitors properly mounted and secure?
- Are monitors properly exhausted from room or scrubbed?
- Are zero and span systems operational?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*WIND EQUIPMENT*

- Is wind sensor properly oriented?
- Does wind equipment appear to be functioning properly?
- Date of last calibration. Date: September 2024

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS:

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\_\_\_\_\_

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AUDITOR: Al Clark

DATE: April 24, 2025





## Network Site Documents Audit Checklist

<b>Network</b>	
Name: <u>          Tamarack          </u>	Location: <u>          Imperial Oil Resources          </u>
Facility/Zone: <u>          LICA          </u>	Operator: <u>          Bureau Veritas          </u>

<p><b>Required Elements of AMD Chapter 3 SS 4-C</b> Do the Network Site Documents Contain the Following:</p> <p>(a) A Recent Area Map Showing the Following:</p> <ul style="list-style-type: none"> <li>(i) Station Locations</li> <li>(ii) Roadways</li> <li>(iii) Railway Lines</li> <li>(iv) Airports</li> <li>(v) Lakes</li> <li>(vi) Rivers</li> <li>(vii) Human Settlements</li> <li>(viii) Locations of Identified Industrial &amp; Non-Industrial Pollutant Sources</li> <li>(ix) Other Significant Landmarks</li> </ul> <p>(b) A windrose for each Continuous Ambient Air Monitoring Station</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr style="background-color: #cccccc;"> <td colspan="5" style="height: 15px;"> </td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO						X						X					X					X				X					X					X					X							X			X				
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COMMENTS:           Missing Elements (ii) (iii) (iv)            
            
          

AUDITOR:           Al Clark                                DATE:           April 24, 2025          



### Station Checklist

**Station**

Name: Tamarack Location: Imperial Oil Resources

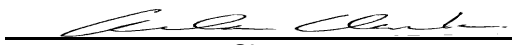
Facility/Zone: LICA Operator: Bureau Veritas

Yes      No      N/A

Are all Particulate Sampler Heads put back in the correct	X		
Has the existing or new TEOM filter been installed?			X
Has the flow bypass line on Teom Been reinstalled?			X
Has the Sharp Filter Tape been installed back on spool?	X		
Has the BAM sampler been put back into the sample mode?			X
Have all intermittent particulate samplers been returned to an as found condition?			X
Have all sample lines been reconnected as found?	X		
Have all parameters that were marked down on the DAS been marked up?	X		
Are all ambient gas analyzers back in sample mode?	X		
Is everything left as it was at the start of the audit?	X		
Is the station properly secured upon departure?	X		

Auditor: AI Clark  
Print

Date: April 24, 2025

  
Signature

Operator: Alex Yakapov  
Print

Date: April 24, 2025

  
Signature

# STATION AUDIT

File No. 2025 - 029A-033A

Date: April 25, 2025

Performed by: Al Clark

## Station

Name: St Lina

Location: St Lina

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 23.5 C

Barometric Press: 703 mmHg

## Location

Latitude N 54° 12' 59.0"

Magnetic Declination 12° 53' E

Longitude W 111° 30' 09.7"

Elevation 683 M

Status of Site Documentation Good

Status of Network Documentation Missing elements

Status of QAP Good

Manifold Material Glass

Manifold Condition Good

## Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>24 kph / 197 degrees</u>	<u>20-25 kph / SSW</u>
Station Temperature	<u>23.5 c</u>	<u>22.8 c</u>
Relative Humidity	<u>23.7 %</u>	<u>22.2%</u>
Ambient Temperature	<u>18.2 C</u>	<u>18.0 C</u>
Barometric Pressure	<u>704 mmHg (938mb)</u>	<u>703 mmHg</u>
Precipitation	<u>1.0 mil</u>	<u>10 tips</u>

## Remarks:

Missing element (ii) (iii) (iv)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# SO<sub>2</sub> ANALYZER AUDIT

File No. 2025 - 029A

Date: April 25, 2025

Performed by: AI Clark

## Station

Name: St Lina

Location: St Lina

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 21.6 C

Barometric Press: 702 mmHg

## Monitor

Make/Model: Thermo 43i TLE Serial No: 1180930031

Inlet flow (sccm): 427 Full Scale Range ppm: 0.5

Last cal. Date: April 12, 2025 Old Correction Factor: 1.000

Zero/Bkg 5.03

Span Coef 0.910

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T1XY16R AMU #: 2092

CGA Date: October 2024 SO<sub>2</sub> Concentration PPM: 50.48

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4910	0.0	4910	0.000	0.000		
4882	39.5	4921	0.405	0.410	1%	± 10%
4898	20.2	4918	0.207	0.209	1%	± 10%
4919	10.5	4929	0.108	0.109	1%	± 10%
Absolute Average Percent Difference					1%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0115

b (Intercept as % of full scale)= -0.0161

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

## Remarks:

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# H<sub>2</sub>S ANALYZER AUDIT

File No. 2025 - 030A

Date: April 25, 2025

Performed by: AI Clark

## Station

Name: St Lina

Location: St Lina

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 21.6 C

Barometric Press: 702 mmHg

## Monitor

Make/Model: Thermo 450i Serial No: 18010058

Inlet flow (sccm): 780 Full Scale Range ppm: 0.1

Last cal. Date: April 12, 2025 Old Correction Factor: 0.999

Zero/Bkg 81.8

Span Coef 1.028

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T3CH4GL AMU #: 2092

CGA Date: October 2024 H<sub>2</sub>S Concentration PPM: 10.14

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4910	0.0	4910	0.0000	0.0002		
4881	40.3	4921	0.0830	0.0838	1%	± 10%
4898	20.3	4918	0.0419	0.0430	2%	± 10%
4919	10.0	4929	0.0206	0.0205	-1%	± 10%
Absolute Average Percent Difference					1%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 0.9999

m (Slope)= 1.0094

b (Intercept as % of full scale)= 0.1657

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

## Remarks:

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# Non Methane Analyzer Audit

File No. 2025 - 031A

Date: April 25, 2025

Performed by: Al Clark

**Station:**

Name: St Lina Location: St Lina Operator: Bureau Veritas  
 Facility/Zone: LICA Temp. 19.0 C BP: 702 mmHg

**Monitor:**

Make/Model: Thermo 55i Serial No. 1180930025  
 Inlet flow (scm): N/A CH<sub>4</sub> Range ppm: 20.0  
 Last cal. Date: April 13, 2025 Non CH<sub>4</sub> Range ppm: 20.0  
 THC Range ppm: 40.0  
 Old Correction Factor: CH<sub>4</sub>: 1.004  
 Non CH<sub>4</sub>: 0.994  
 THC: 0.999

**Calibration Method:**

Gas Dilution

**Calibrator:**

Make/Model Sabio 2010 AMU# 2270

HC cylinder # T30Y8NP CH<sub>4</sub> conc. (ppm) 994.5 CH<sub>4</sub> Equiv (C3H8 only) (ppm) 827.2

CGA Date October 2024 C<sub>3</sub>H<sub>8</sub> conc. (ppm) 300.8 Total CH<sub>4</sub> Equiv. (ppm) 1821.7

Calibrator Flows			Calc. Conc.			Indicated Concentration			% Difference vs Audit Gas		
			CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	Limit ± 10%		
Air	Gas	Total							CH <sub>4</sub>	Non CH <sub>4</sub>	THC
4892	0.0	4892	0.00	0.00	0.00	0.00	0.00	0.00	<del>0%</del>	<del>0%</del>	<del>0%</del>
3846	68.6	3915	17.43	14.49	31.92	17.50	14.76	32.26	0%	2%	1%
3869	34.3	3903	8.74	7.27	16.01	8.68	7.33	16.00	-1%	1%	0%
4857	9.8	4867	2.00	1.67	3.67	1.94	1.36	3.31	-3%	<b>-18%</b>	-10%
Absolute Average Percent Difference									1%	5%	3%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	<u>CH<sub>4</sub></u>	<u>Non CH<sub>4</sub></u>	<u>THC</u>	<u>LIMITS</u>
Correlation Coeff.=	<u>1.0000</u>	<u>0.9998</u>	<u>0.9999</u>	<b>≥ 0.995</b>
m (Slope)=	<u>1.0053</u>	<u>1.0285</u>	<u>1.0156</u>	<b>0.90-1.10</b>
b (Intercept as % of FS)=	<u>-0.2465</u>	<u>-0.8088</u>	<u>-0.5213</u>	<b>± 3% F.S.</b>

**Remarks:**

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# NO-NOx-NO2 Analyzer Audit

File No. 2025 - 032A

Date: April 25, 2025 Performed by: Al Clark

**Station:**

Name: St Lina Location: St Lina Operator: Bureau Veritas  
Facility/Zone: LICA Temp. 16.7 C BP: 703 mmHg

**Monitor:**

Make/Model: Thermo 42i Serial No. 1180930029  
Inlet flow (scm): 591 Range ppm: 0.5  
Last cal. Date: April 12, 2025 Old CF: NO: 1.000  
NOx: 1.000  
NO2: 0.996  
  
NO Bkg 5.5  
NOx Bkg 5.7  
NO Coef 1.109  
NOx Coef 1.010  
NO2 Coef 1.003

**Calibration Method:** Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 2270  
NO cylinder # T1FE4LK NO conc. ppm 50.7 NOx conc. ppm 51.1  
CGA Date April 2025

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
			NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
Air	Gas	Total						
4827	0.0	4827	0.000	0.000	0.000	0.001	Limit ± 10%	
4789	39.6	4829	0.416	0.419	0.403	0.410	-3%	-2%
4850	19.6	4870	0.204	0.206	0.200	0.203	-2%	-2%
4872	9.7	4882	0.101	0.102	0.098	0.100	-3%	-2%
Absolute Average Percent Difference							3%	2%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>0.9696</u>	<u>0.9764</u>	<u>1.0000</u>	<b>0.90-1.10</b>
b (Intercept as % of full scale)=	<u>0.1192</u>	<u>0.2442</u>	<u>-0.4674</u>	<b>± 3% F.S.</b>

O <sub>3</sub> Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO <sub>2</sub> Increase	% Difference vs Audit Gas	
		NO	NOx	NO <sub>2</sub>				
0.000	4829	0.399	0.406	0.007	<del>0.280</del>	<del>0.278</del>	<del>-1%</del>	<del>± 10%</del>
0.300	4829	0.119	0.404	0.285	0.280	0.278	-1%	± 10%
0.200	4829	0.212	0.404	0.191	0.187	0.184	-2%	± 10%
0.100	4829	0.304	0.404	0.100	0.095	0.093	-2%	± 10%
Absolute Average Percent Difference							1%	

**Converter Efficiency**

Average Converter Efficiency 98.5%

**Remarks:**

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# O<sub>3</sub> ANALYZER AUDIT

File No. 2025 - 033A

Date: April 25, 2025

Performed by: AI Clark

## Station

Name: St Lina

Location: St Lina

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 16.7 C

Barometric Press: 703 mmHg

## Monitor

Make/Model: 49iQ Serial No: 12208316586

Inlet flow (sccm): 1320 Full Scale Range ppm: 0.5

Last cal. Date: April 13, 2025 Old Correction Factor: 0.999

Zero/Bkg -0.2

Span Coeff. 0.983

## Calibrator

Calibration Method: Generator

Make/Model: Thermo 49i-PS AMU #: 2247

NO cylinder #: na NO concentration ppm: na

Ozone Setting PPB/Current	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0	na	<del>na</del>	na	0.000	0.001		
400	na	<del>na</del>	na	0.400	0.399	-1%	± 10%
200	na	<del>na</del>	na	0.200	0.199	-1%	± 10%
100	na	<del>na</del>	na	0.100	0.099	-2%	± 10%
Absolute Average Percent Difference						1%	

### Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000  
m (Slope)= 0.9960  
b (Intercept as % of full scale)= 0.0400

**LIMITS**  
**≥ 0.995**  
**0.90-1.10**  
**± 3% F.S.**

### Remarks:

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### Station Performance Audit Summary

Company: LICA Facility Name: St Lina

Approval No.: N/A Site Name: St Lina

Region: North Saskatchewan District: Cold Lake

Parameters audited:

H <sub>2</sub> S	X	SO <sub>2</sub>	X	NO <sub>x</sub>	X	NH <sub>3</sub>	
CO		CH <sub>4</sub>	X	NonCH <sub>4</sub>	X	THC	X
PM2.5	X	PM10		TSP		W. Speed	X
W. Direction	X	Amb Tmp	X	Stn. Temp	X	RH	X
O <sub>3</sub>	X	Ethylene		BTEX		SR	
Rainfall		Precip	X	VWS		BP	X
All parameters monitored as per approval:				Yes / No		N/A	X

*GENERAL*

	YES	NO	N/A
Has the location remained unchanged from previous audit?	X		
Is site secure?	X		
Are station operating conditions adequate?	X		

*DATA ACQUISITION*

Are strip charts in use?		X	
Is a telemetry system for data acquisition in use?	X		

*SYSTEM COMPONENTS*

Is a glass sampling manifold installed?	X		
Is sampling manifold clean?	X		
Is a manifold trap in place?	X		
Are spare manifold ports capped	X		
Is manifold oriented so it is not exactly horizontal?	X		
Are manifold ports situated to prevent water entering monitors?	X		
Is manifold pump properly installed and operative?	X		
Do sample lines extend at least 3/4" into manifold?	X		
Are monitor sampling lines connected to manifold?	X		
Are sampling lines clean?	X		
Are monitors properly mounted and secure?	X		
Are monitors properly exhausted from room or scrubbed?	X		
Are zero and span systems operational?	X		

*WIND EQUIPMENT*

Is wind sensor properly oriented?	X		
Does wind equipment appear to be functioning properly?	X		
Date of last calibration.	Date:	<u>August 2024</u>	

COMMENTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

AUDITOR: Al Clark DATE: April 25, 2025



## Station Site Documents Audit Checklist

<b>Station</b>	
Name: <u>          St Lina          </u>	Location: <u>          St Lina          </u>
Facility/Zone: <u>          LICA          </u>	Operator: <u>          Bureau Veritas          </u>

<p><b>Required Elements of AMD Chapter 3 SS 4-B</b> Do the Site Documents Contain the Following:</p> <p>(a) Name of Owner/ Approval Holder</p> <p>(b) Name of Operating Agency</p> <p>(c) Contact Information</p> <p>(d) Date the Site or Station was Established</p> <p>(e) Date the information was last updated</p> <p>(f) Location including Latitude and Longitude</p> <p>(g) Four Colour Photos Looking N, E, S, W From Manifold Inlet</p> <p>(h) Additional Photos/Sketches of AMD Standard Site Non-Conformance</p> <p>(i) List of Instruments Located at the Site</p> <p>(j) Site Description Including the following:</p> <p style="padding-left: 20px;">(i) Land Use By Sector</p> <p style="padding-left: 20px;">(ii) Site Elevation</p> <p style="padding-left: 20px;">(iii) Greatest Angle of Elevation &amp; Direction to Nearby Buildings</p> <p style="padding-left: 20px;">(iv) Average Building height in the area</p> <p style="padding-left: 20px;">(v) Distance to Nearest Trees</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>X</td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr style="background-color: #cccccc;"><td colspan="5"></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X					X					X					X					X					X					X							X			X										X					X					X					X					X				
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<p><b>Required Elements of AMD Chapter 3 SS 4-D</b> Do the Station Site Documents Contain the Following:</p> <p>(a) Recent Area Map Covering Approximately 1Km<sup>2</sup></p> <p>(b) Plan View Sketch</p> <p>(c) Cross-Sectional Sketch of Area Within 500 m Radius</p> <p>(d) Colour Photos Showing Sample Manifold/Inlet</p> <p>(e) Colour Photo of the Station</p> <p>(f) Additional Photos/Sketches of AMD Standard Station Non-Conformance</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>X</td><td></td><td></td></tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X					X					X					X					X							X		
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COMMENTS: \_\_\_\_\_  
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AUDITOR:           Al Clark                                DATE:           April 25, 2025          



## Network Site Documents Audit Checklist

<b>Network</b>	
Name: <u>          St Lina          </u>	Location: <u>          St Lina          </u>
Facility/Zone: <u>          LICA          </u>	Operator: <u>          Bureau Veritas          </u>

<p><b>Required Elements of AMD Chapter 3 SS 4-C</b> Do the Network Site Documents Contain the Following:</p> <p>(a) A Recent Area Map Showing the Following:</p> <ul style="list-style-type: none"> <li>(i) Station Locations</li> <li>(ii) Roadways</li> <li>(iii) Railway Lines</li> <li>(iv) Airports</li> <li>(v) Lakes</li> <li>(vi) Rivers</li> <li>(vii) Human Settlements</li> <li>(viii) Locations of Identified Industrial &amp; Non-Industrial Pollutant Sources</li> <li>(ix) Other Significant Landmarks</li> </ul> <p>(b) A windrose for each Continuous Ambient Air Monitoring Station</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr style="background-color: #cccccc;"> <td colspan="5" style="height: 15px;"></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO						X						X					X					X				X					X					X					X							X			X				
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COMMENTS: Missing elements (ii) (iii) (iv)

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AUDITOR:           Al Clark          

DATE:           April 25, 2025



# STATION AUDIT

File No. 2025 - 012A-016A

Date: April 22, 2025

Performed by: AI Clark

## Station

Name: Lac La Biche

Location: Town of Lac La Biche

Facility/Zone: LICA

Operator: Bureau Veritas

Temp: 23.6 C

Barometric Press: 713 mmHg

## Location

Latitude N 54° 45' 54.55"

Magnetic Declination 13° 14' E

Longitude W 111° 58' 17.20"

13° 14' E

Elevation 564 m

Status of Site Documentation Good

Status of Network Documentation Missing elements

Status of QAP Good

Manifold Material Glass

Manifold Condition Good

## Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>9.0 kph / 170 degrees</u>	<u>10-15 kph / SW</u>
Station Temperature	<u>20.1 C</u>	<u>19.5 C</u>
Relative Humidity	<u>30.0 %</u>	<u>30.6 %</u>
Ambient Temperature	<u>10.9 C</u>	<u>11.0 C</u>
Barometric Pressure	<u>712 mmHg (949mb)</u>	<u>713 mmHg</u>
Precipitation	<u>na</u>	<u>na</u>

## Remarks:

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# SO<sub>2</sub> ANALYZER AUDIT

File No. 2025 - 012A

Date: April 22, 2025

Performed by: AI Clark

## Station

Name: Lac La Biche

Location: Town of Lac La Biche

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 25.7 C

Barometric Press. 713 mmHg

## Monitor

Make/Model: Thermo 43i TLE Serial No: 1180320043

Inlet flow (sccm): 450 Full Scale Range ppm: 0.5

Last cal. Date: April 15, 2025 Old Correction Factor: 0.998

Zero/Bkg 7.98

Span Coef 1.578

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T1XY16R AMU #: 2092

CGA Date: June 25, 2024 SO<sub>2</sub> Concentration PPM: 50.48

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4918	0.0	4918	0.0000	0.0000		
4899	39.5	4938	0.4038	0.4158	3%	± 10%
4907	20.1	4927	0.2059	0.2029	-1%	± 10%
4944	10.5	4954	0.1070	0.1037	-3%	± 10%
Absolute Average Percent Difference					1%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 0.9997

m (Slope)= 1.0322

b (Intercept as % of full scale)= -0.8714

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

## Remarks:

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# H<sub>2</sub>S ANALYZER AUDIT

File No. 2025 - 013A

Date: April 22, 2025

Performed by: AI Clark

## Station

Name: Lac La Biche

Location: Town of Lac La Biche

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 25.7 C

Barometric Press. 713 mmHg

## Monitor

Make/Model: Thermo 450i Serial No: CM17360002

Inlet flow (sccm): 912 Full Scale Range ppm: 0.1

Last cal. Date: April 15, 2025 Old Correction Factor: 1.006

Zero/Bkg 86.4

Span Coef 1.075

## Calibrator

Calibration Method: GAS DILUTION Make/Model: Sabio 2010

Cylinder #: T3CH4GL AMU #: 2092

CGA Date: July 9, 2024 H<sub>2</sub>S Concentration PPM: 10.14

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4918	0.0	4918	0.0000	0.0003		
4898	40.1	4938	0.0823	0.0809	-2%	± 10%
4907	20.0	4927	0.0412	0.0417	1%	± 10%
4944	9.8	4954	0.0201	0.0212	4%	± 10%
Absolute Average Percent Difference					1%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 0.9998

m (Slope)= 0.9750

b (Intercept as % of full scale)= 1.0309

### LIMITS

≥ **0.995**

**0.90-1.10**

± **3% F.S.**

## Remarks:

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# Non Methane Analyzer Audit

File No. 2025-014A

Date: April 22, 2025

Performed by: Al Clark

**Station:**

Name: Lac La Biche Location: Town of Lac La Biche Operator: Bureau Veritas  
Facility/Zone: LICA Temp. 25.4 C BP: 713 mmHg

**Monitor:**

Make/Model: Thermo 55i Serial No. 1314057759  
Inlet flow (sccm): N/A CH<sub>4</sub> Range ppm: 20.0  
Last cal. Date: April 16, 2025 Non CH<sub>4</sub> Range ppm: 20.0  
THC Range ppm: 40.0  
  
Old Correction Factor: CH<sub>4</sub>: 0.999  
Non CH<sub>4</sub>: 1.001  
THC: 1.000

**Calibration Method:**

Gas Dilution

**Calibrator:**

Make/Model Sabio 2010 AMU# 2092

HC cylinder # T30YBNP CH<sub>4</sub> conc. (ppm) 994.5 CH<sub>4</sub> Equiv (C3H8 only) (ppm) 827.2

CGA Date Oct 2024 C<sub>3</sub>H<sub>8</sub> conc. (ppm) 300.8 Total CH<sub>4</sub> Equiv. (ppm) 1821.2

Calibrator Flows			Calc. Conc.			Indicated Concentration			% Difference vs Audit Gas		
			CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	CH <sub>4</sub> (ppm)	Non CH <sub>4</sub> (ppm)	THC (ppm)	Limit ± 10%		
Air	Gas	Total							CH <sub>4</sub>	Non CH <sub>4</sub>	THC
4900	0.0	4900	0.00	0.00	0.00	0.00	0.00	0.00	<del>3%</del>	<del>3%</del>	<del>3%</del>
3864	68.1	3932	17.22	14.33	31.54	17.82	14.80	32.62	3%	3%	3%
3895	34.3	3929	8.68	7.22	15.90	8.94	7.41	16.35	3%	3%	3%
4912	9.7	4922	1.96	1.63	3.59	2.03	1.70	3.74	4%	4%	4%
Absolute Average Percent Difference									3%	3%	3%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	<u>CH<sub>4</sub></u>	<u>Non CH<sub>4</sub></u>	<u>THC</u>	<u>LIMITS</u>
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>1.0341</u>	<u>1.0319</u>	<u>1.0333</u>	<b>0.90-1.10</b>
b (Intercept as % of FS)=	<u>-0.0339</u>	<u>-0.0109</u>	<u>-0.0113</u>	<b>± 3% F.S.</b>

**Remarks:**

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# NO-NOx-NO2 Analyzer Audit

File No. 2025- 015A

Date: April 22, 2025

Performed by: Al Clark

**Station:**

Name: Lac La Biche Location: Town of Lac La Biche Operator: Bureau Veritas  
Facility/Zone: LICA Temp. 23.6 C BP: 713 mmHg

**Monitor:**

Make/Model: Thermo 42i Serial No. 118093007  
Inlet flow (scm): 788 Range ppm: 0.5  
Last cal. Date: April 15, 2025 Old CF: NO: 0.994  
NOx: 1.015  
NO2: 1.008  
  
NO Bkg 8.6  
NOx Bkg 8.7  
NO Coef 0.847  
NOx Coef 1.011  
NO2 Coef 1.002

**Calibration Method:** Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 2270  
NO cylinder # T1FE4LK NO conc. ppm 50.7 NOx conc. ppm 51.1  
CGA Date April 2025

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
			NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
Air	Gas	Total						
4867	0.0	4867	0.000	0.000	0.000	0.000	Limit ± 10%	
4830	39.5	4869	0.411	0.415	0.398	0.408	-3%	-2%
4857	19.5	4876	0.203	0.204	0.196	0.202	-3%	-1%
4893	9.6	4903	0.099	0.100	0.096	0.100	-3%	0%
Absolute Average Percent Difference							3%	1%

**Linear Regression Analysis:**

*y=mx+b (where x=calculated concentration, y=indicated concentration)*

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>0.9676</u>	<u>0.9831</u>	<u>1.0000</u>	<b>0.90-1.10</b>
b (Intercept as % of full scale)=	<u>-0.0128</u>	<u>0.1582</u>	<u>0.0000</u>	<b>± 3% F.S.</b>

O <sub>3</sub> Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO <sub>2</sub> Increase	% Difference vs Audit Gas	
		NO	NOx	NO <sub>2</sub>				
0.000	4869	0.393	0.407	0.015	<del>0.271</del>	<del>0.271</del>	<del>0%</del>	%Dif Limit
0.300	4869	0.122	0.407	0.286	0.271	0.271	0%	± 10%
0.200	4869	0.216	0.408	0.192	0.177	0.177	0%	± 10%
0.100	4869	0.306	0.408	0.102	0.087	0.087	0%	± 10%
Absolute Average Percent Difference							0%	

**Converter Efficiency**

Average Converter Efficiency 100.0%

**Remarks:**

\_\_\_\_\_

\_\_\_\_\_



# O<sub>3</sub> ANALYZER AUDIT

File No. 2025 - 016A

Date: April 22, 2025

Performed by: AI Clark

## Station

Name: Lac La Biche

Location: Town of Lac La Biche

Facility/Zone: LICA

Operator: Bureau Veritas

Temp. 23.6 C

Barometric Press. 713 mmHg

## Monitor

Make/Model: Thermo 49iQ Serial No: 1202068570

Inlet flow (sccm): 1380 Full Scale Range ppm: 0.5

Last cal. Date: April 16, 2025 Old Correction Factor: 1.004

Zero/Bkg 3.3

Span Coeff. 0.992

## Calibrator

Calibration Method: Generator

Make/Model: Thermo 49i-PS AMU #: 2247

NO cylinder #: na NO concentration ppm: na

Ozone Setting PPB/Current	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0	na	<del>na</del>	na	0.000	0.002		
400	na	<del>na</del>	na	0.400	0.399	-1%	± 10%
200	na	<del>na</del>	na	0.200	0.200	-1%	± 10%
100	na	<del>na</del>	na	0.100	0.101	-1%	± 10%
Absolute Average Percent Difference						1%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000  
m (Slope)= 0.9926  
b (Intercept as % of full scale)= 0.3600

### LIMITS

≥ **0.995**  
**0.90-1.10**  
± **3% F.S.**

## Remarks:

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### Station Performance Audit Summary

Company: LICA

Facility Name: Town of Lac La Biche

Approval No.: N/A

Site Name: Lac La Biche

Region: Lower Athabasca

District: Cold Lake

Parameters audited:

H <sub>2</sub> S	X	SO <sub>2</sub>	X	NO <sub>x</sub>	X	NH <sub>3</sub>	
CO		CH <sub>4</sub>	X	NonCH <sub>4</sub>	X	THC	X
PM2.5	X	PM10		TSP		W. Speed	X
W. Direction	X	Amb Tmp	X	Stn. Temp	X	RH	X
O <sub>3</sub>	X	Ethylene		BTEX		SR	
Rainfall		Precip		VWS		BP	X
All parameters monitored as per approval:				Yes / No		N/A	X

*GENERAL*

	YES	NO	N/A
Has the location remained unchanged from previous audit?	X		
Is site secure?	X		
Are station operating conditions adequate?	X		

*DATA ACQUISITION*

Are strip charts in use?		X	
Is a telemetry system for data acquisition in use?	X		

*SYSTEM COMPONENTS*

Is a glass sampling manifold installed?	X		
Is sampling manifold clean?	X		
Is a manifold trap in place?	X		
Are spare manifold ports capped	X		
Is manifold oriented so it is not exactly horizontal?	X		
Are manifold ports situated to prevent water entering monitors?	X		
Is manifold pump properly installed and operative?	X		
Do sample lines extend at least 3/4" into manifold?	X		
Are monitor sampling lines connected to manifold?	X		
Are sampling lines clean?	X		
Are monitors properly mounted and secure?	X		
Are monitors properly exhausted from room or scrubbed?	X		
Are zero and span systems operational?	X		

*WIND EQUIPMENT*

Is wind sensor properly oriented?	X		
Does wind equipment appear to be functioning properly?	X		
Date of last calibration.	Date:	<u>August 2024</u>	

*COMMENTS:*

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\_\_\_\_\_  
\_\_\_\_\_

AUDITOR: Al Clark

DATE: April 22, 2025



### Station Site Documents Audit Checklist

<b>Station</b>	
Name: <u>          Lac La Biche          </u>	Location: <u>          Town of Lac La Biche          </u>
Facility/Zone: <u>          LICA          </u>	Operator: <u>          Bureau Veritas          </u>

<p><b>Required Elements of AMD Chapter 3 SS 4-B</b> Do the Site Documents Contain the Following:</p> <p>(a) Name of Owner/ Approval Holder</p> <p>(b) Name of Operating Agency</p> <p>(c) Contact Information</p> <p>(d) Date the Site or Station was Established</p> <p>(e) Date the information was last updated</p> <p>(f) Location including Latitude and Longitude</p> <p>(g) Four Colour Photos Looking N, E, S, W From Manifold Inlet</p> <p>(h) Additional Photos/Sketches of AMD Standard Site Non-Conformance</p> <p>(i) List of Instruments Located at the Site</p> <p>(j) Site Description Including the following:</p> <p style="padding-left: 20px;">(i) Land Use By Sector</p> <p style="padding-left: 20px;">(ii) Site Elevation</p> <p style="padding-left: 20px;">(iii) Greatest Angle of Elevation &amp; Direction to Nearby Buildings</p> <p style="padding-left: 20px;">(iv) Average Building height in the area</p> <p style="padding-left: 20px;">(v) Distance to Nearest Trees</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>X</td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr style="background-color: #cccccc;"><td colspan="5"></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X					X					X					X					X					X					X							X			X										X					X					X					X					X				
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<p><b>Required Elements of AMD Chapter 3 SS 4-D</b> Do the Station Site Documents Contain the Following:</p> <p>(a) Recent Area Map Covering Approximately 1Km<sup>2</sup></p> <p>(b) Plan View Sketch</p> <p>(c) Cross-Sectional Sketch of Area Within 500 m Radius</p> <p>(d) Colour Photos Showing Sample Manifold/Inlet</p> <p>(e) Colour Photo of the Station</p> <p>(f) Additional Photos/Sketches of AMD Standard Station Non-Conformance</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Meets AMD</th> <th rowspan="2">NA</th> <th colspan="2">Current</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>X</td><td></td><td></td></tr> </tbody> </table>	Meets AMD		NA	Current		YES	NO	YES	NO	X					X					X					X					X							X		
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COMMENTS: \_\_\_\_\_  
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AUDITOR:           Al Clark                                DATE:           April 22, 2025          





### Station Checklist

**Station**

Name: Lac La Biche Location: Town of Lac La Biche

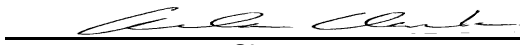
Facility/Zone: LICA Operator: Bureau Veritas

Yes      No      N/A

Are all Particulate Sampler Heads put back in the correct	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the existing or new TEOM filter been installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the flow bypass line on Teom Been reinstalled?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the Sharp Filter Tape been installed back on spool?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the BAM sampler been put back into the sample mode?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have all intermittent particulate samplers been returned to an as found condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have all sample lines been reconnected as found?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have all parameters that were marked down on the DAS been marked up?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all ambient gas analyzers back in sample mode?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is everything left as it was at the start of the audit?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the station properly secured upon departure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Auditor: AI Clark  
Print

Date: April 22, 2025

  
Signature

Operator: Alex Yakapov  
Print

Date: April 22, 2025

  
Signature



## Lakeland Industry and Community Association

Box 8237, 5107W - 50 Street, Bonnyville, AB T9N 2J5

780 812-2182 780 812-2186 www.lica.ca

May 30, 2025

Alberta Environment and Protected Areas  
Resource Stewardship Division  
Airshed & Watershed Stewardship Air Monitoring  
4946 – 89 street  
Edmonton, Alberta T6E 5K1  
Telephone: 780.427.7888

### **RE: 2025 LICA Ambient Air Monitoring Network Audit Results Network File No(s): 2025 – 012A – 033A**

Mr. Al Clark,

Please find below our responses and corresponding corrective actions—both completed and proposed—related to Alberta Environment and Protected Areas' (AEPA) audit of LICA's ambient air monitoring network conducted from April 22–25, 2025.

#### **ST. LINA: HYDROCARBON ANALYZER**

*"The non-methane response failed (>+/- 10 %) at the low concentration point. AEPA tried to replicate the response in the office but came up with the proper response. AEPA is of the opinion based on compliance for slope, intercept and correlation, that the erratic low response noted may be due to an instrument issue at the time of the audit. AEPA is recommending maintenance be completed on the sampling mechanism inside the analyzer."*

**Corrective Action:** On May 6, field staff conducted a series of 3-point audits to investigate the cause of the low-point failure observed during the AEPA audit (see Supplementary Information A). The analyzer was evaluated using calibration ranges defined in the Air Monitoring Directive (AMD) and the same concentrations used during the AEPA field audit.

#### **1. Initial Audit (within AMD-required ranges):**

The analyzer was tested using the three-point calibration ranges required by the AMD (60–80%, 30–40%, and 10–20% of the operating range). The analyzer responded within specification, with all points showing less than 1% error.

#### **2. Replication of AEPA Field Audit Conditions:**

A second audit was conducted using the same three concentration points as the AEPA field audit: approximately 70%, 35.5%, and **8.8%**. While the mid and high points met acceptance criteria, the non-methane response at the low concentration point failed, with a 14.1% error.

#### **3. Maintenance Performed:**

The H<sub>2</sub> desiccant and inlet filter were replaced, and the analyzer was allowed to stabilize before additional audits were performed.

**4. Post-Maintenance Audit (within AMD-required ranges):**

A third audit was conducted using AMD-specified concentration points. The analyzer again showed good performance, with less than 1% error across all checks.

**5. Post-Maintenance Audit (AEPA field audit concentrations):**

The analyzer was re-evaluated using the AEPA audit's three concentration levels. Results were consistent with earlier findings: the high and mid-point checks passed, while the low concentration point again produced an error of approximately 14%.

**6. Confirmation Audit (AEPA field audit concentrations):**

A final post-maintenance audit was conducted using the same three concentration points applied by AEPA during the April 2025 field audit (approximately 70%, 35.5%, and 9.8%). Results were consistent with previous findings: the analyzer met acceptance criteria at the mid and high points, while the low concentration point continued to show a deviation of approximately 14%.

The analyzer is functioning as expected and passes all audits using AMD-required ranges. Since the unit is not routinely calibrated using concentrations below the AMD's minimum, performance at lower concentrations is unknown. Given that all monthly calibrations and audits have adhered to AMD protocols and passed, the data produced by this analyzer are considered valid.

### COLD LAKE SOUTH: RELATIVE HUMIDITY

*"The relative humidity sensor at Cold Lake South did not meet audit tolerances. It was outside the +/- 15% used for audit purposes."*

**Corrective Action:** Field staff conducted a sensor check at the Cold Lake South station on May 12 using a certified standard. The Traceable Certificate of Calibration for the thermohygrometer (the reference standard) was issued on August 17, 2023, and is valid until August 17, 2025. The verification certificate is provided in Supplementary Information B. The sensor met all AEPA check requirements.

In direct response to the audit, the radiation shield was cleaned and the temperature probe was replaced on May 14 to enhance reliability and precision.

### COLD LAKE SOUTH: AIR MONITORING STATION DOOR

*"The shelter door at Cold Lake South needs repairs or replacement. The skin and bottom door frame are in very poor condition."*

**Corrective Action:** A temporary repair will be completed by June 30, 2025 (end of Q1). LICA is also planning a minor station retrofit, including replacement of wall-mounted cabinets with open shelving and refurbishment or replacement of the shelter door. This project is scheduled for completion by September 30, 2025 (end of Q2).

### TAMARACK: AMBIENT TEMPERATURE AND RELATIVE HUMIDITY

*"The ambient temperature and relative humidity sensor at Tamarack did not meet audit tolerances. Audit tolerance for temperature sensors is +/- 1°C and +/- 15% for relative humidity. Recommend cleaning the sensor, cleaning the radiation shield, and recalibrating as required."*

*"The temperature and relative humidity sensor radiation shield at Tamarack was inverted such that it was vertical but facing downwards. It was corrected at the time of notification by the operator, and it was also noted that moisture had collected on the bottom side of the radiation shield. Recommend proper fastening be completed."*

**Corrective Action:** A temporary correction to the inverted radiation shield was made during the audit on April 24. A permanent and secure fastening was completed on April 29 (see Supplementary Information C).

Sensor checks were conducted on April 29 and May 22 using a certified standard. The Traceable Certificate of Calibration was issued August 17, 2023, and is valid until August 17, 2025 (see Supplementary Information B). The check results met AEPA requirements.

To improve accuracy and reliability, the radiation shield will be cleaned and the existing probe replaced with a factory-calibrated unit by September 30, 2025. The removed probe will be recalibrated and retained as a network spare.

## COMMON ISSUE: NETWORK SITE DOCUMENTATION

*"The network site document audit did not meet AMD required elements according to Chapter 3, section 4, subsection 4-C. Recommend updating network site documentation to include all elements. See field sheets for missing elements."*

**Corrective Action:** LICA released a new version of the site documentation files using the Air Monitoring Directive Template available at: [https://www.alberta.ca/system/files/custom\\_downloaded\\_images/amd-site-documentation-template.docx](https://www.alberta.ca/system/files/custom_downloaded_images/amd-site-documentation-template.docx) in March 2025. While the September 2024 audit findings under Subsection 4-B(j) were addressed, Subsection 4-C(a) was unintentionally omitted. This has now been corrected. Updated site documentation is available on the LICA website:

1. [Cold Lake South](#)
2. [Tamarack](#)
3. [St. Lina](#)
4. [PAMS – Lac La Biche](#)

Should you have any questions or require further clarification, please don't hesitate to contact me.

Respectfully,



Michael Bisaga  
Environmental Monitoring Programs Manager, LICA

Cc: Marty Collins – Manager, AEPA  
Al Clark – Monitoring Systems Auditor, AEPA  
Prabal Roy – Senior Air Quality Specialist, AEPA  
Lily Lin – Data and Reporting Specialist, LICA  
Kristina Morris – Executive Director, LICA  
[air.data@gov.ab.ca](mailto:air.data@gov.ab.ca)  
[air.reporting@gov.ab.ca](mailto:air.reporting@gov.ab.ca)

## **Supplementary Information A**

## 1. Initial Audit (AMD-required ranges):

The analyzer was tested using the three-point calibration ranges required by the AMD (60–80%, 30–40%, and 10–20% of the operating range). The analyzer responded within specification, with all points showing less than 1% error.

### Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:													
DATE:	06-May-2025	PREVIOUS CALIBRATION DATE:	13-Apr-2025	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)										
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1028										
LOCATION:	St. Lina	BAROMETRIC (mBar):	943	PARAMETER:	CH4	NMHC	THC										
PURPOSE:	Audit	START TIME (MST):	09:56	RANGE (ppm):	20	20	40										
PERFORMED BY:	Alex Yakupov	END TIME (MST):	11:52	PREVIOUS CF:	1.004	0.994	0.999										
CALIBRATION SYSTEM:																	
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):											
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 30646	HIGH ID:	n/a										
MODEL:	2010	MODEL:	T701	CH <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	869.0 306.3	HIGH EXPIRY:	n/a										
ID:	17100415	ID:	132	CYLINDER (psi):	1400	LOW ID:	n/a										
MFC CALIBRATION DATE:	27-Feb-2025	OXIDIZER ID:	115	EXPIRY DATE	11-Nov-2032	LOW EXPIRY:	n/a										
CALIBRATION PARAMETERS:																	
POINT (CH4/NMHC)	HIGH	MID	LOW	CH4 EQUIVILANCE		Zero Chrom											
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>	842.325	Use Zero Chrom?	Yes										
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>	1711.325	New Zero Chrom?	No										
EXPECTED (REFERENCE) VALUE:																	
INITIAL	CH4	NMHC	THC	FINAL	CH4	NMHC	THC										
	10.39	11.51	21.91		10.39	11.51	21.91										
CALIBRATION:																	
FLOW RATE (mL/min)			CONCENTRATION (PPM)						CORRECTION FACTOR (CF.)								
DILUENT	GAS	TOTAL	CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
			CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3100		3100	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a						
3049	50.70	3100	14.21	13.78	27.99	14.28	14.03	28.31	n/a	n/a	n/a	0.995	0.982	0.989	n/a	n/a	n/a
3075	25.40	3100	7.12	6.90	14.02	7.09	6.96	14.05	n/a	n/a	n/a	1.004	0.992	0.998	n/a	n/a	n/a
3087	12.70	3100	3.56	3.45	7.01	3.53	3.42	6.94	n/a	n/a	n/a	1.009	1.009	1.010	n/a	n/a	n/a
LINEAR REGRESSION ANALYSIS:				Comments:													
	CORRELATION	SLOPE	INTERCEPT	Audit calibration due to AEPA audit findings. See other sheet for AEPA low point													
CH4	1.000	1.005	-0.2%														
NMHC	1.000	1.020	-0.3%														
THC	1.000	1.013	-0.2%														

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## 2. Replication of AEPA Audit Conditions:

A second audit was conducted using the same three concentration points as the AEPA audit: approximately 70%, 35.5%, and 8.8%. While the mid and high points met acceptance criteria, the non-methane response at the low concentration point failed, with a 14.1% error.

### Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:													
DATE:	06-May-2025	PREVIOUS CALIBRATION DATE:	13-Apr-2025	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)										
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1028										
LOCATION:	St. Lina	BAROMETRIC (mBar):	943	PARAMETER:	CH4	NMHC	THC										
PURPOSE	Audit	START TIME (MST):	09:56	RANGE (ppm):	20	20	40										
PERFORMED BY:	Alex Yakupov	END TIME (MST):	11:52	PREVIOUS CF:	1.004	0.994	0.999										
<b>CALIBRATION SYSTEM:</b>																	
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):											
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 30646	HIGH ID:	n/a										
MODEL:	2010	MODEL:	T701	CH <sub>4</sub> /C <sub>2</sub> H <sub>6</sub> (ppm):	869.0   306.3	HIGH EXPIRY:	n/a										
ID:	17100415	ID:	132	CYLINDER (psi):	1400	LOW ID:	n/a										
MFC CALIBRATION DATE:	27-Feb-2025	OXIDIZER ID:	115	EXPIRY DATE	11-Nov-2032	LOW EXPIRY:	n/a										
<b>CALIBRATION PARAMETERS:</b>																	
POINT (CH4/NMHC)	HIGH	MID	LOW	CH4 EQUIVILANCE		Zero Chrom											
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>	842.325	Use Zero Chrom?	Yes										
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>	1711.325	New Zero Chrom?	No										
<b>EXPECTED (REFERENCE) VALUE:</b>																	
INITIAL	CH4	NMHC	THC	FINAL	CH4	NMHC	THC										
	10.39	11.51	21.91		10.39	11.51	21.91										
<b>CALIBRATION:</b>																	
FLOW RATE (mL/min)			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3100	<del>X</del>	3100	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
3049	50.70	3100	14.21	13.78	27.99	14.28	14.03	28.31	n/a	n/a	n/a	0.995	0.982	0.989	n/a	n/a	n/a
3075	25.40	3100	7.12	6.90	14.02	7.09	6.96	14.05	n/a	n/a	n/a	1.004	0.992	0.998	n/a	n/a	n/a
3094	6.30	3100	1.77	1.71	3.48	1.75	1.50	3.25	n/a	n/a	n/a	1.009	1.141	1.070	n/a	n/a	n/a
<b>LINEAR REGRESSION ANALYSIS:</b>								<b>Comments:</b>									
			CORRELATION	SLOPE	INTERCEPT	Audit calibration followed by the AE audit findings. An additional Extra Low point was taken to repeat a target point of the AE audit.											
CH4			1.000	1.005	-0.1%												
NMHC			1.000	1.026	-0.6%												
THC			1.000	1.015	-0.4%												

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### 3. Maintenance Performed:

The H<sub>2</sub> desiccant was replaced, and the analyzer was allowed to stabilize before additional audits were performed.

### 4. Post-Maintenance Audit (AMD ranges):

A third audit was conducted using AMD-specified concentration points. The analyzer again showed good performance, with less than 1% error across all checks.

## Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:													
DATE:	06-May-2025	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)										
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1028										
LOCATION:	St. Lina	BAROMETRIC (mBar):	943	PARAMETER:	CH4	NMHC	THC										
PURPOSE	Install/Post-Repair	START TIME (MST):	13:38	RANGE (ppm):	20	20	40										
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:45	PREVIOUS CF:	n/a	n/a	n/a										
<b>CALIBRATION SYSTEM:</b>																	
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):											
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 30646	HIGH ID:	n/a										
MODEL:	2010	MODEL:	T701	CH <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	869.0 306.3	HIGH EXPIRY:	n/a										
ID:	17100415	ID:	132	CYLINDER (psi):	1400	LOW ID:	n/a										
MFC CALIBRATION DATE:	27-Feb-2025	OXIDIZER ID:	115	EXPIRY DATE	11-Nov-2032	LOW EXPIRY:	n/a										
<b>CALIBRATION PARAMETERS:</b>																	
POINT (CH4/NMHC)	HIGH	MID	LOW	CH4 EQUIVILANCE		Zero Chrom											
TARGET	14	7	3.5	C <sub>2</sub> H <sub>6</sub> as CH <sub>4</sub>	842.325	Use Zero Chrom?	Yes										
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>	1711.325	New Zero Chrom?	Yes										
<b>EXPECTED (REFERENCE) VALUE:</b>																	
INITIAL	CH4	NMHC	THC	FINAL	CH4	NMHC	THC										
	10.39	11.51	21.91		10.01	11.37	21.38										
<b>CALIBRATION:</b>																	
FLOW RATE			CONCENTRATION (PPM)						CORRECTION FACTOR (CF.)								
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3100	<del>3100</del>	3100	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	<del>n/a</del>	<del>n/a</del>	<del>n/a</del>	<del>n/a</del>	<del>n/a</del>	<del>n/a</del>
3049	50.70	3100	14.21	13.78	27.99	n/a	n/a	n/a	14.20	13.88	28.08	n/a	n/a	n/a	1.001	0.993	0.997
3075	25.40	3100	7.12	6.90	14.02	n/a	n/a	n/a	7.07	6.94	14.01	n/a	n/a	n/a	1.007	0.994	1.001
3087	12.70	3100	3.56	3.45	7.01	n/a	n/a	n/a	3.53	3.39	6.92	n/a	n/a	n/a	1.009	1.018	1.013
<b>LINEAR REGRESSION ANALYSIS:</b>				<b>Comments:</b>													
	CORRELATION	SLOPE	INTERCEPT	Post-repair calibration following H2 generator maintenance (Desiccant cartridge was renewed). A new sample inlet filter was installed. AEPA Low point on separate forms.													
CH4	1.000	0.999	-0.1%														
NMHC	1.000	1.010	-0.2%														
THC	1.000	1.004	-0.1%														

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## 5. Post-Maintenance Audit (AEPA field audit concentrations):

The analyzer was re-evaluated using the AEPA audit's three concentration levels. Results were consistent with earlier findings: the high and mid-point checks passed, while the low concentration point again produced an error of approximately 14%.

### Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:													
DATE:	06-May-2025	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)										
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1028										
LOCATION:	St. Lina	BAROMETRIC (mBar):	943	PARAMETER:	CH4	NMHC	THC										
PURPOSE	Install/Post-Repair	START TIME (MST):	13:38	RANGE (ppm):	20	20	40										
PERFORMED BY:	Alex Yakupov	END TIME (MST):	n/a	PREVIOUS CF:	n/a	n/a	n/a										
<b>CALIBRATION SYSTEM:</b>																	
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):											
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 30646	HIGH ID:	n/a										
MODEL:	2010	MODEL:	T701	CH <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	869.0   306.3	HIGH EXPIRY:	n/a										
ID:	17100415	ID:	132	CYLINDER (psi):	1400	LOW ID:	n/a										
MFC CALIBRATION DATE:	27-Feb-2025	OXIDIZER ID:	115	EXPIRY DATE	11-Nov-2032	LOW EXPIRY:	n/a										
<b>CALIBRATION PARAMETERS:</b>																	
POINT (CH4/NMHC)	HIGH	MID	LOW	CH4 EQUIVILANCE		Zero Chrom											
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>	842.325	Use Zero Chrom?	Yes										
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>	1711.325	New Zero Chrom?	Yes										
<b>EXPECTED (REFERENCE) VALUE:</b>																	
INITIAL	CH4	NMHC	THC	FINAL	CH4	NMHC	THC										
	10.39	11.51	21.91		n/a	n/a	n/a										
<b>CALIBRATION:</b>																	
FLOW RATE (mL/min)			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3100	<del>X</del>	3100	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>
3049	50.70	3100	14.21	13.78	27.99	n/a	n/a	n/a	14.20	13.88	28.08	n/a	n/a	n/a	1.001	0.993	0.997
3075	25.40	3100	7.12	6.90	14.02	n/a	n/a	n/a	7.07	6.94	14.01	n/a	n/a	n/a	1.007	0.994	1.001
3094	6.30	3100	1.77	1.71	3.48	n/a	n/a	n/a	1.75	1.50	3.25	n/a	n/a	n/a	1.009	1.141	1.070
<b>LINEAR REGRESSION ANALYSIS:</b>								<b>Comments:</b>									
			CORRELATION	SLOPE	INTERCEPT	An additional Extra-low point calculation form											
CH4			1.000	0.999	-0.1%												
NMHC			1.000	1.015	-0.5%												
THC			1.000	1.007	-0.3%												

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## 6. Confirmation Audit (AEPA field audit concentrations):

A final post-maintenance audit was conducted using the same three concentration points applied by AEPA during the April 2025 field audit (approximately 70%, 35.5%, and 8.8%). Results were consistent with previous findings: the analyzer met acceptance criteria at the mid and high points, while the low concentration point continued to show a deviation of approximately 14%.

### Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:													
DATE:	06-May-2025	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)										
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1028										
LOCATION:	St. Lina	BAROMETRIC (mBar):	943	PARAMETER:	CH4	NMHC	THC										
PURPOSE:	Install/Post-Repair	START TIME (MST):	13:38	RANGE (ppm):	20	20	40										
PERFORMED BY:	Alex Yakupov	END TIME (MST):	n/a	PREVIOUS CF:	n/a	n/a	n/a										
CALIBRATION SYSTEM:																	
CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):											
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 30646	HIGH ID:	n/a										
MODEL:	2010	MODEL:	T701	CH <sub>4</sub> /C <sub>3</sub> H <sub>8</sub> (ppm):	869.0   306.3	HIGH EXPIRY:	n/a										
ID:	17100415	ID:	132	CYLINDER (psi):	1400	LOW ID:	n/a										
MFC CALIBRATION DATE:	27-Feb-2025	OXIDIZER ID:	115	EXPIRY DATE:	11-Nov-2032	LOW EXPIRY:	n/a										
CALIBRATION PARAMETERS:																	
POINT (CH <sub>4</sub> /NMHC)	HIGH	MID	LOW	CH <sub>4</sub> EQUIVILANCE		Zero Chrom											
TARGET	14	7	3.5	C <sub>3</sub> H <sub>8</sub> as CH <sub>4</sub>	842.325	Use Zero Chrom?	Yes										
RANGE	12 - 16	6 - 8	2 - 4	THC as CH <sub>4</sub>	1711.325	New Zero Chrom?	Yes										
EXPECTED (REFERENCE) VALUE:																	
INITIAL	CH <sub>4</sub>	NMHC	THC	FINAL	CH <sub>4</sub>	NMHC	THC										
	10.39	11.51	21.91		n/a	n/a	n/a										
CALIBRATION:																	
FLOW RATE (mL/min)			CONCENTRATION (PPM)						CORRECTION FACTOR (CF.)								
DILUENT	GAS	TOTAL	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC	CH <sub>4</sub>	NMHC	THC
3100	3100	3100	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00						
3049	50.70	3100	14.21	13.78	27.99	n/a	n/a	n/a	14.20	13.88	28.08	n/a	n/a	n/a	1.001	0.993	0.997
3075	25.40	3100	7.12	6.90	14.02	n/a	n/a	n/a	7.07	6.94	14.01	n/a	n/a	n/a	1.007	0.994	1.001
3094	6.30	3100	1.77	1.71	3.48	n/a	n/a	n/a	1.73	1.50	3.24	n/a	n/a	n/a	1.021	1.141	1.073
LINEAR REGRESSION ANALYSIS:				Comments:													
	CORRELATION	SLOPE	INTERCEPT	Extra-low point calculation form. Second attempt.													
CH <sub>4</sub>	1.000	1.000	-0.1%														
NMHC	1.000	1.015	-0.5%														
THC	1.000	1.007	-0.3%														

Shaping a world of trust

## Supplementary Information B



**Calibration complies with ISO/IEC  
17025, ANSI/NCSL Z540-1, and 9001**



**Cert. No.: 9009-14395673**

**Traceable® Certificate of Calibration for Professional Thermohygrometer**

Manufactured for and distributed by : Traceable® Products 12554 Galveston Rd B230, Webster, TX 77598

**Instrument Identification:**

Model: 9009,20250-21

S/N: 230557117

Manufacturer: Control Company

**Standards/Equipment:**

Description	Serial Number	Due Date	NIST Traceable Reference
Chilled Mirror Hygrometer	31874/1H2048MR	22 Feb 2024	21245
Digital Thermometer	130070752	10 Mar 2024	4000-14005482

**Certificate Information:**

Technician: 353

Procedure: CAL-17

Cal Date: 17 Aug 2023

Cal Due Date: 17 Aug 2025

Test Conditions: 58.42%RH 24.13°C 1014mBar

**Calibration Data: (New Instrument)**

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
%RH	N.A.	N.A.		25.16	27.0	Y	22.2	28.2	0.46	>4:1
%RH	N.A.	N.A.		50.10	51.3	Y	48.1	52.1	0.46	>4:1
%RH	N.A.	N.A.		75.51	73.5	Y	72.5	78.5	0.46	>4:1
°C	N.A.	N.A.		24.15	24.0	Y	23.2	25.2	0.076	>4:1

**This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.**

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=(Max-Min)/2; Min=As Left Nominal(Rounded) - Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

*Nicol Rodriguez*  
Nicol Rodriguez, Quality Manager

*Michael Pietronico*  
Michael Pietronico, Technical Manager

Note:

**Maintaining Accuracy:**

In our opinion once calibrated your Professional Thermohygrometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Professional Thermohygrometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

**Recalibration:**

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 17 Aug 2023

**CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598  
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com**

Control Company is an ISO/IEC 17025:2017 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.  
Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-ANAB.  
International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).

## Supplementary Information C

