WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION

Unit 3 - 805 Memorial Drive
Fort McMurray, AB T9K 0K4
P: 780.799.4420 E: info@wbea.org
wbea.org

Wood Buffalo Environmental Association

DECEMBER 2024

MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

January 31, 2025

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS01
BERTHA GANTER - FORT MCKAY
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 6, 2024	Last Cal Date:	November 15, 2024
Start time (MST):	11:52	End time (MST):	15:10
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.21	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC418809			
Removed Cal Gas Conc:	49.21	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	3565
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4766

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1501301448	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994626	0.994626	Backgd or Offset:	20.5	20.8
Calibration intercept:	-0.213467	-0.213467	Coeff or Slope:	0.875	0.888

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4918	81.3	800.3	790.1	1.013
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	789.7	Previous response	795.8	*% change	-0.8%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.6	----
High point	4918	81.3	800.3	801.9	0.998
Mid point	4959	40.7	400.6	399.0	1.004
Low point	4979	20.3	199.8	200.5	0.997
As left zero	5000	0.0	0.0	0.6	----
As left span	4918	81.3	800.3	800.8	0.999
				Average Correction Factor:	1.000

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

SO_2 Calibration Summary

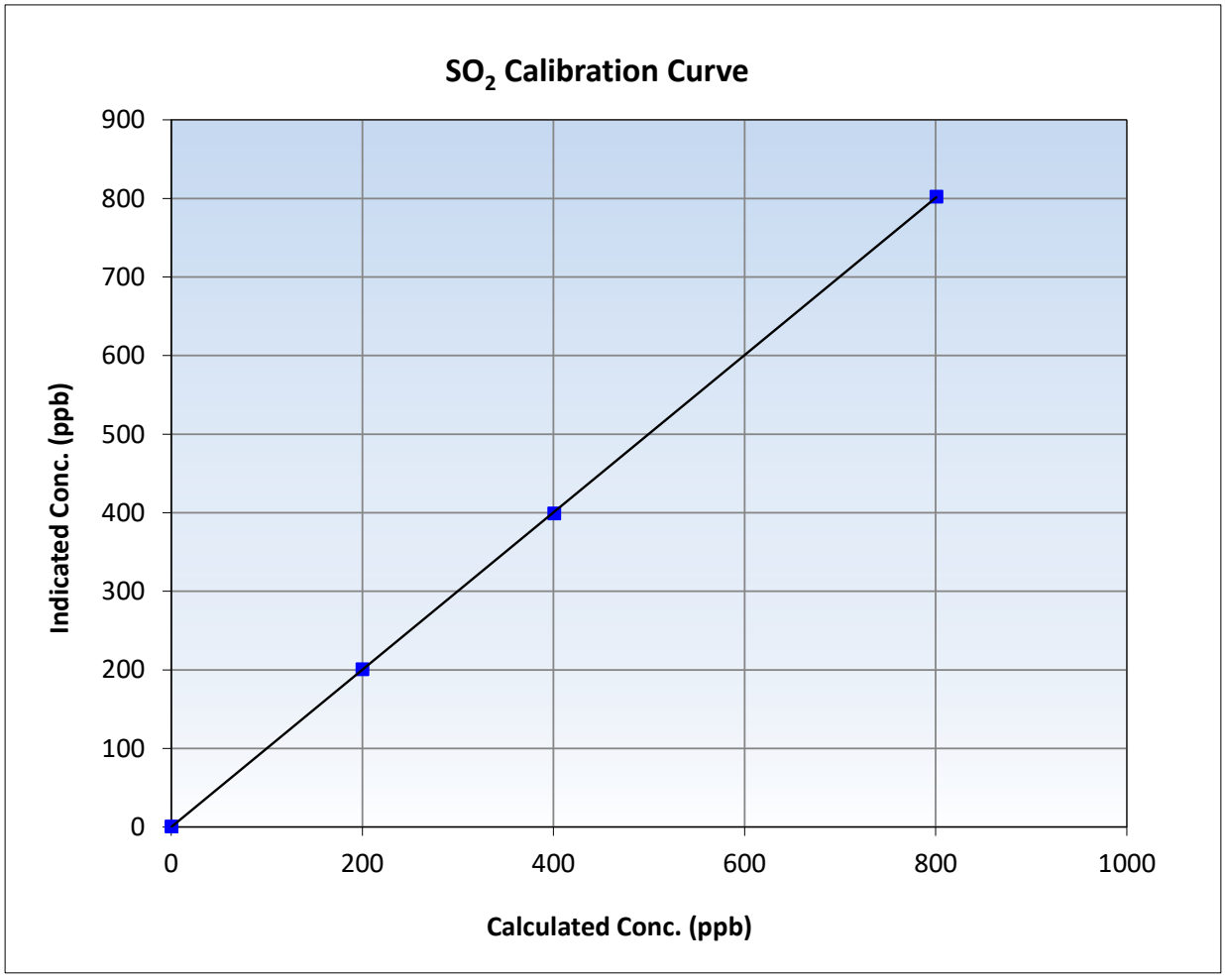
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:52	End Time (MST):	15:10
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301448

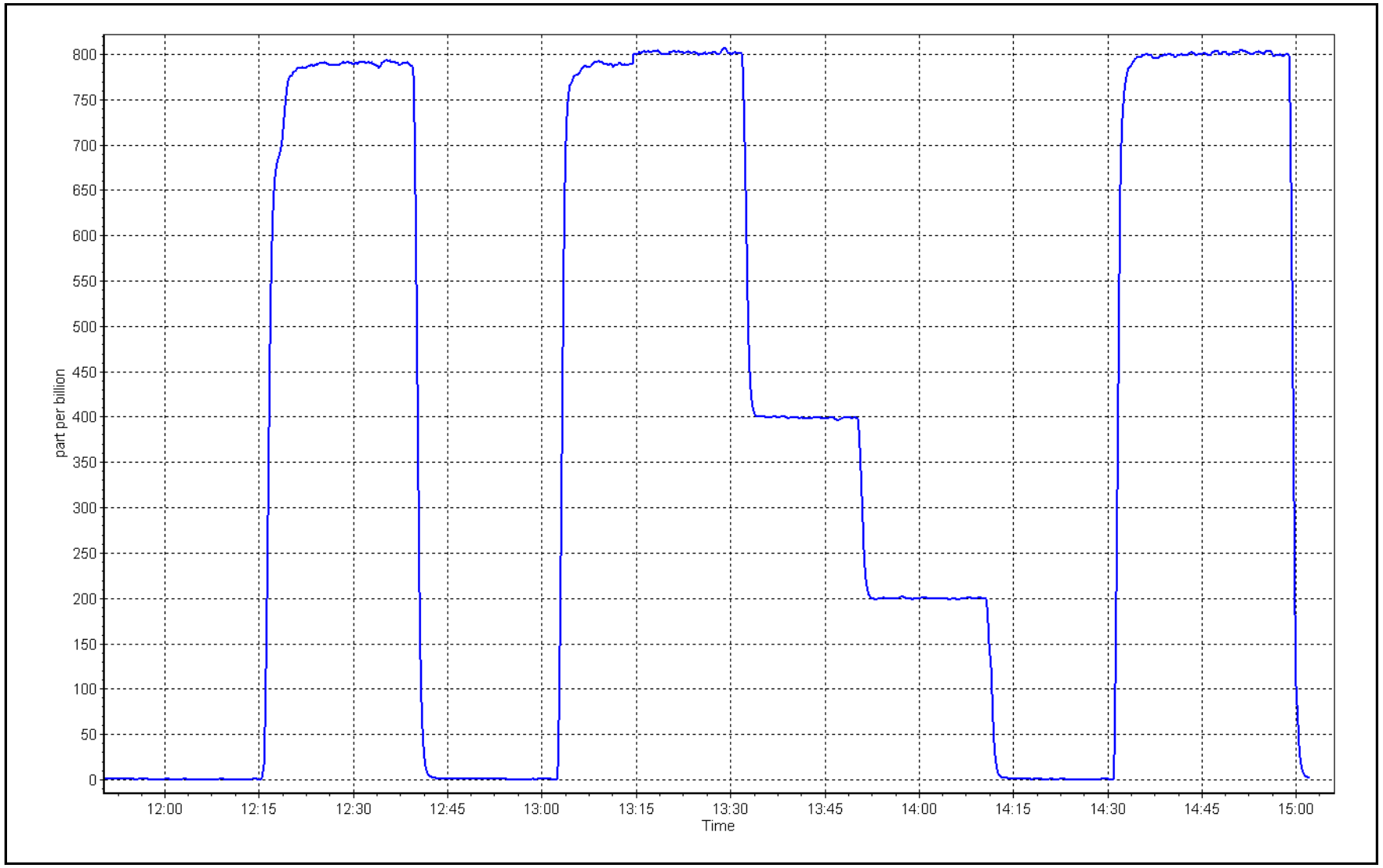
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
800.3	801.9	0.9980
400.6	399.0	1.0040
199.8	200.5	0.9966

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999985	*≥0.995*
Slope	1.000978	*0.90 - 1.10*
Intercept	-0.012554	*+/-30*



SO2 Calibration Plot Date: December 6, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 9, 2024	Last Cal Date:	November 6, 2024
Start time (MST):	10:45	End time (MST):	15:25
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	September 5, 2027
Cal Gas Cylinder #:	CC738239			
Removed Cal Gas Conc:	4.84	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3565
ZAG Make/Model:	Teledyne API T701		Serial Number:	4766

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1218153461
Converter make:	CD Nova		Converter serial #:	470
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.994520	0.995667	Backgd or Offset:	2.60	2.50
Calibration intercept:	0.021668	0.081535	Coeff or Slope:	0.910	0.893

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4917	82.6	80.0	80.9	0.987
As found Mid point	4959	41.3	40.0	40.6	0.982
As found Low point	4979	20.7	20.0	20.3	0.982
New cylinder response					

Baseline Corr As found:	81.0	Prev response:	79.55	*% change:	1.8%
Baseline Corr 2nd AF pt:	40.7	AF Slope:	1.012825	AF Intercept:	-0.018317
Baseline Corr 3rd AF pt:	20.4	AF Correlation:	0.999992	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4917	82.6	80.0	79.7	1.003
Mid point	4959	41.3	40.0	39.9	1.002
Low point	4979	20.7	20.0	20.0	1.002
As left zero	5000	0.0	0.0	0.2	----
As left span	4921	78.4	75.9	78.4	0.968
SO2 Scrubber Check	4919	81.3	813.0	0.0	----
Date of last scrubber change:		December 17, 2021		Ave Corr Factor	1.002
Date of last converter efficiency test:					

Notes: Inlet filter change and scrubber check completed after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

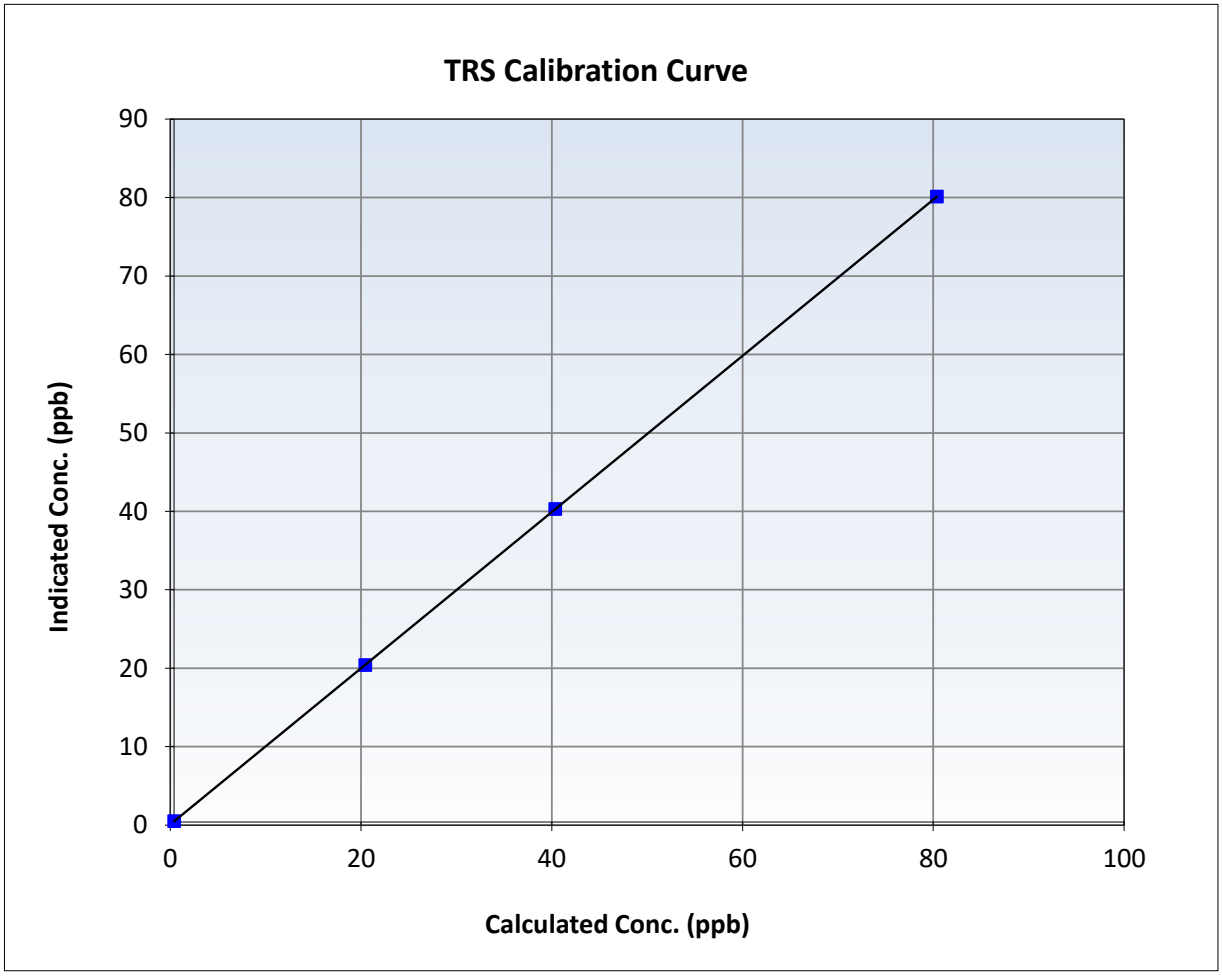
TRS Calibration Summary

Station Information

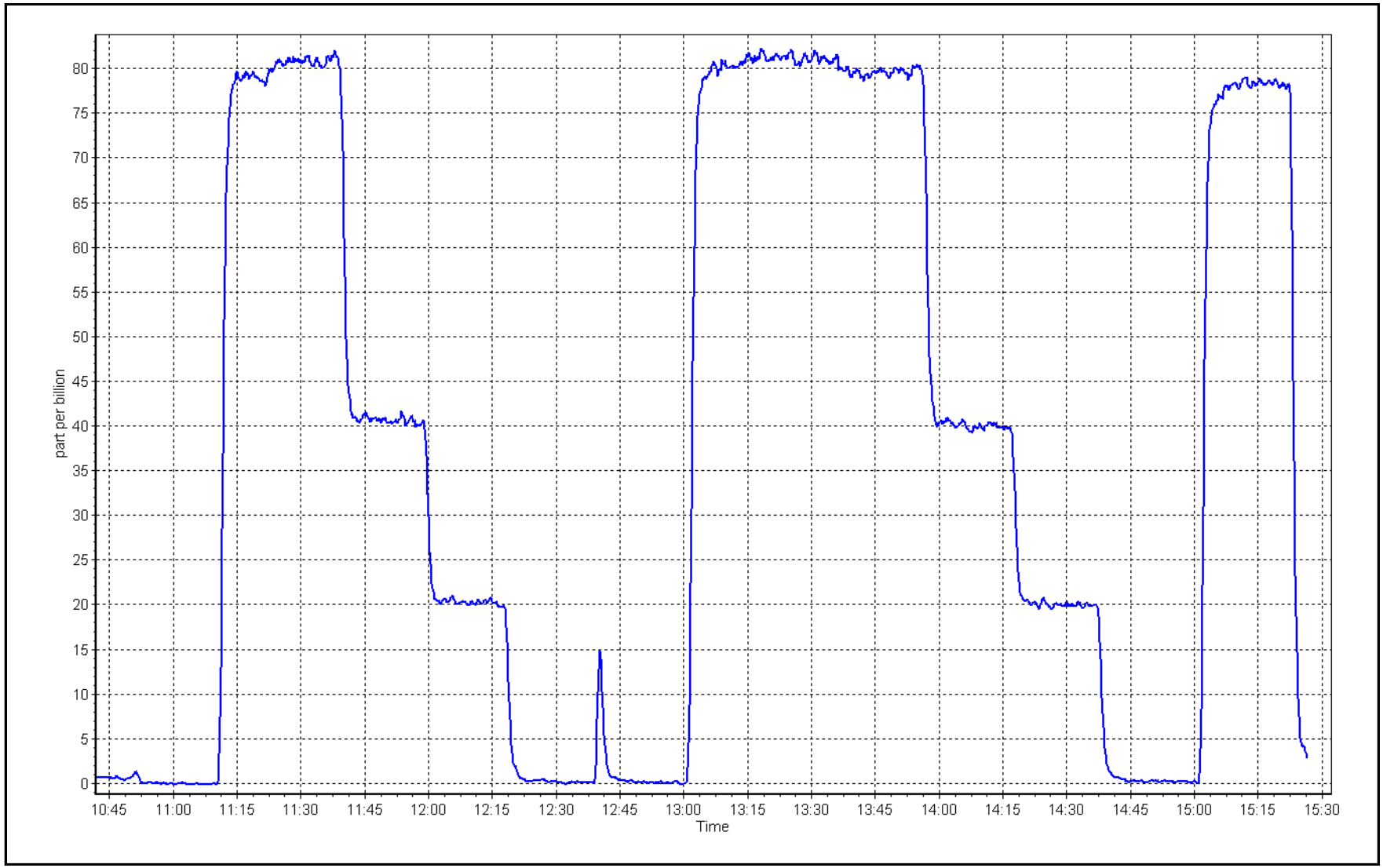
Calibration Date:	December 9, 2024	Previous Calibration:	November 6, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:45	End Time (MST):	15:25
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153461

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	1.000000	*≥0.995*
80.0	79.7	1.0033	Slope	0.995667	*0.90 - 1.10*
40.0	39.9	1.0020			
20.0	20.0	1.0019	Intercept	0.081535	*+/-3*



TRS Calibration Plot Date: December 9, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 9, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	10:45	End time (MST):	15:25
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	September 5, 2027
Cal Gas Cylinder #:	CC738239			
Removed Cal Gas Conc:	4.84	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3565
ZAG Make/Model:	Teledyne API T701		Serial Number:	4766

Analyzer Information

Analyzer make:	Thermo 43iQ-TL		Analyzer serial #:	1200326167
Converter make:	CD Nova		Converter serial #:	2022-221
Analyzer Range	0 - 100 ppb		Converter Temp:	315 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996526	0.992381	Backgd or Offset:	1.58	1.57
Calibration intercept:	0.202067	0.322108	Coeff or Slope:	0.969	0.969

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4917	82.6	80.0	79.8	1.006
As found Mid point	4959	41.3	40.0	40.0	1.007
As found Low point	4979	20.7	20.0	20.1	1.012
New cylinder response					

Baseline Corr As found:	79.5	Prev response:	79.89	*% change:	-0.5%
Baseline Corr 2nd AF pt:	39.7	AF Slope:	0.994669	AF Intercept:	0.242050
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999997	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4917	82.6	80.0	79.7	1.003
Mid point	4959	41.3	40.0	40.0	0.999
Low point	4979	20.7	20.0	20.1	0.997
As left zero	5000	0.0	0.0	0.5	----
As left span	4917	82.6	80.0	79.8	1.002
SO2 Scrubber Check	4919	81.3	813.0	0.0	----

Date of last scrubber change:	January 25, 2024	Ave Corr Factor	1.000	
Date of last converter efficiency test:	November 7, 2024	107.9%	efficiency	

Notes: Inlet filter change and scrubber check completed after as founds.No adjustments made.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

H_2S Calibration Summary

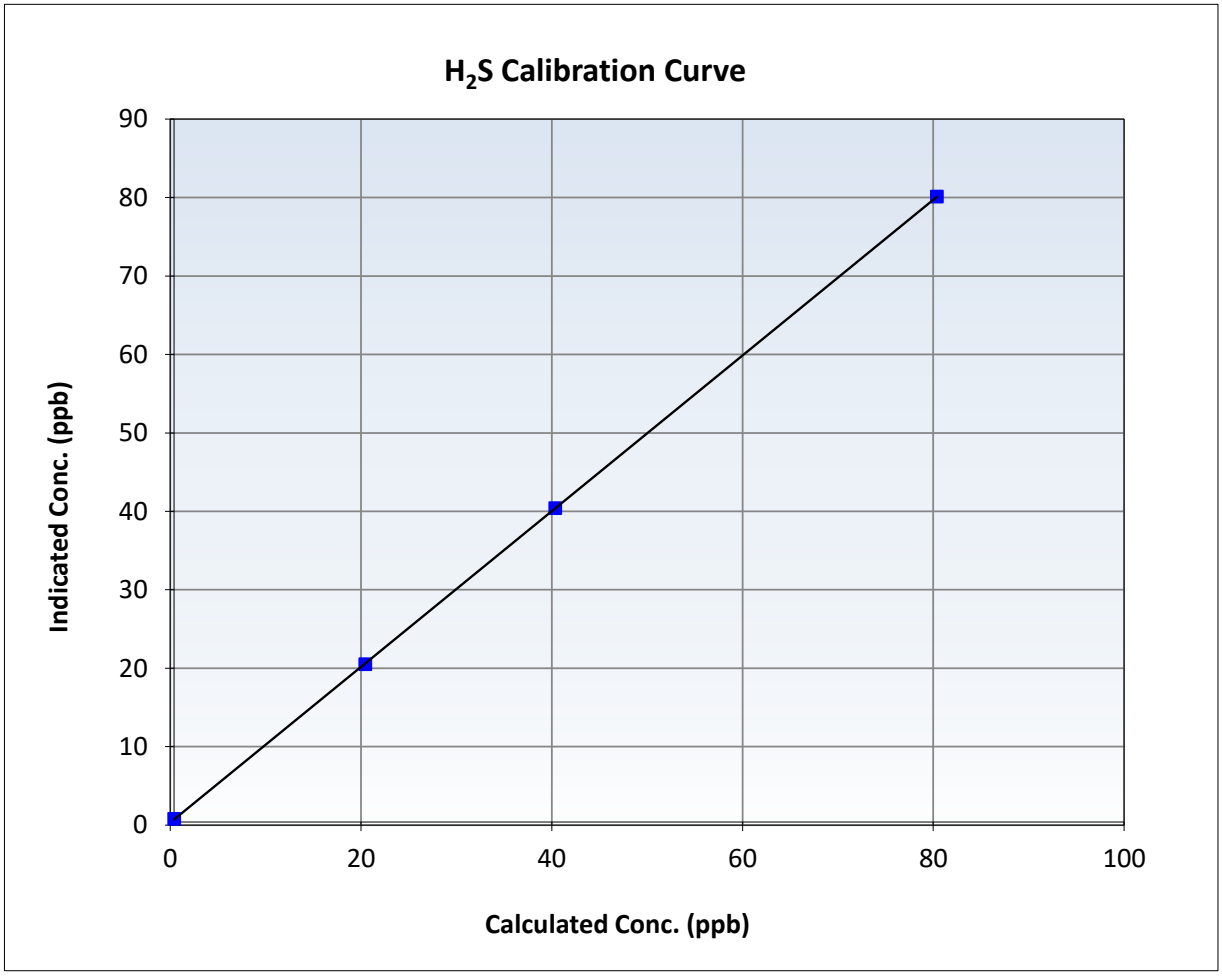
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 7, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:45	End Time (MST):	15:25
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1200326167

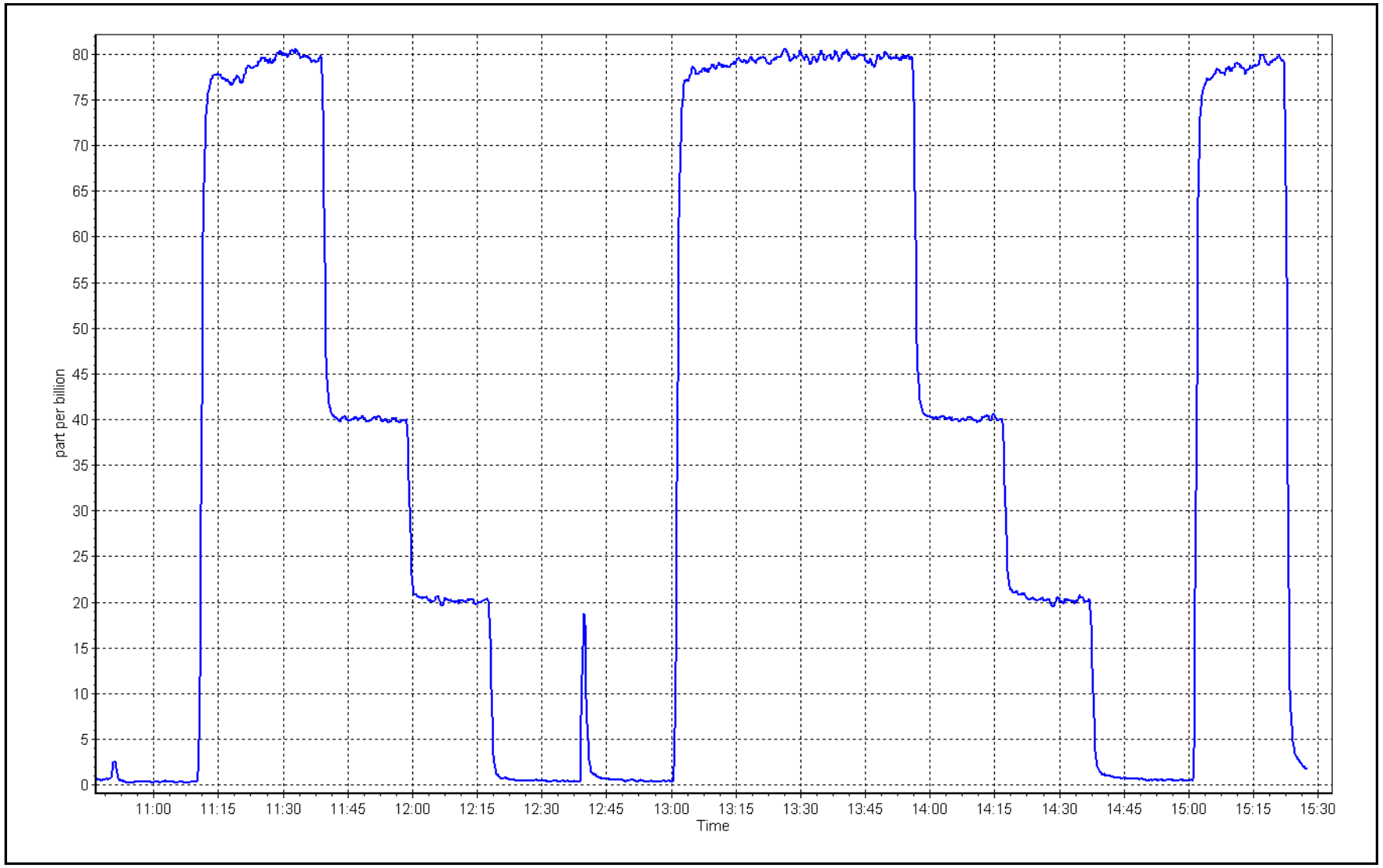
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
80.0	79.7	1.0033
40.0	40.0	0.9994
20.0	20.1	0.9970

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	0.992381	*0.90 - 1.10*
Intercept	0.322108	*+/-3*



H_2S Calibration Plot Date: December 9, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 6, 2024	Last Cal Date:	November 15, 2024
Start time (MST):	11:52	End time (MST):	15:10
Reason:	Routine		

Calibration Standards

Gas Cert Reference:		CC418809	Cal Gas Expiry Date:	March 10, 2031	
CH4 Cal Gas Conc.	497.2	ppm	CH4 Equiv Conc.	1061.8	ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:		NA	Removed Gas Expiry:	NA	
Removed CH4 Conc.	497.2	ppm	CH4 Equiv Conc.	1061.8	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API T700		Serial Number:	3565	
Zero Air Gen model:	Teledyne API T701		Serial Number:	4766	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320040	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	4.48E-04	4.45E-04	NMHC SP Ratio:	8.38E-05	8.40E-05
CH4 Retention time:	16.7	16.7	NMHC Peak Area:	109721	109431
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	17.27	17.39	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.39	Prev response	17.20	*% change	1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	17.27	17.27	1.000
Mid point	4959	40.7	8.64	8.49	1.018
Low point	4979	20.3	4.31	4.25	1.014
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	17.27	17.40	0.992
				Average Correction Factor	1.011

Notes: Changed the inlet filter after as founds. Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	9.18	9.25	0.992
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.25	Prev response	9.15	*% change	1.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	9.18	9.19	1.000
Mid point	4959	40.7	4.60	4.56	1.007
Low point	4979	20.3	2.29	2.30	0.998
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	9.18	9.30	0.987
				Average Correction Factor	1.002

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	8.09	8.14	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.14	Prev response	8.05	*% change	1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	8.09	8.09	1.000
Mid point	4959	40.7	4.05	3.92	1.031
Low point	4979	20.3	2.02	1.96	1.032
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	8.09	8.10	0.999
				Average Correction Factor	1.021

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.999339	1.000516
THC Cal Offset:	-0.055421	-0.055816
CH4 Cal Slope:	1.001489	1.000794
CH4 Cal Offset:	-0.043511	-0.049303
NMHC Cal Slope:	0.997471	0.999886
NMHC Cal Offset:	-0.011511	-0.005712

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

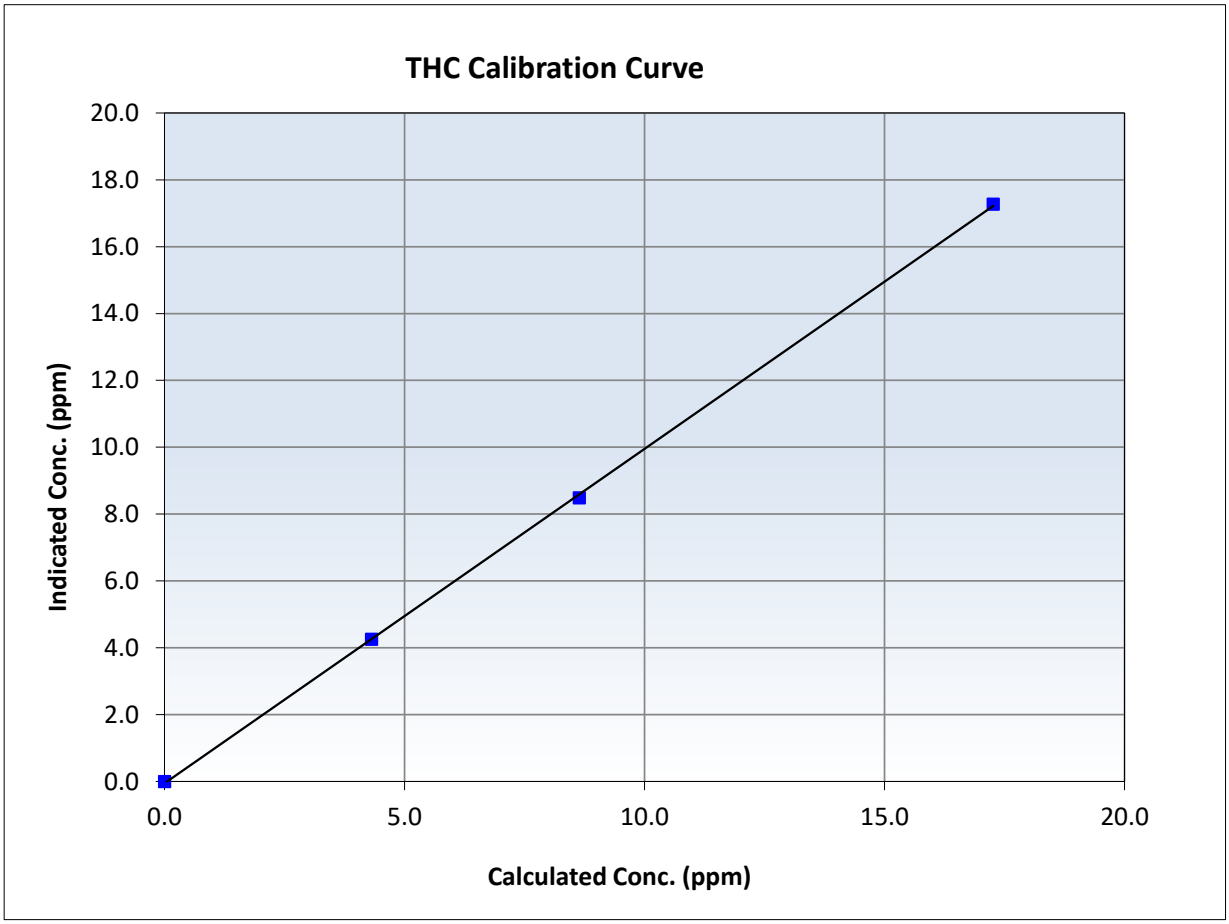
THC Calibration Summary

Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:52	End Time (MST):	15:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999899	≥0.995
17.27	17.27	0.9996	Slope	1.000516	0.90 - 1.10
8.64	8.49	1.0182	Intercept	-0.055816	+/-0.5
4.31	4.25	1.0140			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

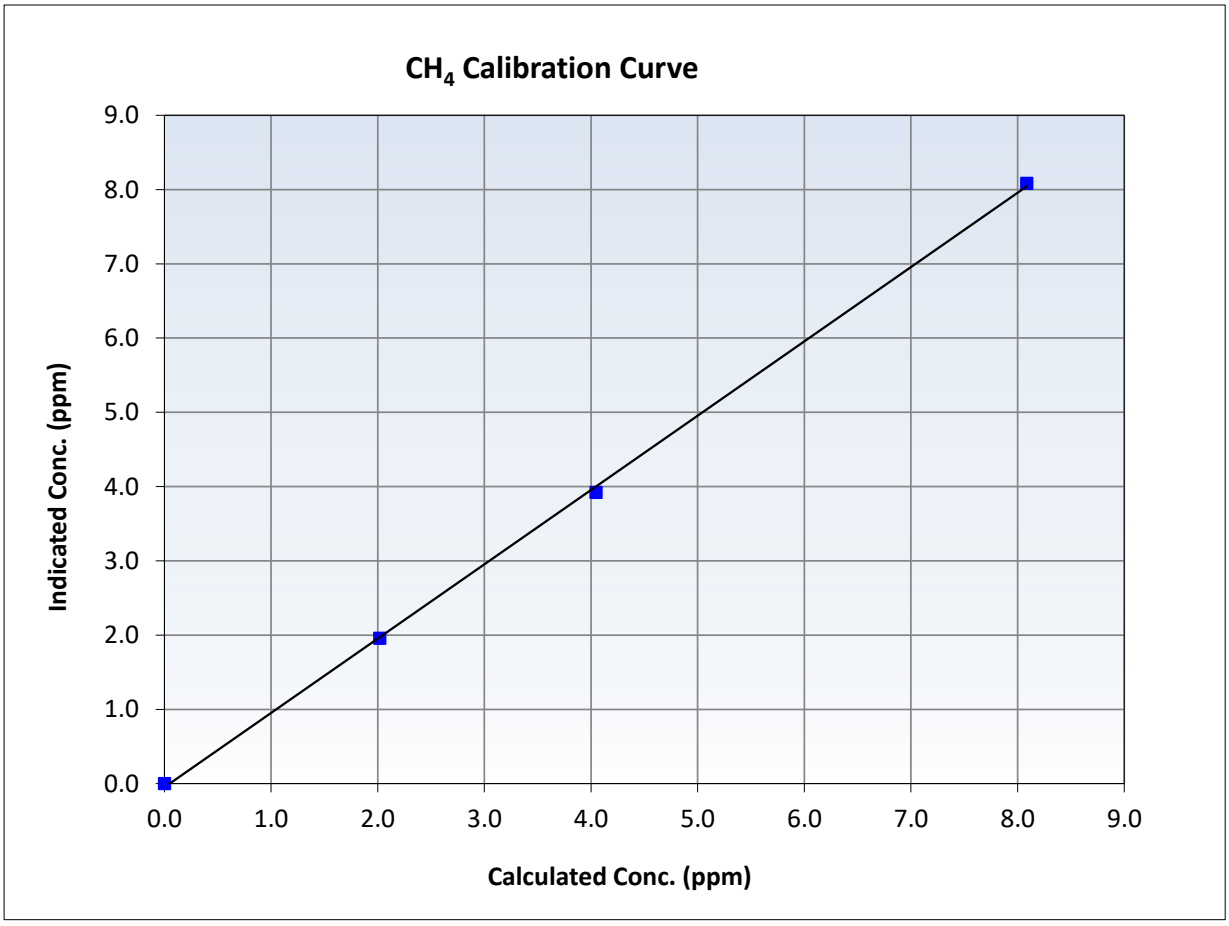
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:52	End Time (MST):	15:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.09	8.09	1.0001
4.05	3.92	1.0315
2.02	1.96	1.0316

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999710	*≥0.995*
Slope	1.000794	*0.90 - 1.10*
Intercept	-0.049303	*+/-0.5*



Wood Buffalo Environmental Association

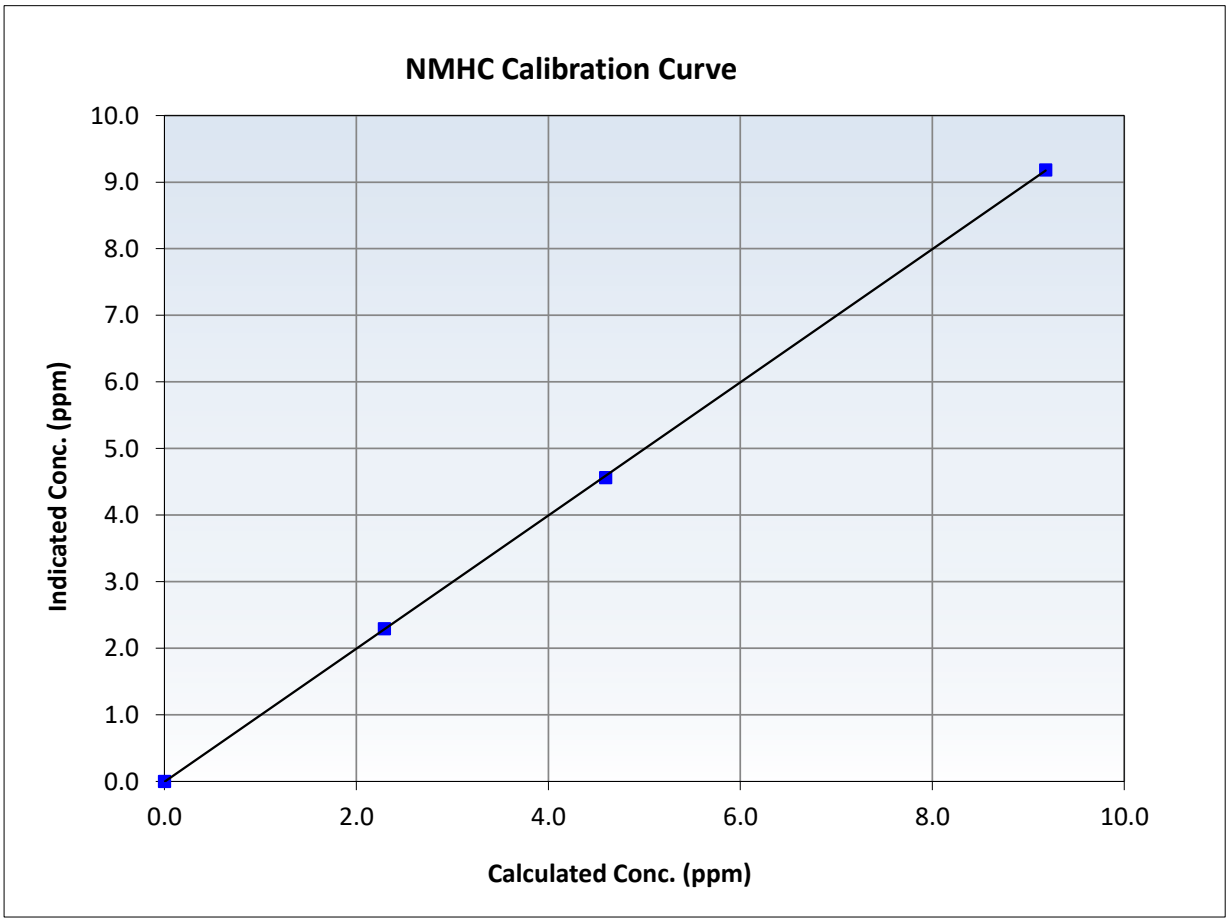
NMHC Calibration Summary

Station Information

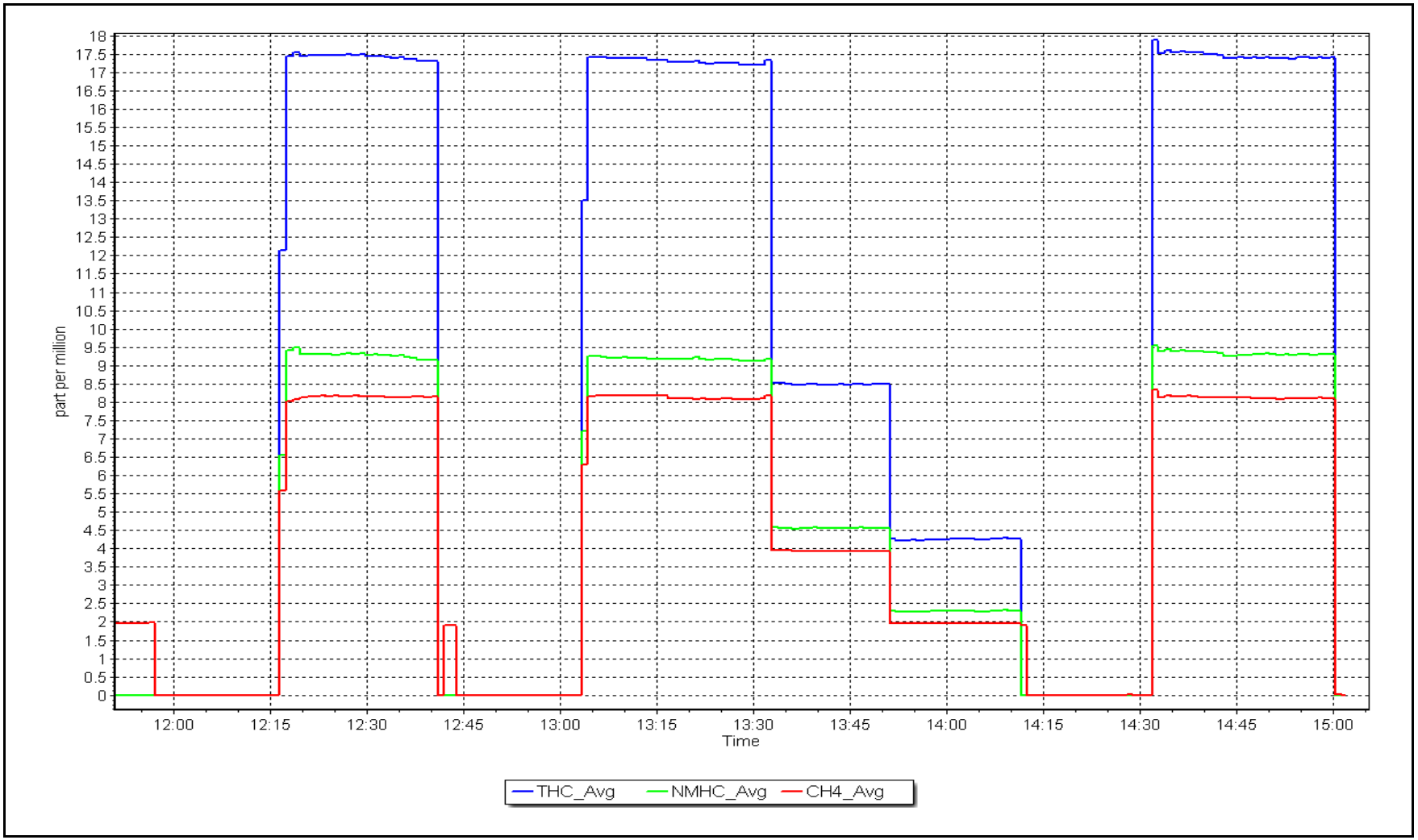
Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:52	End Time (MST):	15:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999981	≥0.995
9.18	9.19	0.9996	Slope	0.999886	0.90 - 1.10
4.60	4.56	1.0070	Intercept	-0.005712	+/-0.5
2.29	2.30	0.9985			



NMHC Calibration Plot Date: December 6, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 17, 2024	Last Cal Date:	December 6, 2024
Start time (MST):	12:45	End time (MST):	15:10
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC418809		Cal Gas Expiry Date:	March 10, 2031	
CH4 Cal Gas Conc.	497.2	ppm	CH4 Equiv Conc.	1061.8	ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	497.2	ppm	CH4 Equiv Conc.	1061.8	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API T700		Serial Number:	3565	
Zero Air Gen model:	Teledyne API T701		Serial Number:	4766	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320040	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	4.45E-04	4.45E-04	NMHC SP Ratio:	8.40E-05	8.40E-05
CH4 Retention time:	16.7	16.7	NMHC Peak Area:	109431	109431
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	17.27	17.37	0.994
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.37	Prev response	17.22	*% change	0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	17.27	17.38	0.993
				Average Correction Factor	

Notes: Changing the N2 cylinder.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	9.18	9.34	0.984
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.34	Prev response	9.17	*% change	1.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	9.18	9.35	0.982
				Average Correction Factor	

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	8.09	8.03	1.007
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.03	Prev response	8.04	*% change	-0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

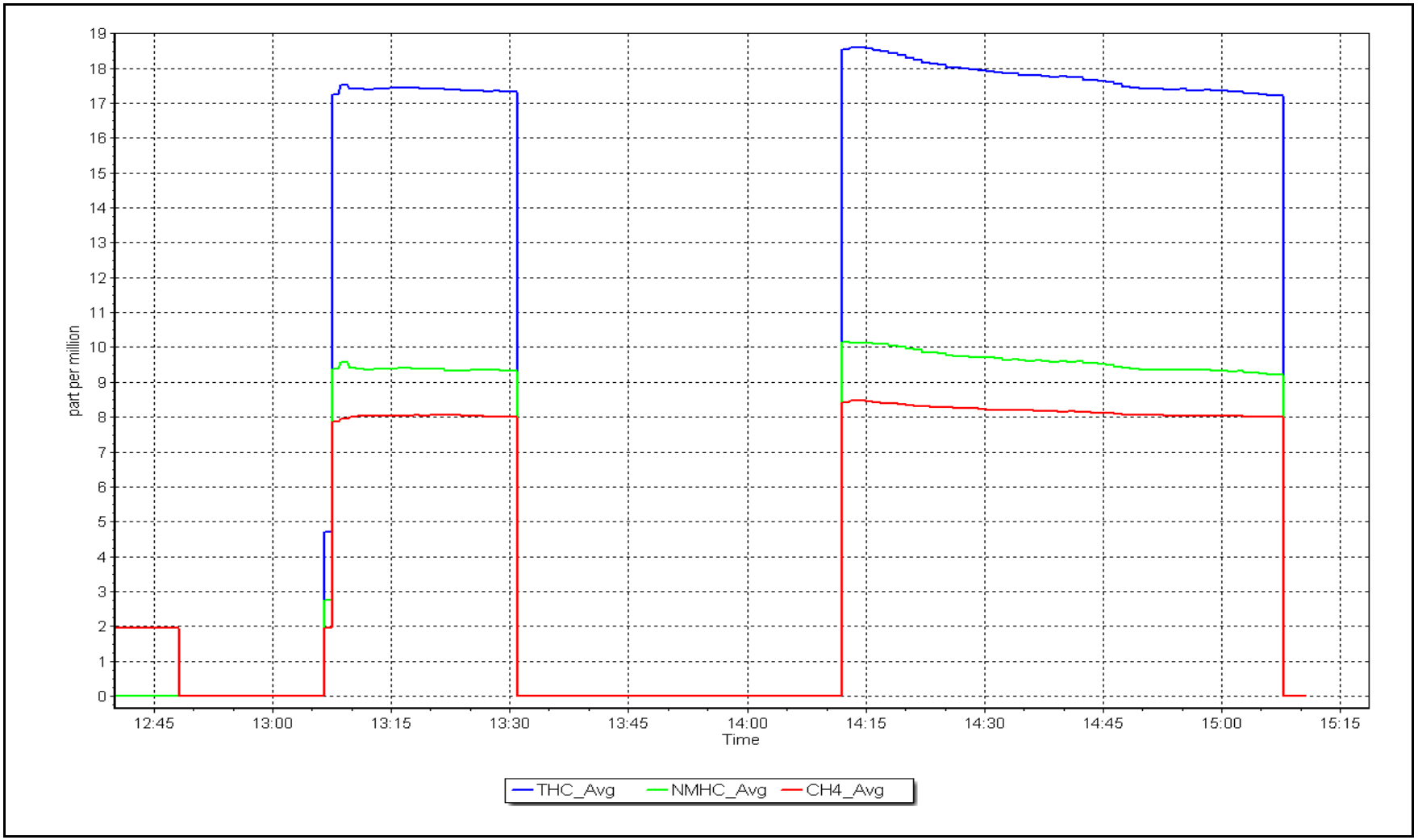
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	8.09	8.04	1.006
				Average Correction Factor	

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.000516	
THC Cal Offset:	-0.055816	
CH4 Cal Slope:	1.000794	
CH4 Cal Offset:	-0.049303	
NMHC Cal Slope:	0.999886	
NMHC Cal Offset:	-0.005712	

Calibration Performed By: Rene Chamberland

NMHC Calibration Plot Date: December 17, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay
Station number:	AMS 01
Calibration Date:	December 5, 2024
Last Cal Date:	November 5, 2024
Start time (MST):	11:53
End time (MST):	16:48
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC335700	Cal Gas Expiry Date:	September 1, 2032
NOX Cal Gas Conc:	59.40 ppm	NO Cal Gas Conc:	59.20 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.40 ppm	Removed Gas NO Conc:	59.20 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3565
ZAG make/model:	Teledyne API T701	Serial Number:	4766

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.5	0.1	----	----
AF High point	4932	67.6	803.1	800.4	2.7	794.8	789.3	5.5	1.0099	1.0134
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	801.8 ppb	NO =	799.5 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -0.8%
Baseline Corr 1st pt	NO_X =	795.2 ppb	NO =	789.8 ppb	As Found Statistics	*Percent Change	NO = -1.2%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 7117

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.148	1.157	NO bkgnd or offset:	-3.1	-3.1
NOX coeff or slope:	1.148	1.161	NOX bkgnd or offset:	-2.9	-2.9
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	6.8	6.9

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.999286	1.001961
NO_X Cal Offset:	-0.700000	-0.240000
NO Cal Slope:	1.000977	1.001534
NO Cal Offset:	-1.660000	-1.580000
NO_2 Cal Slope:	1.000376	1.000167
NO_2 Cal Offset:	-0.520742	0.917072

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.1	----	----
High point	4932	67.6	803.1	800.4	2.7	804.7	801.0	3.6	0.9980	0.9992
Mid point	4966	33.8	401.5	400.2	1.4	401.8	398.2	3.6	0.9994	1.0050
Low point	4983	16.9	200.8	200.1	0.7	200.4	197.0	3.4	1.0019	1.0157
As left zero	5000	0.0	0.0	0.0	0.0	1.3	1.2	0.1	----	----
As left span	4932	67.6	803.1	389.1	414.0	797.0	389.1	407.9	1.0076	1.0000
							Average Correction Factor		0.9997	1.0066

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	796.3	389.8	409.2	409.9	0.9983	100.2%
Mid GPT point	796.3	594.1	204.9	205.9	0.9952	100.5%
Low GPT point	796.3	696.1	102.9	104.9	0.9810	101.9%
				Average Correction Factor	0.9915	100.9%

Notes: Changed the inlet filter after as founds. Adjusted the span.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

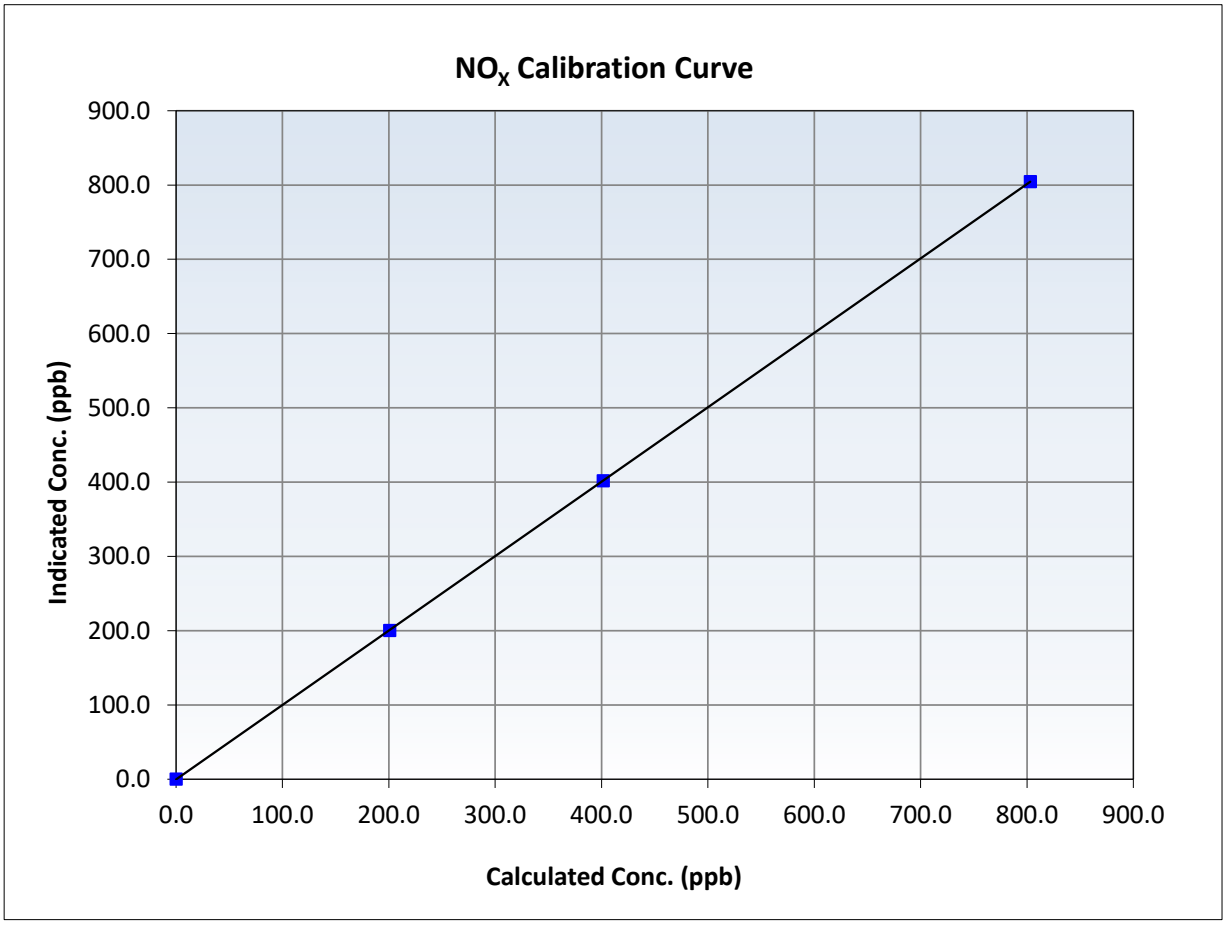
NO_X Calibration Summary

Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:53	End Time (MST):	16:48
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	0.3	----	Correlation Coefficient	0.999998	≥0.995
803.1	804.7	0.9980	Slope	1.001961	0.90 - 1.10
401.5	401.8	0.9994	Intercept	-0.240000	+/-20
200.8	200.4	1.0019			



Wood Buffalo Environmental Association

NO_2 Calibration Summary

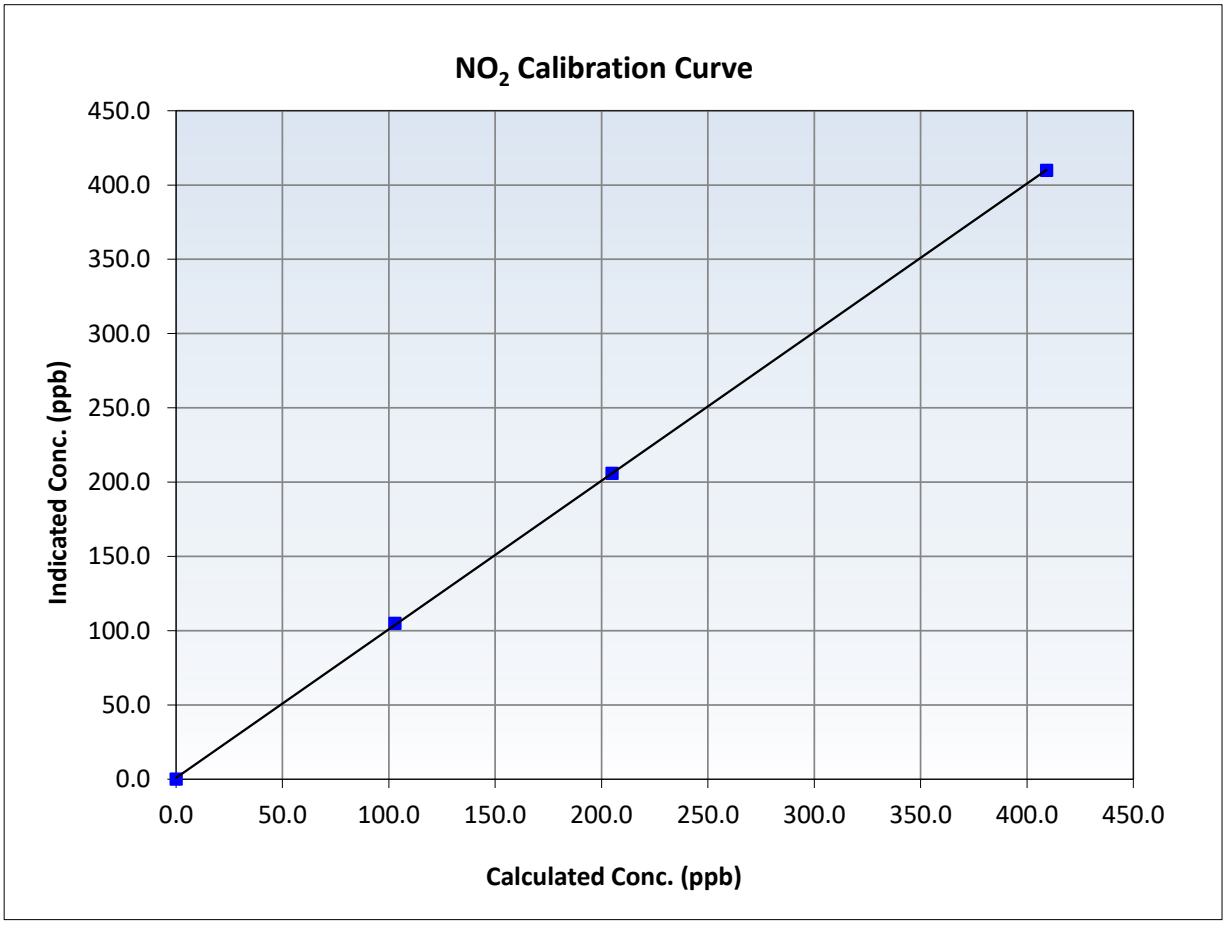
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:53	End Time (MST):	16:48
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
409.2	409.9	0.9983
204.9	205.9	0.9952
102.9	104.9	0.9810

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999979	*≥0.995*
Slope	1.000167	*0.90 - 1.10*
Intercept	0.917072	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

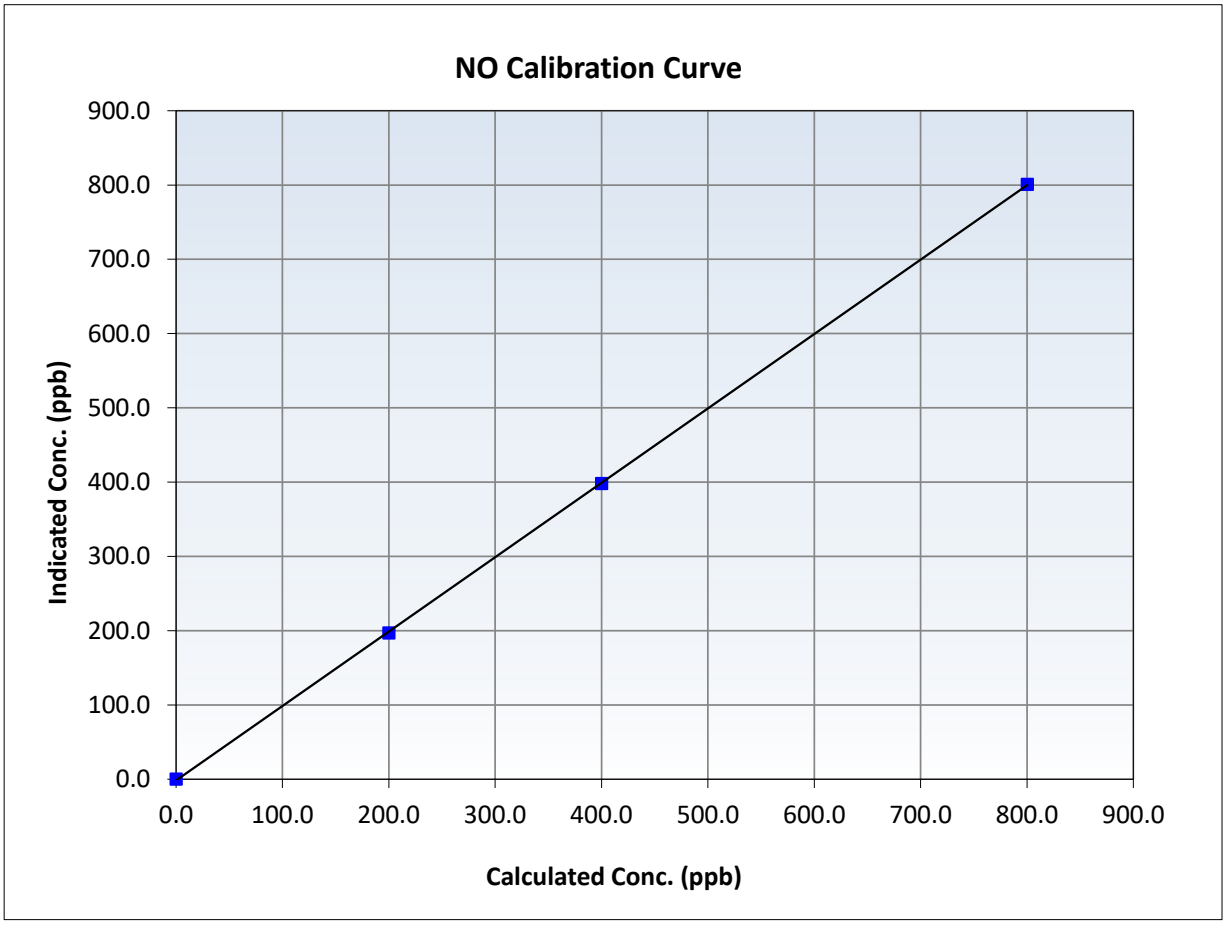
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:53	End Time (MST):	16:48
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

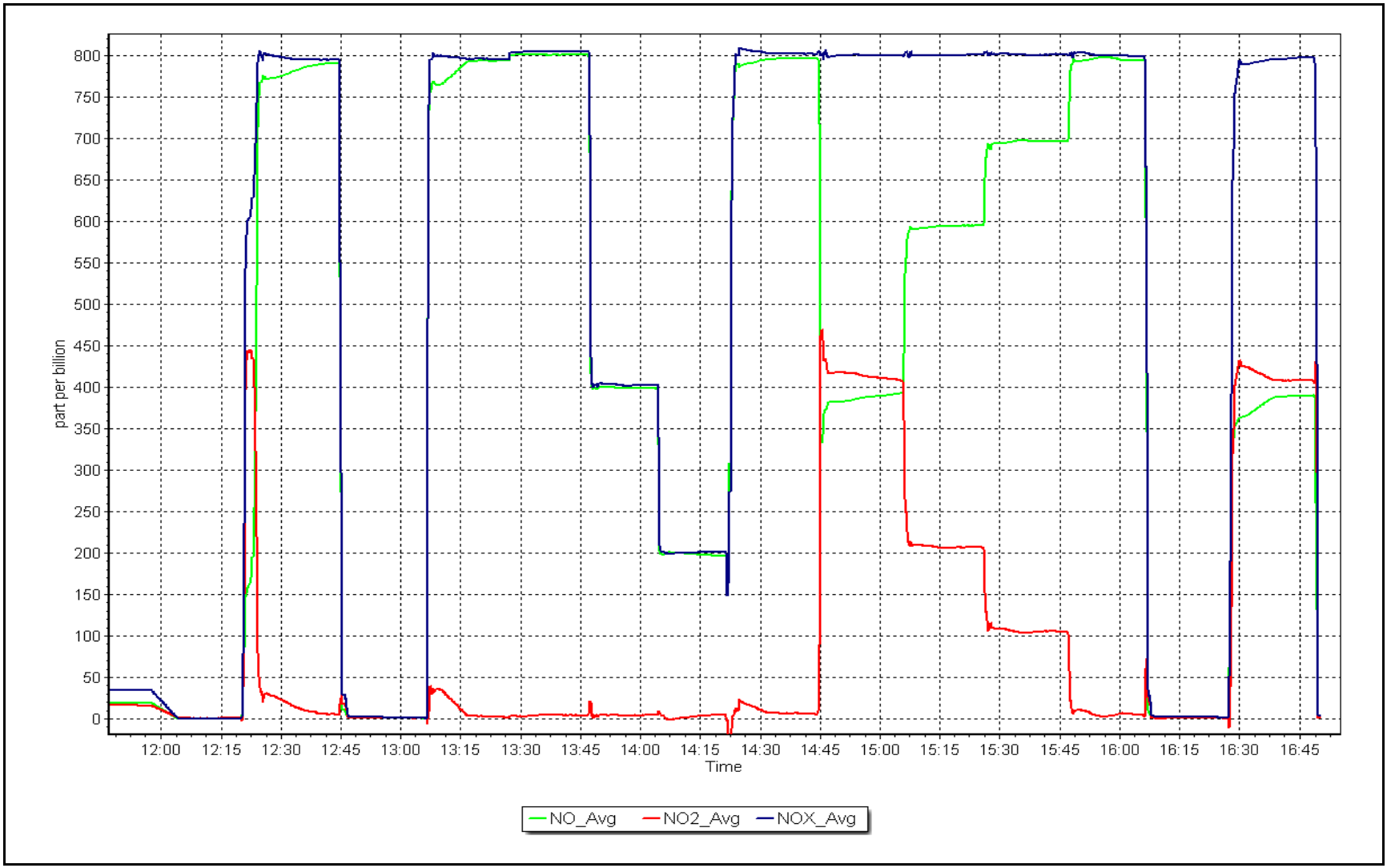
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
800.4	801.0	0.9992
400.2	398.2	1.0050
200.1	197.0	1.0157

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	1.001534	*0.90 - 1.10*
Intercept	-1.580000	*+/-20*



NO_X Calibration Plot Date: December 5, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 2, 2024	Last Cal Date:	November 1, 2024
Start time (MST):	11:30	End time (MST):	13:57
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	3565
ZAG Make/Model:	Teledyne API T701	Serial Number:	4766

Analyzer Information

Analyzer make:	Teledyne API T400		Analyzer serial #:	1107	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003114	1.003514	Backgd or Offset:	5.4	5.4
Calibration intercept:	0.380000	0.160000	Coeff or Slope:	1.010	1.010

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	5000	863.1	400.0	400.9	0.998
As found Mid point					
As found Low point					
Baseline Corr As found:	400.8	Previous response	401.6	*% change	-0.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	5000	863.1	400.0	401.3	0.997
Mid point	5000	744.0	200.0	201.6	0.992
Low point	5000	651.7	100.0	100.1	0.999
As left zero	5000	0.0	0.0	-0.1	----
As left span	5000	863.1	400.0	404.3	0.989
				Average Correction Factor	0.996

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

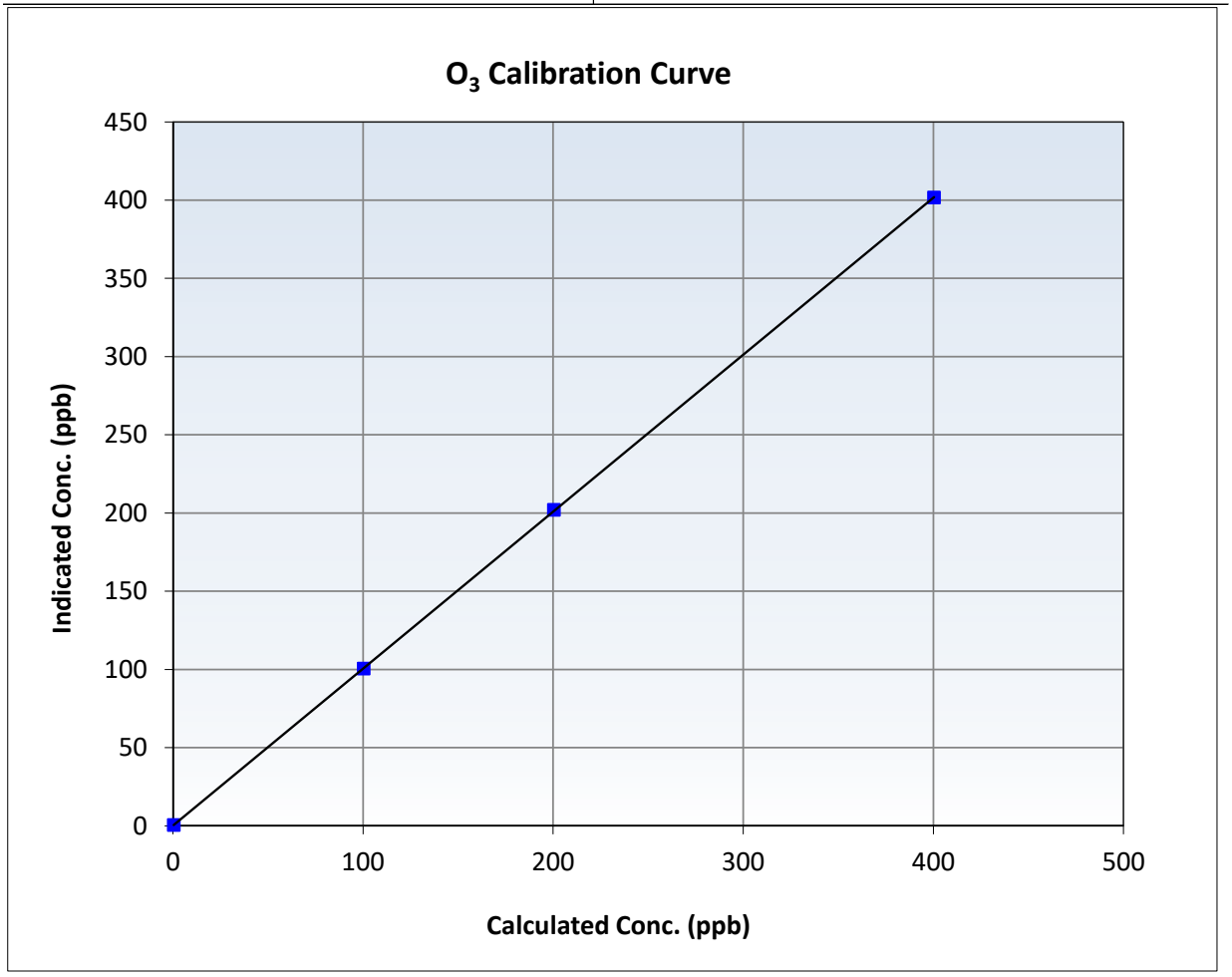
O_3 Calibration Summary

Station Information

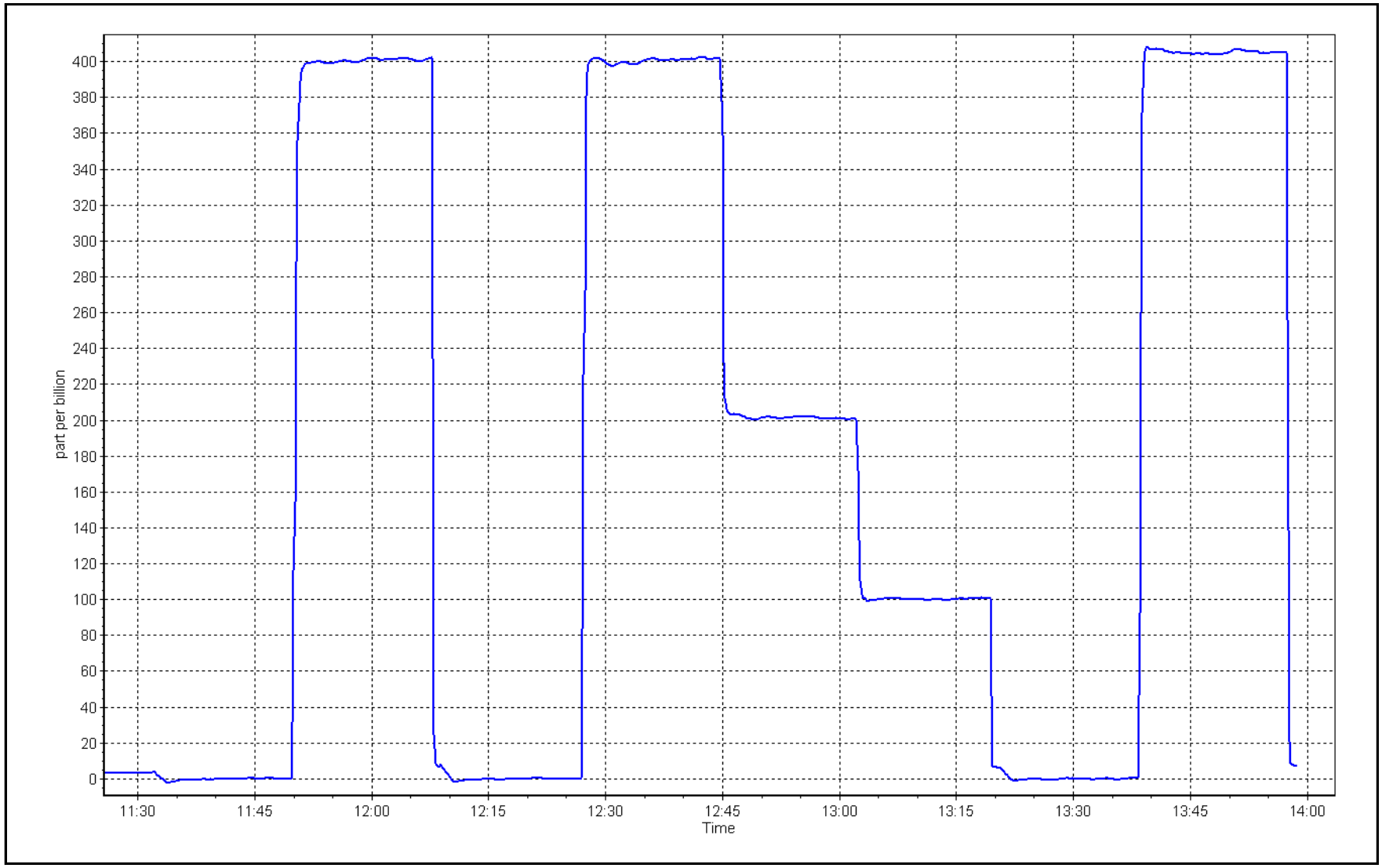
Calibration Date:	December 2, 2024	Previous Calibration:	November 1, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:30	End Time (MST):	13:57
Analyzer make:	Teledyne API T400	Analyzer serial #:	1107

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999991	*≥0.995*
400.0	401.3	0.9968	Slope	1.003514	*0.90 - 1.10*
200.0	201.6	0.9921			
100.0	100.1	0.9990	Intercept	0.160000	*+/- 5*



O_3 Calibration Plot Date: December 2, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
Calibration Date:	December 12, 2024	Last Cal Date:	November 15, 2024
Start time (MST):	13:59	End time (MST):	15:09
Analyzer Make:	Teledyne API T640	S/N:	322
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388752
Temp/RH standard:	Alicat FP-25BT	S/N:	388752

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-12	-12.7	-12	☐	+/- 2 °C
P (mmHg)	729.7	731.96	729.7	☐	+/- 10 mmHg
Flow (LPM)	4.98	4.967	4.98	☐	+/- 0.25 LPM
PW% (pump)	40		40	☐	>80%
Zero Verification	PM w/o HEPA:	5.5	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	10.9 +/- 0.5

Date Optical Chamber Cleaned: October 24, 2024

Date Disposable Filter Changed: October 24, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 24, 2024

Date RH/T Sensor Cleaned: October 24, 2024

Notes: Flow, temperature, and pressure were verified. Leak check passed.

Calibration by: Rene Chamberland

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 3, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	11:52	End time (MST):	14:52
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	3,040	ppm	Cal Gas Exp Date:	December 1, 2028
Cal Gas Cylinder #:	ALM042207			
Removed Cal Gas Conc:	3,040	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3565
ZAG Make/Model:	Teledyne API T701		Serial Number:	4766

Analyzer Information

Analyzer make:	Teledyne API T300		Analyzer serial #:	3520	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002581	1.002243	Backgd or Offset:	-0.014	-0.014
Calibration intercept:	0.161850	0.117838	Coeff or Slope:	0.990	0.996

CO As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4933	66.7	40.6	40.7	1.000
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	40.56	Prev response:	40.82	*% change:	-0.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4933	66.7	40.6	40.7	0.998
Mid point	4966	33.3	20.2	20.7	0.980
Low point	4983	16.7	10.2	10.2	0.992
As left zero	5000	0.0	0.0	0.0	----
As left span	2960	40.0	40.5	40.2	1.009
				Average Correction Factor	0.990

Notes: Changed the inlet filter after as founds. Adjusted the zero.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

CO Calibration Summary

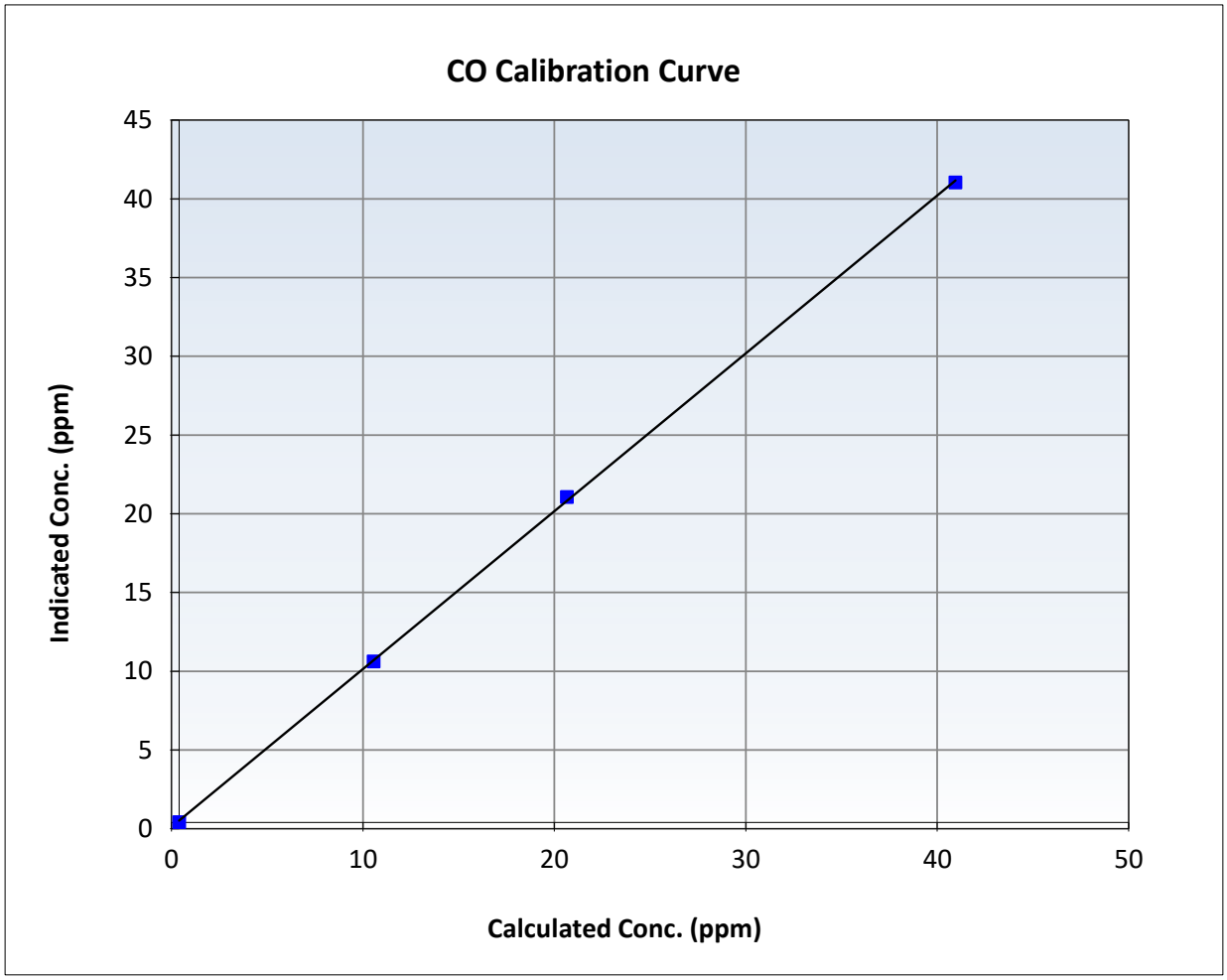
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 4, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:52	End Time (MST):	14:52
Analyzer make:	Teledyne API T300	Analyzer serial #:	3520

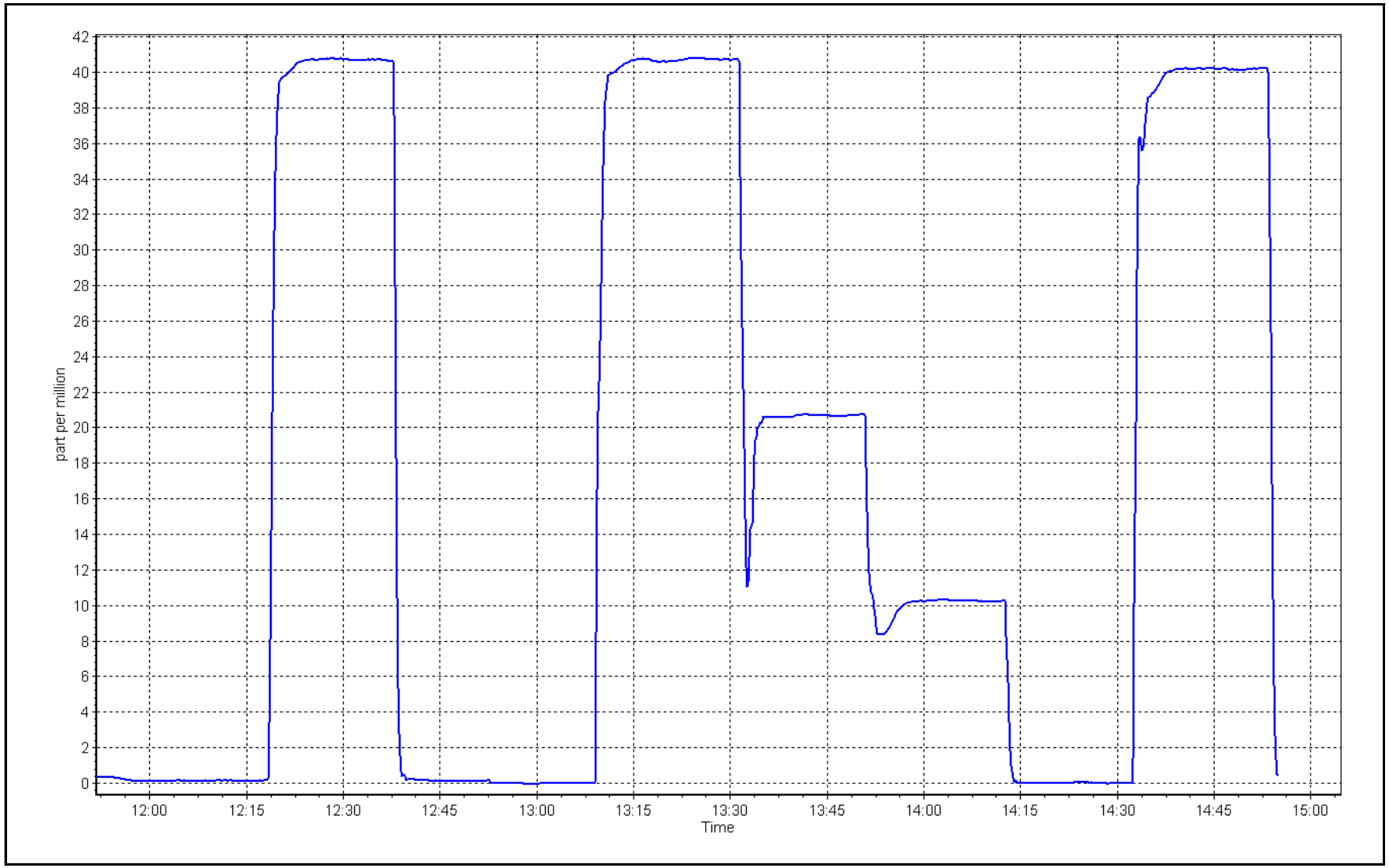
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
40.6	40.7	0.9977
20.2	20.7	0.9796
10.2	10.2	0.9916

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999900	*≥0.995*
Slope	1.002243	*0.90 - 1.10*
Intercept	0.117838	*+/-1.5*



CO Calibration Plot Date: December 3, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

CO_2 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	December 4, 2024	Last Cal Date:	November 12, 2024
Start time (MST):	11:37	End time (MST):	15:00
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	60,200	ppm	Cal Gas Exp Date:	December 1, 2028
Cal Gas Cylinder #:	ALM042207			
Removed Cal Gas Conc:	60,200	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3565
N2 Gen Make/Model:	Peak Scientific		Serial Number:	7220900034

Analyzer Information

Analyzer make:	Teledyne API 360		Analyzer serial #:	442	
Analyzer Range	0 - 2,000 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998806	0.998885	Backgd or Offset:	0.002	0.002
Calibration intercept:	-1.320000	-1.400000	Coeff or Slope:	0.911	0.913

CO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	3000	0.0	0.0	0.4	----
As found High Point	2920	80.0	1605.3	1587.6	1.011
As found Mid Point					
As found Low Point					
New cylinder response					

Baseline Corr As found:	1587.2	Prev response:	1602.1	*% change:	-0.9%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	3000	0.0	0.0	0.6	----
High point	2920	80.0	1605.3	1605.2	1.000
Mid point	2960	40.0	802.7	793.2	1.012
Low point	2980	20.0	401.3	401.6	0.999
As left zero	3000	0.0	0.0	-2.5	----
As left span	2960	40.0	802.7	783.8	1.024
				Average Correction Factor	1.004

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

CO_2 Calibration Summary

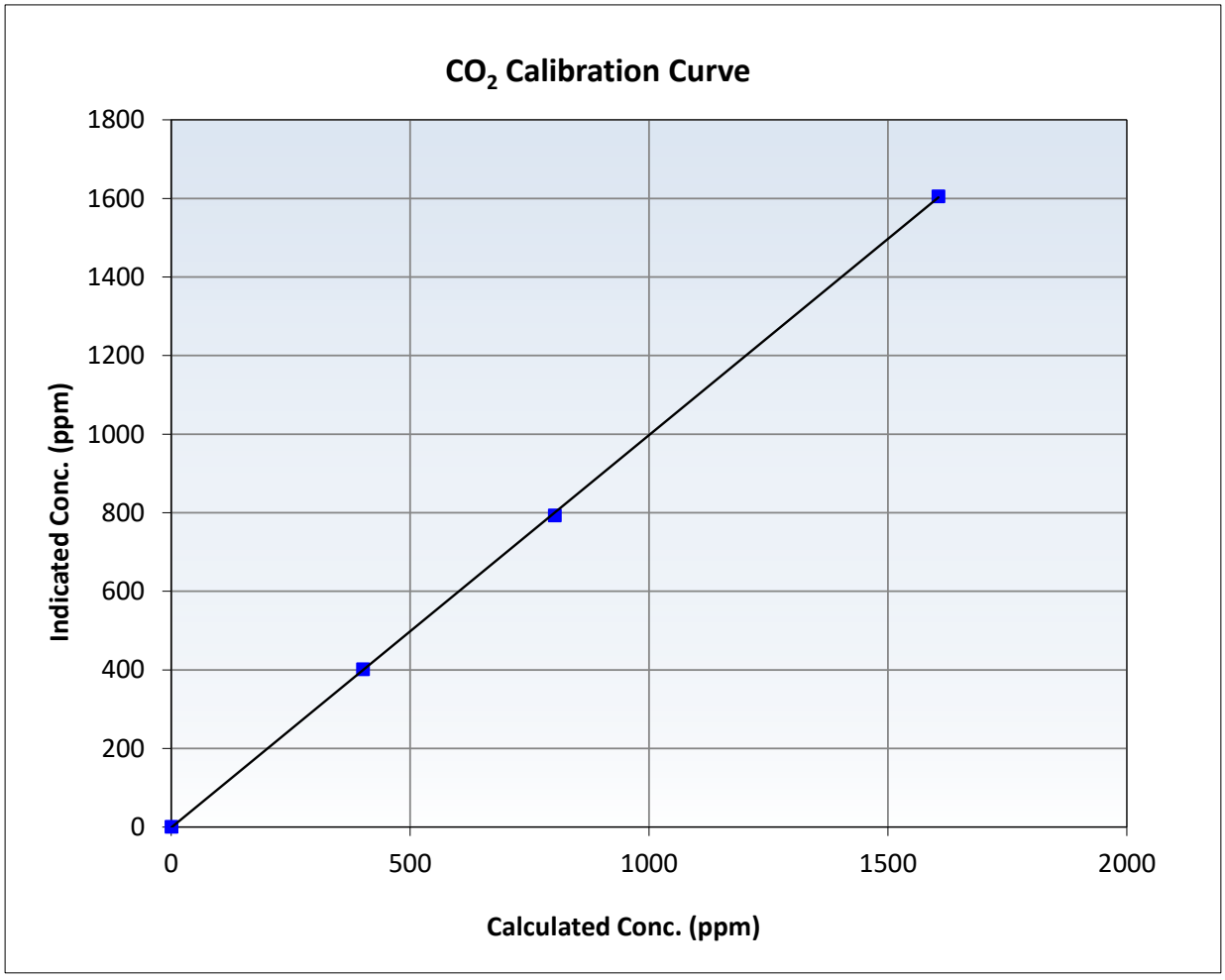
Station Information

Calibration Date	December 4, 2024	Previous Calibration	November 12, 2024
Station Name	Bertha Ganter-Fort McKay	Station Number	AMS 01
Start Time (MST)	11:37	End Time (MST)	15:00
Analyzer make	Teledyne API 360	Analyzer serial #	442

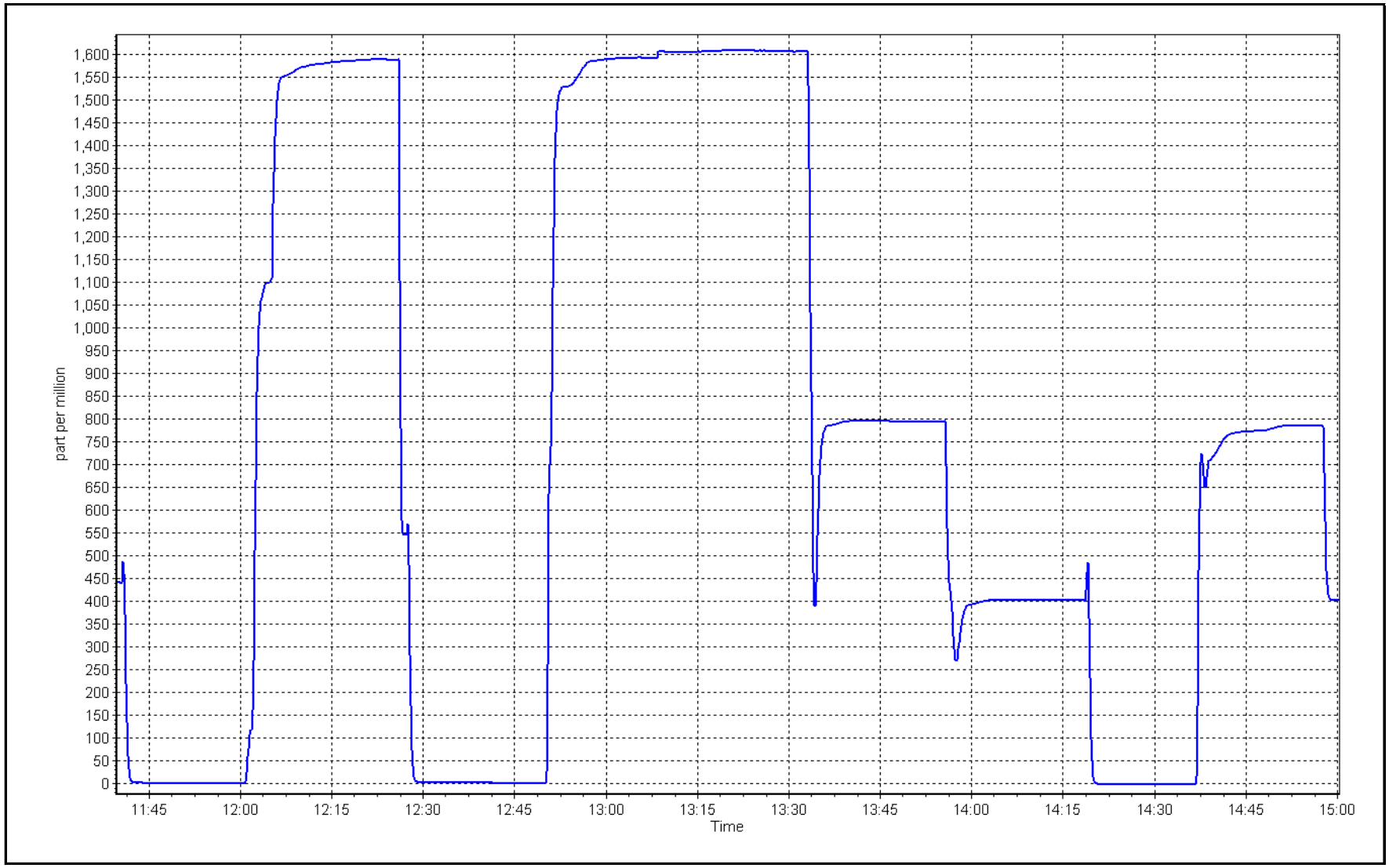
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
1605.3	1605.2	1.0001
802.7	793.2	1.0119
401.3	401.6	0.9993

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999951	*≥0.995*
Slope	0.998885	*0.90 - 1.10*
Intercept	-1.4	*+/-20*



CO_2 Calibration Plot Date: December 4, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
NOX Cal Date:	December 11, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	11:19	End time (MST):	16:05
NH3 Cal Date:	December 12, 2024	Last Cal Date:	November 20, 2024
Start time (MST):	12:15	End time (MST):	16:04
Reason:	Routine		

Calibration Standards

NOX Cal Gas Conc:	59.40	ppm	NO Gas Cylinder #:	CC335700
NO Cal Gas Conc:	59.20	ppm	NO Cal Gas Expiry:	September 1, 2032
Removed NOX Conc:	59.40	ppm	Removed Cylinder #:	NA
Removed NO Conc:	59.20	ppm	Removed cyl Expiry:	NA
NOX gas Diff:			NO gas Diff:	
NH3 Cal Gas Conc:	76.58	ppm	NH3 Gas Cylinder #:	CC743587
			NH3 Cal Gas Expiry:	August 22, 2024
Removed NH3 Conc:	76.58	ppm	Removed Cylinder #:	NA
NH3 gas Diff:			Removed cyl Expiry:	NA
Calibrator Model:	API T700		Serial Number:	3565
ZAG make/model:	API T701		Serial Number:	4766

Analyzer Information

Analyzer model:	API T201	Analyzer serial #:	475
Converter model:	API T501	Converter serial #:	824
NH3 Range (ppb):	0 - 2000 ppb	Reaction cell Press:	11.00
NOX Range (ppb):	0 - 1000 ppb	Sample Flow:	510

	Start	*Finish*		*Start*	*Finish*
NO coefficient:	0.838	0.838	Nt coefficient:	0.851	0.847
NOX coefficient:	0.844	0.841	NO bkgrnd:	-0.9	-0.9
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	-0.3	-0.3
NH3 coefficient:	0.946	0.946	Nt bkgrnd:	1.2	1.2

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.999769	1.009375
NO_X Cal Offset:	-2.020000	-3.420000
NO Cal Slope:	0.997664	1.003233
NO Cal Offset:	-2.300000	-2.800000
NO_2 Cal Slope:	0.996402	1.000150
NO_2 Cal Offset:	-0.671037	0.920283
NH3 Cal Slope:	1.003838	1.002081
NH3 Cal Offset:	-5.989321	-2.741292
Nt Cal Slope:	1.006936	1.005363
Nt Cal Offset:	-6.268143	-3.121782

Wood Buffalo Environmental Association

NO_X - NO - NO_2 Calibration Report

NOx / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NOx Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*	Baseline corr NO Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*
As found zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.4	-0.8	----	----
As found span	4932	67.6	803.1	800.4	803.1	807.2	797.4	808.7	0.9949	1.0037
AF GPT span	4932	67.6	803.1	-----	803.1	800.8	-----	802.0	1.0029	-----
new NO cyl rp										

Baseline Corr As Fd	Nt =	809.5	ppb	NO_X =	807.7	ppb	NO =	797.8	ppb
Previous Response	Nt =	802.39	ppb	NO_X =	800.9	ppb	NO =	796.2	ppb

**NO_X Δ (NO to GPT response) = -0.8%

* *= > +/-2% difference initiates investigation

*Percent Change $Nt_{(NO)}$ = 0.9%

*Percent Change NO_X = 0.8%

*Percent Change NO = 0.2%

* = > +/-5% change initiates investigation

NOx / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.4	-0.9	----	----
High point	4932	67.6	803.1	800.4	803.1	809.2	801.2	810.0	0.9924	0.9990
Mid point	4966	33.8	401.5	400.2	401.5	398.7	398.0	398.9	1.0071	1.0055
Low point	4983	16.9	200.8	200.1	200.8	197.6	195.2	198.0	1.0161	1.0251
							Average Correction Factor		1.0052	1.0099

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Calibration zero	----	----	0.0	-0.2	----	----
High GPT point (400 ppb O3)	793.4	389.1	407.0	407.4	0.9990	100.1%
Mid GPT point (200 ppb O3)	793.4	591.0	205.1	206.7	0.9923	100.8%
Low GPT point (100 ppb O3)	793.4	696.2	99.9	101.9	0.9804	102.0%
				Average Correction Factor	0.9906	101.0%

Wood Buffalo Environmental Association
NH_3 - N_T Calibration Report

NH3 As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Baseline corr Nt Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*
As found zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.8	0.1	----	----
AF High point	3418	82.2	1798.5	----	1798.5	1806.2	----	1800.8	0.995	0.999
AF Mid point							----			
AF Low point							----			
new NH3 cyl rp										

Baseline Corr As Fd	Nt = 1806.8 ppb	NH3 = 1800.7 ppb		*Percent Change	$Nt_{(NH3)}$ =	0.1%
Previous Response	Nt = 1804.7 ppb	NH3 = 1799.4 ppb	* = > +/-5% change initiates investigation	*Percent Change	NH3 =	0.1%

NH3 Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Nt Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.9	-0.6	-0.3	----	----
High point	3418	82.2	1798.5	----	1798.5	1806.2	----	1800.8	0.996	0.999
Mid point	3454	45.7	1000.0	----	1000.0	1001.5	----	998.5	0.999	1.002
Low point	3477	22.8	498.9	----	498.9	495.8	----	494.3	1.006	1.009
								Average Correction Factor	1.0001	1.0032

NH3 Previous Converter Efficiency = 90.8 %
NH3 Current Converter Efficiency = 90.8 %

Notes: Changed the inlet filter after as founds. Adjusted the NOx/Nt span.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

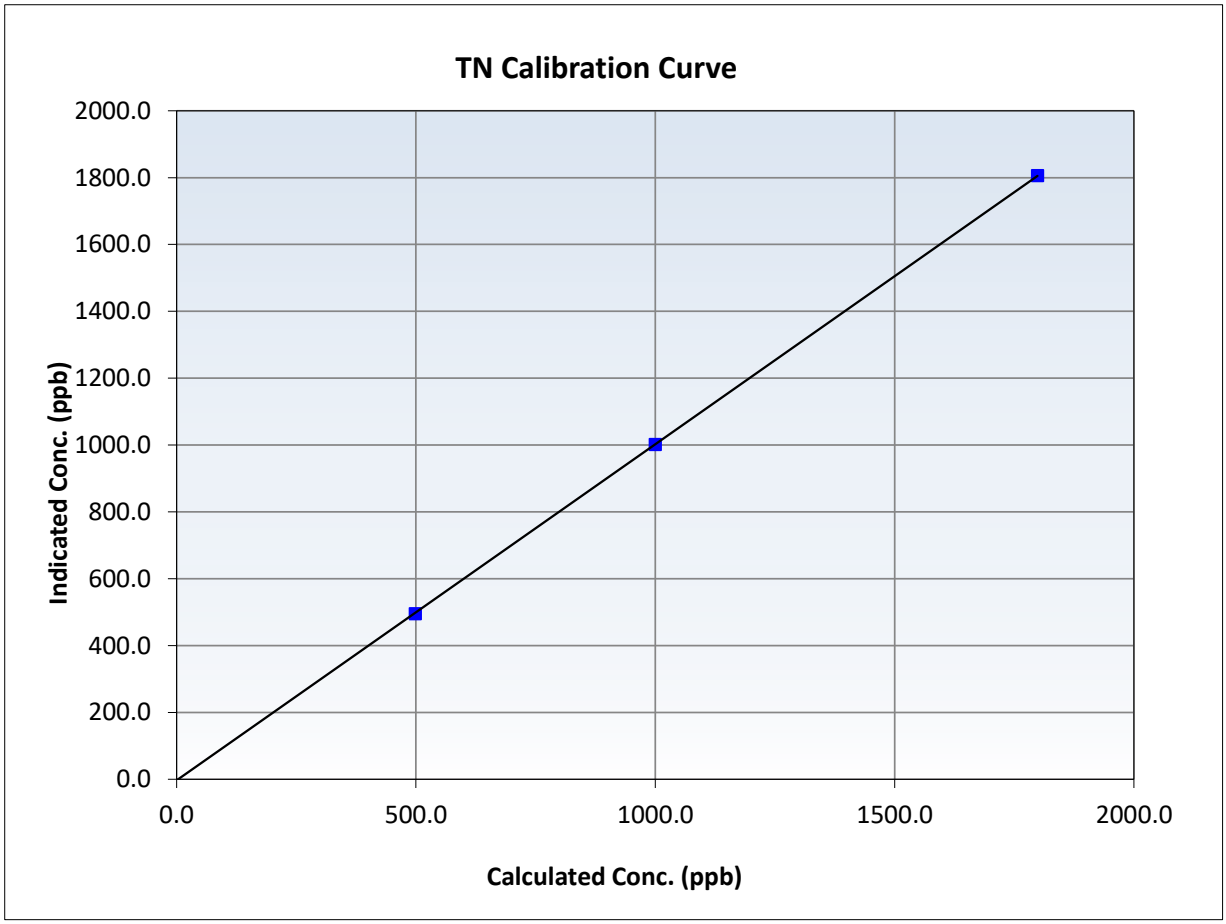
Nt Calibration Summary

Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:19	End Time (MST):	16:05
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	-0.9	----	Correlation Coefficient	0.999992	*≥0.995*
1798.5	1806.2	0.9958	Slope	1.005363	*0.90 - 1.10*
1000.0	1001.5	0.9985	Intercept	-3.121782	*+/-20*
498.9	495.8	1.0062			



Wood Buffalo Environmental Association

NH_3 Calibration Summary

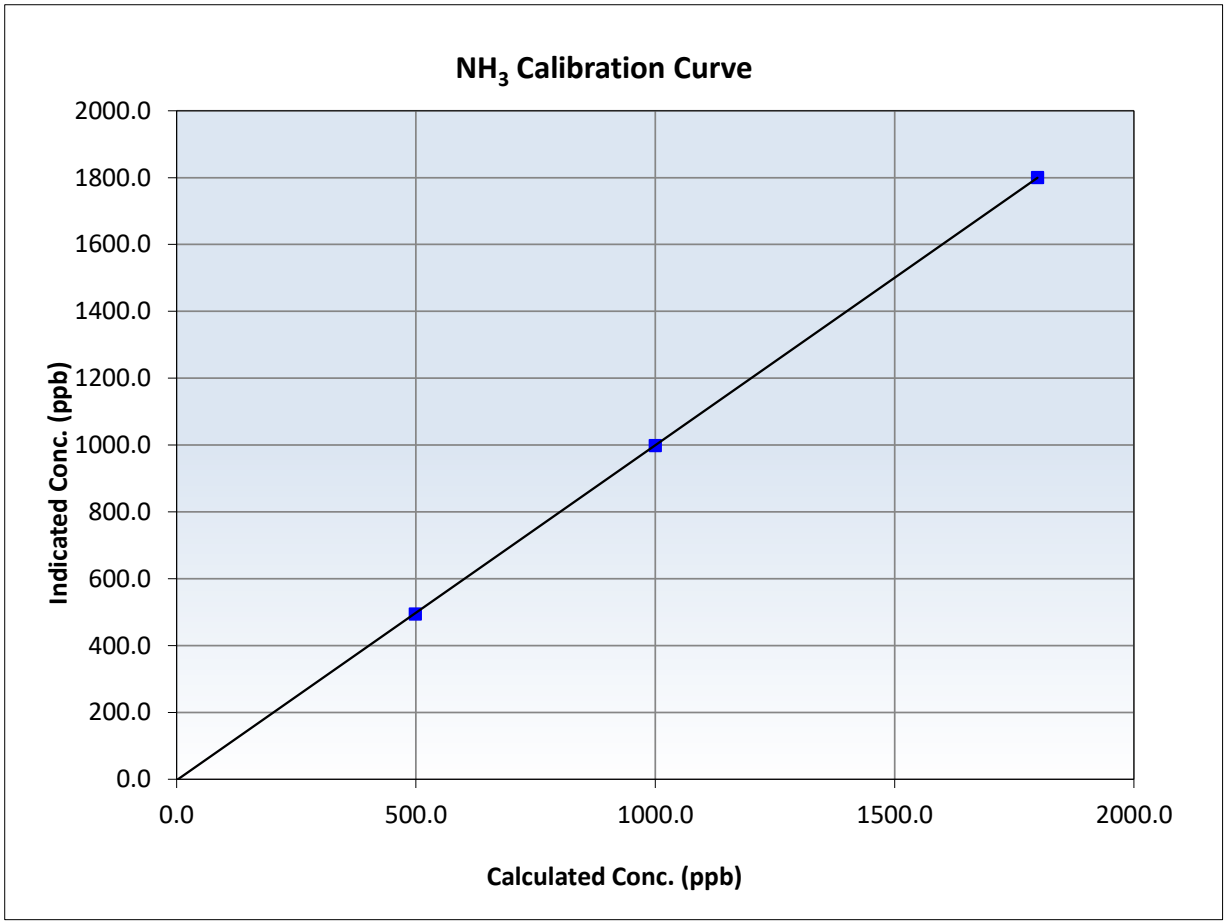
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:19	End Time (MST):	16:05
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
1798.5	1800.8	0.9987
1000.0	998.5	1.0015
498.9	494.3	1.0092

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999991	*≥0.995*
Slope	1.002081	*0.90 - 1.10*
Intercept	-2.741292	*+/-20*



Wood Buffalo Environmental Association

NO_X Calibration Summary

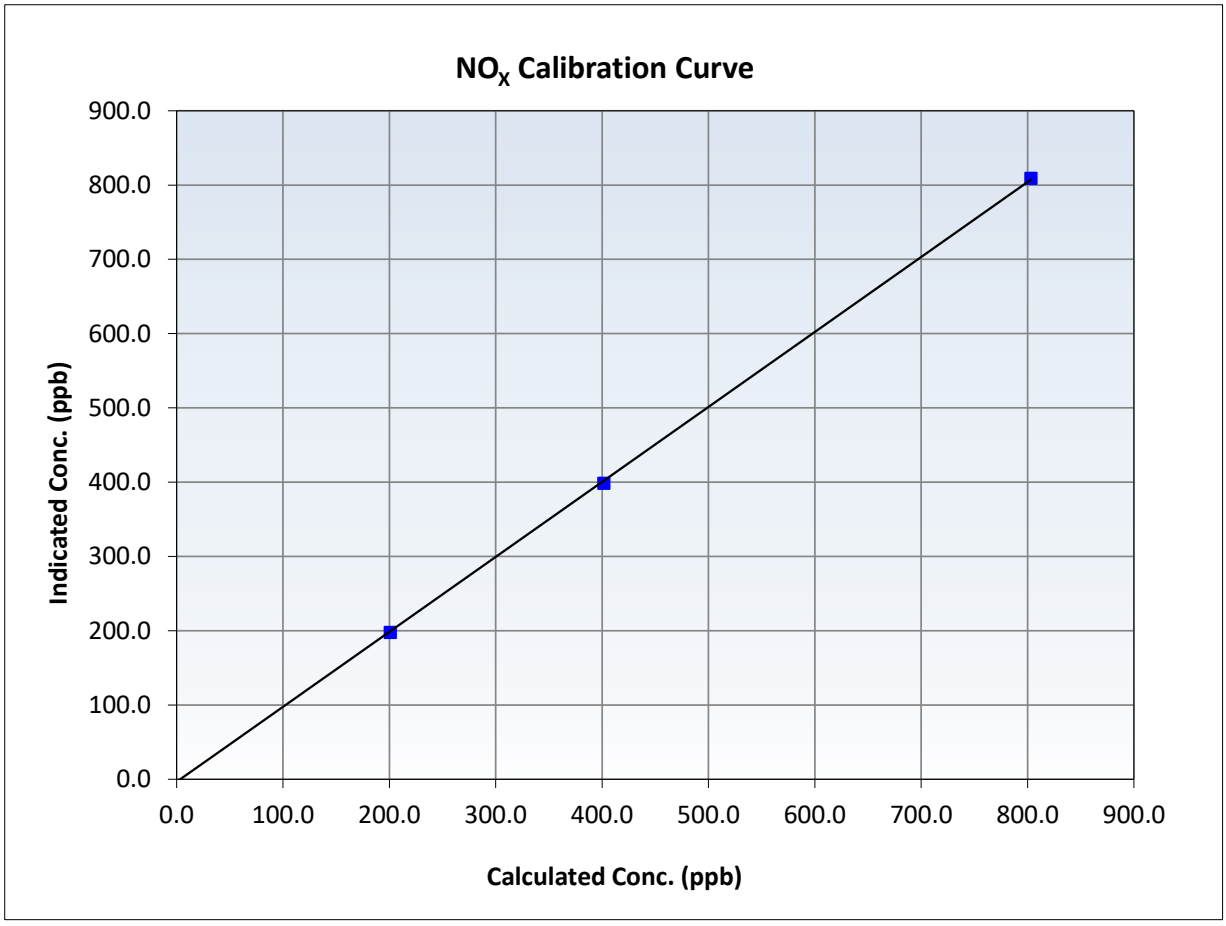
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:19	End Time (MST):	16:05
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.6	----
803.1	809.2	0.9924
401.5	398.7	1.0071
200.8	197.6	1.0161

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999931	*≥0.995*
Slope	1.009375	*0.90 - 1.10*
Intercept	-3.420000	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

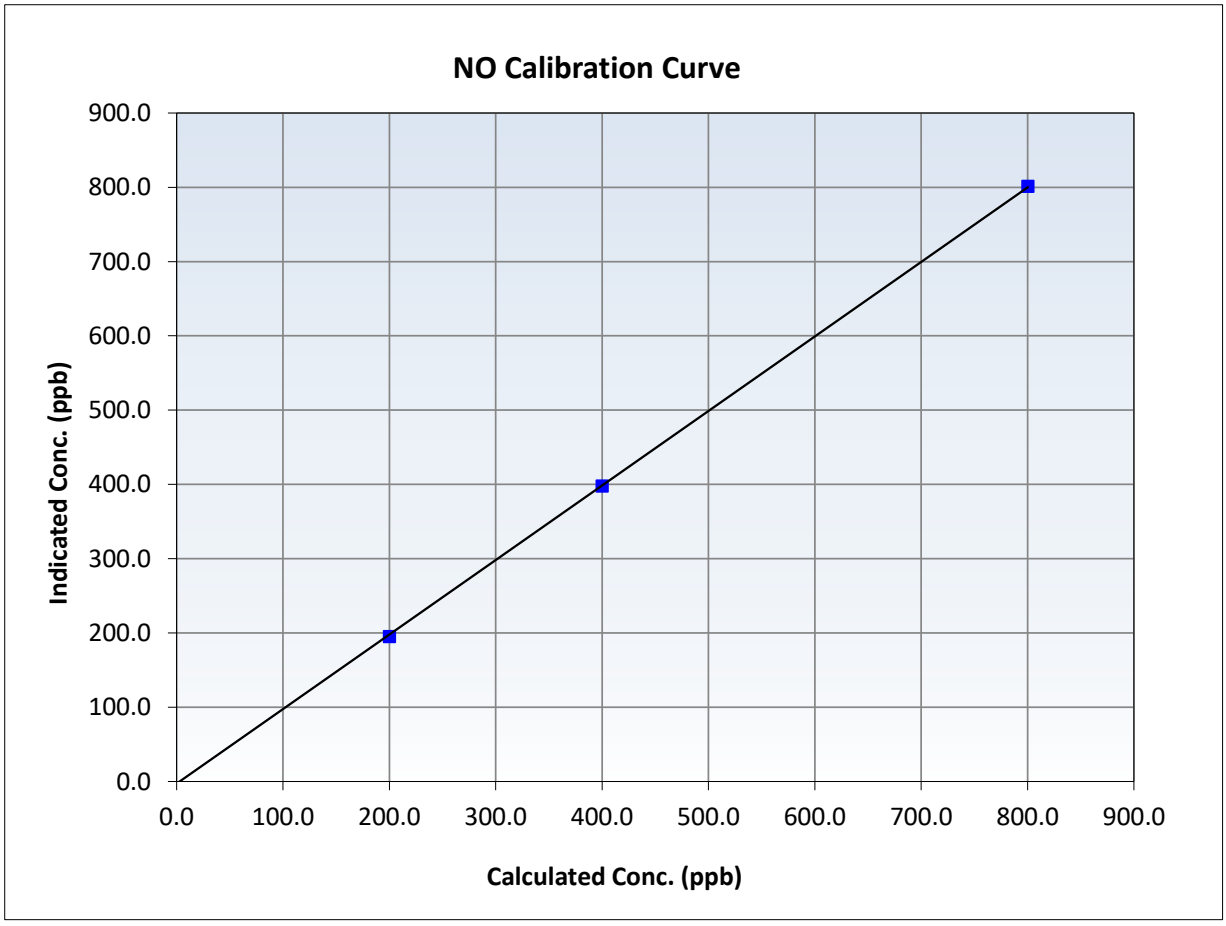
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:19	End Time (MST):	16:05
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
800.4	801.2	0.9990
400.2	398.0	1.0055
200.1	195.2	1.0251

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999958	*≥0.995*
Slope	1.003233	*0.90 - 1.10*
Intercept	-2.800000	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

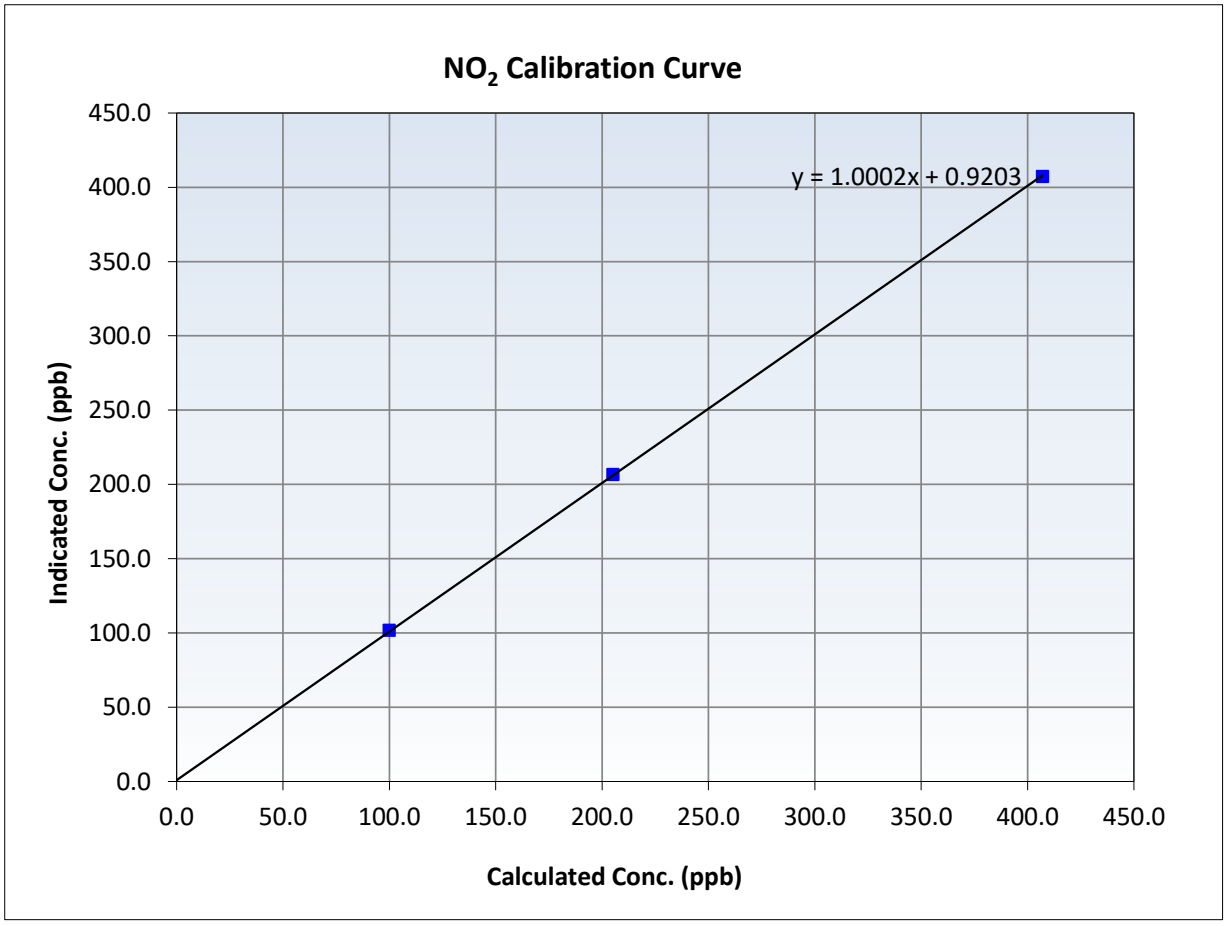
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:19	End Time (MST):	16:05
Analyzer make:	API T201	Analyzer serial #:	475

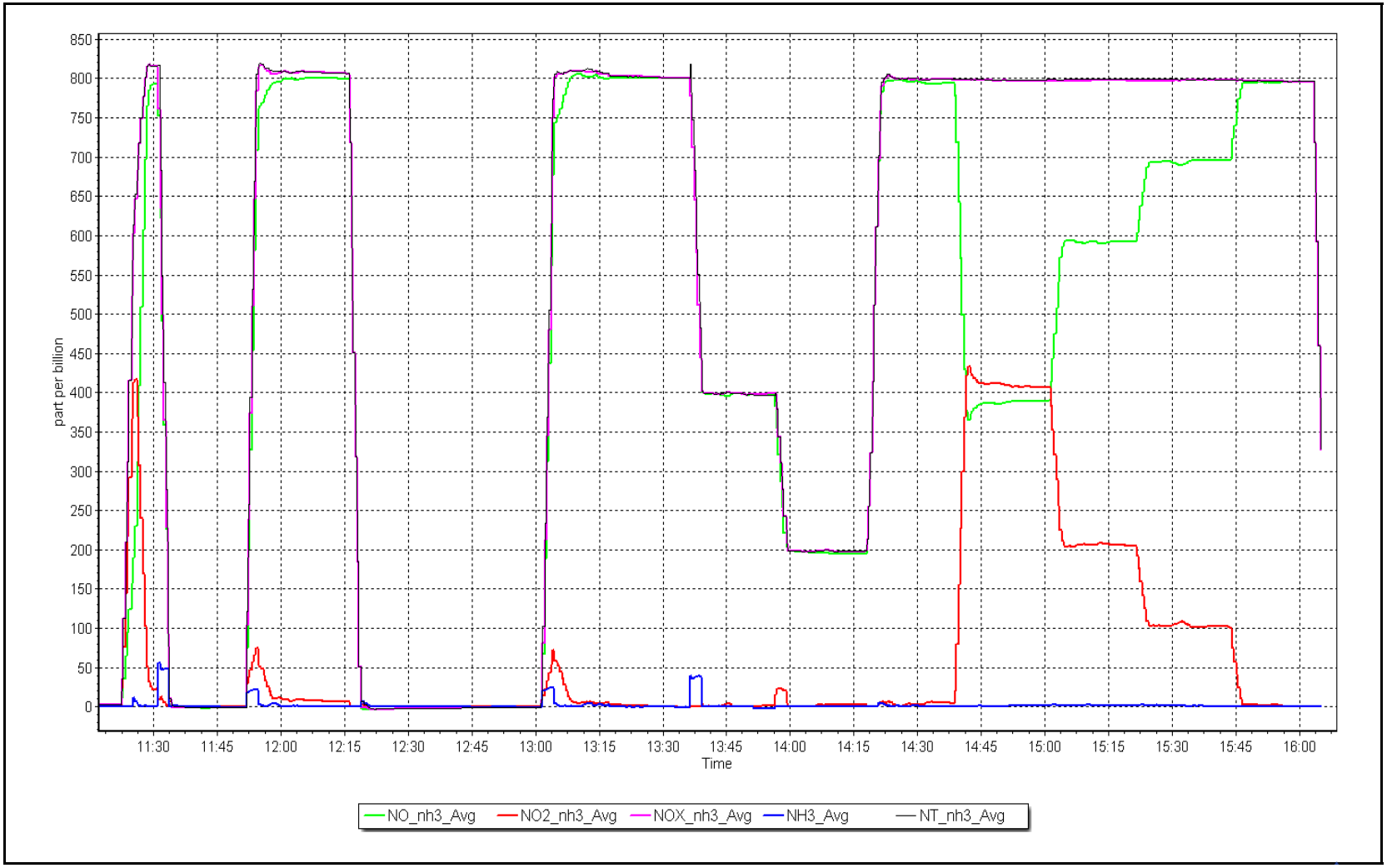
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
407.0	407.4	0.9990
205.1	206.7	0.9923
99.9	101.9	0.9804

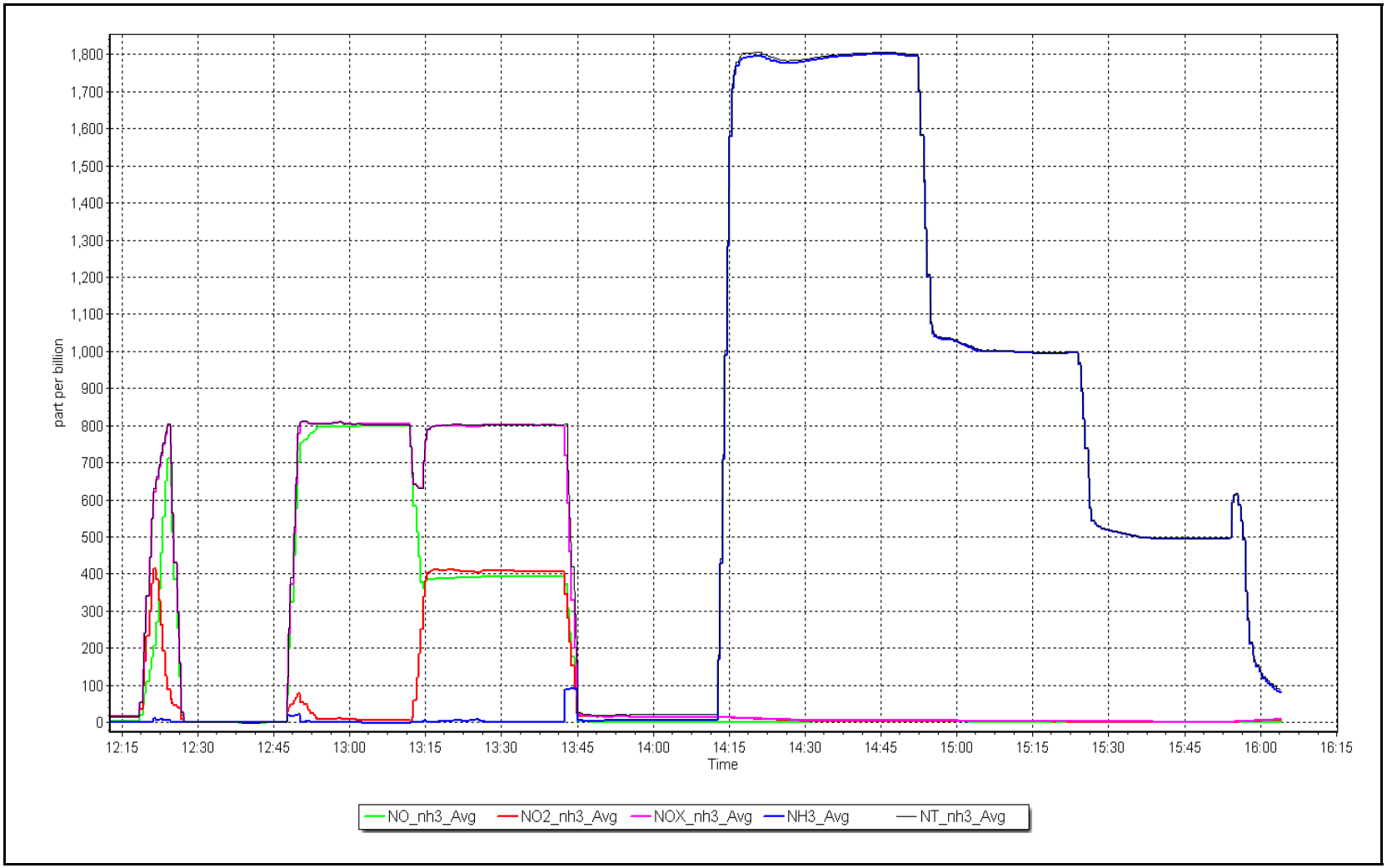
Statistical Evaluation		*Limits*
Correlation Coefficient	0.999966	*≥0.995*
Slope	1.000150	*0.90 - 1.10*
Intercept	0.920283	*+/-20*



NO_X Calibration Plot Date: December 11, 2024 Location: Bertha Ganter-Fort McKay



NH_3 Calibration Plot Date: December 12, 2024 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station Number:	AMS 01
Calibration Date:	December 4, 2024	Prev Cal Date:	November 29, 2024
Start Time (MST):	12:20	End Time (MST):	14:18
Tower Height (m):	10.0	Reason:	Install

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P10041
WS Calibrator:	MetOne 053	Serial Number:	

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error *Limit = +/- 1.5%*
0	0.0		---
200	20.2		
400	39.4		
600	58.6		
800	77.8		

	Start	***Finish***	*Limits*
Correl Coeff (r^2)	0.999999		*≥0.9995*
Calculated slope	0.999594		*0.90 - 1.10*
Calculated intercept	-0.028293		*+/- 2*

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	R14655
As Found Declination (deg east of True North):	14	As Left Declination (deg east of True North):	14
Solar noon time (MST):		Calc Declination*:	13.74 Degrees
Deadband calc:	2.6 degrees (*Limit 4 deg*)		* - calculated declination as per NOAA website

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) *Limit = +/- 1.0%*
0	0.4	---
90	91.8	0.5%
180	180.2	0.0%
270	270.0	0.0%
354	354.8	0.2%

	Start	***Finish***	*Limits*
Correl Coeff (r^2)		0.999987	*≥0.9995*
Calculated slope		1.001036	*0.90 - 1.10*
Calculated intercept		-0.841792	*+/- 4*

Notes: Sensor install.

Calibration Performed By: Rene Chamberland

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS02
MILDRED LAKE
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	December 20, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	10:59	End time (MST):	14:24
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.98	ppm	Cal Gas Exp Date:	August 12, 2024
Cal Gas Cylinder #:	CC501209			
Removed Cal Gas Conc:	49.98	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	1185
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1404901075	
Analyzer Range:	0-1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999445	0.994713	Backgd or Offset:	18.9	18.9
Calibration intercept:	-0.705190	-0.546122	Coeff or Slope:	0.776	0.781

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	4920	80.2	801.6	792.4	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	792.8	Previous response	800.5	*% change	-1.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.2	801.6	797.2	1.006
Mid point	4960	40.1	400.8	397.7	1.008
Low point	4980	20.0	199.9	197.9	1.010
As left zero	5000	0.0	0.0	-0.4	----
As left span	4920	80.2	801.6	800.0	1.002
				Average Correction Factor:	1.008

Notes: Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

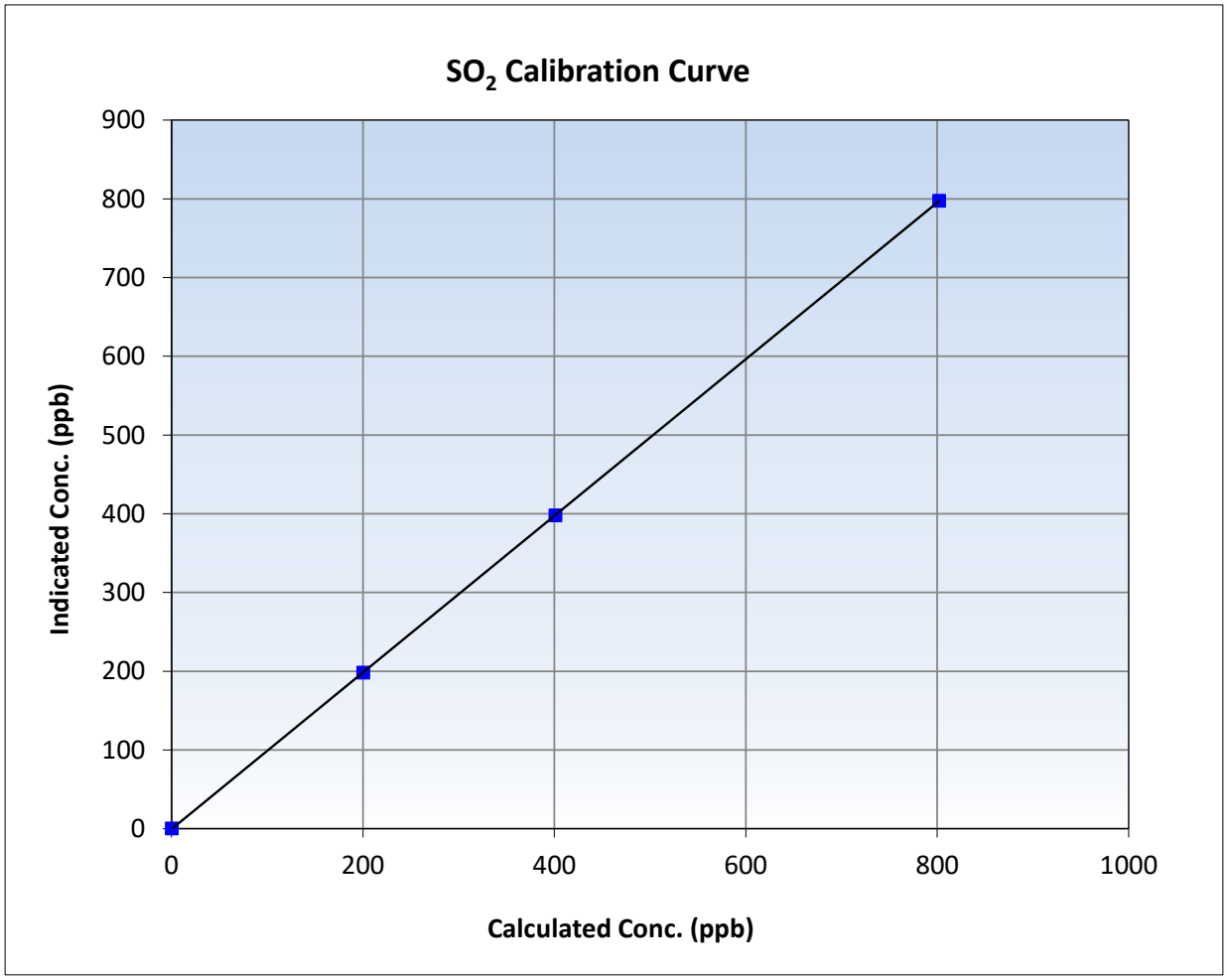
Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:59	End Time (MST):	14:24
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1404901075

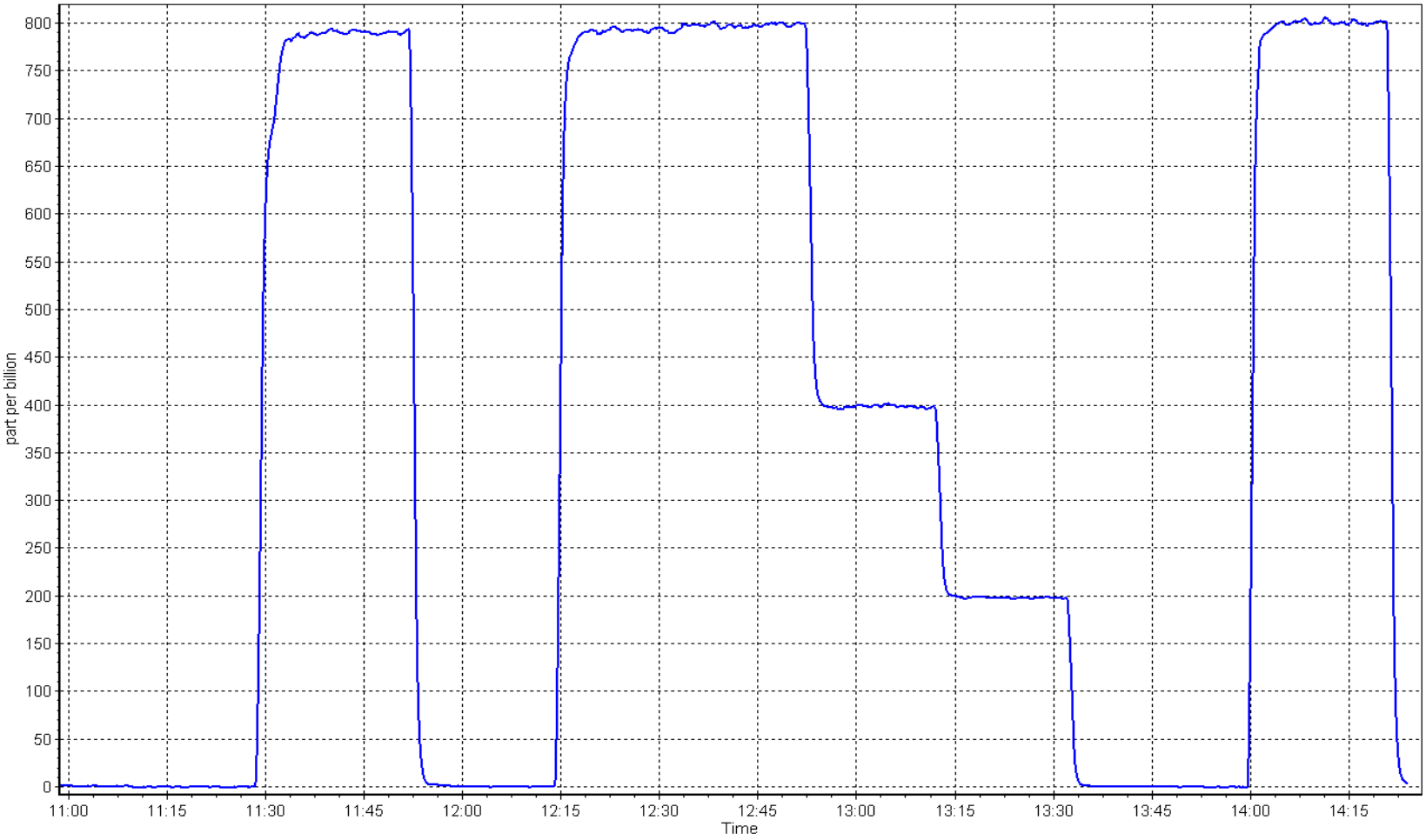
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
801.6	797.2	1.0056
400.8	397.7	1.0079
199.9	197.9	1.0102

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.994713	*0.90 - 1.10*
Intercept	-0.546122	*+/-30*



SO2 Calibration Plot Date: December 20, 2024 Location: Mildred Lake



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	December 18, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	11:00	End time (MST):	14:53
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.29	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC345191			
Removed Cal Gas Conc:	5.29	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1185
ZAG Make/Model:	Teledyne API T701		Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12333331546
Converter make:	Global G150		Converter serial #:	2023-267
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998678	0.991106	Backgd or Offset:	1.46	1.46
Calibration intercept:	-0.099199	-0.059207	Coeff or Slope:	1.007	1.007

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4924	75.6	80.0	79.3	1.009
As found Mid point	4962	37.8	40.0	39.5	1.013
As found Low point	4981	18.9	20.0	19.6	1.020
New cylinder response					

Baseline Corr As found:	79.3	Prev response:	79.79	*% change:	-0.6%
Baseline Corr 2nd AF pt:	39.5	AF Slope:	0.992106	AF Intercept:	-0.119209
Baseline Corr 3rd AF pt:	19.6	AF Correlation:	0.999990	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4924	75.6	80.0	79.2	1.010
Mid point	4962	37.8	40.0	39.7	1.007
Low point	4981	18.9	20.0	19.6	1.020
As left zero	5000	0.0	0.0	0.1	----
As left span	4924	75.6	80.0	79.2	1.010
SO2 Scrubber Check	4920	80.2	802.0	0.1	----

Date of last scrubber change:	July 16, 2024	Ave Corr Factor	1.013
Date of last converter efficiency test:	NA		

Notes: Changed sample inlet filter after as founds. SO2 scrubber test done after calibrator zero. No adjustments made.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

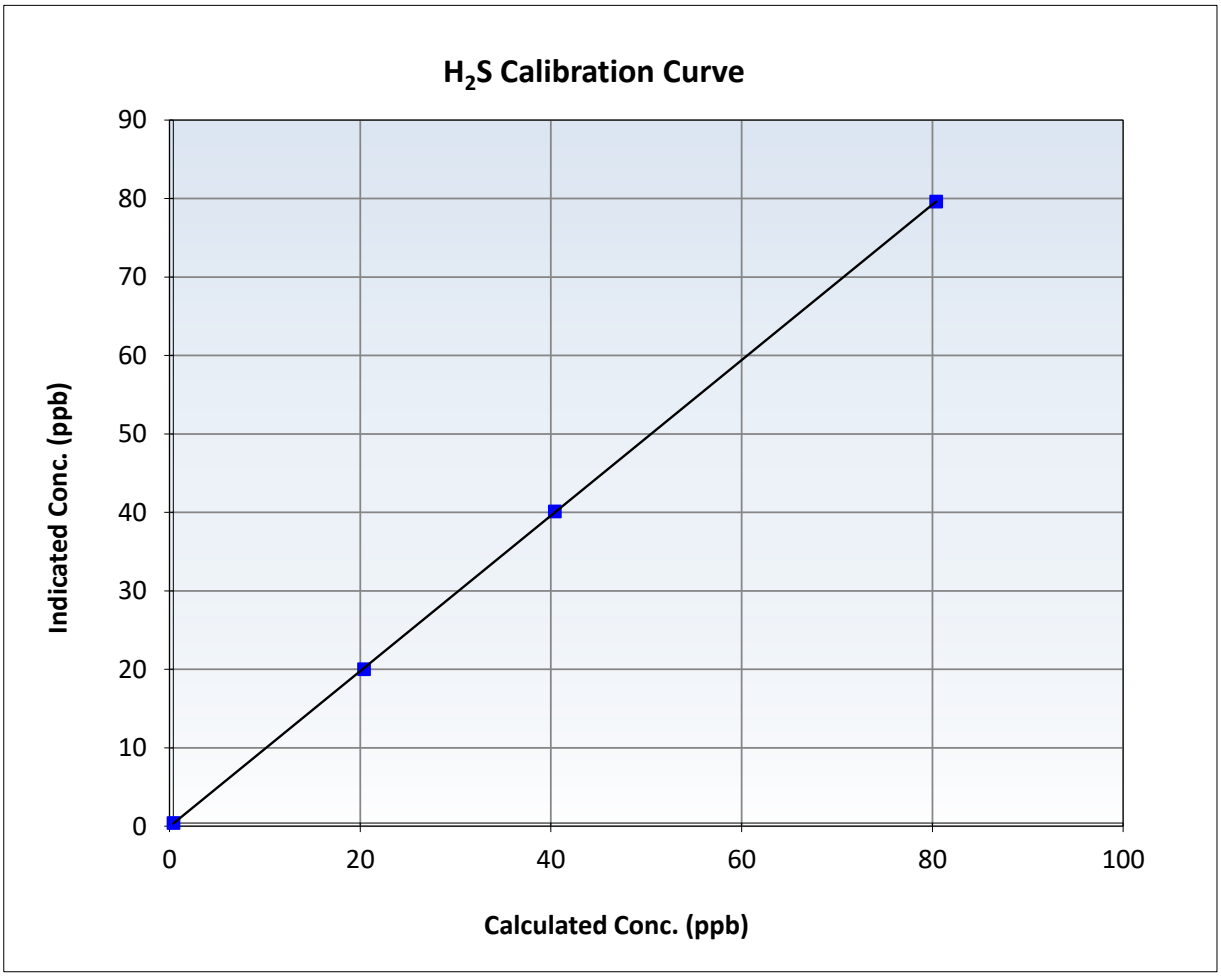
H2S Calibration Summary

Station Information

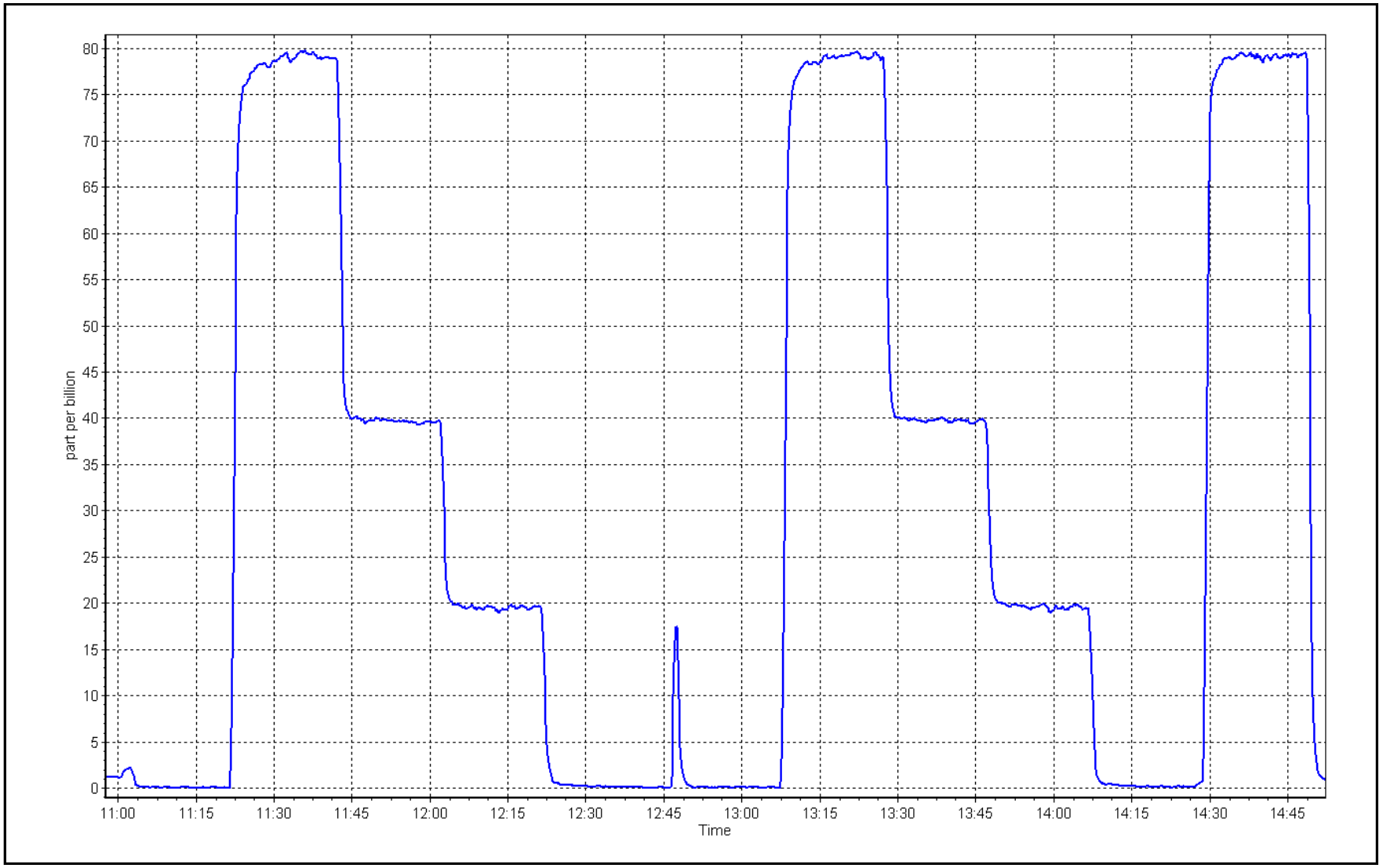
Calibration Date:	July 5, 2024	Previous Calibration:	June 24, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	11:00	End Time (MST):	14:53
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331546

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.0	----	Correlation Coefficient	0.999987	*≥0.995*
80.0	79.2	1.0100	Slope	0.991106	*0.90 - 1.10*
40.0	39.7	1.0074			
20.0	19.6	1.0202	Intercept	-0.059207	*+/-3*



H2S Calibration Plot Date: December 18, 2024 Location: Mildred Lake



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	December 20, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	10:59	End time (MST):	14:24
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
C3H8 Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
Removed C3H8 Conc.	199.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	1185
Zero Air Gen model:	Teledyne API T701	Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.60E-04	2.60E-04	NMHC SP Ratio:	6.85E-05	6.97E-05
CH4 Retention time:	14.6	14.6	NMHC Peak Area:	128504	126172
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	16.82	16.66	1.009
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.66	Prev response	16.87	*% change	-1.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	16.82	16.82	1.000
Mid point	4960	40.0	8.39	8.41	0.997
Low point	4980	20.0	4.19	4.19	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	16.82	16.75	1.004
				Average Correction Factor	1.000

Notes: Changed sample inlet filter after as founds. Adjusted span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.67	1.014
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.67	Prev response	8.77	*% change	-1.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.80	8.80	0.999
Mid point	4960	40.0	4.39	4.39	0.999
Low point	4980	20.0	2.19	2.19	1.001
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.80	8.77	1.003
				Average Correction Factor	1.000

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.02	8.00	1.003
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.00	Prev response	8.11	*% change	-1.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.02	8.02	1.000
Mid point	4960	40.0	4.00	4.02	0.996
Low point	4980	20.0	2.00	2.00	1.003
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	7.98	1.005
				Average Correction Factor	1.000

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.005571	1.000410
THC Cal Offset:	-0.037095	0.001069
CH4 Cal Slope:	1.013671	1.000108
CH4 Cal Offset:	-0.022023	0.001548
NMHC Cal Slope:	0.999351	1.000698
NMHC Cal Offset:	-0.017070	-0.000278

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

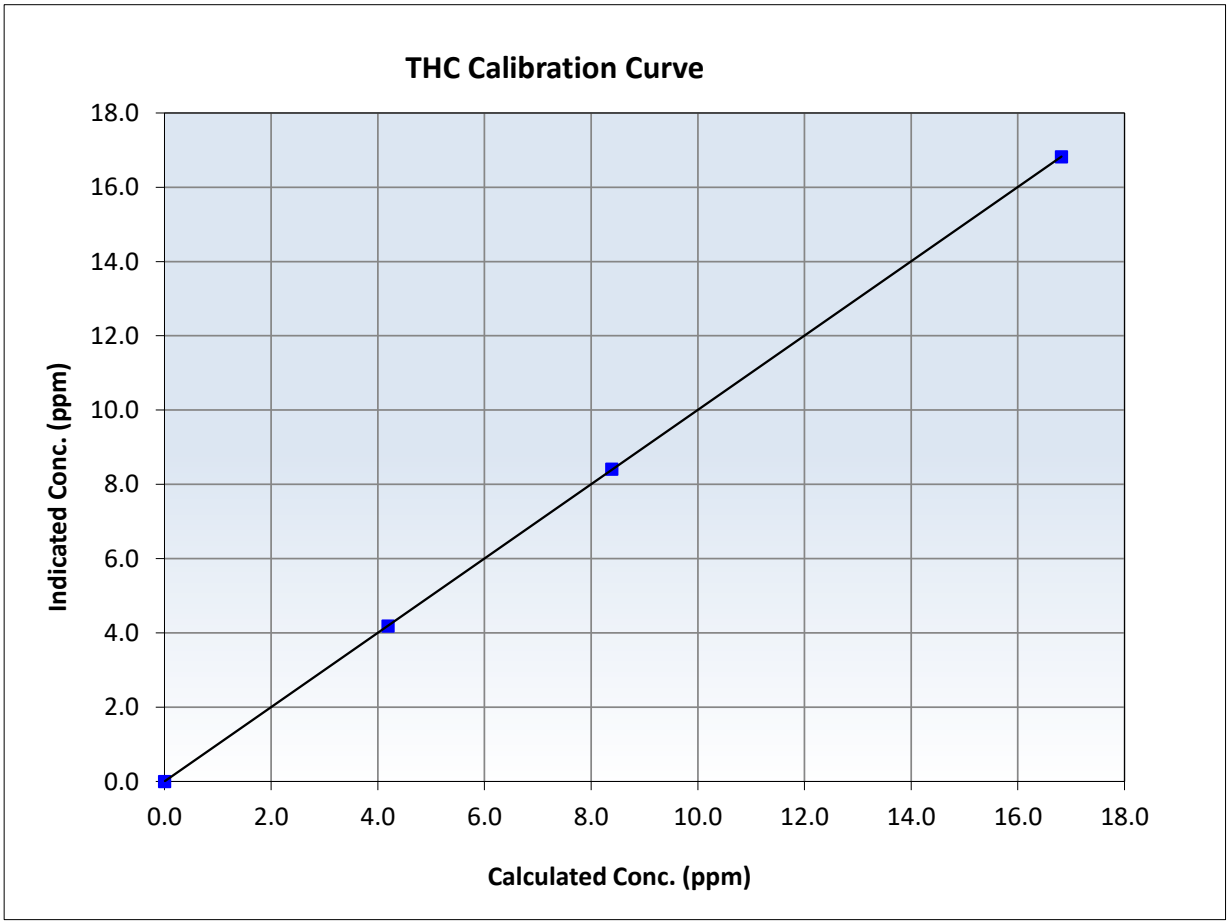
THC Calibration Summary

Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:59	End Time (MST):	14:24
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999997	≥0.995
16.82	16.82	0.9999	Slope	1.000410	0.90 - 1.10
8.39	8.41	0.9974	Intercept	0.001069	+/-0.5
4.19	4.19	1.0017			



Wood Buffalo Environmental Association

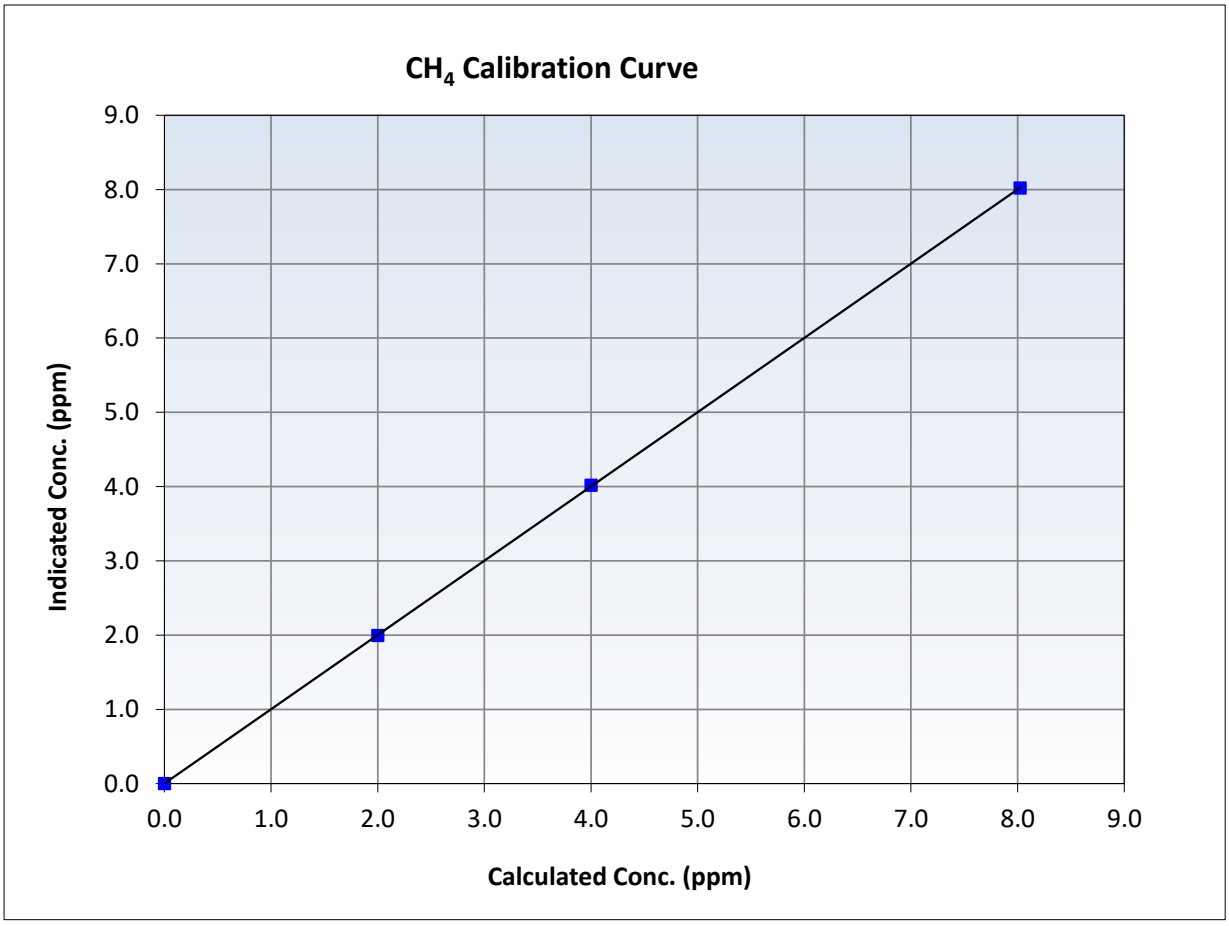
CH_4 Calibration Summary

Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:59	End Time (MST):	14:24
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999992	*≥0.995*
8.02	8.02	1.0004	Slope	1.000108	*0.90 - 1.10*
4.00	4.02	0.9959	Intercept	0.001548	*+/-0.5*
2.00	2.00	1.0029			



Wood Buffalo Environmental Association

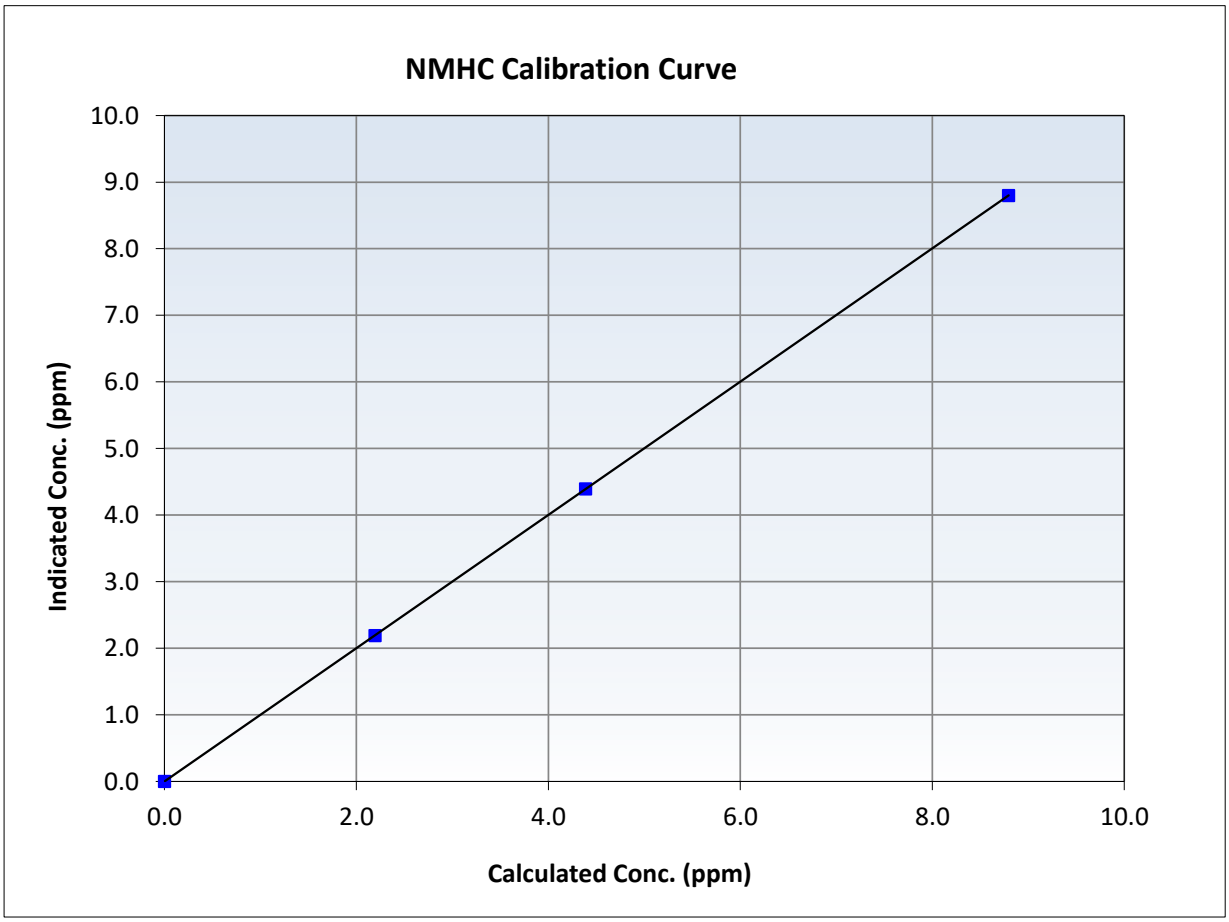
NMHC Calibration Summary

Station Information

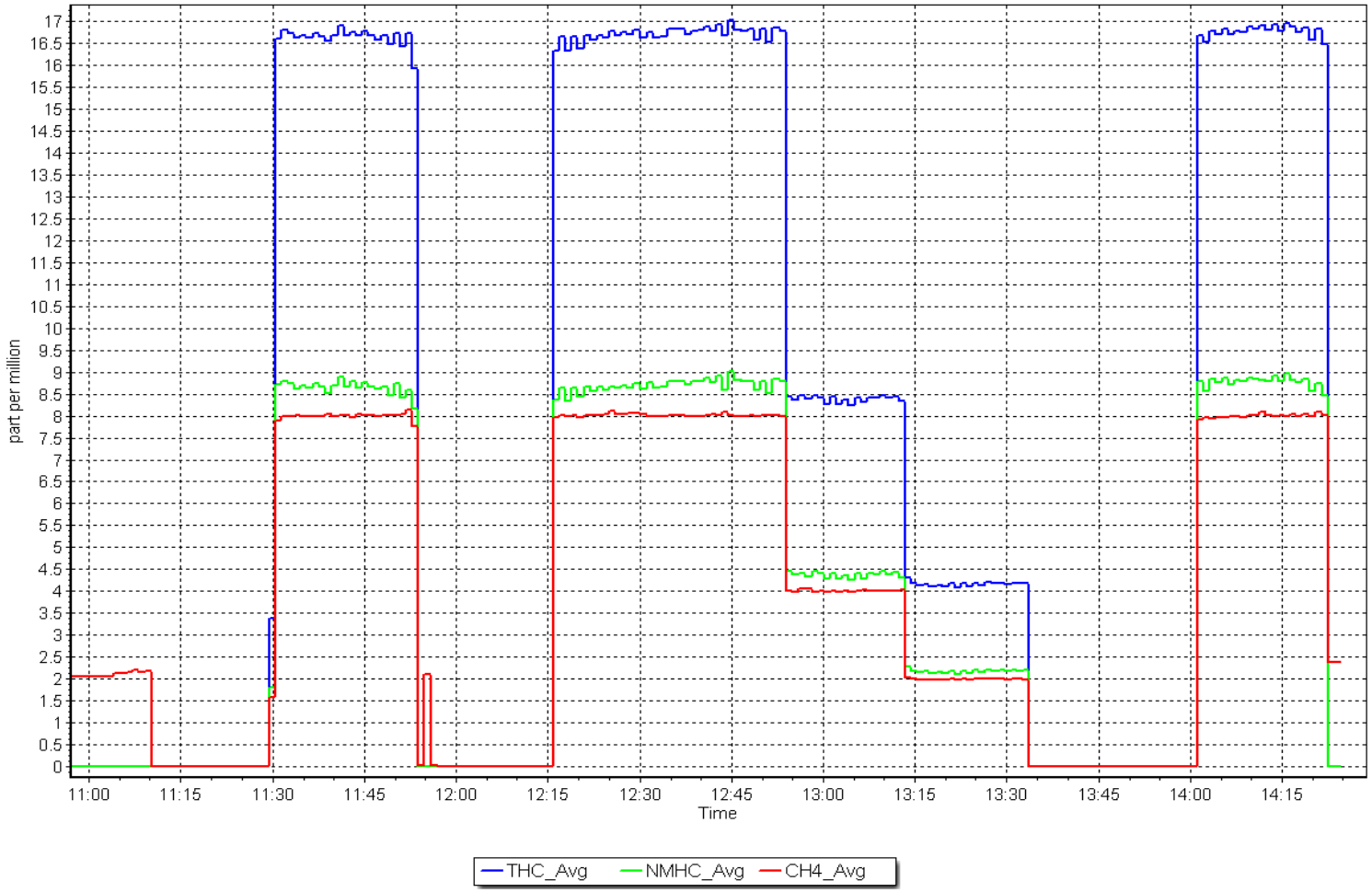
Calibration Date:	December 20, 2024	Previous Calibration:	November 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:59	End Time (MST):	14:24
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	1.000000	≥0.995
8.80	8.80	0.9995	Slope	1.000698	0.90 - 1.10
4.39	4.39	0.9986	Intercept	-0.000278	+/-0.5
2.19	2.19	1.0006			



NMHC Calibration Plot Date: December 20, 2024 Location: Mildred Lake



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS04
BUFFALO VIEWPOINT
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	December 11, 2024	Last Cal Date:	November 6, 2024
Start time (MST):	7:25	End time (MST):	10:10
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.87	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC446753			
Removed Cal Gas Conc:	50.87	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3808
Zero Air Gen Model:	API T701		Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1327300932	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002759	0.996587	Backgd or Offset:	26.5	26.5
Calibration intercept:	-0.385234	-0.826674	Coeff or Slope:	0.877	0.877

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4921	78.6	799.7	799.2	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.1	Previous response	801.6	*% change	-0.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4921	78.6	799.7	796.6	1.004
Mid point	4961	39.3	399.8	397.4	1.006
Low point	4980	19.6	199.4	196.7	1.014
As left zero	5000	0.0	0.0	0.1	----
As left span	4921	78.6	799.7	794.2	1.007
				Average Correction Factor:	1.008

Notes: No Maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

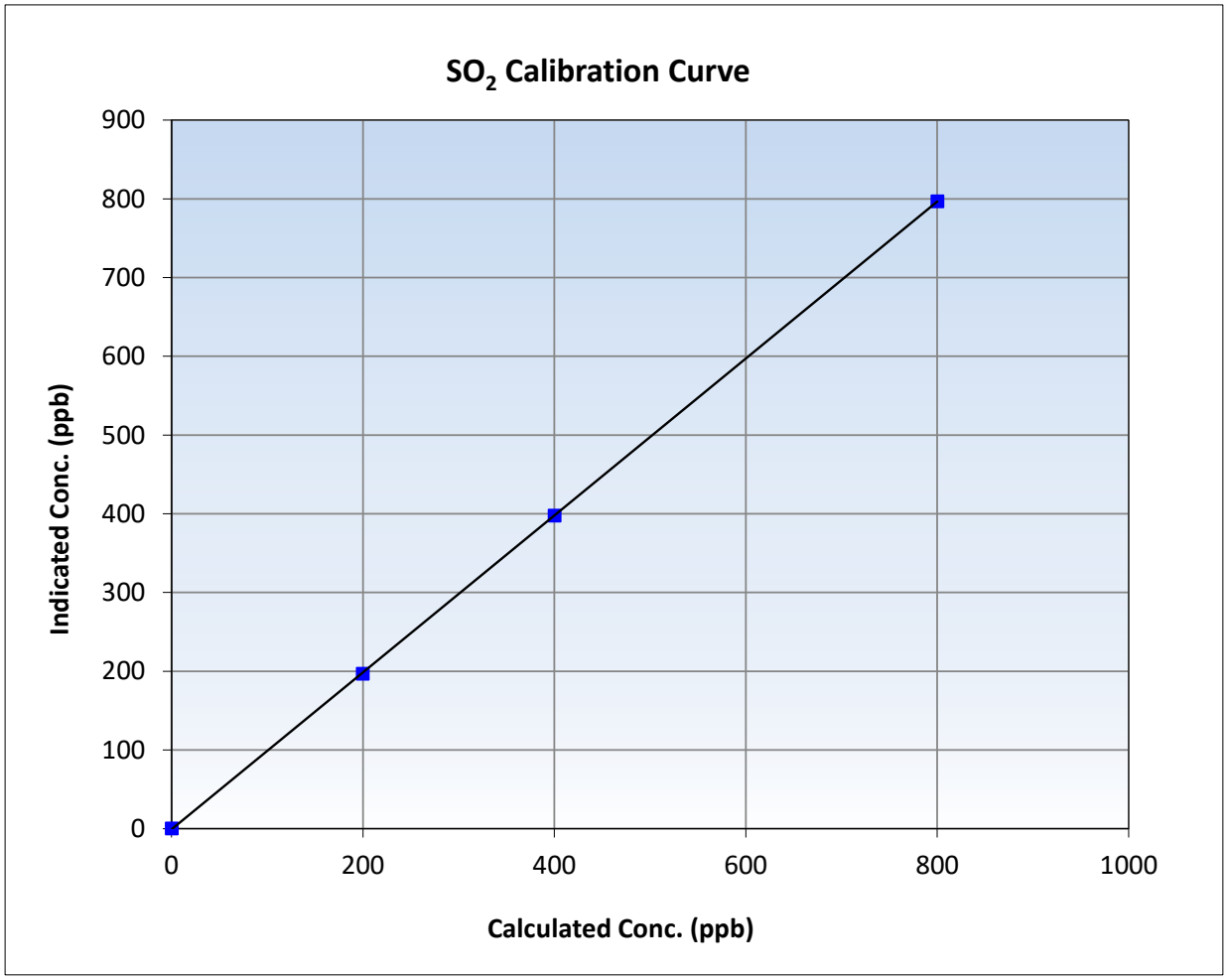
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 6, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:25	End Time (MST):	10:10
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1327300932

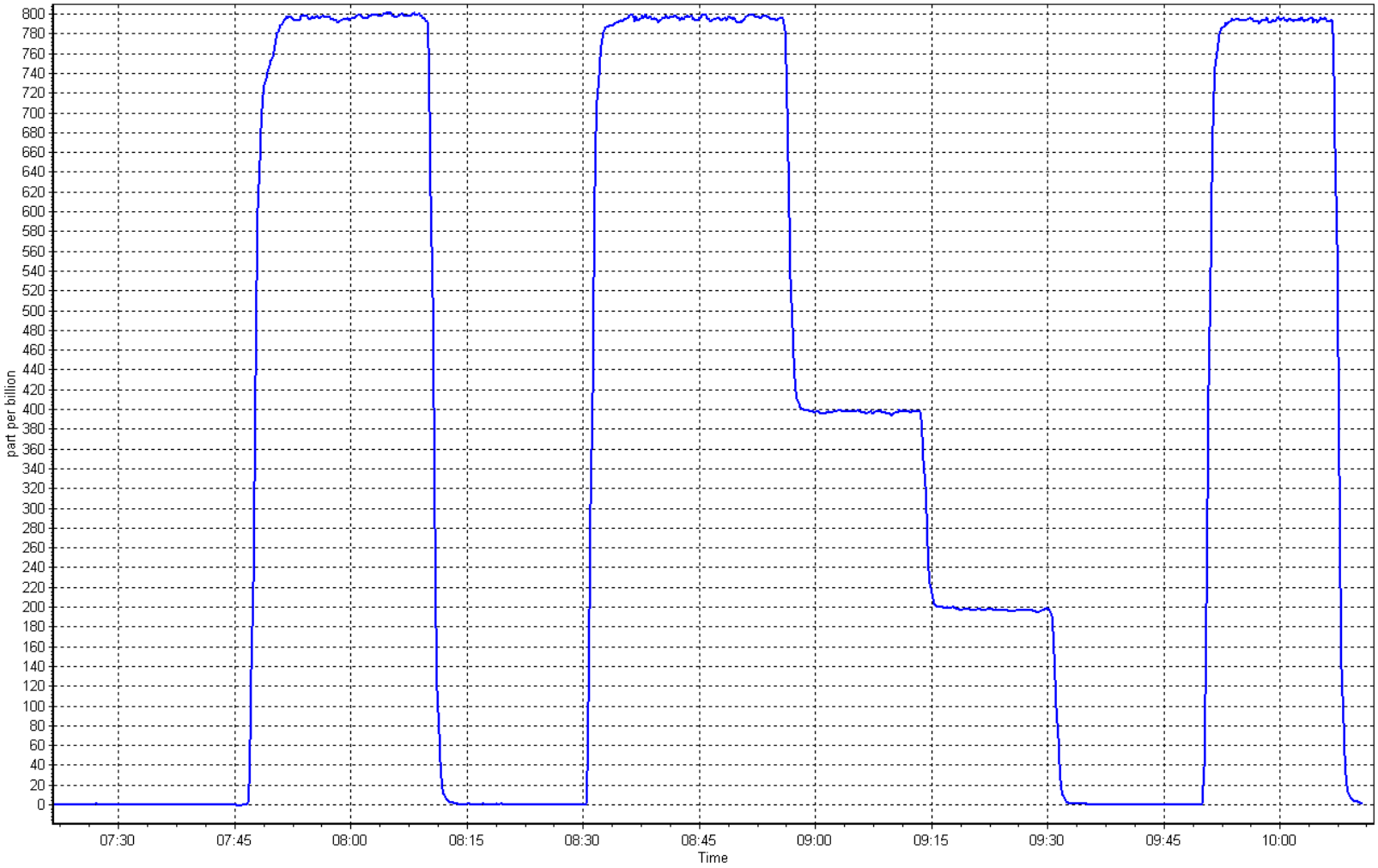
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.7	796.6	1.0039
399.8	397.4	1.0061
199.4	196.7	1.0139

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	0.996587	*0.90 - 1.10*
Intercept	-0.826674	*+/-30*



SO2 Calibration Plot Date: December 11, 2024 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	December 19, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	7:08	End time (MST):	11:50
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.42	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC345266			
Removed Cal Gas Conc:	5.42	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3808
ZAG Make/Model:	Teledyne API T701H		Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Analyzer serial #:	1008841400
Converter make:	Global		Converter serial #:	2022-200
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.999922	0.990525	Backgd or Offset:	1.93	1.95
Calibration intercept:	-0.117954	0.362080	Coeff or Slope:	1.118	1.140

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4926	74.1	80.3	78.5	1.025
As found Mid point	4963	37.0	40.1	39.5	1.018
As found Low point	4982	18.5	20.1	19.5	1.034
New cylinder response					
Baseline Corr As found:	78.4	Prev response:	80.20	*% change:	-2.3%
Baseline Corr 2nd AF pt:	39.4	AF Slope:	0.977152	AF Intercept:	0.081725
Baseline Corr 3rd AF pt:	19.4	AF Correlation:	0.999974	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4926	74.1	80.3	79.8	1.007
Mid point	4963	37.0	40.1	40.4	0.993
Low point	4982	18.5	20.1	20.1	0.998
As left zero	5000	0.0	0.0	0.4	----
As left span	4926	74.1	80.3	80.2	1.002
SO2 Scrubber Check	4920	80.0	800.0	0.1	----
Date of last scrubber change:		16-May-23		Ave Corr Factor	0.999
Date of last converter efficiency test:					

Notes: Accidently hit the high point instead of the SO2 Scrubber check on the calibrator, went back down to zero then did the Sox scrubber check. Sox scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

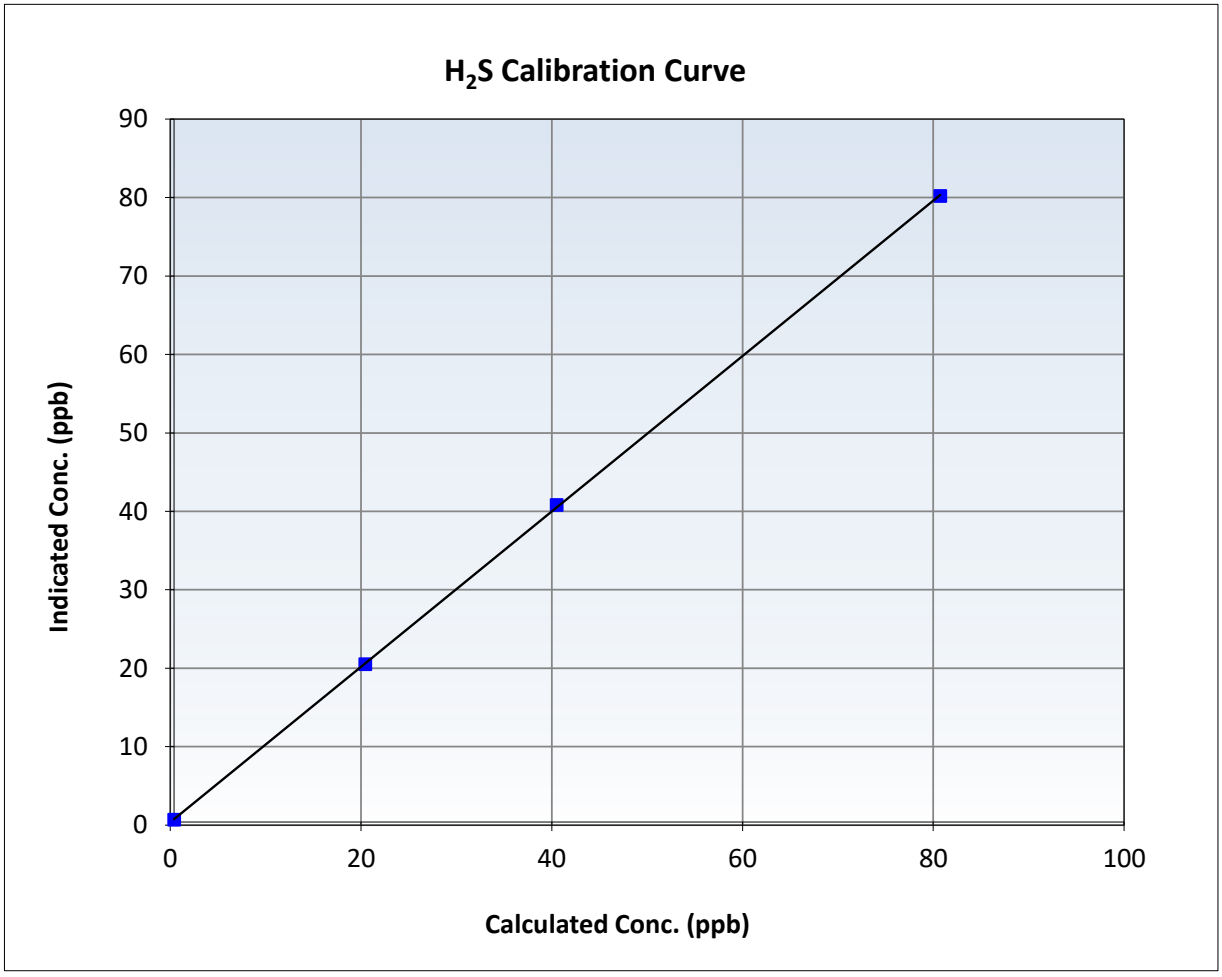
H_2S Calibration Summary

Station Information

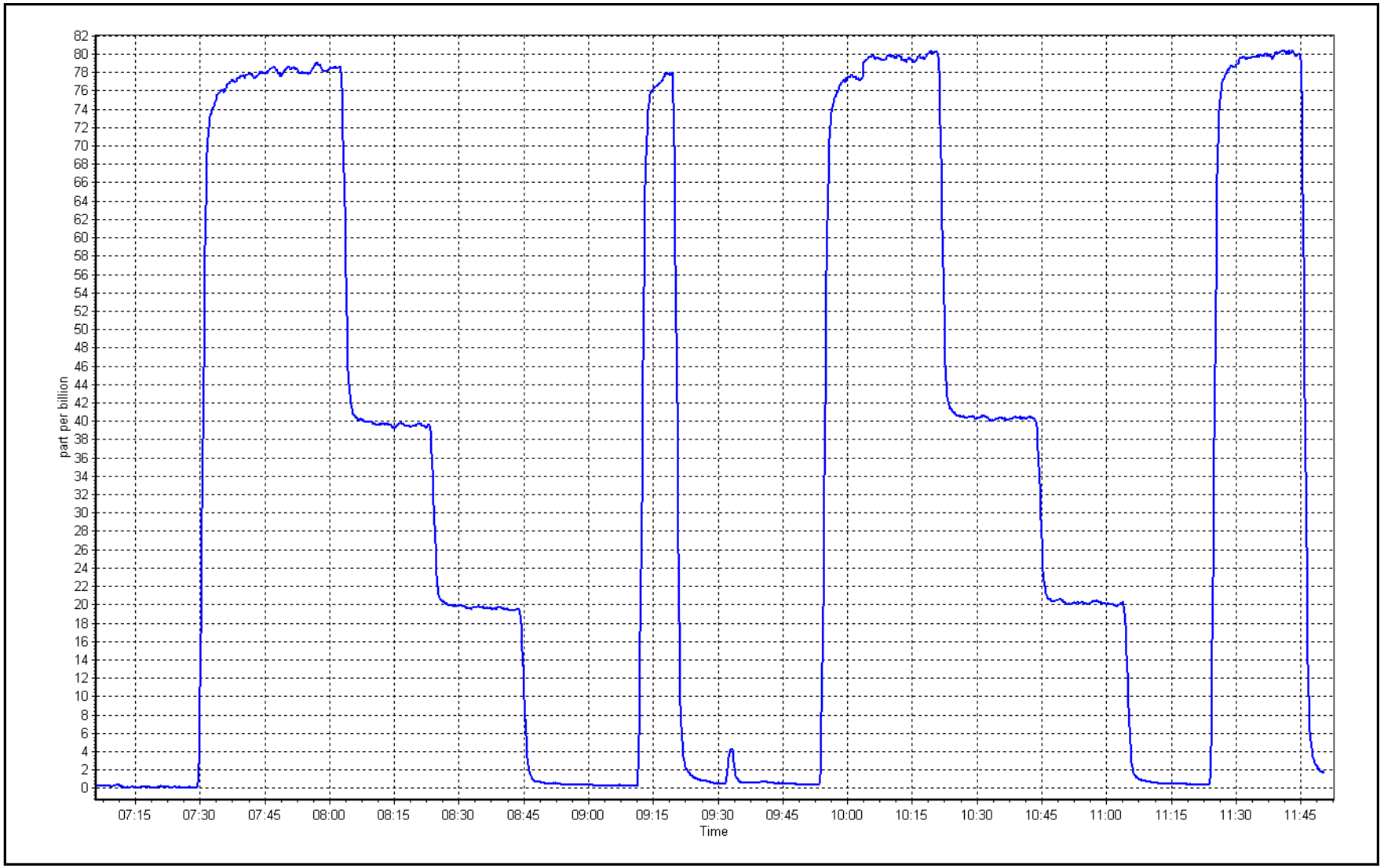
Calibration Date:	December 19, 2024	Previous Calibration:	November 26, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:08	End Time (MST):	11:50
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1008841400

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.3	----	Correlation Coefficient	0.999962	*≥0.995*
80.3	79.8	1.0066	Slope	0.990525	*0.90 - 1.10*
40.1	40.4	0.9928	Intercept	0.362080	*+/-3*
20.1	20.1	0.9976			



H_2S Calibration Plot Date: December 19, 2024 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	December 11, 2024	Last Cal Date:	November 6, 2024
Start time (MST):	7:25	End time (MST):	10:10
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC446753	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	497.2 ppm	CH4 Equiv Conc.	1058.2 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH4 Conc.	497.2 ppm	CH4 Equiv Conc.	1058.2 ppm
Removed C3H8 Conc.	204.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3808
Zero Air Gen model:	API T701	Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	4.51E-04	4.56E-04	NMHC SP Ratio:	1.15E-04	1.16E-04
CH4 Retention time:	13.7	13.7	NMHC Peak Area:	76662	75886
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	16.64	16.35	1.018
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.35	Prev response	16.65	*% change	-1.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	16.64	16.57	1.004
Mid point	4961	39.3	8.32	8.22	1.011
Low point	4980	19.6	4.15	4.11	1.010
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	16.64	16.55	1.006
				Average Correction Factor	1.009

Notes: Hydrogen Cylinder changed out. Span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	8.82	8.66	1.019
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.66	Prev response	8.84	*% change	-2.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	8.82	8.77	1.005
Mid point	4961	39.3	4.41	4.36	1.012
Low point	4980	19.6	2.20	2.19	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	8.82	8.77	1.006
				Average Correction Factor	1.008

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	7.82	7.69	1.016
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.69	Prev response	7.81	*% change	-1.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	7.82	7.80	1.003
Mid point	4961	39.3	3.91	3.86	1.012
Low point	4980	19.6	1.95	1.92	1.015
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	7.82	7.78	1.005
				Average Correction Factor	1.010

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	1.001514	0.996136
THC Cal Offset:	-0.013931	-0.022555
CH4 Cal Slope:	1.001161	0.997784
CH4 Cal Offset:	-0.015104	-0.016312
NMHC Cal Slope:	1.001840	0.994430
NMHC Cal Offset:	0.001373	-0.006044

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

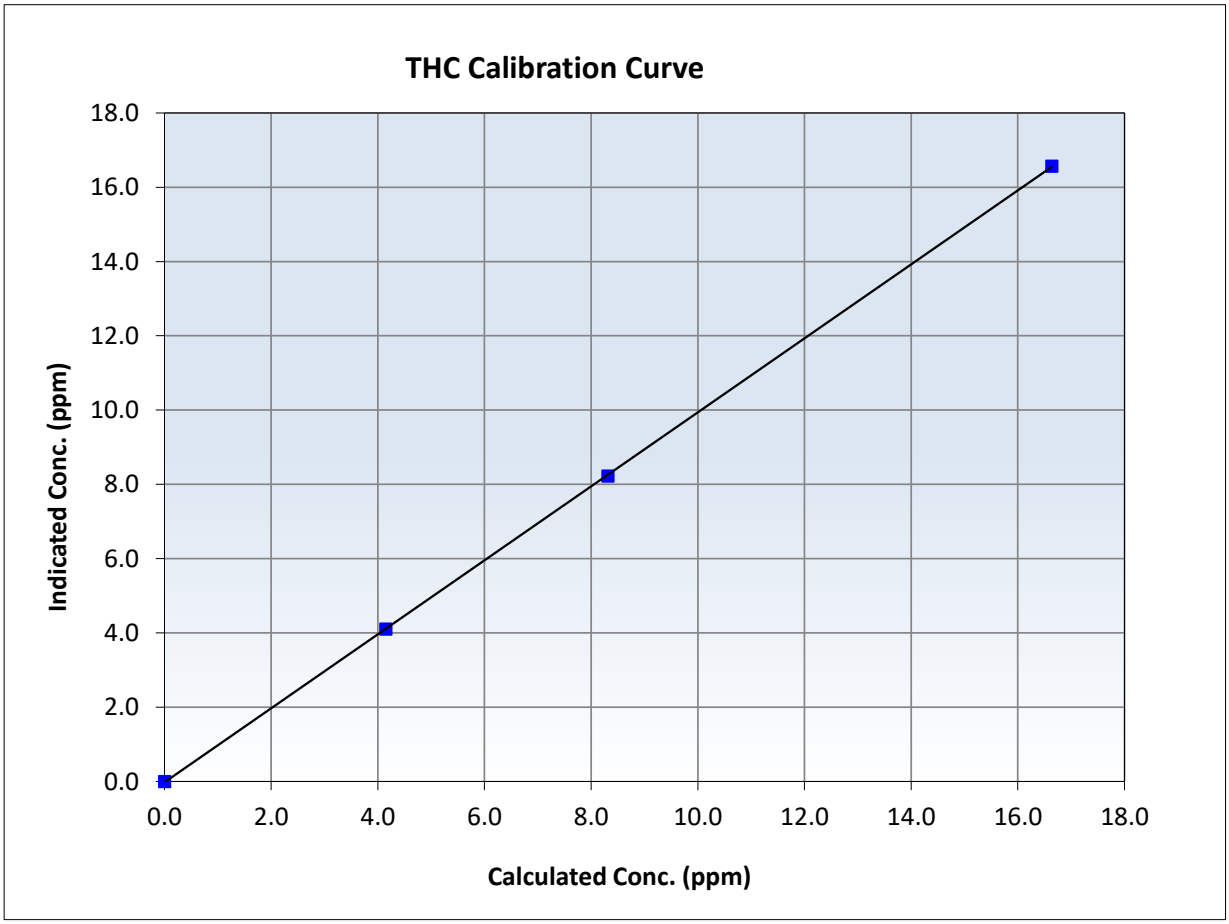
THC Calibration Summary

Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 6, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:25	End Time (MST):	10:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999983	*≥0.995*
16.64	16.57	1.0040	Slope	0.996136	*0.90 - 1.10*
8.32	8.22	1.0114			
4.15	4.11	1.0103	Intercept	-0.022555	*+/-0.5*



Wood Buffalo Environmental Association

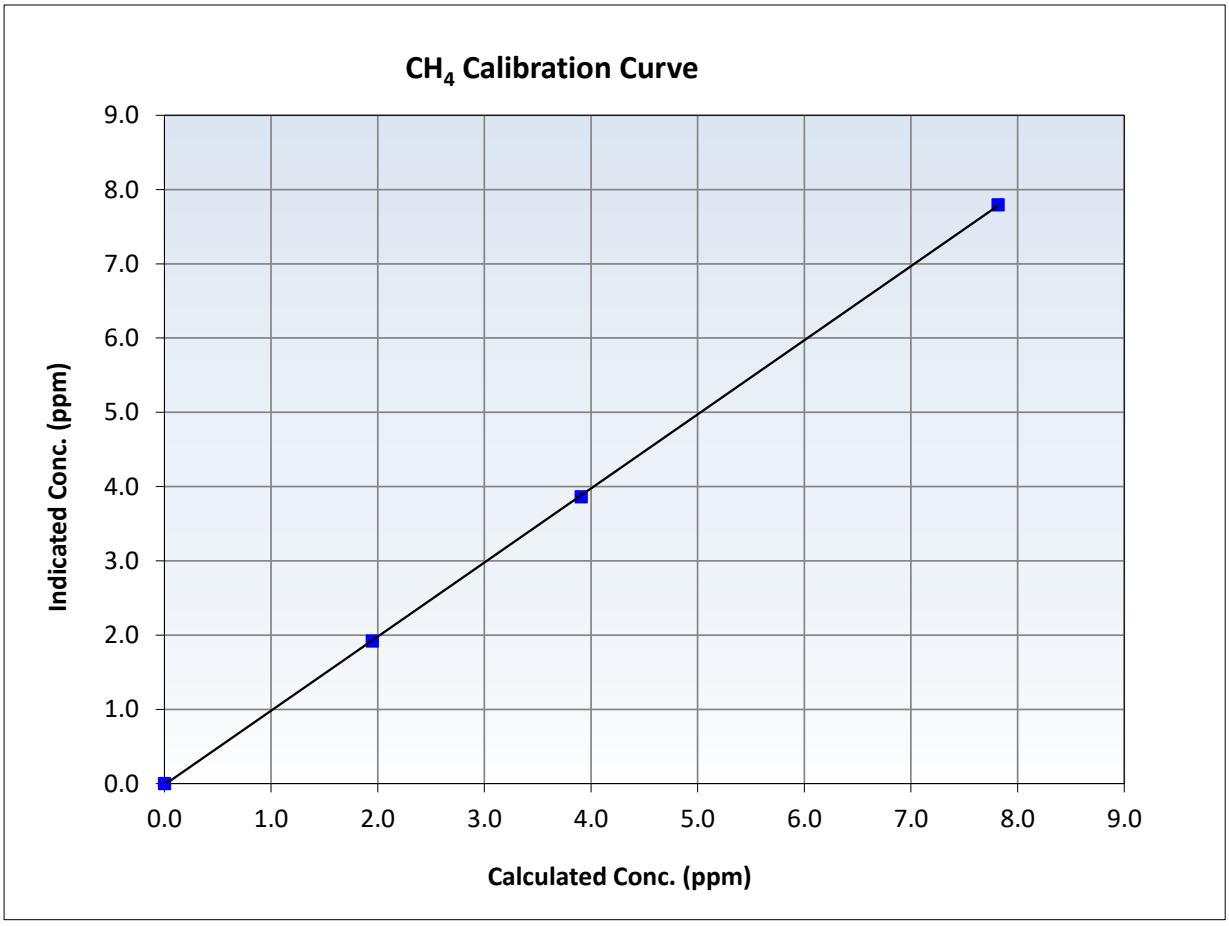
CH_4 Calibration Summary

Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 6, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:25	End Time (MST):	10:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999974	*≥0.995*
7.82	7.80	1.0028	Slope	0.997784	*0.90 - 1.10*
3.91	3.86	1.0116			
1.95	1.92	1.0152	Intercept	-0.016312	*+/-0.5*



Wood Buffalo Environmental Association

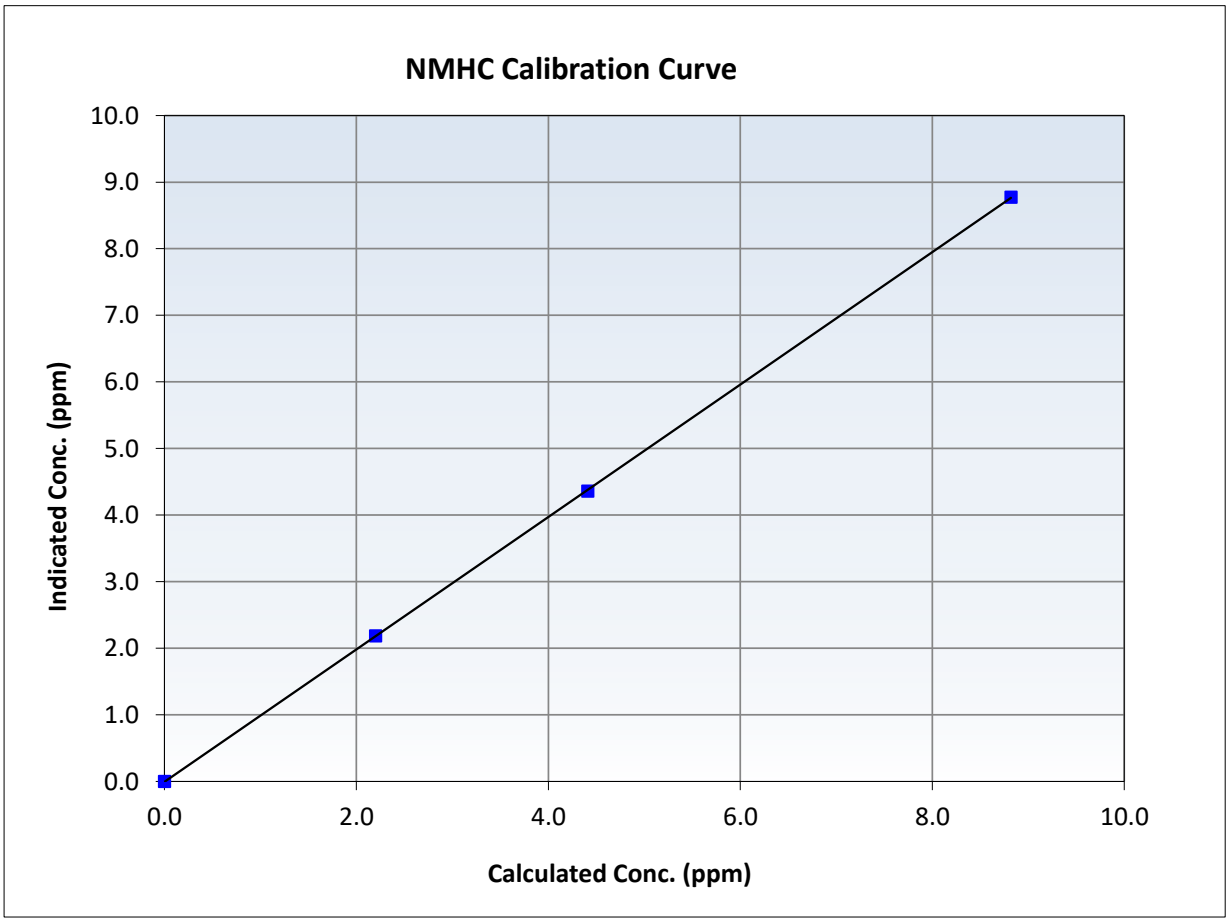
NMHC Calibration Summary

Station Information

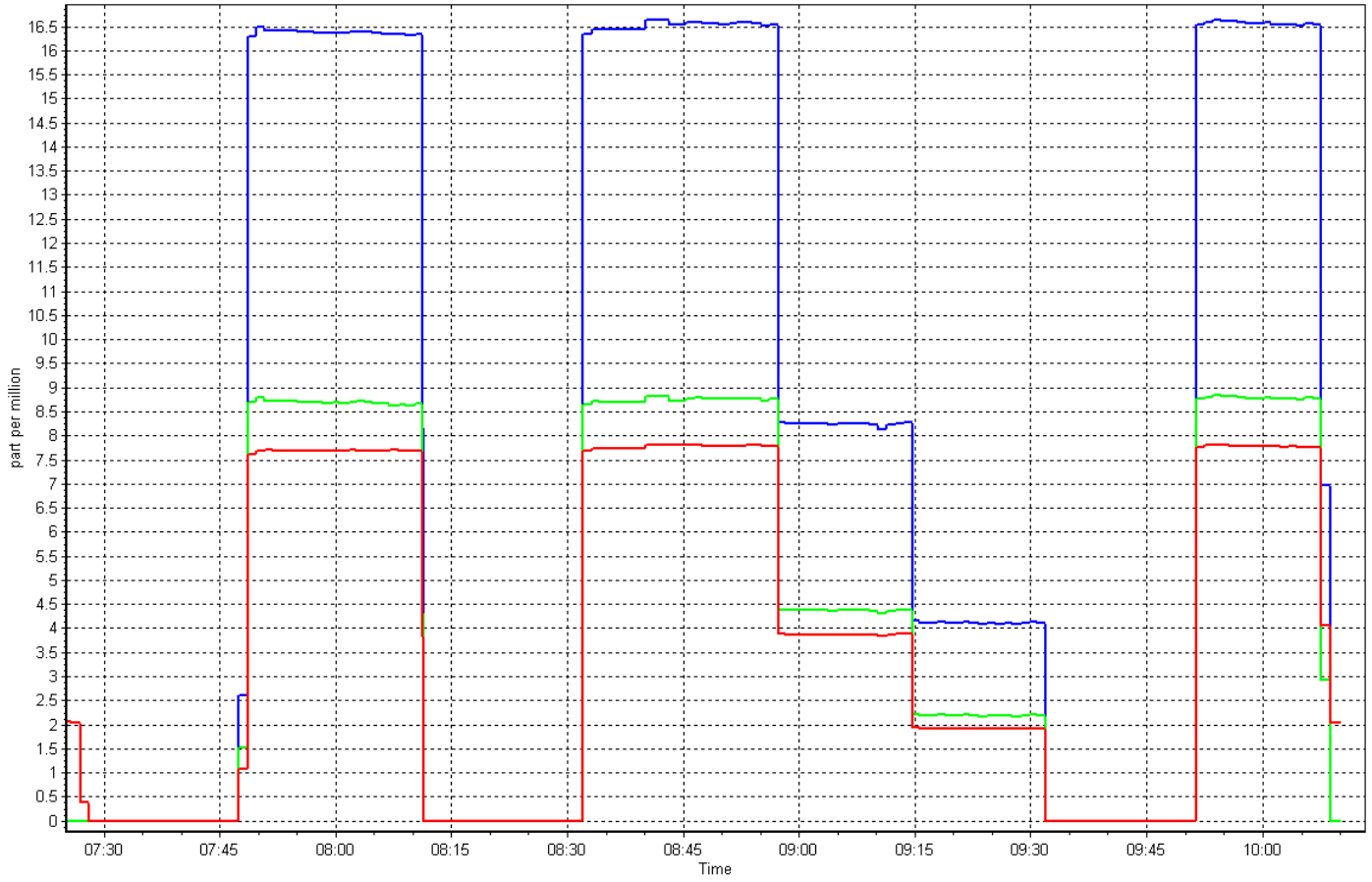
Calibration Date:	December 11, 2024	Previous Calibration:	November 6, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:25	End Time (MST):	10:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999988	≥0.995
8.82	8.77	1.0053	Slope	0.994430	0.90 - 1.10
4.41	4.36	1.0115			
2.20	2.19	1.0061	Intercept	-0.006044	+/-0.5



NMHC Calibration Plot Date: December 11, 2024 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Buffalo Viewpoint
Station number:	AMS 04
Calibration Date:	December 18, 2024
Last Cal Date:	November 15, 2024
Start time (MST):	7:20
End time (MST):	12:07
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC324979	Cal Gas Expiry Date:	November 3, 2032
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Removed Cylinder #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3808
ZAG make/model:	APIT701	Serial Number:	362

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.4	0.1	0.2	----	----
AF High point	4918	81.8	800.0	798.4	1.6	795.7	792.9	2.8	1.0060	1.0071
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 803.9 ppb	NO = 801.3 ppb
Baseline Corr 1st pt	NO_X = 795.3 ppb	NO = 792.8 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change	NO_X = -1.1%		
*Percent Change	NO = -1.1%		

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 721

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.240	1.250	NO bkgnd or offset:	0.2	0.2
NOX coeff or slope:	1.228	1.239	NOX bkgnd or offset:	-0.2	-0.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.8	4.8

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.004121	1.004479
NO_X Cal Offset:	0.547607	-0.452723
NO Cal Slope:	1.003031	0.996506
NO Cal Offset:	0.446673	-1.575097
NO_2 Cal Slope:	0.992934	0.989876
NO_2 Cal Offset:	0.795535	0.217112

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.4	0.1	0.2	----	----
High point	4918	81.8	800.0	798.4	1.6	803.6	795.0	8.5	0.9956	1.0043
Mid point	4959	40.9	400.0	399.2	0.8	400.9	395.0	5.9	0.9978	1.0106
Low point	4980	20.4	199.5	199.1	0.4	199.1	195.4	3.7	1.0020	1.0189
As left zero	5000	0.0	0.0	0.6	-0.6	0.5	0.6	-0.1	----	----
As left span	4918	81.8	800.0	400.6	800.0	793.0	400.6	392.3	1.0089	1.0000
							Average Correction Factor		0.9984	1.0113

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.2	----	----
High GPT point	796.1	399.0	398.7	394.7	1.0102	99.0%
Mid GPT point	796.1	592.9	204.8	203.6	1.0061	99.4%
Low GPT point	796.1	692.4	105.3	104.1	1.0119	98.8%
				Average Correction Factor	1.0094	99.1%

Notes: No maintenance done. Span adjusted. Due to drifitng during the GPT the 2nd NO ref point used.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

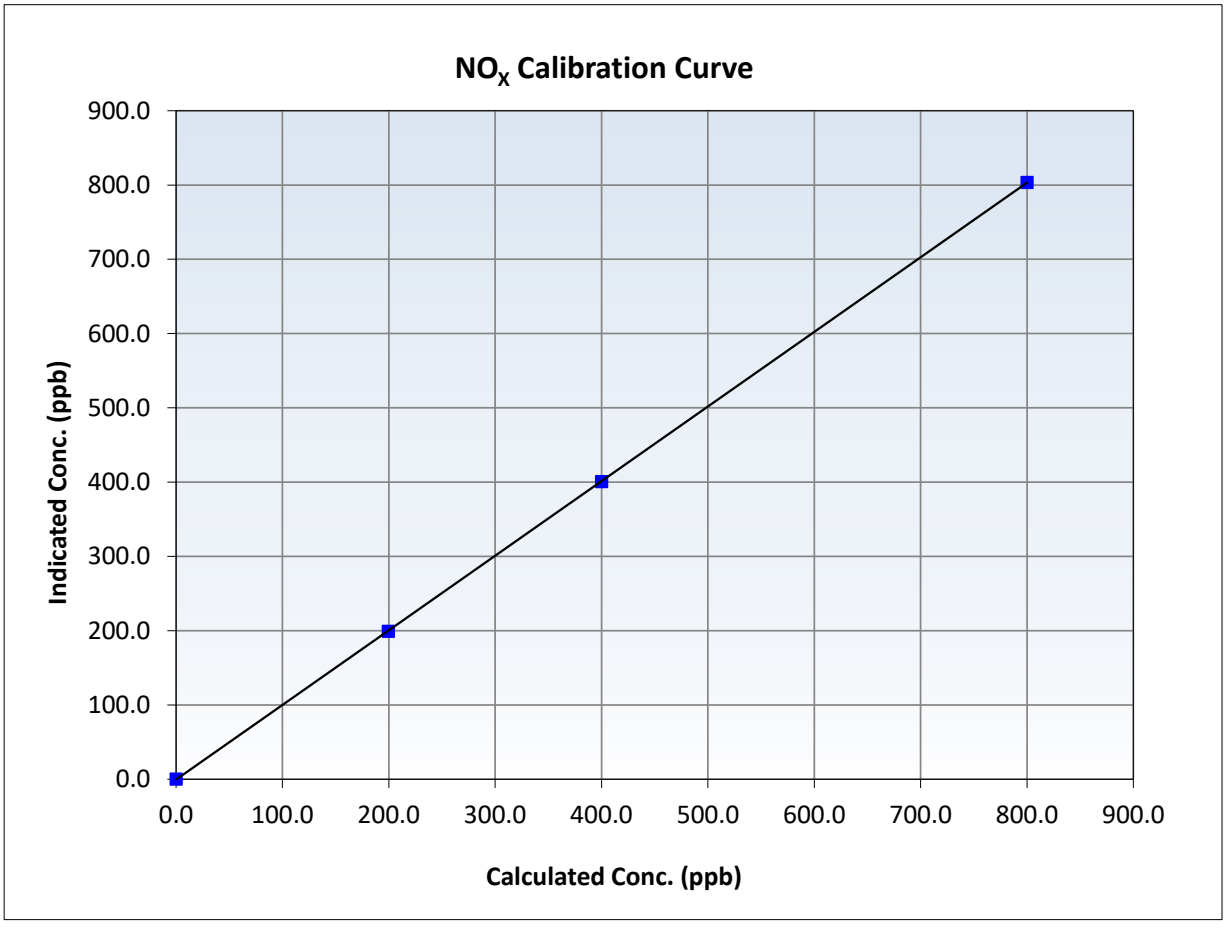
Station Information

Calibration Date:	December 18, 2024	Previous Calibration:	November 15, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	12:07
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
800.0	803.6	0.9956
400.0	400.9	0.9978
199.5	199.1	1.0020

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.004479	*0.90 - 1.10*
Intercept	-0.452723	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

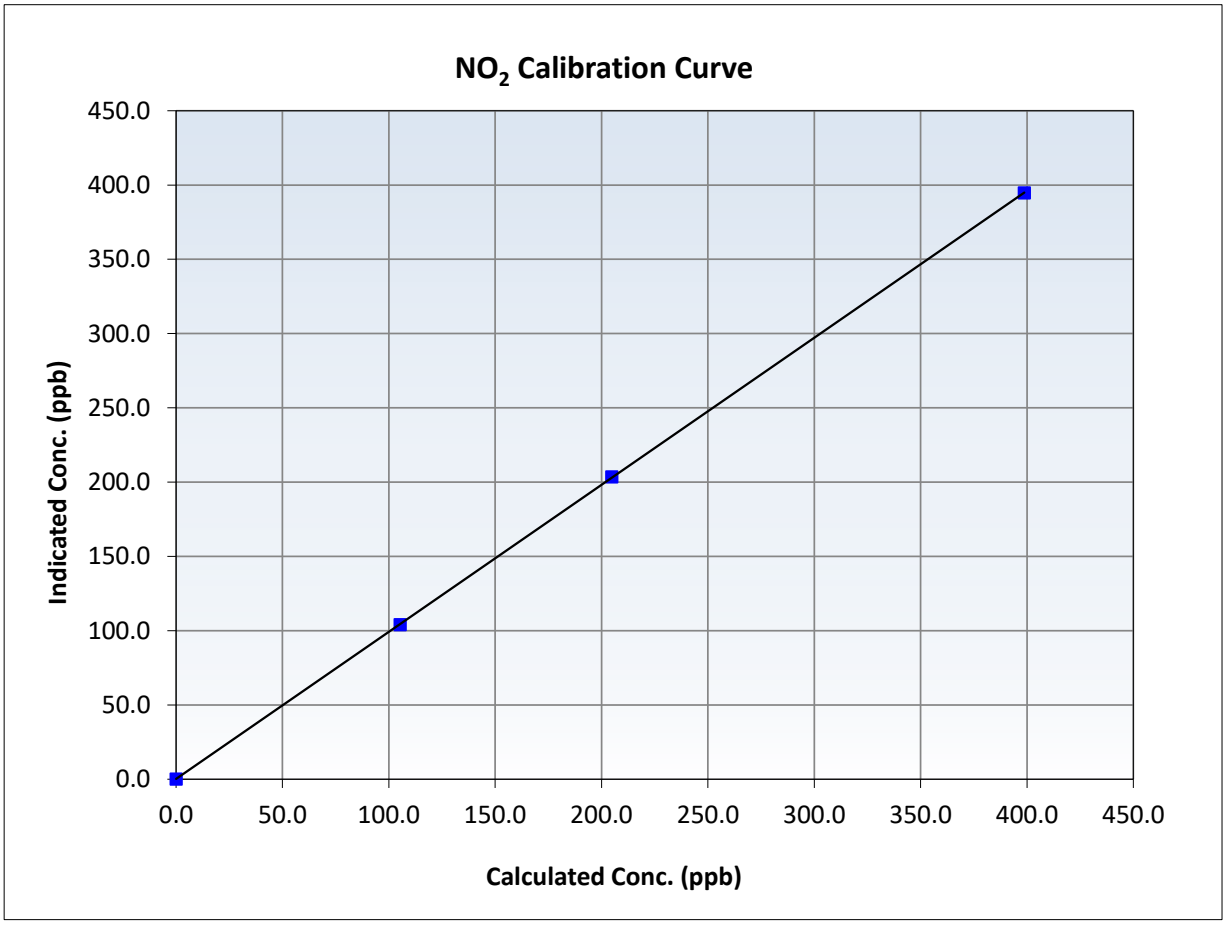
Station Information

Calibration Date:	December 18, 2024	Previous Calibration:	November 15, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	12:07
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
398.7	394.7	1.0102
204.8	203.6	1.0061
105.3	104.1	1.0119

Statistical Evaluation		Limits
Correlation Coefficient	0.999993	≥0.995
Slope	0.989876	0.90 - 1.10
Intercept	0.217112	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

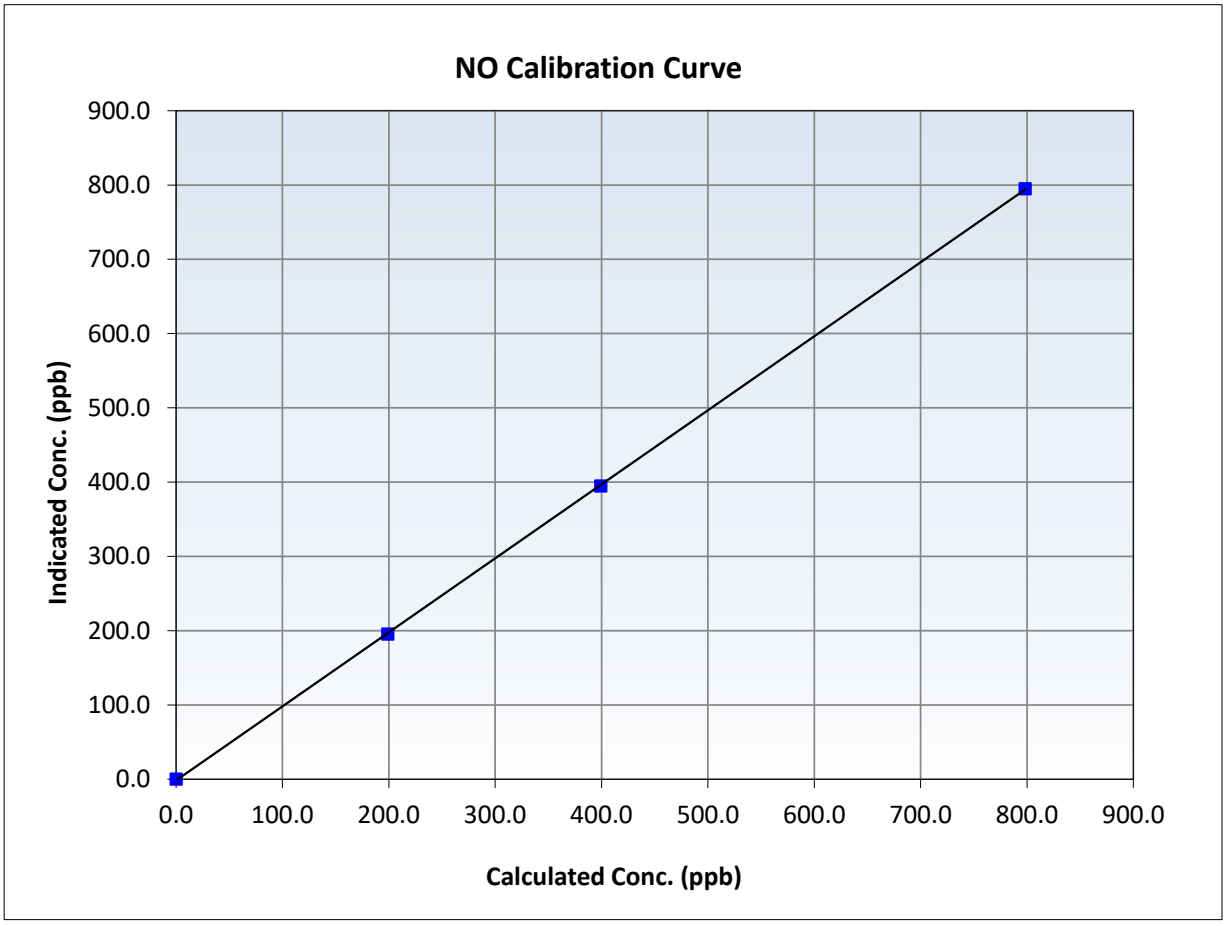
Station Information

Calibration Date:	December 18, 2024	Previous Calibration:	November 15, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	12:07
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

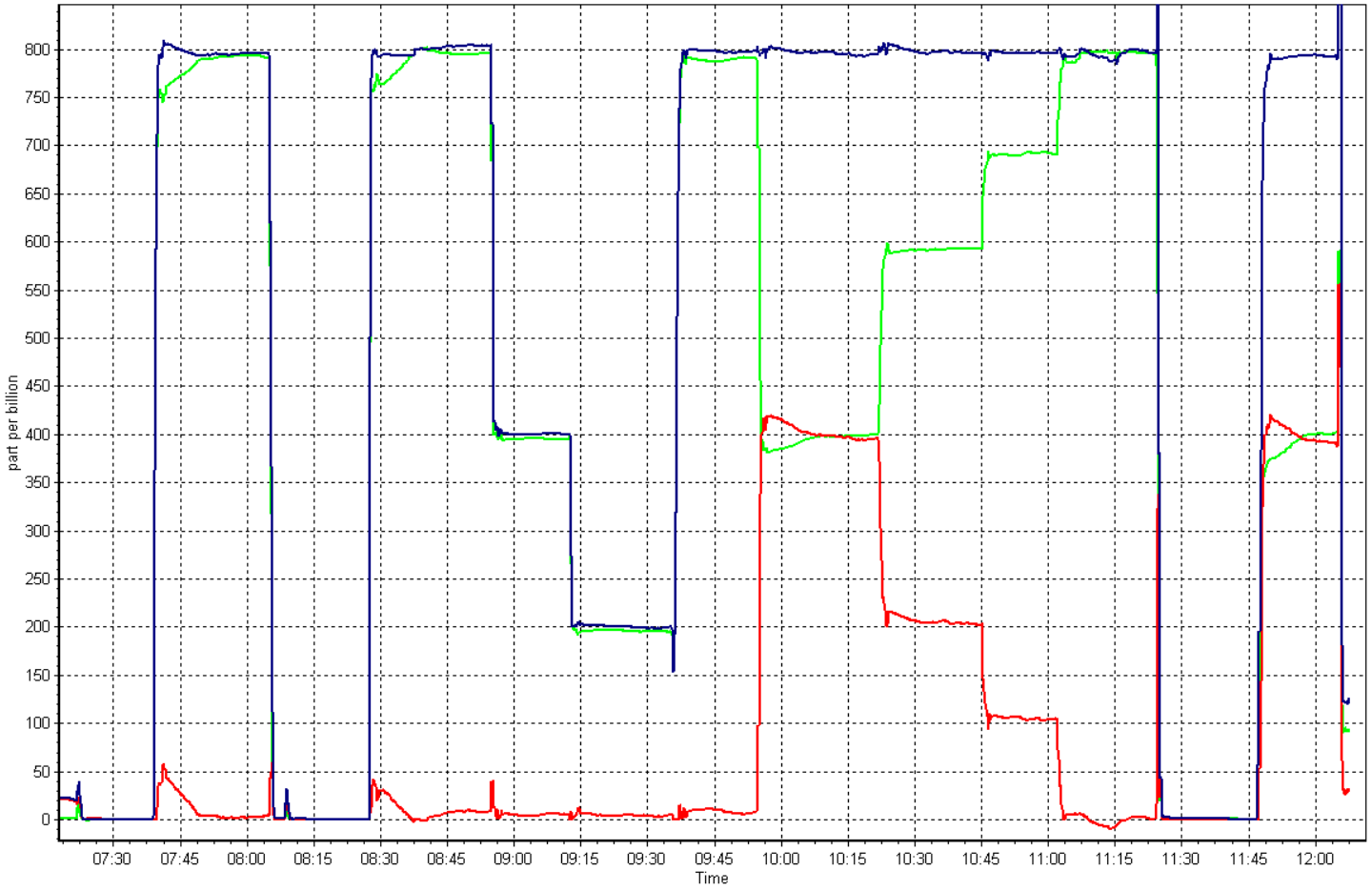
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
798.4	795.0	1.0043
399.2	395.0	1.0106
199.1	195.4	1.0189

Statistical Evaluation		Limits
Correlation Coefficient	0.999979	≥0.995
Slope	0.996506	0.90 - 1.10
Intercept	-1.575097	+/-20



NO_X Calibration Plot Date: December 18, 2024 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	December 11, 2024	Last Cal Date:	November 25, 2024
Start time (MST):	10:08	End time (MST):	12:17
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	APIP T700	Serial Number:	3808
ZAG Make/Model:	API T701	Serial Number:	362

Analyzer Information

Analyzer make:	API T400		Analyzer serial #:	2961	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998371	0.999200	Backgd or Offset:	-2.2	-2.2
Calibration intercept:	0.260000	0.240000	Coeff or Slope:	1.020	1.020

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.5	----
As found High point	5000	997.9	400.0	398.8	1.002
As found Mid point					
As found Low point					
Baseline Corr As found:	399.3	Previous response	399.6	*% change	-0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	5000	997.1	400.0	399.7	1.001
Mid point	5000	821.2	200.0	200.4	0.998
Low point	5000	709.9	100.0	100.4	0.996
As left zero	5000	0.0	0.0	-0.8	----
As left span	5000	996.1	400.0	401.3	0.997
				Average Correction Factor	0.998

Notes: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

O_3 Calibration Summary

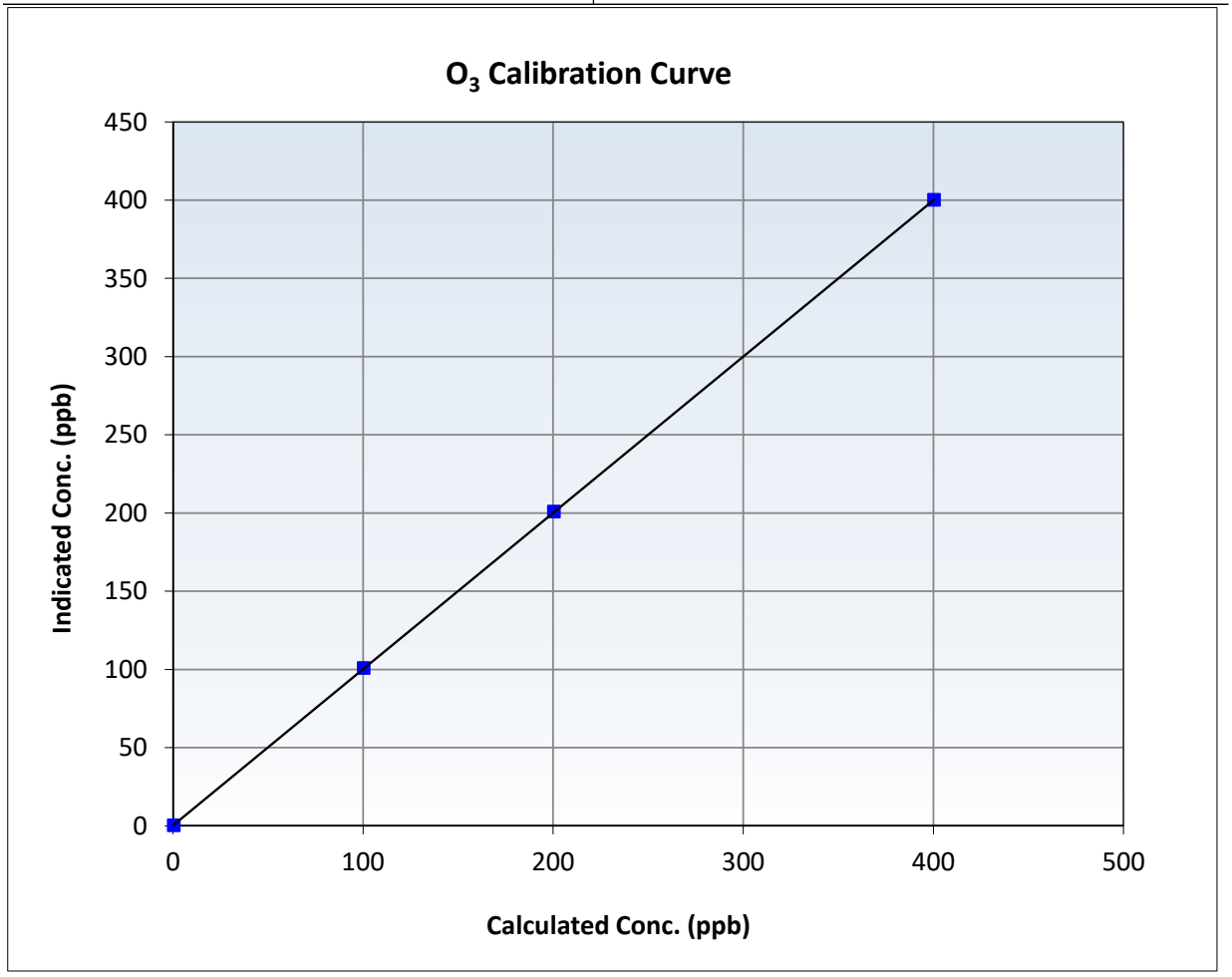
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 25, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	10:08	End Time (MST):	12:17
Analyzer make:	API T400	Analyzer serial #:	2961

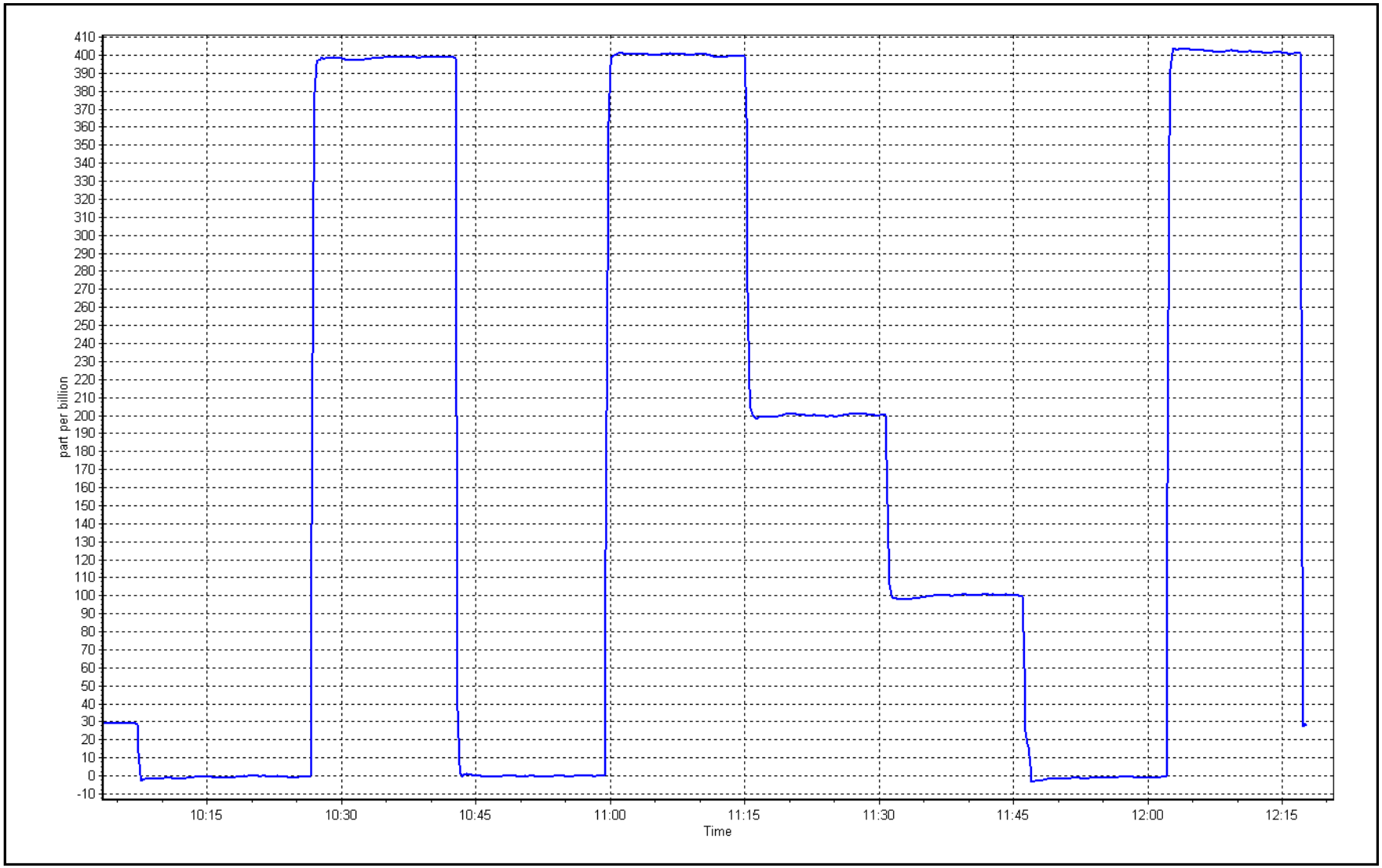
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
400.0	399.7	1.0008
200.0	200.4	0.9980
100.0	100.4	0.9960

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999996	*≥0.995*
Slope	0.999200	*0.90 - 1.10*
Intercept	0.240000	*+/- 5*



O_3 Calibration Plot Date: December 11, 2024 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	December 19, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	8:32	End time (MST):	9:45
Analyzer Make:	Teledyne API T640	S/N:	321
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388753
Temp/RH standard:	Alicat FP-25BT	S/N:	388753

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-24.6	-25.6	-24.6	☐	+/- 2 °C
P (mmHg)	743.0	743.3	743.0	☐	+/- 10 mmHg
Flow (LPM)	5.00	5.20	5.00	☐	+/- 0.25 LPM
PW% (pump)	42	-----	42	☐	>80%
Zero Verification	PM w/o HEPA:	0.1	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 6-10-2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	10.7	10.7	10.7	☐	+/- 0.5

Date Optical Chamber Cleaned: December 19, 2024

Date Disposable Filter Changed: December 19, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: February 27, 2024

Date RH/T Sensor Cleaned: February 27, 2024

Notes: No adjustments done. Leak Check, Flow and PMT checked before and after optical cleaning.

Calibration by: Melissa Lemay

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS05
MANNIX
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	December 12, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	10:02	End time (MST):	13:00
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.84	ppm	Cal Gas Exp Date:	January 6, 2030	
Cal Gas Cylinder #:	CC408659				
Removed Cal Gas Conc:	49.84	ppm	Rem Gas Exp Date:	N/A	
Removed Gas Cyl #:	N/A		Diff between cyl:		
Calibrator Model:	API T700		Serial Number:	5470	
Zero Air Gen Model:	API T701		Serial Number:	361	

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1008841399	
Analyzer Range:	1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.997157	0.992430	Backgd or Offset:	10.0	10.0
Calibration intercept:	-0.665731	-0.685495	Coeff or Slope:	0.935	0.935

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.3	800.4	794.2	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	794.2	Previous response	797.4	*% change	-0.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	80.3	800.4	793.6	1.009
Mid point	4960	40.1	399.7	396.9	1.007
Low point	4980	20.1	200.4	196.5	1.020
As left zero	5000	0.0	0.0	0.1	----
As left span	4920	80.3	800.4	794.8	1.007
				Average Correction Factor:	1.012

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

SO_2 Calibration Summary

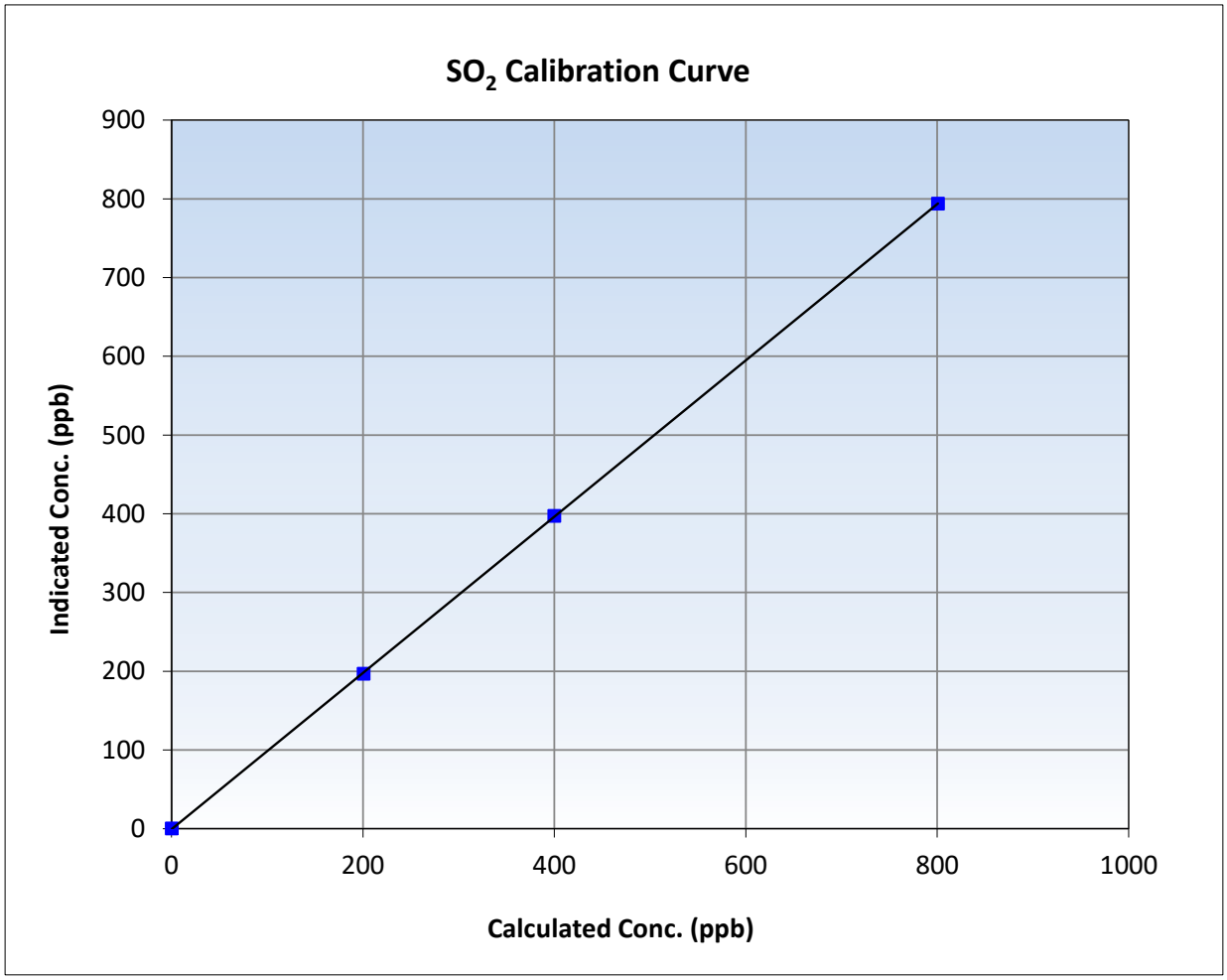
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 21, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	10:02	End Time (MST):	13:00
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841399

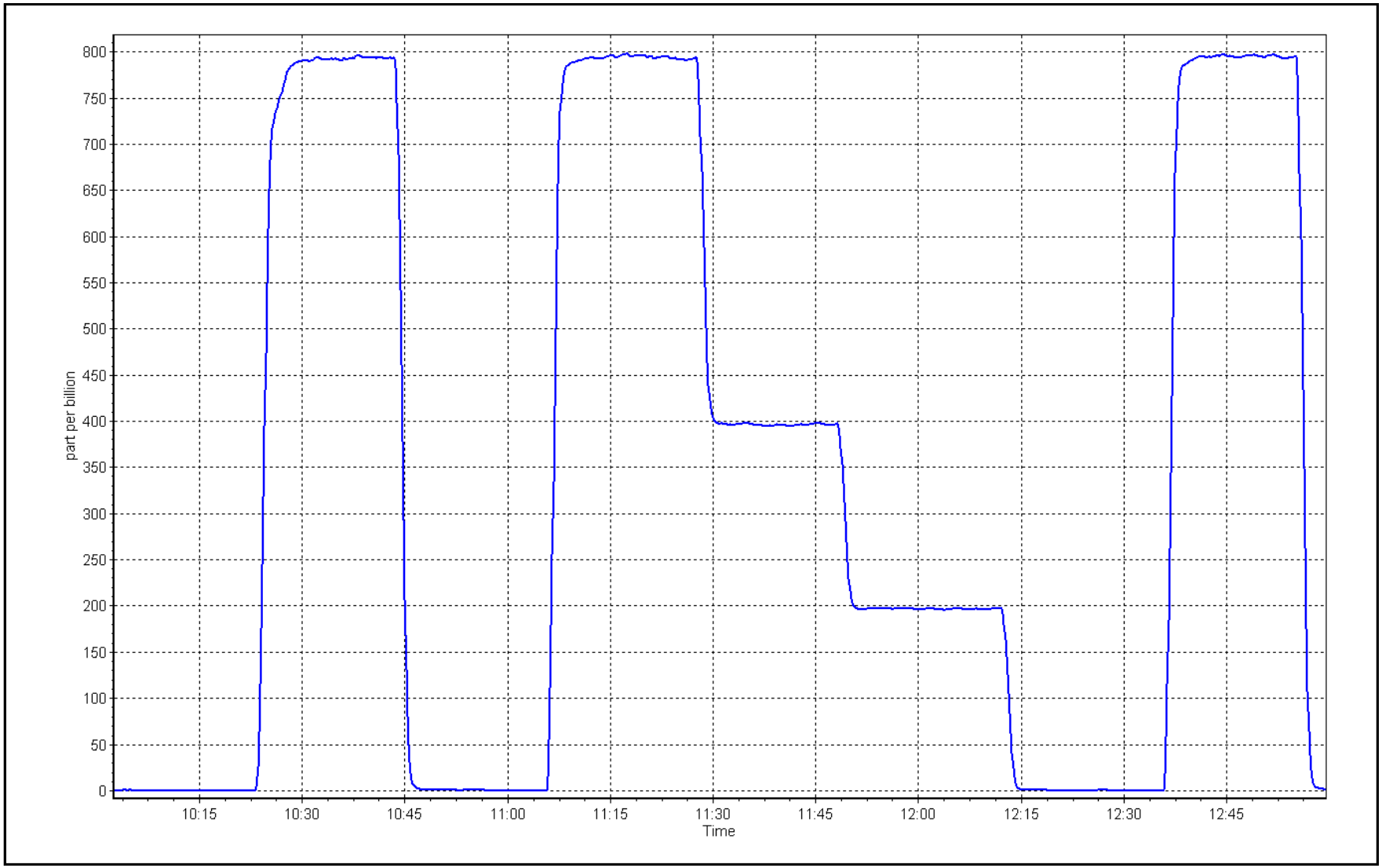
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.4	793.6	1.0085
399.7	396.9	1.0071
200.4	196.5	1.0196

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999988	*≥0.995*
Slope	0.992430	*0.90 - 1.10*
Intercept	-0.685495	*+/-30*



SO2 Calibration Plot Date: December 12, 2024 Location: Mannix



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	December 3, 2024	Last Cal Date:	November 20, 2024
Start time (MST):	9:54	End time (MST):	14:30
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.96	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	DT0037363			
Removed Cal Gas Conc:	4.96	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	5470
ZAG Make/Model:	API T701		Serial Number:	361

Analyzer Information

Analyzer make:	Thermo 43iQ		Analyzer serial #:	1200326169	
Converter make:	Global		Converter serial #:	2022-225	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.987394	0.996970	Backgd or Offset:	1.22	1.25
Calibration intercept:	0.022526	0.062422	Coeff or Slope:	1.009	1.029

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4919	80.6	80.0	78.4	1.020
As found Mid point	4960	40.3	40.0	39.3	1.017
As found Low point	4980	20.2	20.0	19.6	1.022
New cylinder response					
Baseline Corr As found:	78.4	Prev response:	78.98	*% change:	-0.7%
Baseline Corr 2nd AF pt:	39.3	AF Slope:	0.980819	AF Intercept:	0.002612
Baseline Corr 3rd AF pt:	19.6	AF Correlation:	0.999996	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4919	80.6	80.0	79.7	1.003
Mid point	4960	40.3	40.0	40.2	0.994
Low point	4980	20.2	20.0	19.8	1.012
As left zero	5000	0.0	0.0	0.3	----
As left span	4919	80.6	80.0	79.0	1.012
SO2 Scrubber Check	4920	80.3	803.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.003
Date of last converter efficiency test:					

Notes: Changed the inlet filter after as founds. Ran a SO2 scrubber check after calibrator zero. Adjusted the span only.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

H_2S Calibration Summary

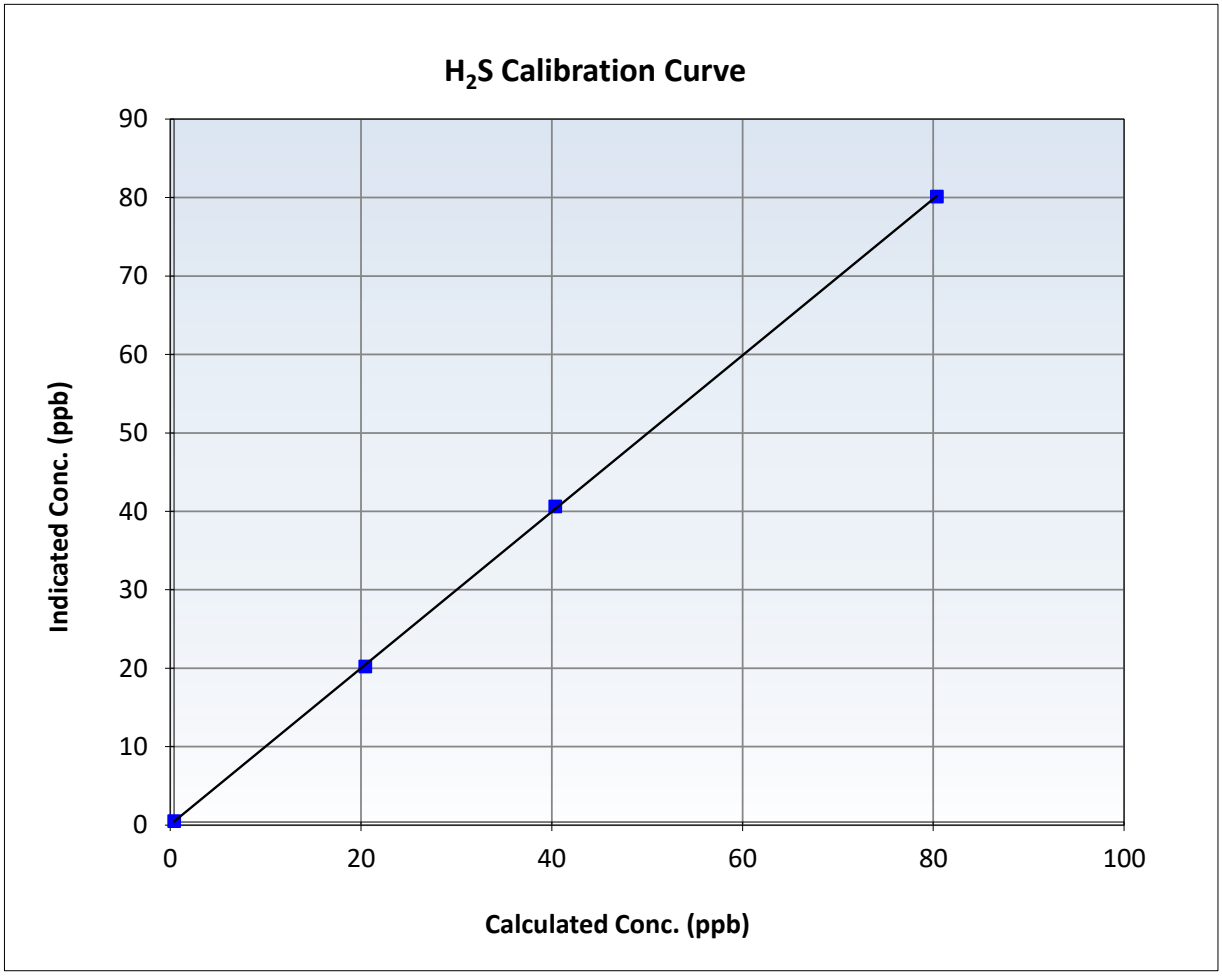
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 20, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	9:54	End Time (MST):	14:30
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1200326169

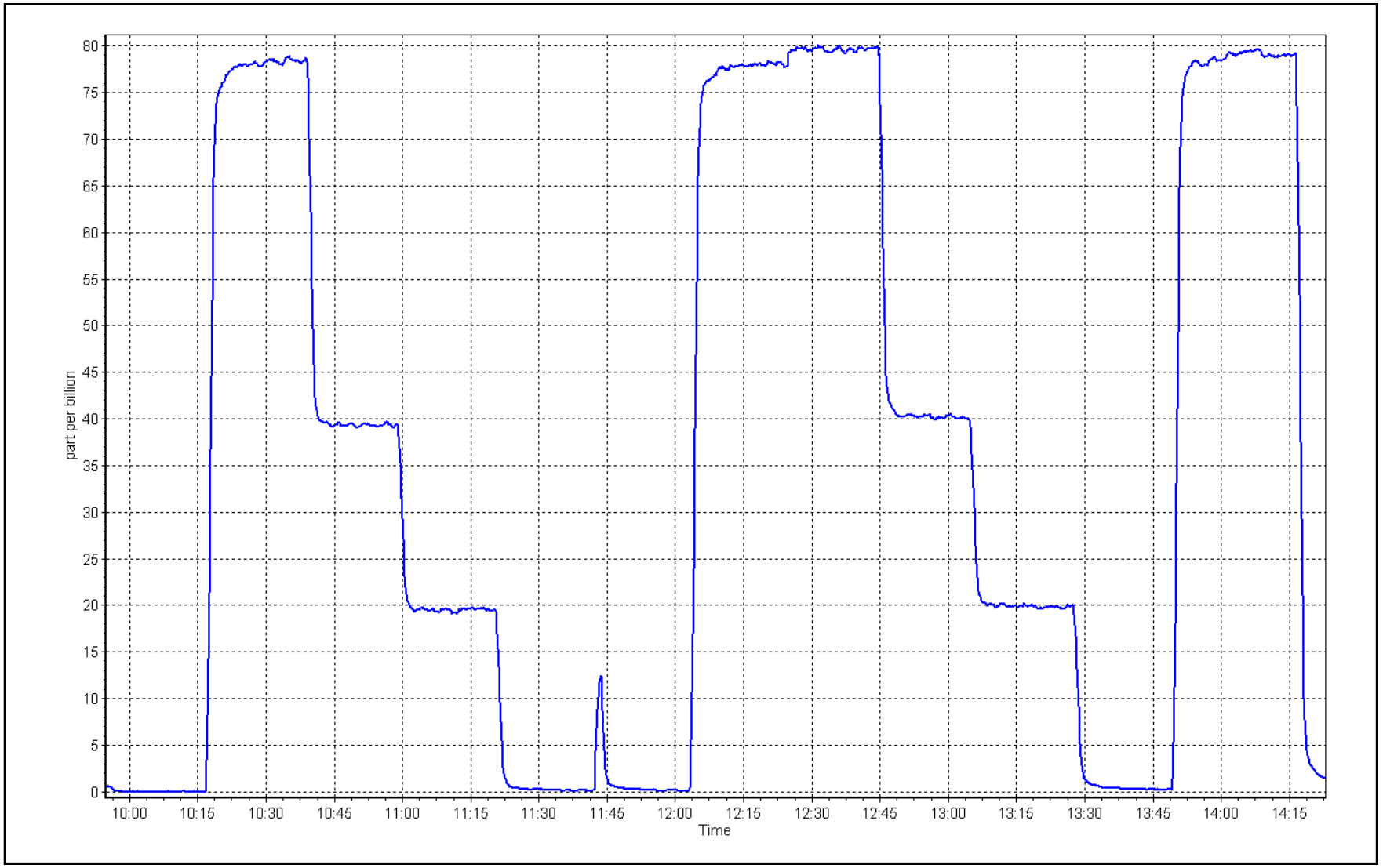
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	79.7	1.0033
40.0	40.2	0.9944
20.0	19.8	1.0120

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999958	*≥0.995*
Slope	0.996970	*0.90 - 1.10*
Intercept	0.062422	*+/-3*



H_2S Calibration Plot Date: December 3, 2024 Location: Mannix



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	December 12, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	10:02	End time (MST):	13:00
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC408659	Cal Gas Expiry Date:	January 6, 2030
CH4 Cal Gas Conc.	507.2 ppm	CH4 Equiv Conc.	1057.8 ppm
C3H8 Cal Gas Conc.	200.2 ppm		
Removed Gas Cert:	N/A	Removed Gas Expiry:	N/A
Removed CH4 Conc.	507.2 ppm	CH4 Equiv Conc.	1057.8 ppm
Removed C3H8 Conc.	200.2 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	5470
Zero Air Gen model:	API T701	Serial Number:	361

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.94E-04	2.94E-04	NMHC SP Ratio:	5.37E-05	5.37E-05
CH4 Retention time:	15.4	15.4	NMHC Peak Area:	164658	164658
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	16.99	17.03	0.997
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.03	Prev response	17.07	*% change	-0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	16.99	17.01	0.998
Mid point	4960	40.1	8.48	8.53	0.995
Low point	4980	20.1	4.25	4.23	1.005
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	16.99	17.05	0.996
				Average Correction Factor	0.999

Notes: Changed the inlet filter after as founds. No adjustments made.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.84	8.87	0.996
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.87	Prev response	8.97	*% change	-1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.84	8.85	0.999
Mid point	4960	40.1	4.42	4.44	0.996
Low point	4980	20.1	2.21	2.20	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.84	8.87	0.997
				Average Correction Factor	1.000

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.15	8.17	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.17	Prev response	8.10	*% change	0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.15	8.16	0.998
Mid point	4960	40.1	4.07	4.09	0.994
Low point	4980	20.1	2.04	2.03	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.15	8.18	0.996
				Average Correction Factor	0.999

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.005080	1.002401
THC Cal Offset:	-0.003124	-0.004715
CH4 Cal Slope:	0.994044	1.002491
CH4 Cal Offset:	0.001544	-0.001054
NMHC Cal Slope:	1.014886	1.002085
NMHC Cal Offset:	-0.004268	-0.003261

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

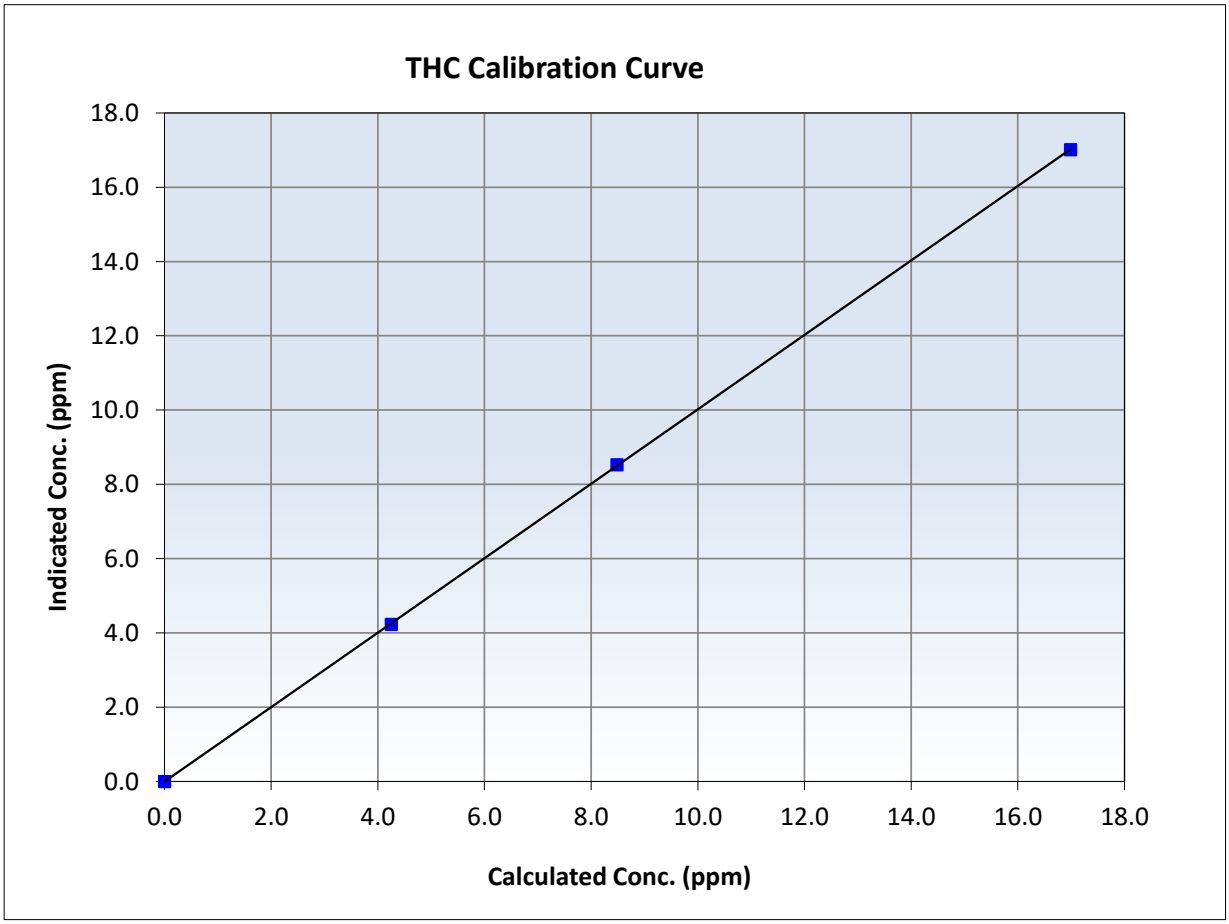
THC Calibration Summary

Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 21, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	10:02	End Time (MST):	13:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999989	≥0.995
16.99	17.01	0.9984	Slope	1.002401	0.90 - 1.10
8.48	8.53	0.9946	Intercept	-0.004715	+/-0.5
4.25	4.23	1.0050			



Wood Buffalo Environmental Association

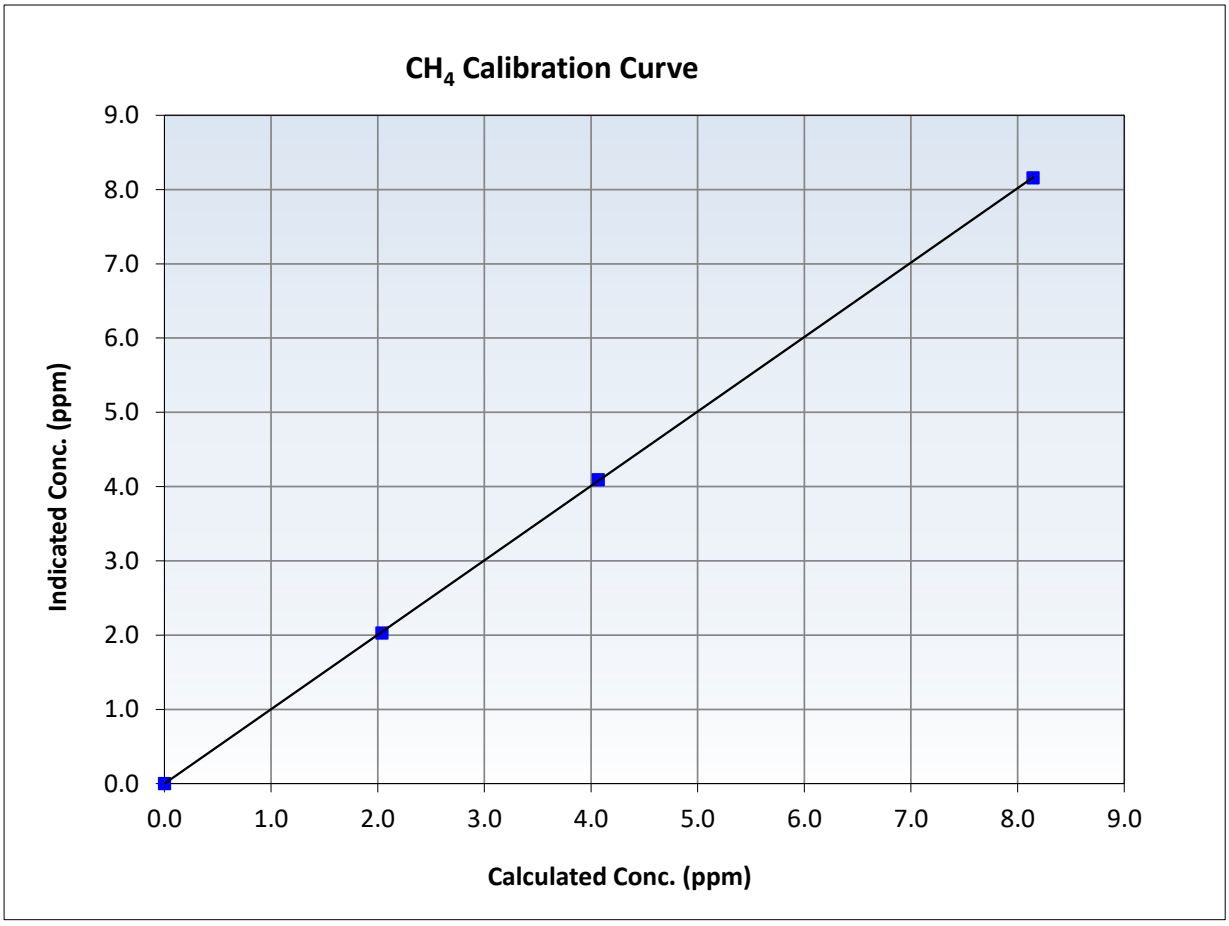
CH_4 Calibration Summary

Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 21, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	10:02	End Time (MST):	13:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999986	≥0.995
8.15	8.16	0.9983	Slope	1.002491	0.90 - 1.10
4.07	4.09	0.9936	Intercept	-0.001054	+/-0.5
2.04	2.03	1.0044			



Wood Buffalo Environmental Association

NMHC Calibration Summary

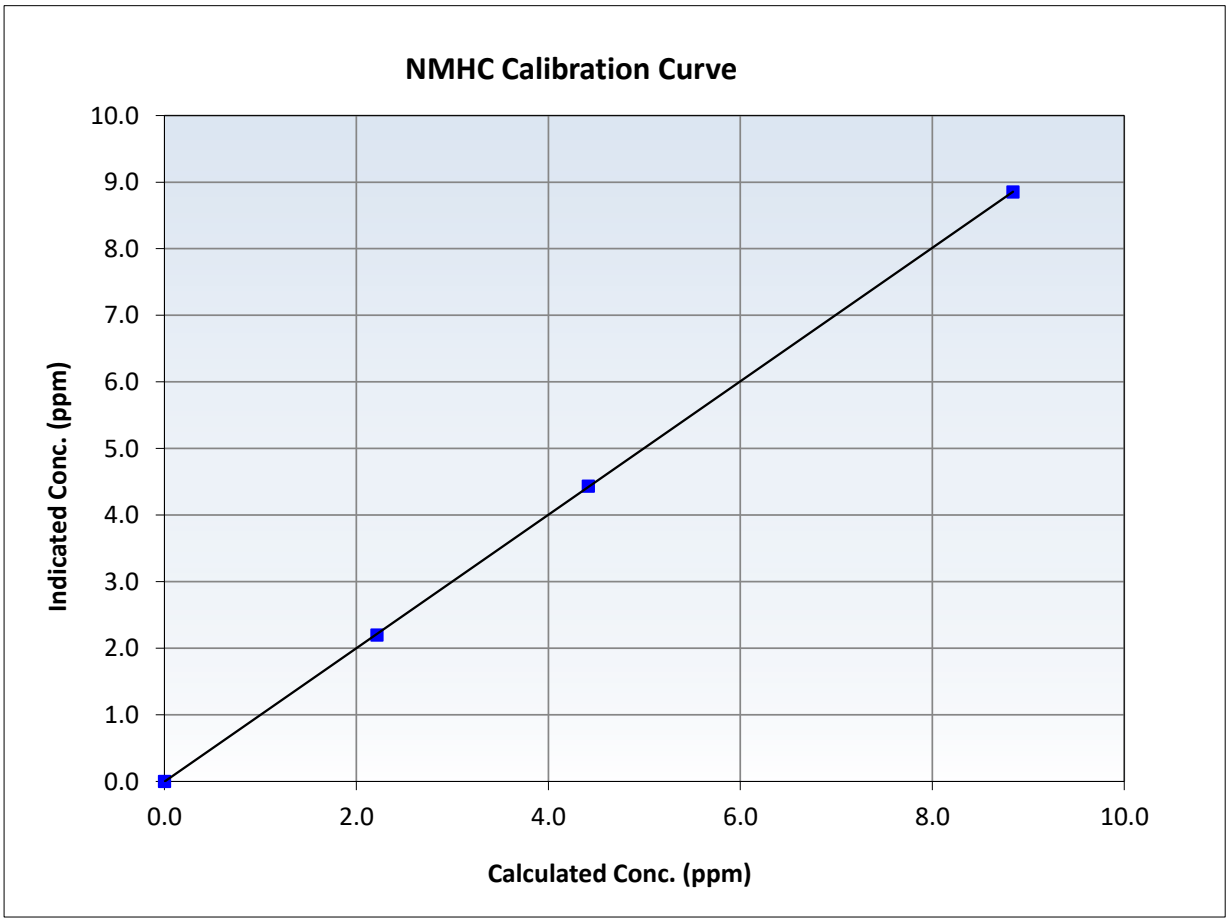
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 21, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	10:02	End Time (MST):	13:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

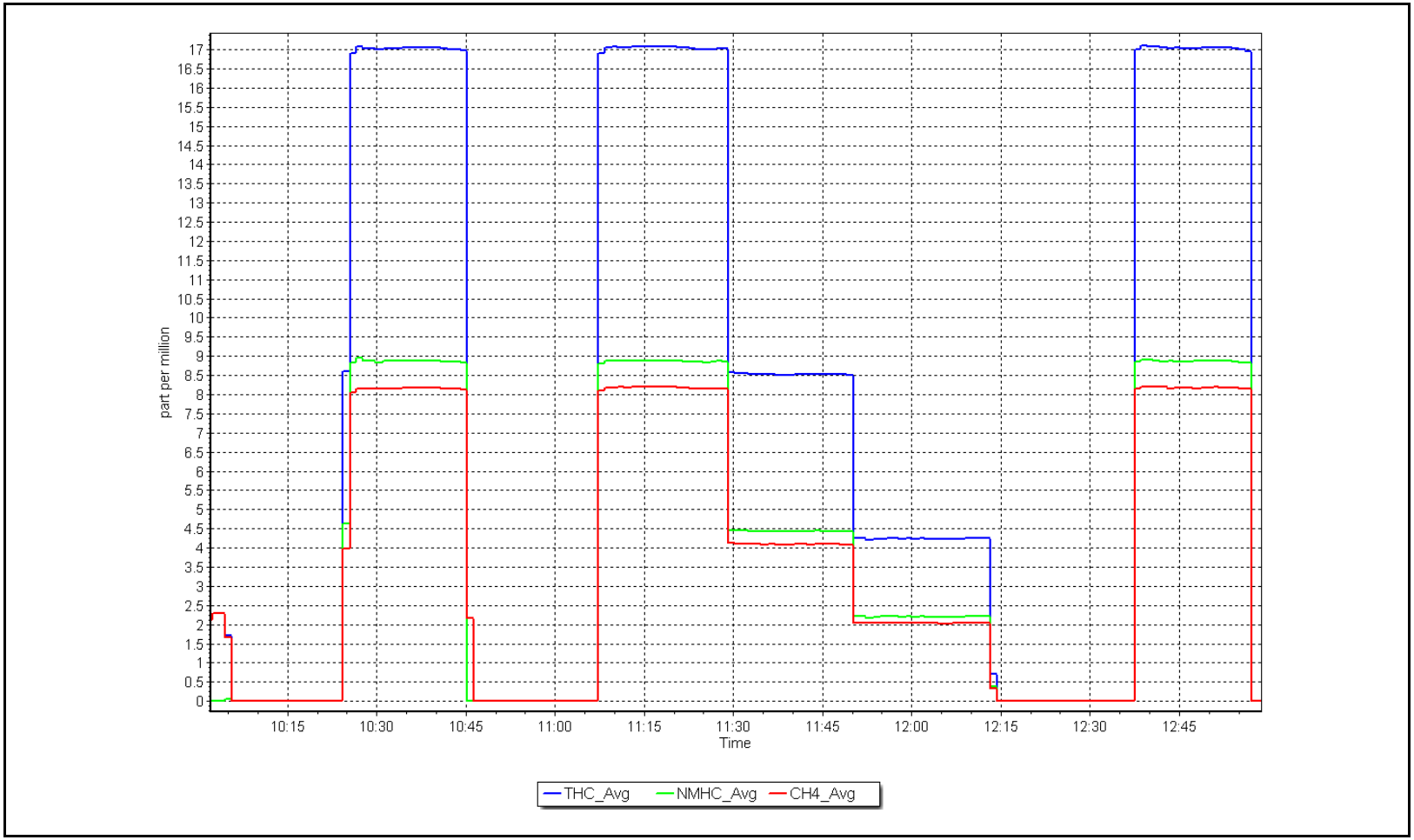
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.84	8.85	0.9987
4.42	4.44	0.9956
2.21	2.20	1.0055

Statistical Evaluation		Limits
Correlation Coefficient	0.999991	≥0.995
Slope	1.002085	0.90 - 1.10
Intercept	-0.003261	+/-0.5



NMHC Calibration Plot Date: December 12, 2024 Location: Mannix



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS06
PATRICIA MCINNES
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	December 2, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	10:30	End time (MST):	13:45
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.78	ppm	Cal Gas Exp Date:	September 9, 2024
Cal Gas Cylinder #:	AAL070632			
Removed Cal Gas Conc:	49.78	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3566
Zero Air Gen Model:	API T701		Serial Number:	5608

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290013	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998832	0.996115	Backgd or Offset:	18.1	18.1
Calibration intercept:	1.880203	1.781114	Coeff or Slope:	0.910	0.910

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4919.7	80.3	799.5	796.5	1.003
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.7	Previous response	800.4	*% change	-0.5%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4919.7	80.3	799.5	797.6	1.002
Mid point	4959.8	40.2	400.2	400.5	0.999
Low point	4979.9	20.1	200.1	203.2	0.985
As left zero	5000	0.0	0.0	0.2	----
As left span	4919.7	80.3	799.5	797.7	1.002
				Average Correction Factor:	0.995

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

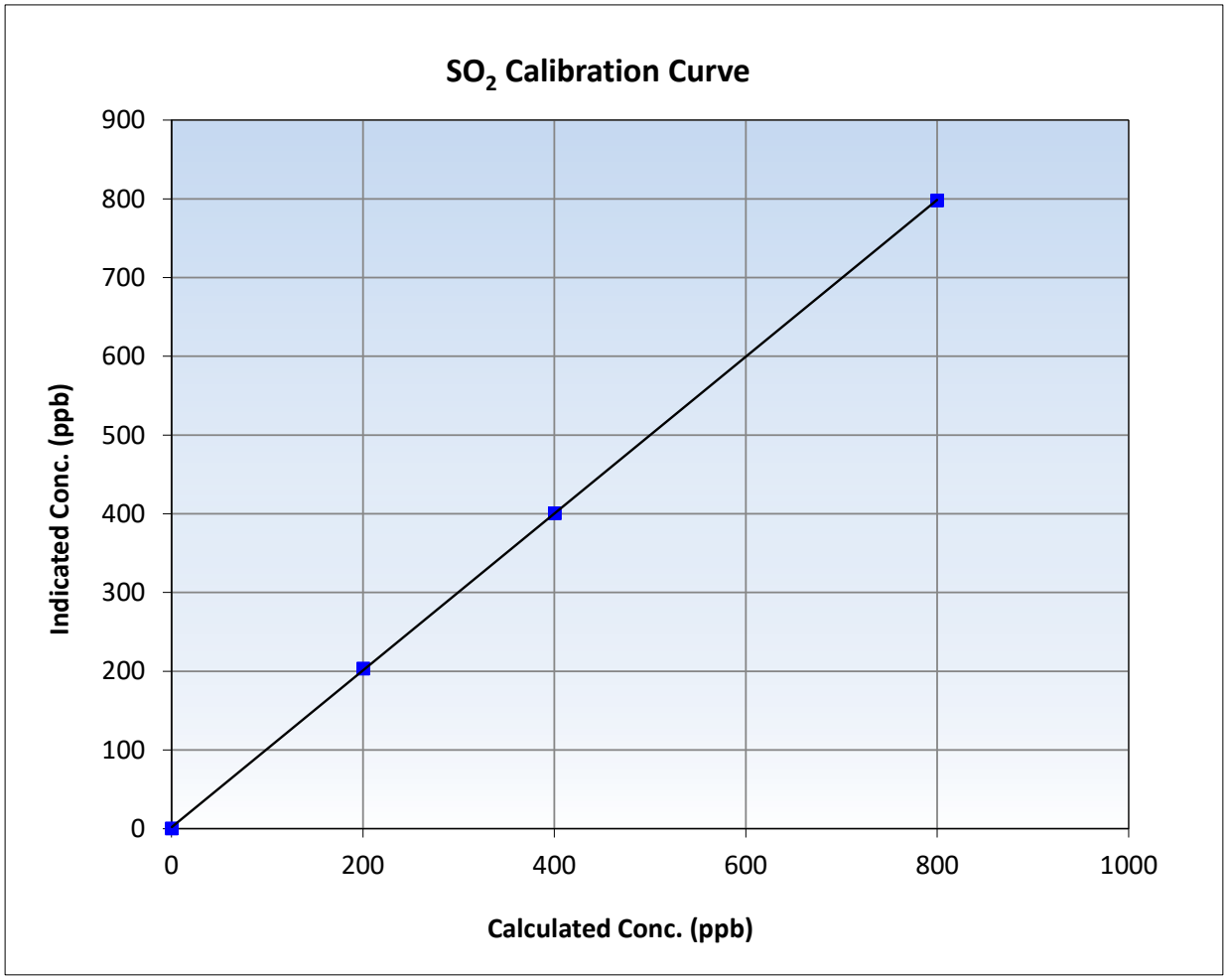
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:30	End Time (MST):	13:45
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290013

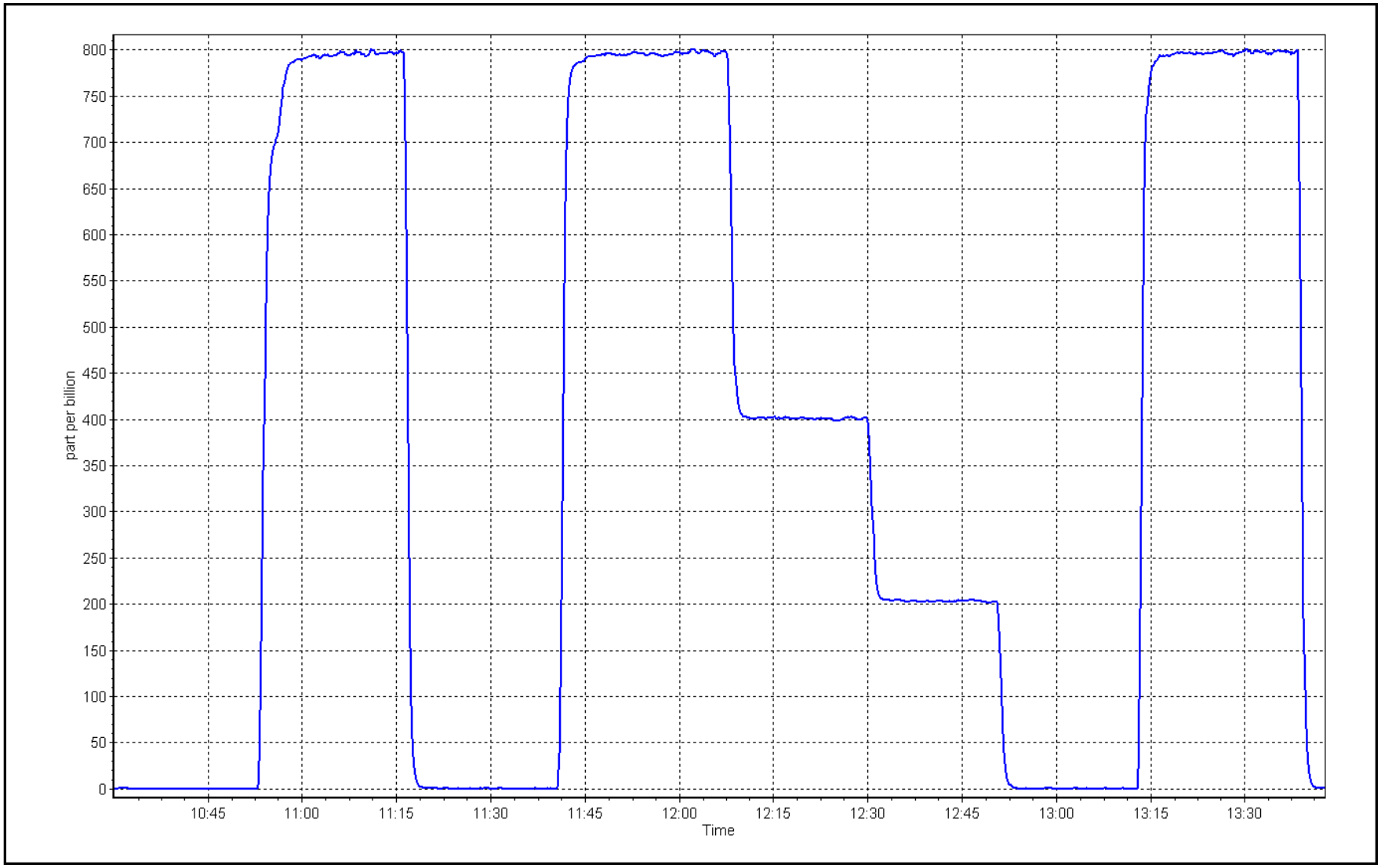
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.5	797.6	1.0023
400.2	400.5	0.9993
200.1	203.2	0.9848

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999979	*≥0.995*
Slope	0.996115	*0.90 - 1.10*
Intercept	1.781114	*+/-30*



SO2 Calibration Plot Date: December 2, 2024 Location: Patricia McInnes



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	December 13, 2024	Last Cal Date:	November 27, 2024
Start time (MST):	9:36	End time (MST):	13:45
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.328	ppm	Cal Gas Exp Date:	February 14, 2025
Cal Gas Cylinder #:	CC506659			
Removed Cal Gas Conc:	5.328	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3566
ZAG Make/Model:	API T701		Serial Number:	4602

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1218153358
Converter make:	CDN-101		Converter serial #:	517
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.002736	1.001163	Backgd or Offset:	1.99	1.99
Calibration intercept:	0.300485	0.280517	Coeff or Slope:	1.153	1.153

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4925	75.1	80.0	82.2	0.975
As found Mid point	4963	37.5	40.0	41.5	0.965
As found Low point	4981	18.8	20.0	20.7	0.973
New cylinder response					

Baseline Corr As found:	82.1	Prev response:	80.54	*% change:	1.9%
Baseline Corr 2nd AF pt:	41.4	AF Slope:	1.026308	AF Intercept:	0.200345
Baseline Corr 3rd AF pt:	20.6	AF Correlation:	0.999968	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4925	75.1	80.0	80.2	0.998
Mid point	4963	37.5	40.0	40.8	0.979
Low point	4981	18.8	20.0	20.1	0.997
As left zero	5000	0.0	0.0	0.3	----
As left span	4925	75.1	80.0	80.9	0.989
SO2 Scrubber Check	4920	80.3	803.0	0.1	----
Date of last scrubber change:		December 20, 2021		Ave Corr Factor	0.991
Date of last converter efficiency test:					

Notes: Changed the inlet filter after as founds. Ran a SO2 scrubber test after calibrator zero. No adjustments made.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

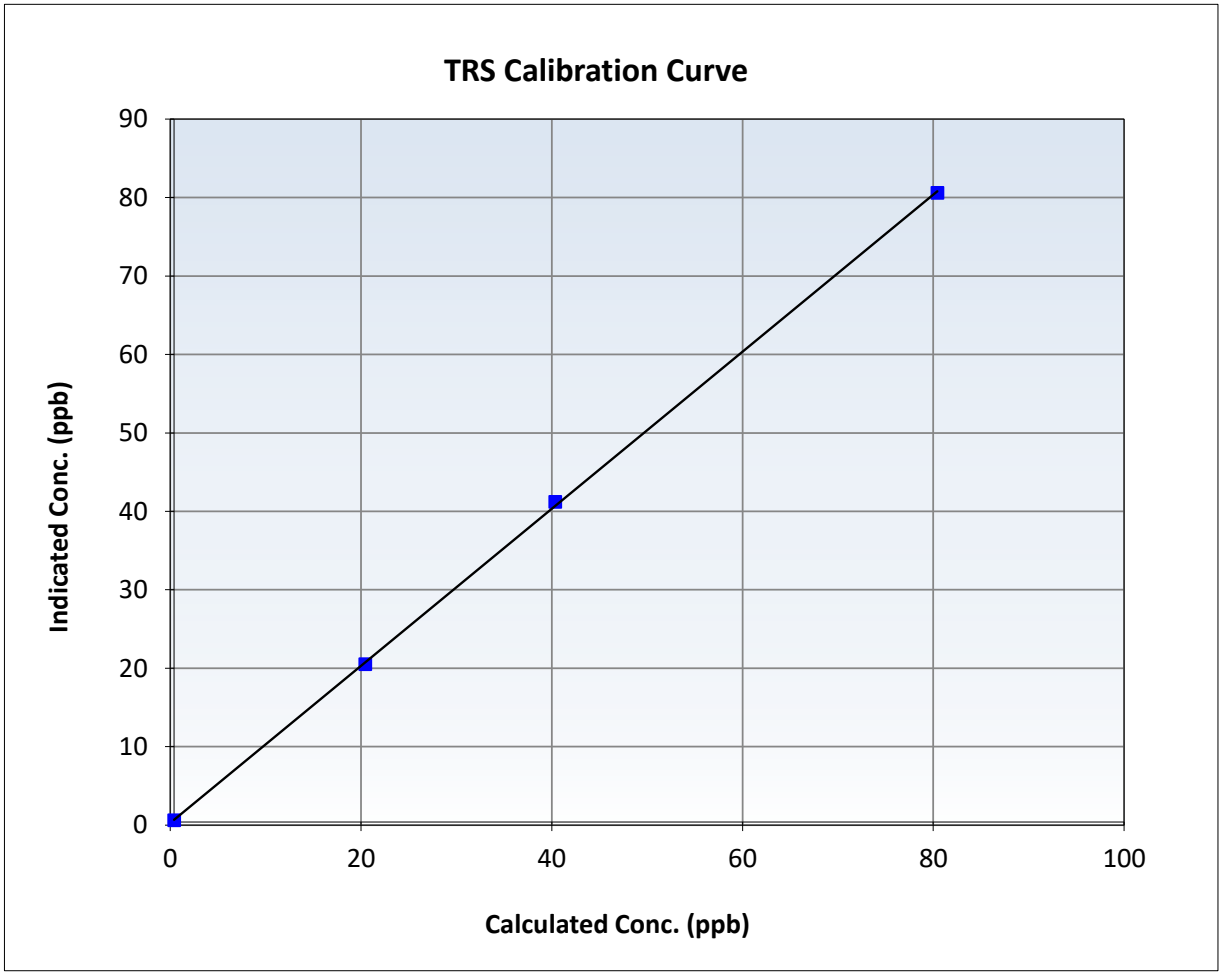
TRS Calibration Summary

Station Information

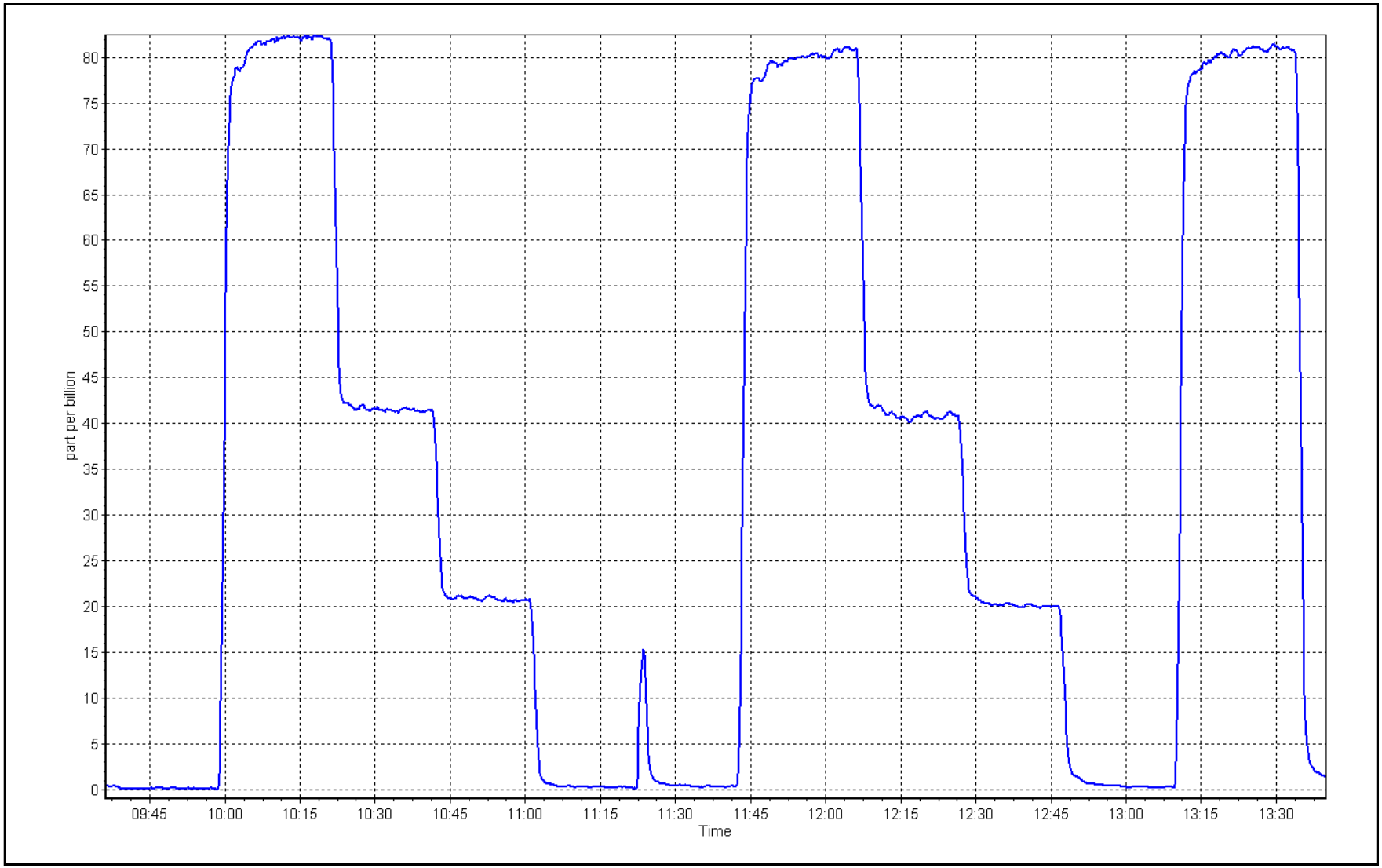
Calibration Date:	December 13, 2024	Previous Calibration:	November 27, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:36	End Time (MST):	13:45
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1218153358

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	0.999895	*≥0.995*
80.0	80.2	0.9978	Slope	1.001163	*0.90 - 1.10*
40.0	40.8	0.9793			
20.0	20.1	0.9967	Intercept	0.280517	*+/-3*



TRS Calibration Plot Date: December 13, 2024 Location: Patricia McInnes



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	December 1, 2024	Last Cal Date:	
Start time (MST):	6:45	End time (MST):	8:45
Reason:	Install		

Calibration Standards

Gas Cert Reference:	AAL070632		Cal Gas Expiry Date:	September 9, 2024	
CH4 Cal Gas Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:	3566	
Zero Air Gen model:	API T701		Serial Number:	4602	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320037	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:		3.14E-04	NMHC SP Ratio:		5.56E-05
CH4 Retention time:		15.6	NMHC Peak Area:		163047
Zero Chromatogram:		OFF	Flat Baseline:		OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	NA	Prev response	NA	*% change	NA
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.12	17.10	1.001
Mid point	4960	40.2	8.57	8.61	0.995
Low point	4980	20.1	4.29	4.38	0.979
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.12	16.99	1.008
				Average Correction Factor	0.992

Notes: Install calibration removed 55i not working properly.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	NA	Prev response	NA	*% change	NA
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.07	9.07	1.000
Mid point	4960	40.2	4.54	4.59	0.990
Low point	4980	20.1	2.27	2.33	0.972
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.07	8.98	1.009
				Average Correction Factor	0.987

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	NA	Prev response	NA	*% change	NA
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.06	8.04	1.002
Mid point	4960	40.2	4.03	4.03	1.001
Low point	4980	20.1	2.02	2.05	0.986
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.06	8.01	1.006
				Average Correction Factor	0.997

Calibration Statistics

	Start	***Finish***
THC Cal Slope:		0.997000
THC Cal Offset:		0.049629
CH4 Cal Slope:		0.996570
CH4 Cal Offset:		0.013646
NMHC Cal Slope:		0.998050
NMHC Cal Offset:		0.035582

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

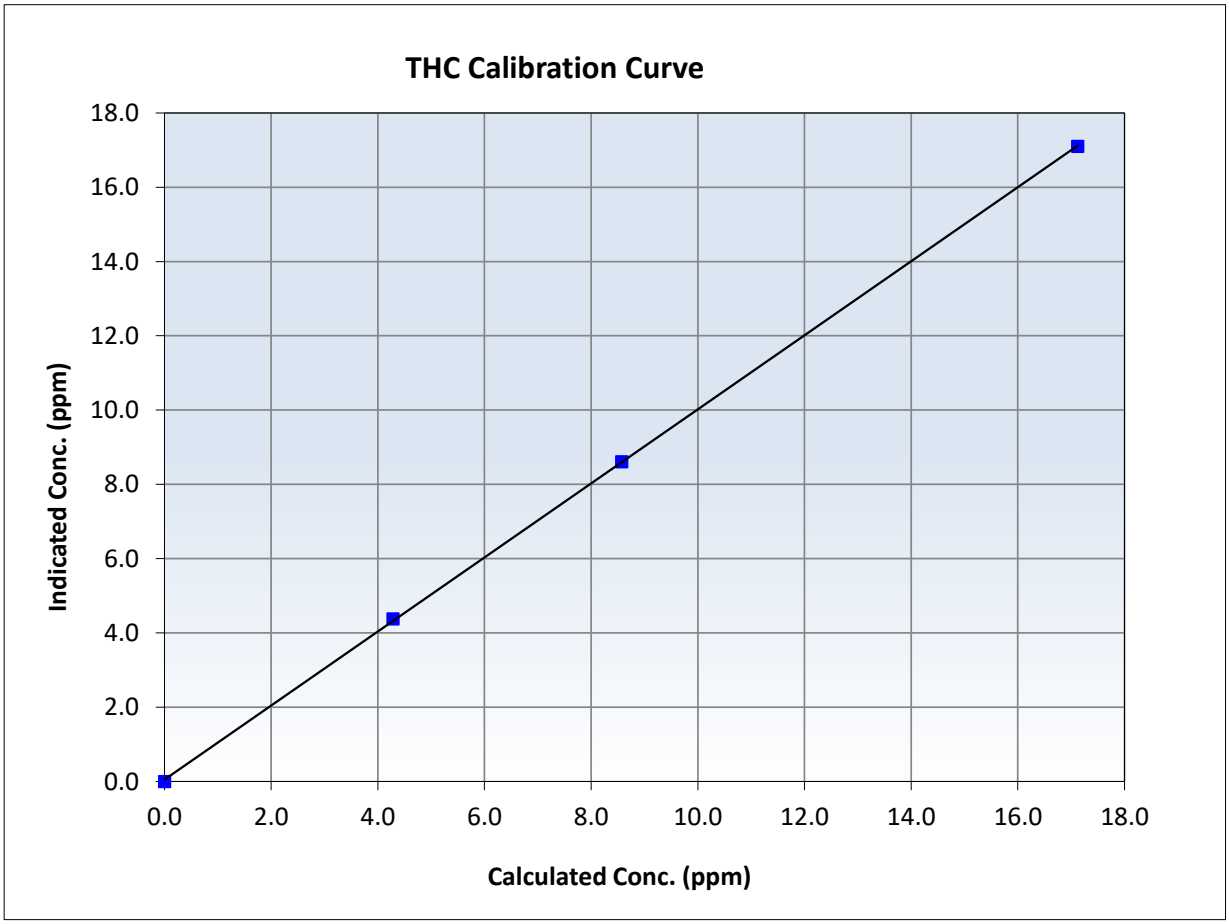
THC Calibration Summary

Station Information

Calibration Date:	December 1, 2024	Previous Calibration:	
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	6:45	End Time (MST):	8:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320037

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999961	≥0.995
17.12	17.10	1.0014	Slope	0.997000	0.90 - 1.10
8.57	8.61	0.9953	Intercept	0.049629	+/-0.5
4.29	4.38	0.9790			



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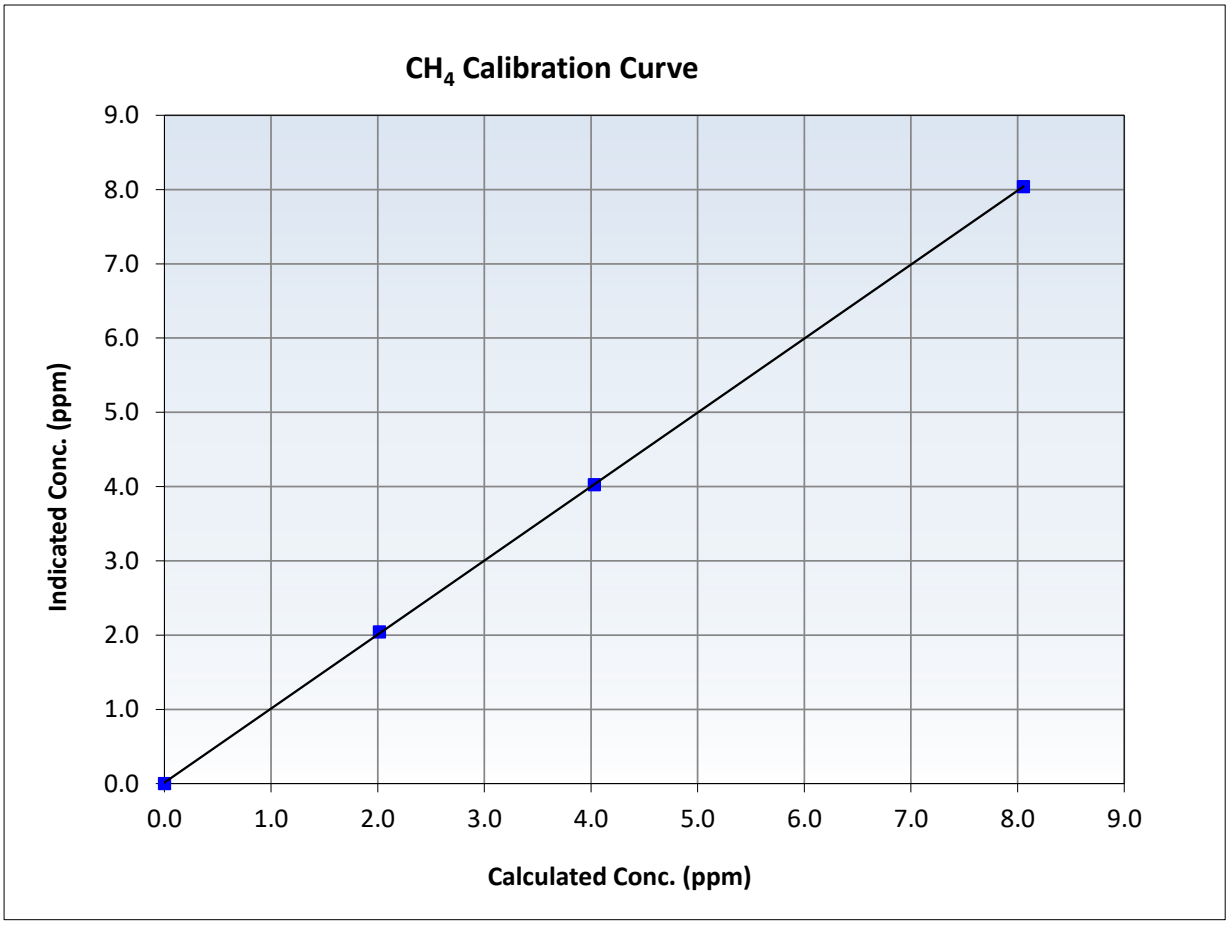
CH_4 Calibration Summary

Station Information

Calibration Date:	December 1, 2024	Previous Calibration:	
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	6:45	End Time (MST):	8:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320037

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999980	≥0.995
8.06	8.04	1.0021	Slope	0.996570	0.90 - 1.10
4.03	4.03	1.0014			
2.02	2.05	0.9860	Intercept	0.013646	+/-0.5



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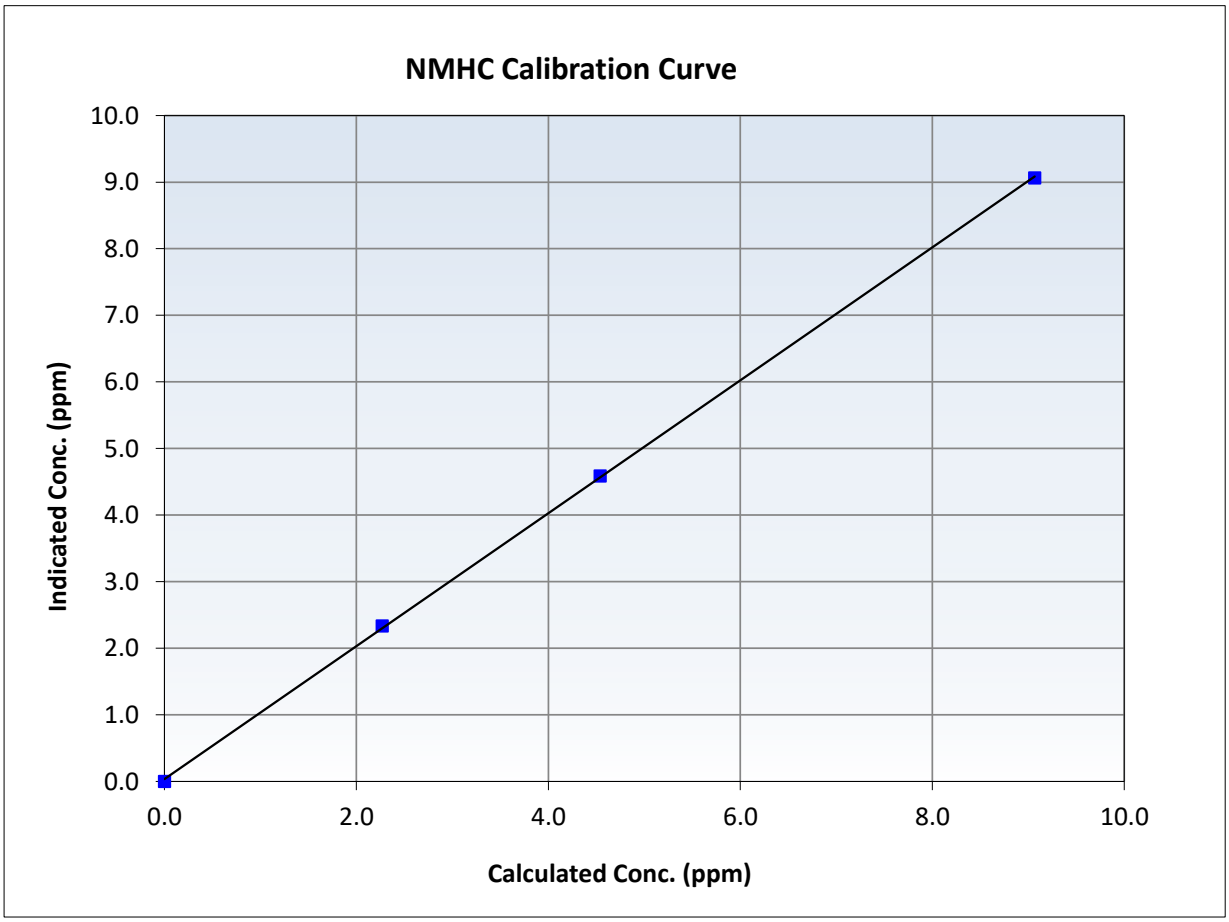
NMHC Calibration Summary

Station Information

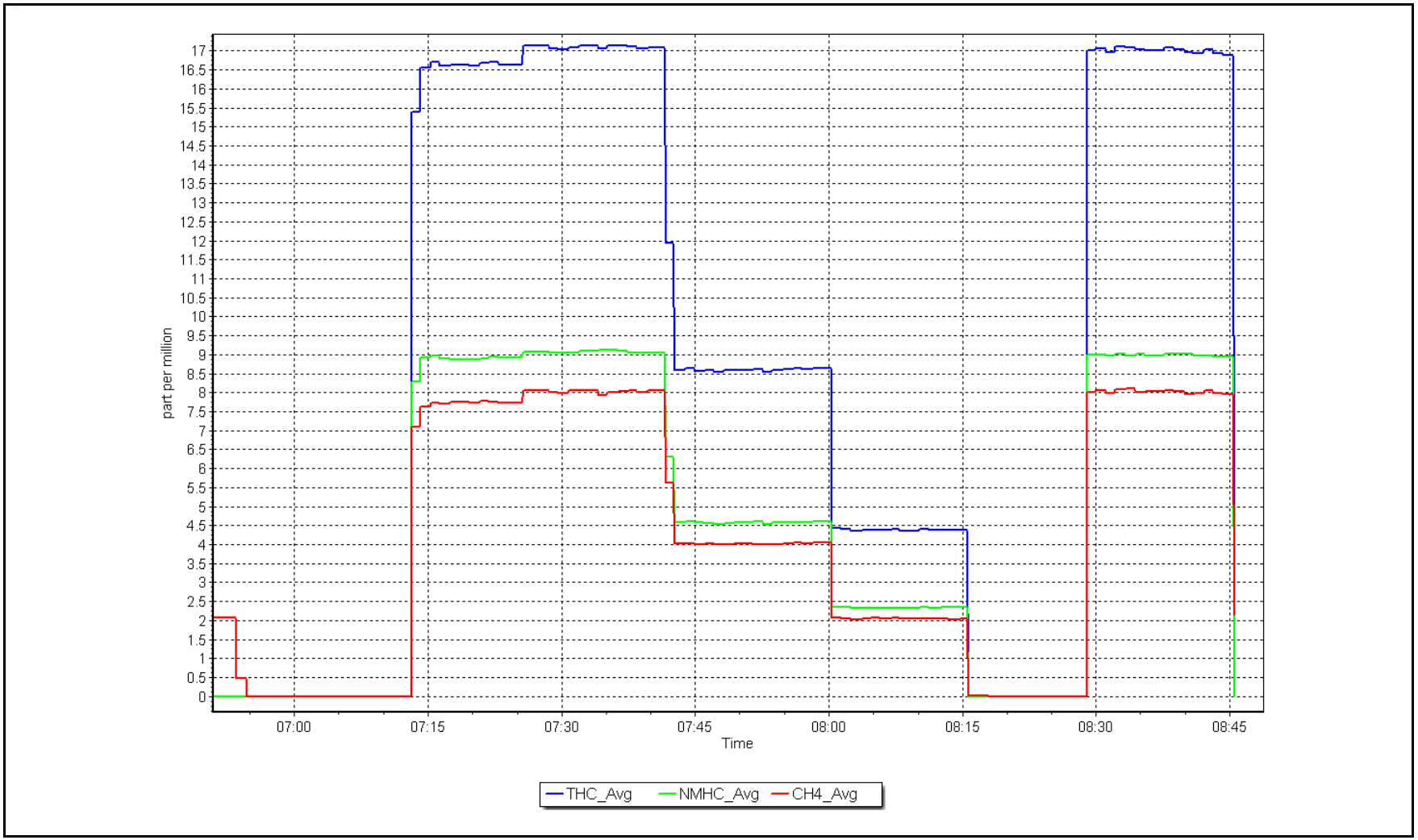
Calibration Date:	December 1, 2024	Previous Calibration:	
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	6:45	End Time (MST):	8:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320037

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999929	≥0.995
9.07	9.07	1.0001	Slope	0.998050	0.90 - 1.10
4.54	4.59	0.9895	Intercept	0.035582	+/-0.5
2.27	2.33	0.9724			



NMHC Calibration Plot Date: December 1, 2024 Location: Patricia McInnes



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THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	December 20, 2024	Last Cal Date:	December 1, 2024
Start time (MST):	12:55	End time (MST):	14:44
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	AAL070632		Cal Gas Expiry Date:	September 9, 2024	
CH4 Cal Gas Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:	3566	
Zero Air Gen model:	API T701		Serial Number:	4602	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320037	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	3.14E-04	3.14E-04	NMHC SP Ratio:	5.56E-05	5.56E-05
CH4 Retention time:	15.6	15.6	NMHC Peak Area:	163047	163047
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.12	17.11	1.001
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.11	Prev response	17.12	*% change	-0.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.12	17.08	1.003
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor: 1.003

Notes: Changed the N2 cylinder after as founds. Small dips occurring. Will monitor.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.07	9.18	0.987
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.18	Prev response	9.08	*% change	1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.07	9.34	0.971
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	0.971

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.06	7.92	1.017
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.92	Prev response	8.04	*% change	-1.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

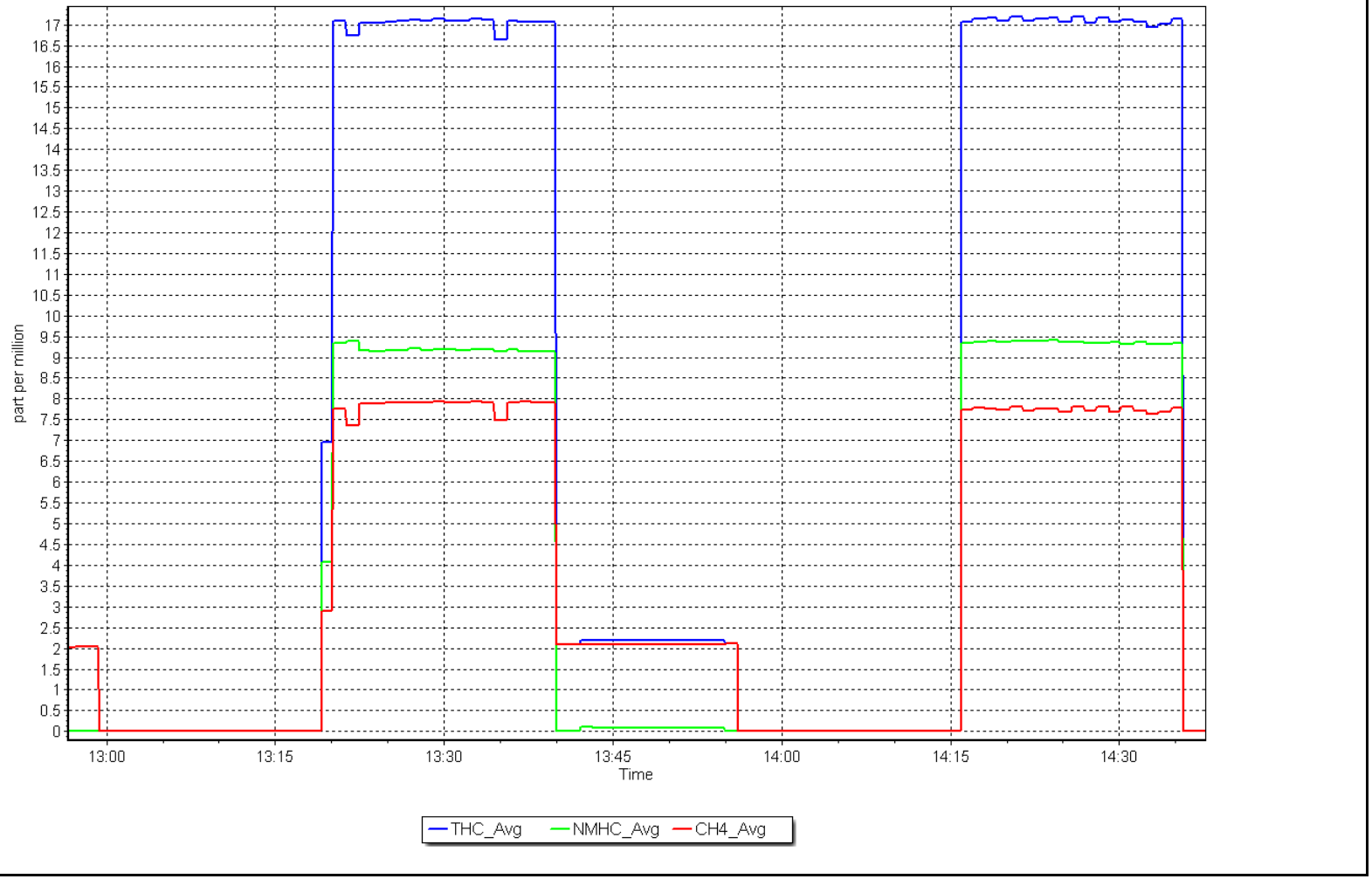
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.06	7.74	1.041
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.041

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997000	0.997269
THC Cal Offset:	0.049629	0.000000
CH4 Cal Slope:	0.996570	0.960438
CH4 Cal Offset:	0.013646	0.000000
NMHC Cal Slope:	0.998050	1.030101
NMHC Cal Offset:	0.035582	0.000000

Calibration Performed By: Max Farrell

NMHC Calibration Plot Date: December 20, 2024 Location: Patricia McInnes



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Patricia McInnes
Station number:	AMS 06
Calibration Date:	December 4, 2024
Last Cal Date:	November 13, 2024
Start time (MST):	10:00
End time (MST):	15:00
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T30YCWN	Cal Gas Expiry Date:	April 11, 2025
NOX Cal Gas Conc:	47.94 ppm	NO Cal Gas Conc:	46.39 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	47.94 ppm	Removed Gas NO Conc:	46.39 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3566
ZAG make/model:	Teledyne API T701	Serial Number:	4602

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-1.0	-0.2	-0.8	----	----
AF High point	4914	86.2	826.5	799.7	26.7	833.2	802.5	30.7	0.9907	0.9963
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 825.4 ppb	NO = 797.5 ppb
Baseline Corr 1st pt	NO_X = 834.2 ppb	NO = 802.7 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X =	1.1%
*Percent Change	NO =	0.6%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1172750022

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.832	0.832	NO bkgnd or offset:	3.7	3.7
NOX coeff or slope:	0.989	0.989	NOX bkgnd or offset:	4.7	4.7
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	155.1	155.1

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.996717	1.003204
NO_X Cal Offset:	1.636275	1.714916
NO Cal Slope:	0.995700	1.003246
NO Cal Offset:	1.223377	0.882218
NO_2 Cal Slope:	1.005126	1.002822
NO_2 Cal Offset:	0.370755	-0.465504

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.1	-0.5	----	----
High point	4914	86.2	826.5	799.7	26.7	829.6	802.6	27.1	0.9962	0.9964
Mid point	4957	43.1	413.2	399.9	13.4	417.6	402.9	14.7	0.9895	0.9925
Low point	4978	21.6	207.1	200.4	6.7	211.7	202.7	9.0	0.9784	0.9888
As left zero	5000	0.0	0.0	0.0	0.0	-0.9	-0.2	-0.7	----	----
As left span	4914	86.2	826.5	405.9	420.6	829.0	405.9	423.1	0.9969	1.0000
							Average Correction Factor		0.9880	0.9926

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.5	----	----
High GPT point	800.6	403.2	424.1	424.6	0.9989	100.1%
Mid GPT point	800.6	599.5	227.8	228.7	0.9962	100.4%
Low GPT point	800.6	700.0	127.3	126.8	1.0041	99.6%
				Average Correction Factor	0.9997	100.0%

Notes: Changed the inlet filter after as founds. No adjustments needed.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

NO_X Calibration Summary

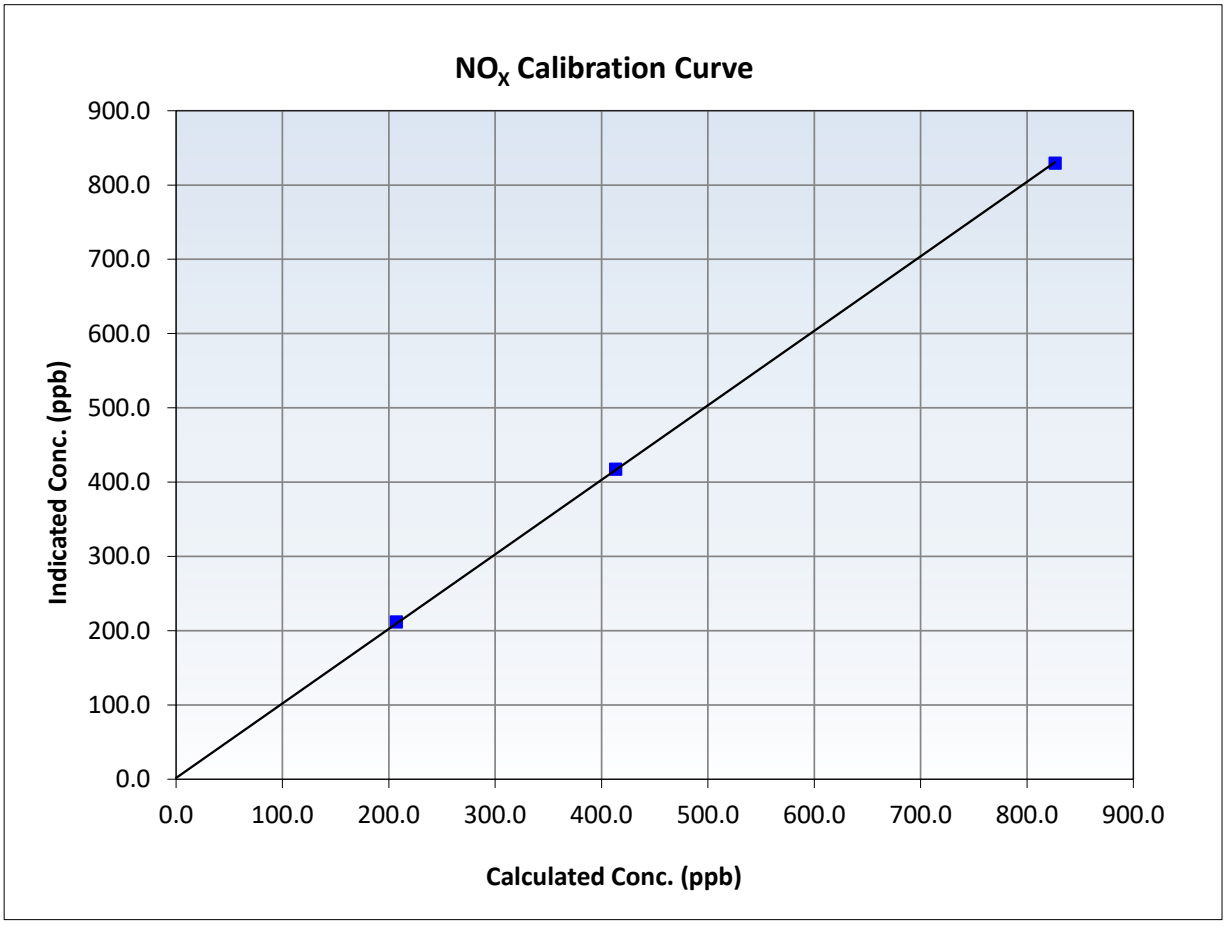
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 13, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:00	End Time (MST):	15:00
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.6	----
826.5	829.6	0.9962
413.2	417.6	0.9895
207.1	211.7	0.9784

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999964	*≥0.995*
Slope	1.003204	*0.90 - 1.10*
Intercept	1.714916	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

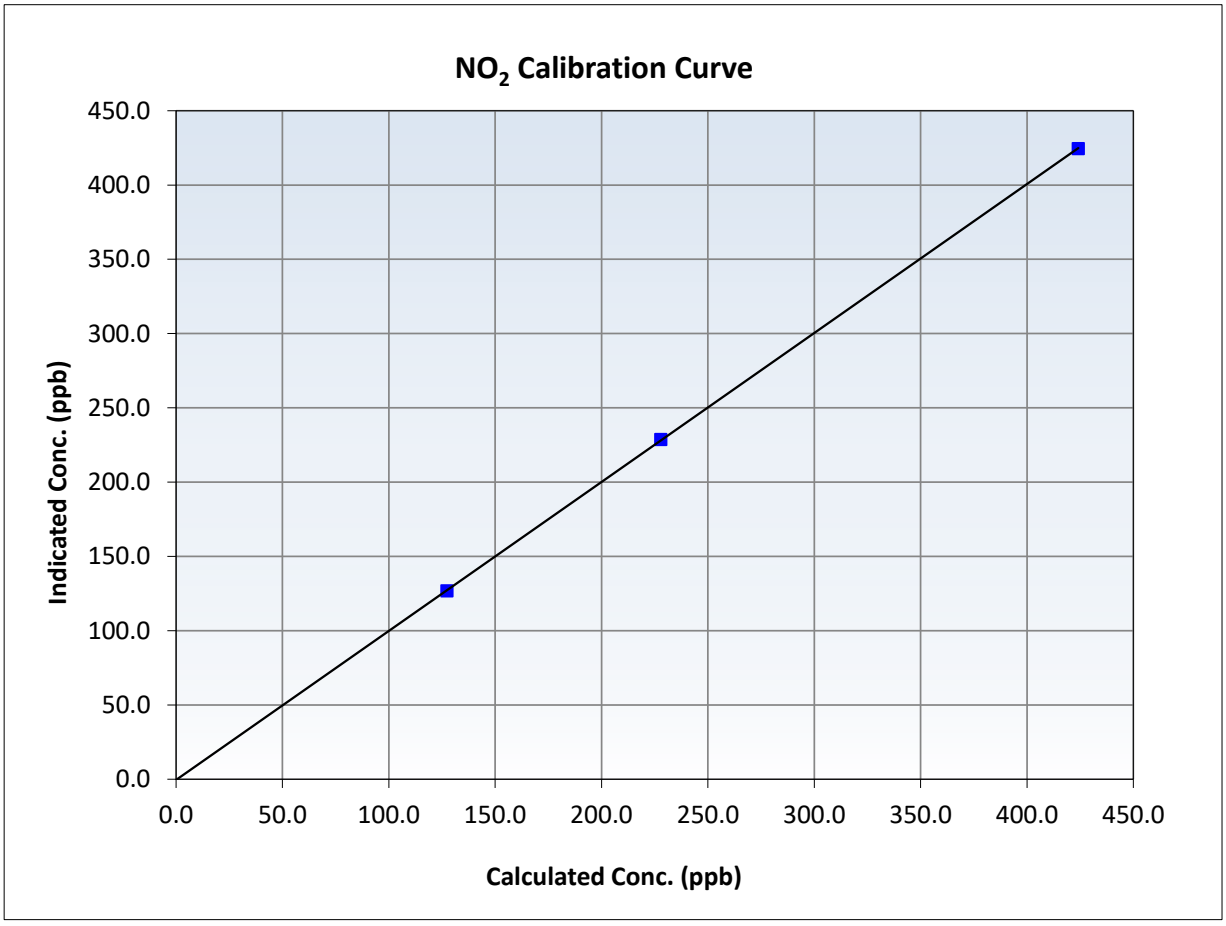
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 13, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:00	End Time (MST):	15:00
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.5	----
424.1	424.6	0.9989
227.8	228.7	0.9962
127.3	126.8	1.0041

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	1.002822	*0.90 - 1.10*
Intercept	-0.465504	*+/-20*



Wood Buffalo Environmental Association

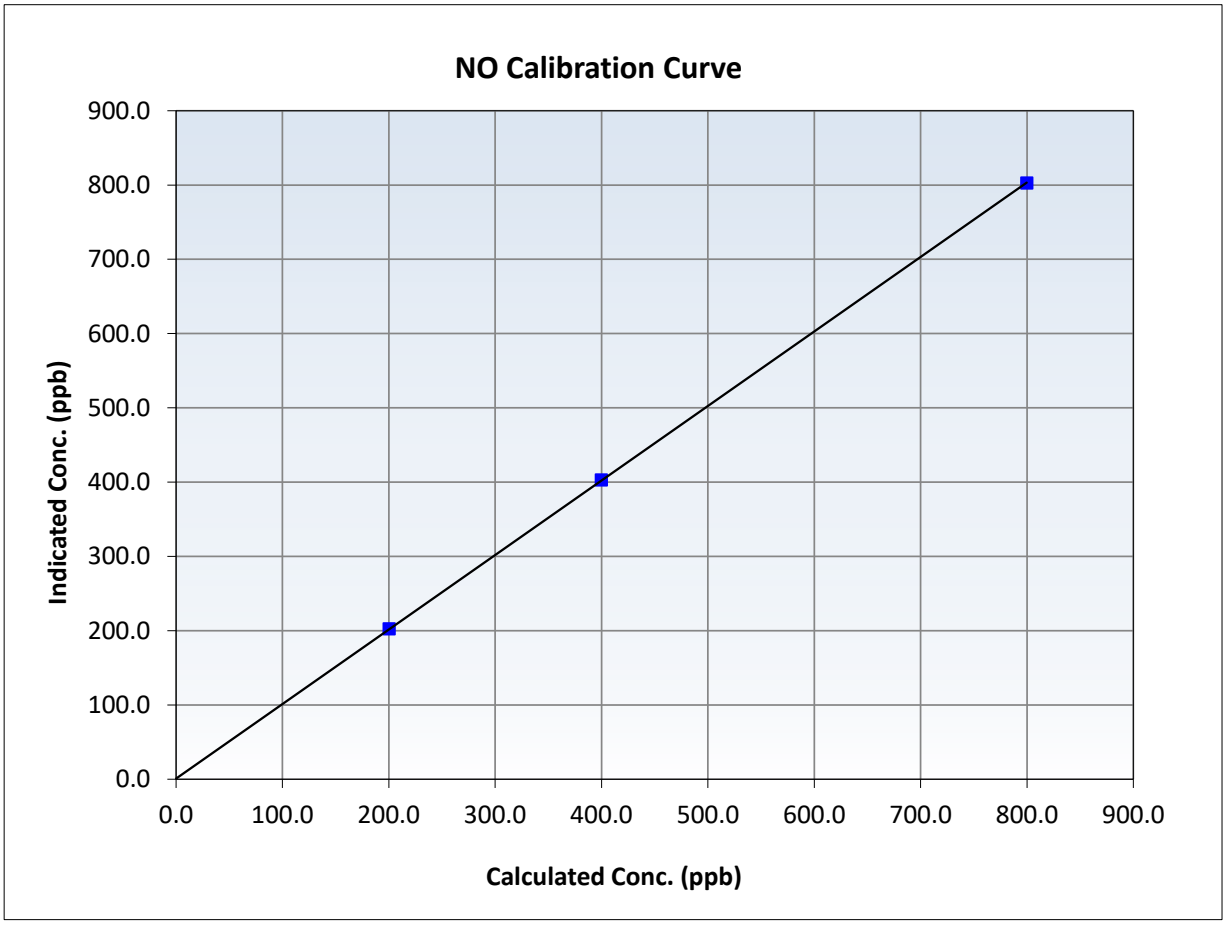
NO Calibration Summary

Station Information

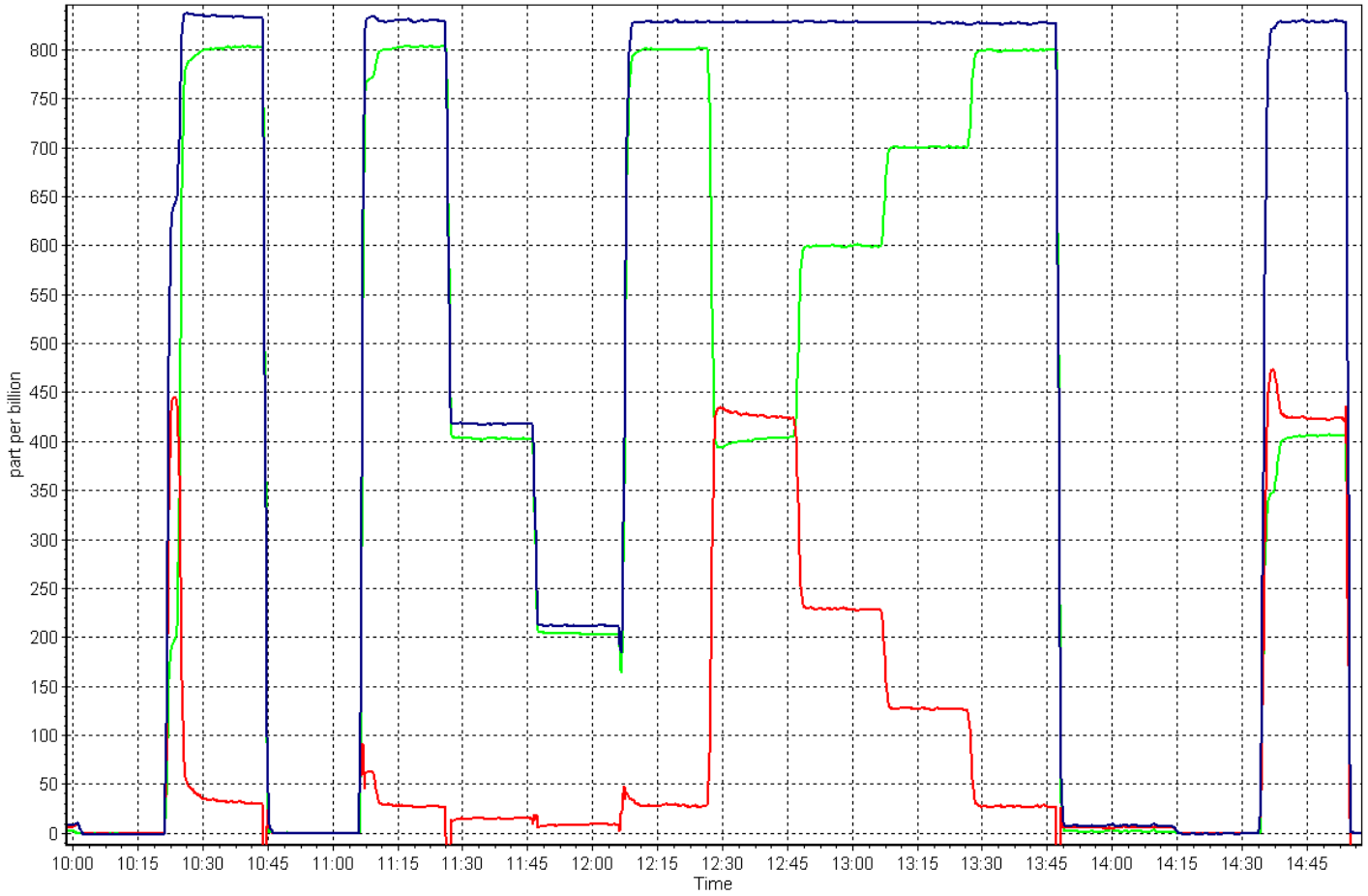
Calibration Date:	December 4, 2024	Previous Calibration:	November 13, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:00	End Time (MST):	15:00
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	-0.1	----	Correlation Coefficient	0.999993	≥0.995
799.7	802.6	0.9964	Slope	1.003246	0.90 - 1.10
399.9	402.9	0.9925			
200.4	202.7	0.9888	Intercept	0.882218	+/-20



NO_X Calibration Plot Date: December 4, 2024 Location: Patricia McInnes



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	December 11, 2024	Last Cal Date:	November 5, 2024
Start time (MST):	11:37	End time (MST):	14:37
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	API T700	Serial Number:	3566
ZAG Make/Model:	API T701	Serial Number:	4602

Analyzer Information

Analyzer make:	Thermo 49i		Analyzer serial #:	1300156234	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000771	1.002771	Backgd or Offset:	-0.9	-0.9
Calibration intercept:	0.140000	0.140000	Coeff or Slope:	1.020	1.020

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	0.2	----
As found High point	5000	1031.0	400.0	400.5	0.999
As found Mid point					
As found Low point					
Baseline Corr As found:	400.3	Previous response	400.4	*% change	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	0.4	----
High point	5000	1031.0	400.0	401.4	0.997
Mid point	5000	821.4	200.0	200.5	0.998
Low point	5000	699.5	100.0	100.2	0.998
As left zero	5000	800.0	0.0	0.7	----
As left span	5000	1031.0	400.0	403.1	0.992
				Average Correction Factor	0.997

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

O_3 Calibration Summary

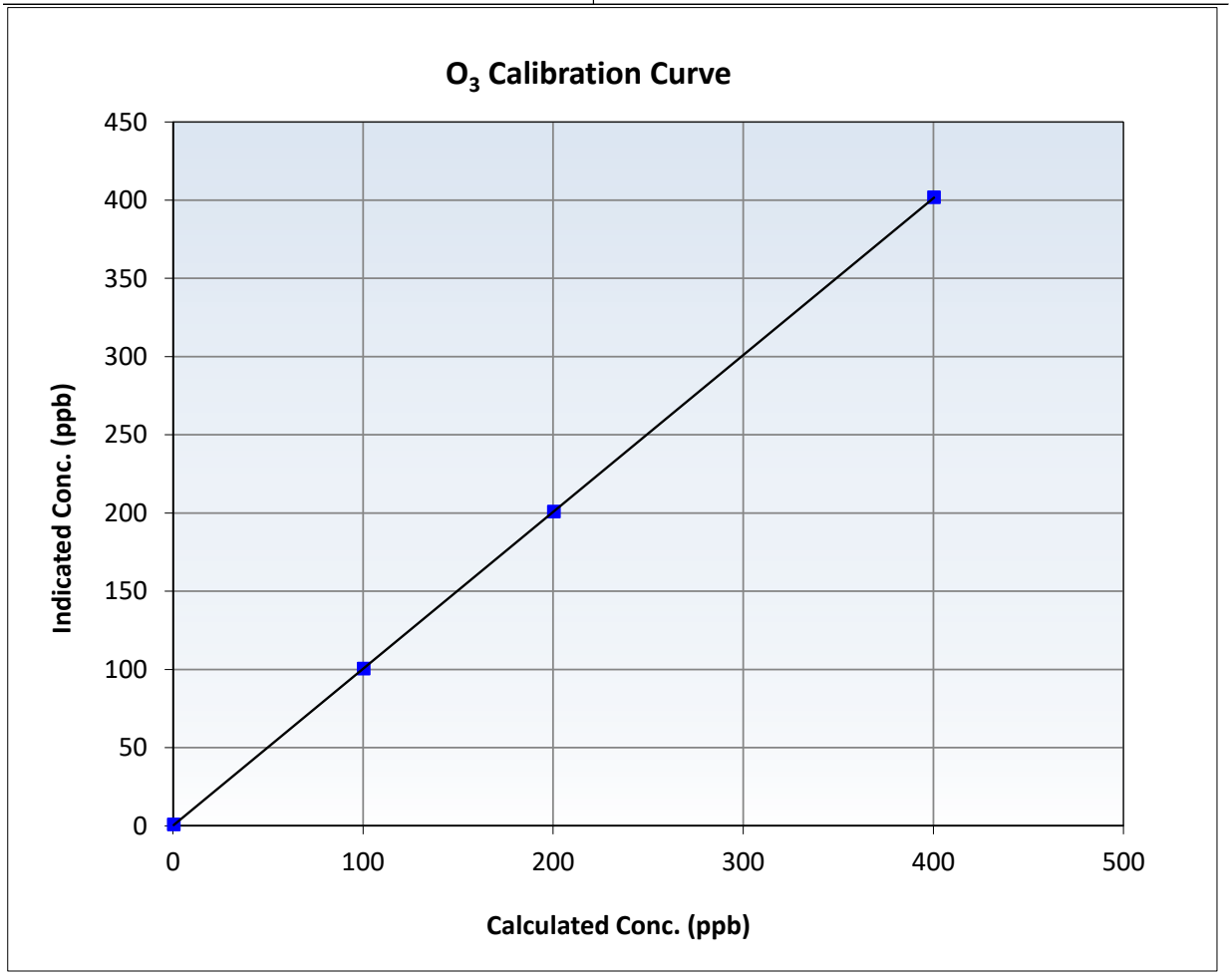
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 5, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	11:37	End Time (MST):	14:37
Analyzer make:	Thermo 49i	Analyzer serial #:	1300156234

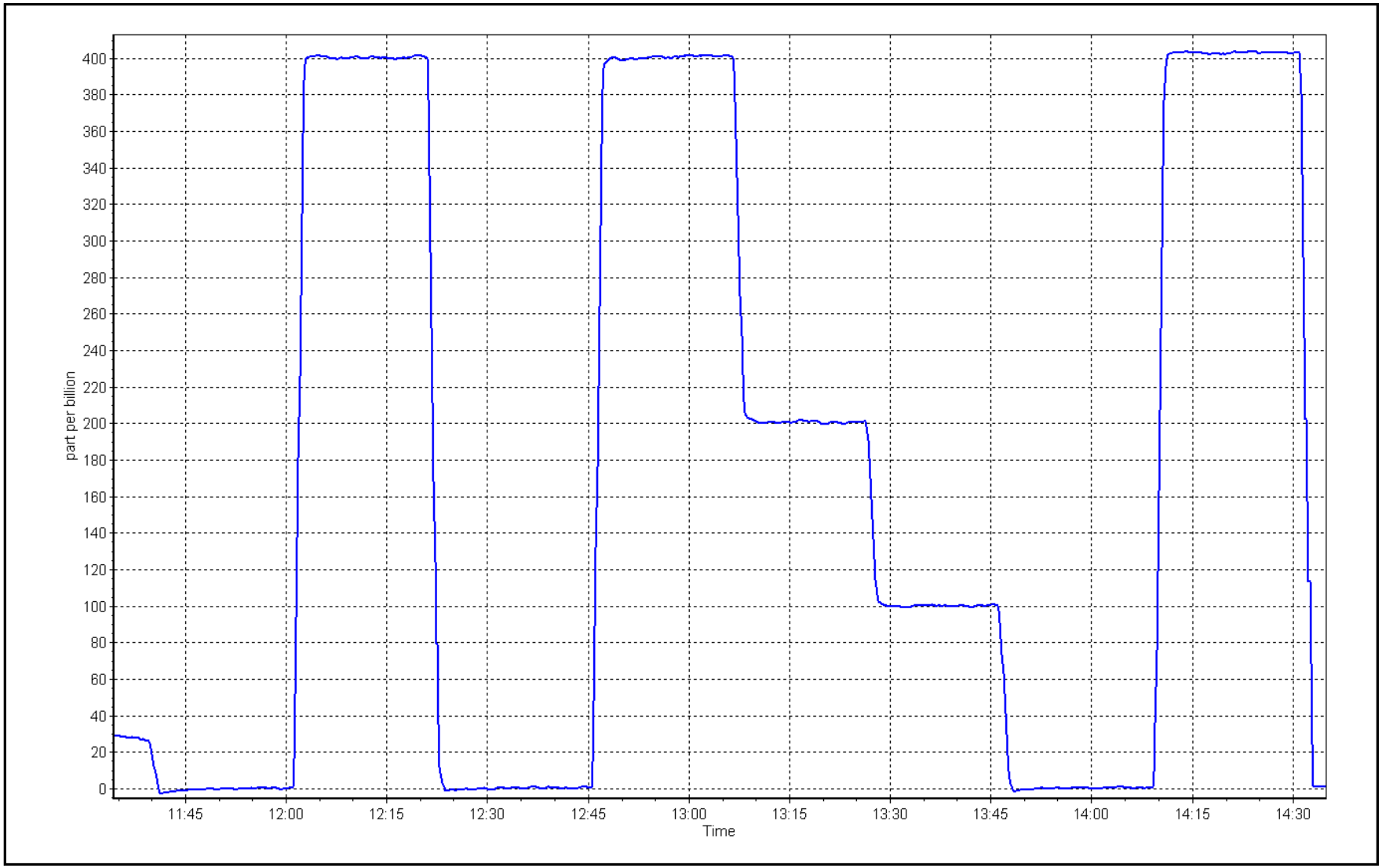
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
400.0	401.4	0.9965
200.0	200.5	0.9975
100.0	100.2	0.9980

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	1.002771	*0.90 - 1.10*
Intercept	0.140000	*+/- 5*



O_3 Calibration Plot Date: December 11, 2024 Location: Patricia McInnes



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	December 13, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	14:07	End time (MST):	15:12
Analyzer Make:	API T640	S/N:	766
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388755
Temp/RH standard:	Alicat FP-25BT	S/N:	388755

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-2.1	-2.2	-2.1	☐	+/- 2 °C
P (mmHg)	717.00	719.00	717.00	☐	+/- 10 mmHg
Flow (LPM)	5.02	5.16	5.02	☐	+/- 0.25 LPM
PW% (pump)	41	-----	41	☐	>80%
Zero Verification	PM w/o HEPA:	15.4	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 6-10-2024 — Lot No.: 100128-050-035

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	11.8	11.8	10.8	☑	+/- 0.5

Date Optical Chamber Cleaned: December 13, 2024

Date Disposable Filter Changed: December 13, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0.00 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: April 13, 2023

Date RH/T Sensor Cleaned: April 13, 2023

Notes: Parameters within limits. Leak check passed. Adjusted the PMT peak.

Calibration by: Max Farrell

Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
NOX Cal Date:	December 9, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	9:48	End time (MST):	14:00
NH3 Cal Date:	December 9, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	14:00	End time (MST):	16:15
Reason:	Routine		

Calibration Standards

NOX Cal Gas Conc:	47.94	ppm	NO Gas Cylinder #:	T30YCWN
NO Cal Gas Conc:	46.39	ppm	NO Cal Gas Expiry:	April 11, 2025
Removed NOX Conc:	47.94	ppm	Removed Cylinder #:	N/A
Removed NO Conc:	46.39	ppm	Removed cyl Expiry:	N/A
NOX gas Diff:			NO gas Diff:	
NH3 Cal Gas Conc:	76.3	ppm	NH3 Gas Cylinder #:	EB0108520
			NH3 Cal Gas Expiry:	August 22, 2024
Removed NH3 Conc:	76.3	ppm	Removed Cylinder #:	N/A
NH3 gas Diff:			Removed cyl Expiry:	N/A
Calibrator Model:	API T700		Serial Number:	3566
ZAG make/model:	API T701		Serial Number:	4602

Analyzer Information

Analyzer model:	API T201		Analyzer serial #:	215
Converter model:	API T501		Converter serial #:	147
NH3 Range (ppb):	0 - 2000 ppb		Reaction cell Press:	6.20
NOX Range (ppb):	0 - 1000 ppb		Sample Flow:	25.4

	Start	*Finish*		*Start*	*Finish*
NO coefficient:	1.009	1.009	Nt coefficient:	1.700	1.700
NOX coefficient:	1.002	1.002	NO bkgrnd:	0.2	0.2
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	0.1	0.1
NH3 coefficient:	1.200	1.200	Nt bkgrnd:	0.0	0.0

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.005599	0.996150
NO_X Cal Offset:	1.473664	3.016603
NO Cal Slope:	1.003405	0.996442
NO Cal Offset:	-0.298339	0.463717
NO_2 Cal Slope:	1.002194	0.999502
NO_2 Cal Offset:	2.833619	0.782057
NH3 Cal Slope:	0.995698	0.988331
NH3 Cal Offset:	7.440608	8.443668
Nt Cal Slope:	0.999133	0.991747
Nt Cal Offset:	7.756362	8.825682

Wood Buffalo Environmental Association

NO_X - NO - NO_2 Calibration Report

NOx / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NOx Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*	Baseline corr NO Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	-0.2	-0.8	----	----
As found span	4914	86.2	826.5	799.7	826.5	829.5	796.5	834.9	0.9963	1.0041
AF GPT span										
new NO cyl rp										

Baseline Corr As Fd	Nt =	835.7	ppb	NO_X =	829.5	ppb	NO =	796.7 ppb
Previous Response	Nt =	833.49	ppb	NO_X =	832.6	ppb	NO =	802.2 ppb

**NO_X Δ (NO to GPT response) =

* *= > +/-2% difference initiates investigation

*Percent Change $Nt_{(NO)}$ = 0.3%

*Percent Change NO_X = -0.4%

*Percent Change NO = -0.7%

* = > +/-5% change initiates investigation

NOx / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	0.4	0.0	1.5	----	----
High point	4914	86.2	826.5	799.7	826.5	824.5	797.1	831.1	1.0024	1.0033
Mid point	4957	43.1	413.2	399.9	413.2	417.4	399.2	419.8	0.9900	1.0017
Low point	4978	21.6	207.1	200.4	207.1	211.0	200.6	213.6	0.9816	0.9991
								Average Correction Factor	0.9913	1.0014

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
As Found zero	----	----	0.0	0.2	----	----
Calibration zero	----	----	0.0	0.5	----	----
High GPT point (400 ppb O3)	800.3	397.1	429.9	430.3	0.9991	100.1%
Mid GPT point (200 ppb O3)	800.3	598.8	228.2	229.1	0.9962	100.4%
Low GPT point (100 ppb O3)	800.3	699.6	127.4	128.4	0.9924	100.8%
				Average Correction Factor	0.9959	100.4%

Wood Buffalo Environmental Association
NH_3 - N_T Calibration Report

NH3 As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Baseline corr Nt Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*
As found zero	5000	0.0	0.0	0.0	0.0	-0.8	0.0	-0.8	----	----
AF High point	3417	82.6	1800.6	0.0	1800.6	1787.6	6.5	1781.1	1.007	1.011
AF Mid point										
AF Low point										
new NH3 cyl rp										

Baseline Corr As Fd Nt = 1788.4 ppb NH3 = 1781.9 ppb *Percent Change $Nt_{(NH3)}$ = -1.0%

Previous Response Nt = 1806.8 ppb NH3 = 1800.3 ppb * = > +/-5% change initiates investigation *Percent Change NH3 = -1.0%

NH3 Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Nt Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	1.5	0.4	1.1	----	----
High point	3417	82.6	1800.6	0.0	1800.6	1787.6	6.5	1781.1	1.007	1.011
Mid point	3454	45.9	1000.5	0.0	1000.5	1012.0	3.8	1008.1	0.989	0.992
Low point	3477	22.9	499.2	0.0	499.2	507.3	2.0	505.3	0.984	0.988
								Average Correction Factor	0.9933	0.9971

NH3 Previous Converter Efficiency = 90.2 %

NH3 Current Converter Efficiency = 90.2 %

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

Nt Calibration Summary

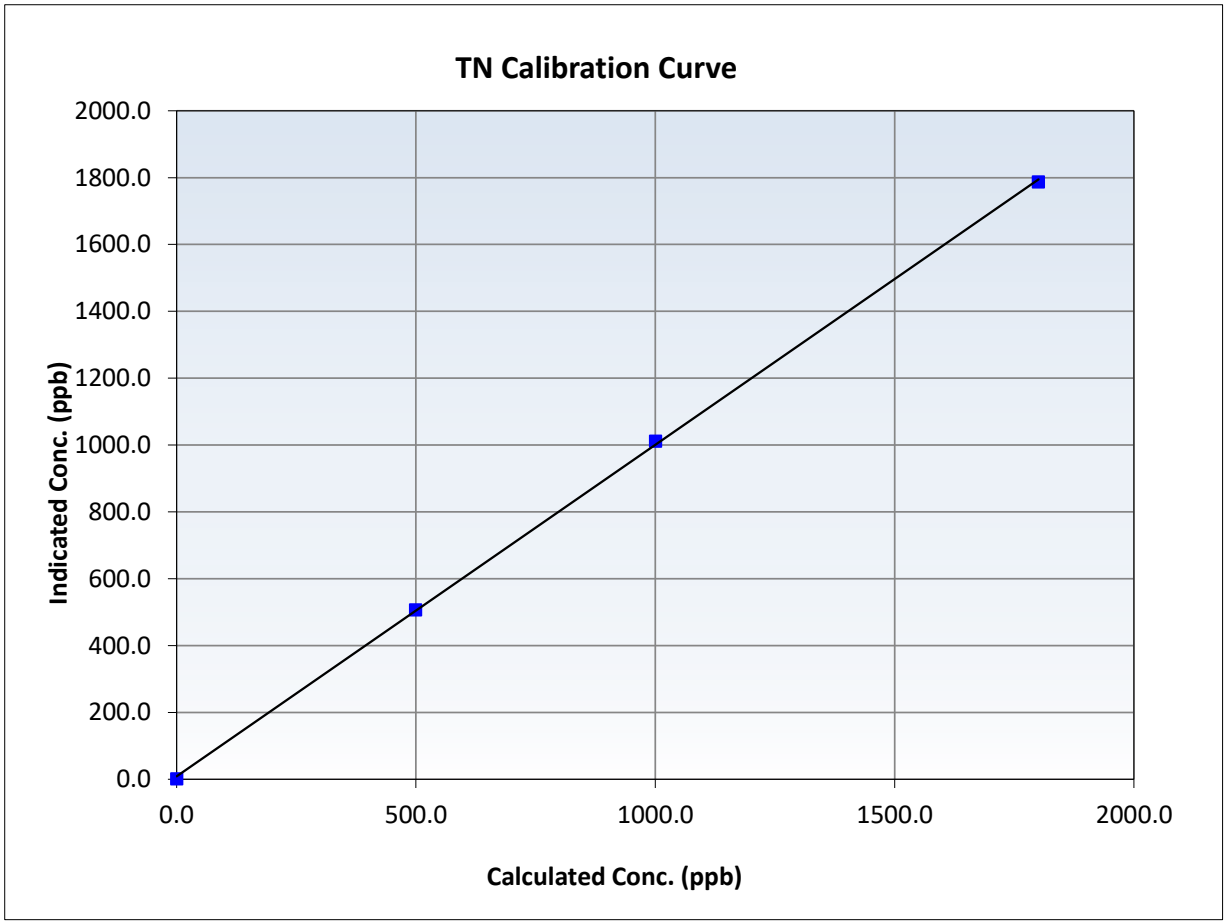
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 19, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:48	End Time (MST):	14:00
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.5	----
1800.6	1787.6	1.0073
1000.5	1012.0	0.9887
499.2	507.3	0.9840

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999866	*≥0.995*
Slope	0.991747	*0.90 - 1.10*
Intercept	8.825682	*+/-20*



Wood Buffalo Environmental Association

NH_3 Calibration Summary

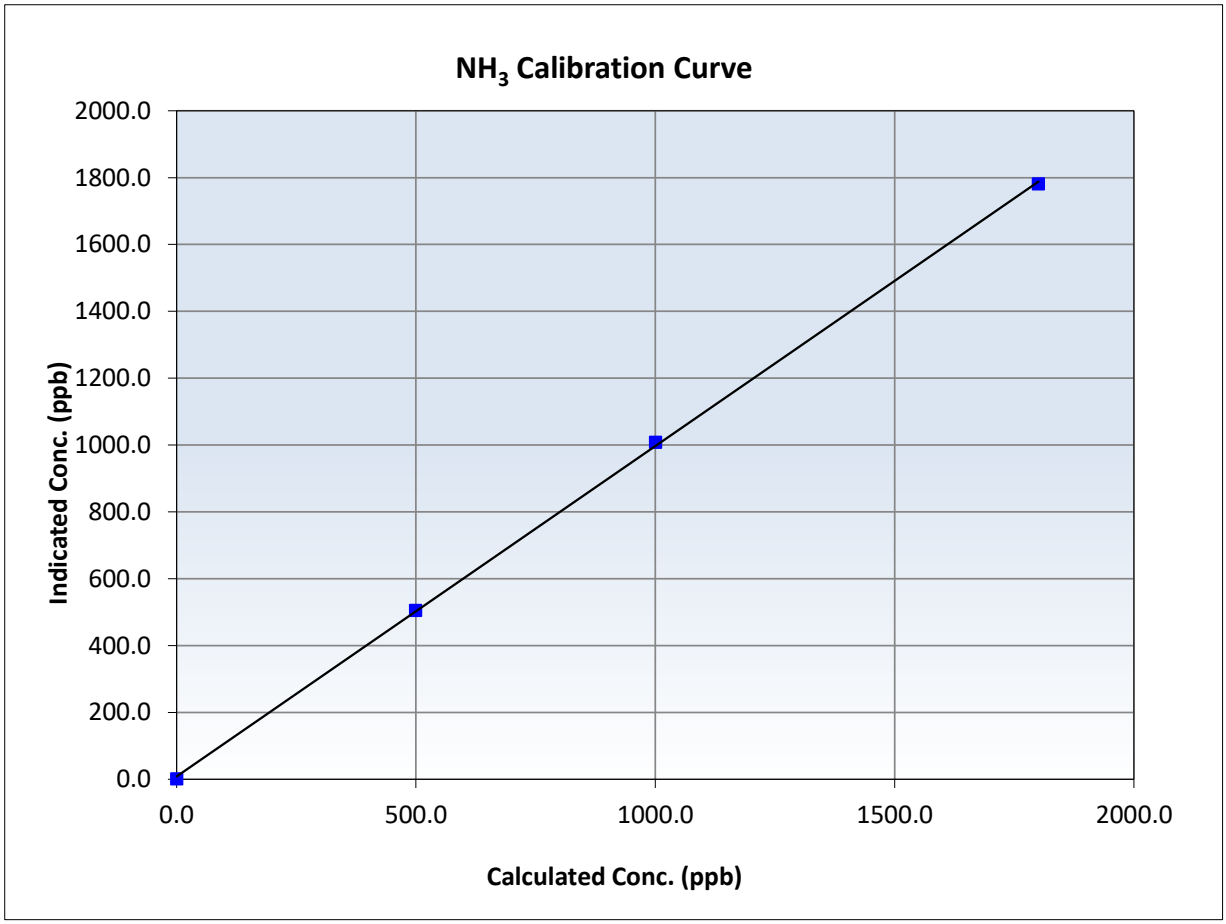
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 19, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:48	End Time (MST):	14:00
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.1	----
1800.6	1781.1	1.0110
1000.5	1008.1	0.9925
499.2	505.3	0.9879

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999866	*≥0.995*
Slope	0.988331	*0.90 - 1.10*
Intercept	8.443668	*+/-20*



Wood Buffalo Environmental Association

NO_X Calibration Summary

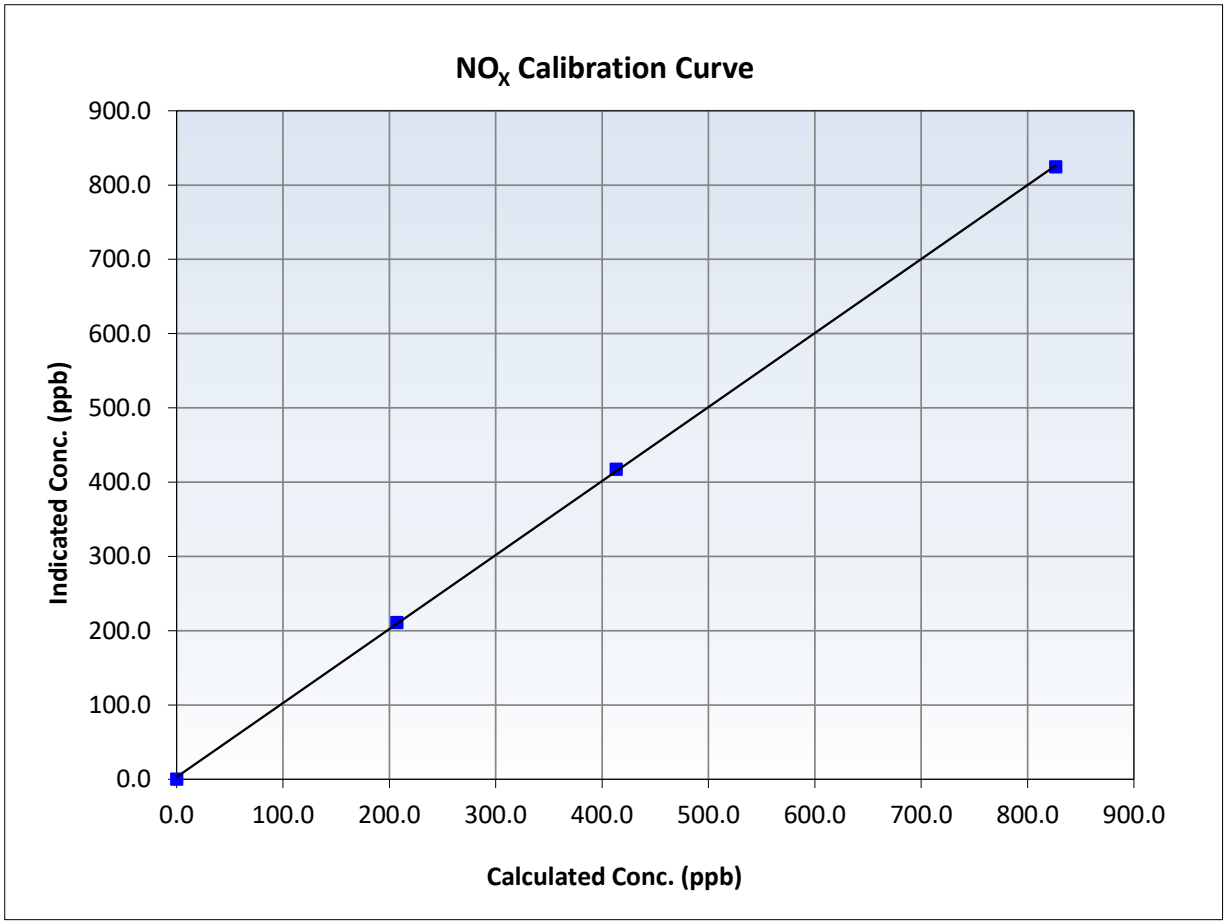
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 19, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:48	End Time (MST):	14:00
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
826.5	824.5	1.0024
413.2	417.4	0.9900
207.1	211.0	0.9816

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999945	*≥0.995*
Slope	0.996150	*0.90 - 1.10*
Intercept	3.016603	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

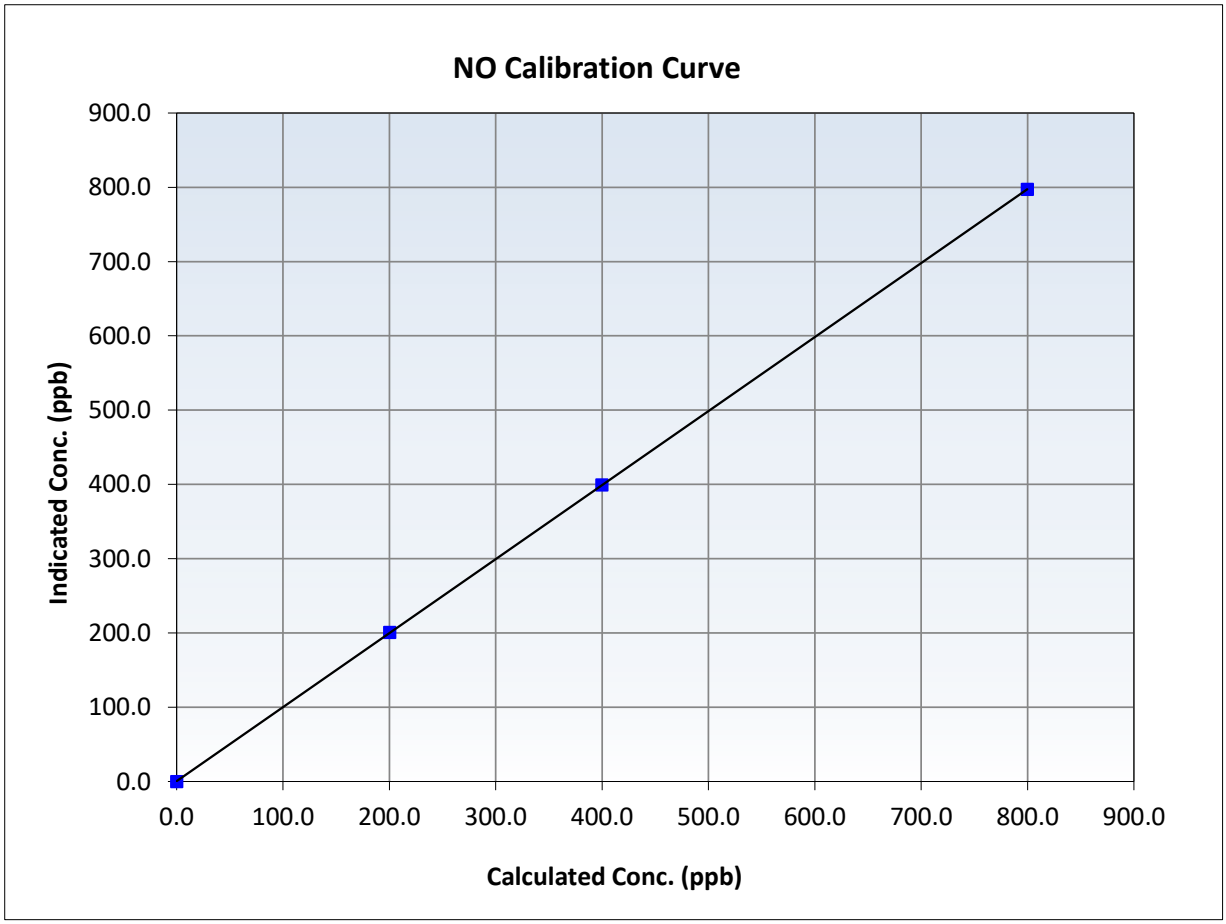
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 19, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:48	End Time (MST):	14:00
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.7	797.1	1.0033
399.9	399.2	1.0017
200.4	200.6	0.9991

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.996442	*0.90 - 1.10*
Intercept	0.463717	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

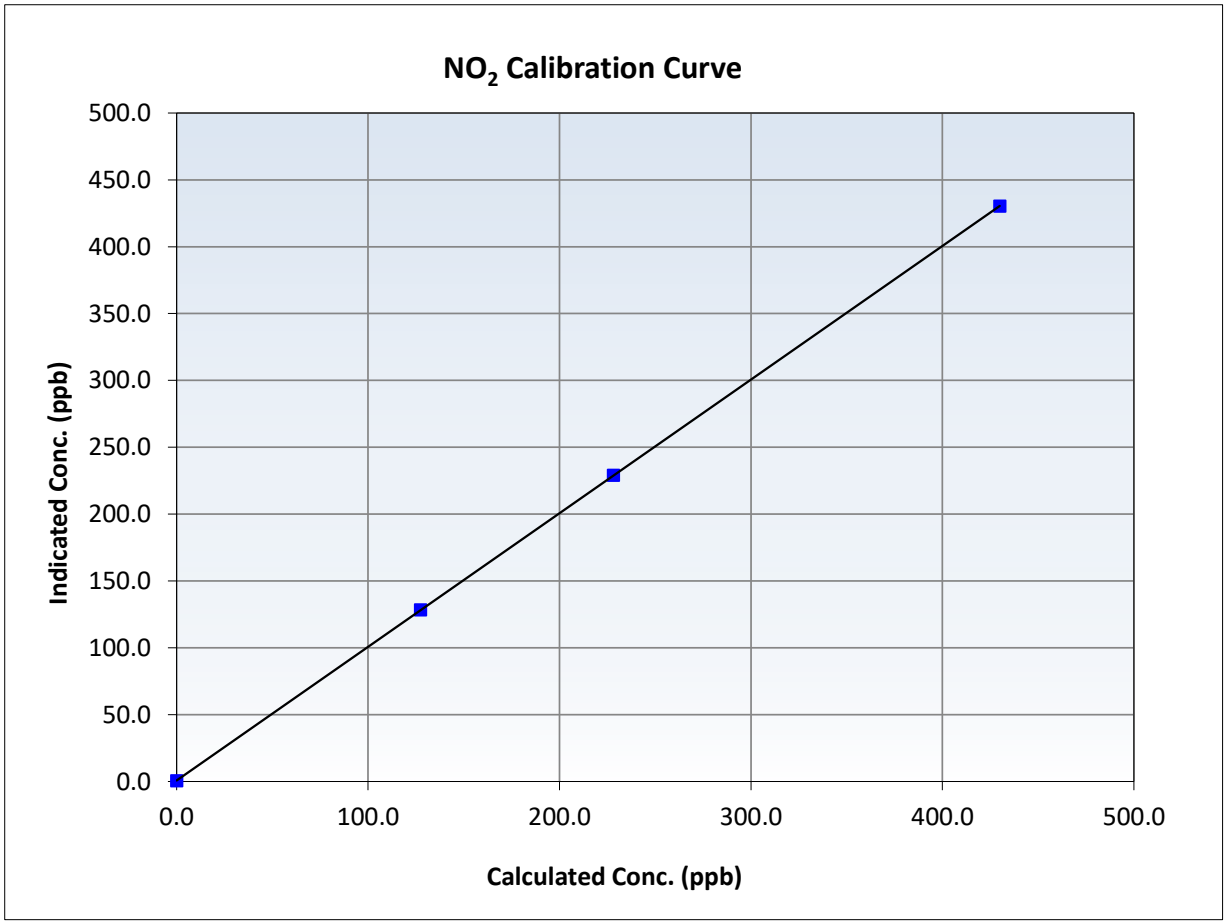
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 19, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:48	End Time (MST):	14:00
Analyzer make:	API T201	Analyzer serial #:	215

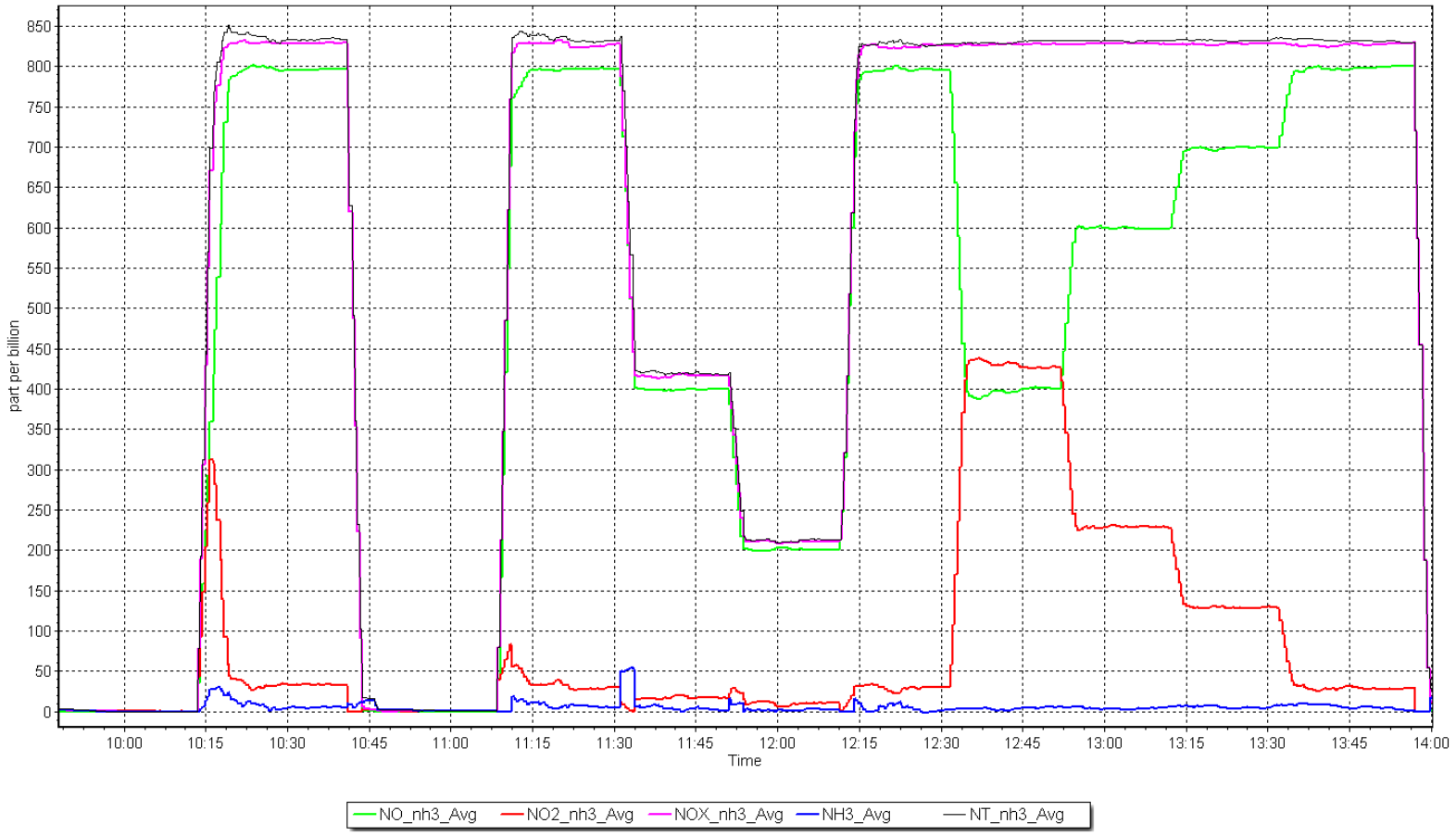
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
429.9	430.3	0.9991
228.2	229.1	0.9962
127.4	128.4	0.9924

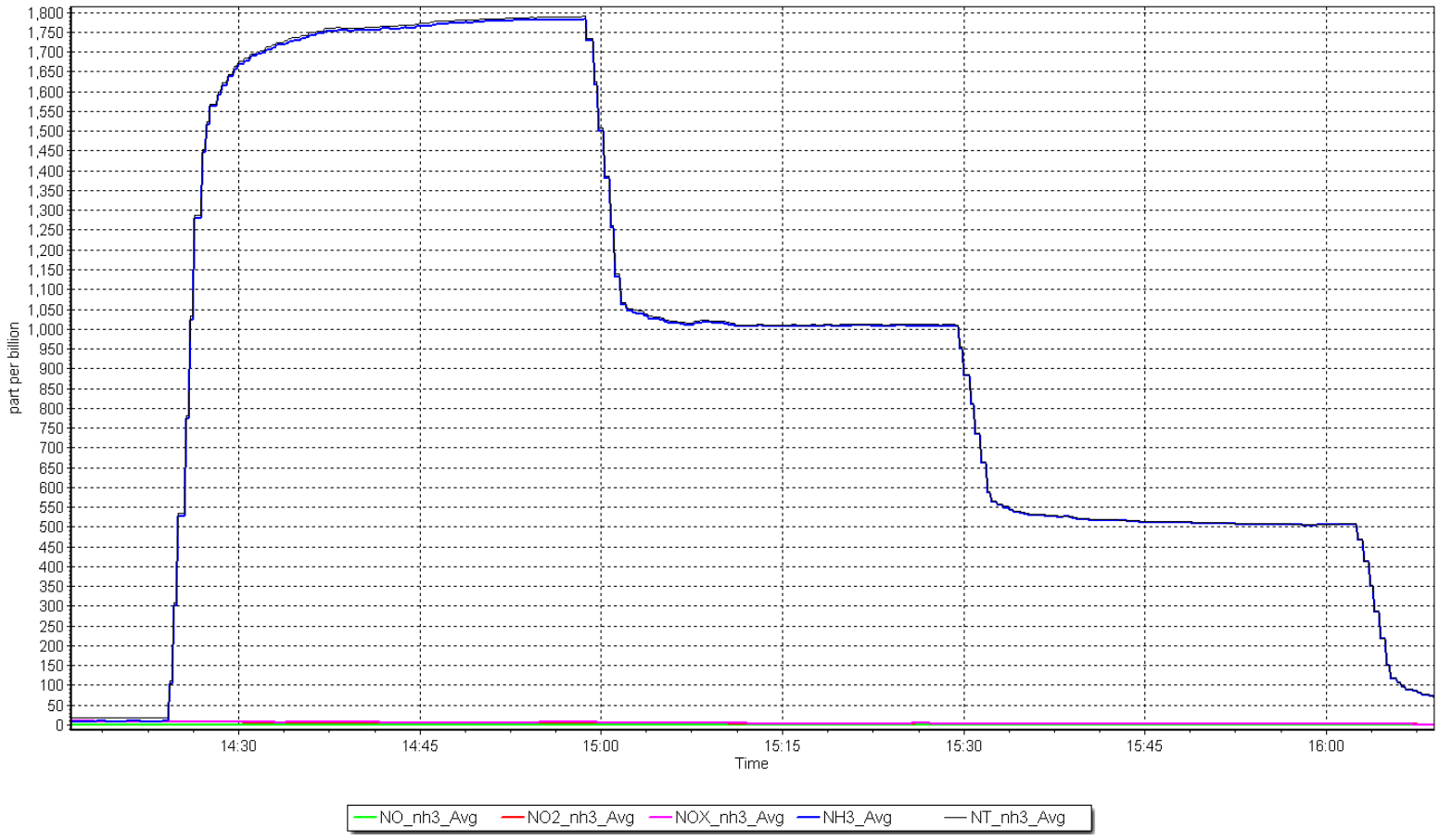
Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.999502	*0.90 - 1.10*
Intercept	0.782057	*+/-20*



NO_X Calibration Plot Date: December 9, 2024 Location: Patricia McInnes



NH_3 Calibration Plot Date: December 9, 2024 Location: Patricia McInnes



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS07
ATHABASCA VALLEY
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	December 13, 2024	Last Cal Date:	November 15, 2024
Start time (MST):	10:28	End time (MST):	14:45
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.06	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC320556			
Removed Cal Gas Conc:	50.06	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3805
Zero Air Gen Model:	API 701H		Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Serial Number:	1507864683	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000034	0.999948	Backgd or Offset:	2.66	2.70
Calibration intercept:	1.583979	2.064237	Coeff or Slope:	0.847	0.854

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	79.8	799.0	791.4	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	791.4	Previous response	800.6	*% change	-1.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	79.8	799.0	799.5	0.999
Mid point	4960	39.9	399.5	404.2	0.988
Low point	4980	20.0	200.2	203.0	0.986
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	79.8	799.0	800.3	0.998
				Average Correction Factor:	0.991

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

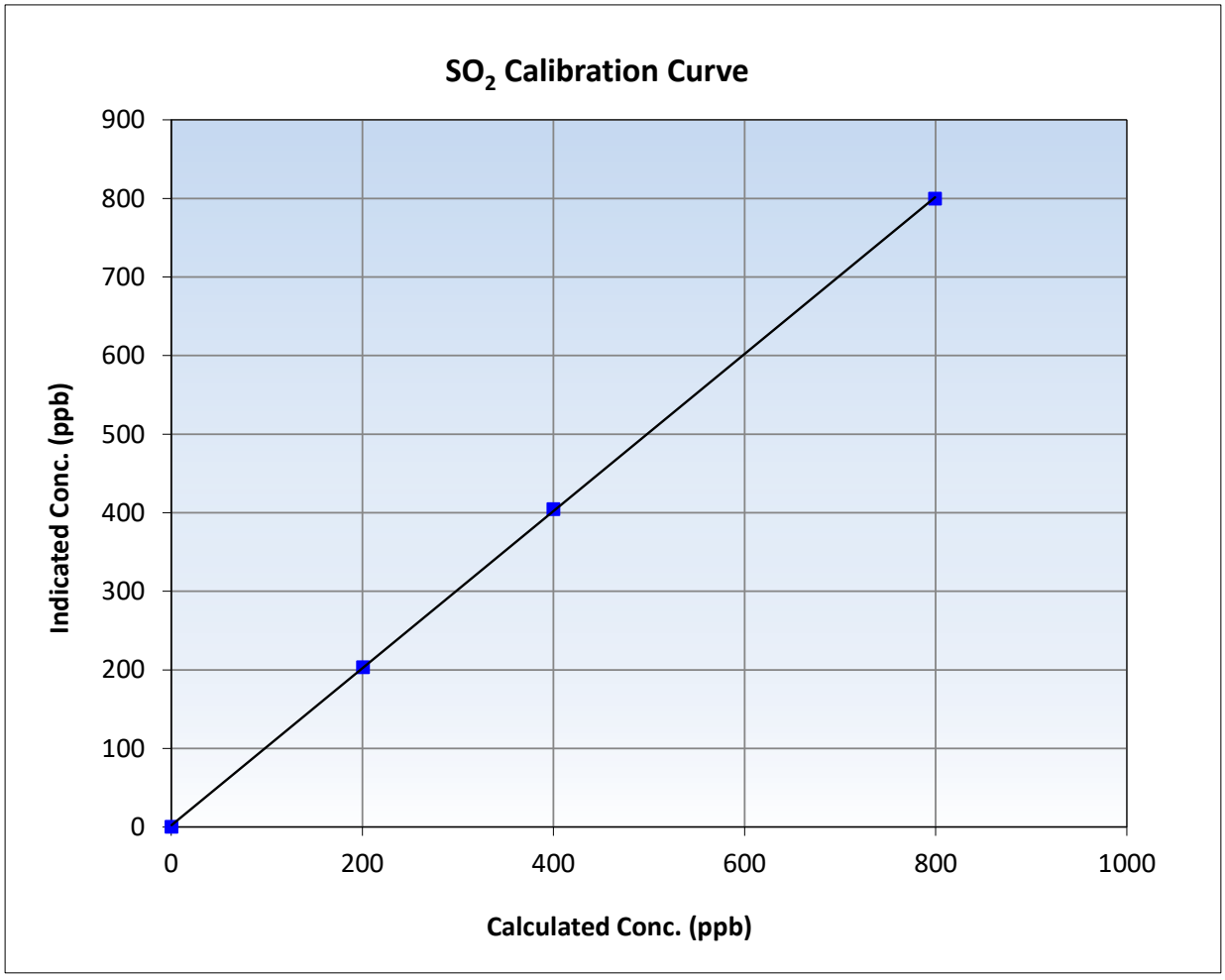
Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	November 15, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	10:28	End Time (MST):	14:45
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1507864683

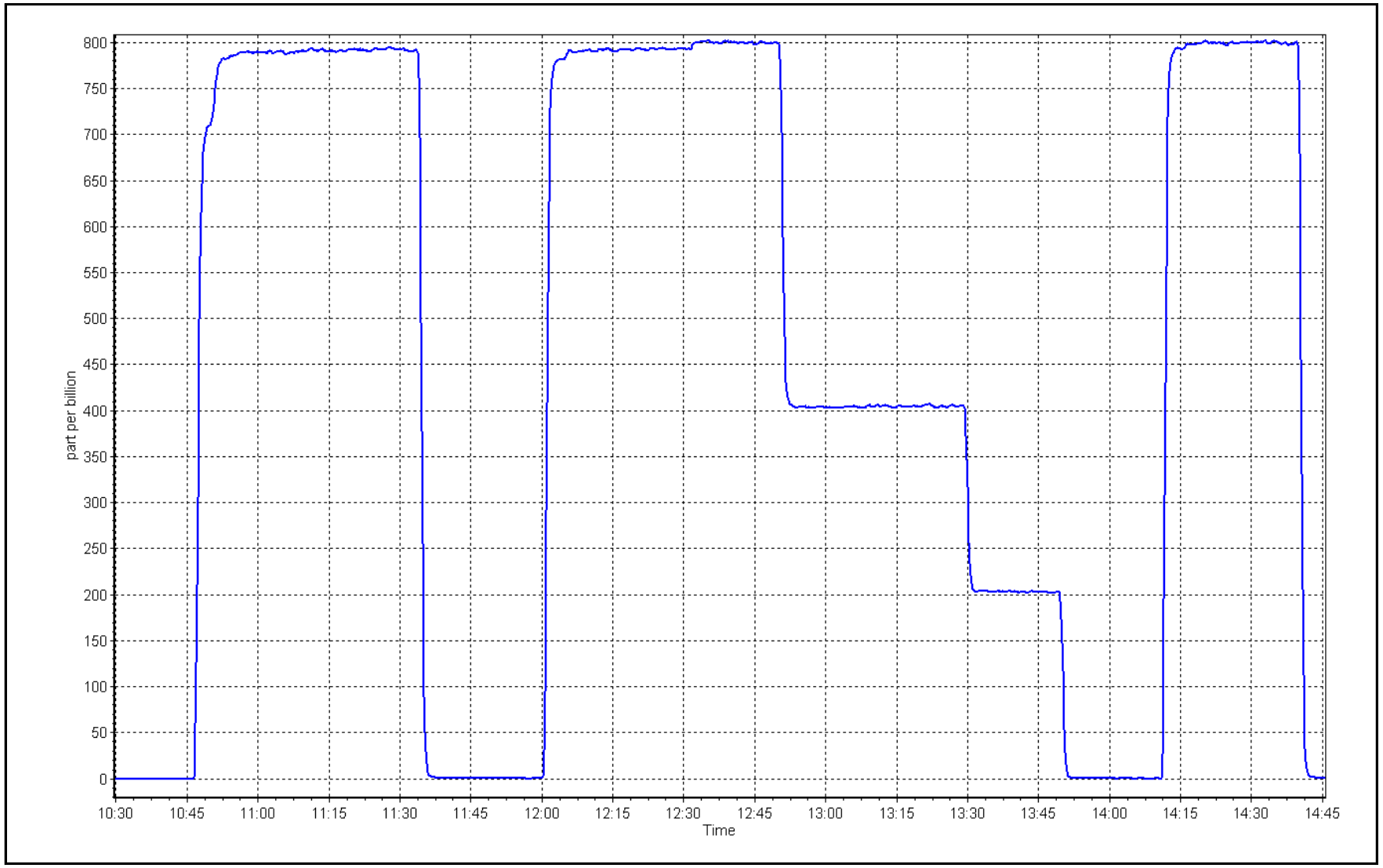
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.0	799.5	0.9994
399.5	404.2	0.9883
200.2	203.0	0.9864

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999962	*≥0.995*
Slope	0.999948	*0.90 - 1.10*
Intercept	2.064237	*+/-30*



SO2 Calibration Plot Date: December 13, 2024 Location: Athabasca Valley



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	December 10, 2024	Last Cal Date:	November 5, 2024
Start time (MST):	10:11	End time (MST):	N/A
Reason:	As Found		

Calibration Standards

Cal Gas Concentration:	5.25	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC504080			
Removed Cal Gas Conc:	5.25	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3805
ZAG Make/Model:	API T701H		Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 43i LTE		Analyzer serial #:	1180540018
Converter make:	CDN-101		Converter serial #:	551
Analyzer Range	0 - 100 ppb		Converter Temp:	840 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.004828		Backgd or Offset:	2.7	N/A
Calibration intercept:	-0.162299		Coeff or Slope:	0.900	N/A

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4925	75.5	79.3	78.0	1.014
As found Mid point	4962	37.7	39.6	39.1	1.007
As found Low point	4981	18.9	19.8	19.3	1.018
New cylinder response					

Baseline Corr As found:	78.2	Prev response:	79.49	*% change:	-1.6%
Baseline Corr 2nd AF pt:	39.3	AF Slope:	0.987227	AF Intercept:	-0.182066
Baseline Corr 3rd AF pt:	19.5	AF Correlation:	0.999983	* = > +/-5% change initiates investigation	

TRS Calibration Data

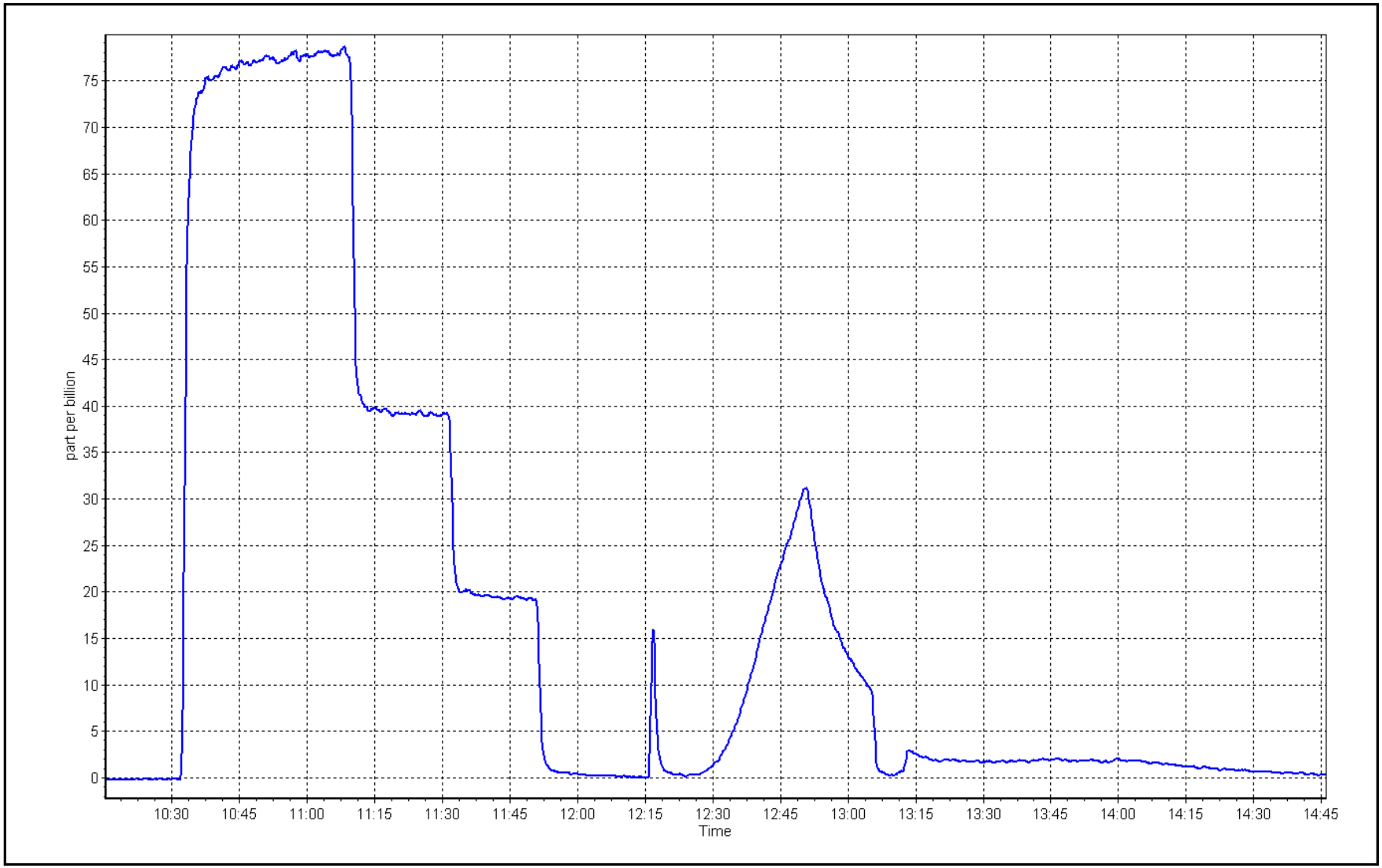
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					
SO2 Scrubber Check	4920	79.2	792.1		----

Date of last scrubber change:	25-Feb-22	Ave Corr Factor	
Date of last converter efficiency test:	April 22, 2022		

Notes: MPAF done, Sox scrubber failed.

Calibration Performed By: Aswin Sasi Kumar

TRS Calibration Plot Date: December 10, 2024 Location: Athabasca Valley



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	December 11, 2024	Last Cal Date:	November 5, 2024
Start time (MST):	10:25	End time (MST):	13:15
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.25	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC504080			
Removed Cal Gas Conc:	5.25	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3805
ZAG Make/Model:	API T701H		Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 43i LTE		Analyzer serial #:	1180540018
Converter make:	CDN-101		Converter serial #:	551
Analyzer Range	0 - 100 ppb		Converter Temp:	840 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.004828	1.004677	Backgd or Offset:	N/A	2.7
Calibration intercept:	-0.162299	-0.182049	Coeff or Slope:	N/A	0.915

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	NA	Prev response:	NA	*% change:	NA
Baseline Corr 2nd AF pt:	NA	AF Slope:	NA	AF Intercept:	NA
Baseline Corr 3rd AF pt:	NA	AF Correlation:	NA	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4925	75.5	79.3	79.4	0.999
Mid point	4962	37.7	39.6	39.9	0.993
Low point	4981	18.9	19.9	19.6	1.013
As left zero	5000	0.0	0.0	0.0	----
As left span	4925	75.5	79.3	79.5	0.998
SO2 Scrubber Check	4920	79.2	792.1	0.1	----
Date of last scrubber change:		25-Feb-22		Ave Corr Factor	1.002
Date of last converter efficiency test:		April 22, 2022			

Notes: MPAF done yesterday, SOx scrubber swapped out. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

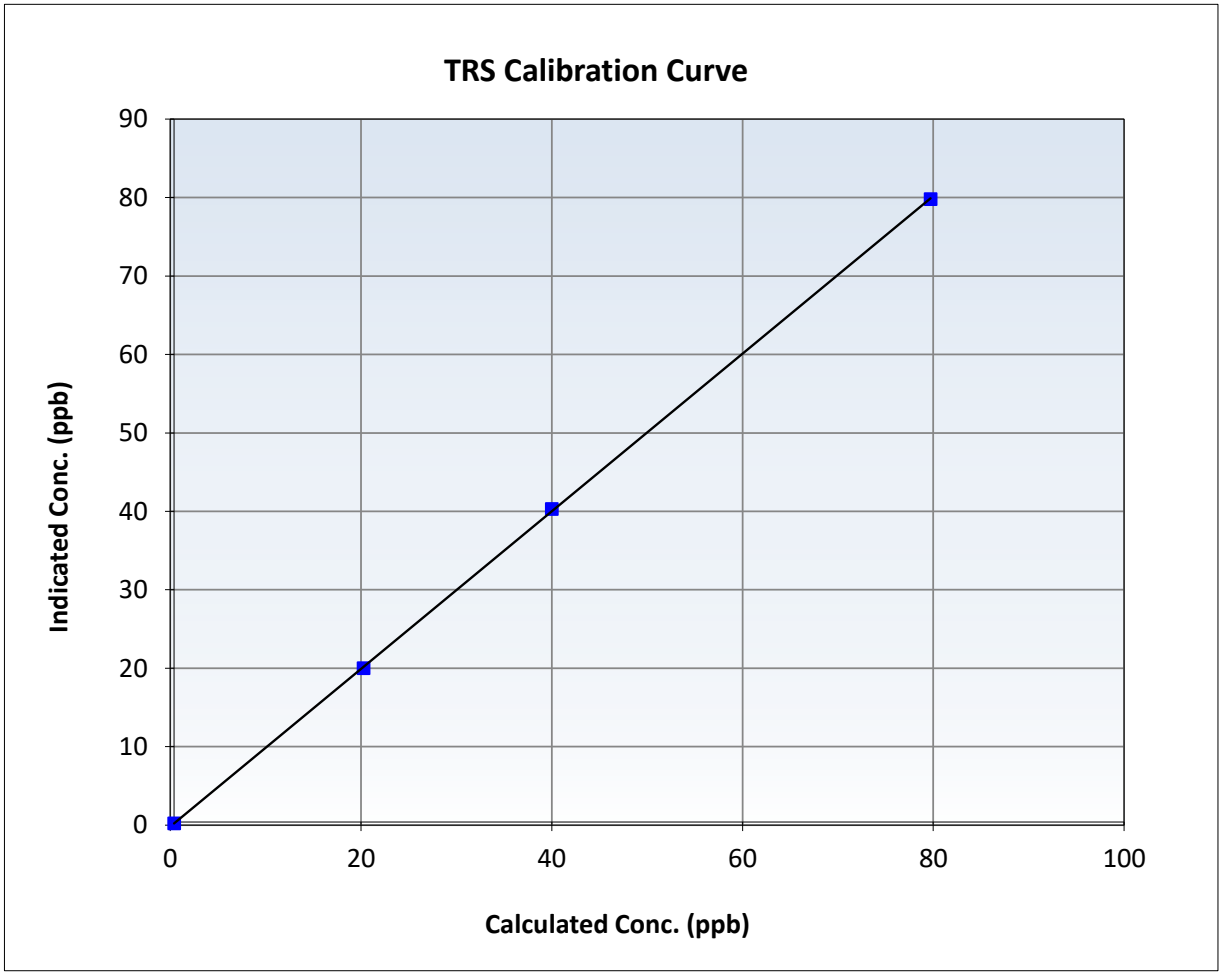
TRS Calibration Summary

Station Information

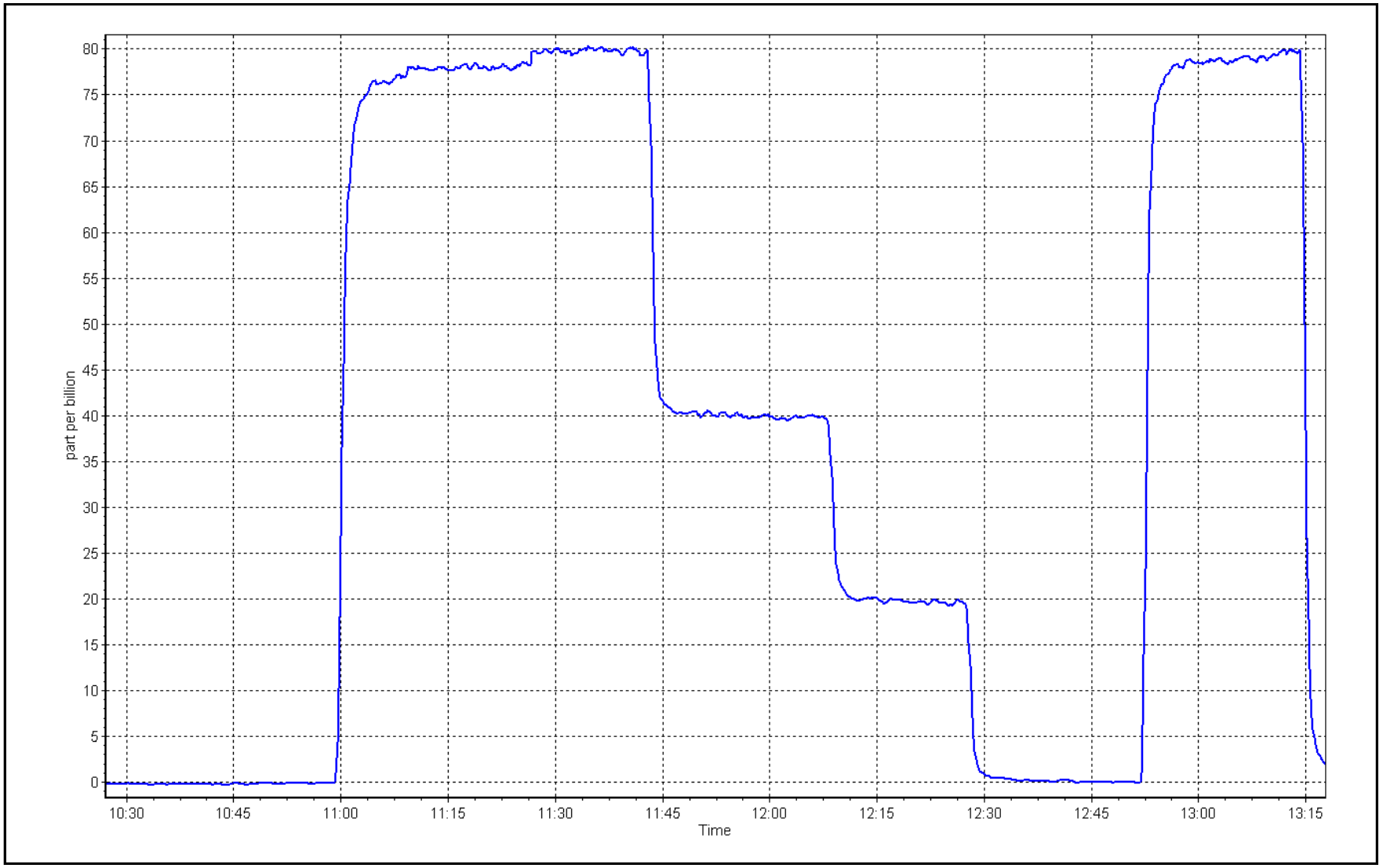
Calibration Date:	December 11, 2024	Previous Calibration:	November 5, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	10:25	End Time (MST):	13:15
Analyzer make:	Thermo 43i LTE	Analyzer serial #:	1180540018

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	-0.2	----	Correlation Coefficient	0.999965	*≥0.995*
79.3	79.4	0.9989	Slope	1.004677	*0.90 - 1.10*
39.6	39.9	0.9927			
19.9	19.6	1.0131	Intercept	-0.182049	*+/-3*



TRS Calibration Plot Date: December 11, 2024 Location: Athabasca Valley



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	December 13, 2024	Last Cal Date:	November 15, 2024
Start time (MST):	10:28	End time (MST):	14:45
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC320556	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
Removed C3H8 Conc.	205.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	3805
Zero Air Gen model:	Teledyne API T701H	Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.90E-04	2.95E-04	NMHC SP Ratio:	6.44E-05	6.06E-05
CH4 Retention time:	13.6	13.6	NMHC Peak Area:	139822	148545
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	16.91	17.54	0.964
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.54	Prev response	16.79	*% change	4.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	16.91	16.79	1.007
Mid point	4960	39.9	8.46	8.31	1.018
Low point	4980	20.0	4.24	4.19	1.012
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	16.91	16.76	1.009
				Average Correction Factor	1.012

Notes: N2 cylinder changed out. Span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.00	9.68	0.930
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.68	Prev response	8.94	*% change	7.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.00	8.93	1.008
Mid point	4960	39.9	4.50	4.45	1.011
Low point	4980	20.0	2.26	2.25	1.001
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.00	8.92	1.009
				Average Correction Factor	1.007

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	7.92	7.86	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.86	Prev response	7.86	*% change	0.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	7.92	7.87	1.007
Mid point	4960	39.9	3.96	3.86	1.025
Low point	4980	20.0	1.98	1.94	1.025
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	7.92	7.84	1.010
				Average Correction Factor	1.019

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.994272	0.992664
THC Cal Offset:	-0.022911	-0.025510
CH4 Cal Slope:	0.995631	0.994014
CH4 Cal Offset:	-0.025522	-0.027921
NMHC Cal Slope:	0.993088	0.991590
NMHC Cal Offset:	0.002812	0.003211

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

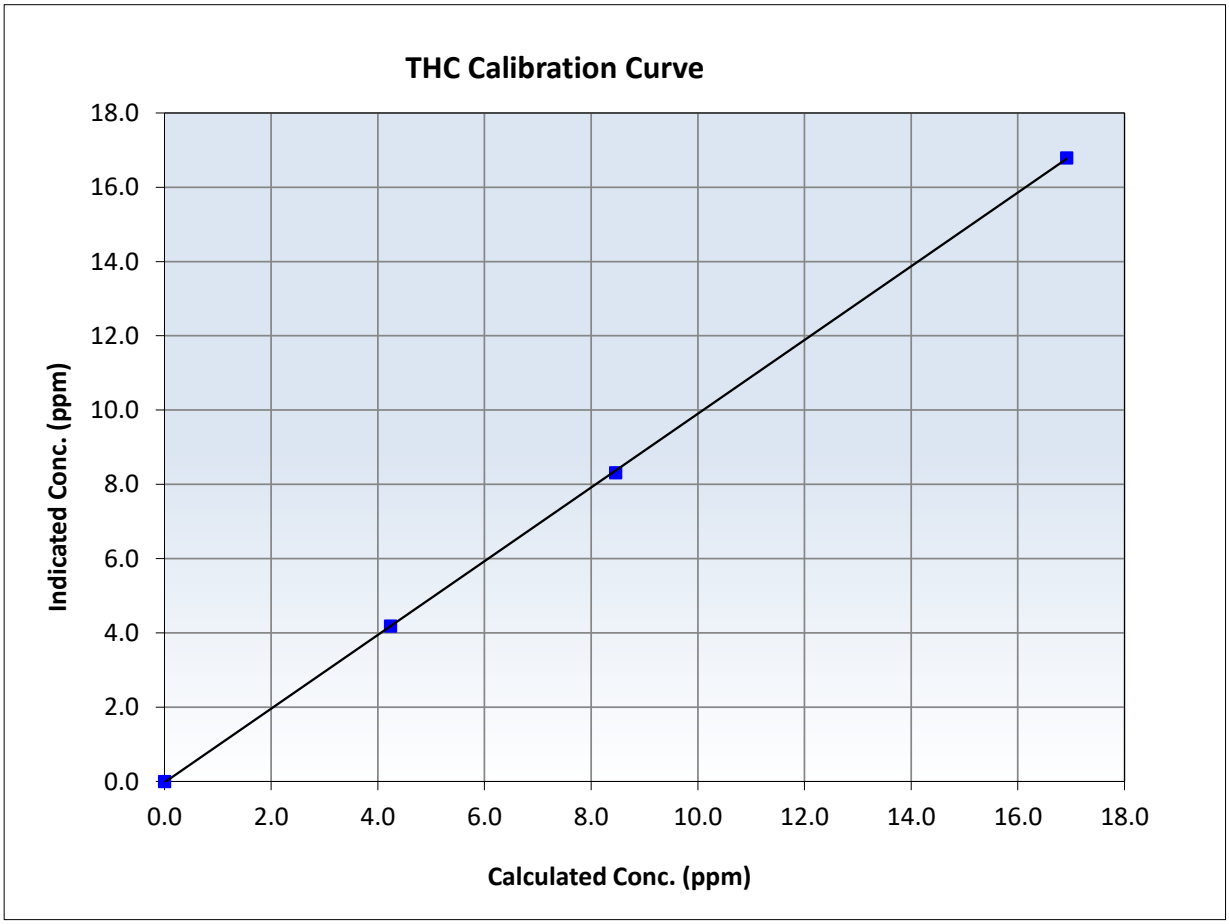
THC Calibration Summary

Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	November 15, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:28	End Time (MST):	14:45
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999967	≥0.995
16.91	16.79	1.0072	Slope	0.992664	0.90 - 1.10
8.46	8.31	1.0177	Intercept	-0.025510	+/-0.5
4.24	4.19	1.0122			



Wood Buffalo Environmental Association

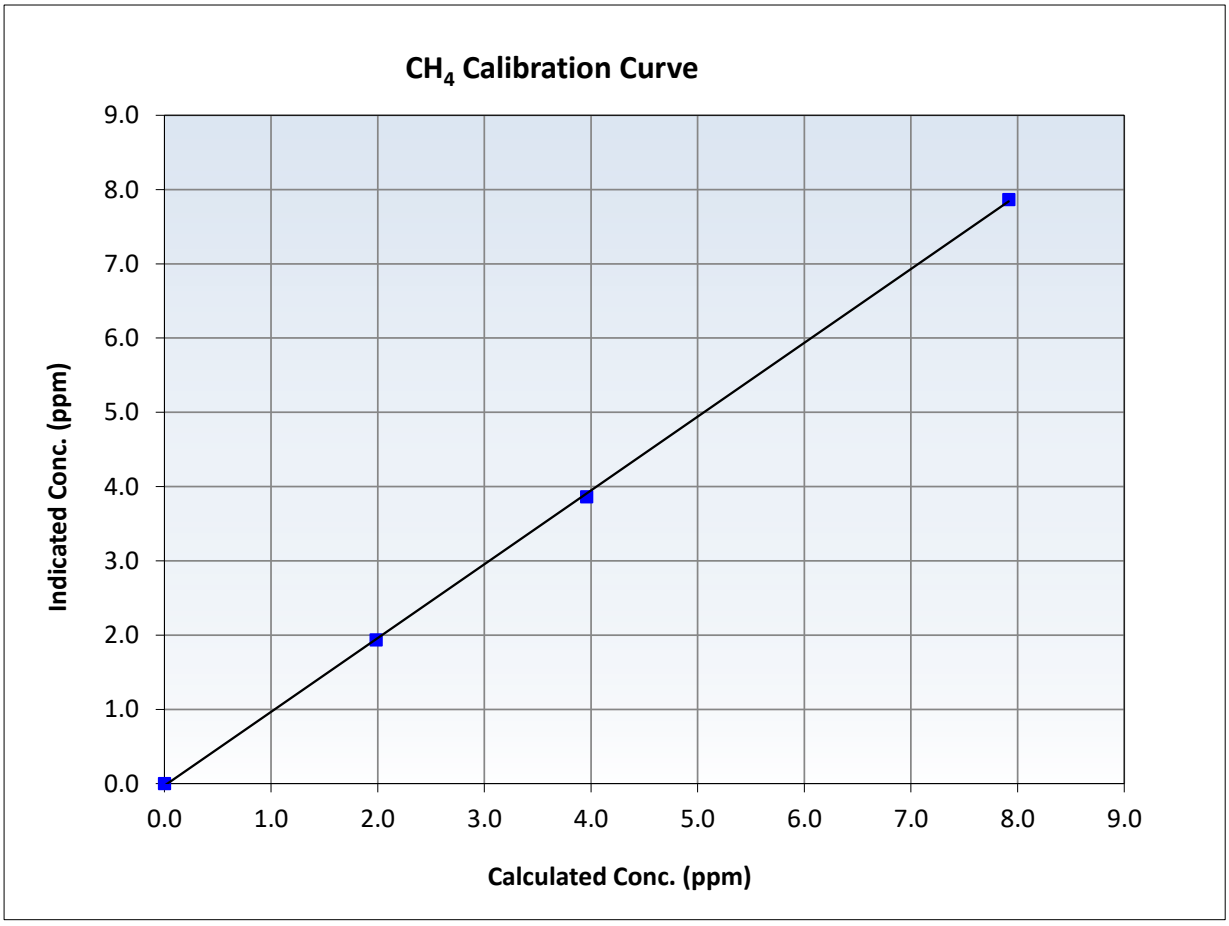
CH_4 Calibration Summary

Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	November 15, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:28	End Time (MST):	14:45
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999902	*≥0.995*
7.92	7.87	1.0065	Slope	0.994014	*0.90 - 1.10*
3.96	3.86	1.0246			
1.98	1.94	1.0248	Intercept	-0.027921	*+/-0.5*



Wood Buffalo Environmental Association

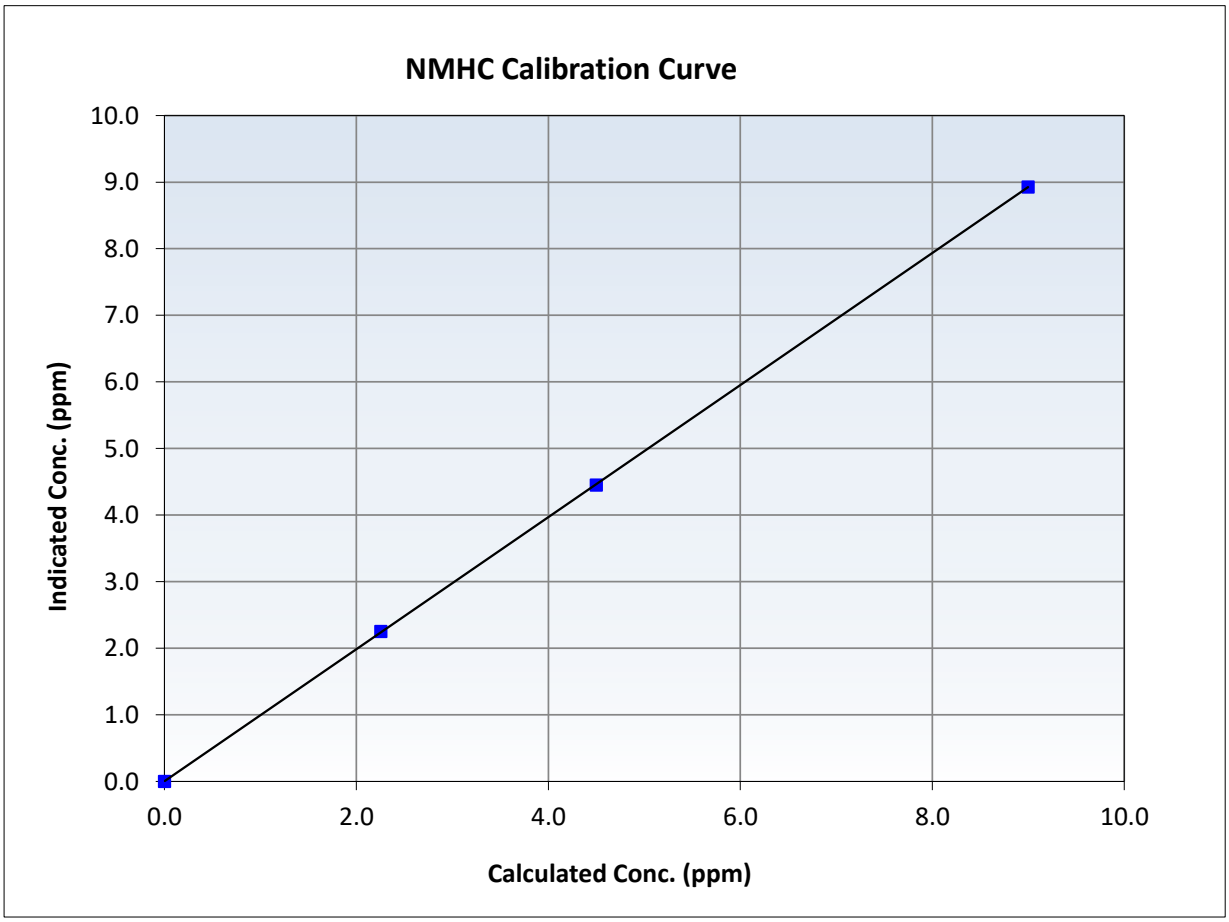
NMHC Calibration Summary

Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	November 15, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:28	End Time (MST):	14:45
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999990	*≥0.995*
9.00	8.93	1.0077	Slope	0.991590	*0.90 - 1.10*
4.50	4.45	1.0110			
2.26	2.25	1.0009	Intercept	0.003211	*+/-0.5*



NMHC Calibration Plot Date: December 13, 2024 Location: Athabasca Valley

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	December 24, 2024	Last Cal Date:	December 13, 2024
Start time (MST):	6:27	End time (MST):	8:53
Reason:	Maintenance	Dipping on CH4 channel	

Calibration Standards

Gas Cert Reference:	CC320556	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
Removed C3H8 Conc.	205.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	3805
Zero Air Gen model:	Teledyne API T701H	Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.95E-04	2.99E-04	NMHC SP Ratio:	6.06E-05	5.75E-05
CH4 Retention time:	13.6	14.0	NMHC Peak Area:	148545	156648
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	16.91	17.46	0.969
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.46	Prev response	16.76	*% change	4.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	16.91	16.91	1.000
Mid point	4960	39.9	8.46	8.39	1.008
Low point	4980	20.0	4.24	4.21	1.007
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	16.91	16.82	1.006
				Average Correction Factor	1.005

Notes: Dipping on the CH4 channel. RT and NM bump has slightly moved over.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.00	9.58	0.939
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.58	Prev response	8.93	*% change	6.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.00	8.99	1.001
Mid point	4960	39.9	4.50	4.49	1.003
Low point	4980	20.0	2.26	2.27	0.996
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.00	8.95	1.005
				Average Correction Factor	1.000

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	7.92	7.88	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.88	Prev response	7.84	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	7.92	7.92	0.999
Mid point	4960	39.9	3.96	3.90	1.014
Low point	4980	20.0	1.98	1.95	1.020
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	7.92	7.86	1.007
				Average Correction Factor	1.011

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.992664	0.999834
THC Cal Offset:	-0.025510	-0.024336
CH4 Cal Slope:	0.994014	1.001695
CH4 Cal Offset:	-0.027921	-0.027533
NMHC Cal Slope:	0.991590	0.998323
NMHC Cal Offset:	0.003211	0.003197

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

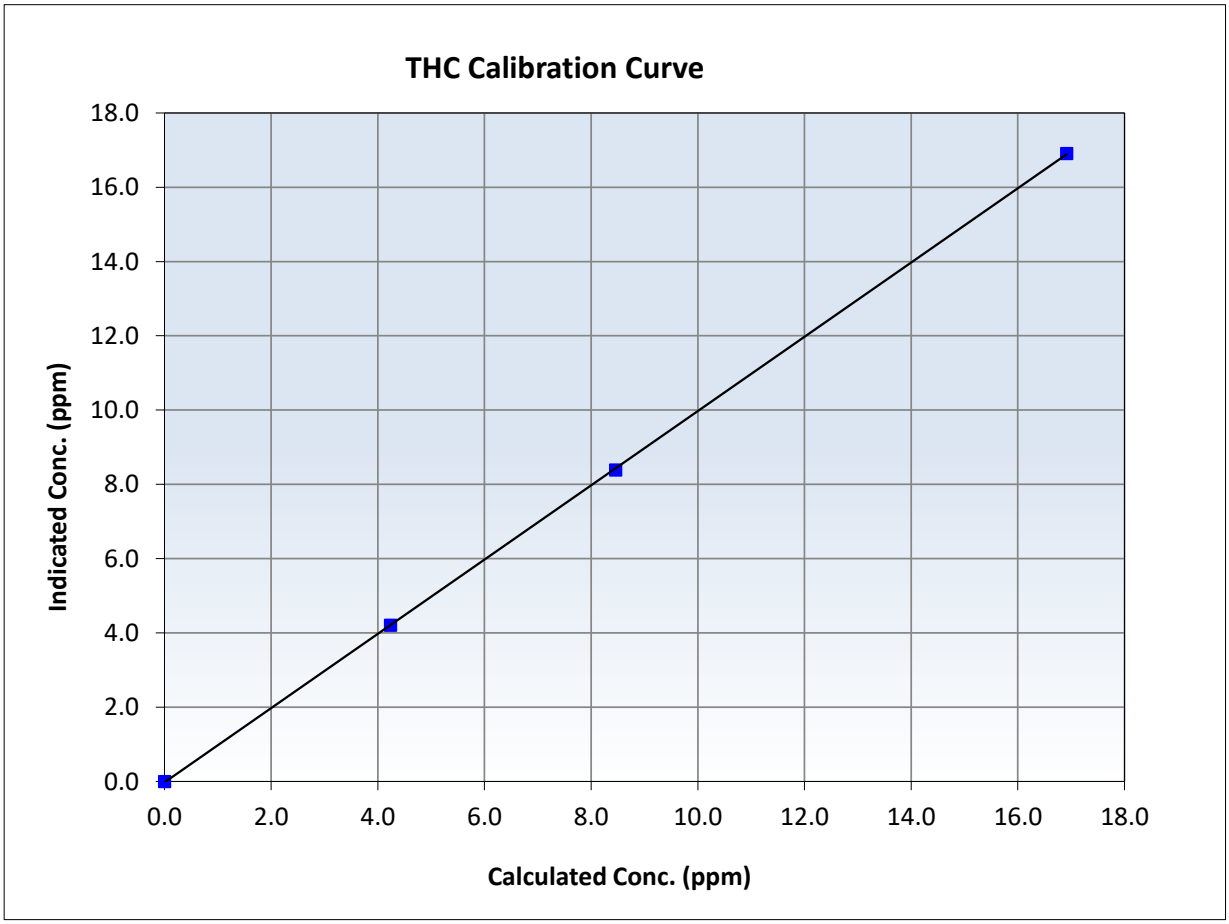
THC Calibration Summary

Station Information

Calibration Date:	December 24, 2024	Previous Calibration:	December 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	6:27	End Time (MST):	8:53
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999980	≥0.995
16.91	16.91	1.0003	Slope	0.999834	0.90 - 1.10
8.46	8.39	1.0083	Intercept	-0.024336	+/-0.5
4.24	4.21	1.0066			



Wood Buffalo Environmental Association

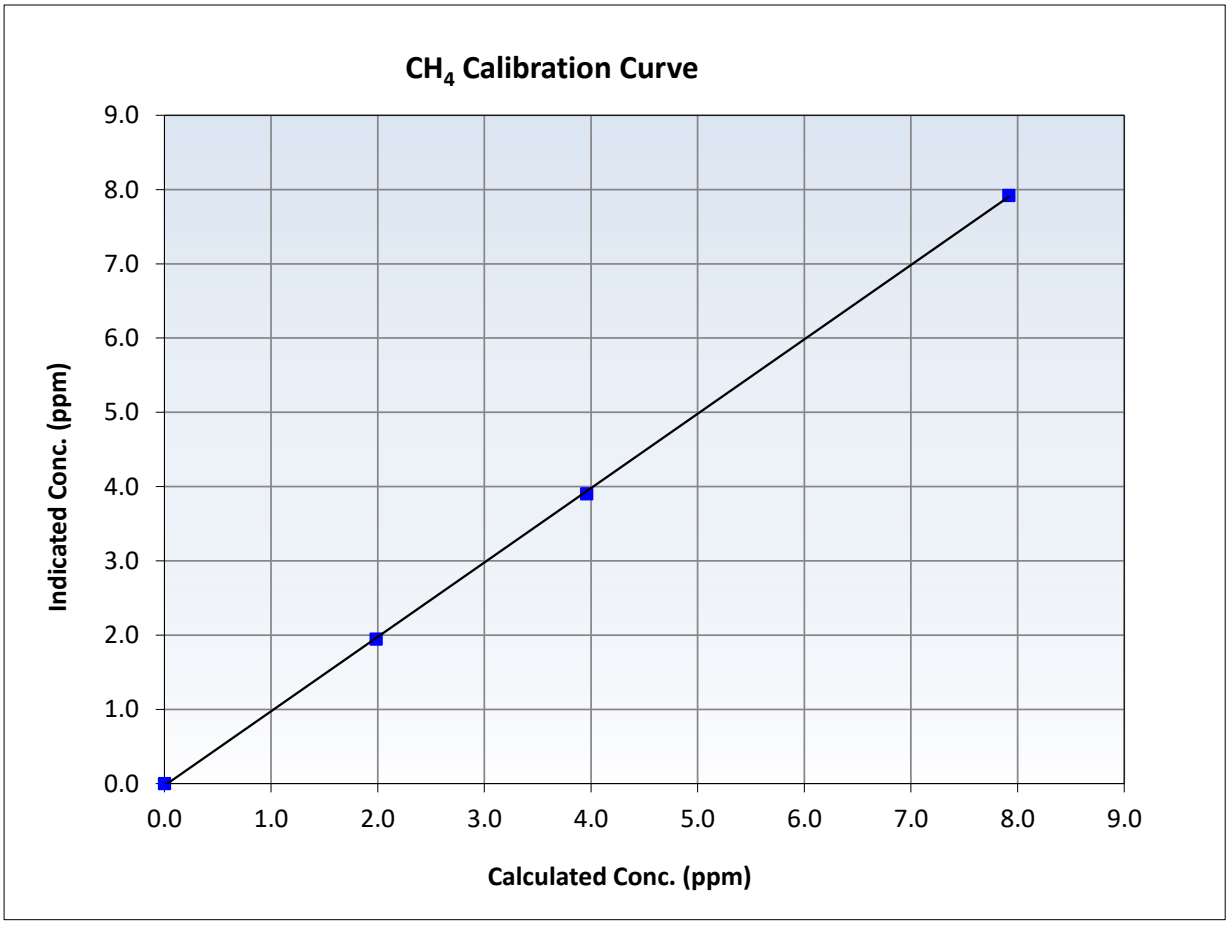
CH_4 Calibration Summary

Station Information

Calibration Date:	December 24, 2024	Previous Calibration:	December 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	6:27	End Time (MST):	8:53
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999926	≥0.995
7.92	7.92	0.9992	Slope	1.001695	0.90 - 1.10
3.96	3.90	1.0141	Intercept	-0.027533	+/-0.5
1.98	1.95	1.0195			



Wood Buffalo Environmental Association

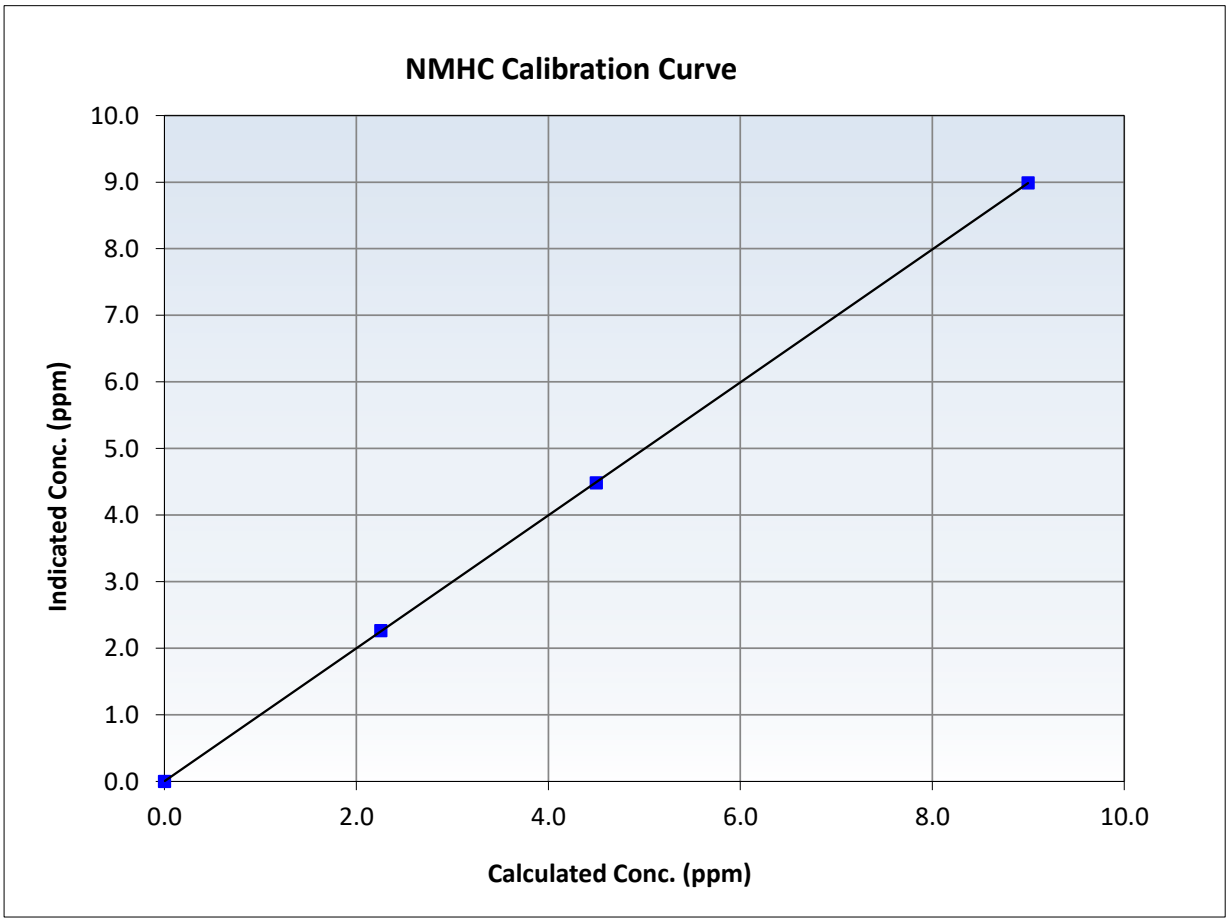
NMHC Calibration Summary

Station Information

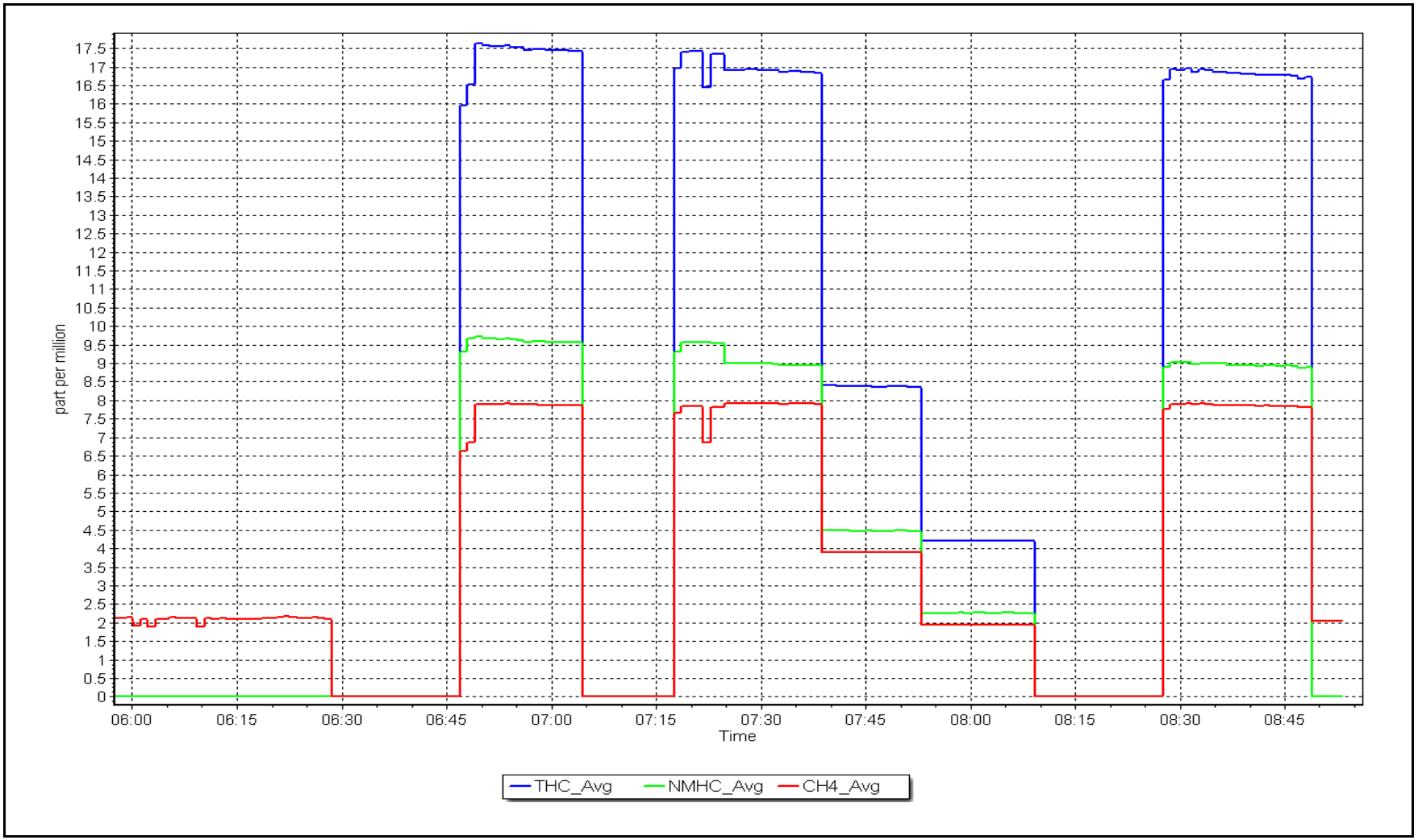
Calibration Date:	December 24, 2024	Previous Calibration:	December 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	6:27	End Time (MST):	8:53
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999995	≥0.995
9.00	8.99	1.0011	Slope	0.998323	0.90 - 1.10
4.50	4.49	1.0031			
2.26	2.27	0.9956	Intercept	0.003197	+/-0.5



NMHC Calibration Plot Date: December 24, 2024 Location: Athabasca Valley



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Athabasca Valley
Station number:	AMS 07
Calibration Date:	December 6, 2024
Last Cal Date:	November 22, 2024
Start time (MST):	10:37
End time (MST):	15:16
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0033919	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	60.10 ppm	NO Cal Gas Conc:	59.90 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	60.10 ppm	Removed Gas NO Conc:	59.90 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3805
ZAG make/model:	API T701H	Serial Number:	198

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	----	----
AF High point	4933	66.8	803.0	800.3	2.7	800.8	798.0	2.9	1.0027	1.0028
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	805.1 ppb	NO =	800.7 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -0.5%
Baseline Corr 1st pt	NO_X =	800.8 ppb	NO =	798.1 ppb	As Found Statistics	*Percent Change	NO = -0.3%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1160120024

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.187	1.162	NO bkgnd or offset:	8.4	8.3
NOX coeff or slope:	1.005	1.005	NOX bkgnd or offset:	8.6	8.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	229.8	227.4

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.000827	1.000855
NO_X Cal Offset:	1.451920	1.591906
NO Cal Slope:	0.998899	0.999328
NO Cal Offset:	1.271961	1.371944
NO_2 Cal Slope:	1.004263	1.001200
NO_2 Cal Offset:	0.892899	0.988044

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
High point	4933	66.8	803.0	800.3	2.7	804.2	800.1	4.2	0.9985	1.0002
Mid point	4966	33.4	401.5	400.2	1.3	405.1	403.0	2.1	0.9912	0.9930
Low point	4983	16.7	200.7	200.1	0.7	203.4	202.0	1.4	0.9870	0.9905
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4933	66.8	803.0	399.6	403.4	805.2	399.6	405.6	0.9972	1.0000
							Average Correction Factor		0.9922	0.9946

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	798.1	398.2	402.6	403.6	0.9975	100.3%
Mid GPT point	798.1	608.3	192.5	194.2	0.9911	100.9%
Low GPT point	798.1	702.9	97.9	99.8	0.9807	102.0%
				Average Correction Factor	0.9897	101.0%

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

NO_X Calibration Summary

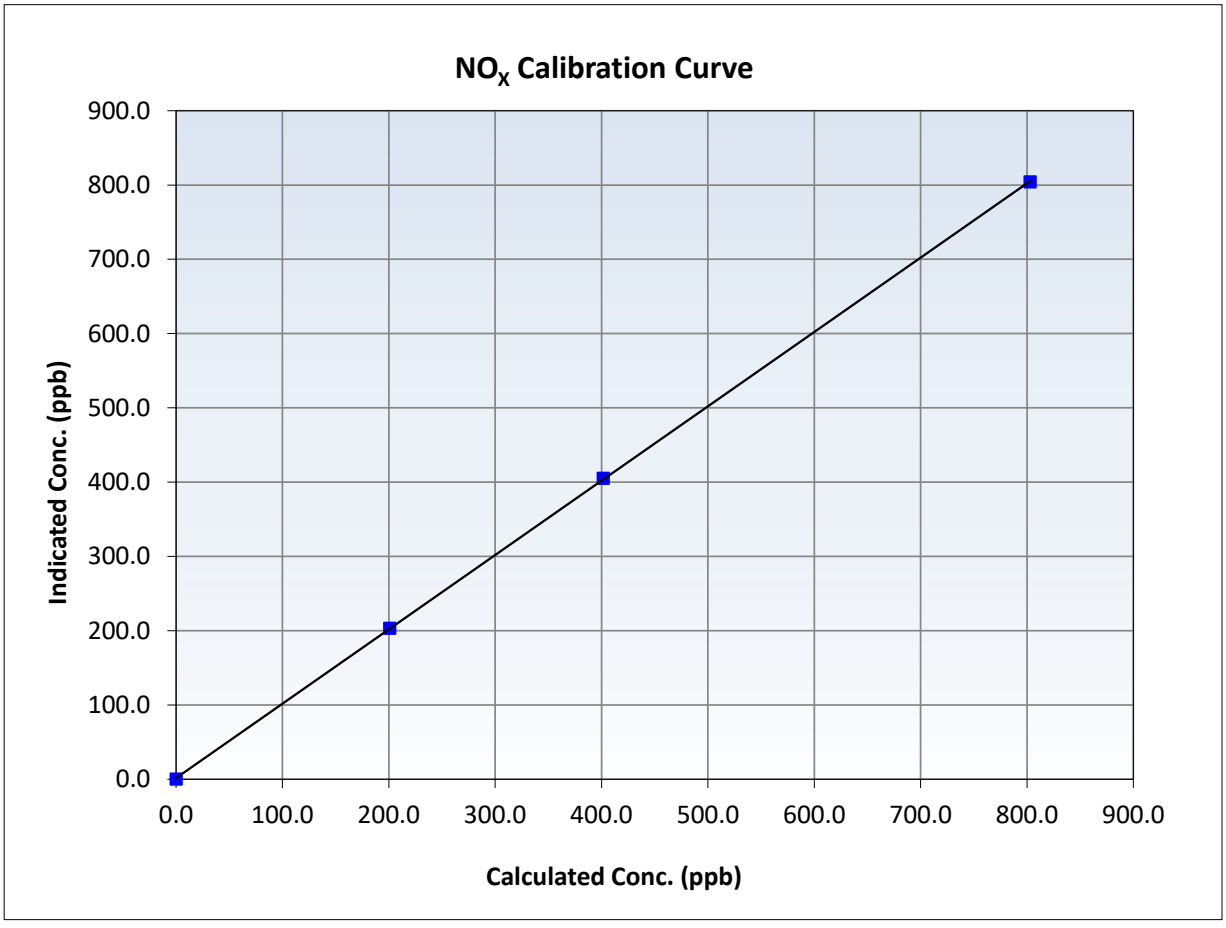
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 22, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:37	End Time (MST):	15:16
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
803.0	804.2	0.9985
401.5	405.1	0.9912
200.7	203.4	0.9870

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999981	*≥0.995*
Slope	1.000855	*0.90 - 1.10*
Intercept	1.591906	*+/-20*



Wood Buffalo Environmental Association

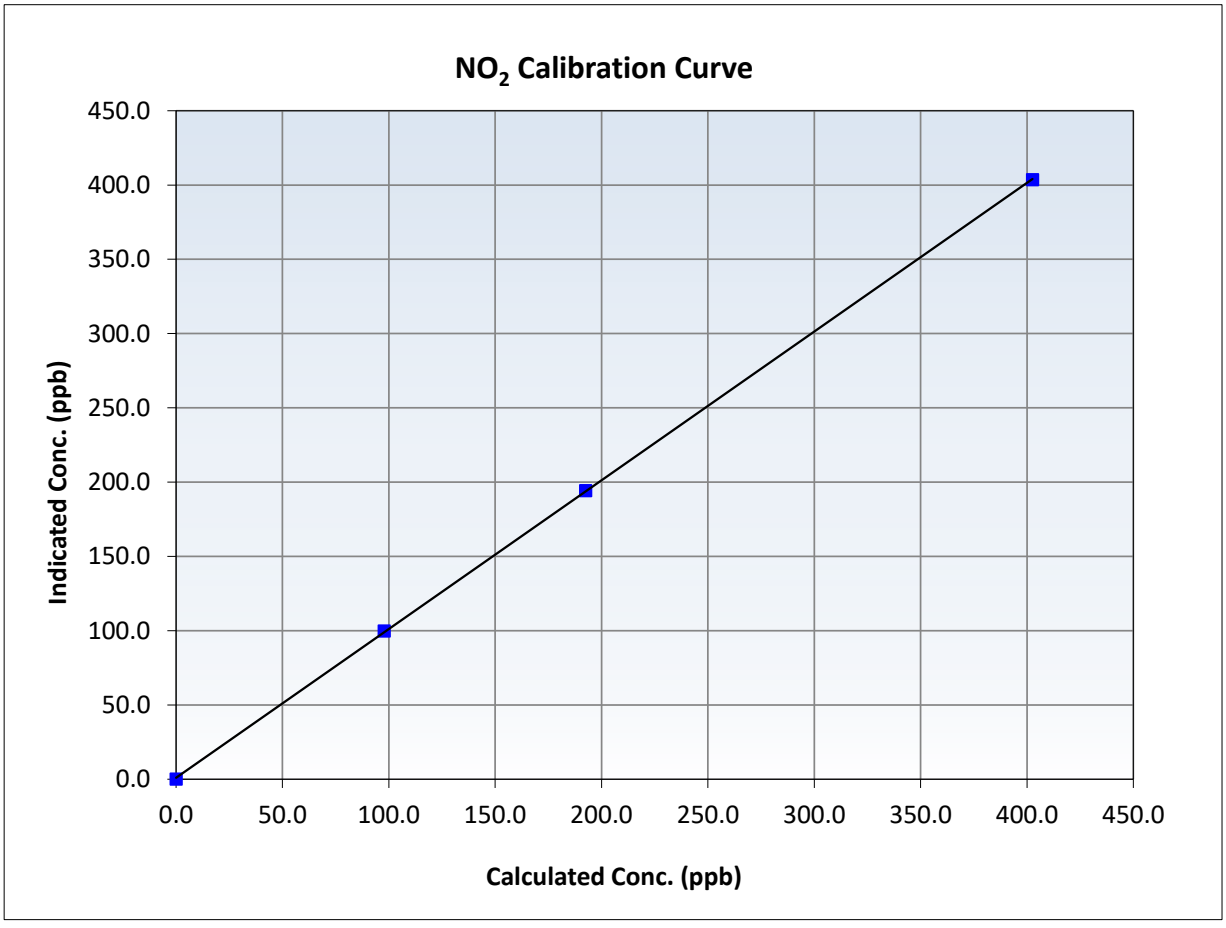
NO_2 Calibration Summary

Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 22, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:37	End Time (MST):	15:16
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	0.1	----	Correlation Coefficient	0.999978	≥0.995
402.6	403.6	0.9975	Slope	1.001200	0.90 - 1.10
192.5	194.2	0.9911	Intercept	0.988044	+/-20
97.9	99.8	0.9807			



Wood Buffalo Environmental Association

NO Calibration Summary

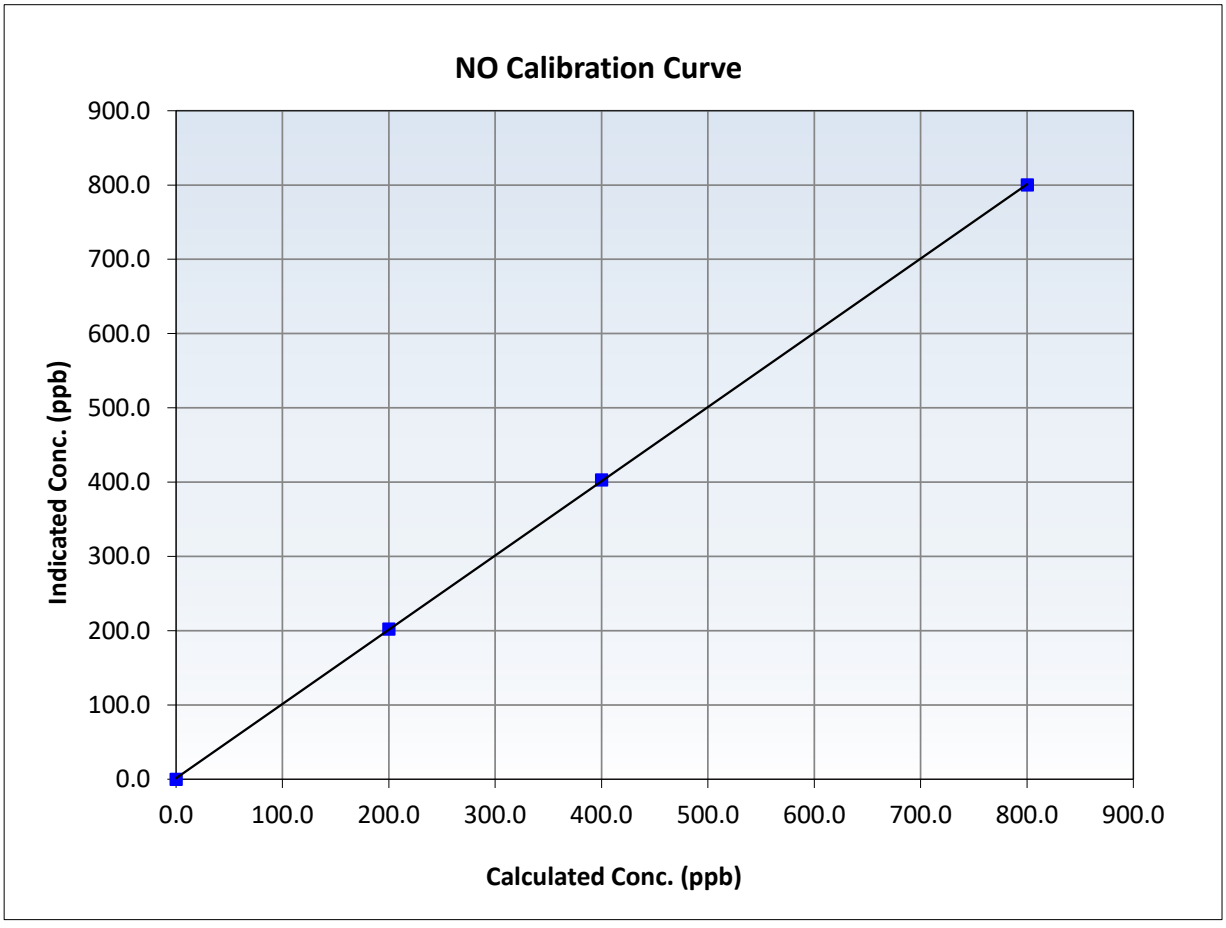
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 22, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:37	End Time (MST):	15:16
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

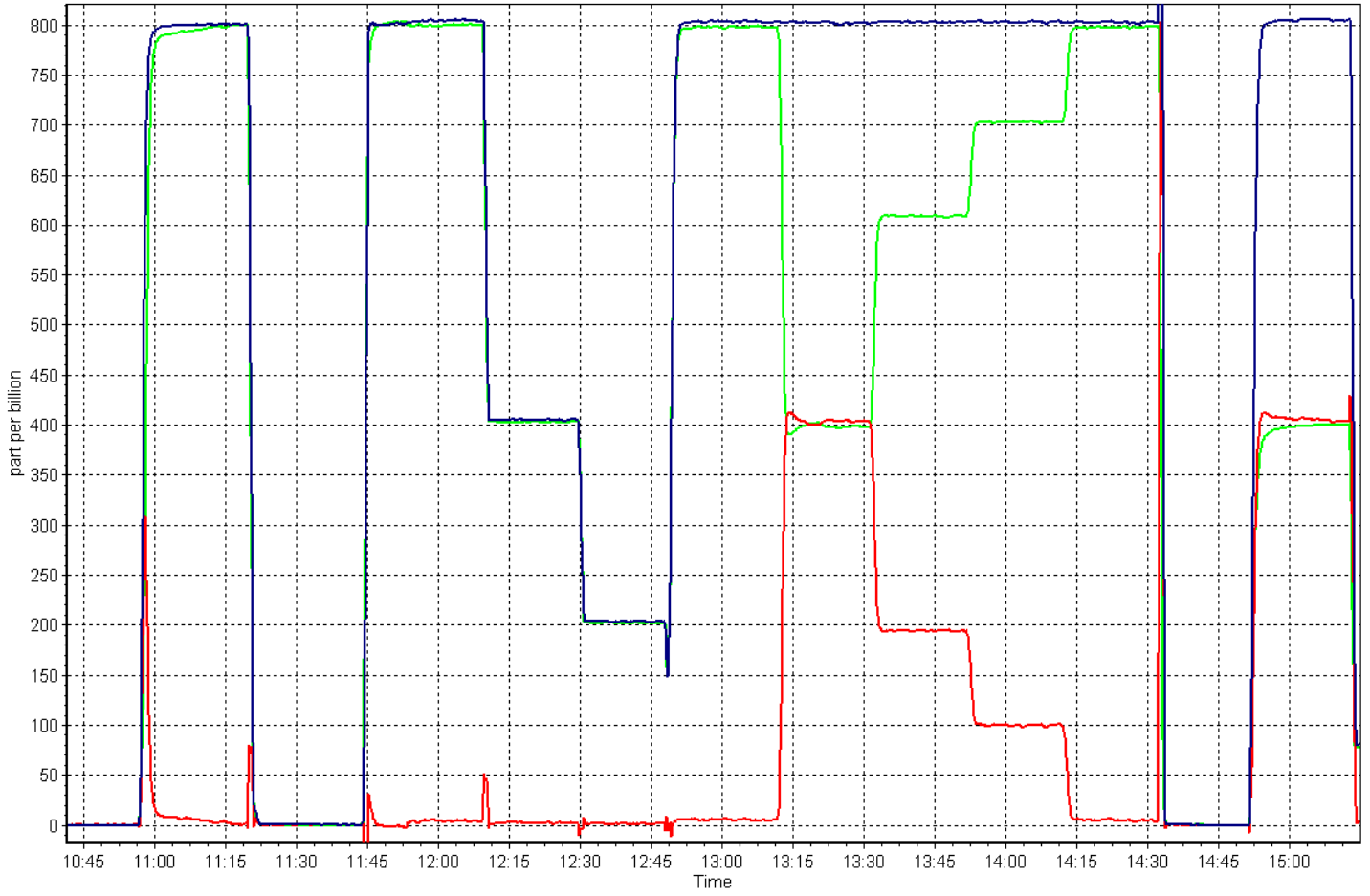
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.3	800.1	1.0002
400.2	403.0	0.9930
200.1	202.0	0.9905

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999982	*≥0.995*
Slope	0.999328	*0.90 - 1.10*
Intercept	1.371944	*+/-20*



NO_X Calibration Plot Date: December 6, 2024 Location: Athabasca Valley



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	December 23, 2024	Last Cal Date:	November 1, 2024
Start time (MST):	9:04	End time (MST):	11:47
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	T700	Serial Number:	3805
ZAG Make/Model:	T701H	Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 49i	Analyzer serial #:	1152220023
Analyzer Range	0 - 500 ppb		

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.997857	1.001223	Backgd or Offset:	-2.0	-2.0
Calibration intercept:	1.000000	1.996000	Coeff or Slope:	1.560	1.560

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	0.8	----
As found High point	5000	1652.0	400.0	401.4	0.999
As found Mid point					
As found Low point					

Baseline Corr As found:	400.6	Previous response	400.1	*% change	0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	1.5	----
High point	5000	1654.3	400.0	402.3	0.994
Mid point	5000	1152.0	200.0	202.3	0.989
Low point	5000	913.0	100.0	102.7	0.973
As left zero	5000	1652.9	0.0	1.7	----
As left span	5000	1582.6	400.0	402.4	0.994
				Average Correction Factor	0.985

Notes: No Maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

O_3 Calibration Summary

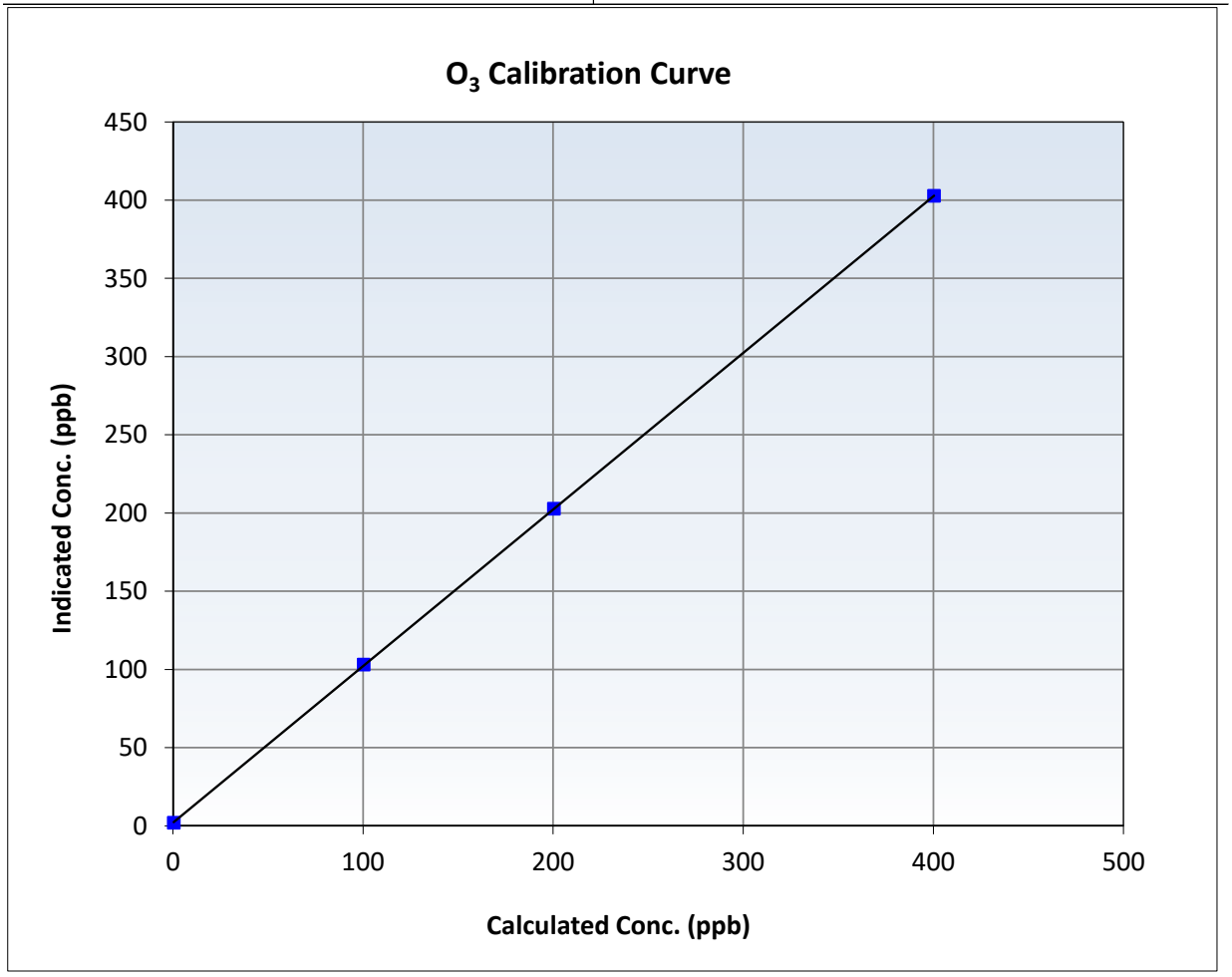
Station Information

Calibration Date:	December 23, 2024	Previous Calibration:	November 1, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	9:04	End Time (MST):	11:47
Analyzer make:	Thermo 49i	Analyzer serial #:	1152220023

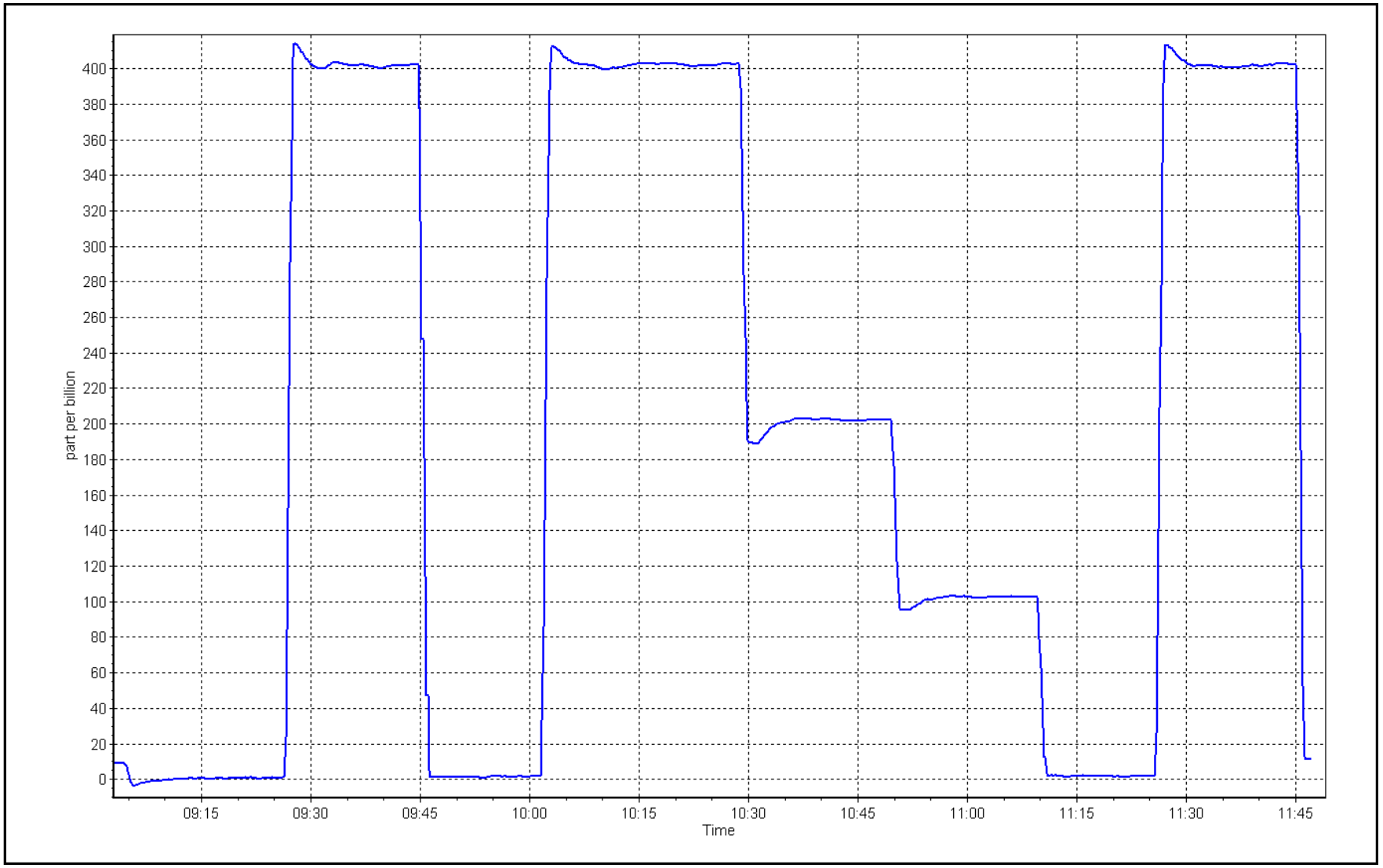
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.5	----
400.0	402.3	0.9943
200.0	202.3	0.9886
100.0	102.7	0.9733

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	1.001223	*0.90 - 1.10*
Intercept	1.996000	*+/- 5*



O_3 Calibration Plot Date: December 23, 2024 Location: Athabasca Valley



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	December 23, 2024	Last Cal Date:	November 22, 2024
Start time (MST):	8:41	End time (MST):	9:05
Analyzer Make:	API T640	S/N:	645
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388753
Temp/RH standard:	Alicat FP-25BT	S/N:	388753

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (^{o}C)	-13.4	-14	-13.4	☐	+/- 2 ^{o}C
P (mmHg)	730.7	729.7	730.7	☐	+/- 10 mmHg
Flow (LPM)	4.94	4.93	4.94	☐	+/- 0.25 LPM
PW% (pump)	39	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	17.9	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: October 6, 2024

Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: November 22, 2024

Date Disposable Filter Changed: August 16, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: July 8, 2024

Date RH/T Sensor Cleaned: July 8, 2024

Notes: No adjustments done.

Calibration by: Melissa Lemay

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	December 11, 2024	Last Cal Date:	November 12, 2024
Start time (MST):	13:15	End time (MST):	16:03
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	2,953	ppm	Cal Gas Exp Date:	September 30, 2029
Cal Gas Cylinder #:	T1TWKRN			
Removed Cal Gas Conc:	2,953	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T750		Serial Number:	282
ZAG Make/Model:	Teledyne API 751H		Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 48i-TLE		Analyzer serial #:	1408761381	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998781	0.996926	Backgd or Offset:	5.219	5.219
Calibration intercept:	0.102000	0.191983	Coeff or Slope:	1.068	1.068

CO As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4932	67.8	40.0	40.0	1.003
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	39.92	Prev response:	40.10	*% change:	-0.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4932	67.8	40.0	40.0	1.001
Mid point	4966	33.9	20.0	20.3	0.986
Low point	4983	16.9	10.0	10.2	0.977
As left zero	5000	0.0	0.0	0.1	----
As left span	4932	67.8	40.0	40.0	1.001
				Average Correction Factor	0.988

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Summary

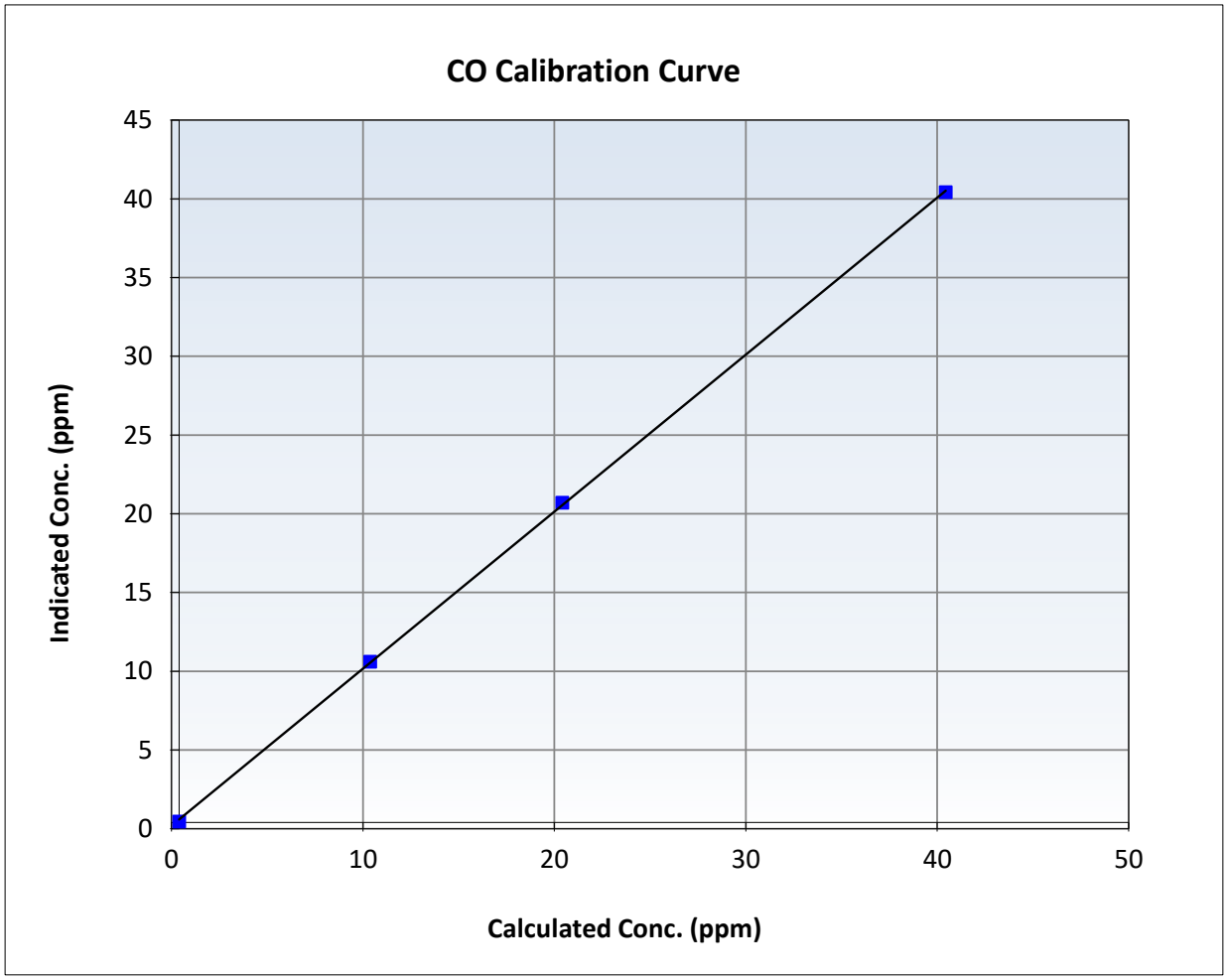
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 12, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	13:15	End Time (MST):	16:03
Analyzer make:	Thermo 48i-TLE	Analyzer serial #:	1408761381

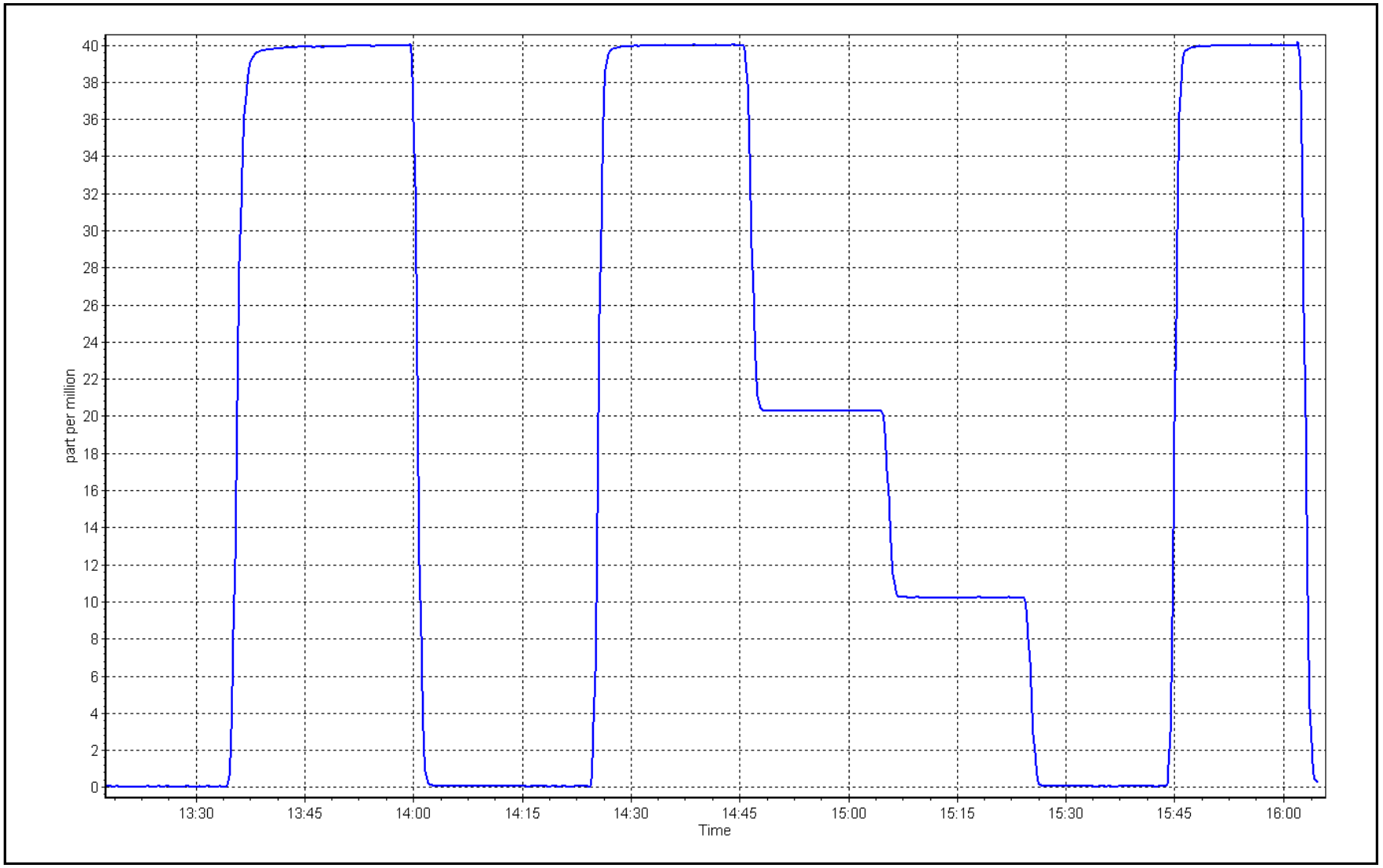
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
40.0	40.0	1.0006
20.0	20.3	0.9863
10.0	10.2	0.9766

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999938	*≥0.995*
Slope	0.996926	*0.90 - 1.10*
Intercept	0.191983	*+/-1.5*



CO Calibration Plot Date: December 11, 2024 Location: Athabasca Valley



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS08
FORT CHIPEWYAN
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS08
Calibration Date:	December 12, 2024	Last Cal Date:	November 15, 2024
Start time (MST):	13:15	End time (MST):	16:04
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.84	ppm	Cal Gas Exp Date:	January 6, 2030
Cal Gas Cylinder #:	CC196697			
Removed Cal Gas Conc:	49.84	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	3252
Zero Air Gen Model:	Teledyne API T701		Serial Number:	135

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Serial Number:	1136451241	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994277	0.995662	Backgd or Offset:	1.8	1.8
Calibration intercept:	0.297009	0.436778	Coeff or Slope:	0.959	0.901

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	4920	80.3	800.4	780.6	1.025
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	781.0	Previous response	796.1	*% change	-1.9%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4920	80.3	800.4	797.4	1.004
Mid point	4960	40.2	400.7	398.6	1.005
Low point	4980	20.1	200.4	201.3	0.995
As left zero	5000	0.0	0.0	-0.3	----
As left span	4920	80.3	800.4	801.2	0.999
				Average Correction Factor:	1.001

Notes: Changed out inlet filter after as founds. Adjustments made to span.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur

Wood Buffalo Environmental Association

SO_2 Calibration Summary

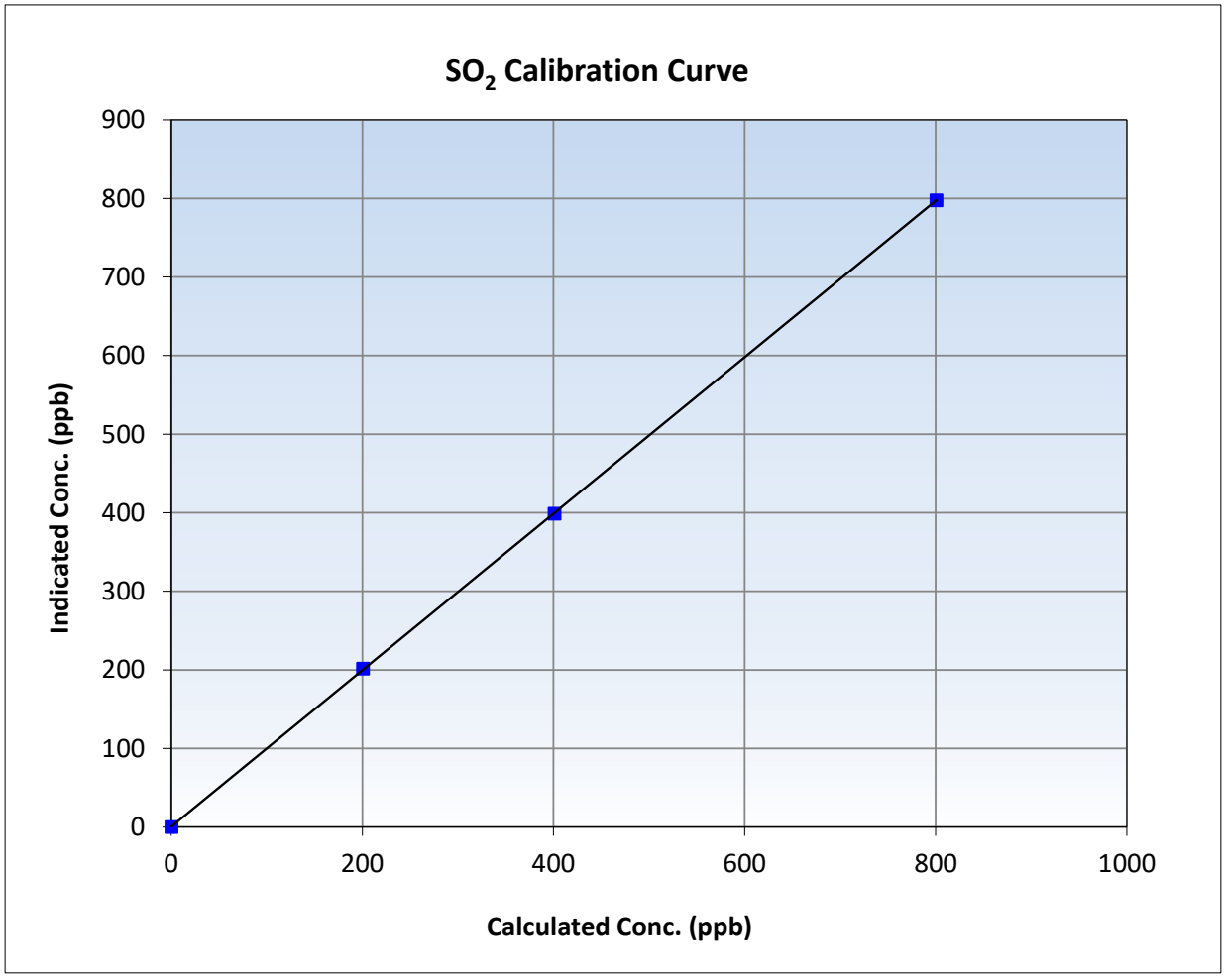
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 15, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS08
Start Time (MST):	13:15	End Time (MST):	16:04
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1136451241

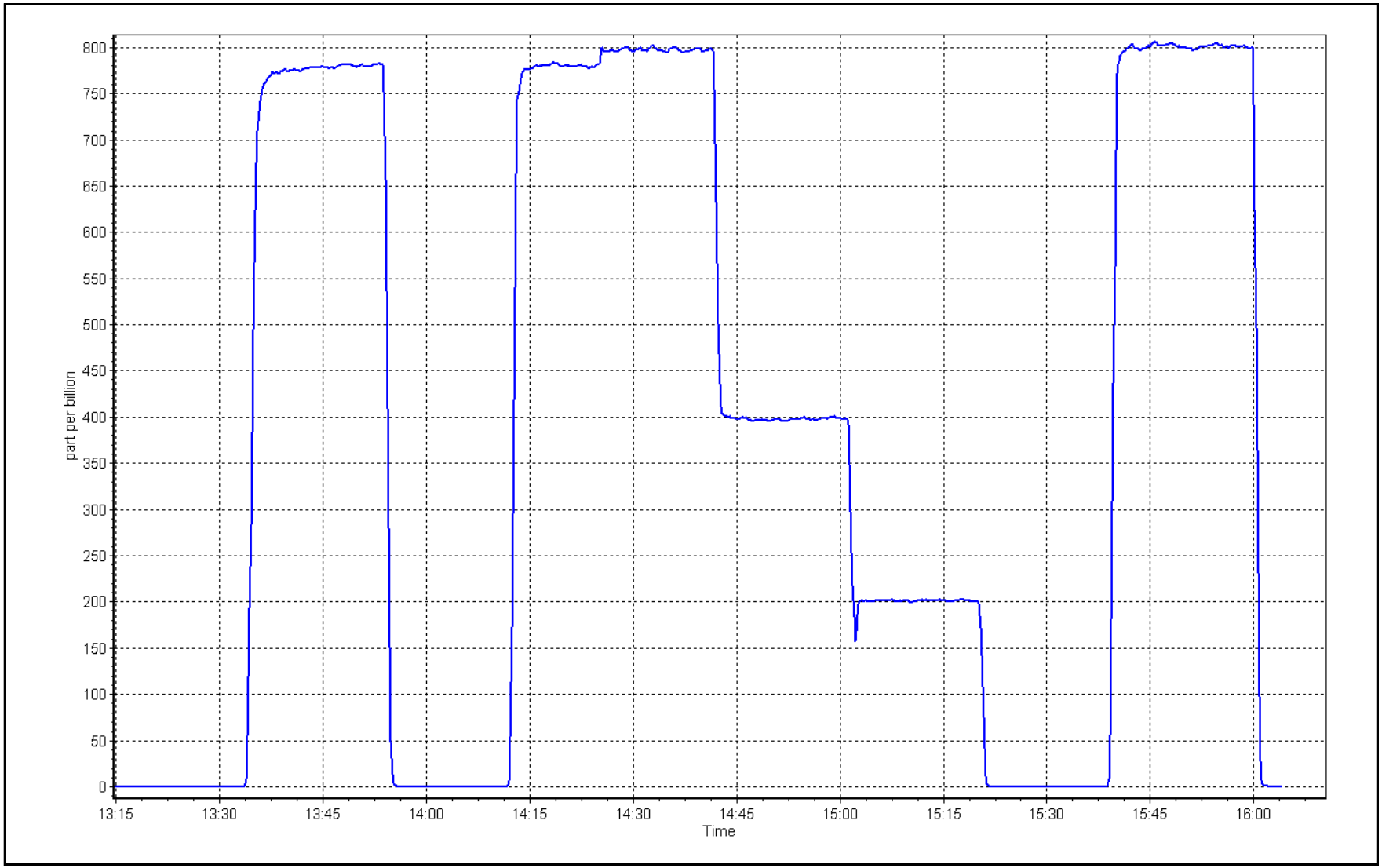
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
800.4	797.4	1.0037
400.7	398.6	1.0053
200.4	201.3	0.9953

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	0.995662	*0.90 - 1.10*
Intercept	0.436778	*+/-30*



SO2 Calibration Plot Date: December 12, 2024 Location: Fort Chipewyan



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	December 11, 2024	Last Cal Date:	November 29, 2024
Start time (MST):	9:02	End time (MST):	13:15
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.97	ppm	Cal Gas Exp Date:	February 9, 2024
Cal Gas Cylinder #:	EY0002276			
Removed Cal Gas Conc:	4.97	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3810
ZAG Make/Model:	Teledyne API T701		Serial Number:	135

Analyzer Information

Analyzer make:	Thermo 43iQ-TL		Analyzer serial #:	1203169744
Converter make:	CDN-101		Converter serial #:	14639
Analyzer Range	0 - 100 ppb		Converter Temp:	833 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.985428	0.997567	Backgd or Offset:	1.4	1.4
Calibration intercept:	0.198526	0.298821	Coeff or Slope:	0.742	0.742

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4920	80.5	80.0	79.2	1.014
As found Mid point	4960	40.2	40.0	39.9	1.009
As found Low point	4980	20.1	20.0	19.8	1.025
New cylinder response					

Baseline Corr As found:	78.9	Prev response:	79.04	*% change:	-0.2%
Baseline Corr 2nd AF pt:	39.6	AF Slope:	0.987284	AF Intercept:	0.258569
Baseline Corr 3rd AF pt:	19.5	AF Correlation:	0.999978	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	80.5	80.0	80.0	1.000
Mid point	4960	40.2	40.0	40.4	0.989
Low point	4980	20.1	20.0	20.2	0.989
As left zero	5000	0.0	0.0	0.3	----
As left span	4920	80.5	80.0	80.4	0.995
SO2 Scrubber Check	4919.7	80.3	803.0	0.2	----

Date of last scrubber change:		March 7, 2022		Ave Corr Factor	0.993
Date of last converter efficiency test:		March 15, 2022		100.7%	efficiency

Notes: Changed inlet filter after multipoint as founds. SO2 scrubber check passed no adjustment made.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur,

Wood Buffalo Environmental Association

TRS Calibration Summary

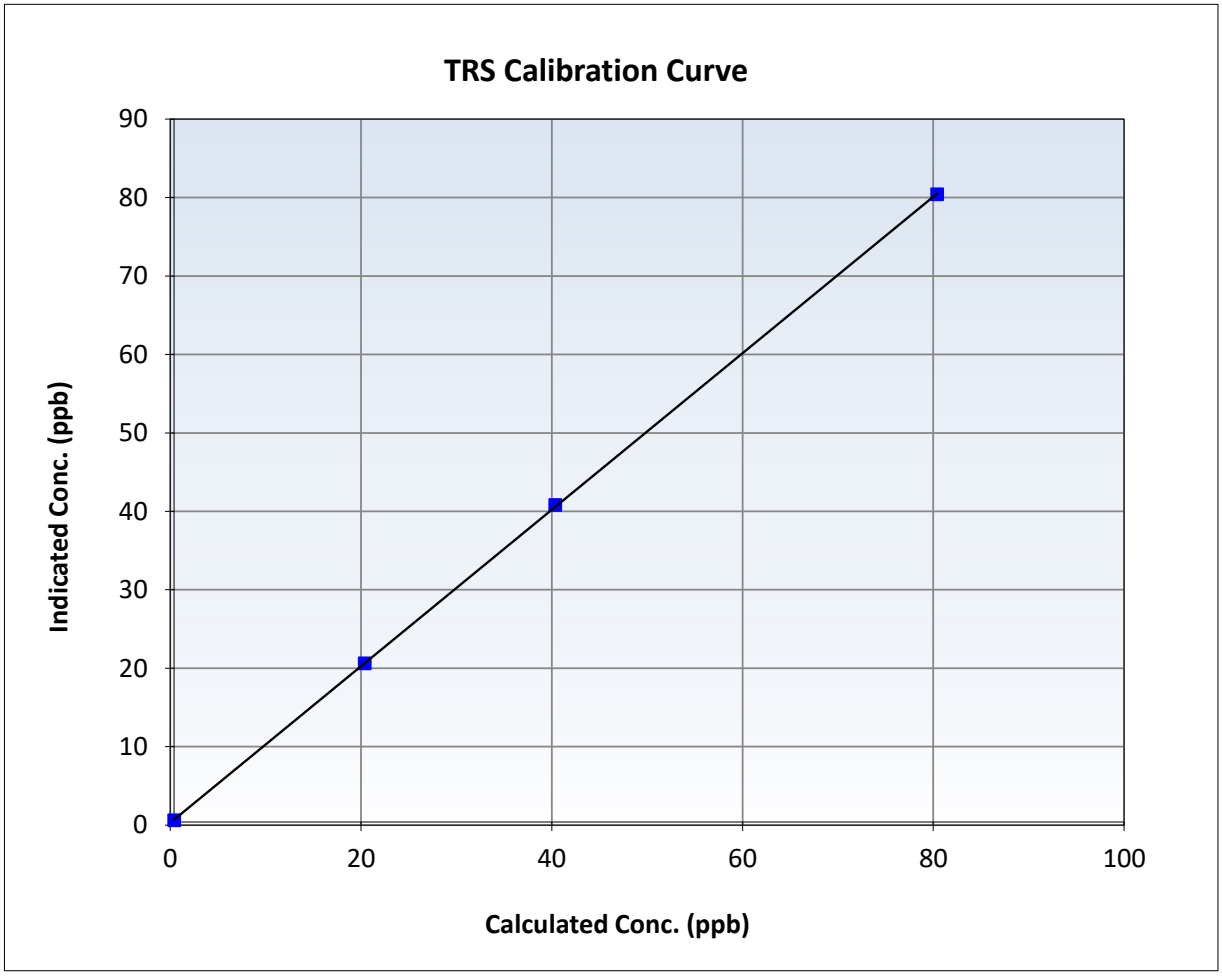
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 29, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	9:02	End Time (MST):	13:15
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1203169744

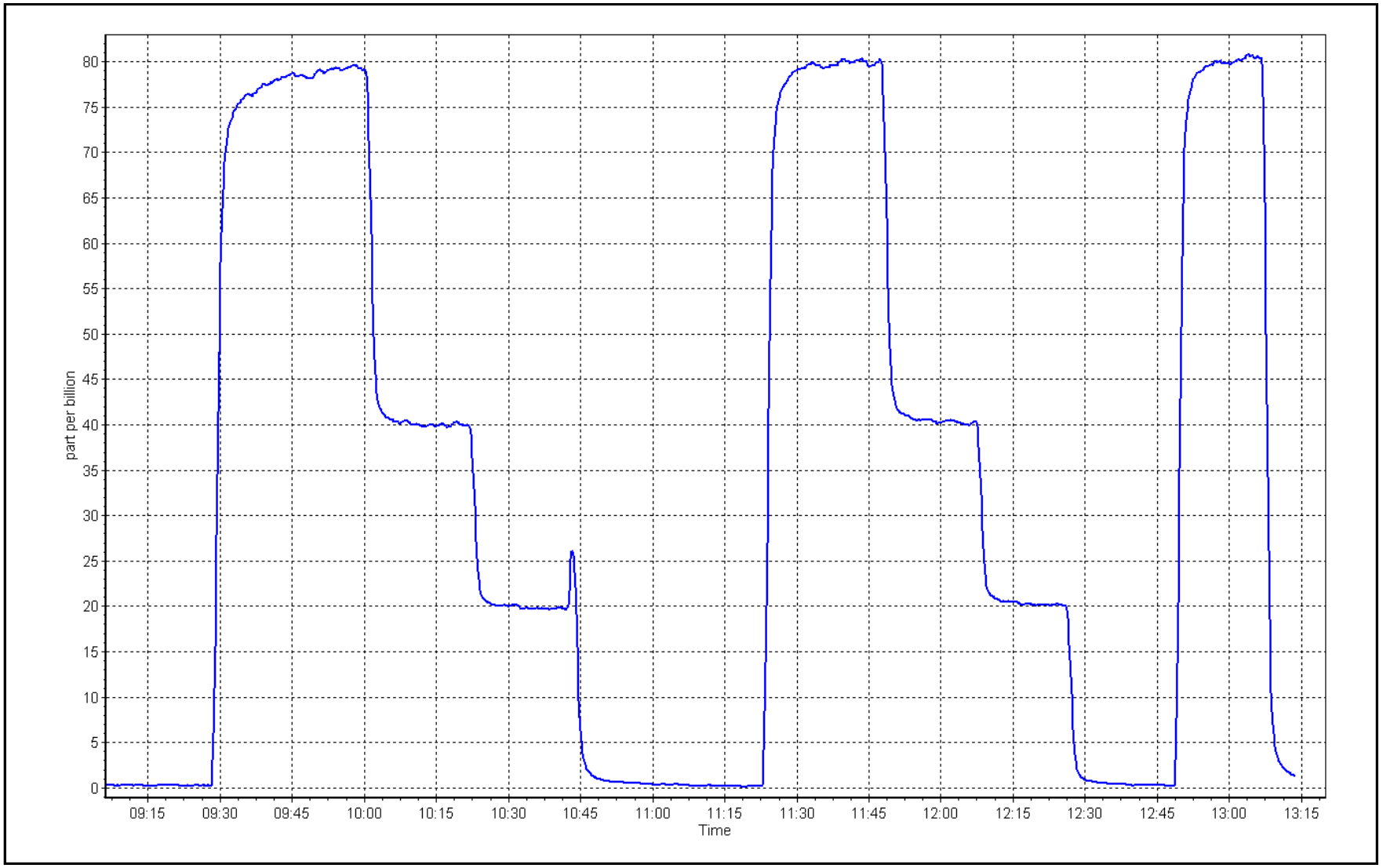
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
80.0	80.0	1.0001
40.0	40.4	0.9890
20.0	20.2	0.9891

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999977	*≥0.995*
Slope	0.997567	*0.90 - 1.10*
Intercept	0.298821	*+/-3*



TRS Calibration Plot Date: December 11, 2024 Location: Fort Chipewyan



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan
Station number:	AMS 08
Calibration Date:	December 12, 2024
Last Cal Date:	November 16, 2024
Start time (MST):	8:55
End time (MST):	13:17
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0046831	Cal Gas Expiry Date:	January 9,2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.00 ppm
Removed Cylinder #:	DT0046831	Removed Gas Exp Date:	January 9,2032
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.00 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3252
ZAG make/model:	Teledyne API T701H	Serial Number:	135

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.2	0.1	----	----
AF High point	4933	66.7	803.1	800.4	2.7	820.1	815.0	5.1	0.9792	0.9819
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	798.5 ppb	NO =	797.1 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = 2.6%
Baseline Corr 1st pt	NO_X =	820.2 ppb	NO =	815.2 ppb	As Found Statistics	*Percent Change	NO = 2.2%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 4460

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.195	1.168	NO bkgnd or offset:	1.2	0.9
NOX coeff or slope:	1.194	1.167	NOX bkgnd or offset:	1.2	0.6
NO2 coeff or slope:	2.100	1.300	Reaction cell Press:	2.1	1.2

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.992491	0.997601
NO_X Cal Offset:	1.414756	-0.805395
NO Cal Slope:	0.996043	0.997455
NO Cal Offset:	-0.145628	-1.165086
NO_2 Cal Slope:	1.010685	1.007149
NO_2 Cal Offset:	0.893977	1.334457

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	-0.4	0.4	----	----
High point	4933	66.7	803.1	800.4	2.7	800.7	797.4	2.9	1.0030	1.0038
Mid point	4967	33.3	400.9	399.6	1.3	399.0	397.7	1.3	1.0048	1.0047
Low point	4983	16.7	201.1	200.4	0.7	198.8	197.5	2.3	1.0114	1.0147
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.2	0.2	----	----
As left span	4933	66.7	803.1	383.5	419.6	797.8	383.5	414.2	1.0067	1.0000
							Average Correction Factor		1.0064	1.0077

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.4	----	----
High GPT point	796.2	377.8	421.1	425.1	0.9905	101.0%
Mid GPT point	796.2	589.9	209.0	211.8	0.9866	101.4%
Low GPT point	796.2	693.5	105.4	108.7	0.9693	103.2%
				Average Correction Factor	0.9822	101.8%

Notes: Changed inlet filter after as founds. Made adjustments to span high point.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur

Wood Buffalo Environmental Association

NO_X Calibration Summary

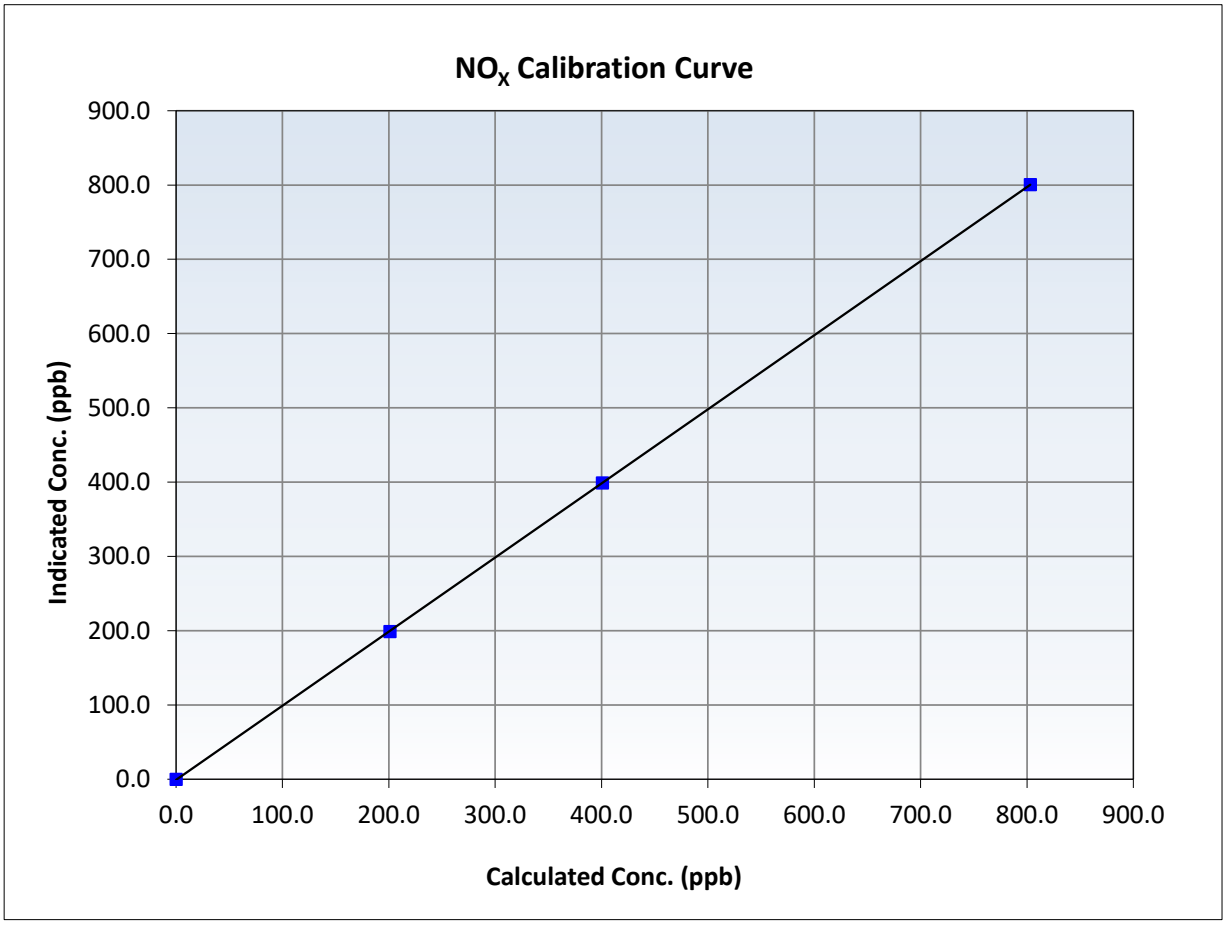
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 16, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:55	End Time (MST):	13:17
Analyzer make:	Teledyne API T200	Analyzer serial #:	4460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
803.1	800.7	1.0030
400.9	399.0	1.0048
201.1	198.8	1.0114

Statistical Evaluation		Limits
Correlation Coefficient	0.999995	≥0.995
Slope	0.997601	0.90 - 1.10
Intercept	-0.805395	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

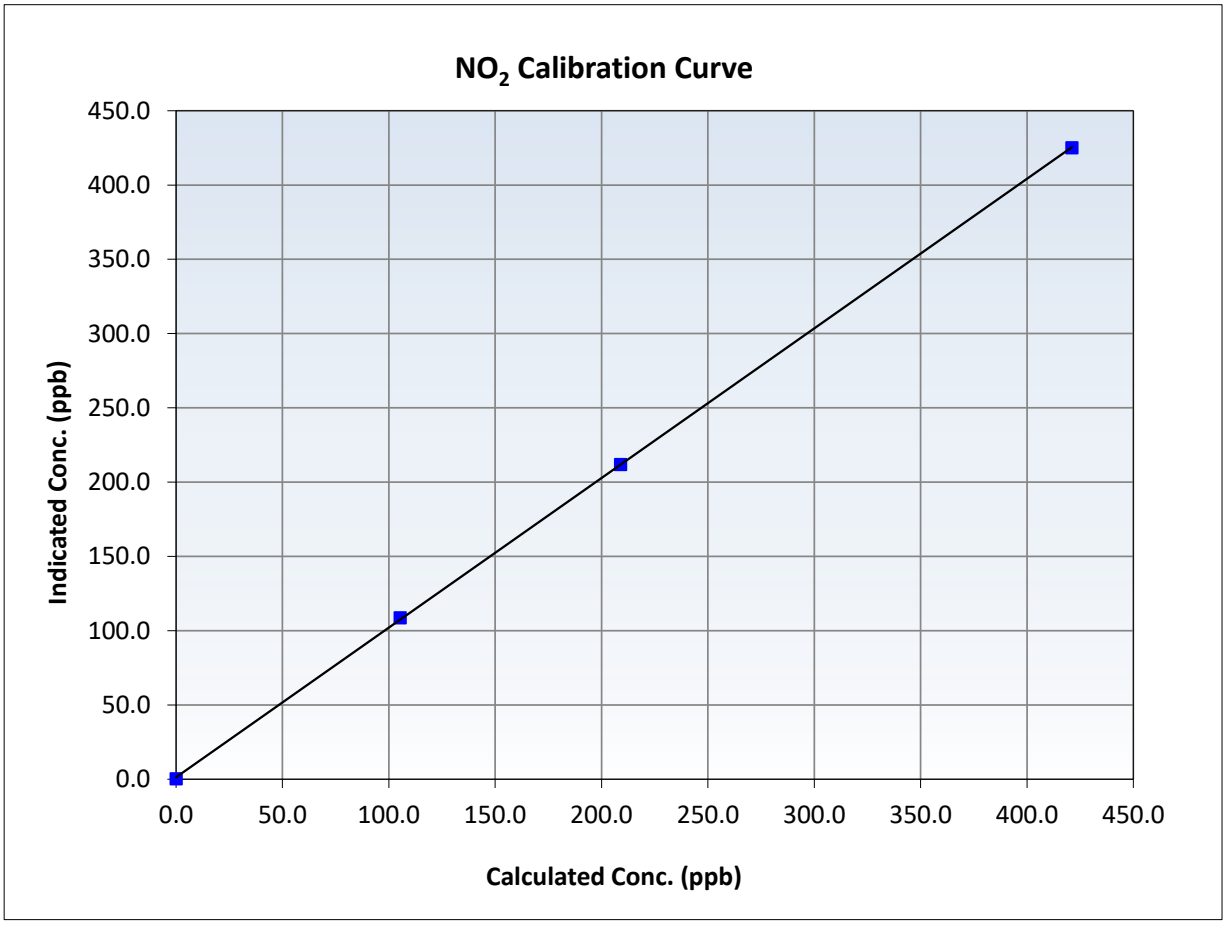
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 16, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:55	End Time (MST):	13:17
Analyzer make:	Teledyne API T200	Analyzer serial #:	4460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
421.1	425.1	0.9905
209.0	211.8	0.9866
105.4	108.7	0.9693

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999974	*≥0.995*
Slope	1.007149	*0.90 - 1.10*
Intercept	1.334457	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

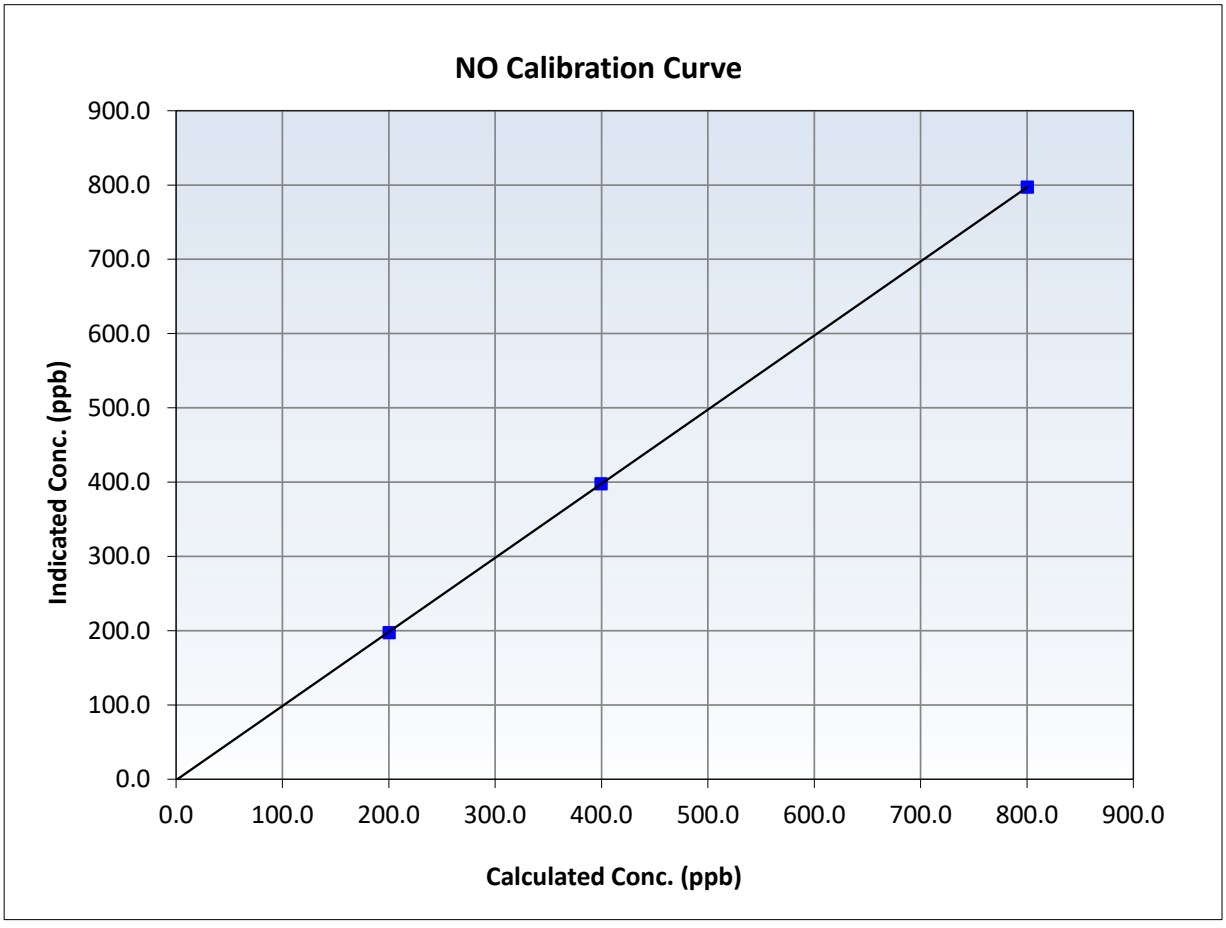
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 16, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:55	End Time (MST):	13:17
Analyzer make:	Teledyne API T200	Analyzer serial #:	4460

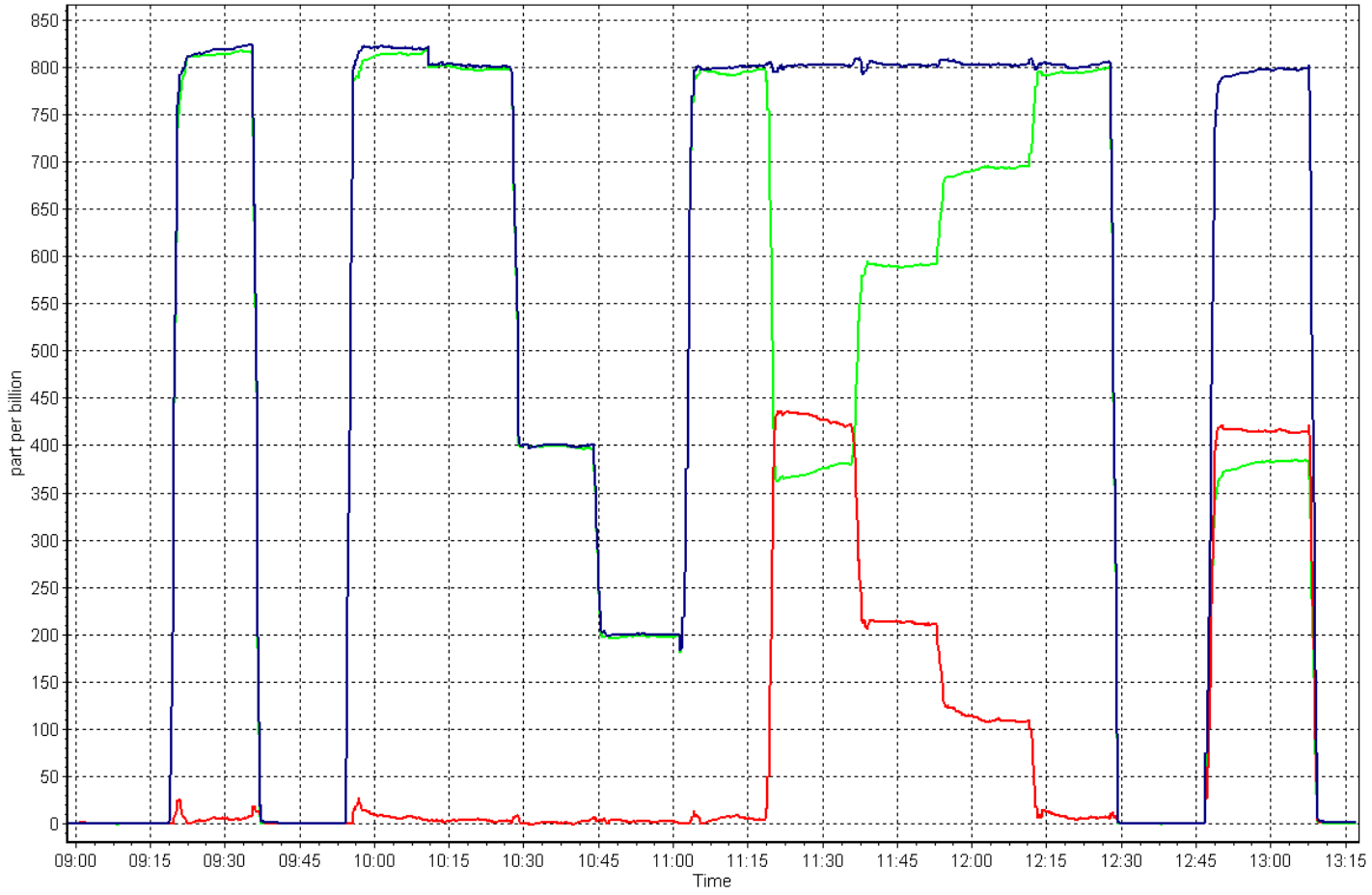
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
800.4	797.4	1.0038
399.6	397.7	1.0047
200.4	197.5	1.0147

Statistical Evaluation		Limits
Correlation Coefficient	0.999994	≥0.995
Slope	0.997455	0.90 - 1.10
Intercept	-1.165086	+/-20



NO_X Calibration Plot Date: December 12, 2024 Location: Fort Chipewyan



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	December 10, 2024	Last Cal Date:	November 5, 2024
Start time (MST):	8:42	End time (MST):	11:22
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	3810
ZAG Make/Model:	Teledyne API T701	Serial Number:	135

Analyzer Information

Analyzer make:	Teledyne API T400		Analyzer serial #:	3872	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.987743	0.979971	Backgd or Offset:	-2.2	-2.2
Calibration intercept:	1.220000	1.480000	Coeff or Slope:	0.982	0.982

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.9	----
As found High point	5000	913.0	400.0	394.6	1.016
As found Mid point					
As found Low point					
Baseline Corr As found:	393.7	Previous response	396.3	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	1.3	----
High point	5000	914.7	400.0	393.3	1.017
Mid point	5000	786.4	200.0	197.8	1.011
Low point	5000	701.3	100.0	99.5	1.005
As left zero	5000	0.0	0.0	1.3	----
As left span	5000	914.7	400.0	393.3	1.017
				Average Correction Factor	1.011

Notes: Changed out inlet filter after as found. No adjustments made.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur

Wood Buffalo Environmental Association

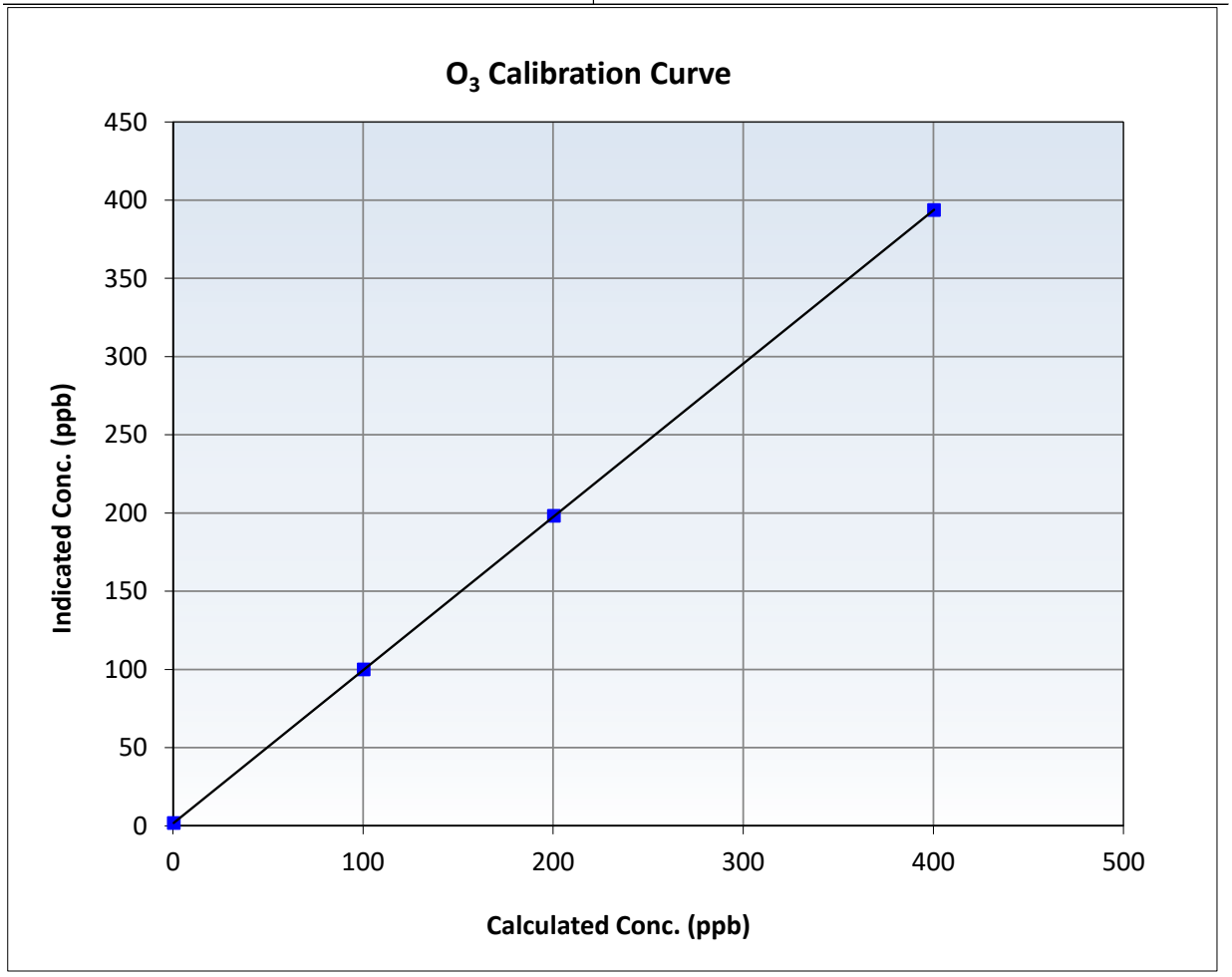
O_3 Calibration Summary

Station Information

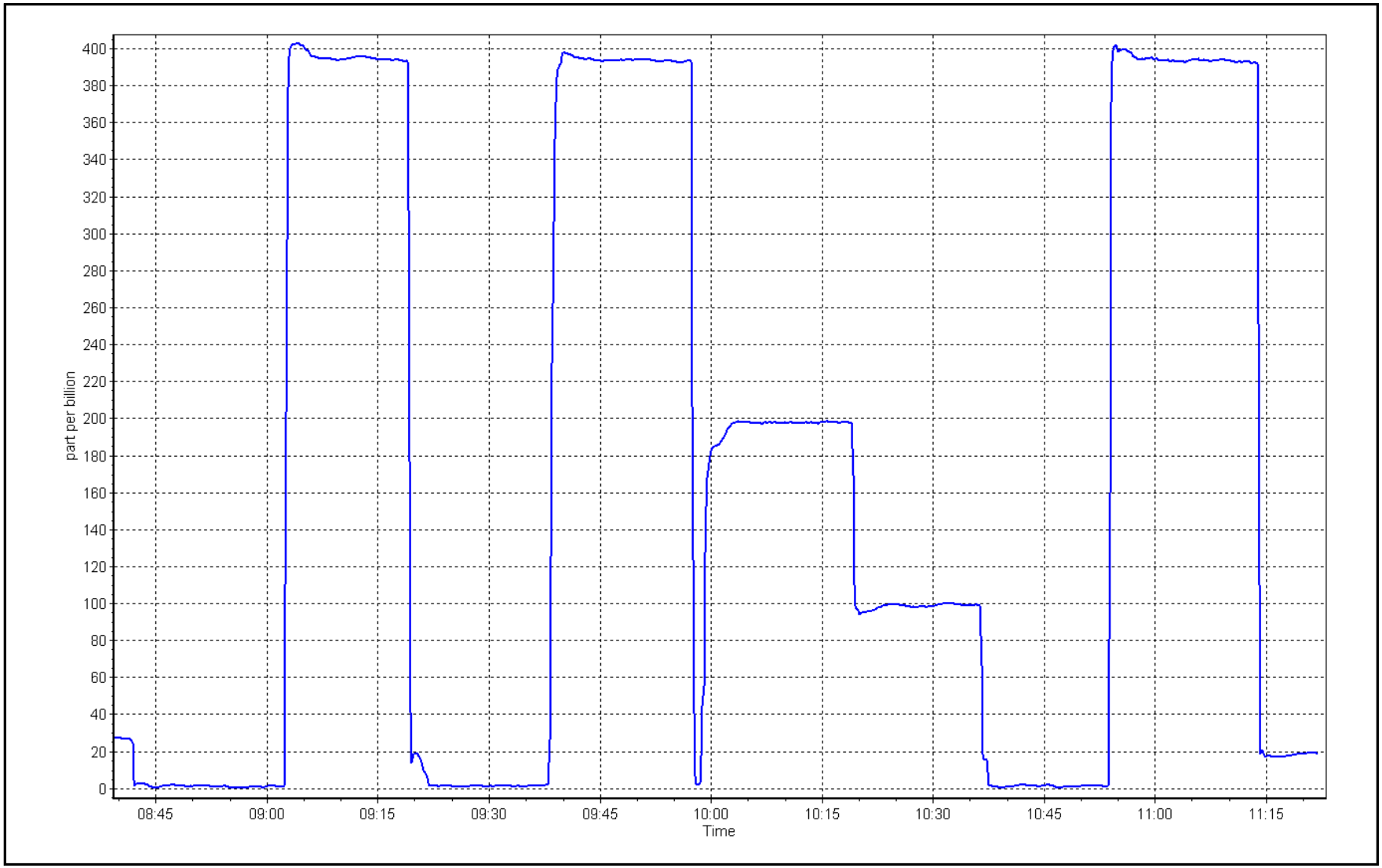
Calibration Date:	December 10, 2024	Previous Calibration:	November 5, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:42	End Time (MST):	11:22
Analyzer make:	Teledyne API T400	Analyzer serial #:	3872

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	1.3	----	Correlation Coefficient	0.999998	≥0.995
400.0	393.3	1.0170	Slope	0.979971	0.90 - 1.10
200.0	197.8	1.0111			
100.0	99.5	1.0050	Intercept	1.480000	+/- 5



O_3 Calibration Plot Date: December 10, 2024 Location: Fort Chipewyan



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	December 10, 2024	Last Cal Date:	October 22, 2024
Start time (MST):	11:15	End time (MST):	11:45
Analyzer Make:	Teledyne API T640	S/N:	319
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	14719
Temp/RH standard:	Alicat FP-25BT	S/N:	14719

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-22.10	-23.9	-22.10	☐	+/- 2 °C
P (mmHg)	751.90	753.6	751.90	☐	+/- 10 mmHg
Flow (LPM)	5.00	4.97	5.00	☐	+/- 0.25 LPM
PW% (pump)	42%		39%	☐	>80%
Zero Verification	PM w/o HEPA:	4.40	PM w/ HEPA:	0.00	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☐ Alignment Factor On : ☐

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: 10-Jun-24 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	11.00	11.00	11.00	☐	+/- 0.5

Date Optical Chamber Cleaned: September 18, 2024

Date Disposable Filter Changed: September 18, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0.00 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: August 29, 2024

Date RH/T Sensor Cleaned: August 29, 2024

Notes: No adjustment made

Calibration by: Morgan Voyageur, Sabian Voyageur

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	December 10, 2024	Last Cal Date:	November 5, 2024
Start time (MST):	11:25	End time (MST):	14:01
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	3,030	ppm	Cal Gas Exp Date:	December 1, 2028
Cal Gas Cylinder #:	ALM014846			
Removed Cal Gas Conc:	3,030	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3810
ZAG Make/Model:	Teledyne API T701H		Serial Number:	135

Analyzer Information

Analyzer make:	Teledyne API T300		Analyzer serial #:	3505	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.008286	1.005457	Backgd or Offset:	-0.015	-0.015
Calibration intercept:	-0.085114	0.234888	Coeff or Slope:	1.005	1.005

CO As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4934	66.7	40.4	40.9	0.994
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	40.67	Prev response:	40.66	*% change:	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4934	66.7	40.4	40.8	0.990
Mid point	4966.7	33.3	20.2	20.6	0.980
Low point	4983.3	16.7	10.1	10.4	0.969
As left zero	5000	0.0	0.0	0.2	----
As left span	2960	40.0	40.4	40.8	0.989
				Average Correction Factor	0.980

Notes: Changed inlet filter after as found. No adjustments made

Calibration Performed By: Morgan Voyageur, Sabian Voyageur.

Wood Buffalo Environmental Association

CO Calibration Summary

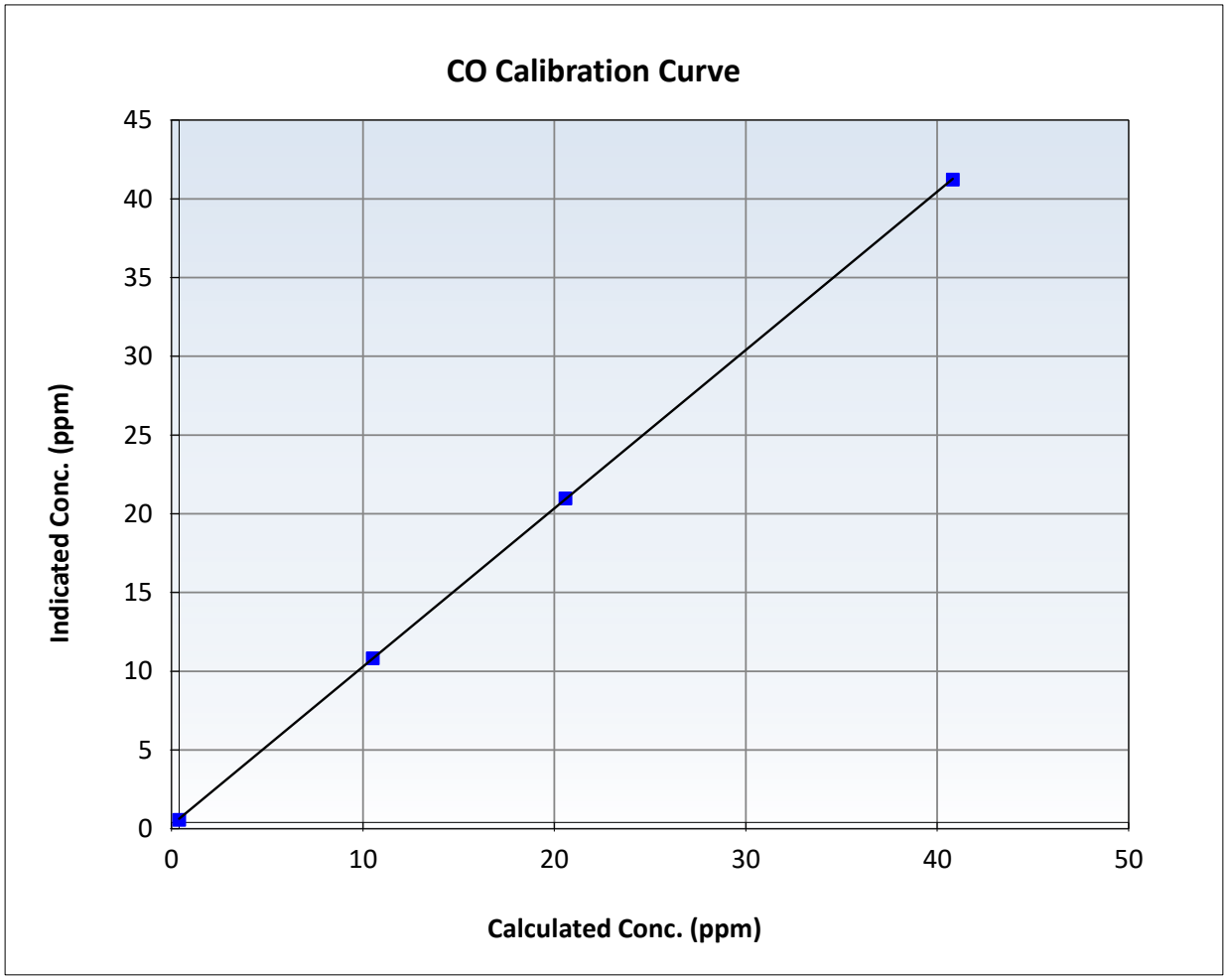
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 5, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	11:25	End Time (MST):	14:01
Analyzer make:	Teledyne API T300	Analyzer serial #:	3505

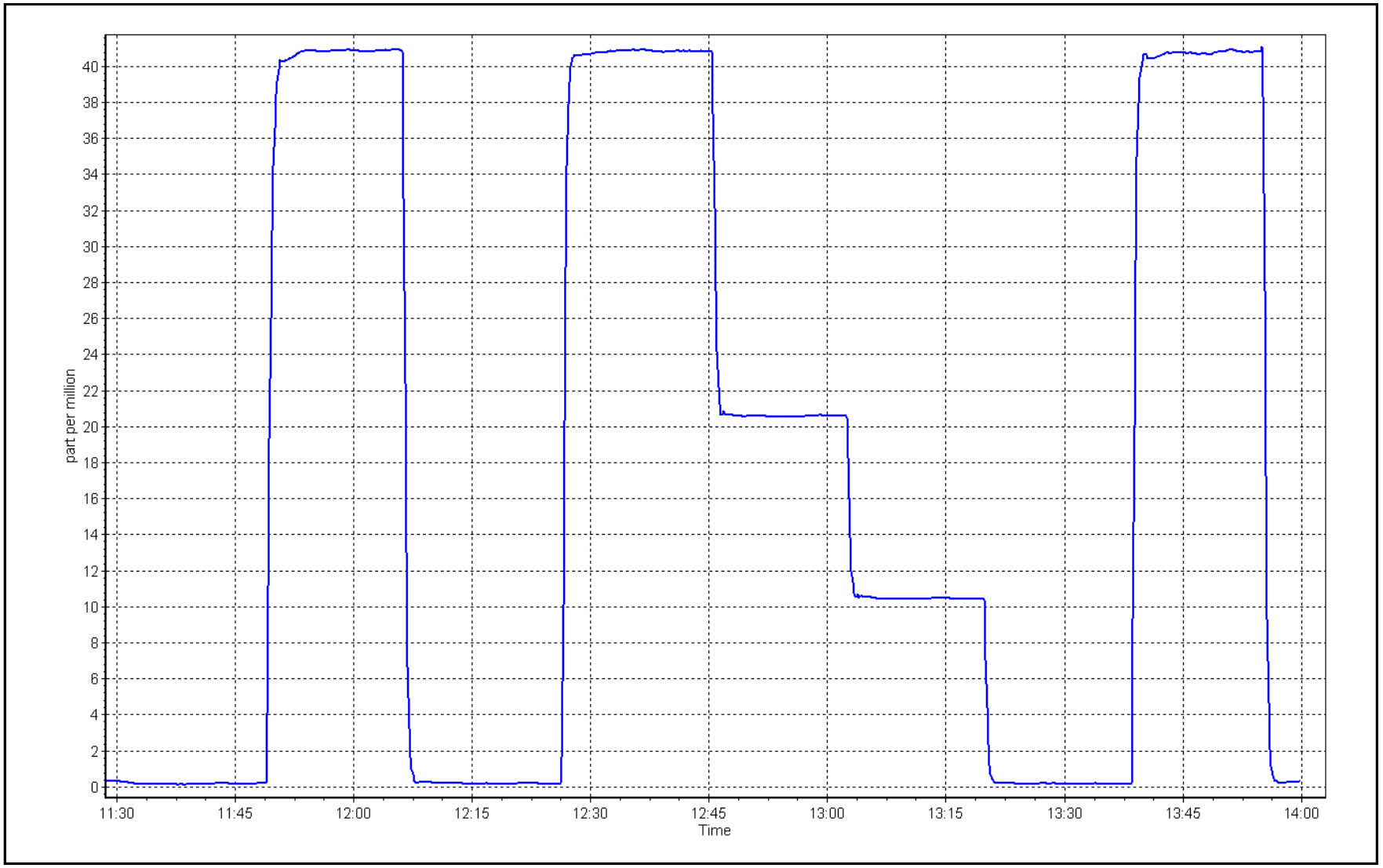
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
40.4	40.8	0.9898
20.2	20.6	0.9801
10.1	10.4	0.9694

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999989	*≥0.995*
Slope	1.005457	*0.90 - 1.10*
Intercept	0.234888	*+/-1.5*



CO Calibration Plot Date: December 10, 2024 Location: Fort Chipewyan



Wood Buffalo Environmental Association

CO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	December 10, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	14:08	End time (MST):	16:51
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	60,220	ppm	Cal Gas Exp Date:	December 1, 2028
Cal Gas Cylinder #:	ALM014846			
Removed Cal Gas Conc:	60,220	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3810
N2 Gen Make/Model:	Peak Scientific		Serial Number:	135

Analyzer Information

Analyzer make:	Teledyne API T360		Analyzer serial #:	289	
Analyzer Range	0 - 2,000 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.008701	1.003841	Backgd or Offset:	-0.016	-0.016
Calibration intercept:	-6.680000	-7.440000	Coeff or Slope:	1.034	1.034

CO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	3000	0.0	0.0	0.2	----
As found High Point	2920	80.0	1605.9	1614.0	0.995
As found Mid Point					
As found Low Point					
New cylinder response					

Baseline Corr As found:	1613.8	Prev response:	1613.2	*% change:	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	3000	0.0	0.0	0.5	----
High point	2920	80.0	1605.9	1612.7	0.996
Mid point	2960	40.0	802.9	782.2	1.027
Low point	2980	20.0	401.5	395.9	1.014
As left zero	3000	0.0	0.0	-0.1	----
As left span	2960	40.0	802.9	778.5	1.031
				Average Correction Factor	1.012

Notes: Changed inlet filter after as found, No adjustments made.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur

Wood Buffalo Environmental Association

CO_2 Calibration Summary

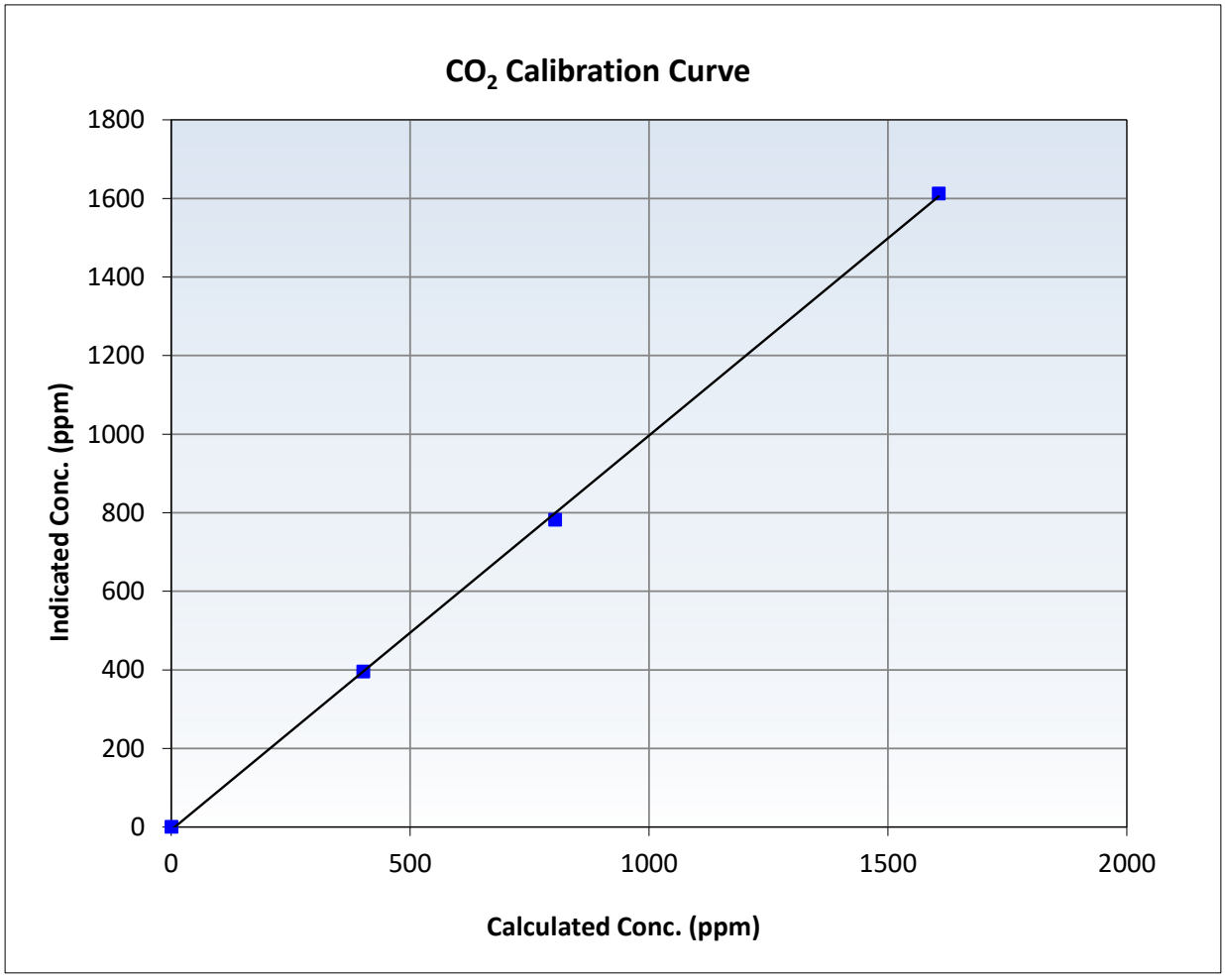
Station Information

Calibration Date	December 10, 2024	Previous Calibration	November 18, 2024
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	14:08	End Time (MST)	16:51
Analyzer make	Teledyne API T360	Analyzer serial #	289

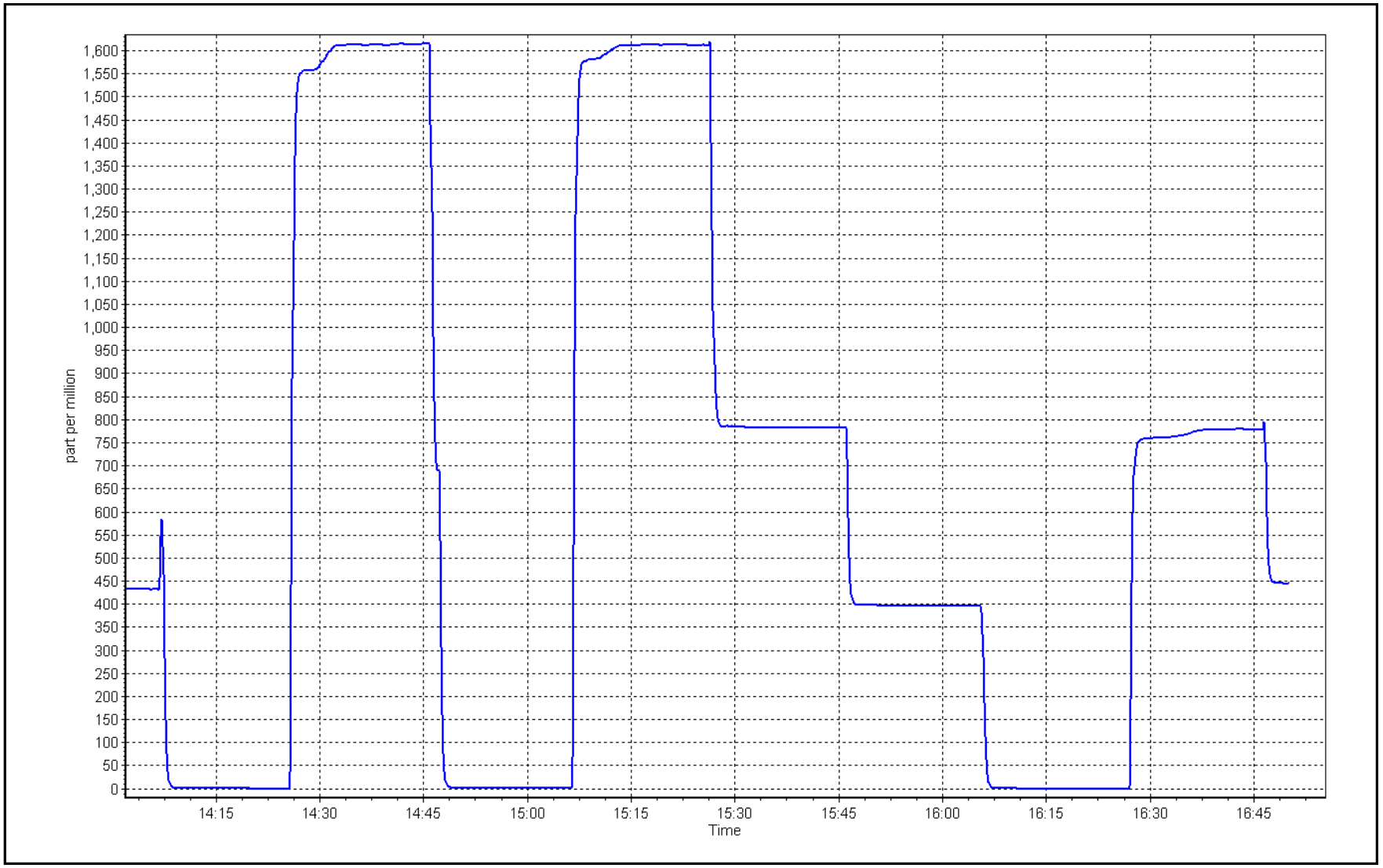
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
1605.9	1612.7	0.9958
802.9	782.2	1.0265
401.5	395.9	1.0141

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999721	*≥0.995*
Slope	1.003841	*0.90 - 1.10*
Intercept	-7.4	*+/-20*



CO_2 Calibration Plot Date: December 10, 2024 Location: Fort Chipewyan



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS09
BARGE LANDING
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	December 3, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	10:05	End time (MST):	13:05
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.96	ppm	Cal Gas Exp Date:	January 5, 2025
Cal Gas Cylinder #:	CC151285			
Removed Cal Gas Conc:	49.96	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3812
Zero Air Gen Model:	APIT701		Serial Number:	4888

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1118148498	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994978	1.002005	Backgd or Offset:	10.9	10.9
Calibration intercept:	0.085896	0.047698	Coeff or Slope:	0.963	0.963

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4919	80.2	801.5	802.6	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	802.8	Previous response	797.5	*% change	0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4919	80.2	801.5	803.5	0.997
Mid point	4960	40.1	400.7	400.6	1.000
Low point	4980	20.0	199.8	200.7	0.996
As left zero	5000	0.0	0.0	-0.1	----
As left span	4919	80.2	801.5	803.0	0.998
				Average Correction Factor:	0.998

Notes: Inlet filter changed after as founds.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

SO_2 Calibration Summary

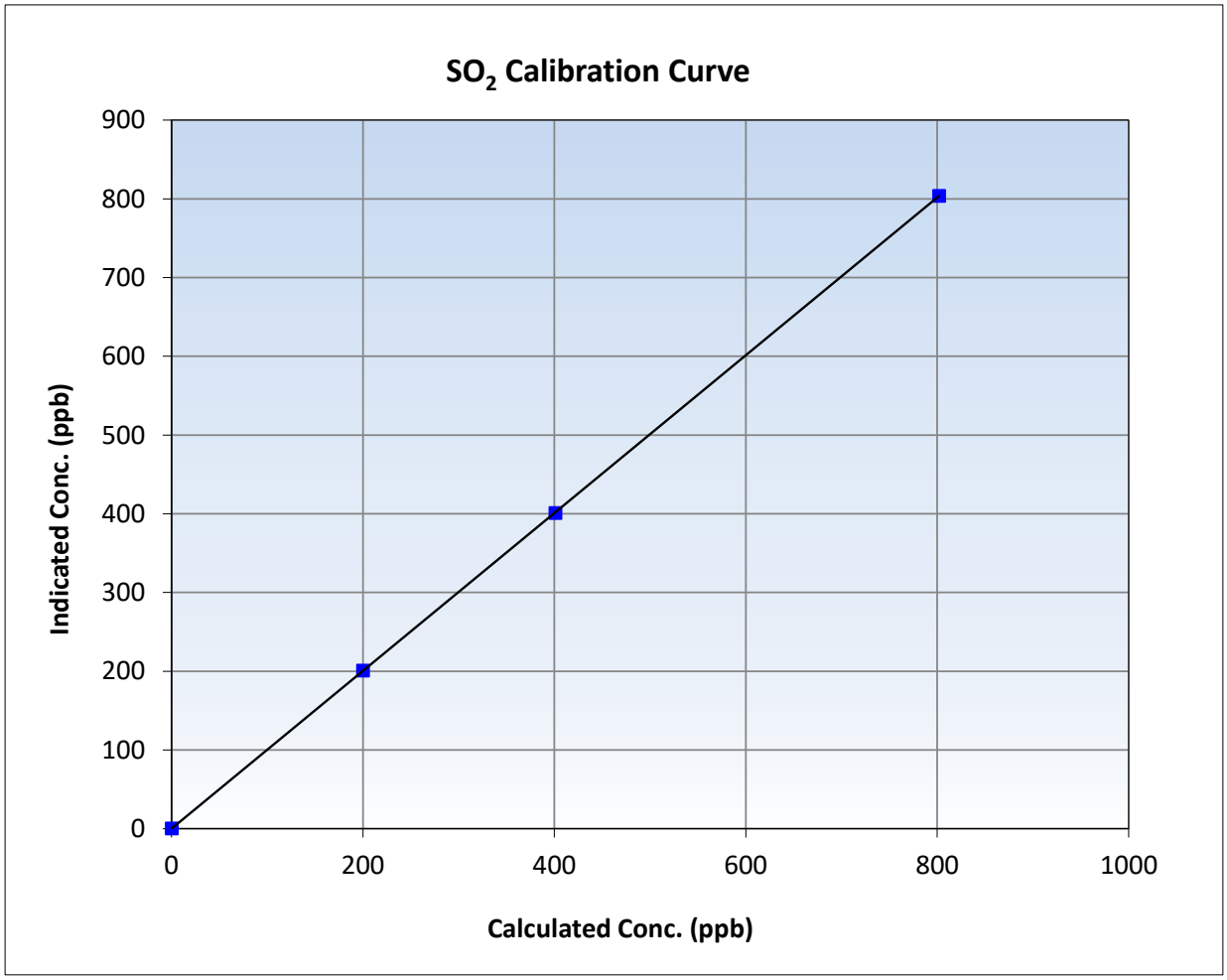
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 7, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	13:05
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148498

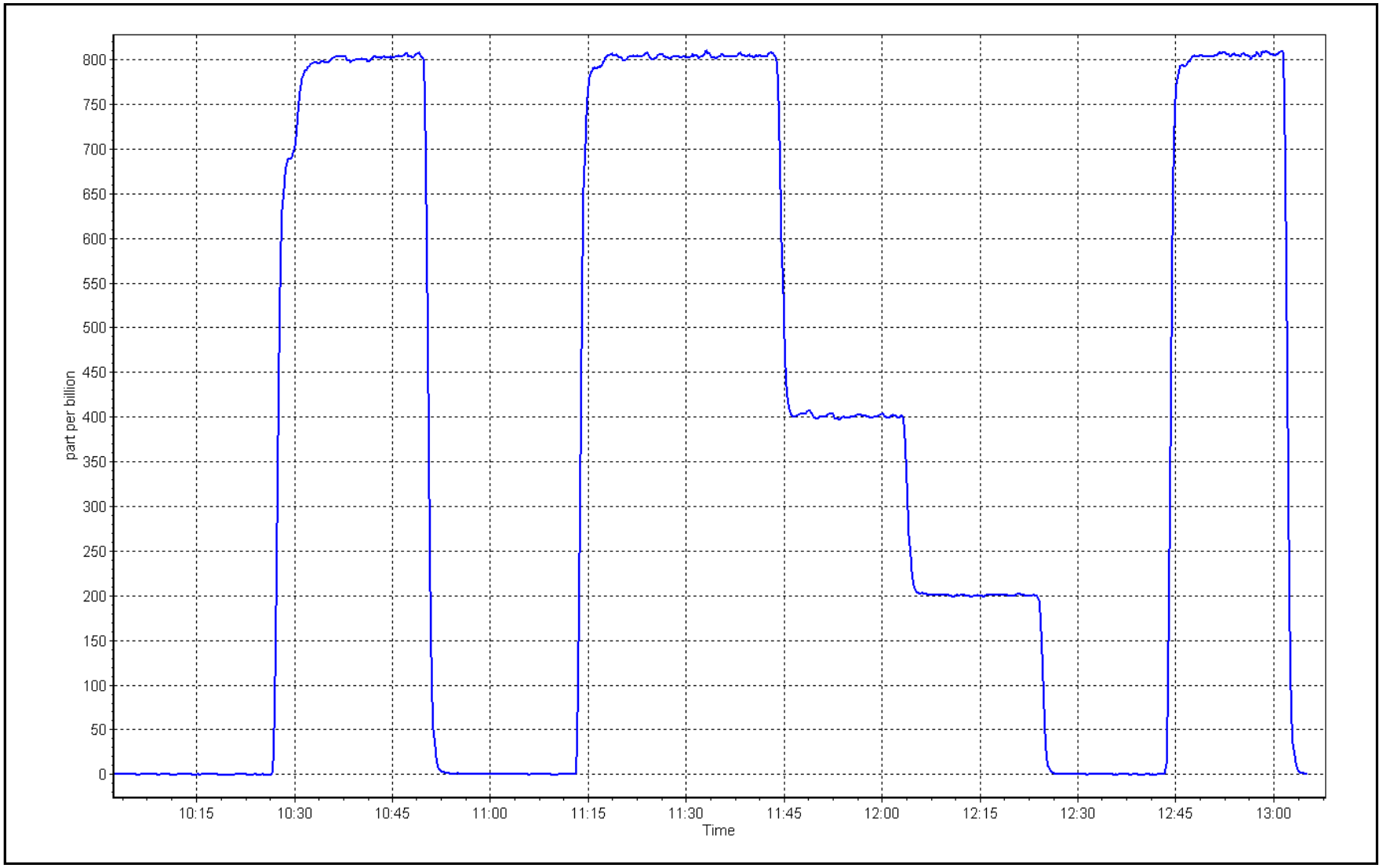
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
801.5	803.5	0.9975
400.7	400.6	1.0002
199.8	200.7	0.9957

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	1.002005	*0.90 - 1.10*
Intercept	0.047698	*+/-30*



SO2 Calibration Plot Date: December 3, 2024 Location: Barge Landing



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	December 5, 2024	Last Cal Date:	November 12, 2024
Start time (MST):	9:55	End time (MST):	14:25
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.17	ppm	Cal Gas Exp Date:	August 22, 2026
Cal Gas Cylinder #:	CC511415			
Removed Cal Gas Conc:	5.17	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3812
ZAG Make/Model:	API T701		Serial Number:	4888

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1331259320
Converter make:	CDN-101		Converter serial #:	519
Analyzer Range	0 - 100 ppb		Converter Temp:	830 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.001976	1.001834	Backgd or Offset:	2.860	2.880
Calibration intercept:	0.099442	0.179444	Coeff or Slope:	1.182	1.182

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4923	77.4	80.0	80.0	1.002
As found Mid point	4961	38.7	40.0	40.2	0.998
As found Low point	4981	19.3	20.0	20.1	0.998
New cylinder response					

Baseline Corr As found:	79.9	Prev response:	80.30	*% change:	-0.5%
Baseline Corr 2nd AF pt:	40.1	AF Slope:	0.998122	AF Intercept:	0.159370
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999996	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4923	77.4	80.0	80.3	0.997
Mid point	4961	38.7	40.0	40.4	0.991
Low point	4981	19.3	20.0	20.2	0.988
As left zero	5000	0.0	0.0	0.1	----
As left span	4923	77.4	80.0	80.6	0.993
SO2 Scrubber Check	4920	80.2	802.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	0.992
Date of last converter efficiency test:					

Notes: Sample inlet filter changed after multipoint as founds. SO2 scrubber check completed after calibrator zero. No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

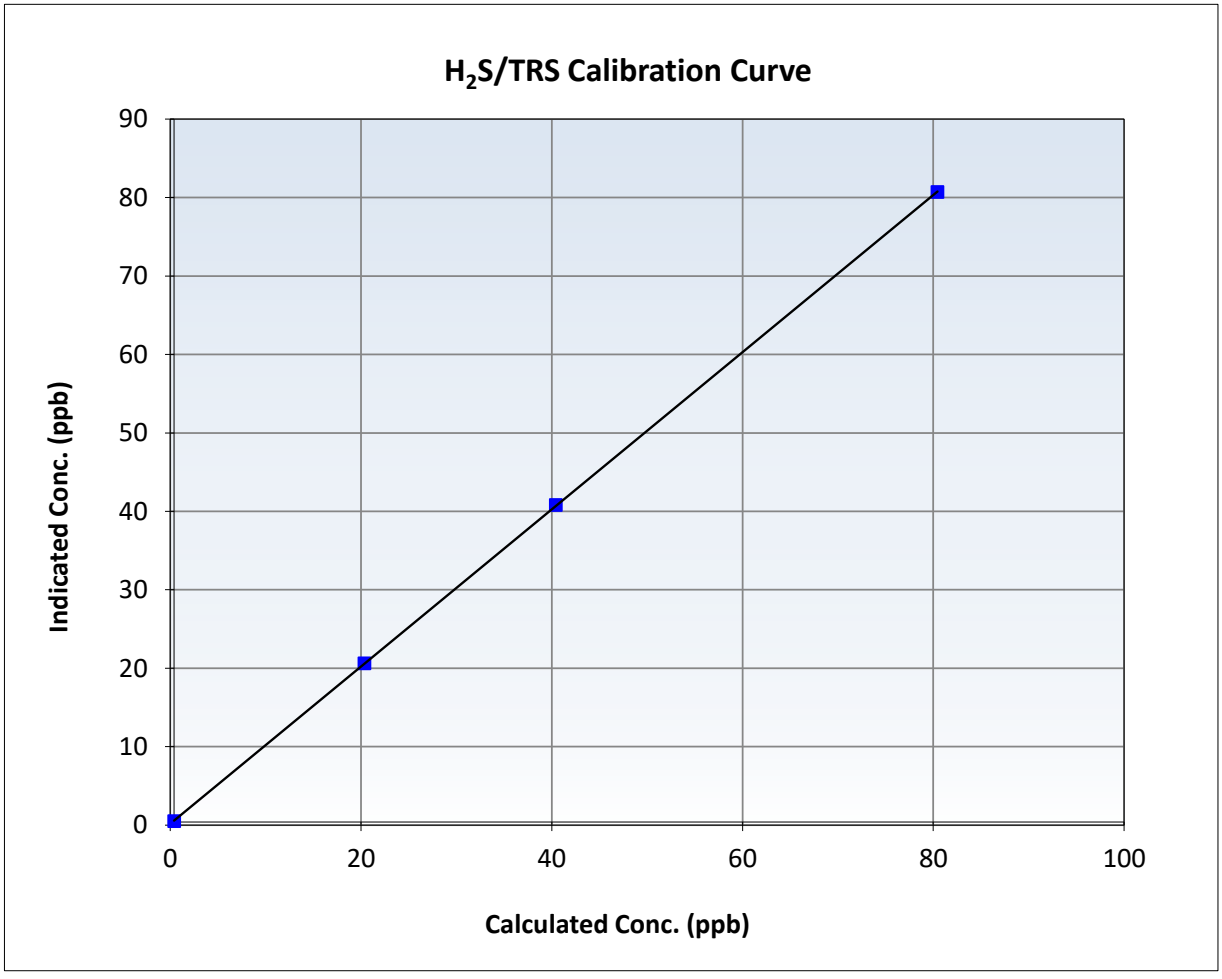
TRS Calibration Summary

Station Information

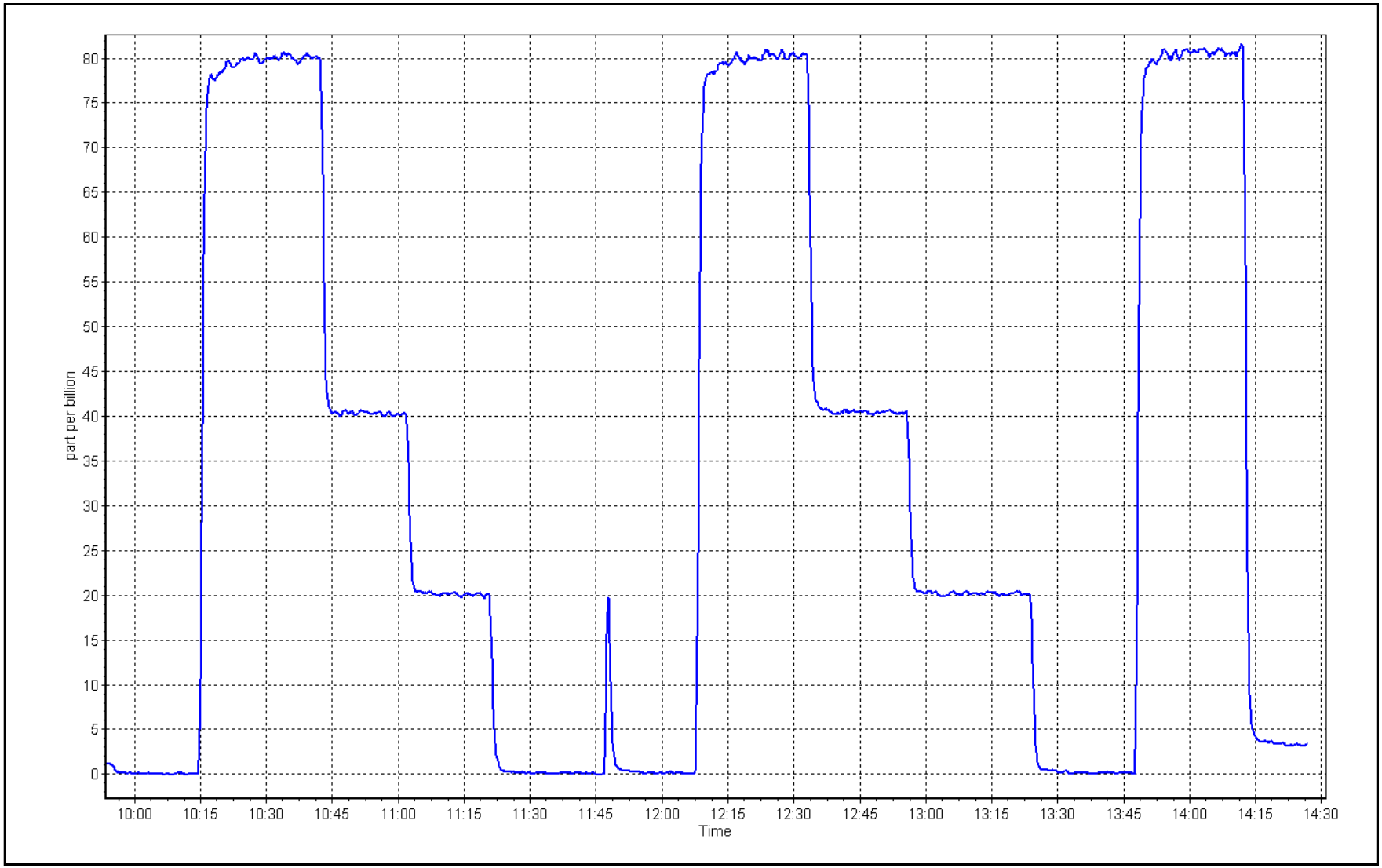
Calibration Date:	December 5, 2024	Previous Calibration:	November 12, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	9:55	End Time (MST):	14:25
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1331259320

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999993	*≥0.995*
80.0	80.3	0.9968	Slope	1.001834	*0.90 - 1.10*
40.0	40.4	0.9907			
20.0	20.2	0.9881	Intercept	0.179444	*+/-3*



TRS Calibration Plot Date: December 5, 2024 Location: Barge Landing



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	December 3, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	10:05	End time (MST):	13:05
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC151285	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	497.6 ppm	CH4 Equiv Conc.	1067.1 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	
Removed CH4 Conc.	497.6 ppm	CH4 Equiv Conc.	1067.1 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3812
Zero Air Gen model:	APIT701	Serial Number:	4888

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.29E-04	2.41E-04	NMHC SP Ratio:	5.49E-05	5.82E-05
CH4 Retention time:	14.0	14.0	NMHC Peak Area:	166530	157157
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4919	80.2	17.12	16.15	1.062
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.13	Prev response	17.25	*% change	-7.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	17.12	17.09	1.002
Mid point	4960	40.1	8.56	8.50	1.007
Low point	4980	20.0	4.27	4.27	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	17.12	17.09	1.002
				Average Correction Factor	1.002

Notes: Changed the inlet filter after as founds. Span adjusted

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4919	80.2	9.14	8.56	1.067
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.56	Prev response	9.21	*% change	-7.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	9.14	9.13	1.001
Mid point	4960	40.1	4.57	4.52	1.010
Low point	4980	20.0	2.28	2.28	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	9.14	9.15	0.999
				Average Correction Factor	1.004

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4919	80.2	7.98	7.59	1.056
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.56	Prev response	8.04	*% change	-6.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	7.98	7.96	1.002
Mid point	4960	40.1	3.99	3.98	1.003
Low point	4980	20.0	1.99	2.00	0.997
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	7.98	7.94	1.006
				Average Correction Factor	1.001

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.004139	0.997813
THC Cal Offset:	0.055488	-0.004153
CH4 Cal Slope:	1.002924	0.997172
CH4 Cal Offset:	0.029078	0.003659
NMHC Cal Slope:	1.004963	0.998236
NMHC Cal Offset:	0.026610	-0.007012

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

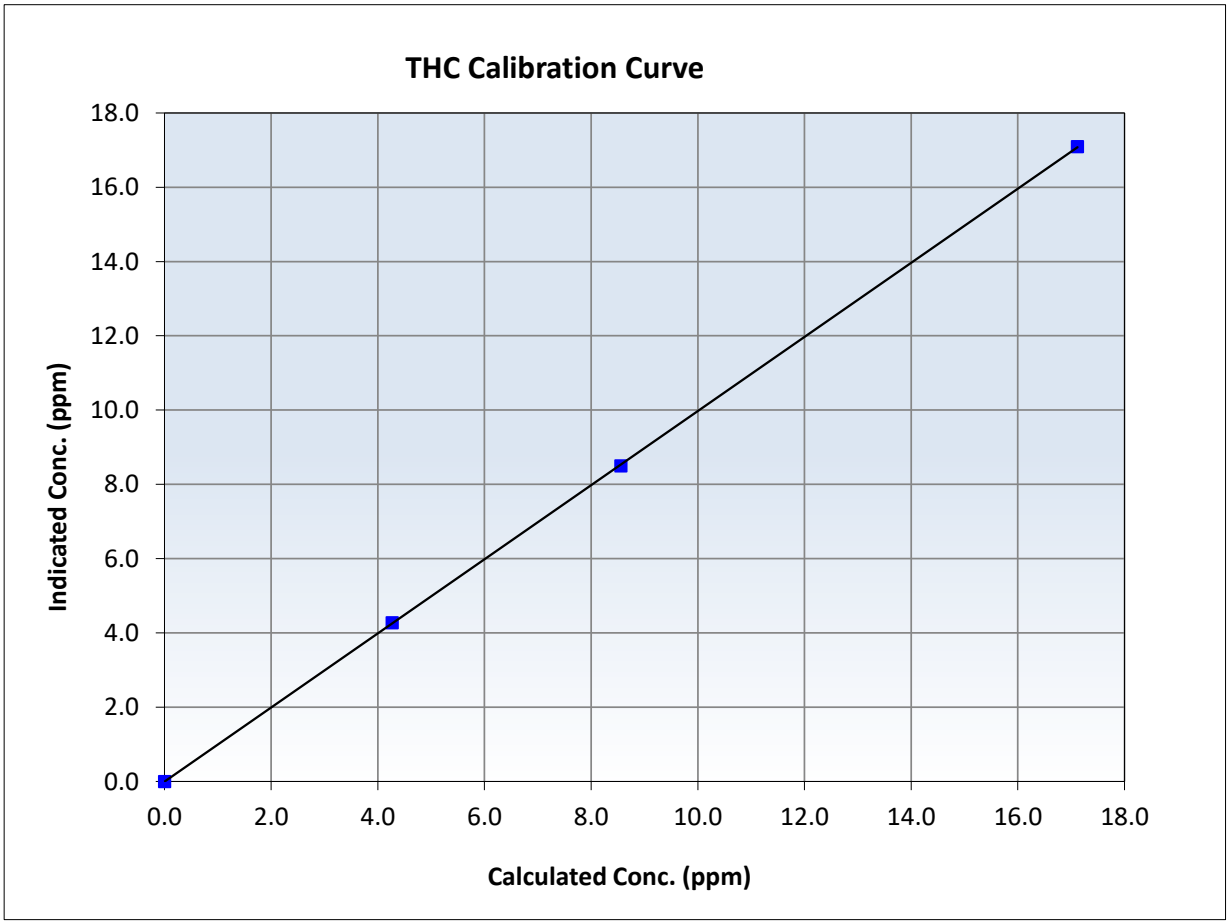
THC Calibration Summary

Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 7, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	13:05
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999989	≥0.995
17.12	17.09	1.0017	Slope	0.997813	0.90 - 1.10
8.56	8.50	1.0068	Intercept	-0.004153	+/-0.5
4.27	4.27	0.9989			



Wood Buffalo Environmental Association

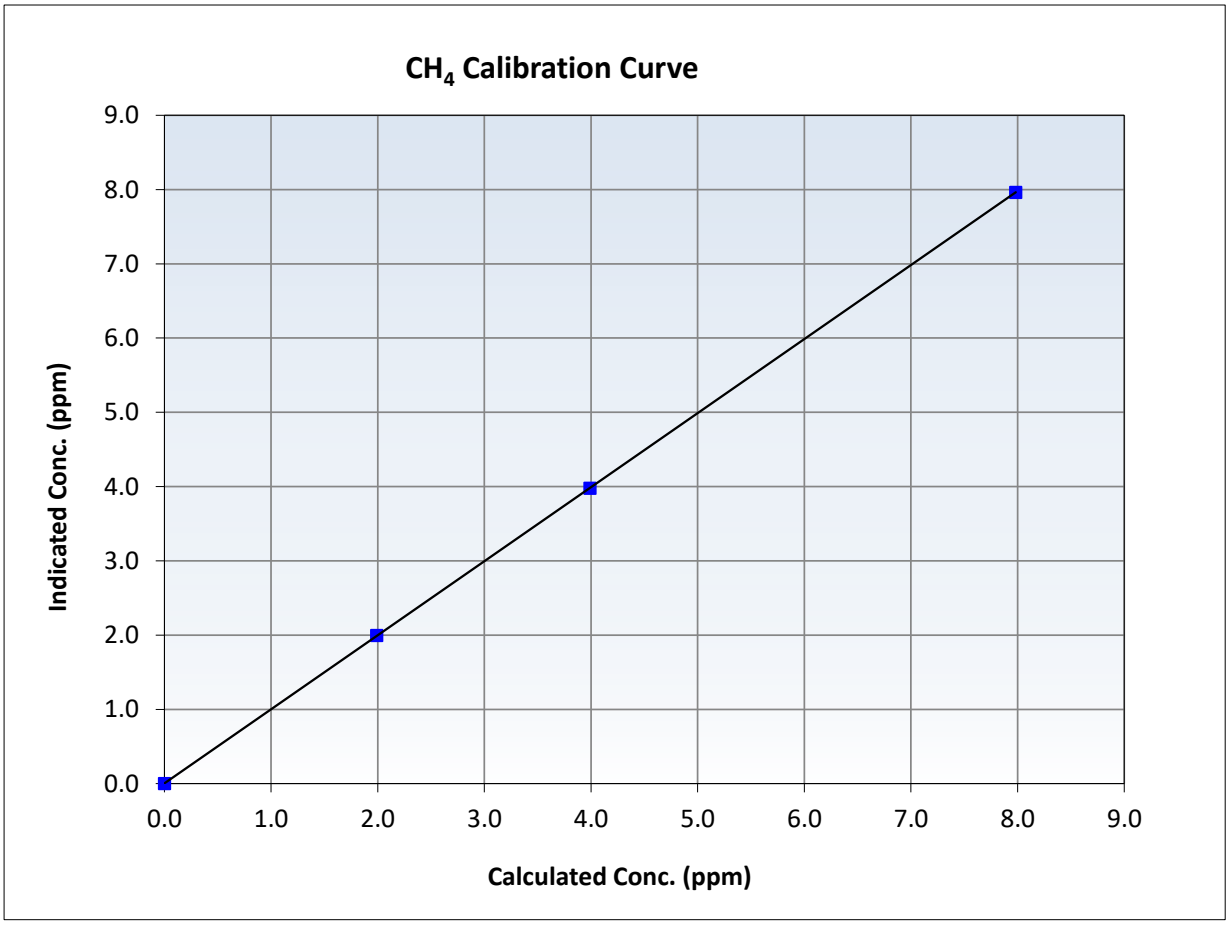
CH_4 Calibration Summary

Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 7, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	13:05
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999997	*≥0.995*
7.98	7.96	1.0024	Slope	0.997172	*0.90 - 1.10*
3.99	3.98	1.0029			
1.99	2.00	0.9972	Intercept	0.003659	*+/-0.5*



Wood Buffalo Environmental Association

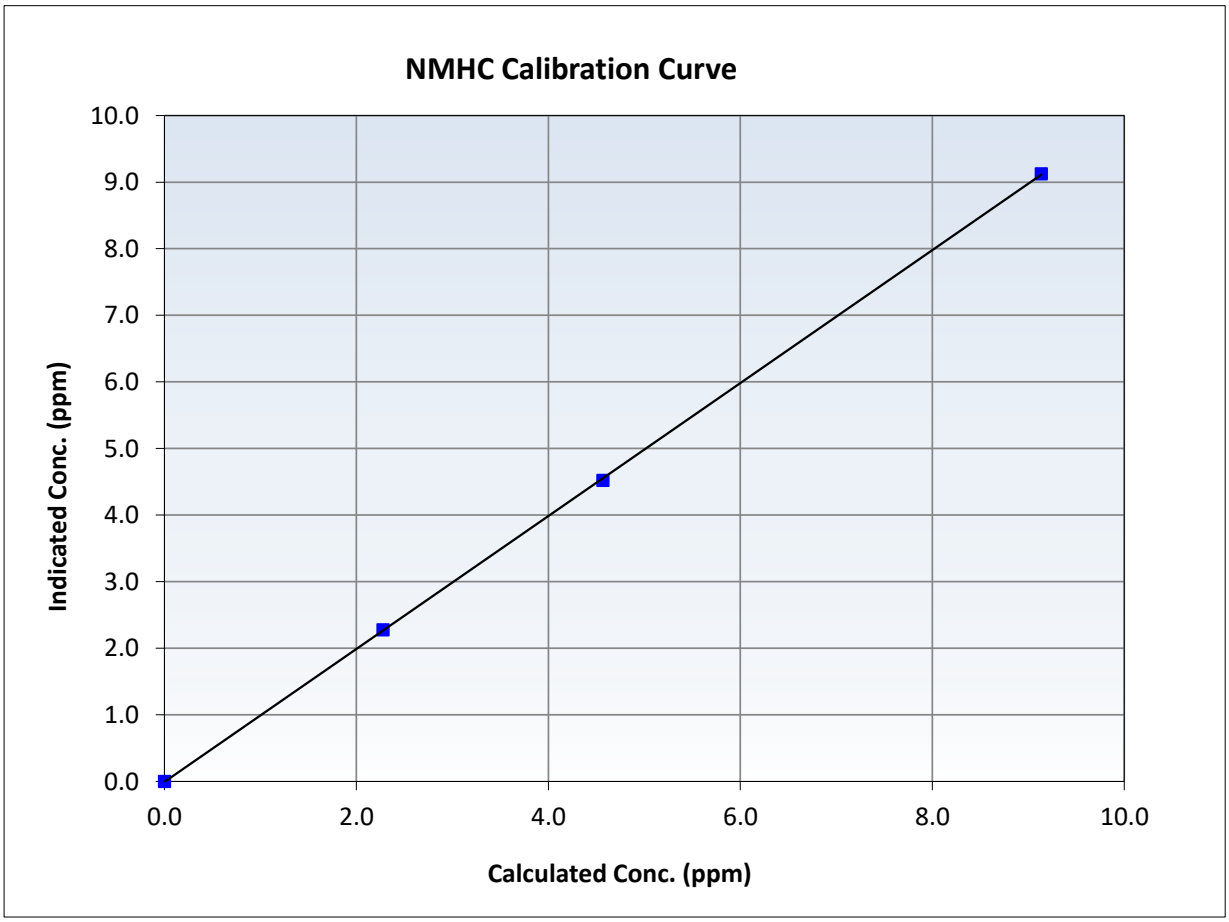
NMHC Calibration Summary

Station Information

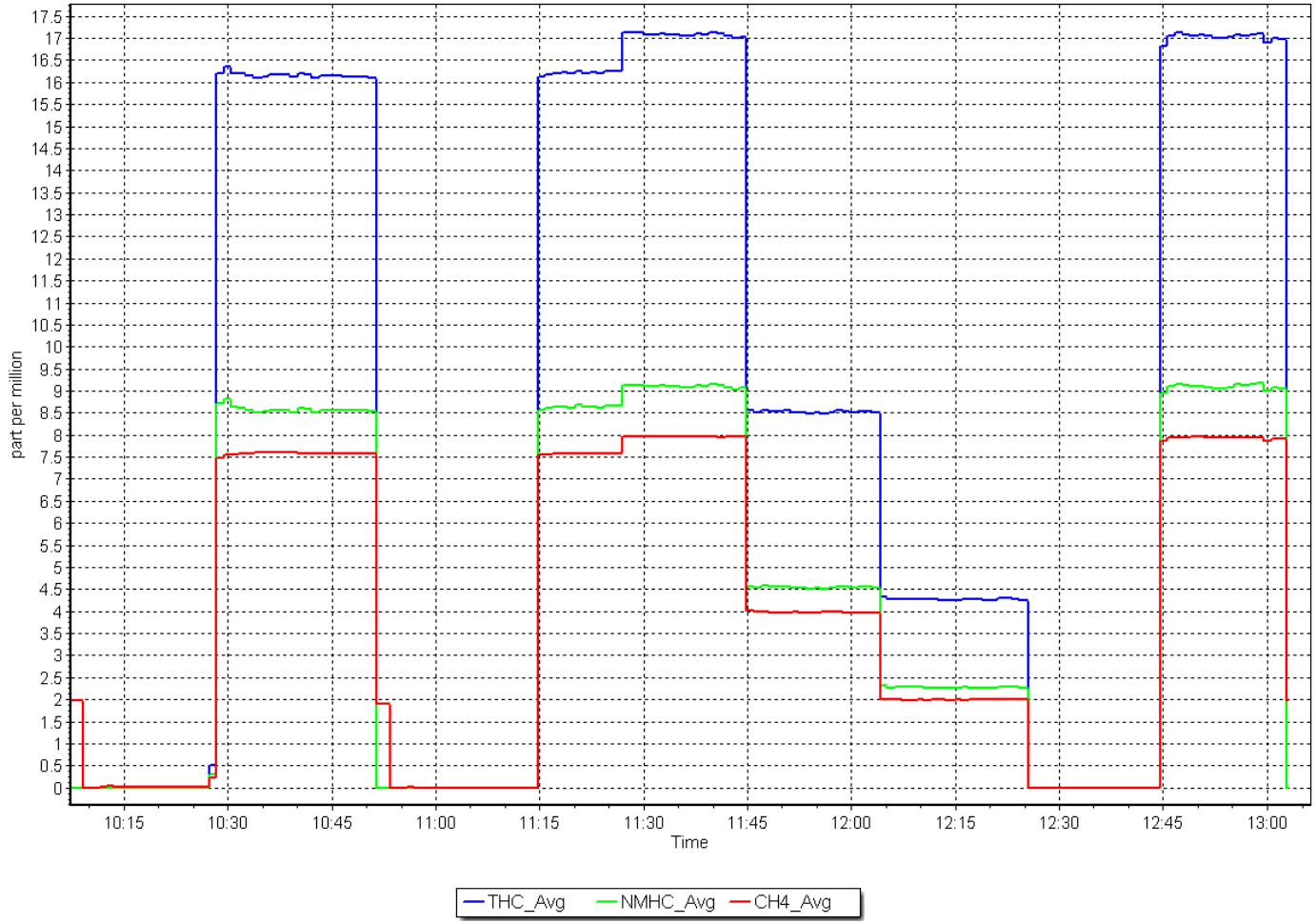
Calibration Date:	December 3, 2024	Previous Calibration:	November 7, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	13:05
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999973	≥0.995
9.14	9.13	1.0012	Slope	0.998236	0.90 - 1.10
4.57	4.52	1.0101	Intercept	-0.007012	+/-0.5
2.28	2.28	1.0000			



NMHC Calibration Plot Date: December 3, 2024 Location: Barge Landing



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	December 23, 2024	Last Cal Date:	December 3, 2024
Start time (MST):	10:15	End time (MST):	12:00
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC151285	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	497.6 ppm	CH4 Equiv Conc.	1067.1 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	
Removed CH4 Conc.	497.6 ppm	CH4 Equiv Conc.	1067.1 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3812
Zero Air Gen model:	APIT701	Serial Number:	4888

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.41E-04	2.41E-04	NMHC SP Ratio:	5.82E-05	5.82E-05
CH4 Retention time:	14.0	14.0	NMHC Peak Area:	157157	157157
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4919	80.2	17.12	16.06	1.068
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.03	Prev response	17.08	*% change	-6.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	17.12	15.96	1.073
				Average Correction Factor	

Notes: N2 Cylinder Change

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4919	80.2	9.14	8.58	1.064
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.58	Prev response	9.11	*% change	-6.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	9.14	8.52	1.073
				Average Correction Factor	

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4919	80.2	7.98	7.47	1.072
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.45	Prev response	7.96	*% change	-6.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

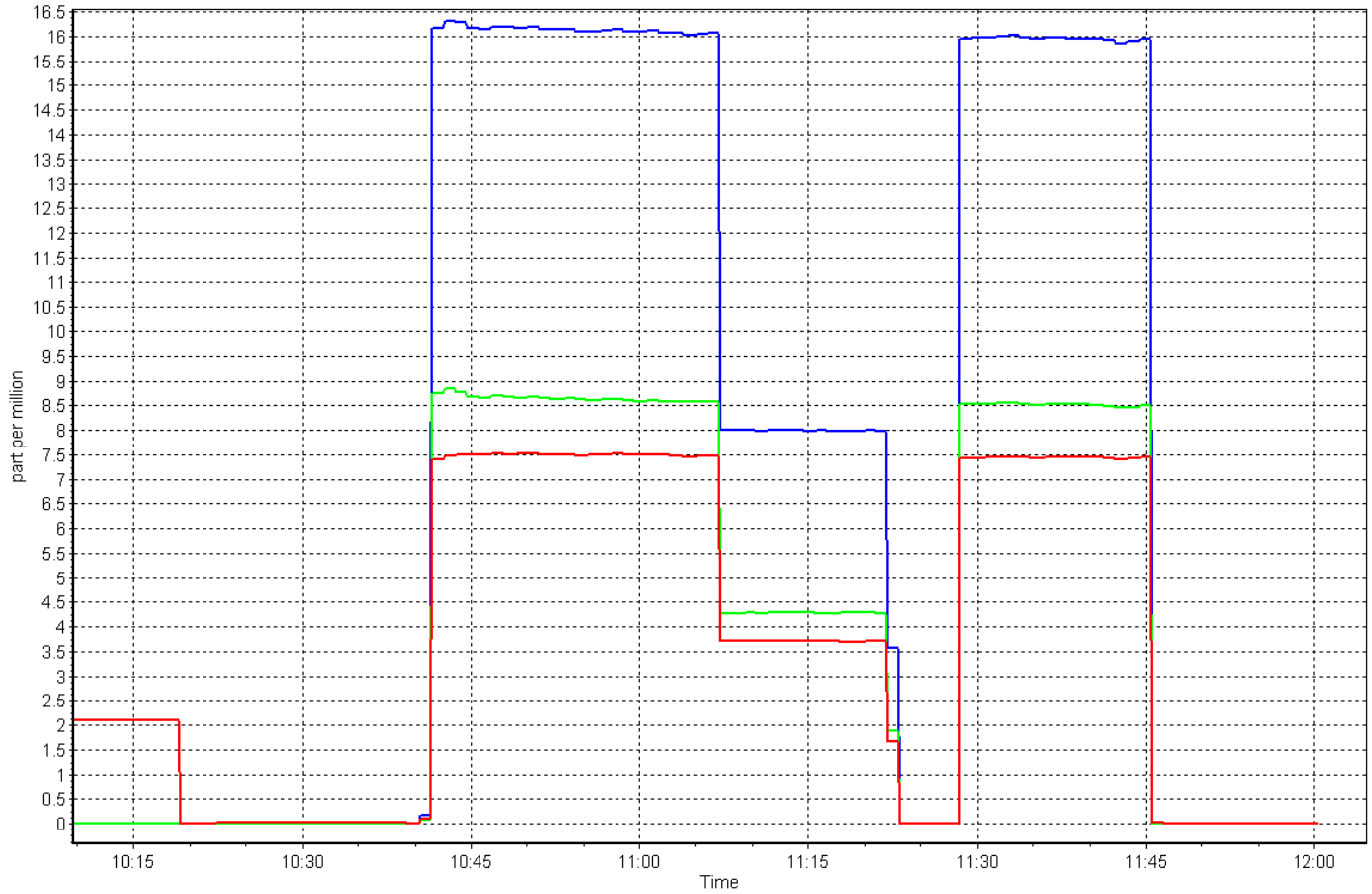
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	7.98	7.44	1.073
				Average Correction Factor	

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997813	
THC Cal Offset:	-0.004153	
CH4 Cal Slope:	0.997172	
CH4 Cal Offset:	0.003659	
NMHC Cal Slope:	0.998236	
NMHC Cal Offset:	-0.007012	

Calibration Performed By: Devin Russell

NMHC Calibration Plot Date: December 23, 2024 Location: Barge Landing



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Barge Landing
Station number:	AMS 09
Calibration Date:	December 9, 2024
Last Cal Date:	November 15, 2024
Start time (MST):	10:05
End time (MST):	15:00
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T2Y1KDH	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	47.38 ppm	NO Cal Gas Conc:	46.94 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	47.38 ppm	Removed Gas NO Conc:	46.94 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3812
ZAG make/model:	Api T701	Serial Number:	4888

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.1	-0.2	----	----
AF High point	4915	85.3	808.3	800.7	7.5	798.5	790.0	8.5	1.0118	1.0135
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 806.6 ppb	NO = 800.1 ppb
Baseline Corr 1st pt	NO_X = 798.8 ppb	NO = 790.1 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X =	-1.0%
*Percent Change	NO =	-1.3%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1426262593

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.095	1.107	NO bkgnd or offset:	10.0	10.1
NOX coeff or slope:	1.000	0.999	NOX bkgnd or offset:	10.3	10.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	176.2	179.5

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.997622	0.997861
NO_X Cal Offset:	0.317920	0.658322
NO Cal Slope:	0.999938	0.998554
NO Cal Offset:	-0.643839	-0.483887
NO_2 Cal Slope:	0.999704	1.003546
NO_2 Cal Offset:	-0.753159	0.547567

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.2	0.1	-0.2	----	----
High point	4915	85.3	808.3	800.7	7.5	806.6	799.3	7.3	1.0021	1.0018
Mid point	4957	42.6	403.7	400.0	3.7	404.4	398.9	5.5	0.9983	1.0027
Low point	4979	21.3	201.8	200.0	1.9	202.6	198.4	4.3	0.9962	1.0078
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
As left span	4915	85.3	808.3	421.1	387.2	806.8	421.1	385.7	1.0018	1.0000
							Average Correction Factor		0.9988	1.0041

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.2	----	----
High GPT point	795.4	419.6	383.3	384.8	0.9961	100.4%
Mid GPT point	795.4	610.7	192.2	193.9	0.9913	100.9%
Low GPT point	795.4	703.9	99.0	100.6	0.9842	101.6%
				Average Correction Factor	0.9905	101.0%

Notes: Inlet filter changed after as founds. Span adjusted.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

NO_X Calibration Summary

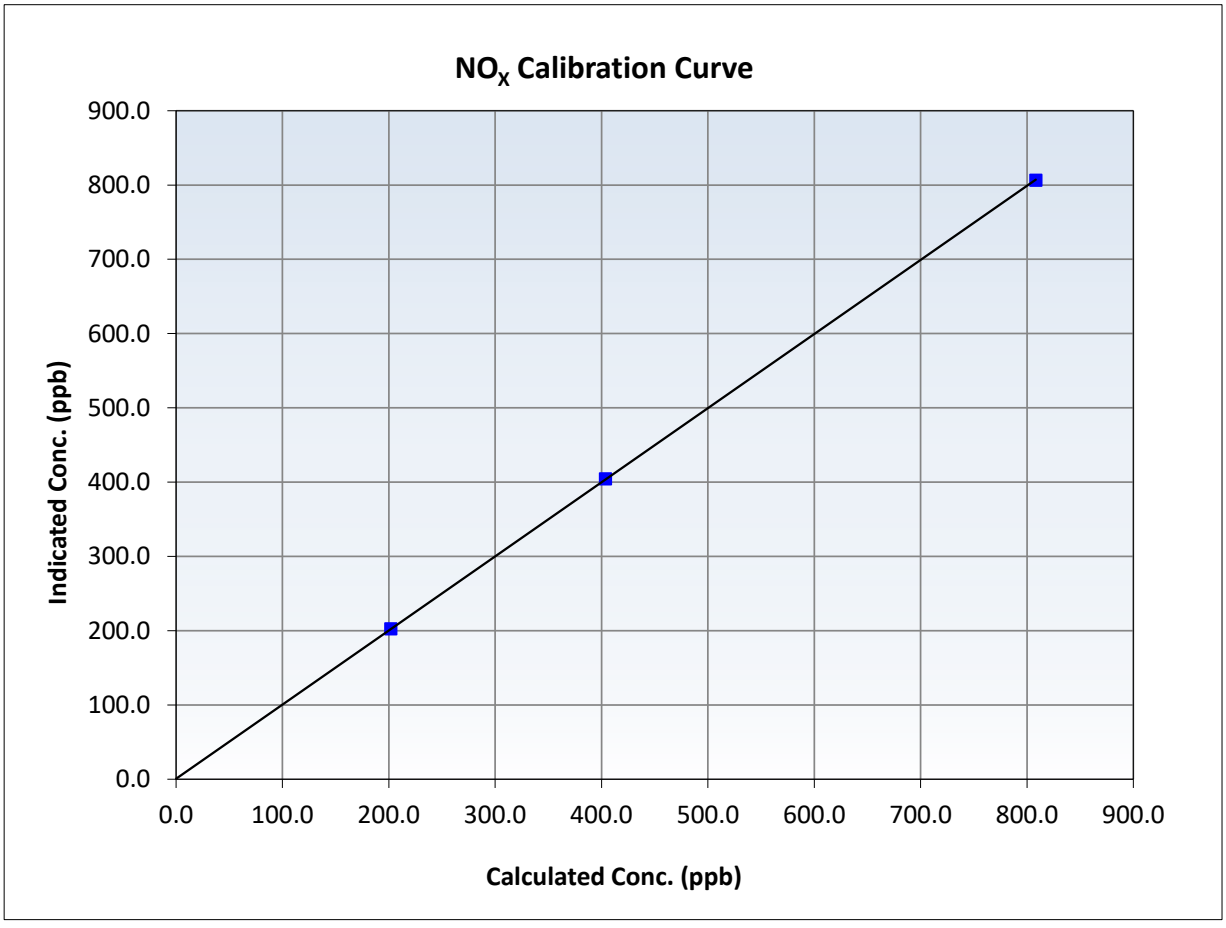
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 15, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	15:00
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
808.3	806.6	1.0021
403.7	404.4	0.9983
201.8	202.6	0.9962

Statistical Evaluation		Limits
Correlation Coefficient	0.999994	≥0.995
Slope	0.997861	0.90 - 1.10
Intercept	0.658322	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

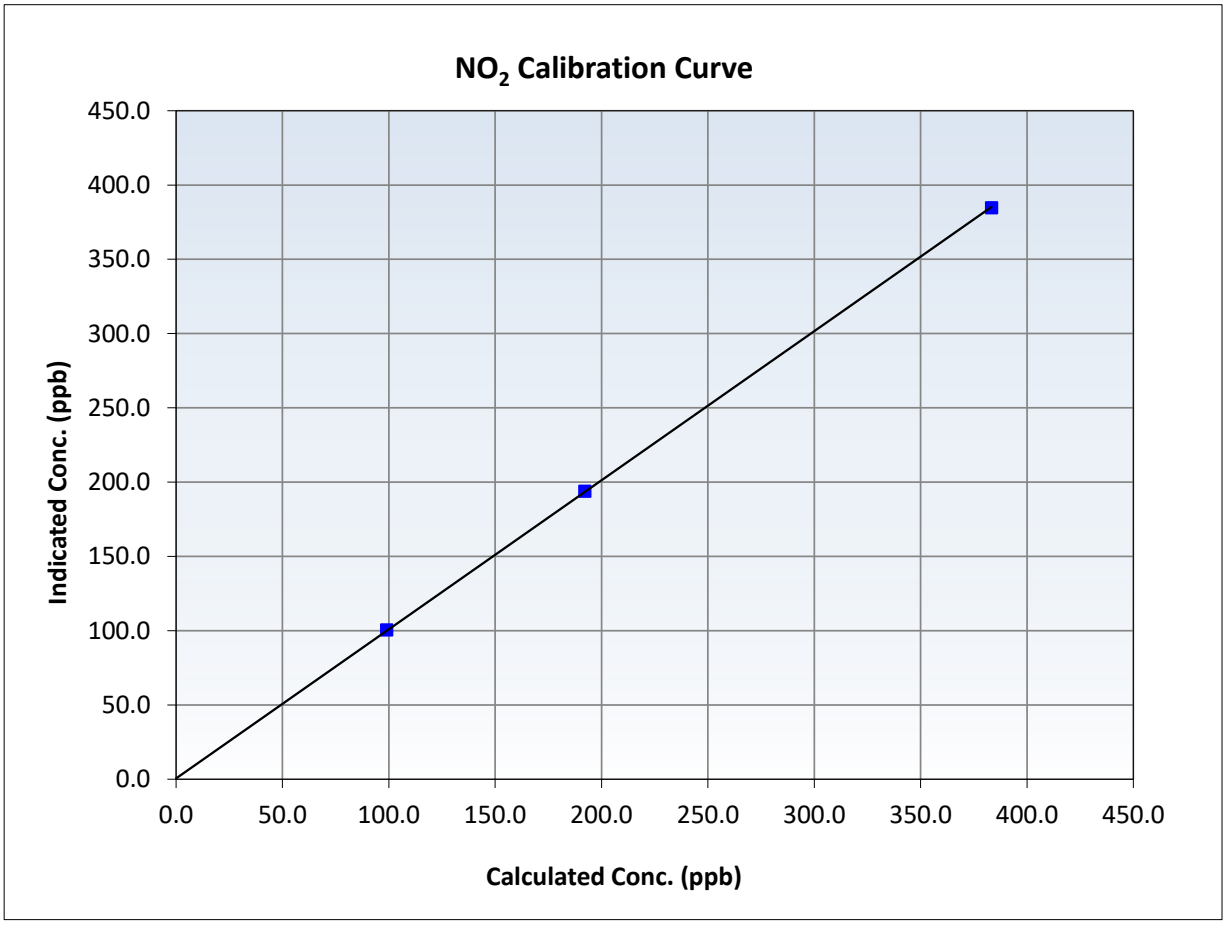
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 15, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	15:00
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
383.3	384.8	0.9961
192.2	193.9	0.9913
99.0	100.6	0.9842

Statistical Evaluation		Limits
Correlation Coefficient	0.999982	≥0.995
Slope	1.003546	0.90 - 1.10
Intercept	0.547567	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

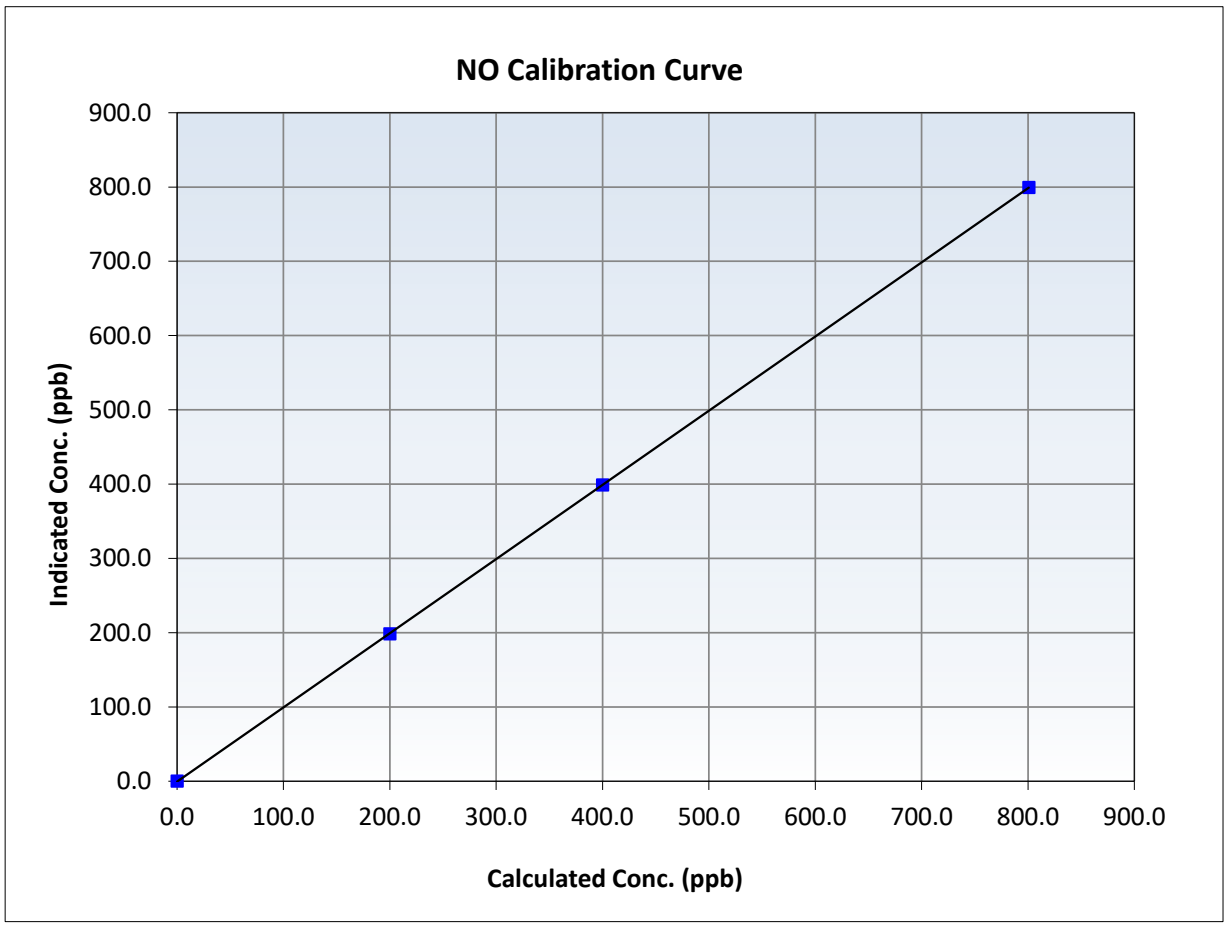
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 15, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:05	End Time (MST):	15:00
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

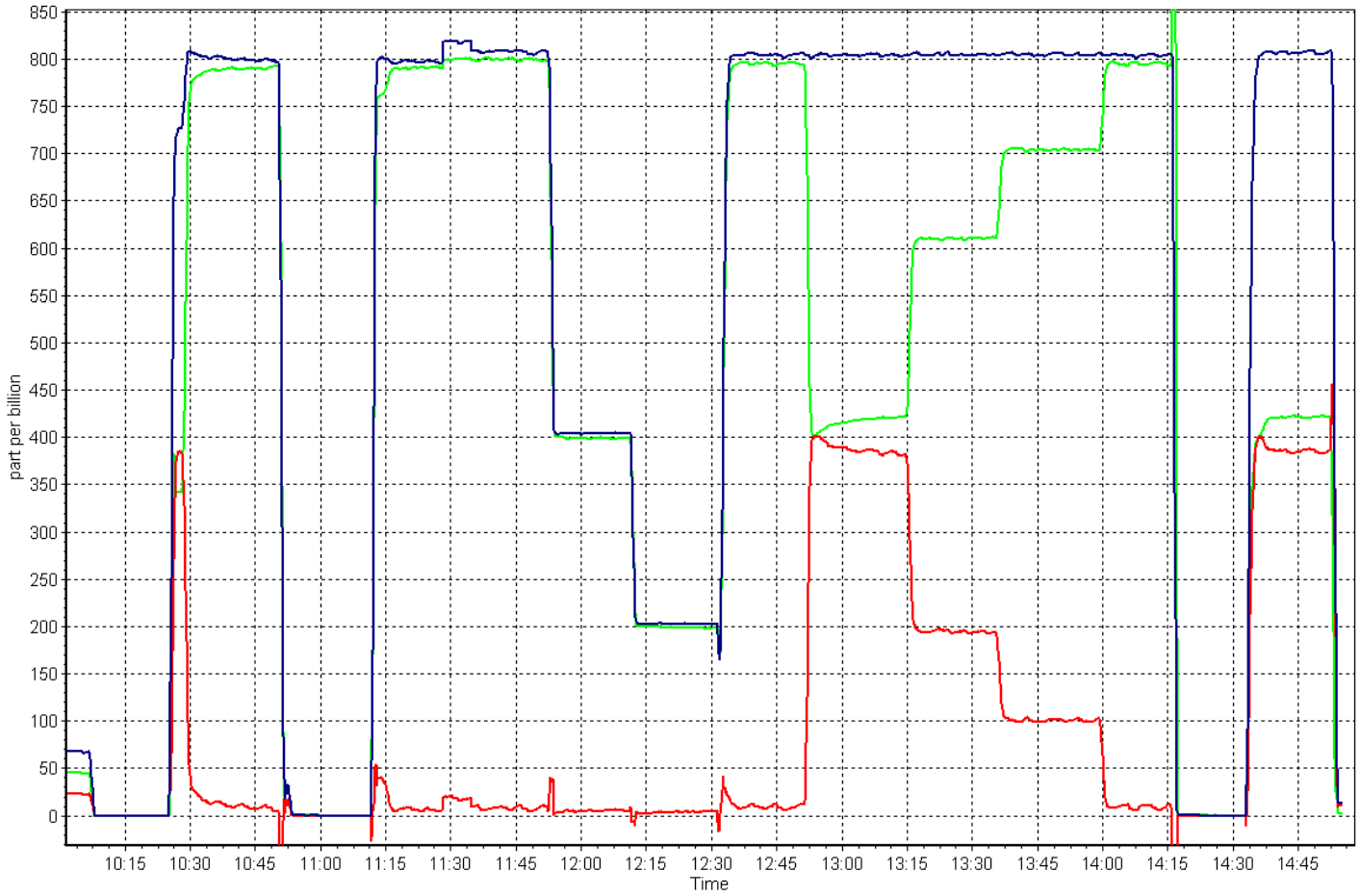
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.7	799.3	1.0018
400.0	398.9	1.0027
200.0	198.4	1.0078

Statistical Evaluation		Limits
Correlation Coefficient	0.999997	≥0.995
Slope	0.998554	0.90 - 1.10
Intercept	-0.483887	+/-20



NO_X Calibration Plot Date: December 9, 2024 Location: Barge Landing



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	December 9, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	11:45	End time (MST):	12:50
Analyzer Make:	API T640	S/N:	844
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388746
Temp/RH standard:	Alicat FP-25BT	S/N:	388746

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-6.40	-6.40	-6.40	☐	+/- 2 °C
P (mmHg)	731.10	737.10	731.10	☐	+/- 10 mmHg
Flow (LPM)	4.98	5.12	4.98	☐	+/- 0.25 LPM
PW% (pump)	40	-----	40	☐	>80%
Zero Verification	PM w/o HEPA:	3.00	PM w/ HEPA:	0.00	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: October 18, 2024

Date Disposable Filter Changed: October 18, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 18, 2024

Date RH/T Sensor Cleaned: October 18, 2024

Notes: Verified flow, pressure, temperature and pump power. No adjustment needed. Leak check passed.

Calibration by: Devin Russell

Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	December 29, 2024	Last Cal Date:	December 9, 2024
Start time (MST):	12:41	End time (MST):	13:15
Analyzer Make:	API T640	S/N:	844
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388748
Temp/RH standard:	Alicat FP-25BT	S/N:	388748

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-6.80	-6.40	-6.80	☐	+/- 2 °C
P (mmHg)	721.80	725.80	721.80	☐	+/- 10 mmHg
Flow (LPM)	5.05	5.02	5.05	☐	+/- 0.25 LPM
PW% (pump)	39	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	6.30	PM w/ HEPA:	0.00	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	10.20	10.20	11.00	☑	+/- 0.5

Date Optical Chamber Cleaned: December 29, 2024

Date Disposable Filter Changed: December 29, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 18, 2024

Date RH/T Sensor Cleaned: October 18, 2024

Notes: Here to address cyclic readings on PM2.5 channel. Verified flow, temp and pressure. Leak check passed. Chamber cleaned. DFU filter changed out. PMT adjusted.

Calibration by: Aswin Sasi Kumar

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS11
LOWER CAMP
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	December 11, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	11:50	End time (MST):	15:55
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.25	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC2216			
Removed Cal Gas Conc:	49.25	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	3807
Zero Air Gen Model:	Teledyne API T701		Serial Number:	196

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	100841398	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.005641	0.994133	Backgd or Offset:	15.8	15.6
Calibration intercept:	-0.988705	-1.481721	Coeff or Slope:	0.977	0.977

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4932	81.4	799.6	790.7	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	790.6	Previous response	803.2	*% change	-1.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4932	81.4	799.6	794.5	1.006
Mid point	4959	40.7	400.9	395.5	1.014
Low point	4981	20.4	200.9	197.3	1.018
As left zero	5000	0.0	0.0	0.3	----
As left span	4932	81.4	799.6	792.7	1.009
				Average Correction Factor:	1.013

Notes: Changed sample inlet filter after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

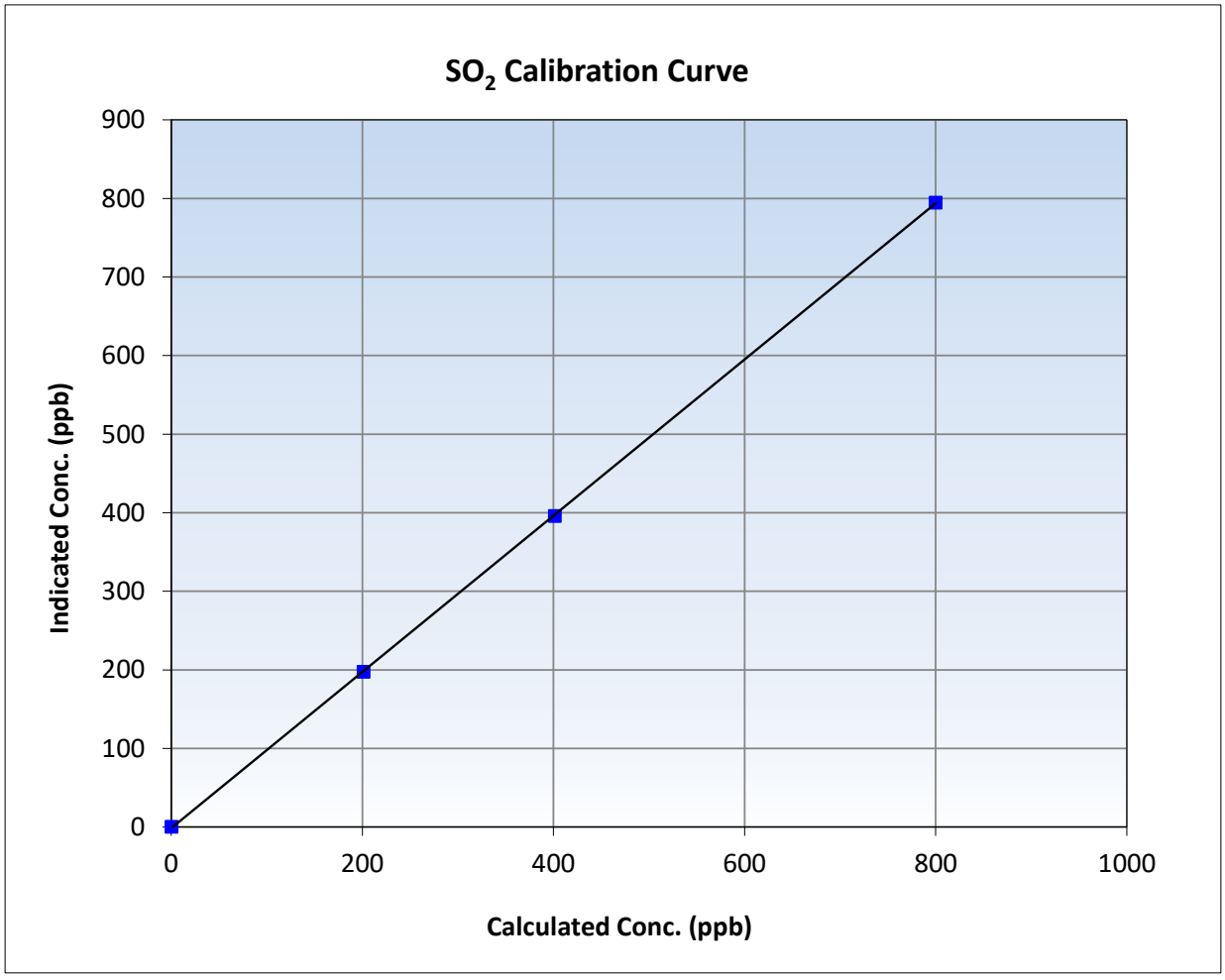
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 18, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	11:50	End Time (MST):	15:55
Analyzer make:	Thermo 43i	Analyzer serial #:	100841398

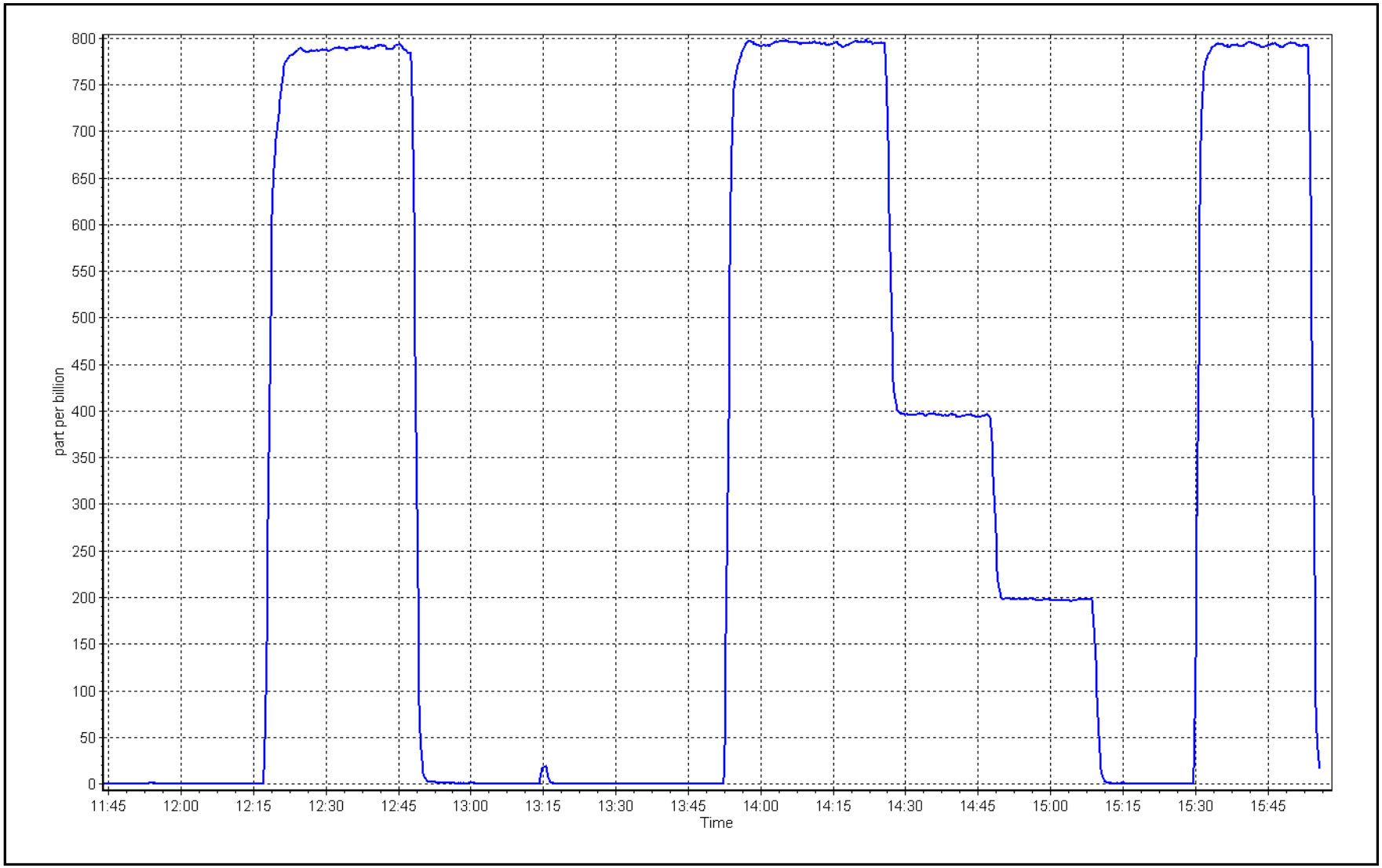
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.6	794.5	1.0065
400.9	395.5	1.0137
200.9	197.3	1.0182

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999981	*≥0.995*
Slope	0.994133	*0.90 - 1.10*
Intercept	-1.481721	*+/-30*



SO2 Calibration Plot Date: December 11, 2024 Location: Lower Camp



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	December 10, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	10:59	End time (MST):	15:10
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.43	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC501097			
Removed Cal Gas Conc:	5.43	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3807
ZAG Make/Model:	API T701H		Serial Number:	196

Analyzer Information

Analyzer make:	Thermo 43iQ		Analyzer serial #:	1203169745	
Converter make:	Global G150		Converter serial #:	2022-223	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.991875	0.998327	Backgd or Offset:	2.6	2.6
Calibration intercept:	-0.183931	0.015156	Coeff or Slope:	0.769	0.769

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4926	73.6	79.9	79.7	0.999
As found Mid point	4963	36.8	40.0	39.8	0.996
As found Low point	4982	18.6	20.2	20.1	0.990
New cylinder response					
Baseline Corr As found:	80.0	Prev response:	79.09	*% change:	1.1%
Baseline Corr 2nd AF pt:	40.1	AF Slope:	1.000335	AF Intercept:	-0.205188
Baseline Corr 3rd AF pt:	20.4	AF Correlation:	0.999993	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4926	73.6	79.9	79.7	1.003
Mid point	4963	36.8	40.0	40.1	0.996
Low point	4982	18.6	20.2	20.2	1.000
As left zero	5000	0.0	0.0	0.0	----
As left span	4926	73.6	79.9	79.6	1.004
SO2 Scrubber Check	4935	81.5	812.3	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.000
Date of last converter efficiency test:					

Notes: Changed sample inlet filter after as founds. Ran scrubber check after calibrator zero and it passed. No adjustments made.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

H_2S Calibration Summary

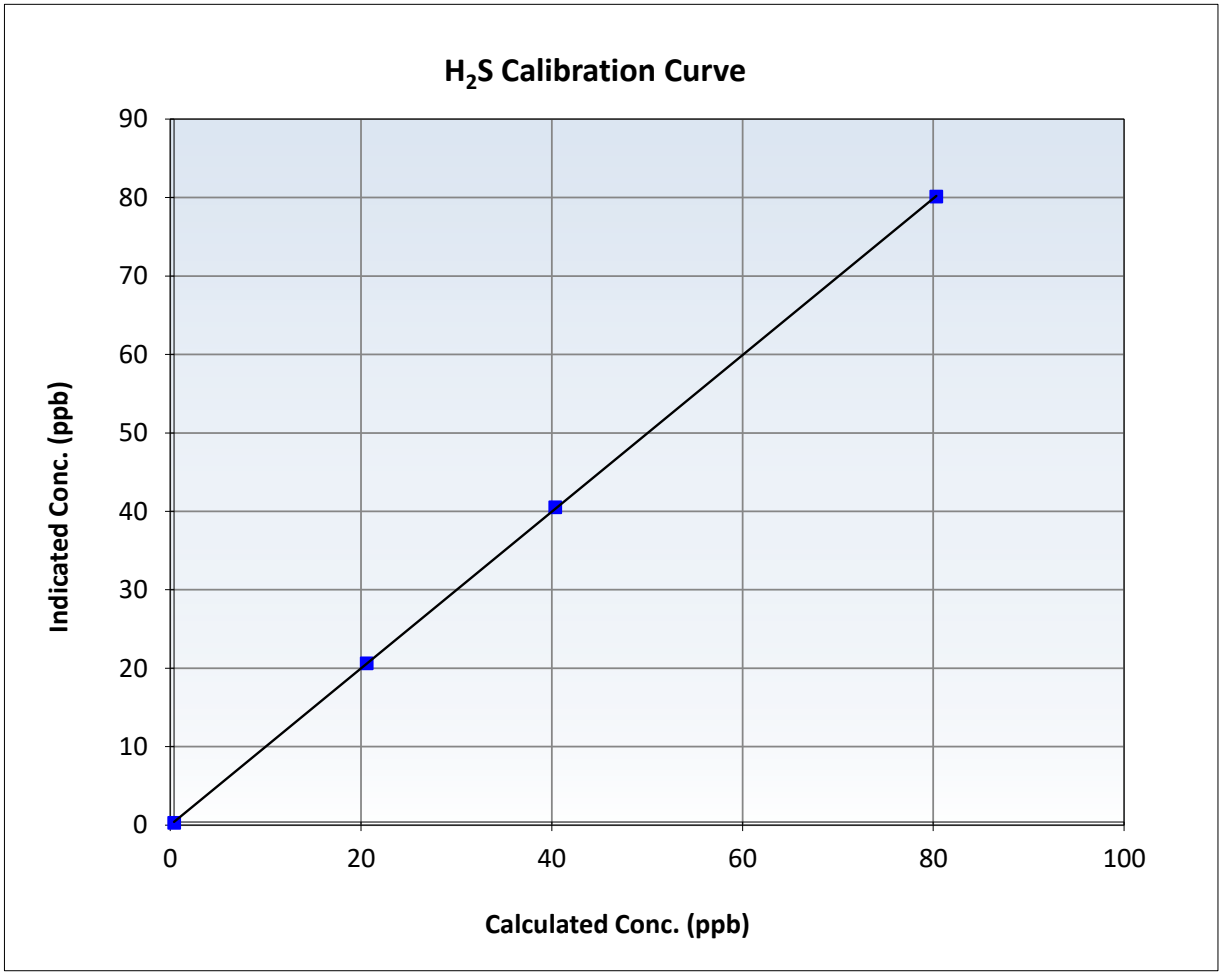
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 26, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:59	End Time (MST):	15:10
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1203169745

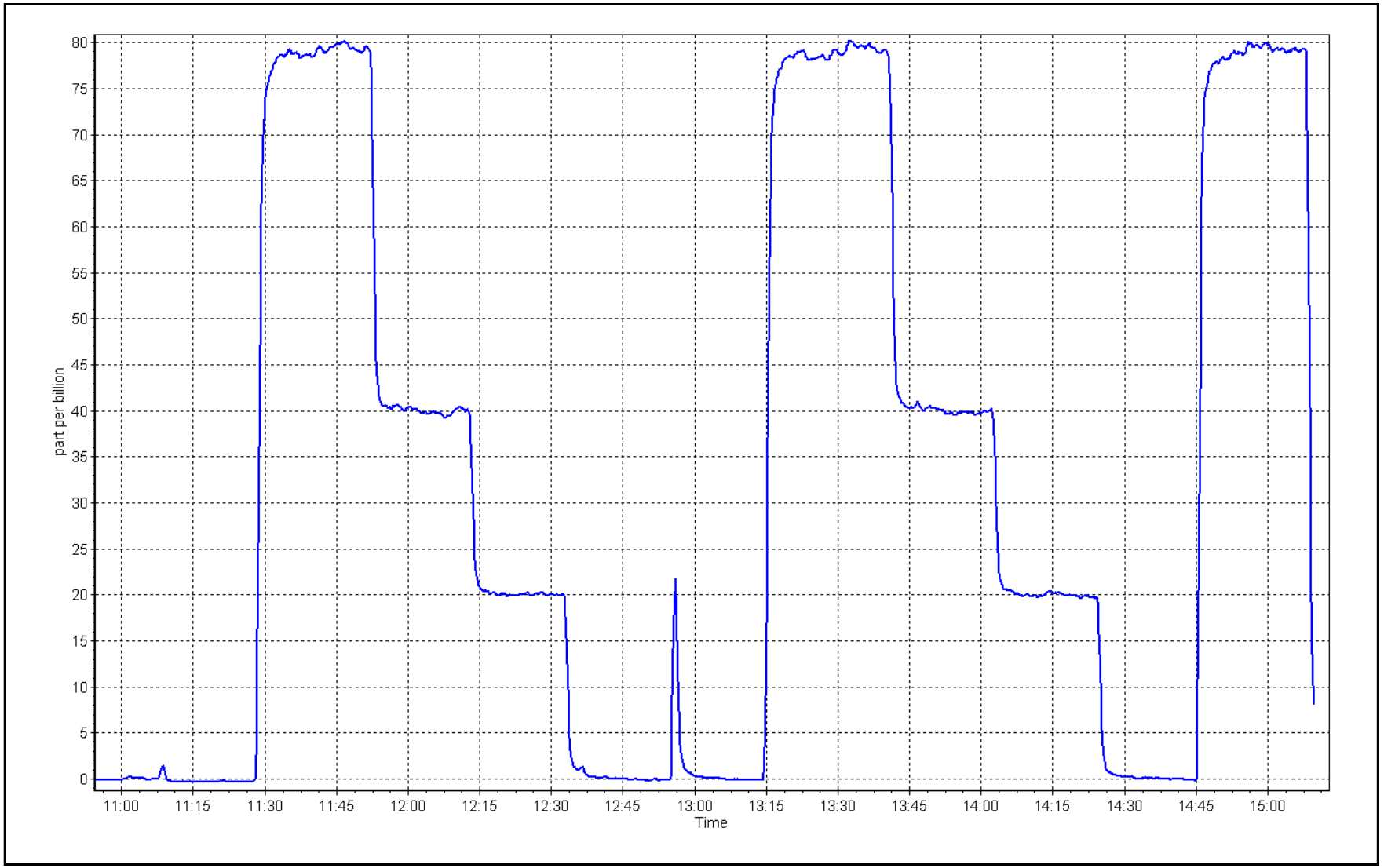
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
79.9	79.7	1.0028
40.0	40.1	0.9965
20.2	20.2	0.9997

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999982	*≥0.995*
Slope	0.998327	*0.90 - 1.10*
Intercept	0.015156	*+/-3*



H_2S Calibration Plot Date: December 10, 2024 Location: Lower Camp



Wood Buffalo Environmental Association

THC / CH4 / NMHC Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	December 11, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	11:50	End time (MST):	15:55
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC2216	Cal Gas Expiry Date:	February 23, 2025
CH4 Cal Gas Conc.	502.0 ppm	CH4 Equiv Conc.	1067.1 ppm
C3H8 Cal Gas Conc.	205.5 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	502.0 ppm	CH4 Equiv Conc.	1067.1 ppm
Removed C3H8 Conc.	205.5 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3807
Zero Air Gen model:	API T701	Serial Number:	196

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.63E-04	2.90E-04	NMHC SP Ratio:	4.48E-05	4.65E-05
CH4 Retention time:	15.4	15.8	NMHC Peak Area:	204852	197066
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	17.33	16.90	1.025
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.90	Prev response	17.29	*% change	-2.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	17.33	17.27	1.003
Mid point	4959	40.7	8.69	8.62	1.008
Low point	4981	20.4	4.35	4.32	1.008
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	17.33	17.33	1.000
				Average Correction Factor	1.007

Notes: Changed sample inlet filter and both Hydrogen and Nitrogen cylinders after as founds. Adjusted both zero and span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	9.18	9.11	1.007
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.11	Prev response	9.16	*% change	-0.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	9.18	9.14	1.003
Mid point	4959	40.7	4.60	4.55	1.010
Low point	4981	20.4	2.31	2.28	1.010
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	9.18	9.15	1.003
				Average Correction Factor	1.008

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	8.15	7.78	1.047
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.78	Prev response	8.13	*% change	-4.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	8.15	8.13	1.003
Mid point	4959	40.7	4.09	4.06	1.006
Low point	4981	20.4	2.05	2.04	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	8.15	8.19	0.996
				Average Correction Factor	1.005

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.999787	0.996781
THC Cal Offset:	-0.030112	-0.016298
CH4 Cal Slope:	1.000126	0.996965
CH4 Cal Offset:	-0.021159	-0.004369
NMHC Cal Slope:	0.999609	0.996730
NMHC Cal Offset:	-0.008955	-0.012128

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

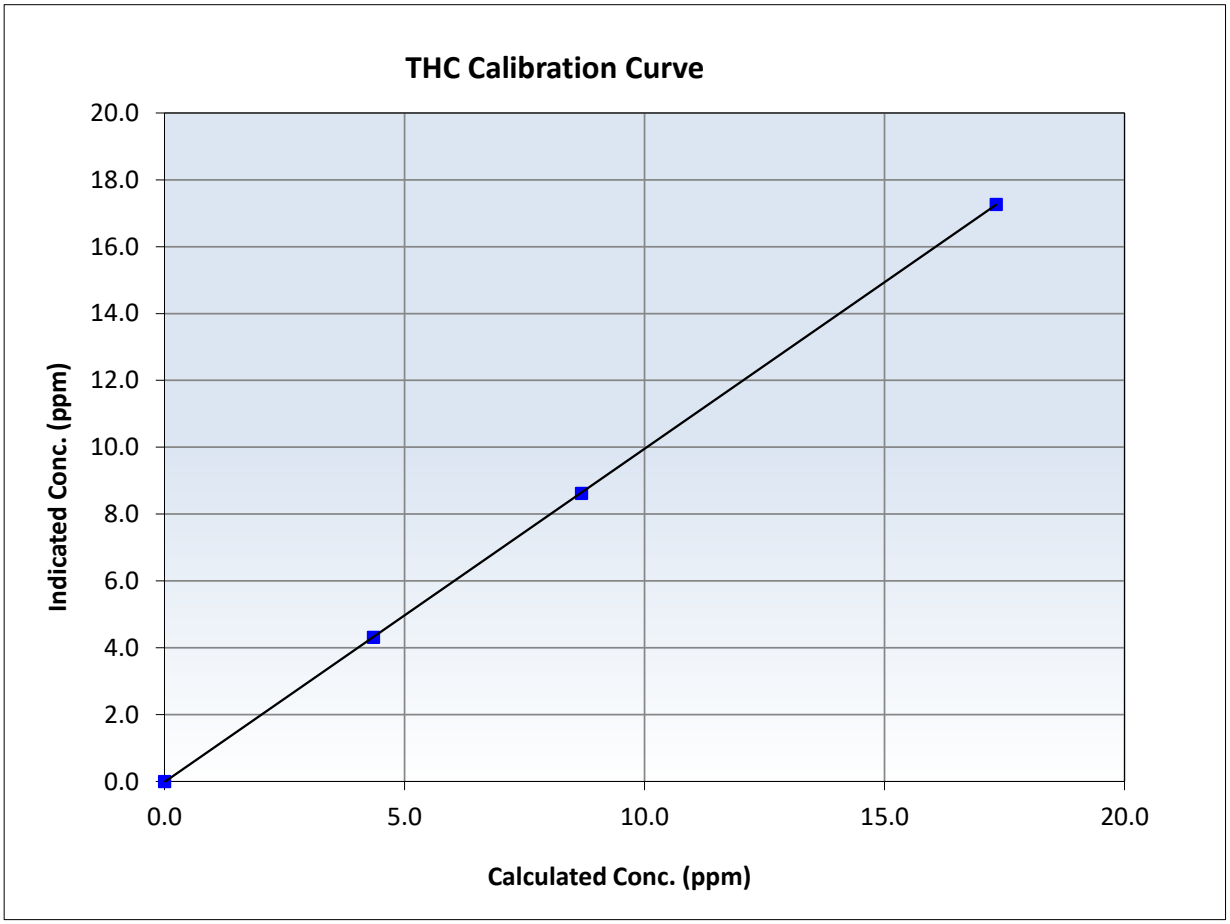
THC Calibration Summary

Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 18, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	11:50	End Time (MST):	15:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999993	*≥0.995*
17.33	17.27	1.0034	Slope	0.996781	*0.90 - 1.10*
8.69	8.62	1.0080			
4.35	4.32	1.0083	Intercept	-0.016298	*+/-0.5*



Wood Buffalo Environmental Association

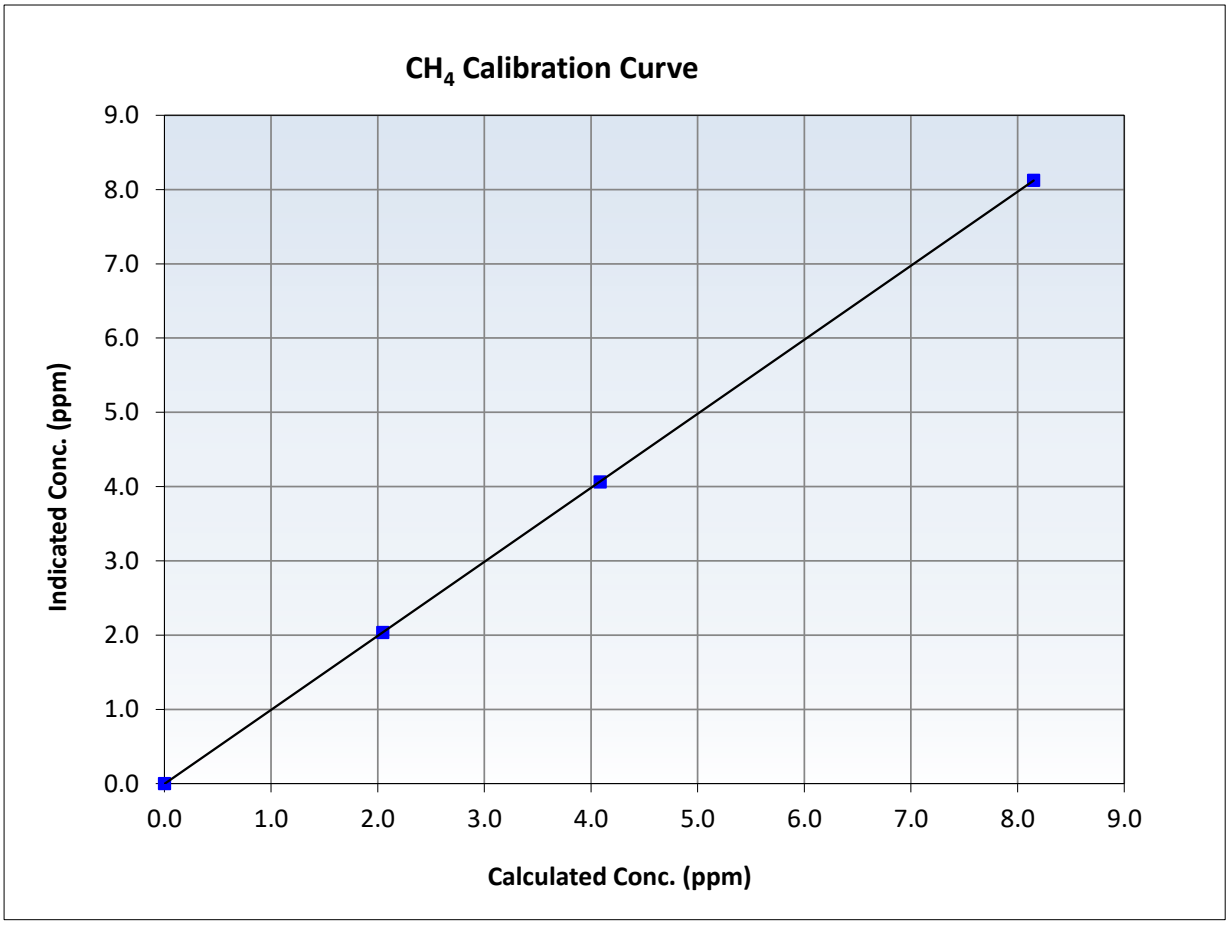
CH_4 Calibration Summary

Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 18, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	11:50	End Time (MST):	15:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999998	≥0.995
8.15	8.13	1.0032	Slope	0.996965	0.90 - 1.10
4.09	4.06	1.0055			
2.05	2.04	1.0062	Intercept	-0.004369	+/-0.5



Wood Buffalo Environmental Association

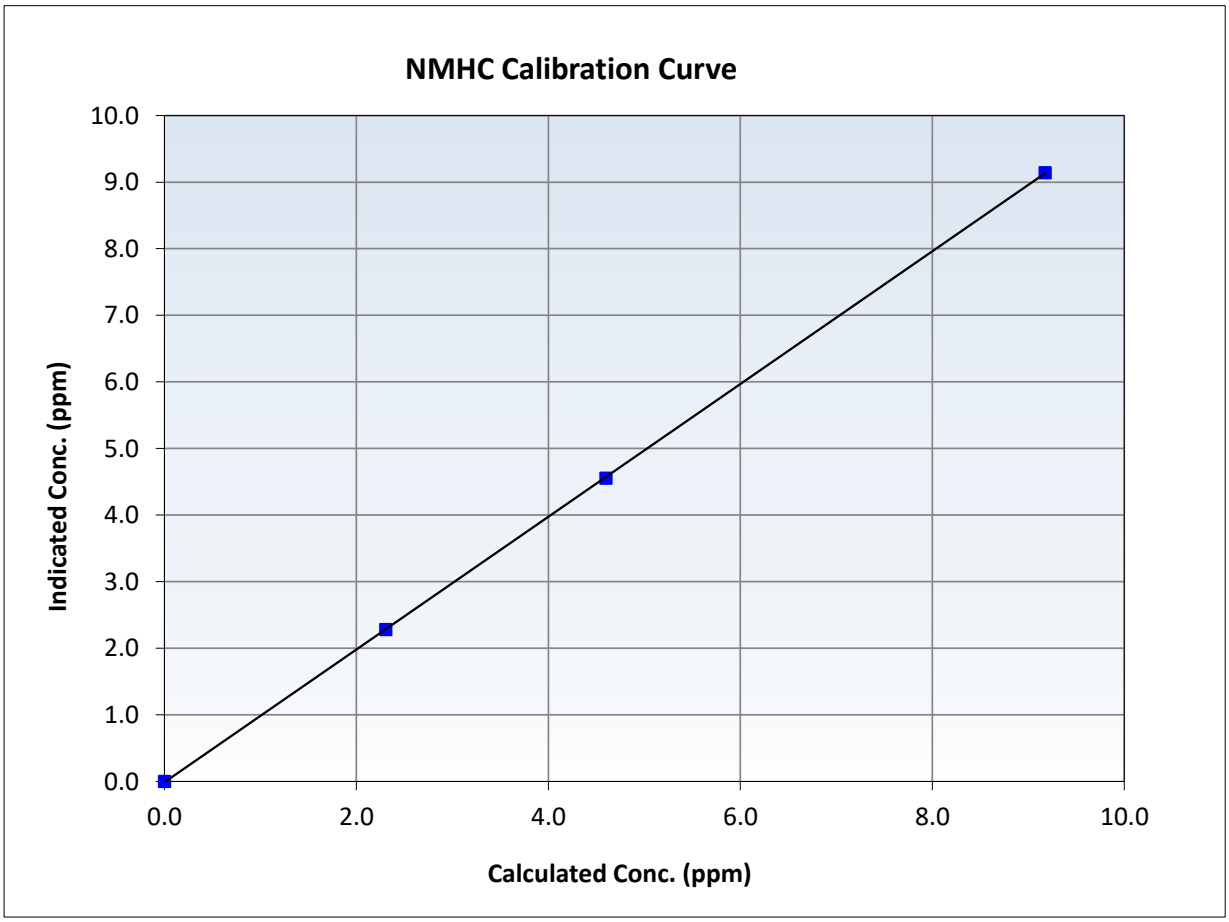
NMHC Calibration Summary

Station Information

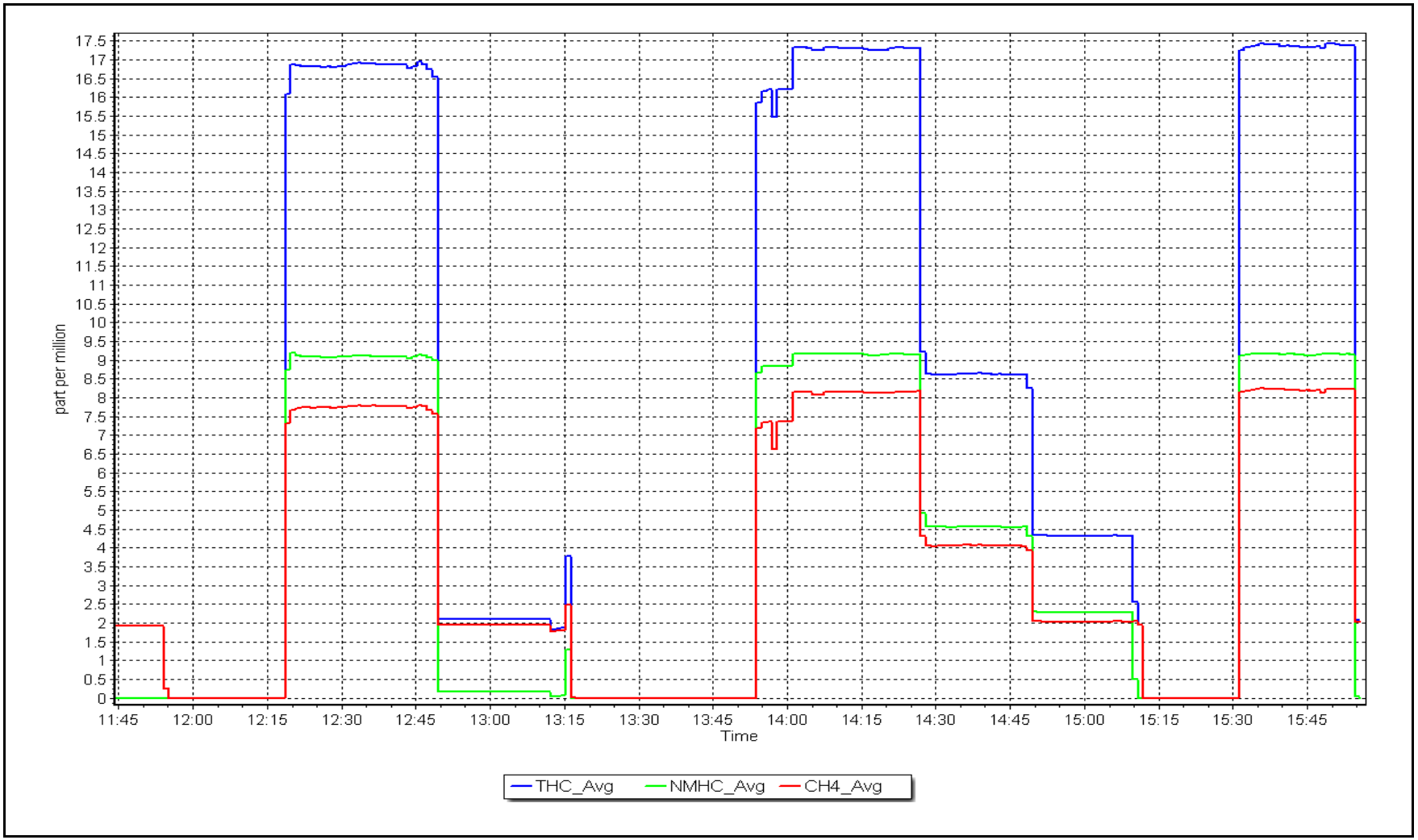
Calibration Date:	December 11, 2024	Previous Calibration:	November 18, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	11:50	End Time (MST):	15:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999986	≥0.995
9.18	9.14	1.0035	Slope	0.996730	0.90 - 1.10
4.60	4.55	1.0102			
2.31	2.28	1.0101	Intercept	-0.012128	+/-0.5



NMHC Calibration Plot Date: July 18, 2024 Location: Lower Camp



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS13
FORT MCKAY SOUTH
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	December 5, 2024	Last Cal Date:	November 1, 2024
Start time (MST):	10:20	End time (MST):	12:55
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.55	ppm	Cal Gas Exp Date:	December 29, 2028
Cal Gas Cylinder #:	CC260812			
Removed Cal Gas Conc:	50.55	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2448
Zero Air Gen Model:	Teledyne API T701		Serial Number:	1118

Analyzer Information

Analyzer make:	Teledyne API T100		Serial Number:	599	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003744	1.002885	Backgd or Offset:	99.5	99.5
Calibration intercept:	-3.278551	-2.978200	Coeff or Slope:	0.697	0.697

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	4921	79.1	799.7	799.5	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.9	Previous response	799.4	*% change	0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.4	----
High point	4921	79.1	799.7	800.2	0.999
Mid point	4961	39.5	399.3	396.5	1.007
Low point	4980	19.8	200.2	195.0	1.027
As left zero	5000	0.0	0.0	-0.1	----
As left span	4921	79.1	799.7	800.0	1.000
				Average Correction Factor:	1.011

Notes: Sample inlet filters changed after as founds. No adjustment made.

Calibration Performed By: Kelly Baragar

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

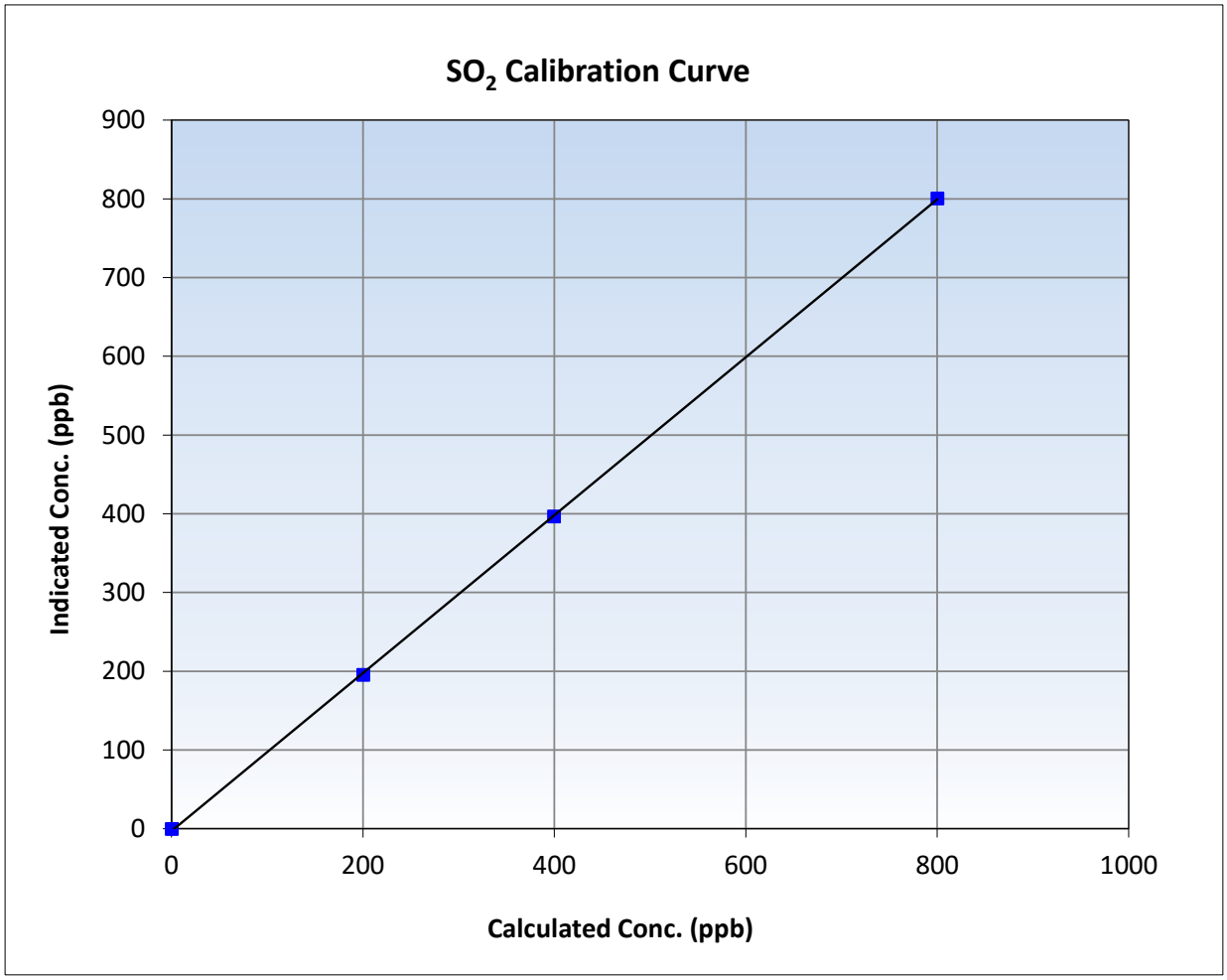
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 1, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:20	End Time (MST):	12:55
Analyzer make:	Teledyne API T100	Analyzer serial #:	599

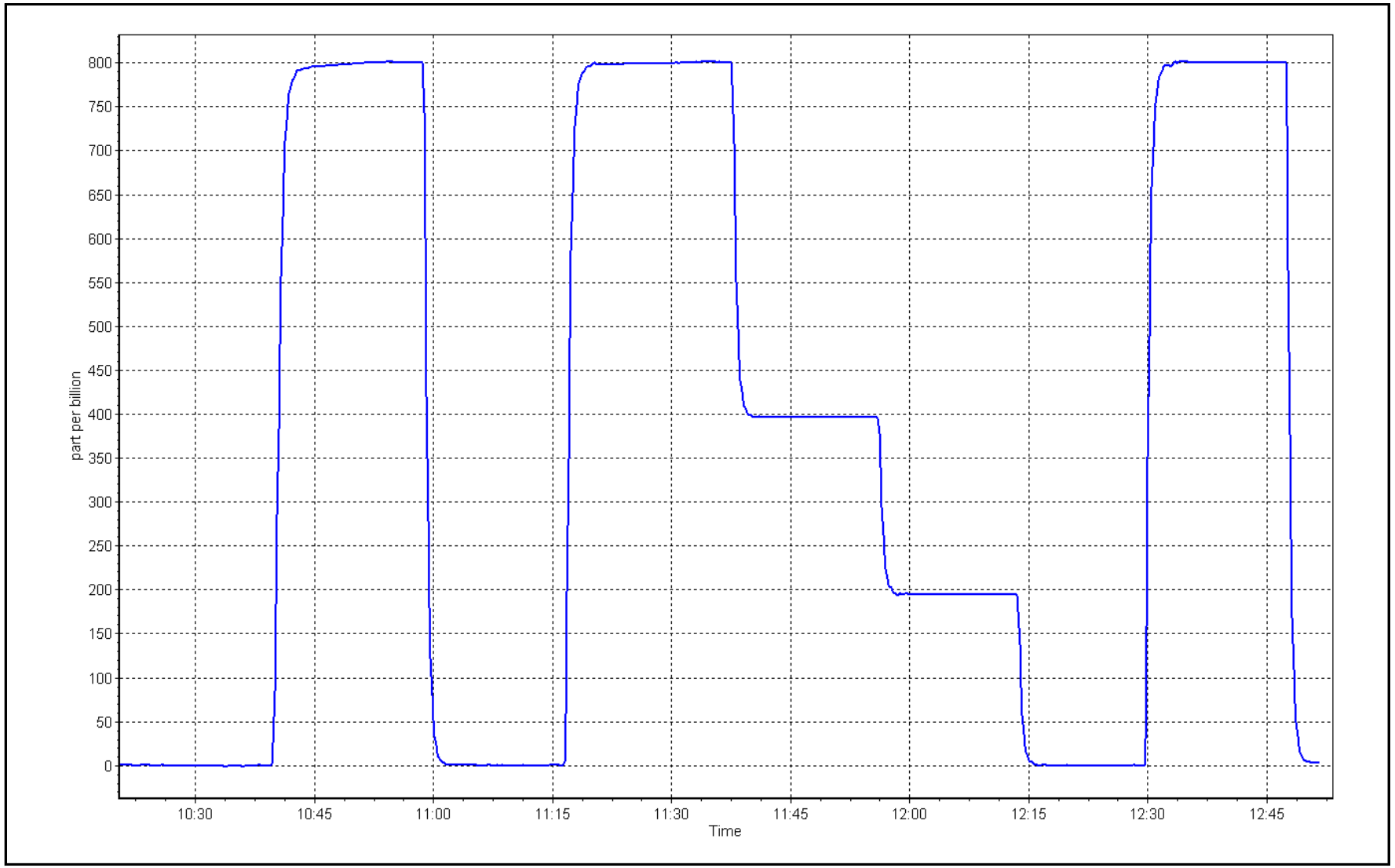
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
799.7	800.2	0.9994
399.3	396.5	1.0071
200.2	195.0	1.0266

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999952	*≥0.995*
Slope	1.002885	*0.90 - 1.10*
Intercept	-2.978200	*+/-30*



SO2 Calibration Plot Date: December 5, 2024 Location: Fort McKay South



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	December 13, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	10:09	End time (MST):	14:34
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.34	ppm	Cal Gas Exp Date:	January 1, 2025
Cal Gas Cylinder #:	CC500241			
Removed Cal Gas Conc:	5.34	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2448
ZAG Make/Model:	Teledyne API T701		Serial Number:	5609

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1180540017
Converter make:	CDN-101		Converter serial #:	521
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.986610	1.000080	Backgd or Offset:	3.69	3.77
Calibration intercept:	-0.122144	0.077786	Coeff or Slope:	1.13	1.14

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4925	75.5	80.6	80.2	1.005
As found Mid point	4962	37.7	40.3	40.0	1.007
As found Low point	4981	18.9	20.2	19.9	1.014
New cylinder response					

Baseline Corr As found:	80.2	Prev response:	79.42	*% change:	1.0%
Baseline Corr 2nd AF pt:	40.0	AF Slope:	0.995402	AF Intercept:	-0.082214
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999994	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4925	75.5	80.6	80.7	0.999
Mid point	4962	37.7	40.3	40.4	0.997
Low point	4981	18.9	20.2	20.2	0.999
As left zero	5000	0.0	0.0	0.3	----
As left span	4925	75.5	80.6	80.0	1.008
SO2 Scrubber Check	4921	79.1	791.0	0.1	----

Date of last scrubber change:	20-Jan-20	Ave Corr Factor	0.998
Date of last converter efficiency test:			

Notes: Changed inlet filter and pump after multipoint as founds. SO2 scrubber check done after calibrator zero and passed. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

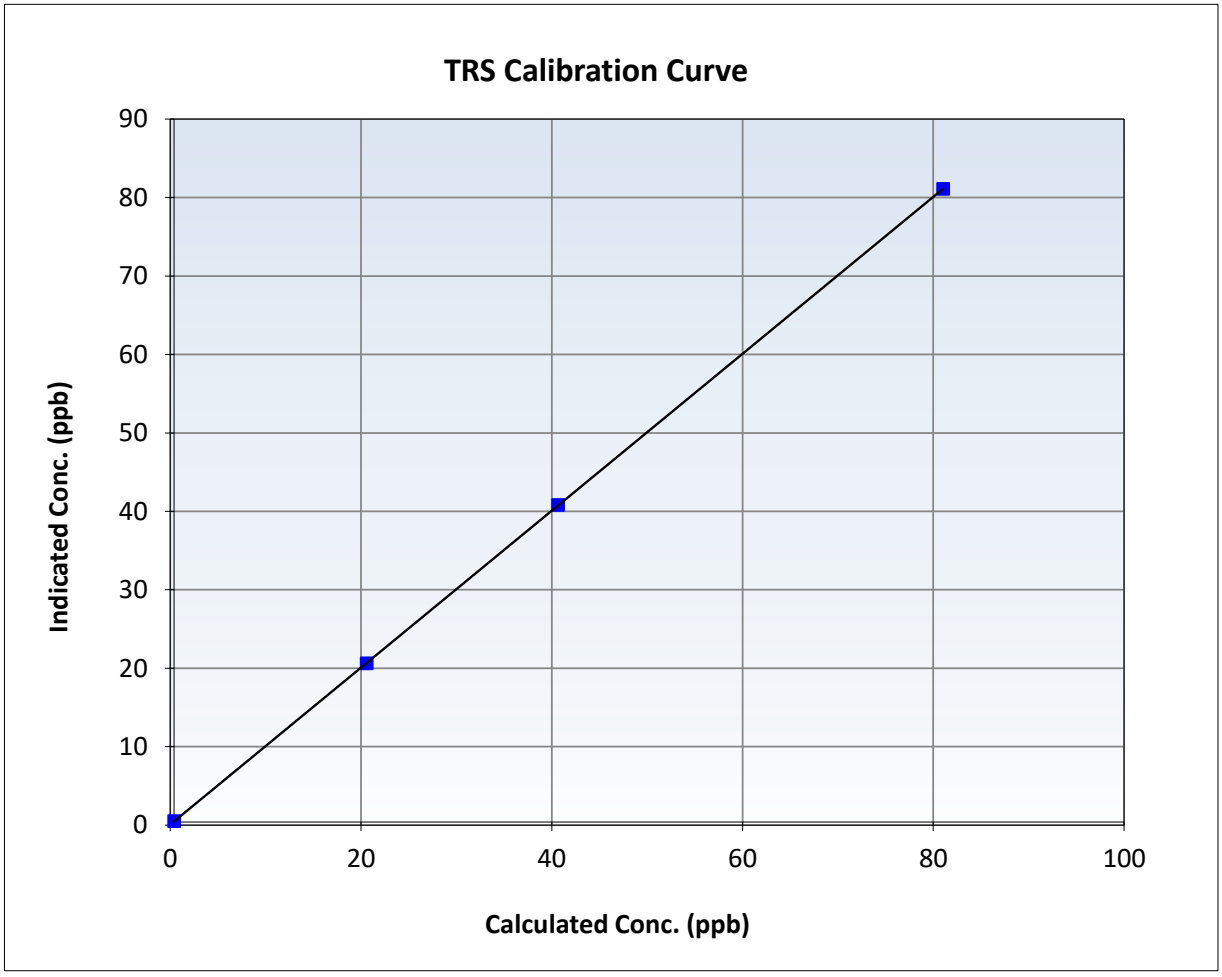
TRS Calibration Summary

Station Information

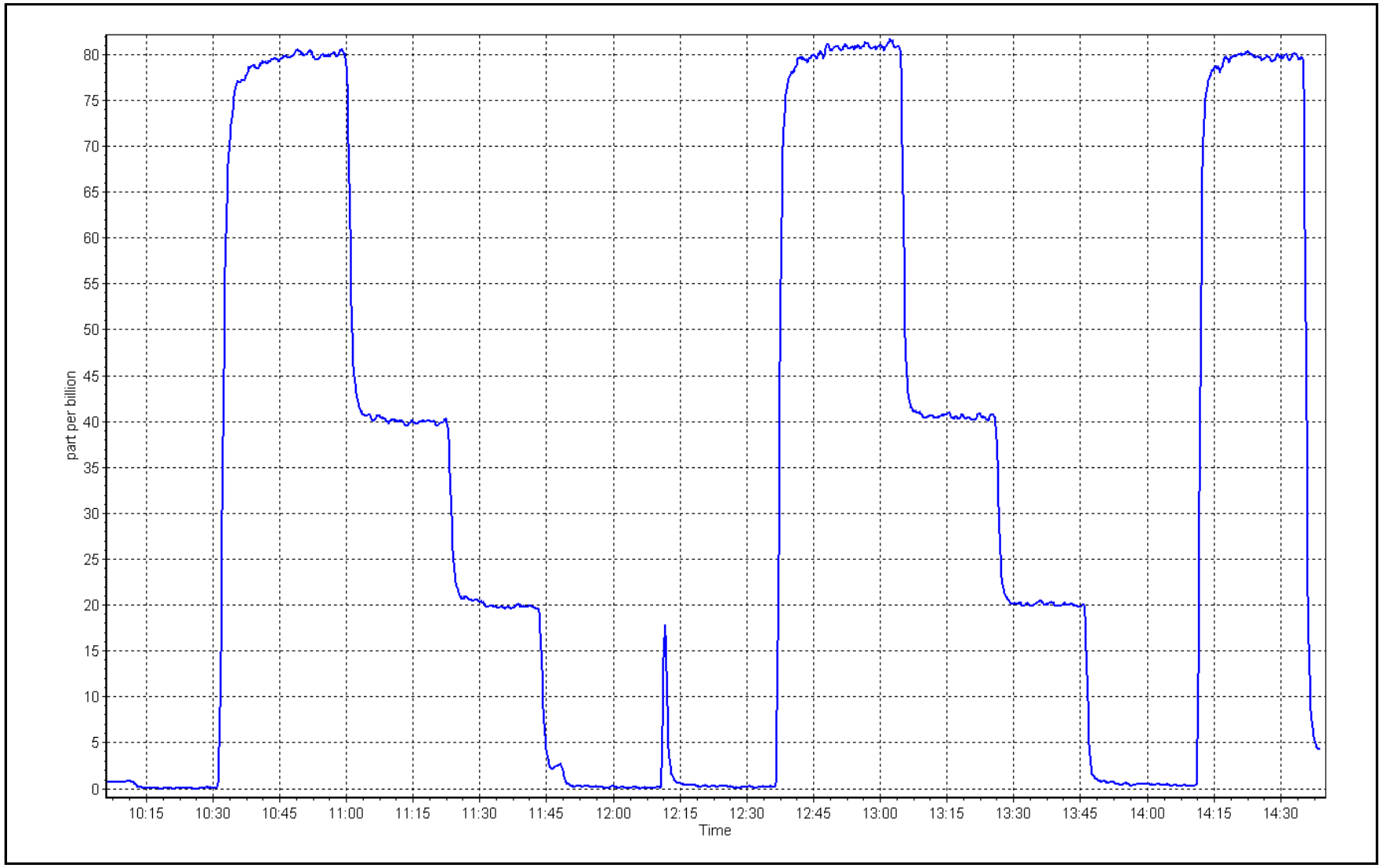
Calibration Date:	December 13, 2024	Previous Calibration:	November 13, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:09	End Time (MST):	14:34
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1180540017

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999998	*≥0.995*
80.6	80.7	0.9991	Slope	1.000080	*0.90 - 1.10*
40.3	40.4	0.9967			
20.2	20.2	0.9993	Intercept	0.077786	*+/-3*



TRS Calibration Plot Date: December 13, 2024 Location: Fort McKay South



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	December 5, 2024	Last Cal Date:	November 25, 2024
Start time (MST):	10:20	End time (MST):	12:55
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC2608112	Cal Gas Expiry Date:	
CH4 Cal Gas Conc.	503.6 ppm	CH4 Equiv Conc.	1077.5 ppm
C3H8 Cal Gas Conc.	208.7 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	
Removed CH4 Conc.	503.6 ppm	CH4 Equiv Conc.	1077.5 ppm
Removed C3H8 Conc.	208.7 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	2448
Zero Air Gen model:	Teledyne API T701	Serial Number:	1118

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.58E-04	2.58E-04	NMHC SP Ratio:	5.87E-05	4.75E-05
CH4 Retention time:	14.60	14.60	NMHC Peak Area:	154800	191241
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	17.05	17.82	0.957
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.82	Prev response	17.08	*% change	4.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	17.05	17.08	0.998
Mid point	4961	39.5	8.51	8.48	1.004
Low point	4980	19.8	4.27	4.18	1.021
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	17.05	17.14	0.995
				Average Correction Factor	1.008

Notes: Replaced N2 carrier gas and adjusted NM window from 33 to 32 seconds. Performed span adjustment.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	9.08	9.89	0.918
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.89	Prev response	9.11	*% change	7.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	9.08	9.12	0.996
Mid point	4961	39.5	4.53	4.52	1.002
Low point	4980	19.8	2.27	2.24	1.016
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	9.08	9.13	0.995
				Average Correction Factor	1.005

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	7.97	7.93	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.93	Prev response	7.97	*% change	-0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	7.97	7.97	1.000
Mid point	4961	39.5	3.98	3.96	1.006
Low point	4980	19.8	1.99	1.94	1.026
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	7.97	8.01	0.995
				Average Correction Factor	1.011

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.003277	1.003815
THC Cal Offset:	-0.023150	-0.049161
CH4 Cal Slope:	1.002838	1.002163
CH4 Cal Offset:	-0.023183	-0.025579
NMHC Cal Slope:	1.003297	1.005604
NMHC Cal Offset:	0.000232	-0.024182

Calibration Performed By: Kelly Baragar

Wood Buffalo Environmental Association

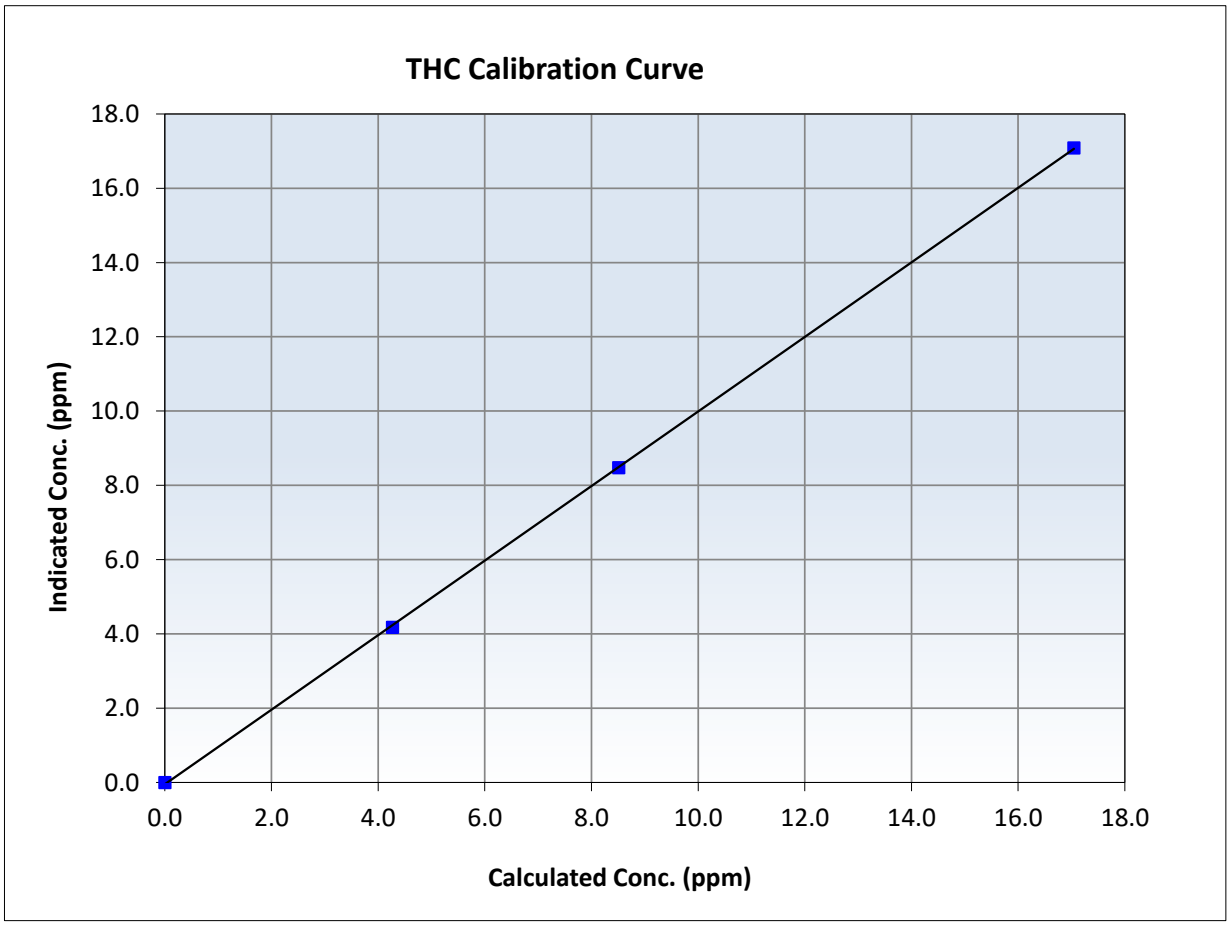
THC Calibration Summary

Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 25, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:20	End Time (MST):	12:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999962	≥0.995
17.05	17.08	0.9978	Slope	1.003815	0.90 - 1.10
8.51	8.48	1.0040			
4.27	4.18	1.0209	Intercept	-0.049161	+/-0.5



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CH_4 Calibration Summary

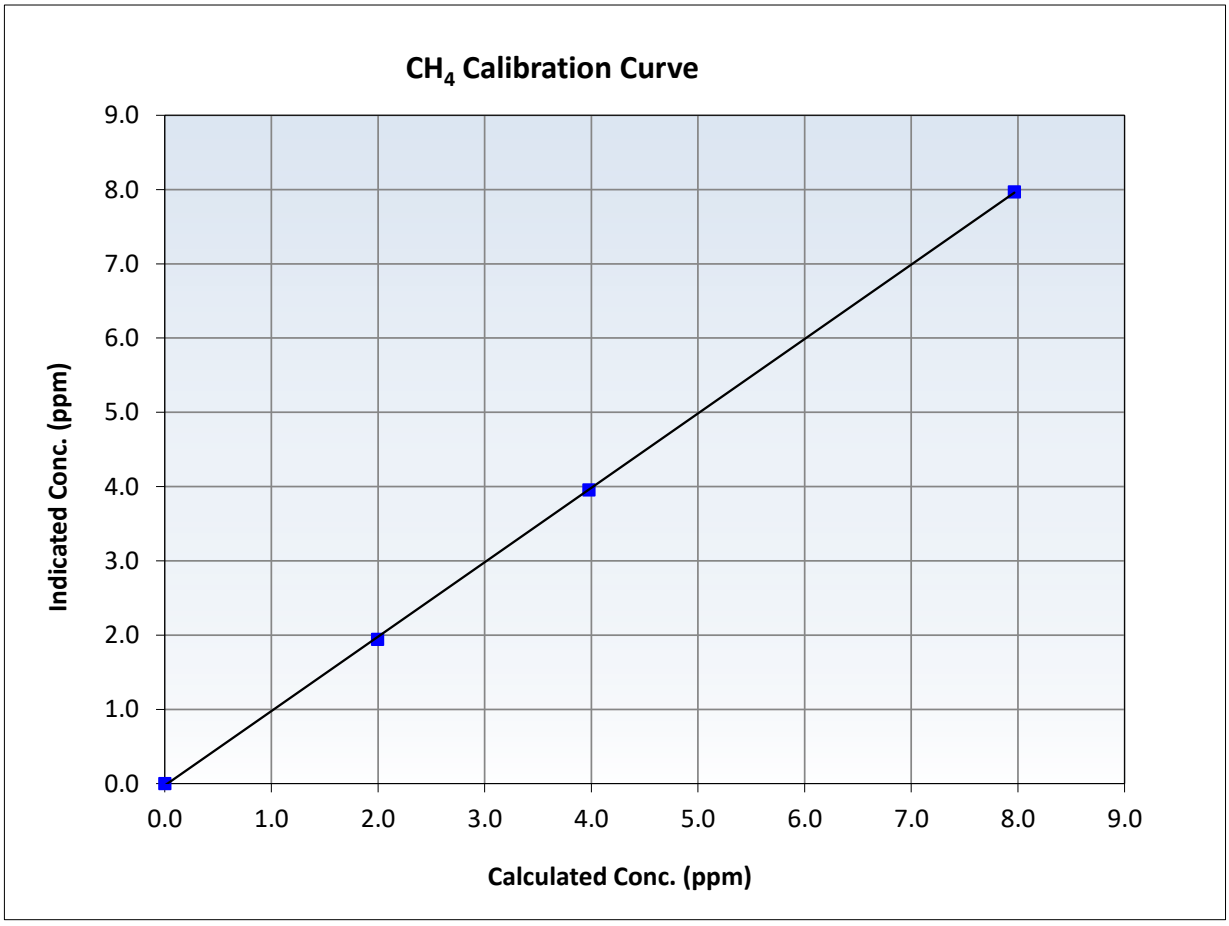
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 25, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:20	End Time (MST):	12:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
7.97	7.97	0.9997
3.98	3.96	1.0058
1.99	1.94	1.0264

Statistical Evaluation		Limits
Correlation Coefficient	0.999951	≥0.995
Slope	1.002163	0.90 - 1.10
Intercept	-0.025579	+/-0.5



Wood Buffalo Environmental Association

NMHC Calibration Summary

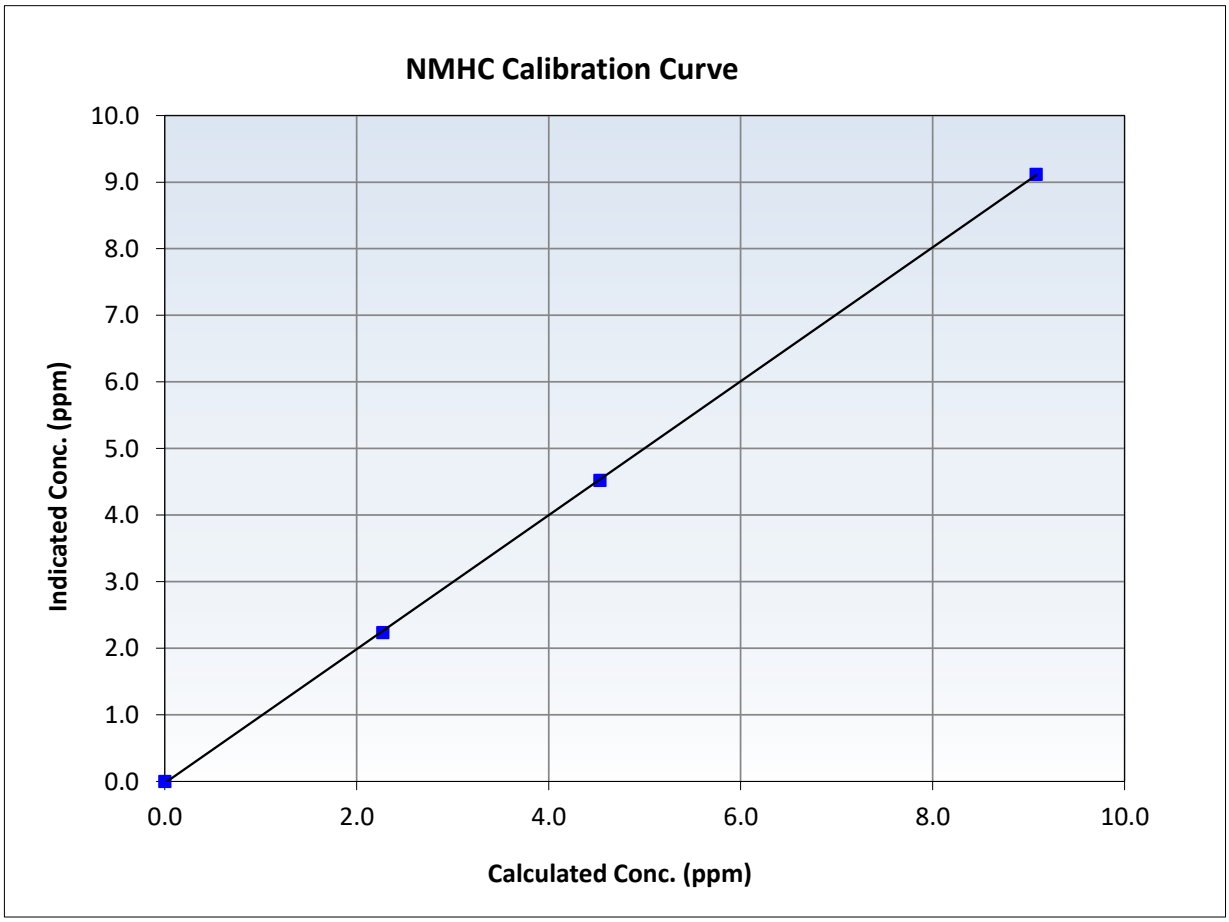
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 25, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:20	End Time (MST):	12:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

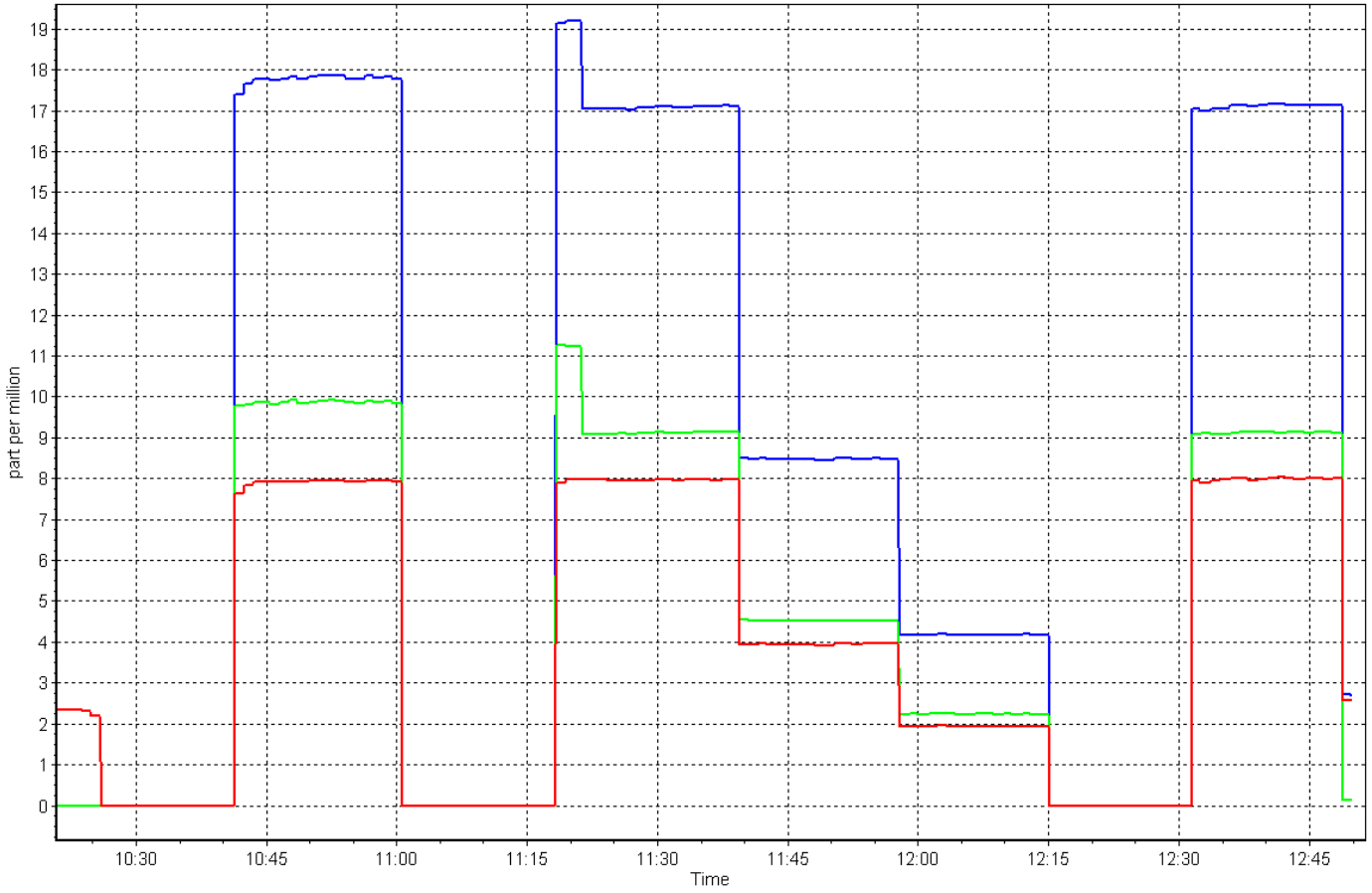
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
9.08	9.12	0.9958
4.53	4.52	1.0023
2.27	2.24	1.0160

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999968	*≥0.995*
Slope	1.005604	*0.90 - 1.10*
Intercept	-0.024182	*+/-0.5*



NMHC Calibration Plot Date: December 5, 2024 Location: Fort McKay South



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort McKay South
Station number:	AMS 13
Calibration Date:	December 10, 2024
Last Cal Date:	November 6, 2024
Start time (MST):	10:45
End time (MST):	14:50
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T2UP1RP	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	48.25 ppm	NO Cal Gas Conc:	47.88 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.25 ppm	Removed Gas NO Conc:	47.88 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	2448
ZAG make/model:	Teledyne APIT701	Serial Number:	1118

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	1.9	1.9	0.0	----	----
AF High point	4917	83.5	805.7	799.5	6.2	806.1	797.4	8.7	1.0019	1.0050
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	801.7 ppb	NO =	792.6 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = 0.3%
Baseline Corr 1st pt	NO_X =	804.2 ppb	NO =	795.5 ppb	As Found Statistics	*Percent Change	NO = 0.4%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1410661329

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.148	1.148	NO bkgnd or offset:	10.2	12.4
NOX coeff or slope:	1.004	1.004	NOX bkgnd or offset:	10.4	12.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	161.1	161.1

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.997562	0.996427
NO_X Cal Offset:	-2.032369	-1.932112
NO Cal Slope:	0.994805	0.996592
NO Cal Offset:	-2.769719	-2.870130
NO_2 Cal Slope:	1.000308	1.011196
NO_2 Cal Offset:	0.284103	1.206318

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.2	0.1	0.1	----	----
High point	4917	83.5	805.7	799.5	6.2	801.9	795.3	6.5	1.0047	1.0053
Mid point	4958	41.8	403.4	400.3	3.1	399.1	394.9	4.2	1.0107	1.0137
Low point	4979	20.9	201.7	200.1	1.5	196.8	193.4	3.4	1.0248	1.0349
As left zero	5000	0.0	0.0	0.0	0.0	1.2	1.0	0.2	----	----
As left span	4917	83.5	805.7	374.3	431.4	794.8	374.3	420.5	1.0137	1.0000
								Average Correction Factor	1.0134	1.0179

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	783.1	373.5	415.8	420.9	0.9878	101.2%
Mid GPT point	783.1	577.0	212.3	216.9	0.9787	102.2%
Low GPT point	783.1	681.4	107.9	111.1	0.9710	103.0%
				Average Correction Factor	0.9792	102.1%

Notes: Changed inlet filter. Performed zero adjustment, suspect the slightly high PMT temperature has affected the baseline slightly. Used second GPT reference point due to slight drift.

Calibration Performed By: Kelly Baragar

Wood Buffalo Environmental Association

NO_X Calibration Summary

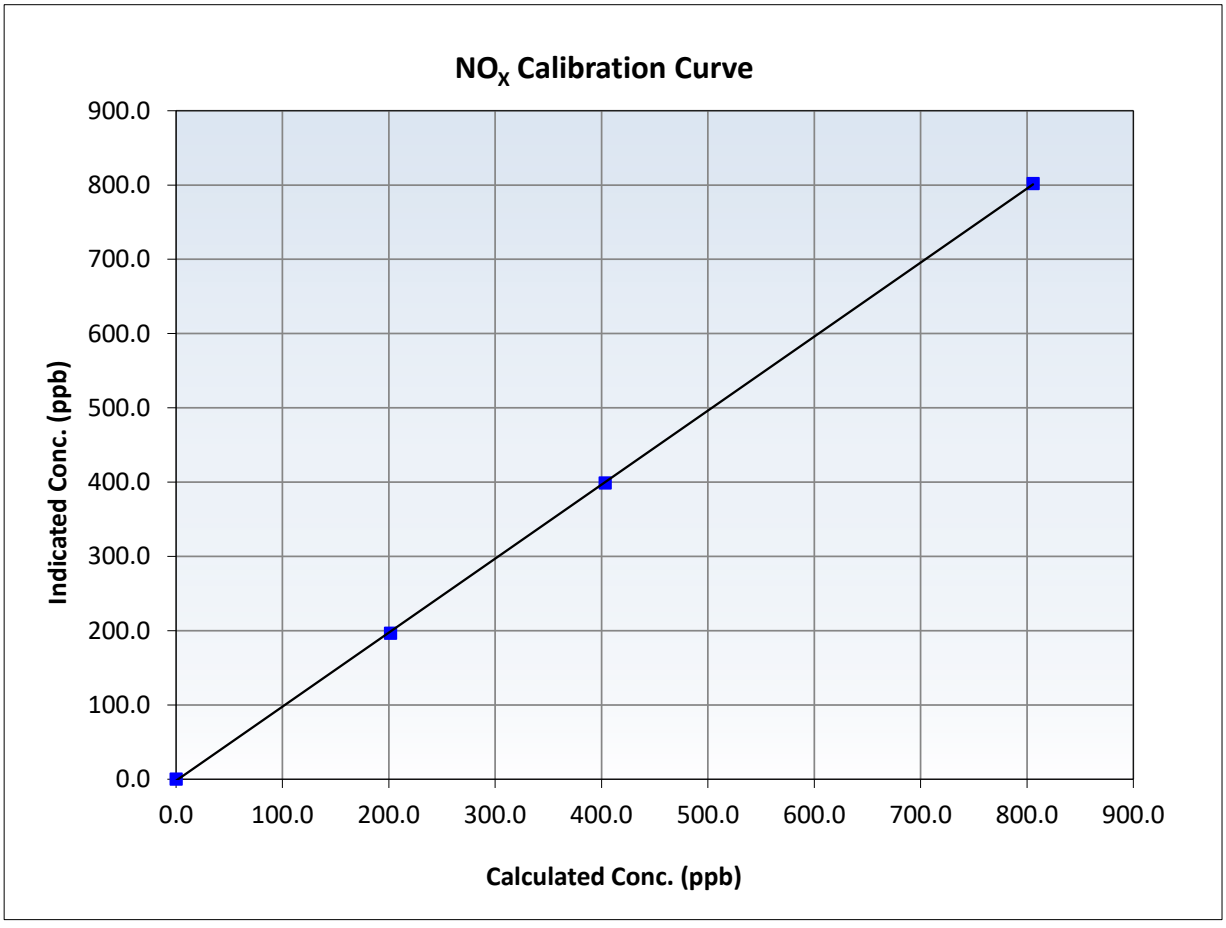
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 6, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:45	End Time (MST):	14:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
805.7	801.9	1.0047
403.4	399.1	1.0107
201.7	196.8	1.0248

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999968	*≥0.995*
Slope	0.996427	*0.90 - 1.10*
Intercept	-1.932112	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

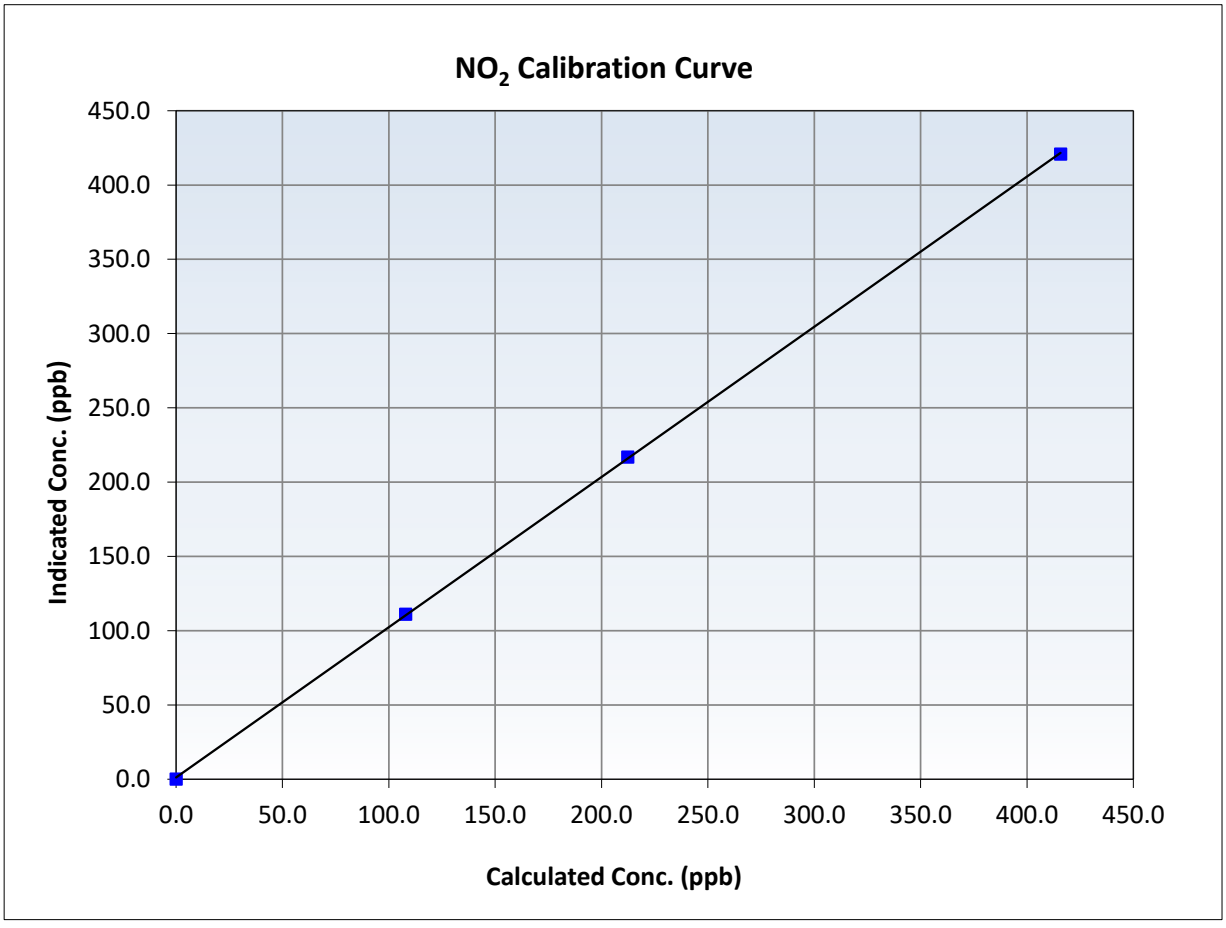
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 6, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:45	End Time (MST):	14:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
415.8	420.9	0.9878
212.3	216.9	0.9787
107.9	111.1	0.9710

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999964	*≥0.995*
Slope	1.011196	*0.90 - 1.10*
Intercept	1.206318	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

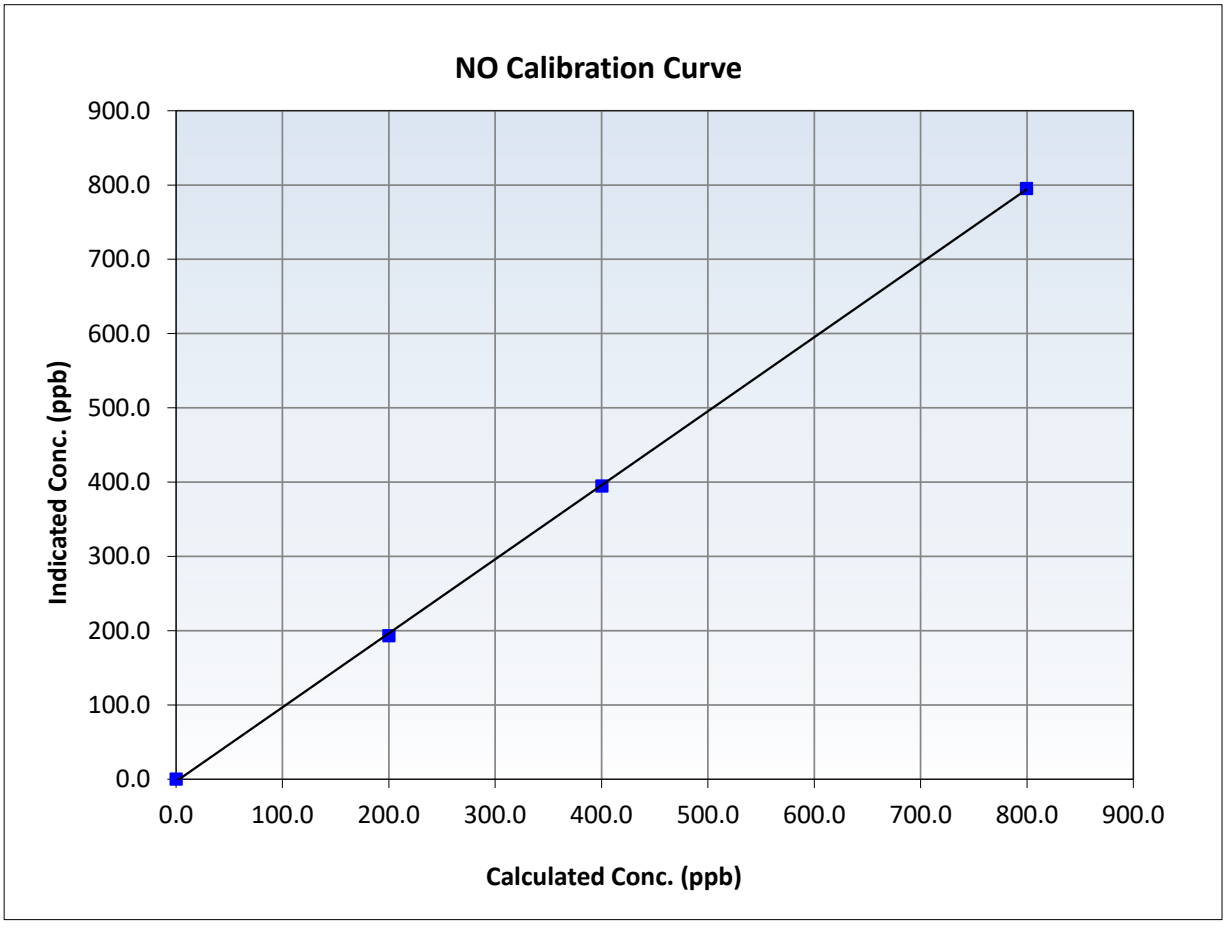
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 6, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:45	End Time (MST):	14:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

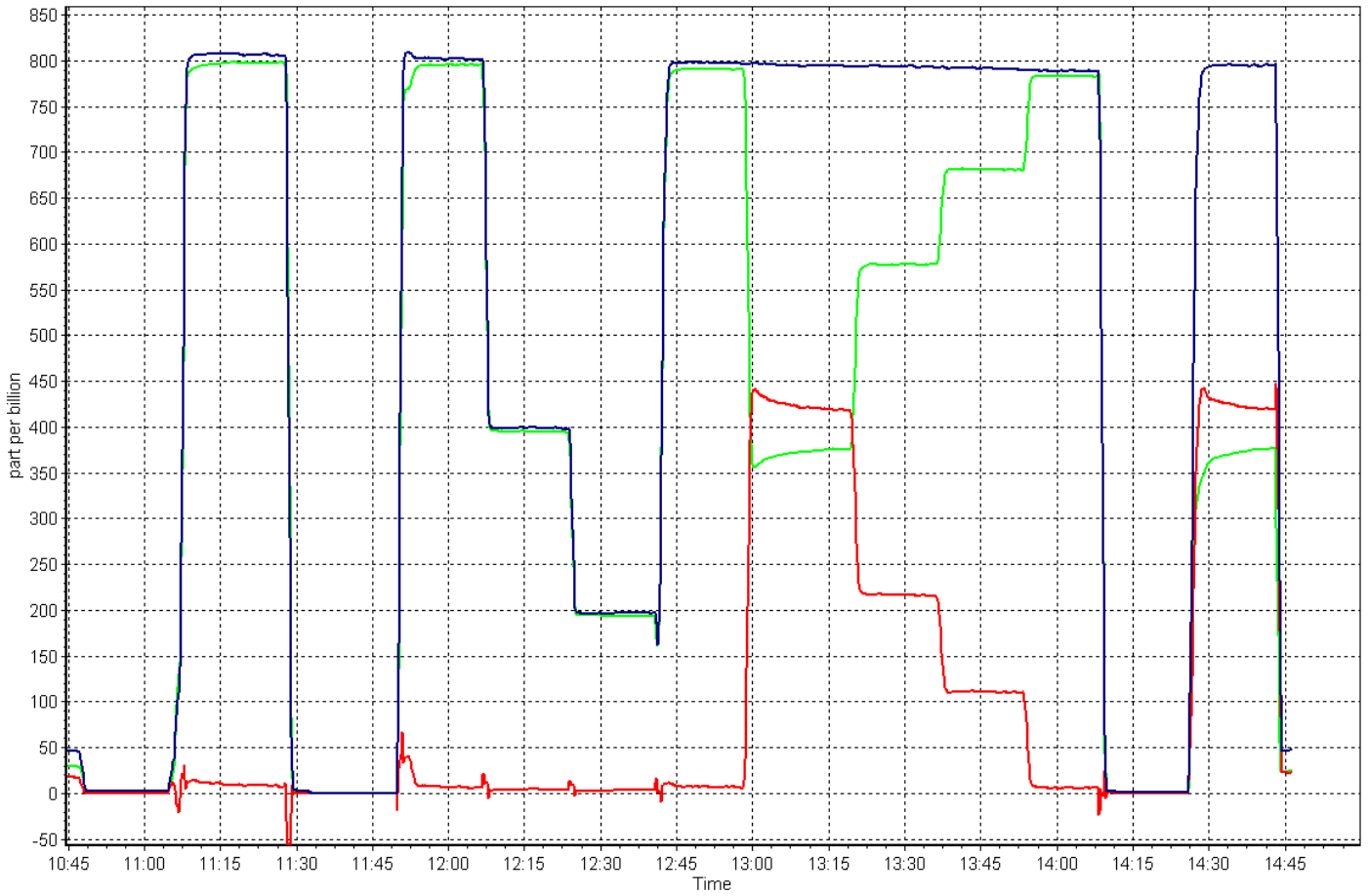
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
799.5	795.3	1.0053
400.3	394.9	1.0137
200.1	193.4	1.0349

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999936	*≥0.995*
Slope	0.996592	*0.90 - 1.10*
Intercept	-2.870130	*+/-20*



NO_X Calibration Plot Date: December 10, 2024 Location: Fort McKay South



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	December 2, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	10:28	End time (MST):	13:26
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	2448
ZAG Make/Model:	Teledyne API T701	Serial Number:	1118

Analyzer Information

Analyzer make:	Teledyne API T400		Analyzer serial #:	3871	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002457	1.002486	Backgd or Offset:	2.7	2.7
Calibration intercept:	1.220000	0.940000	Coeff or Slope:	0.973	0.973

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.5	----
As found High point	5000	997.5	400.0	401.8	0.994
As found Mid point					
As found Low point					
Baseline Corr As found:	402.3	Previous response	402.2	*% change	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	5000	996.1	400.0	401.4	0.997
Mid point	5000	850.2	200.0	202.2	0.989
Low point	5000	751.7	100.0	101.8	0.982
As left zero	5000	0.0	0.0	0.3	----
As left span	5000	996.1	400.0	403.0	0.993
				Average Correction Factor	0.989

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

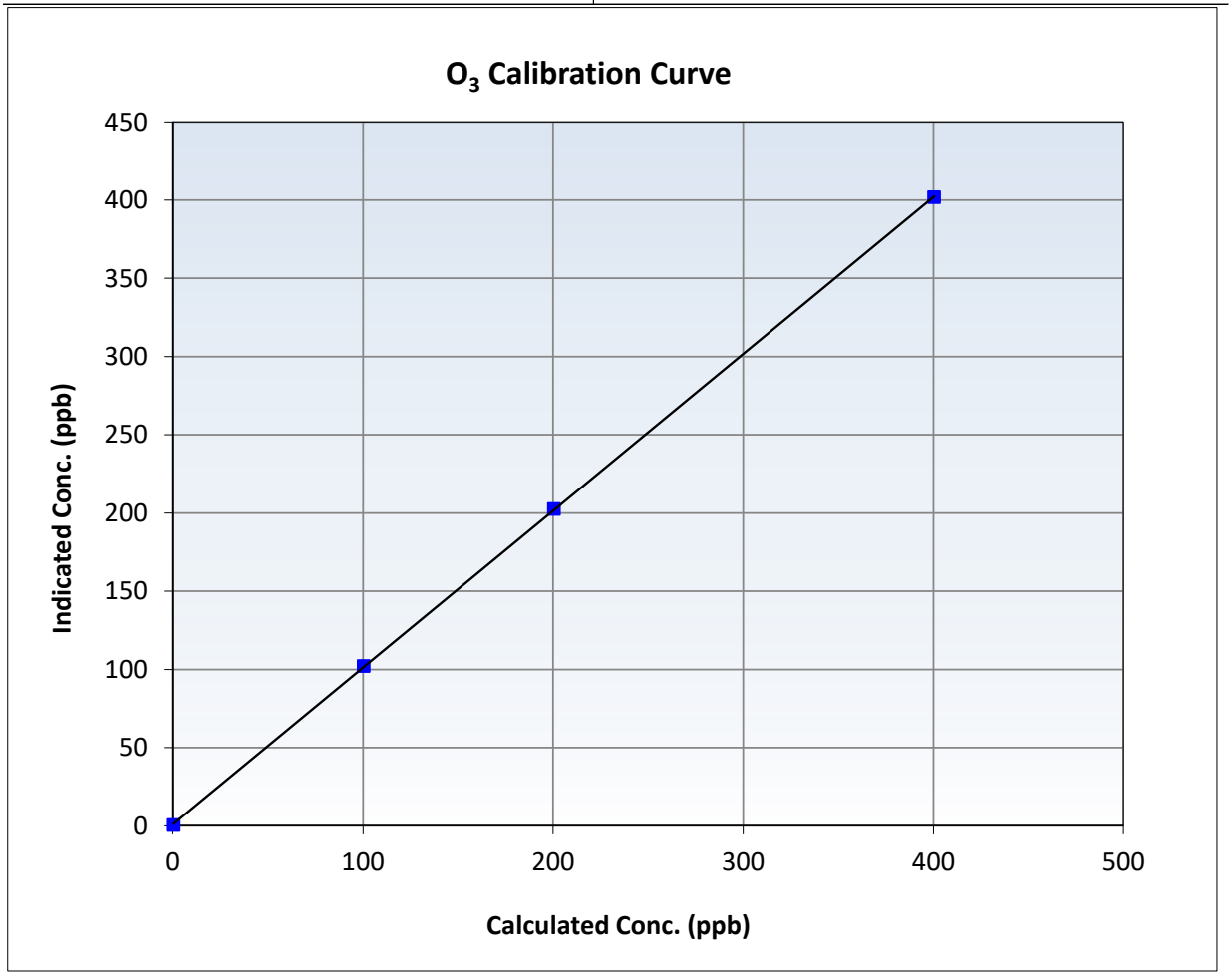
O_3 Calibration Summary

Station Information

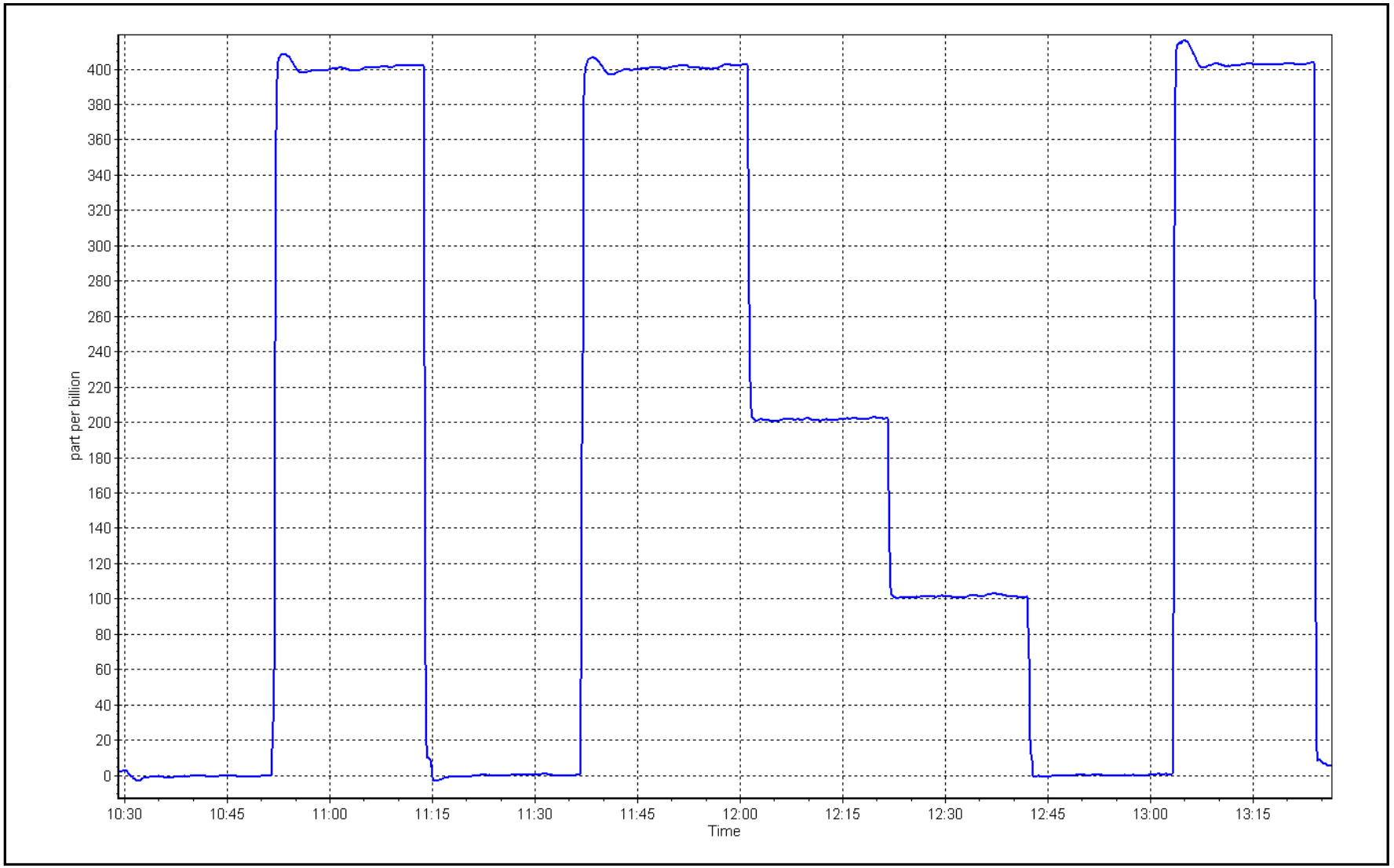
Calibration Date:	December 2, 2024	Previous Calibration:	November 4, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:28	End Time (MST):	13:26
Analyzer make:	Teledyne API T400	Analyzer serial #:	3871

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999978	*≥0.995*
400.0	401.4	0.9965	Slope	1.002486	*0.90 - 1.10*
200.0	202.2	0.9891			
100.0	101.8	0.9823	Intercept	0.940000	*+/- 5*



O_3 Calibration Plot Date: December 2, 2024 Location: Fort McKay South



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	December 10, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	11:55	End time (MST):	13:07
Analyzer Make:	Teledyne API T640	S/N:	1335
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388746
Temp/RH standard:	Alicat FP-25BT	S/N:	388746

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-19.6	-21.23	-19.6	☐	+/- 2 °C
P (mmHg)	747.7	749.56	747.7	☐	+/- 10 mmHg
Flow (LPM)	5.00	4.87	5.00	☑	+/- 0.25 LPM
PW% (pump)	44	-----	44	☐	>80%
Zero Verification	PM w/o HEPA:	3.6	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	7.0		11.0	☑	+/- 0.5

Date Optical Chamber Cleaned: October 1, 2024

Date Disposable Filter Changed: October 1, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 1, 2024

Date RH/T Sensor Cleaned: October 1, 2024

Notes: Made slight adjustment to flow, performed peak test and adjusted PMT from 1599 to 1630. Leak check performed before and after PMT adjustment, no issues.

Calibration by: Kelly Baragar

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS14
ANZAC
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 3, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	11:02	End time (MST):	14:33
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.95	ppm	Cal Gas Exp Date:	January 5, 2025
Cal Gas Cylinder #:	CC279389			
Removed Cal Gas Conc:	49.95	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3060
Zero Air Gen Model:	API T701H		Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	0710321322	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.006657	0.996286	Backgd or Offset:	24.8	24.1
Calibration intercept:	-2.605499	-1.499686	Coeff or Slope:	1.043	1.043

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.6	----
As found High point	4938	80.3	799.3	795.8	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.4	Previous response	802.0	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4938	80.3	799.3	795.9	1.004
Mid point	4979	40.2	400.1	395.7	1.011
Low point	4998	20.2	201.1	197.2	1.020
As left zero	5000	0.0	0.0	0.3	----
As left span	4938	80.3	799.3	800.9	0.998
				Average Correction Factor:	1.012

Notes: Sample inlet filter changed after as founds. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

SO_2 Calibration Summary

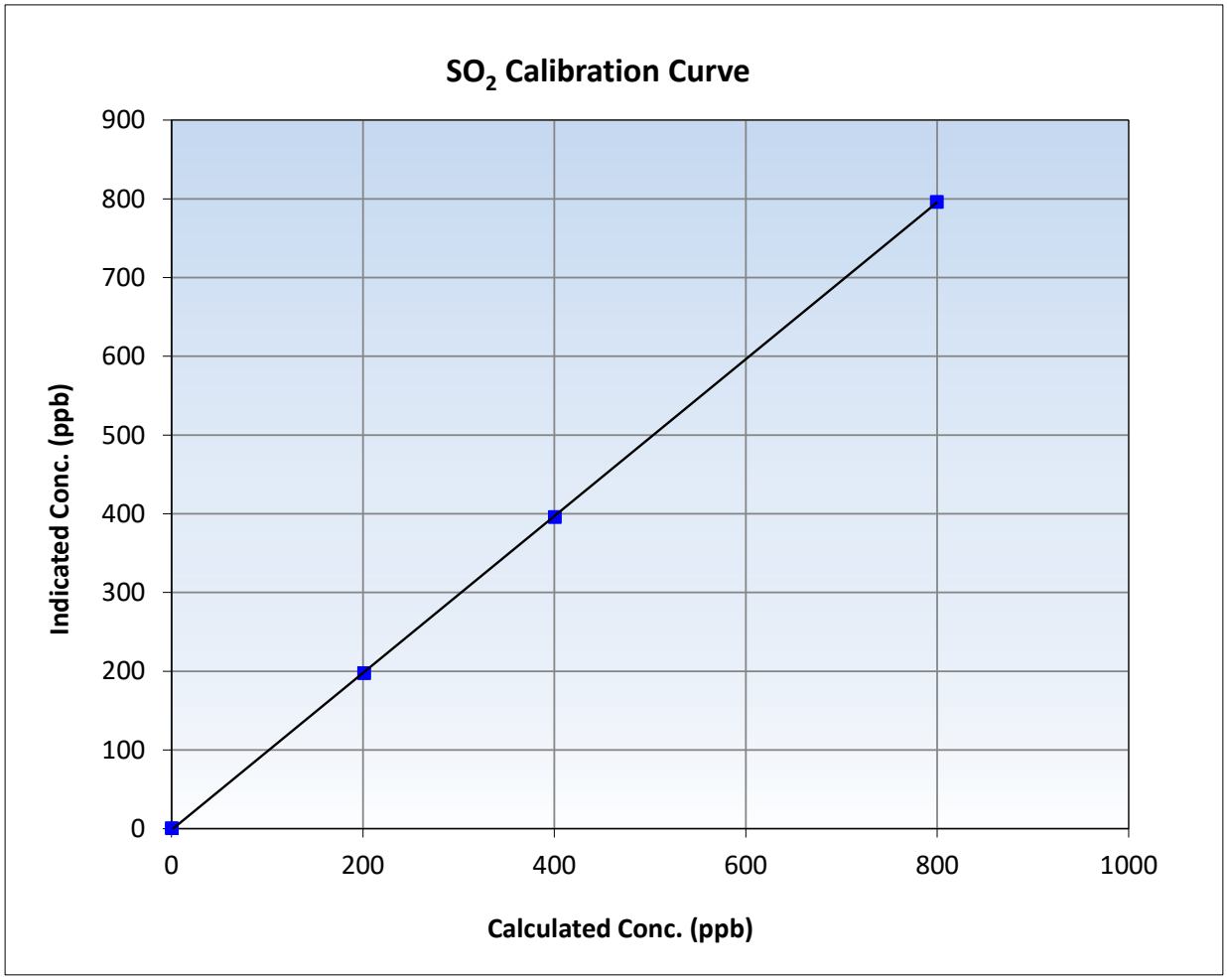
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 7, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:02	End Time (MST):	14:33
Analyzer make:	Thermo 43i	Analyzer serial #:	0710321322

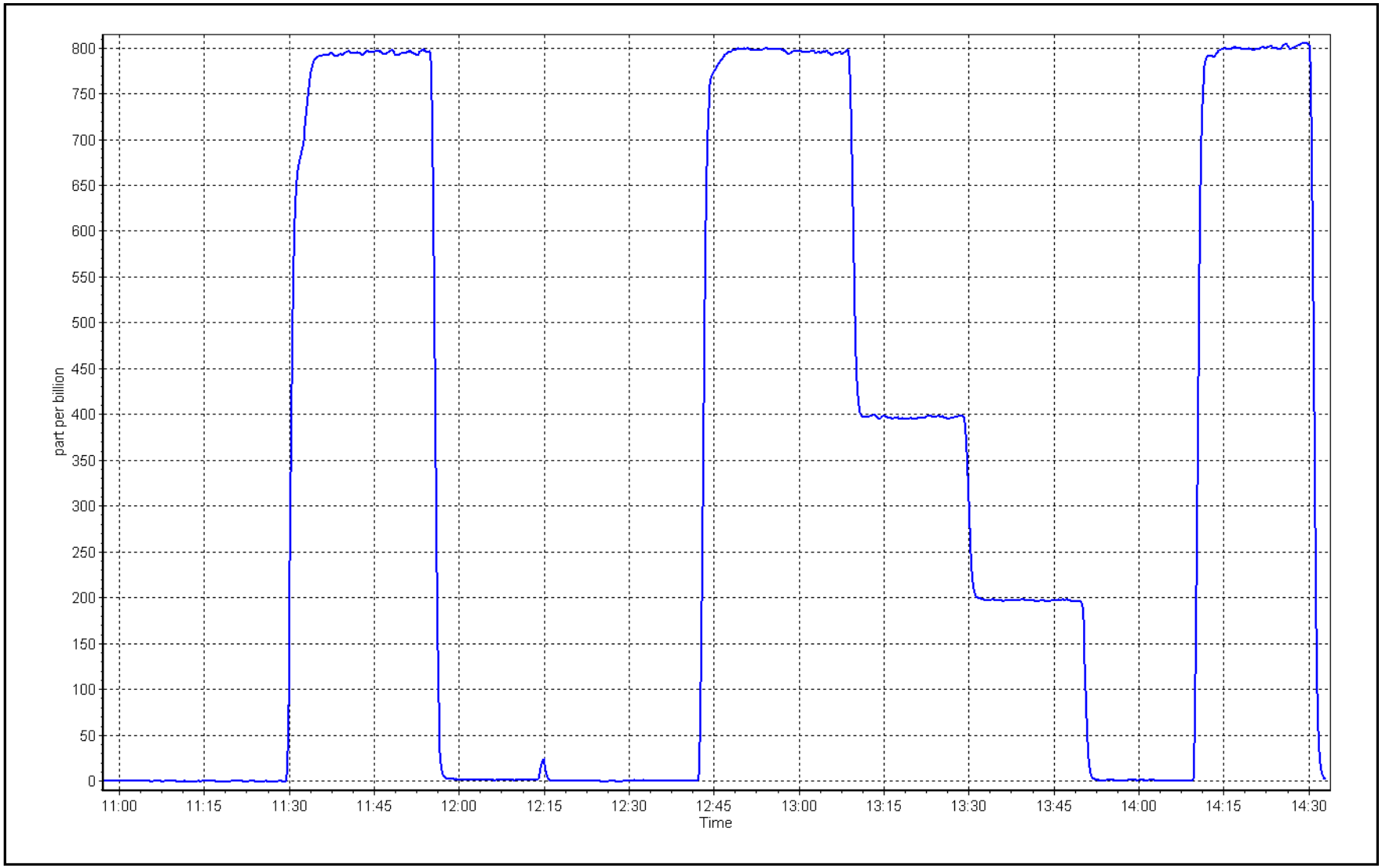
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
799.3	795.9	1.0042
400.1	395.7	1.0110
201.1	197.2	1.0196

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999973	*≥0.995*
Slope	0.996286	*0.90 - 1.10*
Intercept	-1.499686	*+/-30*



SO2 Calibration Plot Date: December 3, 2024 Location: Anzac



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 12, 2024	Last Cal Date:	November 27, 2024
Start time (MST):	10:07	End time (MST):	14:58
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.15	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC510379			
Removed Cal Gas Conc:	5.15	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3060
ZAG Make/Model:	API 701H		Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1218153582	
Converter make:	CD Nova CDN-101		Converter serial #:	503	
Analyzer Range	0 - 100 ppb		Converter Temp:	800	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.975285	1.000876	Backgd or Offset:	2.3	2.5
Calibration intercept:	-0.065266	0.014569	Coeff or Slope:	0.995	1.065

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4938	77.9	80.0	76.1	1.048
As found Mid point	4973	38.9	40.0	37.7	1.055
As found Low point	4997	19.5	20.0	18.6	1.065
New cylinder response					
Baseline Corr As found:	76.3	Prev response:	77.94	*% change:	-2.2%
Baseline Corr 2nd AF pt:	37.9	AF Slope:	0.954900	AF Intercept:	-0.365158
Baseline Corr 3rd AF pt:	18.8	AF Correlation:	0.999978	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4938	77.9	80.0	80.1	0.998
Mid point	4973	38.9	40.0	39.9	1.001
Low point	4997	19.5	20.0	20.0	1.001
As left zero	5000	0.0	0.0	0.2	----
As left span	4938	77.9	80.0	79.3	1.008
SO2 Scrubber Check	4936	80.3	800.4	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.000
Date of last converter efficiency test:					

Notes: Changed the sample inlet filter after as founds. Completed a SO2 scrubber check after calibrator zero. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

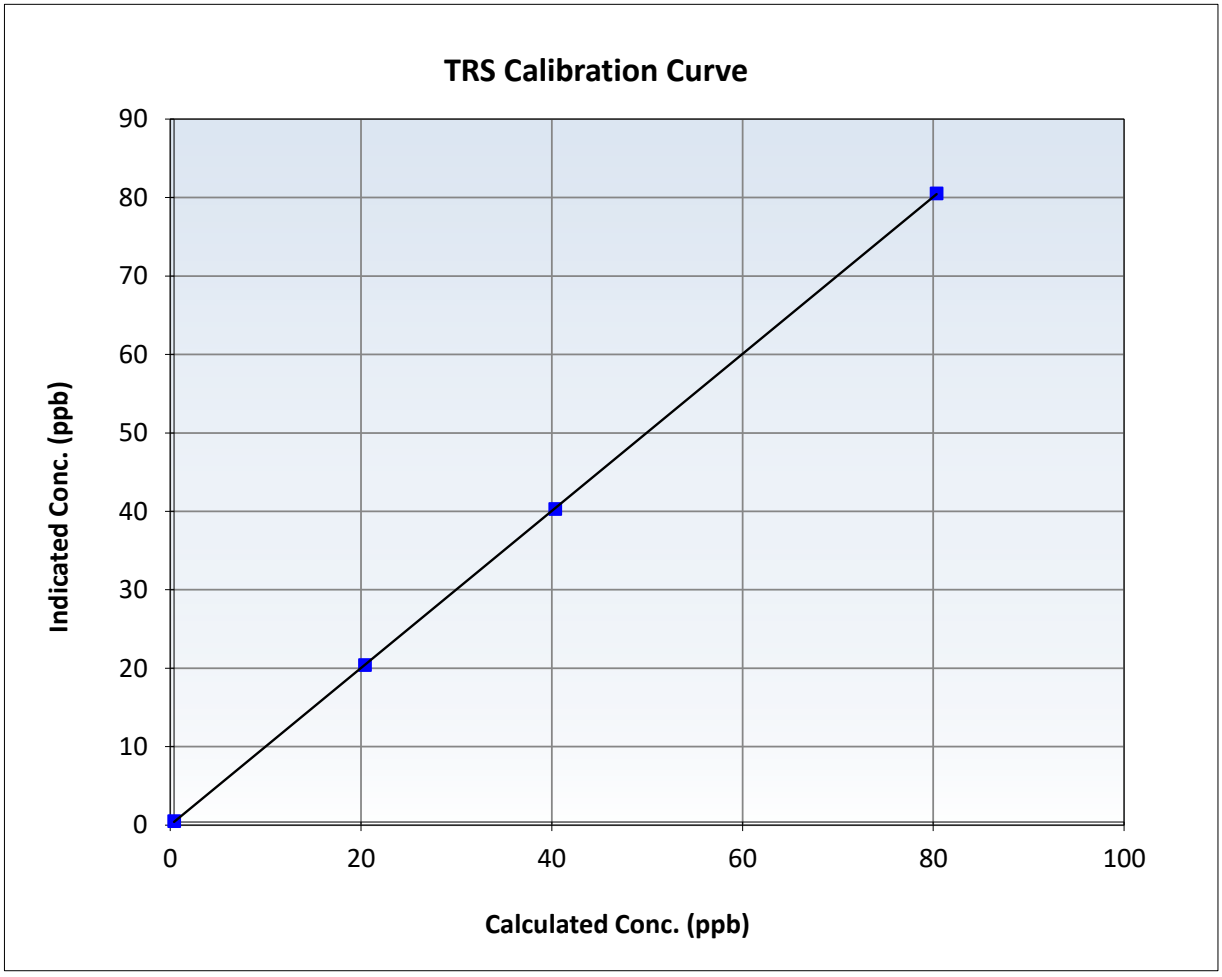
TRS Calibration Summary

Station Information

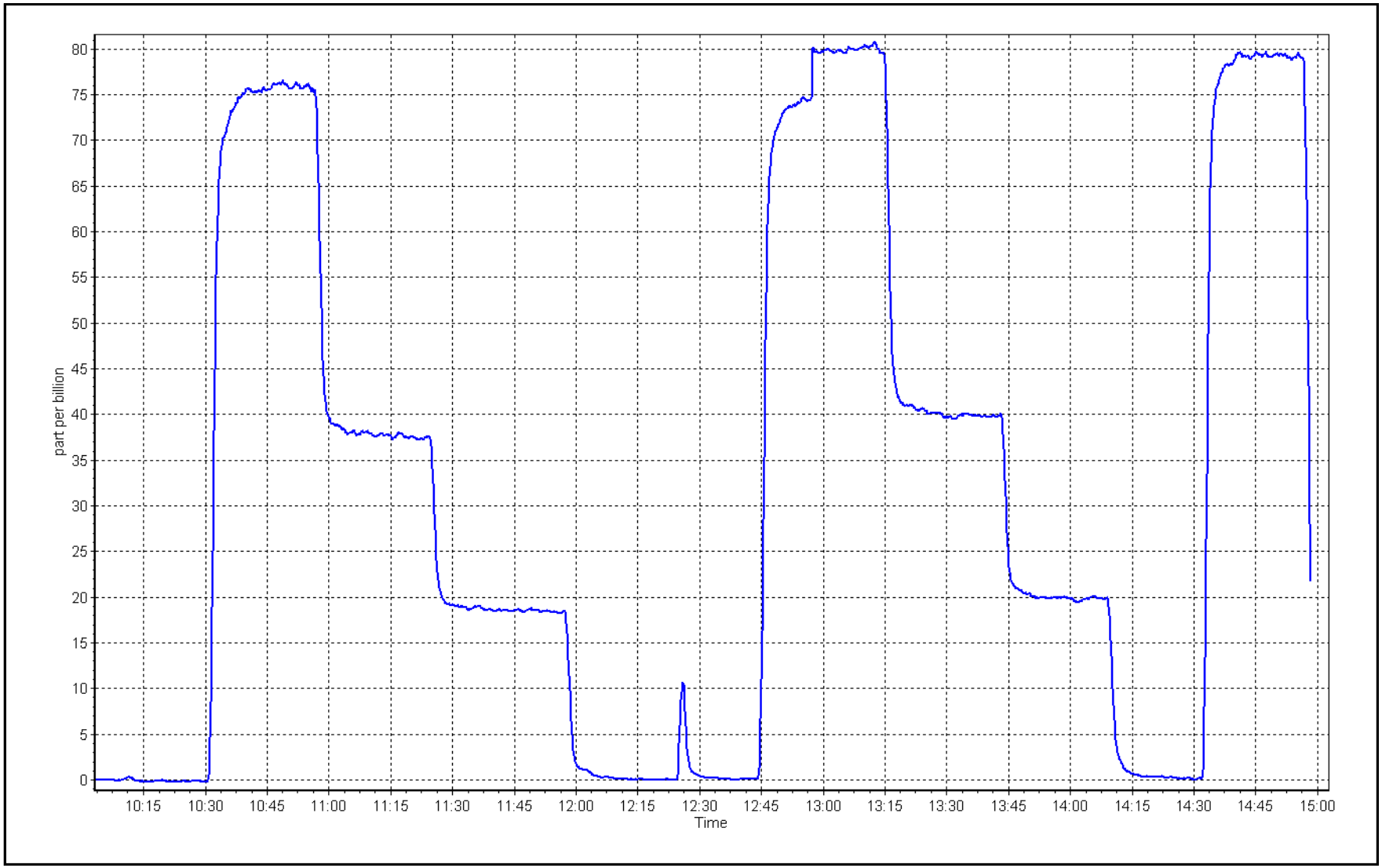
Calibration Date:	December 12, 2024	Previous Calibration:	November 27, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:07	End Time (MST):	14:58
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153582

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999993	*≥0.995*
80.0	80.1	0.9981	Slope	1.000876	*0.90 - 1.10*
40.0	39.9	1.0014			
20.0	20.0	1.0006	Intercept	0.014569	*+/-3*



TRS Calibration Plot Date: December 12, 2024 Location: Anzac



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 3, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	11:02	End time (MST):	14:33
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC279389	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3060
Zero Air Gen model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	4.60E-04	4.40E-04	NMHC SP Ratio:	4.49E-05	4.48E-05
CH4 Retention time:	14.80	14.60	NMHC Peak Area:	203545	203902
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.14	17.57	0.976
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.57	Prev response	17.14	*% change	2.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.15	1.000
Mid point	4960	40.1	8.57	8.53	1.005
Low point	4980	20.0	4.28	4.27	1.001
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.14	17.08	1.004
				Average Correction Factor	1.002

Notes: Sample inlet filter changed after as founds. Adjusted zero and span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	9.17	0.996
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.17	Prev response	9.11	*% change	0.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.13	1.001
Mid point	4960	40.1	4.57	4.55	1.005
Low point	4980	20.0	2.28	2.27	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.13	9.14	1.000
				Average Correction Factor	1.003

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.01	8.40	0.953
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.40	Prev response	8.03	*% change	4.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	8.02	0.998
Mid point	4960	40.1	4.00	3.98	1.006
Low point	4980	20.0	2.00	2.00	0.997
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.01	7.94	1.008
				Average Correction Factor	1.000

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.999637	1.000257
THC Cal Offset:	-0.001623	-0.012023
CH4 Cal Slope:	1.001585	1.001044
CH4 Cal Offset:	0.004958	-0.004645
NMHC Cal Slope:	0.997917	0.999556
NMHC Cal Offset:	-0.006781	-0.007578

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

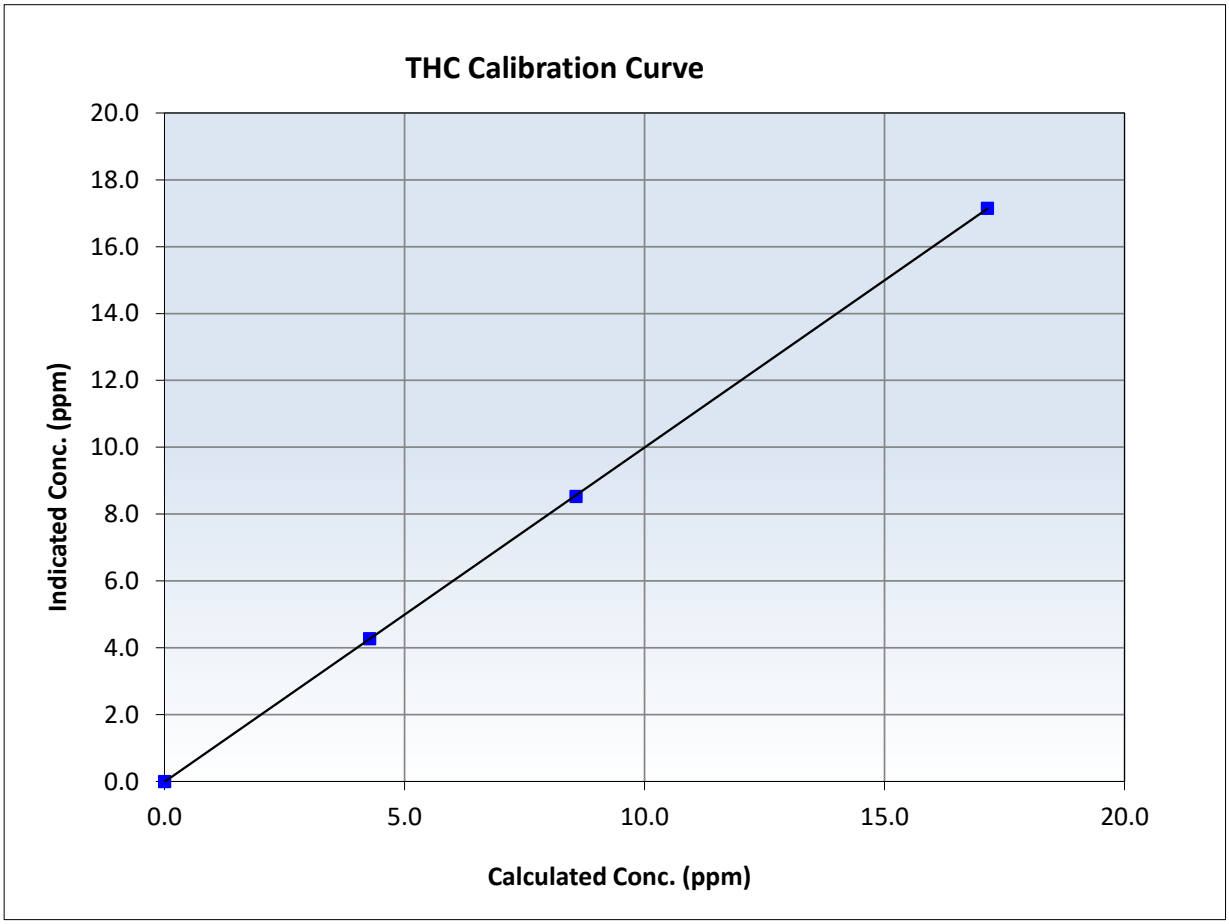
THC Calibration Summary

Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 21, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:02	End Time (MST):	14:33
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999990	≥0.995
17.14	17.15	0.9995	Slope	1.000257	0.90 - 1.10
8.57	8.53	1.0051	Intercept	-0.012023	+/-0.5
4.28	4.27	1.0010			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

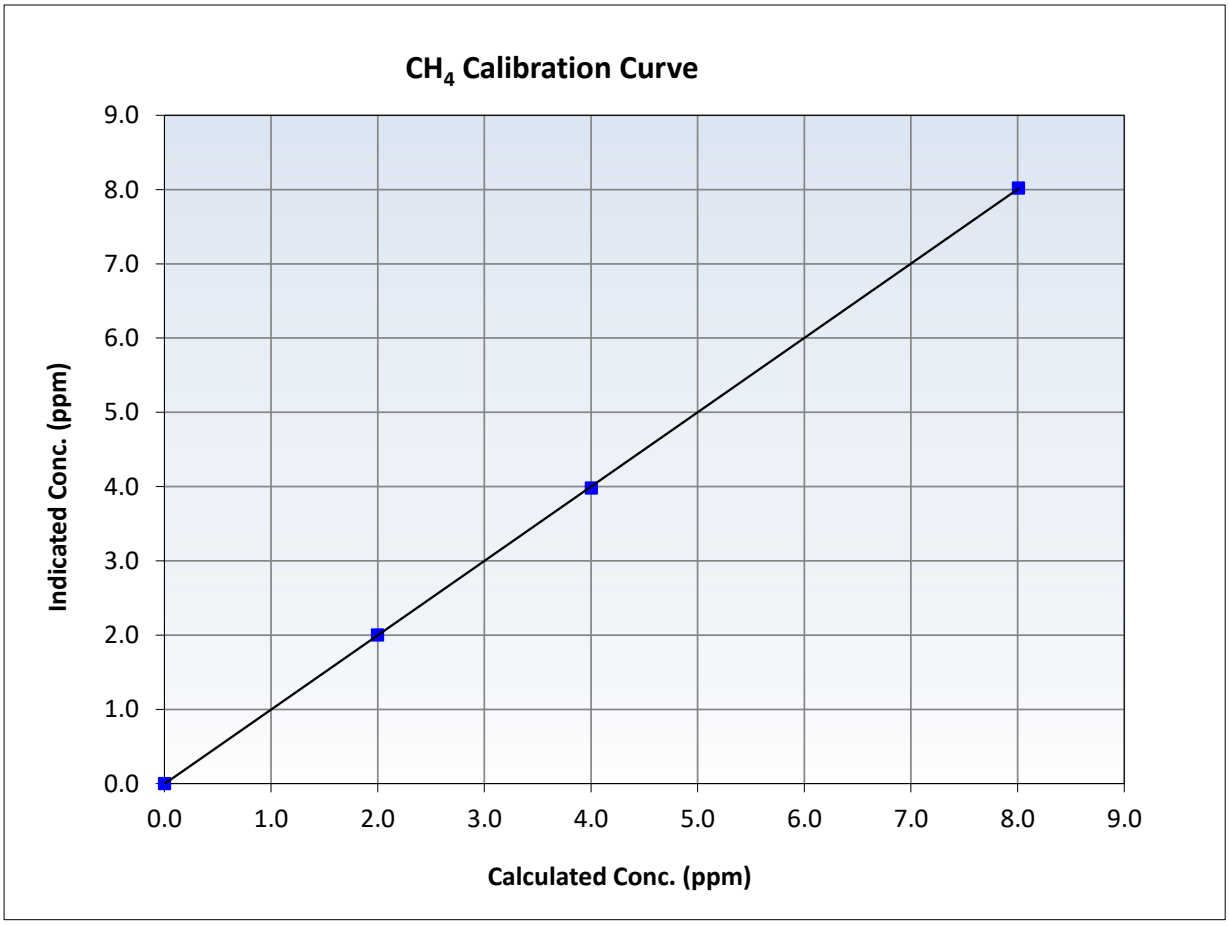
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 21, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:02	End Time (MST):	14:33
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.01	8.02	0.9984
4.00	3.98	1.0056
2.00	2.00	0.9971

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999982	*≥0.995*
Slope	1.001044	*0.90 - 1.10*
Intercept	-0.004645	*+/-0.5*



Wood Buffalo Environmental Association

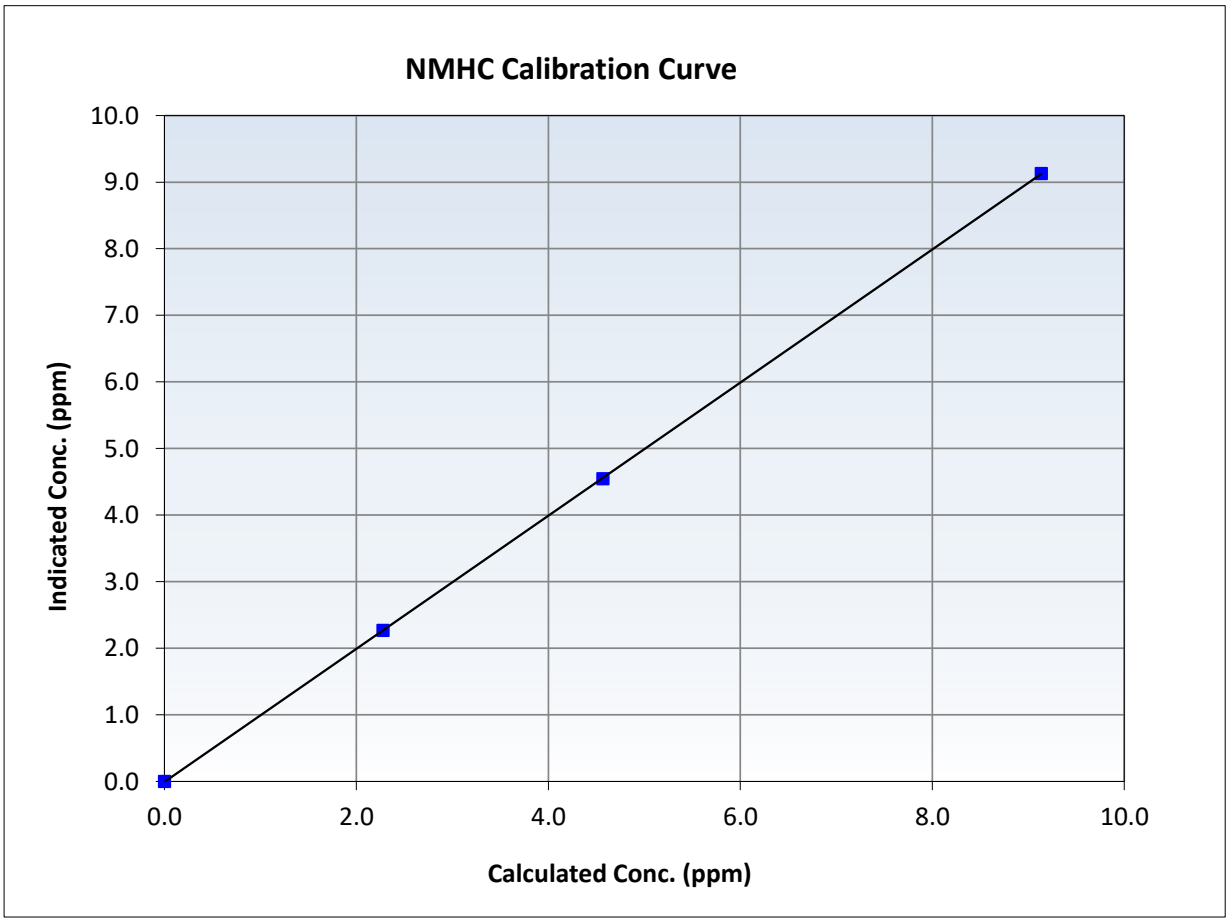
NMHC Calibration Summary

Station Information

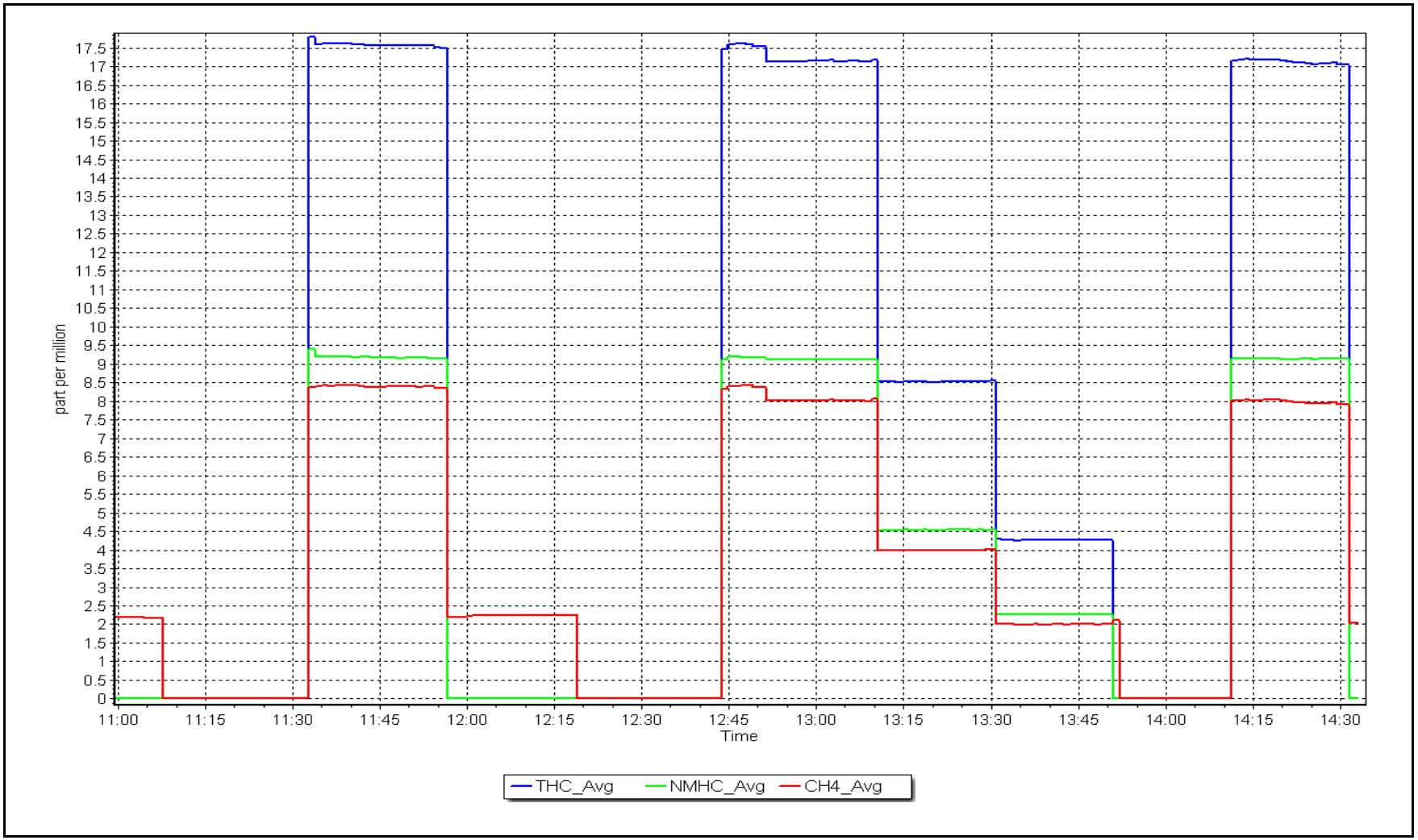
Calibration Date:	December 3, 2024	Previous Calibration:	November 21, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:02	End Time (MST):	14:33
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999994	≥0.995
9.13	9.13	1.0005	Slope	0.999556	0.90 - 1.10
4.57	4.55	1.0050			
2.28	2.27	1.0045	Intercept	-0.007578	+/-0.5



NMHC Calibration Plot Date: December 3, 2024 Location: Anzac



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 16, 2024	Last Cal Date:	December 3, 2024
Start time (MST):	10:39	End time (MST):	14:58
Reason:	Maintenance		

Calibration Standards

Gas Cert Reference:	CC279389	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3060
Zero Air Gen model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	4.40E-04	4.96E-04	NMHC SP Ratio:	4.48E-05	4.66E-05
CH4 Retention time:	14.6	14.8	NMHC Peak Area:	203902	195844
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.14	15.92	1.077
As found Mid point	4960	40.1	8.57	7.93	1.081
As found Low point	4980	20.0	4.28	3.97	1.076
New cylinder response					
Baseline Corr AF:	15.92	Prev response	17.14	*% change	-7.6%
Baseline Corr 2nd AF:	7.93	AF Slope:	0.928328	AF Intercept:	-0.004722
Baseline Corr 3rd AF:	3.97	AF Correlation:	0.999995	* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.18	0.998
Mid point	4960	40.1	8.57	8.55	1.003
Low point	4980	20.0	4.28	4.28	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.14	17.22	0.995
				Average Correction Factor	1.000

Notes: Replaced the actuator and the pump due to dips that started occuring and the drift on the span. Adjusted the span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	8.89	1.027
As found Mid point	4960	40.1	4.57	4.41	1.035
As found Low point	4980	20.0	2.28	2.20	1.035
New cylinder response					
Baseline Corr AF:	8.89	Prev response	9.12	*% change	-2.6%
Baseline Corr 2nd AF:	4.41	AF Slope:	0.973864	AF Intercept:	-0.013437
Baseline Corr 3rd AF:	2.20	AF Correlation:	0.999983	* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.14	0.999
Mid point	4960	40.1	4.57	4.55	1.004
Low point	4980	20.0	2.28	2.28	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.13	9.15	0.998
				Average Correction Factor	1.001

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.01	7.03	1.140
As found Mid point	4960	40.1	4.00	3.52	1.139
As found Low point	4980	20.0	2.00	1.77	1.128
New cylinder response					
Baseline Corr AF:	7.03	Prev response	8.01	*% change	-14.0%
Baseline Corr 2nd AF:	3.52	AF Slope:	0.876687	AF Intercept:	0.007915
Baseline Corr 3rd AF:	1.77	AF Correlation:	0.999992	* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	8.03	0.997
Mid point	4960	40.1	4.00	4.00	1.001
Low point	4980	20.0	2.00	2.00	0.998
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.01	8.07	0.992
				Average Correction Factor	0.999

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.000257	1.001557
THC Cal Offset:	-0.012023	-0.008018
CH4 Cal Slope:	1.001044	1.002871
CH4 Cal Offset:	-0.004645	-0.003045
NMHC Cal Slope:	0.999556	1.000581
NMHC Cal Offset:	-0.007578	-0.005173

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

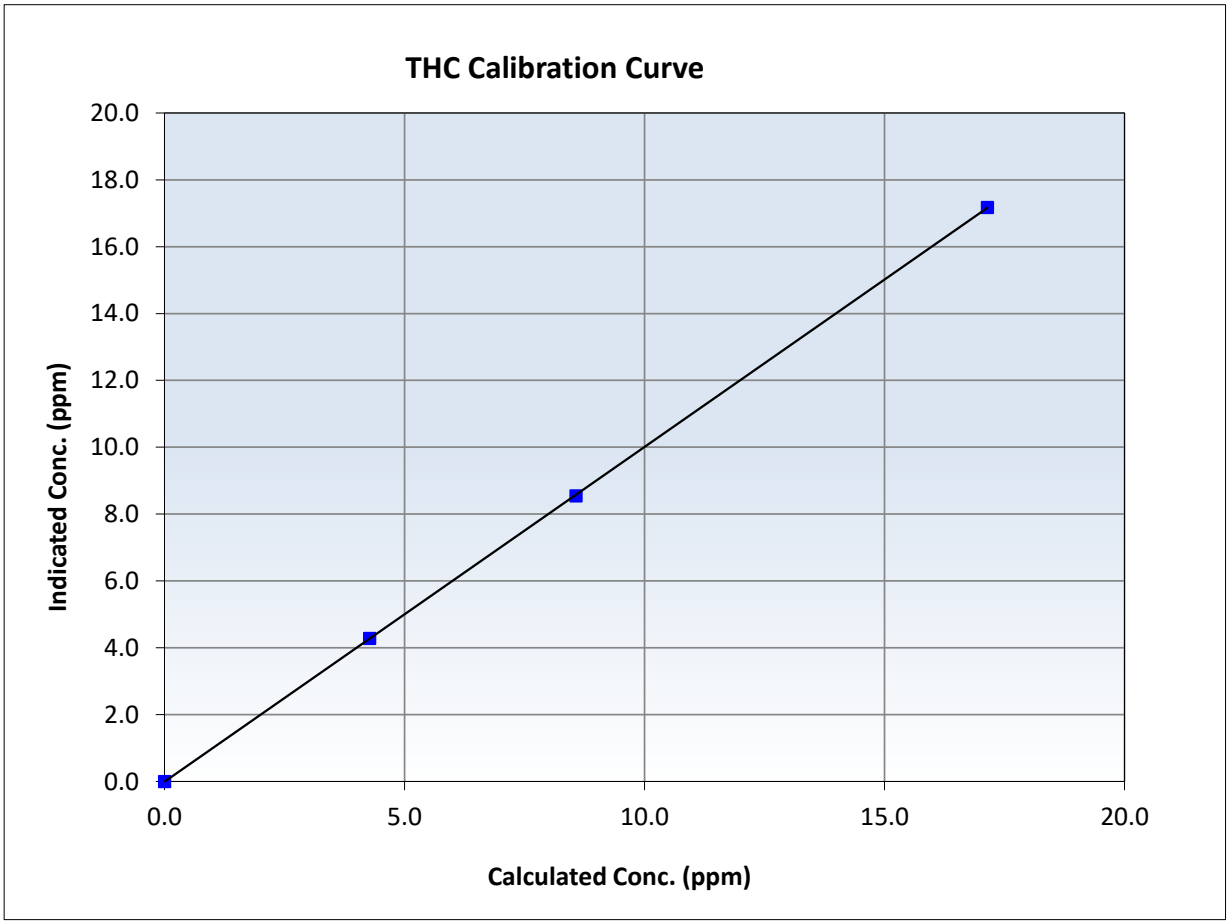
THC Calibration Summary

Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	December 3, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:39	End Time (MST):	14:58
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999993	≥0.995
17.14	17.18	0.9982	Slope	1.001557	0.90 - 1.10
8.57	8.55	1.0028	Intercept	-0.008018	+/-0.5
4.28	4.28	0.9989			



Wood Buffalo Environmental Association

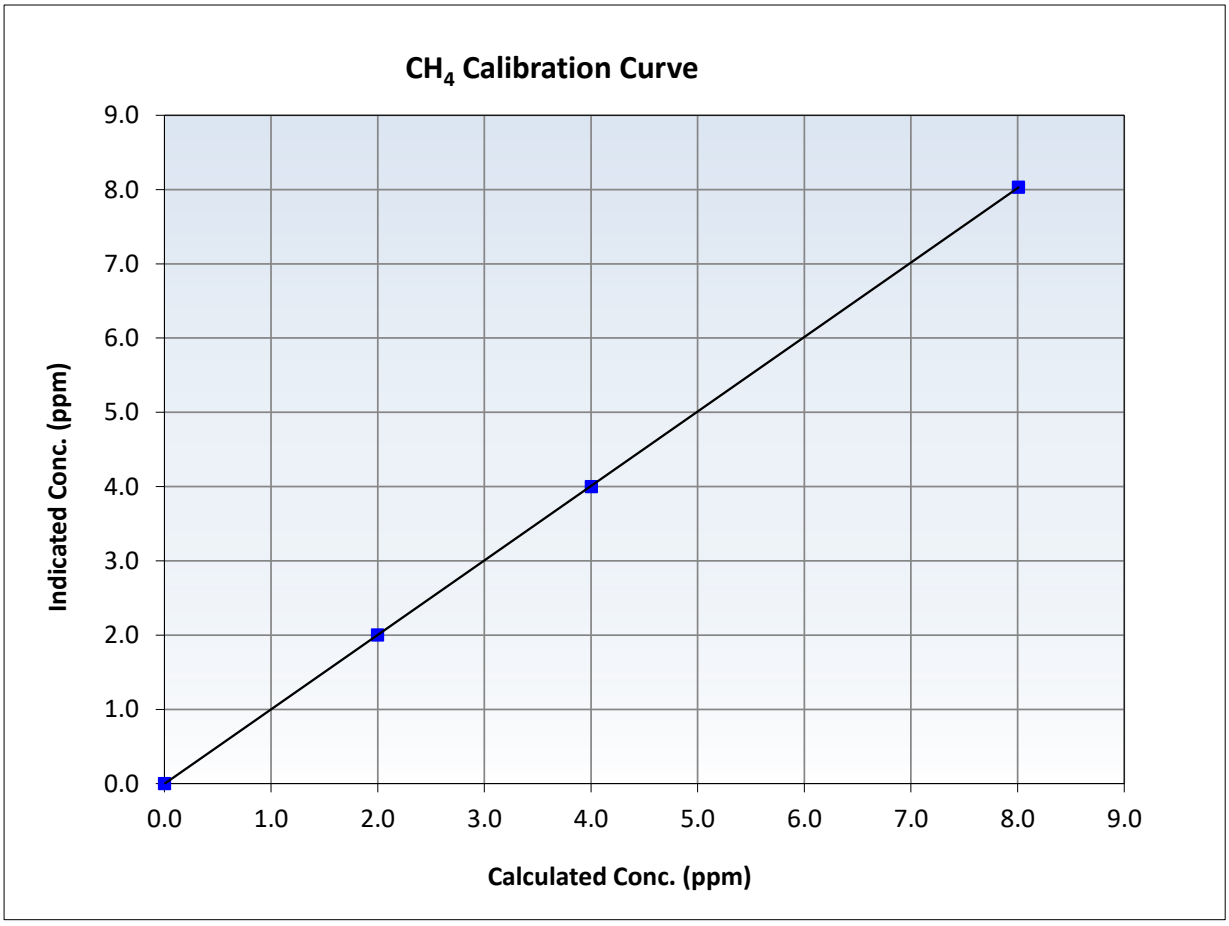
CH_4 Calibration Summary

Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	December 3, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:39	End Time (MST):	14:58
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999994	≥0.995
8.01	8.03	0.9968	Slope	1.002871	0.90 - 1.10
4.00	4.00	1.0008	Intercept	-0.003045	+/-0.5
2.00	2.00	0.9981			



Wood Buffalo Environmental Association

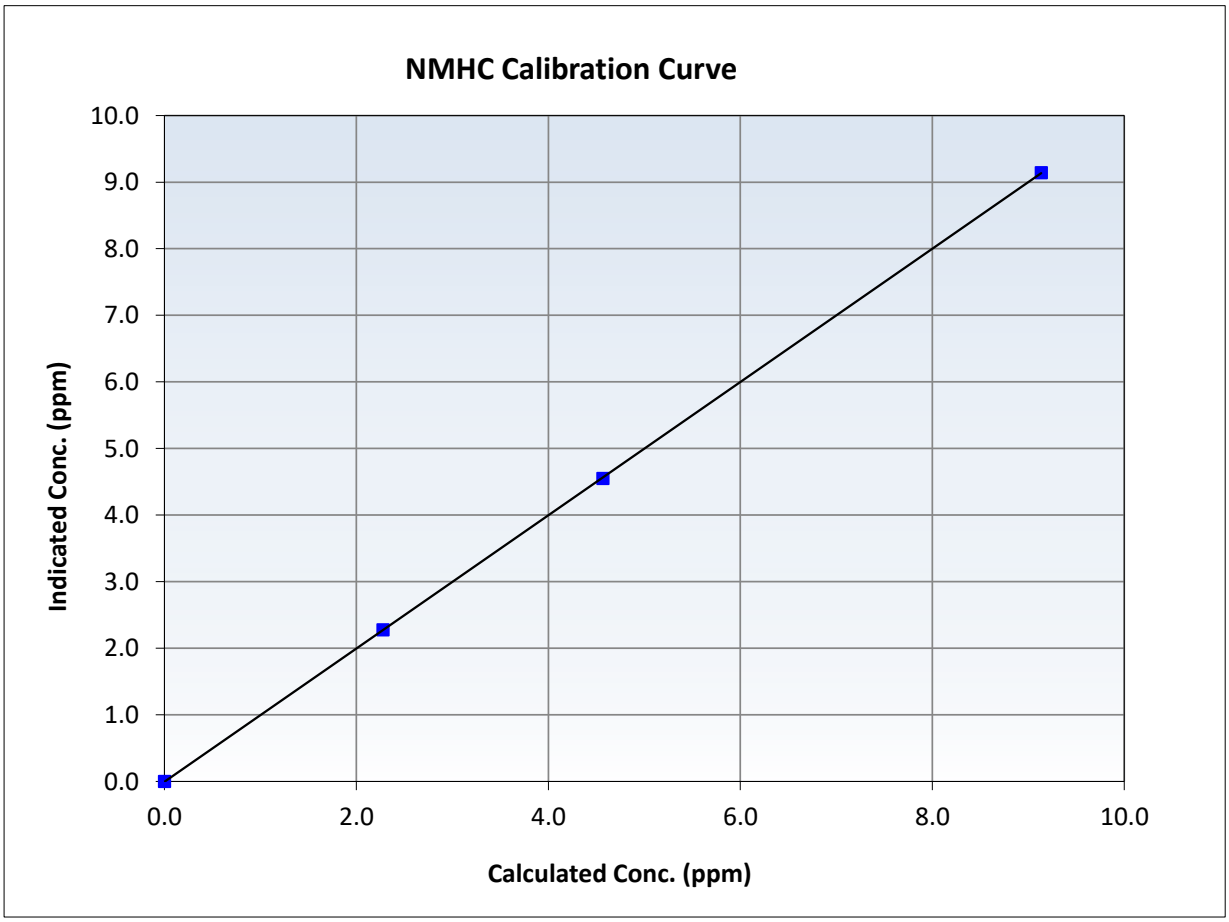
NMHC Calibration Summary

Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	December 3, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:39	End Time (MST):	14:58
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999992	≥0.995
9.13	9.14	0.9992	Slope	1.000581	0.90 - 1.10
4.57	4.55	1.0041			
2.28	2.28	1.0000	Intercept	-0.005173	+/-0.5



NMHC Calibration Plot Date: December 16, 2024 Location: Anzac

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 31, 2024	Last Cal Date:	December 16, 2024
Start time (MST):	9:30	End time (MST):	13:30
Reason:	Maintenance		

Calibration Standards

Gas Cert Reference:	CC279389	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3060
Zero Air Gen model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	4.96E-04	5.89E-04	NMHC SP Ratio:	4.66E-05	4.87E-05
CH4 Retention time:	14.8	15.0	NMHC Peak Area:	195844	187508
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.01	----
As found High point	4920	80.2	17.14	15.63	1.097
As found Mid point	4960	40.1	8.57	7.77	1.105
As found Low point	4980	20.0	4.28	3.89	1.102
New cylinder response					
Baseline Corr AF:	15.63	Prev response	17.16	*% change	-9.8%
Baseline Corr 2nd AF:	7.76	AF Slope:	0.911559	AF Intercept:	-0.011996
Baseline Corr 3rd AF:	3.88	AF Correlation:	0.999986	* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.26	0.993
Mid point	4960	40.1	8.57	8.55	1.003
Low point	4980	20.0	4.28	4.27	1.001
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.14	17.22	0.995
				Average Correction Factor	0.999

Notes: Calibrating the instrument due to a baseline shift yesterday.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	8.82	1.035
As found Mid point	4960	40.1	4.57	4.38	1.042
As found Low point	4980	20.0	2.28	2.19	1.039
New cylinder response					
Baseline Corr AF:	8.82	Prev response	9.13	*% change	-3.5%
Baseline Corr 2nd AF:	4.38	AF Slope:	0.965883	AF Intercept:	-0.009052
Baseline Corr 3rd AF:	2.19	AF Correlation:	0.999986	* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.13	1.000
Mid point	4960	40.1	4.57	4.54	1.006
Low point	4980	20.0	2.28	2.27	1.003
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.13	9.15	0.998
				Average Correction Factor	1.003

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.01	----
As found High point	4920	80.2	8.01	6.81	1.178
As found Mid point	4960	40.1	4.00	3.38	1.185
As found Low point	4980	20.0	2.00	1.69	1.184
New cylinder response					
Baseline Corr AF:	6.80	Prev response	8.03	*% change	-18.1%
Baseline Corr 2nd AF:	3.38	AF Slope:	0.849166	AF Intercept:	-0.001945
Baseline Corr 3rd AF:	1.69	AF Correlation:	0.999987	* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	8.13	0.985
Mid point	4960	40.1	4.00	4.01	0.998
Low point	4980	20.0	2.00	2.00	0.998
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.01	8.07	0.992
				Average Correction Factor	0.994

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	1.001557	1.007143
THC Cal Offset:	-0.008018	-0.029399
CH4 Cal Slope:	1.002871	1.015499
CH4 Cal Offset:	-0.003045	-0.021023
NMHC Cal Slope:	1.000581	0.999793
NMHC Cal Offset:	-0.005173	-0.007776

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

THC Calibration Summary

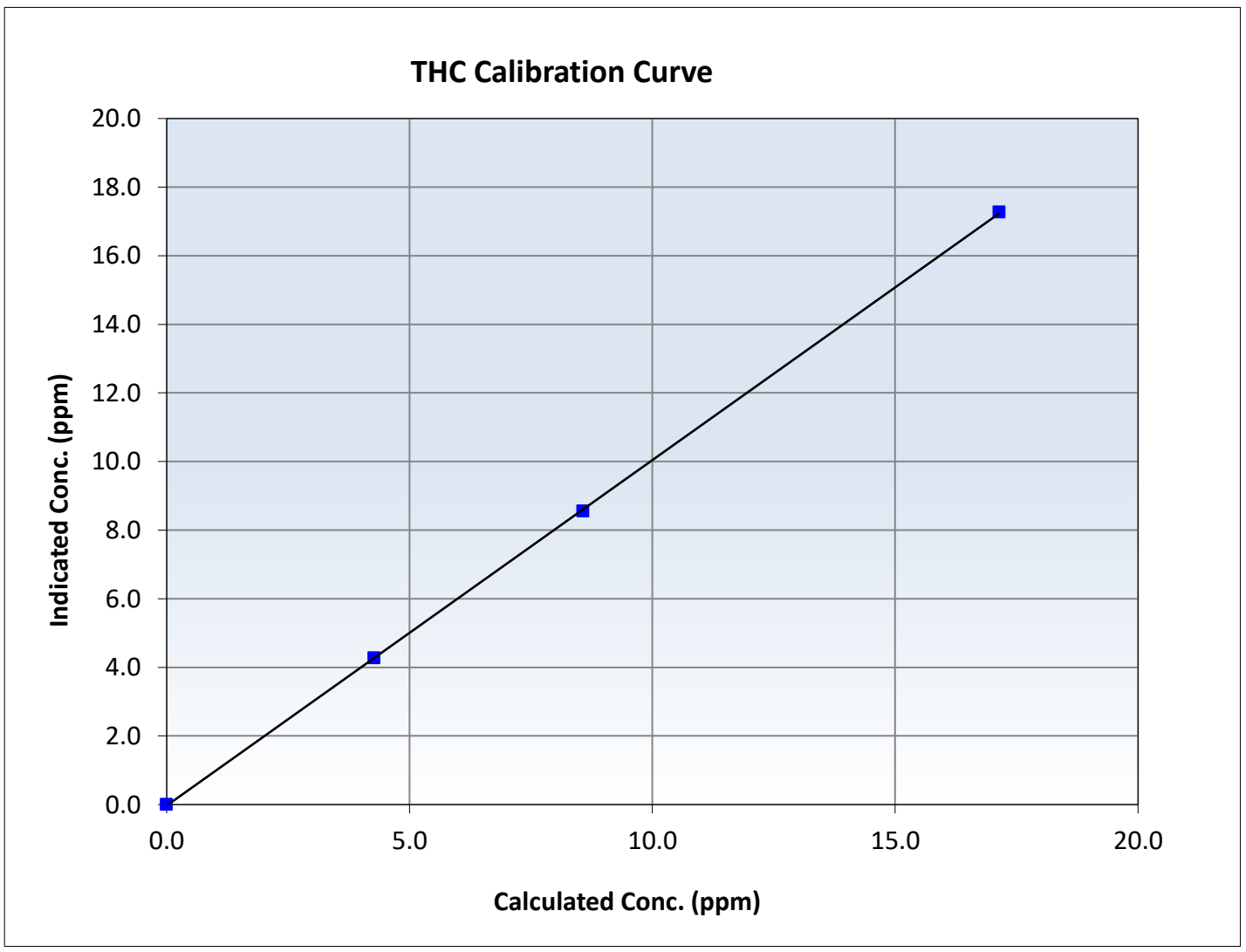
Station Information

Calibration Date:	December 31, 2024	Previous Calibration:	December 16, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:30	End Time (MST):	13:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
17.14	17.26	0.9930
8.57	8.55	1.0026
4.28	4.27	1.0005

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999972	*≥0.995*
Slope	1.007143	*0.90 - 1.10*
Intercept	-0.029399	*+/-0.5*



Wood Buffalo Environmental Association

CH_4 Calibration Summary

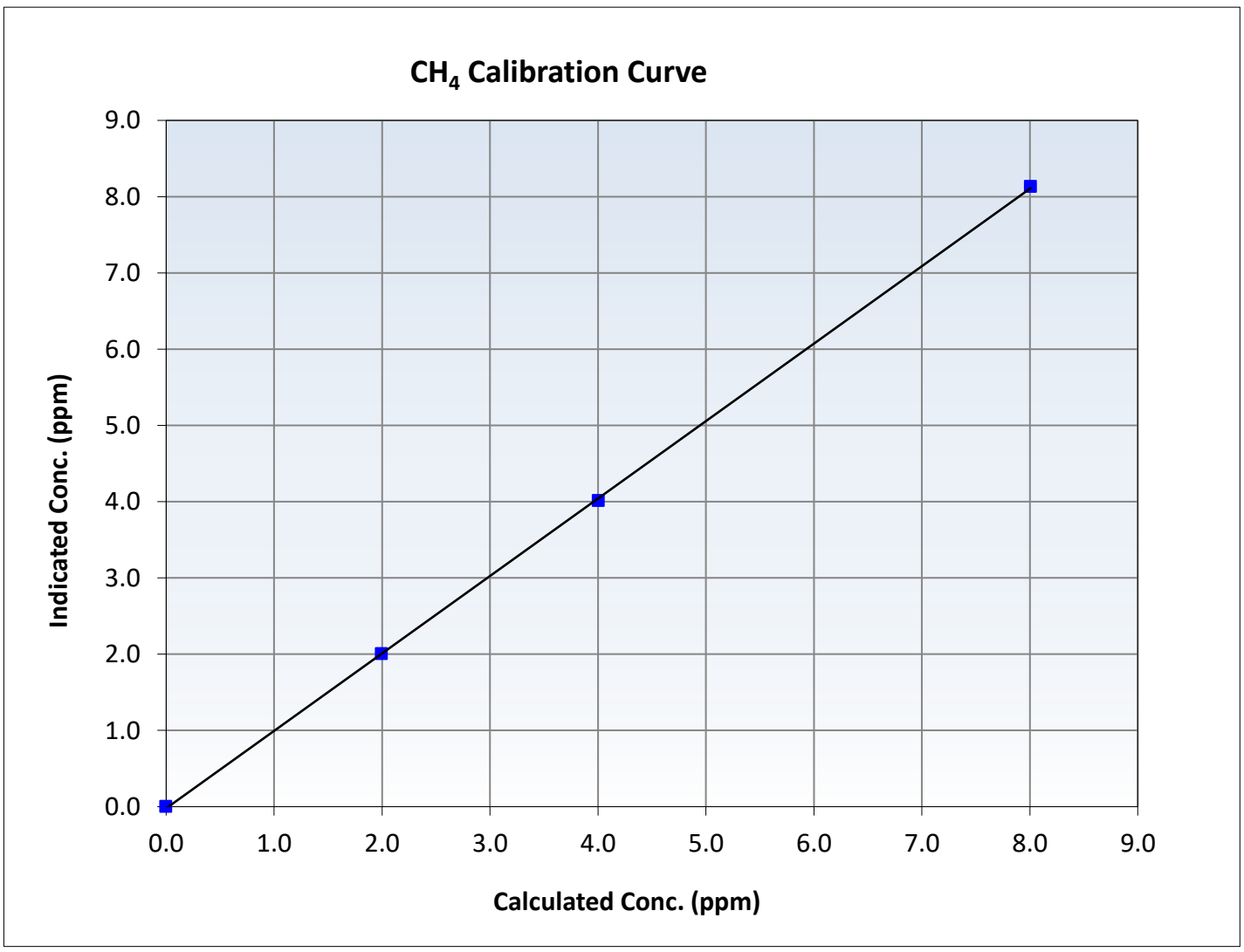
Station Information

Calibration Date:	December 31, 2024	Previous Calibration:	December 16, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:30	End Time (MST):	13:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.01	8.13	0.9850
4.00	4.01	0.9983
2.00	2.00	0.9976

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999945	*≥0.995*
Slope	1.015499	*0.90 - 1.10*
Intercept	-0.021023	*+/-0.5*



Wood Buffalo Environmental Association

NMHC Calibration Summary

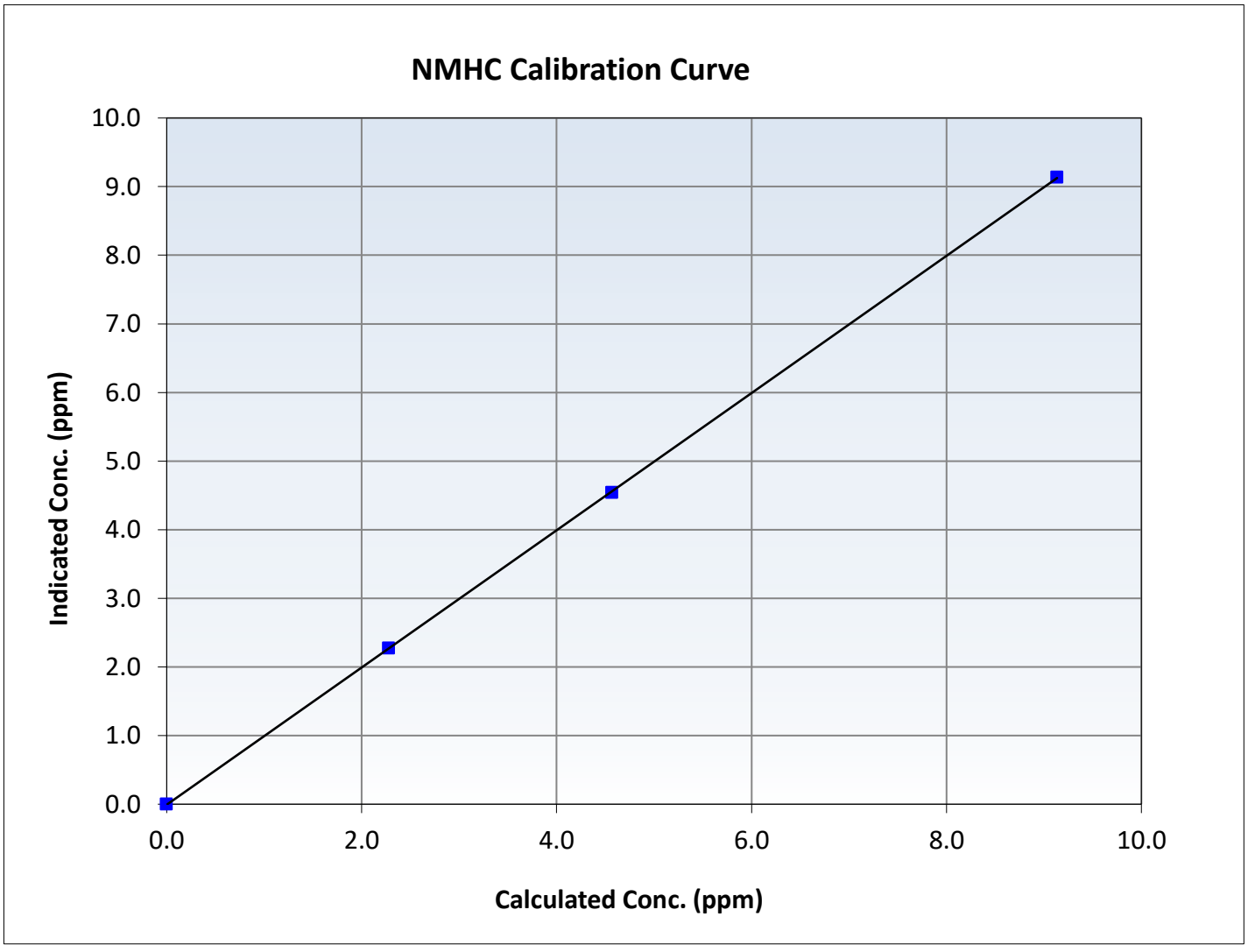
Station Information

Calibration Date:	December 31, 2024	Previous Calibration:	December 16, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:30	End Time (MST):	13:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

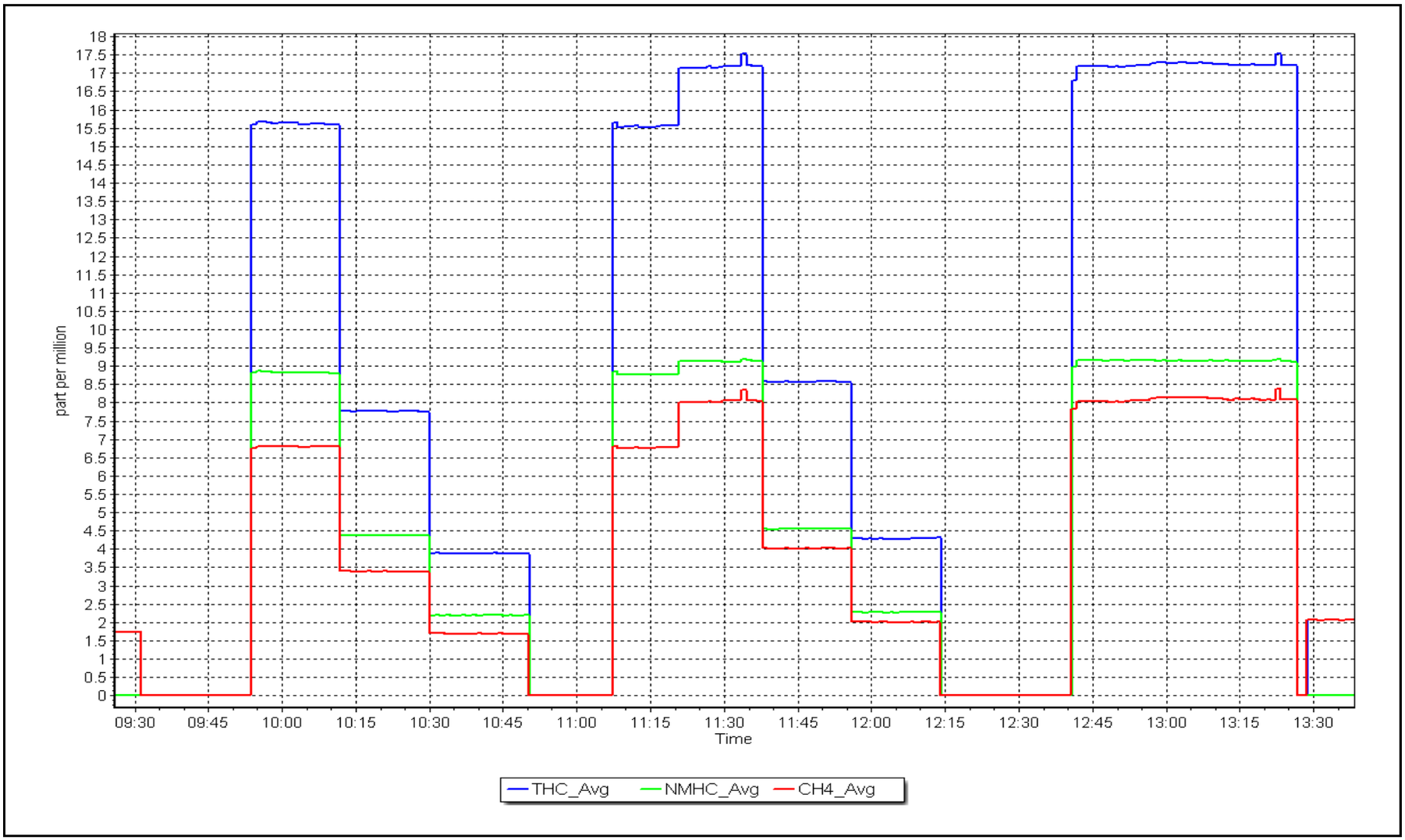
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
9.13	9.13	1.0001
4.57	4.54	1.0061
2.28	2.27	1.0027

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999989	*≥0.995*
Slope	0.999793	*0.90 - 1.10*
Intercept	-0.007776	*+/-0.5*



NMHC Calibration Plot Date: December 31, 2024 Location: Anzac



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Anzac
Station number:	AMS 14
Calibration Date:	December 2, 2024
Last Cal Date:	November 6, 2024
Start time (MST):	11:09
End time (MST):	15:46
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0037092		Cal Gas Expiry Date:	May 16, 2031	
NOX Cal Gas Conc:	60.7	ppm	NO Cal Gas Conc:	60.40	ppm
Removed Cylinder #:	NA		Removed Gas Exp Date:	NA	
Removed Gas NOX Conc:	60.70	ppm	Removed Gas NO Conc:	60.40	ppm
NOX gas Diff:			NO gas Diff:		
Calibrator Model:	Teledyne API T700		Serial Number:	3060	
ZAG make/model:	Teledyne API T700H		Serial Number:	357	

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	----	----
AF High point	4934	66.3	804.8	800.9	4.0	813.4	808.3	5.1	0.9895	0.9907
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	802.4	ppb	NO =	799.9	ppb	
Baseline Corr 1st pt	NO_X =	813.4	ppb	NO =	808.4	ppb	
Baseline Corr 2nd pt	NO_X =	NA	ppb	NO =	NA	ppb	
Baseline Corr 3rd pt	NO_X =	NA	ppb	NO =	NA	ppb	

* = > +/-5% change initiates investigation

*Percent Change	NO_X =	1.4%	
*Percent Change	NO =	1.1%	

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1152430008

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.424	1.424	NO bkgnd or offset:	3.9	3.9
NOX coeff or slope:	0.996	0.996	NOX bkgnd or offset:	3.8	3.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	155.7	157.5

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.997812	1.007671
NO_X Cal Offset:	-0.710232	-0.731231
NO Cal Slope:	1.001538	1.011561
NO Cal Offset:	-2.229291	-2.190787
NO_2 Cal Slope:	1.001925	0.995747
NO_2 Cal Offset:	-1.159515	-1.424813

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	----	----
High point	4934	66.3	804.8	800.9	4.0	810.5	808.9	1.6	0.9930	0.9901
Mid point	4985	33.2	401.6	399.6	2.0	404.1	401.4	2.7	0.9938	0.9955
Low point	5004	16.7	201.9	200.9	1.0	201.5	198.4	3.1	1.0020	1.0126
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
As left span	4934	66.3	804.8	426.2	378.6	805.7	426.2	379.6	0.9989	1.0000
							Average Correction Factor		0.9963	0.9994

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	805.2	415.8	393.4	391.0	1.0061	99.4%
Mid GPT point	805.2	612.2	197.0	194.1	1.0148	98.5%
Low GPT point	805.2	709.7	99.5	96.0	1.0362	96.5%
				Average Correction Factor	1.0190	98.1%

Notes: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

NO_X Calibration Summary

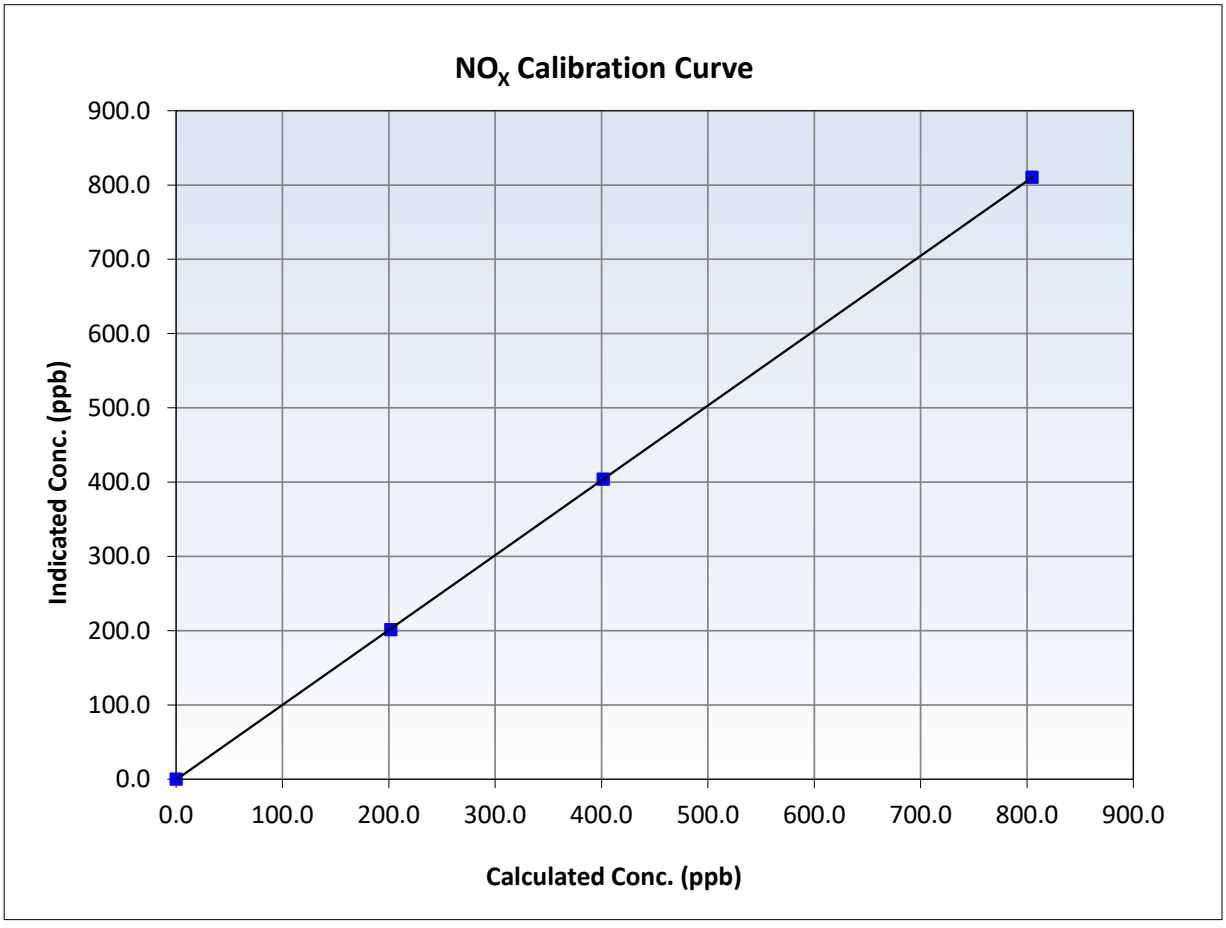
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 6, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:09	End Time (MST):	15:46
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
804.8	810.5	0.9930
401.6	404.1	0.9938
201.9	201.5	1.0020

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999994	*≥0.995*
Slope	1.007671	*0.90 - 1.10*
Intercept	-0.731231	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

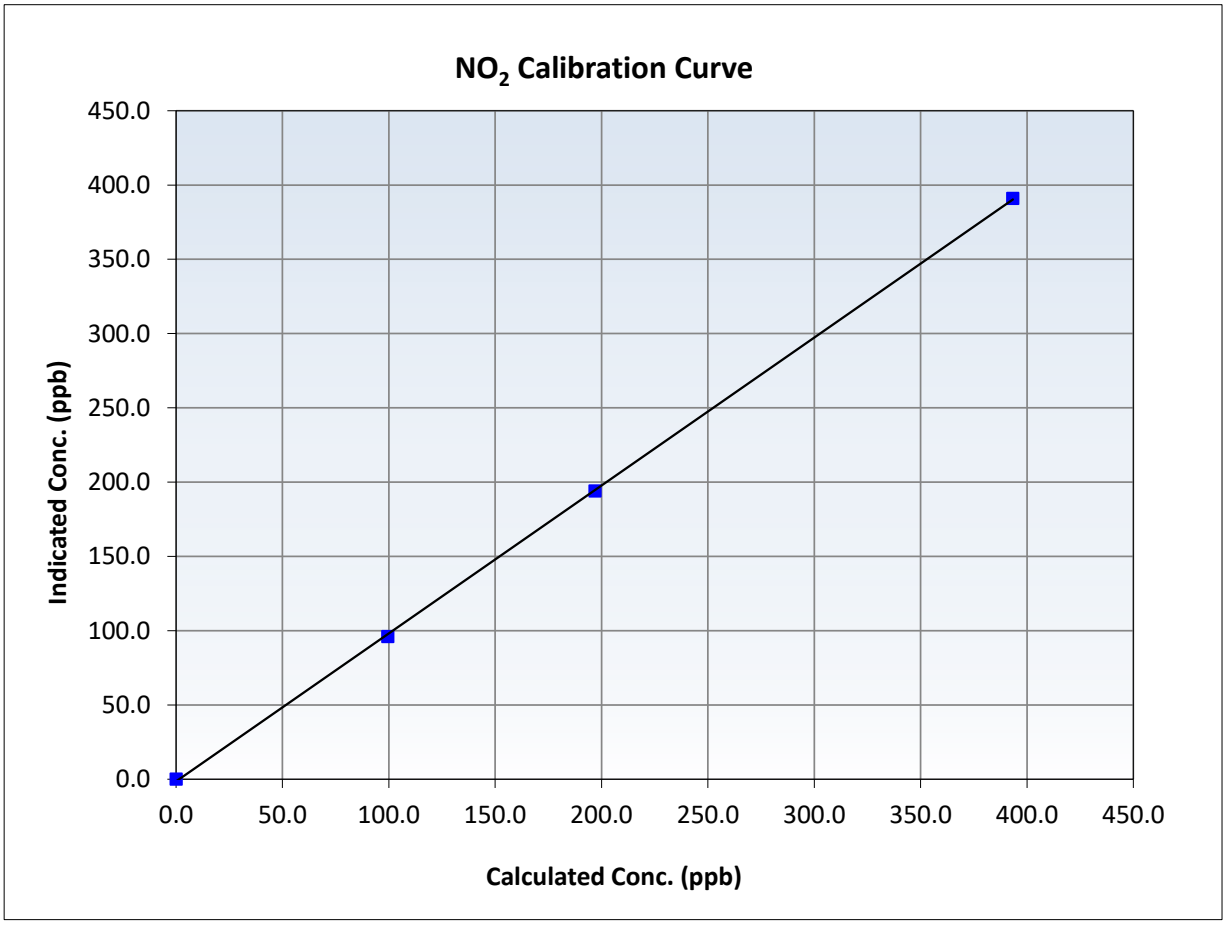
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 6, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:09	End Time (MST):	15:46
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
393.4	391.0	1.0061
197.0	194.1	1.0148
99.5	96.0	1.0362

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999930	*≥0.995*
Slope	0.995747	*0.90 - 1.10*
Intercept	-1.424813	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

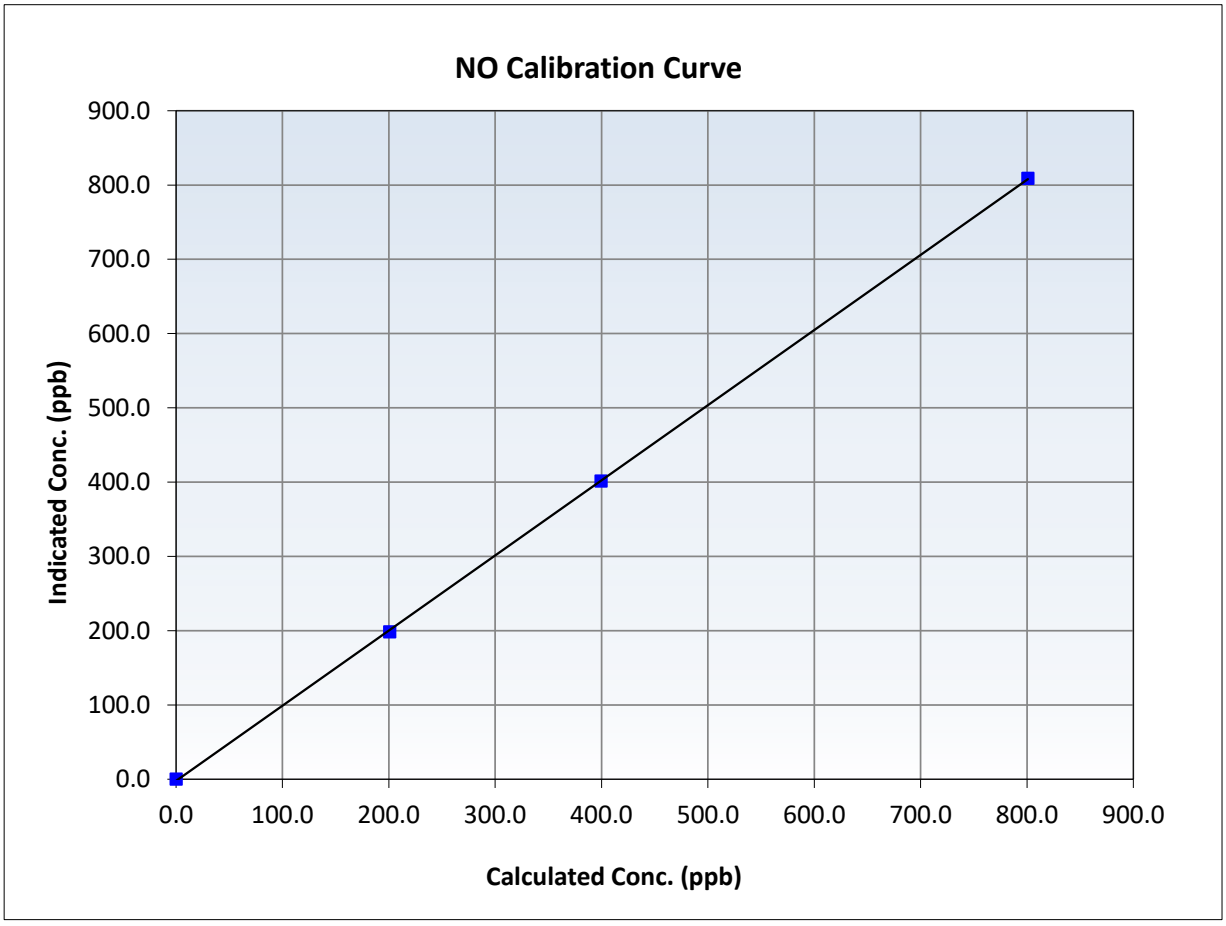
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 6, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:09	End Time (MST):	15:46
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

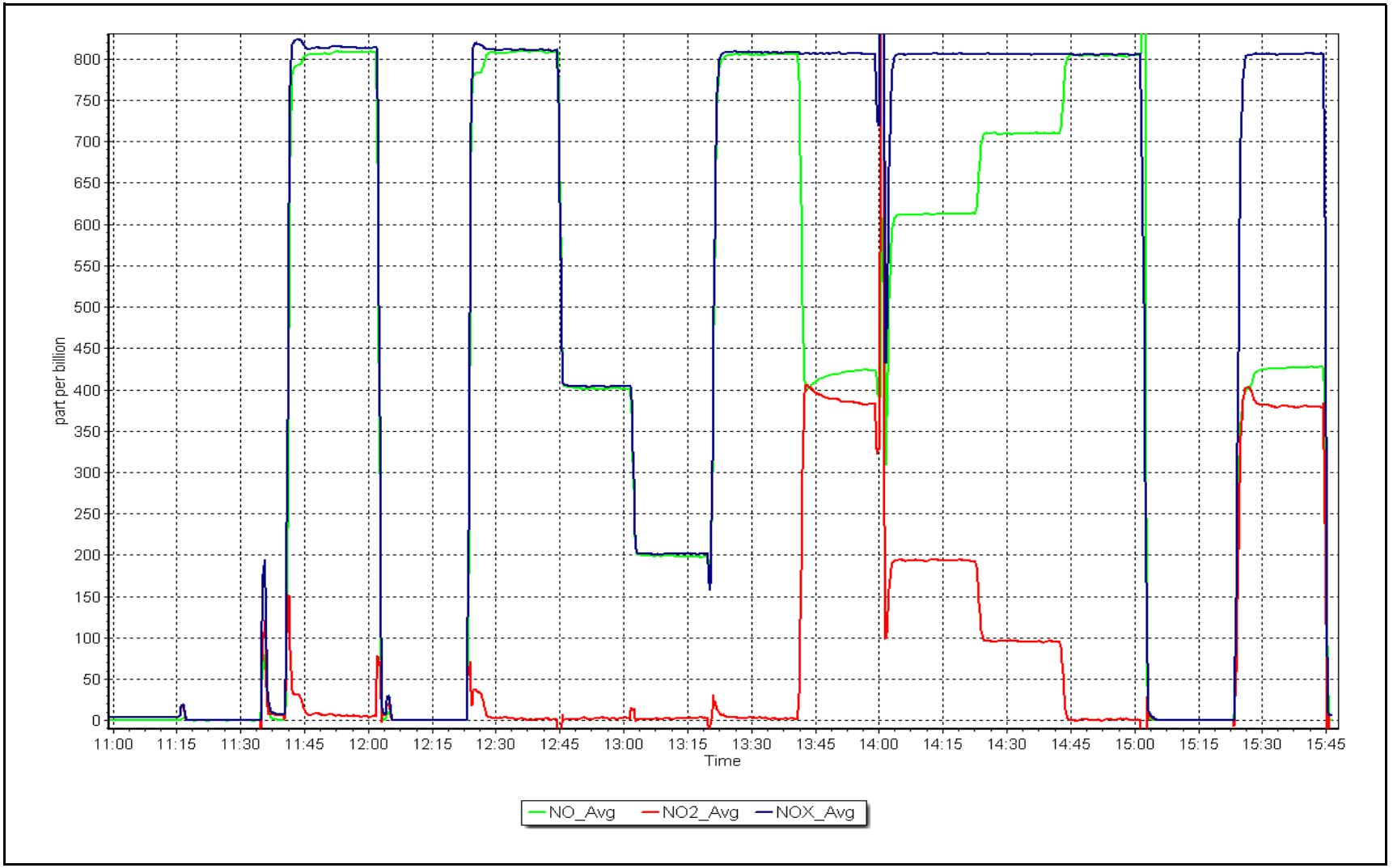
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.9	808.9	0.9901
399.6	401.4	0.9955
200.9	198.4	1.0126

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999962	*≥0.995*
Slope	1.011561	*0.90 - 1.10*
Intercept	-2.190787	*+/-20*



NO_X Calibration Plot Date: December 2, 2024 Location: Anzac



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 9, 2024	Last Cal Date:	November 25, 2024
Start time (MST):	10:26	End time (MST):	13:32
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	API T700	Serial Number:	3060
ZAG Make/Model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595
Analyzer Range	0 - 500 ppb		

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.002457	1.004286	Backgd or Offset:	2.1	2.1
Calibration intercept:	-1.180000	-1.200000	Coeff or Slope:	1.667	1.667

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	5000	918.8	400.0	399.1	1.003
As found Mid point					
As found Low point					
Baseline Corr As found:	398.8	Previous response	399.8	*% change	-0.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	5000	918.8	400.0	400.9	0.998
Mid point	5000	803.8	200.0	199.4	1.003
Low point	5000	709.8	100.0	98.2	1.018
As left zero	5000	0.0	0.0	-0.5	----
As left span	5000	918.8	400.0	402.8	0.993
				Average Correction Factor	1.006

Notes: Sample inlet filter changed after asfounds. No adjustments needed.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

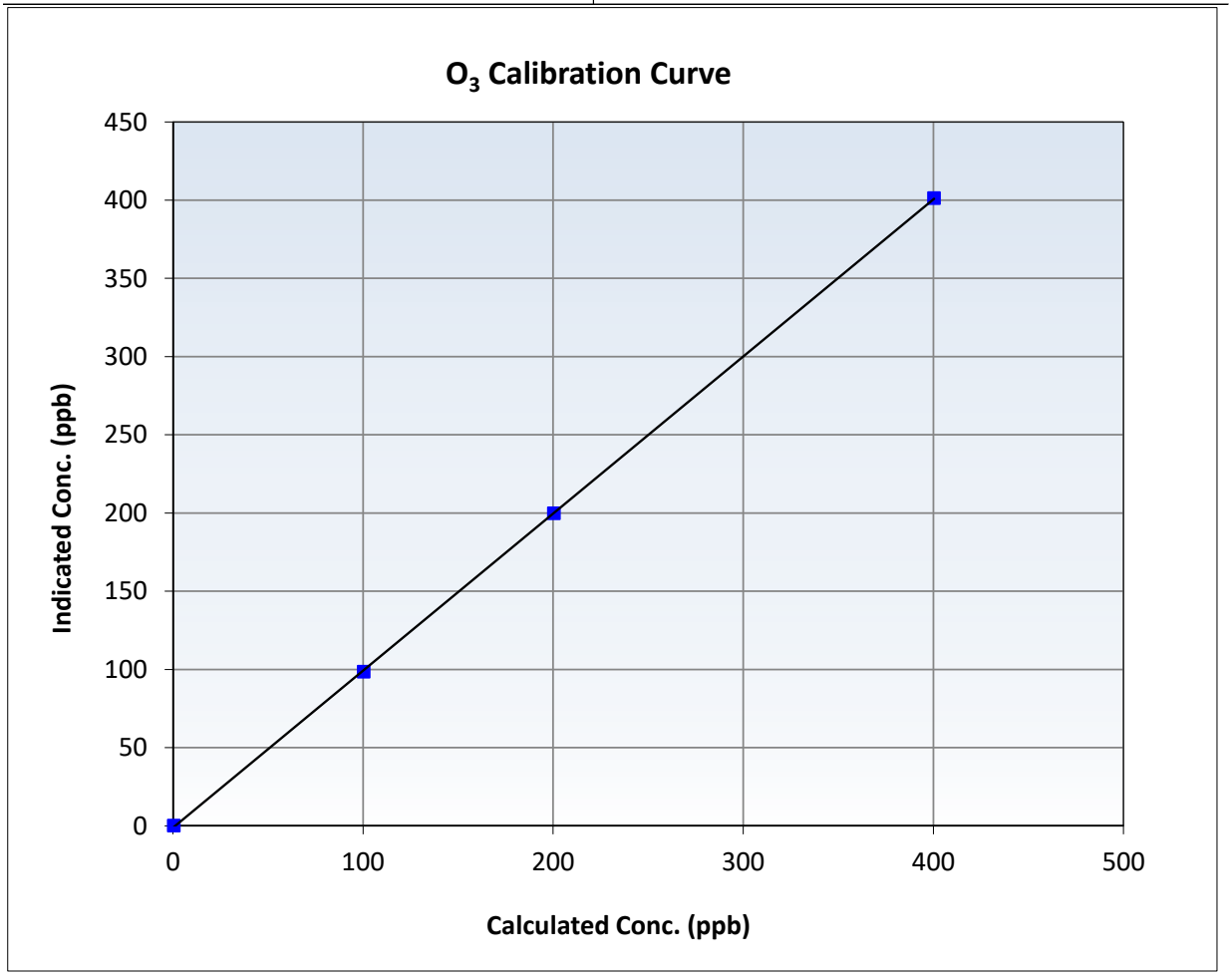
O_3 Calibration Summary

Station Information

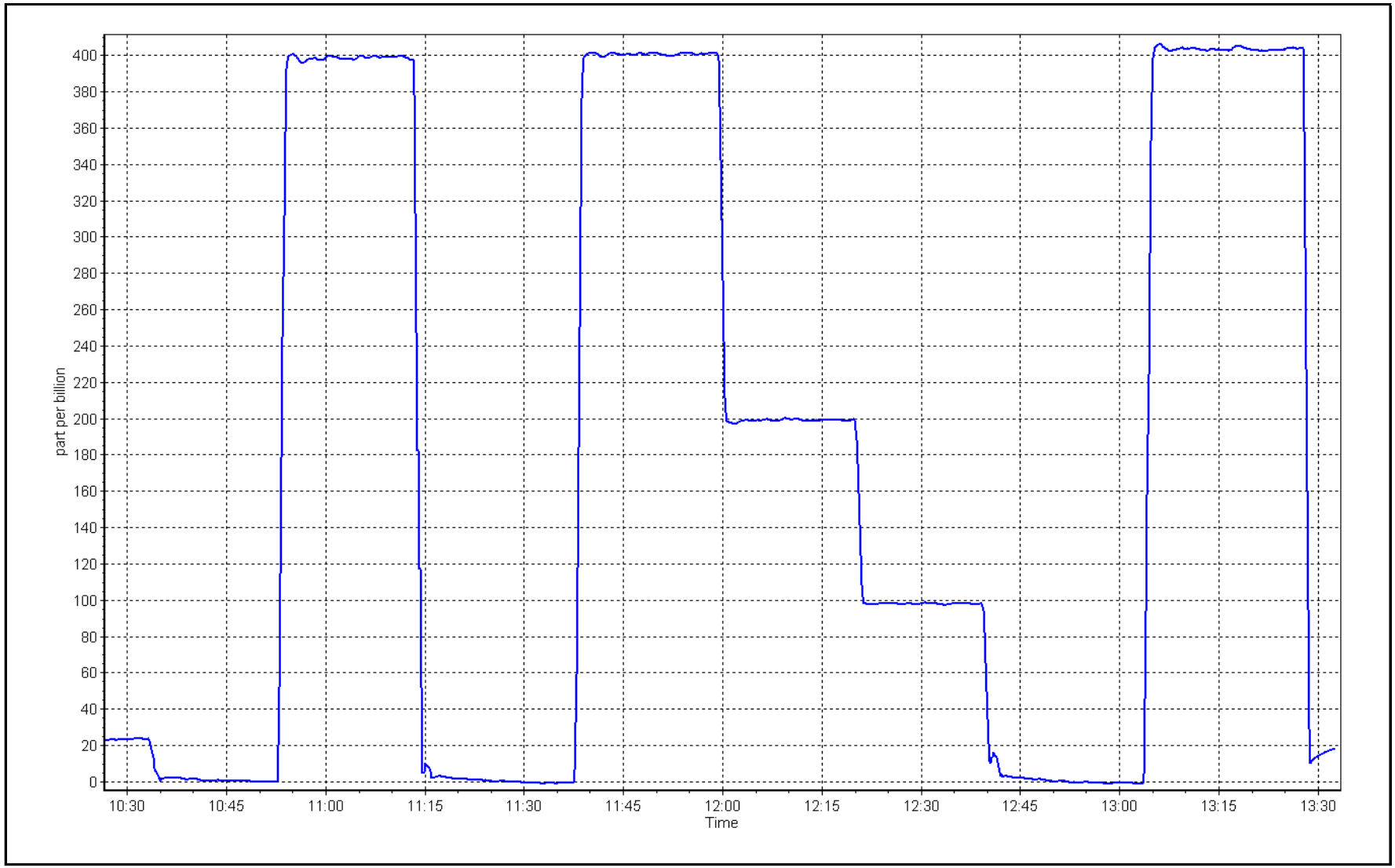
Calibration Date:	December 9, 2024	Previous Calibration:	November 25, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:26	End Time (MST):	13:32
Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	-0.3	----	Correlation Coefficient	0.999976	*≥0.995*
400.0	400.9	0.9978	Slope	1.004286	*0.90 - 1.10*
200.0	199.4	1.0030			
100.0	98.2	1.0183	Intercept	-1.200000	*+/- 5*



O_3 Calibration Plot Date: December 9, 2024 Location: Anzac



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	December 12, 2024	Last Cal Date:	November 27, 2024
Start time (MST):	15:15	End time (MST):	15:29
Analyzer Make:	AP T640	S/N:	825
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388749
Temp/RH standard:	Alicat FP-25BT	S/N:	388749

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (^{o}C)	-11.1	-11.16	-11.1	☐	+/- 2 ^{o}C
P (mmHg)	709.8	710.72	709.8	☐	+/- 10 mmHg
Flow (LPM)	5.000	4.963	5.000	☐	+/- 0.25 LPM
PW% (pump)	41	-----	41	☐	>80%
Zero Verification	PM w/o HEPA:	3.0	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: — Lot No.: — Expiry Date:

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: August 29, 2024

Date Disposable Filter Changed: August 29, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: August 29, 2024

Date RH/T Sensor Cleaned: August 29, 2024

Notes: No adjustments made. Leak check passed. Head cleaned.

Calibration by: Mohammed Kashif

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS17
WAPASU
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	December 2, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	11:43	End time (MST):	15:00
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.38	ppm	Cal Gas Exp Date:	January 12, 2029
Cal Gas Cylinder #:	ALM066507			
Removed Cal Gas Conc:	50.38	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2449
Zero Air Gen Model:	Teledyne API 701H		Serial Number:	359

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1218153459	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999668	1.000869	Backgd or Offset:	13.4	15.0
Calibration intercept:	-1.939863	-2.760072	Coeff or Slope:	1.109	1.109

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.7	----
As found High point	4921	79.4	800.0	799.5	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	798.8	Previous response	797.8	*% change	0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.6	----
High point	4921	79.4	800.0	799.0	1.001
Mid point	4960	39.7	400.0	396.5	1.009
Low point	4980	19.8	199.5	194.8	1.024
As left zero	5000	0.0	0.0	-0.9	----
As left span	4920	79.4	800.1	803.5	0.996
				Average Correction Factor:	1.011

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

SO_2 Calibration Summary

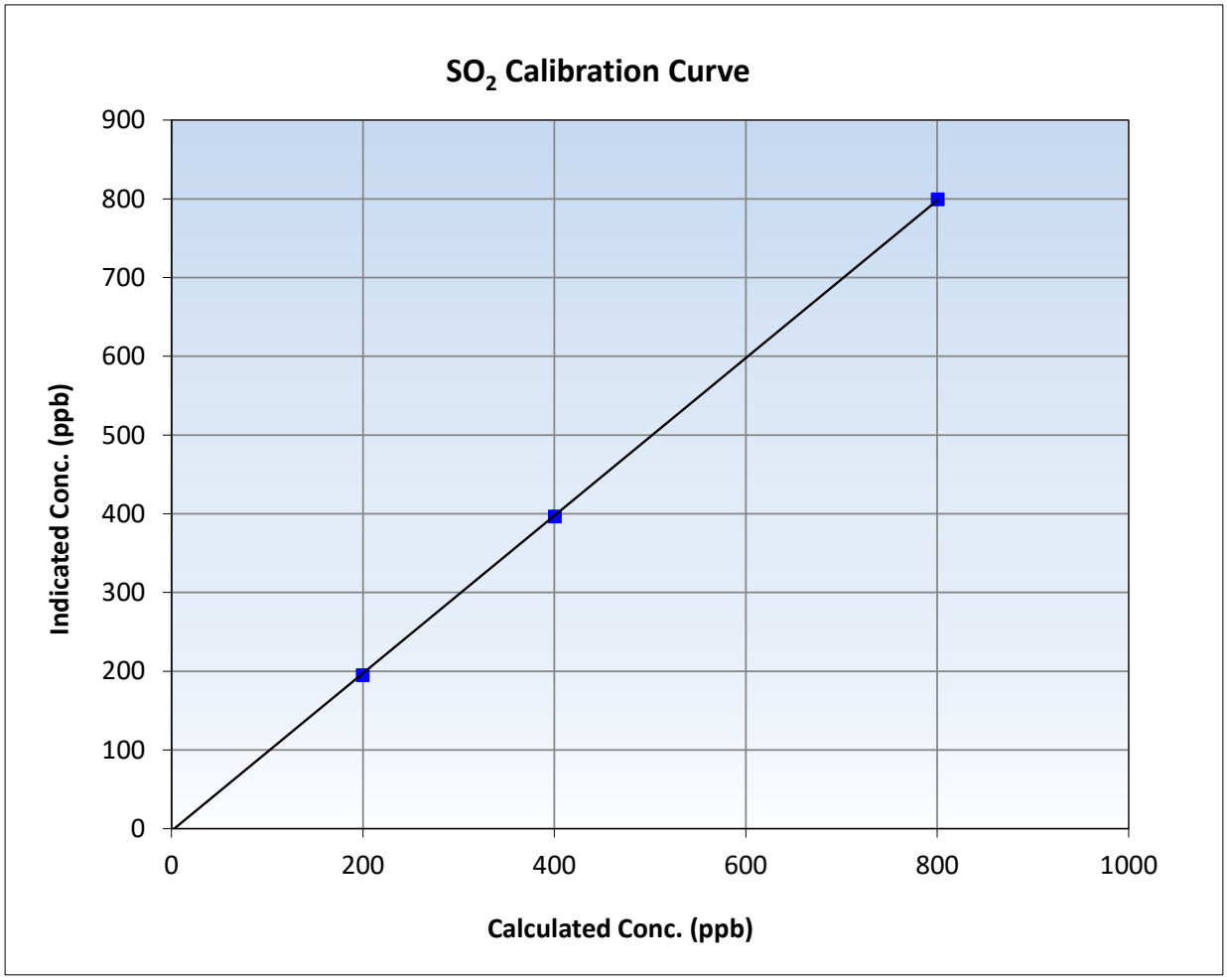
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 4, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	11:43	End Time (MST):	15:00
Analyzer make:	Thermo 43i	Analyzer serial #:	1218153459

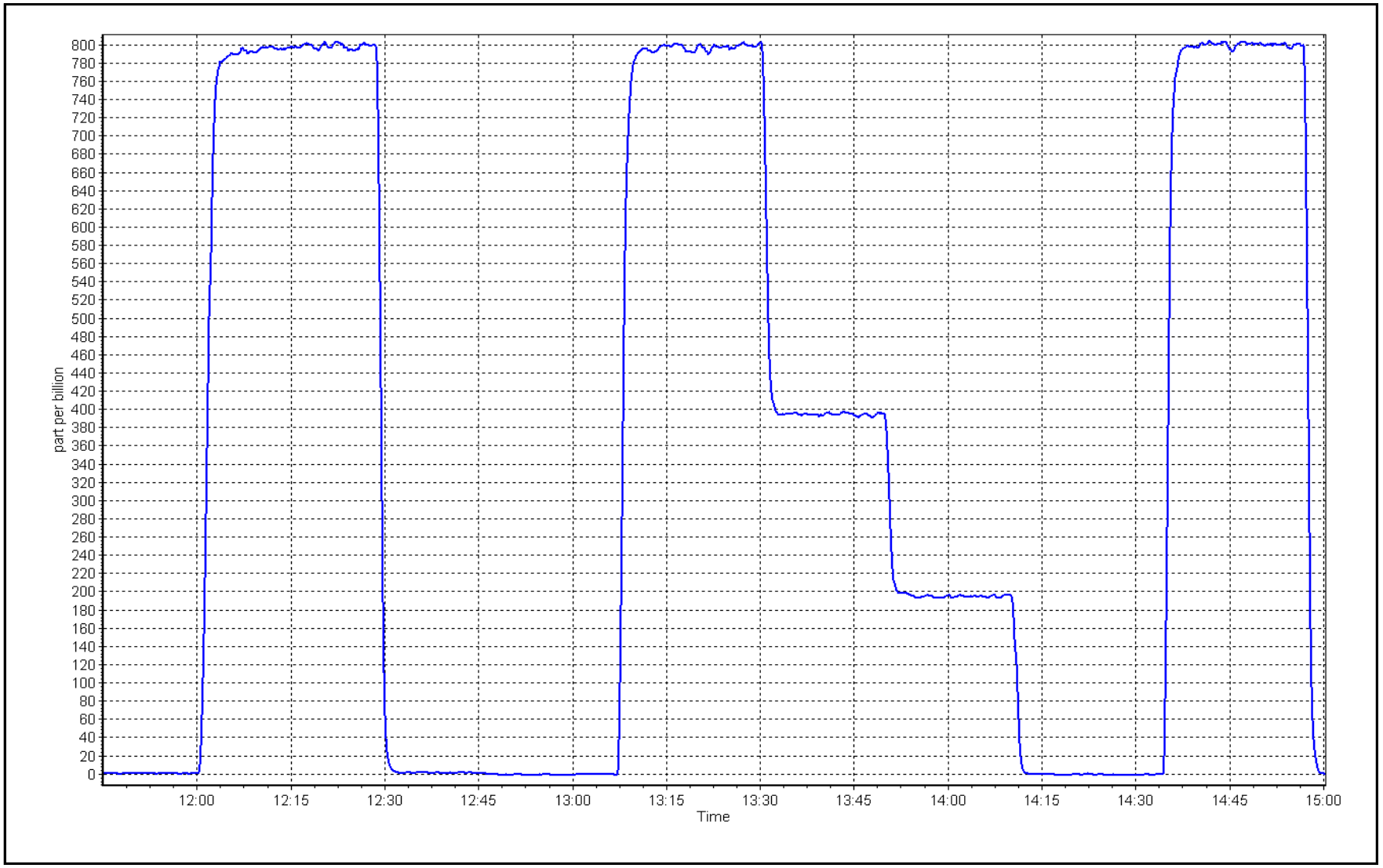
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.6	----
800.0	799.0	1.0012
400.0	396.5	1.0089
199.5	194.8	1.0242

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999967	*≥0.995*
Slope	1.000869	*0.90 - 1.10*
Intercept	-2.760072	*+/-30*



SO2 Calibration Plot Date: December 2, 2024 Location: Wapasu



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	December 16, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	12:19	End time (MST):	16:55
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.77	ppm	Cal Gas Exp Date:	August 28, 2027
Cal Gas Cylinder #:	DT20029267			
Removed Cal Gas Conc:	4.77	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	2449
ZAG Make/Model:	API T701H		Serial Number:	359

Analyzer Information

Analyzer make:	Thermo 450i		Analyzer serial #:	1218153583
Converter make:	CD Nova		Converter serial #:	N/A
Analyzer Range	0 - 100 ppb		Converter Temp:	340 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.997214	1.011211	Backgd or Offset:	13.5	13.5
Calibration intercept:	-0.239842	-0.079935	Coeff or Slope:	1.141	1.141

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4916	83.9	80.0	83.1	0.964
As found Mid point	4958	41.9	40.0	41.3	0.970
As found Low point	4979	21.0	20.0	20.3	0.992
New cylinder response					
Baseline Corr As found:	83.0	Prev response:	79.58	*% change:	4.1%
Baseline Corr 2nd AF pt:	41.2	AF Slope:	1.039054	AF Intercept:	-0.179781
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999945	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4916	83.9	80.0	81.0	0.988
Mid point	4958	41.9	40.0	40.1	0.997
Low point	4979	21.0	20.0	20.1	0.997
As left zero	5000	0.0	0.0	0.3	----
As left span	4916	83.9	80.0	80.3	0.997
SO2 Scrubber Check	4921	79.4	793.9	0.1	----
Date of last scrubber change:		N/A		Ave Corr Factor	0.994
Date of last converter efficiency test:		N/A			

Notes: Changed the sample inlet filter after as founds. Completed a SO2 scrubber check after calibrator zero. No adjustments performed.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

H_2S Calibration Summary

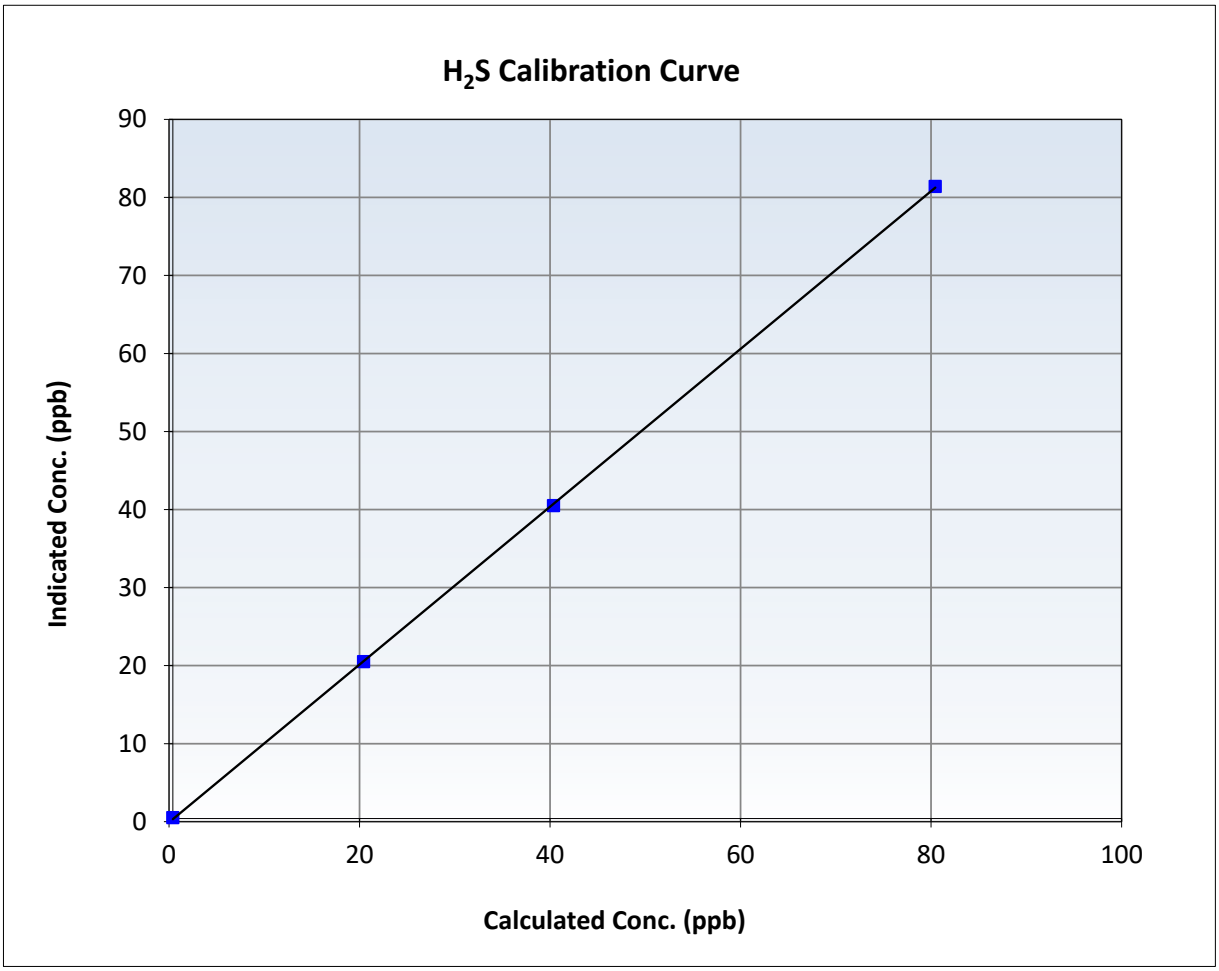
Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	November 26, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	12:19	End Time (MST):	16:55
Analyzer make:	Thermo 450i	Analyzer serial #:	1218153583

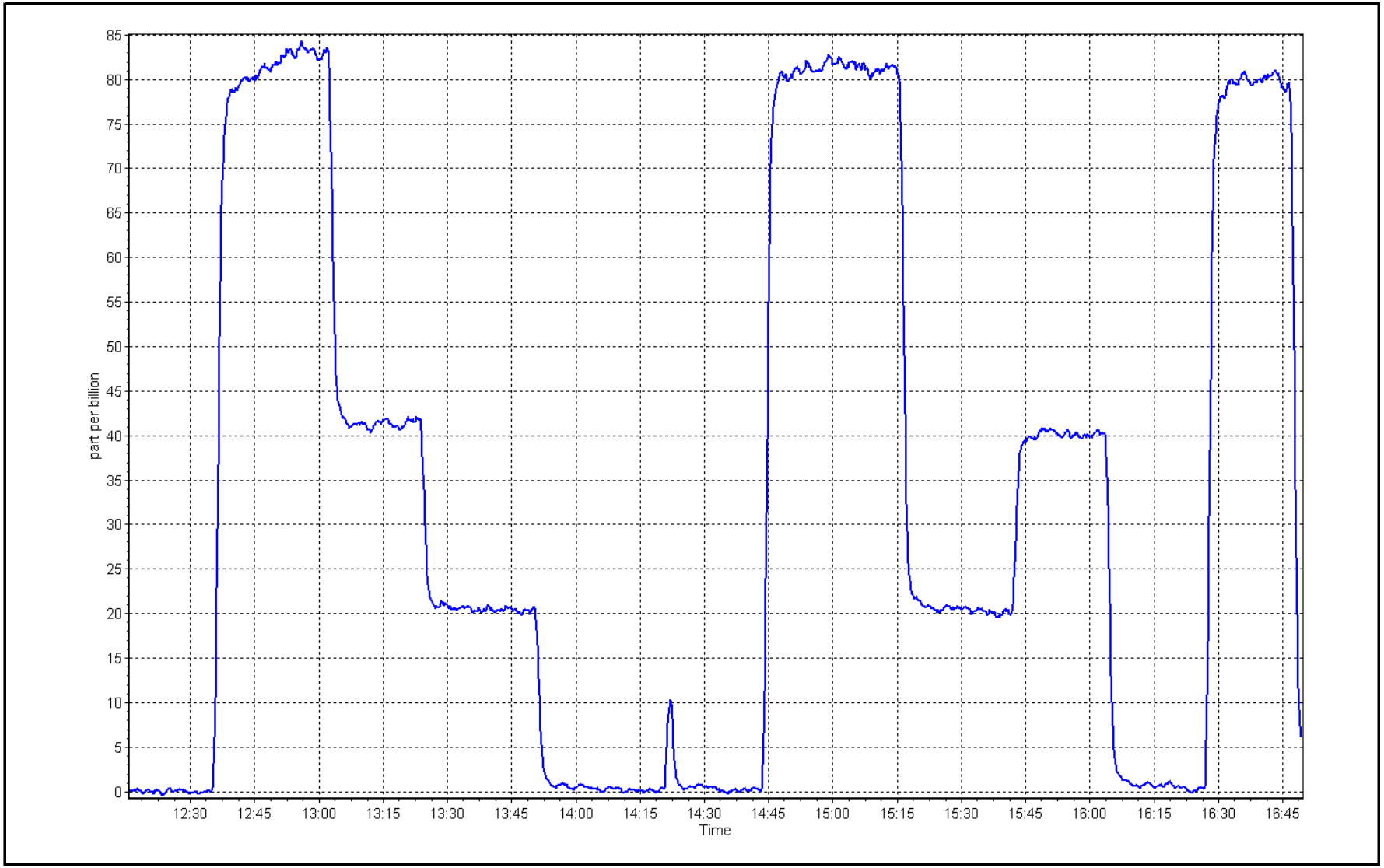
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	81.0	0.9882
40.0	40.1	0.9968
20.0	20.1	0.9967

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999967	*≥0.995*
Slope	1.011211	*0.90 - 1.10*
Intercept	-0.079935	*+/-3*



H_2S Calibration Plot Date: December 16, 2024 Location: Wapasu



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	December 2, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	11:43	End time (MST):	15:00
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	ALM066507		Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	503.5	ppm	CH4 Equiv Conc.	1076.3	ppm
C3H8 Cal Gas Conc.	208.3	ppm			
Removed Gas Cert:		n/a	Removed Gas Expiry:		
Removed CH4 Conc.	503.5	ppm	CH4 Equiv Conc.	1076.3	ppm
Removed C3H8 Conc.	208.3	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2449	
ZAG Make/Model:	Teledyne API 701H		Serial Number:	359	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1218153352

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996481	1.002146	Background:	3.020	3.020
Calibration intercept:	-0.038354	0.019052	Coefficient:	4.475	4.475

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.08	----
As found High point	4921	79.4	17.09	17.20	0.998
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	17.12	Previous response	16.99	*% change	0.8%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.07	----
High point	4921	79.4	17.09	17.18	0.995
Mid point	4960	39.7	8.55	8.54	1.001
Low point	4980	19.8	4.26	4.25	1.003
As left zero	5000	0.0	0.00	0.05	----
As left span	4921	79.4	17.09	17.00	1.006
				Average Correction Factor	1.000

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

Version 03-2024

Wood Buffalo Environmental Association

THC Calibration Summary

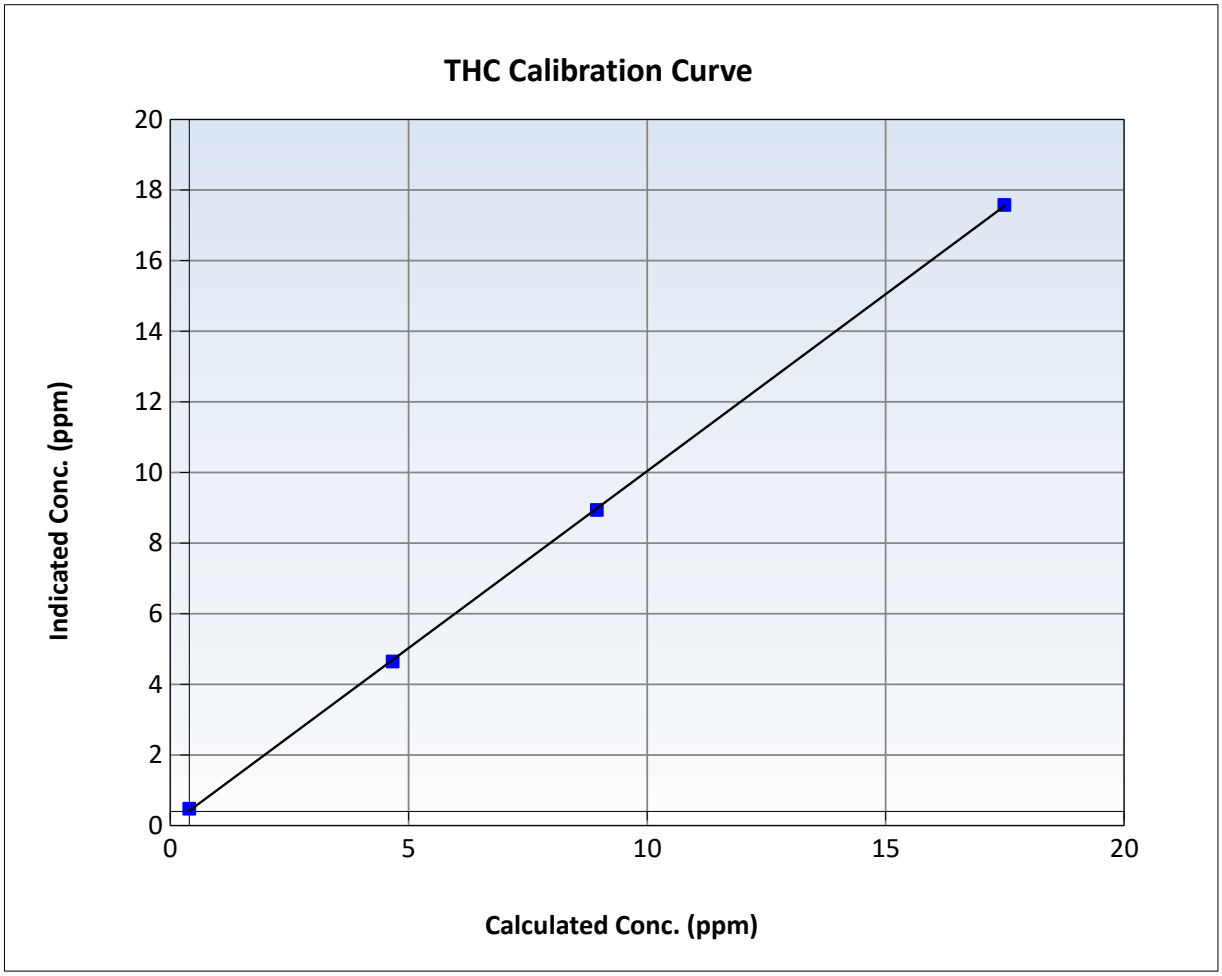
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 4, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	11:43	End Time (MST):	15:00
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1218153352

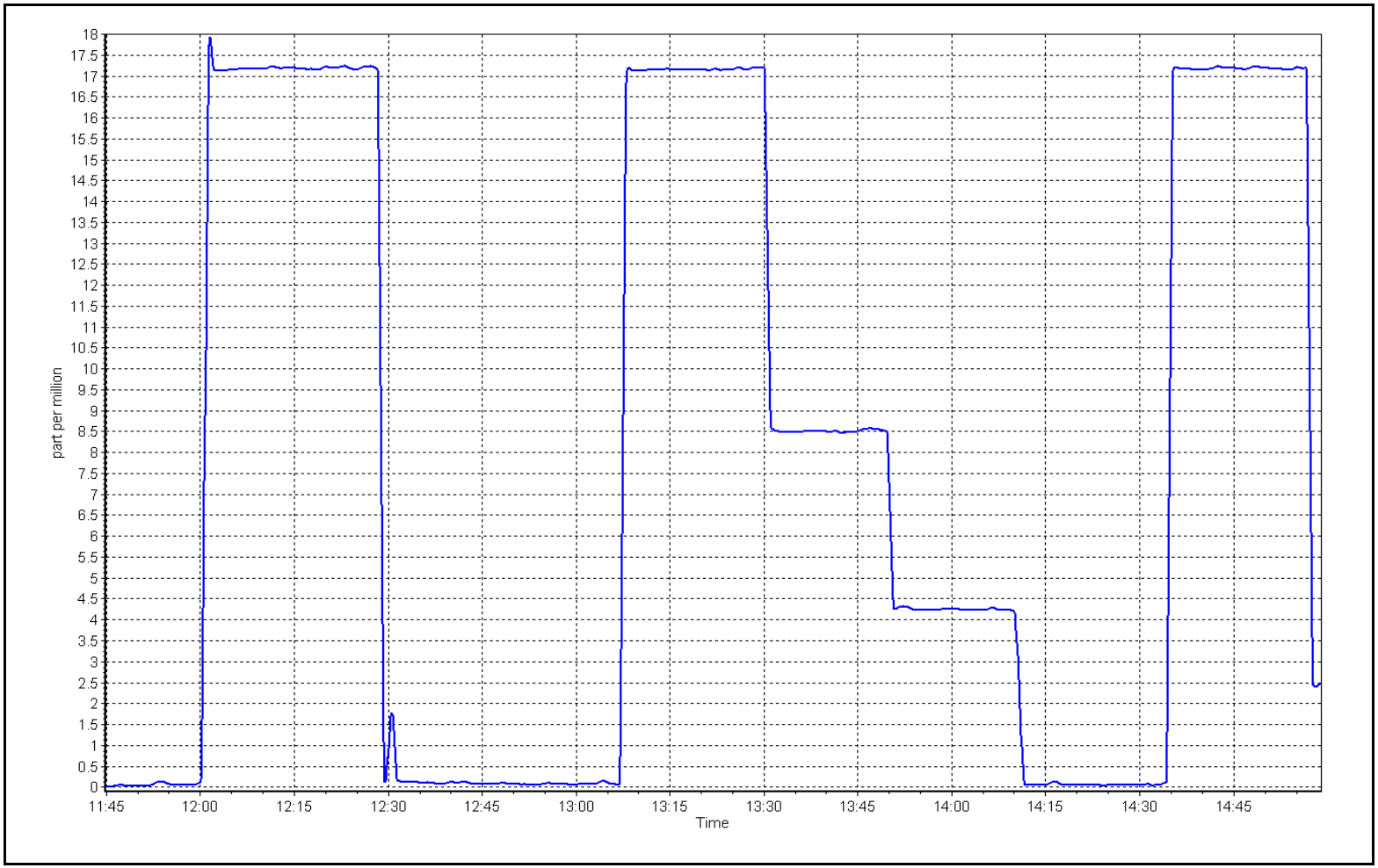
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.07	----
17.09	17.18	0.9948
8.55	8.54	1.0010
4.26	4.25	1.0034

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999950	*≥0.995*
Slope	1.002146	*0.90 - 1.10*
Intercept	0.019052	*+/-1.5*



THC Calibration Plot Date: December 2, 2024 Location: Wapasu



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Wapasu
Station number:	AMS 17
Calibration Date:	December 12, 2024
Last Cal Date:	November 13, 2024
Start time (MST):	10:50
End time (MST):	14:55
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T375YK8	Cal Gas Expiry Date:	April 13, 2025
NOX Cal Gas Conc:	49.11 ppm	NO Cal Gas Conc:	48.07 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	49.11 ppm	Removed Gas NO Conc:	48.07 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	2449
ZAG make/model:	API T701H	Serial Number:	359

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.3	-0.4	----	----
AF High point	4917	83.2	817.2	799.9	17.3	816.3	796.5	19.9	1.0004	1.0039
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 815.9 ppb	NO = 798.0 ppb
Baseline Corr 1st pt	NO_X = 816.9 ppb	NO = 796.8 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X =	0.1%
*Percent Change	NO =	-0.2%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo Scientific 42i
Serial Number: 1218153460
NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.087	1.091	NO bkgnd or offset:	3.8	3.8
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	4.2	4.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	241.5	239.7

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.000138	1.001214
NO_X Cal Offset:	-1.420000	-1.480000
NO Cal Slope:	1.000015	1.001016
NO Cal Offset:	-1.880000	-1.780000
NO_2 Cal Slope:	1.002948	1.001334
NO_2 Cal Offset:	-0.302443	-0.701642

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.1	-0.4	----	----
High point	4917	83.2	817.2	799.9	17.3	817.3	799.8	17.4	0.9999	1.0001
Mid point	4958	41.6	408.6	399.9	8.7	406.8	397.6	9.2	1.0044	1.0059
Low point	4979	20.8	204.3	200.0	4.3	202.3	196.8	5.6	1.0099	1.0161
As left zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.1	-0.4	----	----
As left span	4917	83.2	817.2	404.8	412.4	817.0	404.8	412.3	1.0002	1.0000
							Average Correction Factor		1.0047	1.0074

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.4	----	----
High GPT point	797.7	399.5	415.5	415.6	0.9998	100.0%
Mid GPT point	797.7	601.5	213.5	212.7	1.0038	99.6%
Low GPT point	797.7	701.9	113.1	112.4	1.0063	99.4%
				Average Correction Factor	1.0033	99.7%

Notes: Sample inlet filter changed after as founds. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

NO_X Calibration Summary

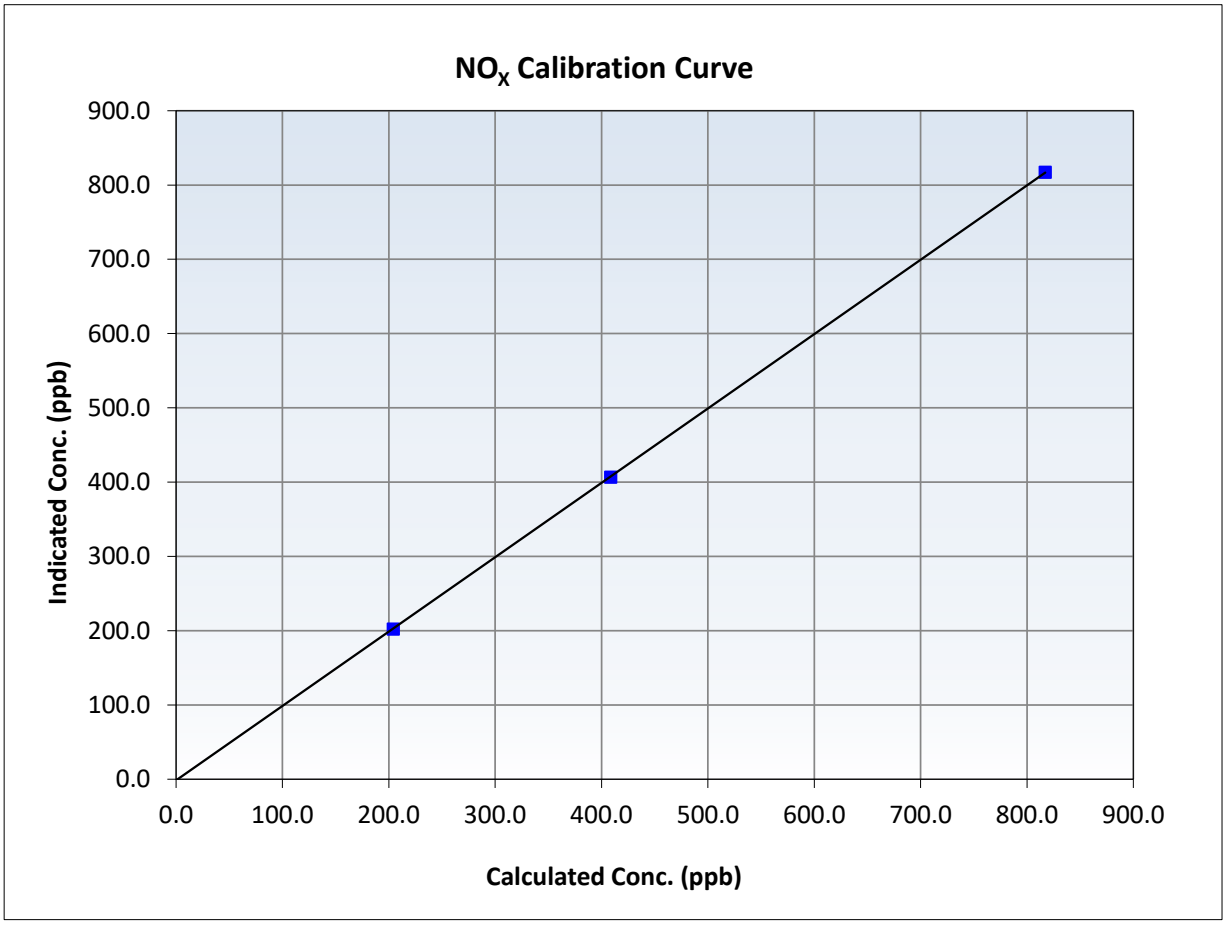
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 13, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:50	End Time (MST):	14:55
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.5	----
817.2	817.3	0.9999
408.6	406.8	1.0044
204.3	202.3	1.0099

Statistical Evaluation		Limits
Correlation Coefficient	0.999993	≥0.995
Slope	1.001214	0.90 - 1.10
Intercept	-1.480000	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

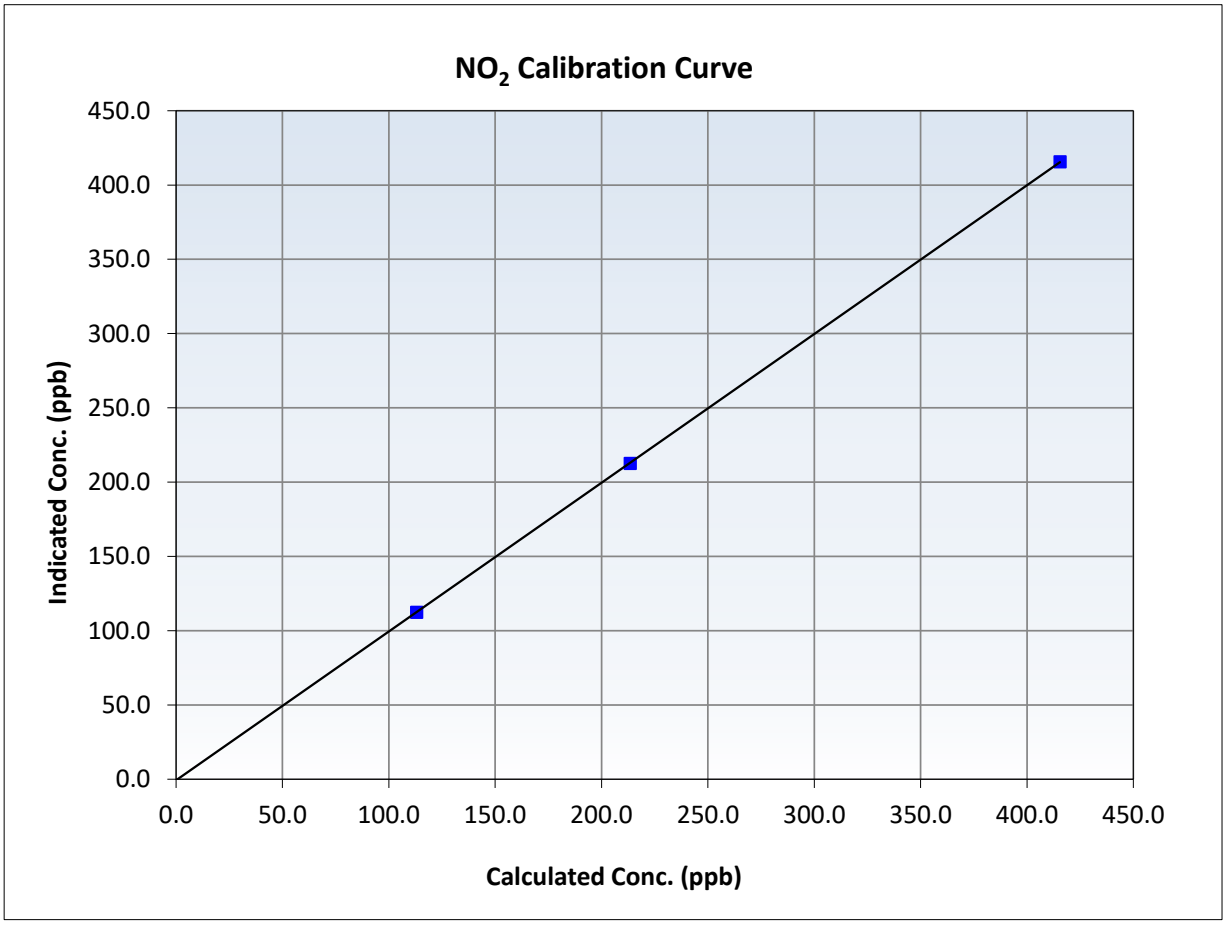
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 13, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:50	End Time (MST):	14:55
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
415.5	415.6	0.9998
213.5	212.7	1.0038
113.1	112.4	1.0063

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	1.001334	*0.90 - 1.10*
Intercept	-0.701642	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

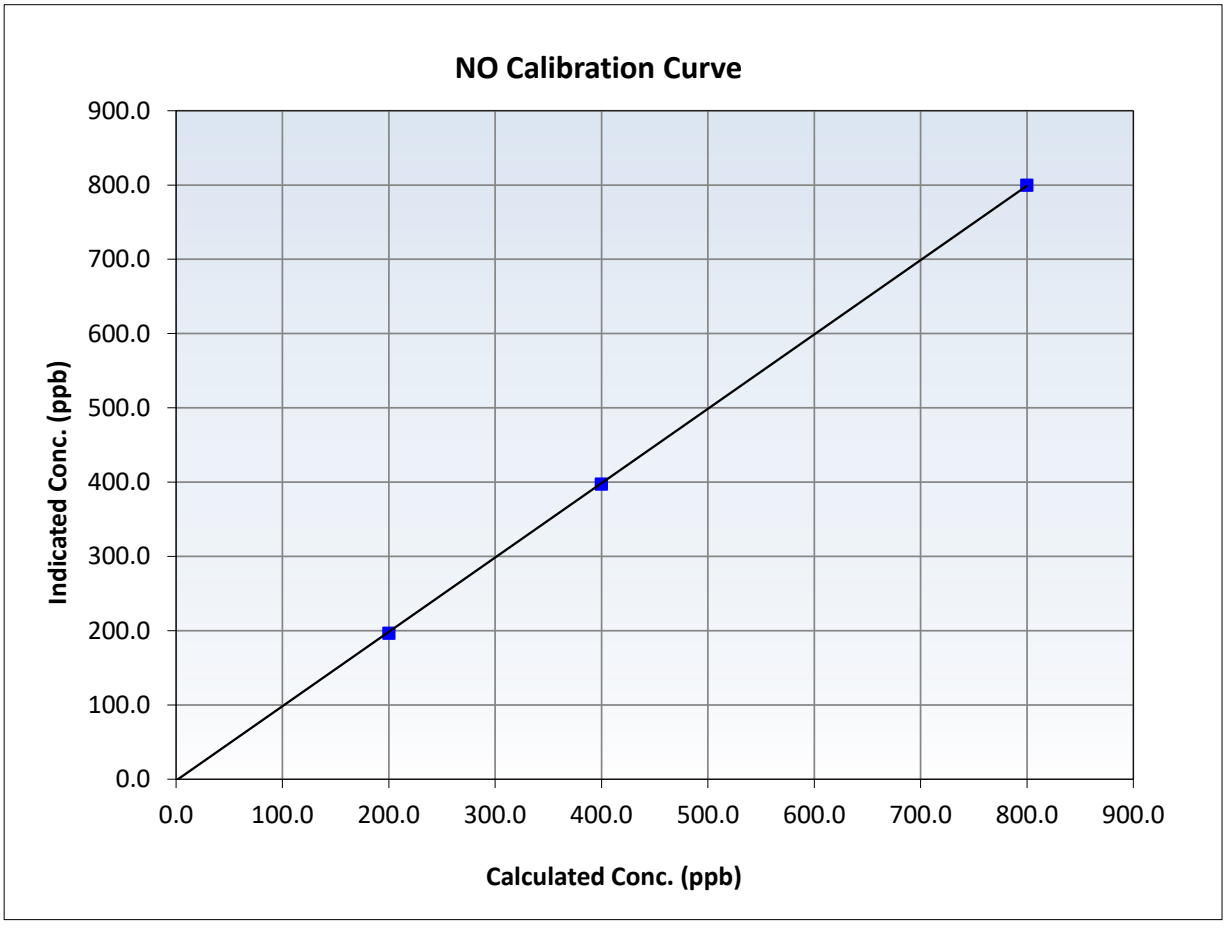
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 13, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:50	End Time (MST):	14:55
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

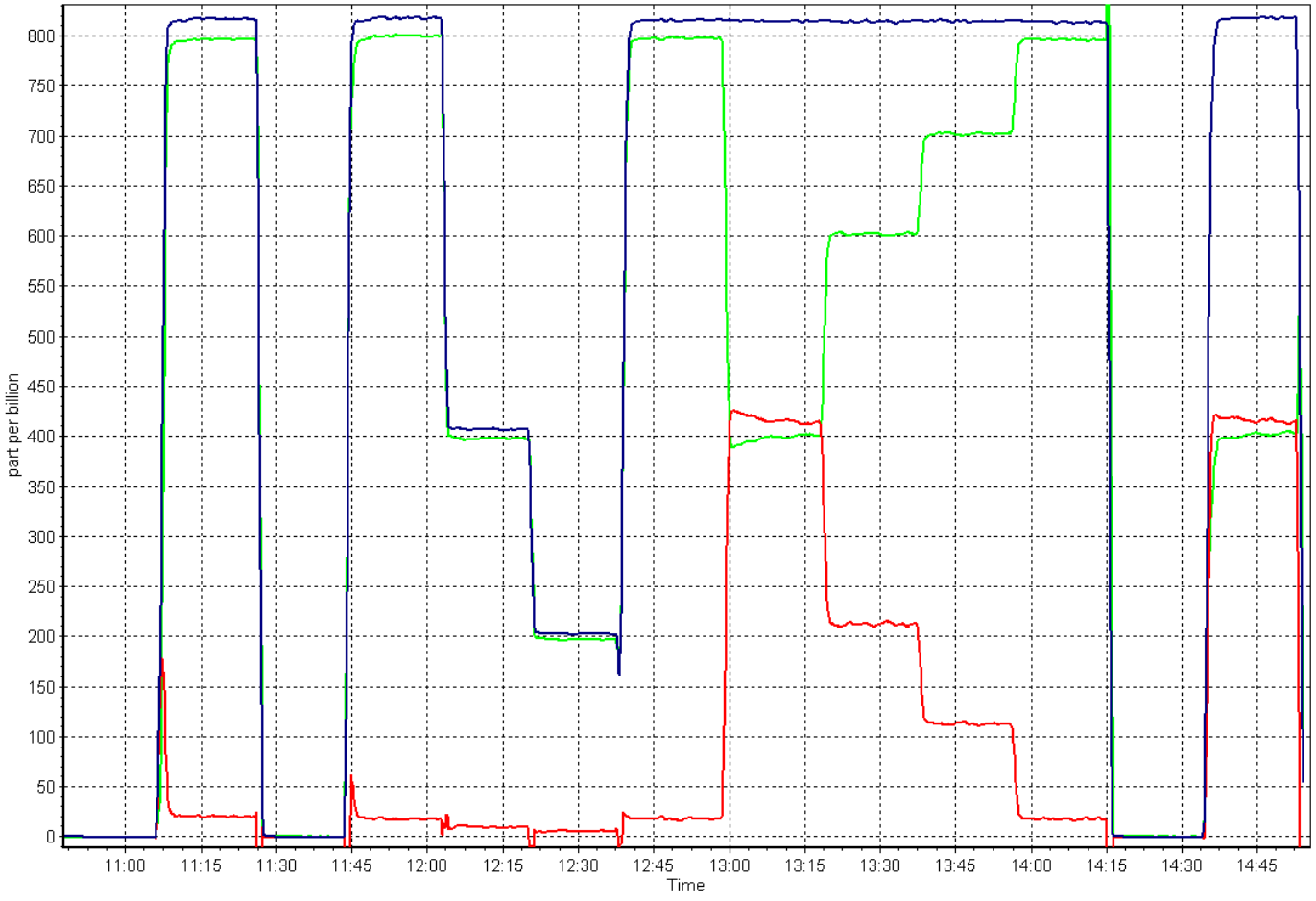
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.9	799.8	1.0001
399.9	397.6	1.0059
200.0	196.8	1.0161

Statistical Evaluation		Limits
Correlation Coefficient	0.999980	≥0.995
Slope	1.001016	0.90 - 1.10
Intercept	-1.780000	+/-20



NO_X Calibration Plot Date: December 12, 2024 Location: Wapasu



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	December 9, 2024	Last Cal Date:	November 6, 2024
Start time (MST):	11:26	End time (MST):	15:25
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	API T700	Serial Number:	2449
ZAG Make/Model:	API T701H	Serial Number:	359

Analyzer Information

Analyzer make:	API T400		Analyzer serial #:	7045	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001086	1.002114	Backgd or Offset:	0.6	0.6
Calibration intercept:	-0.740000	-0.420000	Coeff or Slope:	1.018	1.028

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	5000	1104.7	400.0	398.0	1.004
As found Mid point					
As found Low point					
Baseline Corr As found:	398.4	Previous response	399.7	*% change	-0.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	5000	1104.7	400.0	401.0	0.998
Mid point	5000	917.3	200.0	199.0	1.005
Low point	5000	797.9	100.0	99.5	1.005
As left zero	5000	0.0	0.0	0.6	----
As left span	5000	1104.0	400.0	405.4	0.987
				Average Correction Factor	1.003

Notes: Inlet filter changed after as founds. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

O_3 Calibration Summary

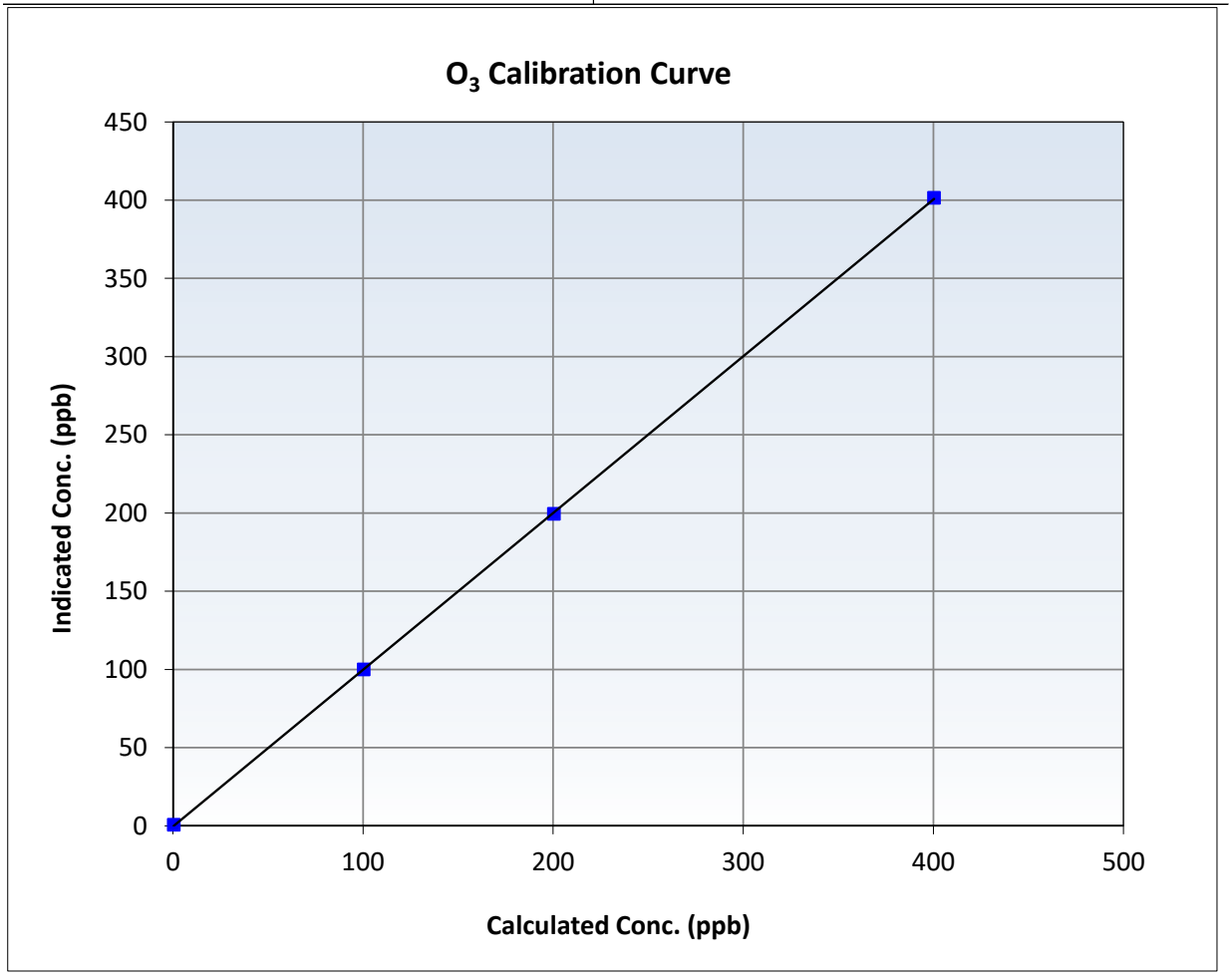
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 6, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	11:26	End Time (MST):	15:25
Analyzer make:	API T400	Analyzer serial #:	7045

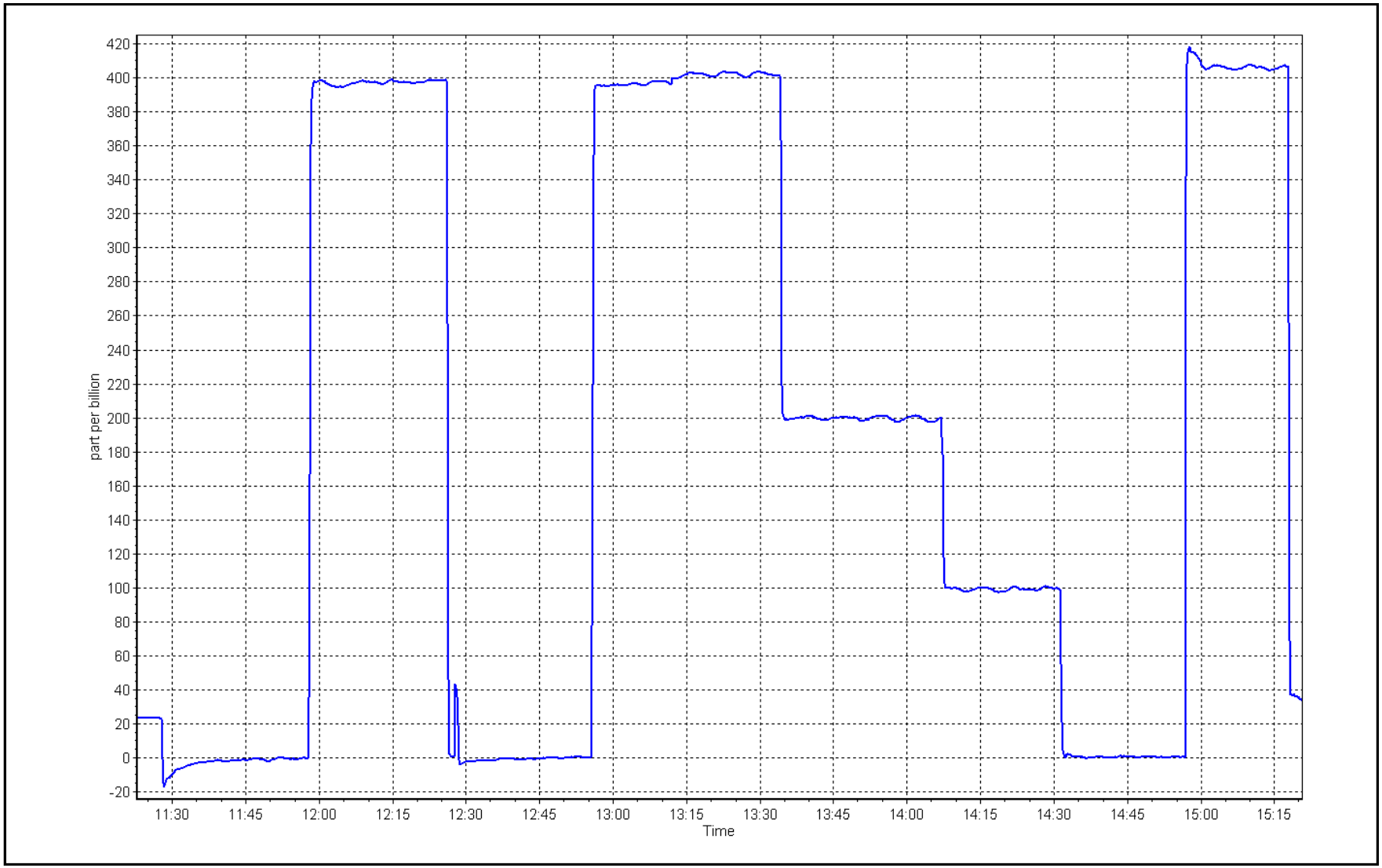
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
400.0	401.0	0.9975
200.0	199.0	1.0050
100.0	99.5	1.0050

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999978	*≥0.995*
Slope	1.002114	*0.90 - 1.10*
Intercept	-0.420000	*+/- 5*



O_3 Calibration Plot Date: December 9, 2024 Location: Wapasu



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	December 19, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	11:52	End time (MST):	14:00
Analyzer Make:	Teledyne API T640	S/N:	1183
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388749
Temp/RH standard:	Alicat FP-25BT	S/N:	388749

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-15.30	-16.20	-15.60	☐	+/- 2 °C
P (mmHg)	725.20	728.05	728.05	☐	+/- 10 mmHg
Flow (LPM)	4.16	4.20	5.00	☑	+/- 0.25 LPM
PW% (pump)	100	-----	39	☑	>80%
Zero Verification	PM w/o HEPA:	1.7	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: October 6, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: October 18, 2024

Date Disposable Filter Changed: December 19, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: July 23, 2024

Date RH/T Sensor Cleaned: July 23, 2024

Notes:

Pump swapped out after as founds. Flow adjusted. Leak check passed. DFU filter changed out.

Calibration by: Aswin Sasi Kumar

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS18
STONY MOUNTAIN
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	December 5, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	11:55	End time (MST):	15:07
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.02	ppm	Cal Gas Exp Date:	January 12, 2029
Cal Gas Cylinder #:	XC026809B			
Removed Cal Gas Conc:	50.02	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	XC026809B		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2658
Zero Air Gen Model:	Teledyne API 701H		Serial Number:	360

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1501301453	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.997772	0.996102	Backgd or Offset:	23.6	23.6
Calibration intercept:	-0.160000	-0.800000	Coeff or Slope:	0.797	0.797

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.6	----
As found High point	4920	80.0	800.3	794.5	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	793.9	Previous response	798.4	*% change	-0.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.8	----
High point	4920	80.0	800.3	796.9	1.004
Mid point	4960	40.0	400.2	397.9	1.006
Low point	4980	20.0	200.1	196.3	1.019
As left zero	5000	0.0	0.0	0.7	----
As left span	4920	80.0	800.3	797.1	1.004
				Average Correction Factor:	1.010

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

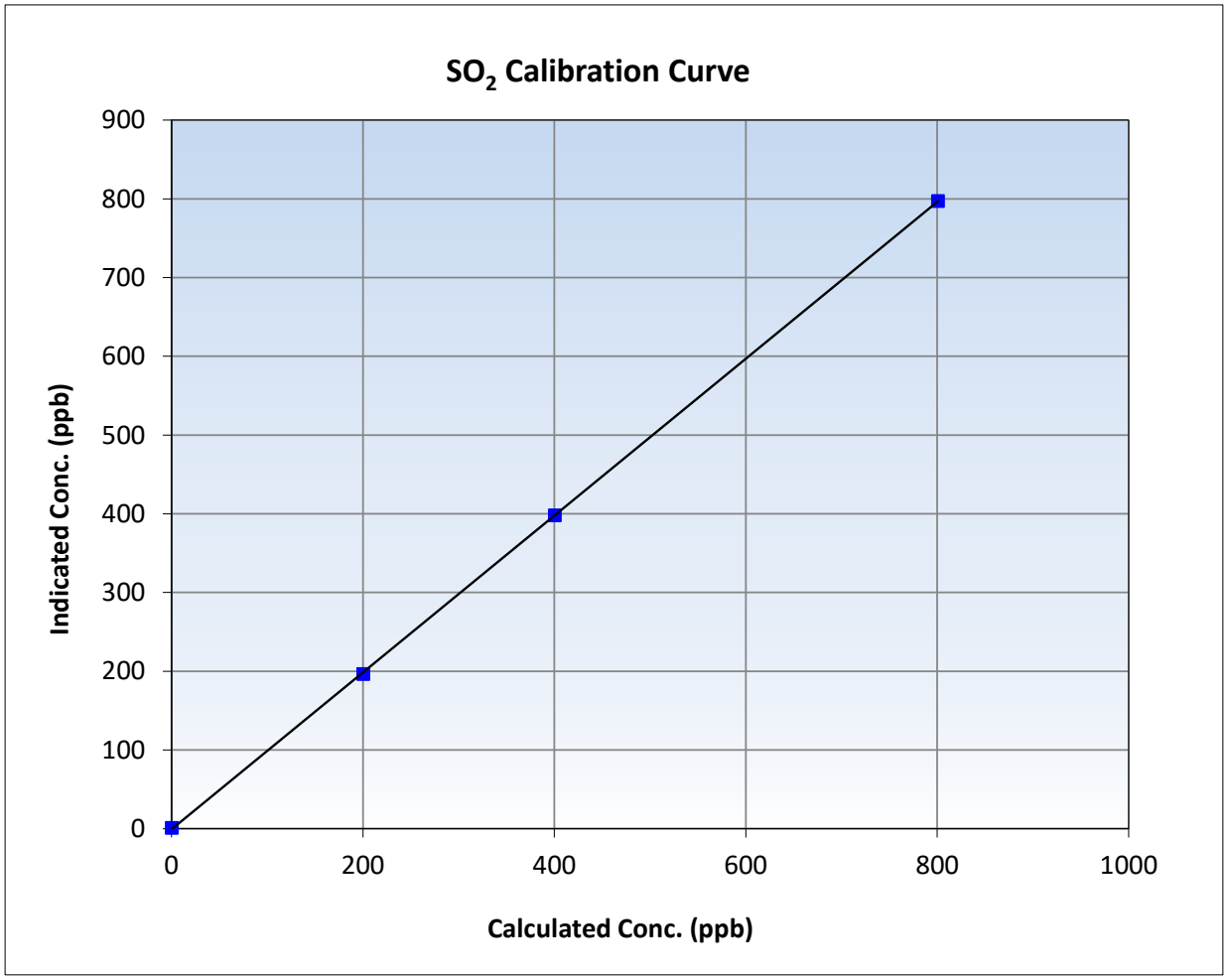
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 21, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	15:07
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301453

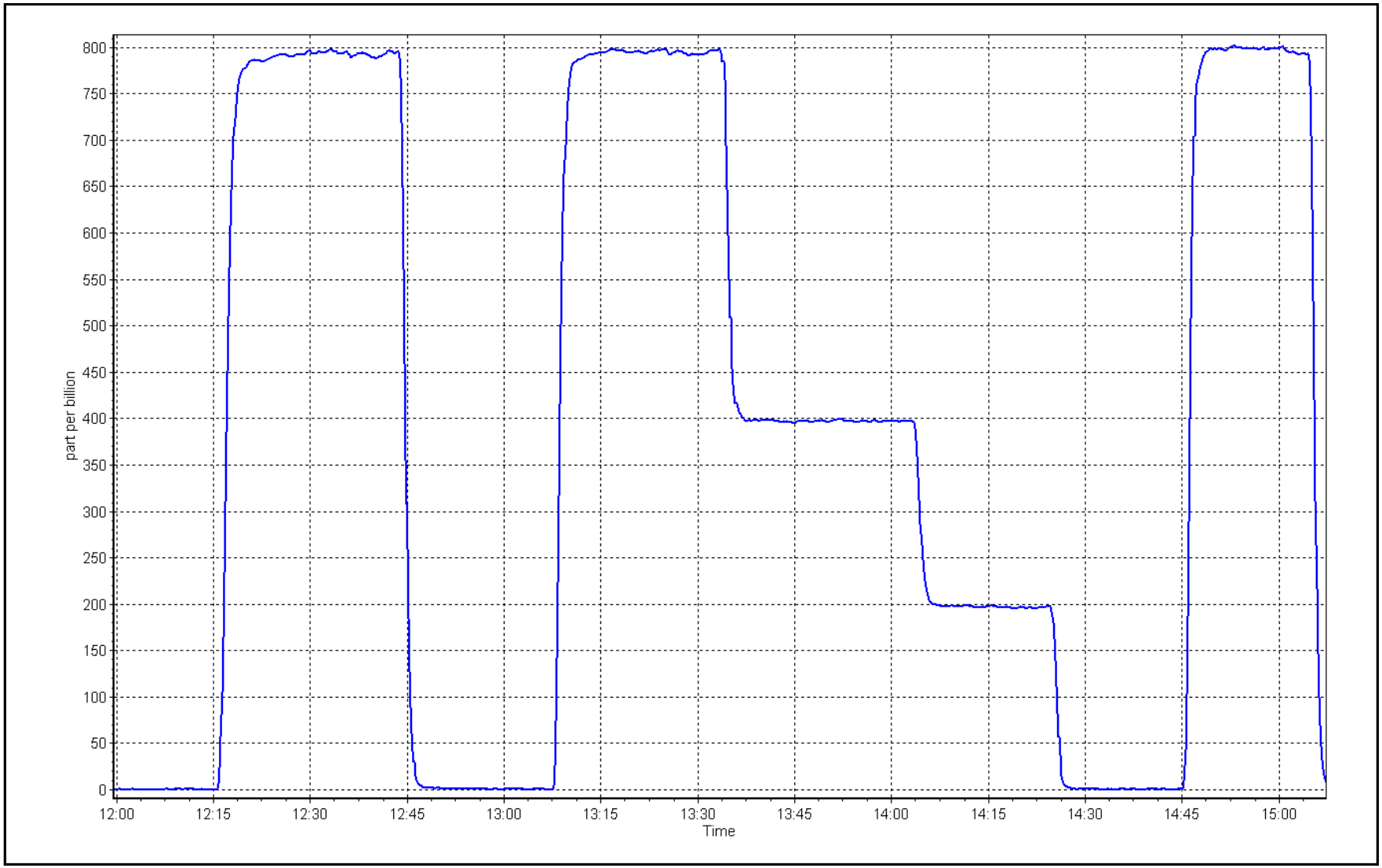
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.8	----
800.3	796.9	1.0043
400.2	397.9	1.0057
200.1	196.3	1.0193

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999978	*≥0.995*
Slope	0.996102	*0.90 - 1.10*
Intercept	-0.800000	*+/-30*



SO2 Calibration Plot Date: December 5, 2024 Location: Stony Mountain



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS18
Calibration Date:	December 3, 2024	Last Cal Date:	November 28, 2024
Start time (MST):	11:36	End time (MST):	16:17
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.48	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC500395			
Removed Cal Gas Conc:	5.48	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2658
ZAG Make/Model:	Teledyne API T701		Serial Number:	360

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1218153359
Converter make:	CD Nova CDN-101		Converter serial #:	555
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.001158	0.996582	Backgd or Offset:	3.3	3.09
Calibration intercept:	0.400939	0.161164	Coeff or Slope:	1.335	1.248

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4927	73.0	80.0	87.8	0.911
As found Mid point	4964	36.5	40.0	44.4	0.901
As found Low point	4983	18.3	20.0	21.7	0.924
New cylinder response					

Baseline Corr As found:	87.8	Prev response:	80.49	*% change:	8.3%
Baseline Corr 2nd AF pt:	44.4	AF Slope:	1.099611	AF Intercept:	-0.020748
Baseline Corr 3rd AF pt:	21.7	AF Correlation:	0.999924	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4927	73.0	80.0	79.8	1.002
Mid point	4964	36.5	40.0	40.3	0.992
Low point	4983	18.3	20.0	19.9	1.007
As left zero	5000	0.0	0.0	0.3	----
As left span	4927	73.0	80.0	79.6	1.005
SO2 Scrubber Check	4923	77.1	771.0	0.1	----

Date of last scrubber change:	17-Dec-21	Ave Corr Factor	1.001
Date of last converter efficiency test:			

Notes: Asfounds high due to weather. Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

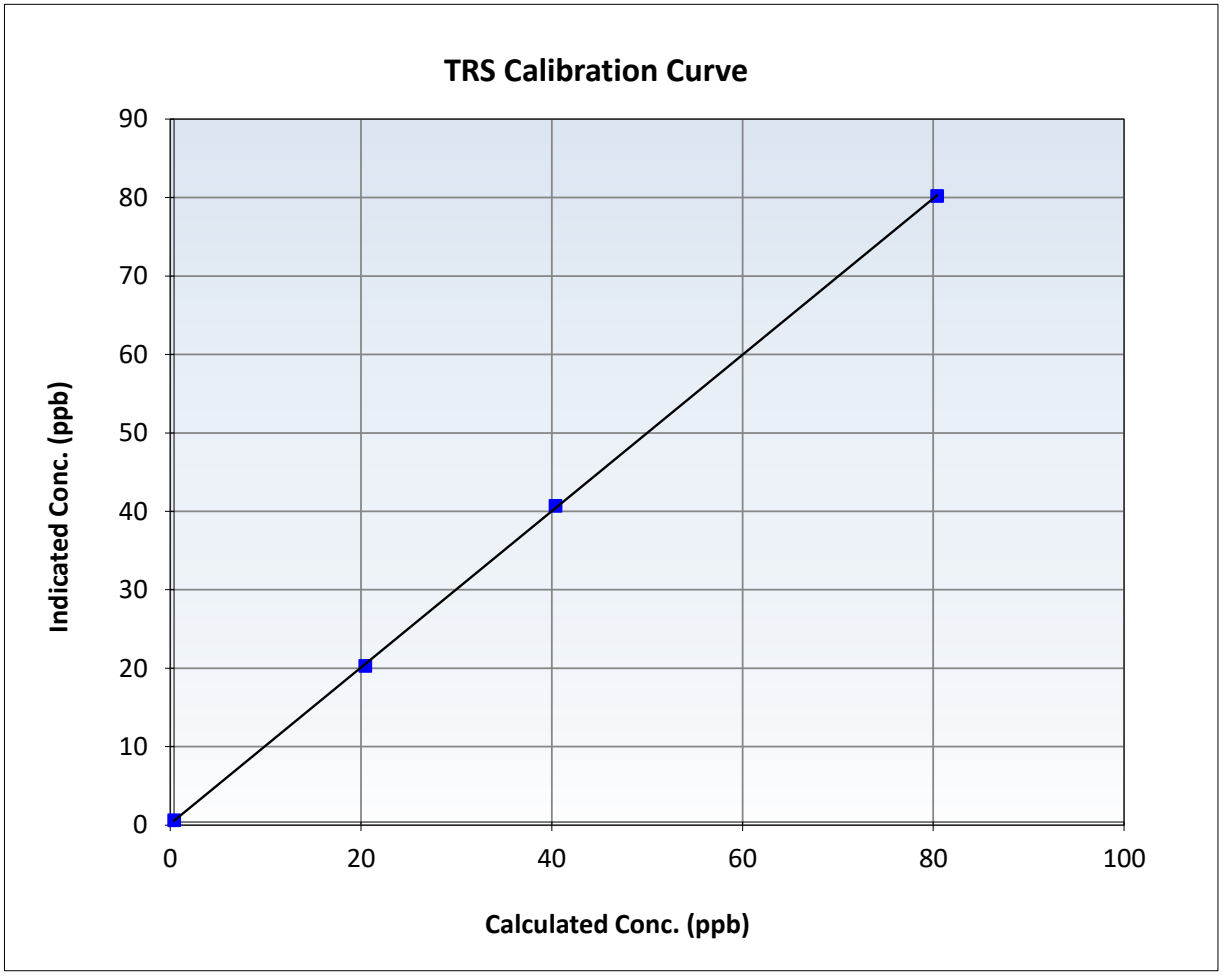
TRS Calibration Summary

Station Information

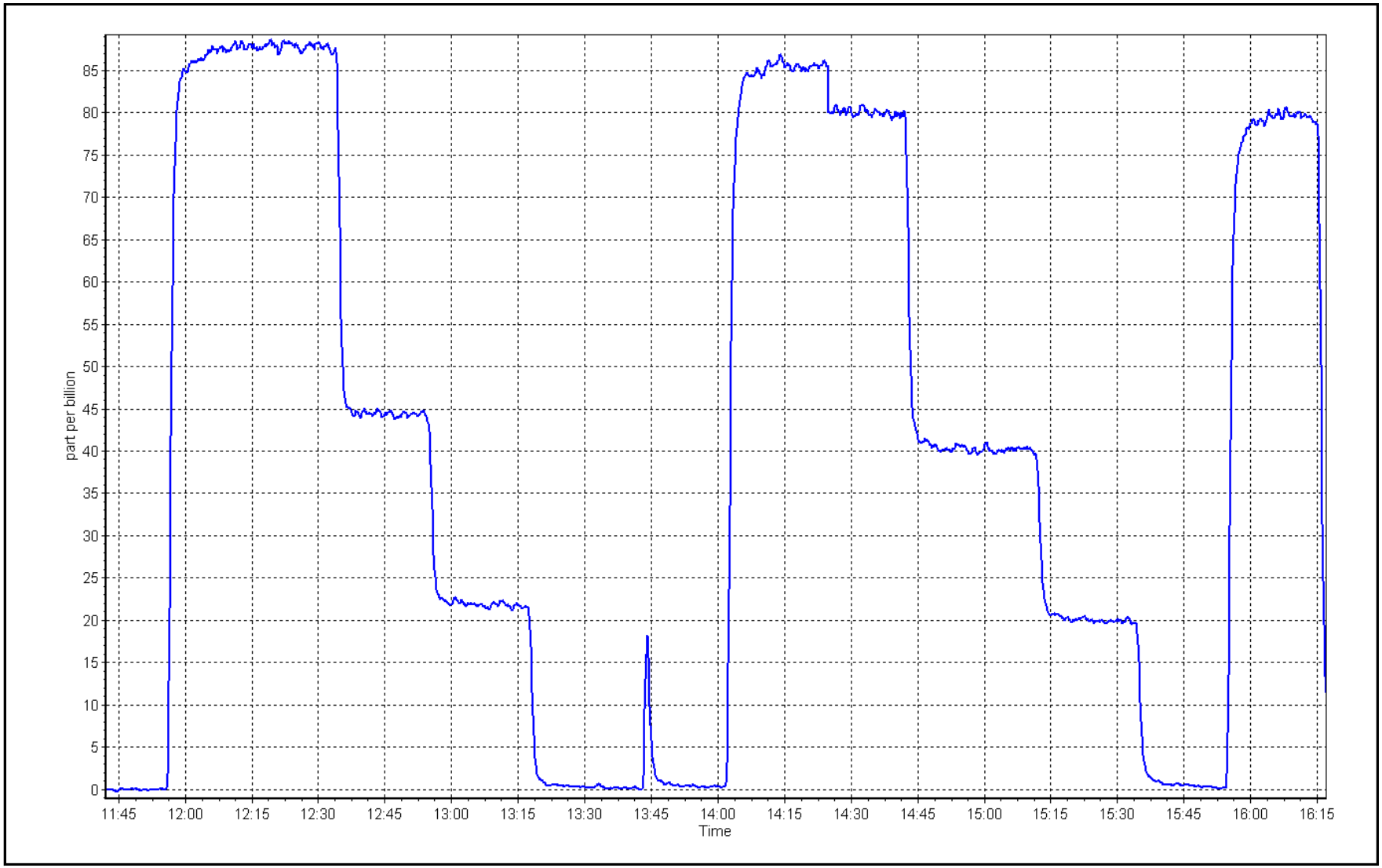
Calibration Date:	December 3, 2024	Previous Calibration:	November 28, 2024
Station Name:	Stony Mountain	Station Number:	AMS18
Start Time (MST):	11:36	End Time (MST):	16:17
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153359

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	0.999958	*≥0.995*
80.0	79.8	1.0024	Slope	0.996582	*0.90 - 1.10*
40.0	40.3	0.9924			
20.0	19.9	1.0074	Intercept	0.161164	*+/-3*



TRS Calibration Plot Date: December 3, 2024 Location: Stony Mountain



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	December 5, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	11:55	End time (MST):	15:07
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	XC026809B	Cal Gas Expiry Date:	January 12, 2029
CH4 Cal Gas Conc.	504.9 ppm	CH4 Equiv Conc.	1076.6 ppm
C3H8 Cal Gas Conc.	207.9 ppm		
Removed Gas Cert:	CC463851	Removed Gas Expiry:	February 23, 2025
Removed CH4 Conc.	500.8 ppm	CH4 Equiv Conc.	1066.8 ppm
Removed C3H8 Conc.	205.8 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T750	Serial Number:	282
Zero Air Gen model:	Teledyne API T751H	Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.71E-04	2.71E-04	NMHC SP Ratio:	4.16E-05	4.16E-05
CH4 Retention time:	16.4	16.4	NMHC Peak Area:	223110	223110
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4920	80.0	17.07	17.02	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.00	Prev response	17.05	*% change	-0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.02	----
High point	4920	80.0	17.23	16.97	1.015
Mid point	4960	40.0	8.61	8.52	1.011
Low point	4980	20.0	4.31	4.27	1.009
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	17.23	17.17	1.003
				Average Correction Factor	1.012

Notes: No adjustments needed.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.0	9.06	9.05	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.05	Prev response	9.07	*% change	-0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.0	9.15	9.03	1.013
Mid point	4960	40.0	4.57	4.54	1.008
Low point	4980	20.0	2.29	2.27	1.007
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	9.15	9.14	1.001
				Average Correction Factor	1.009

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4920	80.0	8.01	7.97	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.95	Prev response	7.98	*% change	-0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.02	----
High point	4920	80.0	8.08	7.94	1.017
Mid point	4960	40.0	4.04	3.98	1.015
Low point	4980	20.0	2.02	2.00	1.012
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	8.08	8.03	1.007
				Average Correction Factor	1.015

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997150	0.984207
THC Cal Offset:	0.029600	0.027400
CH4 Cal Slope:	0.993818	0.980986
CH4 Cal Offset:	0.016800	0.017400
NMHC Cal Slope:	1.000106	0.987150
NMHC Cal Offset:	0.013000	0.009600

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

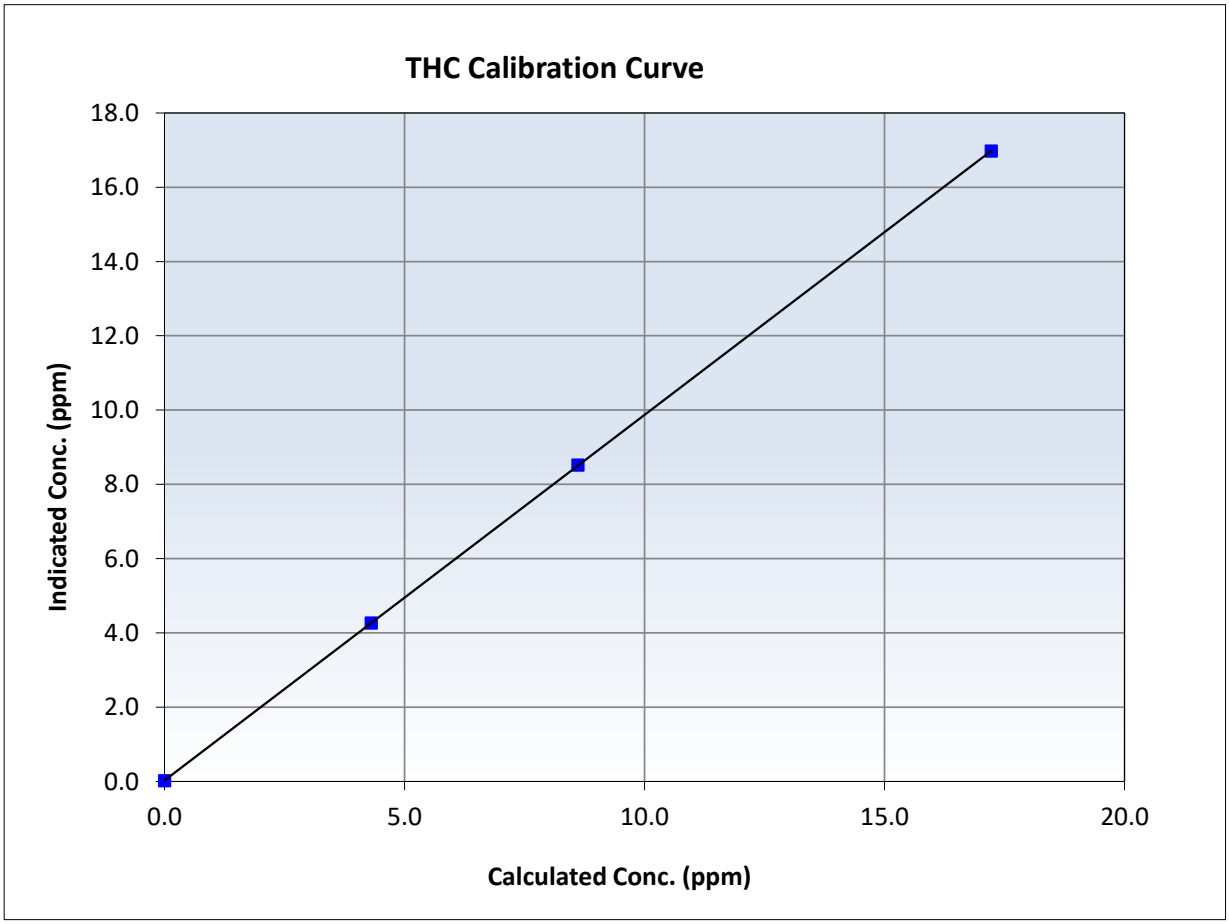
THC Calibration Summary

Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 21, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	15:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.02	----	Correlation Coefficient	0.999998	≥0.995
17.23	16.97	1.0148	Slope	0.984207	0.90 - 1.10
8.61	8.52	1.0110	Intercept	0.027400	+/-0.5
4.31	4.27	1.0095			



Wood Buffalo Environmental Association

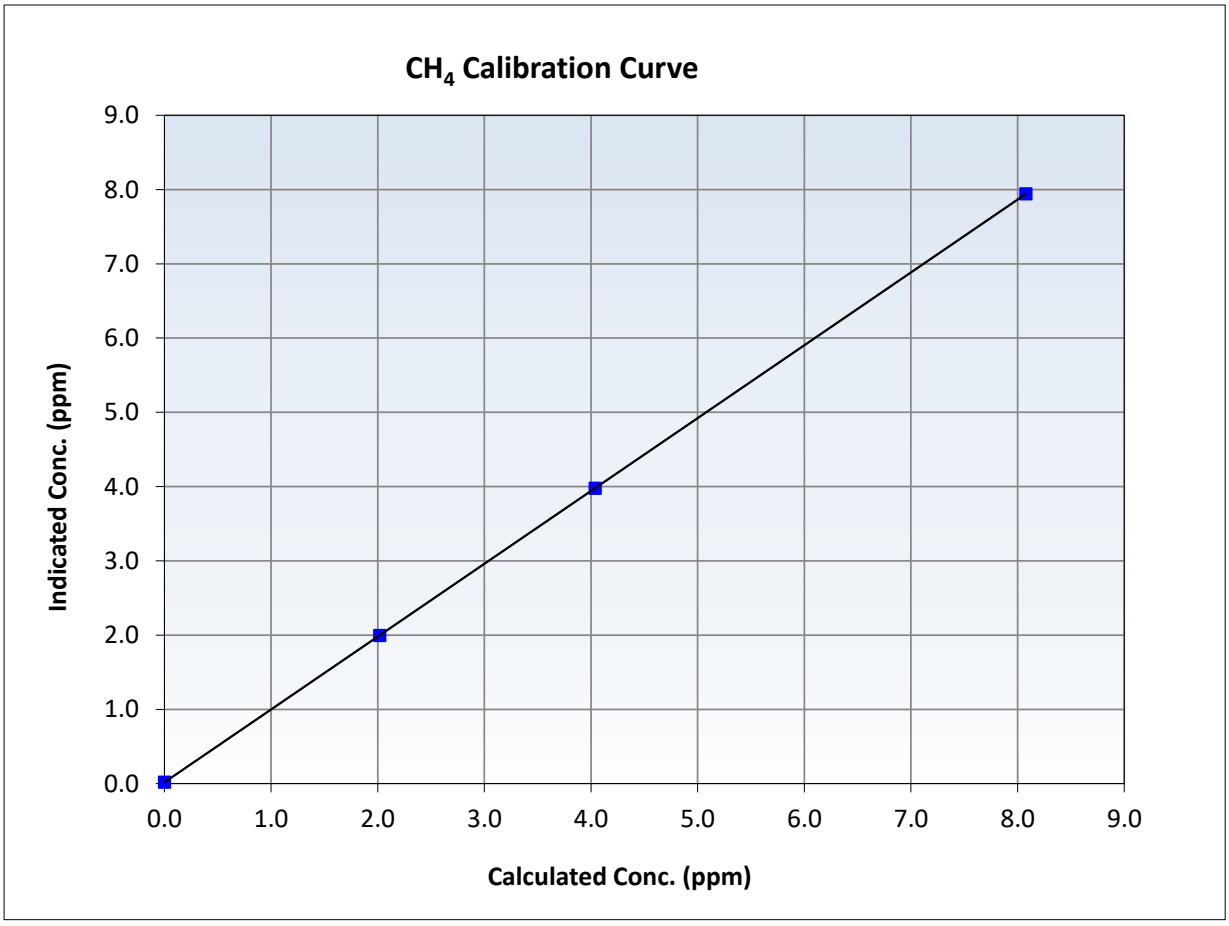
CH_4 Calibration Summary

Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 21, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	15:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.02	----	Correlation Coefficient	0.999999	*≥0.995*
8.08	7.94	1.0170	Slope	0.980986	*0.90 - 1.10*
4.04	3.98	1.0149	Intercept	0.017400	*+/-0.5*
2.02	2.00	1.0123			



Wood Buffalo Environmental Association

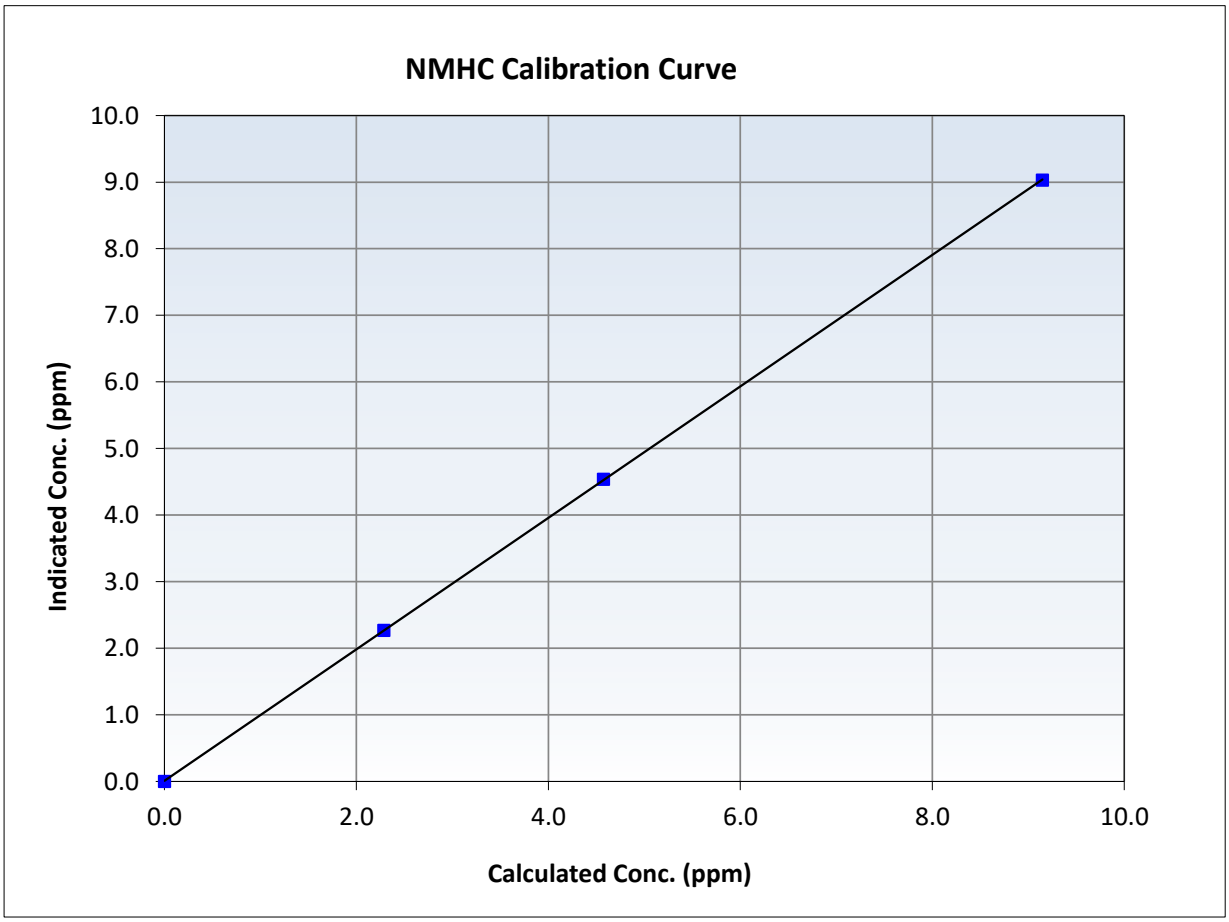
NMHC Calibration Summary

Station Information

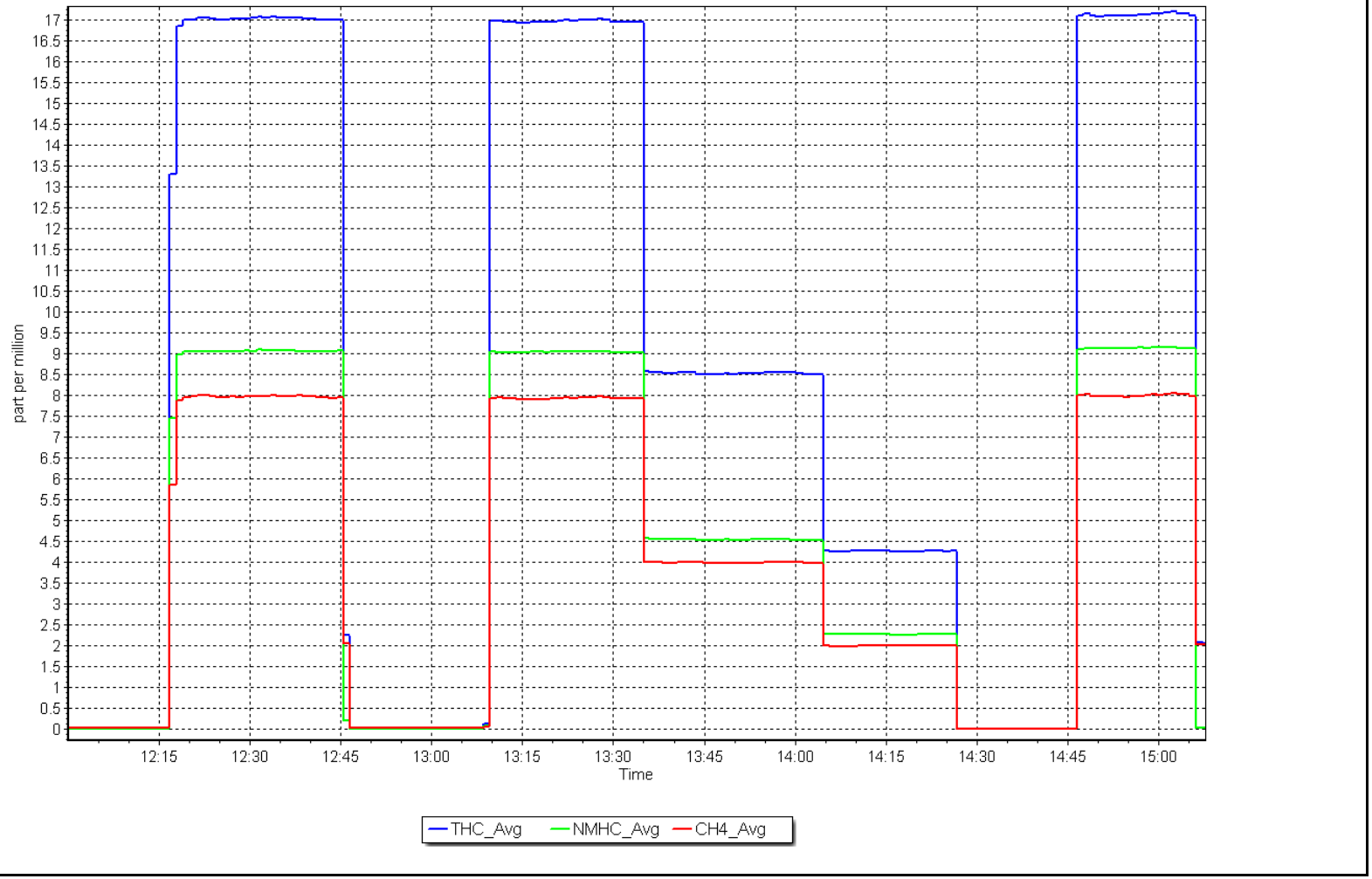
Calibration Date:	December 5, 2024	Previous Calibration:	November 21, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	15:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999992	≥0.995
9.15	9.03	1.0128	Slope	0.987150	0.90 - 1.10
4.57	4.54	1.0079			
2.29	2.27	1.0070	Intercept	0.009600	+/-0.5



NMHC Calibration Plot Date: December 5, 2024 Location: Stony Mountain



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Stony Mountain
Station number:	AMS 18
Calibration Date:	December 20, 2024
Last Cal Date:	November 28, 2024
Start time (MST):	9:42
End time (MST):	14:42
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0045516	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	2658
ZAG make/model:	Teledyne API 701H	Serial Number:	355

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-2.1	-1.4	-0.7	----	----
AF High point	4933	66.6	803.3	800.6	2.7	782.9	778.5	4.5	1.0233	1.0265
AF Mid point										
AF Low point										
New cyl resp										

Previous Respo	4933	NO_X =	804.3 ppb	NO =	802.6 ppb		
Baseline Corr 1st pt		NO_X =	785.0 ppb	NO =	779.9 ppb		
Baseline Corr 2nd pt		NO_X =	NA ppb	NO =	NA ppb		
Baseline Corr 3rd pt		NO_X =	NA ppb	NO =	NA ppb		

* = > +/-5% change initiates investigation

*Percent Change	NO_X =	-2.5%	
*Percent Change	NO =	-2.9%	
Nx Sl:	Nx Int:		
NO Sl:	NO Int:		
NO2 Sl:	NO_2 Int:		

As Found Statistics

As found NO_X r^2:

As found NO r^2:

As found NO_2 r^2:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 1035

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.932	0.932	NO bkgnd or offset:	-38.0	-38.0
NOX coeff or slope:	0.929	0.929	NOX bkgnd or offset:	-37.1	-37.1
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	7.2	7.2

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001325	0.999821
NO_X Cal Offset:	-0.027026	-0.148573
NO Cal Slope:	1.002817	1.001637
NO Cal Offset:	-0.207696	-0.969502
NO_2 Cal Slope:	0.990356	1.001892
NO_2 Cal Offset:	1.039482	1.135453

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	1.2	1.7	-0.5	----	----
High point	4933	66.6	803.3	800.6	2.7	803.5	802.4	1.0	0.9997	0.9978
Mid point	4967	33.3	401.6	400.2	1.3	401.1	398.2	2.9	1.0012	1.0051
Low point	4983	16.6	200.2	199.5	0.7	198.4	196.5	1.8	1.0091	1.0155
As left zero										
As left span										
								Average Correction Factor	1.0033	1.0061

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.5	----	----
High GPT point	798.8	382.2	419.3	420.6	0.9968	100.3%
Mid GPT point	798.8	595.3	206.2	208.0	0.9912	100.9%
Low GPT point	798.8	705.2	96.3	99.5	0.9675	103.4%
				Average Correction Factor	0.9852	101.5%

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

NO_X Calibration Summary

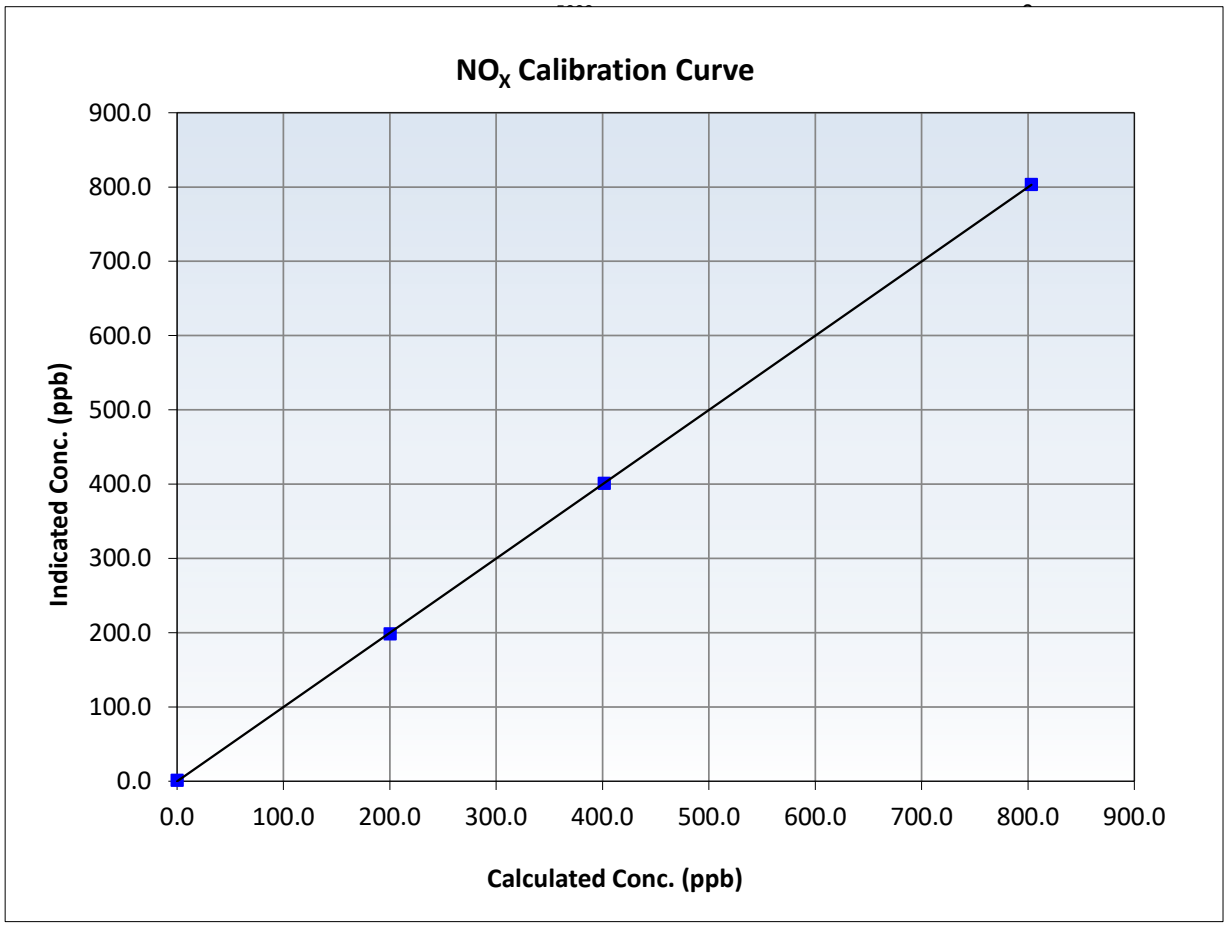
Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 28, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:42	End Time (MST):	14:42
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.2	----
803.3	803.5	0.9997
401.6	401.1	1.0012
200.2	198.4	1.0091

Statistical Evaluation		Limits
Correlation Coefficient	0.999986	≥0.995
Slope	0.999821	0.90 - 1.10
Intercept	-0.148573	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

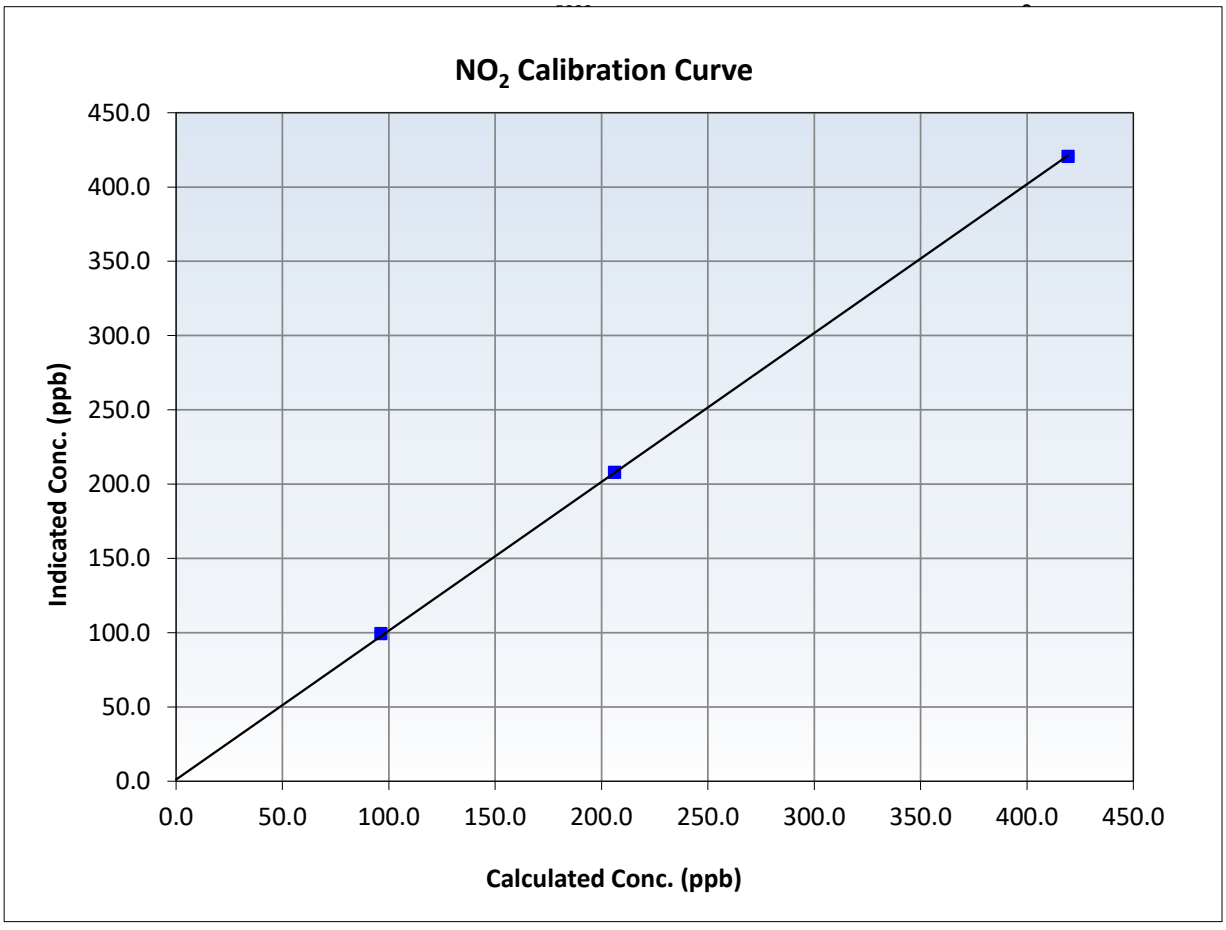
Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 28, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:42	End Time (MST):	14:42
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.5	----
419.3	420.6	0.9968
206.2	208.0	0.9912
96.3	99.5	0.9675

Statistical Evaluation		Limits
Correlation Coefficient	0.999930	≥0.995
Slope	1.001892	0.90 - 1.10
Intercept	1.135453	+/-20



Wood Buffalo Environmental Association

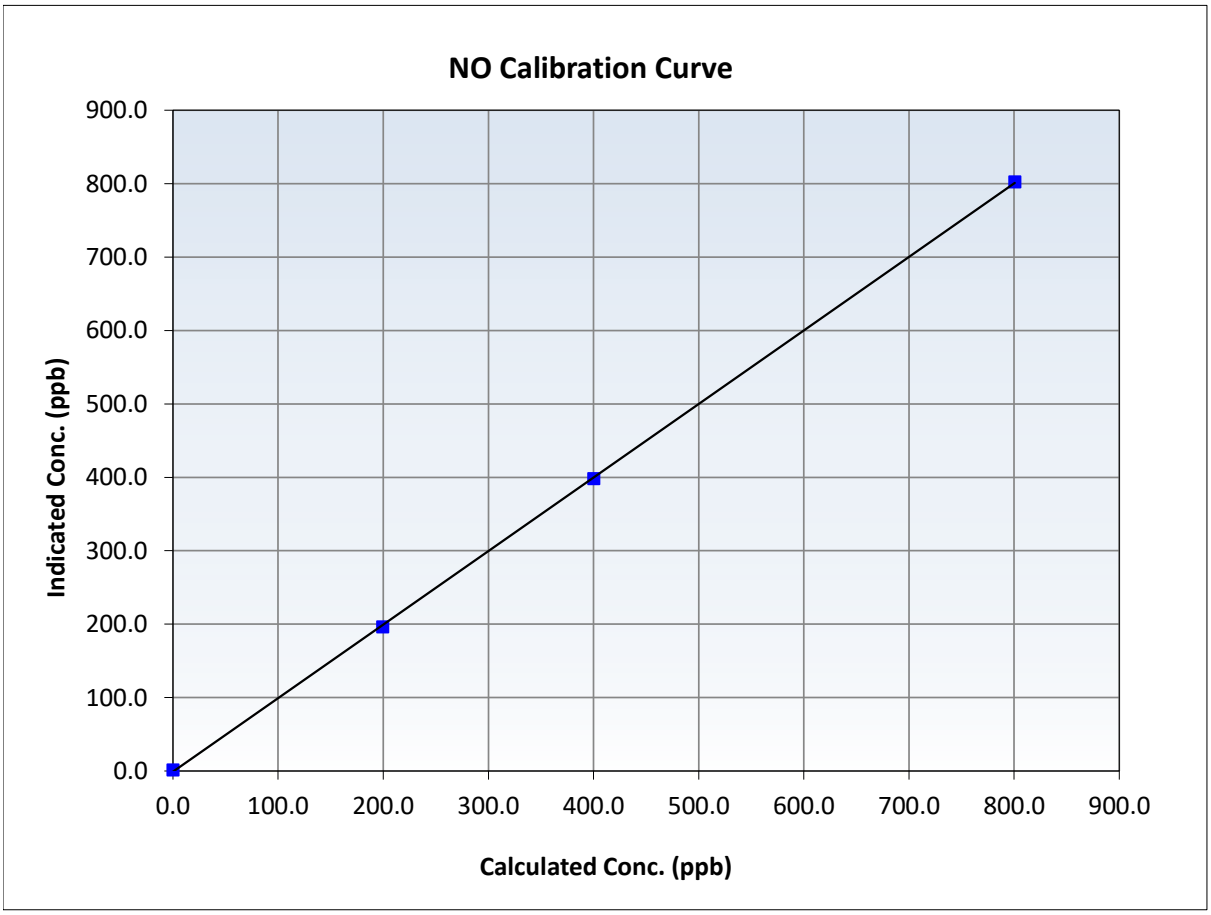
NO Calibration Summary

Station Information

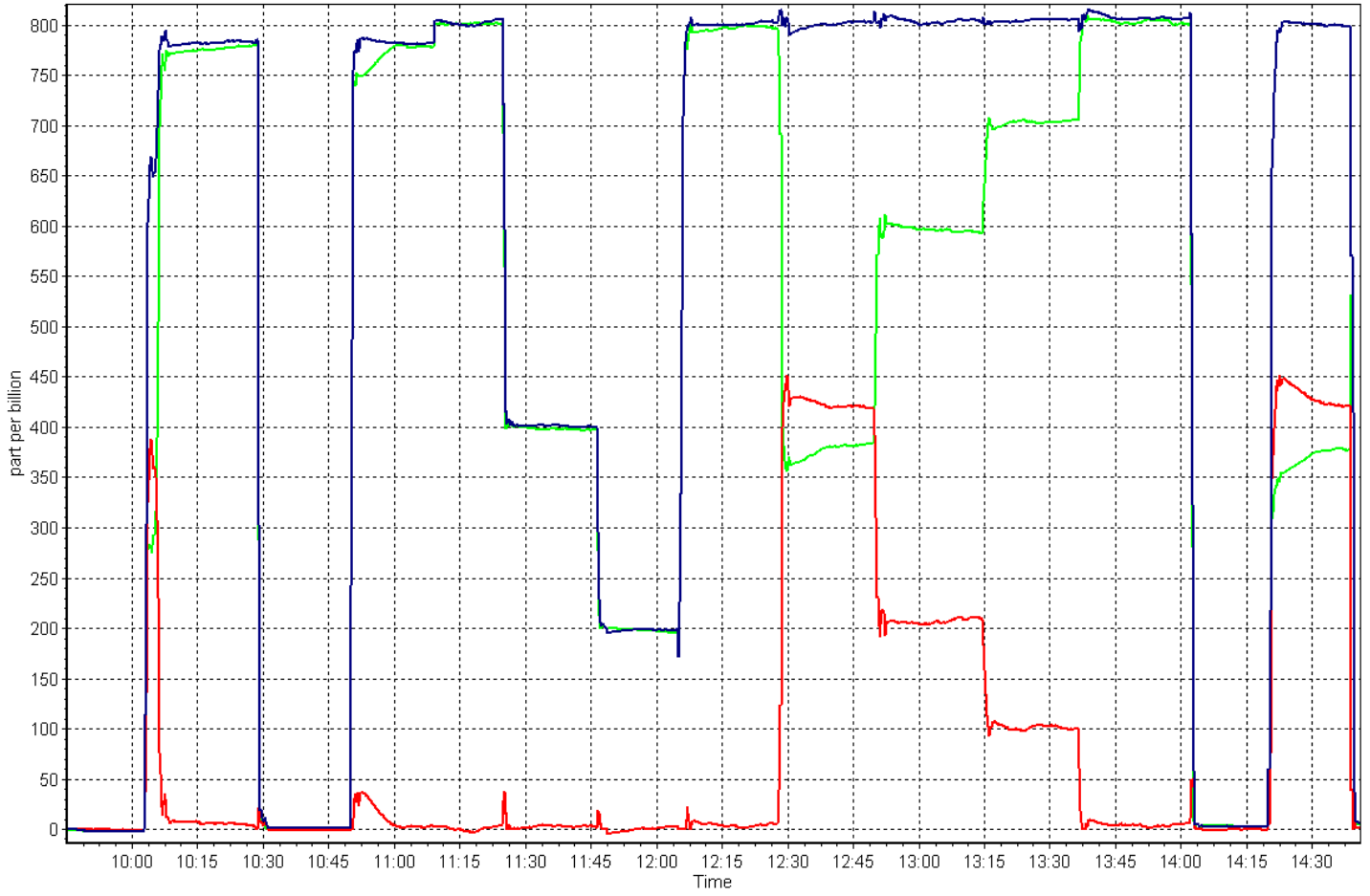
Calibration Date:	December 20, 2024	Previous Calibration:	November 28, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:42	End Time (MST):	14:42
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	1.7	----	Correlation Coefficient	0.999949	*≥0.995*
800.6	802.4	0.9978	Slope	1.001637	*0.90 - 1.10*
400.2	398.2	1.0051			
199.5	196.5	1.0155	Intercept	-0.969502	*+/-20*
		5000		0	
		4933		66.6	



NO_X Calibration Plot Date: December 20, 2024 Location: Stony Mountain



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	December 4, 2024	Last Cal Date:	November 20, 2024
Start time (MST):	11:49	End time (MST):	14:56
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	2658
ZAG Make/Model:	Teledyne API 701H	Serial Number:	355

Analyzer Information

Analyzer make:	API T400		Analyzer serial #:	825	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999629	1.003457	Backgd or Offset:	2.0	2.0
Calibration intercept:	0.540000	0.220000	Coeff or Slope:	0.994	1.009

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	NA	0.0	-0.1	----
As found High point	4888	1138.1	400.0	396.3	1.009
As found Mid point					
As found Low point					
Baseline Corr As found:	396.4	Previous response	400.4	*% change	-1.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	NA	0.0	0.2	----
High point	4888	1138.1	400.0	401.6	0.996
Mid point	4888	884.5	200.0	200.9	0.996
Low point	4888	741.4	100.0	100.6	0.994
As left zero	5000	NA	0.0	0.5	----
As left span	4812	1097.9	400.0	401.6	0.996
				Average Correction Factor	0.995

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

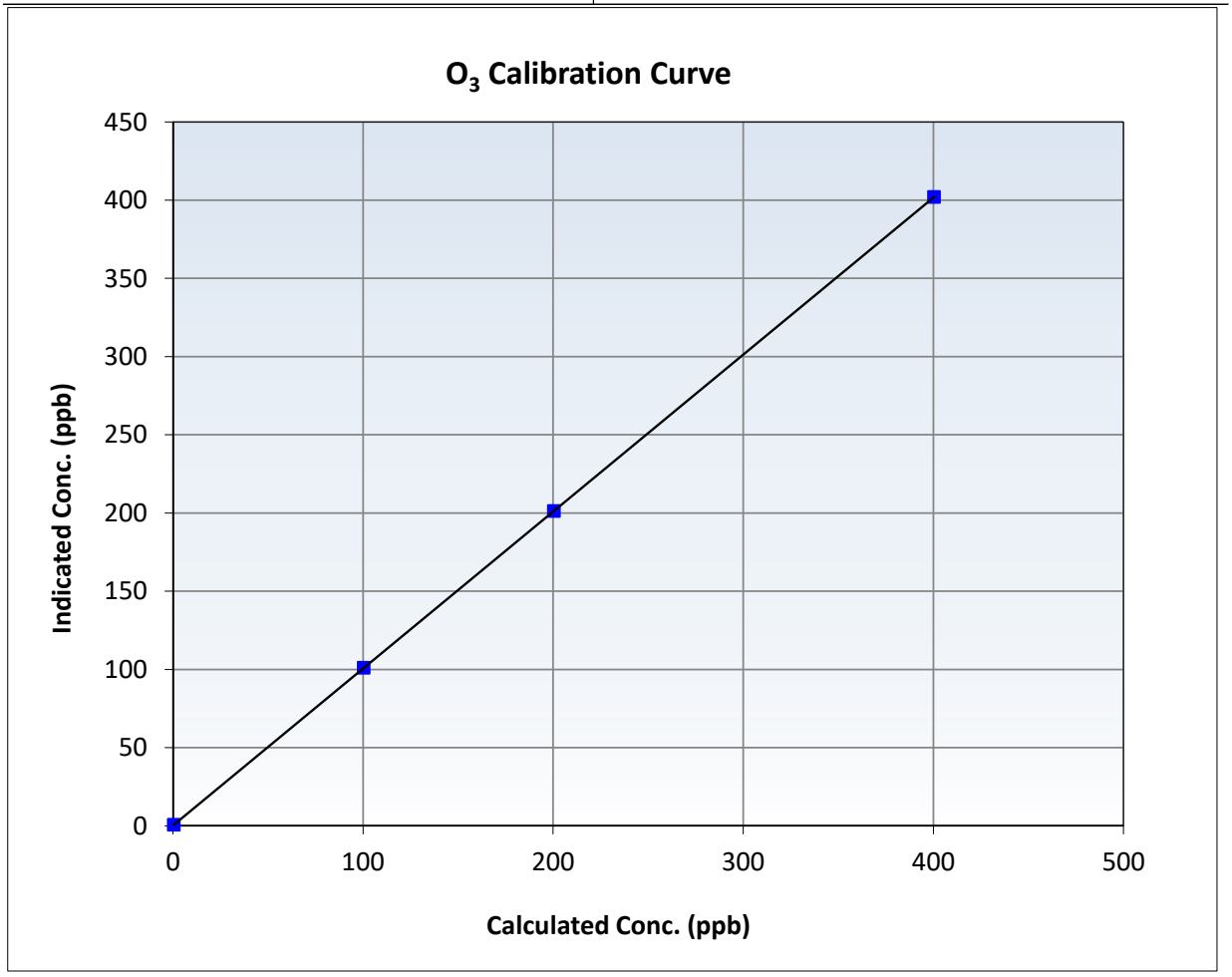
O_3 Calibration Summary

Station Information

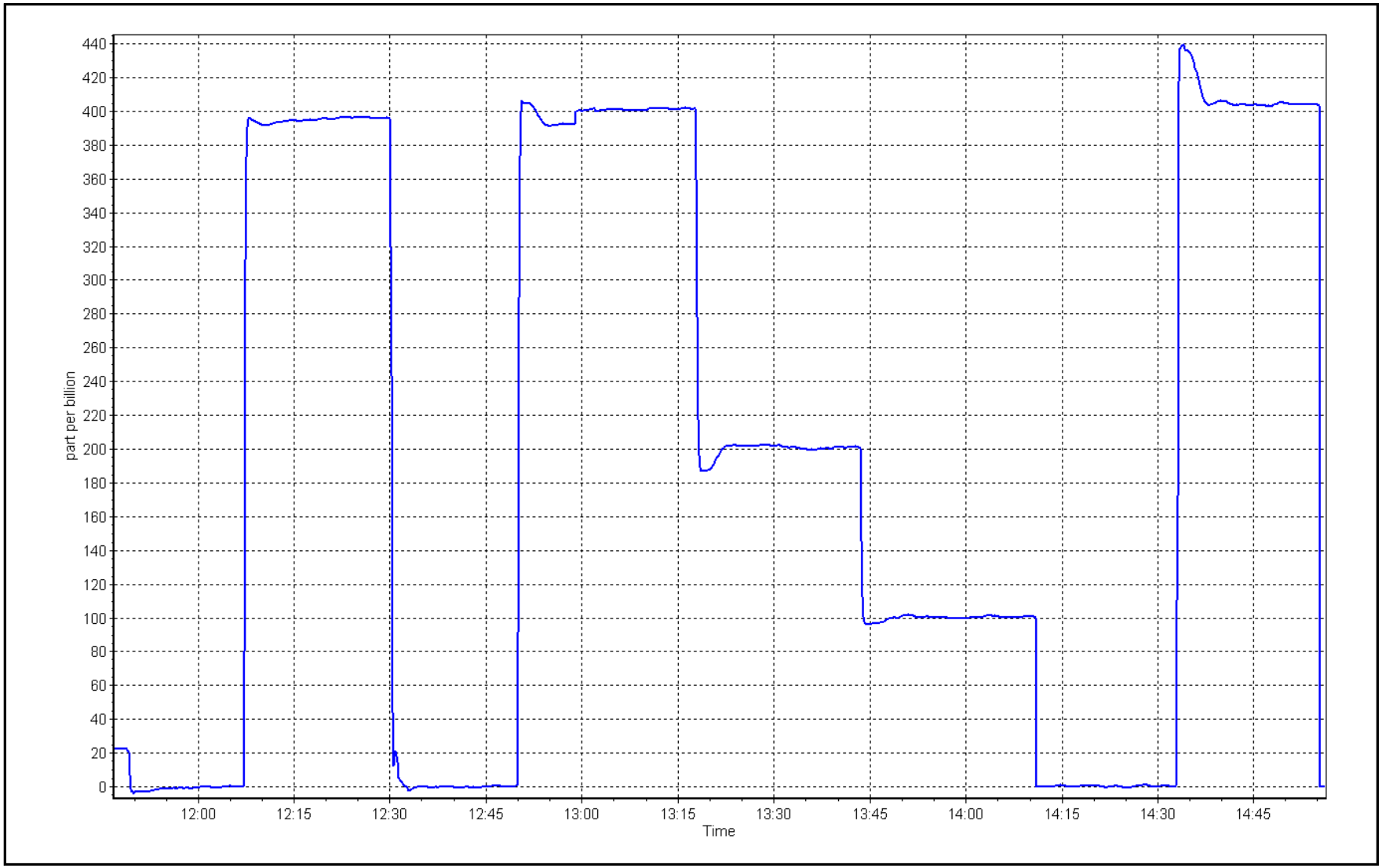
Calibration Date:	December 4, 2024	Previous Calibration:	November 20, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:49	End Time (MST):	14:56
Analyzer make:	API T400	Analyzer serial #:	825

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	1.000000	*≥0.995*
400.0	401.6	0.9960	Slope	1.003457	*0.90 - 1.10*
200.0	200.9	0.9955			
100.0	100.6	0.9940	Intercept	0.220000	*+/- 5*



O_3 Calibration Plot Date: December 4, 2024 Location: Stony Mountain



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	December 20, 2024	Last Cal Date:	November 28, 2024
Start time (MST):	13:15	End time (MST):	14:06
Analyzer Make:	API T640	S/N:	324
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388750
Temp/RH standard:	Alicat FP-25BT	S/N:	388750

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-13.3	-14	-13.3	☐	+/- 2 °C
P (mmHg)	700.1	697.50	700.1	☐	+/- 10 mmHg
Flow (LPM)	5.00	5.05	5.00	☐	+/- 0.25 LPM
PW% (pump)	57	-----	57	☐	>80%
Zero Verification	PM w/o HEPA:	2.7	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: October 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	N/A	N/A	N/A	☐	+/- 0.5

Date Optical Chamber Cleaned: September 24, 2024

Date Disposable Filter Changed: December 20, 2024

Post- maintenance Zero Verification: PM w/ HEPA: N/A <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: July 4, 2024

Date RH/T Sensor Cleaned: July 4, 2024

Notes: Flow, temp and pressure checked. Leak check passed. DFU filter changed out.

Calibration by: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	December 17, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	12:06	End time (MST):	15:08
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	3,080	ppm	Cal Gas Exp Date:	November 4, 2028
Cal Gas Cylinder #:	EB0065608			
Removed Cal Gas Conc:	3,080	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2658
ZAG Make/Model:	Teledyne API T701H		Serial Number:	355

Analyzer Information

Analyzer make:	Teledyne API T300		Analyzer serial #:	3504	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.005671	1.010873	Backgd or Offset:	-0.011	-0.012
Calibration intercept:	0.149779	0.123780	Coeff or Slope:	0.909	0.909

CO As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4933	66.7	41.1	41.4	0.997
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	41.23	Prev response:	41.47	*% change:	-0.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4933	66.7	41.1	41.6	0.988
Mid point	4966	33.3	20.5	21.0	0.976
Low point	4983	16.7	10.3	10.5	0.984
As left zero	5000	0.0	0.0	0.0	----
As left span	4933	66.7	41.1	41.6	0.987
				Average Correction Factor	0.983

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Summary

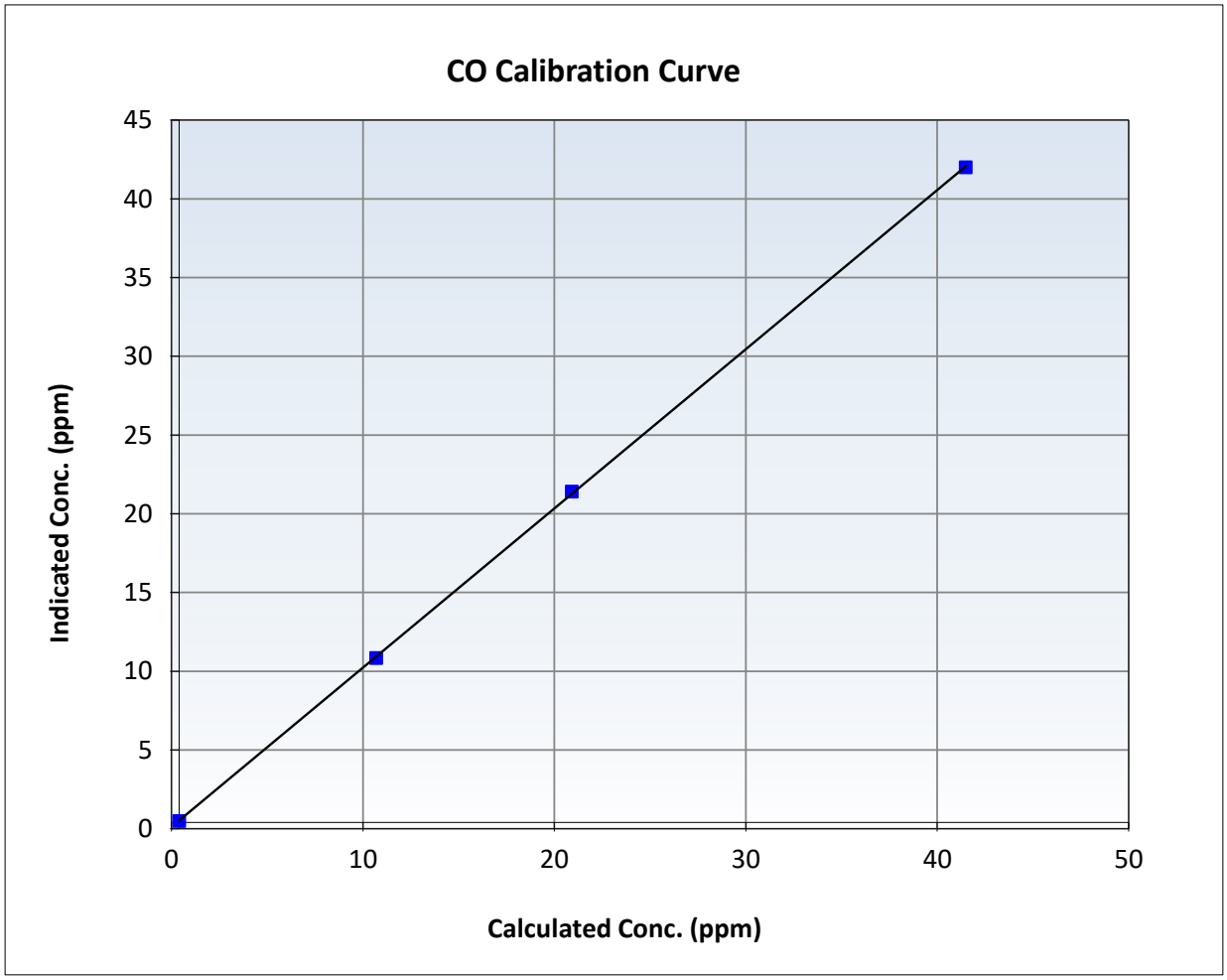
Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 7, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	12:06	End Time (MST):	15:08
Analyzer make:	Teledyne API T300	Analyzer serial #:	3504

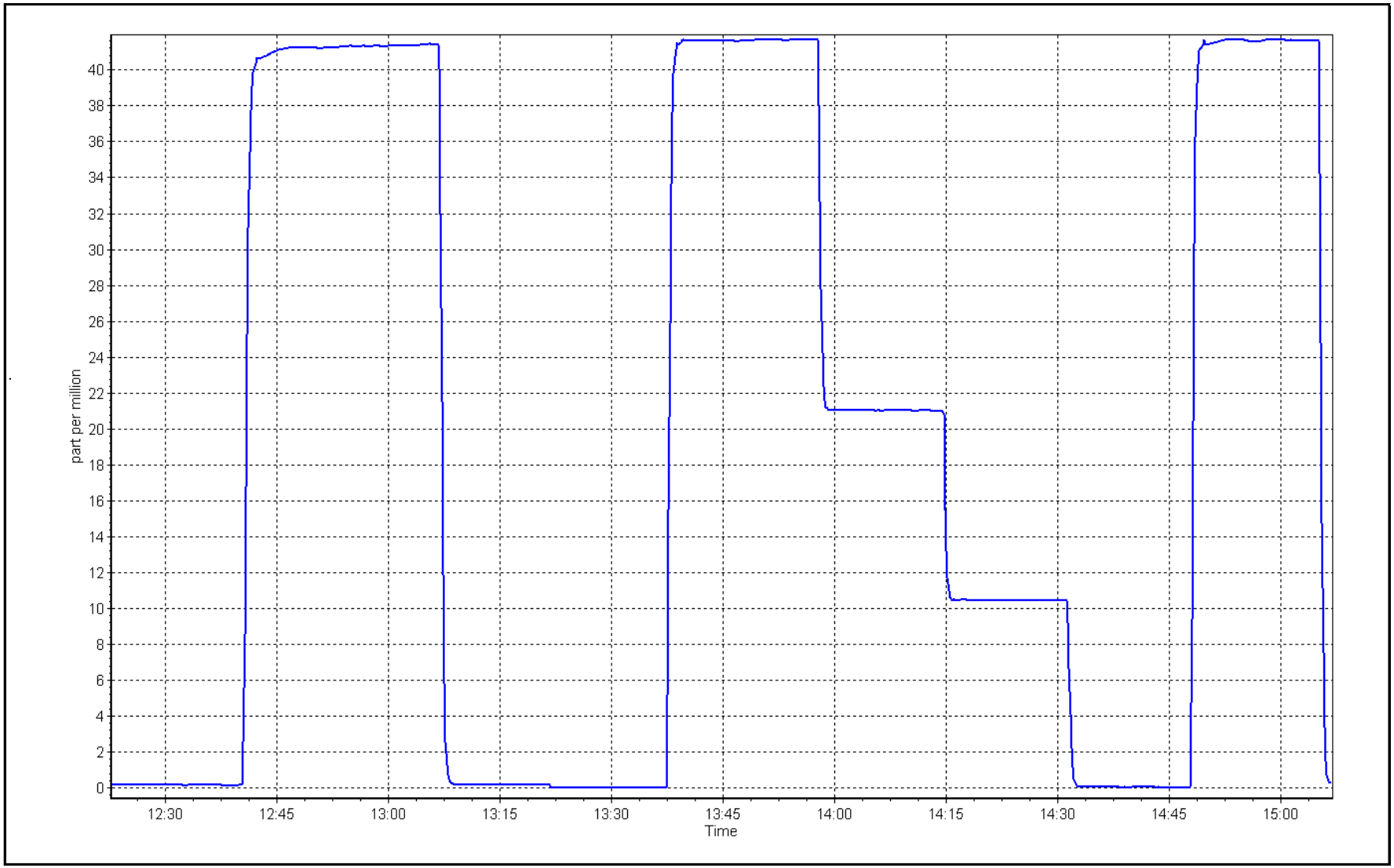
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
41.1	41.6	0.9877
20.5	21.0	0.9760
10.3	10.5	0.9845

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999964	*≥0.995*
Slope	1.010873	*0.90 - 1.10*
Intercept	0.123780	*+/-1.5*



CO Calibration Plot Date: December 17, 2024 Location: Stony Mountain



Wood Buffalo Environmental Association

CO_2 Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	December 18, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	12:04	End time (MST):	15:00
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	59,100	ppm	Cal Gas Exp Date:	November 4, 2028
Cal Gas Cylinder #:	EB0065608			
Removed Cal Gas Conc:	59,100	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2658
N2 Gen Make/Model:	Peak Scientific		Serial Number:	771048317

Analyzer Information

Analyzer make:	API T360		Analyzer serial #:	489	
Analyzer Range	0 - 2,000 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001022	1.000819	Backgd or Offset:	-0.068	-0.068
Calibration intercept:	-5.080000	-4.740000	Coeff or Slope:	0.961	0.961

CO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	3000	0.0	0.0	-0.6	----
As found High Point	2920	80.0	1576.0	1573.0	1.002
As found Mid Point					
As found Low Point					
New cylinder response					

Baseline Corr As found:	1573.6	Prev response:	1572.5	*% change:	0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	3000	0.0	0.0	-0.1	----
High point	2920	80.0	1576.0	1577.0	0.999
Mid point	2960	40.0	788.0	775.2	1.017
Low point	2980	20.0	394.0	389.2	1.012
As left zero	3000	0.0	0.0	-0.6	----
As left span	2930	80.0	1570.8	1573.0	0.999
				Average Correction Factor	1.009

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO_2 Calibration Summary

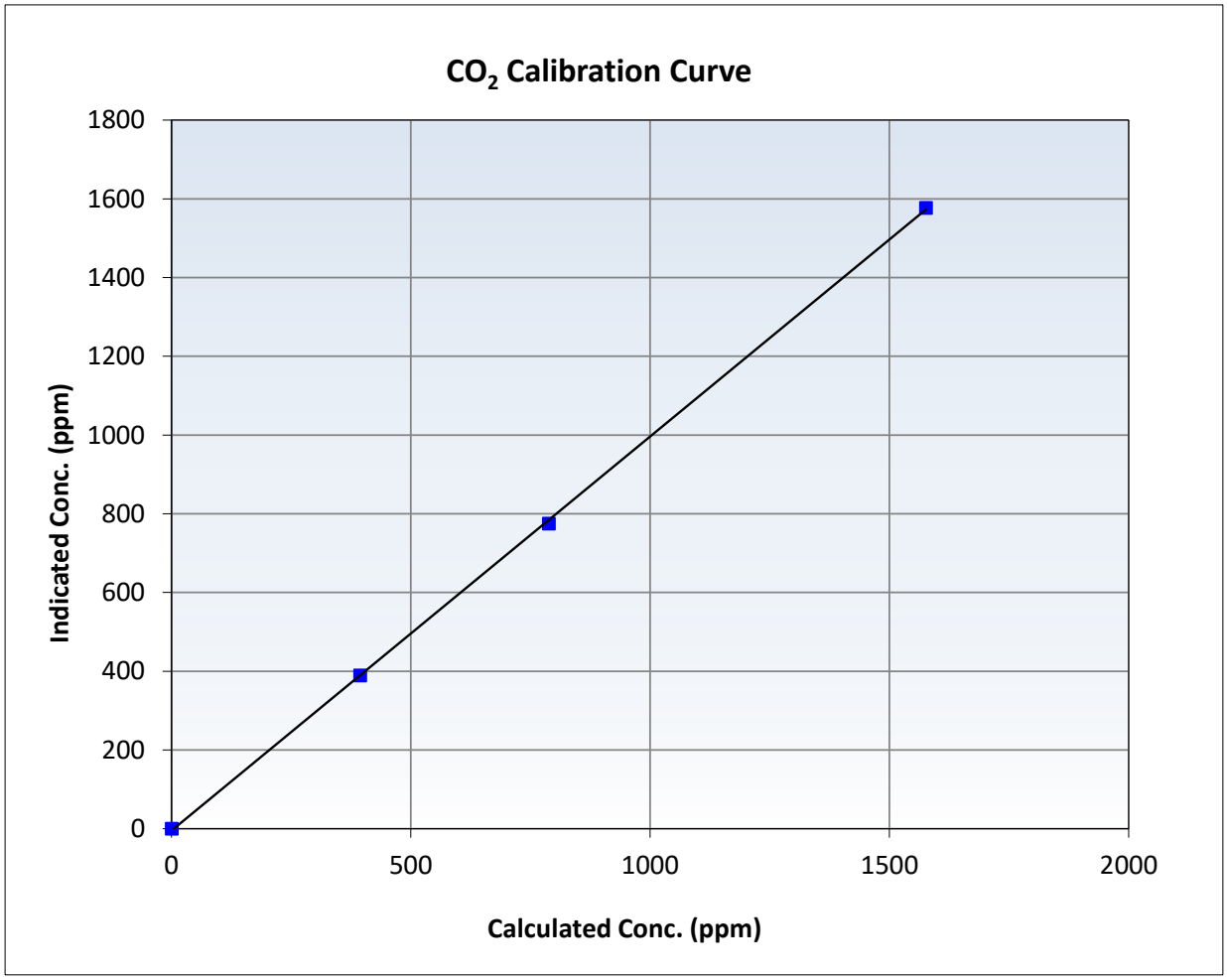
Station Information

Calibration Date	December 18, 2024	Previous Calibration	November 19, 2024
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	12:04	End Time (MST)	15:00
Analyzer make	API T360	Analyzer serial #	489

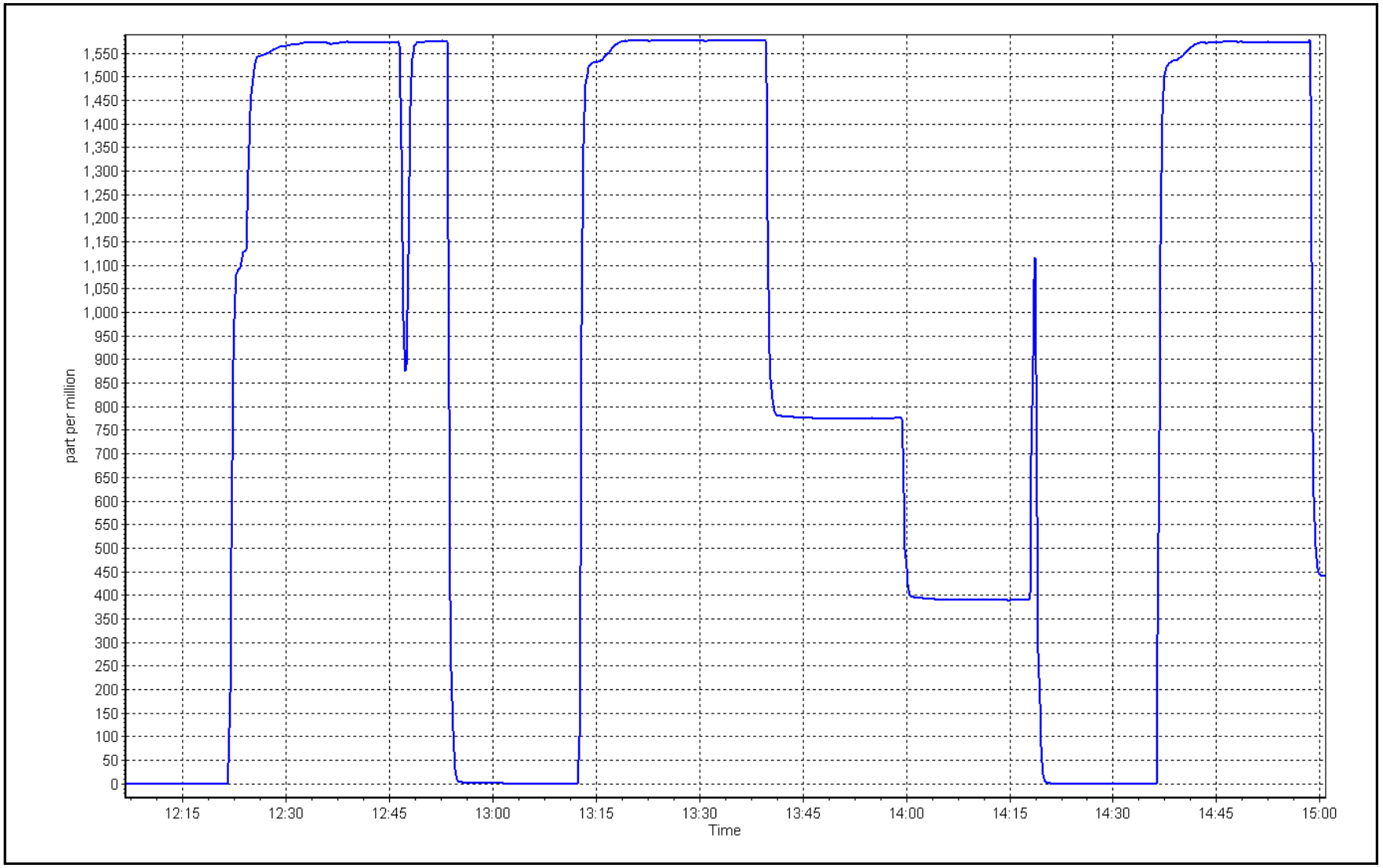
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
1576.0	1577.0	0.9994
788.0	775.2	1.0165
394.0	389.2	1.0123

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999914	*≥0.995*
Slope	1.000819	*0.90 - 1.10*
Intercept	-4.7	*+/-20*



CO_2 Calibration Plot Date: December 18, 2024 Location: Stony Mountain



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS19
FIREBAG
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	December 16, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	12:09	End time (MST):	15:47
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.29	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC716618			
Removed Cal Gas Conc:	49.29	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	1607
Zero Air Gen Model:	Teledyne API T701H		Serial Number:	201

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1410661308	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002779	1.003024	Backgd or Offset:	10.5	10.5
Calibration intercept:	0.417366	0.856640	Coeff or Slope:	0.981	0.981

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	4999	0.0	0.0	0.1	----
As found High point	4919	81.1	799.5	803.0	0.996
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	802.9	Previous response	802.1	*% change	0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	4999	0.0	0.0	0.1	----
High point	4919	81.1	799.5	802.0	0.997
Mid point	4959	40.6	400.3	403.8	0.991
Low point	4980	20.3	200.1	201.6	0.993
As left zero	4999	0.0	0.0	0.1	----
As left span	4919	81.1	799.5	806.0	0.992
				Average Correction Factor:	0.994

Notes: Changed sample inlet filter after as founds. No adjustments made.

Calibration Performed By: Braiden Boutilier

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

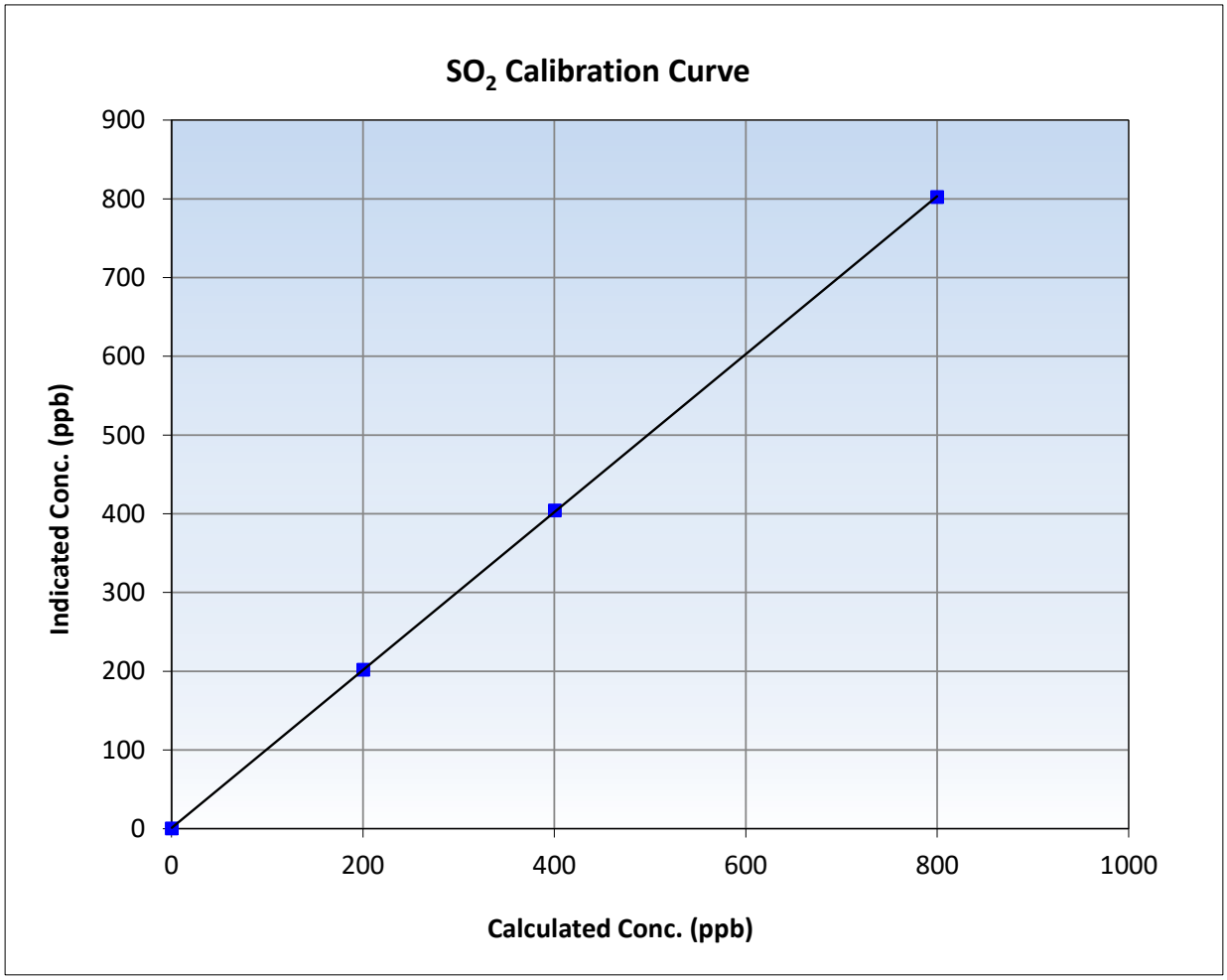
Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	November 18, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	12:09	End Time (MST):	15:47
Analyzer make:	Thermo 43i	Analyzer serial #:	1410661308

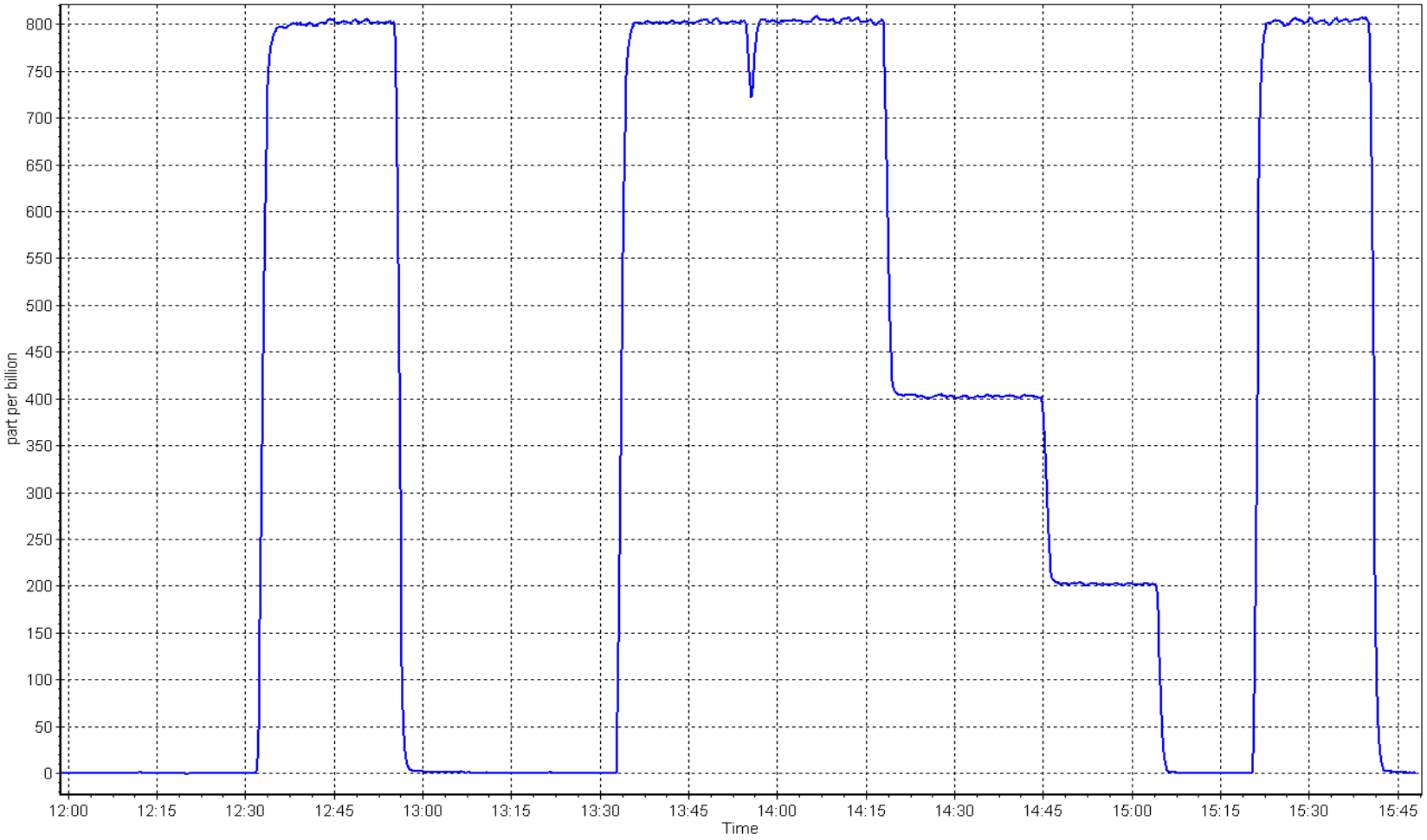
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
799.5	802.0	0.9968
400.3	403.8	0.9913
200.1	201.6	0.9926

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999991	*≥0.995*
Slope	1.003024	*0.90 - 1.10*
Intercept	0.856640	*+/-30*



SO2 Calibration Plot Date: December 16, 2024 Location: Firebag



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	December 6, 2024	Last Cal Date:	November 26, 2024
Start time (MST):	11:11	End time (MST):	15:17
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.29	ppm	Cal Gas Exp Date:	March 19, 2027
Cal Gas Cylinder #:	DT0010492			
Removed Cal Gas Conc:	5.29	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1607
ZAG Make/Model:	Teledyne API T701		Serial Number:	201

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1151680032
Converter make:	Global		Converter serial #:	2022-222
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.994189	0.998904	Backgd or Offset:	2.94	2.98
Calibration intercept:	0.160000	0.220000	Coeff or Slope:	1.205	1.215

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4924	75.6	80.0	80.1	0.999
As found Mid point	4962	37.8	40.0	40.3	0.992
As found Low point	4981	18.9	20.0	20.1	0.995
New cylinder response					

Baseline Corr As found:	80.1	Prev response:	79.68	*% change:	0.5%
Baseline Corr 2nd AF pt:	40.3	AF Slope:	1.001476	AF Intercept:	0.080000
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999988	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4924	75.6	80.0	80.0	1.000
Mid point	4962	37.8	40.0	40.4	0.990
Low point	4981	18.9	20.0	20.2	0.990
As left zero	5000	0.0	0.0	0.2	----
As left span	4924	75.6	80.0	79.5	1.006
SO2 Scrubber Check	4922	78.3	783.0	0.0	----

Date of last scrubber change:	18-Jan-23	Ave Corr Factor	0.993
Date of last converter efficiency test:	November 26, 2024	106.2%	efficiency

Notes: Changed sample inlet filter after as founds. Completed scrubber test after calibrator zero. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

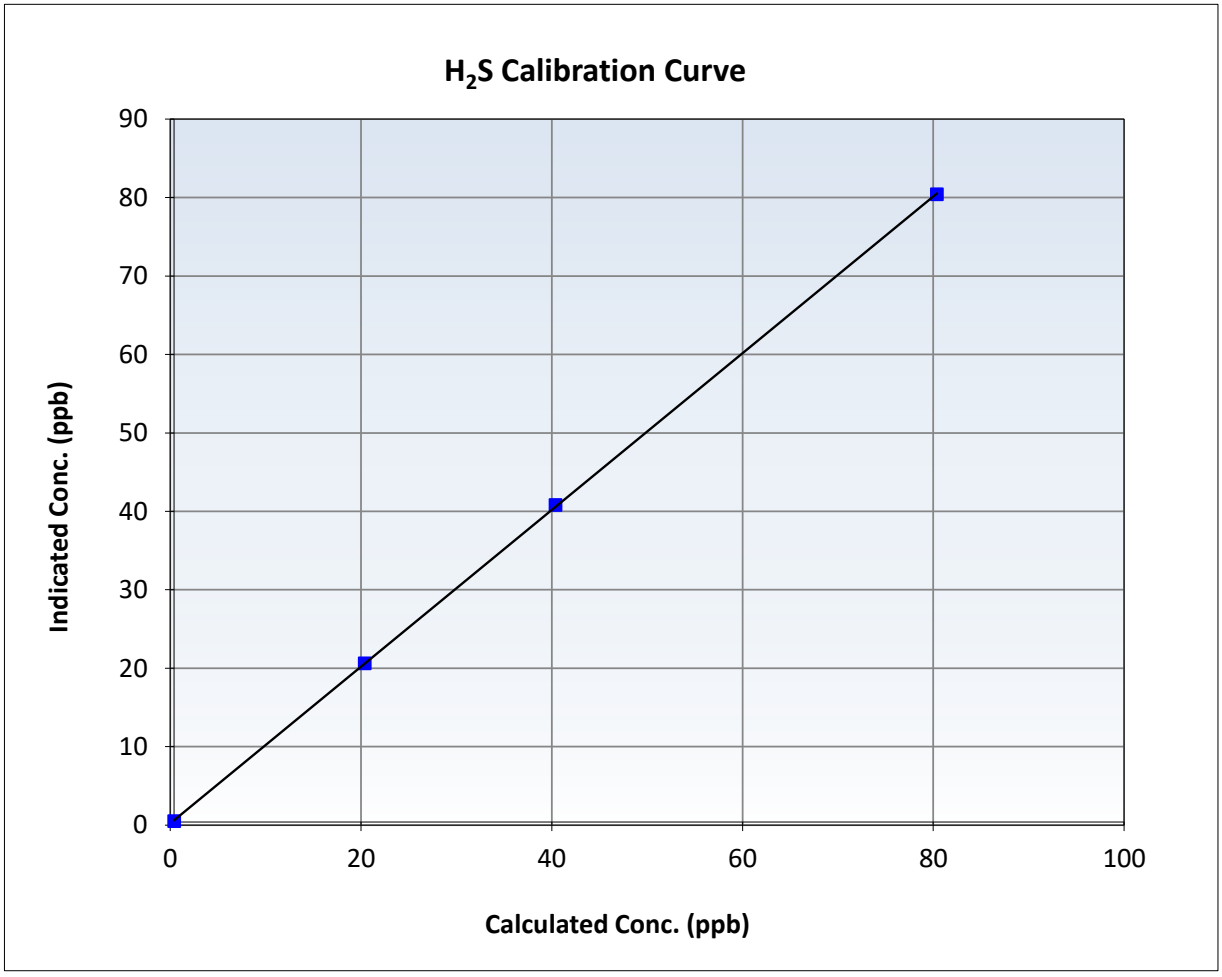
H2S Calibration Summary

Station Information

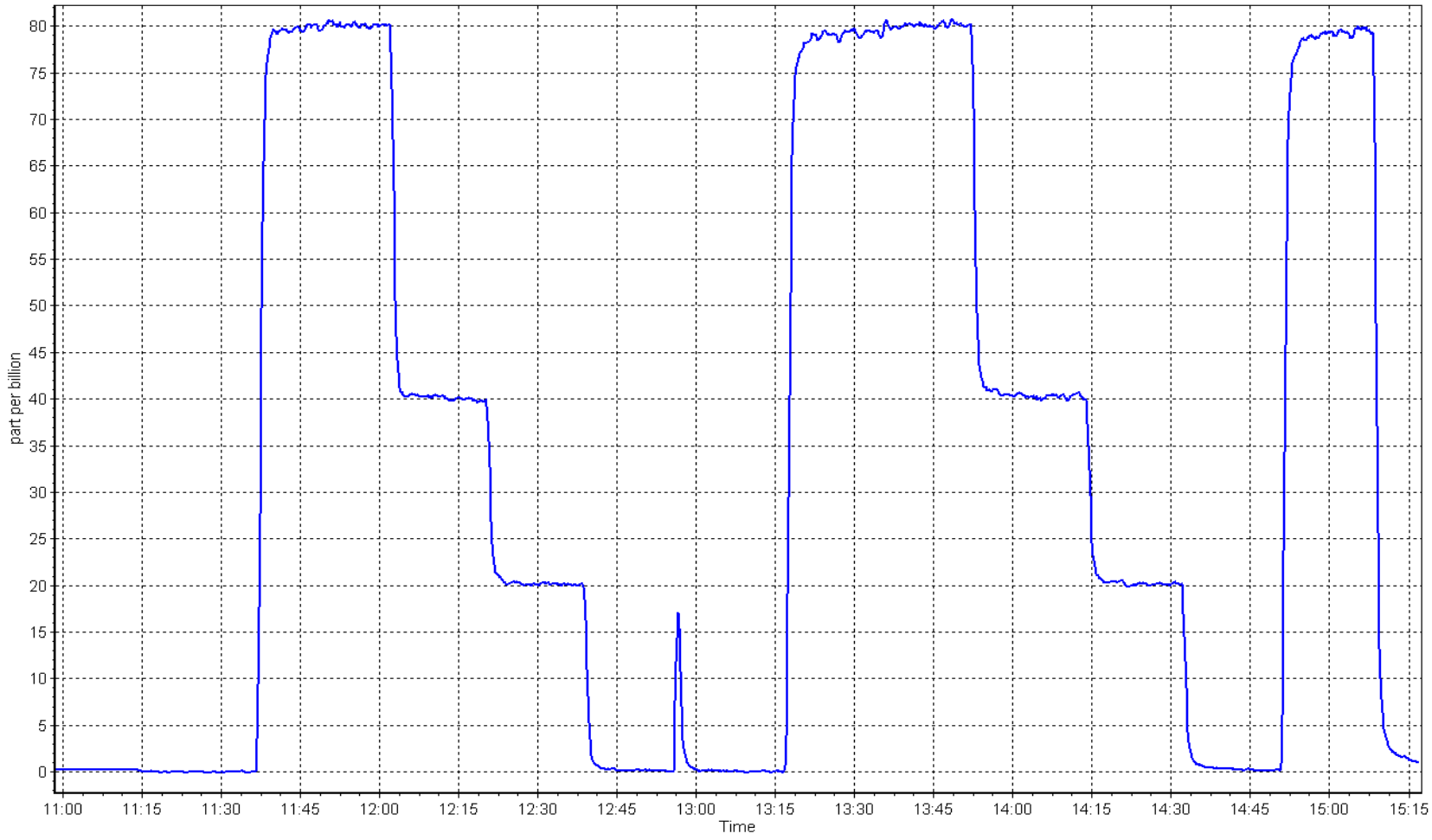
Calibration Date:	December 6, 2024	Previous Calibration:	November 26, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:11	End Time (MST):	15:17
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680032

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999977	*≥0.995*
80.0	80.0	0.9998	Slope	0.998904	*0.90 - 1.10*
40.0	40.4	0.9899	Intercept	0.220000	*+/-3*
20.0	20.2	0.9899			



H2S Calibration Plot Date: December 6, 2024 Location: Firebag



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	December 16, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	12:09	End time (MST):	15:47
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC716618		Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	500.7	ppm	CH4 Equiv Conc.	1066.9	ppm
C3H8 Cal Gas Conc.	205.9	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	500.7	ppm	CH4 Equiv Conc.	1066.9	ppm
Removed C3H8 Conc.	205.9	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1607	
ZAG Make/Model:	Teledyne API T701H		Serial Number:	201	

Analyzer Information

Analyzer make:	Thermo 51i-LT		Analyzer serial #:	1336160089	
Analyzer Range:	0 - 20 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998247	0.993942	Background:	1.93	1.91
Calibration intercept:	-0.033912	0.054452	Coefficient:	3.877	3.851

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	4999	0.0	0.00	0.10	----
As found High point	4919	81.1	17.31	17.43	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.33	Previous response	17.24	*% change	0.5%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	4999	0.0	0.00	0.01	----
High point	4919	81.1	17.31	17.25	1.003
Mid point	4959	40.6	8.66	8.64	1.003
Low point	4980	20.3	4.33	4.43	0.978
As left zero	5000	0.0	0.00	0.13	----
As left span	4919	81.1	17.31	17.45	0.992
				Average Correction Factor	0.995

Notes: Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

THC Calibration Summary

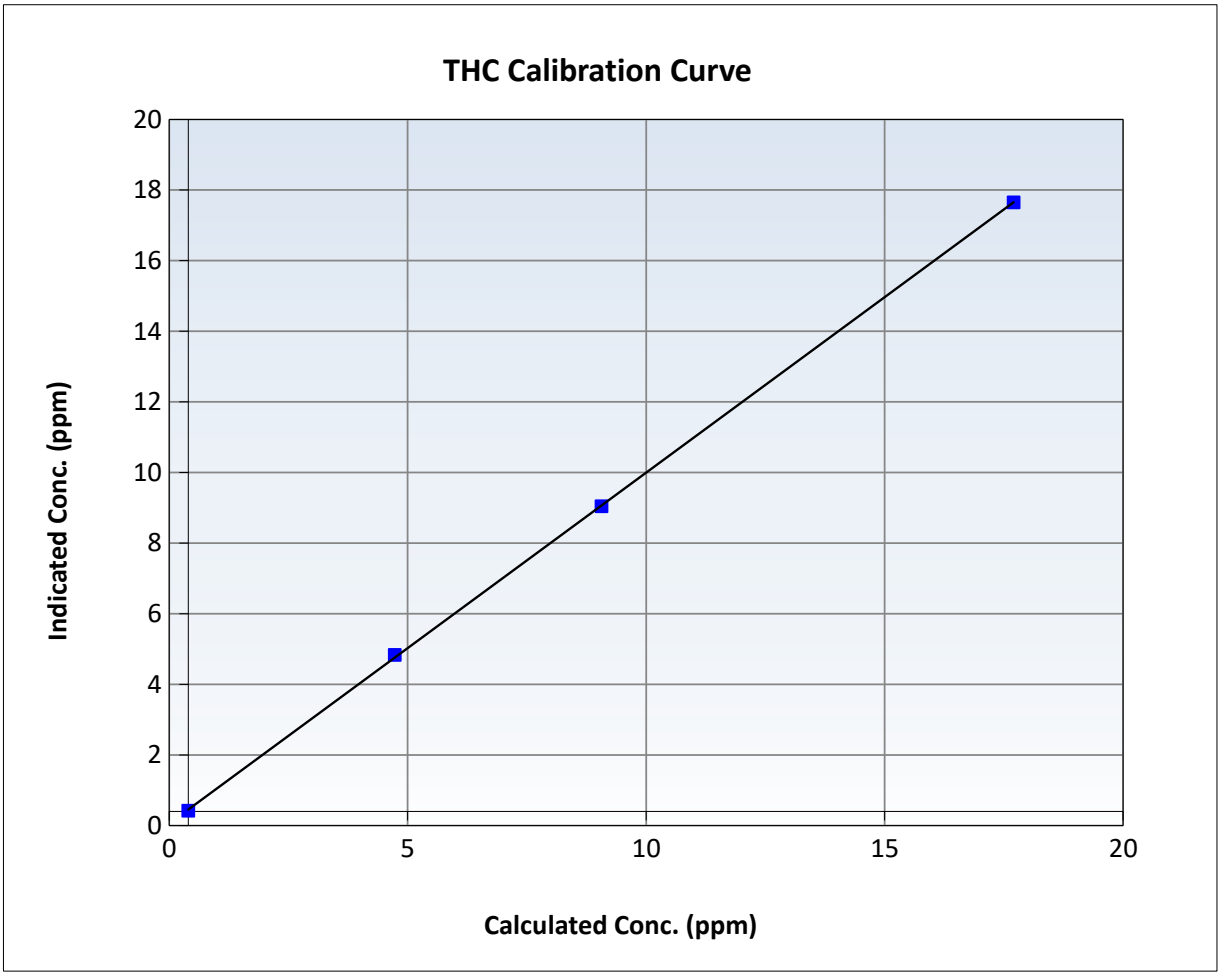
Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	November 18, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	12:09	End Time (MST):	15:47
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1336160089

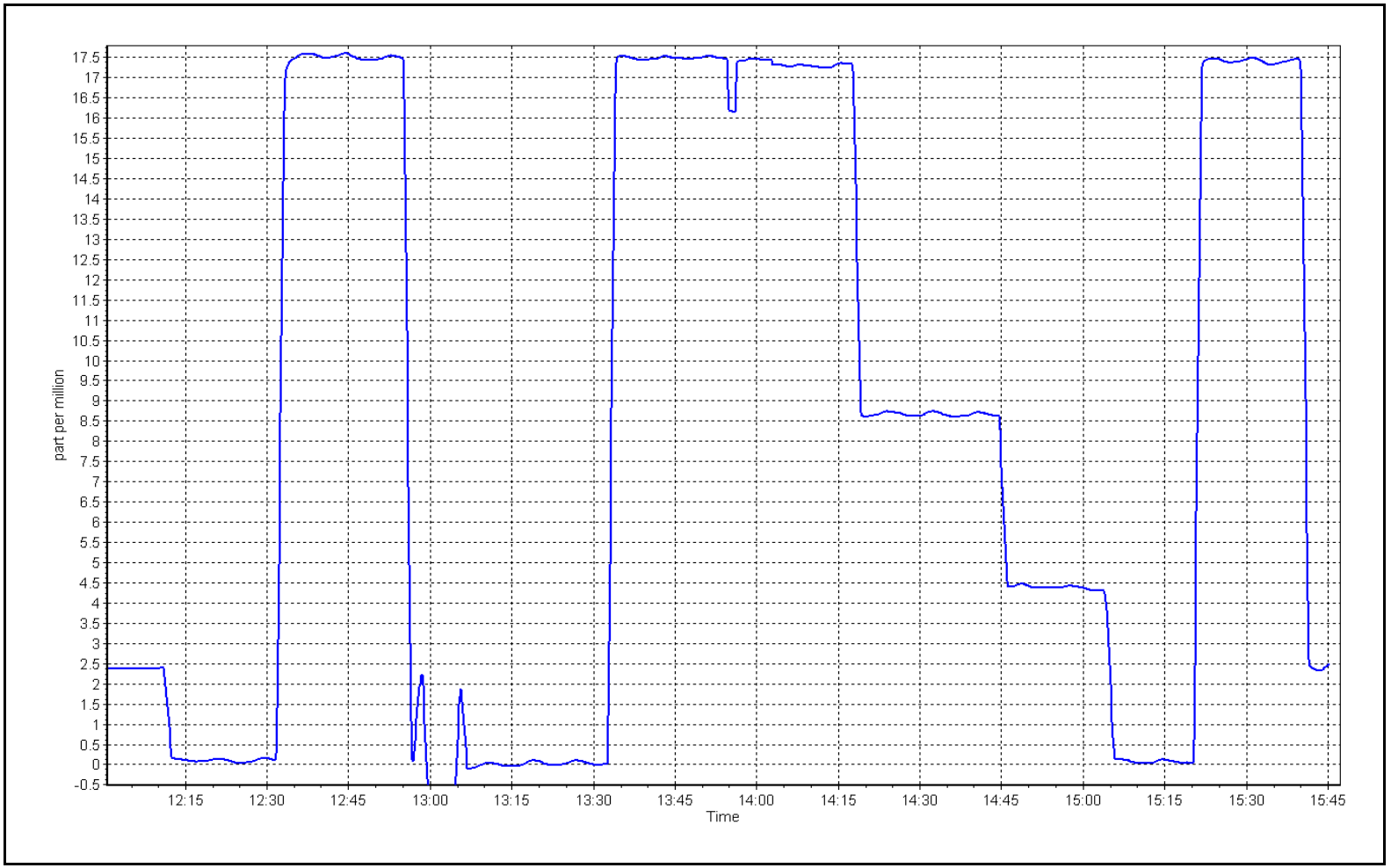
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.01	----
17.31	17.25	1.0032
8.66	8.64	1.0028
4.33	4.43	0.9775

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999954	*≥0.995*
Slope	0.993942	*0.90 - 1.10*
Intercept	0.054452	*+/-1.5*



THC Calibration Plot Date: December 16, 2024 Location: Firebag



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Firebag
Station number:	AMS 19
Calibration Date:	December 17, 2024
Last Cal Date:	November 12, 2024
Start time (MST):	11:18
End time (MST):	15:36
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0044018	Cal Gas Expiry Date:	November 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.70 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.70 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	1607
ZAG make/model:	Teledyne API T701H	Serial Number:	201

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
AF High point	4918	82.1	802.9	799.7	3.3	820.0	815.0	4.5	0.9790	0.9809
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 804.5 ppb	NO = 801.2 ppb
Baseline Corr 1st pt	NO_X = 820.2 ppb	NO = 815.2 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	*Percent Change	NO_X = 1.9%
As found	NO r^2:	*Percent Change	NO = 1.7%
As found	NO_2 r^2:	Nx Sl:	Nx Int:
		NO Sl:	NO Int:
		NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1410661309

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.918	0.903	NO bkgnd or offset:	4.6	4.5
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	4.6	4.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	160.5	164.2

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.000536	0.999383
NO_X Cal Offset:	1.140119	0.920189
NO Cal Slope:	1.001187	1.001559
NO Cal Offset:	0.600188	0.219979
NO_2 Cal Slope:	1.003587	1.007368
NO_2 Cal Offset:	0.606716	-0.236154

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4918	82.1	802.9	799.7	3.3	803.0	801.0	2.0	0.9999	0.9983
Mid point	4959	41.1	402.0	400.3	1.6	402.8	401.3	1.4	0.9979	0.9975
Low point	4980	20.5	200.5	199.7	0.8	202.4	200.4	2.0	0.9906	0.9964
As left zero	5000	0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
As left span	4918	82.1	802.9	413.6	389.3	804.0	413.6	390.5	0.9987	1.0000
							Average Correction Factor		0.9961	0.9974

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	796.8	413.6	386.5	389.1	0.9933	100.7%
Mid GPT point	796.8	606.1	194.0	195.4	0.9928	100.7%
Low GPT point	796.8	702.9	97.2	97.2	0.9998	100.0%
				Average Correction Factor	0.9953	100.5%

Notes: Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

NO_X Calibration Summary

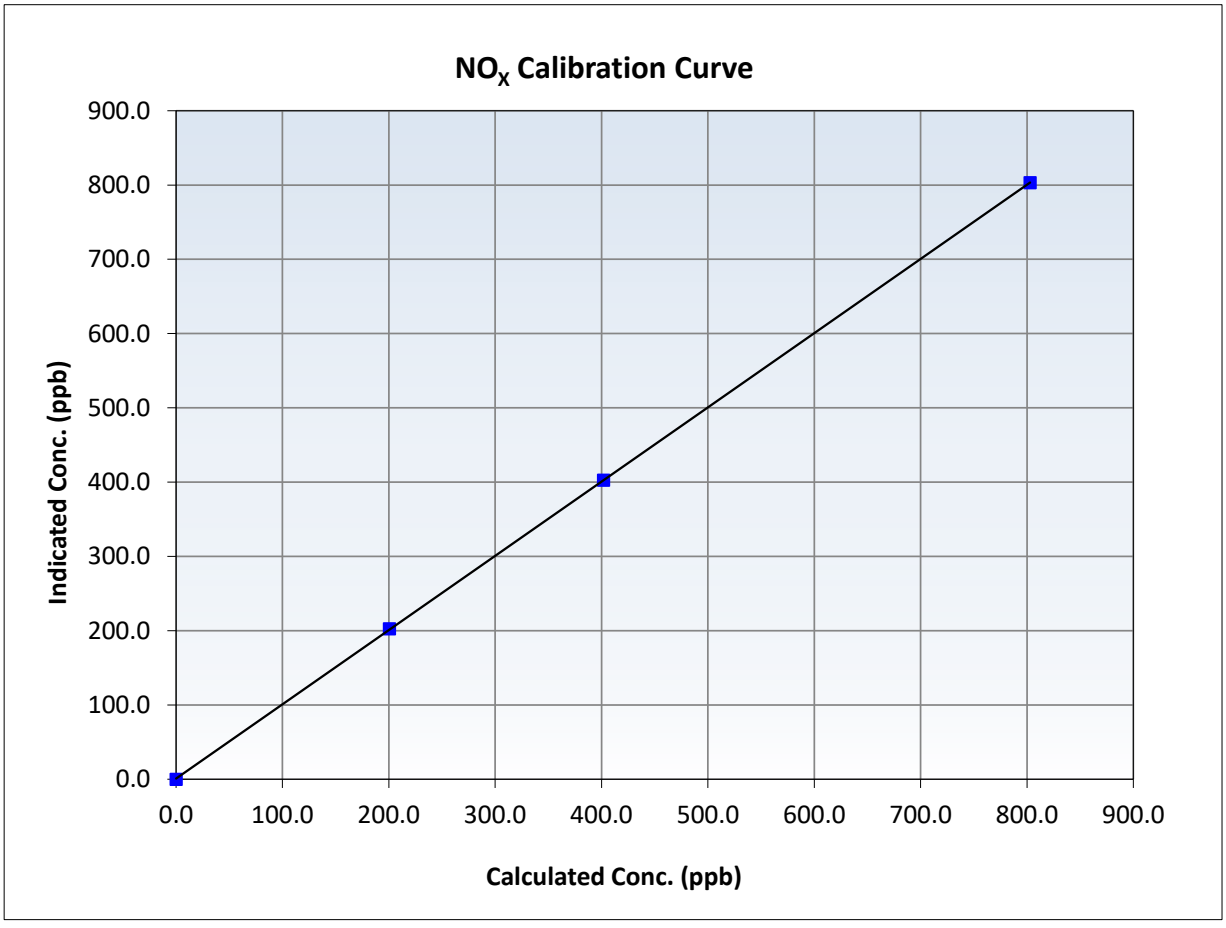
Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 12, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:18	End Time (MST):	15:36
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
802.9	803.0	0.9999
402.0	402.8	0.9979
200.5	202.4	0.9906

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999994	*≥0.995*
Slope	0.999383	*0.90 - 1.10*
Intercept	0.920189	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

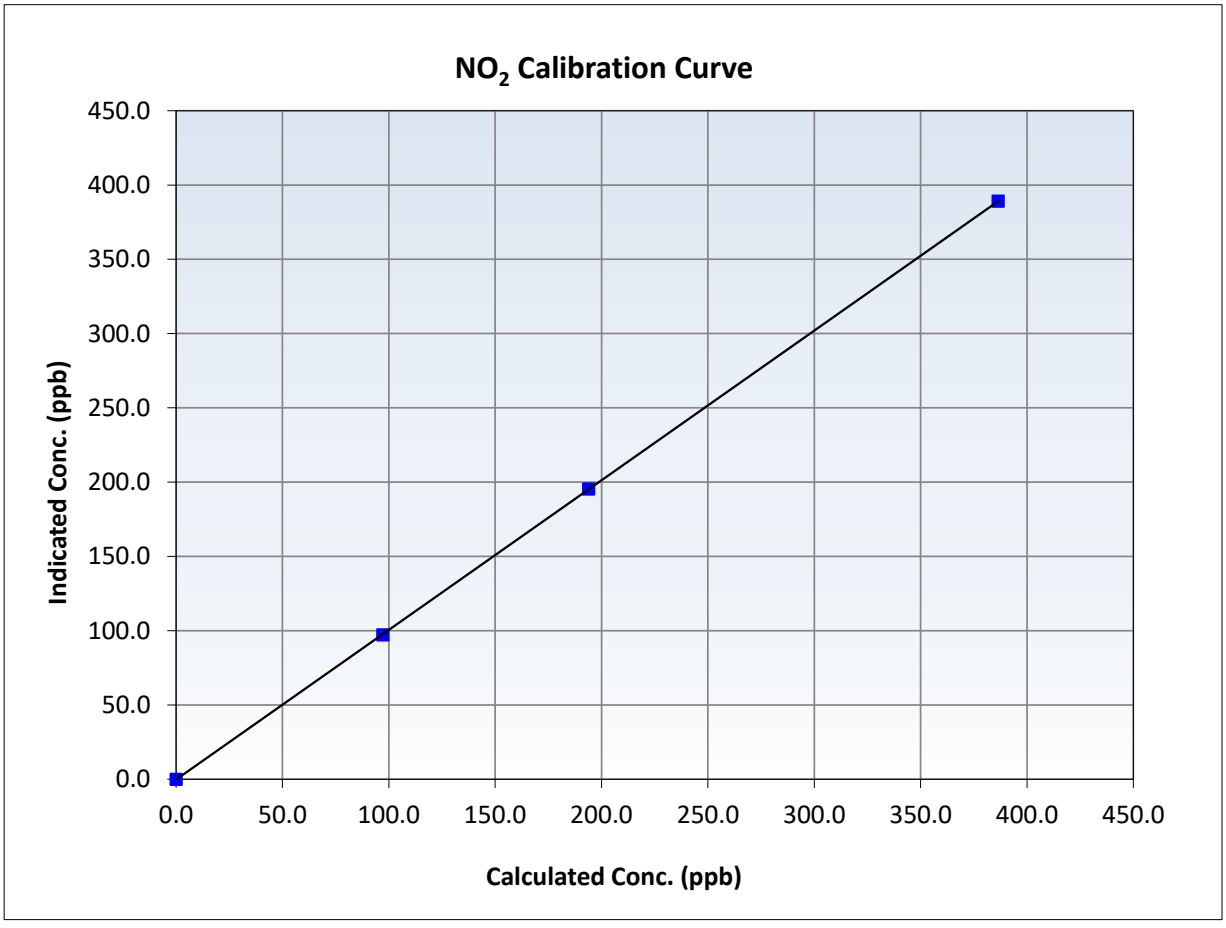
Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 12, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:18	End Time (MST):	15:36
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
386.5	389.1	0.9933
194.0	195.4	0.9928
97.2	97.2	0.9998

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999996	*≥0.995*
Slope	1.007368	*0.90 - 1.10*
Intercept	-0.236154	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

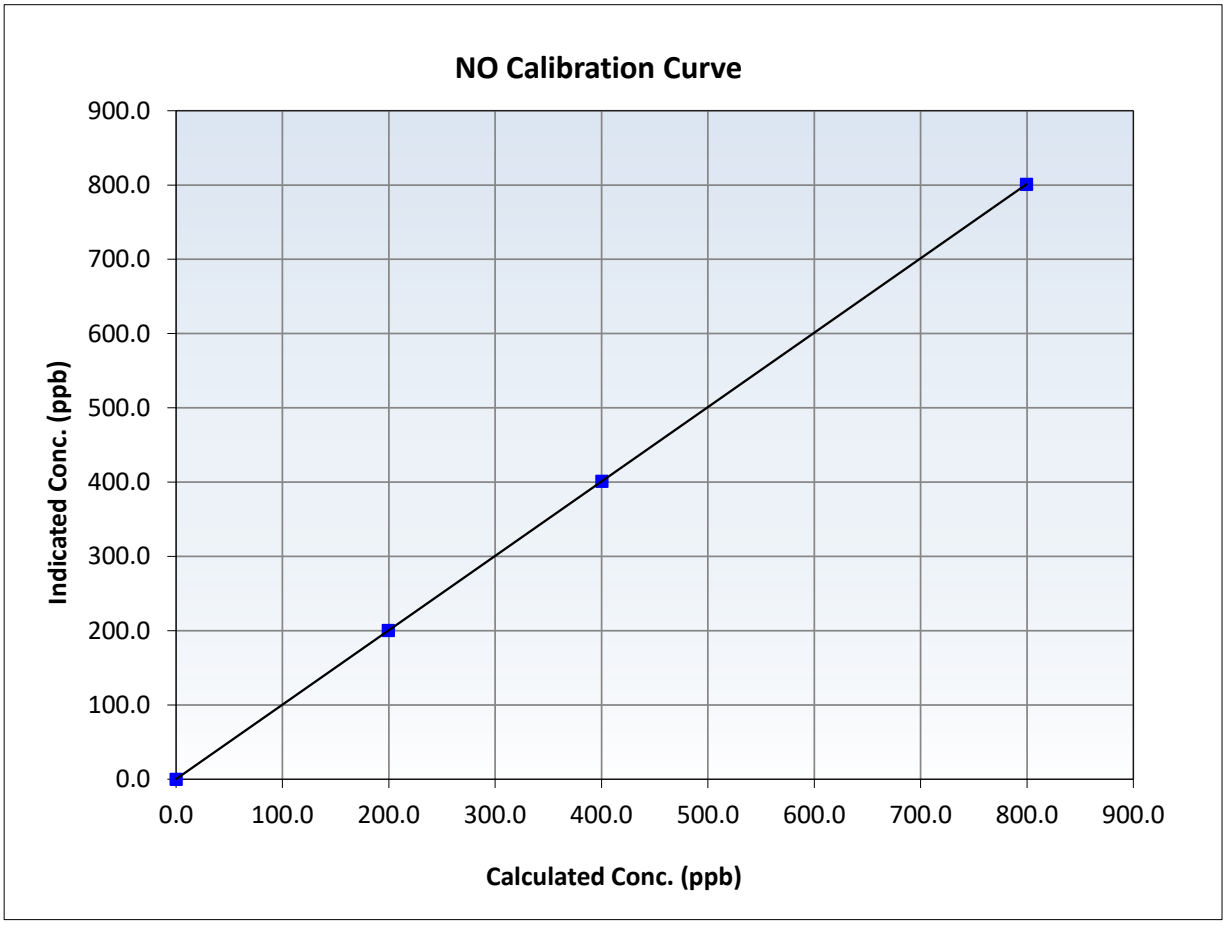
Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 12, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:18	End Time (MST):	15:36
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.7	801.0	0.9983
400.3	401.3	0.9975
199.7	200.4	0.9964

Statistical Evaluation		*Limits*
Correlation Coefficient	1.000000	*≥0.995*
Slope	1.001559	*0.90 - 1.10*
Intercept	0.219979	*+/-20*



NO_X Calibration Plot Date: December 17, 2024 Location: Firebag

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS20
MACKAY RIVER
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	December 5, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	8:53	End time (MST):	11:46
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.22	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC30686			
Removed Cal Gas Conc:	49.22	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	1220
Zero Air Gen Model:	API 701		Serial Number:	4522

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1501301450	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996067	0.996980	Backgd or Offset:	18.9	19.3
Calibration intercept:	3.811121	3.691185	Coeff or Slope:	0.930	0.939

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4919	81.3	800.3	792.7	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	792.5	Previous response	800.9	*% change	-1.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.6	----
High point	4919	81.3	800.3	800.4	1.000
Mid point	4959	40.7	400.7	403.5	0.993
Low point	4980	20.3	199.8	206.8	0.966
As left zero	5000	0.0	0.0	0.6	----
As left span	4919	81.3	800.3	799.3	1.001
				Average Correction Factor:	0.986

Notes: No Maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

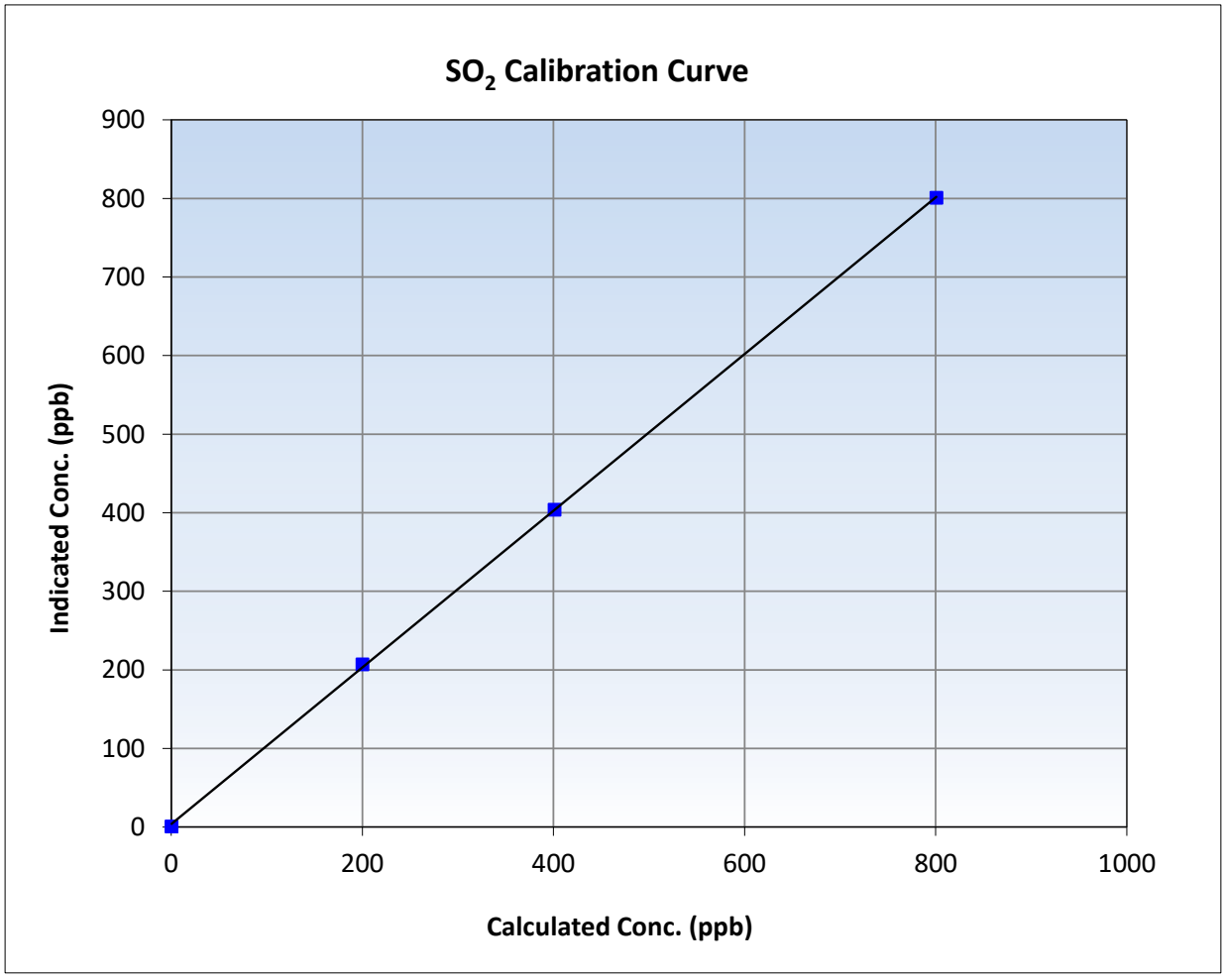
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 19, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:53	End Time (MST):	11:46
Analyzer make:	Thermo 43i	Analyzer serial #:	1501301450

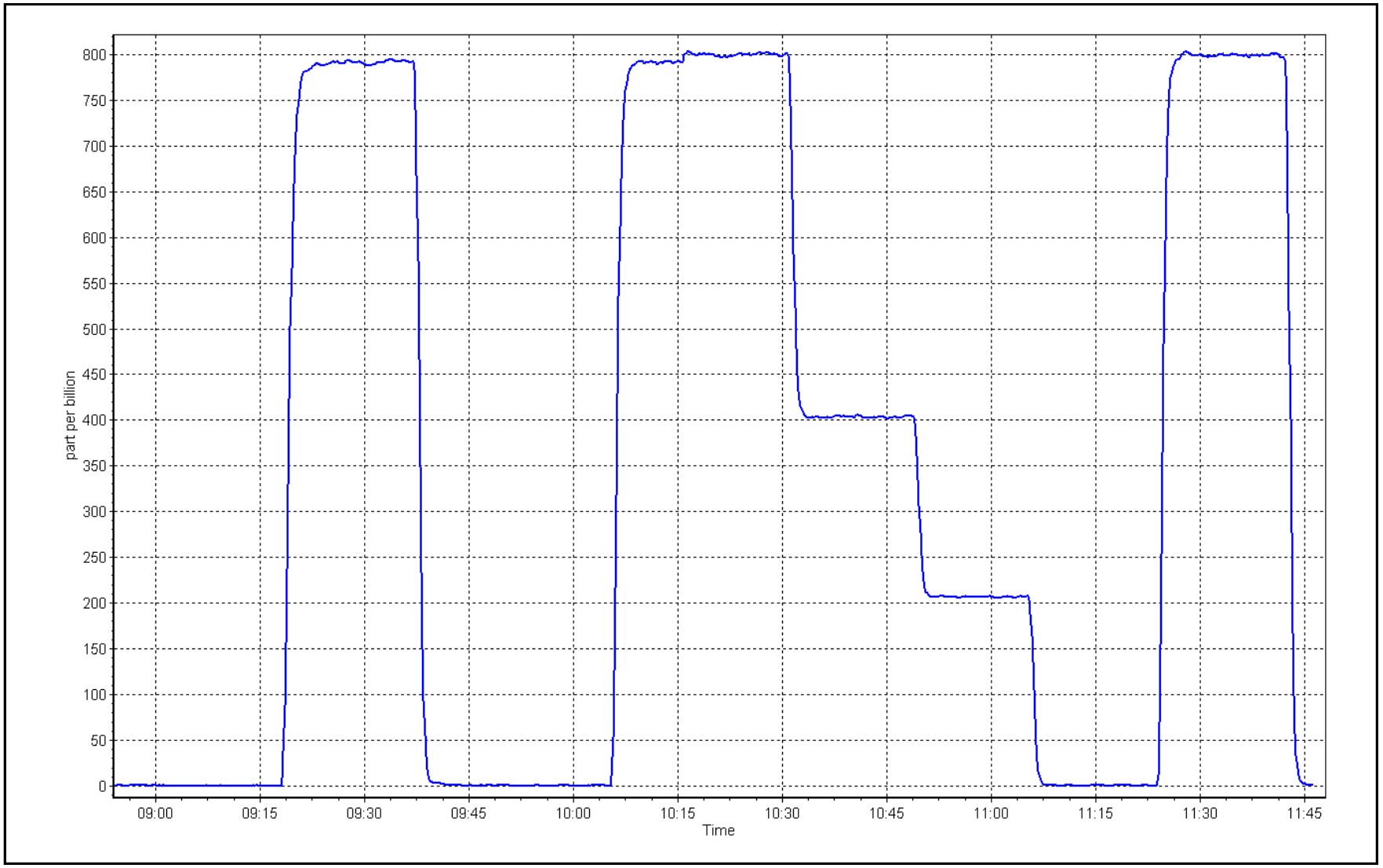
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
800.3	800.4	0.9998
400.7	403.5	0.9930
199.8	206.8	0.9663

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999925	*≥0.995*
Slope	0.996980	*0.90 - 1.10*
Intercept	3.691185	*+/-30*



SO2 Calibration Plot Date: December 5, 2024 Location: MacKay River



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	December 4, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	8:28	End time (MST):	12:33
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.12	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC515997			
Removed Cal Gas Conc:	5.12	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	1220
ZAG Make/Model:	API 701		Serial Number:	4522

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1236656117	
Converter make:	Global		Converter serial #:	2022-226	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.981587	0.968153	Backgd or Offset:	3.43	3.43
Calibration intercept:	0.599198	0.718985	Coeff or Slope:	1.051	1.051

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4922	78.1	80.0	78.6	1.019
As found Mid point	4961	39.0	39.9	39.8	1.006
As found Low point	4980	19.5	20.0	20.5	0.979
New cylinder response					

Baseline Corr As found:	78.5	Prev response:	79.10	*% change:	-0.8%
Baseline Corr 2nd AF pt:	39.7	AF Slope:	0.978872	AF Intercept:	0.519148
Baseline Corr 3rd AF pt:	20.4	AF Correlation:	0.999869	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4922	78.1	80.0	77.9	1.027
Mid point	4961	39.0	39.9	39.7	1.006
Low point	4980	19.5	20.0	20.4	0.979
As left zero	5000	0.0	0.0	0.4	----
As left span	4922	78.1	80.0	78.4	1.020
SO2 Scrubber Check	4982	81.3	802.8	0.0	----
Date of last scrubber change:		25-May-23		Ave Corr Factor	1.004
Date of last converter efficiency test:					

Notes: Sox scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

H_2S Calibration Summary

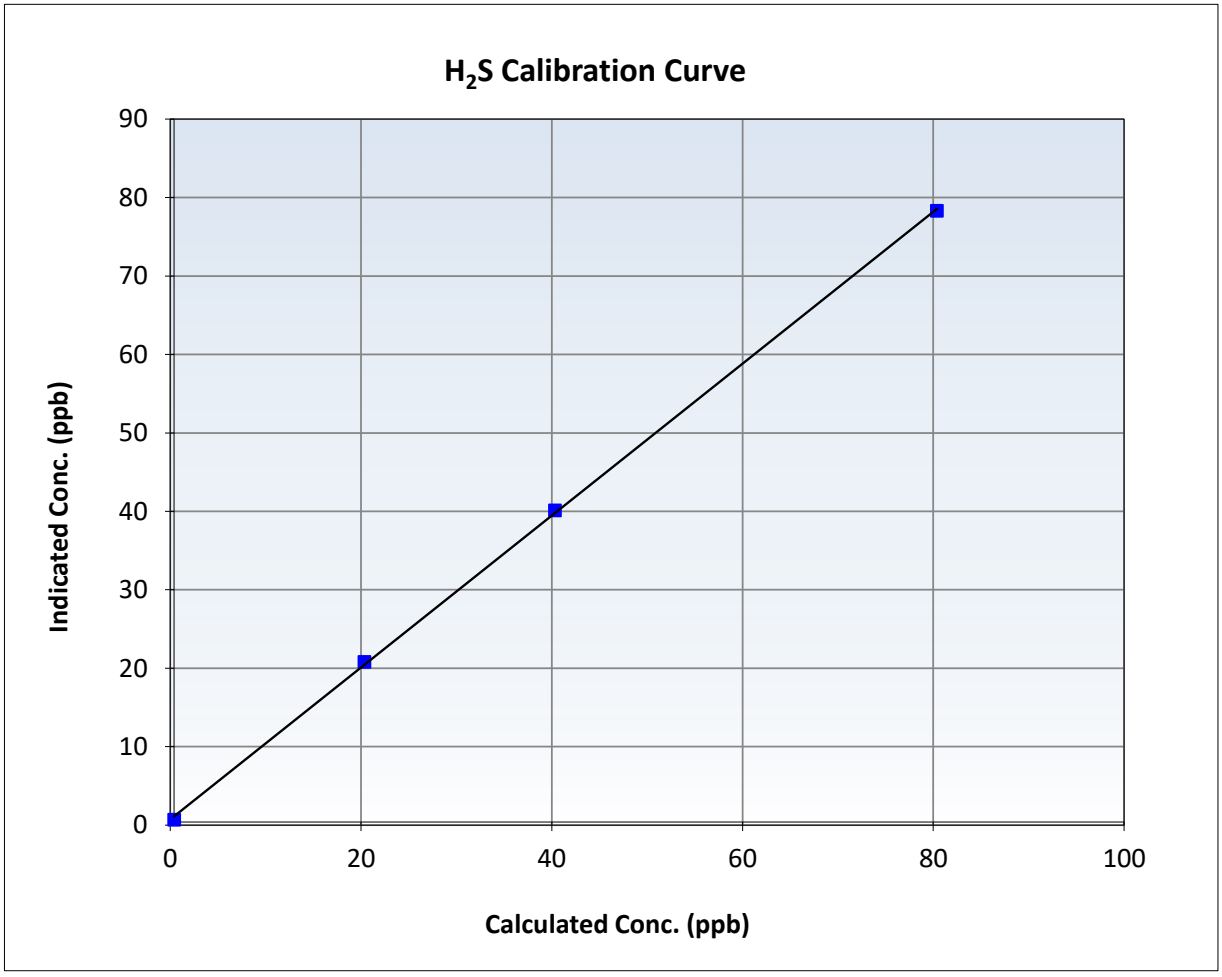
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 13, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:28	End Time (MST):	12:33
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1236656117

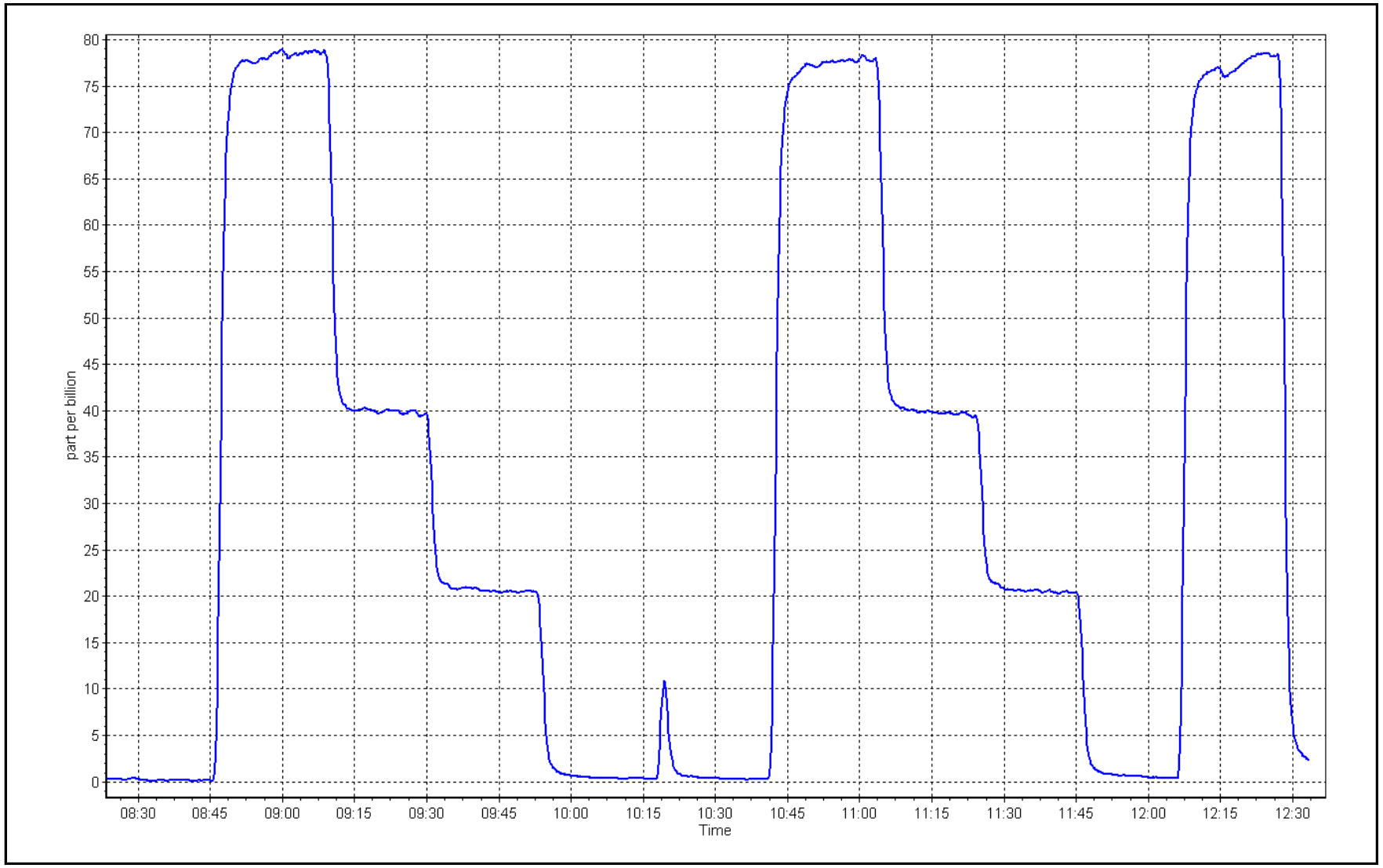
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
80.0	77.9	1.0266
39.9	39.7	1.0059
20.0	20.4	0.9789

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999861	*≥0.995*
Slope	0.968153	*0.90 - 1.10*
Intercept	0.718985	*+/-3*



H_2S Calibration Plot Date: December 4, 2024 Location: MacKay River



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	December 5, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	8:53	End time (MST):	11:45
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC306868		Cal Gas Expiry Date:	February 23, 2024	
CH4 Cal Gas Conc.	499.4	ppm	CH4 Equiv Conc.	1066.5	ppm
C3H8 Cal Gas Conc.	206.2	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	499.4	ppm	CH4 Equiv Conc.	1066.5	ppm
Removed C3H8 Conc.	206.2	ppm	Diff between cyl:		
Calibrator Make/Model:	API T700		Serial Number:	1220	
ZAG Make/Model:	API 701		Serial Number:	4522	

Analyzer Information

Analyzer make:	Thermo 51i-LT		Analyzer serial #:	1501663727	
Analyzer Range:	0 - 20 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994787	0.996948	Background:	4.310	4.690
Calibration intercept:	0.087208	0.004814	Coefficient:	5.600	5.924

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.15	----
As found High point	4919	81.3	17.34	17.06	1.025
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	16.91	Previous response	17.34	*% change	-2.5%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	-0.03	----
High point	4919	81.3	17.34	17.29	1.003
Mid point	4959	40.7	8.68	8.64	1.004
Low point	4980	20.3	4.33	4.37	0.990
As left zero	5000	0.0	0.00	-0.05	----
As left span	4919	81.3	17.34	17.29	1.003
				Average Correction Factor	0.999

Notes: No maintenance. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay

Version 03-2024

Wood Buffalo Environmental Association

THC Calibration Summary

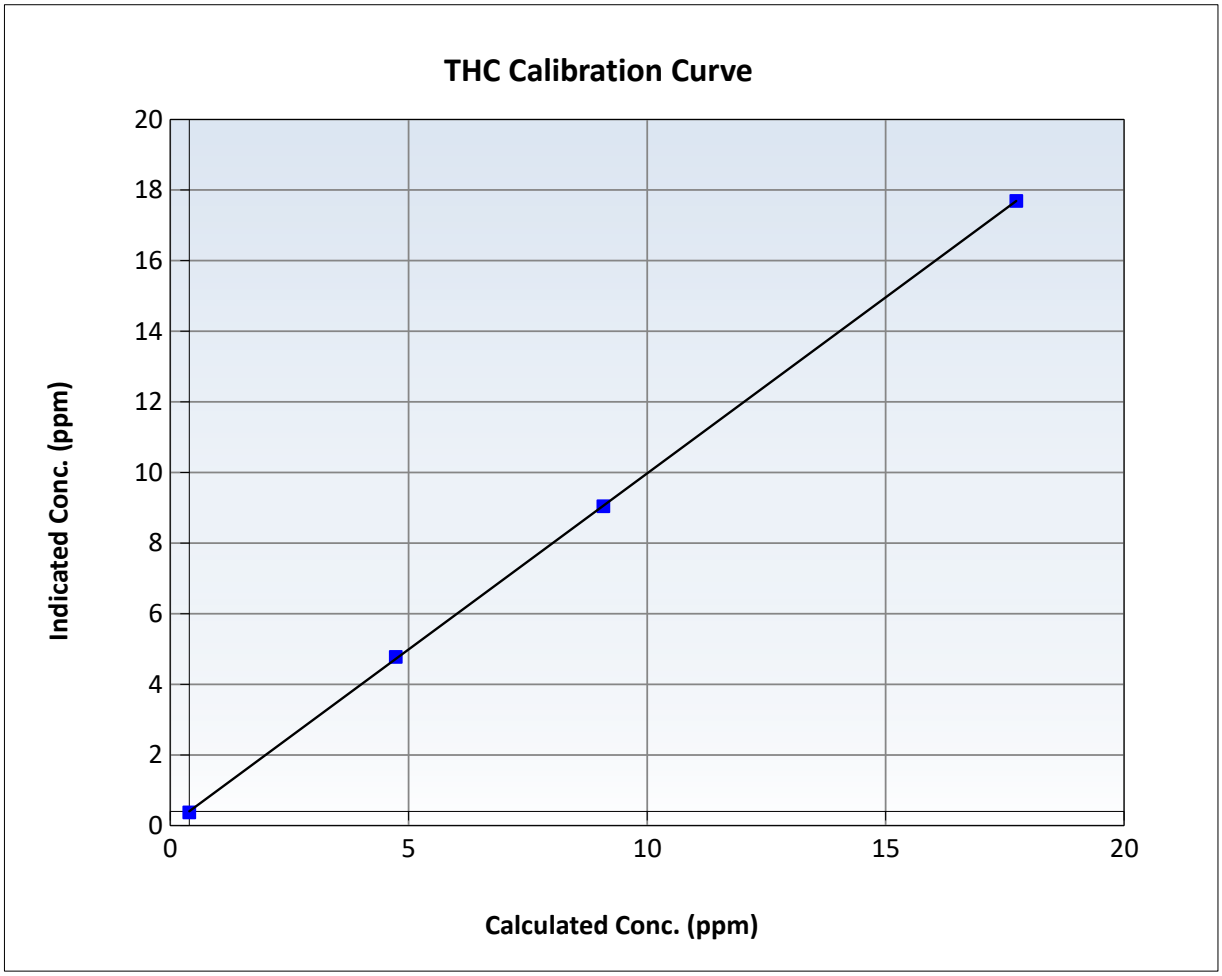
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 19, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:53	End Time (MST):	11:45
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1501663727

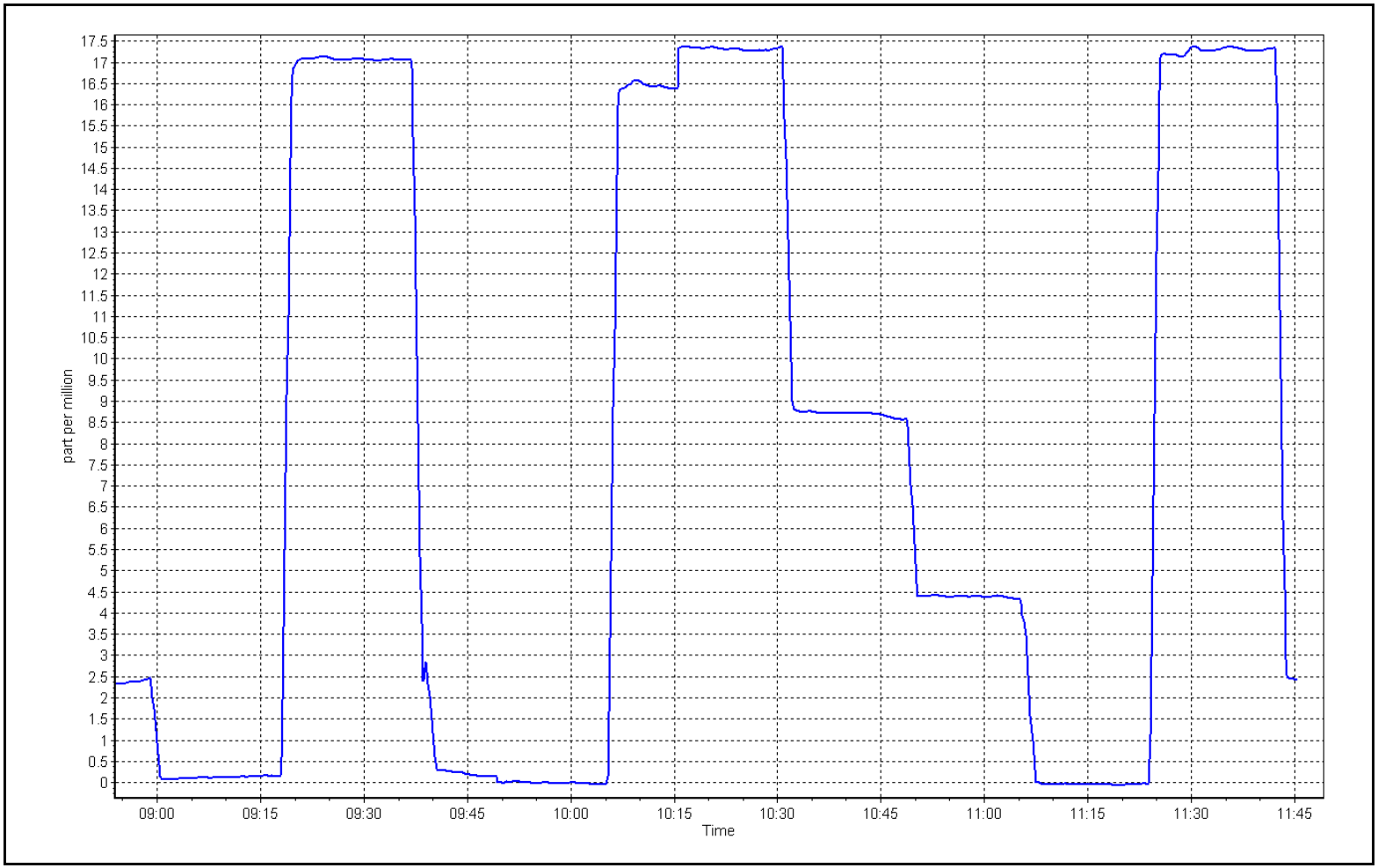
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	-0.03	----
17.34	17.29	1.0031
8.68	8.64	1.0043
4.33	4.37	0.9898

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	0.996948	*0.90 - 1.10*
Intercept	0.004814	*+/-1.5*



THC Calibration Plot Date: December 5, 2024 Location: MacKay River



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	December 12, 2024	Last Cal Date:	December 5, 2024
Start time (MST):	10:40	End time (MST):	13:50
Reason:	Maintenance		

Calibration Standards

Gas Cert Reference:	CC306868		Cal Gas Expiry Date:	February 23, 2024	
CH4 Cal Gas Conc.	499.4	ppm	CH4 Equiv Conc.	1066.5	ppm
C3H8 Cal Gas Conc.	206.2	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	499.4	ppm	CH4 Equiv Conc.	1066.5	ppm
Removed C3H8 Conc.	206.2	ppm	Diff between cyl:		
Calibrator Make/Model:	API T700		Serial Number:	1220	
ZAG Make/Model:	API 701		Serial Number:	4522	

Analyzer Information

Analyzer make:	Thermo 51i-LT		Analyzer serial #:	1501663727	
Analyzer Range:	0 - 20 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996948	0.992322	Background:	4.690	4.140
Calibration intercept:	0.004814	0.086409	Coefficient:	5.924	5.026

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.03	----
As found High point	4919	81.3	17.34	19.34	0.898
As found Mid point	4959	40.7	8.68	9.76	0.892
As found Low point	4979	20.3	4.33	5.05	0.864
New cylinder response					
Baseline Corr As found:	19.31	Previous response	17.29	*% change	10.4%
Baseline Corr 2nd AF pt:	9.73	AF Slope:	1.110141	AF Intercept:	0.122207
Baseline Corr 3rd AF pt:	5.01	AF Correlation:	0.999888	* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.03	----
High point	4919	81.3	17.34	17.27	1.004
Mid point	4959	40.7	8.68	8.70	0.997
Low point	4980	20.3	4.33	4.45	0.972
As left zero	5000	0.0	0.00	-0.07	----
As left span	4919	81.3	17.34	17.26	1.005
				Average Correction Factor	0.991

Notes: Pump replaced after as founds. Zero and span adjusted

Calibration Performed By: Devin Russell

Version 03-2024

Wood Buffalo Environmental Association

THC Calibration Summary

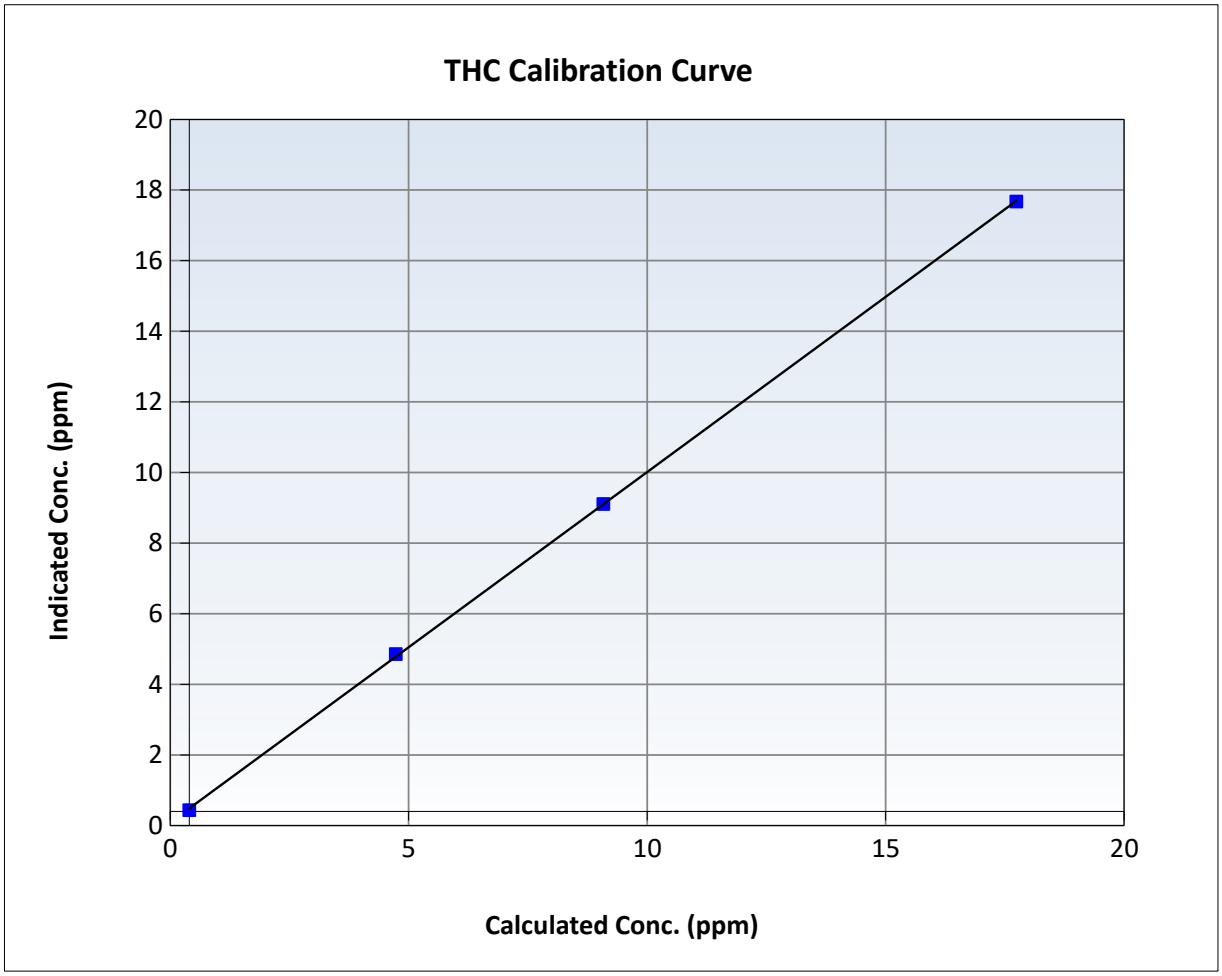
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	December 5, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	10:40	End Time (MST):	13:50
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1501663727

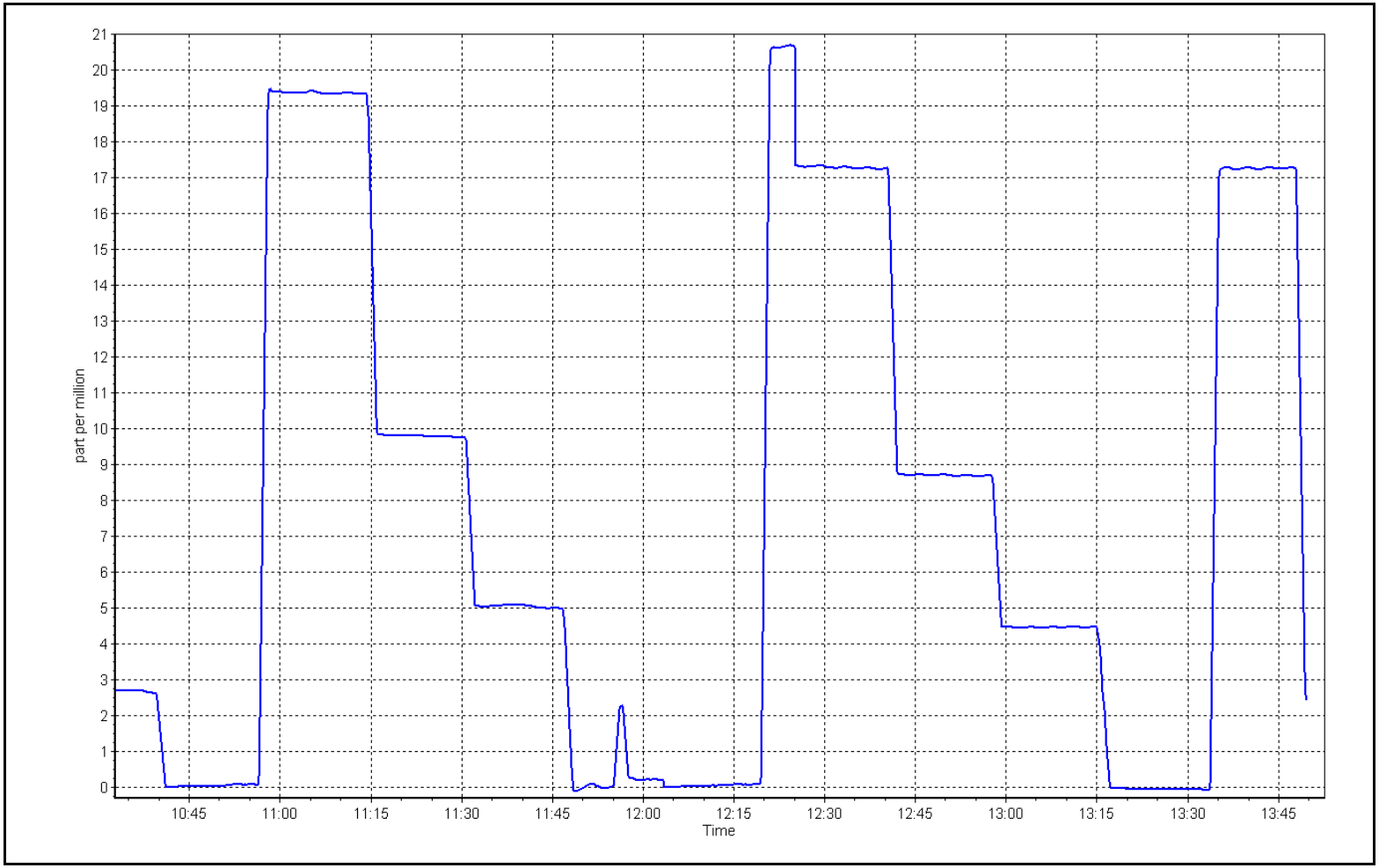
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.03	----
17.34	17.27	1.0038
8.68	8.70	0.9974
4.33	4.45	0.9725

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999951	*≥0.995*
Slope	0.992322	*0.90 - 1.10*
Intercept	0.086409	*+/-1.5*



THC Calibration Plot Date: December 12, 2024 Location: MacKay River



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	MacKay River
Station number:	AMS 20
Calibration Date:	December 3, 2024
Last Cal Date:	November 14, 2024
Start time (MST):	7:55
End time (MST):	11:58
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T376265	Cal Gas Expiry Date:	April 13, 2025
NOX Cal Gas Conc:	49.19 ppm	NO Cal Gas Conc:	48.04 ppm
Removed Cylinder #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	49.19 ppm	Removed Gas NO Conc:	48.04 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	1220
ZAG make/model:	API T701	Serial Number:	4522

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
AF High point	4917	83.3	819.5	800.3	19.2	819.9	797.5	22.5	0.9993	1.0035
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 820.6 ppb	NO = 800.5 ppb
Baseline Corr 1st pt	NO_X = 820.0 ppb	NO = 797.5 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -0.1%

*Percent Change NO = -0.4%

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1505164379

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.001	1.001	NO bkgnd or offset:	2.8	2.8
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	3.0	3.0
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	161.5	161.5

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.996324	0.997202
NO_X Cal Offset:	4.202261	4.362344
NO Cal Slope:	0.996144	0.995687
NO Cal Offset:	3.242757	3.402729
NO_2 Cal Slope:	1.002283	1.002574
NO_2 Cal Offset:	-0.864534	-0.544534

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	----	----
High point	4917	83.3	819.5	800.3	19.2	819.6	798.8	20.8	0.9998	1.0019
Mid point	4958	41.7	410.3	400.7	9.6	414.9	403.4	11.5	0.9888	0.9933
Low point	4979	20.8	204.6	199.9	4.8	213.3	206.1	7.1	0.9594	0.9697
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	----	----
As left span	4917	83.3	819.5	436.6	382.9	817.0	436.6	380.3	1.0030	1.0000
								Average Correction Factor	0.9827	0.9883

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	795.6	436.2	378.6	379.2	0.9983	100.2%
Mid GPT point	795.6	608.6	206.2	206.1	1.0003	100.0%
Low GPT point	795.6	698.5	116.3	115.4	1.0074	99.3%
				Average Correction Factor	1.0020	99.8%

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

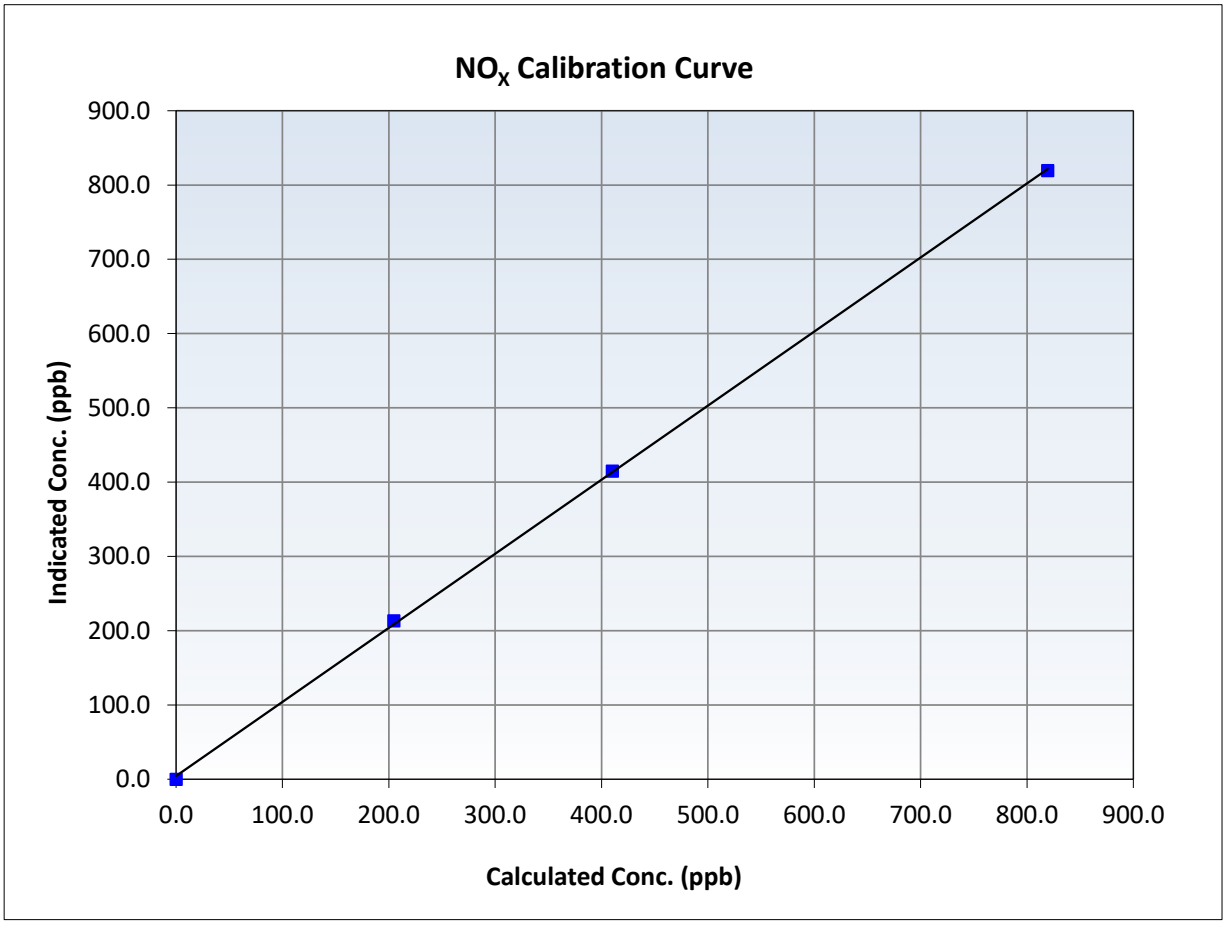
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 14, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	7:55	End Time (MST):	11:58
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
819.5	819.6	0.9998
410.3	414.9	0.9888
204.6	213.3	0.9594

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999867	*≥0.995*
Slope	0.997202	*0.90 - 1.10*
Intercept	4.362344	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

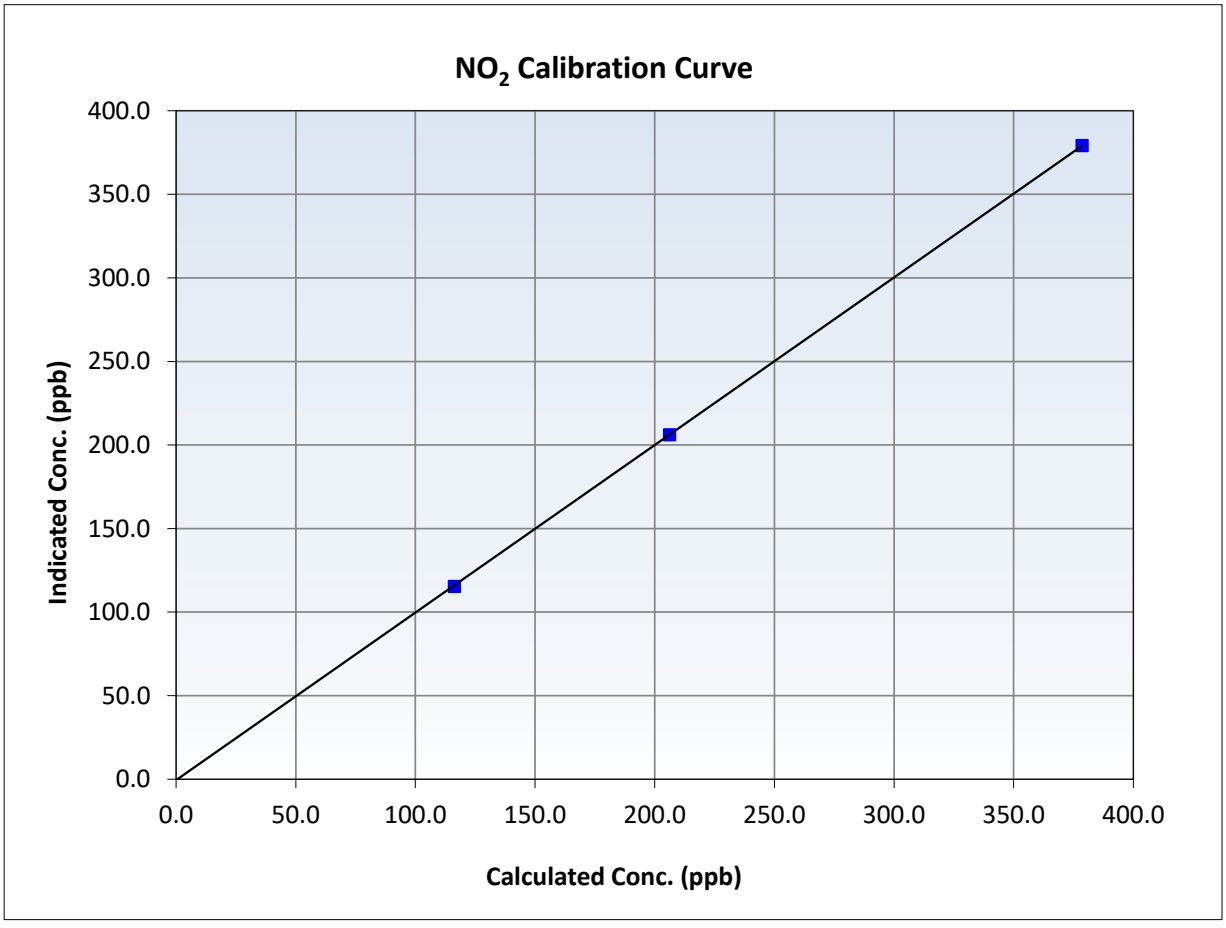
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 14, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	7:55	End Time (MST):	11:58
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
378.6	379.2	0.9983
206.2	206.1	1.0003
116.3	115.4	1.0074

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	1.002574	*0.90 - 1.10*
Intercept	-0.544534	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

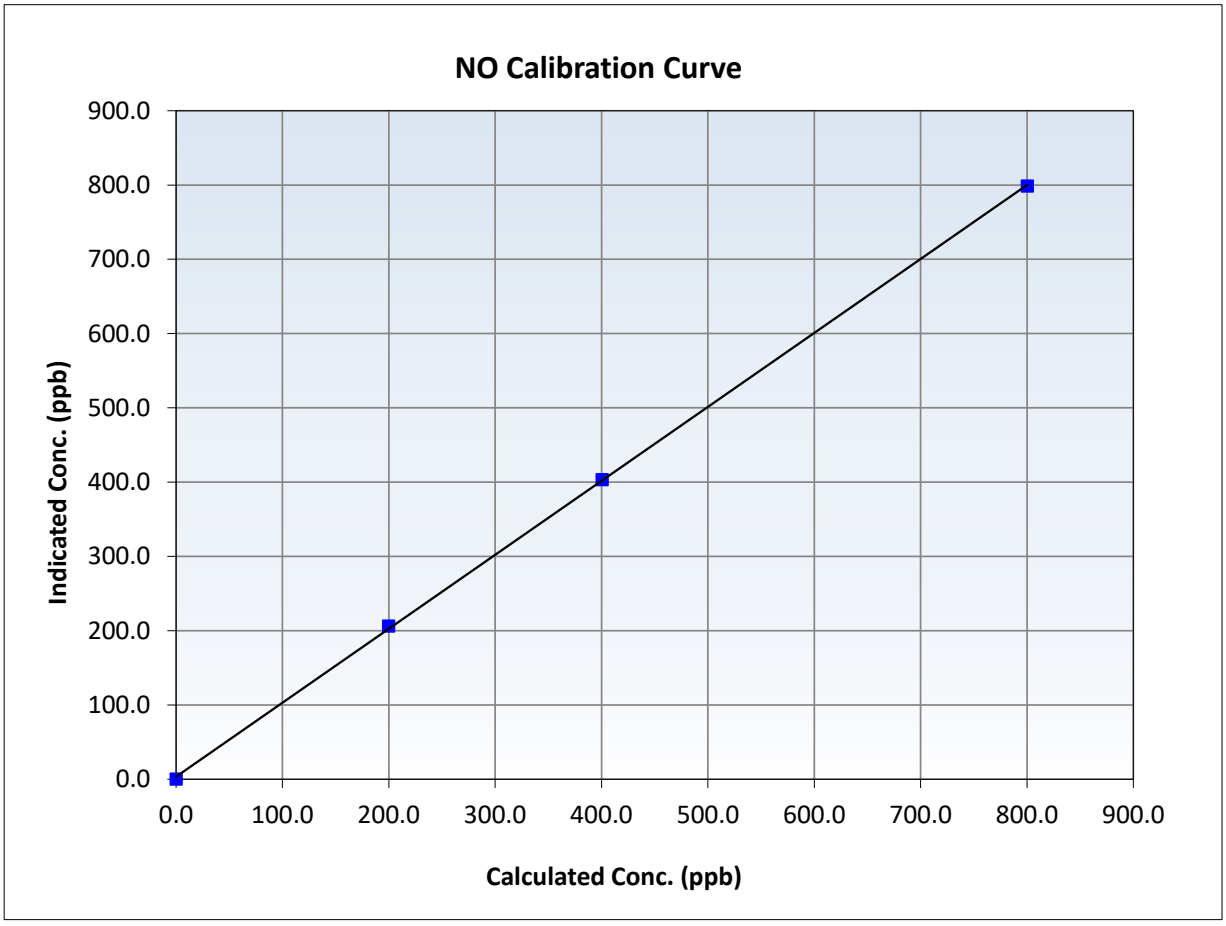
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 14, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	7:55	End Time (MST):	11:58
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

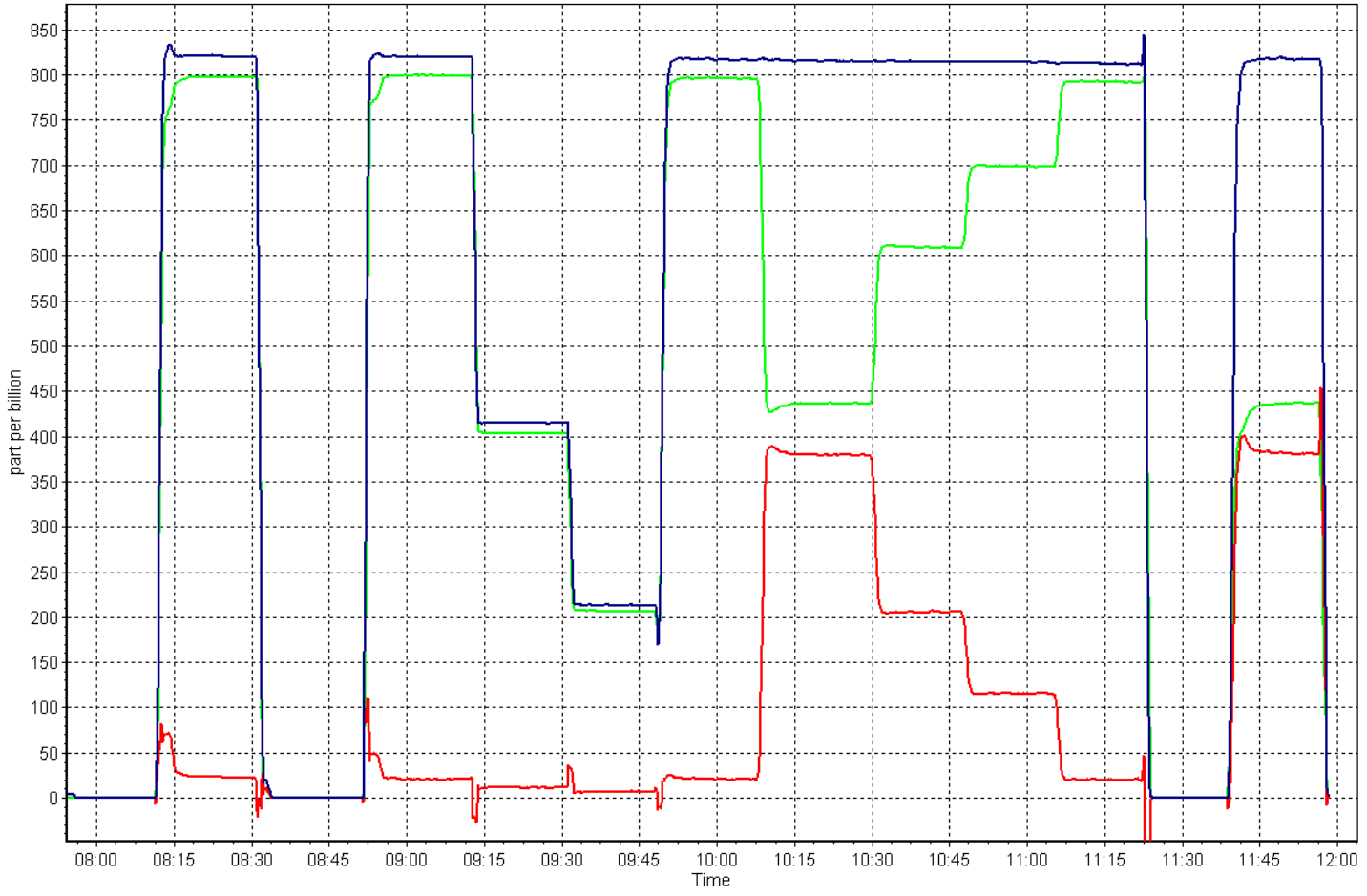
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.3	798.8	1.0019
400.7	403.4	0.9933
199.9	206.1	0.9697

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999920	*≥0.995*
Slope	0.995687	*0.90 - 1.10*
Intercept	3.402729	*+/-20*



NO_X Calibration Plot Date: December 3, 2024 Location: MacKay River



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS21
CONKLIN
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	December 12, 2024	Last Cal Date:	November 28, 2024
Start time (MST):	9:51	End time (MST):	13:33
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.34	ppm	Cal Gas Exp Date:	October 9, 2032
Cal Gas Cylinder #:	CC340840			
Removed Cal Gas Conc:	49.93	ppm	Rem Gas Exp Date:	January 5, 2025
Removed Gas Cyl #:	CC259455		Diff between cyl:	-1.9%
Calibrator Model:	Teledyne API T700		Serial Number:	5252
Zero Air Gen Model:	Teledyne API T701		Serial Number:	953

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1428701363	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999503	0.998751	Backgd or Offset:	28.6	29.3
Calibration intercept:	-0.024227	-0.083970	Coeff or Slope:	0.886	0.899

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.2	800.8	802.3	0.998
As found Mid point					
As found Low point					
New cylinder response	4920	80.2	807.4	793.5	1.018
Baseline Corr As found:	802.3	Previous response	800.4	*% change	0.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	80.2	807.4	806.6	1.001
Mid point	4960	40.1	403.7	402.6	1.003
Low point	4980	20.0	201.8	201.4	1.002
As left zero	5000	0.0	0.0	0.0	----
As left span	4920	80.2	807.4	807.2	1.000
				Average Correction Factor:	1.002

Notes: Sample inlet filter and SO2 cylinder was changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

SO_2 Calibration Summary

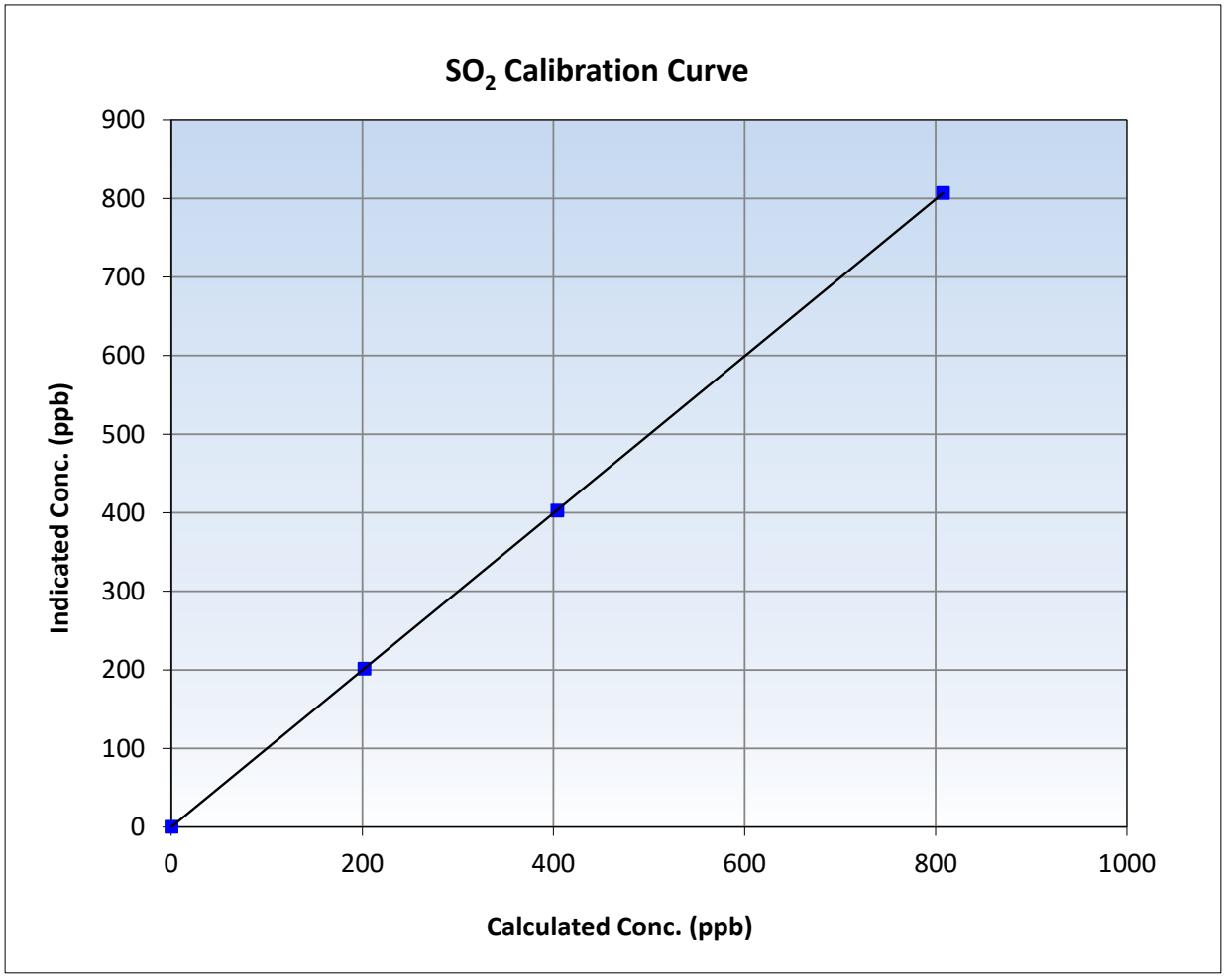
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 28, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:51	End Time (MST):	13:33
Analyzer make:	Thermo 43i	Analyzer serial #:	1428701363

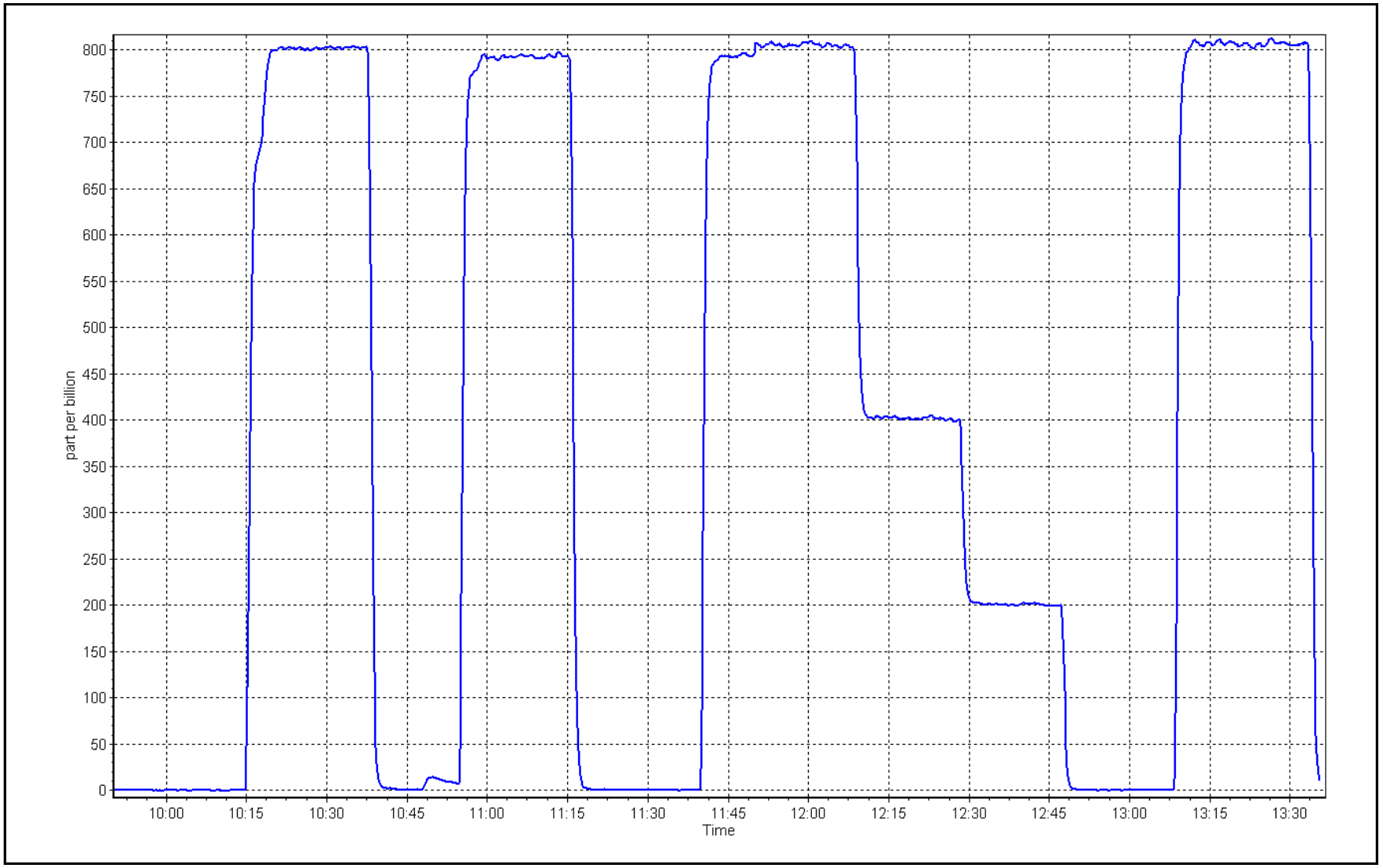
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
807.4	806.6	1.0010
403.7	402.6	1.0028
201.8	201.4	1.0018

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.998751	*0.90 - 1.10*
Intercept	-0.083970	*+/-30*



SO2 Calibration Plot Date: December 12, 2024 Location: Conklin



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	December 2, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	10:15	End time (MST):	14:56
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.00	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC501204			
Removed Cal Gas Conc:	5.00	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne T700		Serial Number:	5252
ZAG Make/Model:	Teledyne T701		Serial Number:	953

Analyzer Information

Analyzer make:	Thermo 43i-QTL		Analyzer serial #:	12228021058
Converter make:	CD-Nova 101		Converter serial #:	565
Analyzer Range	0 - 100 ppb		Converter Temp:	850 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001714	1.011143	Backgd or Offset:	3.1	3.1
Calibration intercept:	-0.060000	-0.040000	Coeff or Slope:	1.517	1.556

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.0	80.0	78.8	1.015
As found Mid point	4960	40.0	40.0	39.5	1.013
As found Low point	4980	20.0	20.0	19.7	1.015
New cylinder response					

Baseline Corr As found:	78.8	Prev response:	80.08	*% change:	-1.6%
Baseline Corr 2nd AF pt:	39.5	AF Slope:	0.985143	AF Intercept:	0.020000
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999998	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	80.0	80.0	81.0	0.988
Mid point	4960	40.0	40.0	40.1	0.998
Low point	4980	20.0	20.0	20.2	0.990
As left zero	5000	0.0	0.0	0.1	----
As left span	4920	80.0	80.0	81.3	0.984
SO2 Scrubber Check	4920	80.2	802.0	0.1	----

Date of last scrubber change:	November 13, 2024	Ave Corr Factor	0.992
Date of last converter efficiency test:			

Notes: Sample inlet filter was changed after multipoint as founds. Sox scrubber check done after calibrator zero and passed. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

TRS Calibration Summary

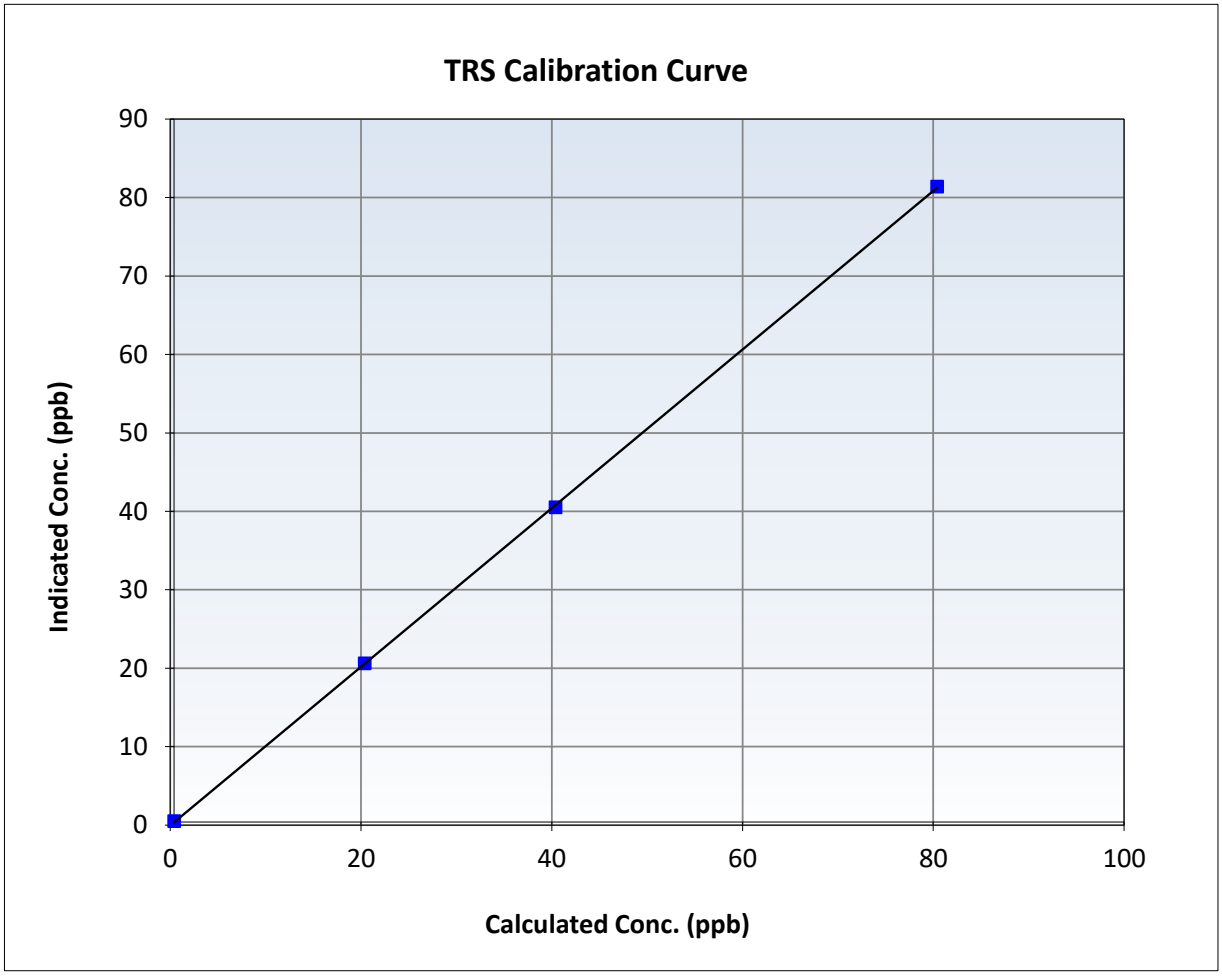
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 13, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:15	End Time (MST):	14:56
Analyzer make:	Thermo 43i-QTL	Analyzer serial #:	12228021058

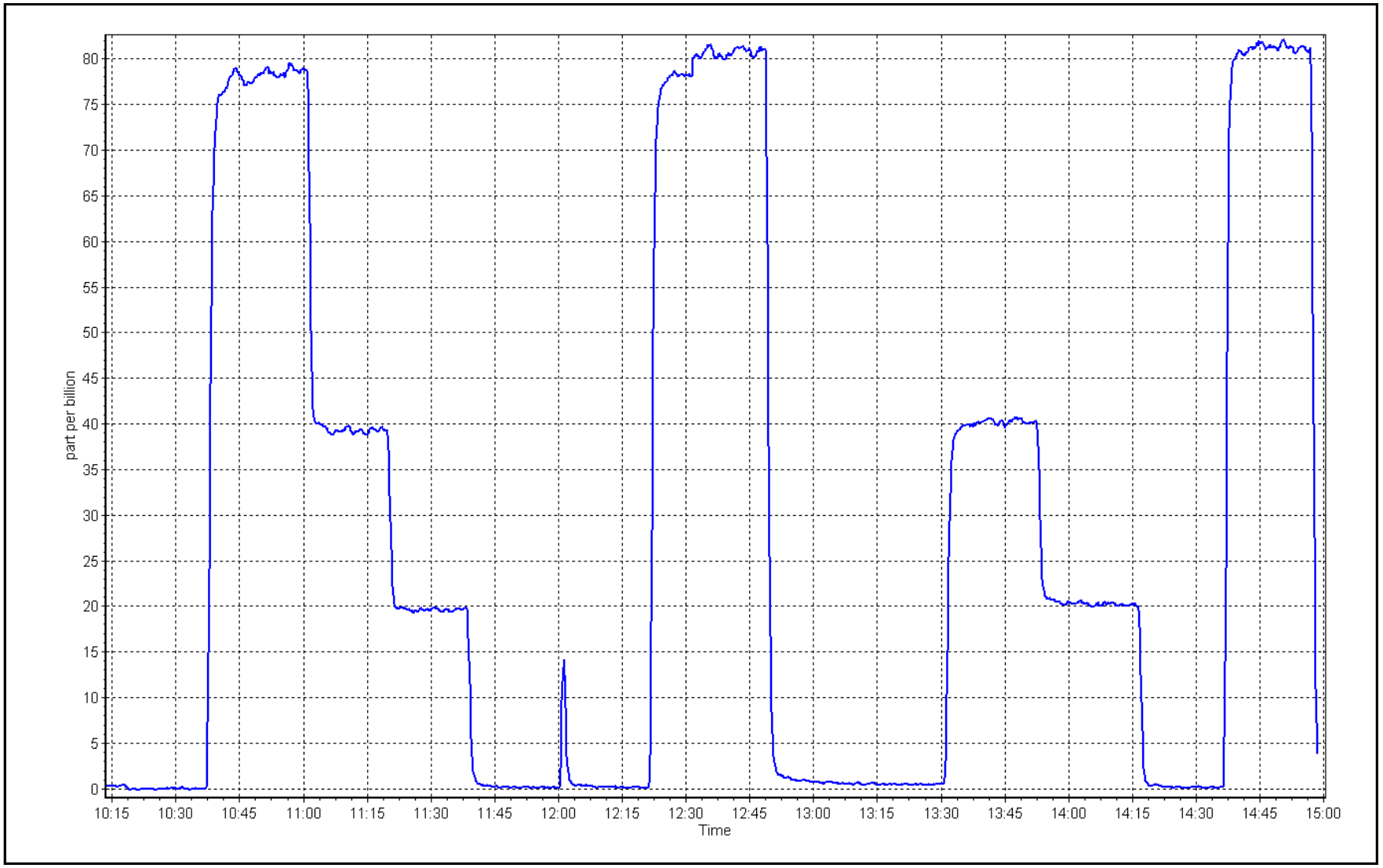
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	81.0	0.9877
40.0	40.1	0.9975
20.0	20.2	0.9901

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999962	*≥0.995*
Slope	1.011143	*0.90 - 1.10*
Intercept	-0.040000	*+/-3*



TRS Calibration Plot Date: December 2, 2024 Location: Conklin



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	December 12, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	9:51	End time (MST):	13:33
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC340840	Cal Gas Expiry Date:	October 9, 2032
CH4 Cal Gas Conc.	503.8 ppm	CH4 Equiv Conc.	1067.6 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	CC259455	Removed Gas Expiry:	January 5, 2025
Removed CH4 Conc.	497.9 ppm	CH4 Equiv Conc.	1067.7 ppm
Removed C3H8 Conc.	207.2 ppm	Diff between cyl (THC):	0.8%
Diff between cyl (CH_4):	-0.7%	Diff between cyl (NM):	2.2%
Calibrator Model:	Teledyne API T700	Serial Number:	5252
Zero Air Gen model:	Teledyne API T701	Serial Number:	953

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.27E-04	2.30E-04	NMHC SP Ratio:	4.60E-05	4.73E-05
CH4 Retention time:	15.0	15.2	NMHC Peak Area:	198650	190954
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.13	16.62	1.031
As found Mid point					
As found Low point					
New cylinder response	4920	80.2	17.12	16.74	1.023
Baseline Corr AF:	16.62	Prev response	17.06	*% change	-2.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.12	17.11	1.001
Mid point	4960	40.1	8.56	8.54	1.003
Low point	4980	20.0	4.28	4.29	0.998
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.12	17.11	1.001
				Average Correction Factor	1.001

Notes: Sample inlet filter and SO2 cylinder was changed after as founds. Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.14	8.66	1.055
As found Mid point					
As found Low point					
New cylinder response	4920	80.2	9.04	8.75	1.033
Baseline Corr AF:	8.66	Prev response	9.09	*% change	-4.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.04	9.03	1.001
Mid point	4960	40.1	4.52	4.53	0.998
Low point	4980	20.0	2.26	2.28	0.989
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.04	9.04	1.001
				Average Correction Factor	0.996

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	7.99	7.95	1.004
As found Mid point					
As found Low point					
New cylinder response	4920	80.2	8.08	7.99	1.012
Baseline Corr AF:	7.95	Prev response	7.98	*% change	-0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.08	8.08	1.000
Mid point	4960	40.1	4.04	4.01	1.008
Low point	4980	20.0	2.02	2.00	1.009
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.08	8.08	1.000
				Average Correction Factor	1.006

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.992600	0.998793
THC Cal Offset:	0.064362	0.000765
CH4 Cal Slope:	1.000525	0.999952
CH4 Cal Offset:	-0.013244	-0.012639
NMHC Cal Slope:	0.985800	0.997884
NMHC Cal Offset:	0.076606	0.013405

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

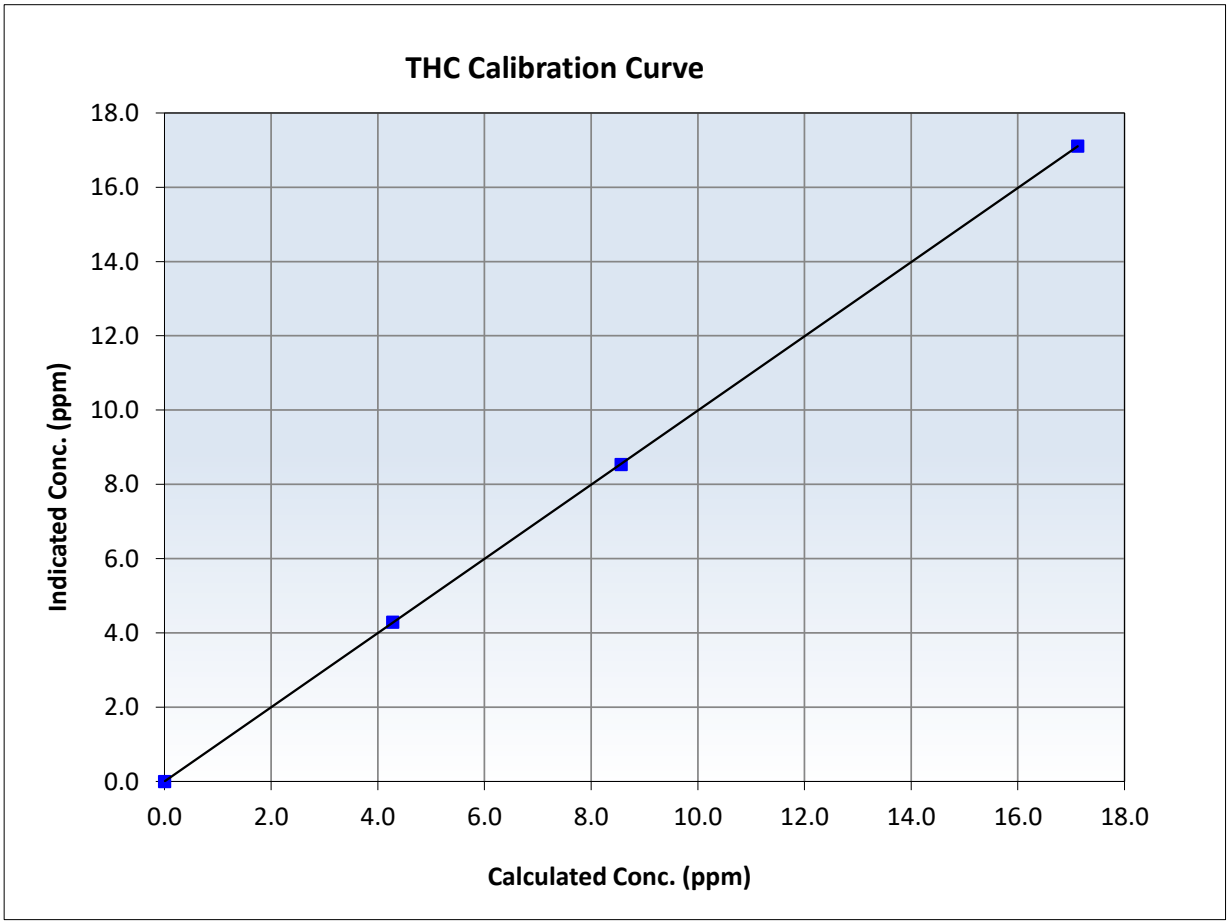
THC Calibration Summary

Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 18, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:51	End Time (MST):	13:33
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999997	*≥0.995*
17.12	17.11	1.0009	Slope	0.998793	*0.90 - 1.10*
8.56	8.54	1.0030	Intercept	0.000765	*+/-0.5*
4.28	4.29	0.9983			



Wood Buffalo Environmental Association

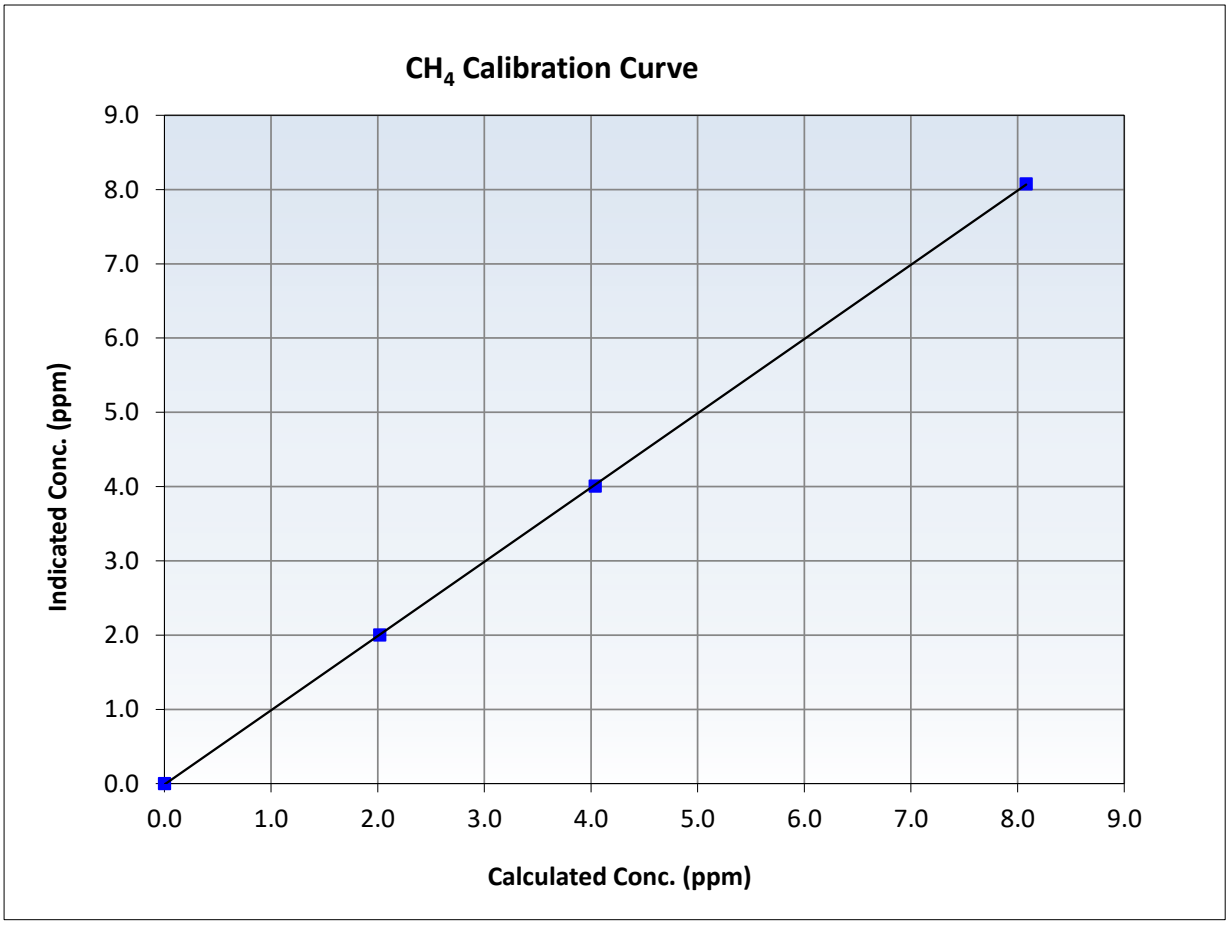
CH_4 Calibration Summary

Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 18, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:51	End Time (MST):	13:33
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999982	≥0.995
8.08	8.08	1.0003	Slope	0.999952	0.90 - 1.10
4.04	4.01	1.0078			
2.02	2.00	1.0086	Intercept	-0.012639	+/-0.5



Wood Buffalo Environmental Association

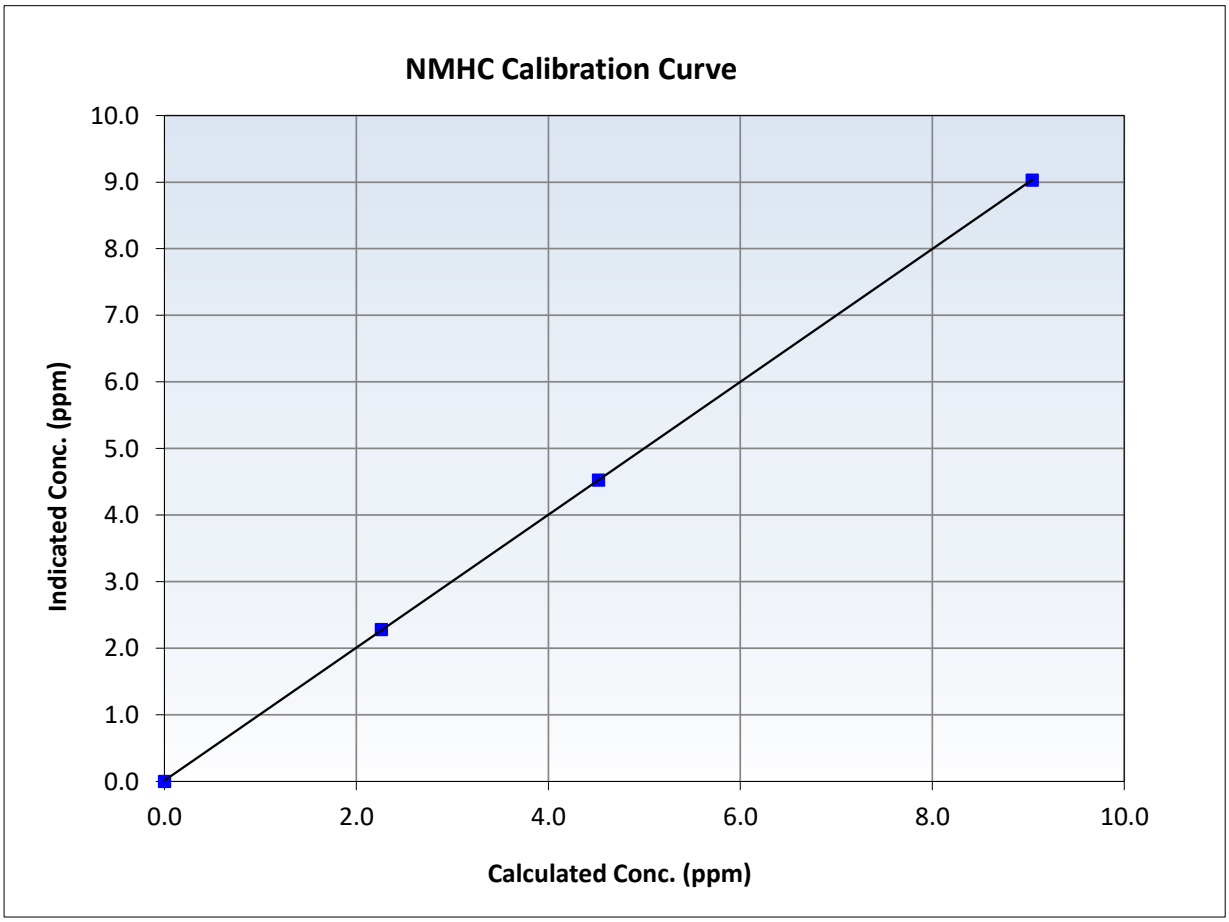
NMHC Calibration Summary

Station Information

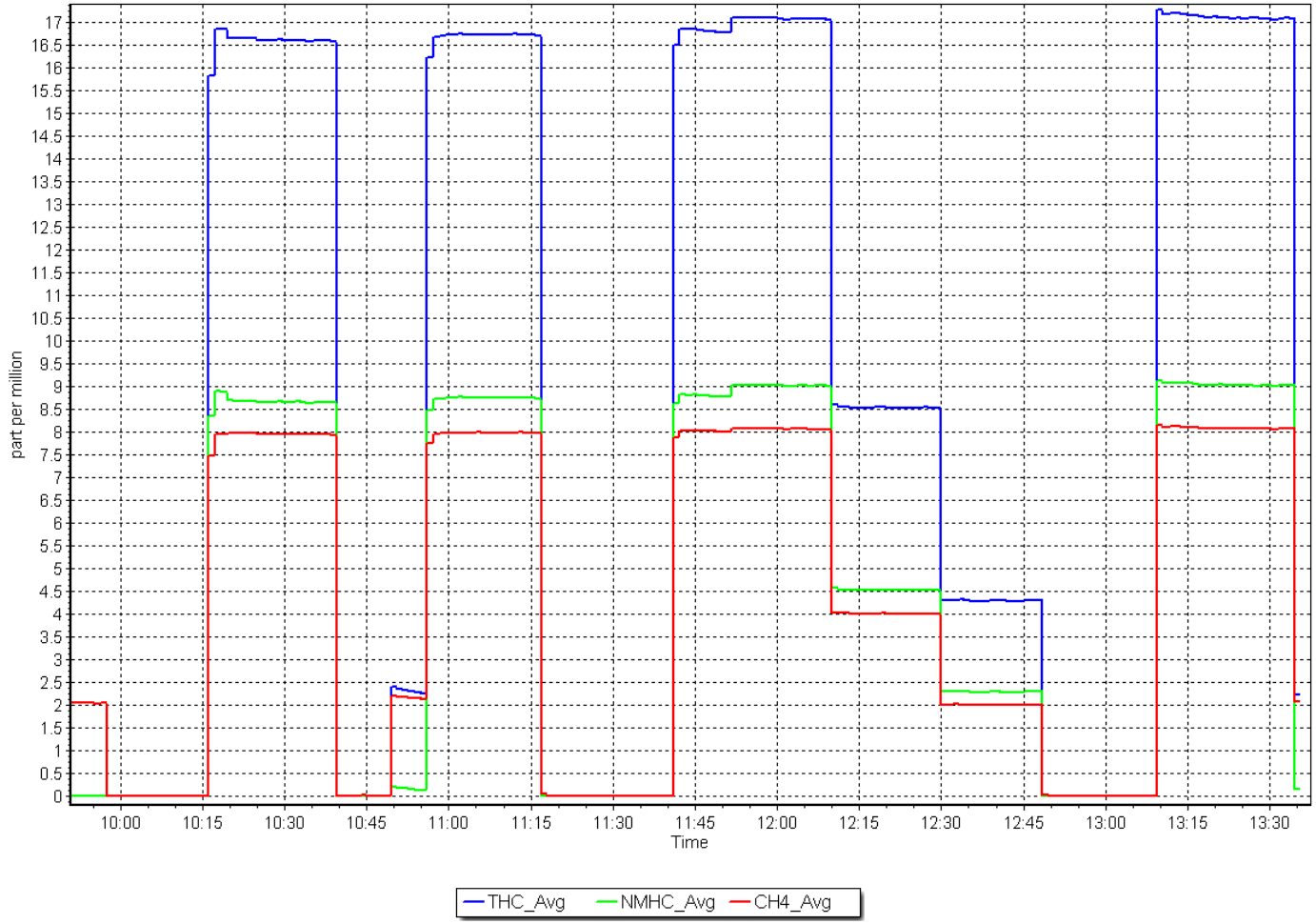
Calibration Date:	December 12, 2024	Previous Calibration:	November 18, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:51	End Time (MST):	13:33
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999989	*≥0.995*
9.04	9.03	1.0012	Slope	0.997884	*0.90 - 1.10*
4.52	4.53	0.9985	Intercept	0.013405	*+/-0.5*
2.26	2.28	0.9893			



NMHC Calibration Plot Date: December 12, 2024 Location: Conklin



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Conklin
Station number:	AMS 21
Calibration Date:	December 11, 2024
Last Cal Date:	November 27, 2024
Start time (MST):	9:20
End time (MST):	13:42
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	SA18828	Cal Gas Expiry Date:	November 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5252
ZAG make/model:	Teledyne API T701H	Serial Number:	953

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
AF High point	4918	82.0	802.0	800.3	1.6	761.0	757.0	4.0	1.0538	1.0572
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 802.3 ppb	NO = 801.0 ppb
Baseline Corr 1st pt	NO_X = 761.0 ppb	NO = 757.0 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change	NO_X =	-5.4%	
*Percent Change	NO =	-5.8%	

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1501663731

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	0.982	1.034	NO bkgnd or offset:	9.6	10.1
NOX coeff or slope:	0.995	0.996	NOX bkgnd or offset:	9.5	10.0
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	148.8	148.8

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.999101	0.993172
NO_X Cal Offset:	1.088026	1.067977
NO Cal Slope:	1.001291	0.994694
NO Cal Offset:	-0.312001	0.047961
NO_2 Cal Slope:	1.003757	0.999973
NO_2 Cal Offset:	-0.410756	0.024329

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
High point	4918	82.0	802.0	800.3	1.6	796.9	796.1	0.8	1.0063	1.0053
Mid point	4959	41.0	401.0	400.2	0.8	400.3	398.1	2.2	1.0017	1.0052
Low point	4980	20.5	200.5	200.1	0.4	200.8	199.1	1.7	0.9984	1.0048
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
As left span	4918	82.0	802.0	436.7	365.3	793.7	436.7	357.0	1.0104	1.0000
								Average Correction Factor	1.0021	1.0051

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	791.0	423.9	368.7	368.8	0.9998	100.0%
Mid GPT point	791.0	603.6	189.0	189.0	1.0002	100.0%
Low GPT point	791.0	702.5	90.1	90.1	1.0004	100.0%
				Average Correction Factor	1.0002	100.0%

Notes: Sample inlet filter was changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

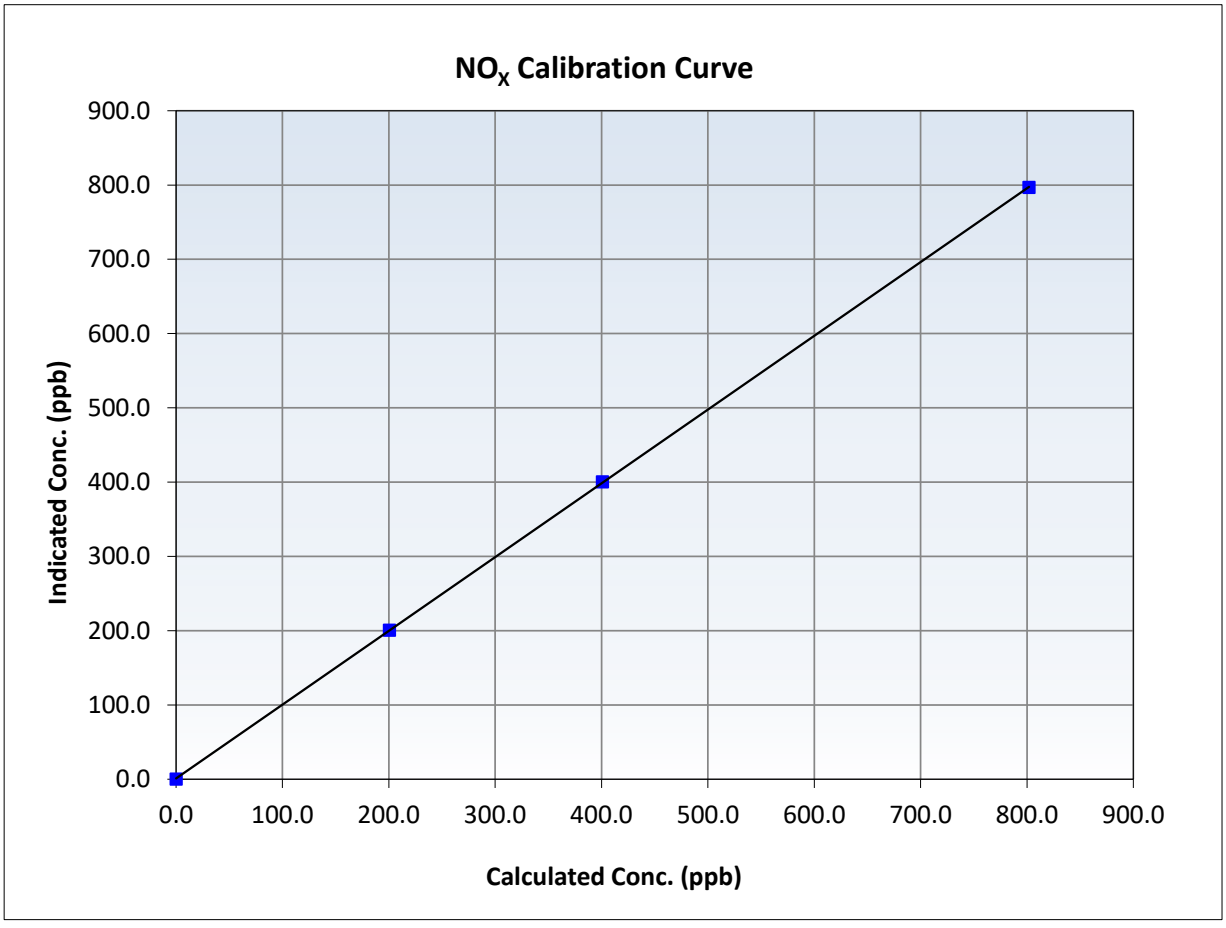
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 27, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:20	End Time (MST):	13:42
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
802.0	796.9	1.0063
401.0	400.3	1.0017
200.5	200.8	0.9984

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	0.993172	*0.90 - 1.10*
Intercept	1.067977	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

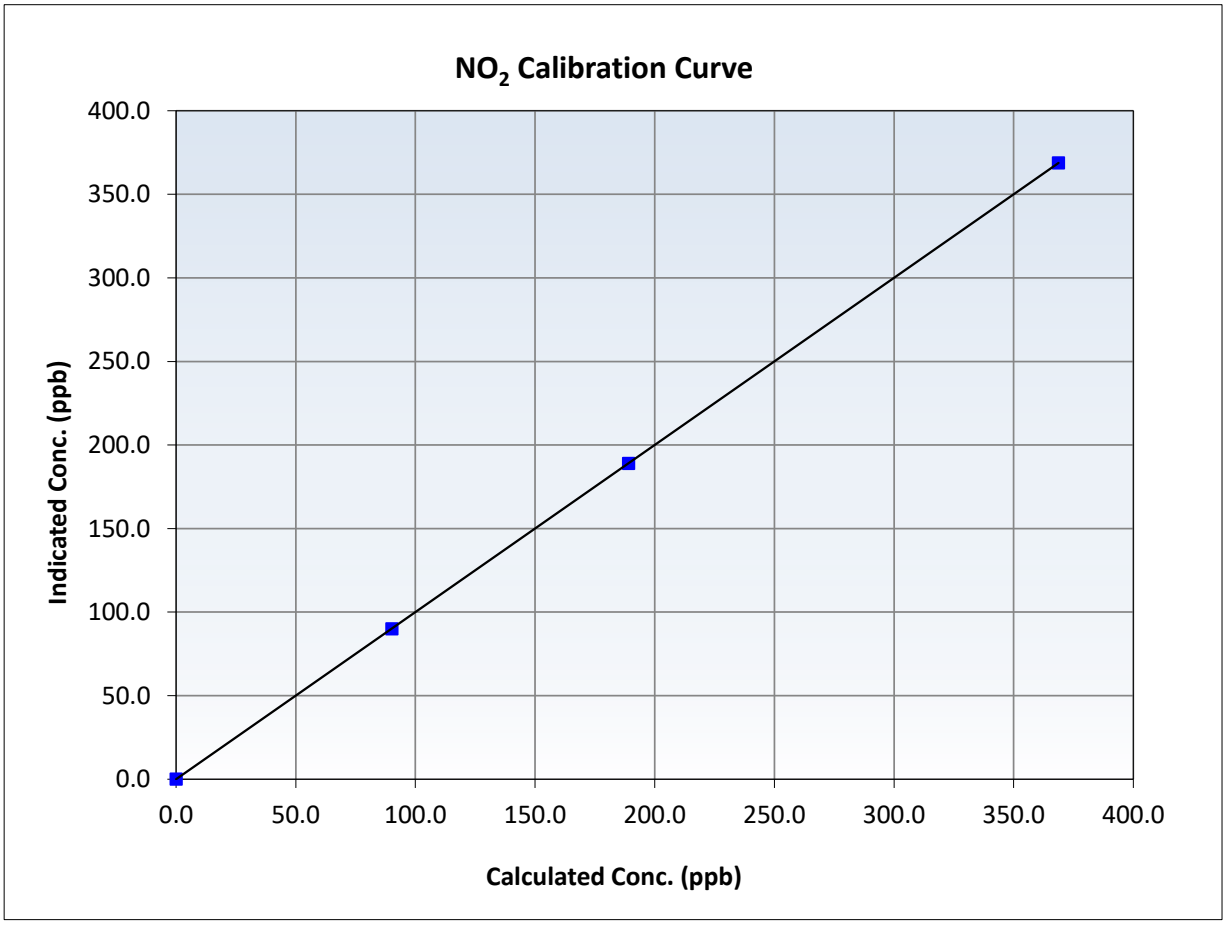
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 27, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:20	End Time (MST):	13:42
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
368.7	368.8	0.9998
189.0	189.0	1.0002
90.1	90.1	1.0004

Statistical Evaluation		*Limits*
Correlation Coefficient	1.000000	*≥0.995*
Slope	0.999973	*0.90 - 1.10*
Intercept	0.024329	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

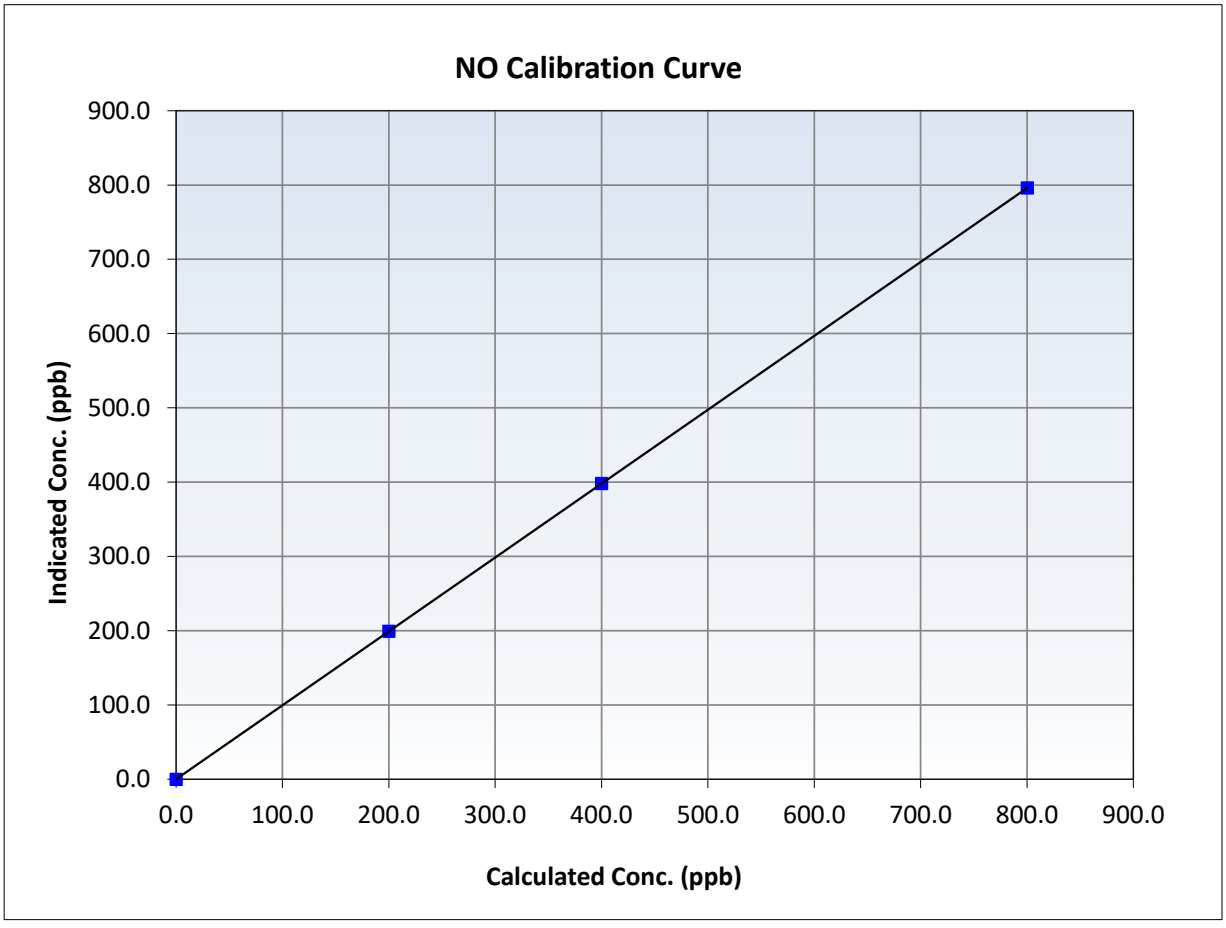
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 27, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:20	End Time (MST):	13:42
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

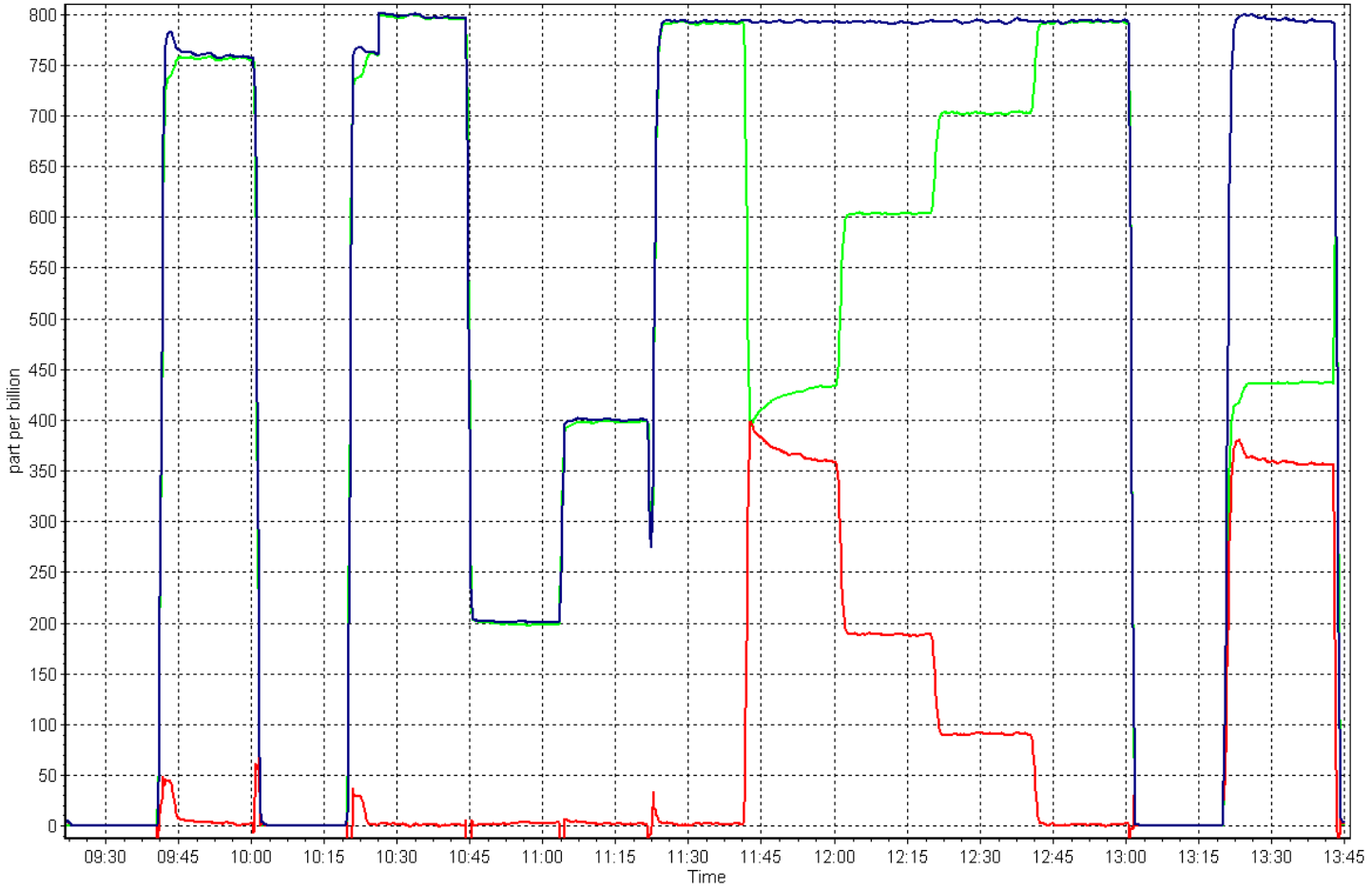
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.3	796.1	1.0053
400.2	398.1	1.0052
200.1	199.1	1.0048

Statistical Evaluation		Limits
Correlation Coefficient	1.000000	≥0.995
Slope	0.994694	0.90 - 1.10
Intercept	0.047961	+/-20



NO_X Calibration Plot Date: December 11, 2024 Location: Conklin



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	December 2, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	10:15	End time (MST):	13:28
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T750	Serial Number:	281
ZAG Make/Model:	Teledyne API 751H	Serial Number:	77

Analyzer Information

Analyzer make:	Thermo 49i		Analyzer serial #:	1501663734	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.006886	1.000571	Backgd or Offset:	2.3	1.3
Calibration intercept:	-0.980000	-0.500000	Coeff or Slope:	1.119	1.097

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	-1.1	----
As found High point	5000	1095.7	400.0	401.7	0.993
As found Mid point					
As found Low point					
Baseline Corr As found:	402.8	Previous response	401.8	*% change	0.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	-0.1	----
High point	5000	1096.6	400.0	399.9	1.000
Mid point	5000	813.9	200.0	199.5	1.003
Low point	5000	685.3	100.0	99.1	1.009
As left zero	5000	800.0	0.0	-0.6	----
As left span	5000	908.4	400.0	409.9	0.976
				Average Correction Factor	1.004

Notes: Sample inlet filter changed after as founds. Adjusted zero and span.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

O_3 Calibration Summary

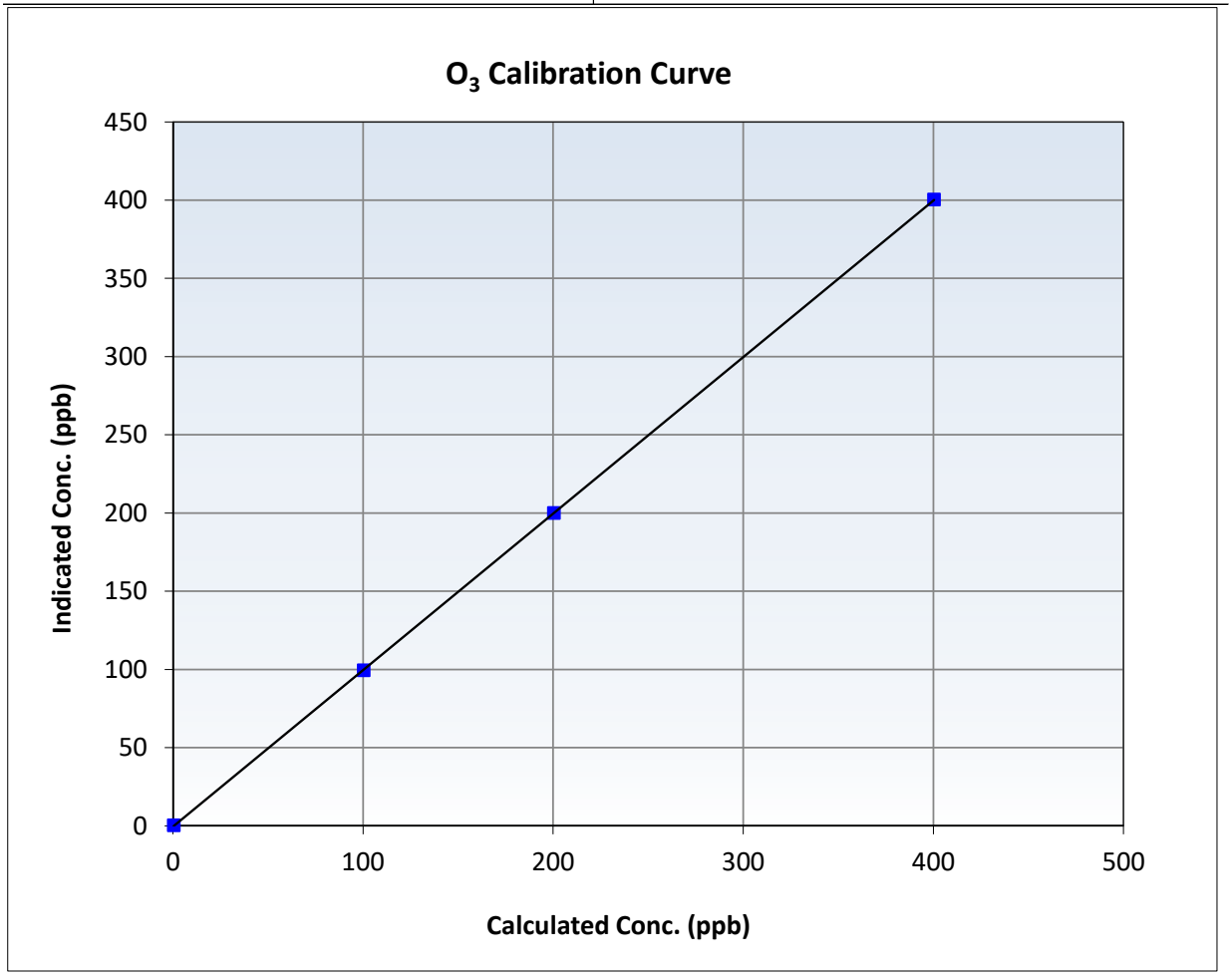
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 7, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:15	End Time (MST):	13:28
Analyzer make:	Thermo 49i	Analyzer serial #:	1501663734

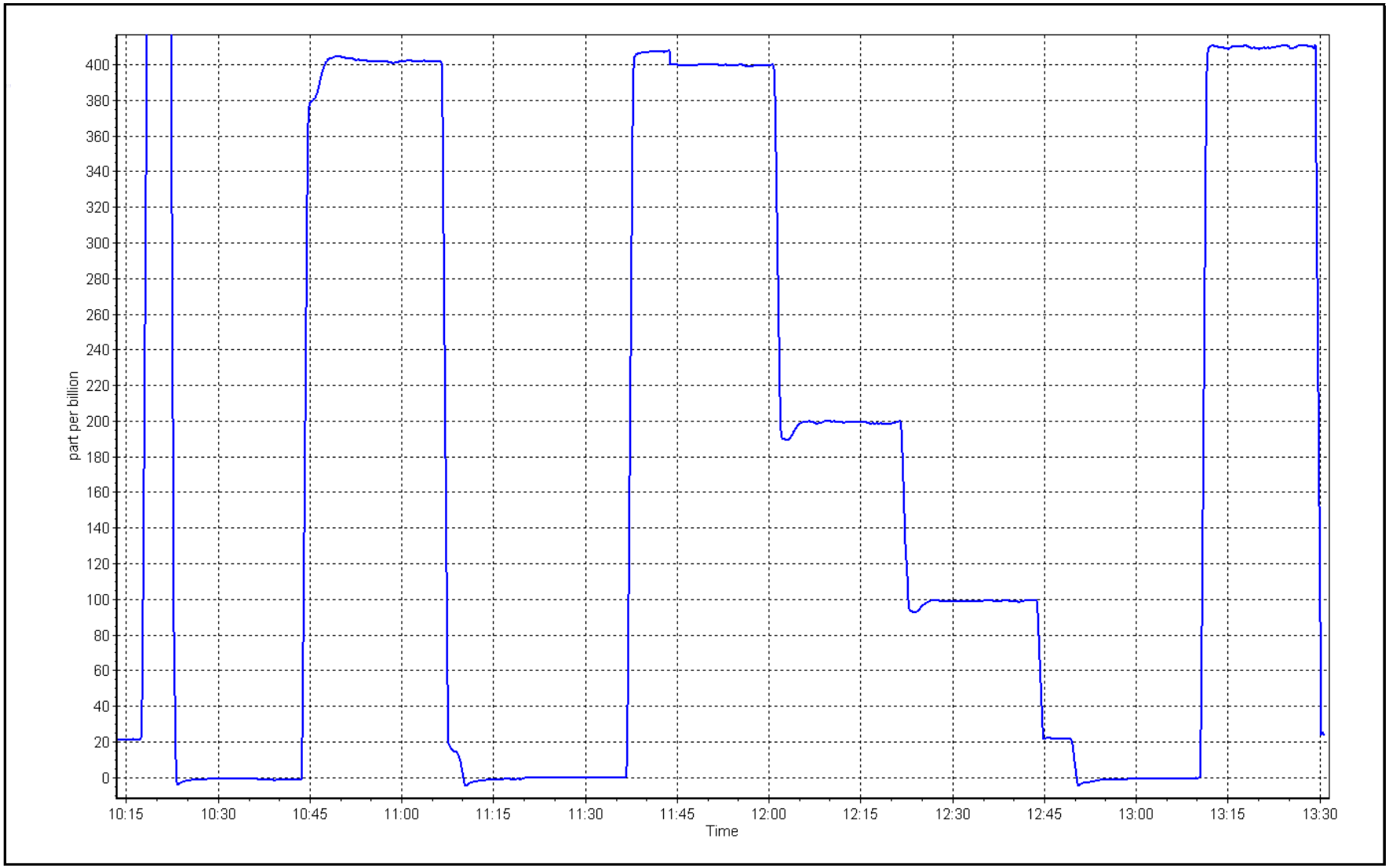
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
400.0	399.9	1.0003
200.0	199.5	1.0025
100.0	99.1	1.0091

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.000571	*0.90 - 1.10*
Intercept	-0.500000	*+/- 5*



O_3 Calibration Plot Date: December 2, 2024 Location: Conklin



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	December 11, 2024	Last Cal Date:	November 27, 2024
Start time (MST):	12:26	End time (MST):	12:50
Analyzer Make:	API T640	S/N:	326
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388754
Temp/RH standard:	Alicat FP-25BT	S/N:	388754

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (^{o}C)	-14.70	-15.41	-14.70	☐	+/- 2 ^{o}C
P (mmHg)	713.20	714.91	713.20	☐	+/- 10 mmHg
Flow (LPM)	4.99	5.06	4.99	☐	+/- 0.25 LPM
PW% (pump)	43	-----	43	☐	>80%
Zero Verification	PM w/o HEPA:	3.20	PM w/ HEPA:	0.00	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: September 29, 2024 — Lot No.: 100128-050-040

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: November 27, 2024

Date Disposable Filter Changed: November 27, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: August 9, 2024

Date RH/T Sensor Cleaned: August 9, 2024

Notes: Verified flow, pressure, temperature and pump power. No adjustment needed. Leak check passed.

Calibration by: Jan Castro

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS22
JANVIER
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	December 19, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	12:53	End time (MST):	16:00
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.11	ppm	Cal Gas Exp Date:	January 18, 2029
Cal Gas Cylinder #:	CC281519			
Removed Cal Gas Conc:	50.11	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	3806
Zero Air Gen Model:	Teledyne API T701		Serial Number:	691

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1152430006	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002936	1.000706	Backgd or Offset:	25.0	25.2
Calibration intercept:	0.043822	-0.075626	Coeff or Slope:	1.024	1.046

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4920	79.8	799.8	780.3	1.025
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	780.2	Previous response	802.2	*% change	-2.8%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	79.8	799.8	800.2	0.999
Mid point	4960	39.9	399.9	400.4	0.999
Low point	4980	20.0	200.4	200.2	1.001
As left zero	5000	0.0	0.0	0.3	----
As left span	4920	79.8	799.8	804.8	0.994
				Average Correction Factor:	1.000

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

SO_2 Calibration Summary

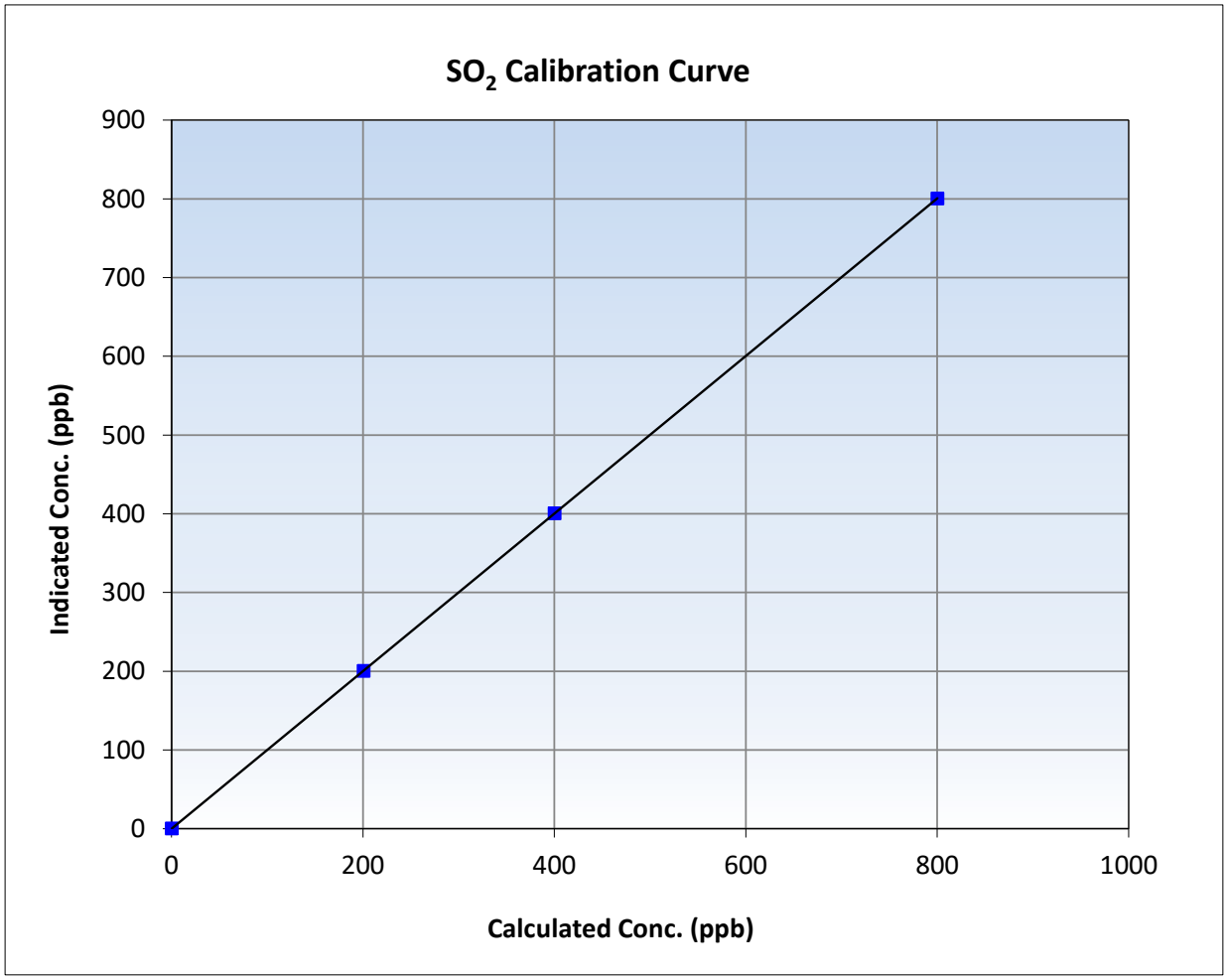
Station Information

Calibration Date:	December 19, 2024	Previous Calibration:	November 18, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:53	End Time (MST):	16:00
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430006

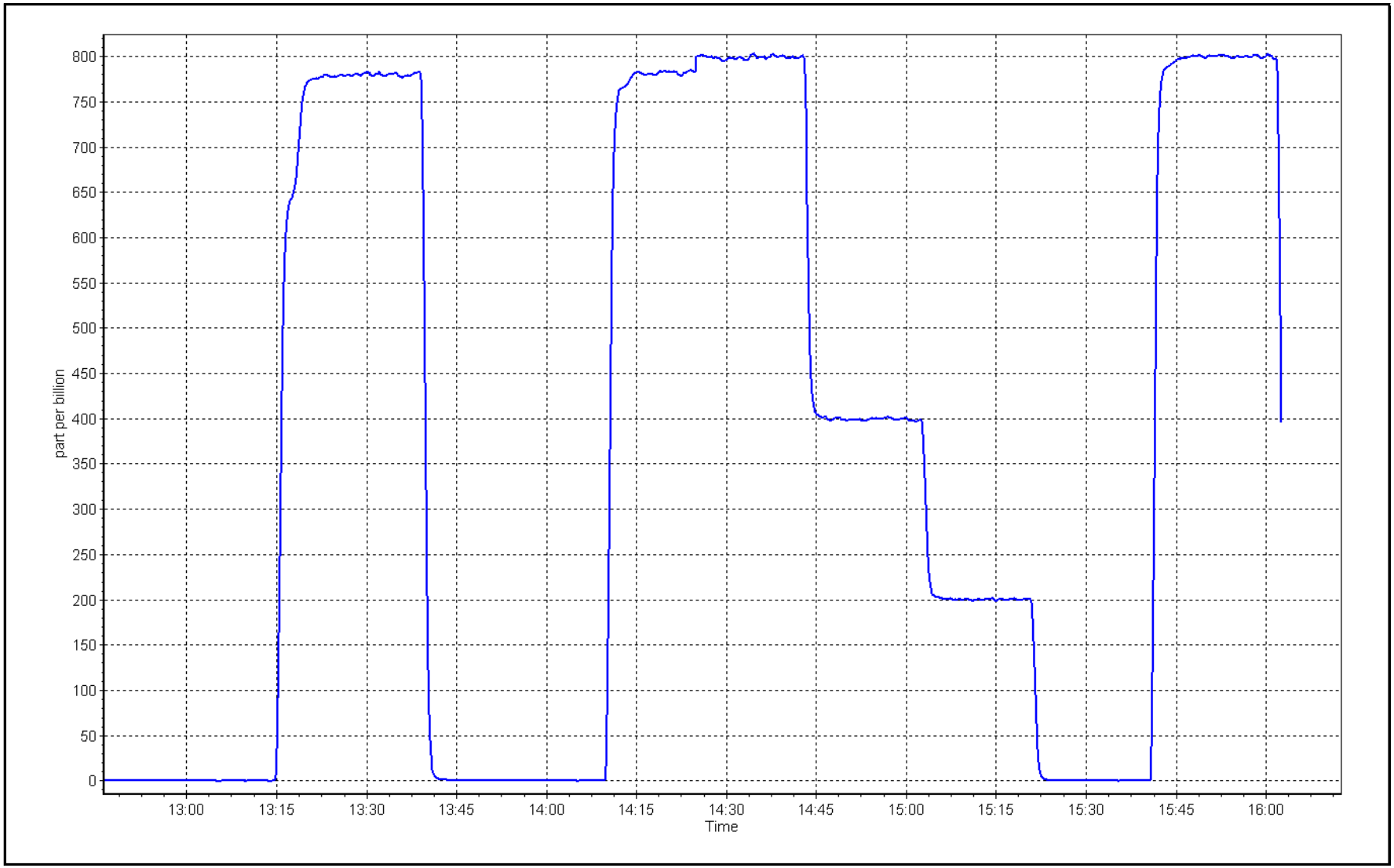
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.8	800.2	0.9995
399.9	400.4	0.9987
200.4	200.2	1.0012

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.000706	*0.90 - 1.10*
Intercept	-0.075626	*+/-30*



SO2 Calibration Plot Date: December 19, 2024 Location: Janvier



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	December 20, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	12:53	End time (MST):	16:42
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.02	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	CC424047			
Removed Cal Gas Conc:	5.02	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3806
ZAG Make/Model:	Teledyne API T701		Serial Number:	691

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1151680031
Converter make:	CDN-101		Converter serial #:	620
Analyzer Range	0 - 100 ppb		Converter Temp:	850 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.987240	0.979100	Backgd or Offset:	3.74	3.77
Calibration intercept:	0.280383	0.440224	Coeff or Slope:	1.197	1.197

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4920	79.7	80.0	79.0	1.016
As found Mid point	4960	39.8	40.0	40.2	0.999
As found Low point	4980	19.9	20.0	20.0	1.009
New cylinder response					

Baseline Corr As found:	78.8	Prev response:	79.28	*% change:	-0.6%
Baseline Corr 2nd AF pt:	40.0	AF Slope:	0.985094	AF Intercept:	0.380470
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999915	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4920	79.7	80.0	78.7	1.017
Mid point	4960	39.8	40.0	39.8	1.004
Low point	4980	19.9	20.0	19.9	1.004
As left zero	5000	0.0	0.0	0.6	----
As left span	4920	79.7	80.0	79.1	1.012
SO2 Scrubber Check	4920	79.8	798.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.008
Date of last converter efficiency test:					

Notes: Changed the inlet filter after as founds. Scrubber test performed after zero point, no issues. No adjustments were made.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

TRS Calibration Summary

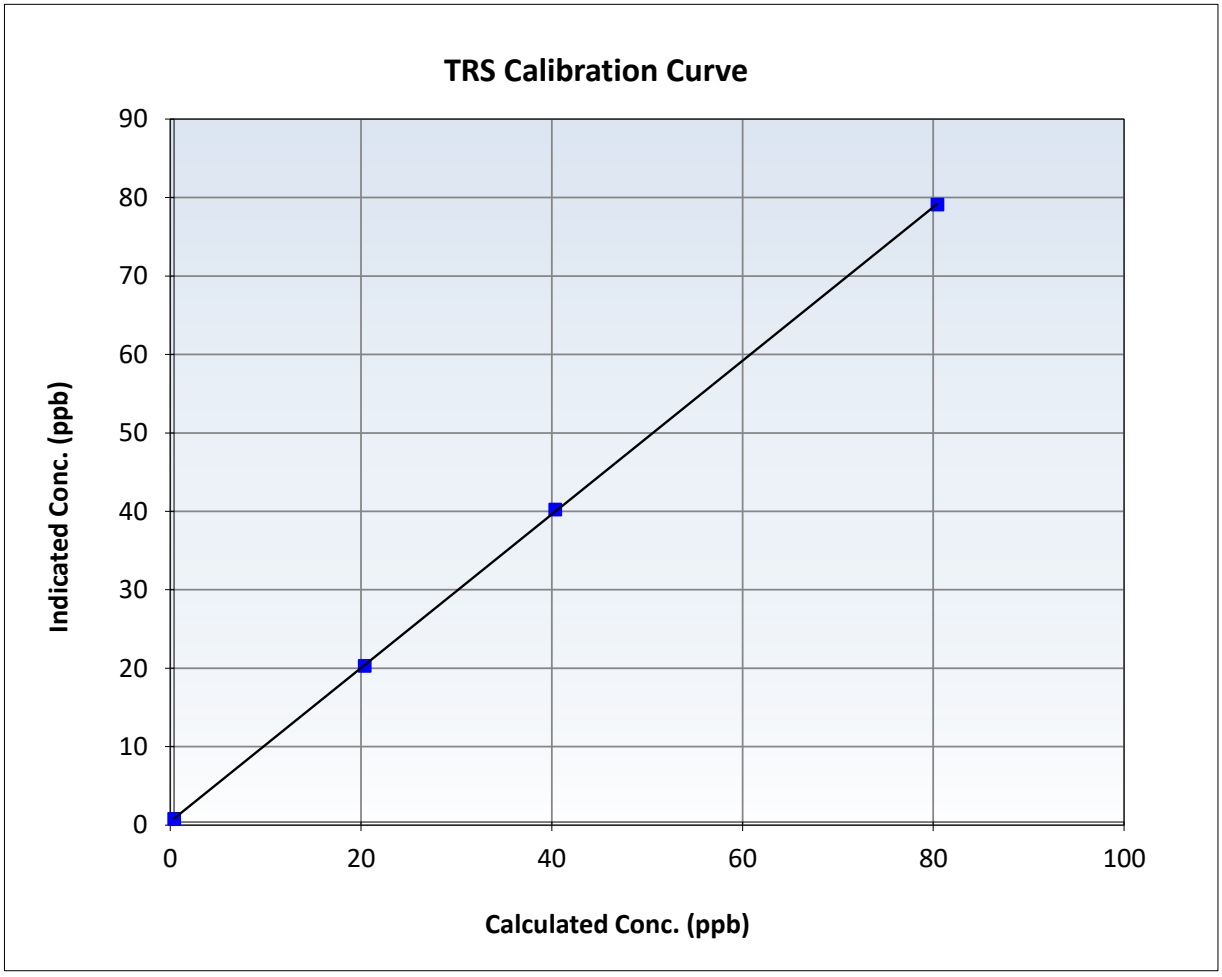
Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 21, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:53	End Time (MST):	16:42
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680031

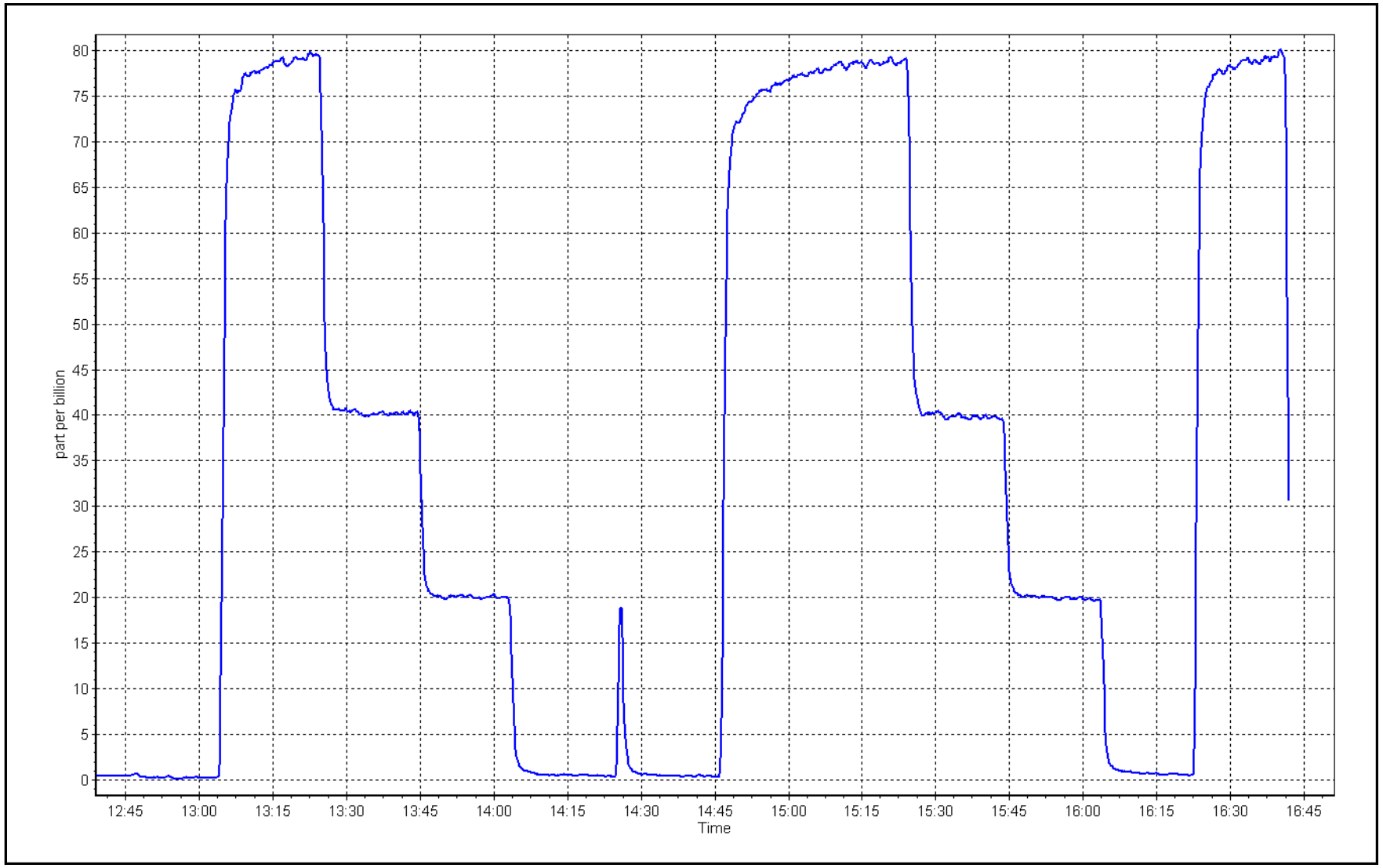
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
80.0	78.7	1.0168
40.0	39.8	1.0040
20.0	19.9	1.0040

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999978	*≥0.995*
Slope	0.979100	*0.90 - 1.10*
Intercept	0.440224	*+/-3*



TRS Calibration Plot Date: December 20, 2024 Location: Janvier



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	December 19, 2024	Last Cal Date:	November 18, 2024
Start time (MST):	12:53	End time (MST):	16:00
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC281519		Cal Gas Expiry Date:	January 18, 2029	
CH4 Cal Gas Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
C3H8 Cal Gas Conc.	208.4	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
Removed C3H8 Conc.	208.4	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API 700		Serial Number:	3806	
Zero Air Gen model:	Teledyne API 701		Serial Number:	691	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1317958219	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	2.49E-04	2.44E-04	NMHC SP Ratio:	5.95E-05	5.75E-05
CH4 Retention time:	11.6	11.6	NMHC Peak Area:	153693	159068
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	17.17	17.51	0.981
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.51	Prev response	17.14	*% change	2.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	17.17	17.13	1.003
Mid point	4960	39.9	8.59	8.48	1.012
Low point	4980	20.0	4.30	4.24	1.015
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	17.17	17.13	1.003
				Average Correction Factor	1.010

Notes: Changed the inlet filter and N2 cylinder after as founds. Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.15	9.36	0.978
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.36	Prev response	9.13	*% change	2.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.15	9.11	1.005
Mid point	4960	39.9	4.57	4.53	1.009
Low point	4980	20.0	2.29	2.27	1.009
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.15	9.12	1.003
				Average Correction Factor	1.008

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	8.03	8.15	0.984
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.15	Prev response	8.01	*% change	1.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	8.03	8.02	1.001
Mid point	4960	39.9	4.01	3.95	1.015
Low point	4980	20.0	2.01	1.97	1.022
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	8.03	8.01	1.002
				Average Correction Factor	1.013

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.999803	0.997965
THC Cal Offset:	-0.027392	-0.037583
CH4 Cal Slope:	1.001053	0.999957
CH4 Cal Offset:	-0.024358	-0.027756
NMHC Cal Slope:	0.999092	0.995631
NMHC Cal Offset:	-0.003835	-0.008227

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

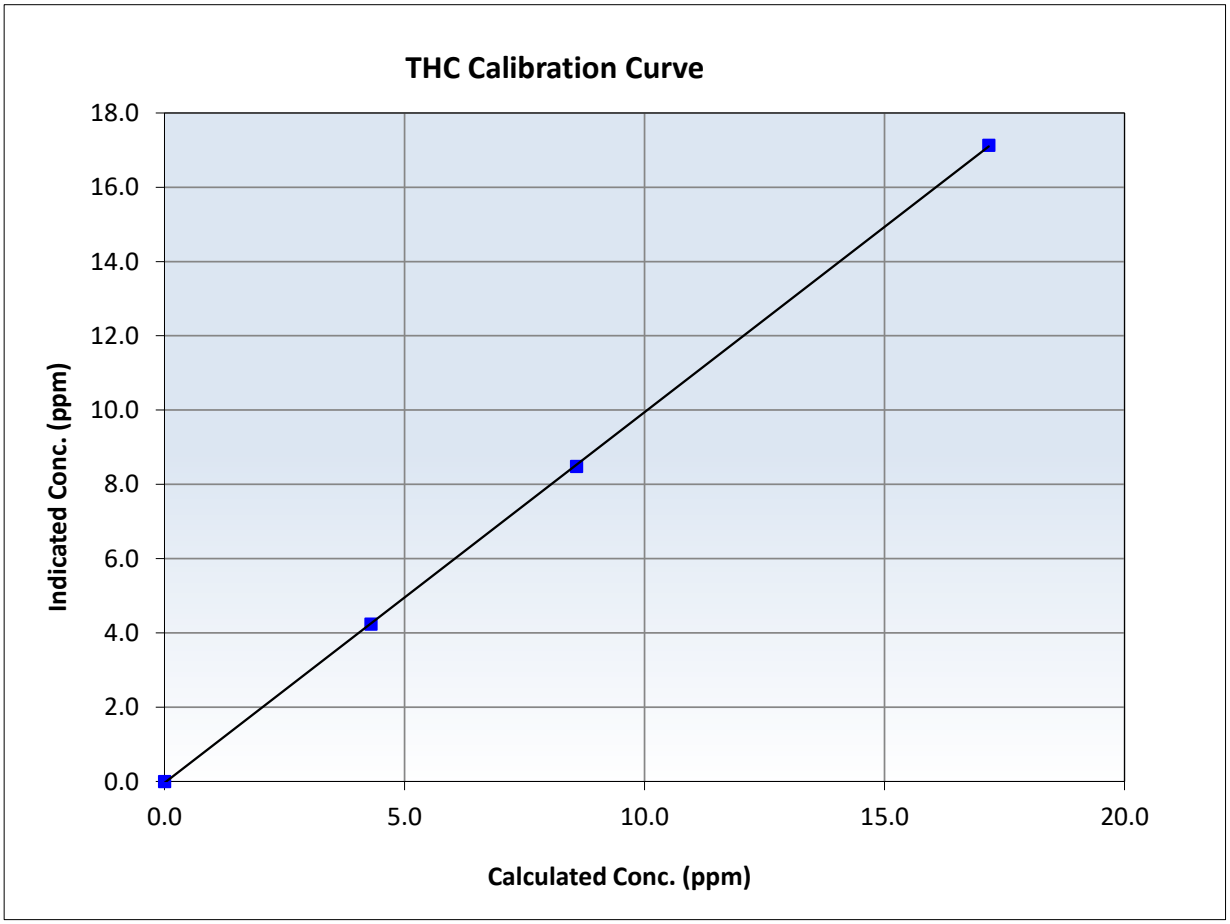
THC Calibration Summary

Station Information

Calibration Date:	December 19, 2024	Previous Calibration:	November 18, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:53	End Time (MST):	16:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999970	≥0.995
17.17	17.13	1.0026	Slope	0.997965	0.90 - 1.10
8.59	8.48	1.0121	Intercept	-0.037583	+/-0.5
4.30	4.24	1.0152			



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CH_4 Calibration Summary

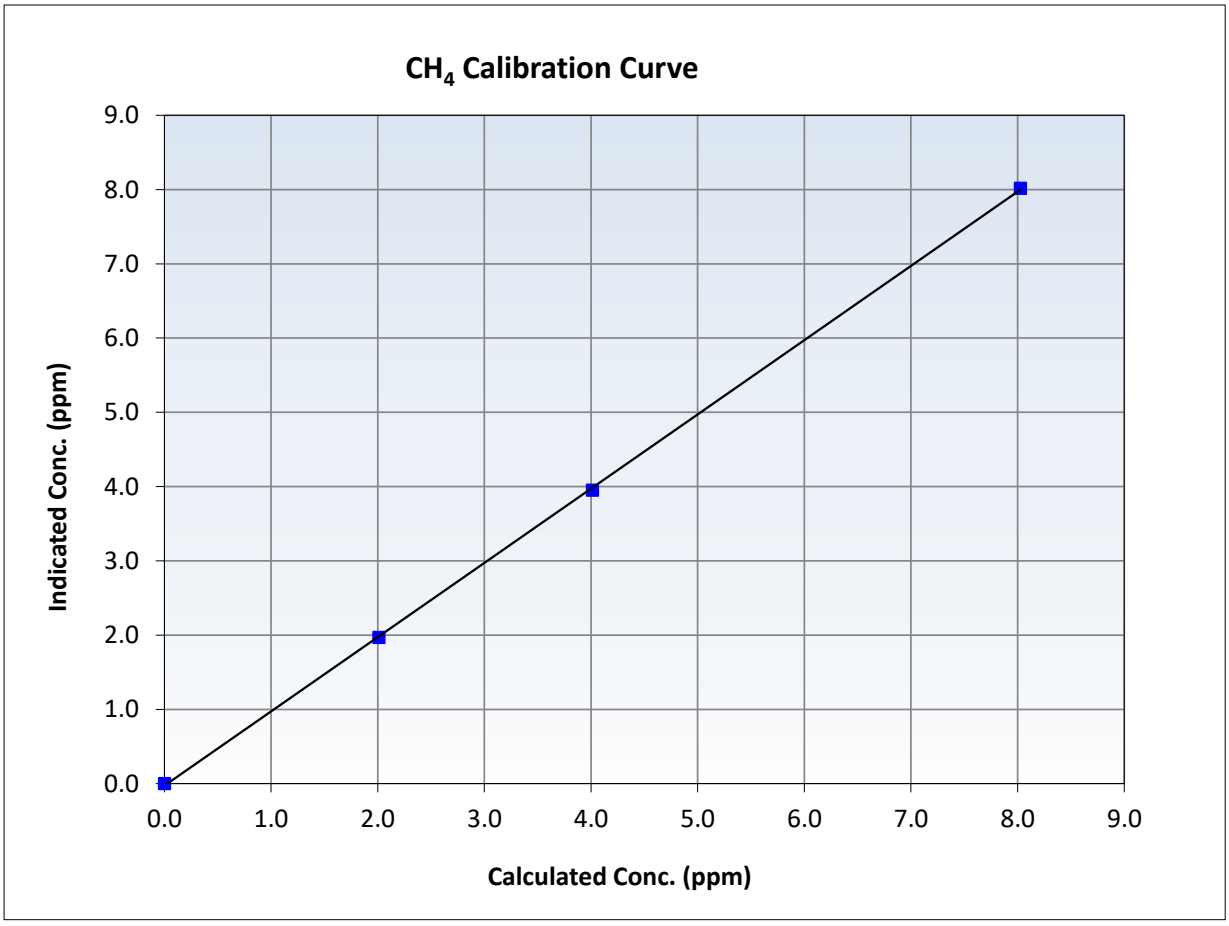
Station Information

Calibration Date:	December 19, 2024	Previous Calibration:	November 18, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:53	End Time (MST):	16:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.03	8.02	1.0010
4.01	3.95	1.0153
2.01	1.97	1.0220

Statistical Evaluation		Limits
Correlation Coefficient	0.999930	≥0.995
Slope	0.999957	0.90 - 1.10
Intercept	-0.027756	+/-0.5



Wood Buffalo Environmental Association

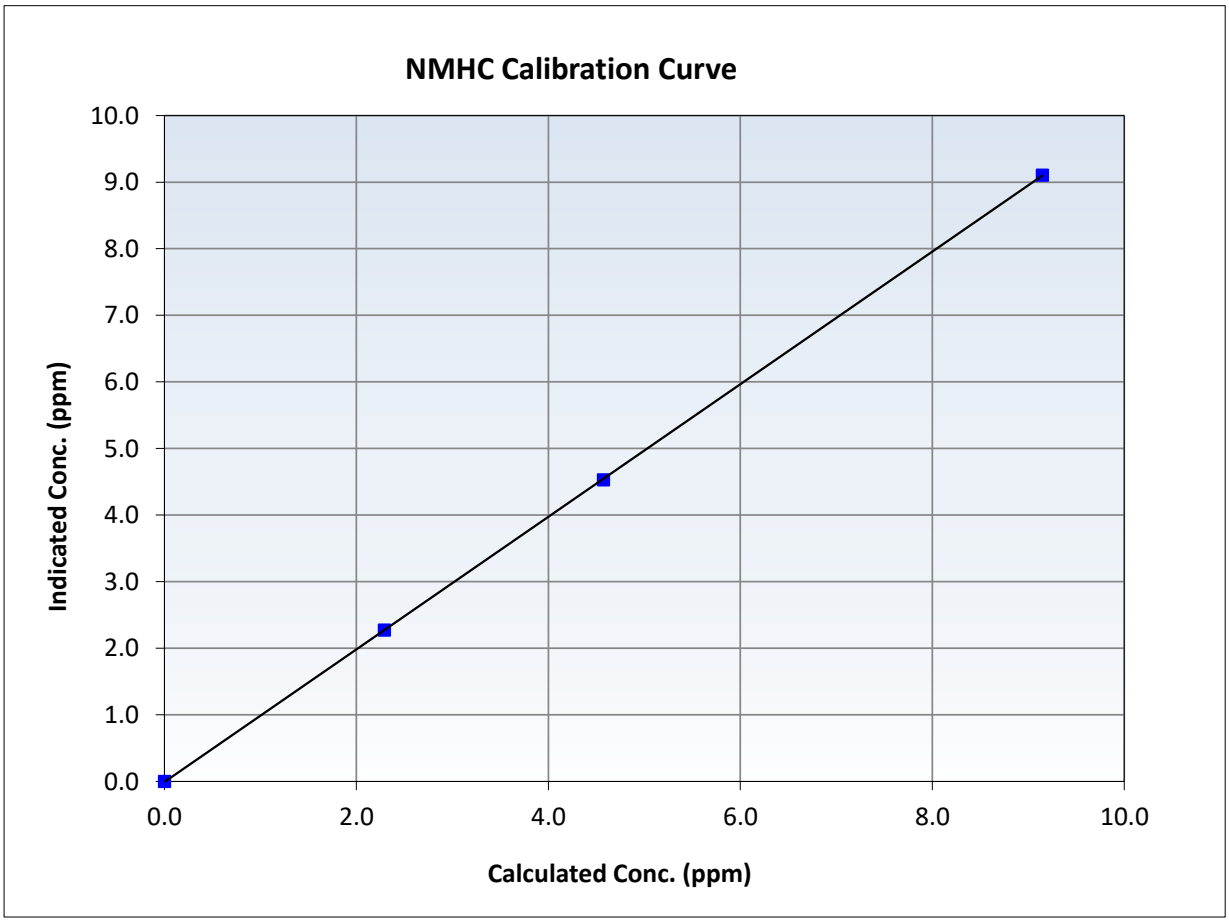
NMHC Calibration Summary

Station Information

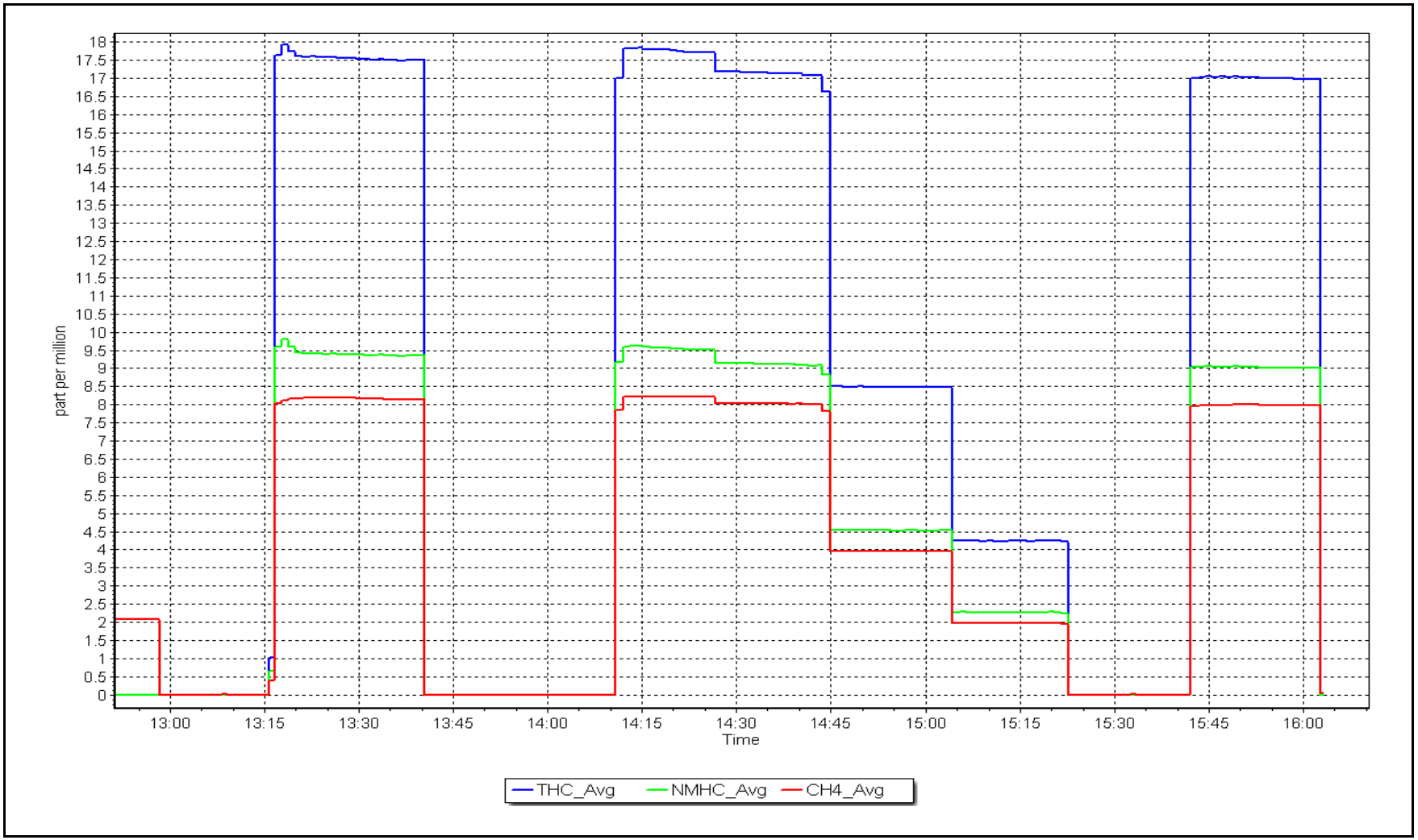
Calibration Date:	December 19, 2024	Previous Calibration:	November 18, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:53	End Time (MST):	16:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999993	≥0.995
9.15	9.11	1.0045	Slope	0.995631	0.90 - 1.10
4.57	4.53	1.0091	Intercept	-0.008227	+/-0.5
2.29	2.27	1.0090			



NMHC Calibration Plot Date: December 19, 2024 Location: Janvier



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THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	December 23, 2024	Last Cal Date:	December 19, 2024
Start time (MST):	11:52	End time (MST):	14:21
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC281519		Cal Gas Expiry Date:	January 18, 2029	
CH4 Cal Gas Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
C3H8 Cal Gas Conc.	208.4	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
Removed C3H8 Conc.	208.4	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API 700		Serial Number:	3806	
Zero Air Gen model:	Teledyne API 701		Serial Number:	691	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1317958219	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	2.44E-04	2.44E-04	NMHC SP Ratio:	5.75E-05	5.75E-05
CH4 Retention time:	11.6	11.6	NMHC Peak Area:	159068	159068
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	17.17	16.87	1.018
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.87	Prev response	17.10	*% change	-1.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	17.17	16.62	1.033
				Average Correction Factor	

Notes: Swapped out the H2 cylinder after as founds.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.15	8.94	1.024
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.94	Prev response	9.10	*% change	-1.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.15	8.78	1.042
				Average Correction Factor	

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	8.03	7.93	1.012
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.93	Prev response	8.00	*% change	-0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

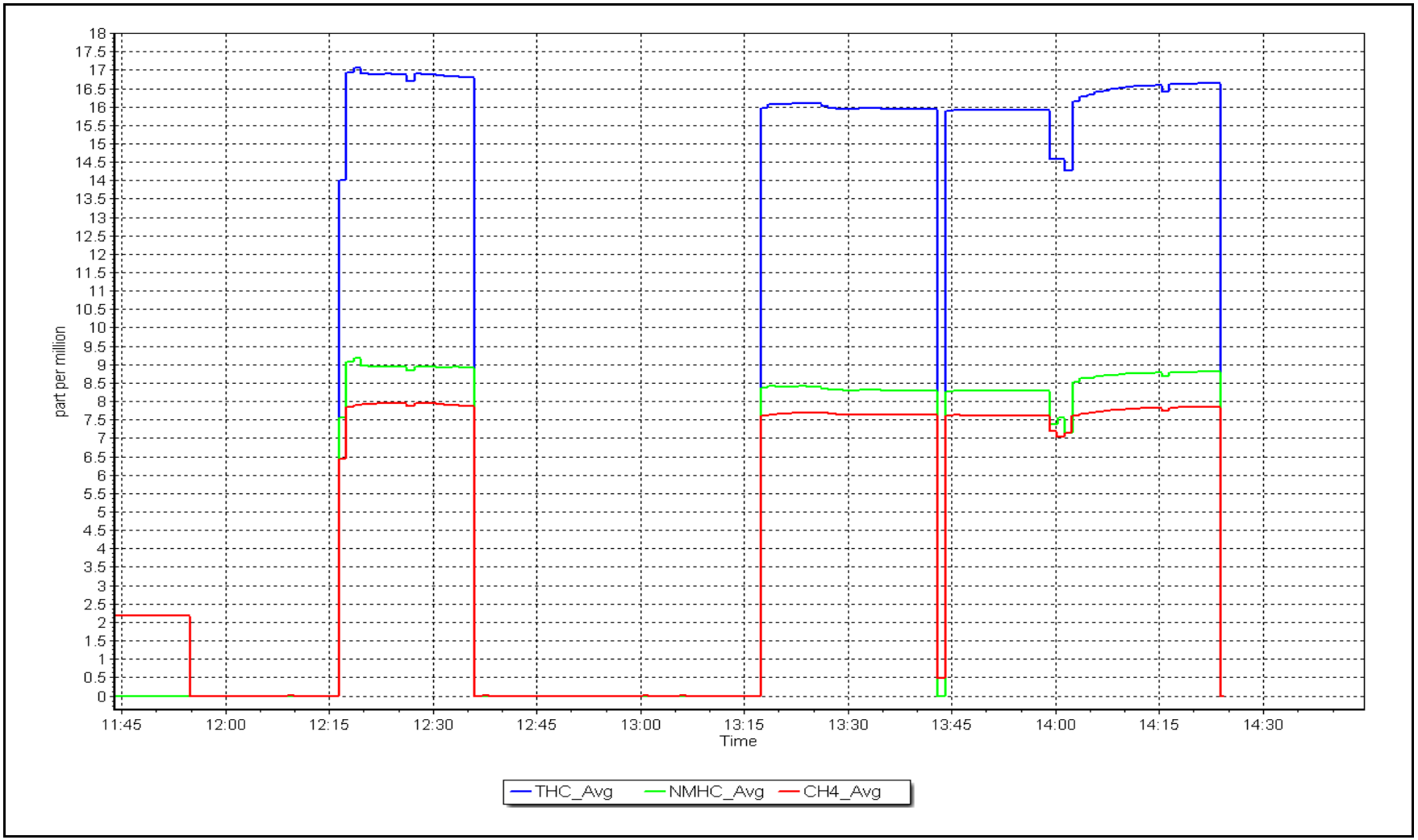
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	8.03	7.83	1.024
				Average Correction Factor	

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997965	
THC Cal Offset:	-0.037583	
CH4 Cal Slope:	0.999957	
CH4 Cal Offset:	-0.027756	
NMHC Cal Slope:	0.995631	
NMHC Cal Offset:	-0.008227	

Calibration Performed By: Rene Chamberland

NMHC Calibration Plot Date: December 23, 2024 Location: Janvier



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Janvier
Station number:	AMS 22
Calibration Date:	December 16, 2024
Last Cal Date:	November 26, 2024
Start time (MST):	11:45
End time (MST):	16:00
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0047765	Cal Gas Expiry Date:	March 11, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3806
ZAG make/model:	Teledyne API T701	Serial Number:	691

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.1	-0.1	0.2	----	----
AF High point	4918	82.0	802.0	800.3	1.6	807.8	795.3	12.6	0.9929	1.0062
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	795.1 ppb	NO =	790.3 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = 1.6%
Baseline Corr 1st pt	NO_X =	807.7 ppb	NO =	795.4 ppb	As Found Statistics	*Percent Change	NO = 0.6%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 833

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.880	0.880	NO bkgnd or offset:	-0.7	-0.7
NOX coeff or slope:	0.879	0.879	NOX bkgnd or offset:	0.5	0.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	8.4	8.4

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.991246	1.002119
NO_X Cal Offset:	0.163866	1.424245
NO Cal Slope:	0.988179	0.999960
NO Cal Offset:	-0.576326	0.424054
NO_2 Cal Slope:	1.001375	0.997993
NO_2 Cal Offset:	-0.096837	1.353493

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	----	----
High point	4918	82.0	802.0	800.3	1.6	804.1	800.4	3.8	0.9973	0.9999
Mid point	4960	41.0	400.9	400.1	0.8	404.7	401.1	3.6	0.9906	0.9975
Low point	4980	20.5	200.5	200.1	0.4	203.2	200.5	2.7	0.9866	0.9978
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.2	----	----
As left span	4918	82.0	802.0	399.0	403.0	802.0	399.0	402.9	1.0000	1.0000
								Average Correction Factor	0.9915	0.9984

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	800.1	396.8	404.9	404.5	1.0011	99.9%
Mid GPT point	800.1	596.3	205.4	207.8	0.9886	101.1%
Low GPT point	800.1	697.7	104.0	106.2	0.9797	102.1%
				Average Correction Factor	0.9898	101.0%

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

NO_X Calibration Summary

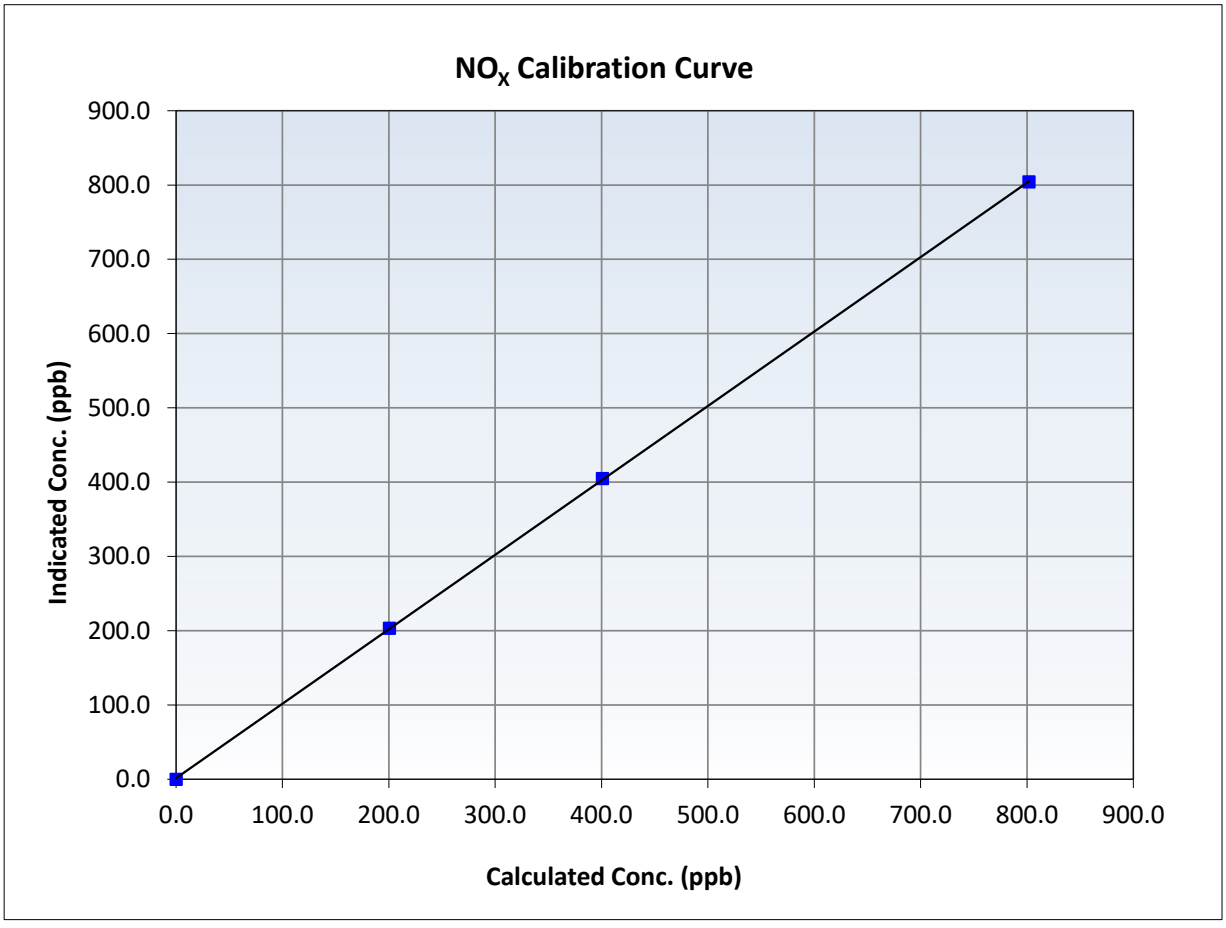
Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	November 26, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:45	End Time (MST):	16:00
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
802.0	804.1	0.9973
400.9	404.7	0.9906
200.5	203.2	0.9866

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999983	*≥0.995*
Slope	1.002119	*0.90 - 1.10*
Intercept	1.424245	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

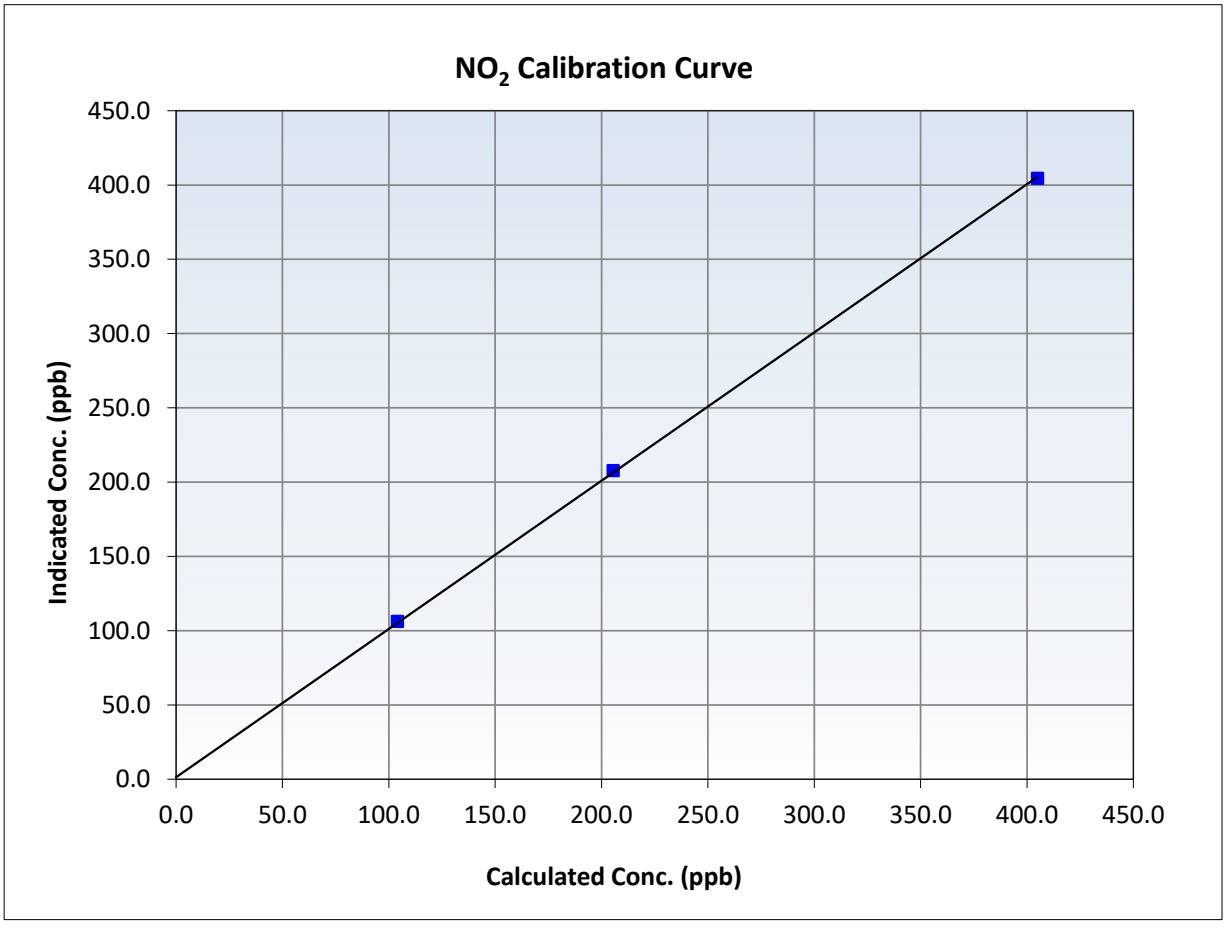
Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	November 26, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:45	End Time (MST):	16:00
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
404.9	404.5	1.0011
205.4	207.8	0.9886
104.0	106.2	0.9797

Statistical Evaluation		Limits
Correlation Coefficient	0.999931	≥0.995
Slope	0.997993	0.90 - 1.10
Intercept	1.353493	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

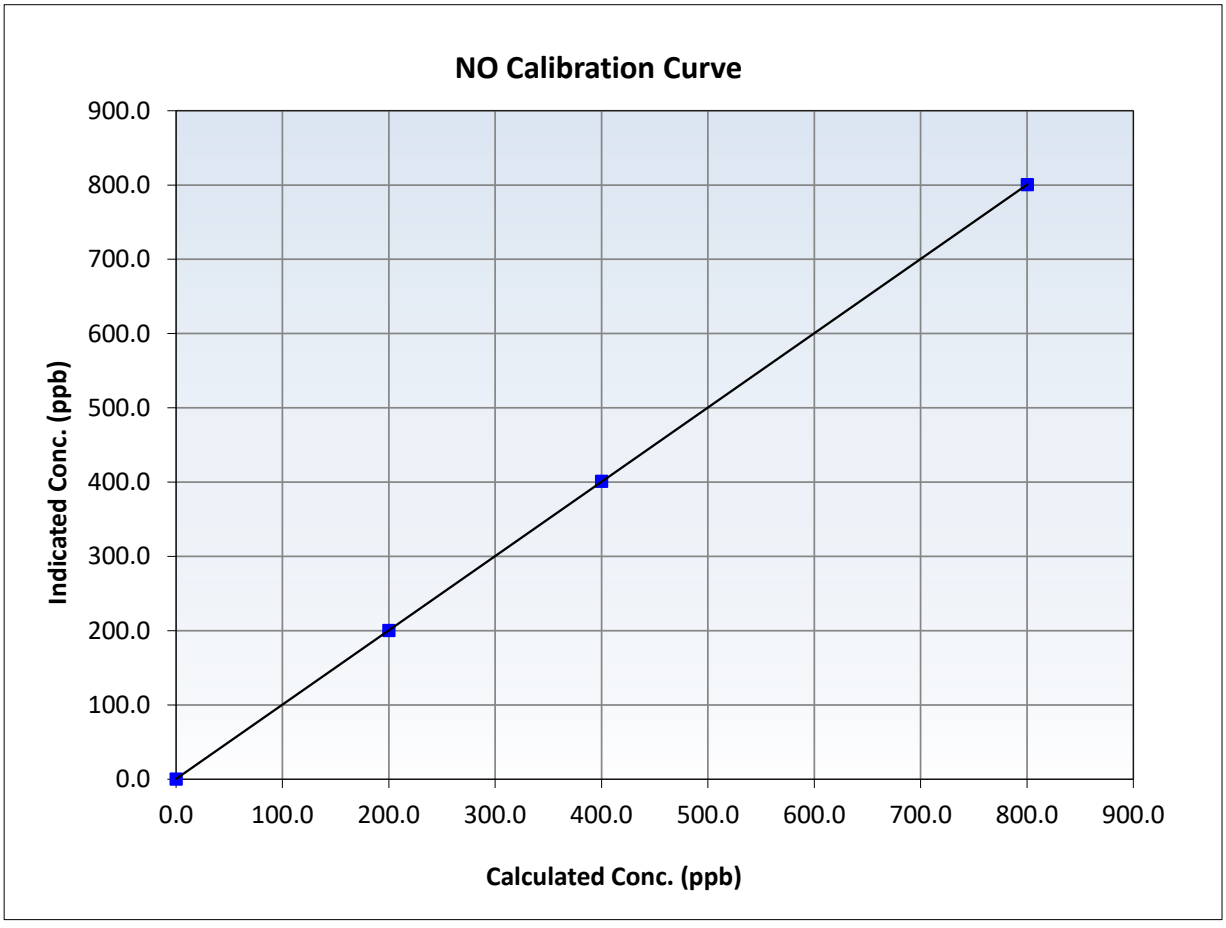
Station Information

Calibration Date:	December 16, 2024	Previous Calibration:	November 26, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:45	End Time (MST):	16:00
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

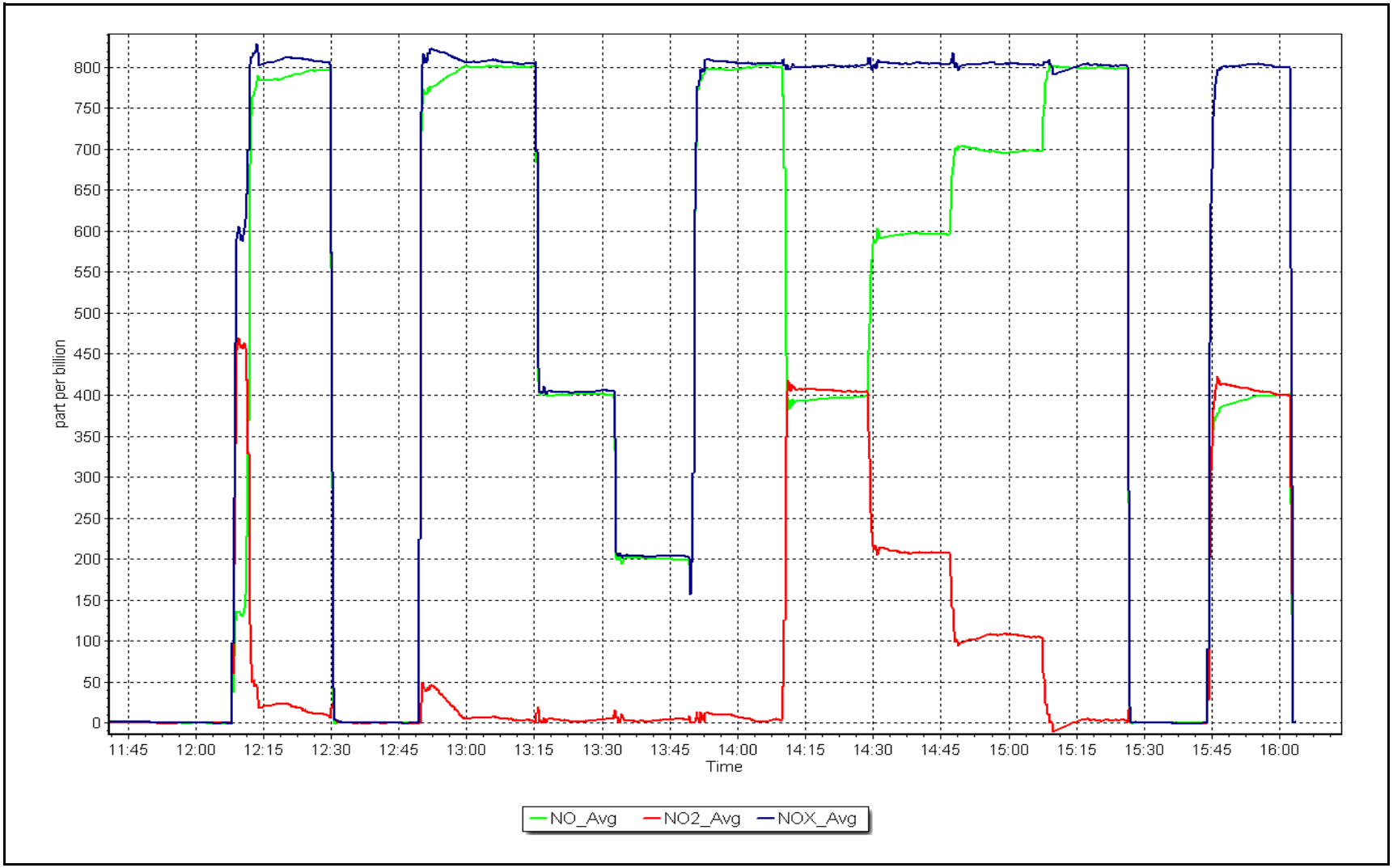
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.3	800.4	0.9999
400.1	401.1	0.9975
200.1	200.5	0.9978

Statistical Evaluation		Limits
Correlation Coefficient	0.999998	≥0.995
Slope	0.999960	0.90 - 1.10
Intercept	0.424054	+/-20



NO_X Calibration Plot Date: December 16, 2024 Location: Janvier



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	December 13, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	13:16	End time (MST):	15:55
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	3806
ZAG Make/Model:	Teledyne API T701H	Serial Number:	691

Analyzer Information

Analyzer make:	Teledyne API T400	Analyzer serial #:	7046
Analyzer Range	0 - 500 ppb		

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999771	0.996314	Backgd or Offset:	1.5	1.5
Calibration intercept:	1.440000	1.220000	Coeff or Slope:	1.011	1.011

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	-0.6	----
As found High point	5000	922.9	400.0	399.1	1.001
As found Mid point					
As found Low point					
Baseline Corr As found:	399.7	Previous response	401.3	*% change	-0.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	0.0	----
High point	5000	922.9	400.0	399.1	1.002
Mid point	5000	768.8	200.0	201.2	0.994
Low point	5000	656.1	100.0	102.0	0.980
As left zero	5000	800.0	0.0	0.7	----
As left span	5000	916.2	400.0	402.3	0.994
				Average Correction Factor	0.992

Notes: Changed the inlet filter after the as founds. No adjustments made.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

O_3 Calibration Summary

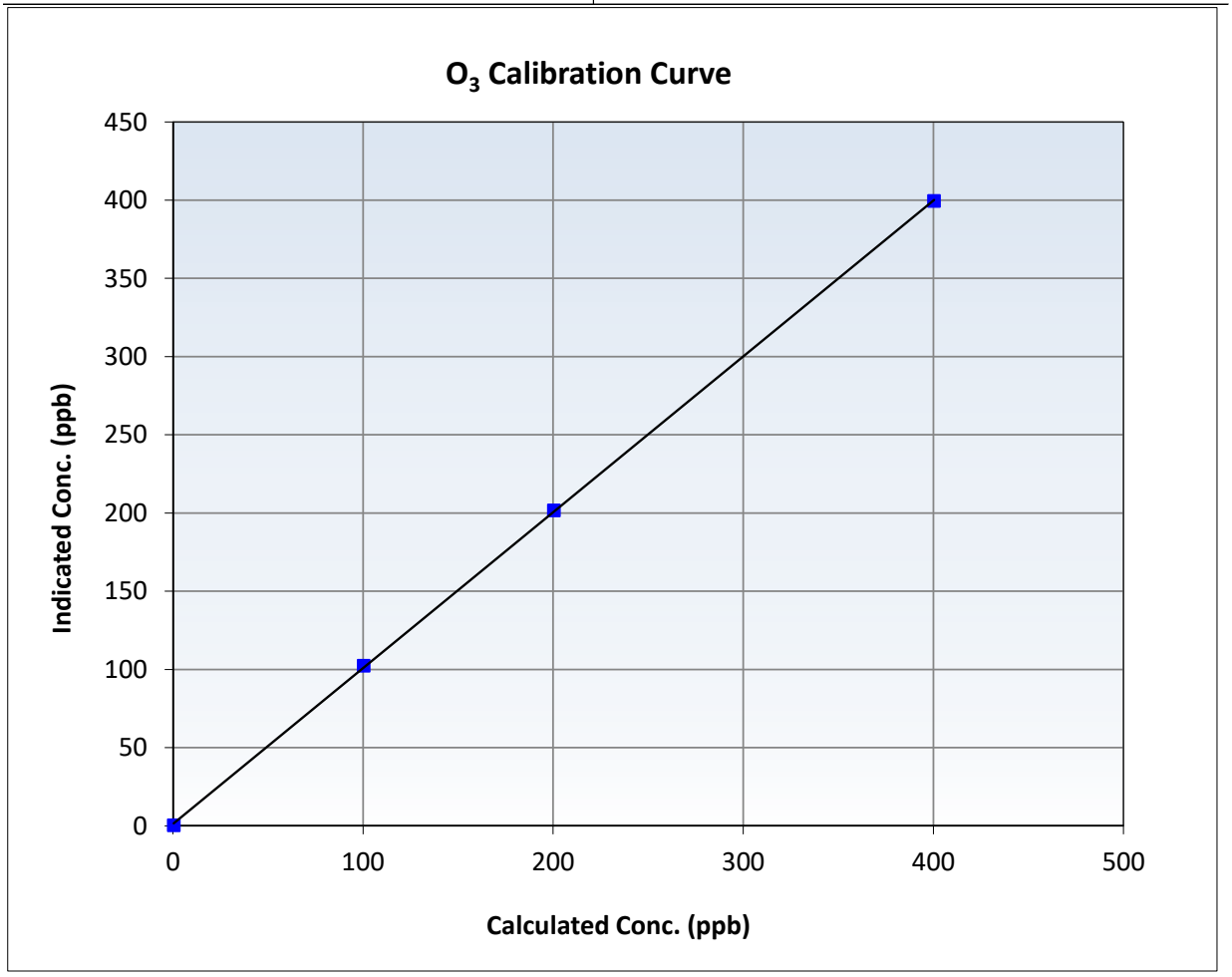
Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	November 13, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	13:16	End Time (MST):	15:55
Analyzer make:	Teledyne API T400	Analyzer serial #:	7046

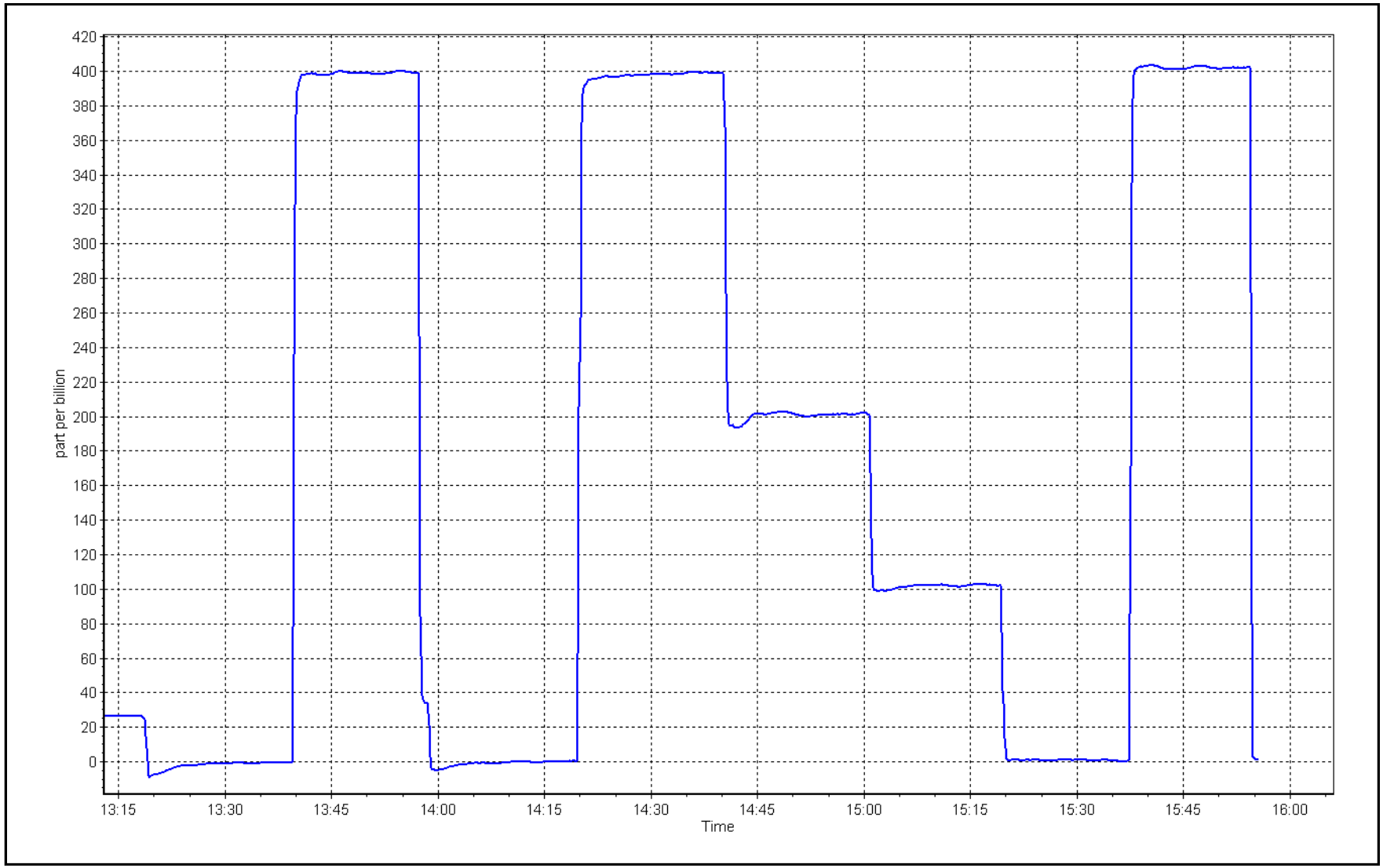
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
400.0	399.1	1.0023
200.0	201.2	0.9940
100.0	102.0	0.9804

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999957	*≥0.995*
Slope	0.996314	*0.90 - 1.10*
Intercept	1.220000	*+/- 5*



O_3 Calibration Plot Date: December 13, 2024 Location: Janvier



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	December 20, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	13:27	End time (MST):	14:35
Analyzer Make:	Teledyne API T640	S/N:	325
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388752
Temp/RH standard:	Alicat FP-25BT	S/N:	388752

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-11.3	-11.63	-11.3	☐	+/- 2 °C
P (mmHg)	717.7	718.35	717.7	☐	+/- 10 mmHg
Flow (LPM)	5.02	4.961	5.02	☐	+/- 0.25 LPM
PW% (pump)	40	-----	40	☐	>80%
Zero Verification	PM w/o HEPA:	2.5	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☑	10.9 +/- 0.5

Date Optical Chamber Cleaned: October 29, 2024

Date Disposable Filter Changed: October 29, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 29, 2024

Date RH/T Sensor Cleaned: October 29, 2024

Notes: Verified flow, temperature, and pressure. Leak checks passed.

Calibration by: Rene Chamberland

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS23
FORT HILLS
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	December 17, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	8:25	End time (MST):	12:17
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.76	ppm	Cal Gas Exp Date:	January 5, 2025
Cal Gas Cylinder #:	CC281425			
Removed Cal Gas Conc:	49.76	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	451
Zero Air Gen Model:	API T701		Serial Number:	5611

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290012	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000937	0.992885	Backgd or Offset:	18.3	18.3
Calibration intercept:	-0.623634	-0.282101	Coeff or Slope:	1.056	1.056

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4920	80.3	799.1	794.4	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	794.1	Previous response	799.2	*% change	-0.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4920	80.3	799.1	793.4	1.007
Mid point	4960	40.2	400.1	396.9	1.008
Low point	4980	20.1	200.0	197.3	1.014
As left zero	5000	0.0	0.0	0.6	----
As left span	4920	80.3	799.1	793.4	1.007
				Average Correction Factor:	1.010

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

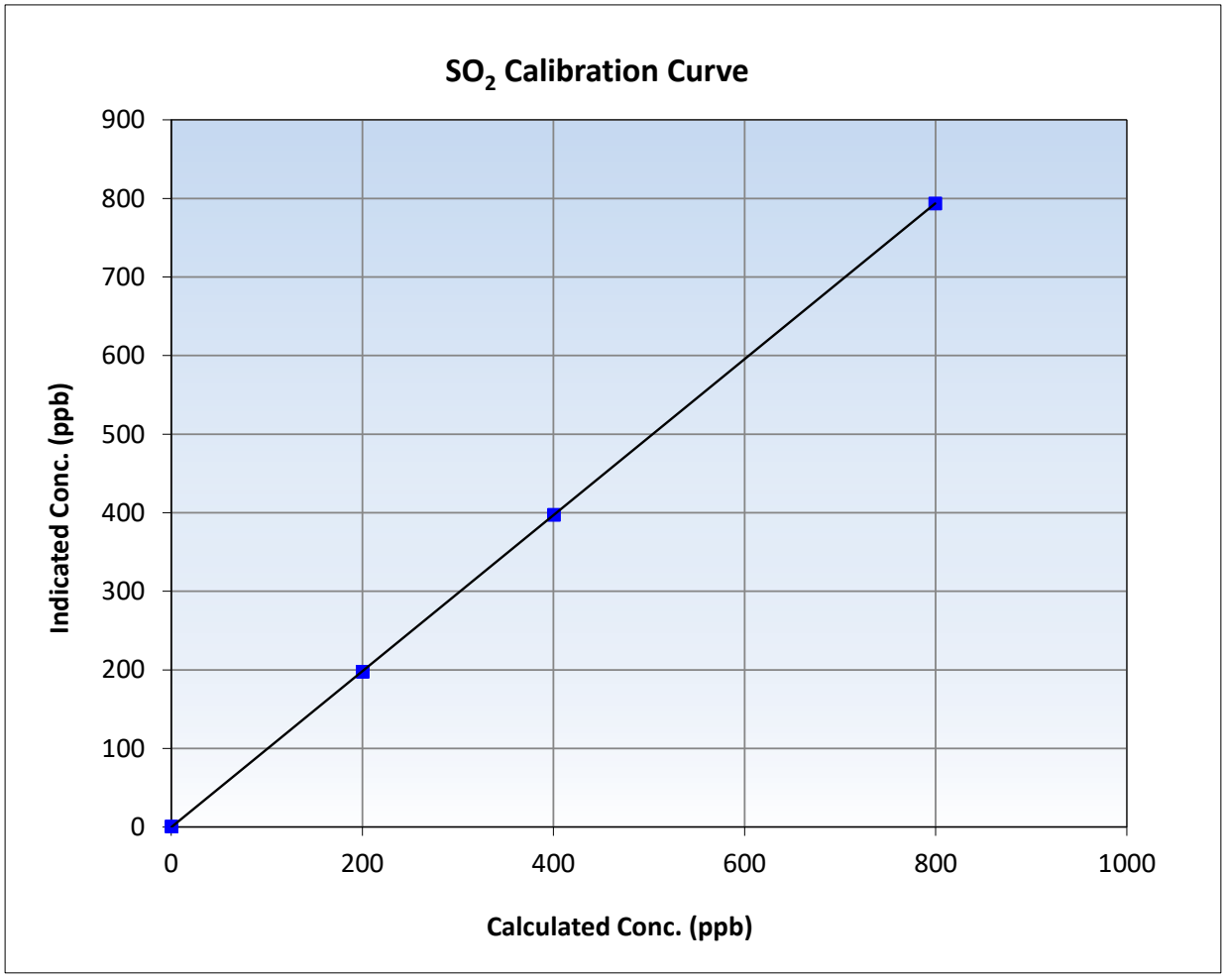
Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 21, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	8:25	End Time (MST):	12:17
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290012

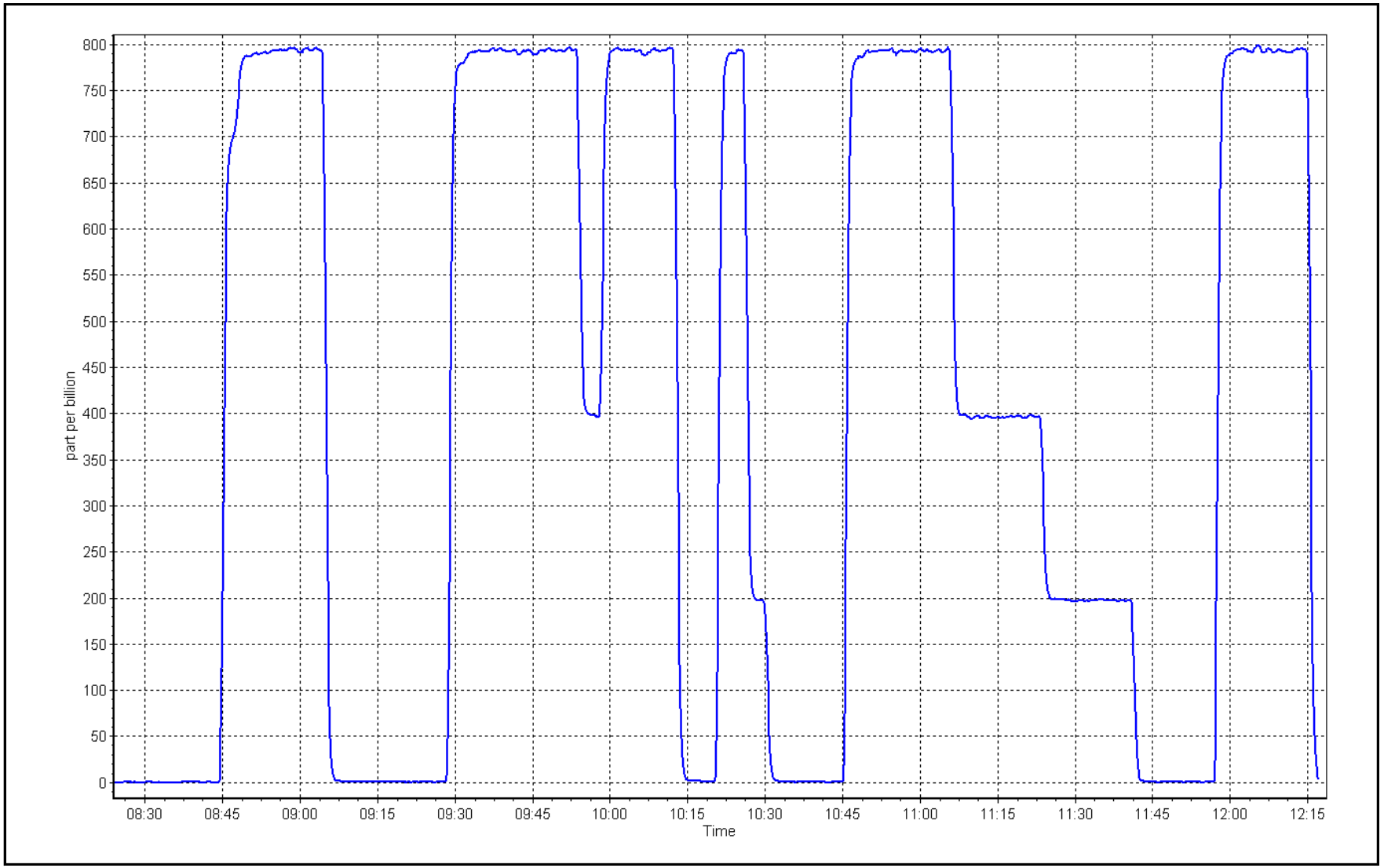
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
799.1	793.4	1.0072
400.1	396.9	1.0079
200.0	197.3	1.0138

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	0.992885	*0.90 - 1.10*
Intercept	-0.282101	*+/-30*



SO2 Calibration Plot Date: December 17, 2024 Location: Fort Hills



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	December 10, 2024	Last Cal Date:	November 1, 2024
Start time (MST):	8:00	End time (MST):	12:05
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	August 28, 2027
Cal Gas Cylinder #:	DT0021910			
Removed Cal Gas Conc:	5.20	ppm	Rem Gas Exp Date:	February 5, 2024
Removed Gas Cyl #:	CC517372		Diff between cyl:	1.3%
Calibrator Make/Model:	API T700		Serial Number:	451
ZAG Make/Model:	API T701		Serial Number:	5611

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1300156232
Converter make:	CDN-101		Converter serial #:	594
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000783	1.017684	Backgd or Offset:	2.00	2.00
Calibration intercept:	-0.198212	-0.138341	Coeff or Slope:	1.172	1.172

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4923	77.0	80.1	81.2	0.986
As found Mid point	4962	38.5	40.0	40.5	0.989
As found Low point	4981	19.2	20.0	19.9	1.003
New cylinder response	4917	82.6	80.0	82.2	0.973

Baseline Corr As found:	81.2	Prev response:	79.94	*% change:	1.5%
Baseline Corr 2nd AF pt:	40.5	AF Slope:	1.015335	AF Intercept:	-0.157857
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999980	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4917	82.6	80.0	81.4	0.982
Mid point	4959	41.3	40.0	40.3	0.992
Low point	4979	20.7	20.0	20.1	0.997
As left zero	5000	0.0	0.0	0.1	----
As left span	4923	77.0	74.5	82.6	0.902
SO2 Scrubber Check	4920	80.3	803.0	0.0	----

Date of last scrubber change:				Ave Corr Factor	0.990
Date of last converter efficiency test:		March 13, 2024		110.3%	efficiency

Notes: SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Version 02-2024

Wood Buffalo Environmental Association

TRS Calibration Summary

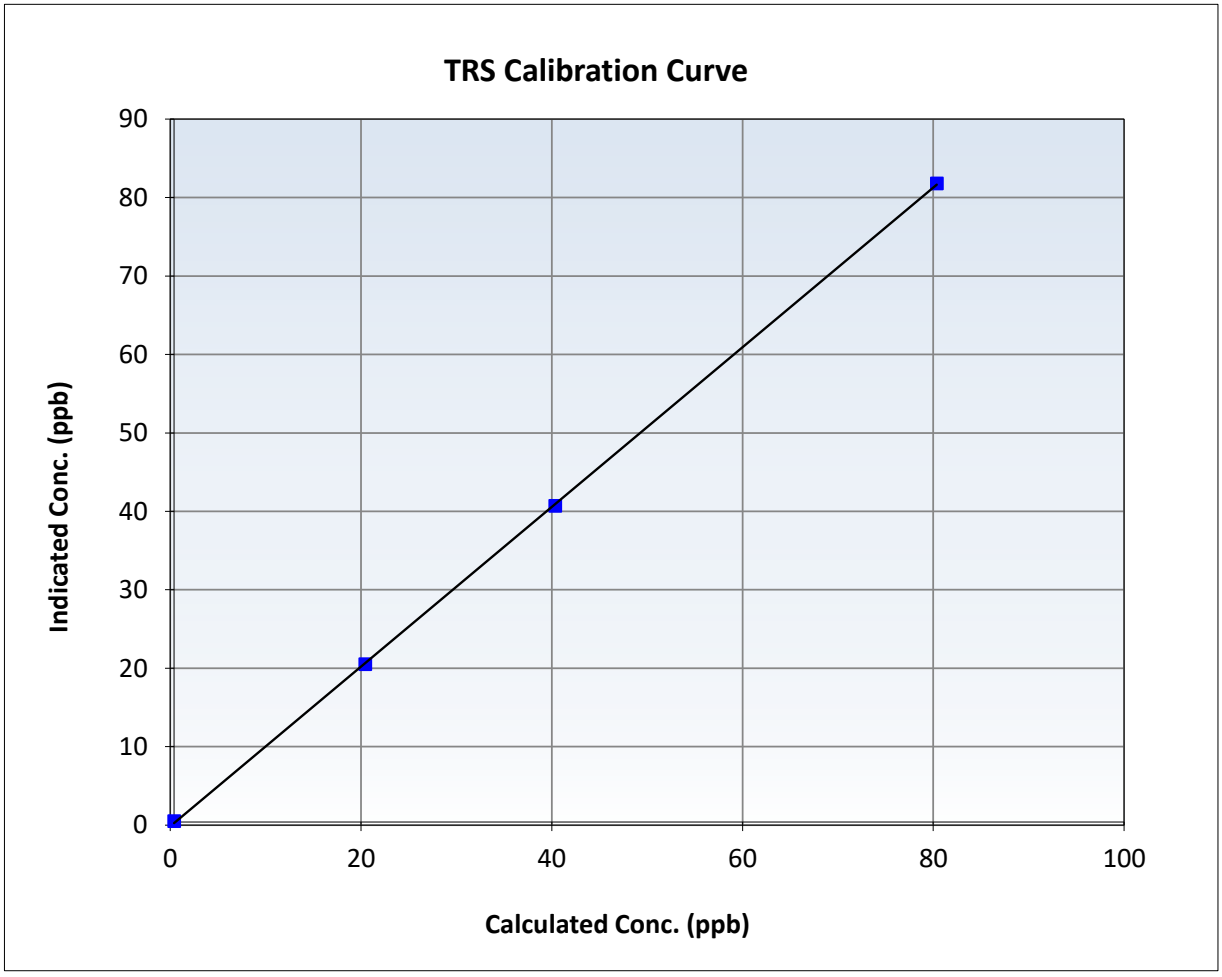
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 1, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	8:00	End Time (MST):	12:05
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1300156232

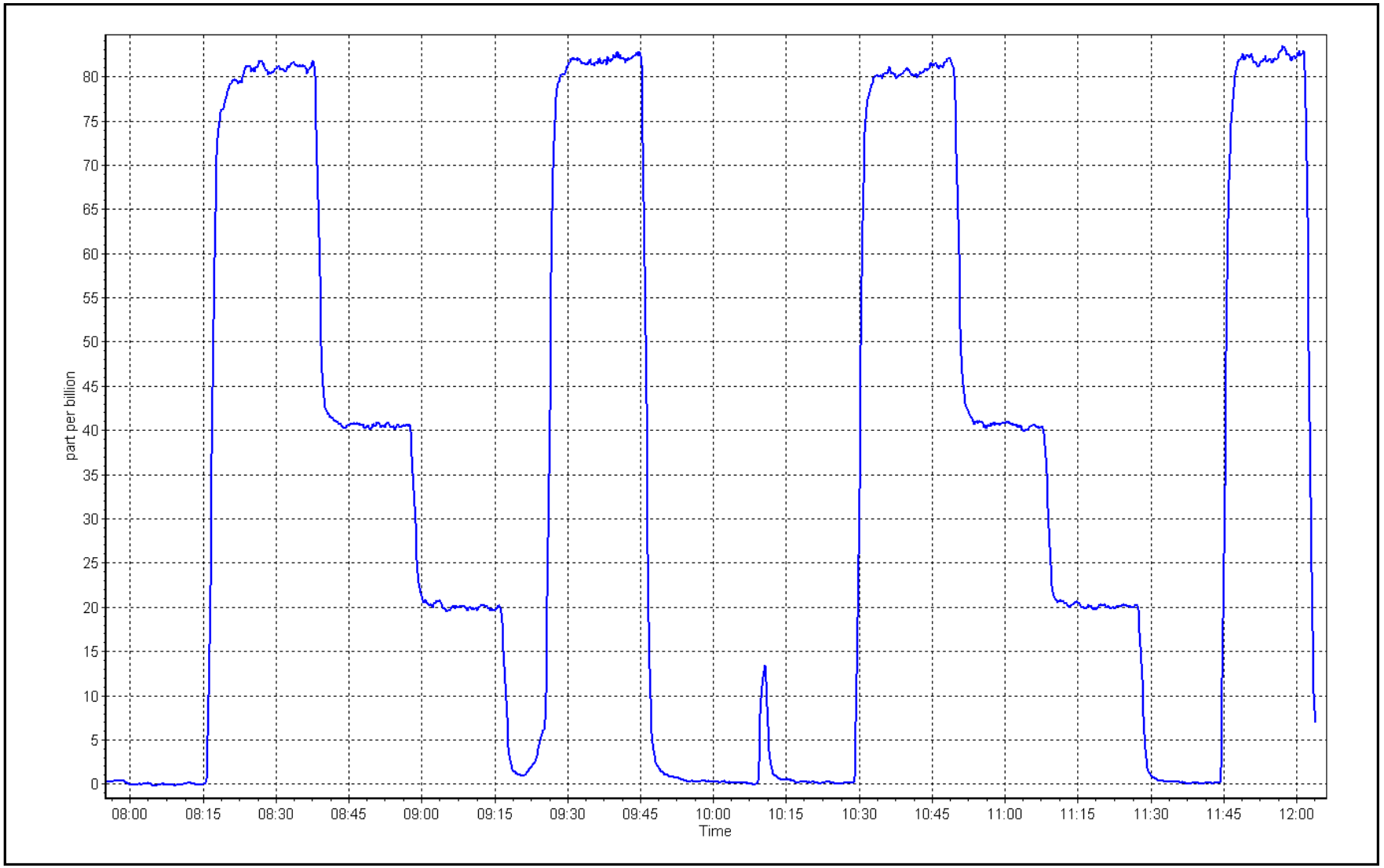
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	81.4	0.9823
40.0	40.3	0.9920
20.0	20.1	0.9970

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999954	*≥0.995*
Slope	1.017684	*0.90 - 1.10*
Intercept	-0.138341	*+/-3*



TRS Calibration Plot Date: December 10, 2024 Location: Fort Hills



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	December 12, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	8:35	End time (MST):	9:37
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC281425	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1070.6 ppm
C3H8 Cal Gas Conc.	207.4 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1070.6 ppm
Removed C3H8 Conc.	207.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	451
Zero Air Gen model:	API T701	Serial Number:	5611

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.00E-05	2.00E-05	NMHC SP Ratio:	7.19E-05	7.19E-05
CH4 Retention time:	12.0	12.0	NMHC Peak Area:	127432	127432
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.19	16.96	1.014
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.96	Prev response	17.22	*% change	-1.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.19	16.97	1.013
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor: 1.013

Notes: Nitrogen Cylinder Changed.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.16	8.96	1.023
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.96	Prev response	9.19	*% change	-2.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.16	8.97	1.021
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.021

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.03	8.00	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.00	Prev response	8.03	*% change	-0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

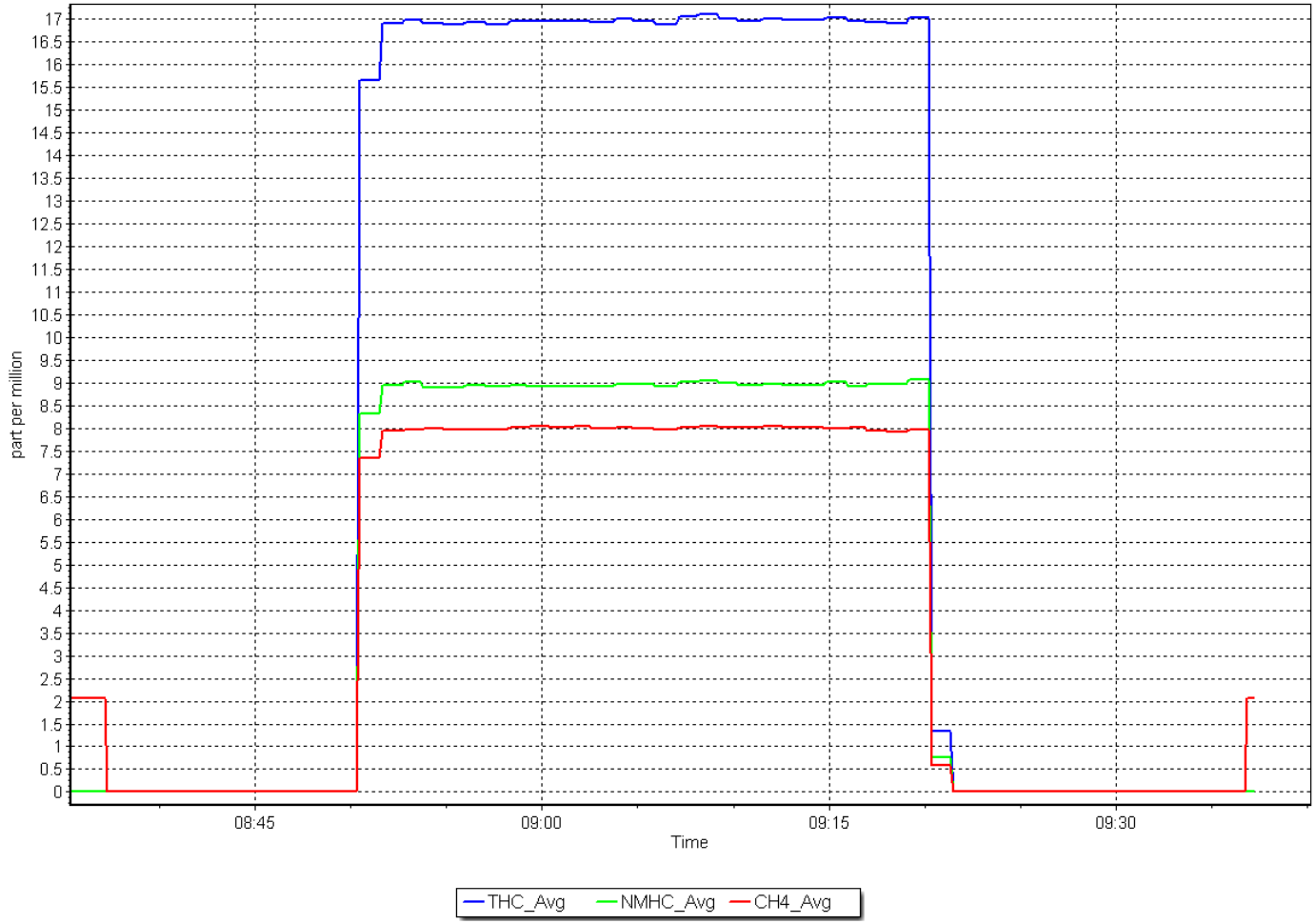
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.03	8.00	1.005
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.005

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.998719	0.986971
THC Cal Offset:	0.052792	0.000000
CH4 Cal Slope:	1.001737	0.995303
CH4 Cal Offset:	-0.013844	0.000000
NMHC Cal Slope:	0.996196	0.979445
NMHC Cal Offset:	0.065637	0.000000

Calibration Performed By: Melissa Lemay

NMHC Calibration Plot Date: December 12, 2024 Location: Fort Hills



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	December 17, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	8:25	End time (MST):	12:16
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC281425	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1070.6 ppm
C3H8 Cal Gas Conc.	207.4 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1070.6 ppm
Removed C3H8 Conc.	207.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	451
Zero Air Gen model:	API T701	Serial Number:	5611

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.00E-05	2.02E-05	NMHC SP Ratio:	7.19E-05	7.43E-05
CH4 Retention time:	12.0	12.0	NMHC Peak Area:	127432	122718
Zero Chromatogram:	OFF	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.19	16.80	1.023
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.80	Prev response	17.22	*% change	-2.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.19	17.14	1.003
Mid point	4960	40.2	8.61	8.56	1.006
Low point	4980	20.1	4.30	4.26	1.010
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.19	17.15	1.003
				Average Correction Factor	1.006

Notes: Linear issues on NM channel. Zero chromatogram turned to ON. Zero and span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.16	8.79	1.042
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.79	Prev response	9.19	*% change	-4.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.16	9.08	1.009
Mid point	4960	40.2	4.59	4.57	1.004
Low point	4980	20.1	2.29	2.29	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.16	9.10	1.006
				Average Correction Factor	1.005

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.03	8.01	1.002
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.01	Prev response	8.03	*% change	-0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.03	8.06	0.997
Mid point	4960	40.2	4.02	3.99	1.008
Low point	4980	20.1	2.01	1.97	1.019
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.03	8.05	0.998
				Average Correction Factor	1.008

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.998719	0.997331
THC Cal Offset:	0.052792	-0.015765
CH4 Cal Slope:	1.001737	1.004381
CH4 Cal Offset:	-0.013844	-0.026641
NMHC Cal Slope:	0.996196	0.991173
NMHC Cal Offset:	0.065637	0.010277

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

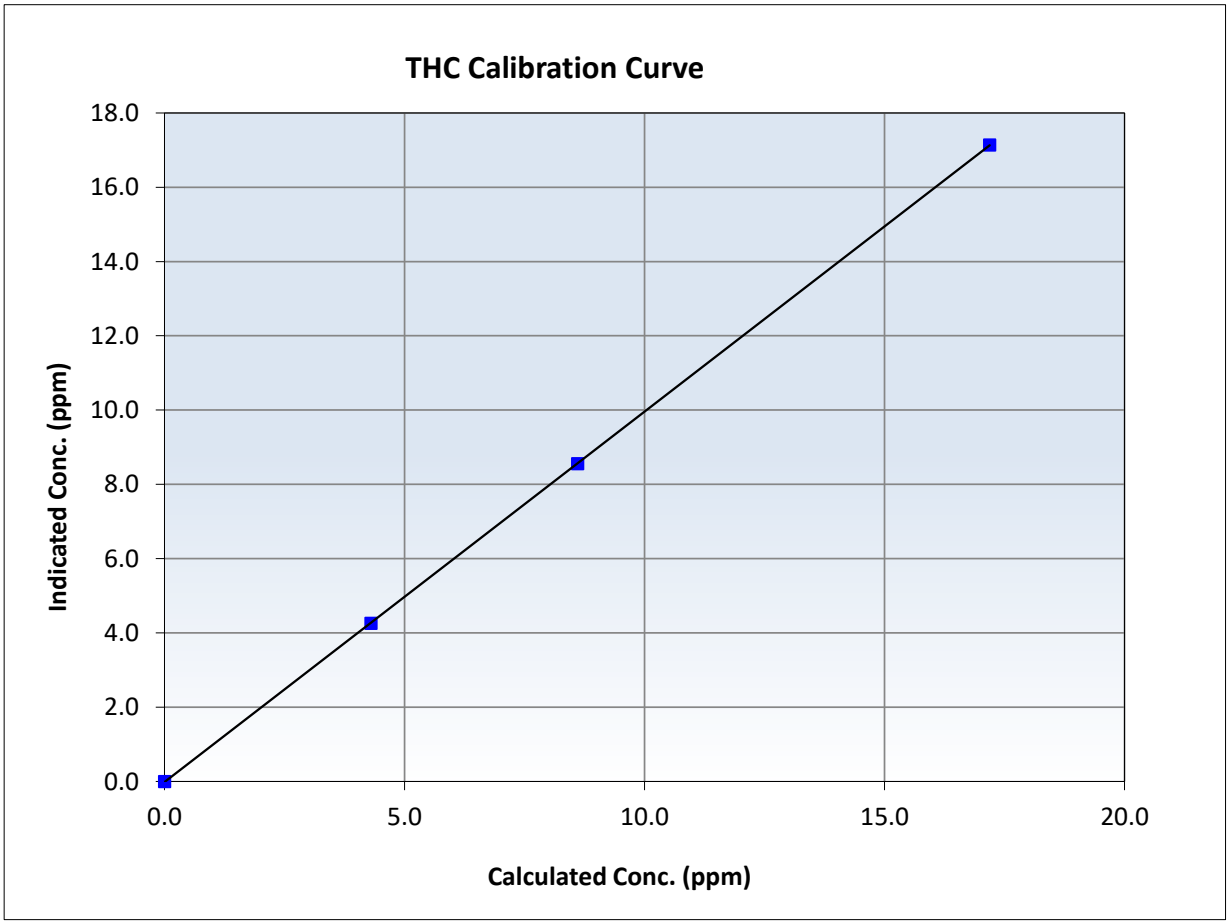
THC Calibration Summary

Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 21, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	8:25	End Time (MST):	12:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999996	≥0.995
17.19	17.14	1.0031	Slope	0.997331	0.90 - 1.10
8.61	8.56	1.0057			
4.30	4.26	1.0097	Intercept	-0.015765	+/-0.5



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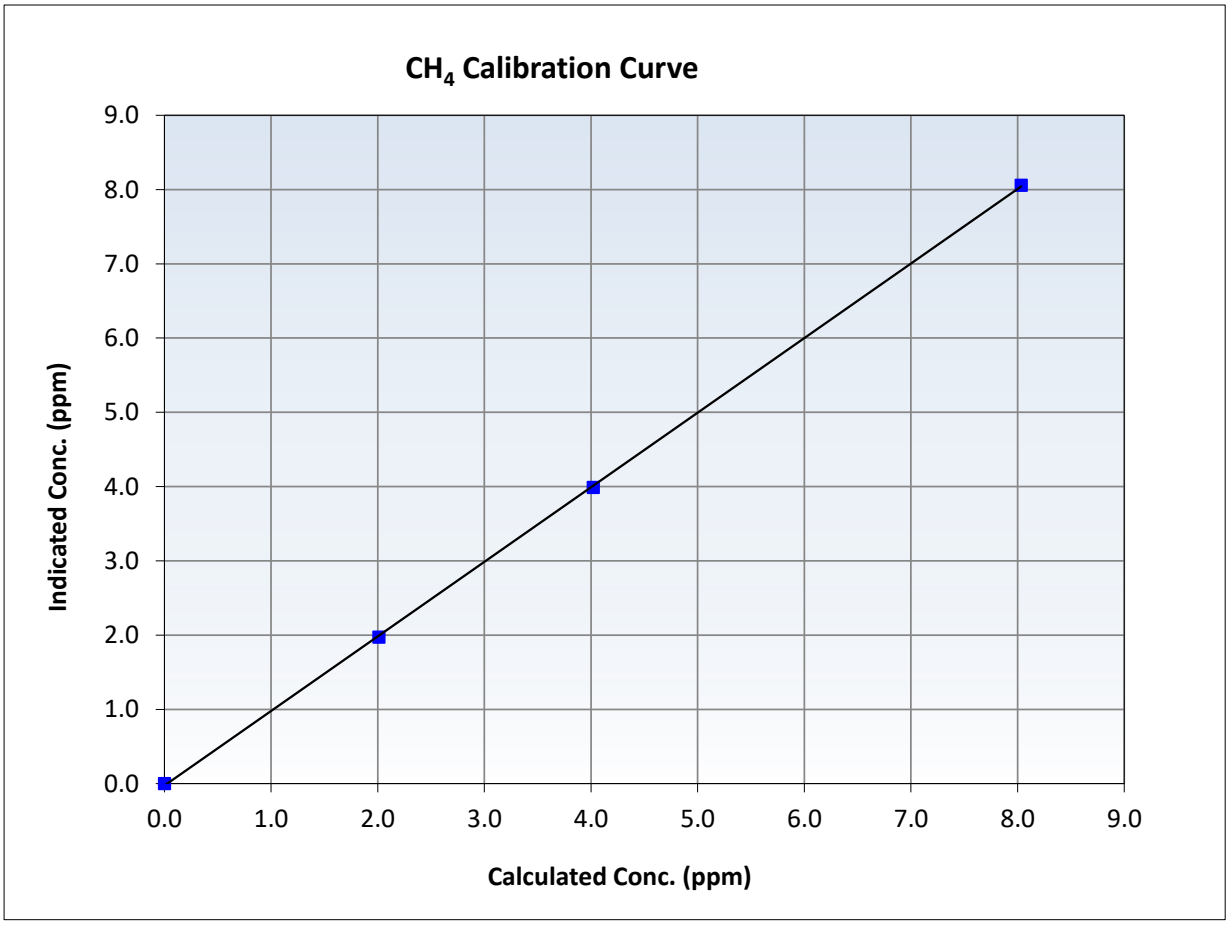
CH_4 Calibration Summary

Station Information

Calibration Date:	December 17, 2024	Previous Calibration:	November 21, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	8:25	End Time (MST):	12:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999946	≥0.995
8.03	8.06	0.9969	Slope	1.004381	0.90 - 1.10
4.02	3.99	1.0081			
2.01	1.97	1.0191	Intercept	-0.026641	+/-0.5



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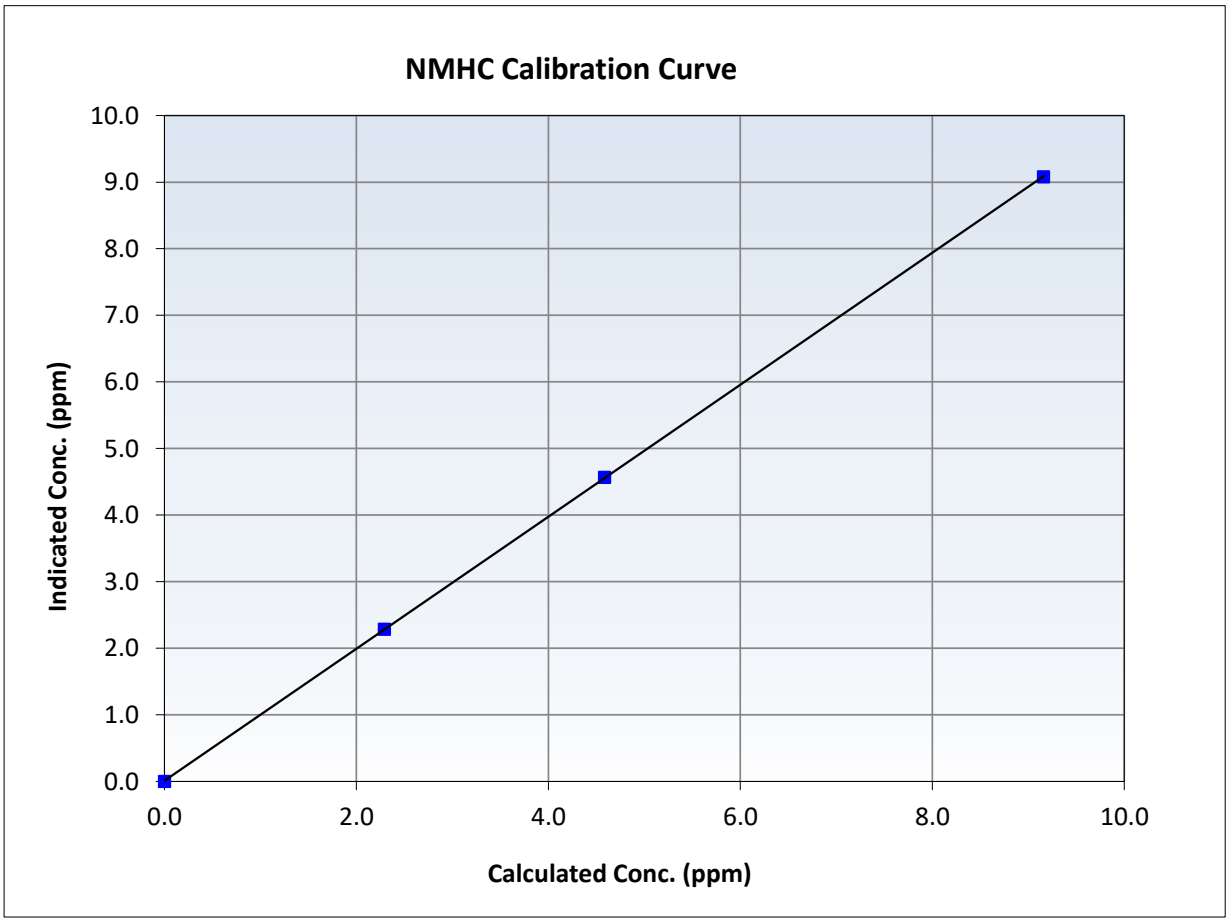
NMHC Calibration Summary

Station Information

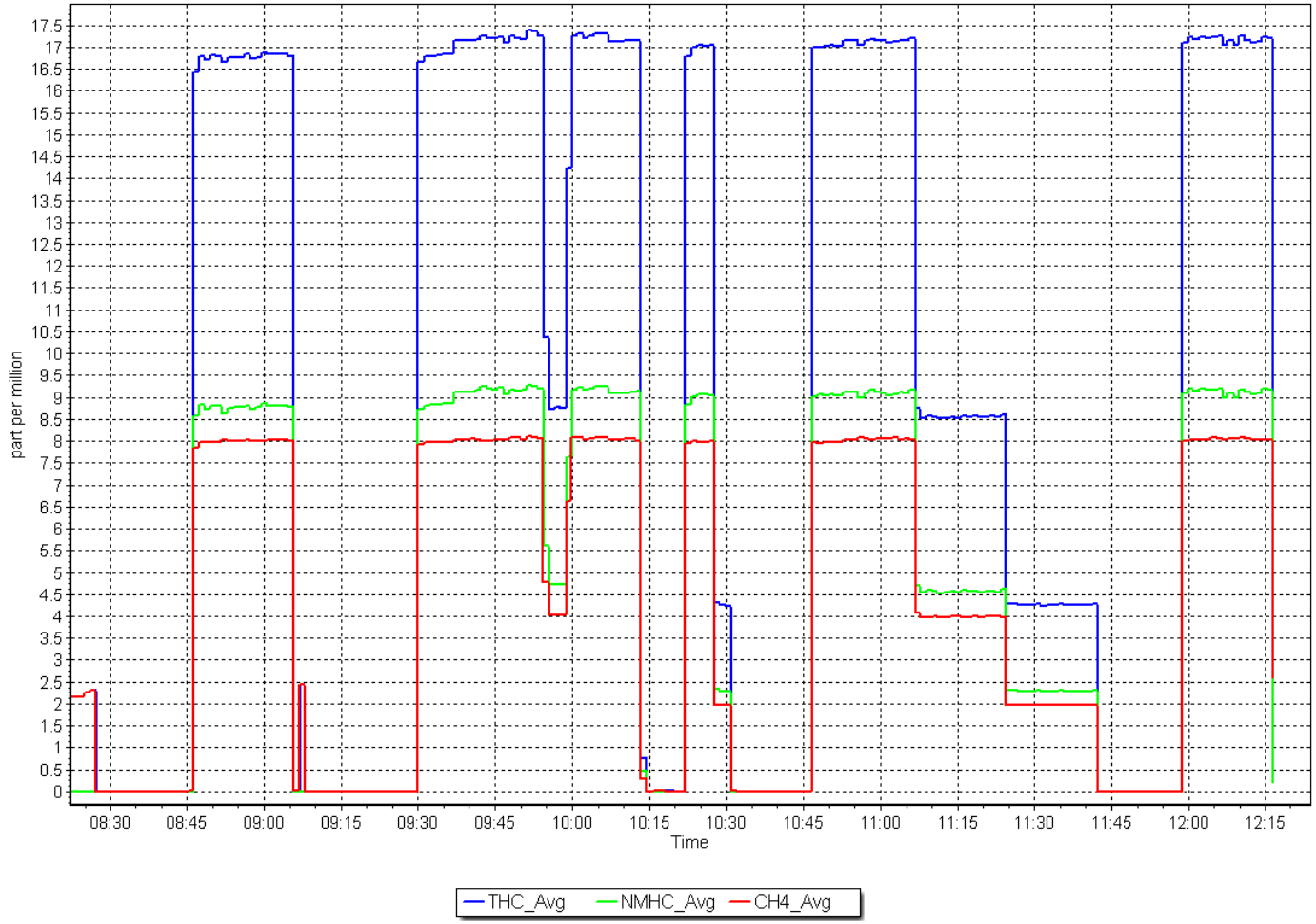
Calibration Date:	December 17, 2024	Previous Calibration:	November 21, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	8:25	End Time (MST):	12:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999992	*≥0.995*
9.16	9.08	1.0086	Slope	0.991173	*0.90 - 1.10*
4.59	4.57	1.0038			
2.29	2.29	1.0021	Intercept	0.010277	*+/-0.5*



NMHC Calibration Plot Date: December 17, 2024 Location: Fort Hills



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort Hills
Station number:	AMS 23
Calibration Date:	December 12, 2024
Last Cal Date:	November 4, 2024
Start time (MST):	9:35
End time (MST):	12:03
Reason:	As Found

Calibration Standards

NO Gas Cylinder #:	CC358149	Cal Gas Expiry Date:	January 5, 1932
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	451
ZAG make/model:	API T701	Serial Number:	5611

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.1	-0.2	----	----
AF High point	4934	66.3	799.5	796.9	2.7	730.4	727.0	3.4	1.0942	1.0960
AF Mid point	4967	33.2	400.4	399.0	1.3	367.0	363.9	3.1	1.0901	1.0963
AF Low point	4983	16.6	200.2	199.5	0.7	183.4	180.1	3.3	1.0899	1.1074
New cyl resp										

Previous Response	NO_X = 798.5 ppb	NO = 798.2 ppb
Baseline Corr 1st pt	NO_X = 730.7 ppb	NO = 727.1 ppb
Baseline Corr 2nd pt	NO_X = 367.3 ppb	NO = 364.0 ppb
Baseline Corr 3rd pt	NO_X = 183.7 ppb	NO = 180.2 ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -9.3%

*Percent Change NO = -9.8%

As Found Statistics

As found	NO_X r^2: 0.999995	Nx Sl: 0.913802	Nx Int: 0.267
As found	NO r^2: 0.999992	NO Sl: 0.913226	NO Int: -0.871
As found	NO_2 r^2: 0.999997	NO2 Sl: 0.997840	NO_2 Int: 0.079

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero	----	----	0.0	-0.2	----	----
As found high GPT point	730.5	370.5	362.7	361.8	1.0024	99.8%
As found mid GPT point	730.5	551.3	181.9	181.7	1.0008	99.9%
As found low GPT point	730.5	642.0	91.2	91.3	0.9984	100.2%

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
Serial Number: 1152430007
NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.327	1.327	NO bkgnd or offset:	4.0	4.0
NOX coeff or slope:	0.990	0.990	NOX bkgnd or offset:	4.2	4.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	212.1	212.1

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.999069	
NO_X Cal Offset:	-0.253684	
NO Cal Slope:	1.003782	
NO Cal Offset:	-1.713073	
NO_2 Cal Slope:	0.994533	
NO_2 Cal Offset:	-1.185414	

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero										
High point										
Mid point										
Low point										
As left zero										
As left span										
								Average Correction Factor		

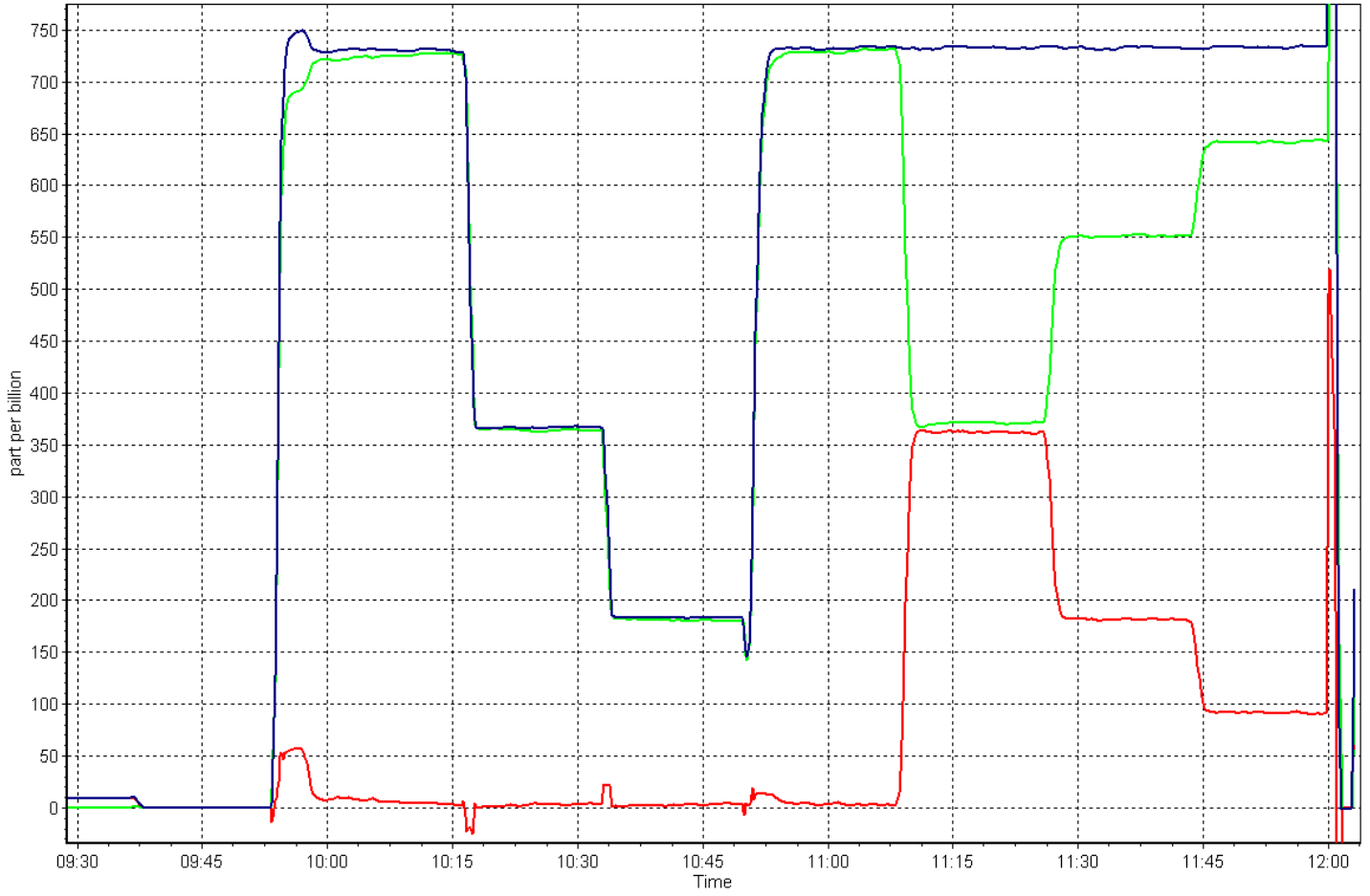
GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero						
High GPT point						
Mid GPT point						
Low GPT point						
				Average Correction Factor		

Notes: As founds to change the pump and charcoal.

Calibration Performed By: Melissa Lemay

NO_X Calibration Plot Date: December 12, 2024 Location: Fort Hills



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort Hills
Station number:	AMS 23
Calibration Date:	December 13, 2024
Last Cal Date:	December 12, 2024
Start time (MST):	7:32
End time (MST):	11:11
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC358149	Cal Gas Expiry Date:	January 5, 1932
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	451
ZAG make/model:	API T701	Serial Number:	5611

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X =	NA
Baseline Corr 1st pt	NO_X = NA	ppb	NO = NA	ppb	As Found Statistics	*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO r^2:	NO Sl:	NO Int:	
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1152430007

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.327	0.955	NO bkgnd or offset:	4.0	2.9
NOX coeff or slope:	0.990	0.999	NOX bkgnd or offset:	4.2	3.1
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	145.3	145.3

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.999069	0.999069
NO_X Cal Offset:	-0.253684	-0.253684
NO Cal Slope:	1.003782	1.003782
NO Cal Offset:	-1.713073	-1.713073
NO_2 Cal Slope:	0.994533	0.994533
NO_2 Cal Offset:	-1.185414	-1.185414

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.2	----	----
High point	4934	66.3	799.5	796.9	2.7	798.0	797.8	0.2	1.0019	0.9988
Mid point	4967	33.2	400.4	399.0	1.3	399.4	397.2	2.2	1.0024	1.0047
Low point	4983	16.6	200.2	199.5	0.7	199.4	196.4	3.0	1.0041	1.0160
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	----	----
As left span	4934	66.3	799.5	404.0	395.5	790.8	404.0	386.9	1.0110	1.0000
							Average Correction Factor		1.0028	1.0065

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.2	----	----
High GPT point	789.8	405.4	387.1	386.8	1.0007	99.9%
Mid GPT point	789.8	597.9	194.6	193.6	1.0049	99.5%
Low GPT point	789.8	693.8	98.7	96.0	1.0276	97.3%
				Average Correction Factor	1.0111	98.9%

Notes: Calibration after pump and charcoal replaced. Span adjusted. Due to drifting during the GPT the 2nd NO ref point was used.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

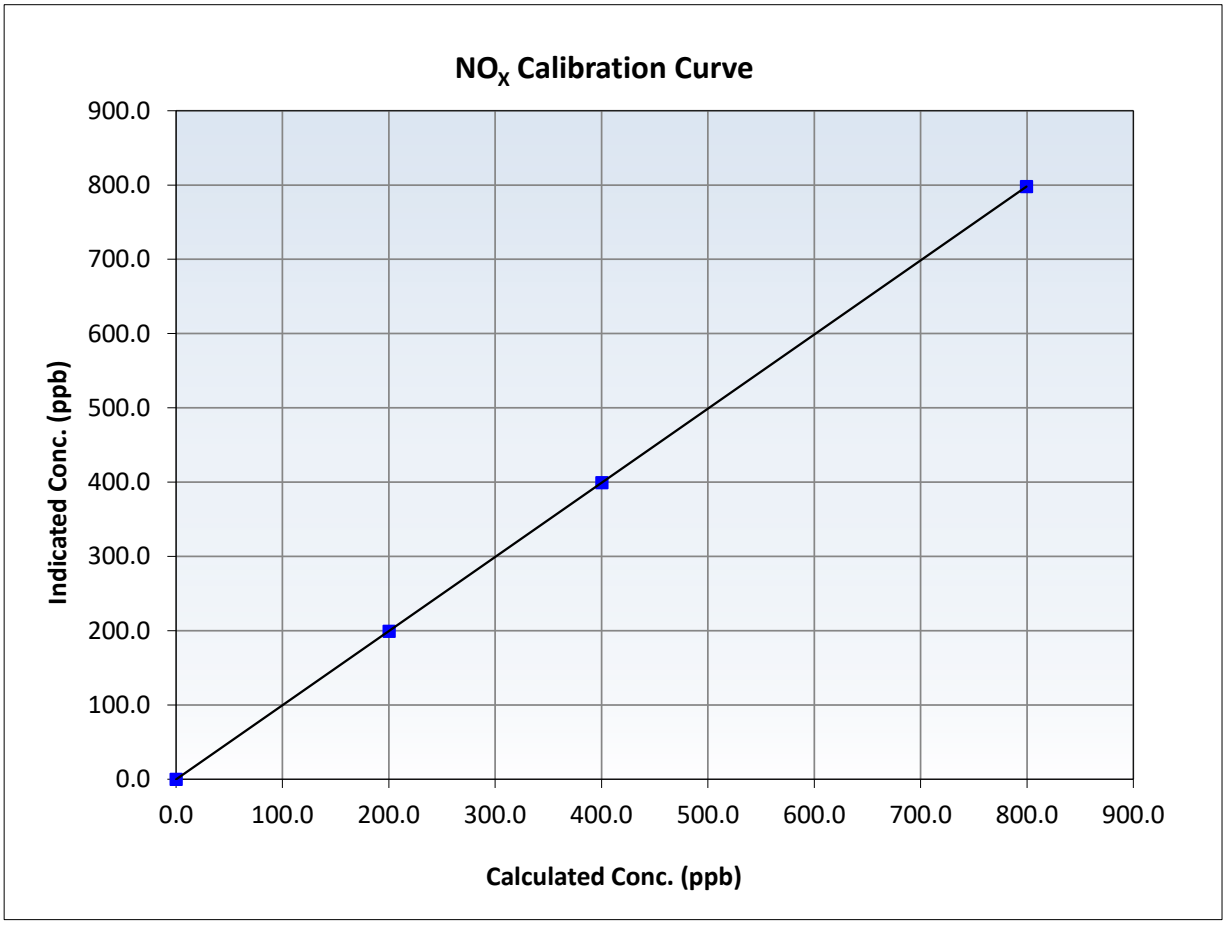
Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	December 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:32	End Time (MST):	11:11
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.5	798.0	1.0019
400.4	399.4	1.0024
200.2	199.4	1.0041

Statistical Evaluation		Limits
Correlation Coefficient	1.000000	≥0.995
Slope	0.998240	0.90 - 1.10
Intercept	-0.213435	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

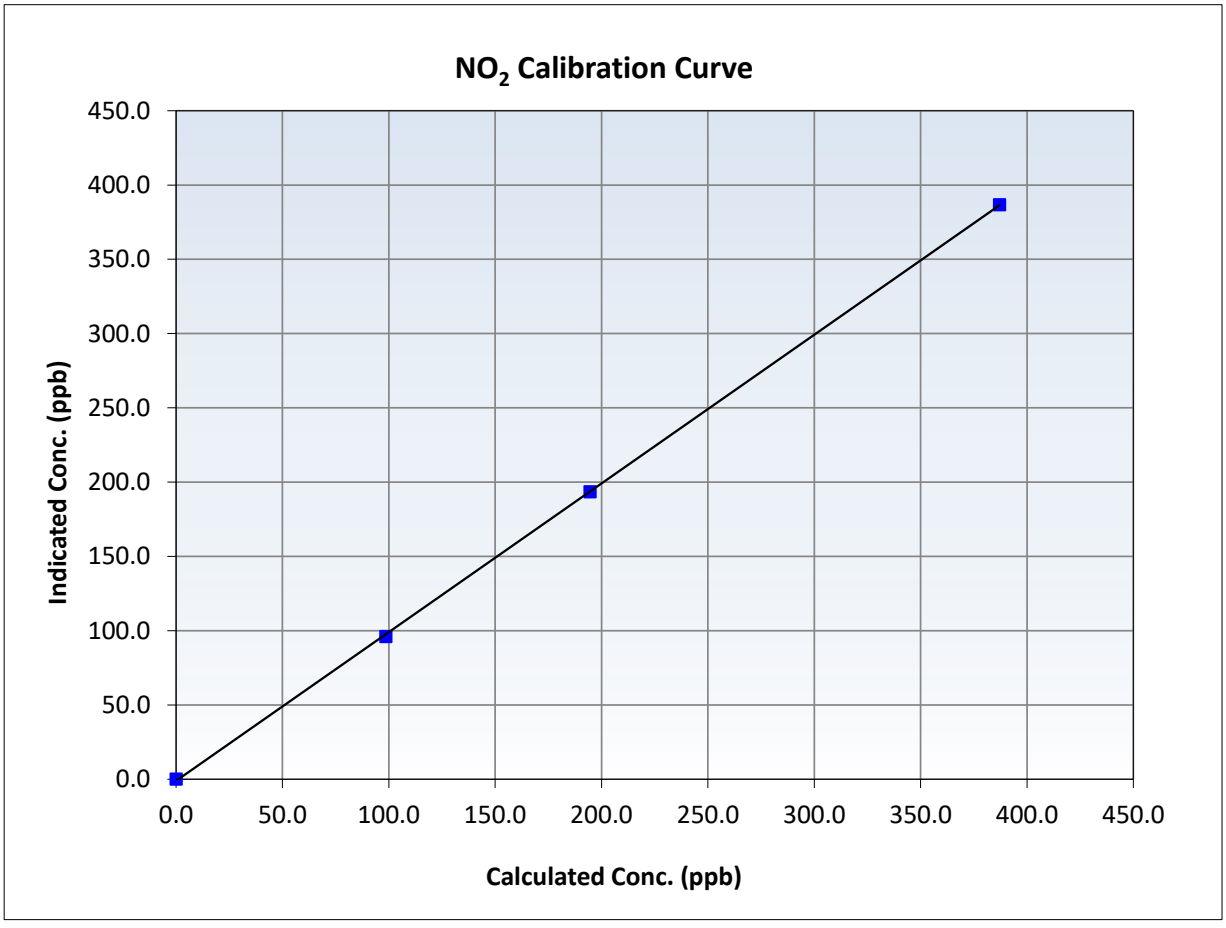
Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	December 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:32	End Time (MST):	11:11
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
387.1	386.8	1.0007
194.6	193.6	1.0049
98.7	96.0	1.0276

Statistical Evaluation		Limits
Correlation Coefficient	0.999943	≥0.995
Slope	1.000947	0.90 - 1.10
Intercept	-1.074996	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

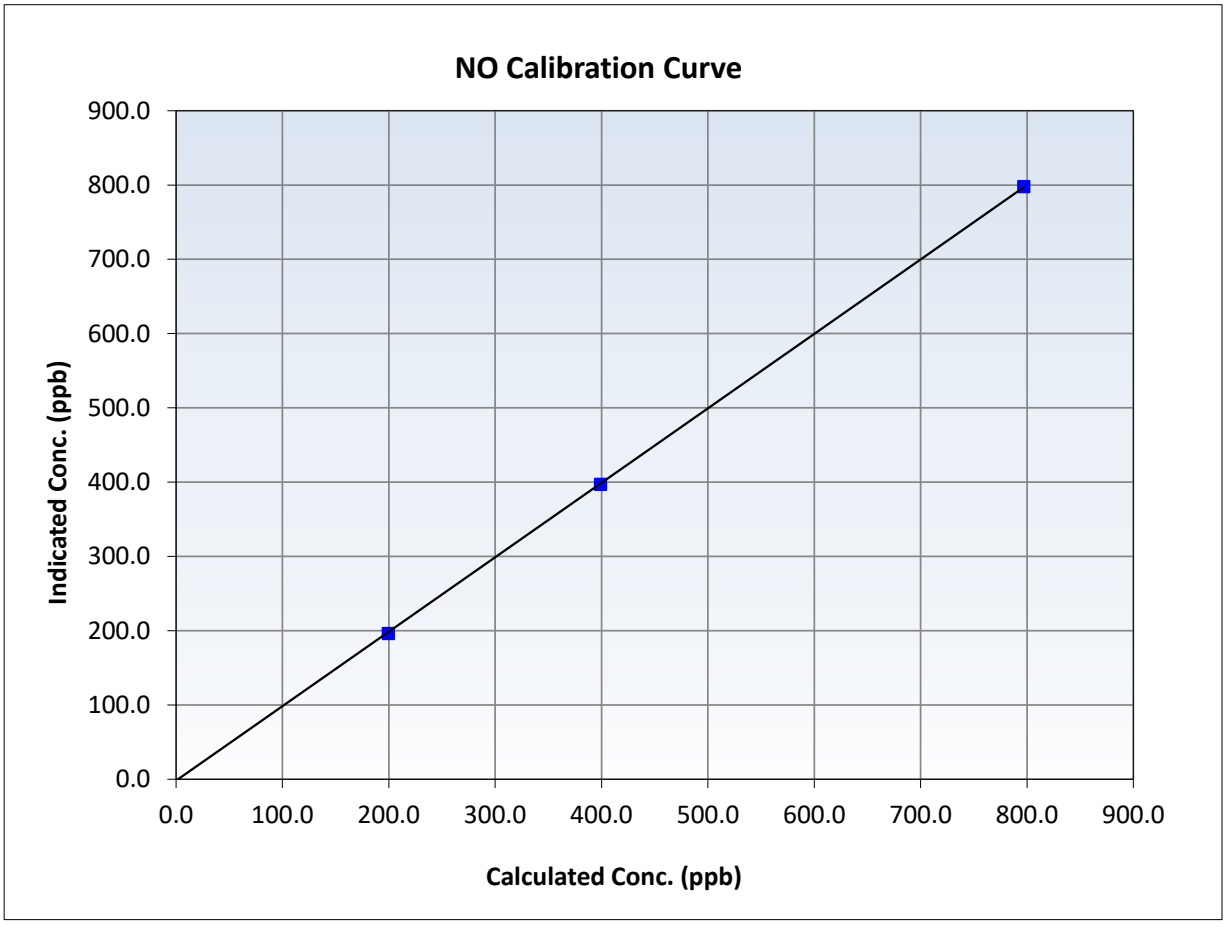
Station Information

Calibration Date:	December 13, 2024	Previous Calibration:	December 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:32	End Time (MST):	11:11
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

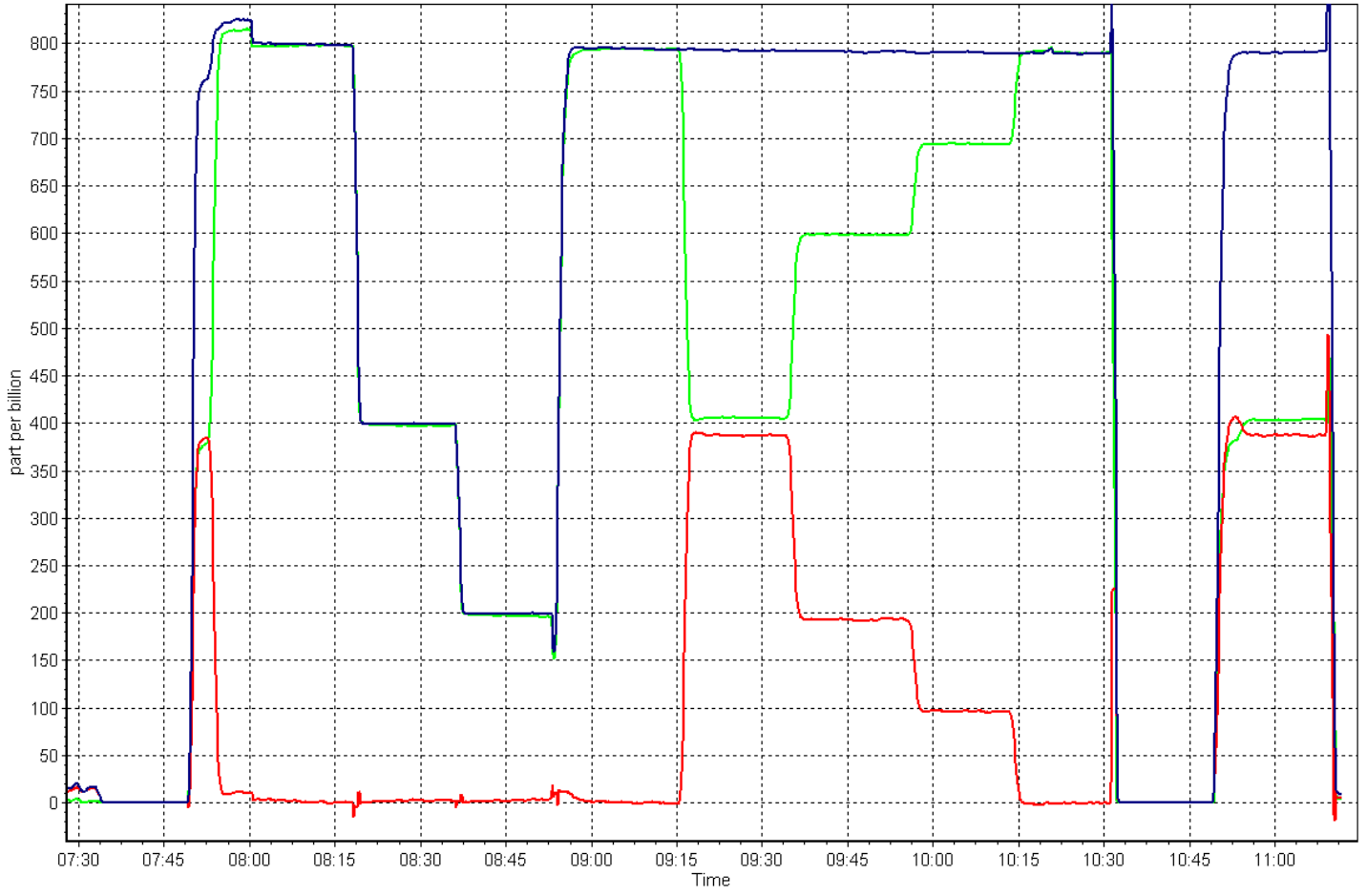
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
796.9	797.8	0.9988
399.0	397.2	1.0047
199.5	196.4	1.0160

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999977	*≥0.995*
Slope	1.002376	*0.90 - 1.10*
Intercept	-1.872616	*+/-20*



NO_X Calibration Plot Date: December 13, 2024 Location: Fort Hills



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	December 17, 2024	Last Cal Date:	November 17, 2024
Start time (MST):	7:57	End time (MST):	8:30
Analyzer Make:	API T640	S/N:	320
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388744
Temp/RH standard:	Alicat FP-25BT	S/N:	388744

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-26.4	-27.4	-26.4	☐	+/- 2 °C
P (mmHg)	749.9	749.4	749.9	☐	+/- 10 mmHg
Flow (LPM)	5.00	4.93	5.00	☐	+/- 0.25 LPM
PW% (pump)	39	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	2.2	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 10-Jun-24 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: November 21, 2024

Date Disposable Filter Changed: November 21, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 17, 2023

Date RH/T Sensor Cleaned: October 17, 2023

Notes: No adjustments done.

Calibration by: Melissa Lemay

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS25
WASKŌW OHCI PIMÂTISIWIN
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Waskow ohci Pimatisiwin	Station number:	AMS 25
Calibration Date:	December 20, 2024	Last Cal Date:	November 28, 2024
Start time (MST):	7:16	End time (MST):	10:07
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.70	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC342445			
Removed Cal Gas Conc:	49.70	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	747
Zero Air Gen Model:	API T701		Serial Number:	4765

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1118148497	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999070	0.998456	Backgd or Offset:	11.6	11.8
Calibration intercept:	-0.112739	-0.372807	Coeff or Slope:	1.062	1.071

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4920	80.5	800.1	791.3	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	791.5	Previous response	799.2	*% change	-1.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4920	80.5	800.1	798.6	1.002
Mid point	4960	40.2	399.6	398.5	1.003
Low point	4980	20.1	199.8	198.8	1.005
As left zero	5000	0.0	0.0	0.0	----
As left span	4920	80.5	800.1	799.6	1.001
				Average Correction Factor:	1.003

Notes: No Maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Summary

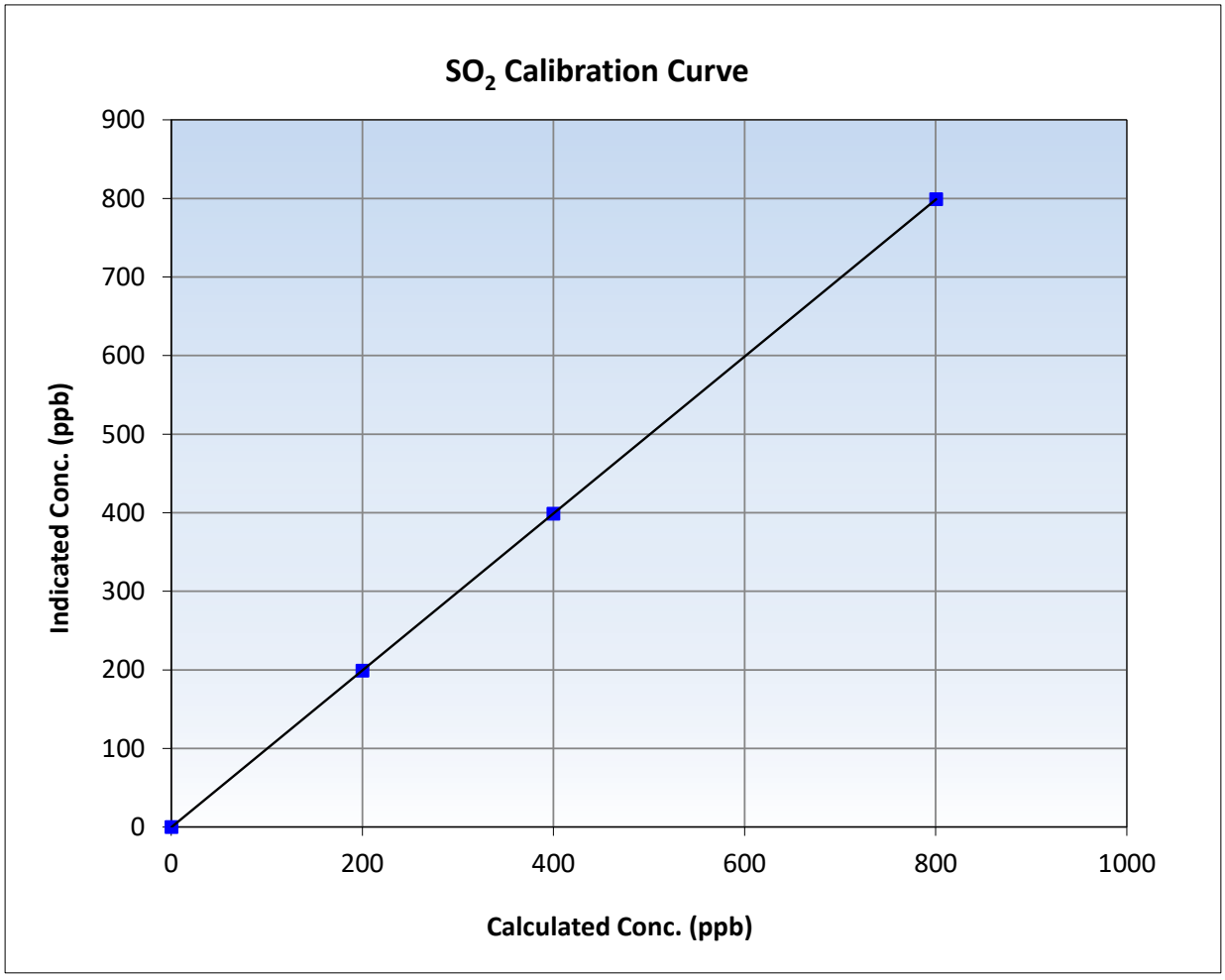
Station Information

Calibration Date:	December 20, 2024	Previous Calibration:	November 28, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	7:16	End Time (MST):	10:07
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148497

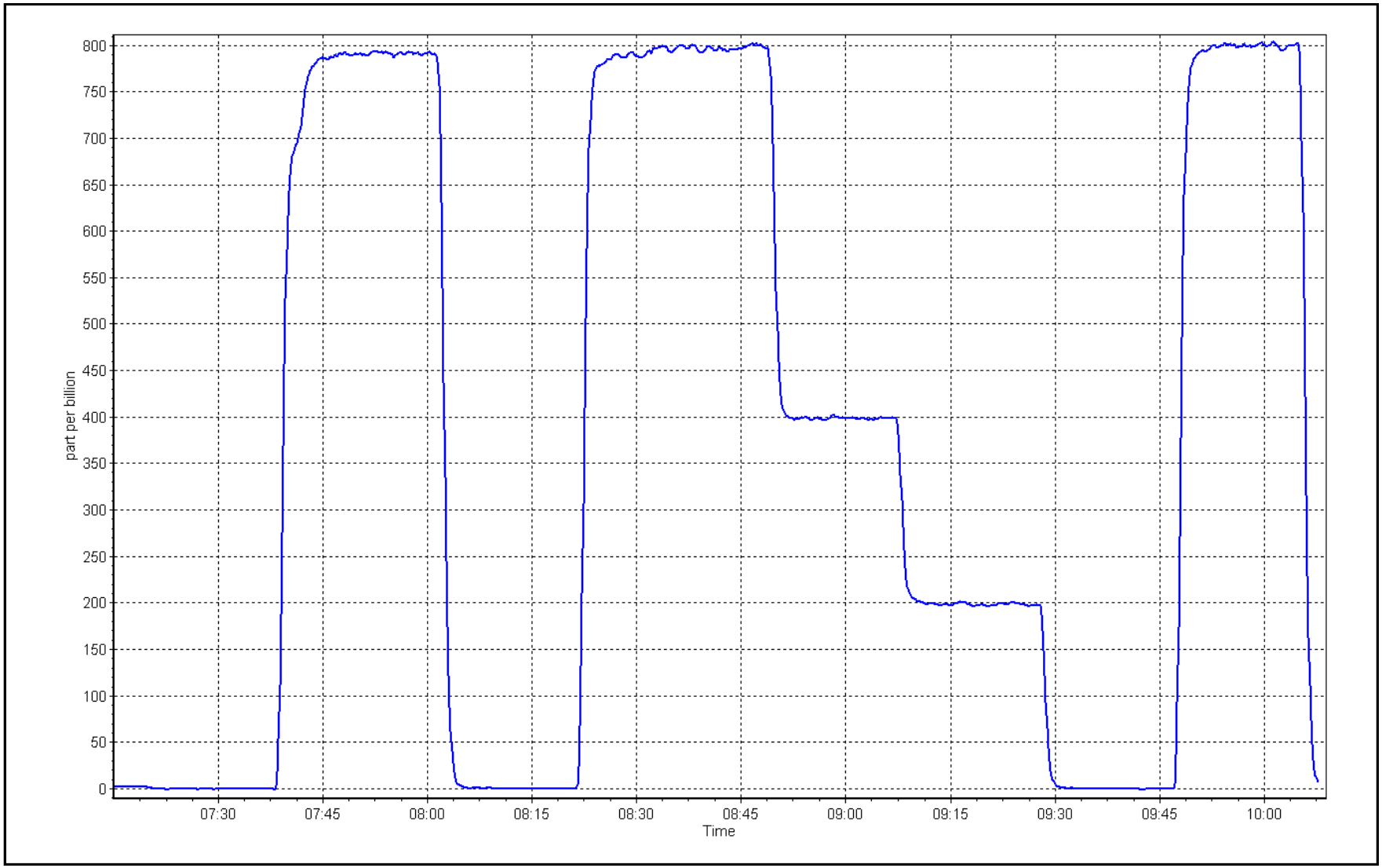
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
800.1	798.6	1.0019
399.6	398.5	1.0027
199.8	198.8	1.0050

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.998456	*0.90 - 1.10*
Intercept	-0.372807	*+/-30*



SO2 Calibration Plot Date: December 20, 2024 Location: Waskow ohci Pimatisiwin



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Waskow ohci Pimatisiwin	Station number:	AMS 25
Calibration Date:	December 16, 2024	Last Cal Date:	November 27, 2024
Start time (MST):	8:27	End time (MST):	12:30
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.97	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC517099			
Removed Cal Gas Conc:	4.97	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	747
ZAG Make/Model:	API T701		Serial Number:	261

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Analyzer serial #:	1170050146
Converter make:	Global G-150		Converter serial #:	2022-219
Analyzer Range	0 - 100 ppb		Converter Temp:	350 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.988502	1.003306	Backgd or Offset:	3.42	3.50
Calibration intercept:	0.360000	0.320000	Coeff or Slope:	1.074	1.096

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.0	79.5	78.2	1.017
As found Mid point	4960	40.0	39.8	39.1	1.017
As found Low point	4980	20.0	19.9	19.7	1.009
New cylinder response					

Baseline Corr As found:	78.2	Prev response:	78.97	*% change:	-1.0%
Baseline Corr 2nd AF pt:	39.1	AF Slope:	0.982754	AF Intercept:	0.060000
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999995	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	80.0	79.5	80.0	0.994
Mid point	4960	40.0	39.8	40.4	0.984
Low point	4980	20.0	19.9	20.3	0.979
As left zero	5000	0.0	0.0	0.3	----
As left span	4912	88.3	800.0	810.4	0.987
SO2 Scrubber Check	4921	79.2	800.0	-0.1	----
Date of last scrubber change:				Ave Corr Factor	0.986
Date of last converter efficiency test:					

Notes: SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

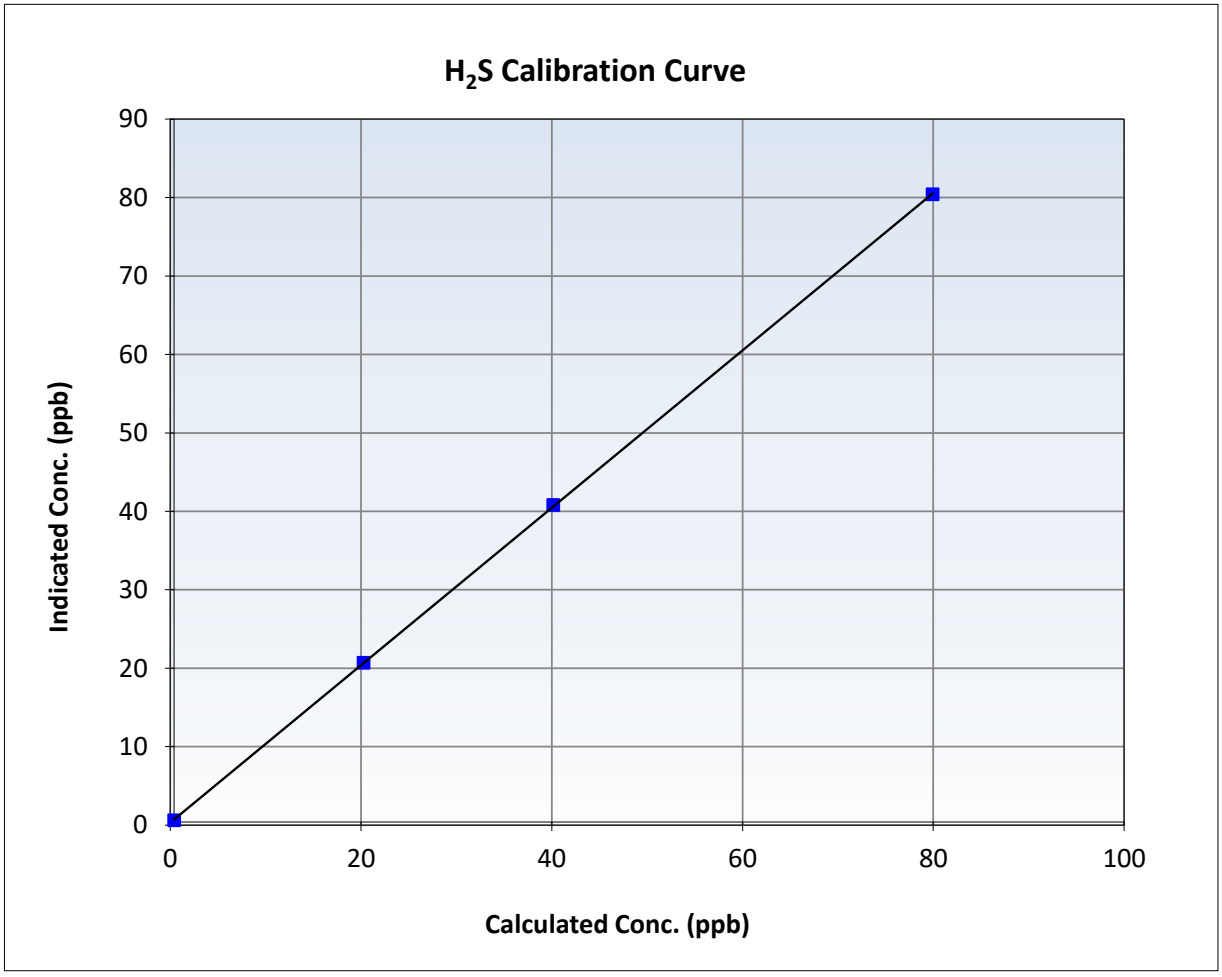
H_2S Calibration Summary

Station Information

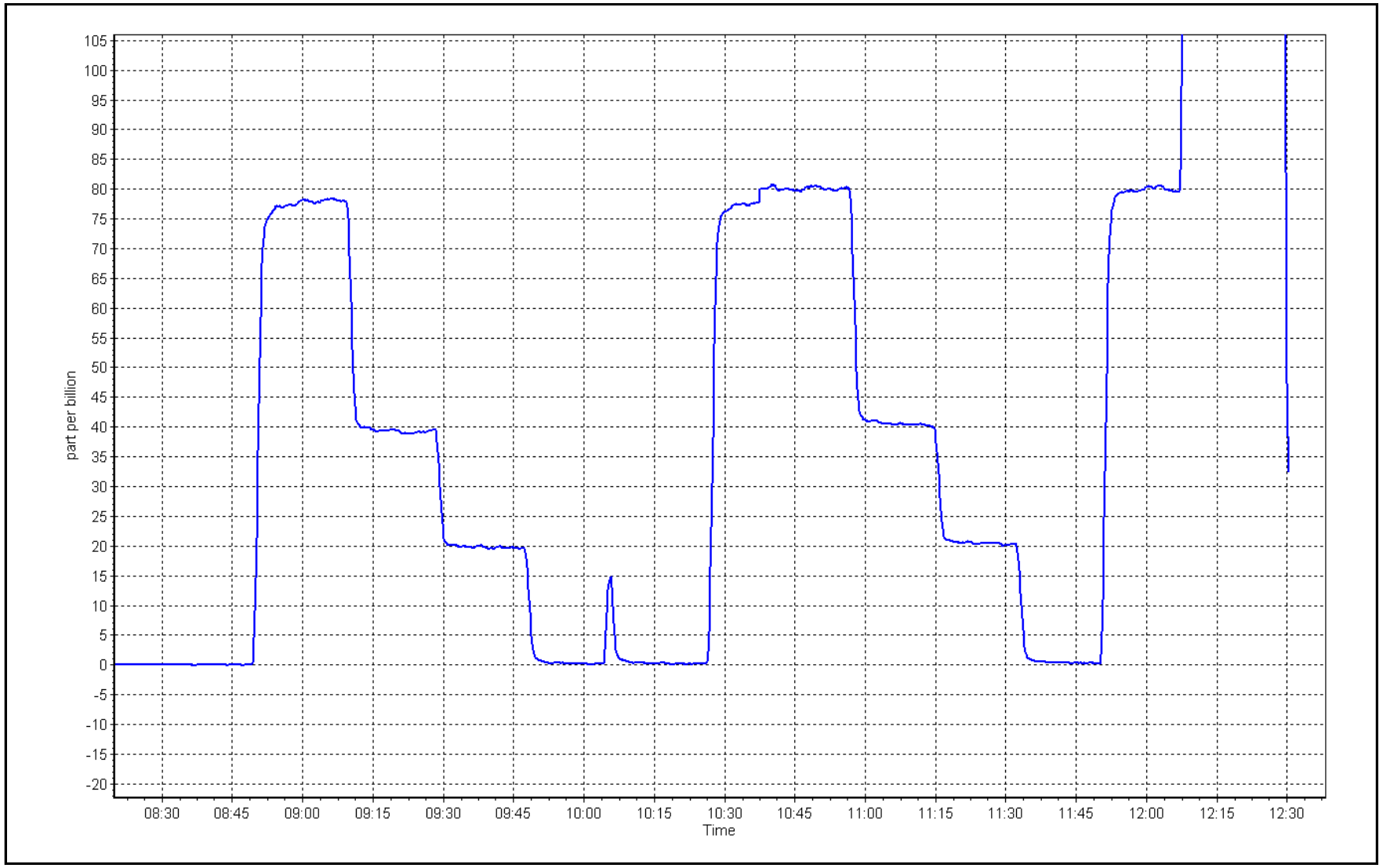
Calibration Date:	December 16, 2024	Previous Calibration:	November 27, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	8:27	End Time (MST):	12:30
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1170050146

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	0.999982	*≥0.995*
79.5	80.0	0.9940	Slope	1.003306	*0.90 - 1.10*
39.8	40.4	0.9842			
19.9	20.3	0.9793	Intercept	0.320000	*+/-3*



H_2S Calibration Plot Date: December 16, 2024 Location: Waskow ohci Pimatisiwin



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS27
JACKFISH 2/3
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Jackfish 2/3	Station number:	AMS 27
Calibration Date:	December 4, 2024	Last Cal Date:	November 12, 2024
Start time (MST):	11:29	End time (MST):	14:32
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.58	ppm	Cal Gas Exp Date:	December 29, 2028
Cal Gas Cylinder #:	SG9133974BAL			
Removed Cal Gas Conc:	50.58	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3811
Zero Air Gen Model:	API 701		Serial Number:	268

Analyzer Information

Analyzer make:	Thermo 43iQ-TL		Serial Number:	12124313138	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.993016	1.001040	Backgd or Offset:	8.2	8.3
Calibration intercept:	-1.166634	-1.325883	Coeff or Slope:	0.927	0.947

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	1.0	----
As found High point	4919	79.1	800.5	780.8	1.027
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	779.8	Previous response	793.7	*% change	-1.8%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	1.3	----
High point	4919	79.1	800.5	801.0	0.999
Mid point	4960	39.5	399.6	398.3	1.003
Low point	4979	19.8	200.3	196.0	1.022
As left zero	5000	0.0	0.0	1.1	----
As left span	4921	79.1	800.2	802.9	0.997
				Average Correction Factor:	1.008

Notes: Changed the sample inlet filter after as founds. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

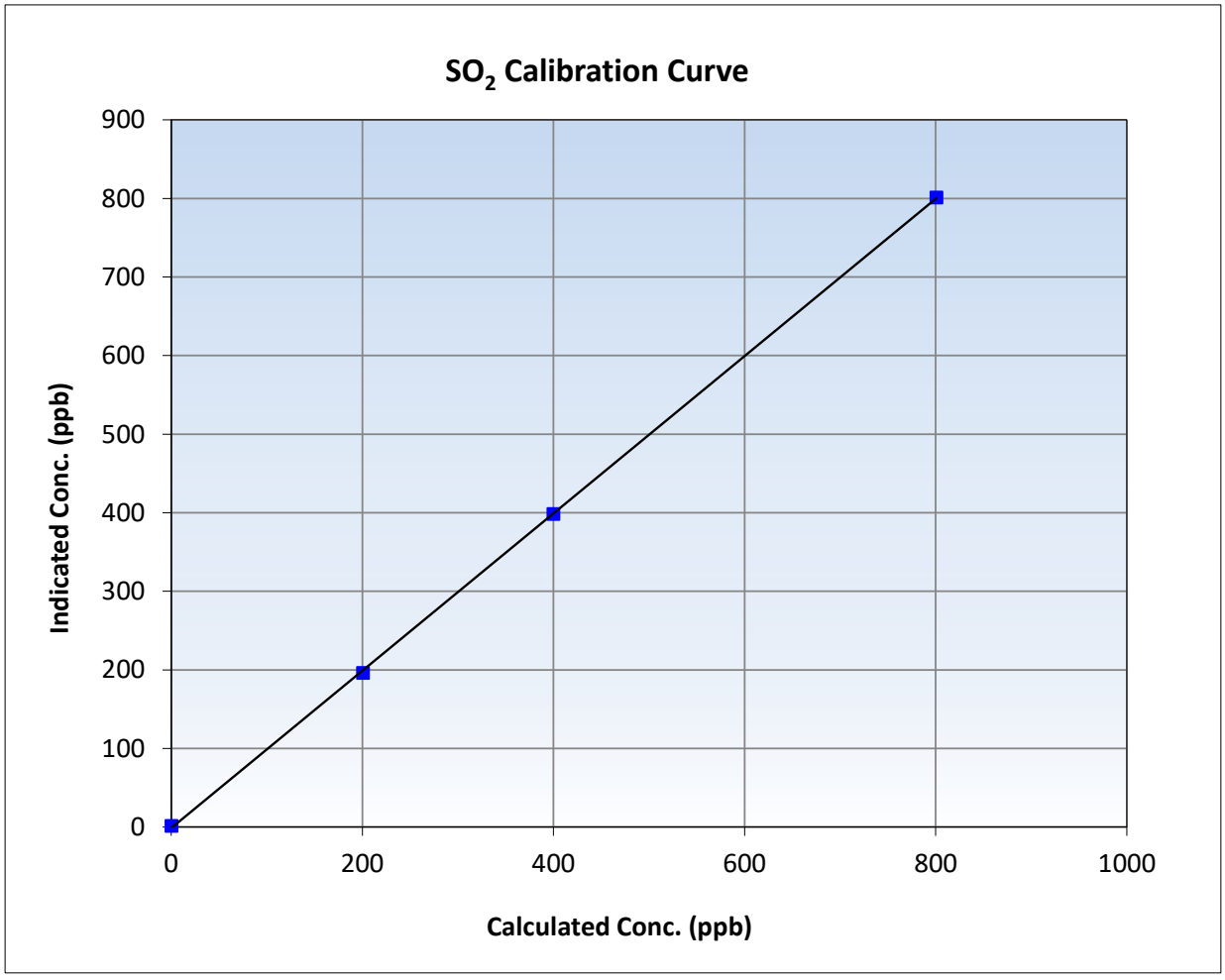
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 12, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	11:29	End Time (MST):	14:32
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	12124313138

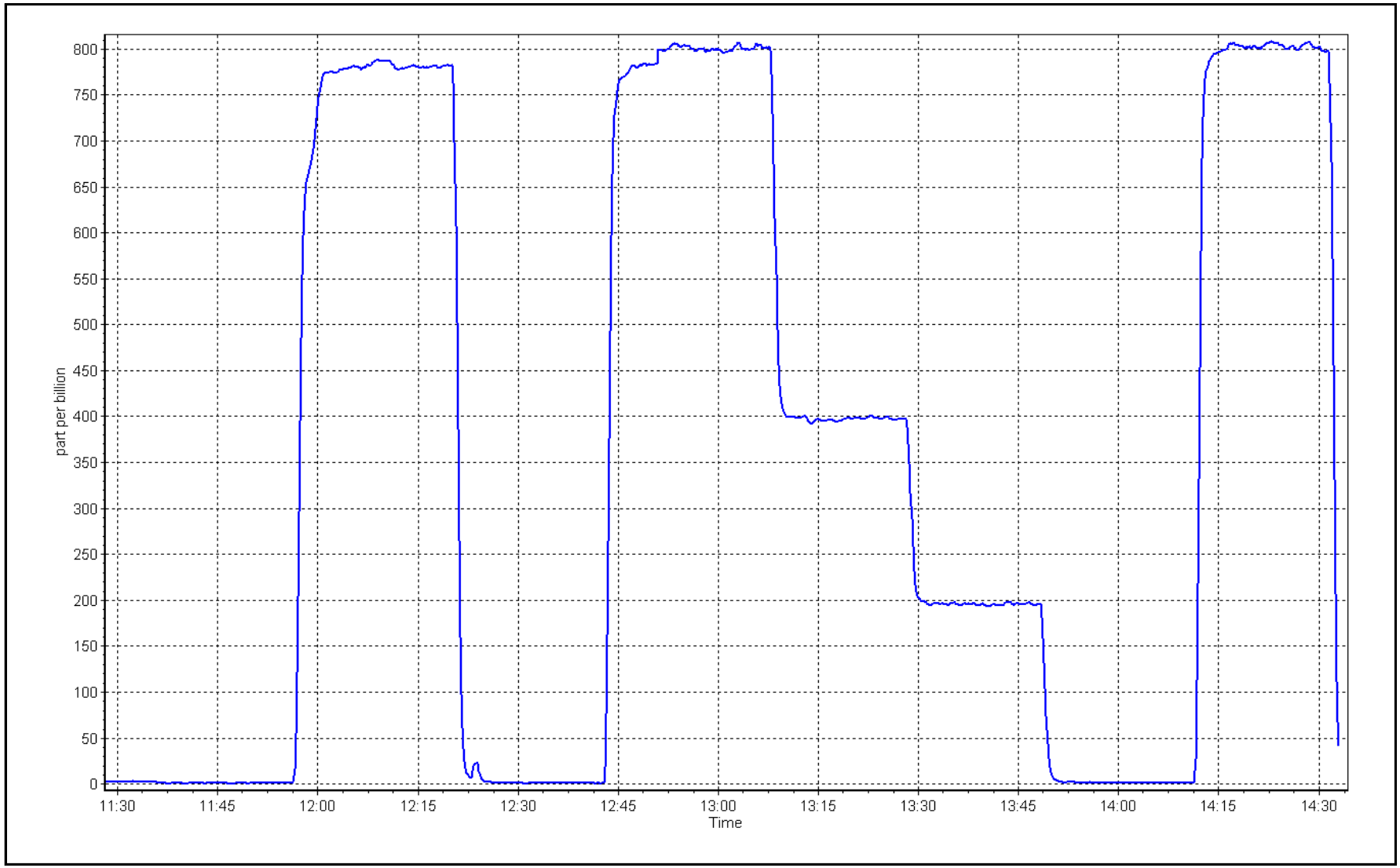
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.3	----
800.5	801.0	0.9994
399.6	398.3	1.0033
200.3	196.0	1.0222

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999947	*≥0.995*
Slope	1.001040	*0.90 - 1.10*
Intercept	-1.325883	*+/-30*



SO2 Calibration Plot Date: December 4, 2024 Location: Jackfish 2/3



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Jackfish 2/3	Station number:	AMS 27
Calibration Date:	December 5, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	10:56	End time (MST):	15:19
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.41	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC345023			
Removed Cal Gas Conc:	5.41	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3811
ZAG Make/Model:	API T701H		Serial Number:	268

Analyzer Information

Analyzer make:	Thermo 43iQ		Analyzer serial #:	12228021055	
Converter make:	Global G150		Converter serial #:	2022-195	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.022160	1.014598	Backgd or Offset:	3.6	3.2
Calibration intercept:	-0.657722	-0.317640	Coeff or Slope:	1.110	1.162

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.8	----
As found High point	4926	74.1	80.2	78.7	1.008
As found Mid point	4963	37.0	40.0	38.5	1.019
As found Low point	4982	18.5	20.0	18.5	1.037
New cylinder response					

Baseline Corr As found:	79.5	Prev response:	81.29	*% change:	-2.3%
Baseline Corr 2nd AF pt:	39.3	AF Slope:	0.993362	AF Intercept:	-1.098199
Baseline Corr 3rd AF pt:	19.3	AF Correlation:	0.999936	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4926	74.1	80.2	81.1	0.989
Mid point	4963	37.0	40.0	40.3	0.993
Low point	4982	18.5	20.0	19.7	1.016
As left zero	5000	0.0	0.0	0.1	----
As left span	4926	74.1	80.2	81.6	0.983
SO2 Scrubber Check	4921	79.1	791.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	0.999
Date of last converter efficiency test:					

Notes: Changed sample inlet filter. Ran scrubber check after calibrator zero and it passed. Adjusted zero and span.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

H_2S Calibration Summary

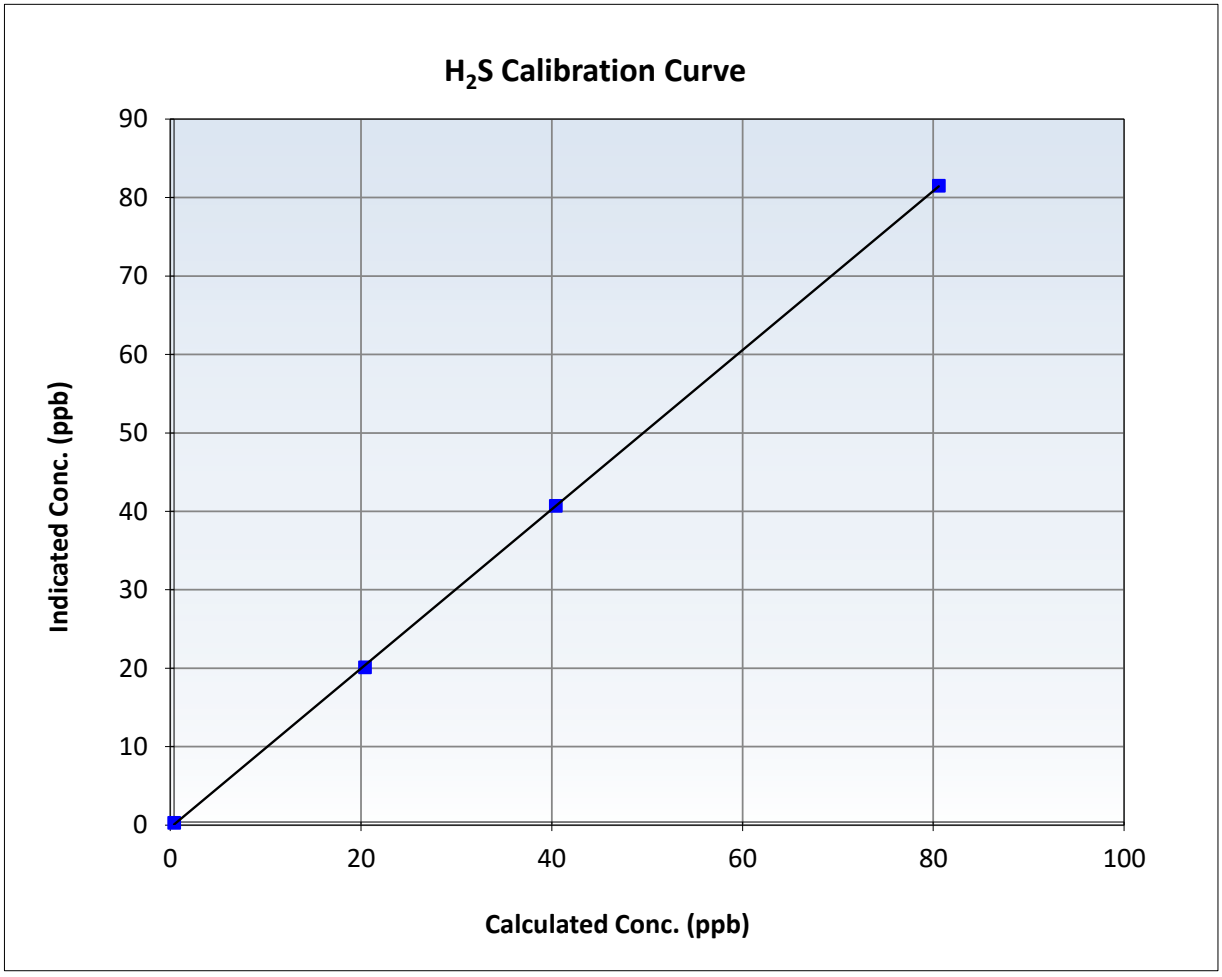
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 19, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:56	End Time (MST):	15:19
Analyzer make:	Thermo 43iQ	Analyzer serial #:	12228021055

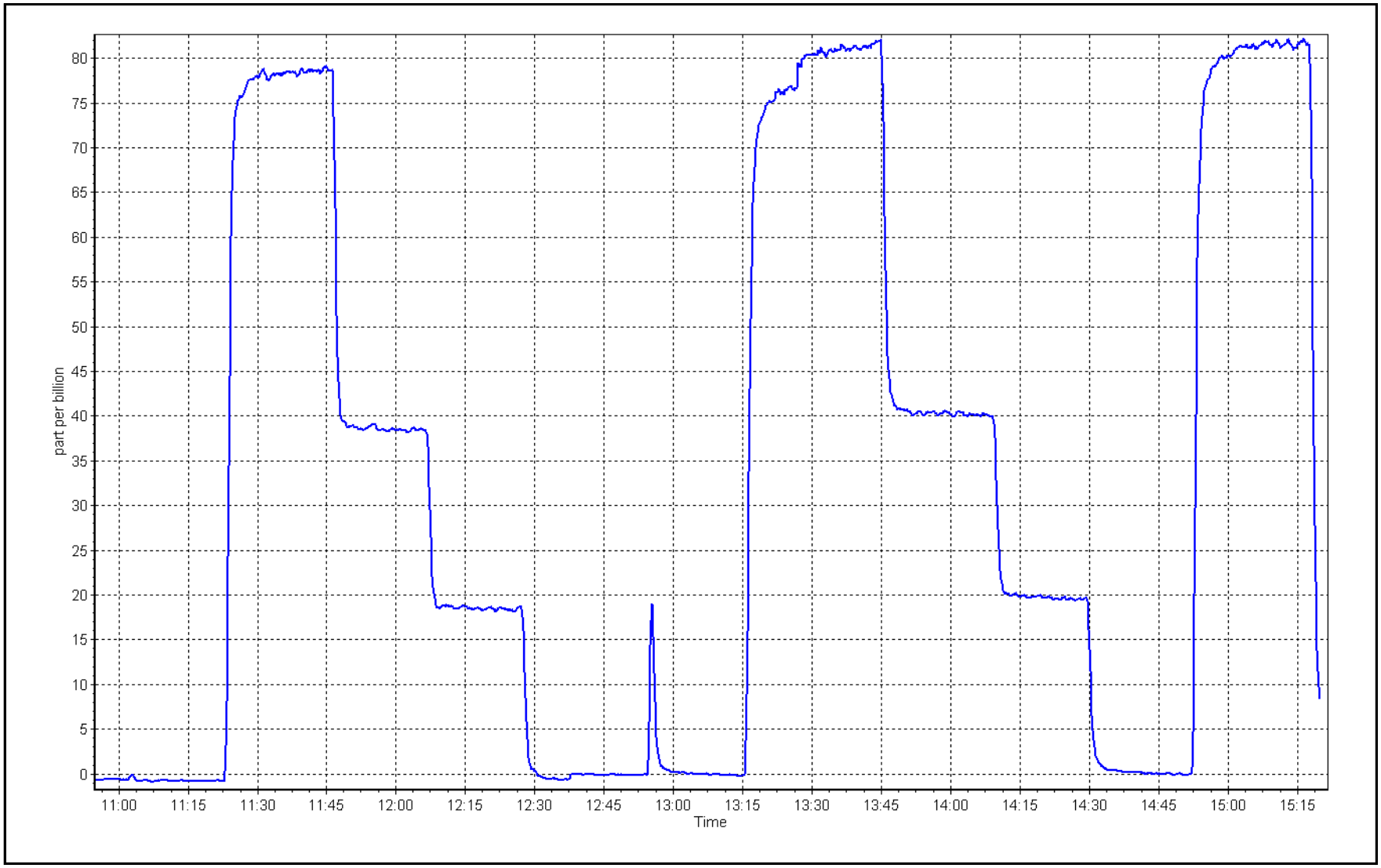
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
80.2	81.1	0.9886
40.0	40.3	0.9934
20.0	19.7	1.0160

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999962	*≥0.995*
Slope	1.014598	*0.90 - 1.10*
Intercept	-0.317640	*+/-3*



H_2S Calibration Plot Date: December 5, 2024 Location: Jackfish 2/3



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Jackfish 2/3
Station number:	AMS 27
Calibration Date:	December 6, 2024
Last Cal Date:	November 15, 2024
Start time (MST):	8:48
End time (MST):	14:37
Reason:	Install

Calibration Standards

NO Gas Cylinder #:	CC757838	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.20 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.20 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3811
ZAG make/model:	Teledyne API T701	Serial Number:	268

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
AF High point	4942	66.5	800.6	799.3	1.3	816.0	815.0	0.8	0.9812	0.9807
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 805.5 ppb	NO = 806.6 ppb
Baseline Corr 1st pt	NO_X = 816.0 ppb	NO = 815.0 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	*Percent Change	NO_X = 1.3%
As found	NO r^2:	*Percent Change	NO = 1.0%
As found	NO_2 r^2:	Nx Sl:	Nx Int:
		NO Sl:	NO Int:
		NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1218153357

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.360	1.332	NO bkgnd or offset:	4.6	4.6
NOX coeff or slope:	0.992	0.992	NOX bkgnd or offset:	4.7	4.7
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	156.9	156.3

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.008779	0.995064
NO_X Cal Offset:	-2.133379	-1.654761
NO Cal Slope:	1.014488	1.001235
NO Cal Offset:	-4.293618	-3.734605
NO_2 Cal Slope:	1.012471	0.996639
NO_2 Cal Offset:	-0.121108	-0.410548

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.8	0.2	0.6	----	----
High point	4942	66.5	800.6	799.3	1.3	796.5	798.8	-2.3	1.0052	1.0006
Mid point	4979	33.3	400.6	399.9	0.7	395.0	393.9	1.0	1.0142	1.0154
Low point	4996	16.6	199.7	199.4	0.3	195.1	192.5	2.6	1.0235	1.0356
As left zero	5000	0.0	0.0	0.0	0.0	1.5	0.2	1.3	----	----
As left span	4942	66.5	800.6	404.9	395.7	804.2	404.9	399.2	0.9956	1.0000
								Average Correction Factor	1.0143	1.0172

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.6	----	----
High GPT point	800.8	403.6	398.5	397.6	1.0023	99.8%
Mid GPT point	800.8	622.3	179.8	177.0	1.0160	98.4%
Low GPT point	800.8	713.8	88.3	87.6	1.0083	99.2%
				Average Correction Factor	1.0089	99.1%

Notes: Changed sample inlet filter after as founds. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

NO_X Calibration Summary

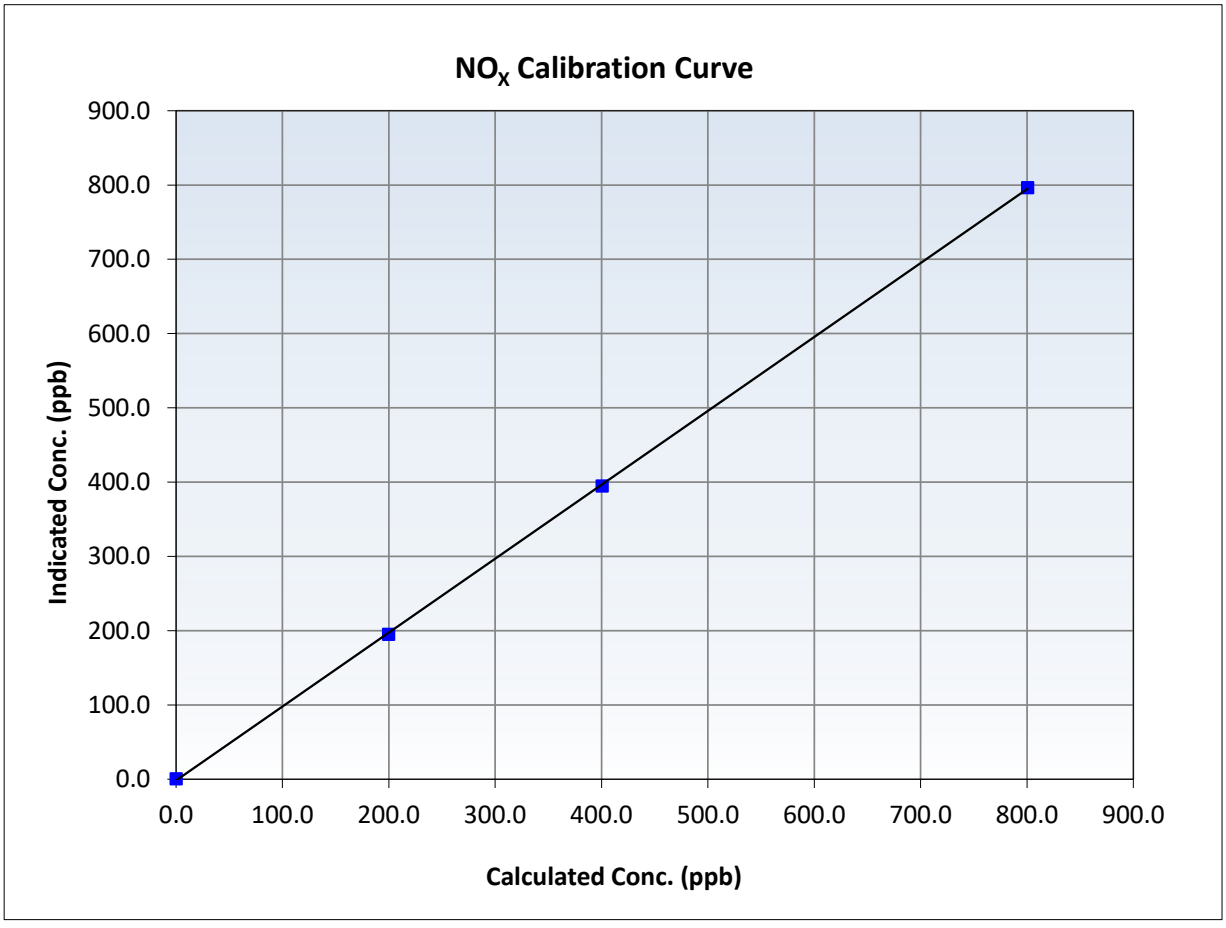
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	8:48	End Time (MST):	14:37
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.8	----
800.6	796.5	1.0052
400.6	395.0	1.0142
199.7	195.1	1.0235

Statistical Evaluation		Limits
Correlation Coefficient	0.999954	≥0.995
Slope	0.995064	0.90 - 1.10
Intercept	-1.654761	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

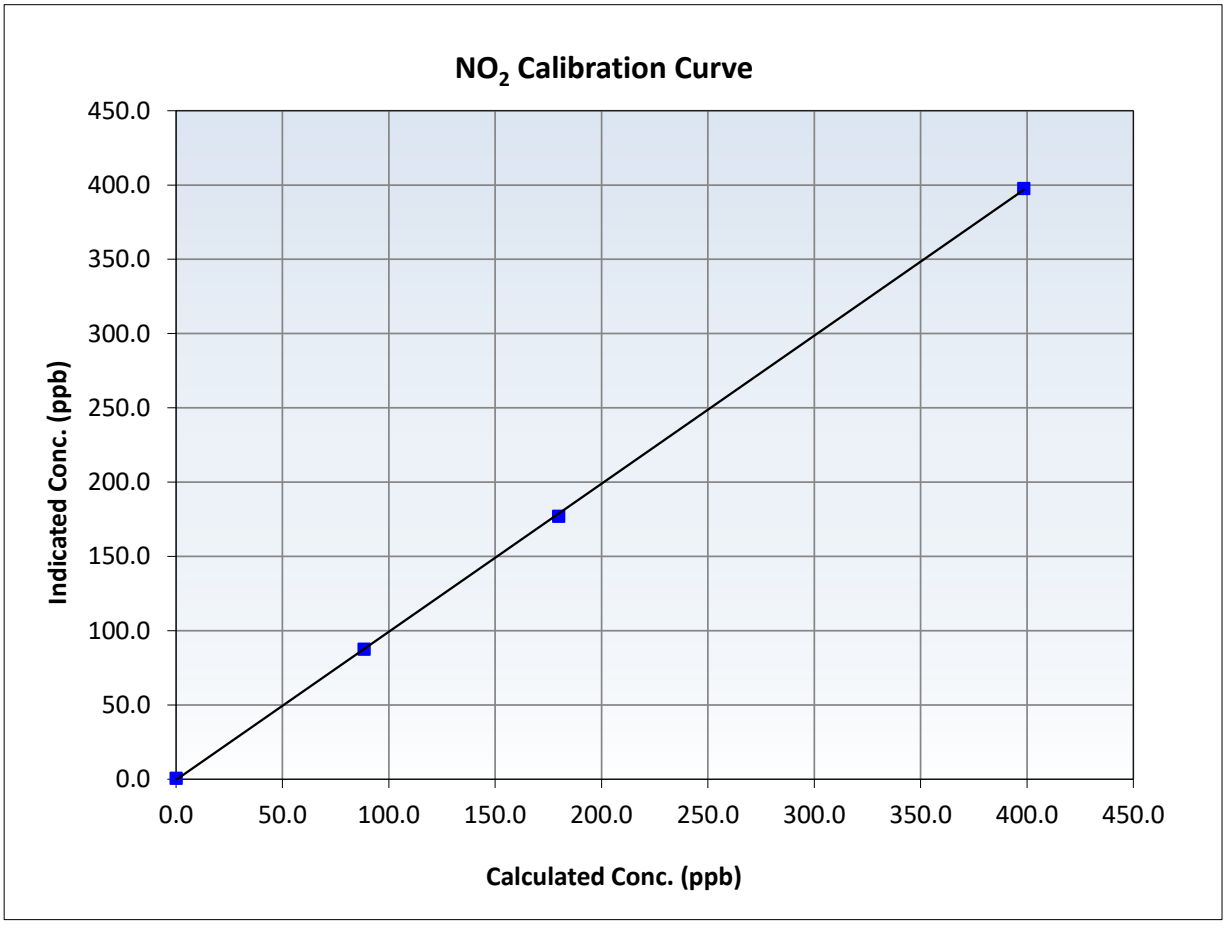
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	8:48	End Time (MST):	14:37
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
398.5	397.6	1.0023
179.8	177.0	1.0160
88.3	87.6	1.0083

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999943	*≥0.995*
Slope	0.996639	*0.90 - 1.10*
Intercept	-0.410548	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

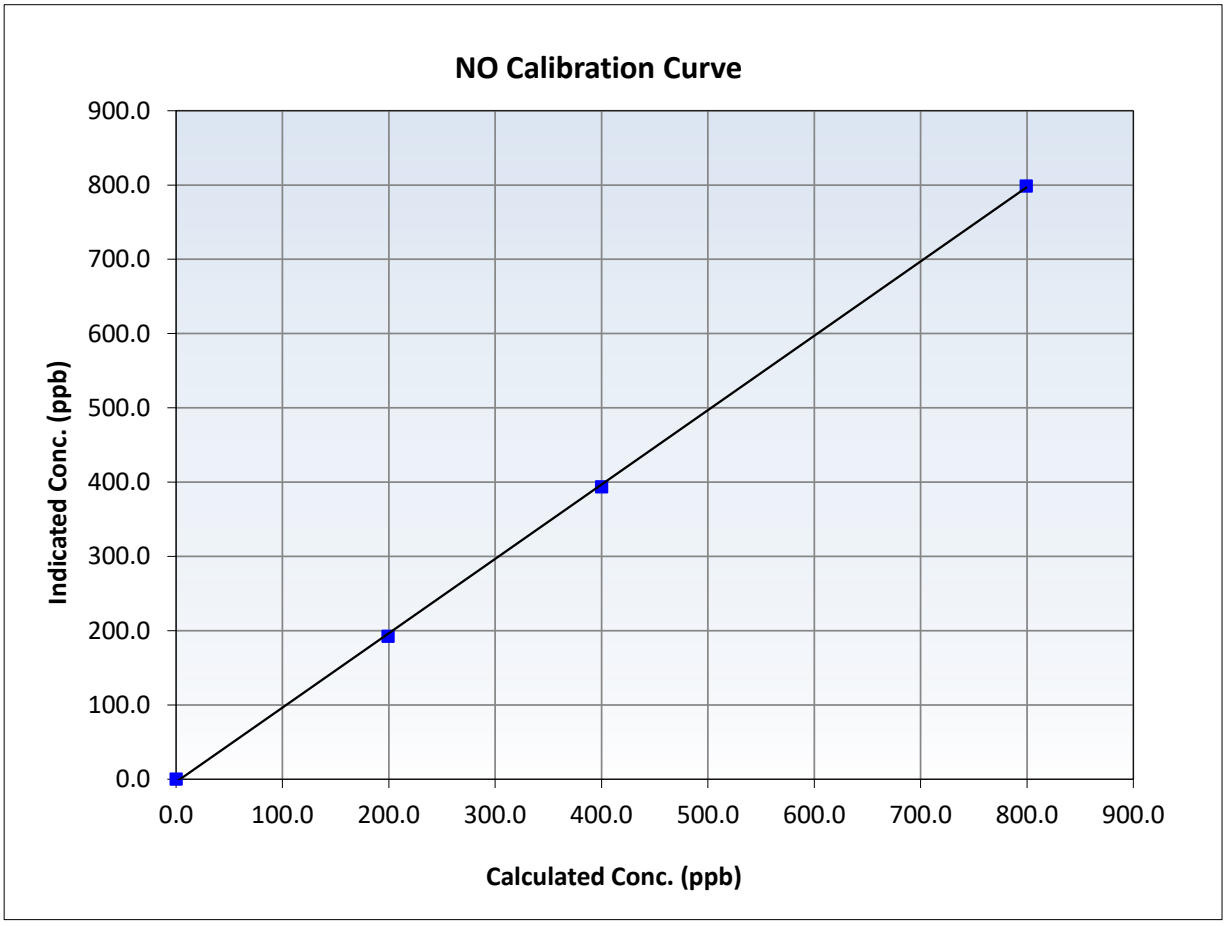
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 15, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	8:48	End Time (MST):	14:37
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

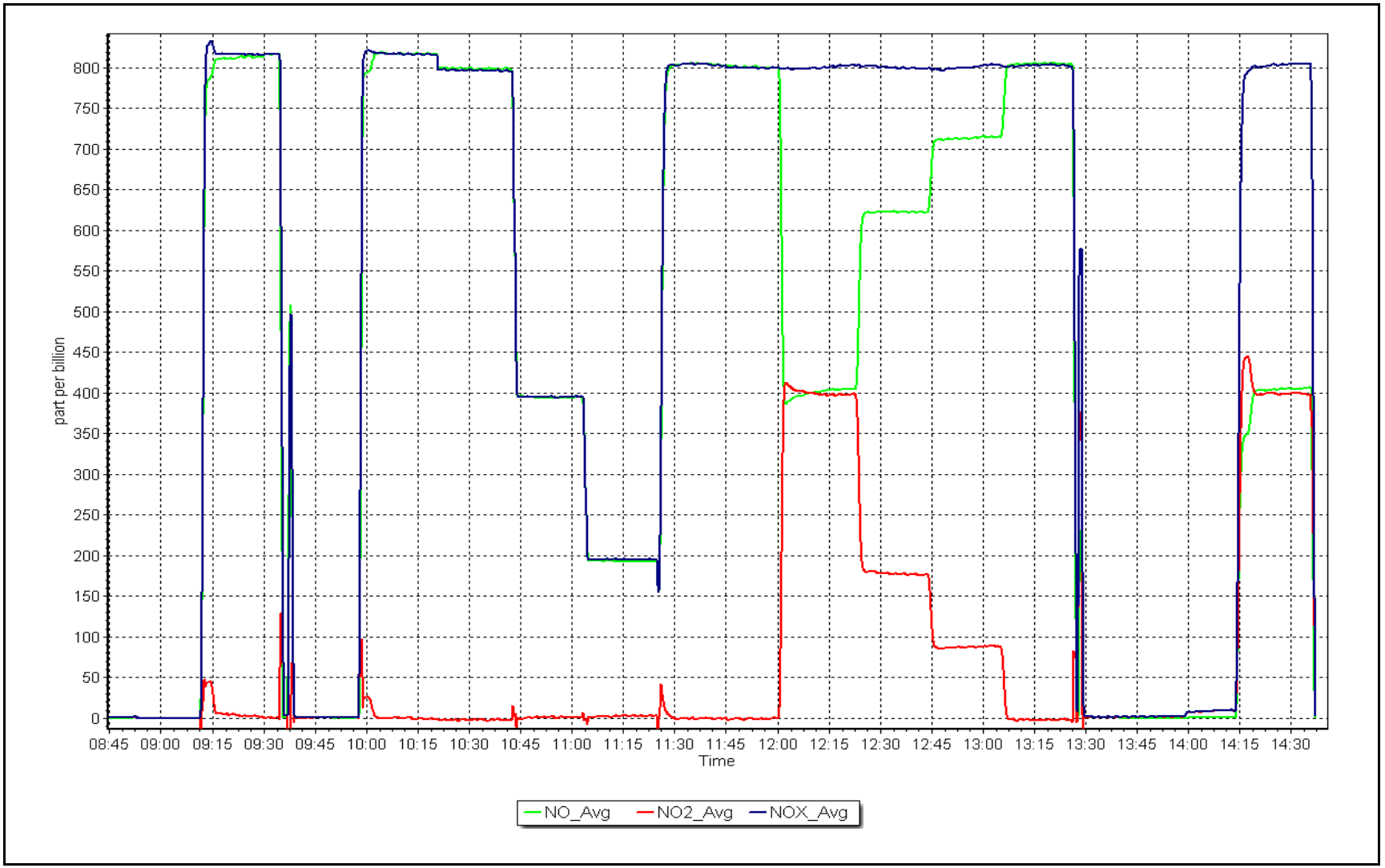
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.3	798.8	1.0006
399.9	393.9	1.0154
199.4	192.5	1.0356

Statistical Evaluation		Limits
Correlation Coefficient	0.999886	≥0.995
Slope	1.001235	0.90 - 1.10
Intercept	-3.734605	+/-20



NO_X Calibration Plot Date: December 6, 2024 Location: Jackfish 2/3



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS29
SURMONT 2
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	December 2, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	11:20	End time (MST):	14:40
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.21	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC356008			
Removed Cal Gas Conc:	49.21	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	5472
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4698

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1170050150	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000130	1.006441	Backgd or Offset:	13.0	14.1
Calibration intercept:	-1.425614	-2.285476	Coeff or Slope:	0.925	0.970

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4919	81.3	800.1	763.7	1.048
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	763.4	Previous response	798.8	*% change	-4.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.4	----
High point	4919	81.3	800.1	804.0	0.995
Mid point	4959	40.7	400.6	399.7	1.002
Low point	4979	20.3	199.8	197.1	1.014
As left zero	5000	0.0	0.0	-0.2	----
As left span	4919	81.3	800.1	808.0	0.990
				Average Correction Factor:	1.004

Notes: Adjusted zero and span. Large span shift likely caused by a dropping lamp voltage, maintenance planned for January.

Calibration Performed By: Braiden Boutilier

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

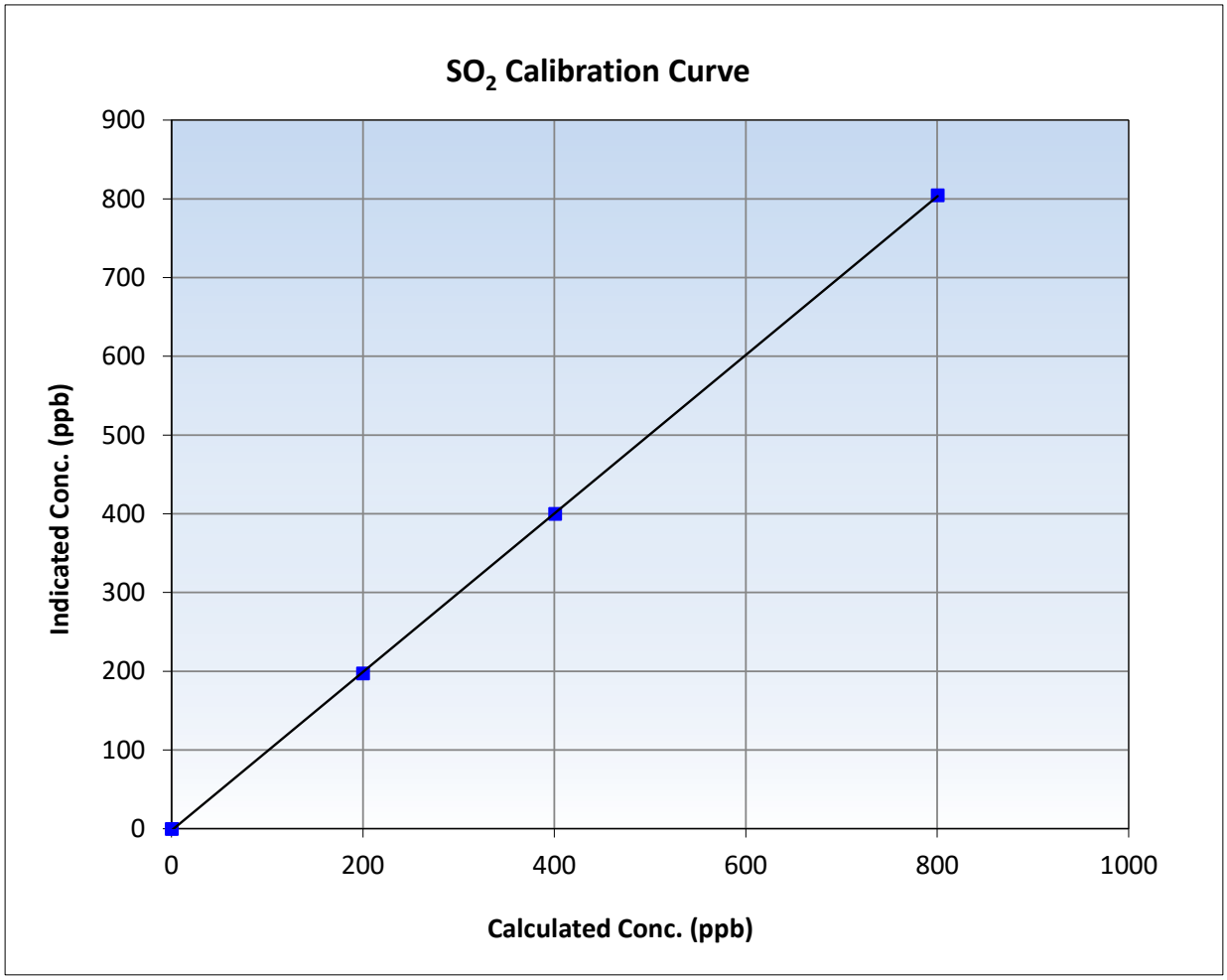
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 7, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:20	End Time (MST):	14:40
Analyzer make:	Thermo 43i	Analyzer serial #:	1170050150

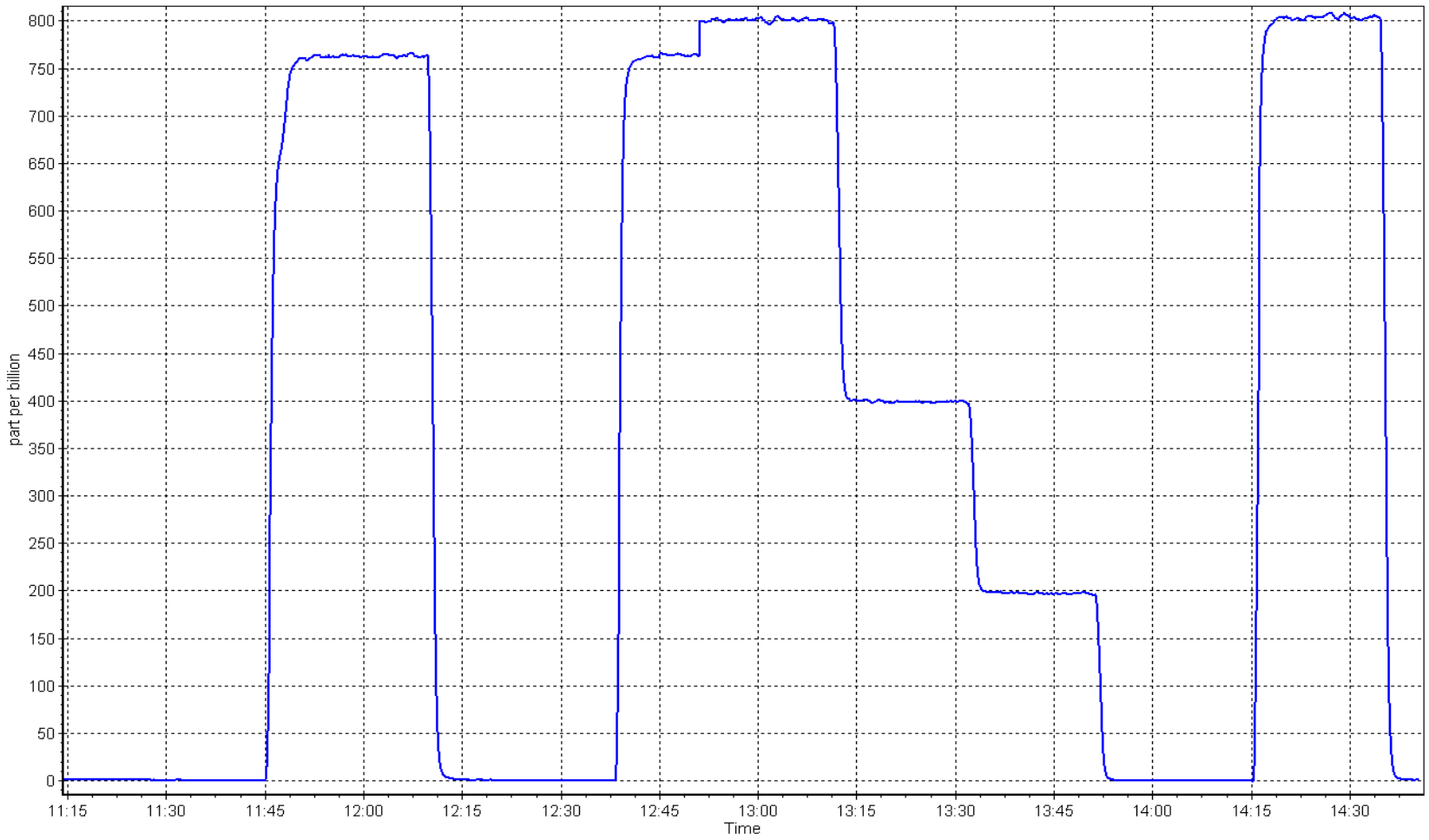
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
800.1	804.0	0.9952
400.6	399.7	1.0022
199.8	197.1	1.0138

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	1.006441	*0.90 - 1.10*
Intercept	-2.285476	*+/-30*



SO2 Calibration Plot Date: December 2, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	December 4, 2024	Last Cal Date:	November 5, 2024
Start time (MST):	12:28	End time (MST):	14:33
Reason:	As Found		

Calibration Standards

Cal Gas Concentration:	5.391	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC508338			
Removed Cal Gas Conc:	5.391	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	CC508338		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698

Analyzer Information

Analyzer make:	Thermo 43iQ-TLE		Analyzer serial #:	1200326170
Converter make:	Global		Converter serial #:	2022-220
Analyzer Range	0 - 100 ppb		Converter Temp:	350.0 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.000611		Backgd or Offset:	0.88	0.88
Calibration intercept:	-0.062596		Coeff or Slope:	1.030	1.030

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4926	74.2	80.0	81.2	0.984
As found Mid point	4963	37.2	40.1	40.5	0.988
As found Low point	4982	18.6	20.1	20.1	0.993
New cylinder response					

Baseline Corr As found:	81.3	Prev response:	79.99	*% change:	1.6%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.016757	AF Intercept:	-0.203396
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999992	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					
SO2 Scrubber Check					

Date of last scrubber change:

Ave Corr Factor

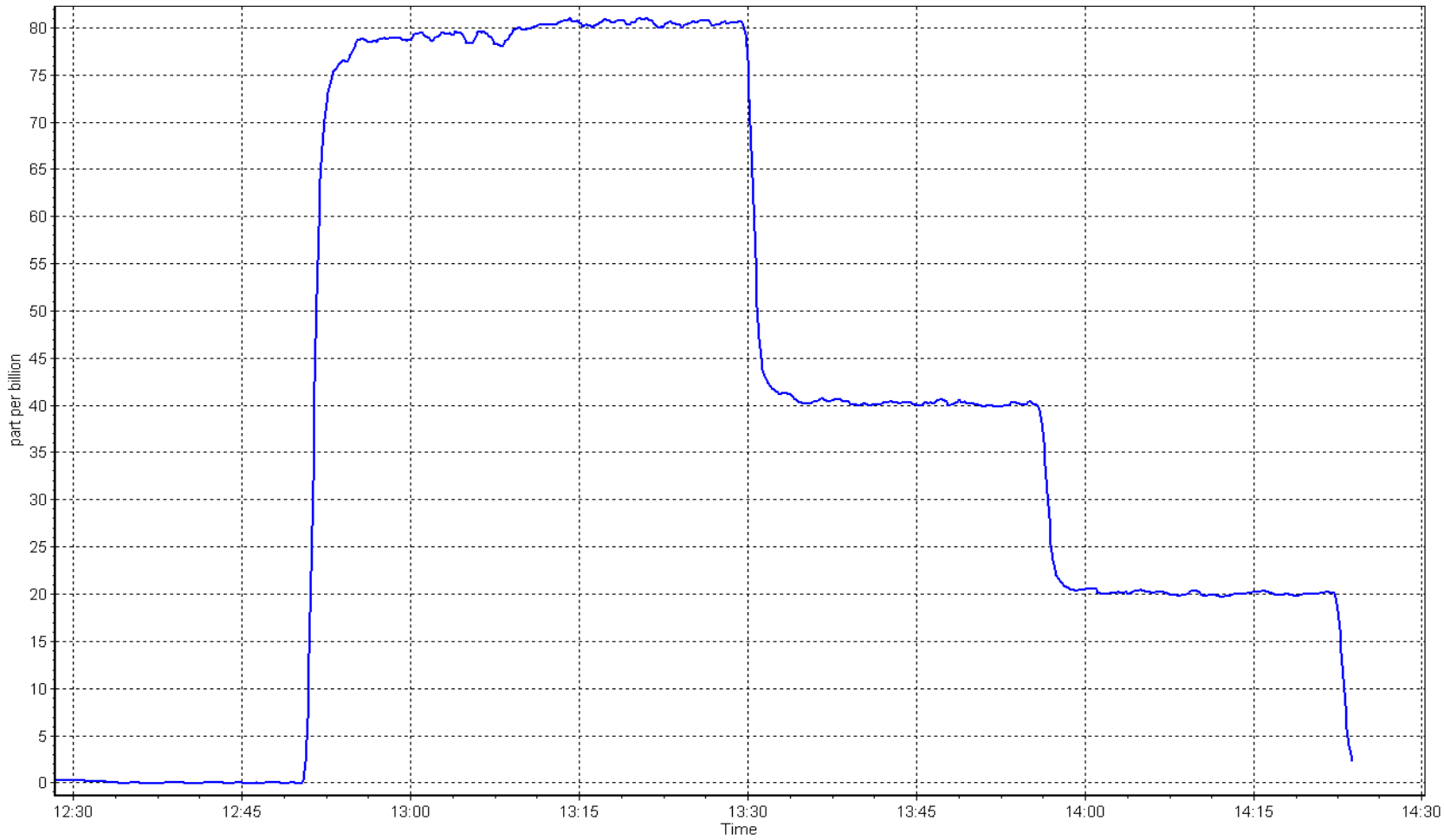
Date of last converter efficiency test:

Notes: As founds completed before changing the converter temperature from 350C to 325C. Calibration and converter efficiency test planned for Dec 5.

Calibration Performed By: Braiden Boutilier

Version 02-2024

H2S Calibration Plot Date: December 4, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	December 5, 2024	Last Cal Date:	December 4, 2024
Start time (MST):	10:39	End time (MST):	15:21
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.391	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC508338			
Removed Cal Gas Conc:	5.391	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	CC508338		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698

Analyzer Information

Analyzer make:	Thermo 43iQ-TLE		Analyzer serial #:	1200326170	
Converter make:	Global		Converter serial #:	2022-220	
Analyzer Range	0 - 100 ppb		Converter Temp:	325.0	degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.000611	1.001184	Backgd or Offset:	0.88	0.88
Calibration intercept:	-0.062596	-0.082675	Coeff or Slope:	1.030	1.030

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	NA	Prev response:	NA	*% change:	NA
Baseline Corr 2nd AF pt:	NA	AF Slope:	NA	AF Intercept:	NA
Baseline Corr 3rd AF pt:	NA	AF Correlation:	NA	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4926	74.2	80.0	80.1	0.999
Mid point	4963	37.2	40.1	39.9	1.005
Low point	4982	18.6	20.1	20.0	1.003
As left zero	5000	0.0	0.0	0.1	----
As left span	4926	74.2	80.0	79.3	1.009
SO2 Scrubber Check				0.0	
Date of last scrubber change:				Ave Corr Factor	1.002
Date of last converter efficiency test:		December 5, 2024		108.1%	efficiency

Notes: Adjusted span during and after converter efficiency test. SOx scrubber check done after converter efficiency test, before the span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

H2S Calibration Summary

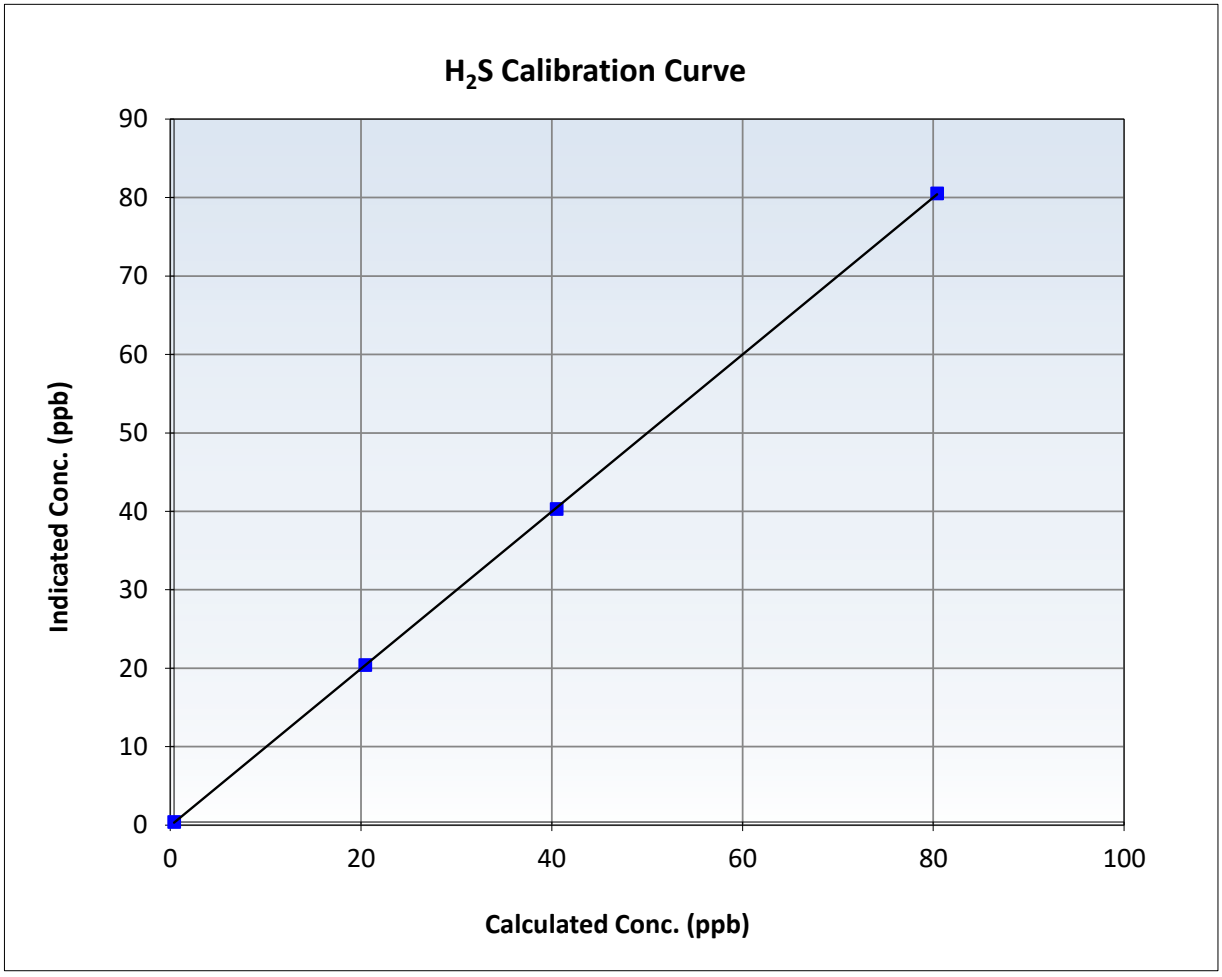
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	December 4, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	10:39	End Time (MST):	15:21
Analyzer make:	Thermo 43iQ-TLE	Analyzer serial #:	1200326170

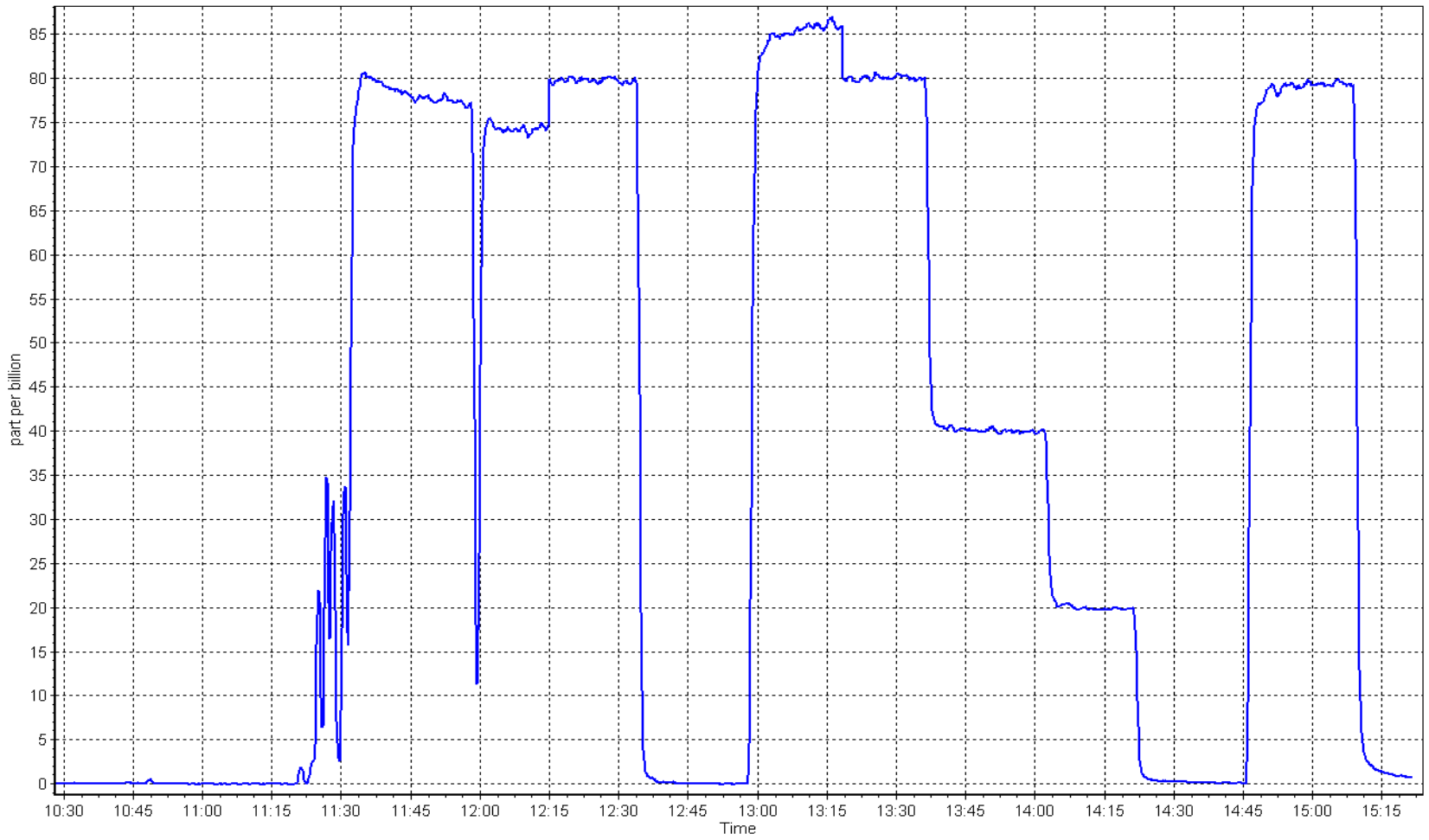
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
80.0	80.1	0.9988
40.1	39.9	1.0052
20.1	20.0	1.0027

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999987	*≥0.995*
Slope	1.001184	*0.90 - 1.10*
Intercept	-0.082675	*+/-3*



H2S Calibration Plot Date: December 5, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	December 2, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	11:20	End time (MST):	14:40
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC356008		Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	499.0	ppm	CH4 Equiv Conc.	1064.7	ppm
C3H8 Cal Gas Conc.	205.7	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	499.0	ppm	CH4 Equiv Conc.	1064.7	ppm
Removed C3H8 Conc.	205.7	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472	
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1170050149

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.999669	1.007016	Background:	3.47	3.37
Calibration intercept:	-0.082263	-0.076638	Coefficient:	3.856	3.876

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	-0.11	----
As found High point	4918	81.3	17.31	17.11	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.22	Previous response	17.23	*% change	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	-0.02	----
High point	4918	81.3	17.31	17.39	0.996
Mid point	4959	40.6	8.65	8.59	1.007
Low point	4979	20.3	4.32	4.23	1.022
As left zero	5000	0.0	0.00	0.02	----
As left span	4918	81.3	17.31	17.46	0.992
				Average Correction Factor	1.008

Notes: Changed sample inlet filter after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

Version 03-2024

Wood Buffalo Environmental Association

THC Calibration Summary

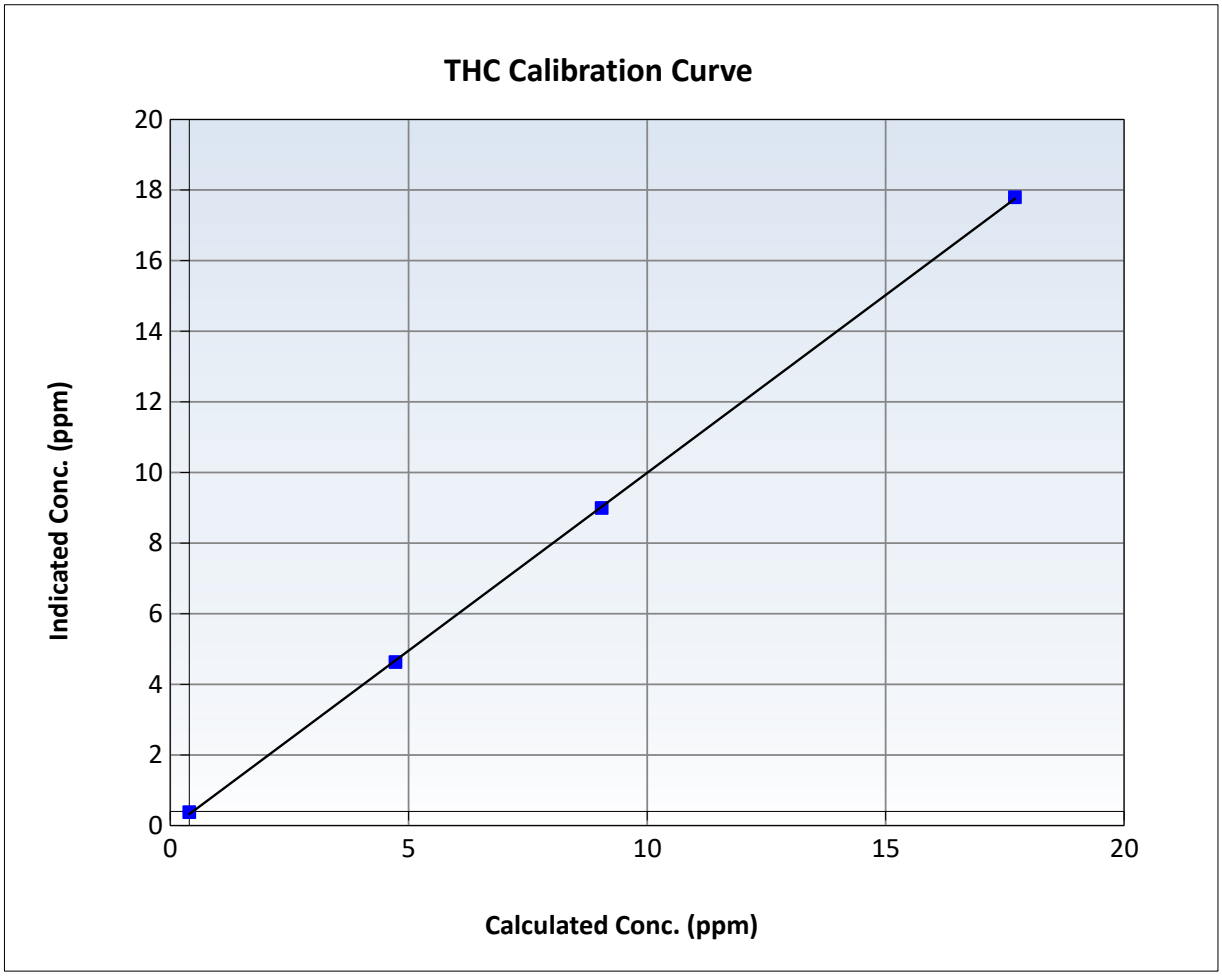
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 7, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:20	End Time (MST):	14:40
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1170050149

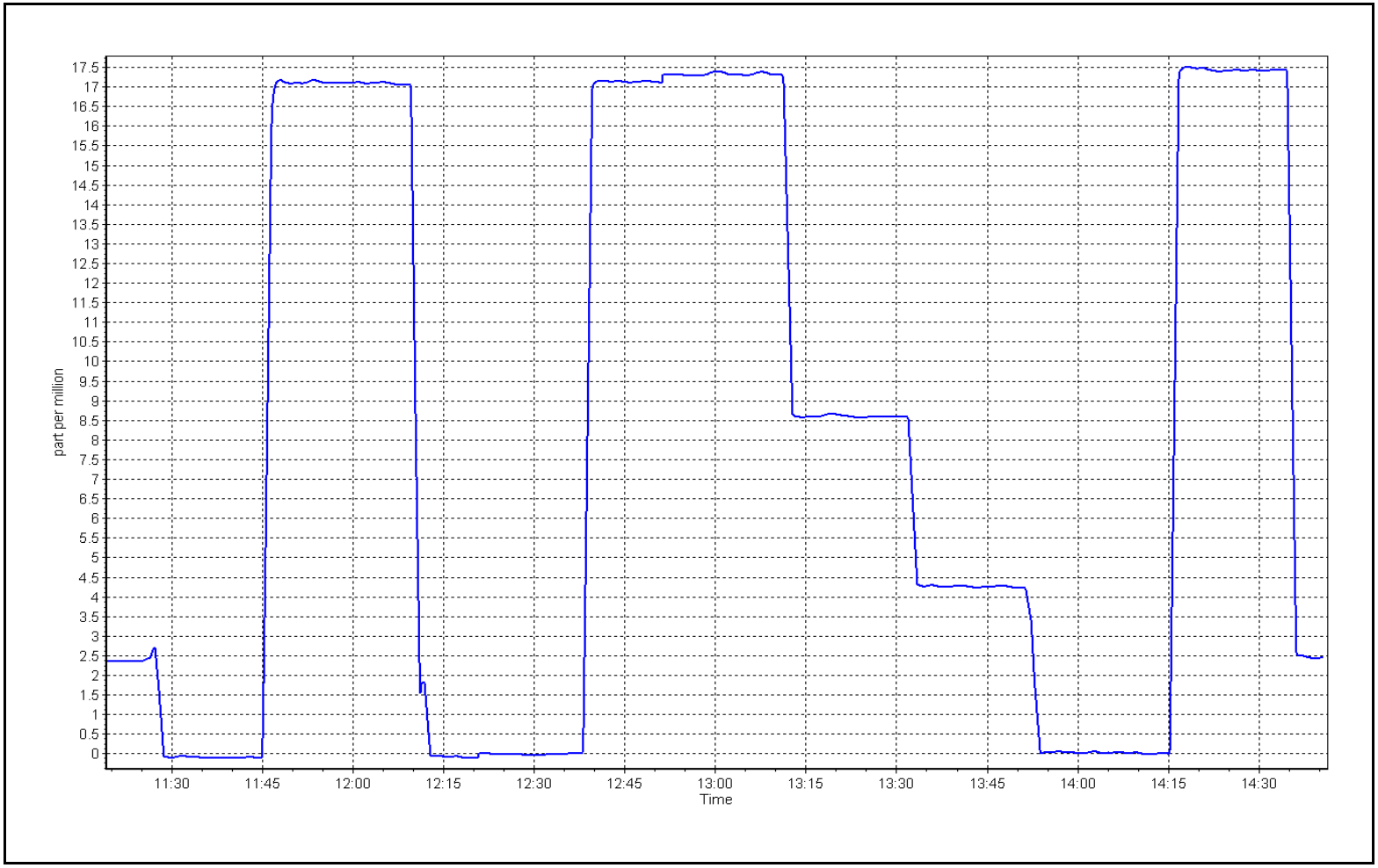
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	-0.02	----
17.31	17.39	0.9956
8.65	8.59	1.0065
4.32	4.23	1.0215

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999955	*≥0.995*
Slope	1.007016	*0.90 - 1.10*
Intercept	-0.076638	*+/-1.5*



THC Calibration Plot Date: December 2, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	December 4, 2024	Last Cal Date:	December 2, 2024
Start time (MST):	10:44	End time (MST):	12:37
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC356008		Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	499.0	ppm	CH4 Equiv Conc.	1064.7	ppm
C3H8 Cal Gas Conc.	205.7	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	499.0	ppm	CH4 Equiv Conc.	1064.7	ppm
Removed C3H8 Conc.	205.7	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472	
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698	

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1170050149
Analyzer Range:	0 - 20 ppm		

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.007016		Background:	3.37	3.37
Calibration intercept:	-0.076638		Coefficient:	3.876	3.876

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.06	----
As found High point	4918	81.3	17.31	17.52	0.992
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.46	Previous response	17.36	*% change	0.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

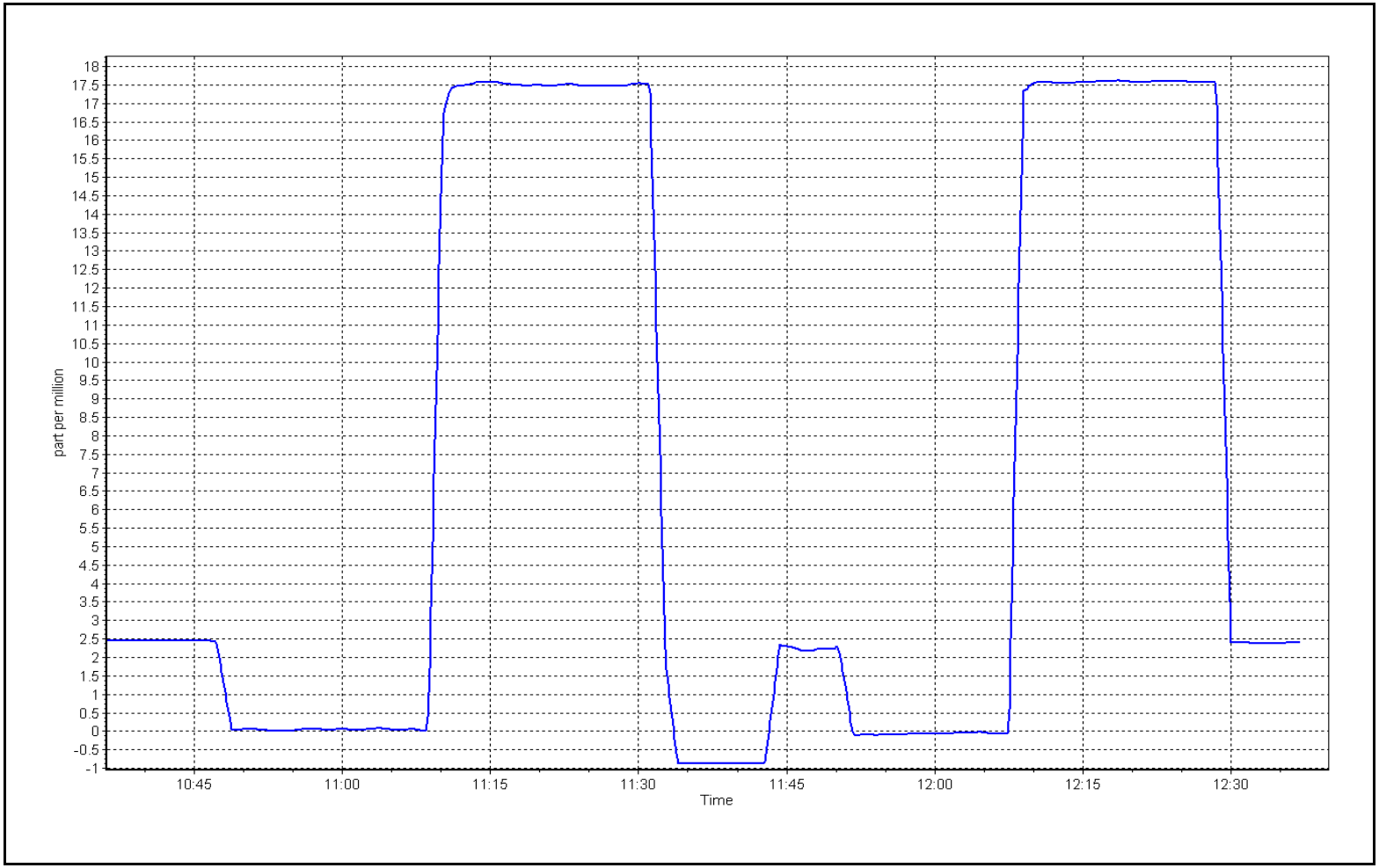
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	-0.06	----
As left span	4918	81.3	17.31	17.58	0.985
				Average Correction Factor	

Notes: Swapped hydrogen cylinder.

Calibration Performed By: Braiden Boutilier

Version 03-2024

THC Calibration Plot Date: December 4, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Surmont 2
Station number:	AMS 29
Calibration Date:	December 18, 2024
Last Cal Date:	November 19, 2024
Start time (MST):	11:11
End time (MST):	16:47
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T12YYFE	Cal Gas Expiry Date:	October 30, 2024
NOX Cal Gas Conc:	47.46 ppm	NO Cal Gas Conc:	47.46 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	47.46 ppm	Removed Gas NO Conc:	47.46 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5472
ZAG make/model:	Teledyne API T701	Serial Number:	4698

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
AF High point	4916	84.3	800.1	800.1	0.0	794.1	792.3	1.8	1.0073	1.0096
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	800.6	ppb	NO =	801.0	ppb	
Baseline Corr 1st pt	NO_X =	794.3	ppb	NO =	792.5	ppb	
Baseline Corr 2nd pt	NO_X =	NA	ppb	NO =	NA	ppb	
Baseline Corr 3rd pt	NO_X =	NA	ppb	NO =	NA	ppb	

* = > +/-5% change initiates investigation

*Percent Change	NO_X =	-0.8%	
*Percent Change	NO =	-1.1%	

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i

Serial Number: 1170050148

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.639	1.652	NO bkgnd or offset:	1.4	1.4
NOX coeff or slope:	0.994	0.998	NOX bkgnd or offset:	1.5	1.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	194.1	198.0

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001911	1.001023
NO_X Cal Offset:	-1.012618	-0.652175
NO Cal Slope:	1.004112	1.000922
NO Cal Offset:	-2.432496	-1.891558
NO_2 Cal Slope:	1.002053	1.006053
NO_2 Cal Offset:	-0.296979	1.038885

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.2	0.1	0.1	----	----
High point	4916	84.2	799.2	799.2	0.0	799.1	798.3	0.8	1.0001	1.0011
Mid point	4958	42.1	399.6	399.6	0.0	401.0	399.3	1.8	0.9965	1.0008
Low point	4979	21.1	200.3	200.3	0.0	197.6	195.1	2.5	1.0135	1.0265
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
As left span	4916	84.2	799.2	599.1	200.1	793.2	599.1	194.0	1.0076	1.0000
							Average Correction Factor		1.0034	1.0095

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	790.0	411.5	378.5	381.2	0.9929	100.7%
Mid GPT point	790.0	599.1	190.9	194.0	0.9840	101.6%
Low GPT point	790.0	691.2	98.8	101.1	0.9773	102.3%
				Average Correction Factor	0.9847	101.6%

Notes: Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

NO_X Calibration Summary

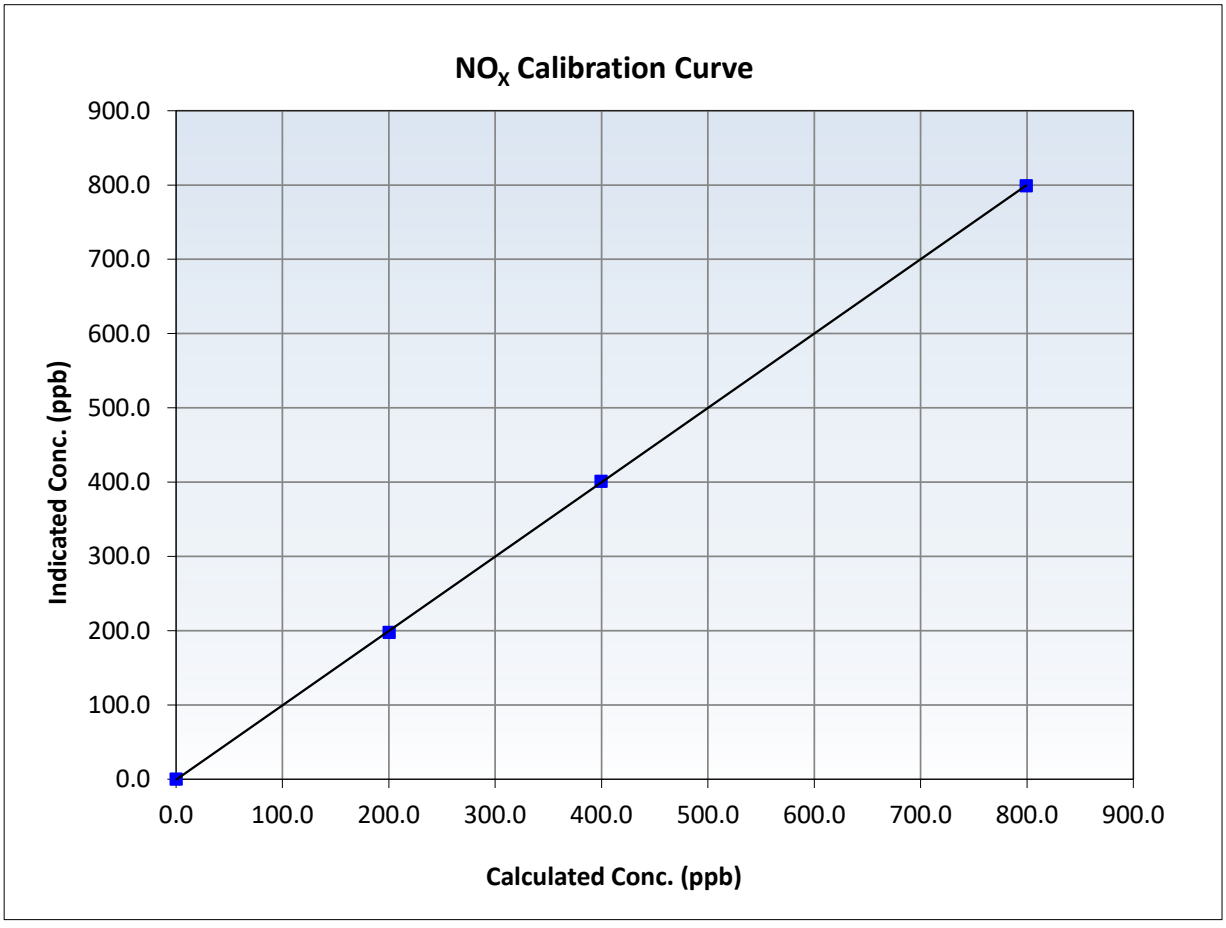
Station Information

Calibration Date:	December 18, 2024	Previous Calibration:	November 19, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:11	End Time (MST):	16:47
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.2	799.1	1.0001
399.6	401.0	0.9965
200.3	197.6	1.0135

Statistical Evaluation		Limits
Correlation Coefficient	0.999976	≥0.995
Slope	1.001023	0.90 - 1.10
Intercept	-0.652175	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

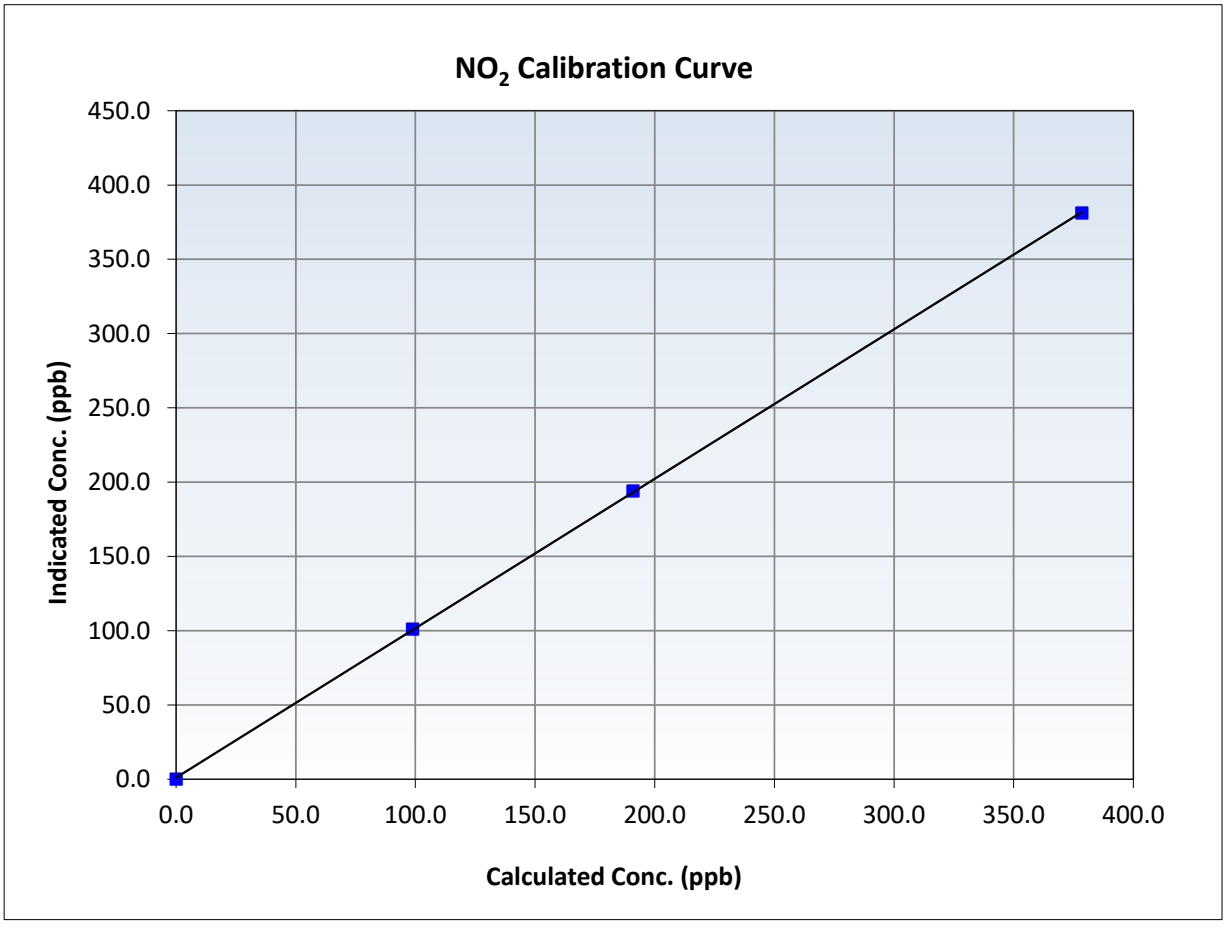
Station Information

Calibration Date:	December 18, 2024	Previous Calibration:	November 19, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:11	End Time (MST):	16:47
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
378.5	381.2	0.9929
190.9	194.0	0.9840
98.8	101.1	0.9773

Statistical Evaluation		Limits
Correlation Coefficient	0.999968	≥0.995
Slope	1.006053	0.90 - 1.10
Intercept	1.038885	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

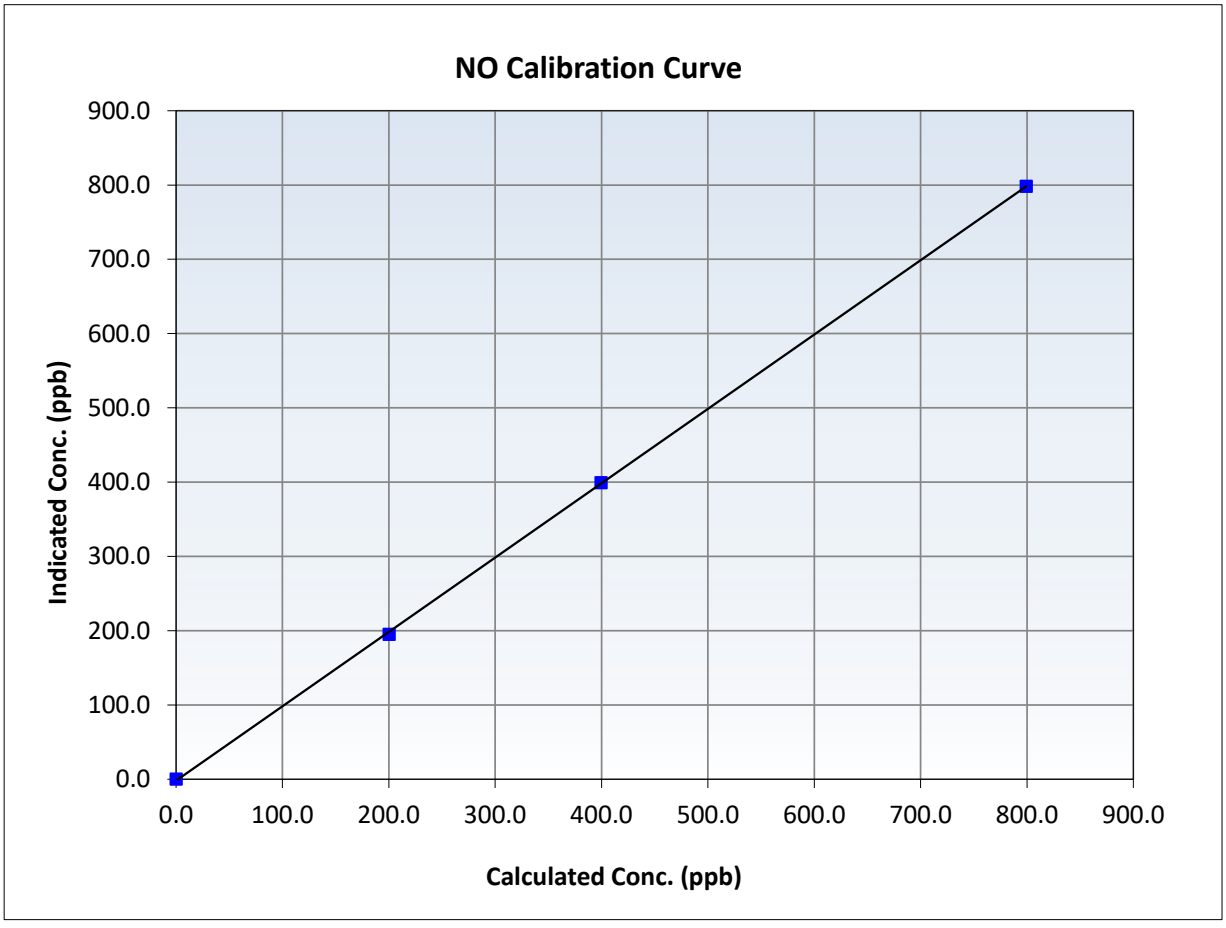
Station Information

Calibration Date:	December 18, 2024	Previous Calibration:	November 19, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:11	End Time (MST):	16:47
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

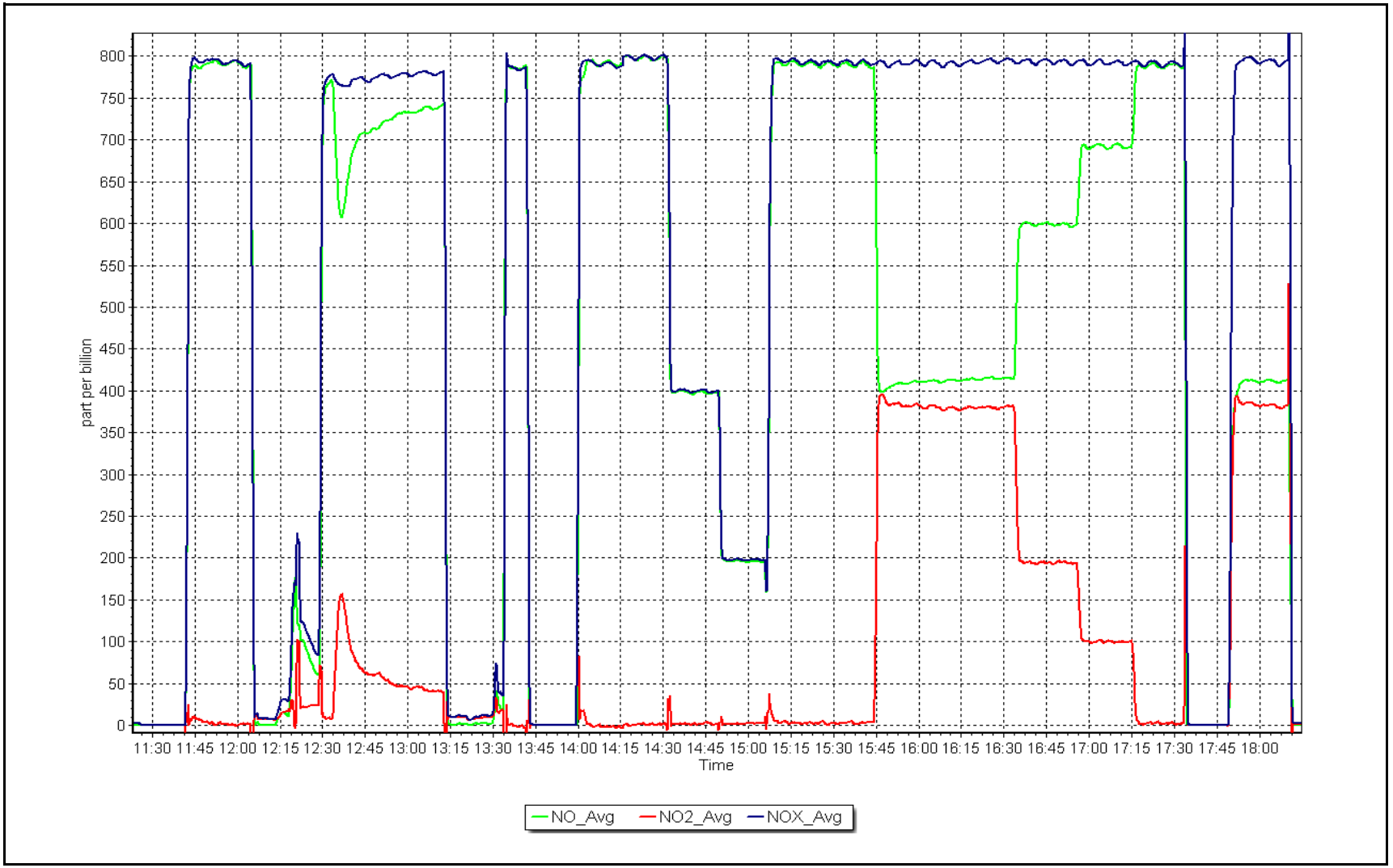
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
799.2	798.3	1.0011
399.6	399.3	1.0008
200.3	195.1	1.0265

Statistical Evaluation		Limits
Correlation Coefficient	0.999950	≥0.995
Slope	1.000922	0.90 - 1.10
Intercept	-1.891558	+/-20



NO_X Calibration Plot Date: December 18, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Surmont 2
Station number:	AMS 29
Calibration Date:	December 19, 2024
Last Cal Date:	December 18, 2024
Start time (MST):	11:40
End time (MST):	13:35
Reason:	Cylinder Change

Calibration Standards

NO Gas Cylinder #:	CC218007	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.00 ppm
Removed Cylinder #:	T12YYFE	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	47.46 ppm	Removed Gas NO Conc:	47.46 ppm
NOX gas Diff:	-1.2%	NO gas Diff:	-2.7%
Calibrator Model:	Teledyne API T700	Serial Number:	5472
ZAG make/model:	Teledyne API T701	Serial Number:	4698

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
AF High point	4916	84.3	800.1	800.1	0.0	794.1	792.3	1.8	1.0073	1.0096
AF Mid point										
AF Low point										
New cyl resp	4933	66.7	803.1	800.4	2.7	787.4	771.9	15.5	1.0111	1.0100

Previous Response	NO_X =	800.6 ppb	NO =	801.0 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -0.8%
Baseline Corr 1st pt	NO_X =	794.3 ppb	NO =	792.5 ppb	As Found Statistics	*Percent Change	NO = -1.1%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1170050148

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.652	1.652	NO bkgnd or offset:	1.4	1.4
NOX coeff or slope:	0.998	0.998	NOX bkgnd or offset:	1.5	1.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	198.0	198.0

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	1.001911	
NO_X Cal Offset:	-1.012618	
NO Cal Slope:	1.004112	
NO Cal Offset:	-2.432496	
NO_2 Cal Slope:	1.002053	
NO_2 Cal Offset:	-0.296979	

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero										
High point										
Mid point										
Low point										
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4933	66.7	803.1	384.9		785.0	384.9	400.1	1.0231	1.0000
								Average Correction Factor		

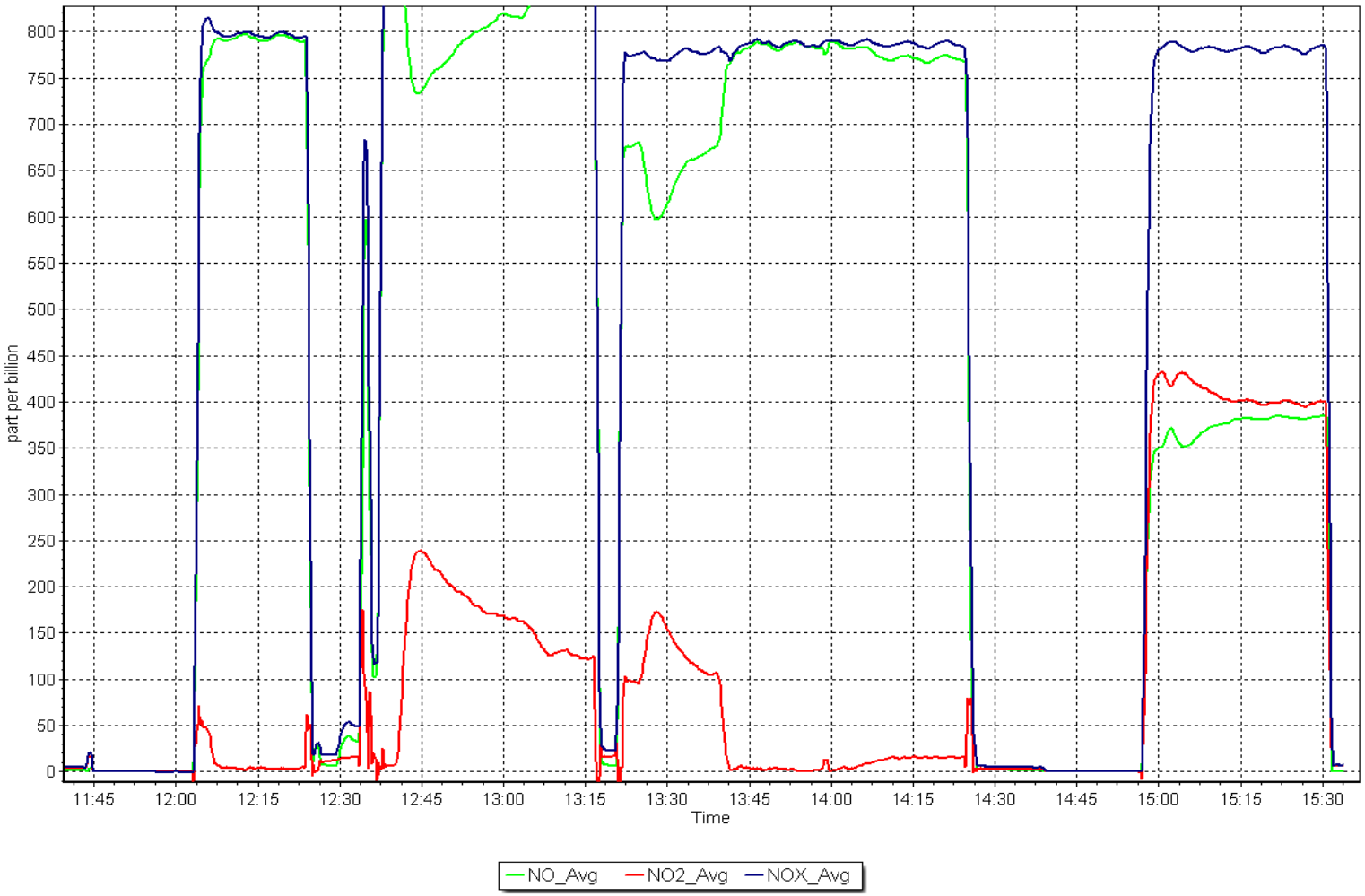
GPT Calibration Data

	O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero							
High GPT point							
Mid GPT point							
Low GPT point							
					Average Correction Factor		

Notes: Swapped NO cylinder.

Calibration Performed By: Braiden Boutilier

NO_X Calibration Plot Date: December 19, 2024 Location: Surmont 2



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	December 13, 2024	Last Cal Date:	November 19, 2024
Start time (MST):	10:45	End time (MST):	14:00
Analyzer Make:	API T640	S/N:	323
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388754
Temp/RH standard:	Alicat FP-25BT	S/N:	388754

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-7.6	-6.41	-7.6	☐	+/- 2 °C
P (mmHg)	704.3	702.84	704.3	☐	+/- 10 mmHg
Flow (LPM)	4.98	4.958	4.98	☐	+/- 0.25 LPM
PW% (pump)	39	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	8.6	PM w/ HEPA:	0.0	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: October 31, 2024

Date Disposable Filter Changed: October 31, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 30, 2024

Date RH/T Sensor Cleaned: October 30, 2024

Notes: Verified temperature, pressure and flow. Leak check passed.

Calibration by: Braiden Boutilier

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS30
ELLS RIVER
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	December 6, 2024	Last Cal Date:	November 1, 2024
Start time (MST):	11:12	End time (MST):	14:07
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	48.75	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC350110			
Removed Cal Gas Conc:	48.75	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3061
Zero Air Gen Model:	API T701H		Serial Number:	358

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1008841397	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003404	1.001932	Backgd or Offset:	9.7	10.1
Calibration intercept:	-2.392023	-3.552064	Coeff or Slope:	0.992	0.992

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4918	82.0	799.5	799.3	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.3	Previous response	799.8	*% change	-0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4918	82.0	799.5	799.1	1.001
Mid point	4959	41.0	399.8	395.6	1.010
Low point	4980	20.5	199.9	193.0	1.036
As left zero	5000	0.0	0.0	-0.2	----
As left span	4918	82.0	799.5	799.8	1.000
				Average Correction Factor:	1.016

Notes: Sample inlet filter was changed after as founds. Adjusted zero only.

Calibration Performed By: Jan Castro

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

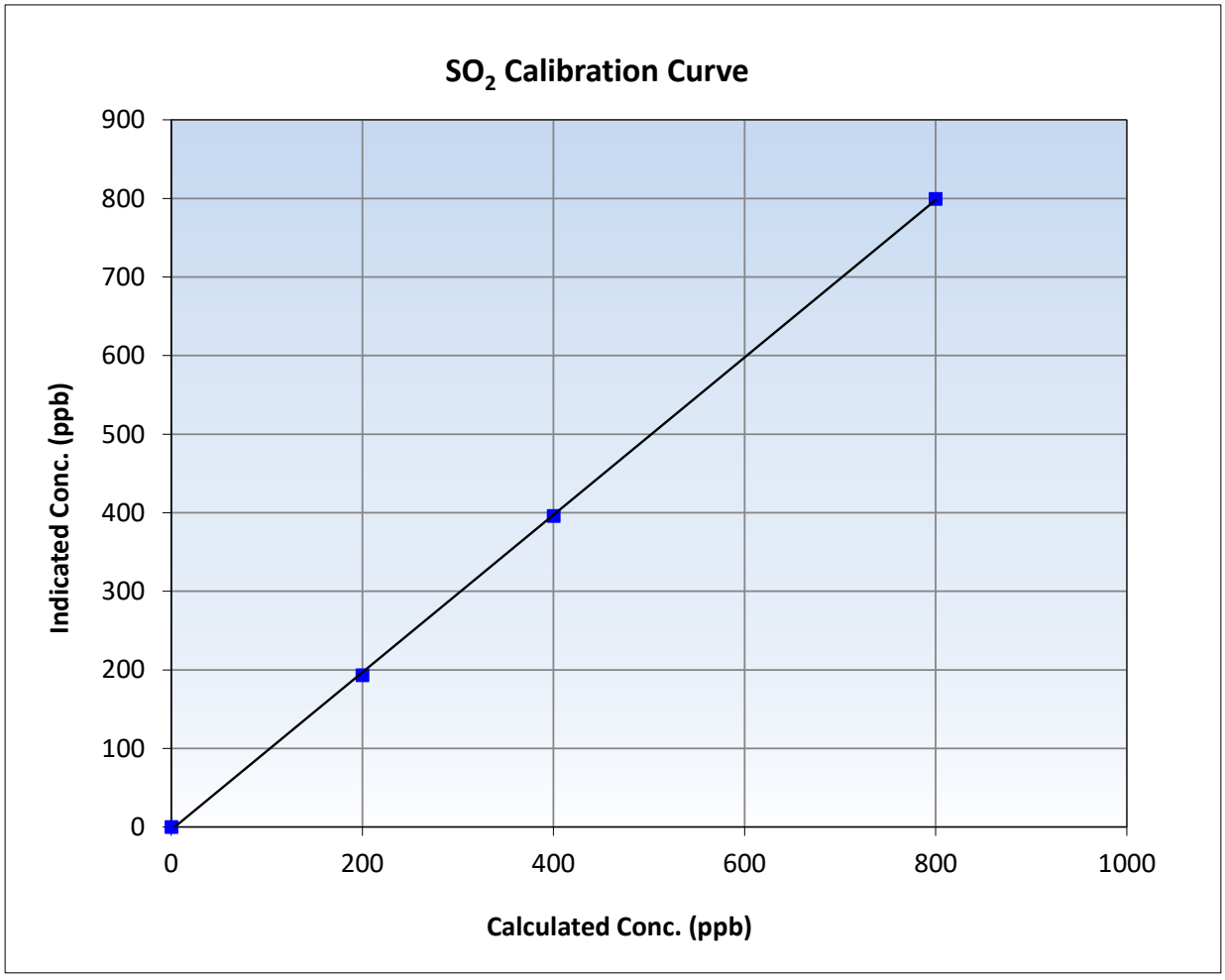
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 1, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	11:12	End Time (MST):	14:07
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841397

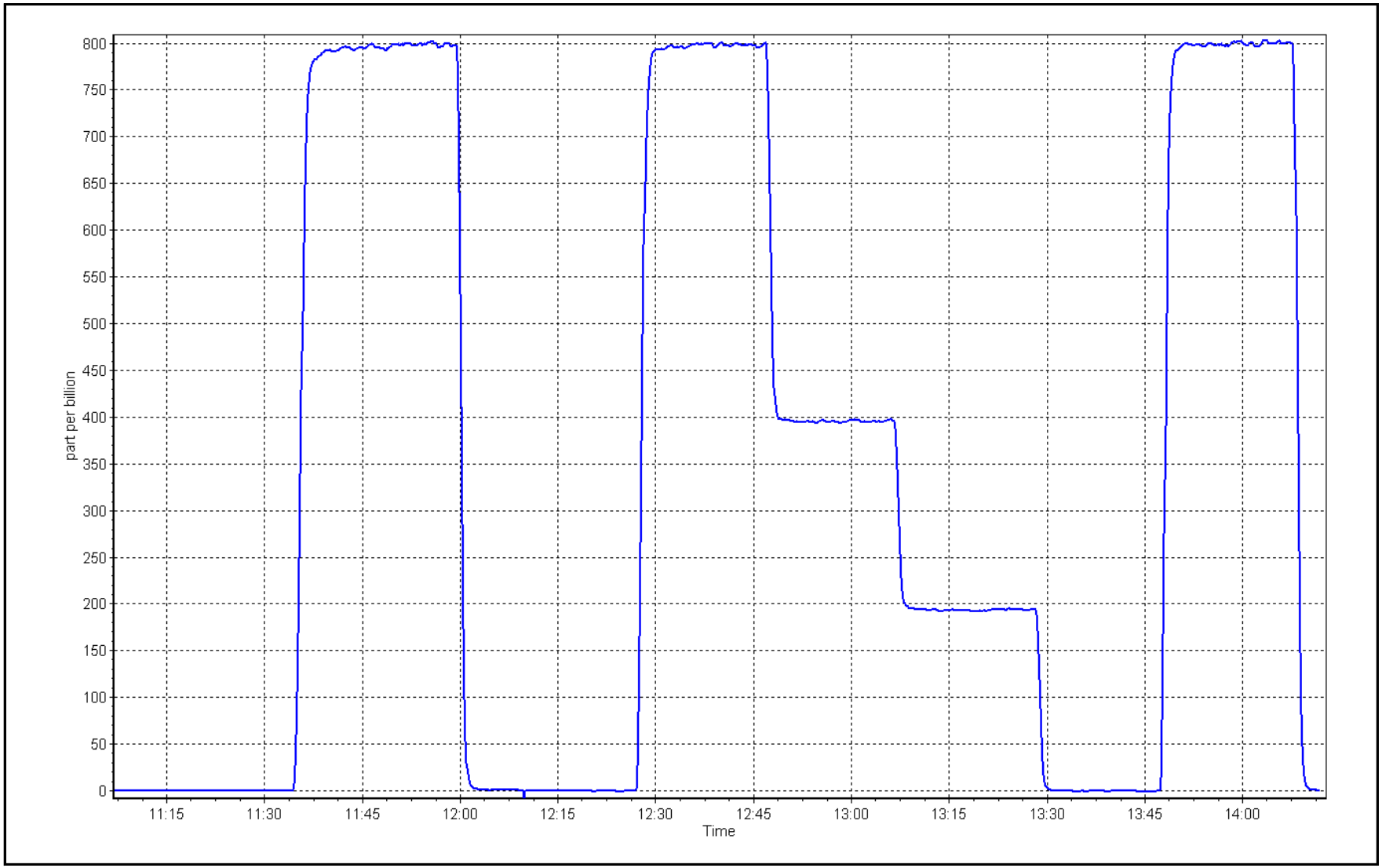
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.5	799.1	1.0005
399.8	395.6	1.0105
199.9	193.0	1.0355

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999915	*≥0.995*
Slope	1.001932	*0.90 - 1.10*
Intercept	-3.552064	*+/-30*



SO2 Calibration Plot Date: December 6, 2024 Location: Ells River



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	December 3, 2024	Last Cal Date:	November 4, 2024
Start time (MST):	9:23	End time (MST):	14:44
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.99	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	CC505806			
Removed Cal Gas Conc:	4.99	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T750		Serial Number:	281
ZAG Make/Model:	API 751H		Serial Number:	77

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1410661331
Converter make:	CDN- 101		Converter serial #:	562
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.008757	0.991618	Backgd or Offset:	1.7	1.6
Calibration intercept:	-0.060386	0.439545	Coeff or Slope:	1.094	1.042

TRS As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4920	80.2	80.0	82.8	0.965
As found Mid point	4960	40.1	40.0	41.4	0.964
As found Low point	4980	20.0	20.0	20.8	0.955
New cylinder response					

Baseline Corr As found:	82.9	Prev response:	80.68	*% change:	2.7%
Baseline Corr 2nd AF pt:	41.5	AF Slope:	1.034880	AF Intercept:	0.000230
Baseline Corr 3rd AF pt:	20.9	AF Correlation:	0.999992	* = > +/-5% change initiates investigation	

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.2	80.0	79.6	1.005
Mid point	4960	40.1	40.0	40.3	0.993
Low point	4980	20.0	20.0	20.7	0.964
As left zero	5000	0.0	0.0	0.5	----
As left span	4920	80.2	80.0	78.5	1.020
SO2 Scrubber Check	4918	82.0	820.0	0.2	----
Date of last scrubber change:				Ave Corr Factor	0.988
Date of last converter efficiency test:					

Notes: Change sample inlet filter after multipoint as founds. Sox scrubber check done after calibrator zero and passed. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

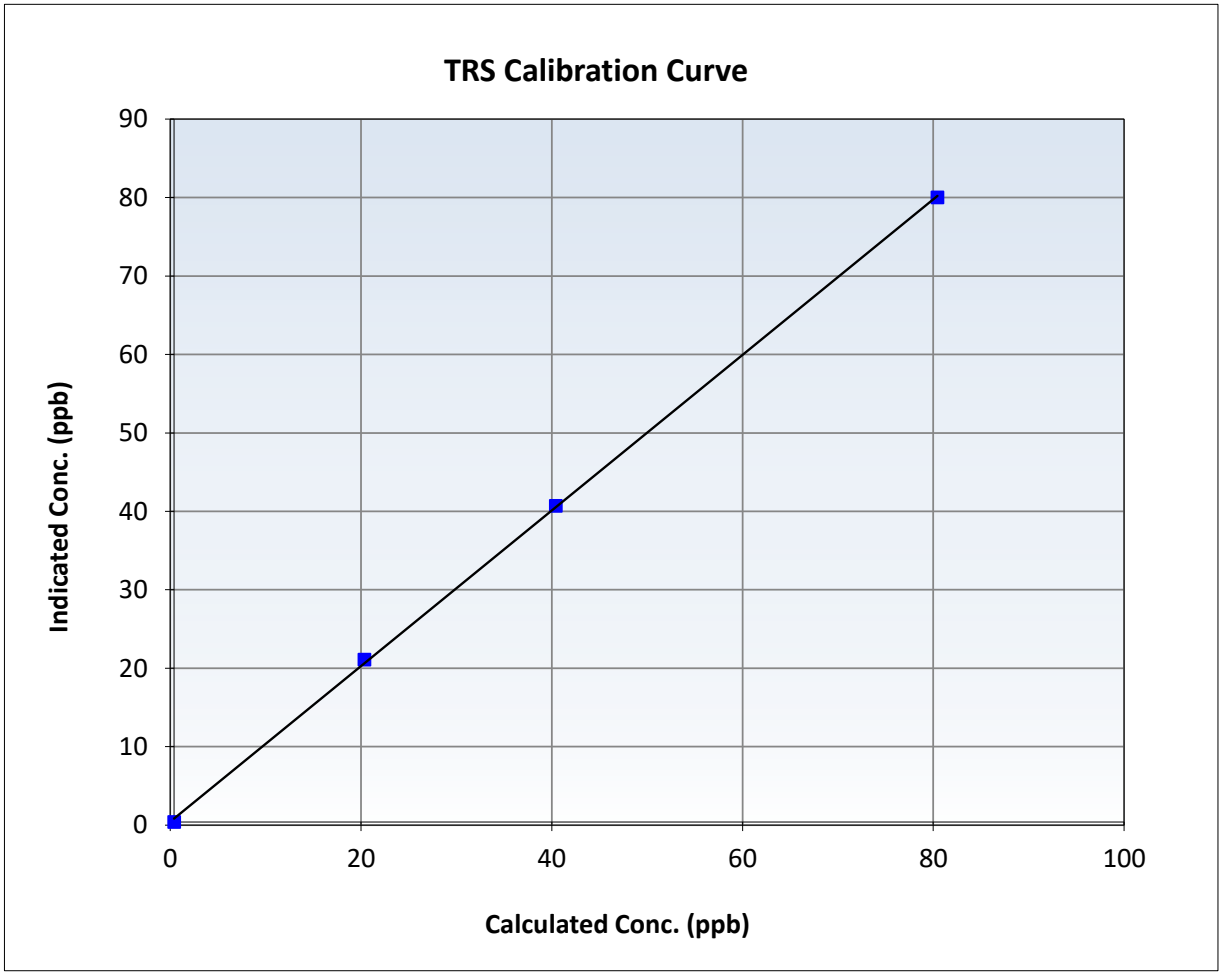
TRS Calibration Summary

Station Information

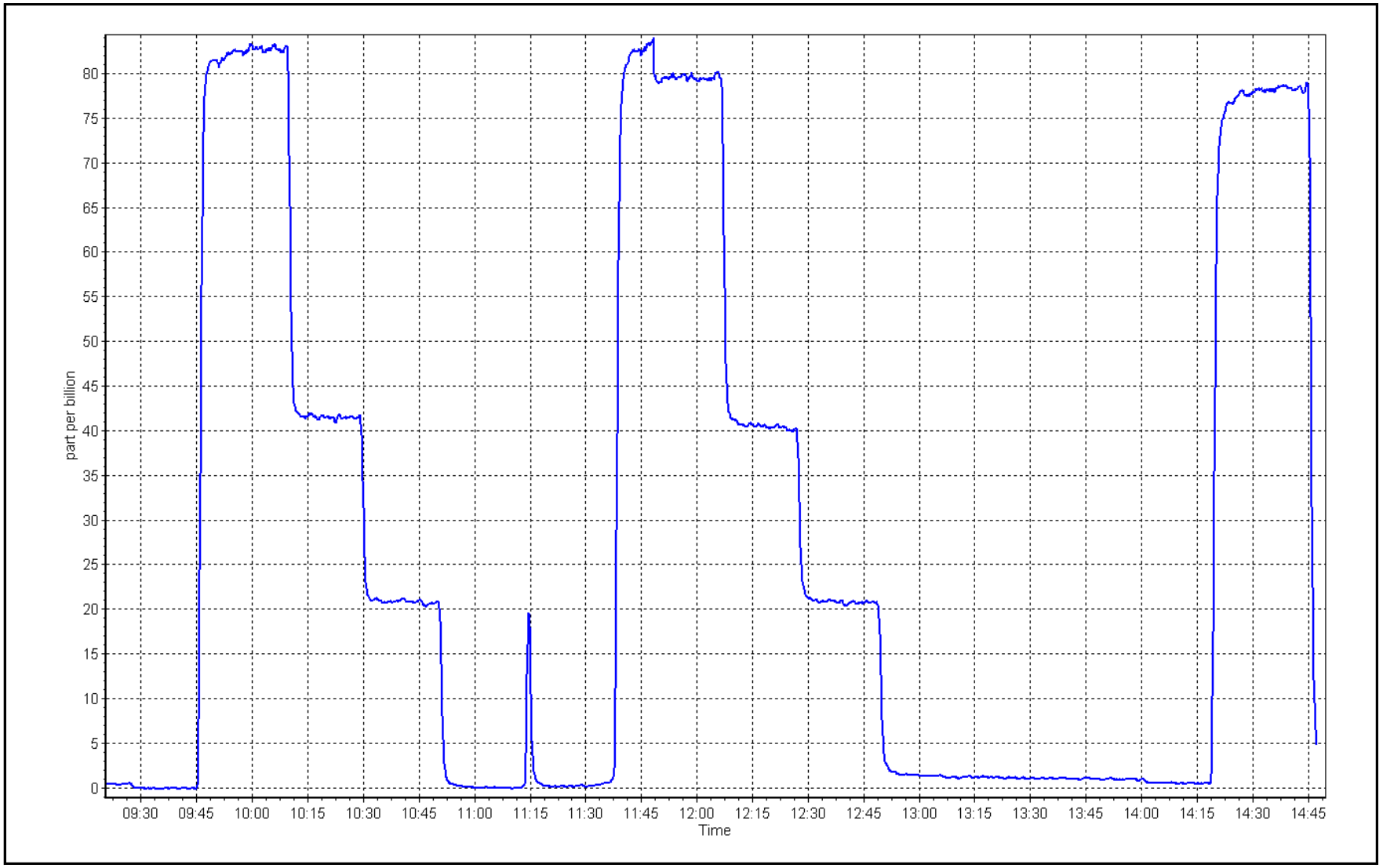
Calibration Date:	December 3, 2024	Previous Calibration:	November 4, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:23	End Time (MST):	14:44
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1410661331

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.0	----	Correlation Coefficient	0.999859	*≥0.995*
80.0	79.6	1.0055	Slope	0.991618	*0.90 - 1.10*
40.0	40.3	0.9930			
20.0	20.7	0.9643	Intercept	0.439545	*+/-3*



TRS Calibration Plot Date: December 3, 2024 Location: Ells River



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	December 6, 2024	Last Cal Date:	November 1, 2024
Start time (MST):	11:12	End time (MST):	14:07
Reason:	Routine		

Calibration Standards

Gas Cert Reference:		CC350110	Cal Gas Expiry Date:	March 10, 2031	
CH4 Cal Gas Conc.	496.6	ppm	CH4 Equiv Conc.	1066.4	ppm
C3H8 Cal Gas Conc.	207.2	ppm			
Removed Gas Cert:		NA	Removed Gas Expiry:	NA	
Removed CH4 Conc.	496.6	ppm	CH4 Equiv Conc.	1066.4	ppm
Removed C3H8 Conc.	207.2	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:	3061	
Zero Air Gen model:	API T701H		Serial Number:	358	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1152430011	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	3.12E-04	3.12E-04	NMHC SP Ratio:	5.94E-05	5.94E-05
CH4 Retention time:	17.6	17.6	NMHC Peak Area:	157107	157107
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	17.49	17.48	1.001
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.48	Prev response	17.49	*% change	0.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	17.49	17.43	1.003
Mid point	4959	41.0	8.74	8.63	1.013
Low point	4980	20.5	4.37	4.27	1.024
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	17.49	17.44	1.003
				Average Correction Factor	1.014

Notes: Sample inlet filter was changed after as founds. No adjustment made.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	9.34	9.35	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.35	Prev response	9.36	*% change	-0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	9.34	9.31	1.004
Mid point	4959	41.0	4.67	4.62	1.011
Low point	4980	20.5	2.34	2.30	1.015
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	9.34	9.31	1.004
				Average Correction Factor	1.010

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	8.14	8.14	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.14	Prev response	8.13	*% change	0.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	8.14	8.12	1.003
Mid point	4959	41.0	4.07	4.01	1.016
Low point	4980	20.5	2.04	1.97	1.036
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	8.14	8.13	1.001
				Average Correction Factor	1.018

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.002015	0.997832
THC Cal Offset:	-0.036226	-0.052226
CH4 Cal Slope:	1.002263	0.998966
CH4 Cal Offset:	-0.033119	-0.036119
NMHC Cal Slope:	1.002360	0.997065
NMHC Cal Offset:	-0.004906	-0.017507

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

THC Calibration Summary

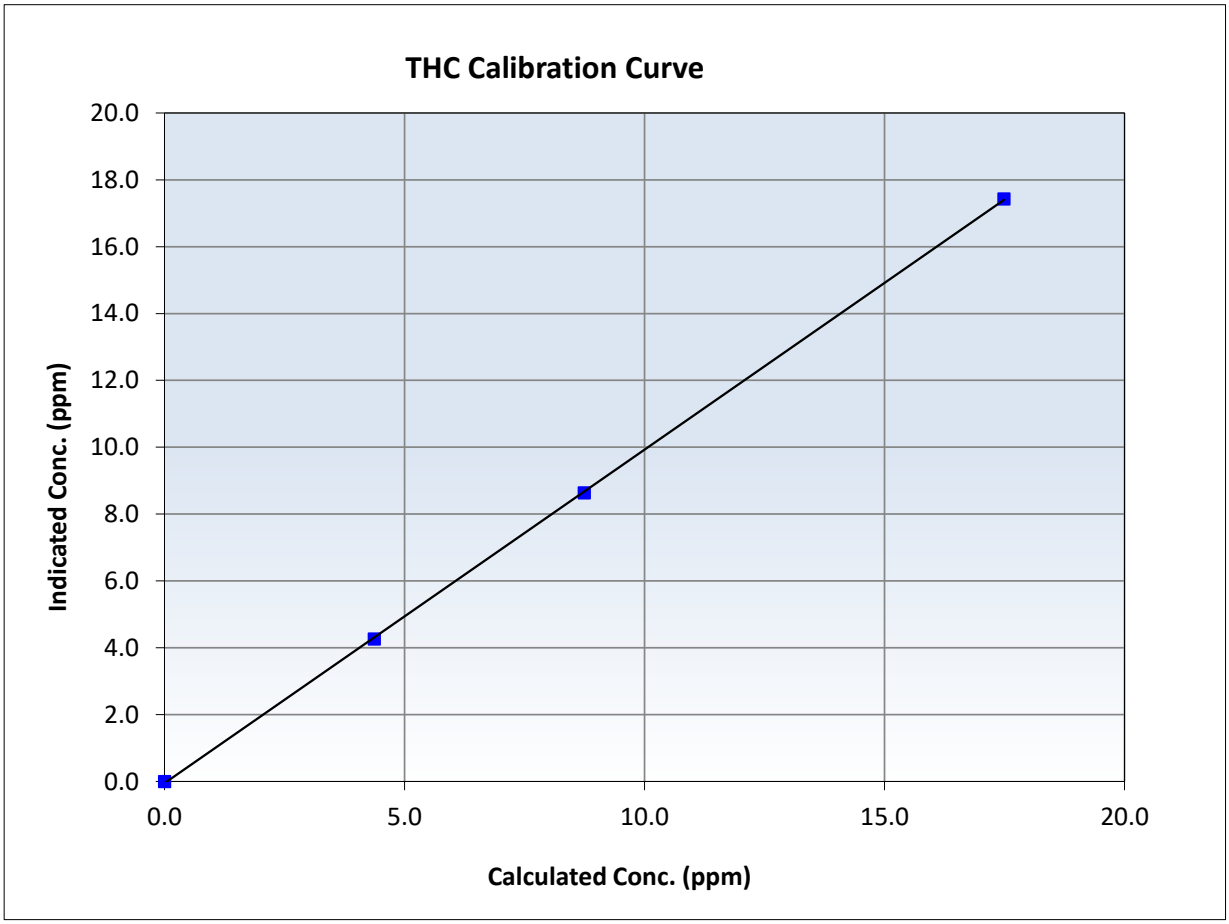
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 1, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	11:12	End Time (MST):	14:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
17.49	17.43	1.0034
8.74	8.63	1.0130
4.37	4.27	1.0243

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999957	*≥0.995*
Slope	0.997832	*0.90 - 1.10*
Intercept	-0.052226	*+/-0.5*



Wood Buffalo Environmental Association

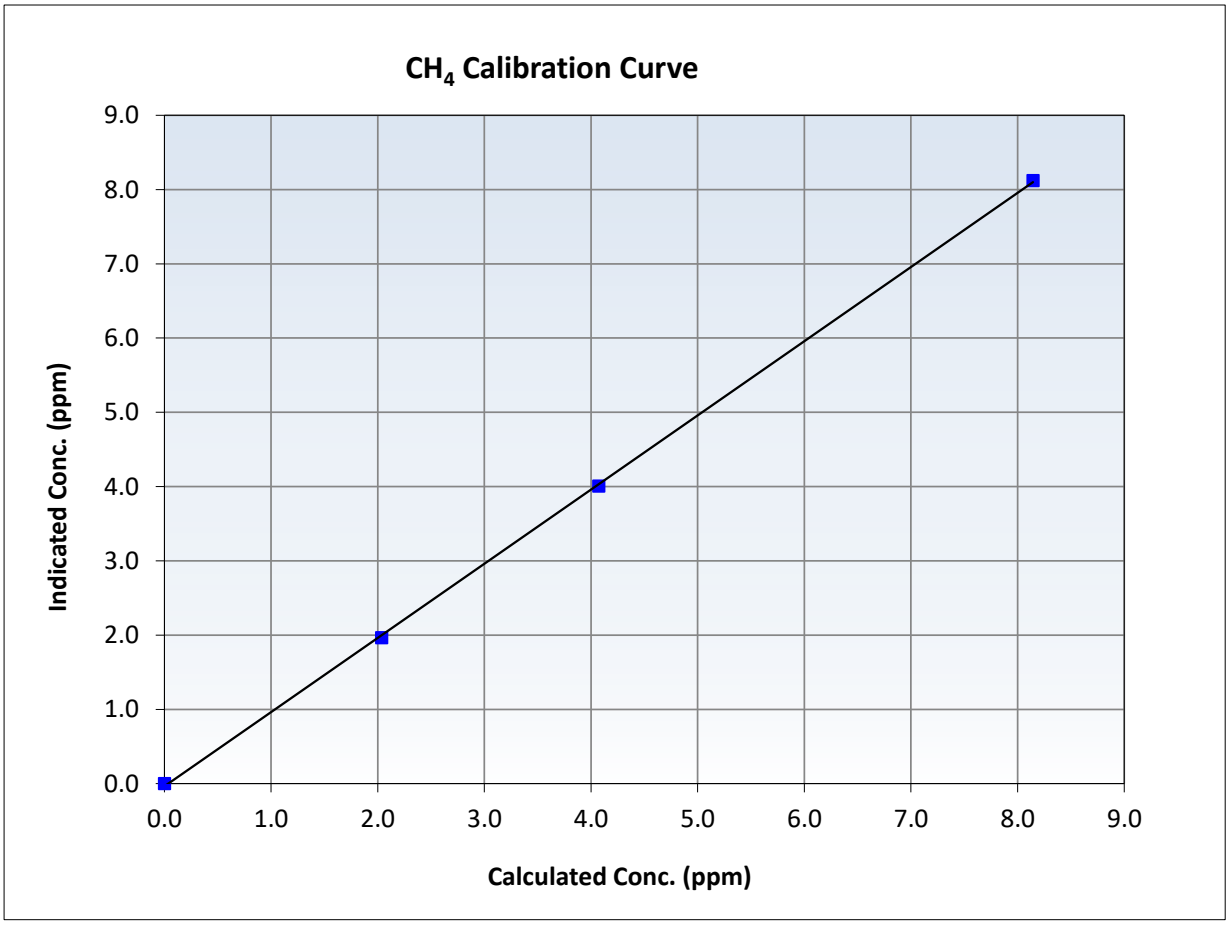
CH_4 Calibration Summary

Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 1, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	11:12	End Time (MST):	14:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999908	≥0.995
8.14	8.12	1.0030	Slope	0.998966	0.90 - 1.10
4.07	4.01	1.0163	Intercept	-0.036119	+/-0.5
2.04	1.97	1.0355			



Wood Buffalo Environmental Association

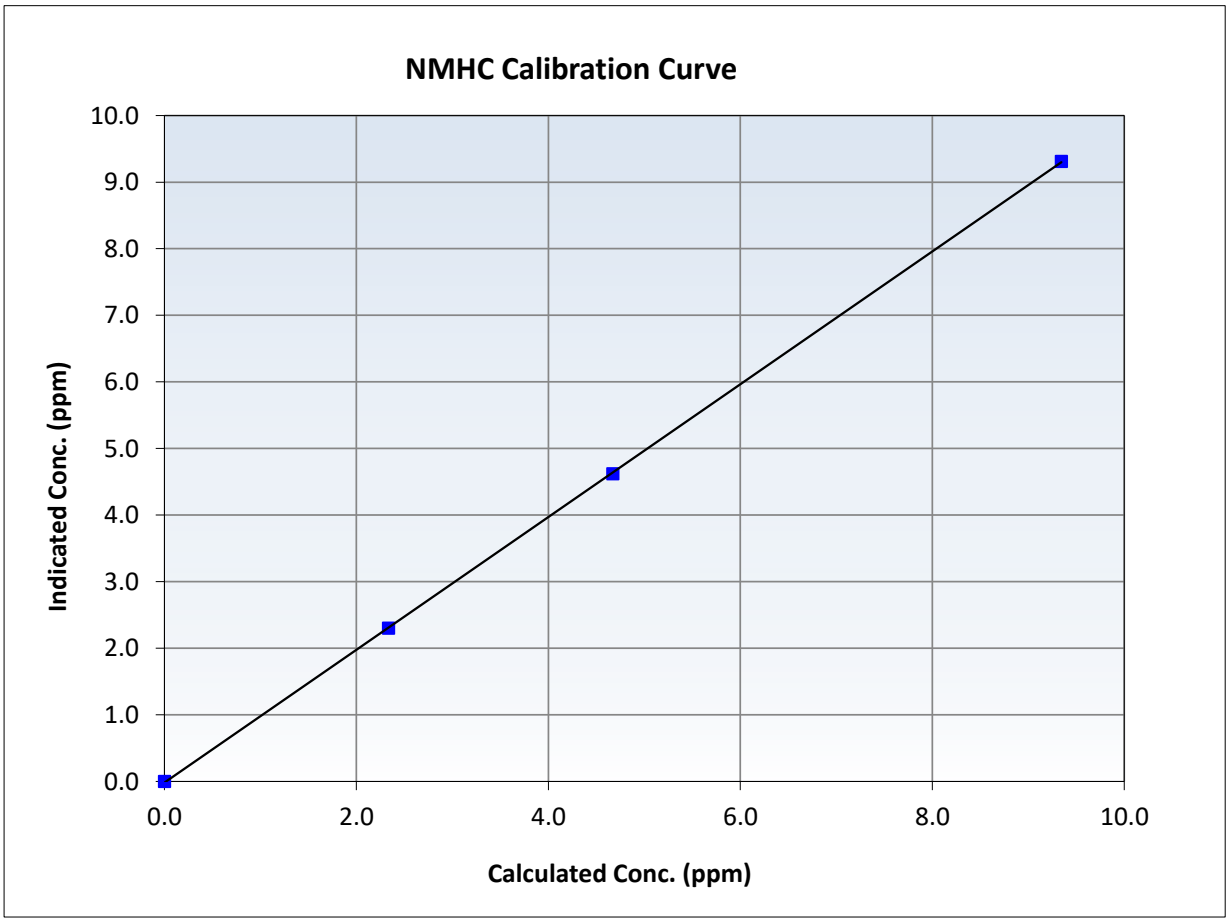
NMHC Calibration Summary

Station Information

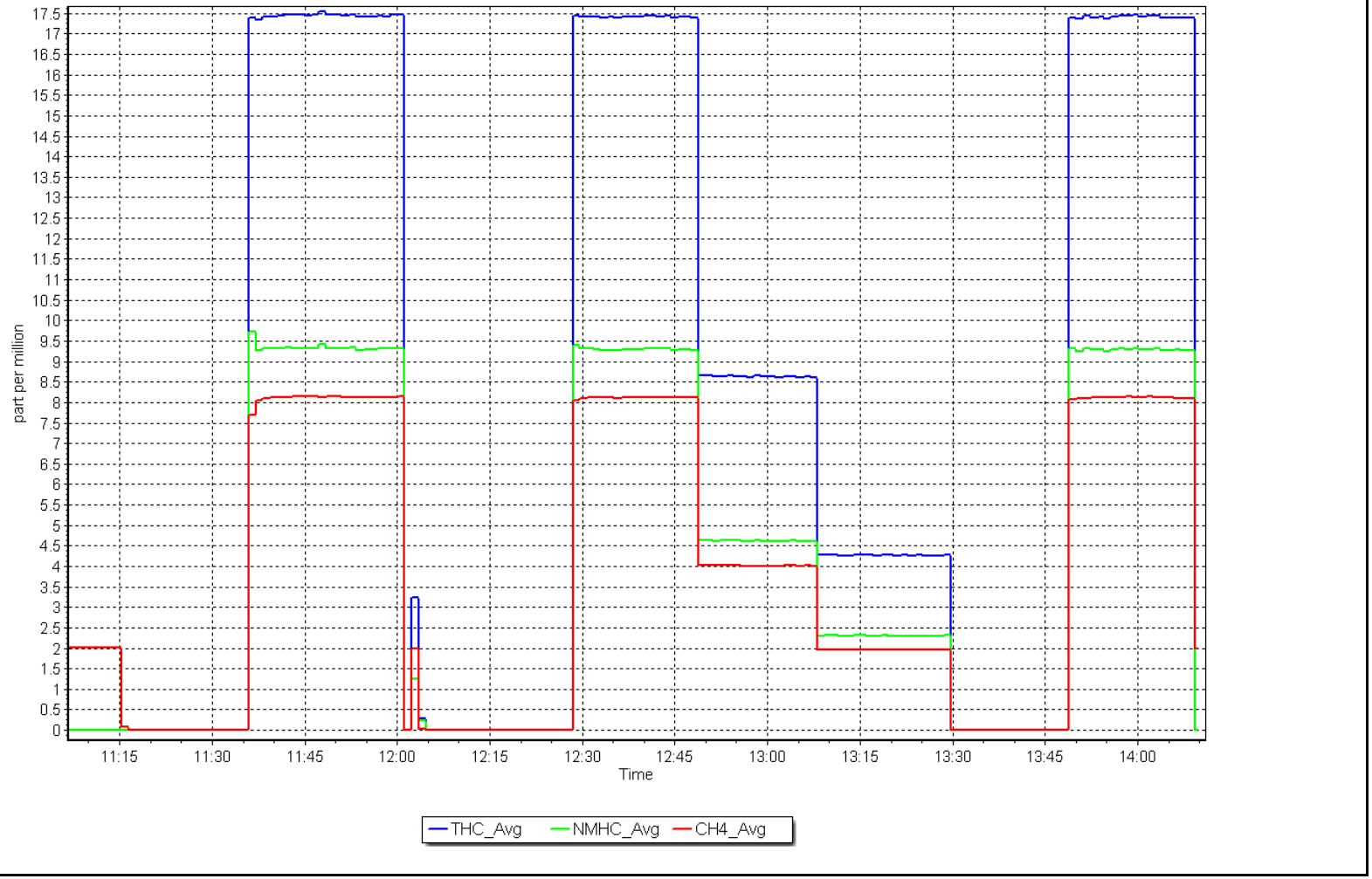
Calibration Date:	December 6, 2024	Previous Calibration:	November 1, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	11:12	End Time (MST):	14:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999980	*≥0.995*
9.34	9.31	1.0035	Slope	0.997065	*0.90 - 1.10*
4.67	4.62	1.0109			
2.34	2.30	1.0152	Intercept	-0.017507	*+/-0.5*



NMHC Calibration Plot Date: December 6, 2024 Location: Ells River



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	December 23, 2024	Last Cal Date:	December 6, 2024
Start time (MST):	11:35	End time (MST):	13:35
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:		CC350110	Cal Gas Expiry Date:	March 10, 2031	
CH4 Cal Gas Conc.	496.6	ppm	CH4 Equiv Conc.	1066.4	ppm
C3H8 Cal Gas Conc.	207.2	ppm			
Removed Gas Cert:		NA	Removed Gas Expiry:	NA	
Removed CH4 Conc.	496.6	ppm	CH4 Equiv Conc.	1066.4	ppm
Removed C3H8 Conc.	207.2	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:	3061	
Zero Air Gen model:	API T701H		Serial Number:	358	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1152430011	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	3.12E-04	3.12E-04	NMHC SP Ratio:	5.94E-05	5.94E-05
CH4 Retention time:	17.6	17.6	NMHC Peak Area:	157107	157107
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	17.49	17.33	1.009
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.33	Prev response	17.40	*% change	-0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	17.49	17.28	1.012
				Average Correction Factor	

Notes: N2 Cylinder Replaced.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	9.34	9.25	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.25	Prev response	9.30	*% change	-0.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	9.34	9.19	1.017
				Average Correction Factor	

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	8.14	8.08	1.007
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.08	Prev response	8.10	*% change	-0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

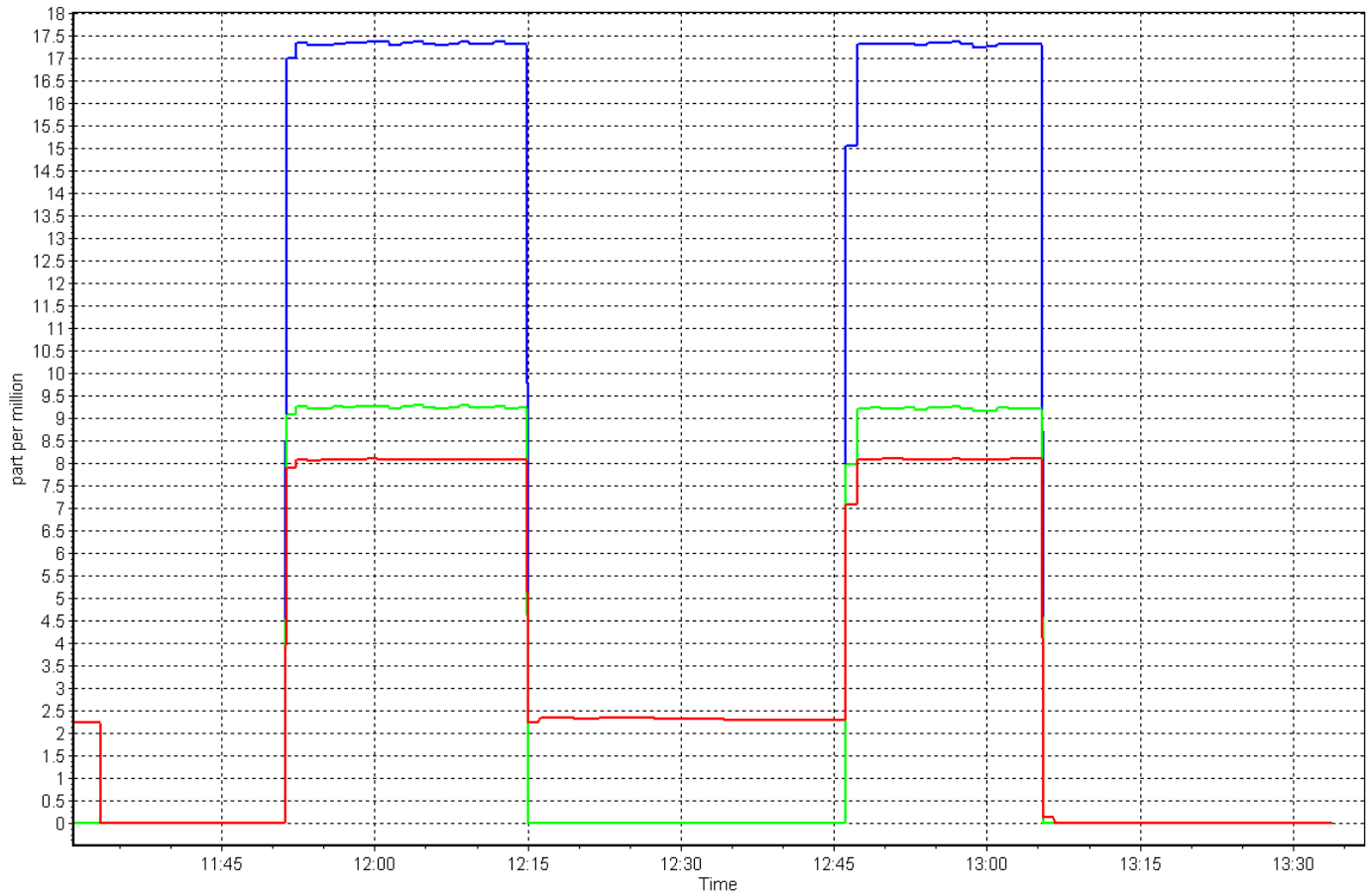
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	8.14	8.09	1.007
				Average Correction Factor	

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997832	
THC Cal Offset:	-0.052226	
CH4 Cal Slope:	0.998966	
CH4 Cal Offset:	-0.036119	
NMHC Cal Slope:	0.997065	
NMHC Cal Offset:	-0.017507	

Calibration Performed By: Devin Russell

NMHC Calibration Plot Date: December 23, 2024 Location: Ells River



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Ells River
Station number:	AMS 30
Calibration Date:	December 3, 2024
Last Cal Date:	November 12, 2024
Start time (MST):	9:23
End time (MST):	13:59
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0027487	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	59.30 ppm	NO Cal Gas Conc:	59.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.30 ppm	Removed Gas NO Conc:	59.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3061
ZAG make/model:	API T701H	Serial Number:	358

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.5	-0.1	----	----
AF High point	4932	67.7	803.0	800.3	2.7	793.7	791.5	2.2	1.0109	1.0104
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 802.0 ppb	NO = 800.6 ppb
Baseline Corr 1st pt	NO_X = 794.3 ppb	NO = 792.0 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X = -1.0%
*Percent Change	NO = -1.1%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 710321429

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.130	1.143	NO bkgnd or offset:	13.4	13.4
NOX coeff or slope:	0.992	0.999	NOX bkgnd or offset:	13.7	13.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	190.6	198.1

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	1.000086	1.001750
NO_X Cal Offset:	-1.078126	-1.237513
NO Cal Slope:	1.002943	0.998473
NO Cal Offset:	-2.018813	-2.379819
NO_2 Cal Slope:	1.000104	0.999496
NO_2 Cal Offset:	-0.123124	0.002264

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.1	----	----
High point	4932	67.7	803.0	800.3	2.7	803.1	797.2	5.8	0.9998	1.0038
Mid point	4966	33.8	400.9	399.5	1.4	401.3	397.0	4.3	0.9990	1.0064
Low point	4983	16.9	200.4	199.8	0.7	197.8	194.0	3.8	1.0133	1.0297
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.1	-0.2	----	----
As left span	4932	67.7	803.0	429.0	374.0	803.0	429.0	374.0	1.0000	1.0000
								Average Correction Factor	1.0040	1.0133

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	797.2	427.5	372.4	371.6	1.0022	99.8%
Mid GPT point	797.2	610.6	189.3	191.0	0.9911	100.9%
Low GPT point	797.2	699.9	100.0	98.9	1.0112	98.9%
				Average Correction Factor	1.0015	99.9%

Notes: Sample inlet filter changed after as founds. Adjusted span only. Used 2nd NO reference point because of drift.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

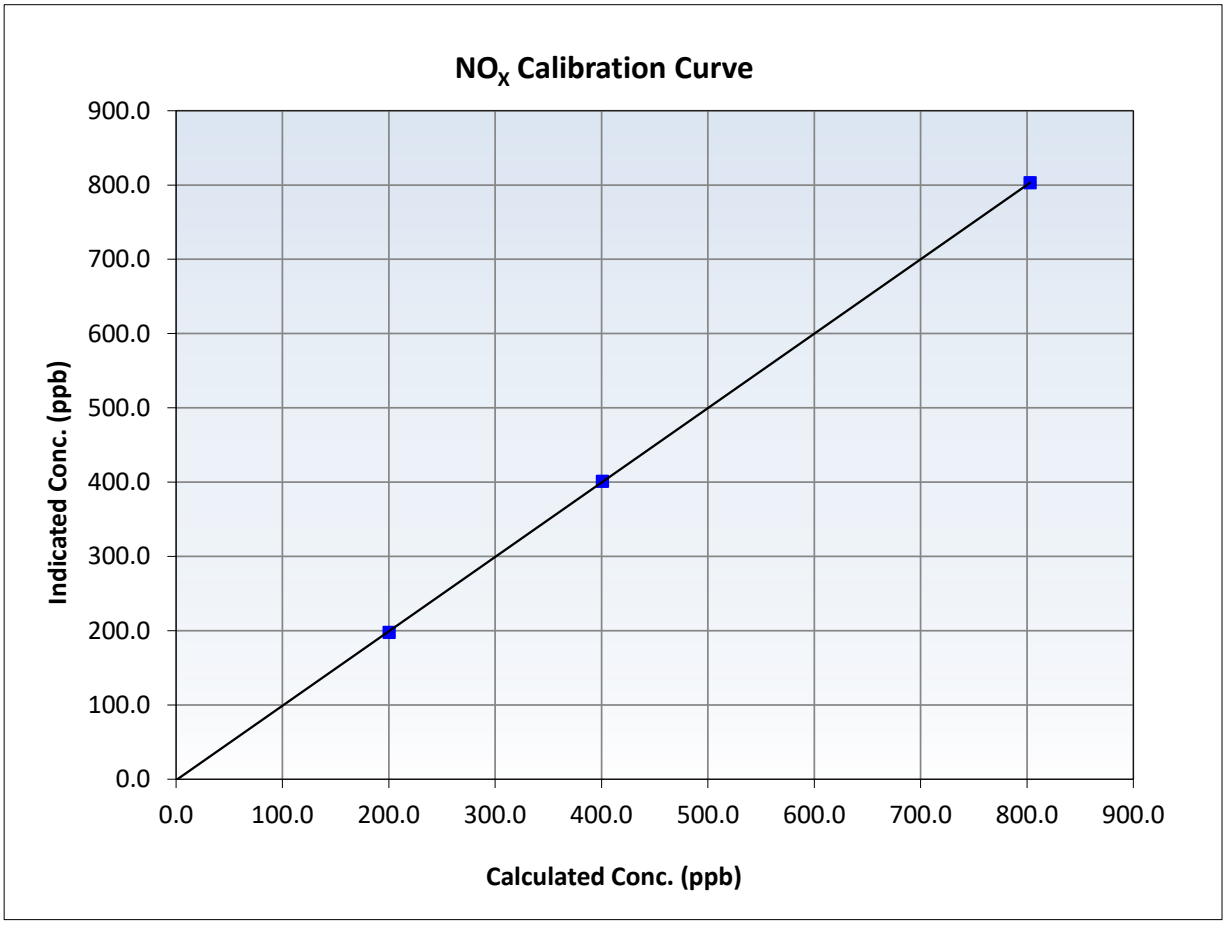
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 12, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:23	End Time (MST):	13:59
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
803.0	803.1	0.9998
400.9	401.3	0.9990
200.4	197.8	1.0133

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999987	*≥0.995*
Slope	1.001750	*0.90 - 1.10*
Intercept	-1.237513	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

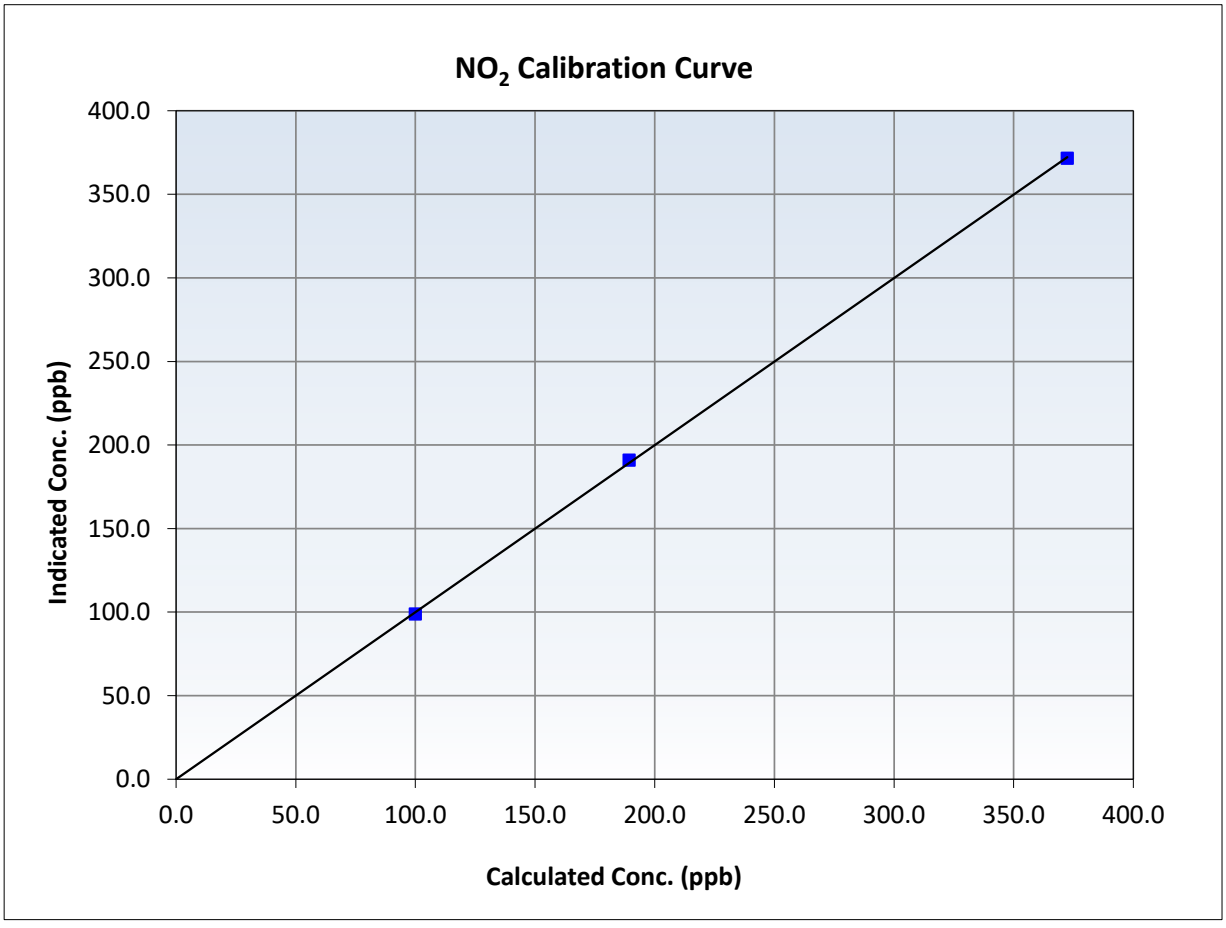
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 12, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:23	End Time (MST):	13:59
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
372.4	371.6	1.0022
189.3	191.0	0.9911
100.0	98.9	1.0112

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999937	*≥0.995*
Slope	0.999496	*0.90 - 1.10*
Intercept	0.002264	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

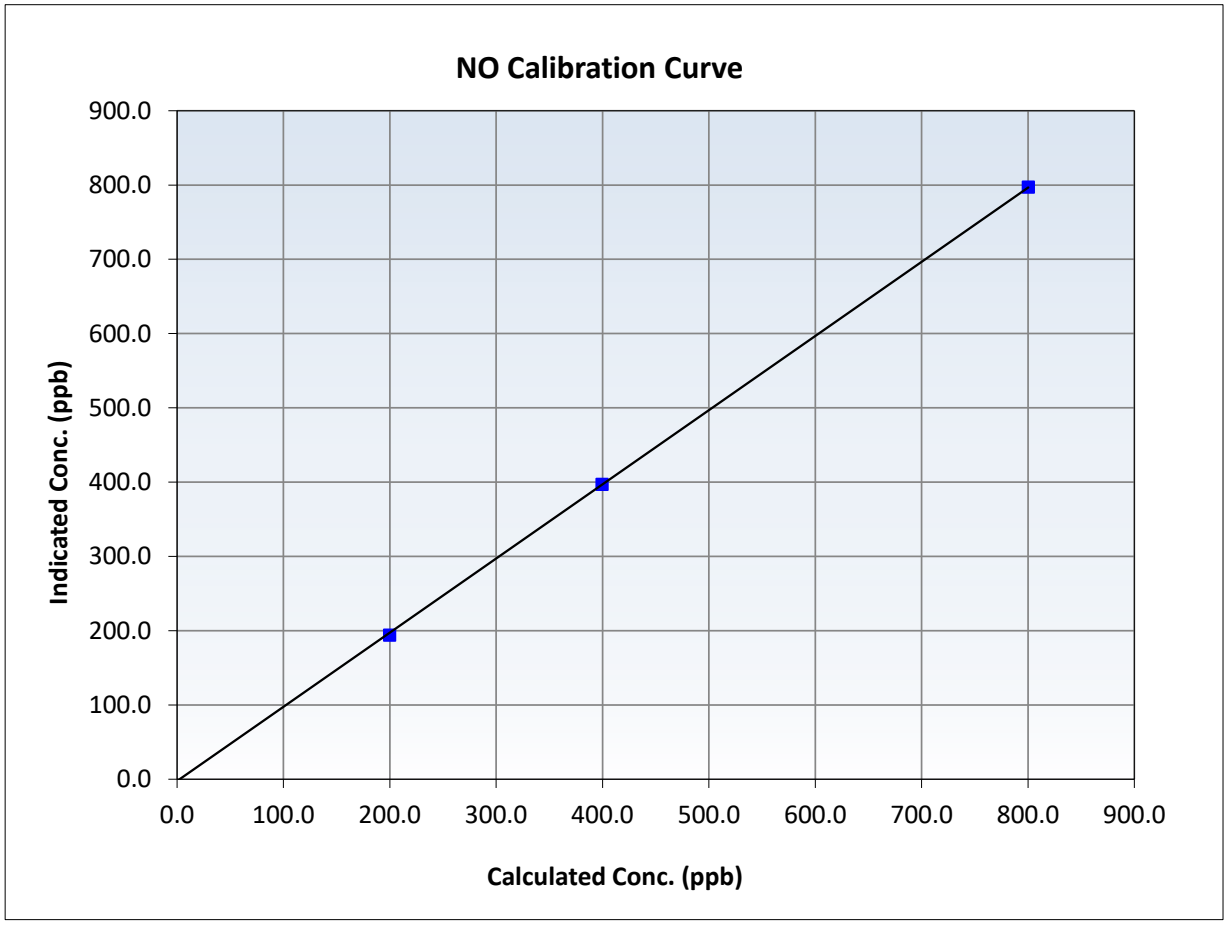
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 12, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:23	End Time (MST):	13:59
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

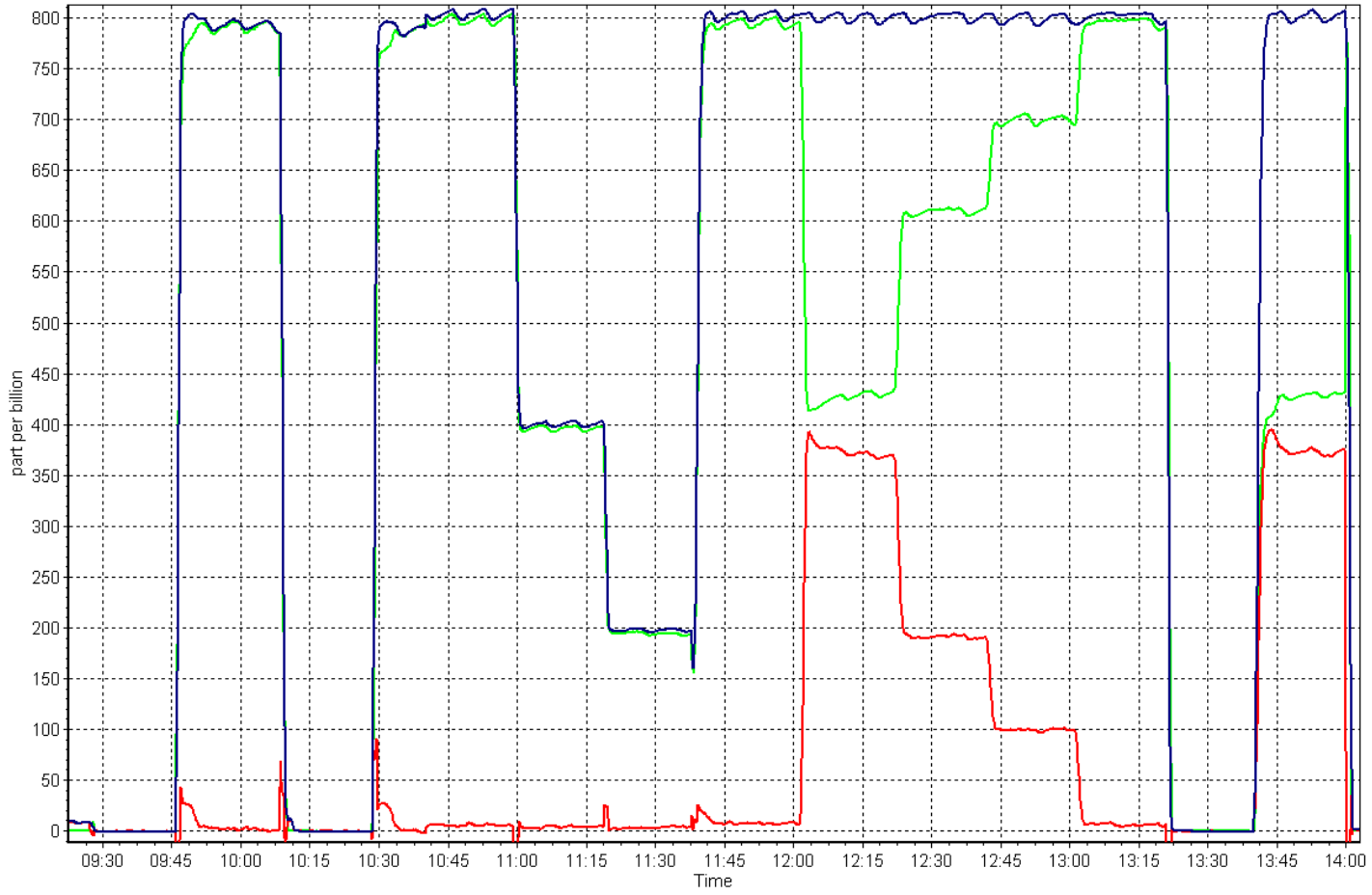
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
800.3	797.2	1.0038
399.5	397.0	1.0064
199.8	194.0	1.0297

Statistical Evaluation		Limits
Correlation Coefficient	0.999959	≥0.995
Slope	0.998473	0.90 - 1.10
Intercept	-2.379819	+/-20



NO_X Calibration Plot Date: December 3, 2024 Location: Ells River



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	December 6, 2024	Last Cal Date:	November 12, 2024
Start time (MST):	13:11	End time (MST):	13:34
Analyzer Make:	API T640	S/N:	875
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388754
Temp/RH standard:	Alicat FP-25BT	S/N:	388754

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (^{o}C)	4.00	3.27	4.00	☐	+/- 2 ^{o}C
P (mmHg)	721.60	723.30	721.60	☐	+/- 10 mmHg
Flow (LPM)	5.01	5.03	5.01	☐	+/- 0.25 LPM
PW% (pump)	33	-----	33	☐	>80%
Zero Verification	PM w/o HEPA:	3.10	PM w/ HEPA:	0.00	<0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: September 29, 2024 — Lot No.: 100128-050-040

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: October 11, 2024

Date Disposable Filter Changed: October 11, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: December 6, 2024

Date RH/T Sensor Cleaned: February 23, 2024

Notes: Verified flow, temperature, pump power and pressure No adjustment made. Leak check passed.

Calibration by: Jan Castro

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS33
MONDAY CREEK
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Monday Creek	Station number:	AMS 33
Calibration Date:	December 5, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	9:07	End time (MST):	12:01
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.62	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	EB0008522			
Removed Cal Gas Conc:	50.62	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne T750		Serial Number:	281
Zero Air Gen Model:	Teledyne 751H		Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1152430005	
Analyzer Range:	0- 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002587	1.004012	Backgd or Offset:	29.0	28.8
Calibration intercept:	1.445233	-1.253595	Coeff or Slope:	0.977	0.960

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4921	79.0	799.8	811.0	0.987
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	810.6	Previous response	803.3	*% change	0.9%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4921	79.0	799.8	802.4	0.997
Mid point	4960	39.5	399.9	399.9	1.000
Low point	4980	19.8	200.5	198.2	1.011
As left zero	5000	0.0	0.0	0.4	----
As left span	4921	79.0	799.8	801.2	0.998
				Average Correction Factor:	1.003

Notes: Sample inlet filter was changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

SO_2 Calibration Summary

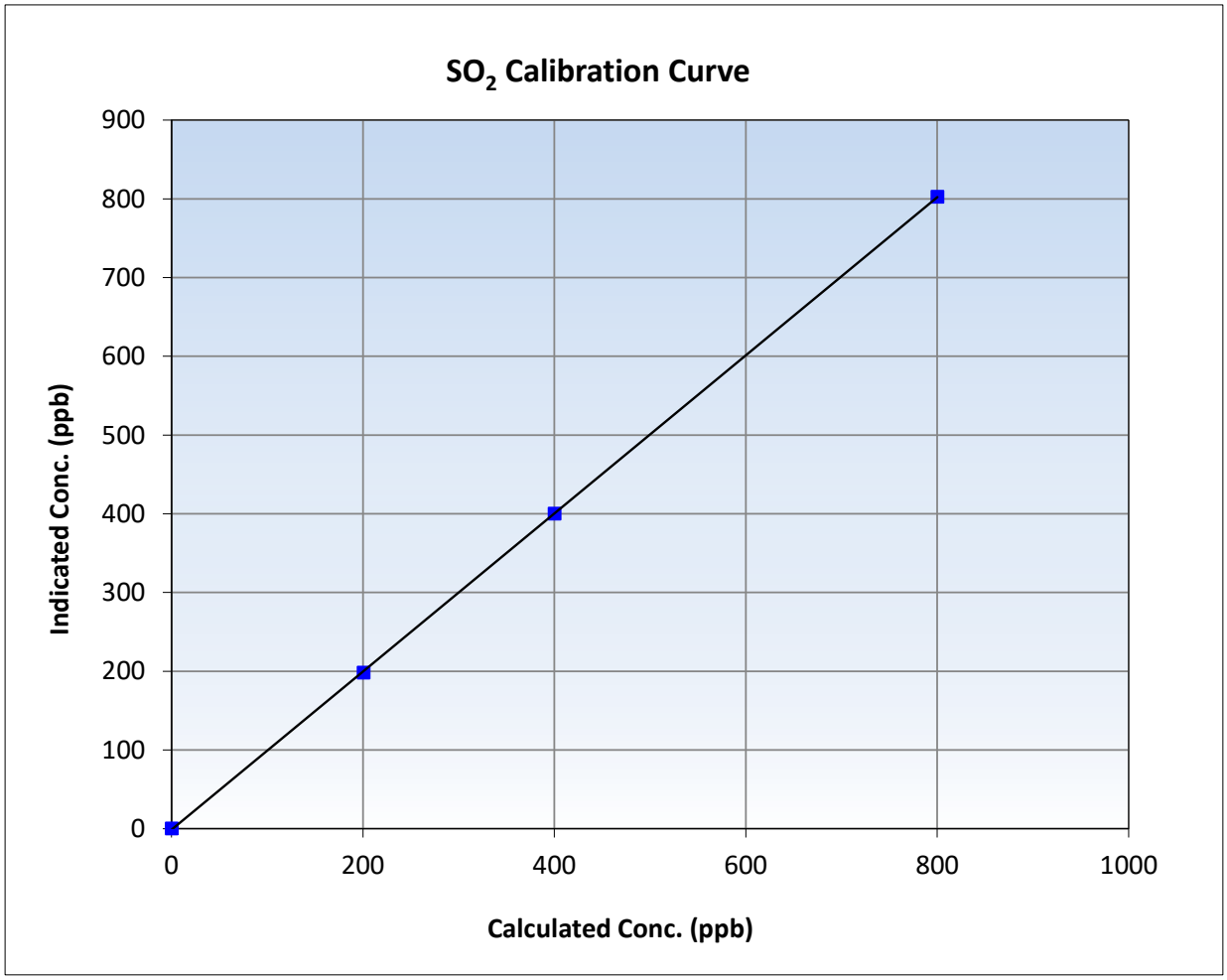
Station Information

Calibration Date:	December 5, 2024	Previous Calibration:	November 7, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	9:07	End Time (MST):	12:01
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430005

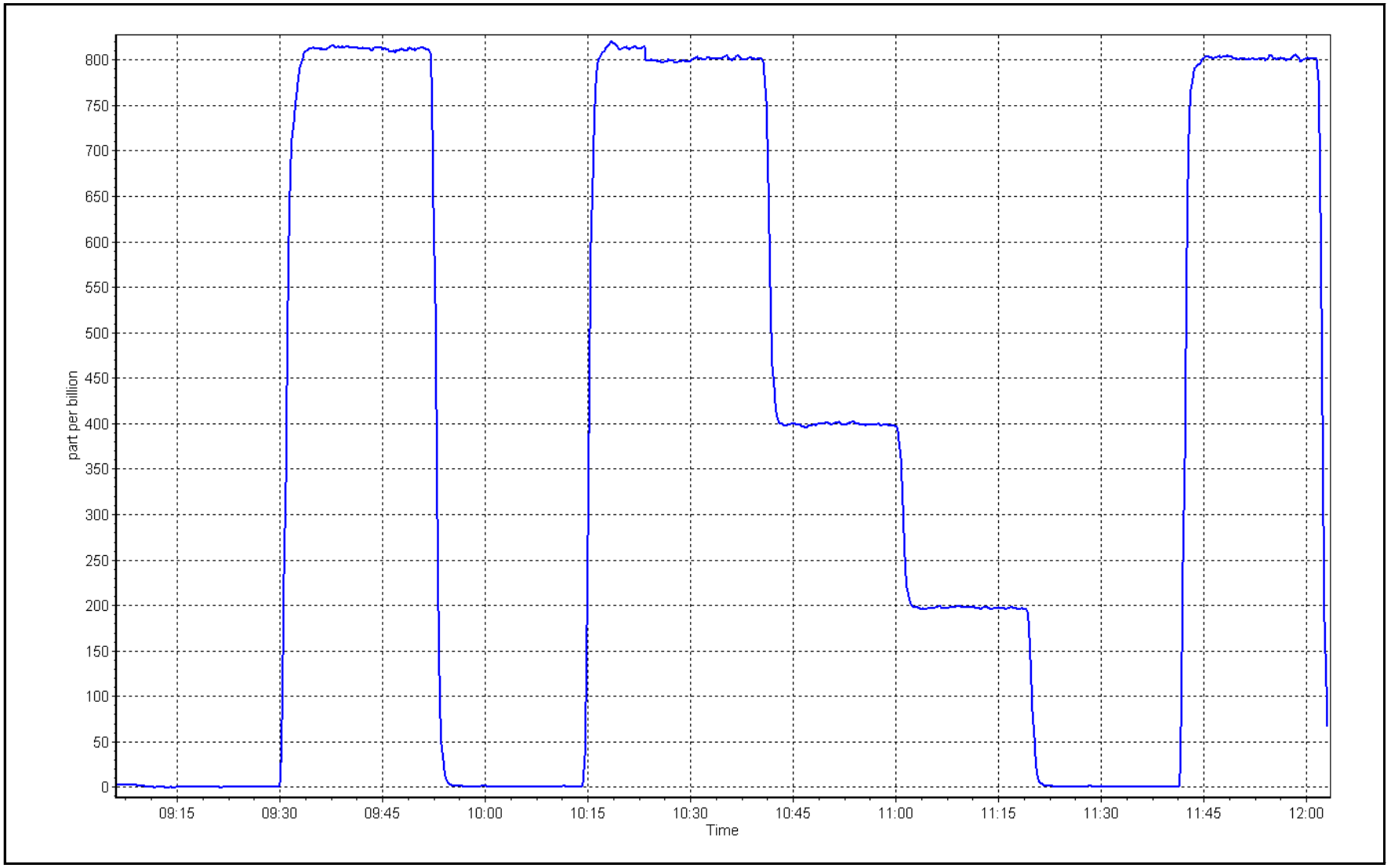
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
799.8	802.4	0.9968
399.9	399.9	1.0001
200.5	198.2	1.0114

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999982	*≥0.995*
Slope	1.004012	*0.90 - 1.10*
Intercept	-1.253595	*+/-30*



SO2 Calibration Plot Date: December 5, 2024 Location: Monday Creek



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Monday Creek	Station number:	AMS 33
Calibration Date:	December 4, 2024	Last Cal Date:	November 7, 2024
Start time (MST):	11:03	End time (MST):	16:30
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.05	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	DT0014831			
Removed Cal Gas Conc:	5.05	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T750		Serial Number:	281
ZAG Make/Model:	Teledyne T701H		Serial Number:	832

Analyzer Information

Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12333331547
Converter make:	Global 150		Converter serial #:	2022-196
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.003998	0.996854	Backgd or Offset:	1.3	1.5
Calibration intercept:	0.138391	0.038399	Coeff or Slope:	1.063	1.063

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4921	79.2	80.0	80.0	1.000
As found Mid point	4960	39.6	40.0	40.1	0.997
As found Low point	4980	19.8	20.0	20.2	0.990
New cylinder response					

Baseline Corr As found:	80.0	Prev response:	80.45	*% change:	-0.6%
Baseline Corr 2nd AF pt:	40.1	AF Slope:	0.999426	AF Intercept:	0.098398
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999993	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4921	79.2	80.0	79.7	1.004
Mid point	4960	39.6	40.0	40.0	1.000
Low point	4980	19.8	20.0	20.1	0.995
As left zero	5000	0.0	0.0	-0.2	----
As left span	4921	79.2	80.0	80.2	0.997
SO2 Scrubber Check	4921	79.0	790.0	0.1	----

Date of last scrubber change:	11-Apr-24	Ave Corr Factor	1.000
Date of last converter efficiency test:			

Notes: Sample inlet filter changed after multipoint as founds. Sox scrubber check done after calibrator zero and passed. Adjusted zero only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

H2S Calibration Summary

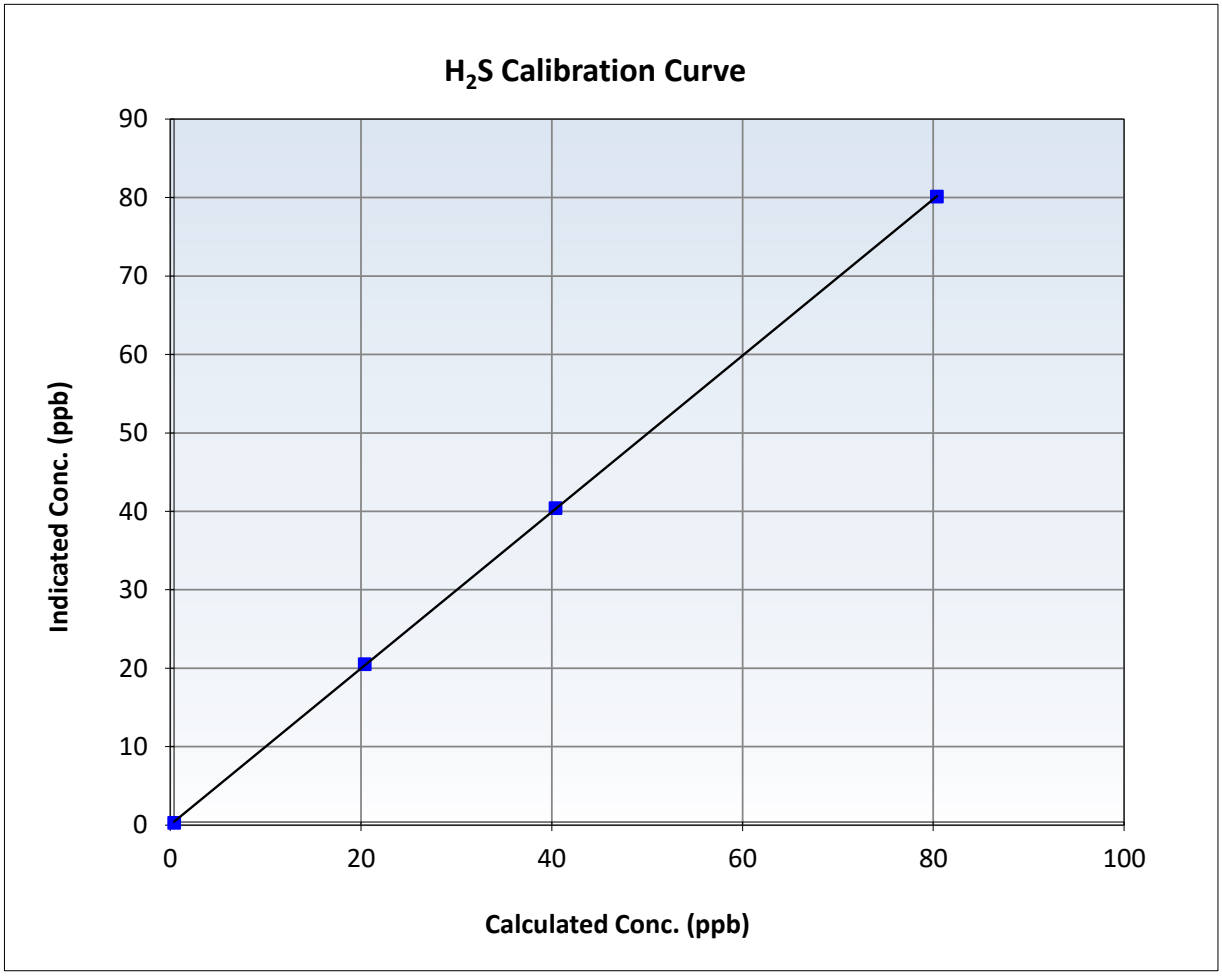
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 7, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	11:03	End Time (MST):	16:30
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331547

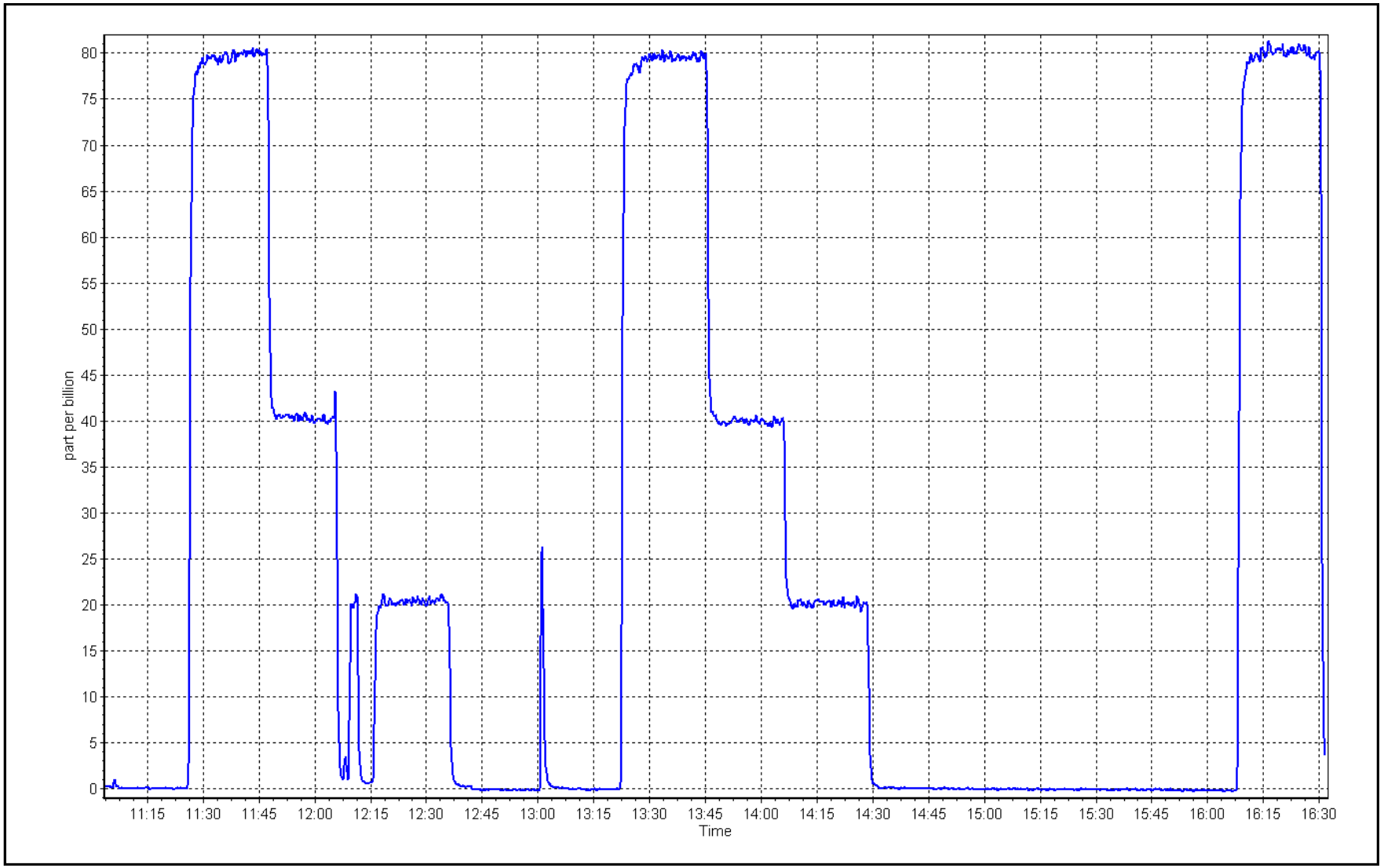
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
80.0	79.7	1.0036
40.0	40.0	1.0000
20.0	20.1	0.9950

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999986	*≥0.995*
Slope	0.996854	*0.90 - 1.10*
Intercept	0.038399	*+/-3*



H2S Calibration Plot Date: December 4, 2024 Location: Monday Creek



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Monday Creek
Station number:	AMS 33
Calibration Date:	December 4, 2024
Last Cal Date:	November 7, 2024
Start time (MST):	11:03
End time (MST):	15:48
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC755290	Cal Gas Expiry Date:	January 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.70 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.70 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5258
ZAG make/model:	Teledyne API T701H	Serial Number:	832

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-1.5	0.1	-1.6	----	----
AF High point	4918	82.1	802.9	799.6	3.3	804.2	806.3	-2.0	0.9966	0.9919
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	799.6 ppb	NO =	801.7 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = 0.8%
Baseline Corr 1st pt	NO_X =	805.7 ppb	NO =	806.2 ppb	As Found Statistics	*Percent Change	NO = 0.6%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1173480006

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.315	1.307	NO bkgnd or offset:	2.5	2.7
NOX coeff or slope:	0.984	0.990	NOX bkgnd or offset:	4.1	2.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	161.7	162.2

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.997620	0.996610
NO_X Cal Offset:	-1.409395	-1.429437
NO Cal Slope:	1.004775	0.999817
NO Cal Offset:	-1.729194	-2.169452
NO_2 Cal Slope:	0.995663	0.998596
NO_2 Cal Offset:	-1.104038	-0.279105

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
High point	4918	82.1	802.9	799.6	3.3	799.5	798.4	1.1	1.0043	1.0016
Mid point	4959	41.1	401.9	400.3	1.6	398.3	396.9	1.3	1.0092	1.0086
Low point	4979	20.5	200.5	199.7	0.8	197.2	195.5	1.7	1.0168	1.0214
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4918	82.1	802.9	360.5	442.4	795.2	360.5	434.7	1.0097	1.0000
							Average Correction Factor		1.0101	1.0105

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	788.3	379.1	412.5	412.3	1.0004	100.0%
Mid GPT point	788.3	574.2	217.4	215.2	1.0101	99.0%
Low GPT point	788.3	683.8	107.8	108.0	0.9980	100.2%
				Average Correction Factor	1.0029	99.7%

Notes: Sample inlet filter changed after as founds. Adjusted zero and span. Used 2nd NO reference point because of drift.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

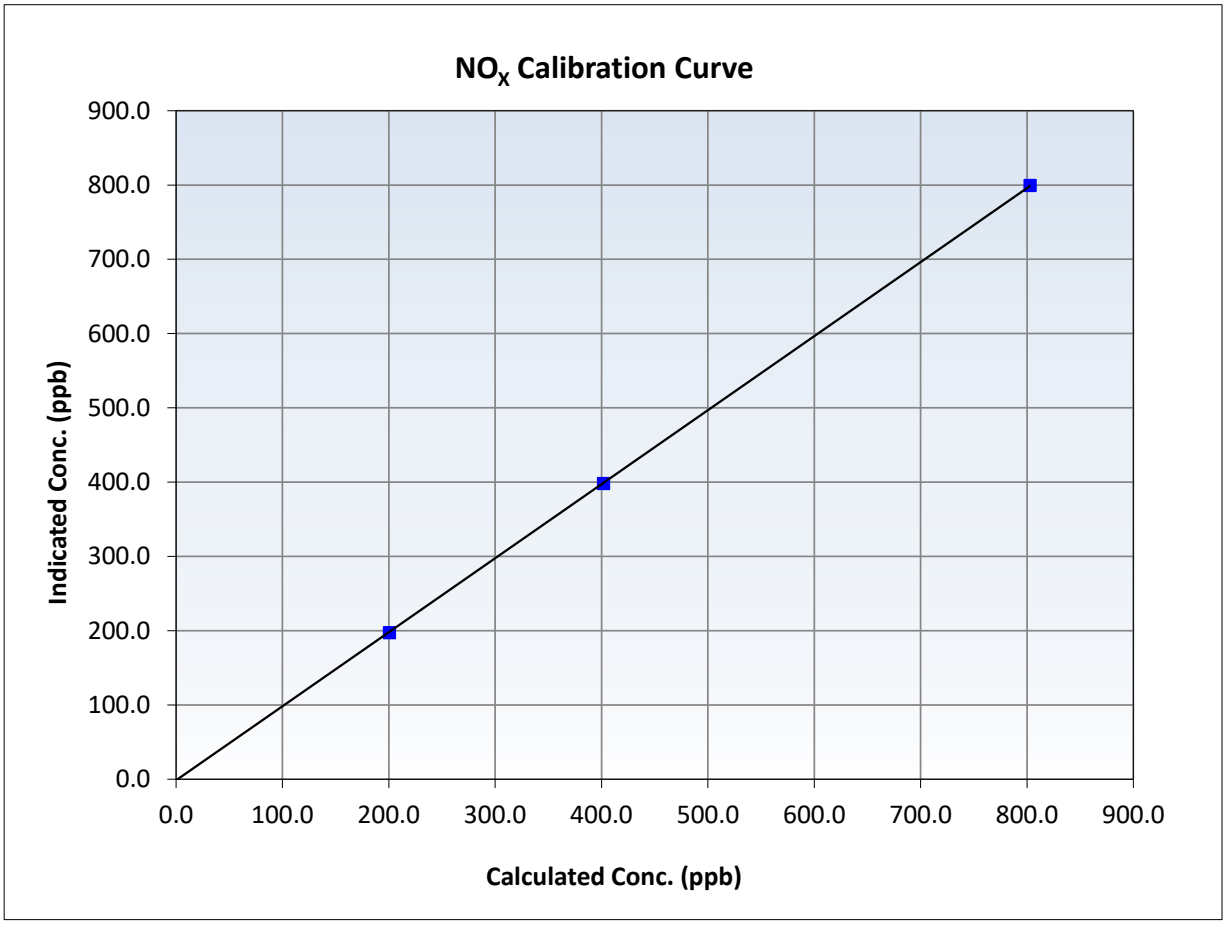
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 7, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	11:03	End Time (MST):	15:48
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
802.9	799.5	1.0043
401.9	398.3	1.0092
200.5	197.2	1.0168

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999987	*≥0.995*
Slope	0.996610	*0.90 - 1.10*
Intercept	-1.429437	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

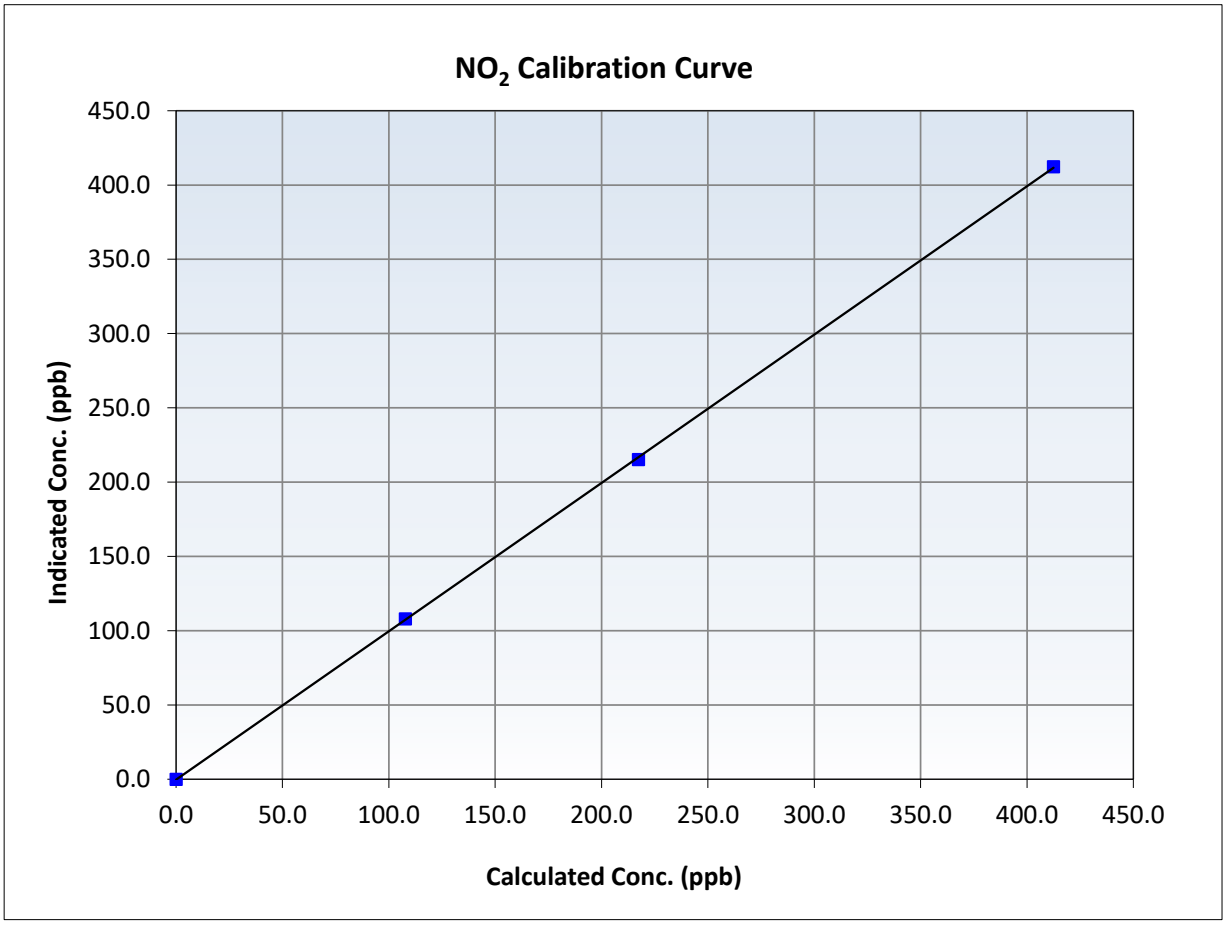
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 7, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	11:03	End Time (MST):	15:48
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
412.5	412.3	1.0004
217.4	215.2	1.0101
107.8	108.0	0.9980

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999962	*≥0.995*
Slope	0.998596	*0.90 - 1.10*
Intercept	-0.279105	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

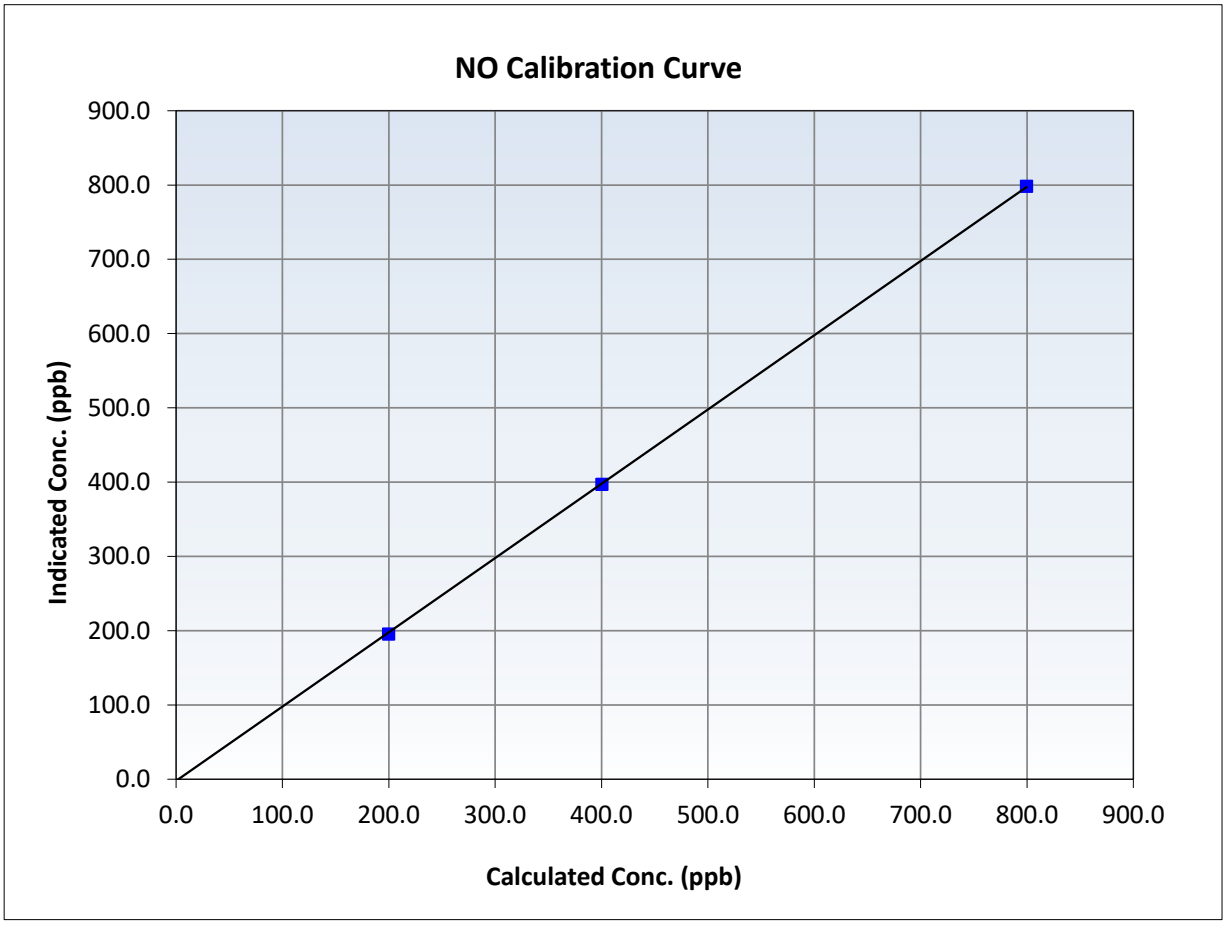
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 7, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	11:03	End Time (MST):	15:48
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

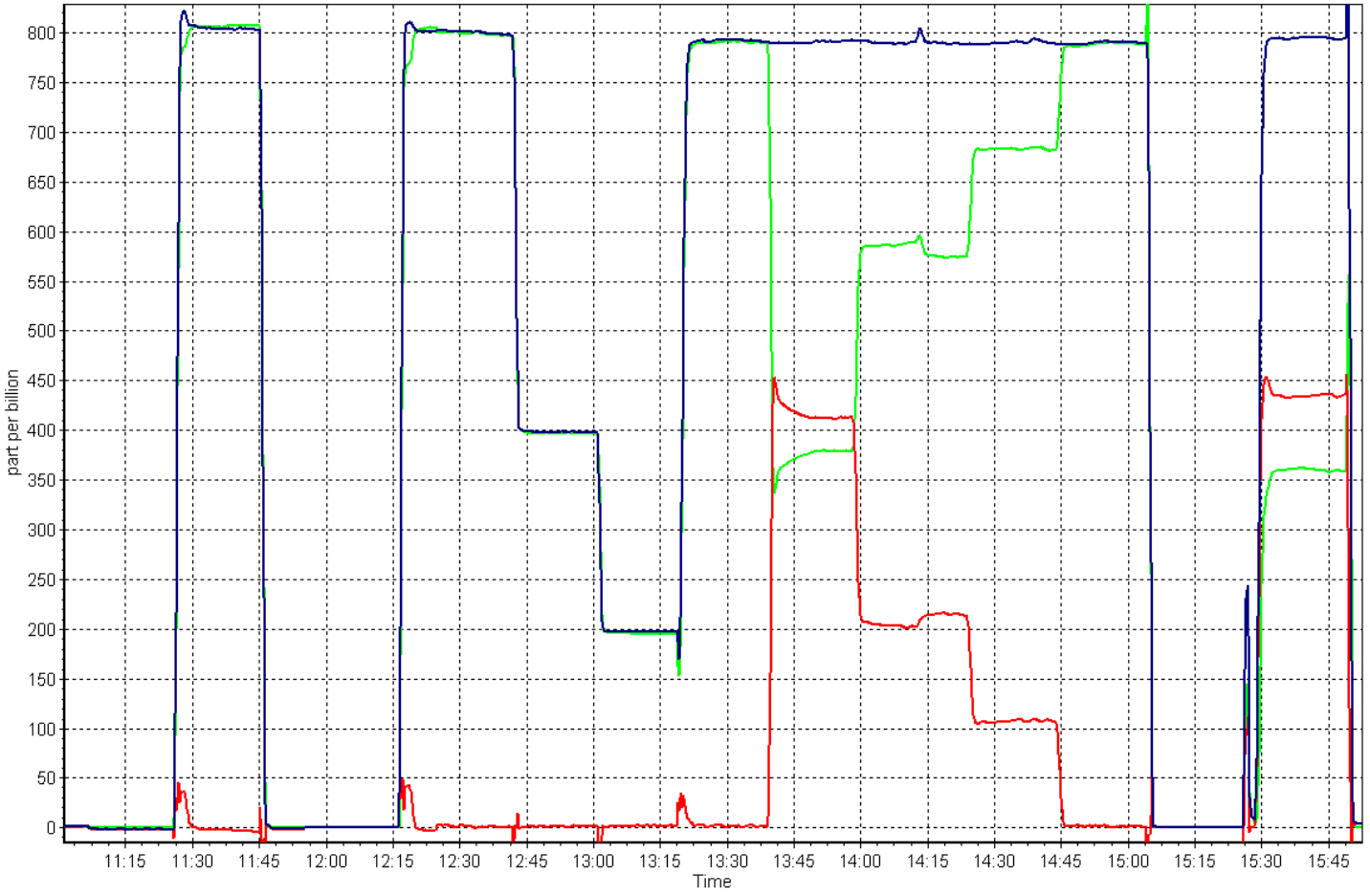
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.6	798.4	1.0016
400.3	396.9	1.0086
199.7	195.5	1.0214

Statistical Evaluation		Limits
Correlation Coefficient	0.999969	≥0.995
Slope	0.999817	0.90 - 1.10
Intercept	-2.169452	+/-20



NO_X Calibration Plot Date: December 4, 2024 Location: Monday Creek



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS506
JACKFISH 1
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Jackfish 1	Station number:	AMS 506
Calibration Date:	December 3, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	13:34	End time (MST):	16:07
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.52	ppm	Cal Gas Exp Date:	December 29, 2028
Cal Gas Cylinder #:	CC274266			
Removed Cal Gas Conc:	50.52	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2659
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4427

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290011	
Analyzer Range:	0-1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001358	0.996659	Backgd or Offset:	20.1	20.1
Calibration intercept:	0.143923	0.464029	Coeff or Slope:	0.979	0.979

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4921	79.2	800.2	796.5	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.2	Previous response	801.4	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4921	79.2	800.2	797.8	1.003
Mid point	4960	39.6	400.2	399.7	1.001
Low point	4980	19.8	200.1	199.8	1.001
As left zero	5000	0.0	0.0	0.2	----
As left span	4921	79.2	800.2	799.7	1.001
				Average Correction Factor:	1.002

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

SO_2 Calibration Summary

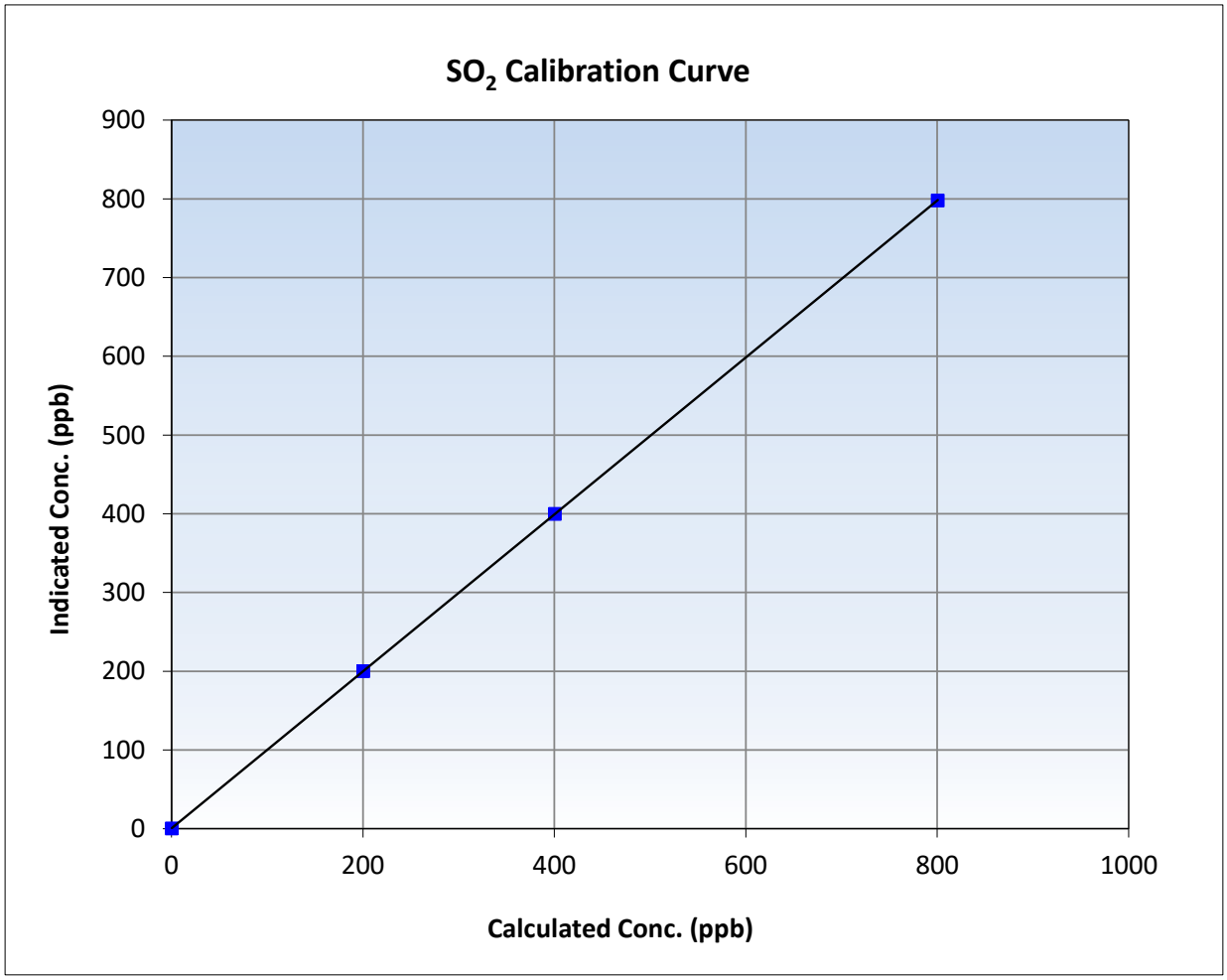
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 21, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	13:34	End Time (MST):	16:07
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290011

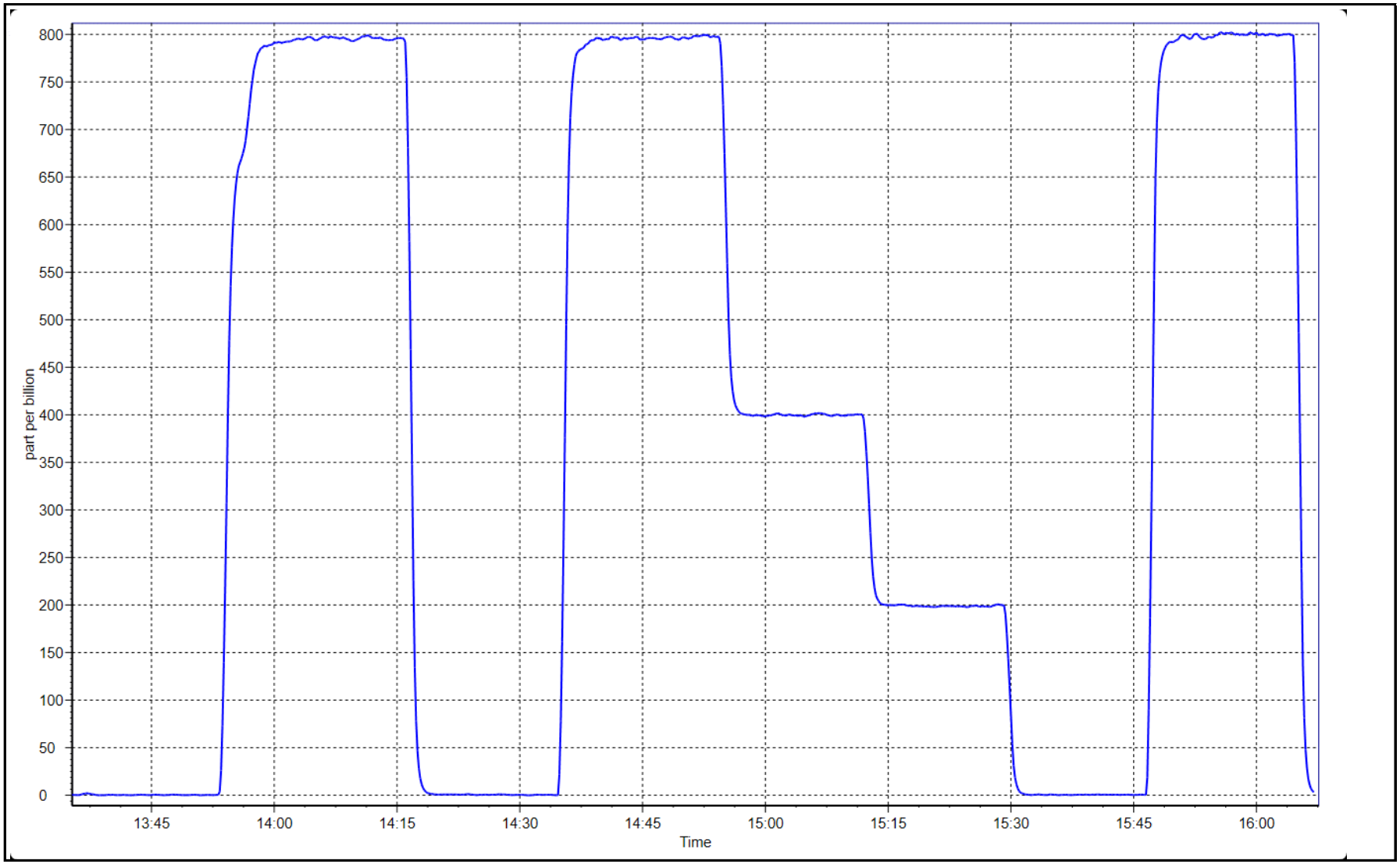
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
800.2	797.8	1.0030
400.2	399.7	1.0011
200.1	199.8	1.0013

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.996659	*0.90 - 1.10*
Intercept	0.464029	*+/-30*



SO2 Calibration Plot Date: December 3, 2024 Location: Jackfish 1



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Jackfish 1	Station number:	AMS 506
Calibration Date:	December 4, 2024	Last Cal Date:	November 20, 2024
Start time (MST):	8:41	End time (MST):	12:42
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.89	ppm	Cal Gas Exp Date:	September 5, 2027
Cal Gas Cylinder #:	CC737971			
Removed Cal Gas Conc:	4.89	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne 750		Serial Number:	282
ZAG Make/Model:	Teledyne 751H		Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1180540020
Converter make:	Global G150		Converter serial #:	2022-218
Analyzer Range	0 - 100 ppb		Converter Temp:	325.0 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998310	0.989169	Backgd or Offset:	3.56	3.56
Calibration intercept:	0.020574	0.040416	Coeff or Slope:	1.154	1.154

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4918	81.8	80.0	79.0	1.010
As found Mid point	4959	40.9	40.0	39.4	1.010
As found Low point	4980	20.4	19.9	19.6	1.008
New cylinder response					

Baseline Corr As found:	79.2	Prev response:	79.89	*% change:	-0.9%
Baseline Corr 2nd AF pt:	39.6	AF Slope:	0.989739	AF Intercept:	-0.179516
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999999	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4918	81.8	80.0	79.2	1.010
Mid point	4959	40.9	40.0	39.6	1.010
Low point	4980	20.4	19.9	19.7	1.013
As left zero	5000	0.0	0.0	0.1	----
As left span	4918	81.8	80.0	79.4	1.008
SO2 Scrubber Check	4921	79.2	800.2	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.011
Date of last converter efficiency test:					

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

H2S Calibration Summary

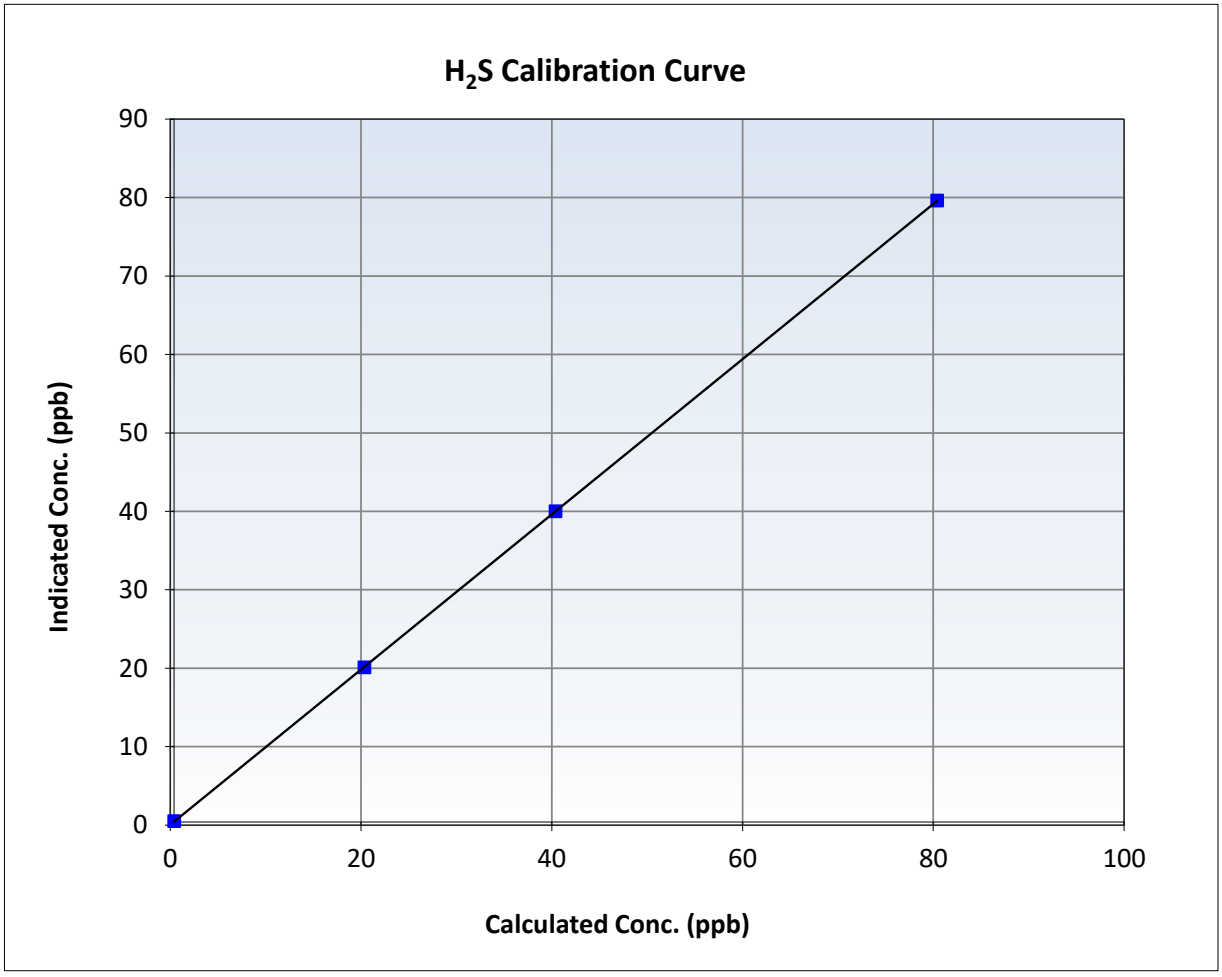
Station Information

Calibration Date:	December 4, 2024	Previous Calibration:	November 20, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	8:41	End Time (MST):	12:42
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1180540020

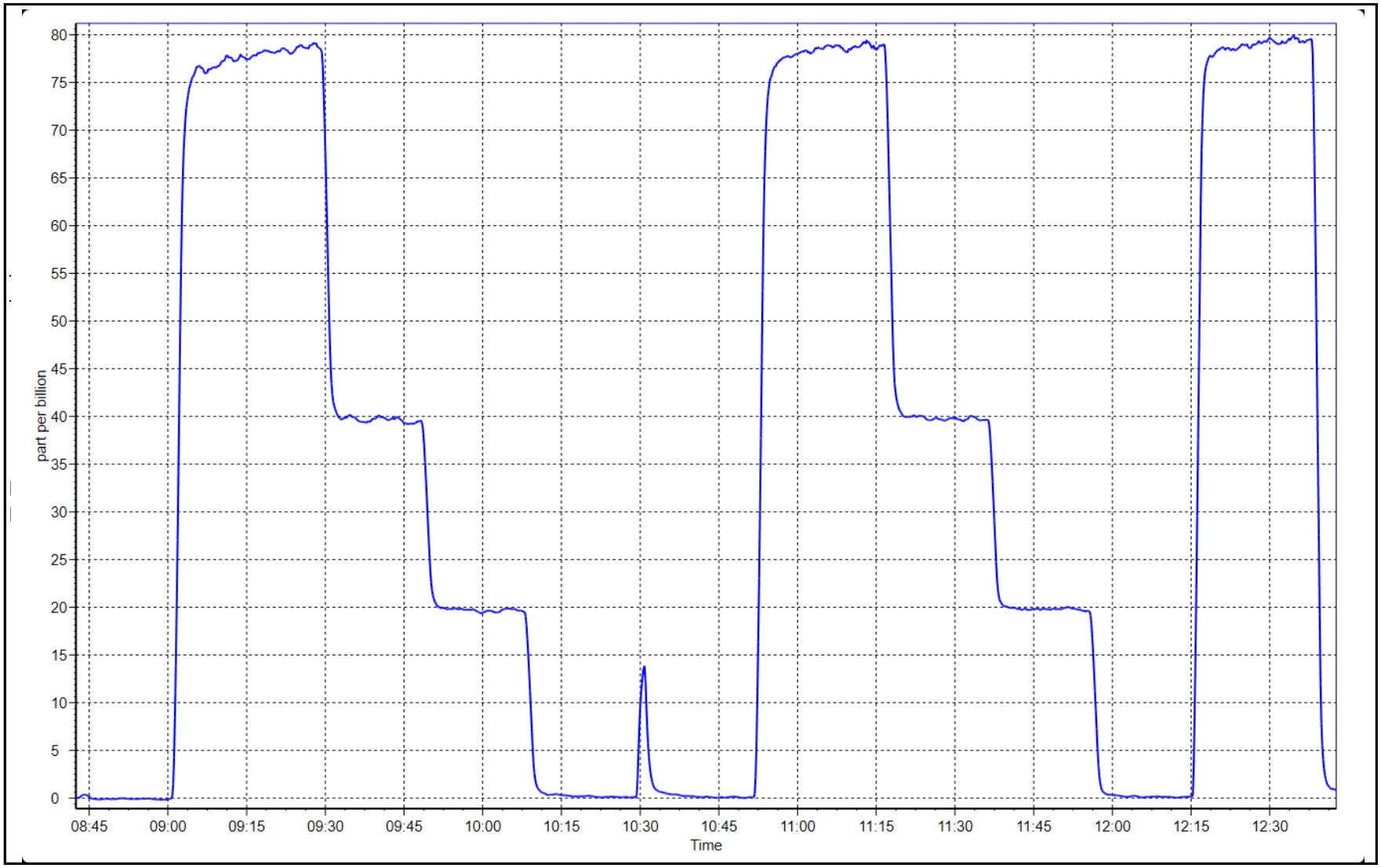
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	79.2	1.0101
40.0	39.6	1.0101
19.9	19.7	1.0127

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	0.989169	*0.90 - 1.10*
Intercept	0.040416	*+/-3*



H2S Calibration Plot Date: December 4, 2024 Location: Jackfish 1



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Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Jackfish 1
Station number:	AMS 506
Calibration Date:	December 3, 2024
Last Cal Date:	November 19, 2024
Start time (MST):	9:30
End time (MST):	13:38
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0022706	Cal Gas Expiry Date:	January 5, 2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T750	Serial Number:	282
ZAG make/model:	Teledyne API T751H	Serial Number:	321

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-1.2	-0.3	-0.9	----	----
AF High point	4933	66.6	801.9	800.6	1.3	836.0	827.0	9.8	0.9579	0.9677
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	801.7 ppb	NO =	797.9 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = 4.2%
Baseline Corr 1st pt	NO_X =	837.2 ppb	NO =	827.3 ppb	As Found Statistics	*Percent Change	NO = 3.5%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i

Serial Number: 1218153356

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.726	1.493	NO bkgnd or offset:	5.3	4.9
NOX coeff or slope:	0.989	0.993	NOX bkgnd or offset:	6.2	6.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	167.4	171.0

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.002537	1.001681
NO_X Cal Offset:	-2.268674	-1.068623
NO Cal Slope:	1.000867	1.004422
NO Cal Offset:	-3.349973	-2.869782
NO_2 Cal Slope:	1.005533	1.003838
NO_2 Cal Offset:	1.350171	0.762410

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	----	----
High point	4933	66.6	801.9	800.6	1.3	802.0	802.0	-0.3	0.9999	0.9982
Mid point	4967	33.3	400.9	400.2	0.7	401.9	399.8	2.0	0.9975	1.0011
Low point	4983	16.6	199.9	199.5	0.3	197.2	193.3	3.9	1.0136	1.0323
As left zero	5000	0.0	0.0	0.0	0.0	-0.7	-0.2	-0.5	----	----
As left span	4933	66.6	801.9	409.7	392.2	814.0	409.7	404.3	0.9852	1.0000
							Average Correction Factor		1.0037	1.0106

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	799.8	399.1	402.0	403.6	0.9961	100.4%
Mid GPT point	799.8	606.2	194.9	197.7	0.9860	101.4%
Low GPT point	799.8	706.5	94.6	96.3	0.9827	101.8%
				Average Correction Factor	0.9883	101.2%

Notes: Changed inlet filter after as founds. Adjusted zero and span.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

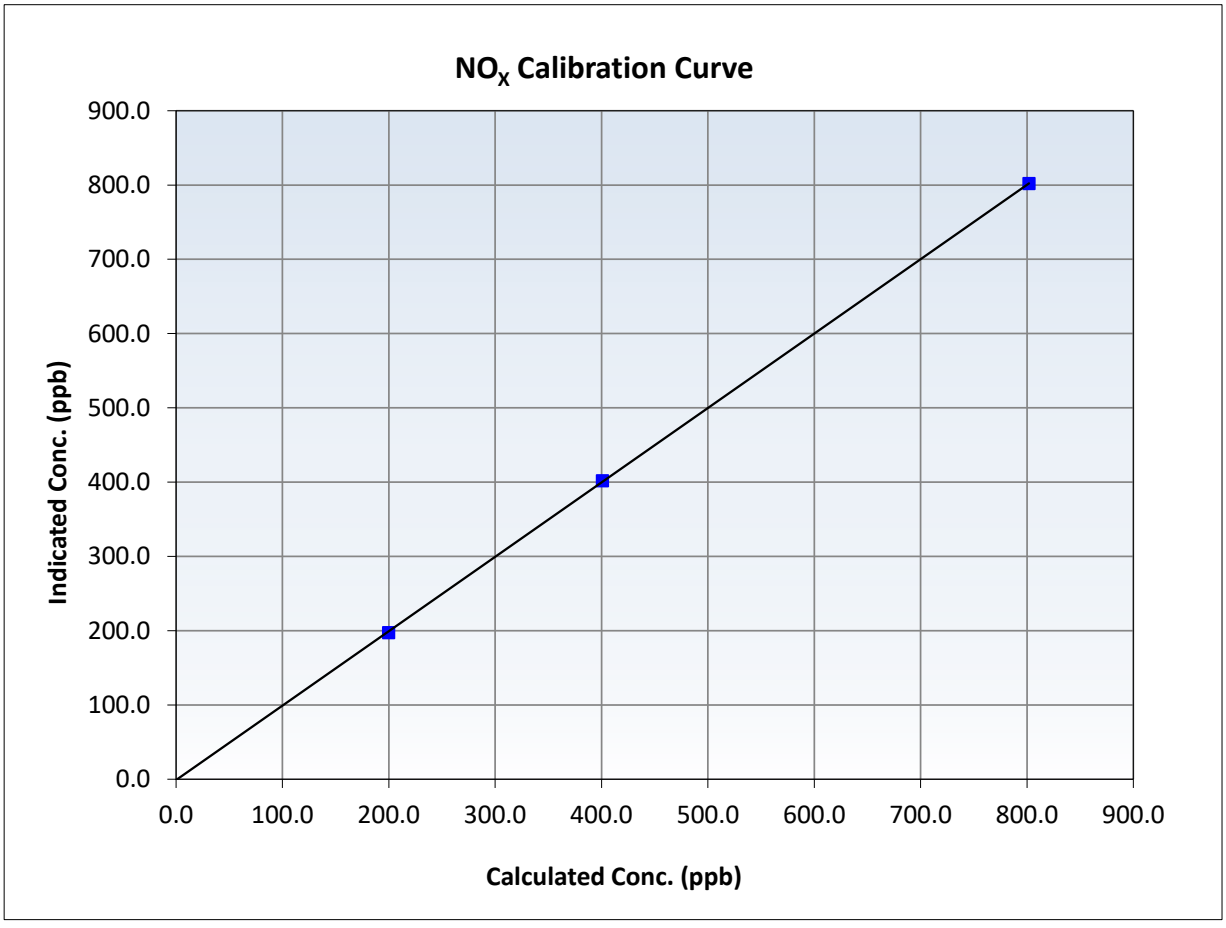
NO_X Calibration Summary

Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 19, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:30	End Time (MST):	13:38
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	-0.3	----	Correlation Coefficient	0.999982	≥0.995
801.9	802.0	0.9999	Slope	1.001681	0.90 - 1.10
400.9	401.9	0.9975	Intercept	-1.068623	+/-20
199.9	197.2	1.0136			



Wood Buffalo Environmental Association

NO_2 Calibration Summary

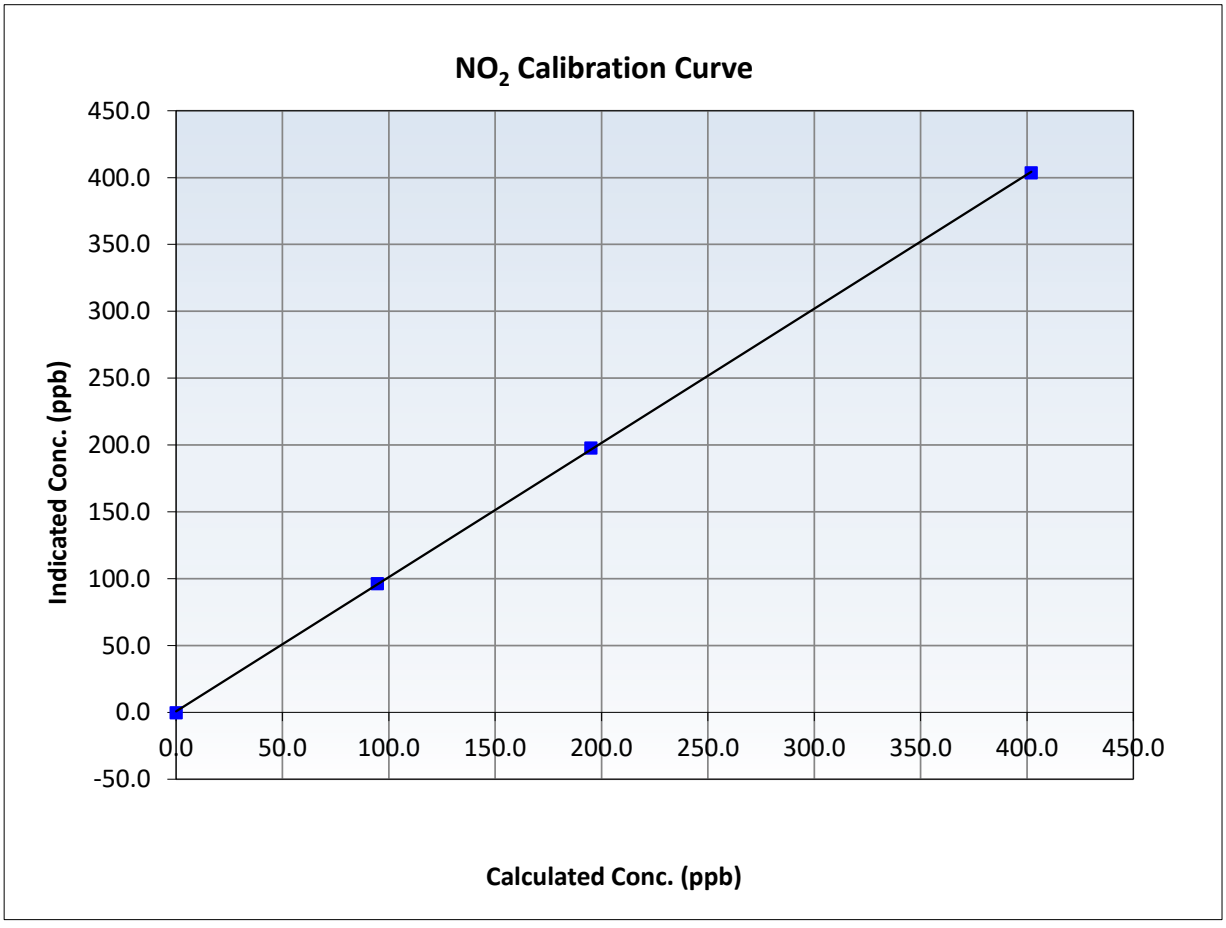
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 19, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:30	End Time (MST):	13:38
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
402.0	403.6	0.9961
194.9	197.7	0.9860
94.6	96.3	0.9827

Statistical Evaluation		Limits
Correlation Coefficient	0.999960	≥0.995
Slope	1.003838	0.90 - 1.10
Intercept	0.762410	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

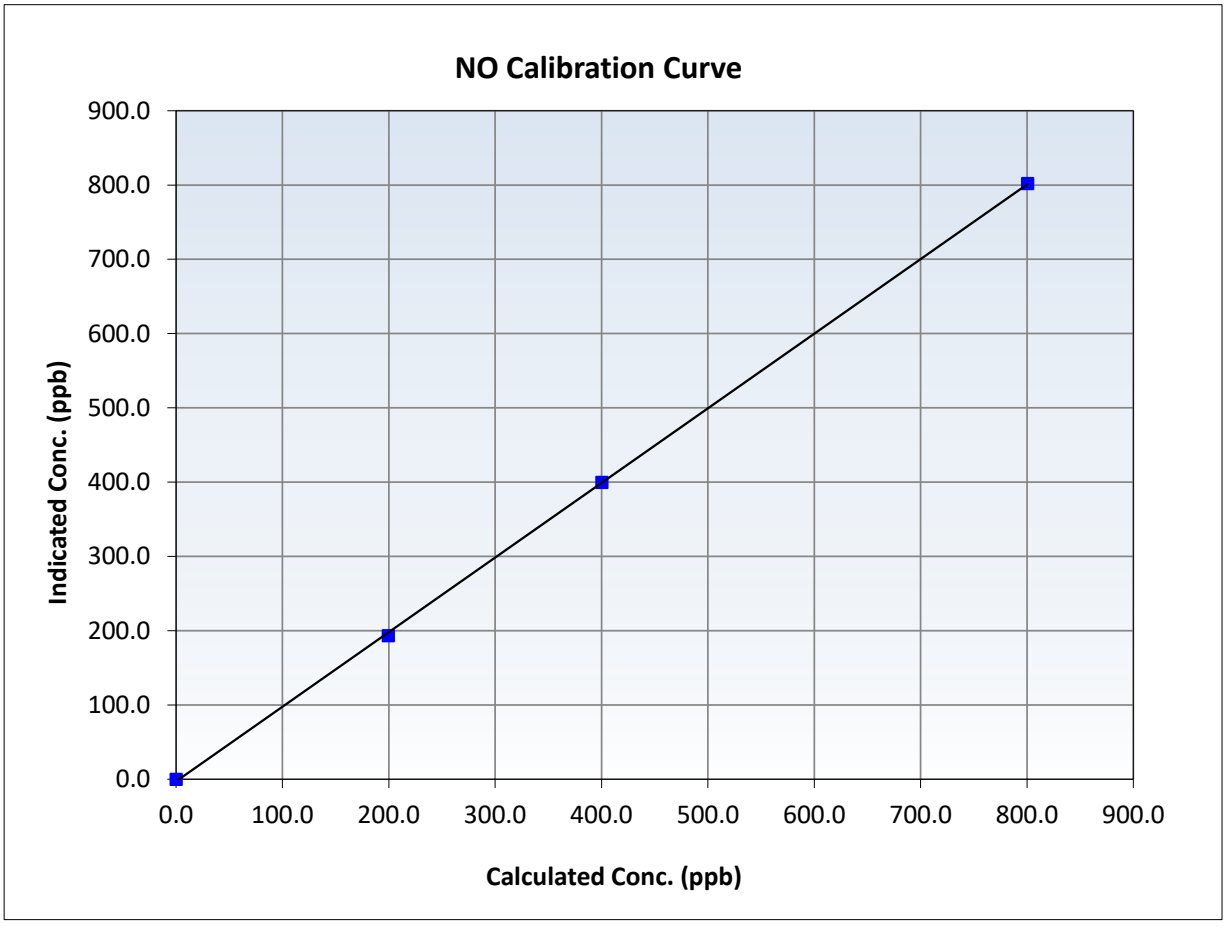
Station Information

Calibration Date:	December 3, 2024	Previous Calibration:	November 19, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:30	End Time (MST):	13:38
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356

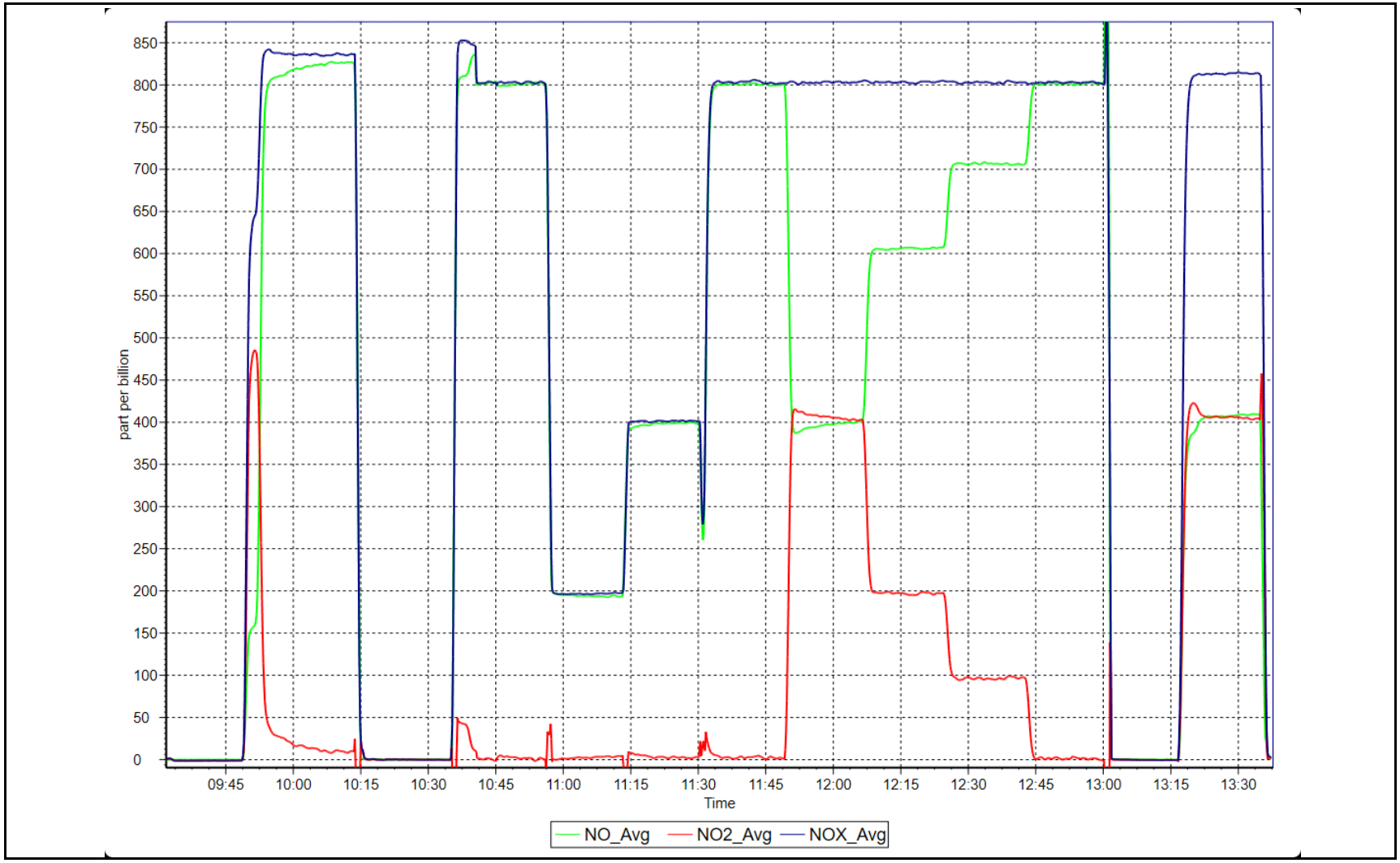
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.6	802.0	0.9982
400.2	399.8	1.0011
199.5	193.3	1.0323

Statistical Evaluation		Limits
Correlation Coefficient	0.999923	≥0.995
Slope	1.004422	0.90 - 1.10
Intercept	-2.869782	+/-20



NO_X Calibration Plot Date: December 3, 2024 Location: Jackfish 1



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS508
KIRBY NORTH
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	December 12, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	9:10	End time (MST):	12:35
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.18	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC303554			
Removed Cal Gas Conc:	49.18	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	5240
Zero Air Gen Model:	Teledyne API T701H		Serial Number:	880

Analyzer Information

Analyzer make:	Thermo 43iQ		Serial Number:	1182340007	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002407	0.994819	Backgd or Offset:	26.6	27.3
Calibration intercept:	0.151064	0.431080	Coeff or Slope:	1.065	1.072

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4919	81.3	799.6	792.7	1.009
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	792.3	Previous response	801.7	*% change	-1.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4919	81.3	799.6	796.0	1.005
Mid point	4959	40.7	400.3	398.0	1.006
Low point	4980	20.3	199.7	200.1	0.998
As left zero	5000	0.0	0.0	-0.1	----
As left span	4919	81.3	799.6	798.5	1.001
				Average Correction Factor:	1.003

Notes: Changed sample inlet filter after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

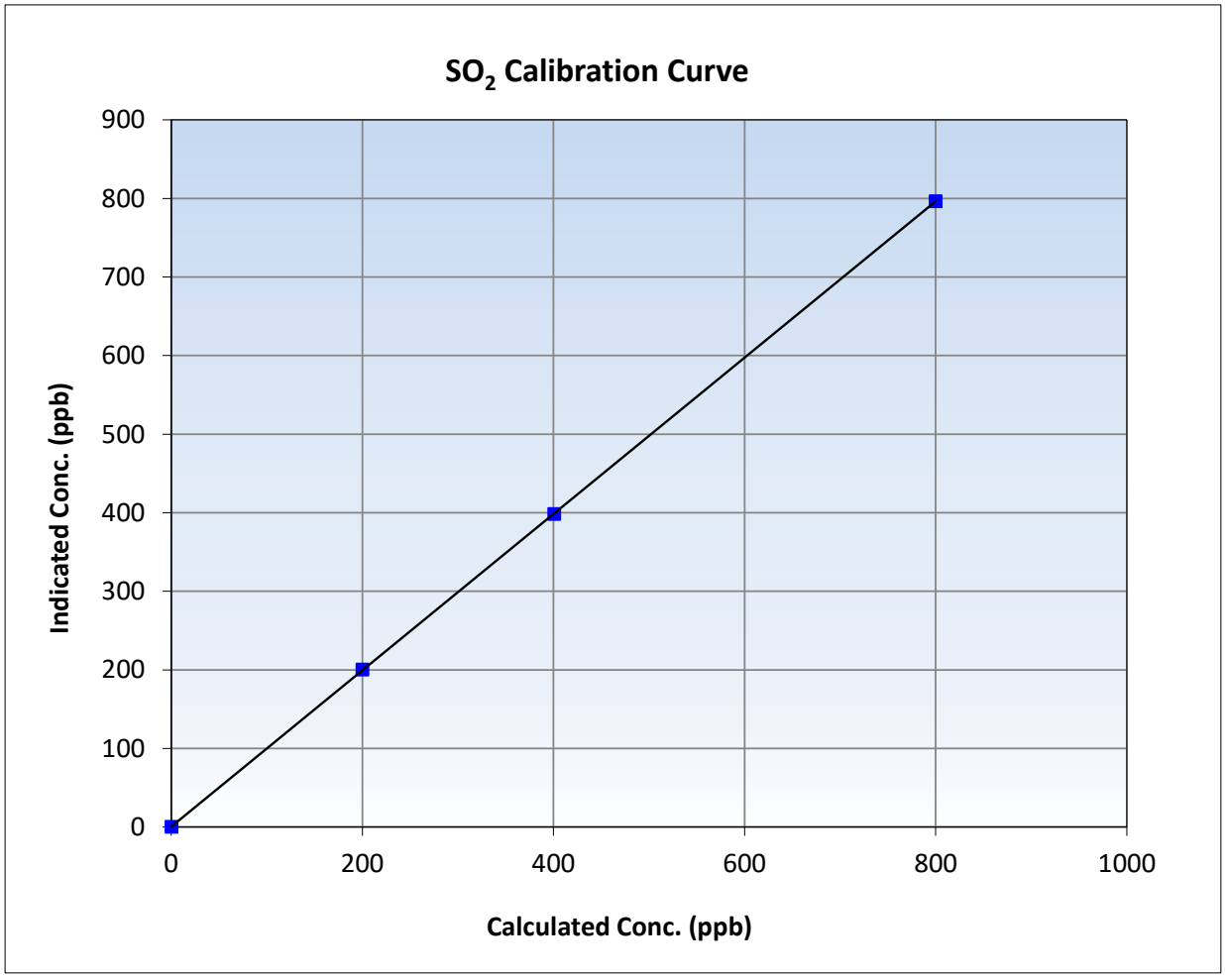
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 13, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	9:10	End Time (MST):	12:35
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1182340007

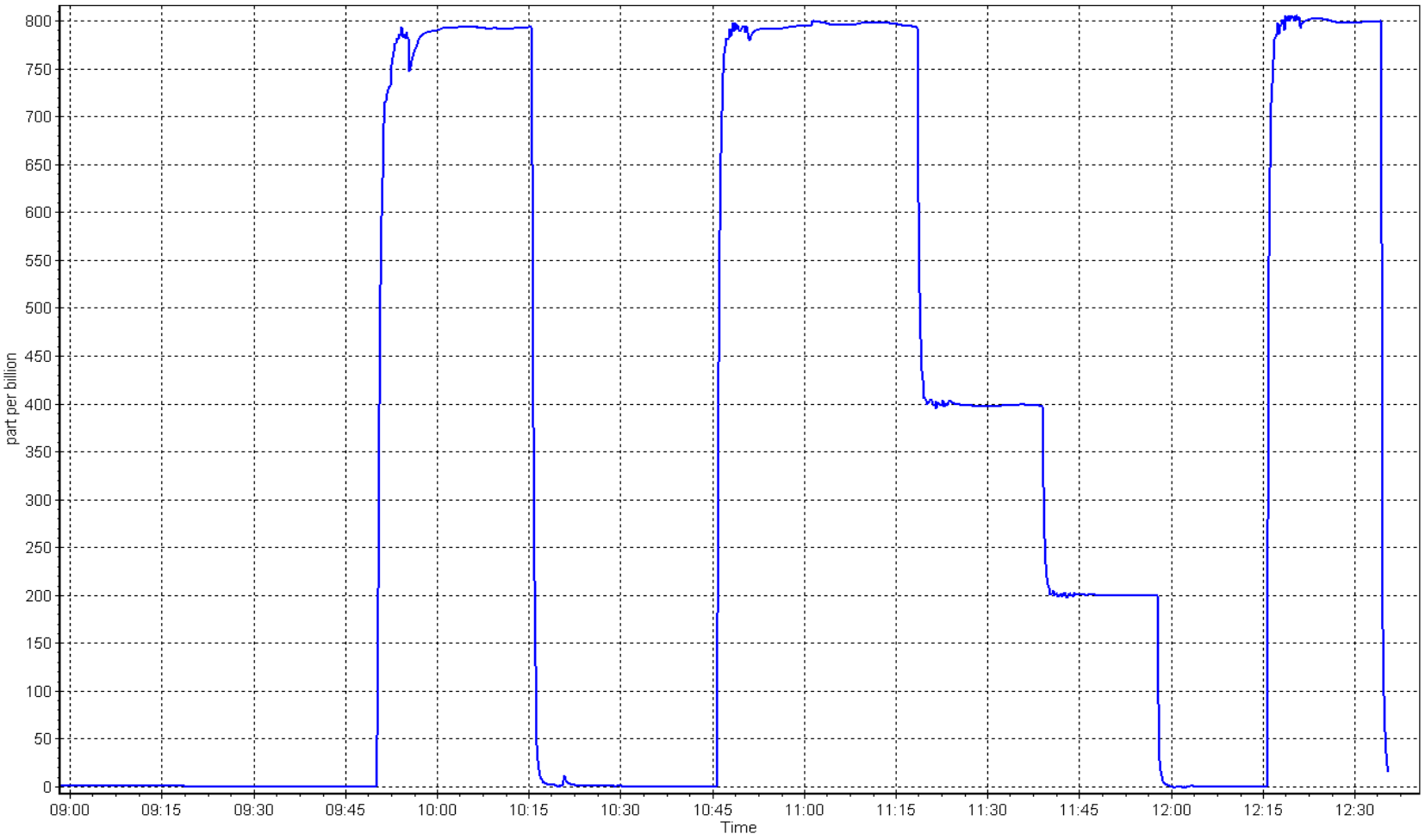
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.6	796.0	1.0045
400.3	398.0	1.0059
199.7	200.1	0.9978

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	0.994819	*0.90 - 1.10*
Intercept	0.431080	*+/-30*



SO2 Calibration Plot Date: December 12, 2024 Location: Kirby North



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	December 11, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	9:10	End time (MST):	11:30
Reason:	As Found		

Calibration Standards

Cal Gas Concentration:	5.05	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	DT0019762			
Removed Cal Gas Conc:	5.05	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	n/a		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5240
ZAG Make/Model:	Teledyne API T701H		Serial Number:	880

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1150840012
Converter make:	Global		Converter serial #:	2022-197
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996242	1.001242	Backgd or Offset:	1.75	1.74
Calibration intercept:	0.259036	-0.240953	Coeff or Slope:	1.037	1.030

H2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4921	79.2	80.0	79.8	1.001
As found Mid point	4960	39.6	40.0	39.8	1.001
As found Low point	4980	19.8	20.0	19.6	1.013
New cylinder response					

Baseline Corr As found:	79.9	Prev response:	79.95	*% change:	-0.1%
Baseline Corr 2nd AF pt:	39.9	AF Slope:	0.999849	AF Intercept:	-0.195960
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999989	* = > +/-5% change initiates investigation	

H2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4921	79.2	80.0	80.0	1.000
Mid point	4960	39.6	40.0	39.6	1.010
Low point	4980	19.8	20.0	19.6	1.020
As left zero	5000	0.0	0.0	0.0	----
As left span	4921	79.2	80.0	79.4	1.007
SO2 Scrubber Check	4919	80.0	800.2	-0.1	----
Date of last scrubber change:		July 25, 2023		Ave Corr Factor	1.010
Date of last converter efficiency test:		n/a			

Notes: Calibration completed. Station lost power from 12:30 to 16:30 MST. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

H2S Calibration Summary

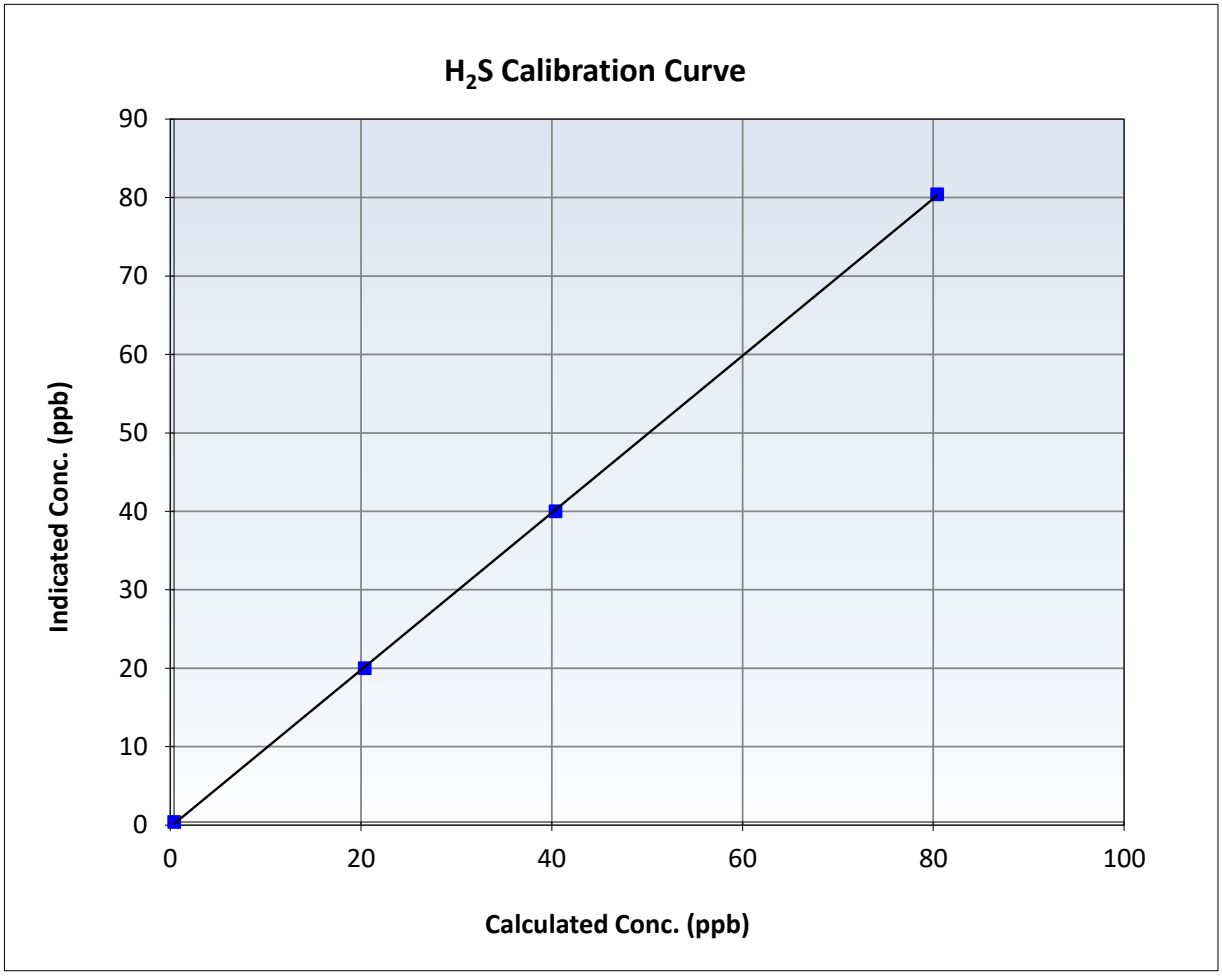
Station Information

Calibration Date:	December 11, 2024	Previous Calibration:	November 13, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	9:10	End Time (MST):	11:30
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1150840012

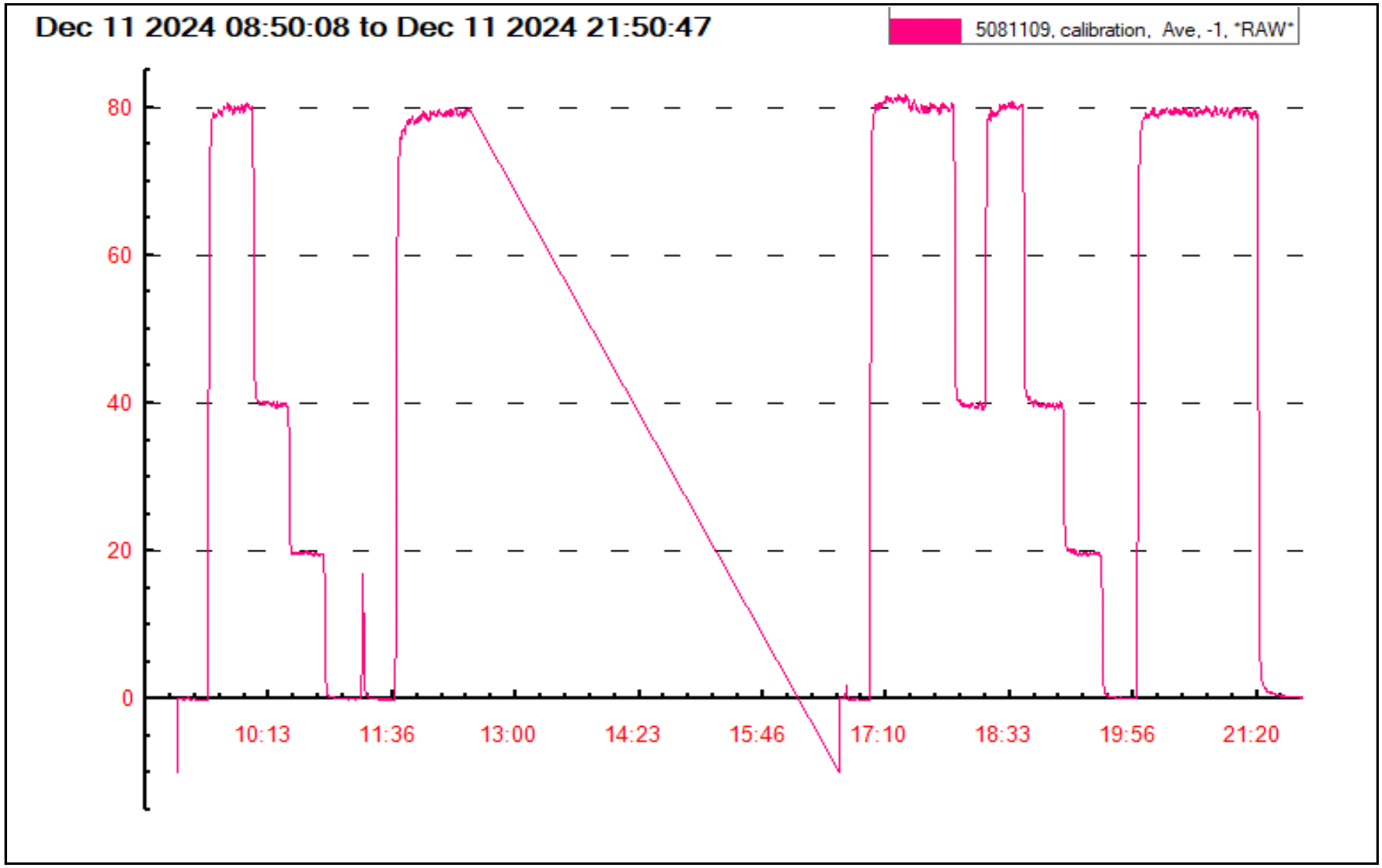
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
80.0	80.0	0.9999
40.0	39.6	1.0101
20.0	19.6	1.0203

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999955	*≥0.995*
Slope	1.001242	*0.90 - 1.10*
Intercept	-0.240953	*+/-3*



H2S Calibration Plot Date: December 11, 2024 Location: Kirby North



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	December 12, 2024	Last Cal Date:	November 13, 2024
Start time (MST):	9:10	End time (MST):	12:35
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC303554		Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	496.6	ppm	CH4 Equiv Conc.	1061.7	ppm
C3H8 Cal Gas Conc.	205.5	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	496.6	ppm	CH4 Equiv Conc.	1061.7	ppm
Removed C3H8 Conc.	205.5	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5240	
ZAG Make/Model:	Teledyne API T701H		Serial Number:	880	

Analyzer Information

Analyzer make:	Thermo 51i-LT		Analyzer serial #:	1182340005	
Analyzer Range:	0 - 20 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.005835	0.996210	Background:	2.08	2.13
Calibration intercept:	-0.076119	0.030089	Coefficient:	3.712	3.659

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.06	----
As found High point	4919	81.3	17.26	17.41	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.35	Previous response	17.29	*% change	0.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.06	
High point	4919	81.3	17.26	17.24	1.001
Mid point	4959	40.7	8.64	8.63	1.002
Low point	4980	20.3	4.31	4.29	1.004
As left zero	5000	0.0	0.00	0.07	----
As left span	4919	81.3	17.26	17.31	0.997
				Average Correction Factor	1.002

Notes: Changed sample inlet filter after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

Version 03-2024

Wood Buffalo Environmental Association

THC Calibration Summary

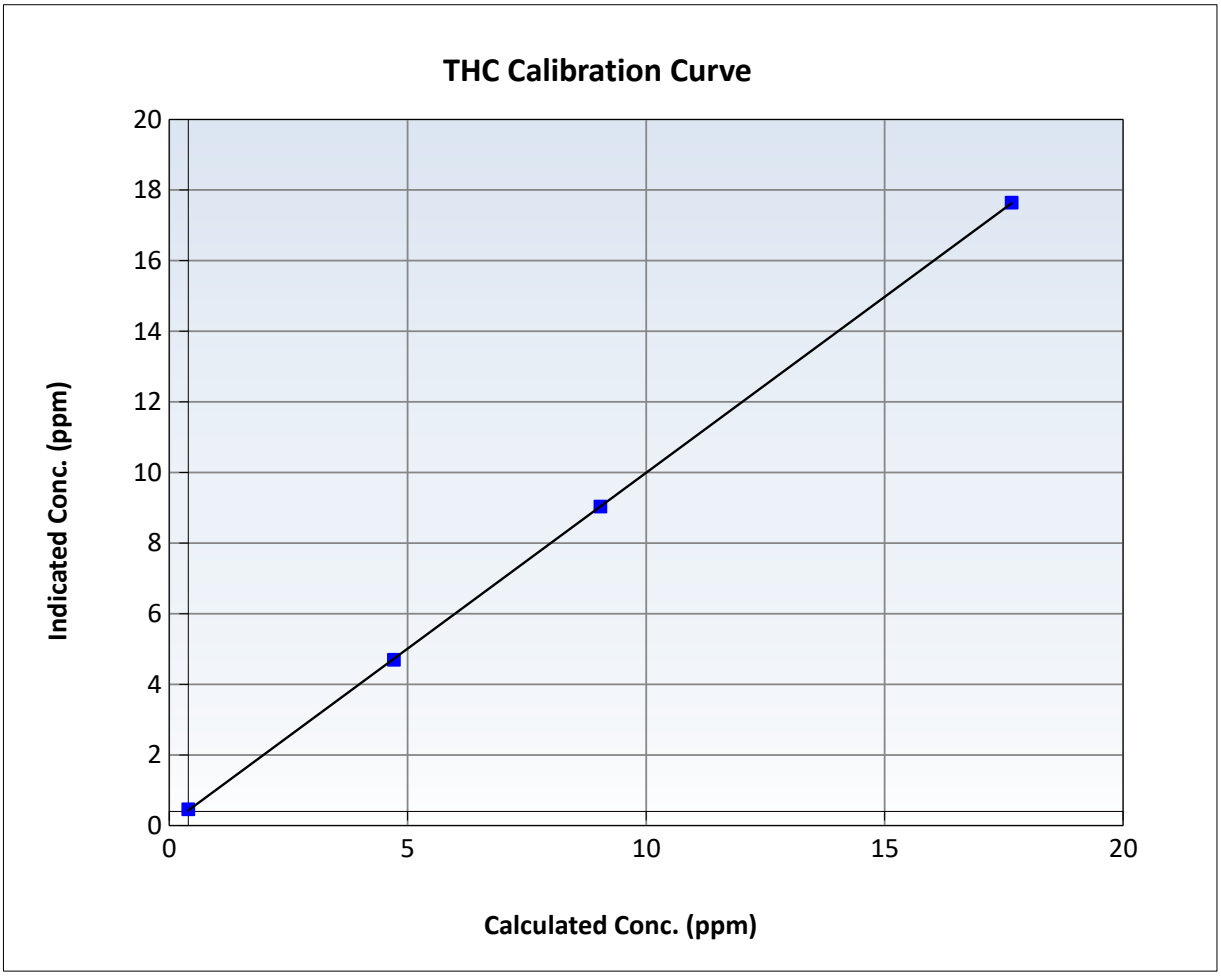
Station Information

Calibration Date:	December 12, 2024	Previous Calibration:	November 13, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	9:10	End Time (MST):	12:35
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1182340005

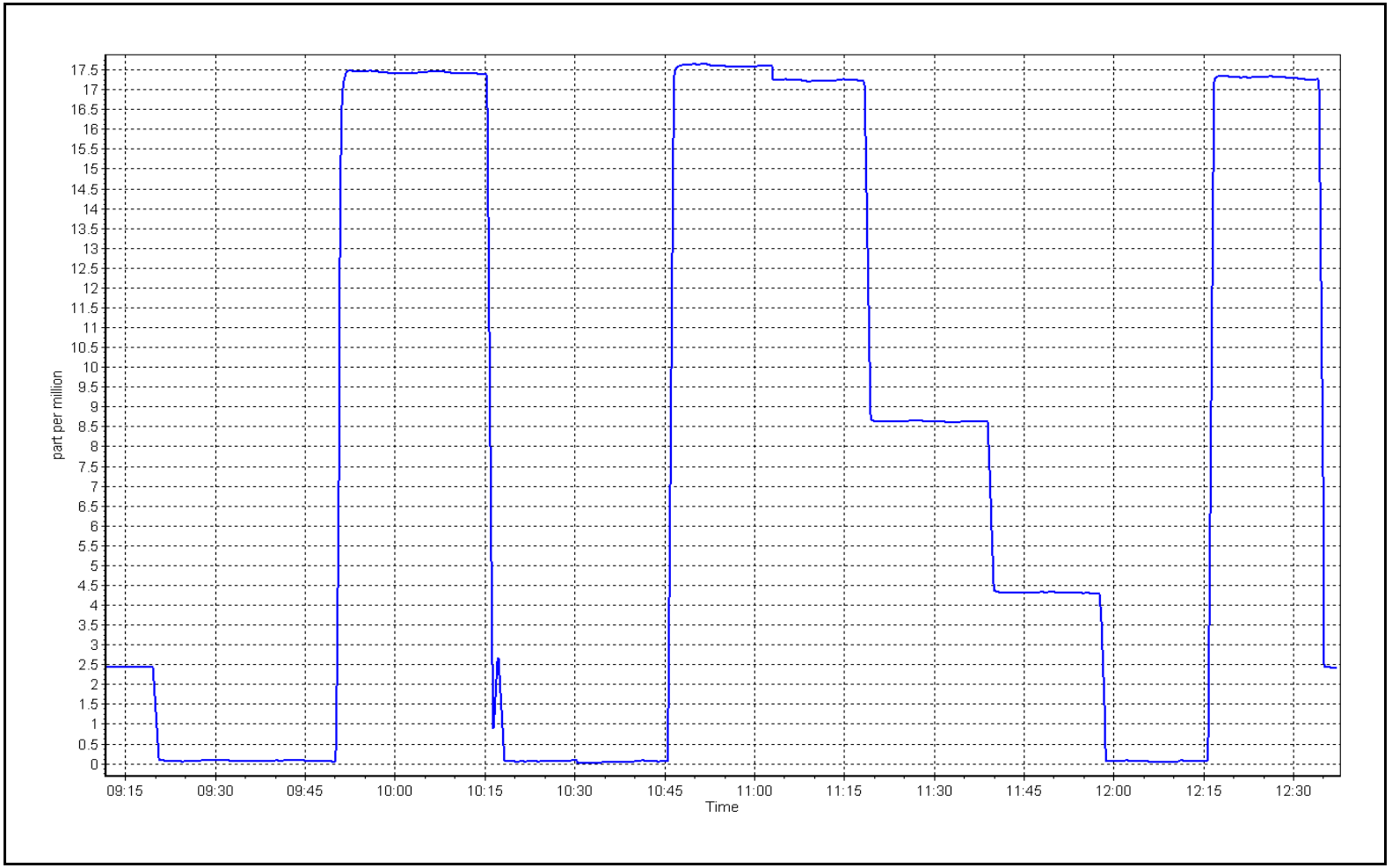
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.06	----
17.26	17.24	1.0013
8.64	8.63	1.0015
4.31	4.29	1.0039

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999988	*≥0.995*
Slope	0.996210	*0.90 - 1.10*
Intercept	0.030089	*+/-1.5*



THC Calibration Plot Date: December 12, 2024 Location: Kirby North



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Kirby North
Station number:	AMS 508
Calibration Date:	December 10, 2024
Last Cal Date:	November 13, 2024
Start time (MST):	15:30
End time (MST):	20:50
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T34ULGL	Cal Gas Expiry Date:	March 8, 2025
NOX Cal Gas Conc:	49.39 ppm	NO Cal Gas Conc:	49.02 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	49.39 ppm	Removed Gas NO Conc:	49.02 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5240
ZAG make/model:	Teledyne API T701H	Serial Number:	880

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
AF High point	4918	81.6	806.1	800.1	6.0	822.0	814.0	8.0	0.9807	0.9829
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 807.1 ppb	NO = 800.8 ppb
Baseline Corr 1st pt	NO_X = 822.0 ppb	NO = 814.0 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X =	1.8%
*Percent Change	NO =	1.6%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i

Serial Number: 1118148496

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.711	0.698	NO bkgnd or offset:	7.7	7.6
NOX coeff or slope:	0.994	0.993	NOX bkgnd or offset:	7.7	7.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	146.5	146.8

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.003355	1.001923
NO_X Cal Offset:	-1.743898	-1.463910
NO Cal Slope:	1.003858	1.003129
NO Cal Offset:	-2.344036	-1.964029
NO_2 Cal Slope:	0.987139	0.978262
NO_2 Cal Offset:	1.475739	2.102038

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	----	----
High point	4918	81.6	806.1	800.1	6.0	807.0	801.8	5.2	0.9989	0.9978
Mid point	4959	40.8	403.0	400.0	3.0	401.5	397.8	3.7	1.0038	1.0056
Low point	4980	20.4	201.5	200.0	1.5	198.9	196.9	2.0	1.0130	1.0157
As left zero	5000	0.0	0.0	0.0	0.0	0.2	0.2	0.0	----	----
As left span	4918	81.6	806.1	390.5	415.6	795.2	390.5	404.7	1.0137	1.0000
							Average Correction Factor		1.0053	1.0064

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	797.0	390.0	413.0	404.6	1.0207	98.0%
Mid GPT point	797.0	609.6	193.4	194.1	0.9963	100.4%
Low GPT point	797.0	702.1	100.9	101.6	0.9930	100.7%
				Average Correction Factor	1.0034	99.7%

Notes: Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

NO_X Calibration Summary

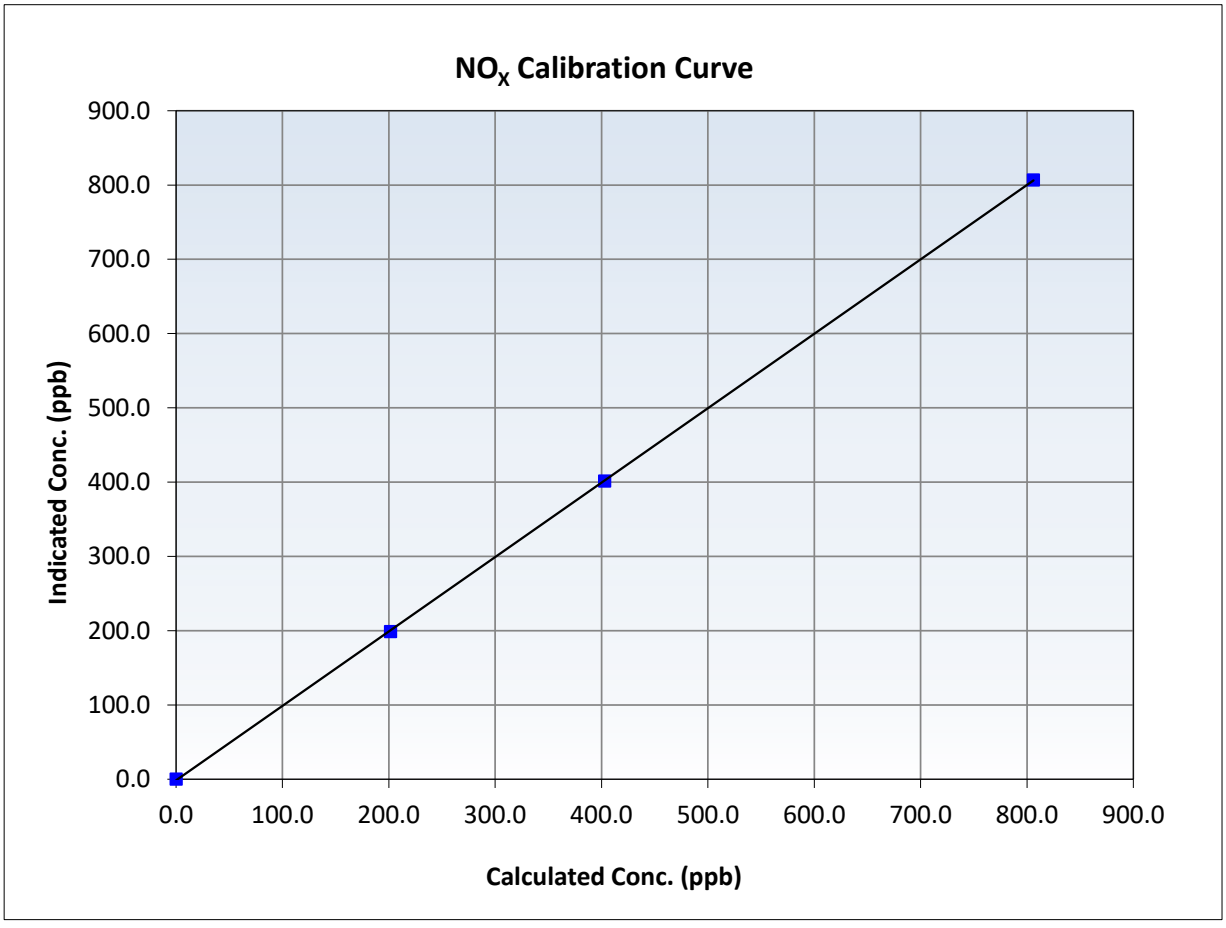
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 13, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	15:30	End Time (MST):	20:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
806.1	807.0	0.9989
403.0	401.5	1.0038
201.5	198.9	1.0130

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999983	*≥0.995*
Slope	1.001923	*0.90 - 1.10*
Intercept	-1.463910	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

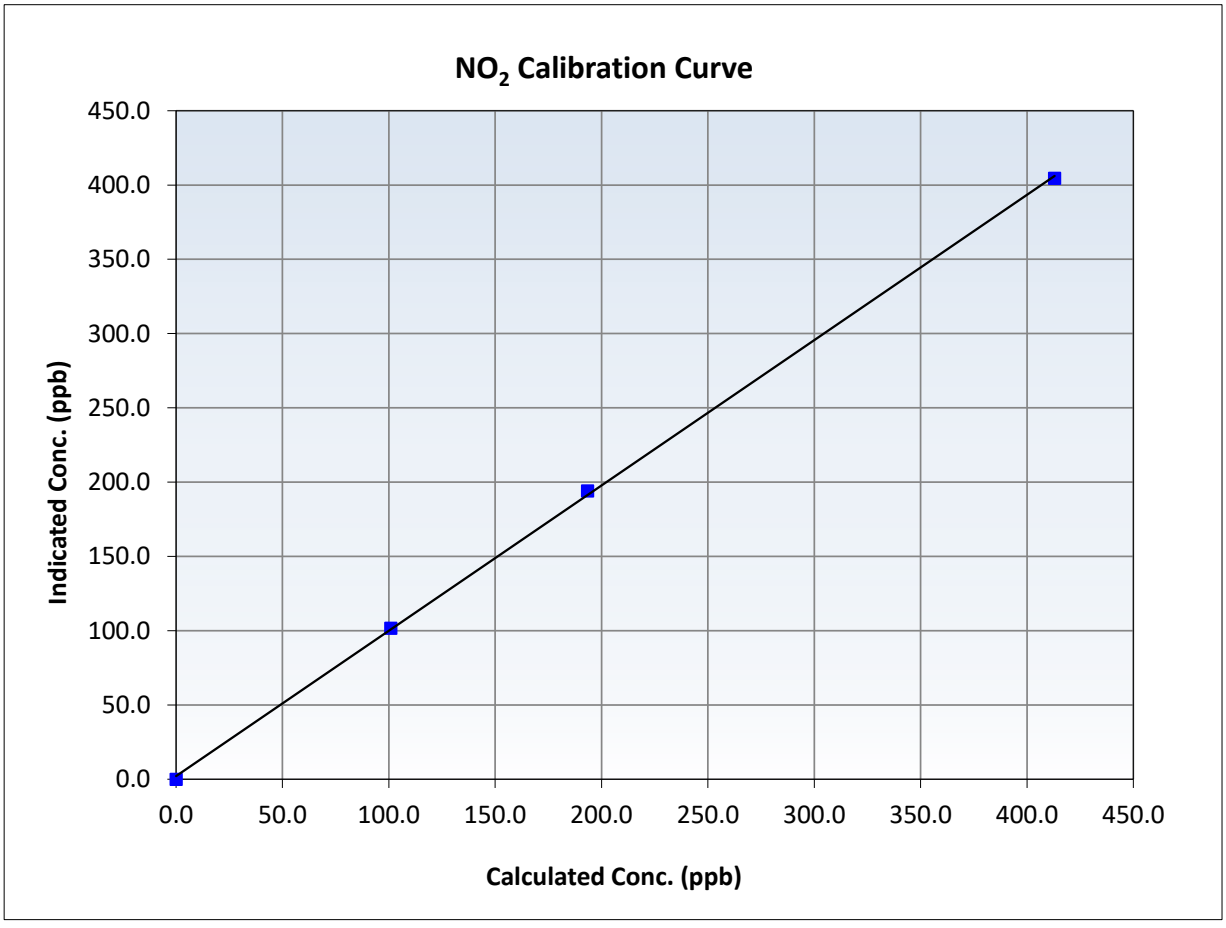
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 13, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	15:30	End Time (MST):	20:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
413.0	404.6	1.0207
193.4	194.1	0.9963
100.9	101.6	0.9930

Statistical Evaluation		Limits
Correlation Coefficient	0.999829	≥0.995
Slope	0.978262	0.90 - 1.10
Intercept	2.102038	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

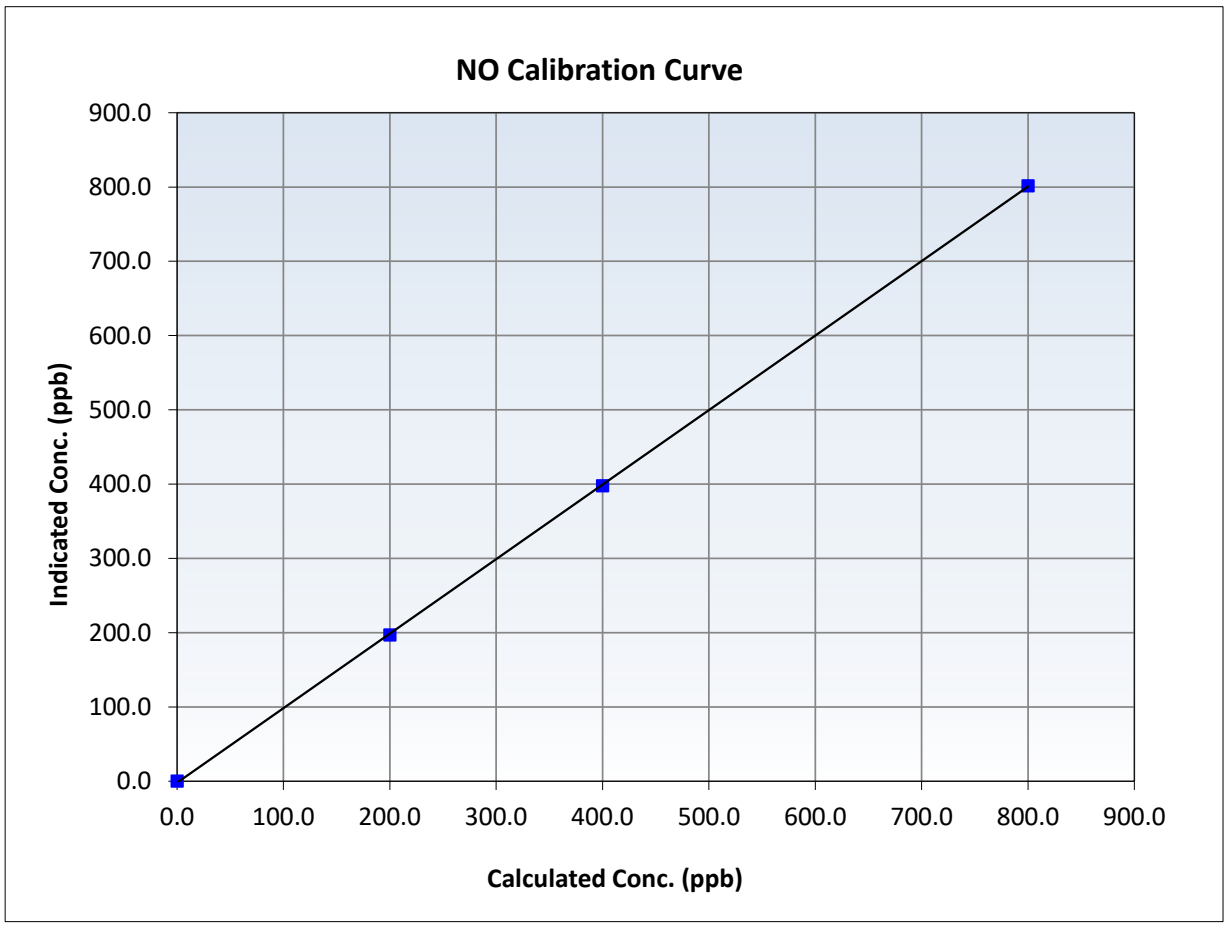
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 13, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	15:30	End Time (MST):	20:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

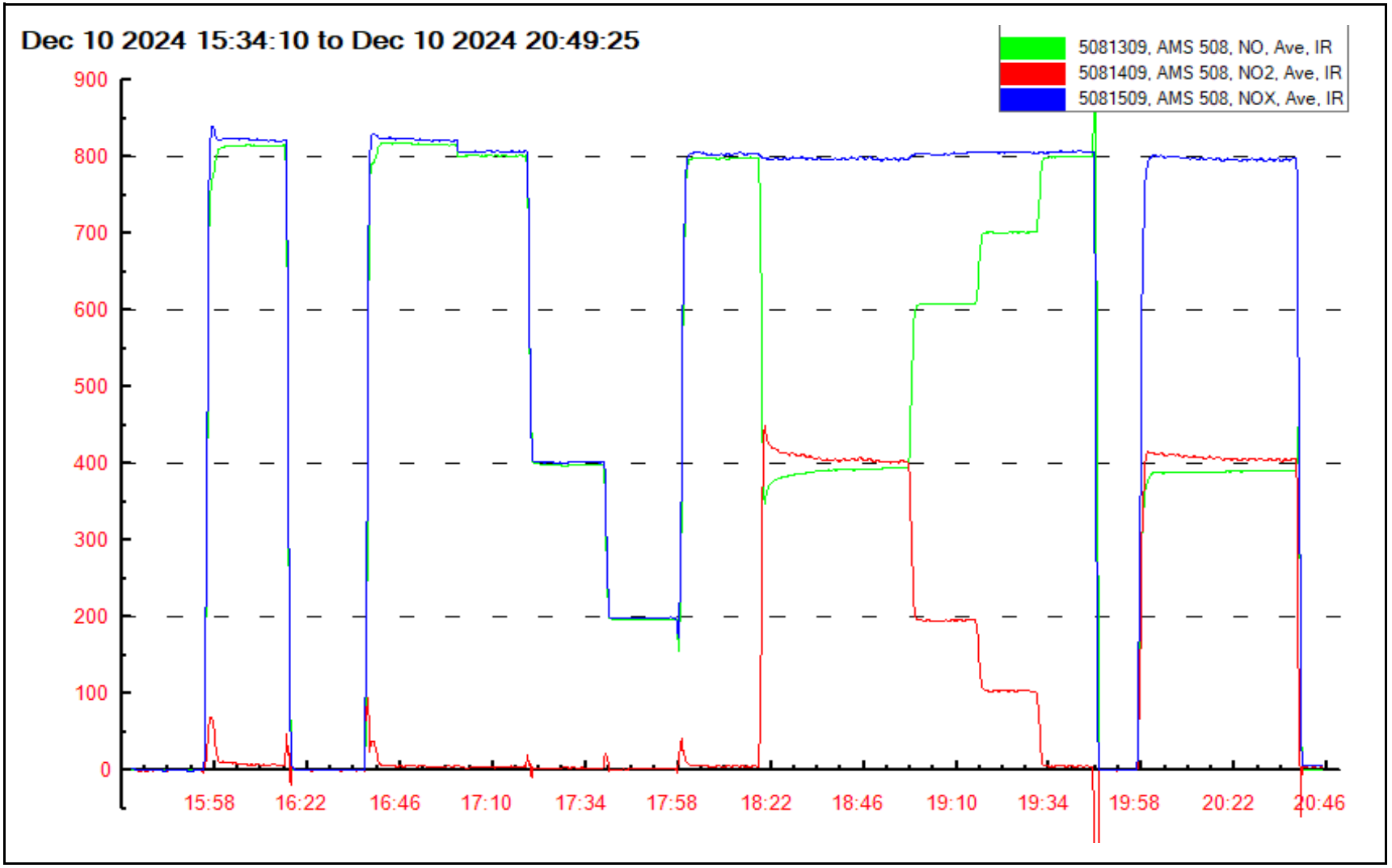
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.1	801.8	0.9978
400.0	397.8	1.0056
200.0	196.9	1.0157

Statistical Evaluation		Limits
Correlation Coefficient	0.999969	≥0.995
Slope	1.003129	0.90 - 1.10
Intercept	-1.964029	+/-20



NO_X Calibration Plot Date: December 10, 2024 Location: Kirby North



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS512
HANGINGSTONE EXPANSION
DECEMBER 2024

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Hangingstone Expansion	Station number:	AMS 512
Calibration Date:	December 9, 2024	Last Cal Date:	November 22, 2024
Start time (MST):	7:48	End time (MST):	10:46
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.06	ppm	Cal Gas Exp Date:	January 5, 2029
Cal Gas Cylinder #:	CC147416			
Removed Cal Gas Conc:	50.06	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2445
Zero Air Gen Model:	Teledyne API 701		Serial Number:	138

Analyzer Information

Analyzer make:	Thermo scientific		Serial Number:	1173410001	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002887	1.003116	Backgd or Offset:	13.6	14.1
Calibration intercept:	-1.243382	-1.623537	Coeff or Slope:	1.164	1.157

SO_2 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4920	79.8	799.0	802.1	0.997
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	801.7	Previous response	800.1	*% change	0.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4920	79.8	799.0	800.9	0.998
Mid point	4960	39.9	399.5	397.5	1.005
Low point	4987	20.0	200.0	198.0	1.010
As left zero	5000	0.0	0.0	0.0	----
As left span	4920	79.8	799.0	801.9	0.996
				Average Correction Factor:	1.004

Notes: No maintanence done. Zero and Span adjusted

Calibration Performed By: Melissa Lemay

Version 03-2024

Wood Buffalo Environmental Association

SO_2 Calibration Summary

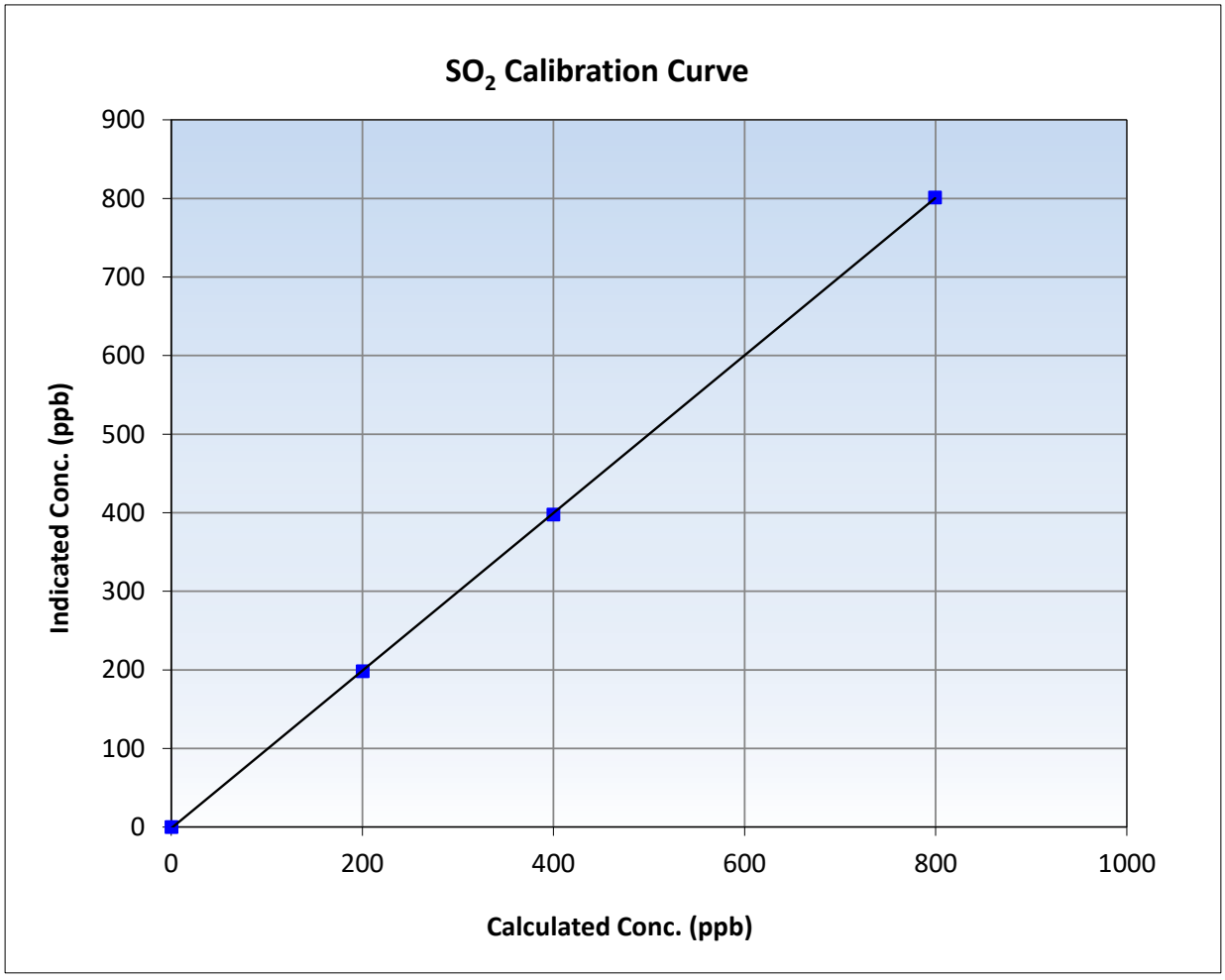
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 22, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:48	End Time (MST):	10:46
Analyzer make:	Thermo scientific	Analyzer serial #:	1173410001

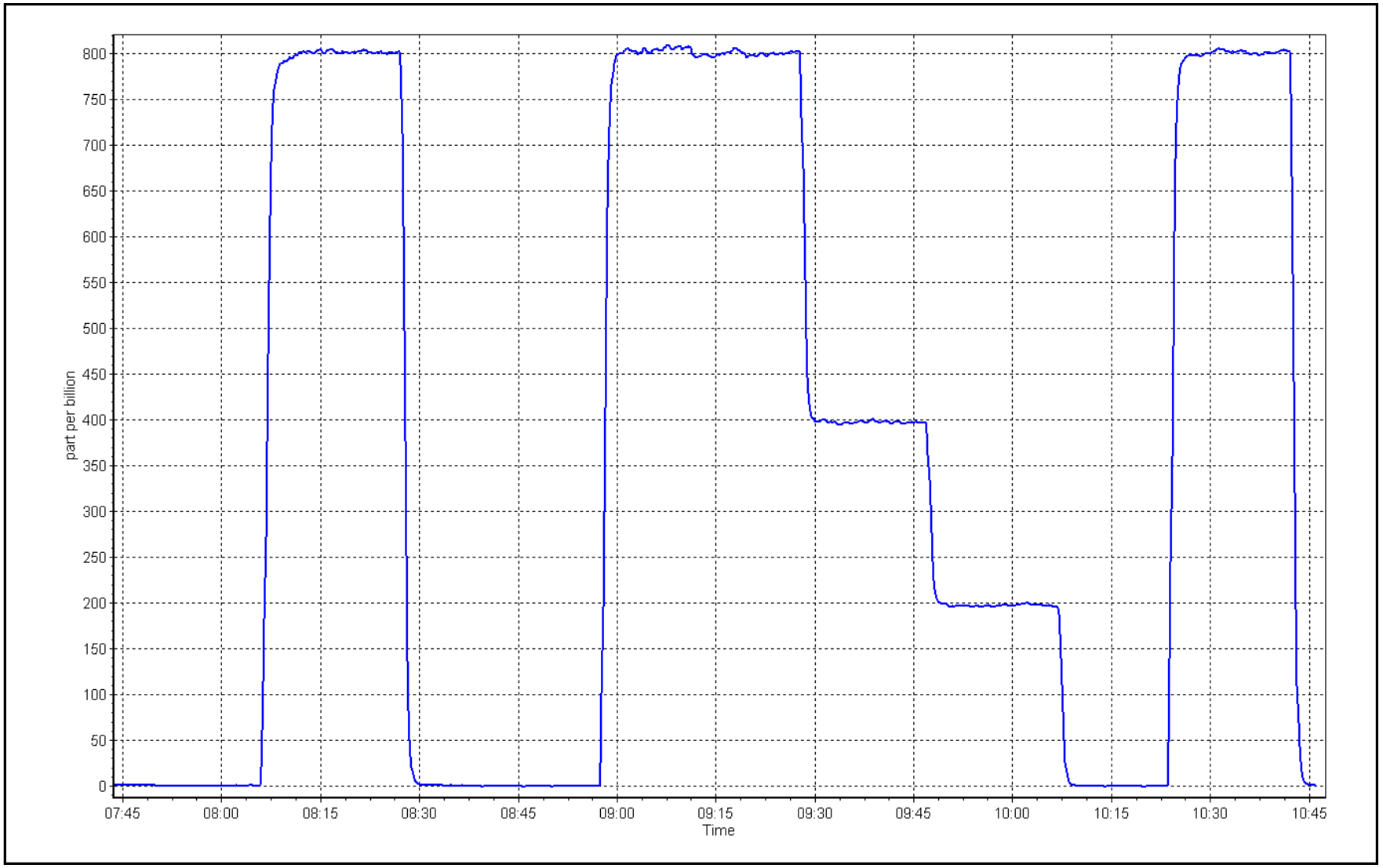
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.0	800.9	0.9976
399.5	397.5	1.0050
200.0	198.0	1.0099

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999980	*≥0.995*
Slope	1.003116	*0.90 - 1.10*
Intercept	-1.623537	*+/-30*



SO2 Calibration Plot Date: December 9, 2024 Location: Hangingstone Expansion



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Hangingstone Expansion	Station number:	AMS 512
Calibration Date:	December 6, 2024	Last Cal Date:	November 20, 2024
Start time (MST):	7:30	End time (MST):	11:41
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.139	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC511397			
Removed Cal Gas Conc:	5.139	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	2445
ZAG Make/Model:	API T701		Serial Number:	138

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Analyzer serial #:	1336160090
Converter make:	Global G150		Converter serial #:	2022-227
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.983476	0.997057	Backgd or Offset:	3.51	3.57
Calibration intercept:	0.181186	-0.019091	Coeff or Slope:	1.194	1.210

H_2S As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4922	77.8	80.0	79.3	1.011
As found Mid point	4961	38.9	40.0	39.6	1.015
As found Low point	4981	19.5	20.0	19.6	1.033
New cylinder response					

Baseline Corr As found:	79.1	Prev response:	78.83	*% change:	0.3%
Baseline Corr 2nd AF pt:	39.4	AF Slope:	0.990767	AF Intercept:	0.001028
Baseline Corr 3rd AF pt:	19.4	AF Correlation:	0.999968	* = > +/-5% change initiates investigation	

H_2S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4922	77.8	80.0	79.8	1.002
Mid point	4961	38.9	40.0	39.8	1.005
Low point	4981	19.5	20.0	19.7	1.017
As left zero	5000	0.0	0.0	0.4	----
As left span	4922	77.8	80.0	78.9	1.014
SO2 Scrubber Check	4920	80.0	800.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.008
Date of last converter efficiency test:					

Notes: Sox scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

H_2S Calibration Summary

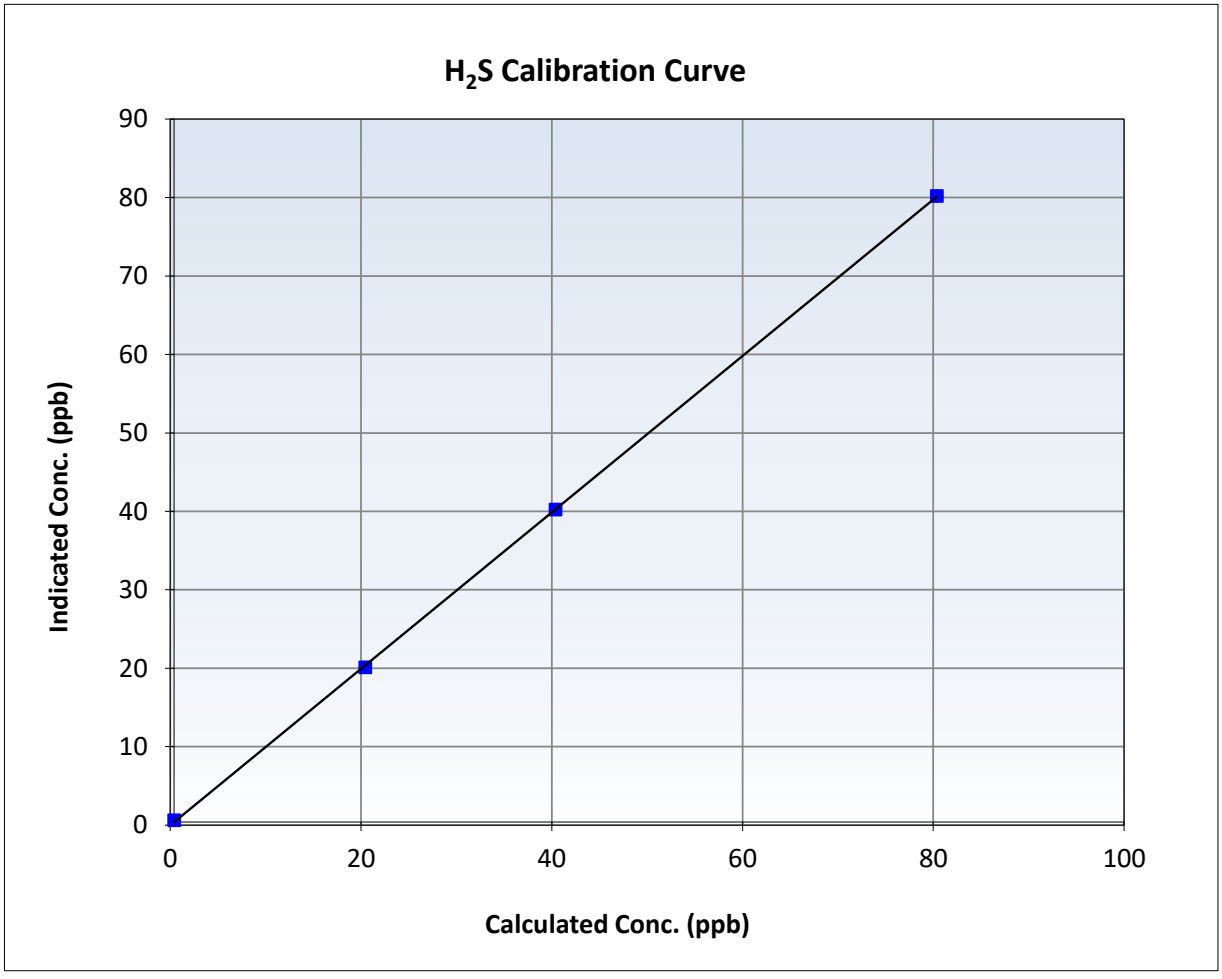
Station Information

Calibration Date:	December 6, 2024	Previous Calibration:	November 20, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:30	End Time (MST):	11:41
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1336160090

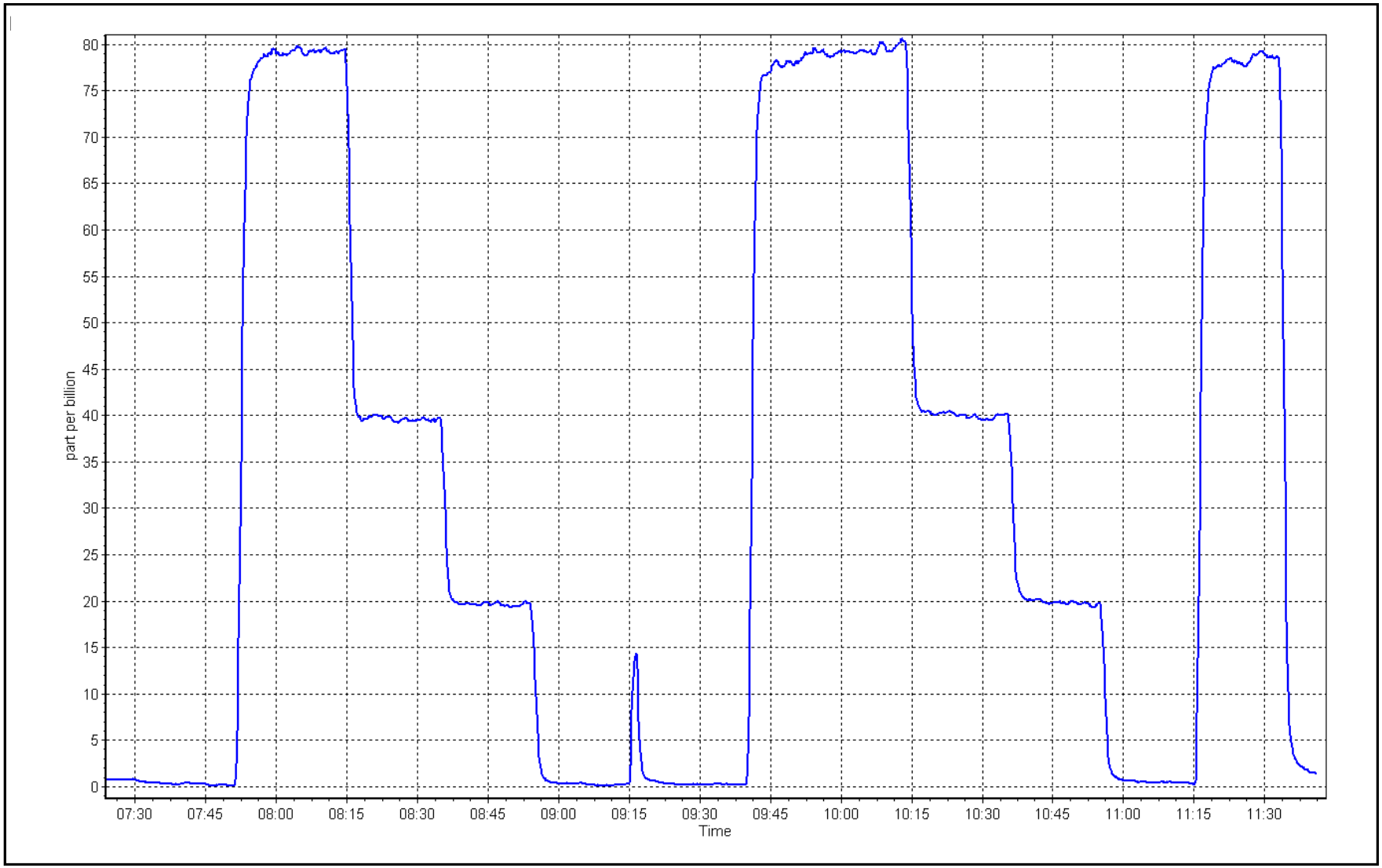
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
80.0	79.8	1.0021
40.0	39.8	1.0046
20.0	19.7	1.0173

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999964	*≥0.995*
Slope	0.997057	*0.90 - 1.10*
Intercept	-0.019091	*+/-3*



H_2S Calibration Plot Date: December 6, 2024 Location: Hangingstone Expansion



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Hangingstone Expansion
Station number:	AMS 512
Calibration Date:	December 2, 2024
Last Cal Date:	November 18, 2024
Start time (MST):	7:55
End time (MST):	12:01
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T0F8P52	Cal Gas Expiry Date:	August 16, 2026
NOX Cal Gas Conc:	47.43 ppm	NO Cal Gas Conc:	47.43 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	47.43 ppm	Removed Gas NO Conc:	47.43 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	2445
ZAG make/model:	Teledyne API T701	Serial Number:	138

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.2	0.1	----	----
AF High point	4916	84.4	800.6	800.6	0.0	799.5	799.1	0.5	1.0012	1.0016
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 799.9 ppb	NO = 799.5 ppb
Baseline Corr 1st pt	NO_X = 799.6 ppb	NO = 799.3 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	*Percent Change	NO_X = 0.0%
As found	NO r^2:	*Percent Change	NO = 0.0%
As found	NO_2 r^2:	Nx Sl:	Nx Int:
		NO Sl:	NO Int:
		NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

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NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 7029

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.056	1.056	NO bkgnd or offset:	0.2	0.2
NOX coeff or slope:	1.052	1.052	NOX bkgnd or offset:	0.4	0.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.6	4.6

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.000766	1.001494
NO_X Cal Offset:	-1.272780	-0.852815
NO Cal Slope:	1.000880	1.001080
NO Cal Offset:	-1.712772	-1.232796
NO_2 Cal Slope:	0.997612	0.996045
NO_2 Cal Offset:	0.073951	0.110093

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4916	84.4	800.6	800.6	0.0	801.1	800.6	0.6	0.9993	0.9999
Mid point	4958	42.2	400.3	400.3	0.0	400.3	399.5	0.8	1.0000	1.0020
Low point	4979	21.1	200.2	200.2	0.0	198.3	197.5	0.8	1.0094	1.0134
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
As left span	4916	84.4	800.6	406.4	394.2	795.8	406.4	389.4	1.0060	1.0000
							Average Correction Factor		1.0029	1.0051

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	799.7	404.1	395.6	394.2	1.0036	99.6%
Mid GPT point	799.7	618.2	181.5	180.6	1.0050	99.5%
Low GPT point	799.7	709.2	90.5	90.6	0.9989	100.1%
				Average Correction Factor	1.0025	99.8%

Notes: No adjustments and maintenance done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

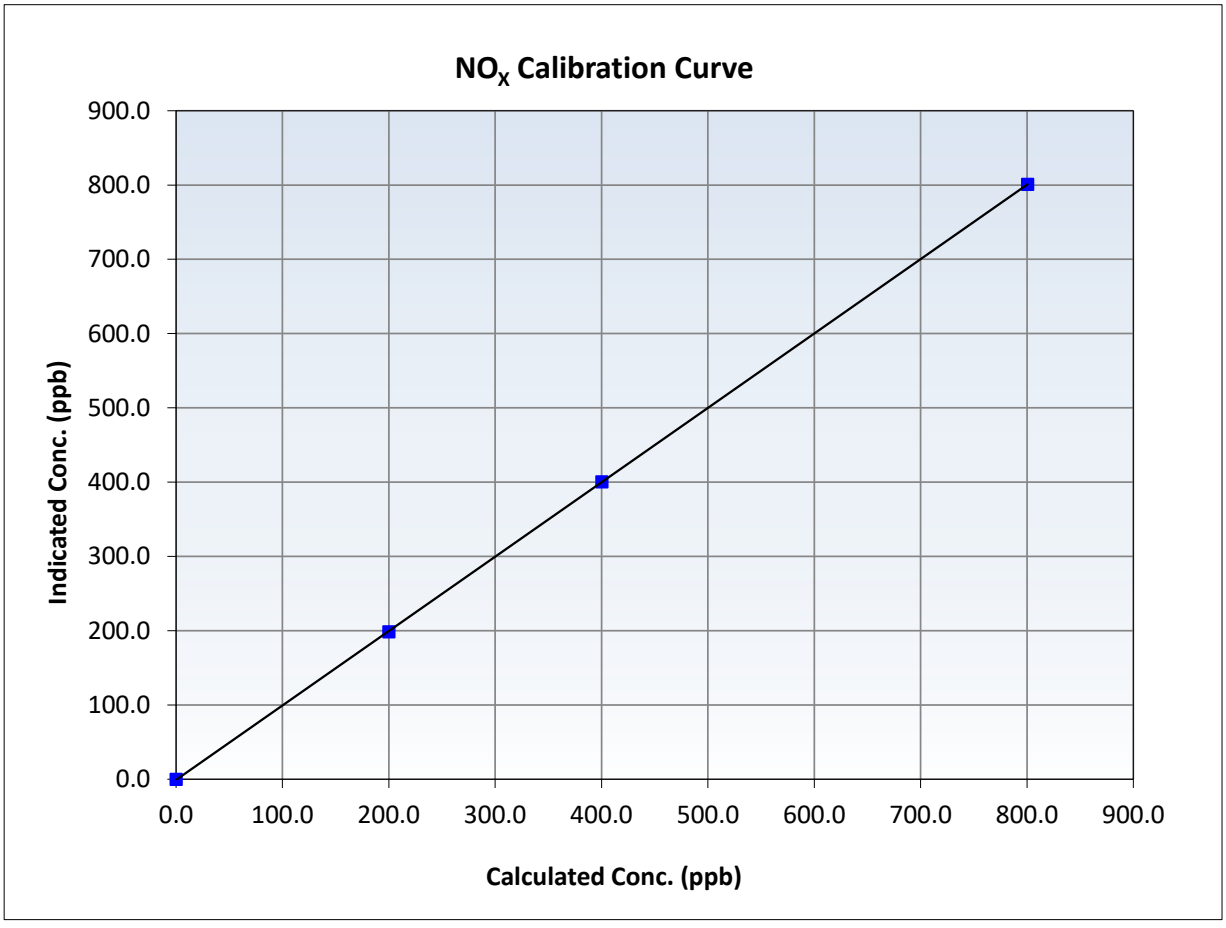
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 18, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:55	End Time (MST):	12:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.6	801.1	0.9993
400.3	400.3	1.0000
200.2	198.3	1.0094

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999993	*≥0.995*
Slope	1.001494	*0.90 - 1.10*
Intercept	-0.852815	*+/-20*



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NO_2 Calibration Summary

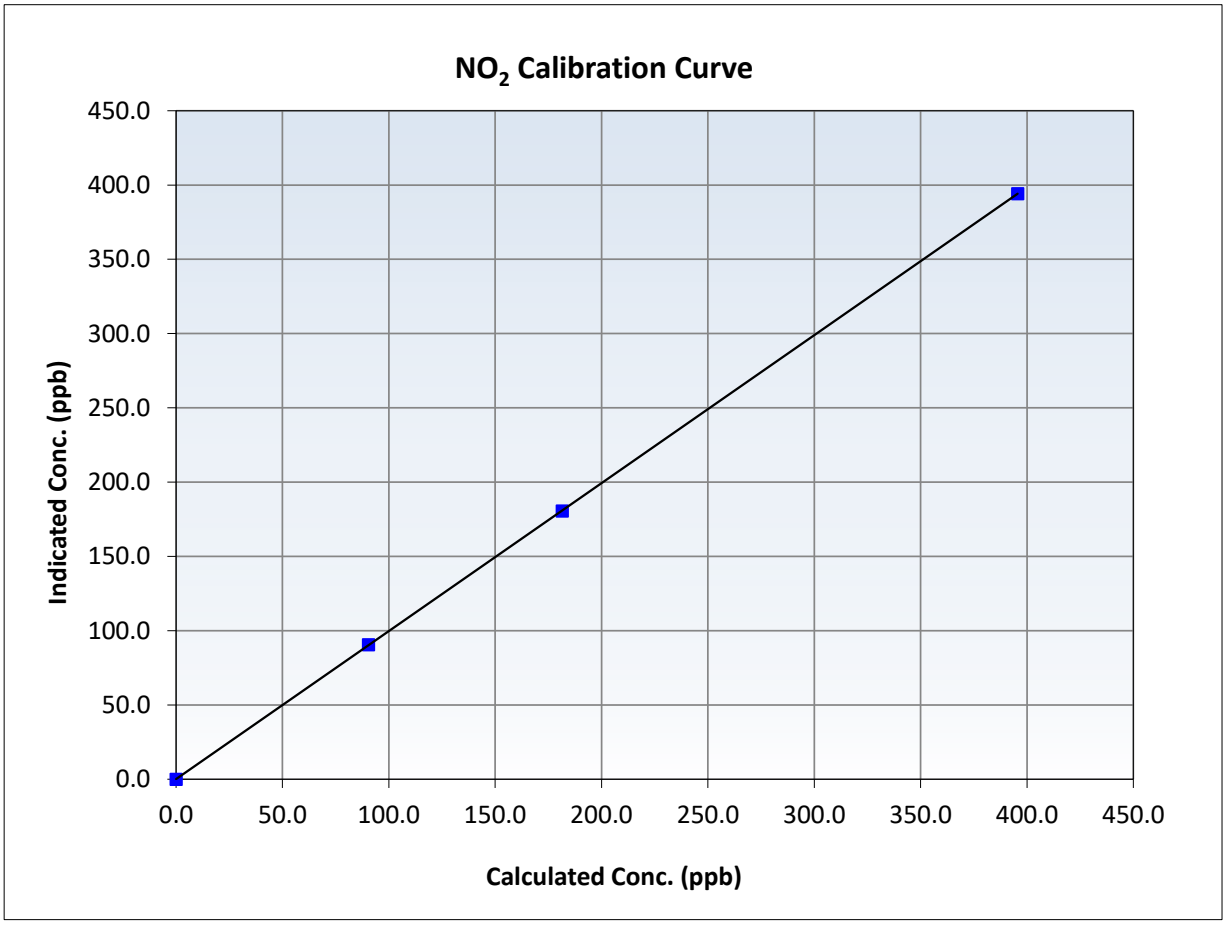
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 18, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:55	End Time (MST):	12:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
395.6	394.2	1.0036
181.5	180.6	1.0050
90.5	90.6	0.9989

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	0.996045	*0.90 - 1.10*
Intercept	0.110093	*+/-20*



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NO Calibration Summary

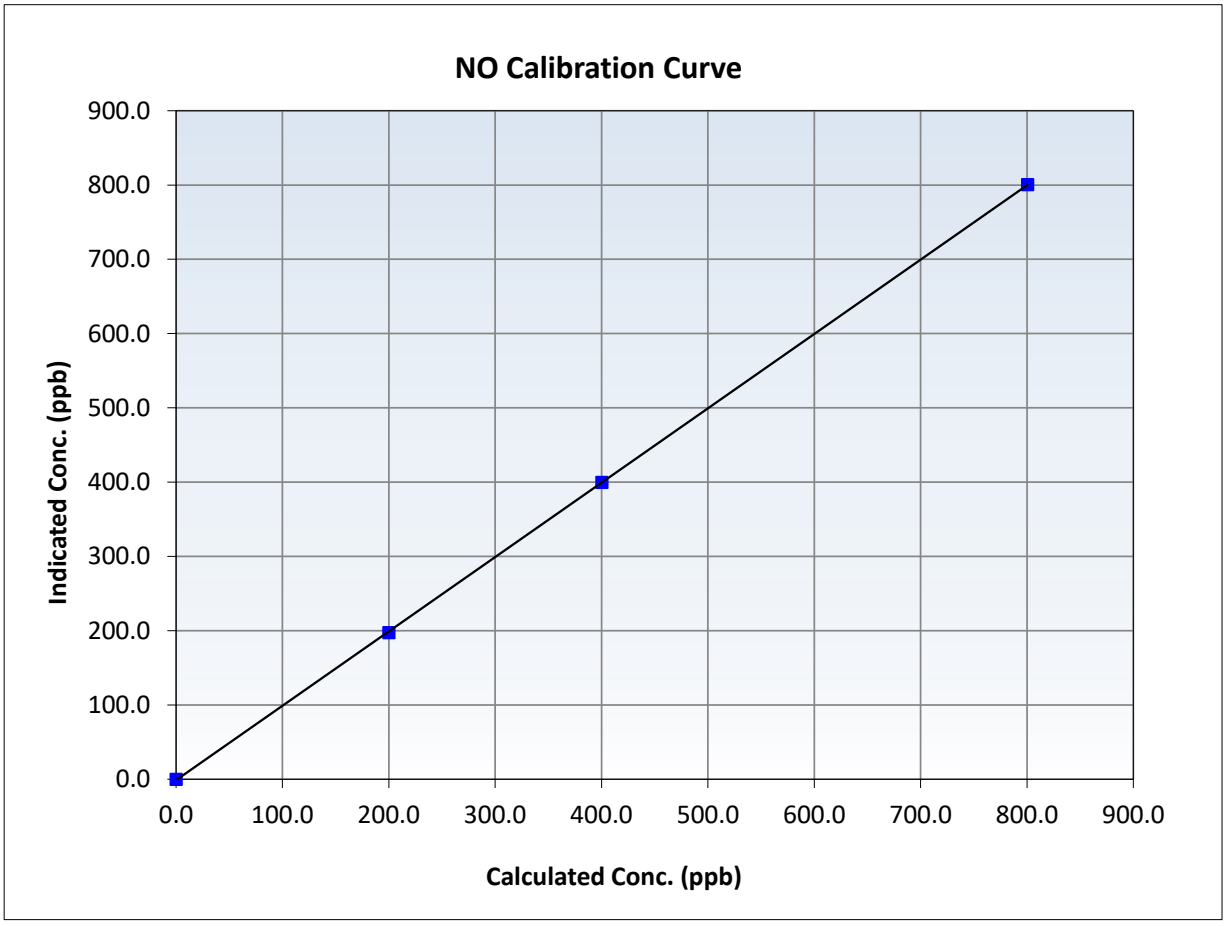
Station Information

Calibration Date:	December 2, 2024	Previous Calibration:	November 18, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:55	End Time (MST):	12:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

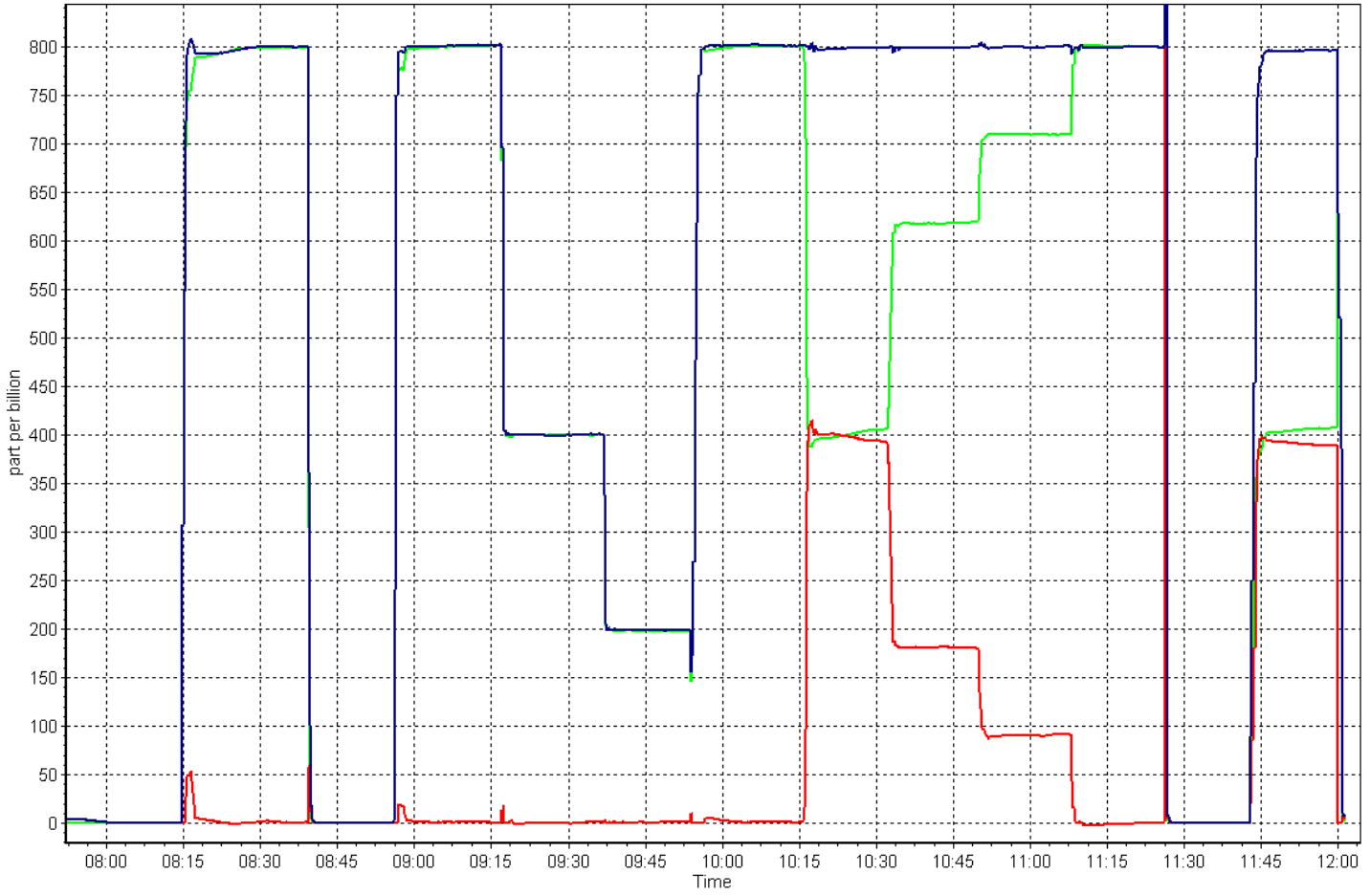
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.6	800.6	0.9999
400.3	399.5	1.0020
200.2	197.5	1.0134

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999988	*≥0.995*
Slope	1.001080	*0.90 - 1.10*
Intercept	-1.232796	*+/-20*



NO_X Calibration Plot Date: December 2, 2024 Location: Hangingstone Expansion



End of Report