



**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

OCTOBER 2024 MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

November 29, 2024

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 OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number: AMS 01
Calibration Date:	October 4, 2024	Last Cal Date: September 9, 2024
Start time (MST):	10:48	End time (MST): 14:10
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003278	0.995198	Backgd or Offset:	20.7	20.6
Calibration intercept:	-0.293098	-0.313567	Coeff or Slope:	0.875	0.875

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.3	----
As found High point	4918	81.3	800.3	788.3	1.016
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	788.0	Previous response	802.6	*% change	-1.9%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4918	81.3	800.3	796.4	1.005
Mid point	4959	40.7	400.6	398.0	1.007
Low point	4979	20.3	199.8	198.1	1.009
As left zero	5000	0.0	0.0	0.3	----
As left span	4918	81.3	800.3	797.1	1.004
Average Correction Factor:					1.007

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

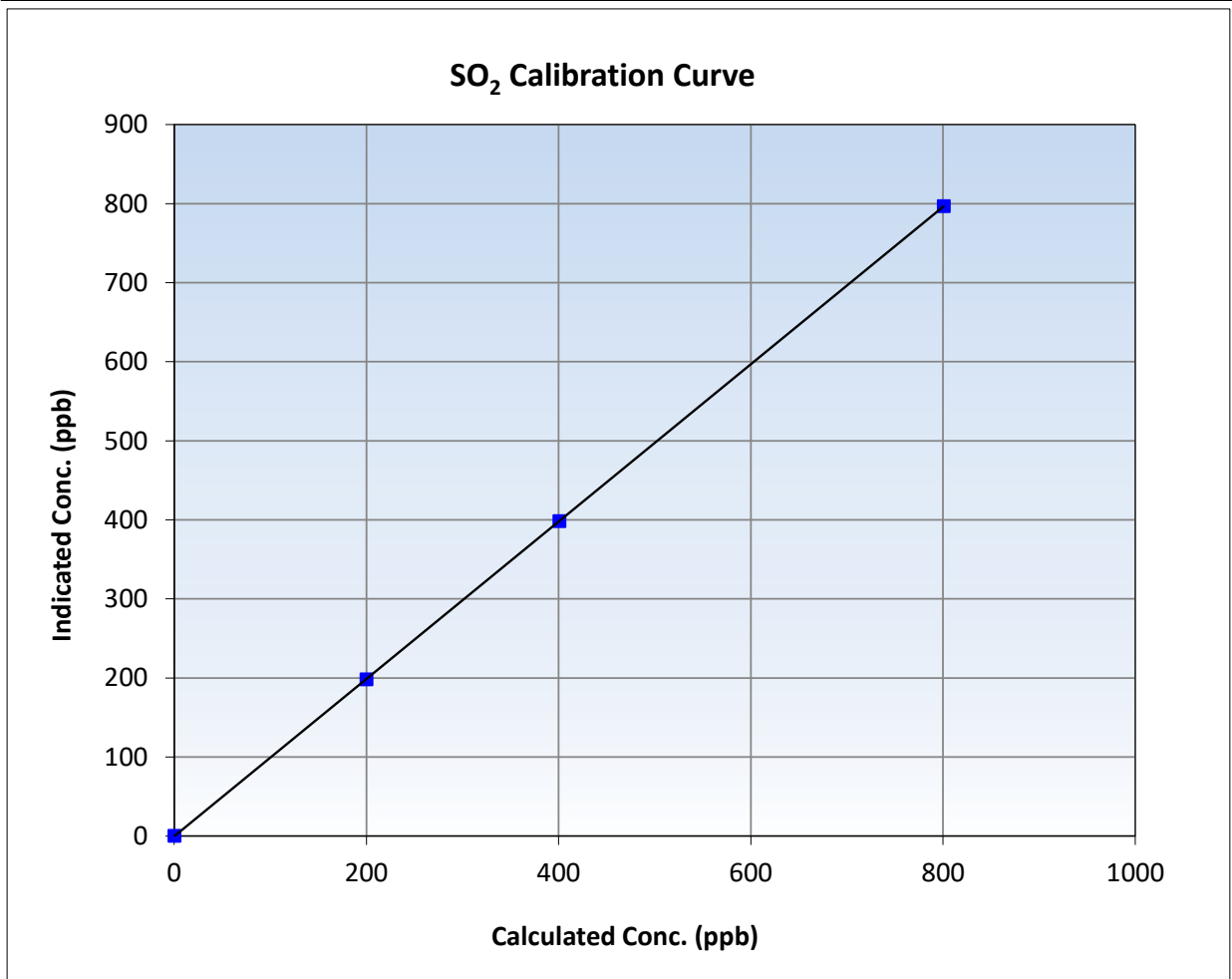
SO₂ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 9, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:48	End Time (MST):	14:10
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301448

Calibration Data

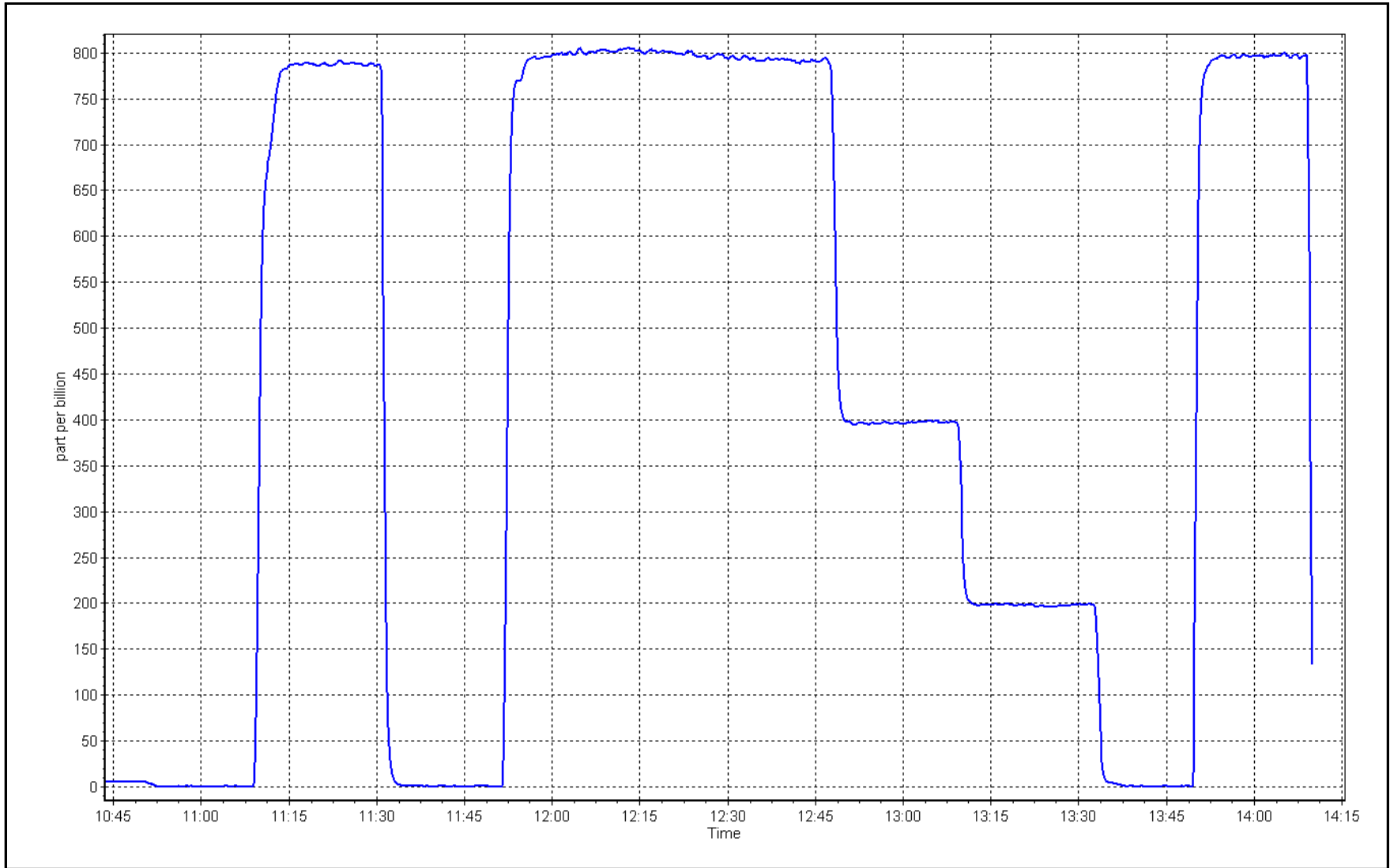
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.2	----	Correlation Coefficient	0.999998	≥0.995
800.3	796.4	1.0049	Slope	0.995198	0.90 - 1.10
400.6	398.0	1.0065	Intercept	-0.313567	+/-30
199.8	198.1	1.0087			



SO2 Calibration Plot

Date: October 4, 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:	October 7, 2024	Last Cal Date:	September 23, 2024
Start time (MST):	9:50	End time (MST):	14:15
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.10	ppm	Cal Gas Exp Date:	September 16, 2024
Cal Gas Cylinder #:	CC511749			
Removed Cal Gas Conc:	5.10	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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002704	1.002275	Backgd or Offset:	2.53	2.54
Calibration intercept:	0.139999	0.079997	Coeff or Slope:	0.881	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4921	78.4	80.0	78.1	1.024
As found Mid point	4960	39.2	40.0	39.2	1.020
As found Low point	4980	19.6	20.0	19.7	1.015
New cylinder response					
Baseline Corr As found:	78.1	Prev response:	80.33	*% change:	-2.9%
Baseline Corr 2nd AF pt:	39.2	AF Slope:	0.975982	AF Intercept:	0.100000
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999992	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4921	78.4	80.0	80.2	0.997
Mid point	4960	39.2	40.0	40.3	0.992
Low point	4980	19.6	20.0	20.0	1.000
As left zero	5000	0.0	0.0	0.2	----
As left span	4921	78.4	80.0	79.4	1.007
SO2 Scrubber Check	4919	81.3	813.0	0.0	----
Date of last scrubber change:	December 17, 2021			Ave Corr Factor	0.996
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

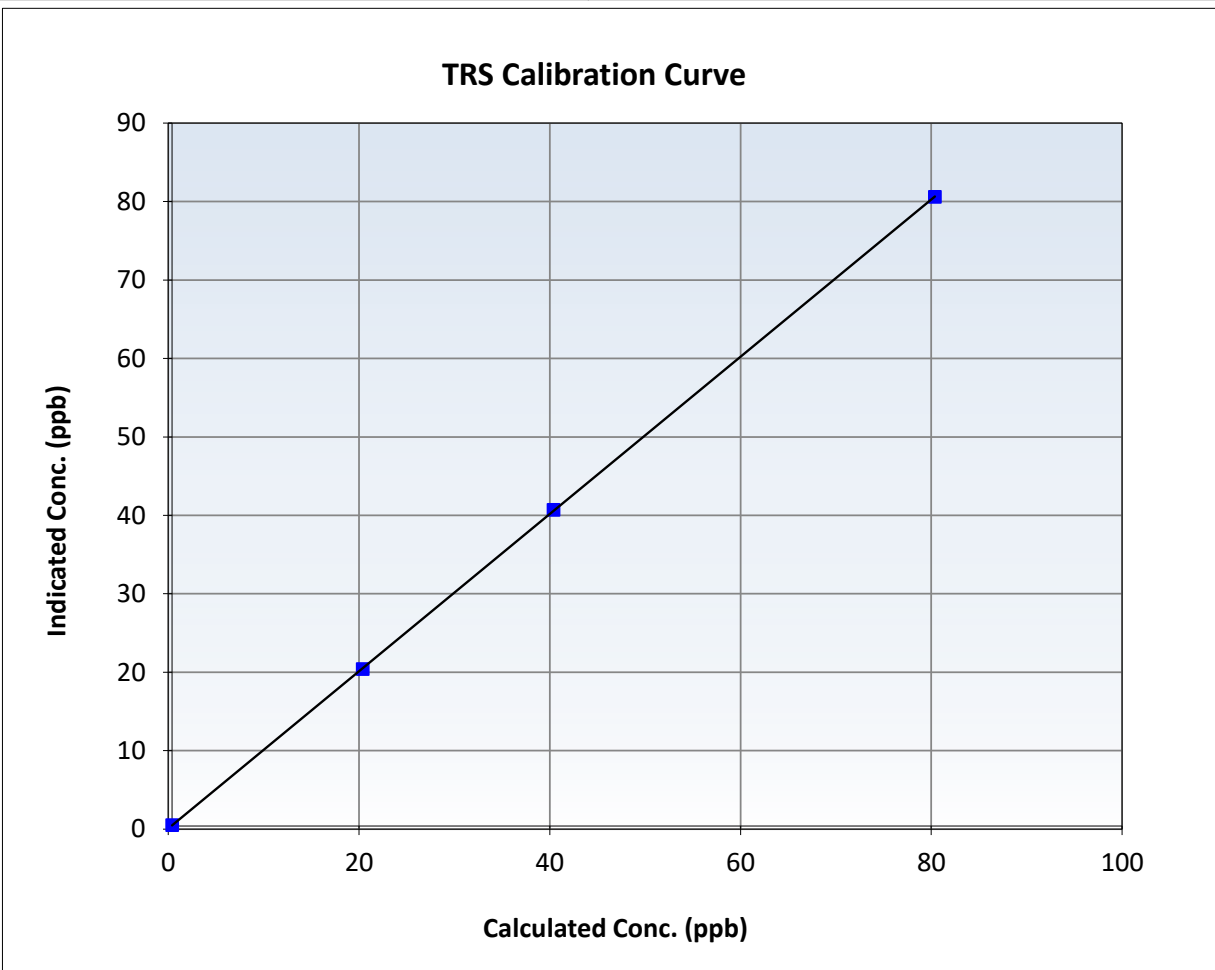
TRS Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 23, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:50	End Time (MST):	14:15
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153461

Calibration Data

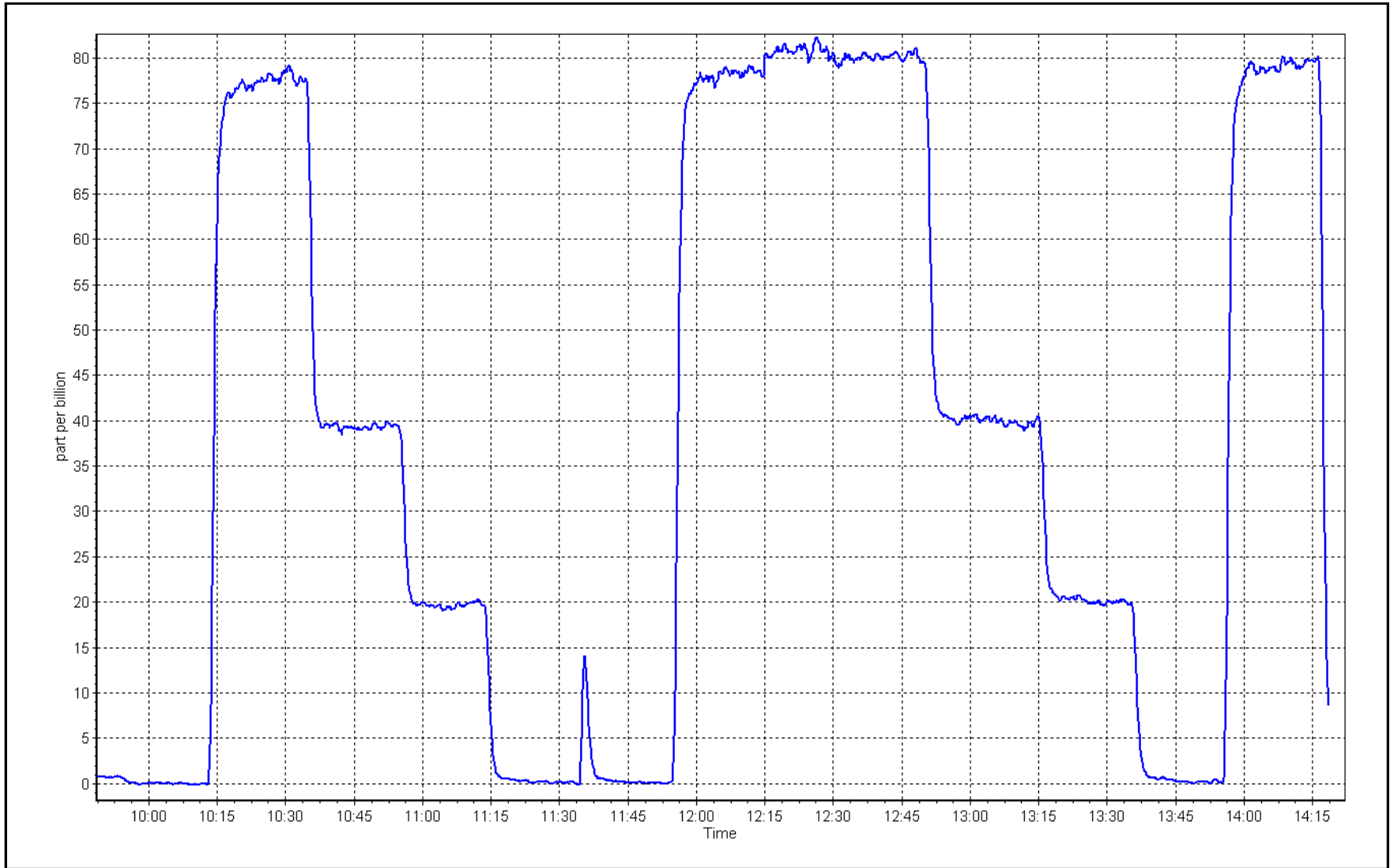
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999990	≥ 0.995
80.0	80.2	0.9972	Slope	1.002275	$0.90 - 1.10$
40.0	40.3	0.9923	Intercept	0.079997	± 3
20.0	20.0	0.9997			



TRS Calibration Plot

Date: October 7, 2024

Location: Bertha Ganter-Fort McKay





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	October 7, 2024	Last Cal Date:	September 23, 2024
Start time (MST):	9:50	End time (MST):	14:15
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.10 ppm	Cal Gas Exp Date:	September 16, 2024
Cal Gas Cylinder #:	CC511749	Rem Gas Exp Date:	NA
Removed Cal Gas Conc:	5.10 ppm	Diff between cyl:	
Removed Gas Cyl #:	NA	Serial Number:	3565
Calibrator Make/Model:	Teledyne API T700	Serial Number:	4766
ZAG Make/Model:	Teledyne API T701		

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:	350 degC

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002767	0.996193	Backgd or Offset:	1.54	1.58
Calibration intercept:	0.116793	0.196801	Coeff or Slope:	0.964	0.964

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4922	78.4	80.0	80.0	1.001
As found Mid point	4960	39.2	40.0	40.2	0.997
As found Low point	4980	19.6	20.0	19.9	1.010
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:	1.000195	AF Intercept:	0.056792
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999986	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4922	78.4	80.0	79.8	1.002
Mid point	4960	39.2	40.0	40.2	0.995
Low point	4980	19.6	20.0	20.0	1.000
As left zero	5000	0.0	0.0	0.4	----
As left span	4922	78.4	80.0	79.3	1.008
SO2 Scrubber Check	4919	81.3	813.0	-0.1	----
Date of last scrubber change:	January 25, 2024			Ave Corr Factor	0.999
Date of last converter efficiency test:					

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

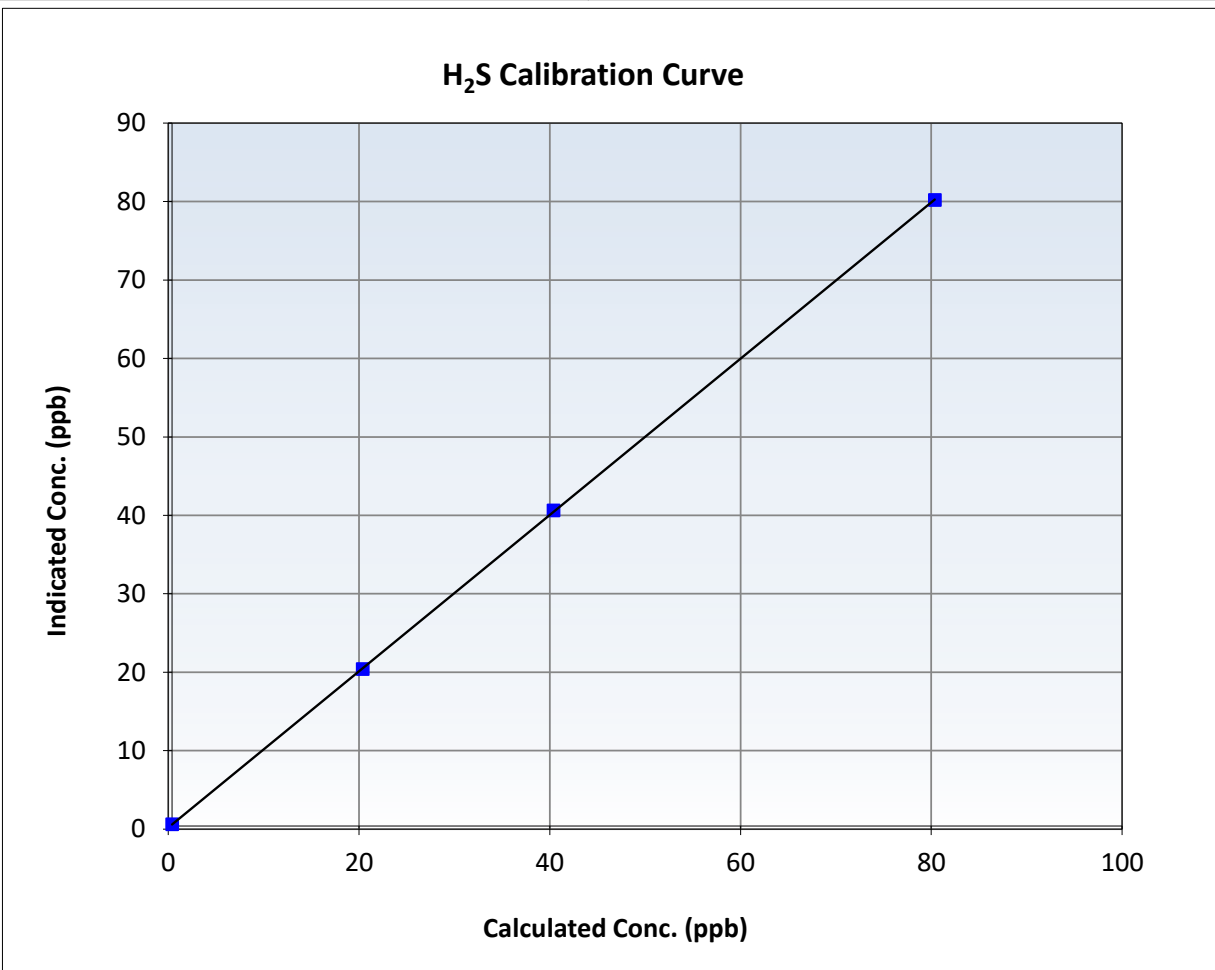
H₂S Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 23, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:50	End Time (MST):	14:15
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1200326167

Calibration Data

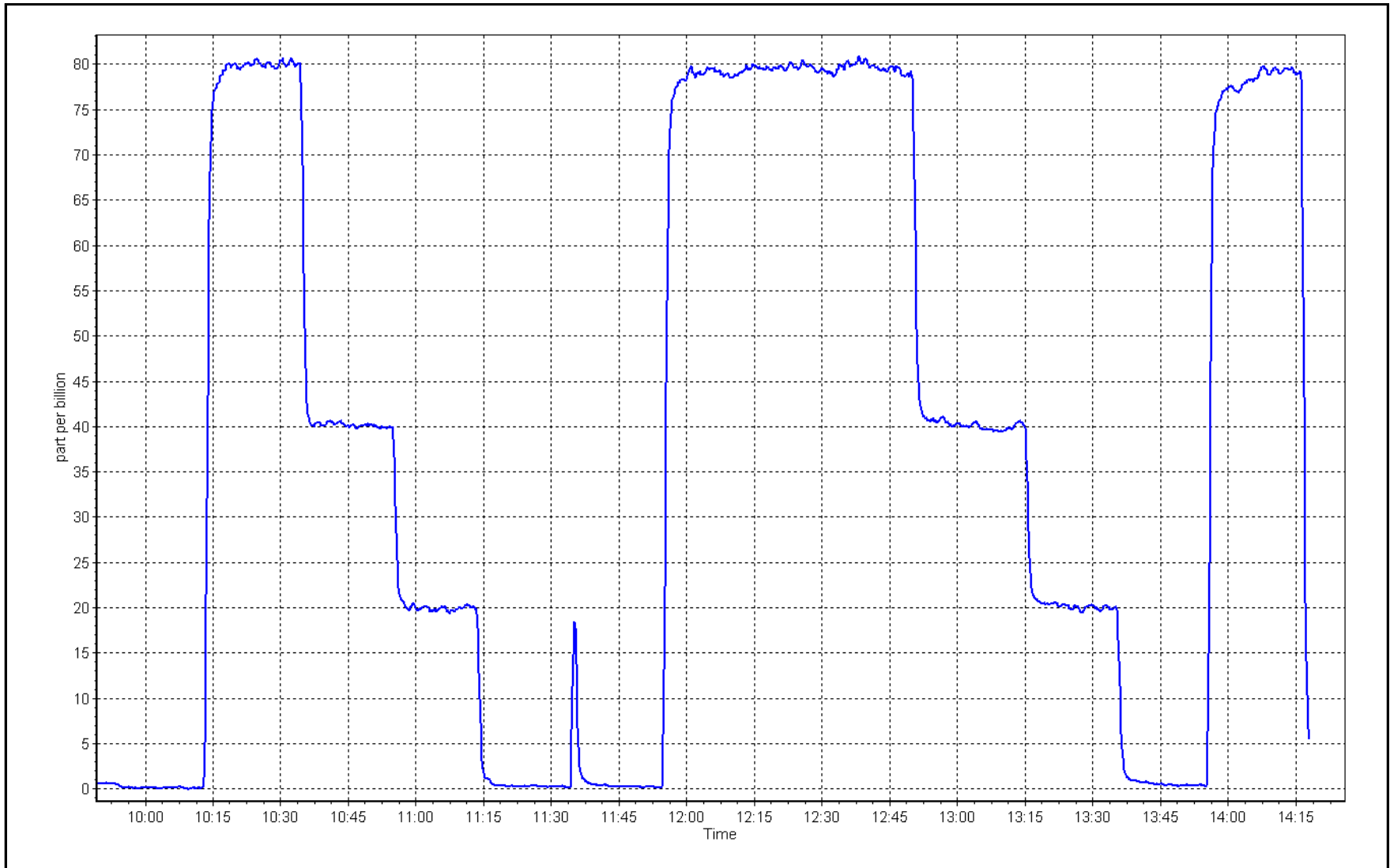
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.2	----	Correlation Coefficient	0.999988	≥0.995
80.0	79.8	1.0020	Slope	0.996193	0.90 - 1.10
40.0	40.2	0.9948	Intercept	0.196801	+/-3
20.0	20.0	0.9997			



H₂S Calibration Plot

Date: October 7, 2024

Location: Bertha Ganter-Fort McKay





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	October 4, 2024	Last Cal Date:	September 9, 2024
Start time (MST):	10:48	End time (MST):	14:10
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC418809	Cal Gas Expiry Date:	March 10, 2031
CH ₄ Cal Gas Conc.	497.2 ppm	CH ₄ Equiv Conc.	1061.8 ppm
C ₃ H ₈ Cal Gas Conc.	205.3 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH ₄ Conc.	497.2 ppm	CH ₄ Equiv Conc.	1061.8 ppm
Removed C ₃ H ₈ 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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH ₄ SP Ratio:	4.44E-04	4.45E-04	NMHC SP Ratio:	8.03E-05	8.28E-05
CH ₄ Retention time:	16.7	16.7	NMHC Peak Area:	114505	110952
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	17.27	17.33	0.996
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.33	Prev response	17.17	*% change	0.9%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	17.27	17.29	0.999
Mid point	4959	40.7	8.64	8.55	1.010
Low point	4979	20.3	4.31	4.29	1.006
As left zero	5000	0.0	0.00	0.02	----
As left span	4918	81.3	17.27	17.30	0.998
Average Correction Factor					1.005

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



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	9.18	9.13	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.13	Prev response	9.12	*% change	0.1%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	9.18	9.16	1.003
Mid point	4959	40.7	4.60	4.61	0.998
Low point	4979	20.3	2.29	2.32	0.990
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	9.18	9.20	0.998
Average Correction Factor					0.997

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	8.09	8.20	0.986
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.20	Prev response	8.04	*% change	1.9%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	8.09	8.14	0.994
Mid point	4959	40.7	4.05	3.95	1.025
Low point	4979	20.3	2.02	1.97	1.025
As left zero	5000	0.0	0.00	0.02	----
As left span	4918	81.3	8.09	8.10	0.998
Average Correction Factor					1.015

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.997236	1.001365
THC Cal Offset:	-0.054031	-0.033230
CH ₄ Cal Slope:	1.001136	1.006927
CH ₄ Cal Offset:	-0.052513	-0.049502
NMHC Cal Slope:	0.993789	0.996678
NMHC Cal Offset:	-0.001718	0.015672

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

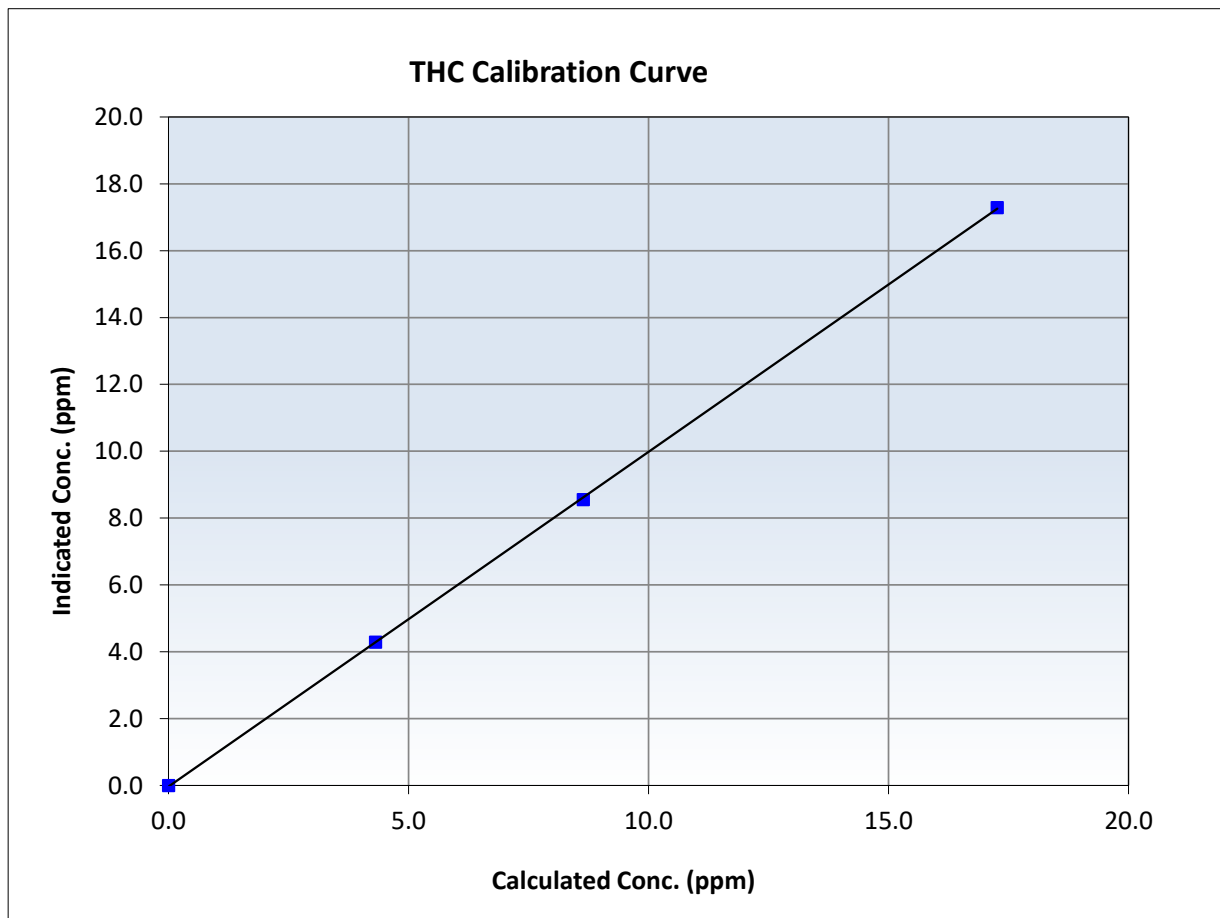
THC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 9, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:48	End Time (MST):	14:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999958	<i>≥0.995</i>
17.27	17.29	0.9986	Slope	1.001365	<i>0.90 - 1.10</i>
8.64	8.55	1.0104	Intercept	-0.033230	<i>+/-0.5</i>
4.31	4.29	1.0062			





Wood Buffalo Environmental Association

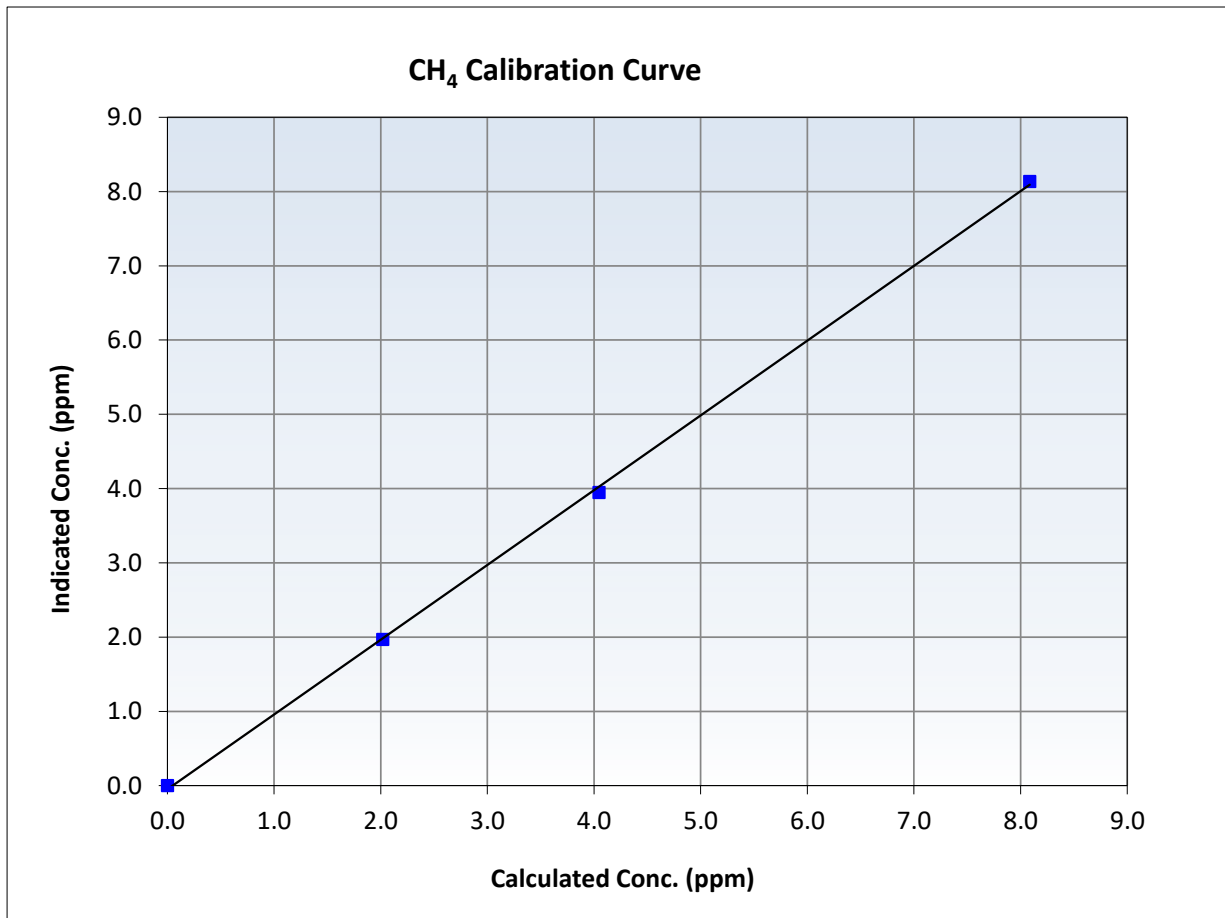
CH₄ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 9, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:48	End Time (MST):	14:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999705	<i>≥0.995</i>
8.09	8.14	0.9939	Slope	1.006927	<i>0.90 - 1.10</i>
4.05	3.95	1.0254	Intercept	-0.049502	<i>+/-0.5</i>
2.02	1.97	1.0248			





Wood Buffalo Environmental Association

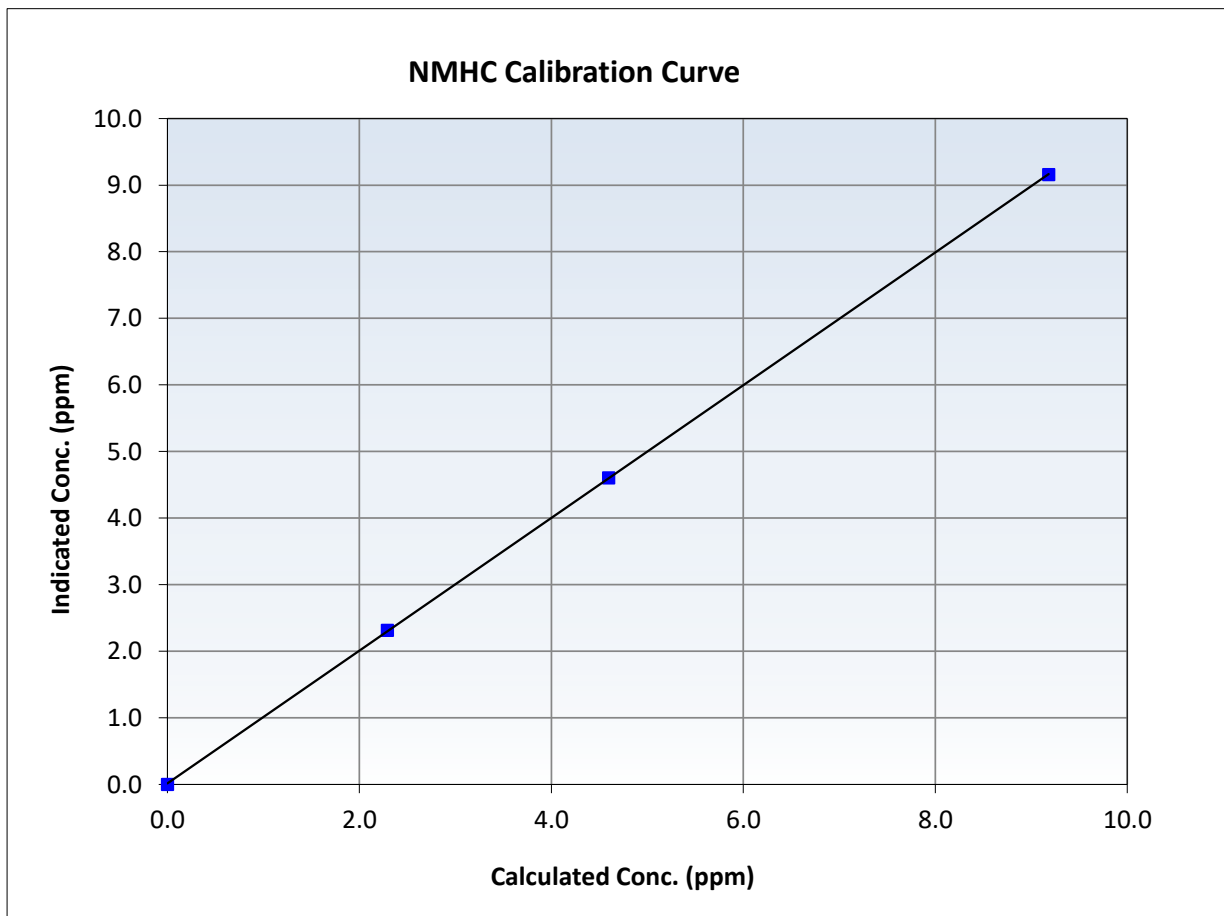
NMHC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 9, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:48	End Time (MST):	14:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

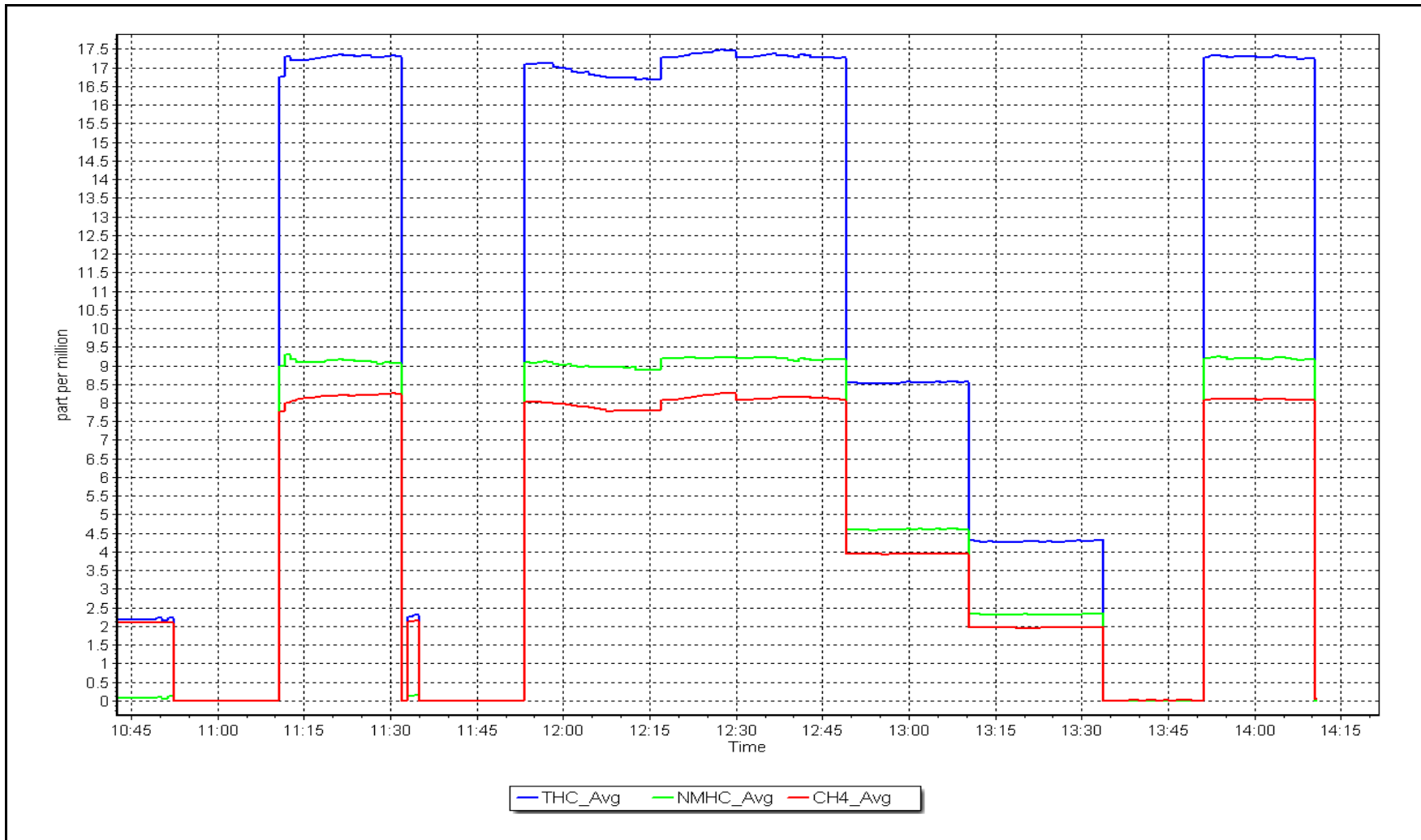
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999986	<i>≥0.995</i>
9.18	9.16	1.0025	Slope	0.996678	<i>0.90 - 1.10</i>
4.60	4.61	0.9978	Intercept	0.015672	<i>+/-0.5</i>
2.29	2.32	0.9903			



NMHC Calibration Plot

Date: October 4, 2024

Location: Bertha Ganter-Fort McKay





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	October 24, 2024	Last Cal Date:	October 4, 2024
Start time (MST):	11:34	End time (MST):	13:29
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC418809	Cal Gas Expiry Date:	March 10, 2031
CH ₄ Cal Gas Conc.	497.2 ppm	CH ₄ Equiv Conc.	1061.8 ppm
C ₃ H ₈ Cal Gas Conc.	205.3 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH ₄ Conc.	497.2 ppm	CH ₄ Equiv Conc.	1061.8 ppm
Removed C ₃ H ₈ 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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH ₄ SP Ratio:	4.45E-04	4.45E-04	NMHC SP Ratio:	8.28E-05	8.28E-05
CH ₄ Retention time:	16.7	16.7	NMHC Peak Area:	110952	110952
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	17.27	17.22	1.003
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.22	Prev response	17.26	*% 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)) <i>Limit = 0.95-1.05</i>
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	17.22	1.003
Average Correction Factor					

Notes: Swapped out the H2 cylinder.



Wood Buffalo Environmental Association

THC / CH₄ / 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	9.18	9.18	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.18	Prev response	9.17	*% change	0.1%
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) <i>Limit = 0.95-1.05</i>
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	9.14	1.004
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	8.09	8.04	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.04	Prev response	8.09	*% change	-0.6%
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) <i>Limit = 0.95-1.05</i>
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	8.08	1.000
Average Correction Factor					

Calibration Statistics

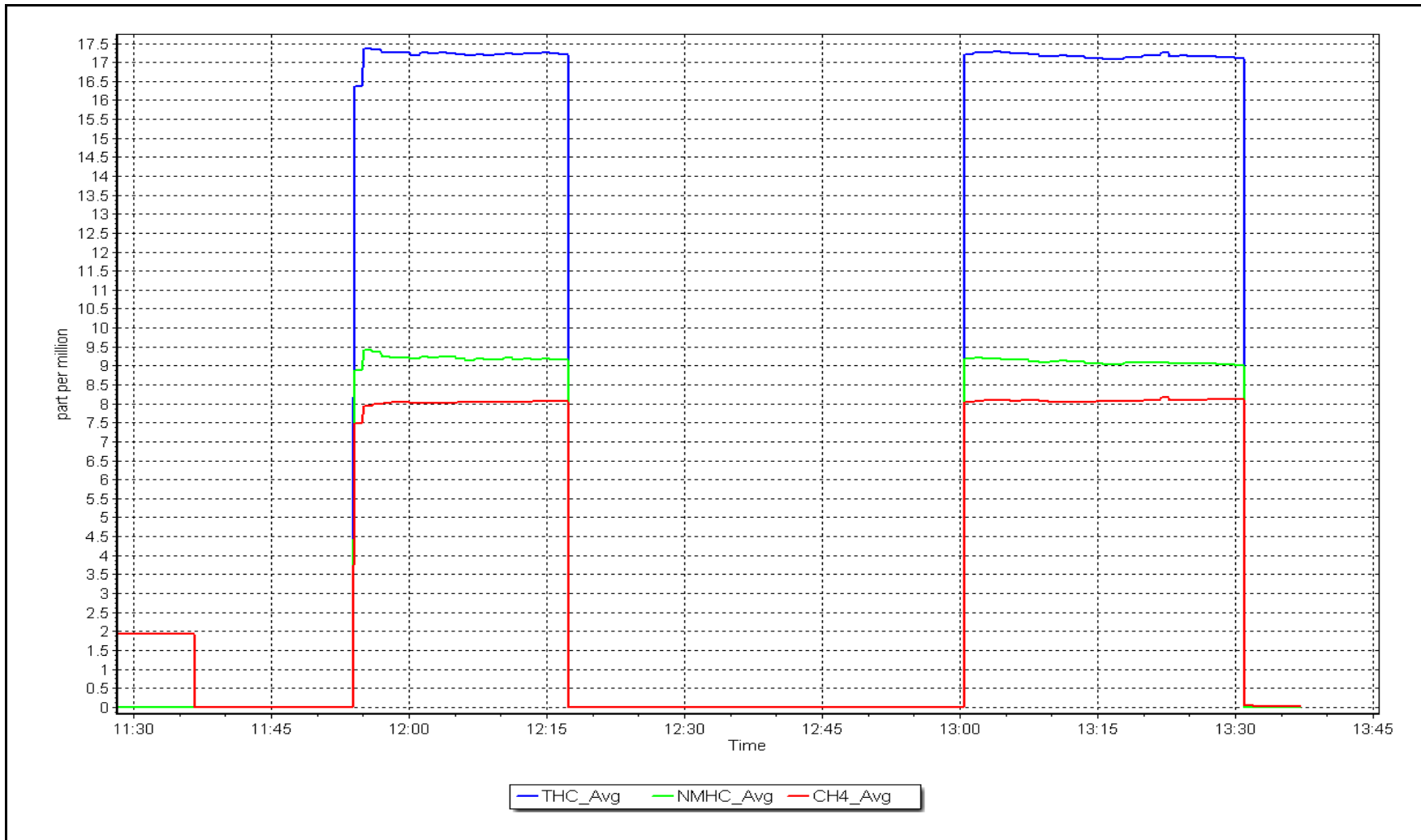
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001365	
THC Cal Offset:	-0.033230	
CH ₄ Cal Slope:	1.006927	
CH ₄ Cal Offset:	-0.049502	
NMHC Cal Slope:	0.996678	
NMHC Cal Offset:	0.015672	

Calibration Performed By: Rene Chamberland

NMHC Calibration Plot

Date: October 24, 2024

Location: Bertha Ganter-Fort McKay





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Bertha Ganter-Fort McKay
 Station number: AMS 01
 Calibration Date: October 2, 2024
 Last Cal Date: September 13, 2024
 Start time (MST): 11:05
 End time (MST): 15:38
 Reason: Routine

Calibration Standards

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

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.7	0.9	-0.2	----	----
AF High point	4932	67.6	803.1	800.4	2.7	785.5	777.3	8.3	1.0233	1.0309
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 803.2 ppb		NO = 799.9 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -2.3%	
Baseline Corr 1st pt	NO _x = 784.8 ppb		NO = 776.4 ppb			<u>As Found Statistics</u>		*Percent Change	NO = -3.0%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 7117

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.001221	1.004110
NO _x Cal Offset:	-0.880000	-1.620000
NO Cal Slope:	1.002205	1.002033
NO Cal Offset:	-2.240000	-2.280000
NO ₂ Cal Slope:	0.999541	1.006464
NO ₂ Cal Offset:	0.879608	1.510023

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.141	1.156	NO bkgnd or offset:	-1.5	0.2
NOX coeff or slope:	1.142	1.161	NOX bkgnd or offset:	-1.2	0.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	6.6	6.6

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.1	----	----
High point	4932	67.6	803.1	800.4	2.7	805.5	800.9	4.5	0.9970	0.9994
Mid point	4966	33.8	401.5	400.2	1.4	400.6	397.2	3.4	1.0024	1.0075
Low point	4983	16.9	200.8	200.1	0.7	199.0	196.6	2.4	1.0089	1.0178
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	----	----
As left span	4932	67.6	803.1	382.2	420.9	797.1	382.2	414.9	1.0075	1.0000
Average Correction Factor									1.0028	1.0082

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	794.7	382.0	415.4	418.7	0.9921	100.8%
Mid GPT point	794.7	565.0	232.4	236.1	0.9843	101.6%
Low GPT point	794.7	679.8	117.6	121.7	0.9663	103.5%
Average Correction Factor					0.9809	102.0%

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

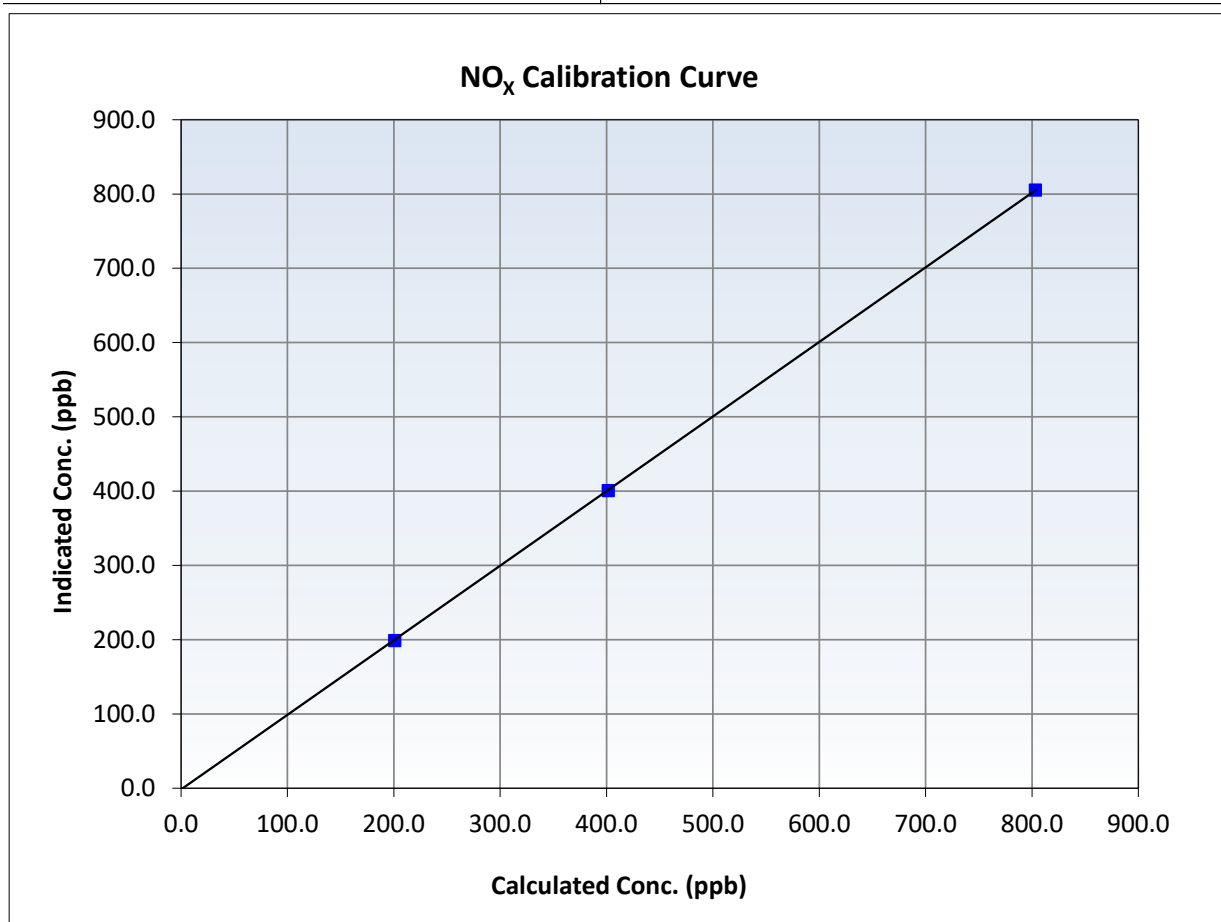
NO_x Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 13, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:05	End Time (MST):	15:38
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.4	----	Correlation Coefficient	0.999989	≥0.995
803.1	805.5	0.9970	Slope	1.004110	0.90 - 1.10
401.5	400.6	1.0024	Intercept	-1.620000	+/-20
200.8	199.0	1.0089			





Wood Buffalo Environmental Association

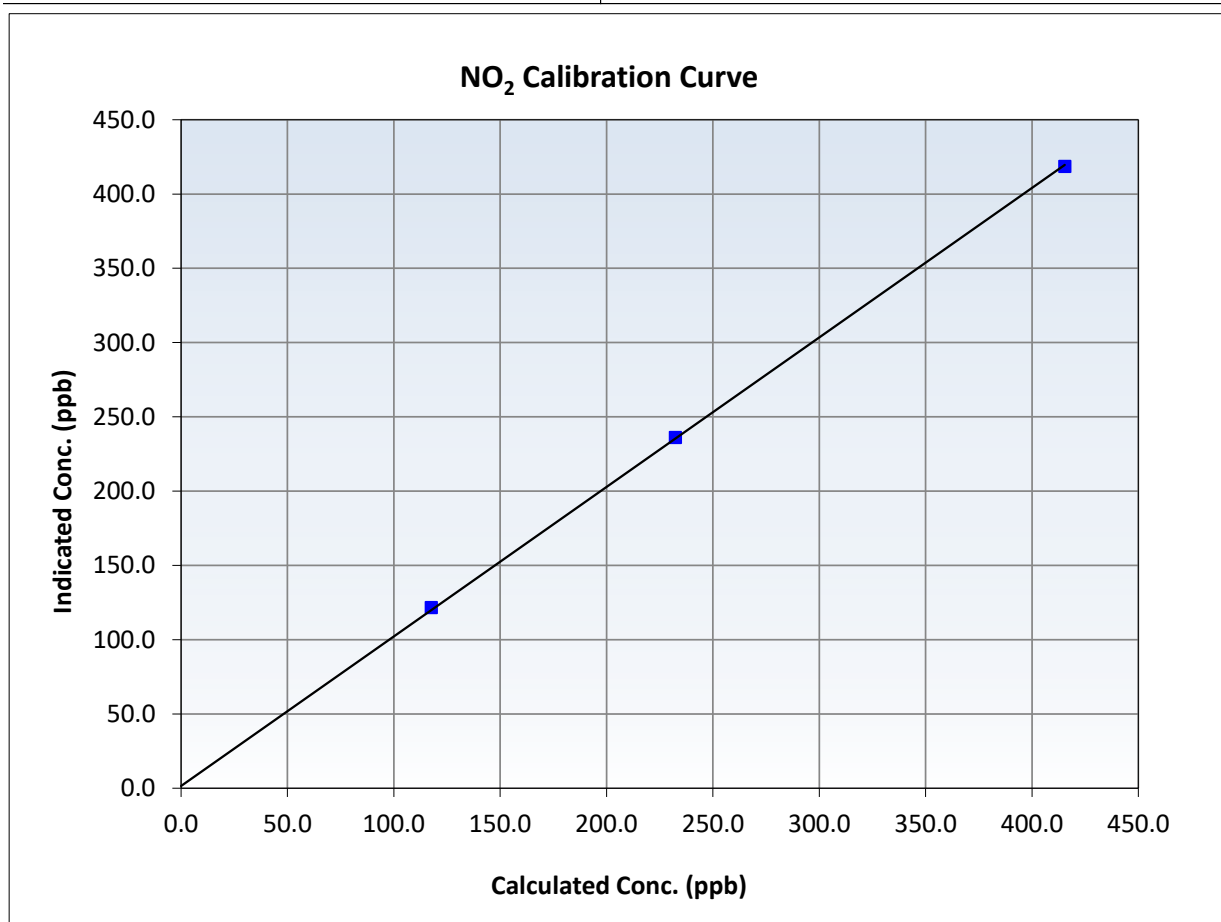
NO₂ Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 13, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:05	End Time (MST):	15:38
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999924	≥0.995
415.4	418.7	0.9921	Slope	1.006464	0.90 - 1.10
232.4	236.1	0.9843	Intercept	1.510023	+/-20
117.6	121.7	0.9663			





Wood Buffalo Environmental Association

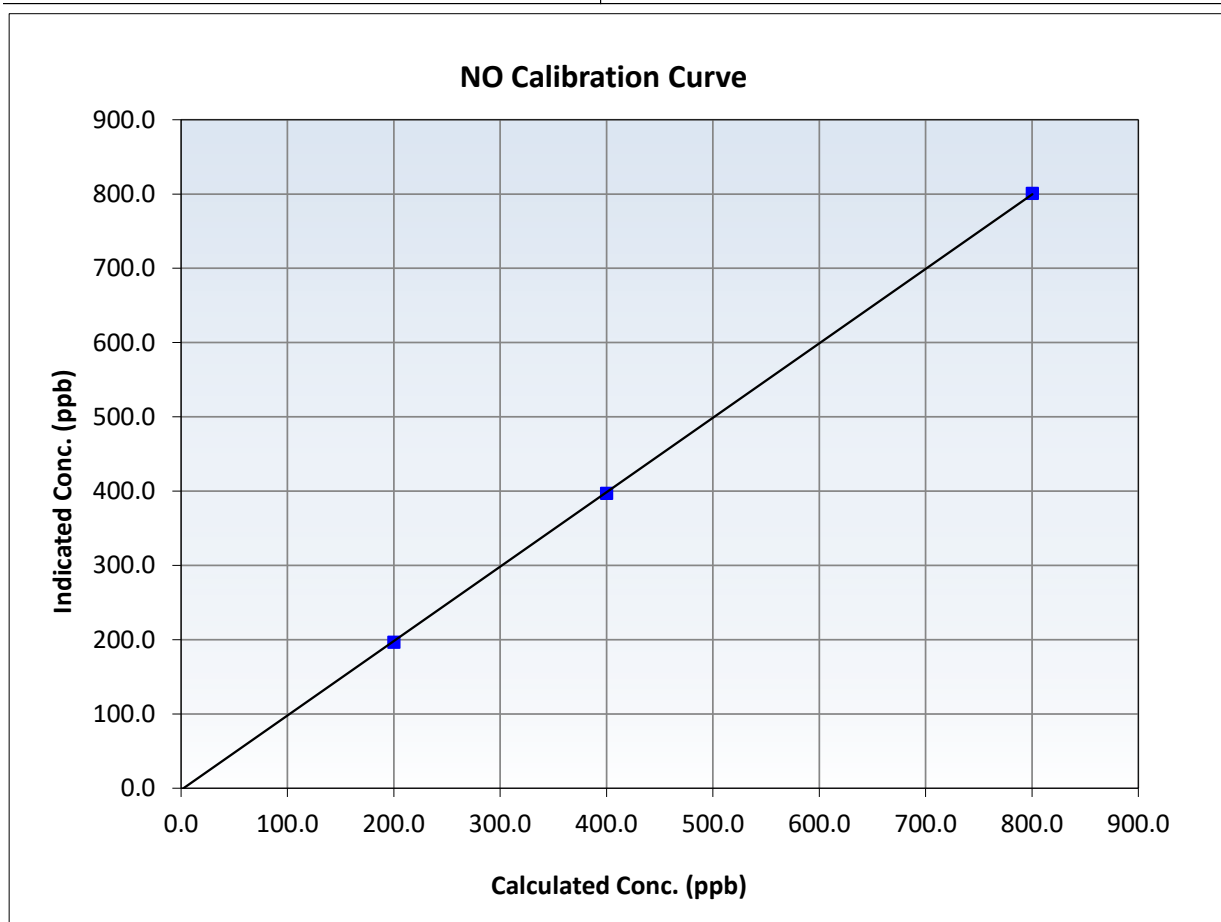
NO Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 13, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:05	End Time (MST):	15:38
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

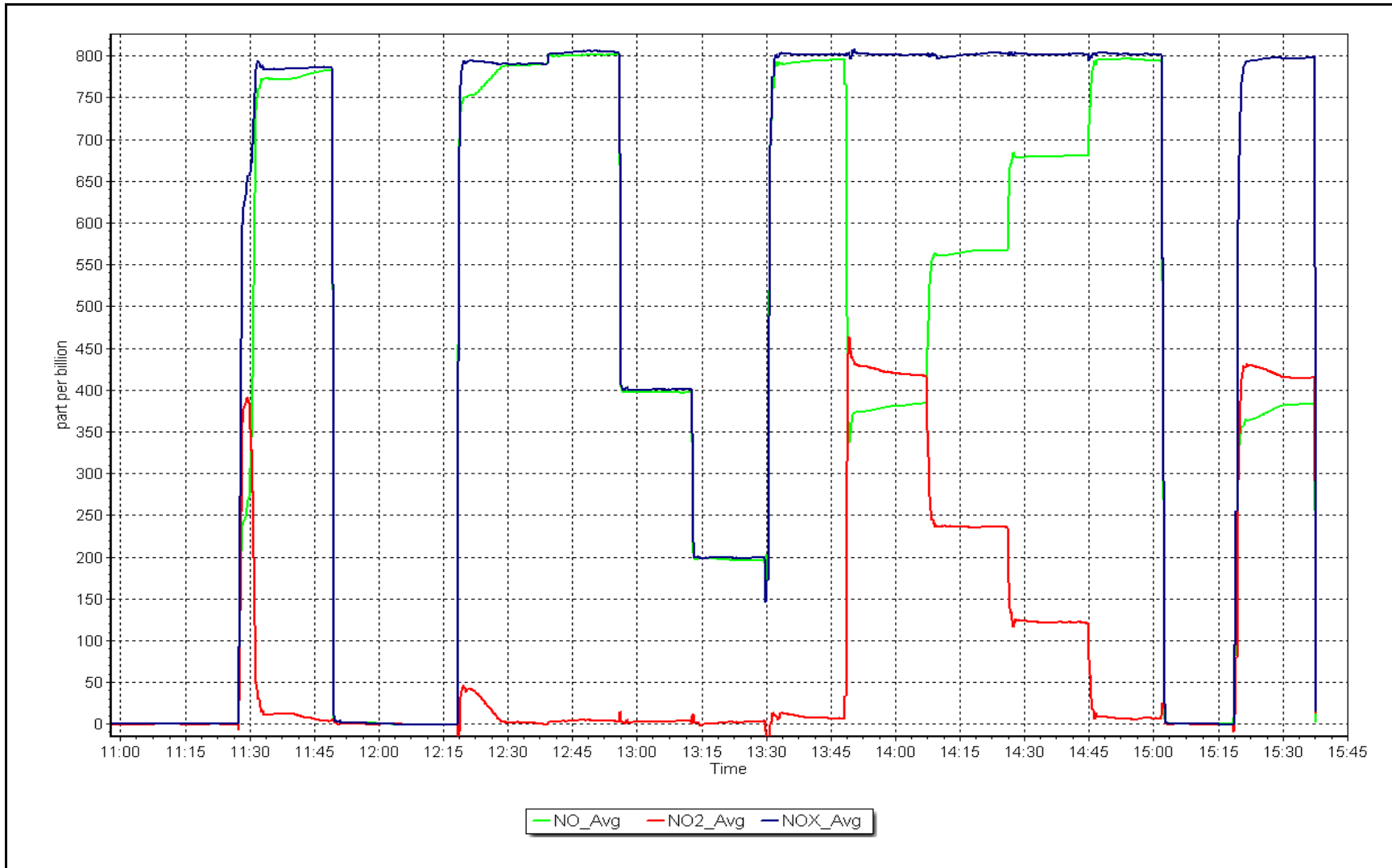
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999971	≥0.995
800.4	800.9	0.9994	Slope	1.002033	0.90 - 1.10
400.2	397.2	1.0075	Intercept	-2.280000	+/-20
200.1	196.6	1.0178			



NO_x Calibration Plot

Date: October 2, 2024

Location: Bertha Ganter-Fort McKay





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number: AMS 01
Calibration Date:	October 1, 2024	Last Cal Date: September 10, 2024
Start time (MST):	9:50	End time (MST): 12:48
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999657	1.002171	Backgd or Offset:	4.2	4.2
Calibration intercept:	0.460000	0.420000	Coeff or Slope:	1.007	1.007

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	----
As found High point	5000	863.1	400.0	401.2	0.998
As found Mid point					
As found Low point					
Baseline Corr As found:	401.0	Previous response	400.3	*% 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	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.6	----
High point	5000	863.1	400.0	401.5	0.996
Mid point	5000	744.0	200.0	200.4	0.998
Low point	5000	651.7	100.0	100.7	0.993
As left zero	5000	0.0	0.0	0.3	----
As left span	5000	863.1	400.0	403.2	0.992
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

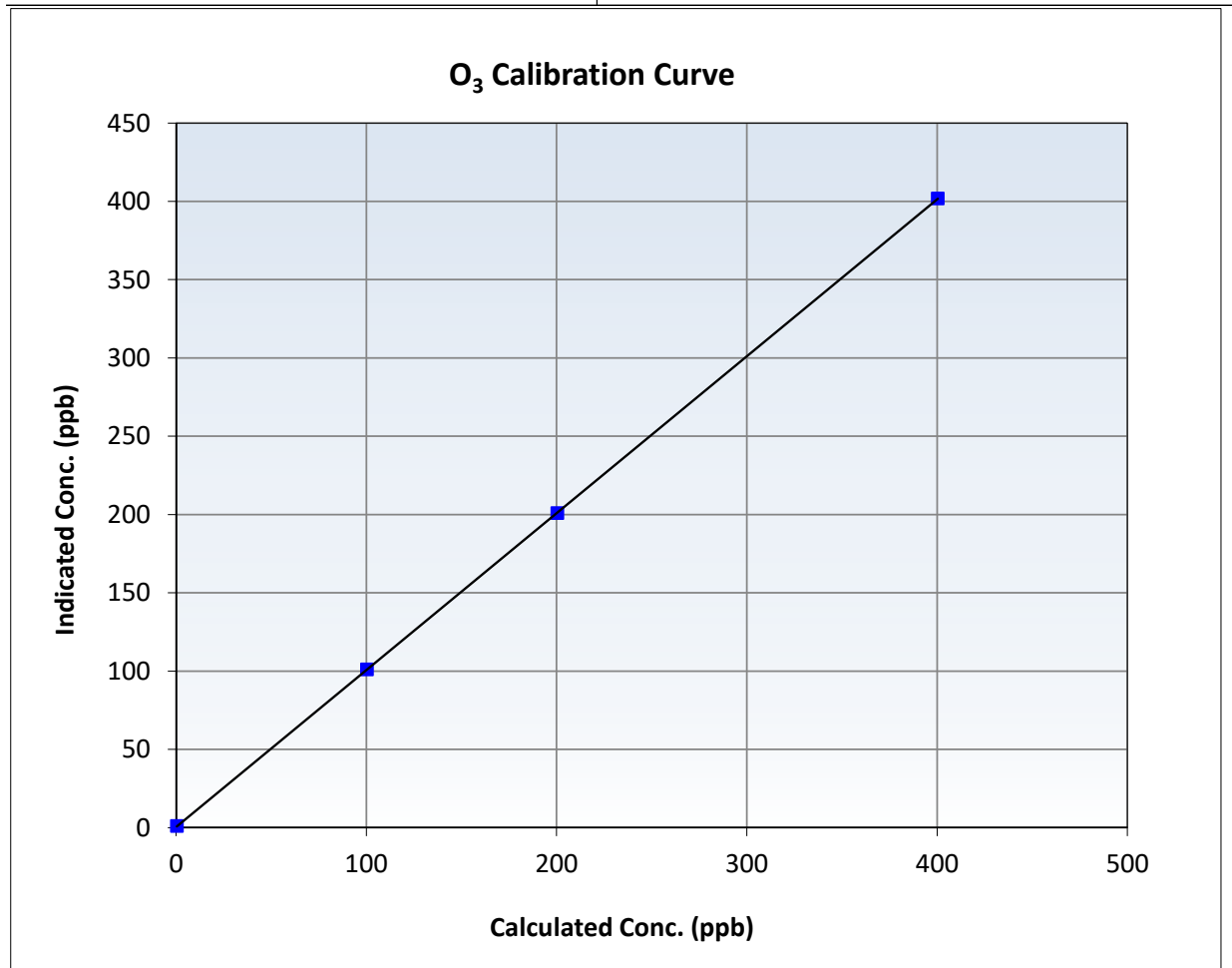
O₃ Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 10, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:50	End Time (MST):	12:48
Analyzer make:	Teledyne API T400	Analyzer serial #:	1107

Calibration Data

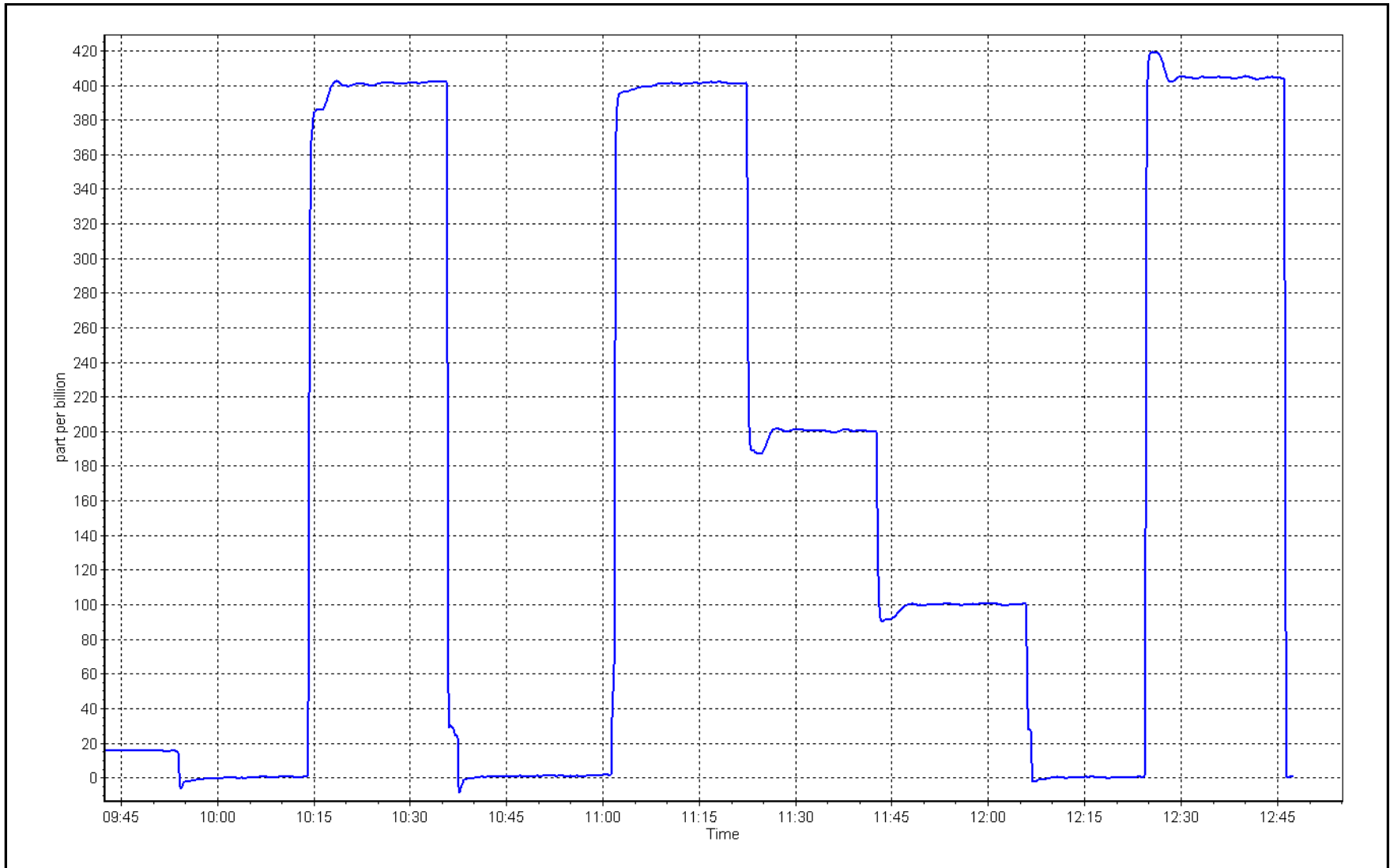
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.6	----	Correlation Coefficient	0.999997	≥0.995
400.0	401.5	0.9963	Slope	1.002171	0.90 - 1.10
200.0	200.4	0.9980	Intercept	0.420000	+/- 5
100.0	100.7	0.9930			



O₃ Calibration Plot

Date: October 1, 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: October 24, 2024 Last Cal Date: September 23, 2024
Start time (MST): 12:58 End time (MST): 14:30

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)	9.2	8.2	9.2	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	730.2	732.27	730.2	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.01	4.988	5.01	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	48		48	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	2.0	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: **10.9** Expiry Date: June 10, 2024
Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test	11.0	10.8	10.8	<input type="checkbox"/>	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: _____ 0.0 <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 checks passed. Optical chamber, RH/T sensor, and sample tube cleaned. Disposable filter changed. PMT peak test completed.

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:	October 3, 2024	Last Cal Date:	September 16, 2024
Start time (MST):	10:50	End time (MST):	13:44
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002157	0.998242	Backgd or Offset:	-0.014	-0.014
Calibration intercept:	0.151869	0.183817	Coeff or Slope:	0.993	0.990

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4933	66.7	40.6	40.9	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	40.84	Prev response:	40.80	*% 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 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4933	66.7	40.6	40.6	1.000
Mid point	4966	33.3	20.2	20.6	0.981
Low point	4983	16.7	10.2	10.3	0.985
As left zero	5000	0.0	0.0	0.1	----
As left span	2960	40.0	40.5	40.2	1.009
Average Correction Factor					0.989

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

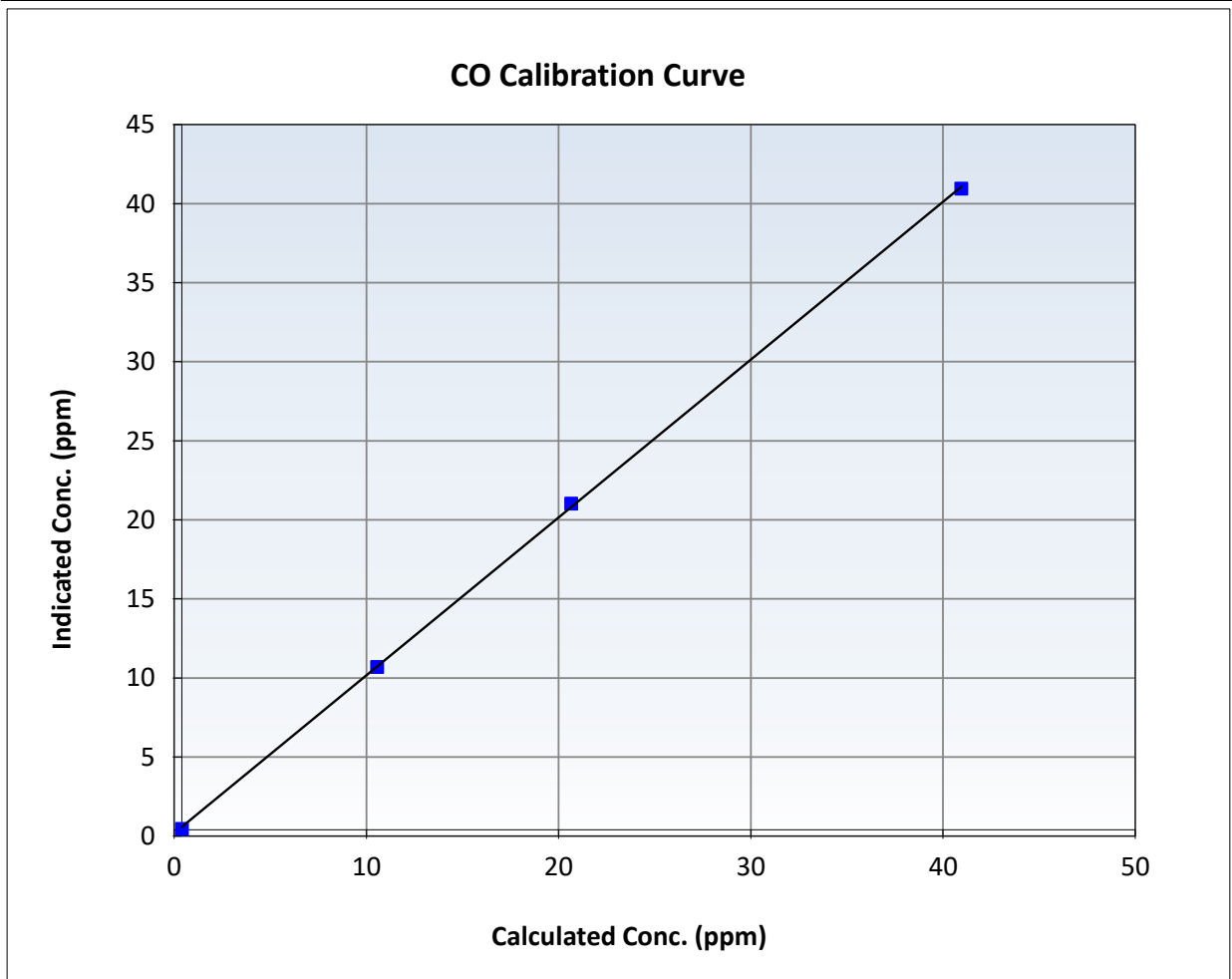
CO Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 16, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:50	End Time (MST):	13:44
Analyzer make:	Teledyne API T300	Analyzer serial #:	3520

Calibration Data

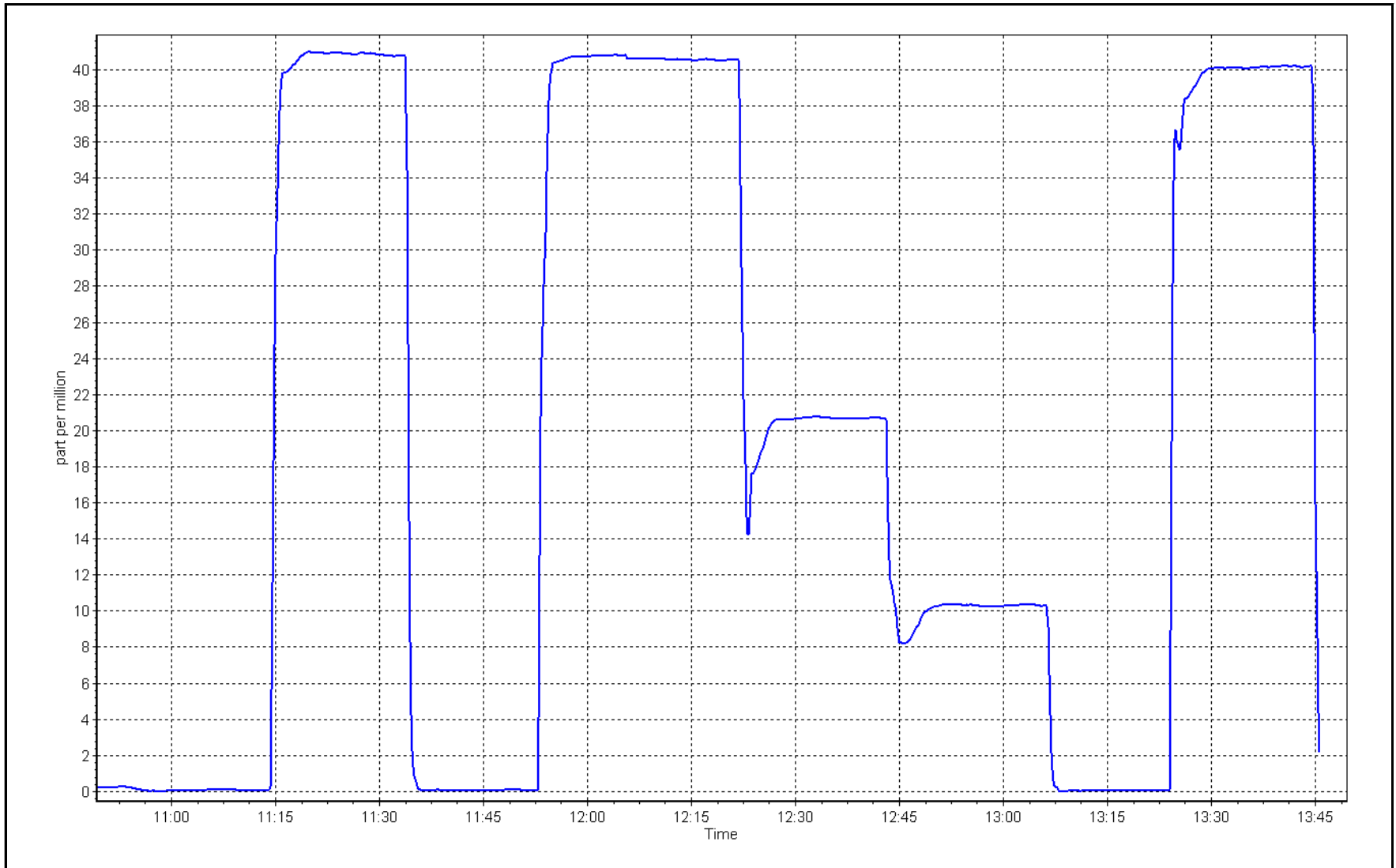
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.1	----	Correlation Coefficient	0.999904	≥0.995
40.6	40.6	1.0001	Slope	0.998242	0.90 - 1.10
20.2	20.6	0.9811	Intercept	0.183817	+/-1.5
10.2	10.3	0.9849			



CO Calibration Plot

Date: October 3, 2024

Location: Bertha Ganter-Fort McKay





Wood Buffalo Environmental Association

CO₂ Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	October 9, 2024	Last Cal Date:	September 24, 2024
Start time (MST):	10:34	End time (MST):	14:00
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.998614	0.998614	Backgd or Offset:	0.002	0.002
Calibration intercept:	0.940000	-2.160000	Coeff or Slope:	0.906	0.911

CO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	3000	0.0	0.0	0.3	----
As found High Point	2920	80.0	1605.3	1560.6	1.029
As found Mid Point					
As found Low Point					
New cylinder response					
Baseline Corr As found:	1560.3	Prev response:	1604.0	*% 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	

CO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	3000	0.0	0.0	0.4	----
High point	2920	80.0	1605.3	1604.2	1.001
Mid point	2960	40.0	802.7	792.2	1.013
Low point	2980	20.0	401.3	400.0	1.003
As left zero	3000	0.0	0.0	-2.8	----
As left span	2960	40.0	802.7	784.6	1.023
Average Correction Factor					1.006

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

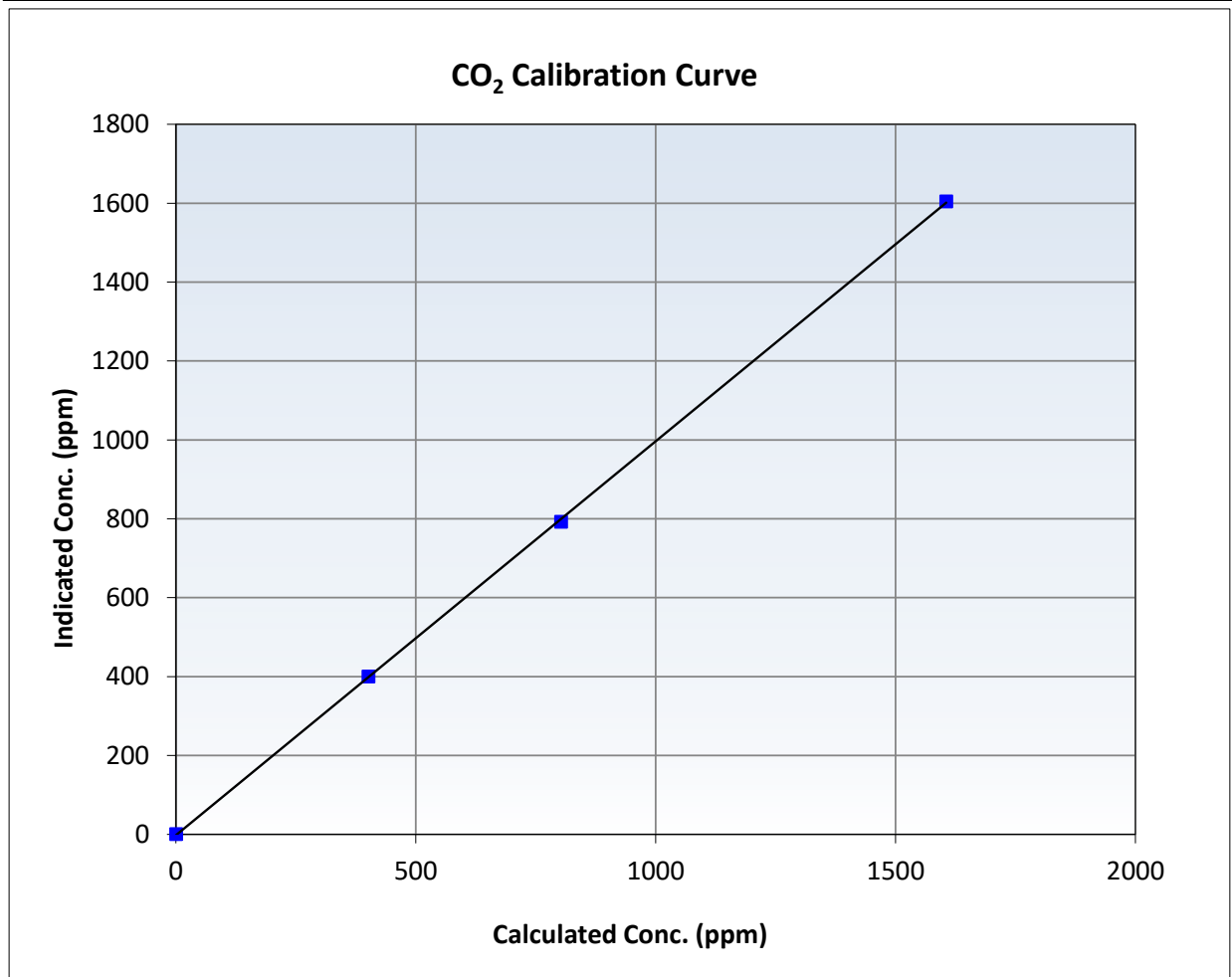
CO₂ Calibration Summary

Station Information

Calibration Date	October 9, 2024	Previous Calibration	September 24, 2024
Station Name	Bertha Ganter-Fort McKay	Station Number	AMS 01
Start Time (MST)	10:34	End Time (MST)	14:00
Analyzer make	Teledyne API 360	Analyzer serial #	442

Calibration Data

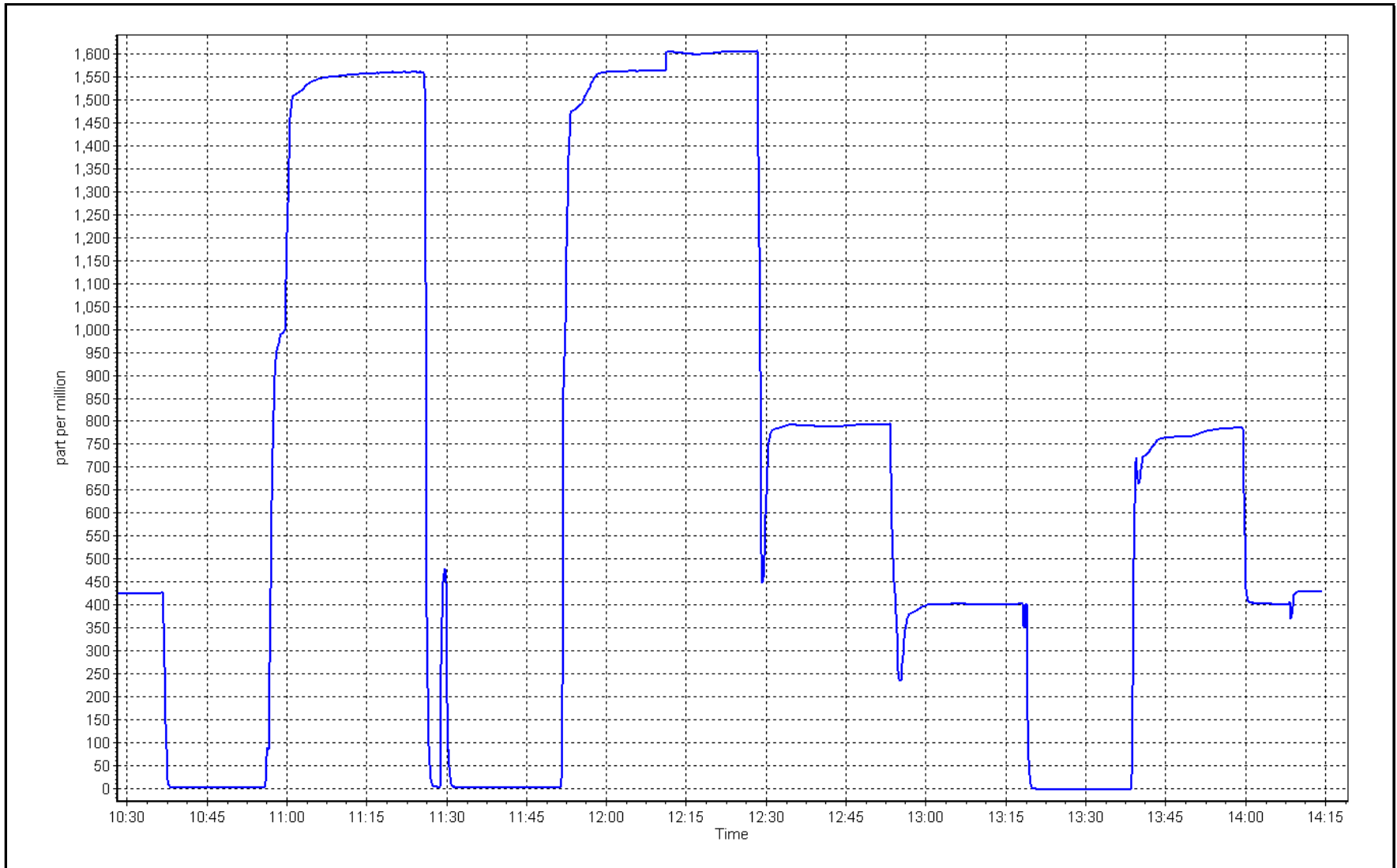
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.4	----	Correlation Coefficient	0.999950	≥0.995
1605.3	1604.2	1.0007	Slope	0.998614	0.90 - 1.10
802.7	792.2	1.0132	Intercept	-2.2	+/-20
401.3	400.0	1.0033			



CO₂ Calibration Plot

Date: October 9, 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:	October 17, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	10:58	End time (MST):	15:15
NH3 Cal Date:	October 18, 2024	Last Cal Date:	September 12, 2024
Start time (MST):	11:10	End time (MST):	14:55
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
Removed NH3 Conc:	76.58	ppm	NH3 Cal Gas Expiry:	August 22, 2024
NH3 gas Diff:			Removed Cylinder #:	NA
Calibrator Model:	API T700		Removed cyl Expiry:	NA
ZAG make/model:	API T701		Serial Number:	3565
			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:	9.80
NOX Range (ppb):	0 - 1000 ppb	Sample Flow:	501

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient:	0.867	0.853	Nt coefficient:	0.881	0.868
NOX coefficient:	0.870	0.861	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

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.999229	1.000182
NO _x Cal Offset:	-1.780000	-1.940000
NO Cal Slope:	1.000277	0.999063
NO Cal Offset:	-2.240000	-3.140000
NO ₂ Cal Slope:	0.991887	1.004253
NO ₂ Cal Offset:	-1.241288	0.178447
NH3 Cal Slope:	0.998711	0.998949
NH3 Cal Offset:	0.661904	-4.233668
Nt Cal Slope:	1.001845	1.002194
Nt Cal Offset:	0.628996	-4.533867



Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

NO_x / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NO _x Correction factor (Cc/Ic)	Baseline corr NO Correction factor (Cc/Ic)
									<i>Limit = 0.9 - 1.0</i>	<i>Limit = 0.9 - 1.0</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.3	----	----
As found span	4932	67.6	803.1	800.4	803.1	812.9	806.0	811.5	0.9879	0.9930
AF GPT span	4932	67.6	803.1	----	803.1	802.5	----	804.0	1.0007	----

new NO cyl rp

Baseline Corr As Fd	Nt = 811.8 ppb	NO _x = 813.0 ppb	NO = 806.1 ppb	*Percent Change	Nt _(NO) = 0.8%
Previous Response	Nt = 805.2 ppb	NO _x = 800.7 ppb	NO = 798.4 ppb	*Percent Change	NO _x = 1.5%
**NO _x Δ (NO to GPT response) =	-1.3%			*Percent Change	NO = 1.0%

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

** = > +/-5% change initiates investigation*

NO_x / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic)	NO Correction factor (Cc/Ic)
									<i>Limit = 0.95-1.05</i>	<i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.8	----	----
High point	4932	67.6	803.1	800.4	803.1	802.3	798.1	802.7	1.0010	1.0029
Mid point	4966	33.8	401.5	400.2	401.5	398.2	394.7	399.5	1.0084	1.0139
Low point	4983	16.9	200.8	200.1	200.8	197.8	194.3	198.2	1.0150	1.0298
Average Correction Factor									1.0081	1.0155

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic)	Converter Efficiency
					<i>Limit = 0.95-1.05</i>	<i>Limit = 96-104%</i>
Calibration zero	----	----	0.0	-0.2	----	----
High GPT point (400 ppb O3)	795.3	385.0	413.0	414.7	0.9959	100.4%
Mid GPT point (200 ppb O3)	795.3	575.3	222.7	224.1	0.9938	100.6%
Low GPT point (100 ppb O3)	795.3	687.3	110.7	111.7	0.9911	100.9%
Average Correction Factor					0.9936	100.6%



Wood Buffalo Environmental Association NH₃ - 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)) <i>Limit = 0.9 - 1.1</i>	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) <i>Limit = 0.9 - 1.1</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.6	0.0	----	----
AF High point	3418	82.2	1798.5	----	1798.5	1800.6	----	1795.2	0.999	1.002
AF Mid point							----			
AF Low point							----			
new NH3 cyl rp										
Baseline Corr As Fd	Nt = 1801.2 ppb		NH3 = 1795.2 ppb						*Percent Change	Nt _(NH3) = -0.1%
Previous Response	Nt = 1802.5 ppb		NH3 = 1796.9 ppb						*Percent Change	NH3 = -0.1%

** = > +/-5% change initiates investigation*

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) <i>Limit = 0.95-1.05</i>	NH3 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.8	-0.4	-0.3	----	----
High point	3418	82.2	1798.5	----	1798.5	1800.6	----	1795.2	0.999	1.002
Mid point	3454	45.7	1000.0	----	1000.0	994.5	----	991.4	1.006	1.009
Low point	3477	22.8	498.9	----	498.9	492.2	----	490.7	1.014	1.017
Average Correction Factor									1.0060	1.0091
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

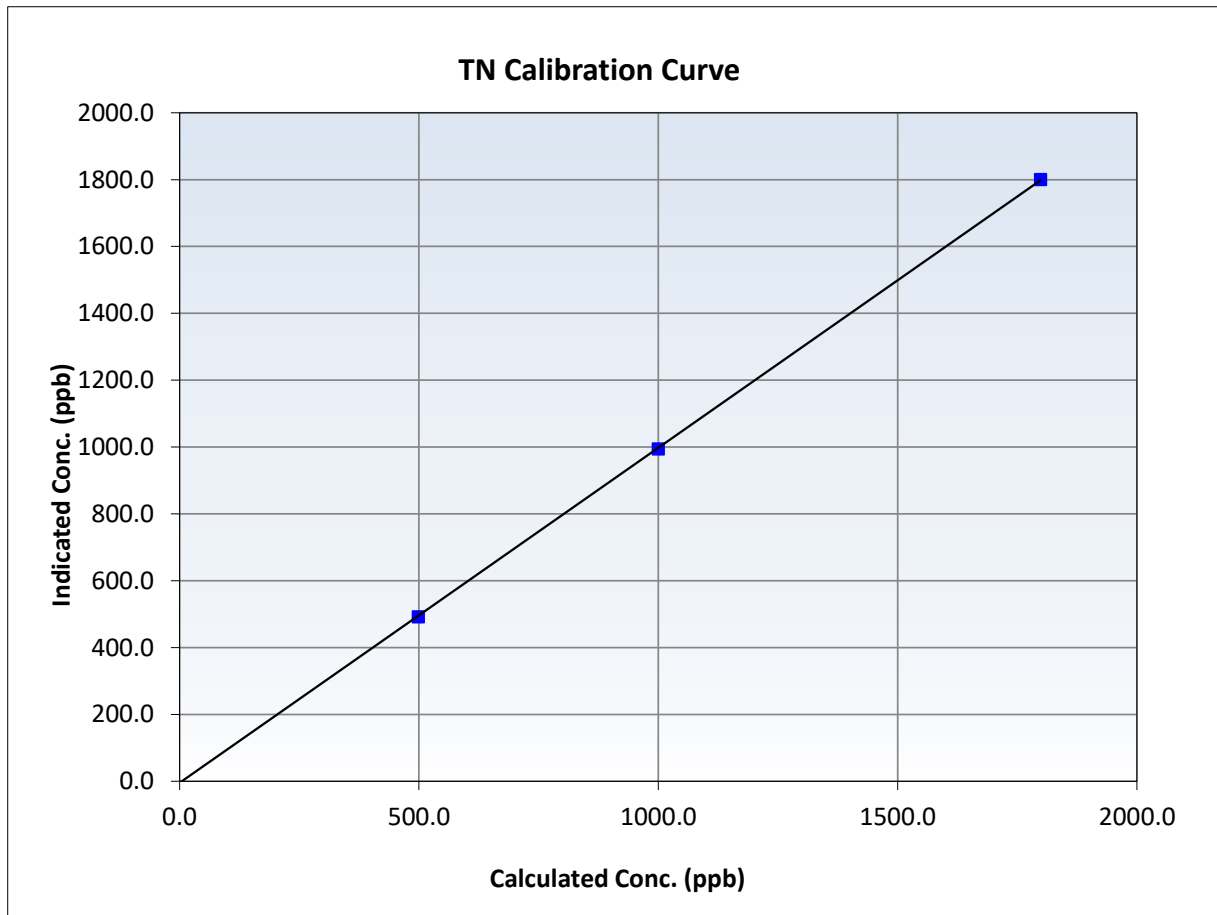
Nt Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:58	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.8	----	Correlation Coefficient	0.999977	≥ 0.995
1798.5	1800.6	0.9989	Slope	1.002194	0.90 - 1.10
1000.0	994.5	1.0055	Intercept	-4.533867	+/-20
498.9	492.2	1.0135			





Wood Buffalo Environmental Association

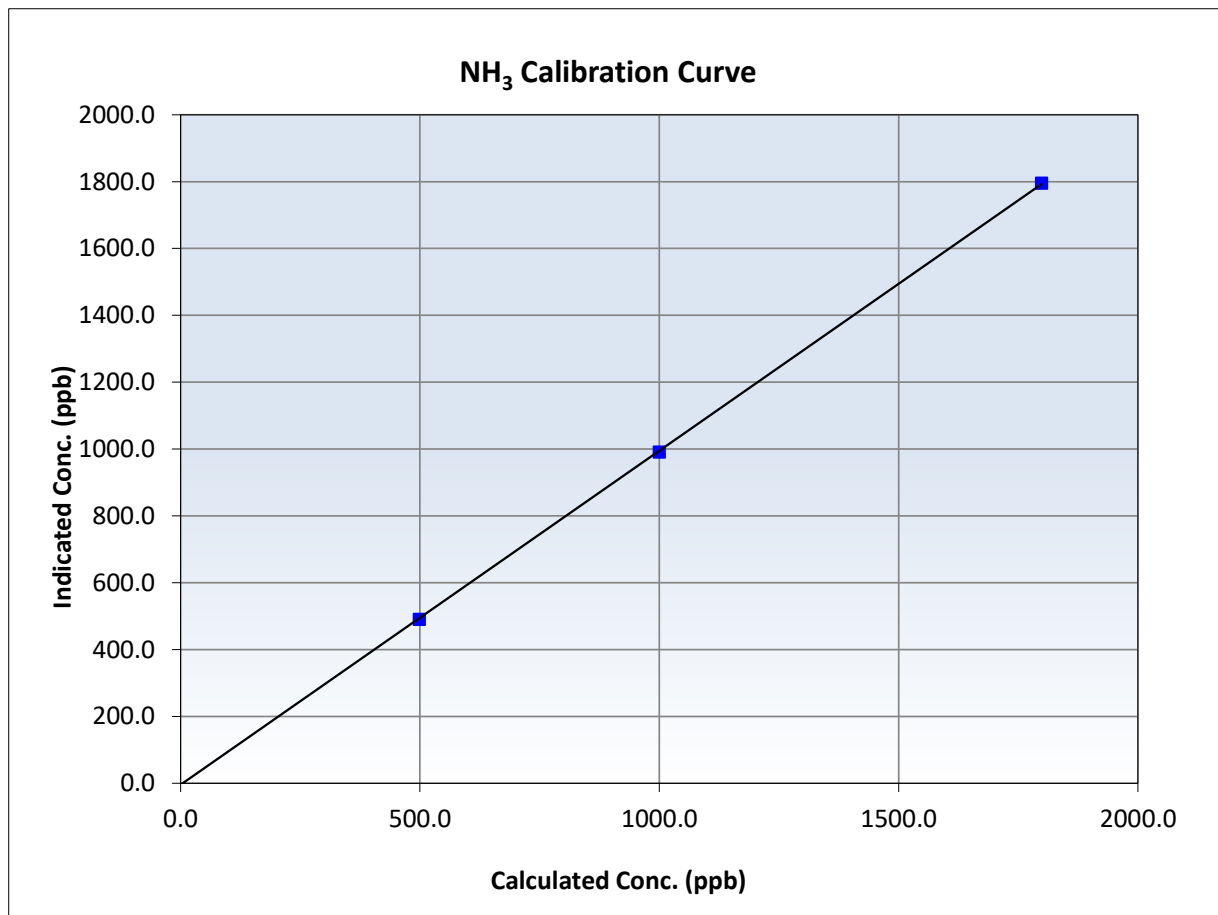
NH₃ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:58	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.3	----	Correlation Coefficient	0.999974	≥0.995
1798.5	1795.2	1.0019	Slope	0.998949	0.90 - 1.10
1000.0	991.4	1.0087	Intercept	-4.233668	+/-20
498.9	490.7	1.0166			





Wood Buffalo Environmental Association

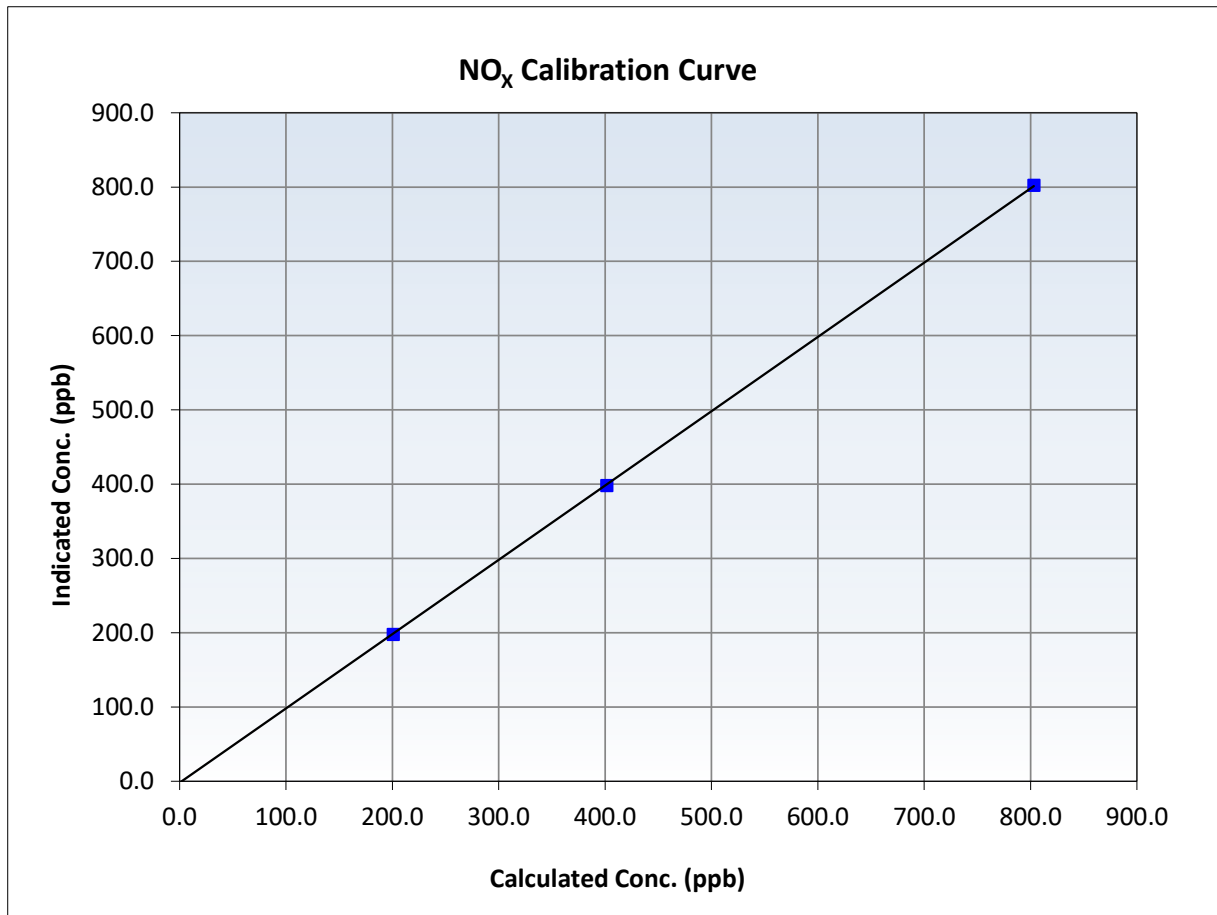
NO_x Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:58	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.4	----	Correlation Coefficient	0.999981	≥0.995
803.1	802.3	1.0010	Slope	1.000182	0.90 - 1.10
401.5	398.2	1.0084	Intercept	-1.940000	+/-20
200.8	197.8	1.0150			





Wood Buffalo Environmental Association

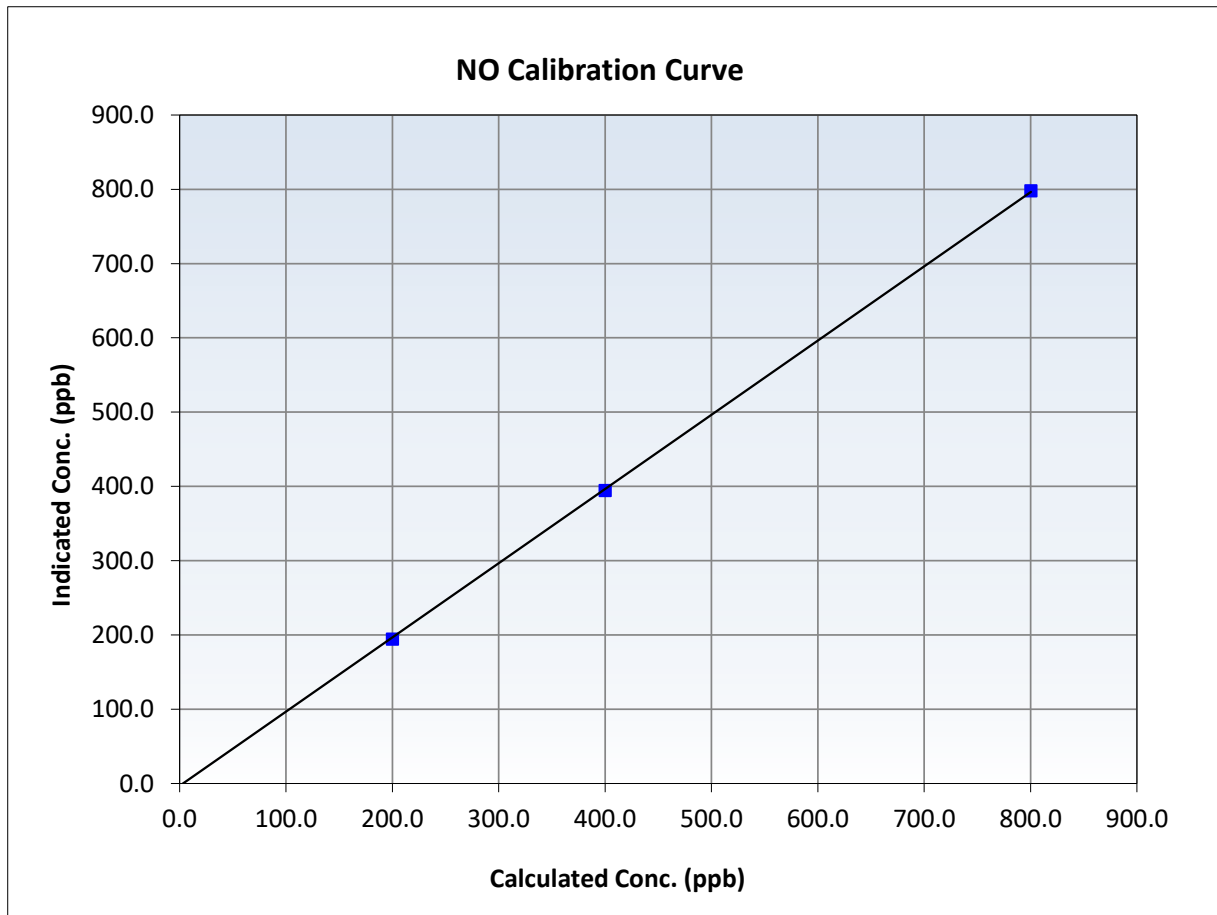
NO Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:58	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.3	----	Correlation Coefficient	0.999941	≥ 0.995
800.4	798.1	1.0029	Slope	0.999063	0.90 - 1.10
400.2	394.7	1.0139	Intercept	-3.140000	+/-20
200.1	194.3	1.0298			





Wood Buffalo Environmental Association

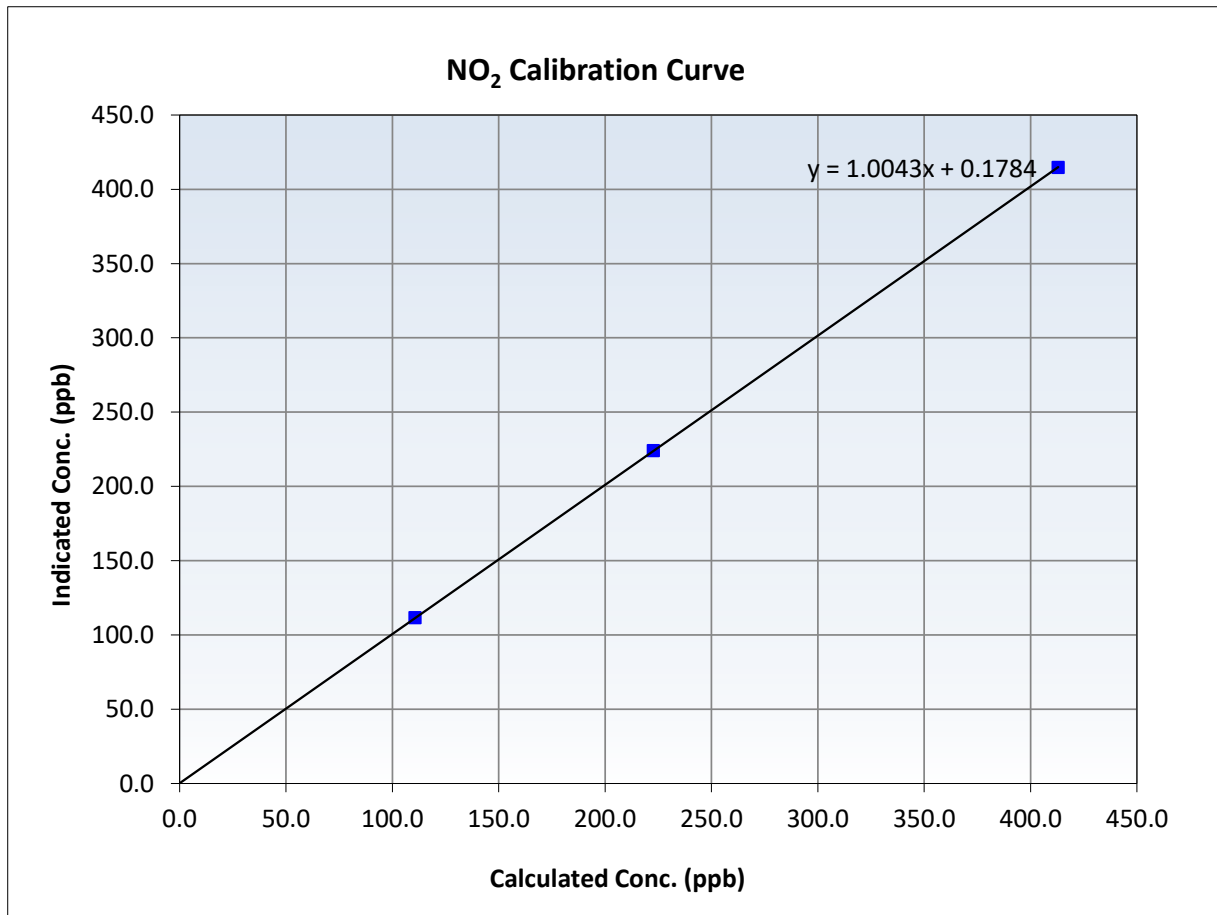
NO₂ Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:58	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

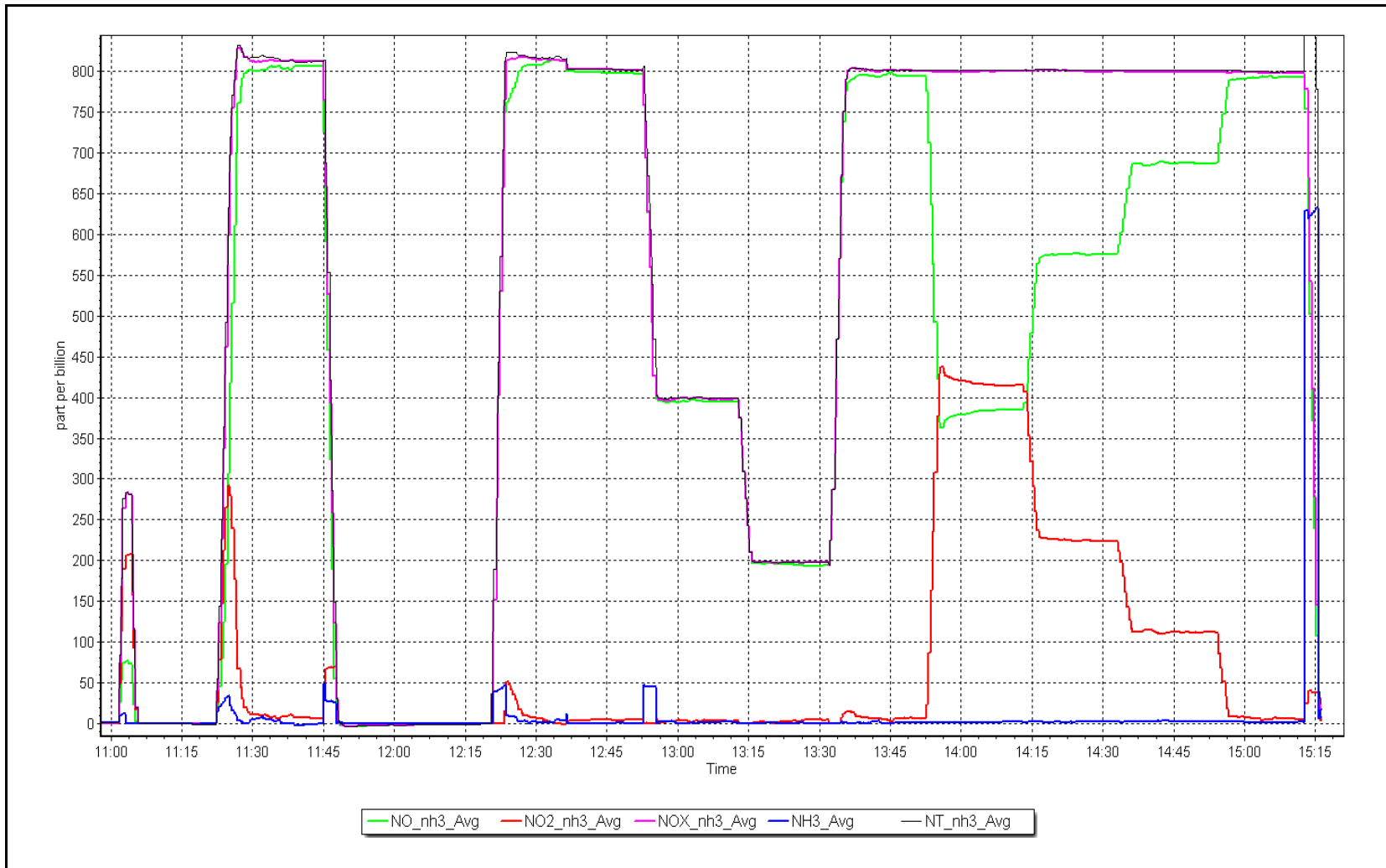
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	0.999996	≥0.995
413.0	414.7	0.9959	Slope	1.004253	0.90 - 1.10
222.7	224.1	0.9938	Intercept	0.178447	+/-20
110.7	111.7	0.9911			



NO_x Calibration Plot

Date: October 17, 2024

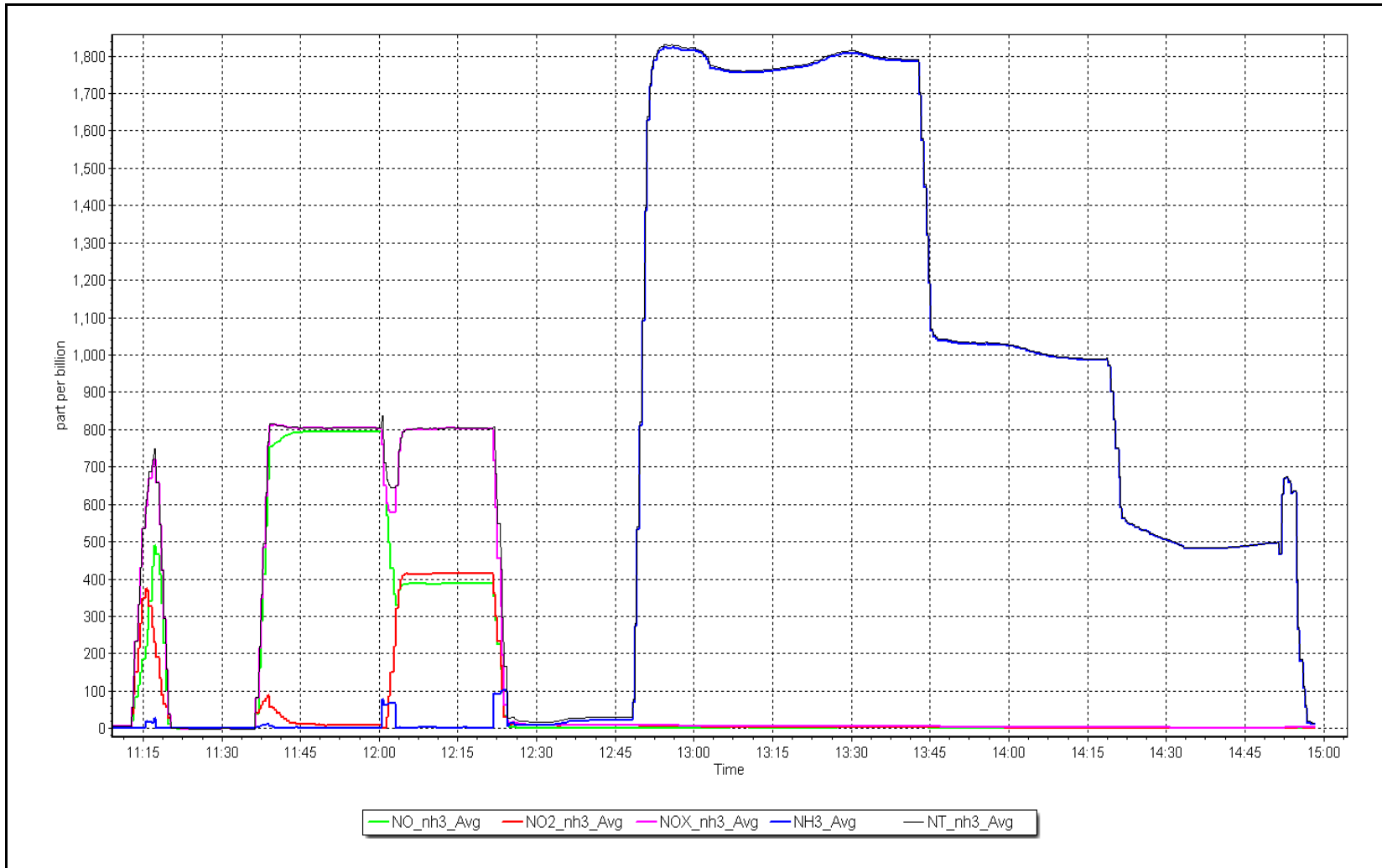
Location: Bertha Ganter-Fort McKay



NH₃ Calibration Plot

Date: October 18, 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:	October 9, 2024	Prev Cal Date:	August 25, 2023
Start Time (MST):	12:30	End Time (MST):	13:40
Tower Height (m):	10.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P10041
WS Calibrator:	MetOne 053	Serial Number:	P15103

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.2%
400	39.4	39.4	0.1%
600	58.6	58.5	0.0%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999999	0.999999	≥0.9995
Calculated slope	0.999594	0.998868	0.90 - 1.10
Calculated intercept	-0.028293	0.028930	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	R14655
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	13:28	Calc Declination*:	13.74 Degrees
Deadband calc:	1.8 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	1.4	---
90	89.8	-0.1%
180	179.6	-0.1%
270	269.2	-0.2%
357	356.6	-0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999997	0.999992	≥0.9995
Calculated slope	1.003199	1.004698	0.90 - 1.10
Calculated intercept	-1.004699	-0.760082	+/- 4

Notes: Performing annual MET sensor calibration. Bearings are good. Crossarm declination was aligned with true North using a compass.

Calibration Performed By: Rene Chamberland



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS02 MILDRED LAKE OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	October 1, 2024	Last Cal Date:	September 5, 2024
Start time (MST):	9:38	End time (MST):	13:27
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999787	0.997180	Backgd or Offset:	18.9	18.7
Calibration intercept:	-0.425107	-0.485823	Coeff or Slope:	0.759	0.768

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-1.1	----
As found High point	4920	80.2	801.6	789.5	1.014
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	790.6	Previous response	801.1	*% change	-1.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4920	80.2	801.6	798.8	1.004
Mid point	4960	40.1	400.8	399.8	1.003
Low point	4980	20.0	199.9	198.1	1.009
As left zero	5000	0.0	0.0	-0.1	----
As left span	4920	80.2	801.6	799.6	1.003
Average Correction Factor:					1.005

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

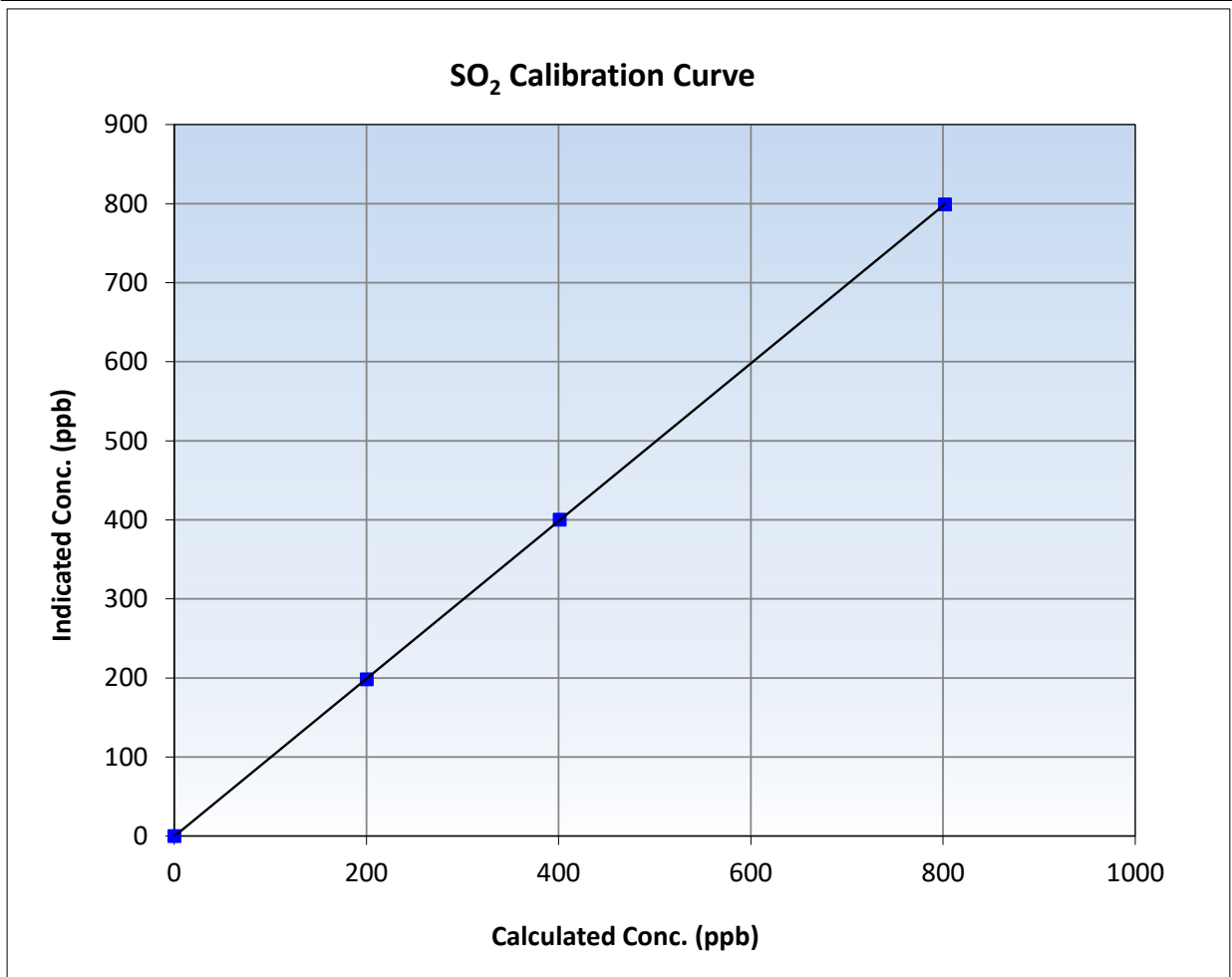
SO₂ Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 5, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:38	End Time (MST):	13:27
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1404901075

Calibration Data

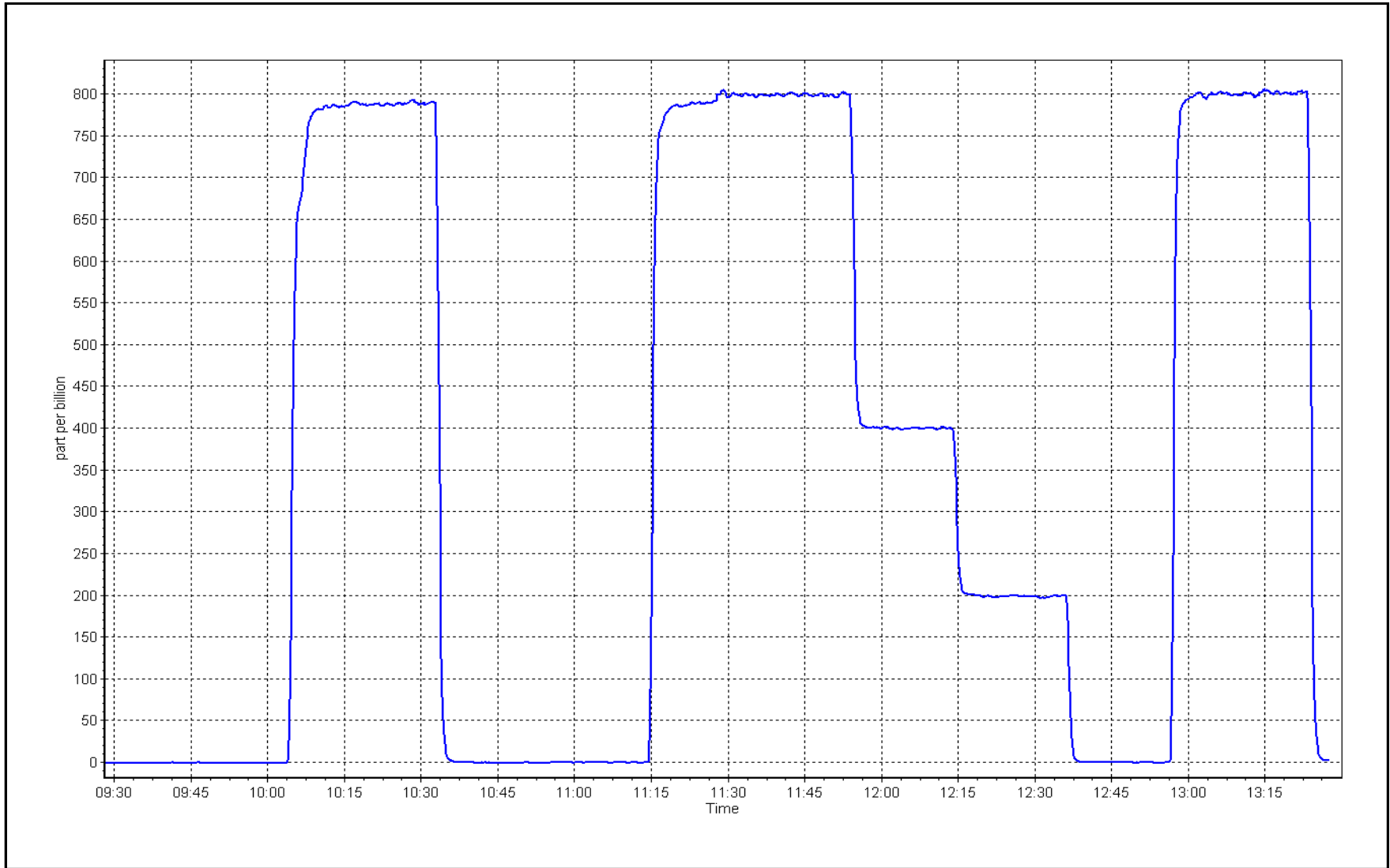
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	0.999997	≥0.995
801.6	798.8	1.0036	Slope	0.997180	0.90 - 1.10
400.8	399.8	1.0026	Intercept	-0.485823	+/-30
199.9	198.1	1.0092			



SO2 Calibration Plot

Date: October 1, 2024

Location: Mildred Lake





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	October 18, 2024	Last Cal Date:	September 18, 2024
Start time (MST):	9:46	End time (MST):	13:05
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997964	0.990678	Backgd or Offset:	1.17	1.17
Calibration intercept:	0.000799	0.080793	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4924	75.6	80.0	79.0	1.014
As found Mid point	4962	37.8	40.0	39.6	1.013
As found Low point	4981	18.9	20.0	19.6	1.025
New cylinder response					
Baseline Corr As found:	78.9	Prev response:	79.83	*% change:	-1.2%
Baseline Corr 2nd AF pt:	39.5	AF Slope:	0.987392	AF Intercept:	0.020789
Baseline Corr 3rd AF pt:	19.5	AF Correlation:	0.999988	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4924	75.6	80.0	79.3	1.009
Mid point	4962	37.8	40.0	39.8	1.005
Low point	4981	18.9	20.0	19.8	1.010
As left zero	5000	0.0	0.0	0.2	----
As left span	4924	75.6	80.0	79.3	1.009
SO2 Scrubber Check	4920	80.2	802.0	0.0	----
Date of last scrubber change:		July 16, 2024		Ave Corr Factor	1.008
Date of last converter efficiency test:		NA			

Notes: Changed sample inlet filter after as founds. SOX scrubber operation tested post as founds, no issue.
No adjustments or maintenance performed.

Calibration Performed By: Kelly Baragar



Wood Buffalo Environmental Association

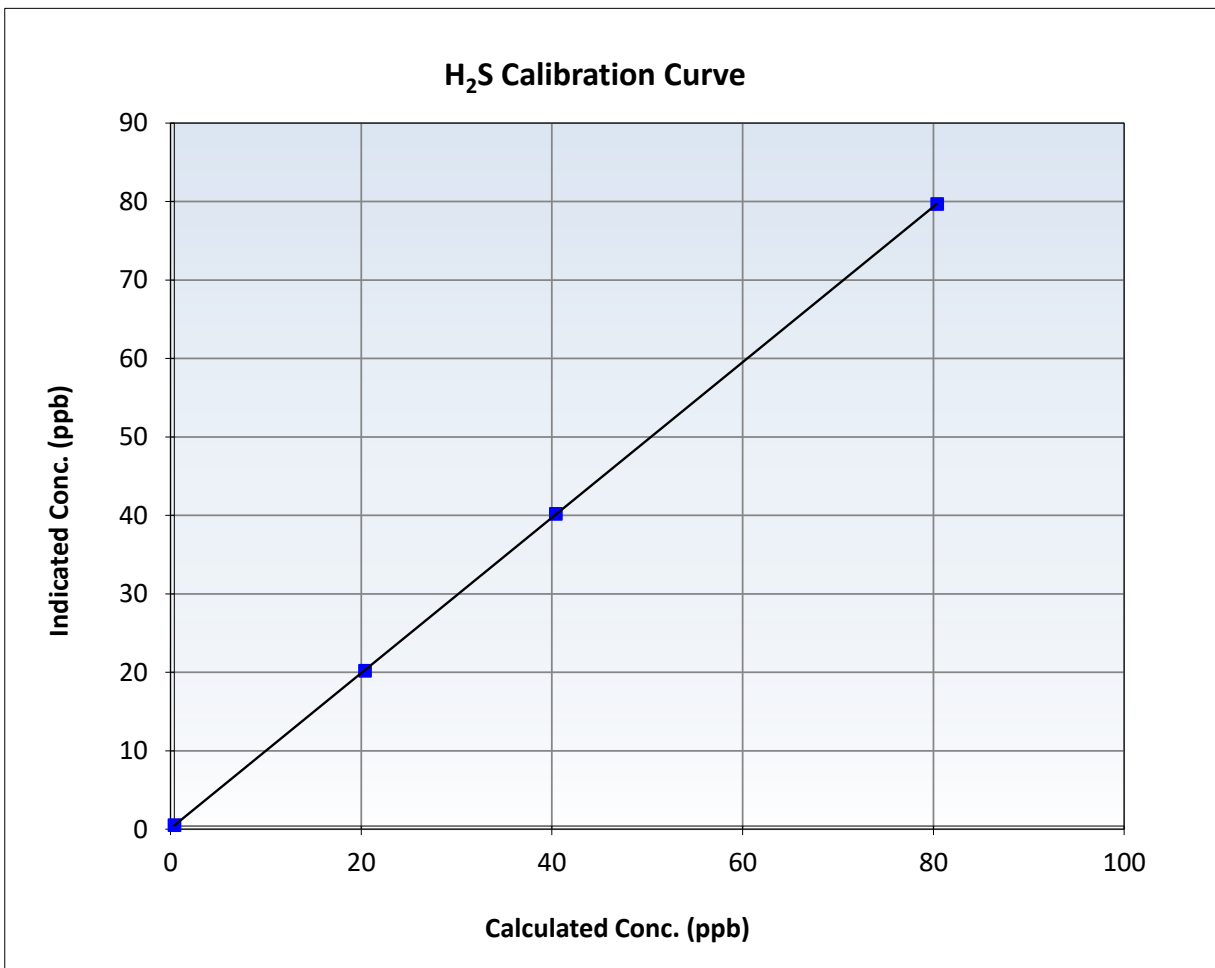
H2S Calibration Summary

Station Information

Calibration Date:	July 5, 2024	Previous Calibration:	June 24, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:46	End Time (MST):	13:05
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331546

Calibration Data

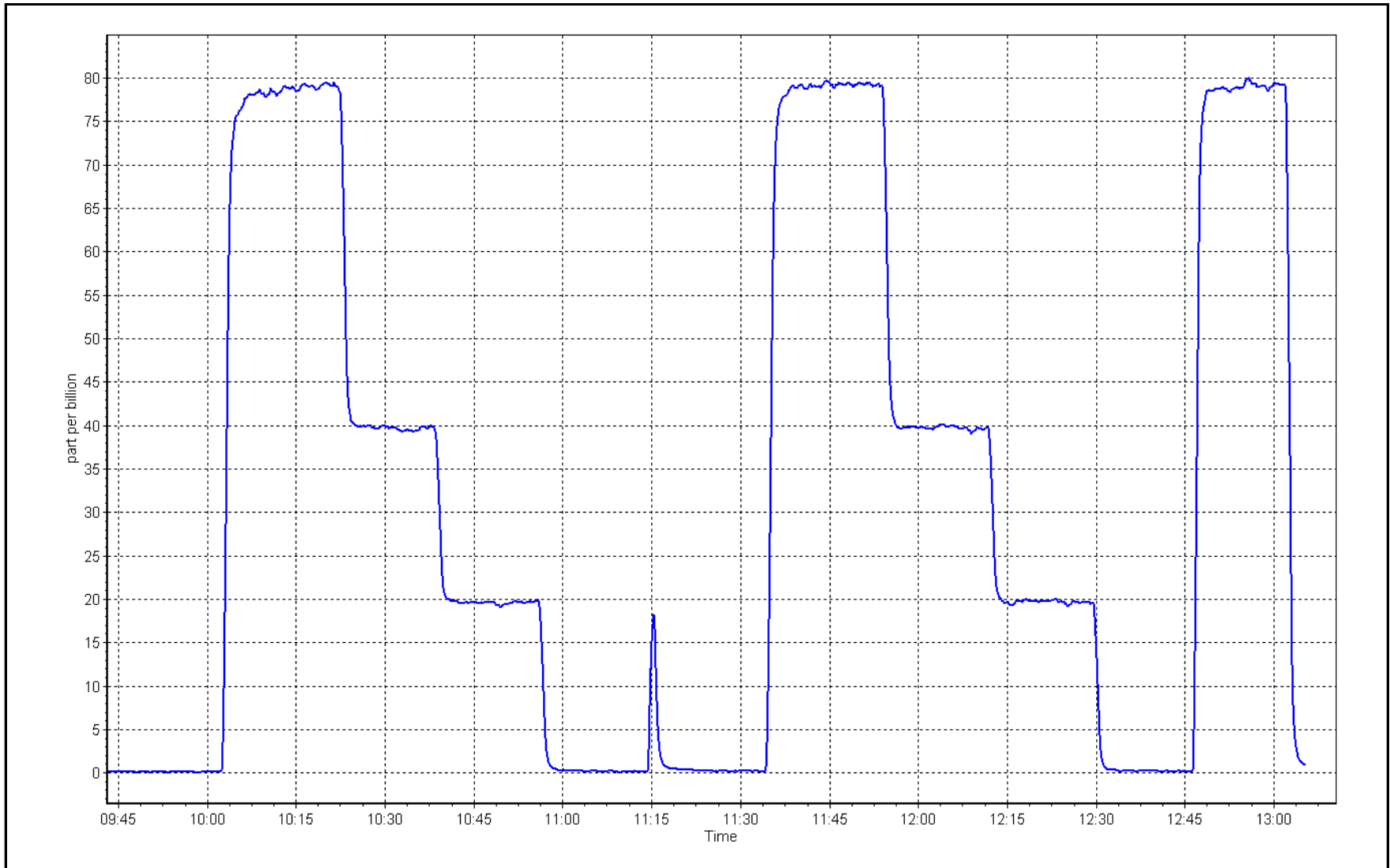
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999994	≥ 0.995
80.0	79.3	1.0087	Slope	0.990678	$0.90 - 1.10$
40.0	39.8	1.0049	Intercept	0.080793	± 3
20.0	19.8	1.0099			



H2S Calibration Plot

Date: October 18, 2024

Location: Mildred Lake





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	October 1, 2024	Last Cal Date:	September 5, 2024
Start time (MST):	9:38	End time (MST):	13:27
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH ₄ Cal Gas Conc.	500.2 ppm	CH ₄ Equiv Conc.	1048.6 ppm
C ₃ H ₈ Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH ₄ Conc.	500.2 ppm	CH ₄ Equiv Conc.	1048.6 ppm
Removed C ₃ H ₈ 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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH ₄ SP Ratio:	2.49E-04	2.51E-04	NMHC SP Ratio:	6.12E-05	6.21E-05
CH ₄ Retention time:	14.0	14.2	NMHC Peak Area:	143798	141632
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	---
As found High point	4920	80.2	16.82	16.64	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.64	Prev response	16.86	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	16.82	16.87	0.997
Mid point	4960	40.1	8.41	8.49	0.990
Low point	4980	20.0	4.19	4.17	1.006
As left zero	5000	0.0	0.00	0.00	---
As left span	4920	80.2	16.82	16.76	1.003
Average Correction Factor					0.998

Notes: Routine cal done early due to CH₄ dips below 1.8ppm seen during sampling. Adjusted span.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.66	1.016
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.66	Prev response	8.83	*% change	-1.9%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.80	8.84	0.995
Mid point	4960	40.1	4.40	4.46	0.986
Low point	4980	20.0	2.19	2.16	1.017
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					0.999

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.02	7.98	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.98	Prev response	8.04	*% change	-0.7%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.02	8.03	0.999
Mid point	4960	40.1	4.01	4.04	0.994
Low point	4980	20.0	2.00	2.01	0.993
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	7.99	1.004
Average Correction Factor					0.996

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.002593	1.004200
THC Cal Offset:	0.001312	-0.003508
CH ₄ Cal Slope:	1.001949	1.000682
CH ₄ Cal Offset:	-0.002642	0.008556
NMHC Cal Slope:	1.003167	1.007448
NMHC Cal Offset:	0.004754	-0.011464

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

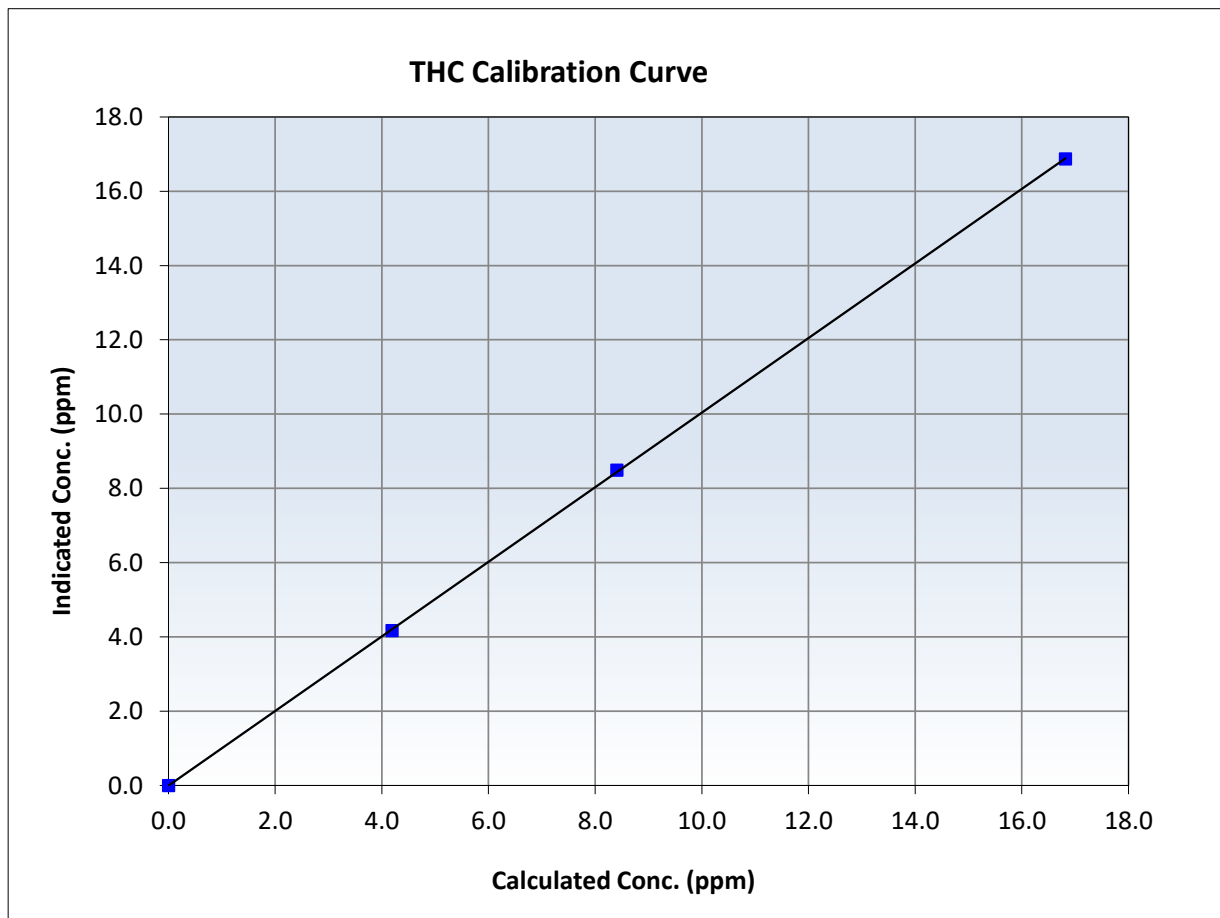
THC Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 5, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:38	End Time (MST):	13:27
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999974	<i>≥0.995</i>
16.82	16.87	0.9969	Slope	1.004200	<i>0.90 - 1.10</i>
8.41	8.49	0.9905	Intercept	-0.003508	<i>+/-0.5</i>
4.19	4.17	1.0056			





Wood Buffalo Environmental Association

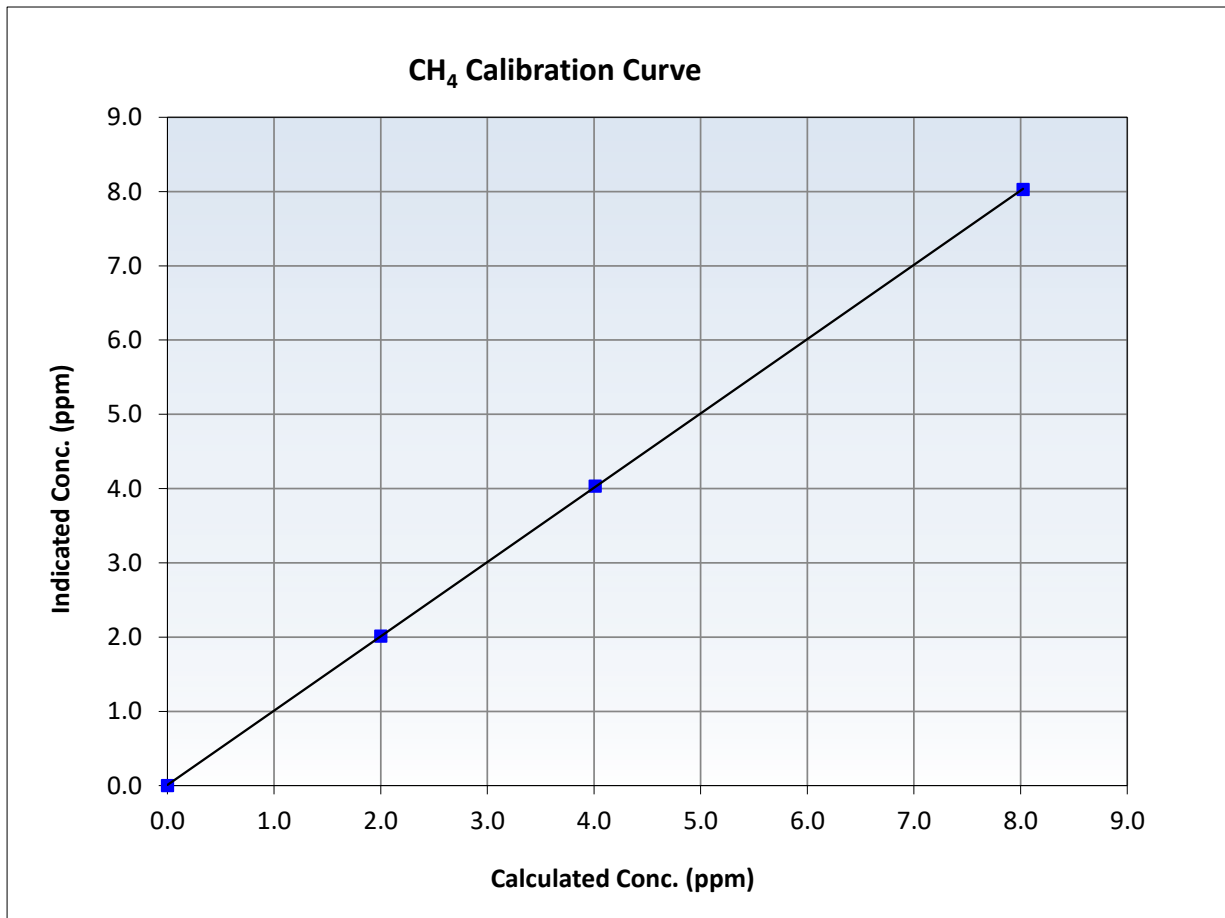
CH₄ Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 5, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:38	End Time (MST):	13:27
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	≥0.995
8.02	8.03	0.9991	Slope	0.90 - 1.10
4.01	4.04	0.9942	Intercept	+/-0.5
2.00	2.01	0.9934		





Wood Buffalo Environmental Association

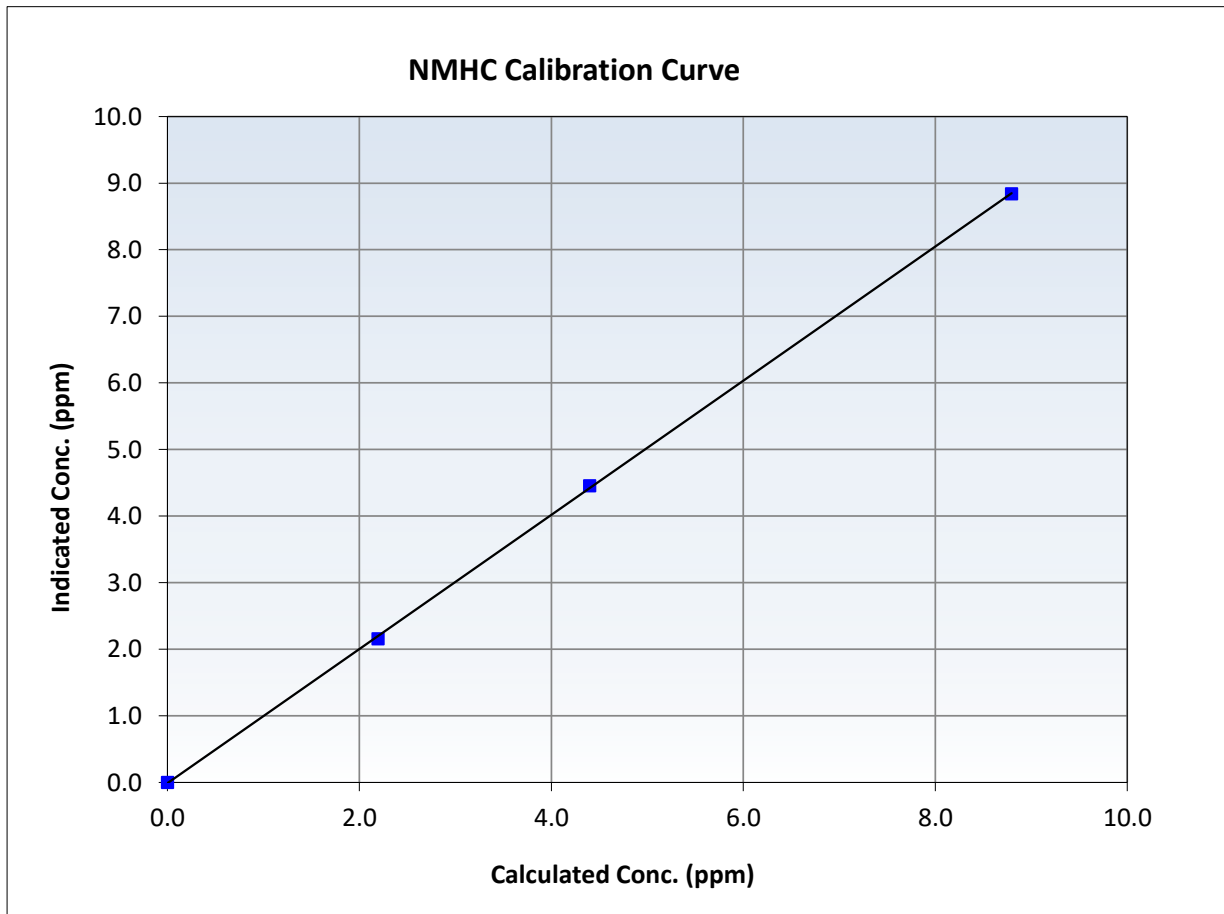
NMHC Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 5, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:38	End Time (MST):	13:27
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

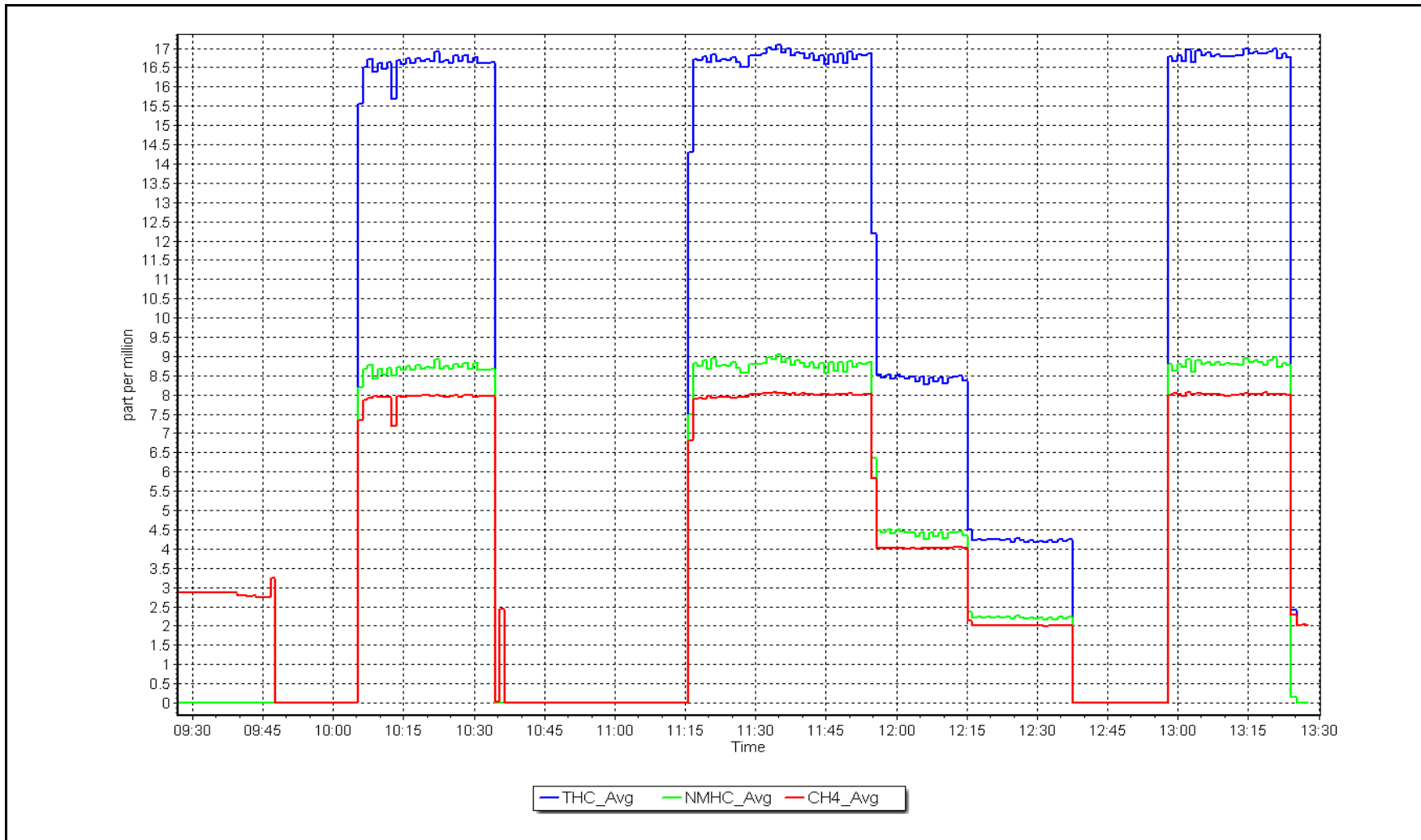
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999920	<i>≥0.995</i>
8.80	8.84	0.9949	Slope	1.007448	<i>0.90 - 1.10</i>
4.40	4.46	0.9865	Intercept	-0.011464	<i>+/-0.5</i>
2.19	2.16	1.0169			



NMHC Calibration Plot

Date: October 1, 2024

Location: Mildred Lake





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	October 4, 2024	Last Cal Date:	October 1, 2024
Start time (MST):	9:47	End time (MST):	14:16
Reason:	Maintenance		

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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.51E-04	2.55E-04	NMHC SP Ratio:	6.21E-05	6.54E-05
CH4 Retention time:	14.2	14.4	NMHC Peak Area:	141632	134659
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.01	---
As found High point	4920	80.2	16.82	16.91	0.995
As found Mid point	4960	40.1	8.41	8.41	1.001
As found Low point	4980	20.0	4.19	4.21	0.998
New cylinder response					
Baseline Corr AF:	16.90	Prev response	16.89	*% change	0.1%
Baseline Corr 2nd AF:	8.40	AF Slope:	1.004652	AF Intercept:	-0.003086
Baseline Corr 3rd AF:	4.20	AF Correlation:	0.999989	<i>* = > +/-5% change initiates investigation</i>	

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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	16.82	16.81	1.000
Mid point	4960	40.1	8.41	8.44	0.996
Low point	4980	20.0	4.19	4.19	1.000
As left zero	5000	0.0	0.00	0.00	---
As left span	4920	80.2	16.82	16.82	1.000
Average Correction Factor					0.999

Notes: Replaced actuator. Adjusted zero and turned on use zero chromatogram. Adjusted span.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	9.04	0.973
As found Mid point	4960	40.1	4.40	4.49	0.979
As found Low point	4980	20.0	2.19	2.27	0.965
New cylinder response					
Baseline Corr AF:	9.04	Prev response	8.85	*% change	2.1%
Baseline Corr 2nd AF:	4.49	AF Slope:	1.026745	AF Intercept:	0.001807
Baseline Corr 3rd AF:	2.27	AF Correlation:	0.999976	* = > +/-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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.80	8.82	0.997
Mid point	4960	40.1	4.40	4.43	0.992
Low point	4980	20.0	2.19	2.20	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.80	8.82	0.997
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))
As found zero	5000	0.0	0.00	0.01	----
As found High point	4920	80.2	8.02	7.86	1.022
As found Mid point	4960	40.1	4.01	3.92	1.027
As found Low point	4980	20.0	2.00	1.94	1.037
New cylinder response					
Baseline Corr AF:	7.85	Prev response	8.04	*% change	-2.4%
Baseline Corr 2nd AF:	3.91	AF Slope:	0.979535	AF Intercept:	-0.003495
Baseline Corr 3rd AF:	1.93	AF Correlation:	0.999982	* = > +/-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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.02	7.99	1.004
Mid point	4960	40.1	4.01	4.00	1.002
Low point	4980	20.0	2.00	2.00	1.001
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	8.00	1.003
Average Correction Factor					1.002

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.004200	0.999741
THC Cal Offset:	-0.003508	0.007288
CH ₄ Cal Slope:	1.000682	0.996167
CH ₄ Cal Offset:	0.008556	0.003146
NMHC Cal Slope:	1.007448	1.003286
NMHC Cal Offset:	-0.011464	0.002544

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

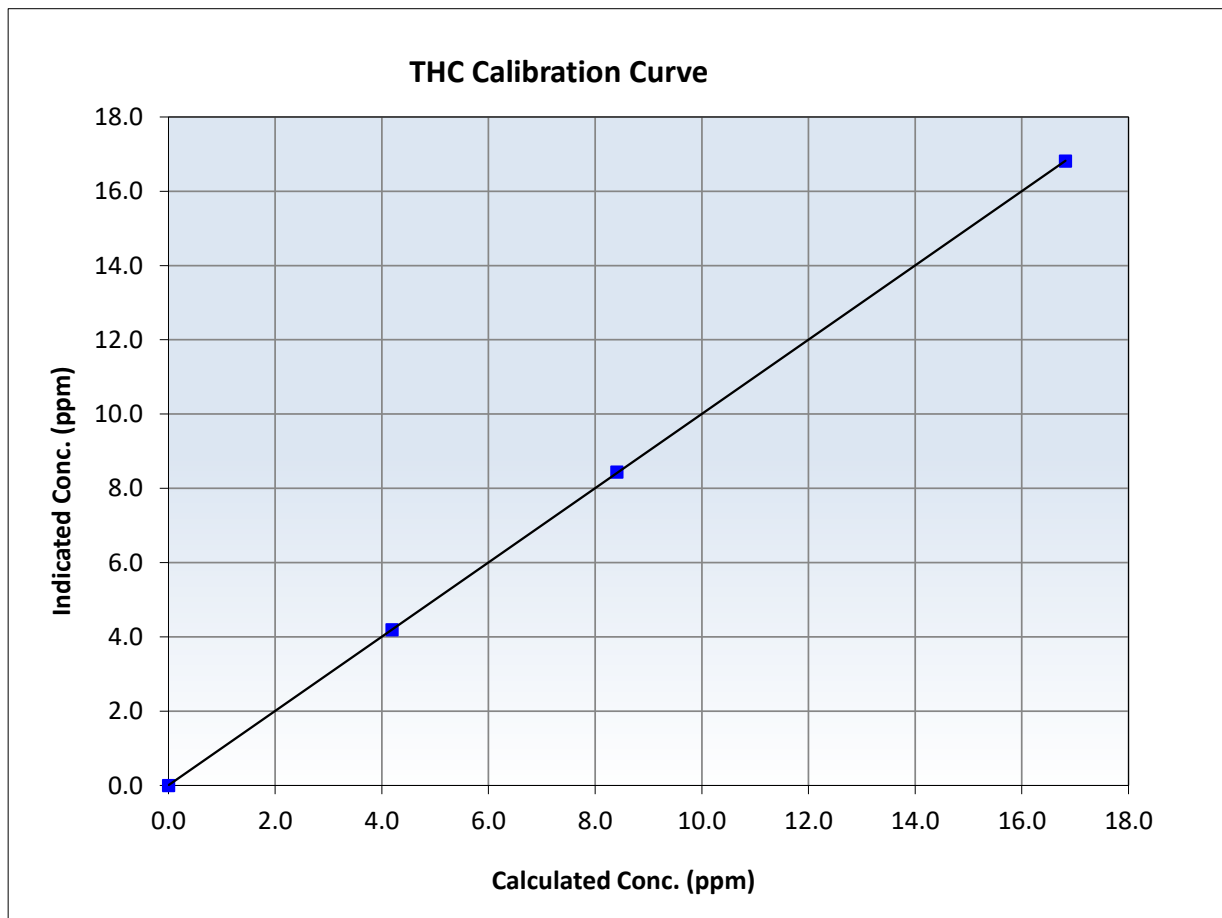
THC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	October 1, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:47	End Time (MST):	14:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999994 ≥0.995
16.82	16.81	1.0005	Slope	0.999741 0.90 - 1.10
8.41	8.44	0.9964	Intercept	0.007288 +/-0.5
4.19	4.19	1.0003		





Wood Buffalo Environmental Association

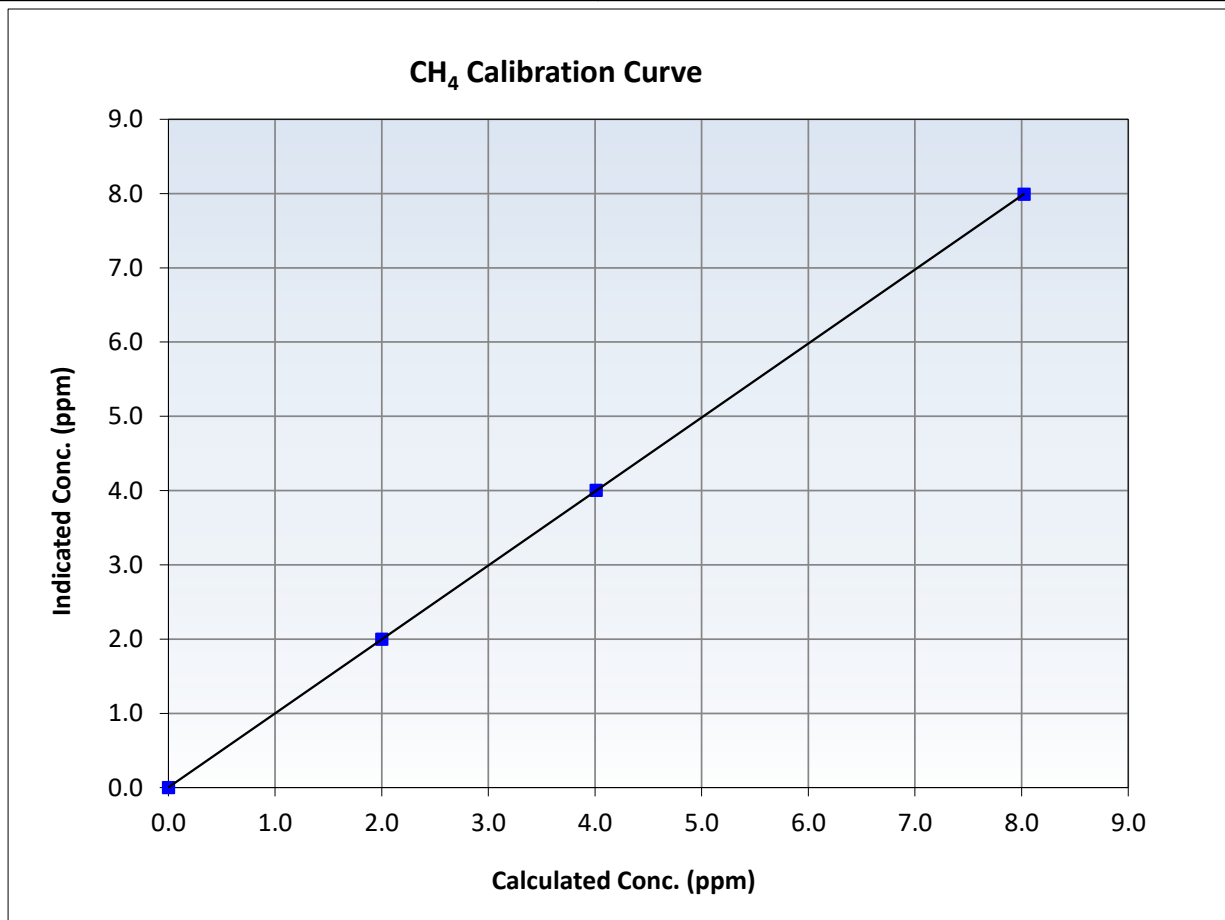
CH₄ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	October 1, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:47	End Time (MST):	14:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999999	<i>≥0.995</i>
8.02	7.99	1.0037	Slope	0.996167	<i>0.90 - 1.10</i>
4.01	4.00	1.0021	Intercept	0.003146	<i>+/-0.5</i>
2.00	2.00	1.0014			





Wood Buffalo Environmental Association

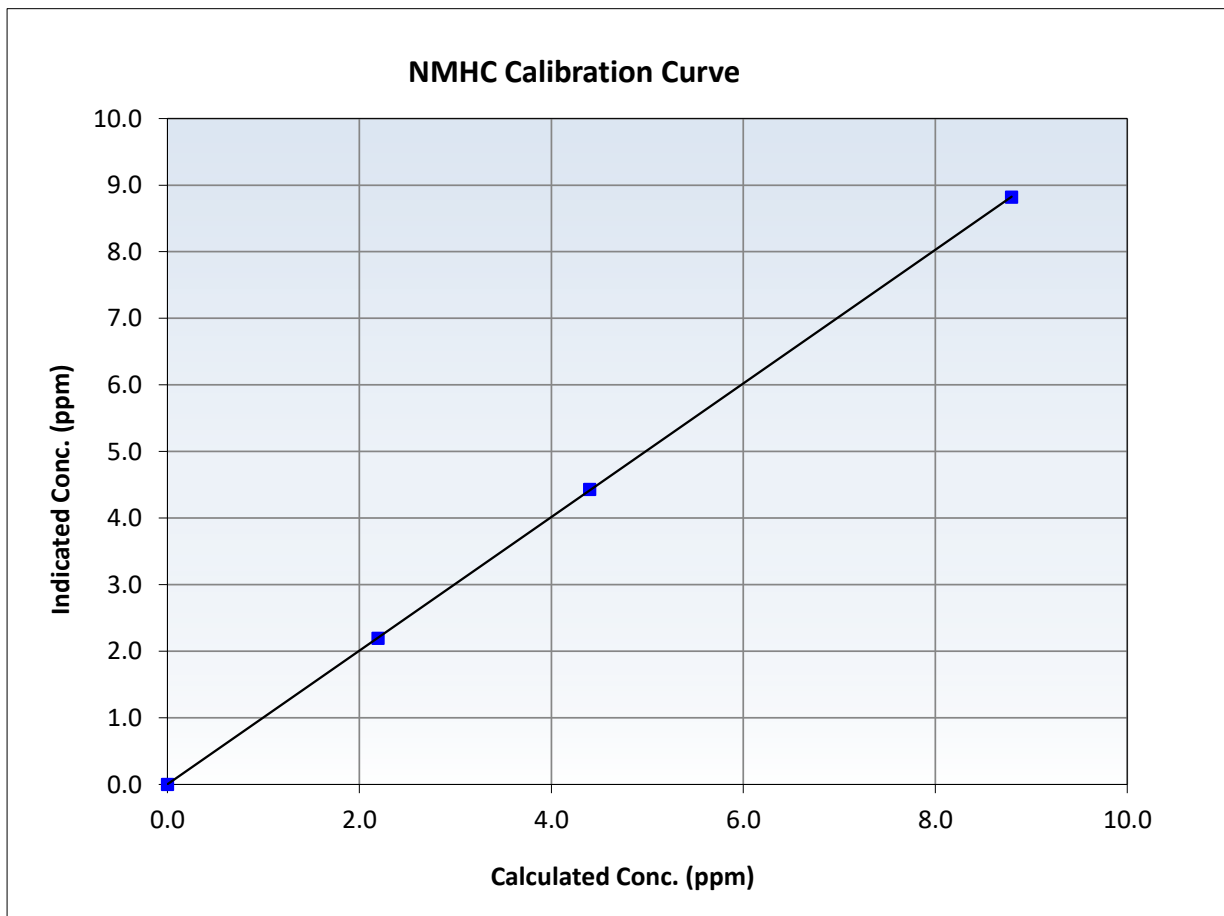
NMHC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	October 1, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:47	End Time (MST):	14:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

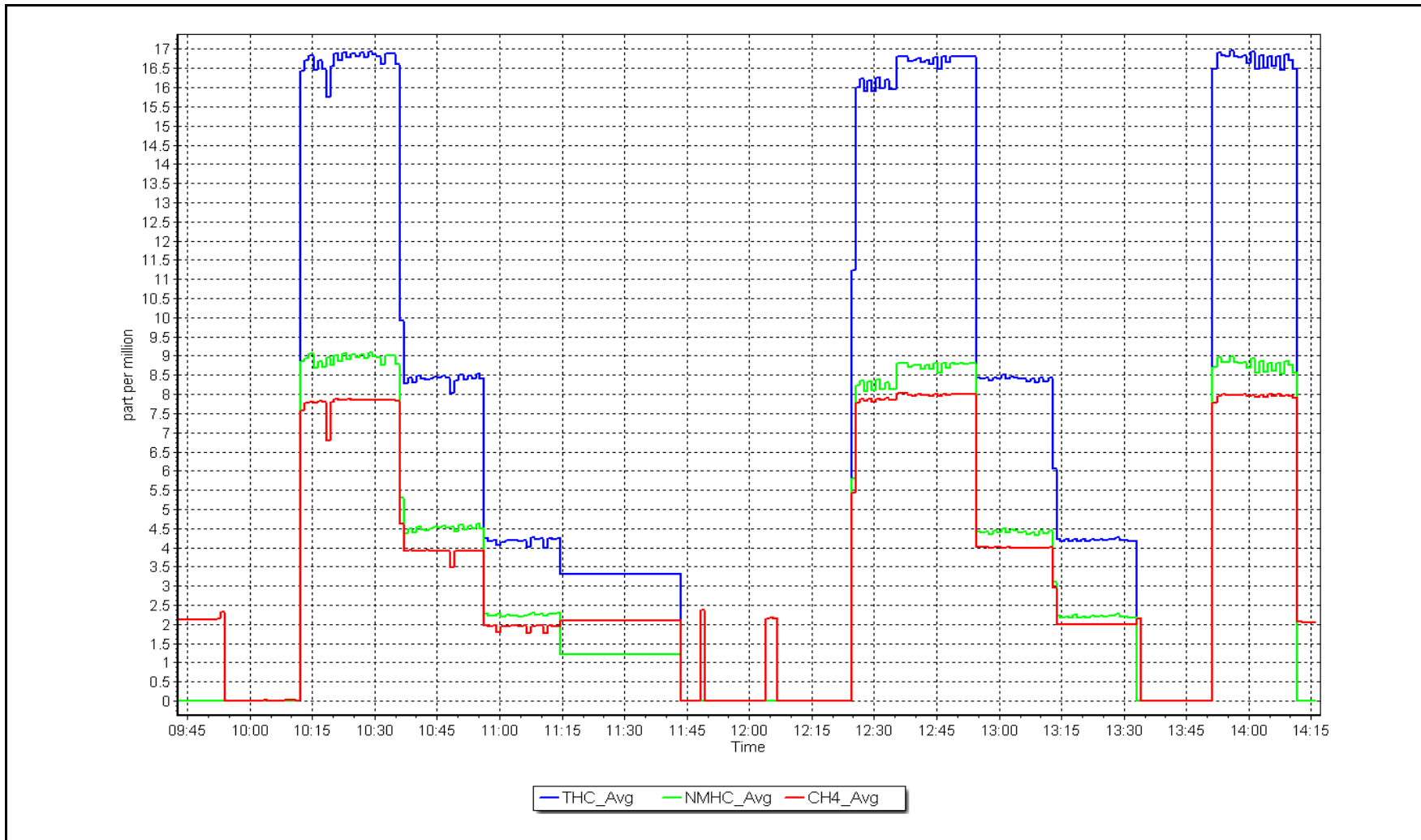
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999990	<i>≥0.995</i>
8.80	8.82	0.9972	Slope	1.003286	<i>0.90 - 1.10</i>
4.40	4.43	0.9923	Intercept	0.002544	<i>+/-0.5</i>
2.19	2.20	0.9993			



NMHC Calibration Plot

Date: October 4, 2024

Location: Mildred Lake





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	October 11, 2024	Last Cal Date:	October 4, 2024
Start time (MST):	9:13	End time (MST):	12:57
Reason:	Maintenance		

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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.55E-04	2.61E-04	NMHC SP Ratio:	6.54E-05	6.64E-05
CH4 Retention time:	14.4	14.8	NMHC Peak Area:	134659	132465
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	---
As found High point	4920	80.2	16.82	16.48	1.021
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.48	Prev response	16.82	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	16.82	16.77	1.003
Mid point	4960	40.1	8.41	8.40	1.001
Low point	4980	20.0	4.19	4.17	1.006
As left zero	5000	0.0	0.00	0.00	---
As left span	4920	80.2	16.82	16.79	1.002
Average Correction Factor					1.003

Notes: Calibrated due to CH₄ dips seen during sampling. Adjusted zero and span.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.65	1.017
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.65	Prev response	8.83	*% change	-2.0%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.80	8.75	1.005
Mid point	4960	40.1	4.40	4.38	1.004
Low point	4980	20.0	2.19	2.17	1.011
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.80	8.79	1.001
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))
As found zero	5000	0.0	0.00	0.01	----
As found High point	4920	80.2	8.02	7.84	1.026
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.82	Prev response	8.00	*% change	-2.2%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.02	8.02	1.000
Mid point	4960	40.1	4.01	4.02	0.998
Low point	4980	20.0	2.00	2.00	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	7.99	1.004
Average Correction Factor					1.000

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999741	0.997492
THC Cal Offset:	0.007288	-0.001923
CH ₄ Cal Slope:	0.996167	0.999757
CH ₄ Cal Offset:	0.003146	0.001551
NMHC Cal Slope:	1.003286	0.995414
NMHC Cal Offset:	0.002544	-0.003674

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

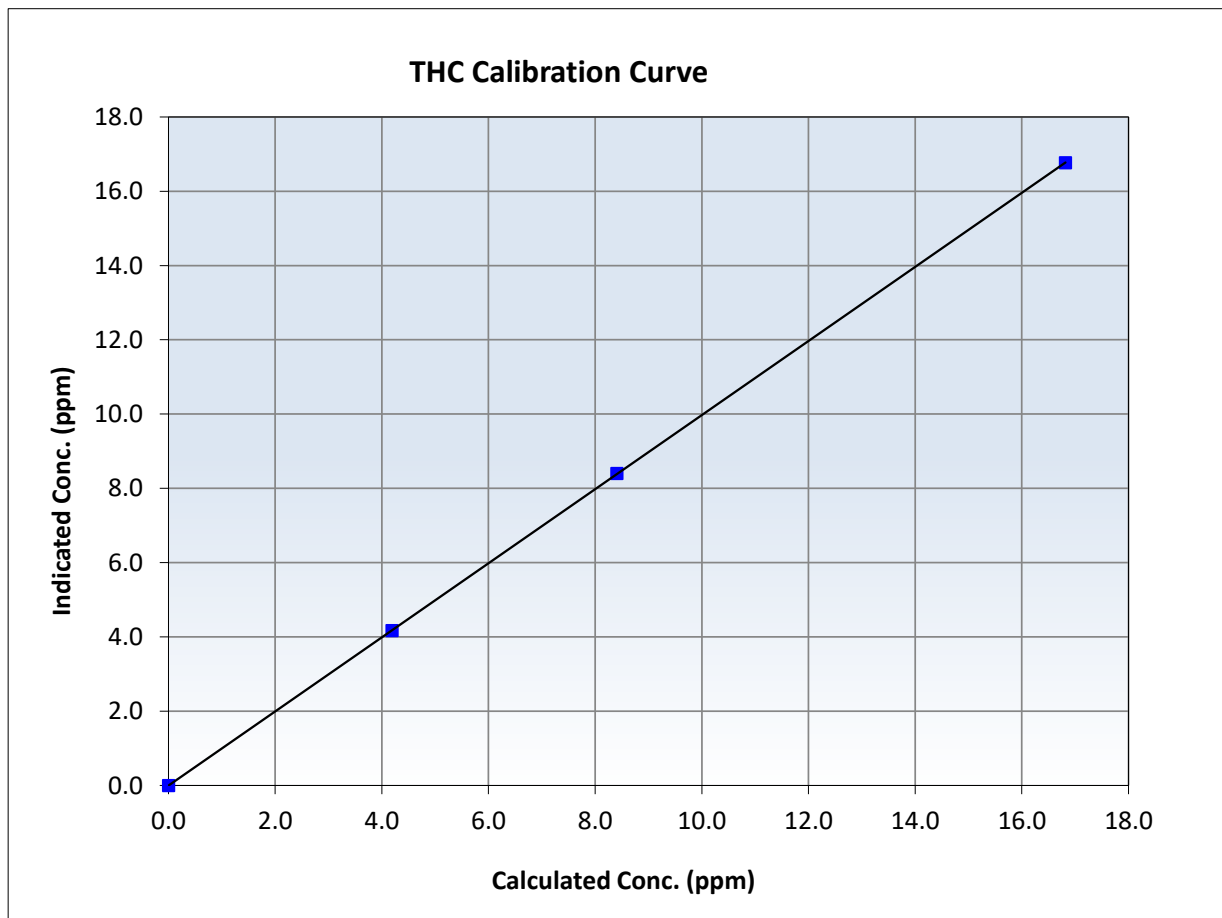
THC Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	October 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:13	End Time (MST):	12:57
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	0.999998	≥0.995
16.82	16.77	1.0029	Slope	0.997492	0.90 - 1.10
8.41	8.40	1.0011	Intercept	-0.001923	+/-0.5
4.19	4.17	1.0058			





Wood Buffalo Environmental Association

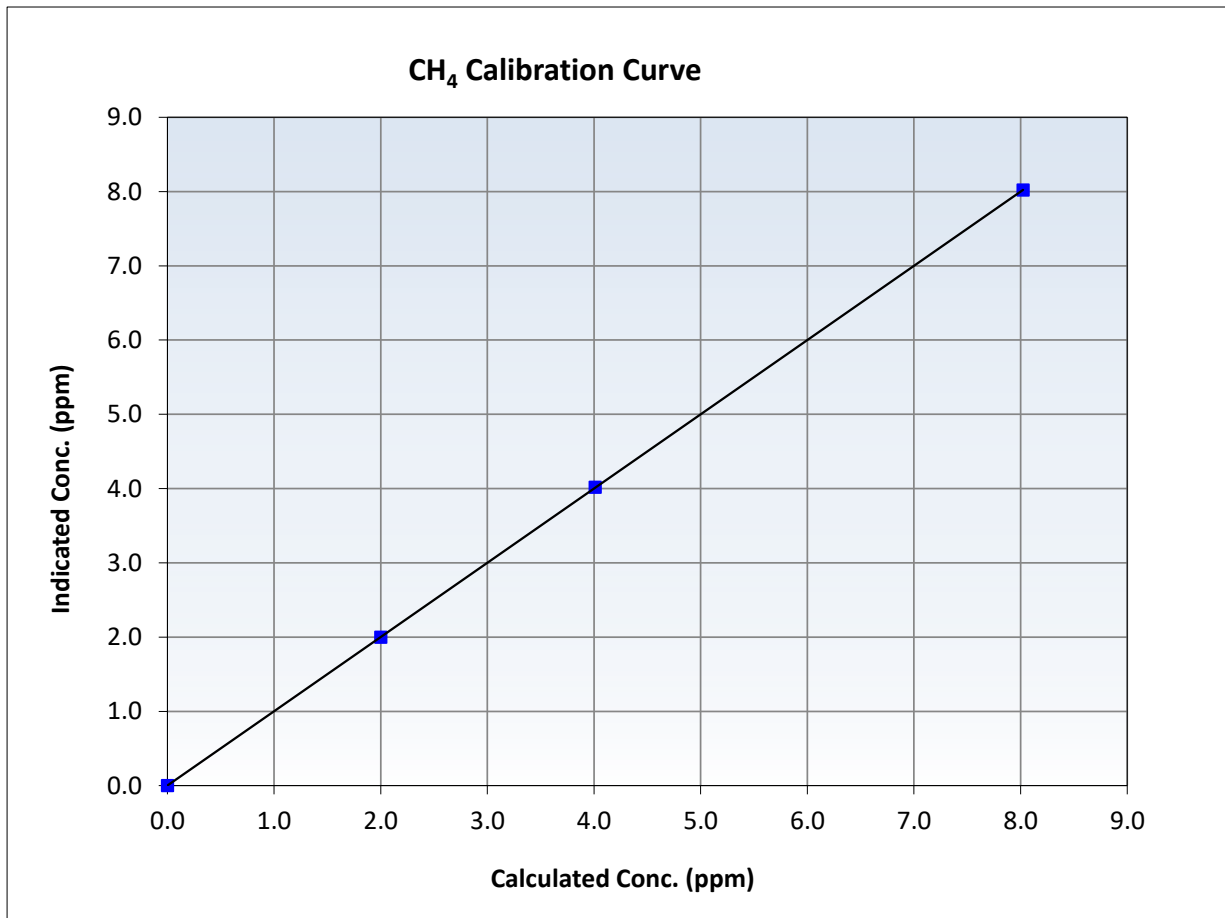
CH₄ Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	October 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:13	End Time (MST):	12:57
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999999	<i>≥0.995</i>
8.02	8.02	1.0004	Slope	0.999757	<i>0.90 - 1.10</i>
4.01	4.02	0.9984	Intercept	0.001551	<i>+/-0.5</i>
2.00	2.00	1.0004			





Wood Buffalo Environmental Association

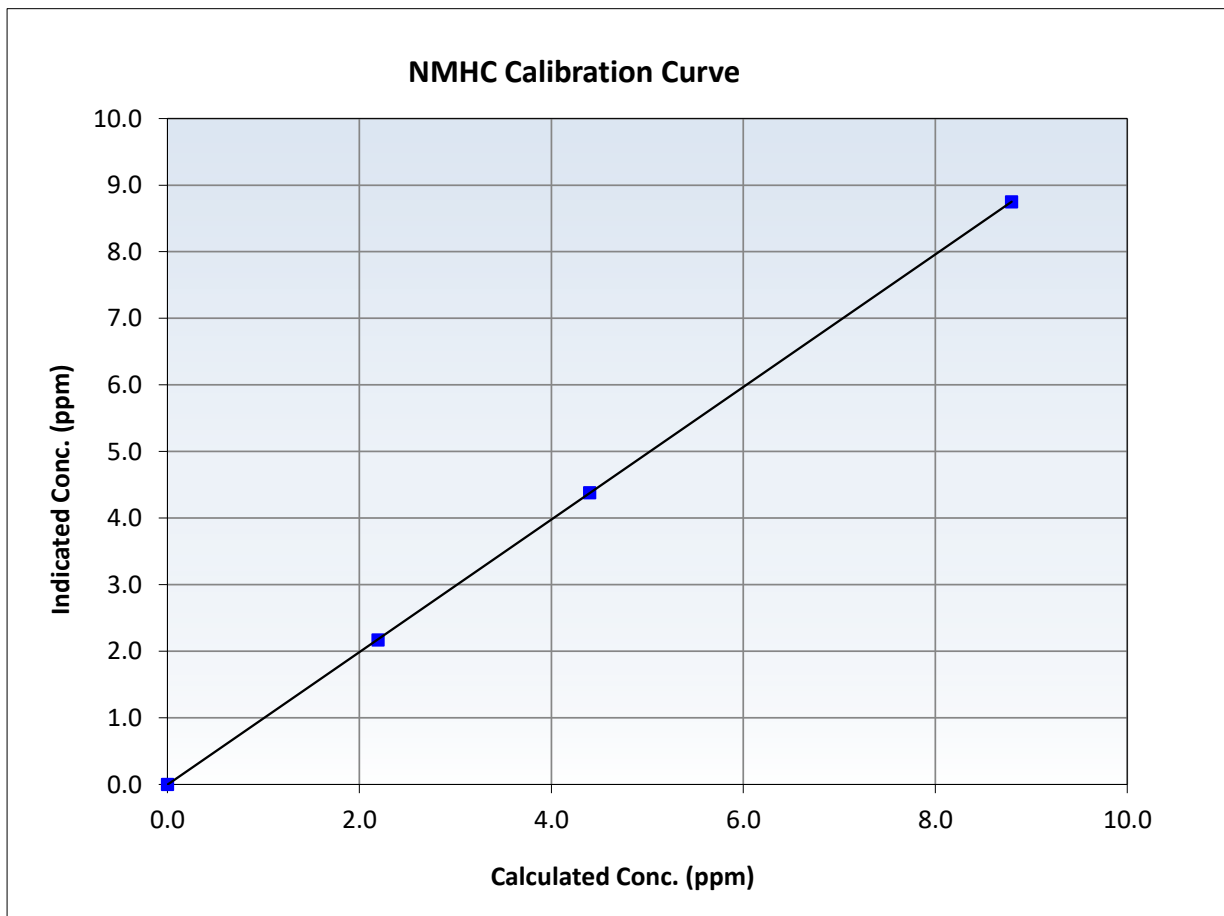
NMHC Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	October 4, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	9:13	End Time (MST):	12:57
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

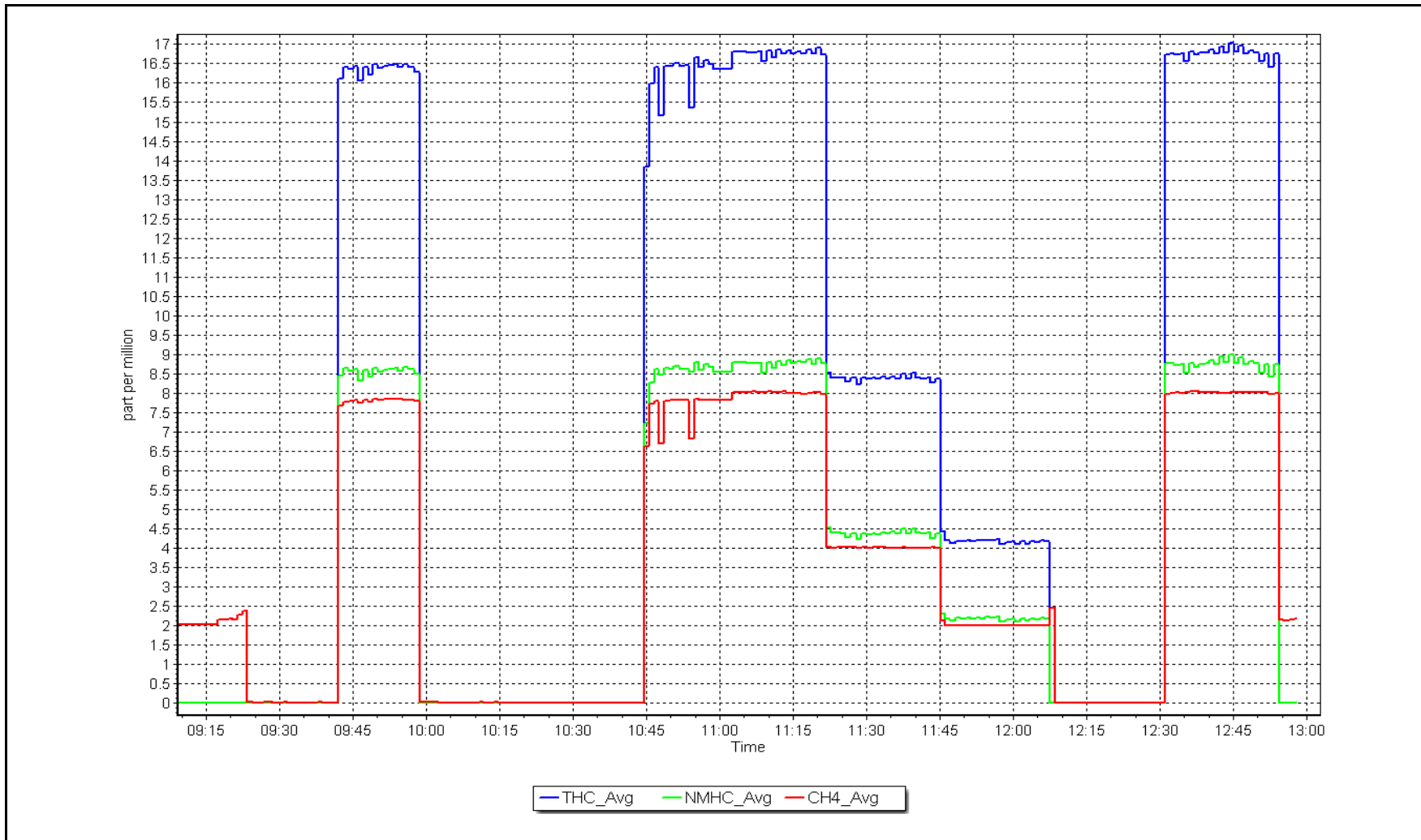
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999996	<i>≥0.995</i>
8.80	8.75	1.0052	Slope	0.995414	<i>0.90 - 1.10</i>
4.40	4.38	1.0038	Intercept	-0.003674	<i>+/-0.5</i>
2.19	2.17	1.0108			



NMHC Calibration Plot

Date: October 11, 2024

Location: Mildred Lake





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	October 23, 2024	Last Cal Date:	October 11, 2024
Start time (MST):	9:11	End time (MST):	11:01
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH ₄ Cal Gas Conc.	500.2 ppm	CH ₄ Equiv Conc.	1048.6 ppm
C ₃ H ₈ Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH ₄ Conc.	500.2 ppm	CH ₄ Equiv Conc.	1048.6 ppm
Removed C ₃ H ₈ 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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH ₄ SP Ratio:	2.61E-04	2.61E-04	NMHC SP Ratio:	6.64E-05	6.64E-05
CH ₄ Retention time:	14.8	14.8	NMHC Peak Area:	132465	132465
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	16.82	16.36	1.028
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.36	Prev response	16.82	*% change	-2.8%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	16.82	16.39	1.026
Average Correction Factor					

Notes: Swapped hydrogen cylinder. No issues to note.



Wood Buffalo Environmental Association

THC / CH₄ / 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.54	1.030
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.54	Prev response	8.83	*% change	-3.4%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.80	8.56	1.027
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.01	----
As found High point	4920	80.2	8.02	7.82	1.028
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.80	Prev response	8.00	*% change	-2.5%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	7.83	1.025
Average Correction Factor					

Calibration Statistics

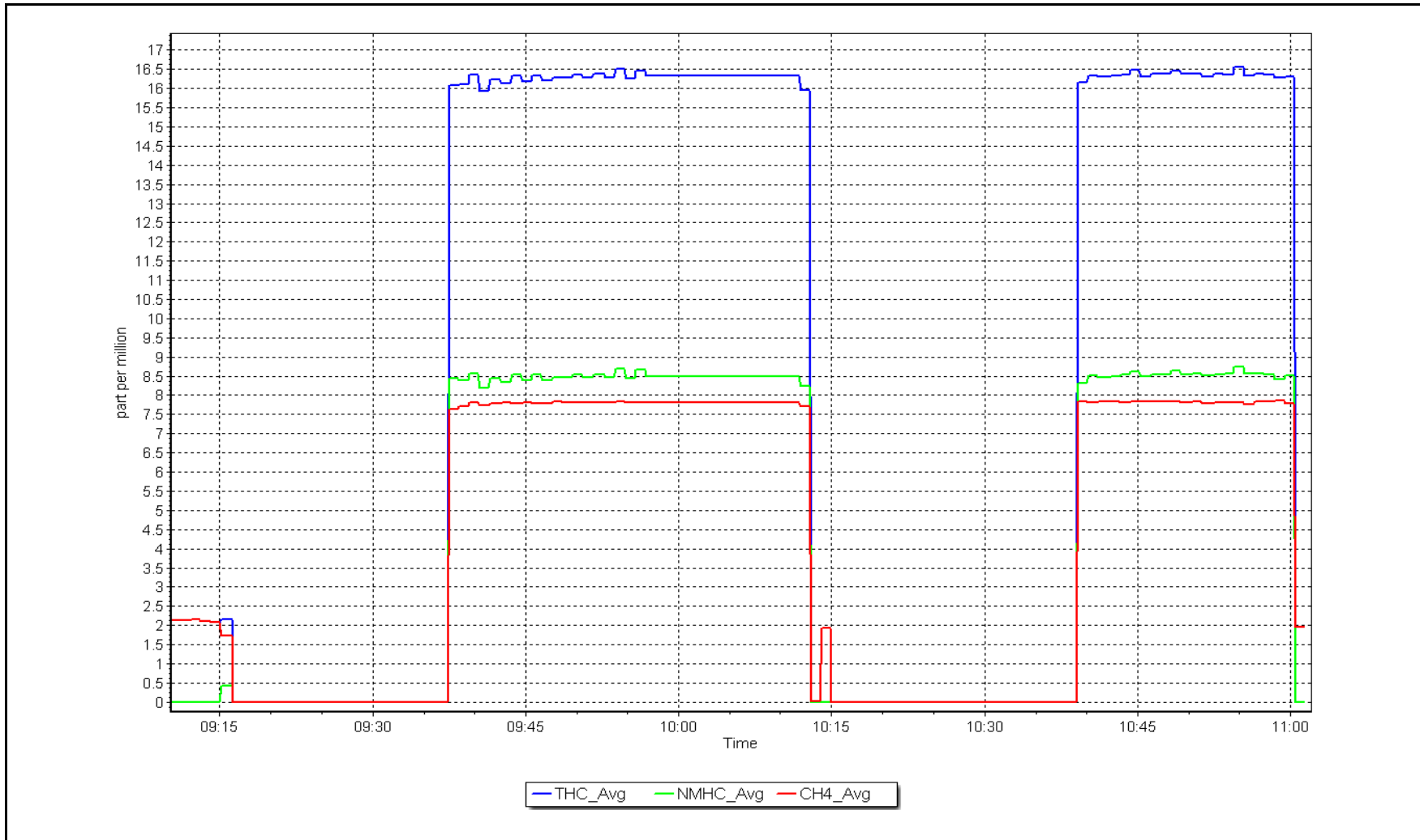
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999741	
THC Cal Offset:	0.007288	
CH ₄ Cal Slope:	0.996167	
CH ₄ Cal Offset:	0.003146	
NMHC Cal Slope:	1.003286	
NMHC Cal Offset:	0.002544	

Calibration Performed By: Braiden Boutilier

NMHC Calibration Plot

Date: October 23, 2024

Location: Mildred Lake





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS04 BUFFALO VIEWPOINT OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number: AMS 04
Calibration Date:	October 10, 2024	Last Cal Date: September 10, 2024
Start time (MST):	6:16	End time (MST): 8:50
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001027	1.000586	Backgd or Offset:	26.1	26.1
Calibration intercept:	0.395469	-0.125278	Coeff or Slope:	0.866	0.866

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4921	78.6	799.7	800.3	0.999
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	800.4	Previous response	801.0	*% change	-0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4921	78.6	799.7	800.0	1.000
Mid point	4961	39.3	399.8	400.2	0.999
Low point	4980	19.6	199.4	199.2	1.001
As left zero	5000	0.0	0.0	0.0	----
As left span	4921	78.6	799.7	799.2	1.001
Average Correction Factor:					1.000

Notes: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

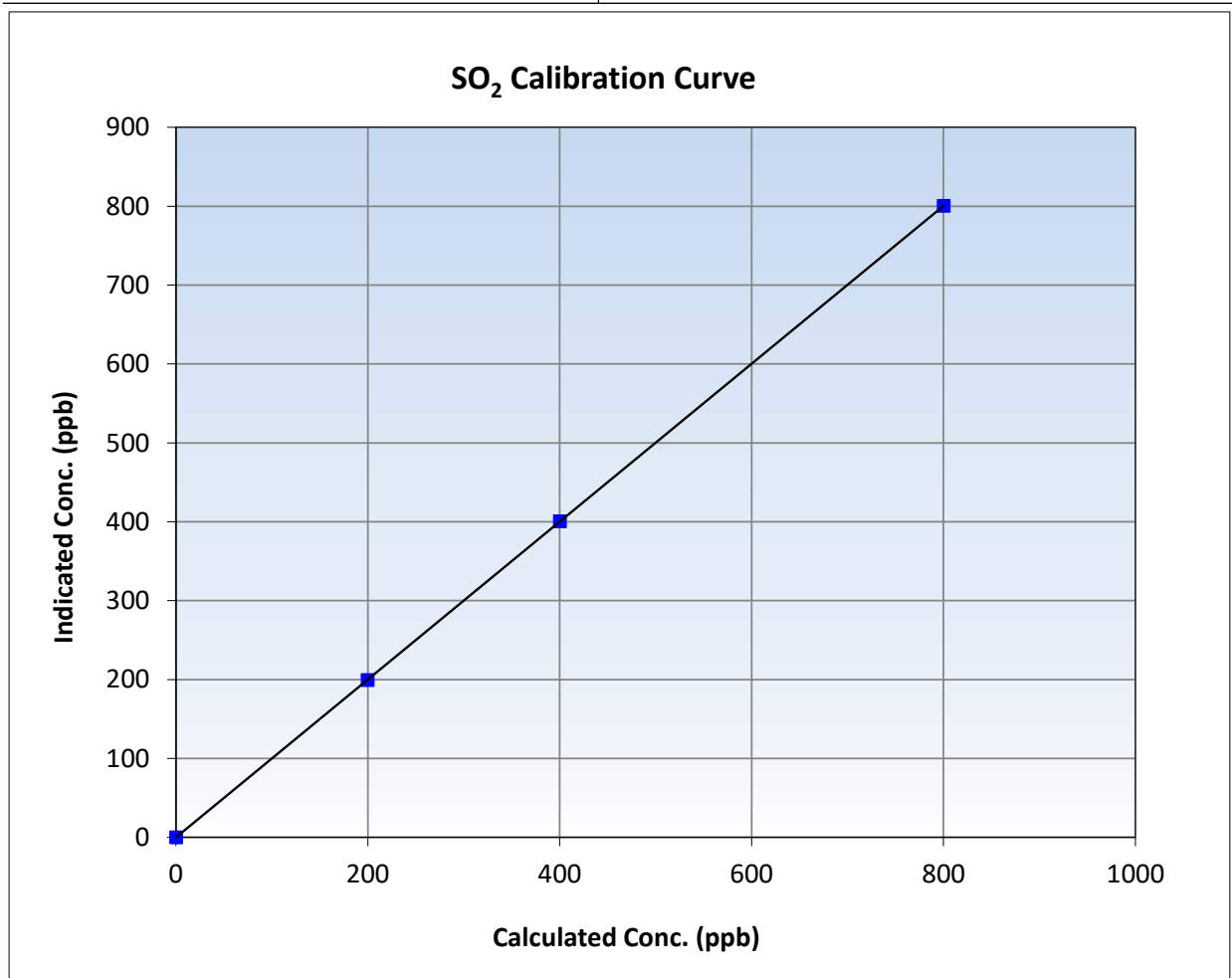
SO₂ Calibration Summary

Station Information

Calibration Date:	October 10, 2024	Previous Calibration:	September 10, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:16	End Time (MST):	8:50
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1327300932

Calibration Data

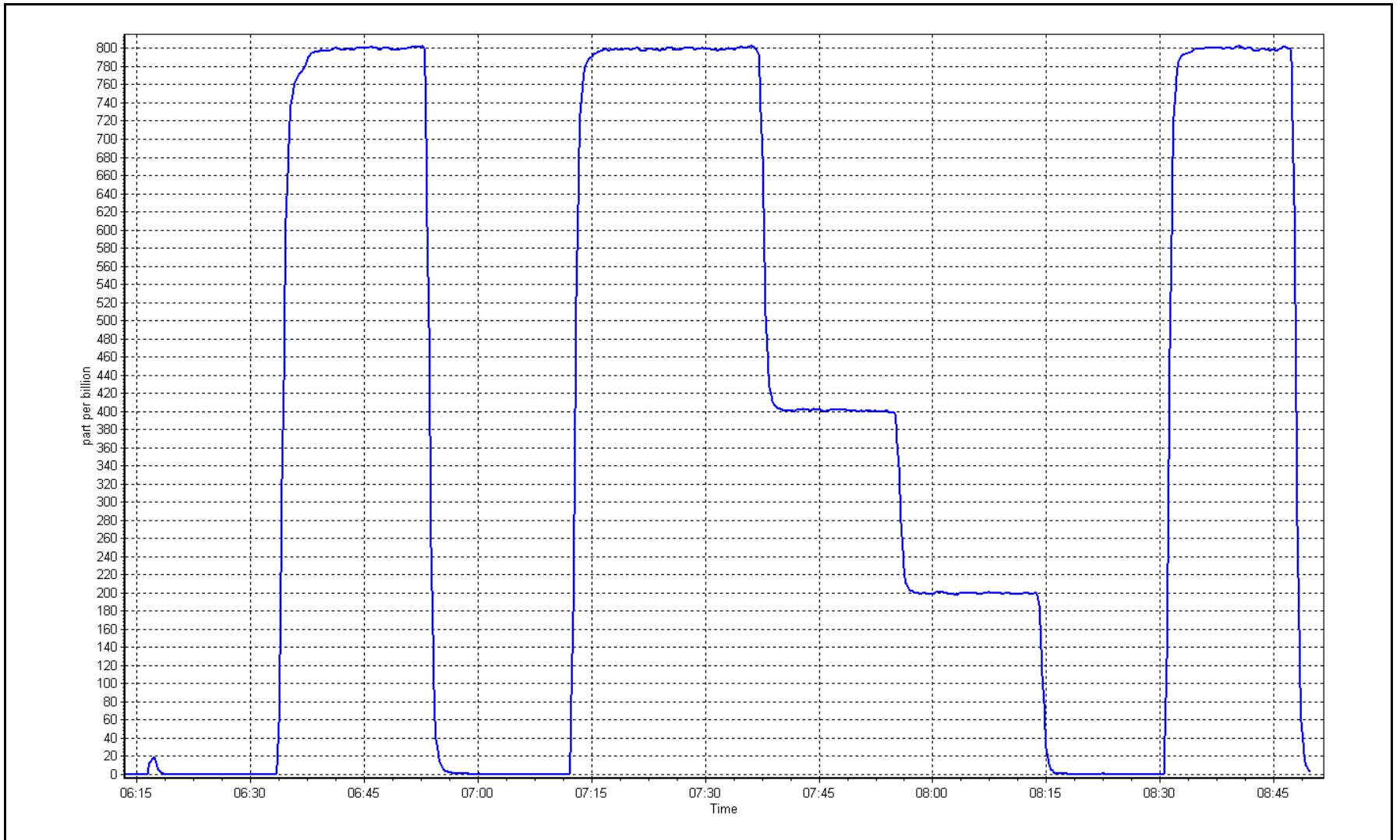
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	1.000000	≥0.995
799.7	800.0	0.9997	Slope	1.000586	0.90 - 1.10
399.8	400.2	0.9990	Intercept	-0.125278	+/-30
199.4	199.2	1.0011			



SO2 Calibration Plot

Date: October 10, 2024

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name: Buffalo Viewpoint	Station number: AMS 04
Calibration Date: October 8, 2024	Last Cal Date: September 23, 2024
Start time (MST): 8:20	End time (MST): 11:54
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.995222	0.988107	Backgd or Offset:	1.92	1.92
Calibration intercept:	0.022118	0.021990	Coeff or Slope:	1.108	1.108

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4926	74.1	80.3	80.5	0.997
As found Mid point	4963	37.0	40.1	40.3	0.993
As found Low point	4982	18.5	20.1	19.9	1.003
New cylinder response					
Baseline Corr As found:	80.6	Prev response:	79.96	*% change:	0.8%
Baseline Corr 2nd AF pt:	40.4	AF Slope:	1.004186	AF Intercept:	-0.117705
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999990	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4926	74.1	80.3	79.3	1.013
Mid point	4963	37.0	40.1	39.9	1.005
Low point	4982	18.5	20.1	19.7	1.018
As left zero	5000	0.0	0.0	0.1	----
As left span	4926	74.1	80.3	78.8	1.019
SO ₂ Scrubber Check	4920	80.0	800.0	-0.1	----
Date of last scrubber change:	16-May-23			Ave Corr Factor	1.012
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

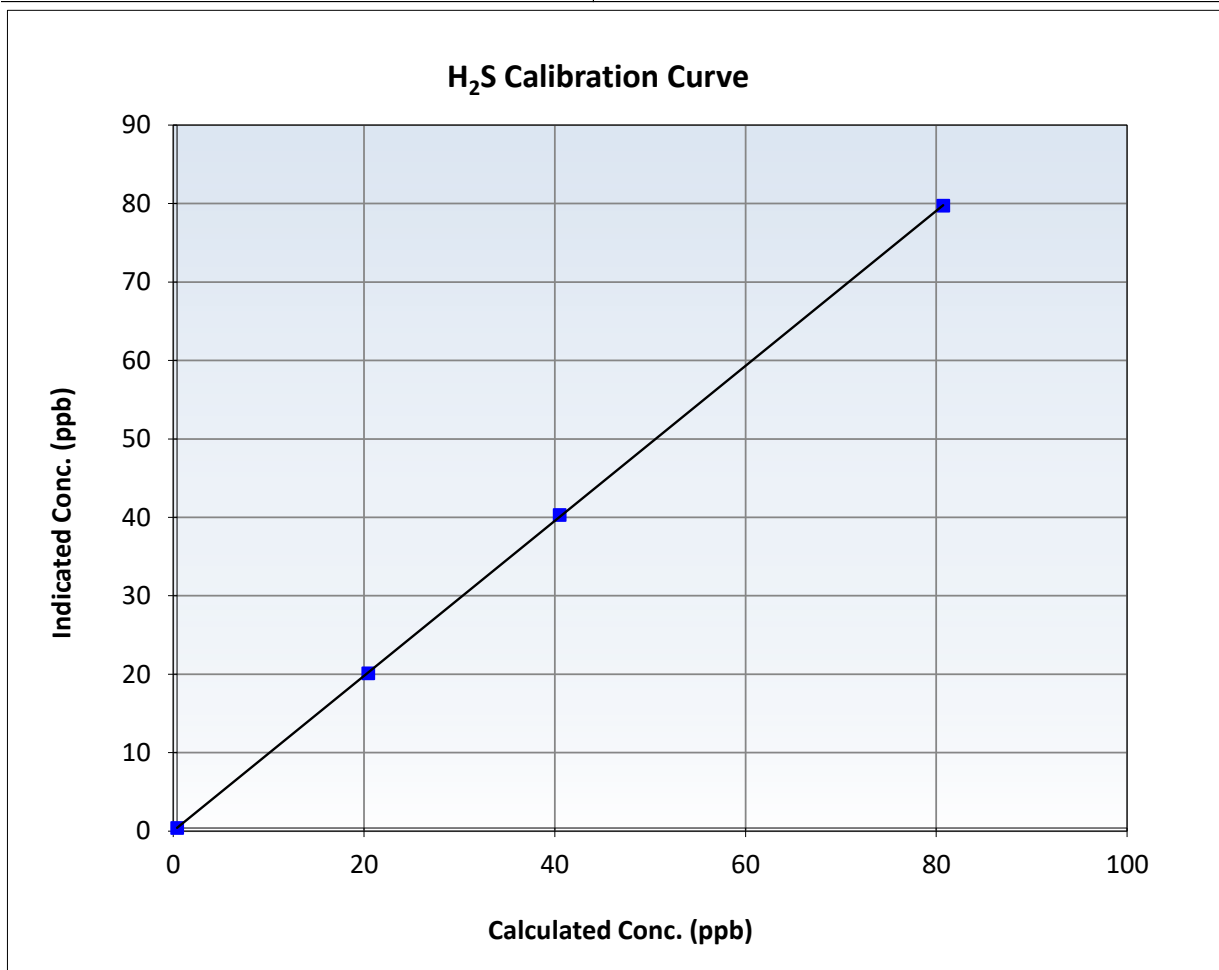
H₂S Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 23, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:20	End Time (MST):	11:54
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1008841400

Calibration Data

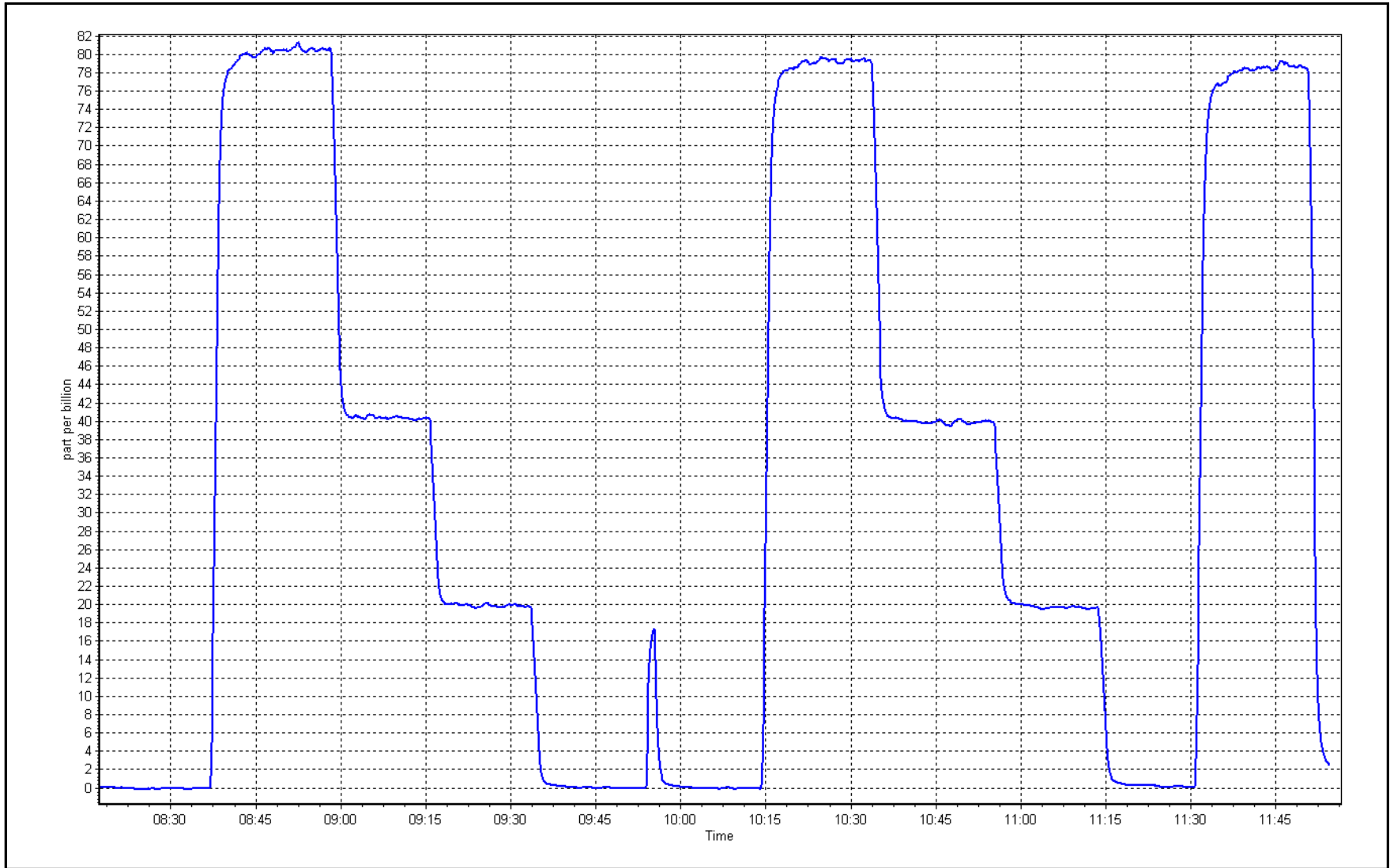
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999974	≥0.995
80.3	79.3	1.0129	Slope	0.988107	0.90 - 1.10
40.1	39.9	1.0052	Intercept	0.021990	+/-3
20.1	19.7	1.0179			



H₂S Calibration Plot

Date: October 8, 2024

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	October 10, 2024	Last Cal Date:	September 10, 2024
Start time (MST):	6:16	End time (MST):	8:48
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.44E-04	4.51E-04	NMHC SP Ratio:	1.13E-04	1.15E-04
CH4 Retention time:	13.7	13.7	NMHC Peak Area:	78327	76662
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	16.64	16.36	1.017
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.36	Prev response	16.52	*% change	-1.0%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	16.64	16.56	1.004
Mid point	4961	39.3	8.32	8.27	1.006
Low point	4980	19.6	4.15	4.12	1.008
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	16.64	16.50	1.008
Average Correction Factor					1.006

Notes: Span adjusted. No maintenance done.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	8.82	8.64	1.021
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.64	Prev response	8.76	*% change	-1.4%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	8.82	8.76	1.006
Mid point	4961	39.3	4.41	4.39	1.004
Low point	4980	19.6	2.20	2.19	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	8.82	8.74	1.010
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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	7.82	7.72	1.013
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.72	Prev response	7.75	*% change	-0.5%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	7.82	7.80	1.002
Mid point	4961	39.3	3.91	3.88	1.007
Low point	4980	19.6	1.95	1.93	1.013
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	7.82	7.77	1.006
Average Correction Factor					1.007

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.992852	0.995889
THC Cal Offset:	-0.000161	-0.007756
CH ₄ Cal Slope:	0.992900	0.998354
CH ₄ Cal Offset:	-0.006117	-0.011510
NMHC Cal Slope:	0.992887	0.993627
NMHC Cal Offset:	0.006157	0.003553

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

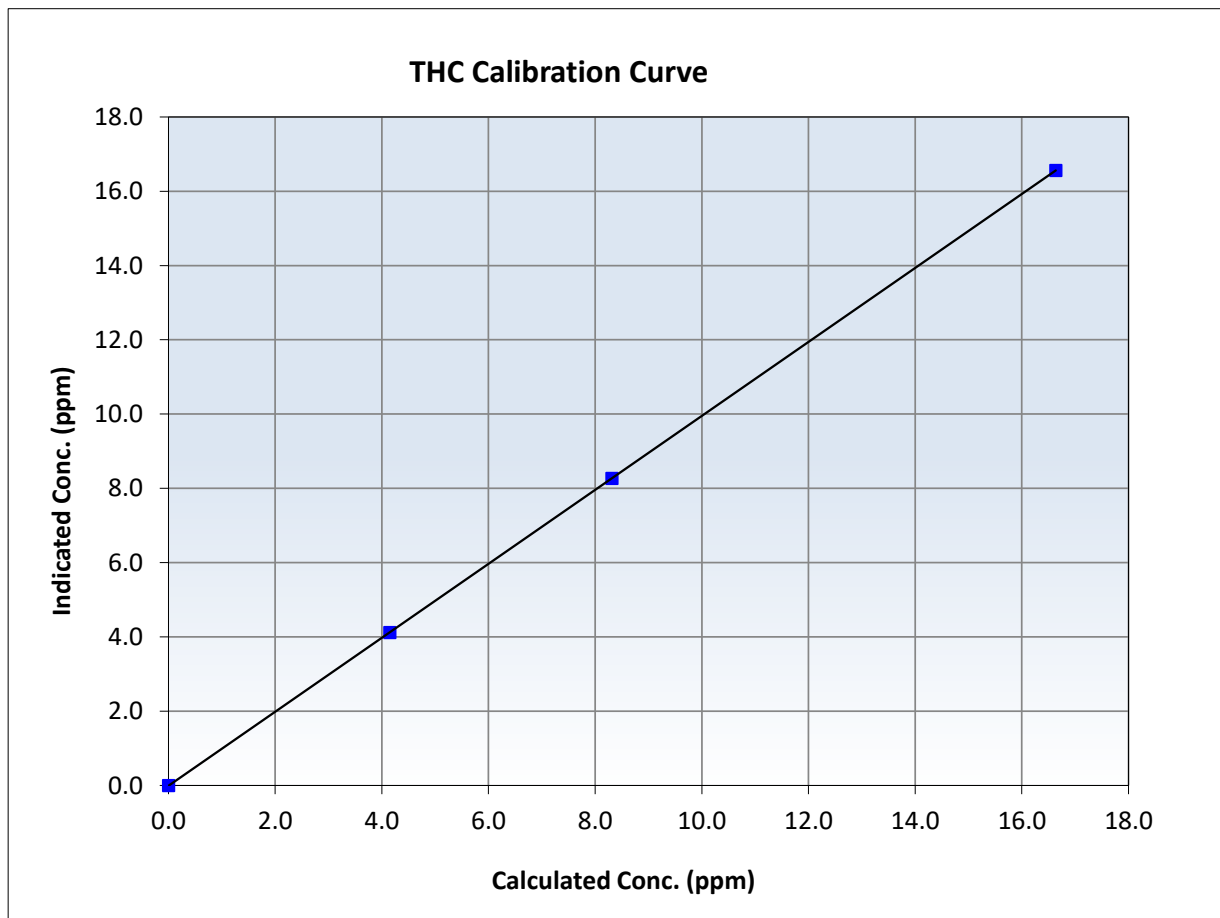
THC Calibration Summary

Station Information

Calibration Date:	October 10, 2024	Previous Calibration:	September 10, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:16	End Time (MST):	8:48
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999999	<i>≥0.995</i>
16.64	16.56	1.0044	Slope	0.995889	<i>0.90 - 1.10</i>
8.32	8.27	1.0056	Intercept	-0.007756	<i>+/-0.5</i>
4.15	4.12	1.0079			





Wood Buffalo Environmental Association

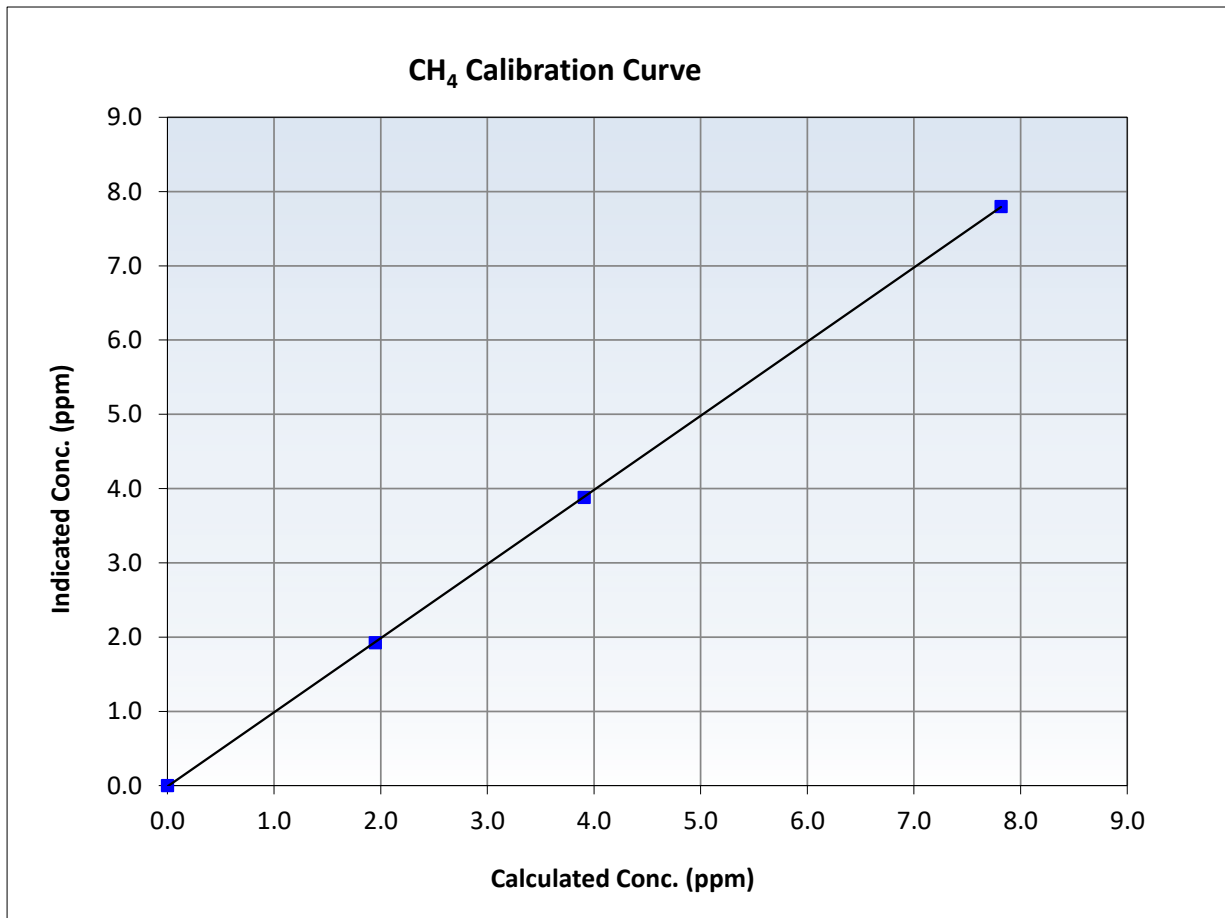
CH₄ Calibration Summary

Station Information

Calibration Date:	October 10, 2024	Previous Calibration:	September 10, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:16	End Time (MST):	8:48
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999990	<i>≥0.995</i>
7.82	7.80	1.0023	Slope	0.998354	<i>0.90 - 1.10</i>
3.91	3.88	1.0069	Intercept	-0.011510	<i>+/-0.5</i>
1.95	1.93	1.0126			





Wood Buffalo Environmental Association

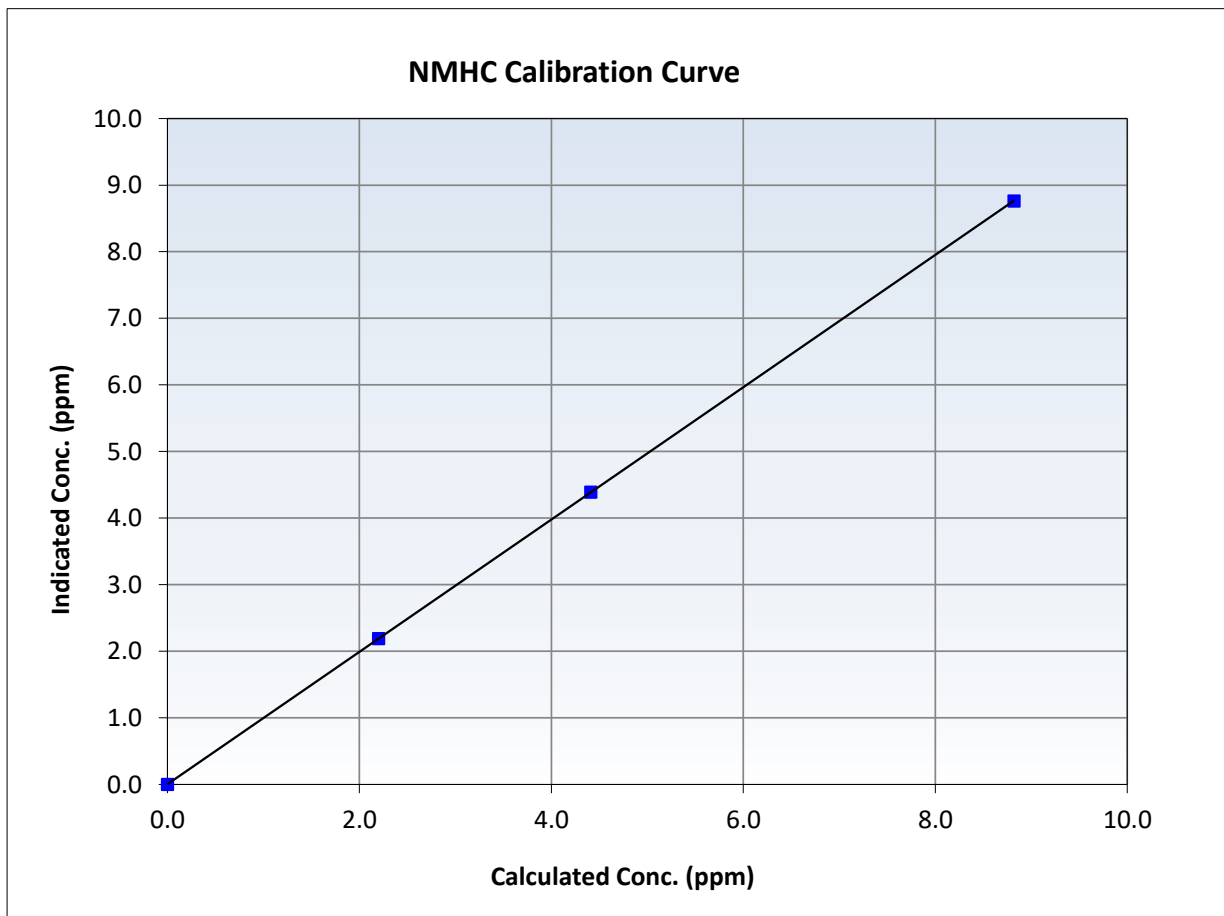
NMHC Calibration Summary

Station Information

Calibration Date:	October 10, 2024	Previous Calibration:	September 10, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:16	End Time (MST):	8:48
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

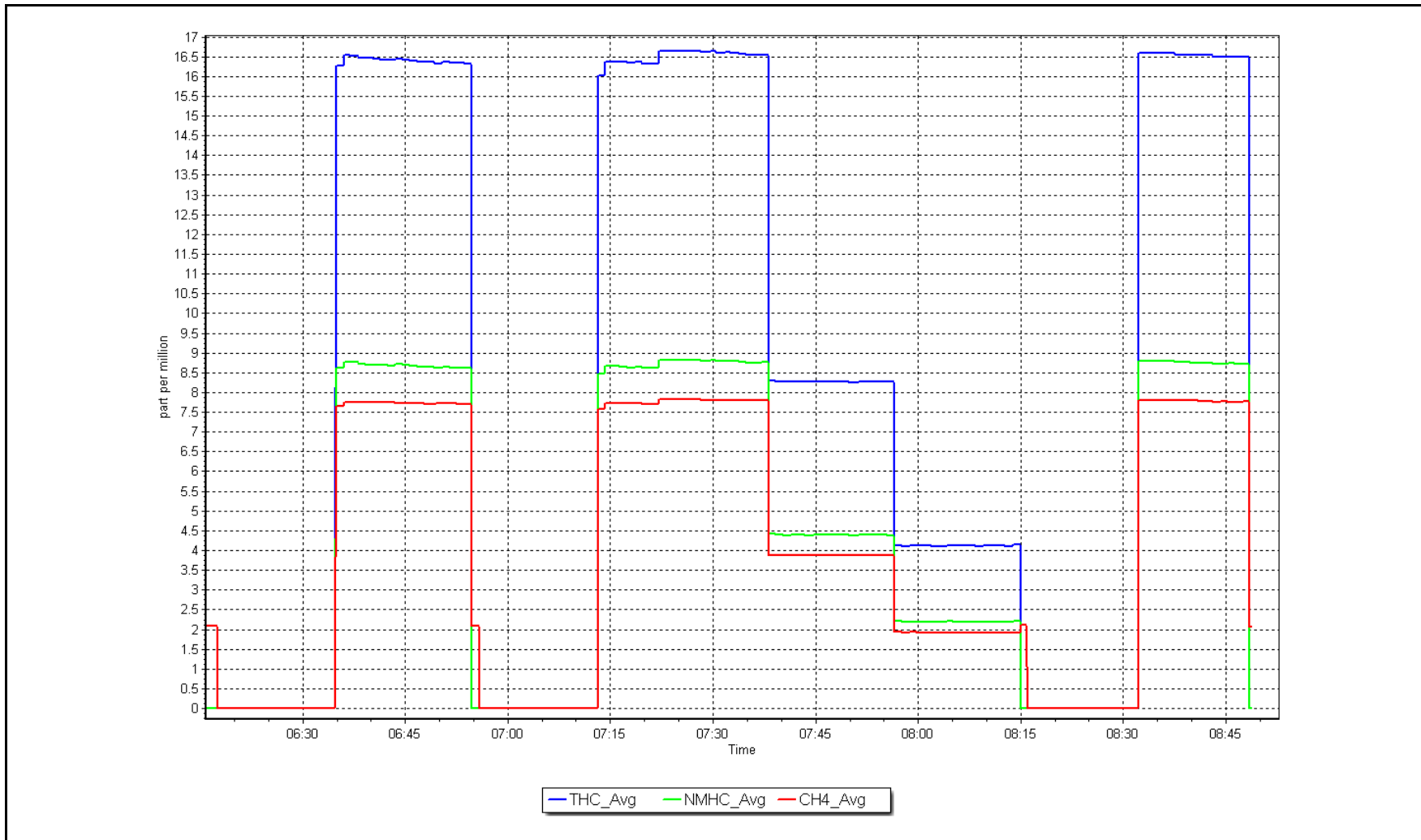
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999999	<i>≥0.995</i>
8.82	8.76	1.0063	Slope	0.993627	<i>0.90 - 1.10</i>
4.41	4.39	1.0044	Intercept	0.003553	<i>+/-0.5</i>
2.20	2.19	1.0042			



NMHC Calibration Plot

Date: October 10, 2024

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	October 23, 2024	Last Cal Date:	October 10, 2024
Start time (MST):	6:18	End time (MST):	7:47
Reason:	Cylinder Change		

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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.51E-04	4.51E-04	NMHC SP Ratio:	1.15E-04	1.15E-04
CH4 Retention time:	13.7	13.7	NMHC Peak Area:	76662	76662
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	16.64	16.83	0.988
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.83	Prev response	16.56	*% change	1.6%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	16.64	16.68	0.998
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.998

Notes: Hydrogen Cylinder Change.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	8.82	8.93	0.988
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.93	Prev response	8.77	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	8.82	8.84	0.998
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.998

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	7.82	7.91	0.989
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.91	Prev response	7.79	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	7.82	7.84	0.997
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.997

Calibration Statistics

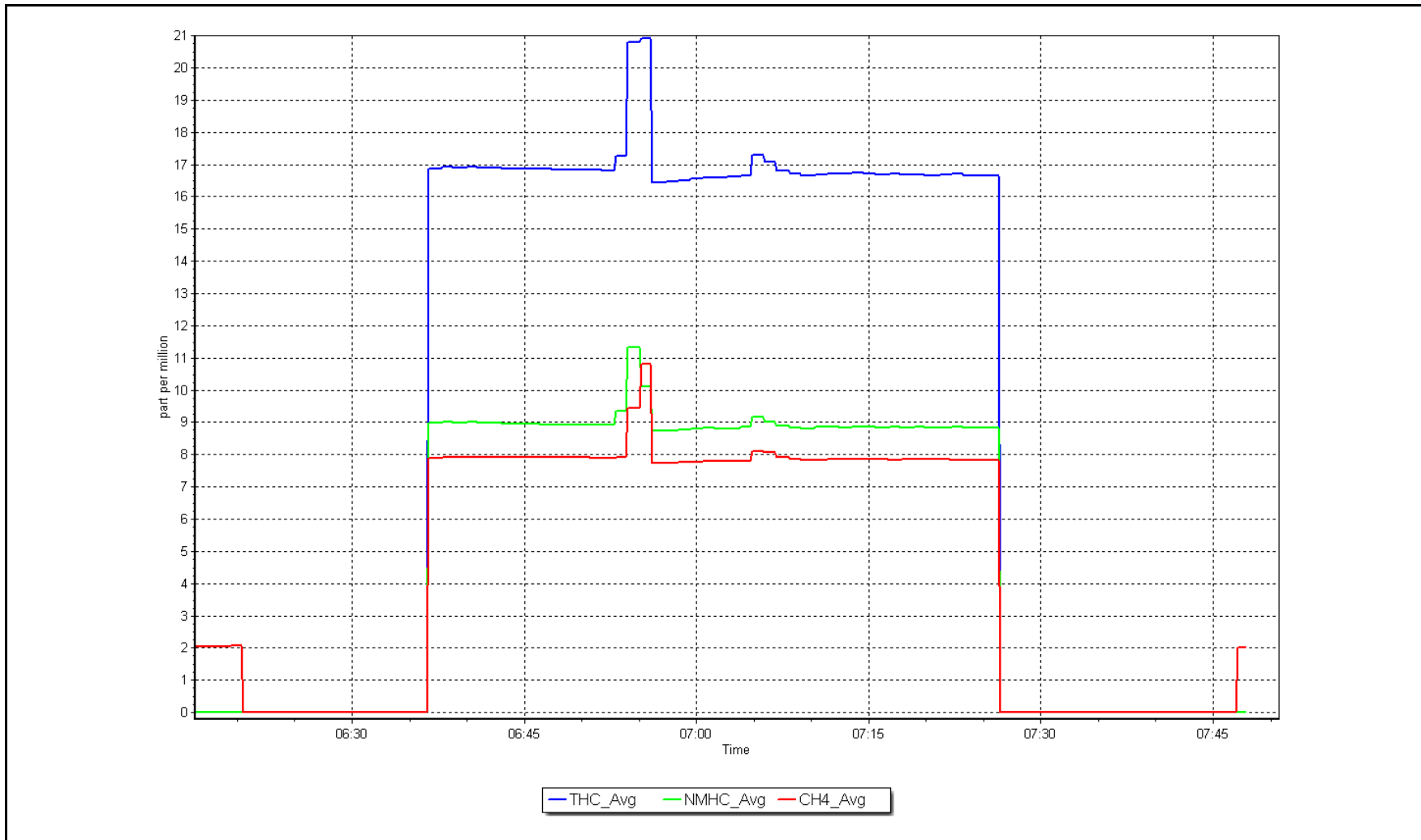
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.995889	1.002450
THC Cal Offset:	-0.007756	0.000000
CH ₄ Cal Slope:	0.998354	1.002609
CH ₄ Cal Offset:	-0.011510	0.000000
NMHC Cal Slope:	0.993627	1.002197
NMHC Cal Offset:	0.003553	0.000000

Calibration Performed By: Melissa Lemay

NMHC Calibration Plot

Date: October 23, 2024

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Buffalo Viewpoint
 Station number: AMS 04
 Calibration Date: October 16, 2024
 Last Cal Date: September 26, 2024
 Start time (MST): 6:10
 End time (MST): 9:10
 Reason: As Found

Calibration Standards

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

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
AF High point	4918	81.8	800.0	798.4	1.6	798.2	792.2	6.0	1.0019	1.0076
AF Mid point	4959	40.9	400.0	399.2	0.8	400.7	396.6	4.0	0.9975	1.0060
AF Low point	4980	20.4	199.5	199.1	0.4	197.8	195.8	2.0	1.0070	1.0158

New cyl resp

Previous Response	NO _x = 801.7 ppb	NO = 797.8 ppb	<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -0.4%
Baseline Corr 1st pt	NO _x = 798.5 ppb	NO = 792.4 ppb	<u>As Found Statistics</u>		*Percent Change	NO = -0.7%
Baseline Corr 2nd pt	NO _x = 401.0 ppb	NO = 396.8 ppb	As found	NO _x r ² : 0.999989	Nx SI: 0.998767	Nx Int: -0.354
Baseline Corr 3rd pt	NO _x = 198.1 ppb	NO = 196.0 ppb	As found	NO r ² : 0.999993	NO SI: 0.993257	NO Int: -0.716
			As found	NO ₂ r ² : 0.999999	NO ₂ SI: 0.984575	NO ₂ Int: 0.024

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
As Found GPT zero	----	----	0.0	-0.1	----	----
As found high GPT point	795.4	400.4	396.6	390.4	1.0160	98.4%
As found mid GPT point	795.4	593.1	203.9	201.1	1.0141	98.6%
As found low GPT point	795.4	690.8	106.2	104.6	1.0156	98.5%



Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 721

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.240	1.240	NO bkgnd or offset:	0.4	0.4
NOX coeff or slope:	1.230	1.230	NOX bkgnd or offset:	0.5	0.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.3	4.7

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.001277	
NO _x Cal Offset:	0.667599	
NO Cal Slope:	0.999396	
NO Cal Offset:	-0.133984	
NO ₂ Cal Slope:	0.988052	
NO ₂ Cal Offset:	0.825493	

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
-----------	---------------------------	-----------------------------	---	--	---	--	---------------------------------------	--	---	--

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 NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
-------------------	--	---------------------------------------	---	--	---	--

Cal zero
 High GPT point
 Mid GPT point
 Low GPT point

Average Correction Factor

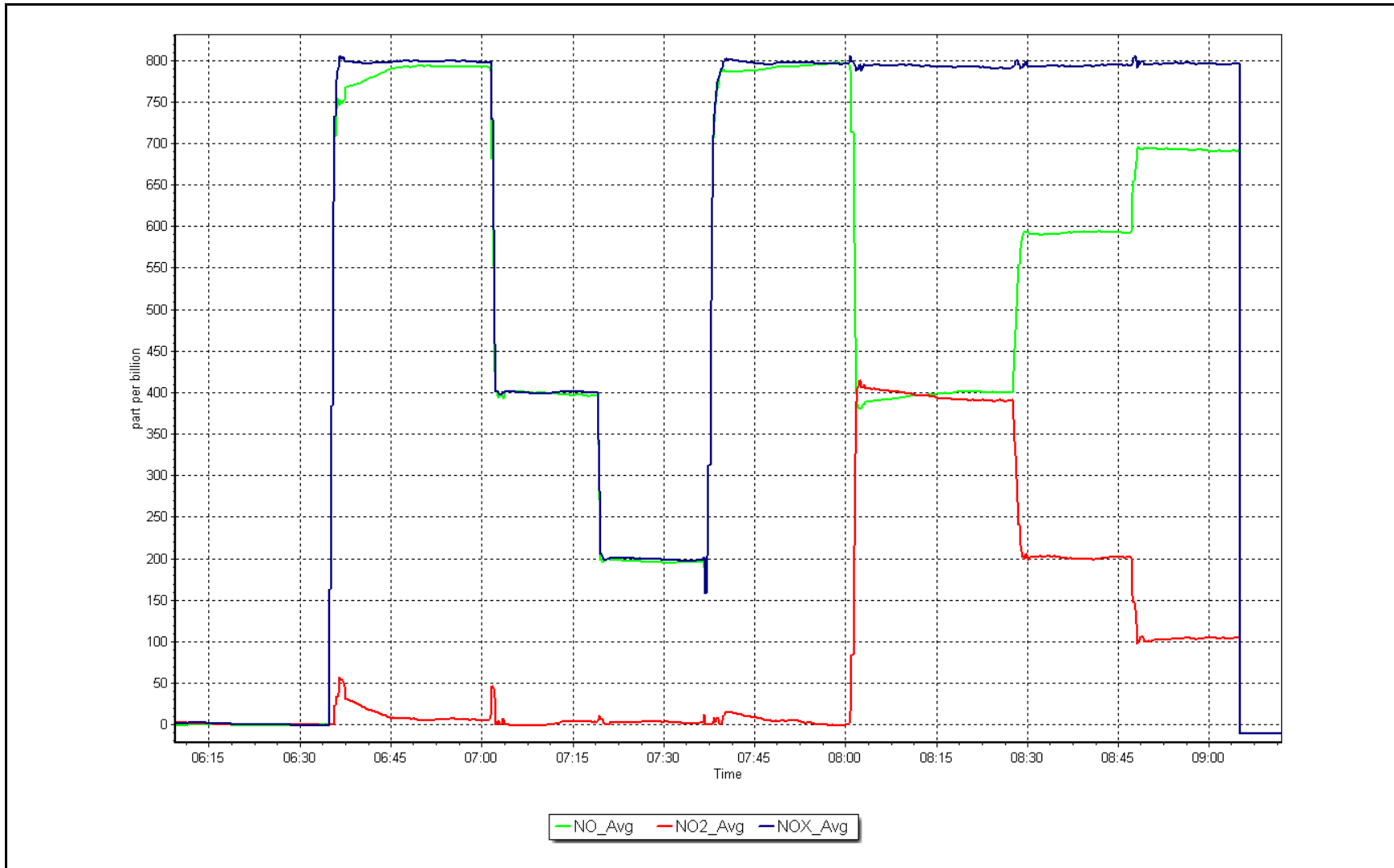
Notes: As Found to put in Extra Dryer to fix unstable zero.

Calibration Performed By: Melissa Lemay

NO_x Calibration Plot

Date: October 16, 2024

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Buffalo Viewpoint
 Station number: AMS 04
 Calibration Date: October 17, 2024
 Last Cal Date: October 16, 2024
 Start time (MST): 6:40
 End time (MST): 11:01
 Reason: Routine

Calibration Standards

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

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = NA	ppb	NO = NA	ppb					*Percent Change	NO _x = NA
Baseline Corr 1st pt	NO _x = NA	ppb	NO = NA	ppb					*Percent Change	NO = NA
Baseline Corr 2nd pt	NO _x = NA	ppb	NO = NA	ppb					Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA	ppb	NO = NA	ppb					NO SI:	NO Int:
									NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 721

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.001277	1.000035
NO _x Cal Offset:	0.667599	1.827250
NO Cal Slope:	0.999396	0.996977
NO Cal Offset:	-0.133984	0.385657
NO ₂ Cal Slope:	0.988052	1.000295
NO ₂ Cal Offset:	0.825493	0.996049

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.240	1.225	NO bkgnd or offset:	0.4	0.2
NOX coeff or slope:	1.230	1.219	NOX bkgnd or offset:	0.5	-0.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.7	4.7

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.4	0.0	0.4	----	----
High point	4918	81.8	800.0	798.4	1.6	800.9	795.9	4.8	0.9989	1.0031
Mid point	4959	40.9	400.0	399.2	0.8	403.4	399.4	4.0	0.9916	0.9995
Low point	4980	20.4	199.5	199.1	0.4	202.2	198.7	3.5	0.9866	1.0020
As left zero	5000	0.0	0.0	0.5	-0.5	0.7	0.5	0.2	----	----
As left span	4918	81.8	800.0	396.1	800.0	795.3	396.1	399.2	1.0060	1.0000
Average Correction Factor									0.9924	1.0015

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.4	----	----
High GPT point	796.4	399.8	398.2	398.5	0.9993	100.1%
Mid GPT point	796.4	595.6	202.4	205.4	0.9856	101.5%
Low GPT point	796.4	694.3	103.7	104.3	0.9946	100.5%
Average Correction Factor					0.9932	100.7%

Notes: Calibration after extra dryer put in. Span adjusted.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

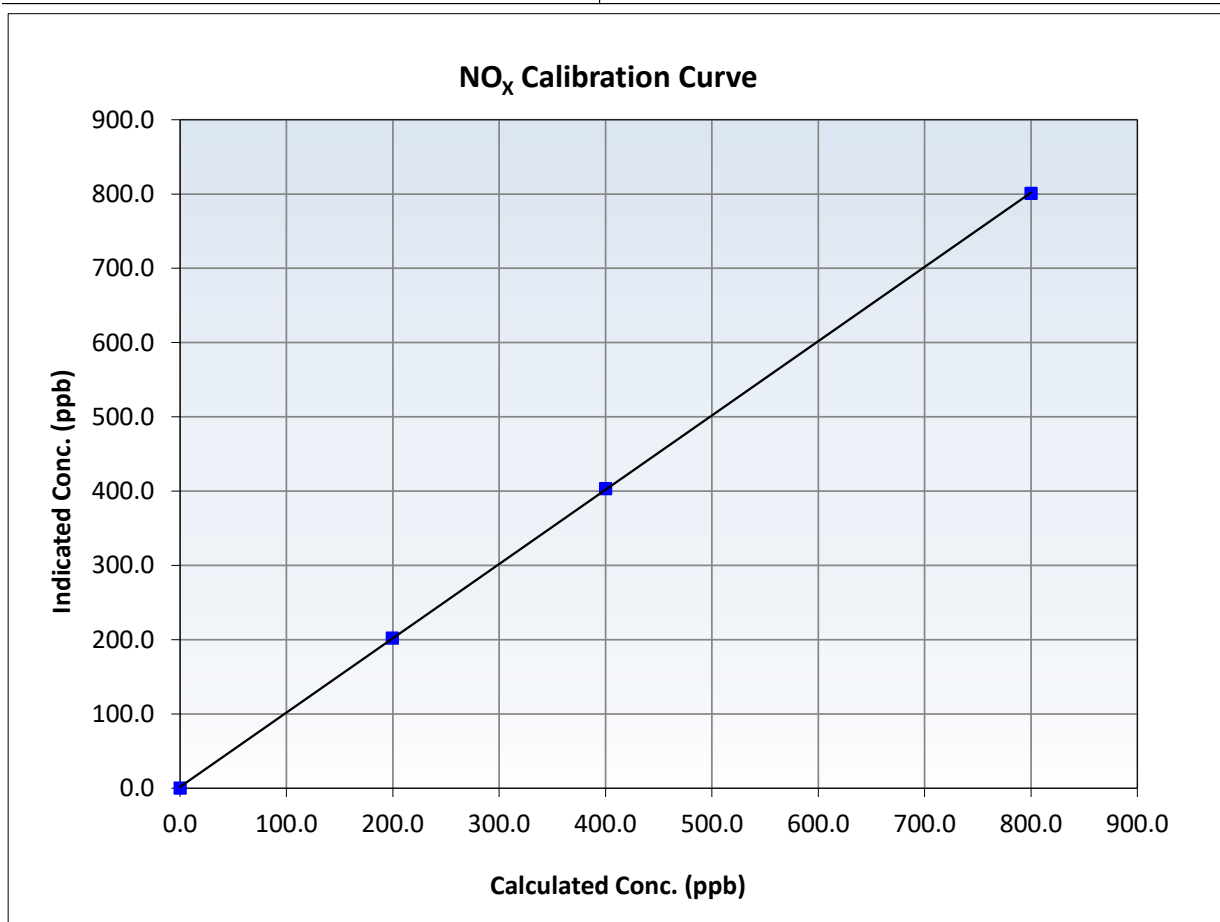
NO_x Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	October 16, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:40	End Time (MST):	11:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.4	----	Correlation Coefficient	0.999982	≥0.995
800.0	800.9	0.9989	Slope	1.000035	0.90 - 1.10
400.0	403.4	0.9916	Intercept	1.827250	+/-20
199.5	202.2	0.9866			





Wood Buffalo Environmental Association

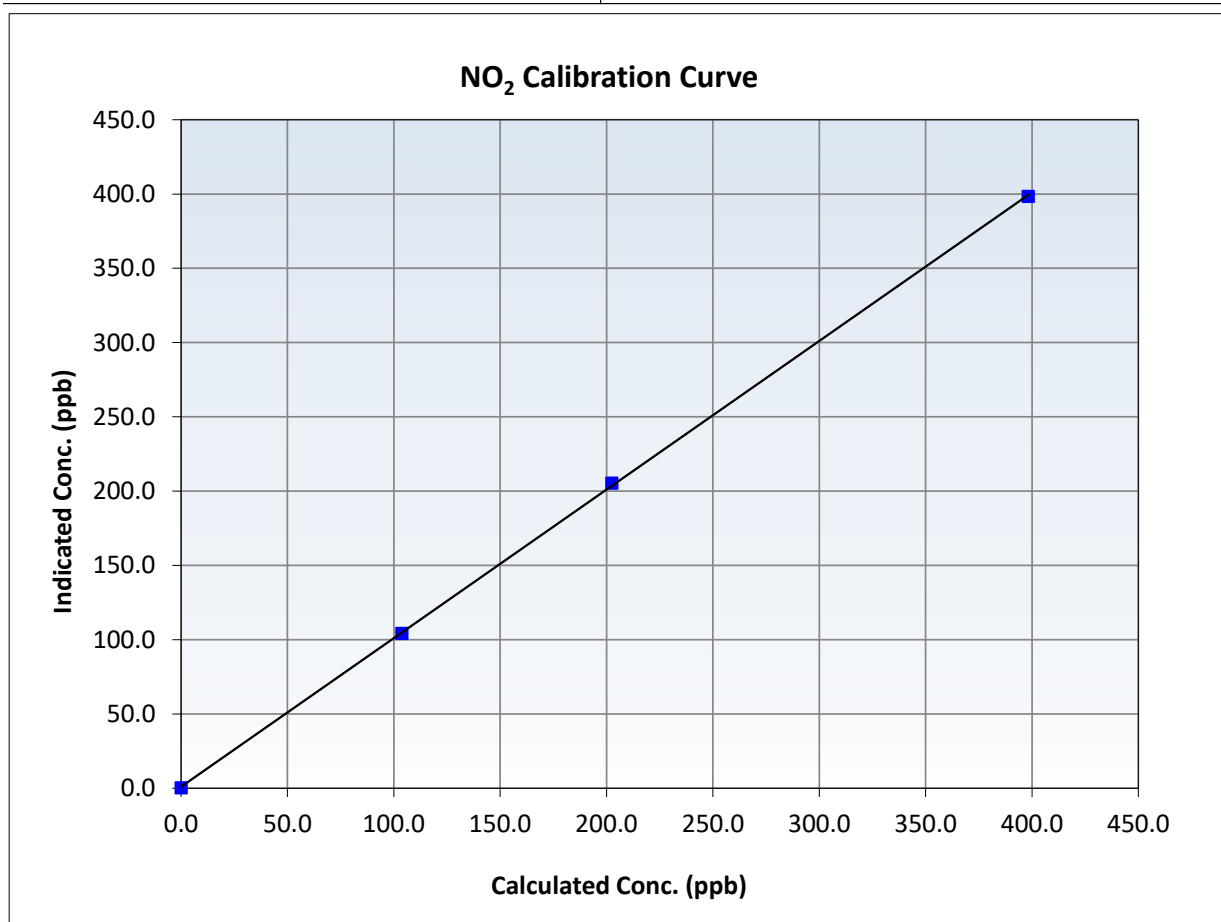
NO₂ Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	October 16, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:40	End Time (MST):	11:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.4	----	Correlation Coefficient	0.999943	<i>≥0.995</i>
398.2	398.5	0.9993	Slope	1.000295	<i>0.90 - 1.10</i>
202.4	205.4	0.9856	Intercept	0.996049	<i>+/-20</i>
103.7	104.3	0.9946			





Wood Buffalo Environmental Association

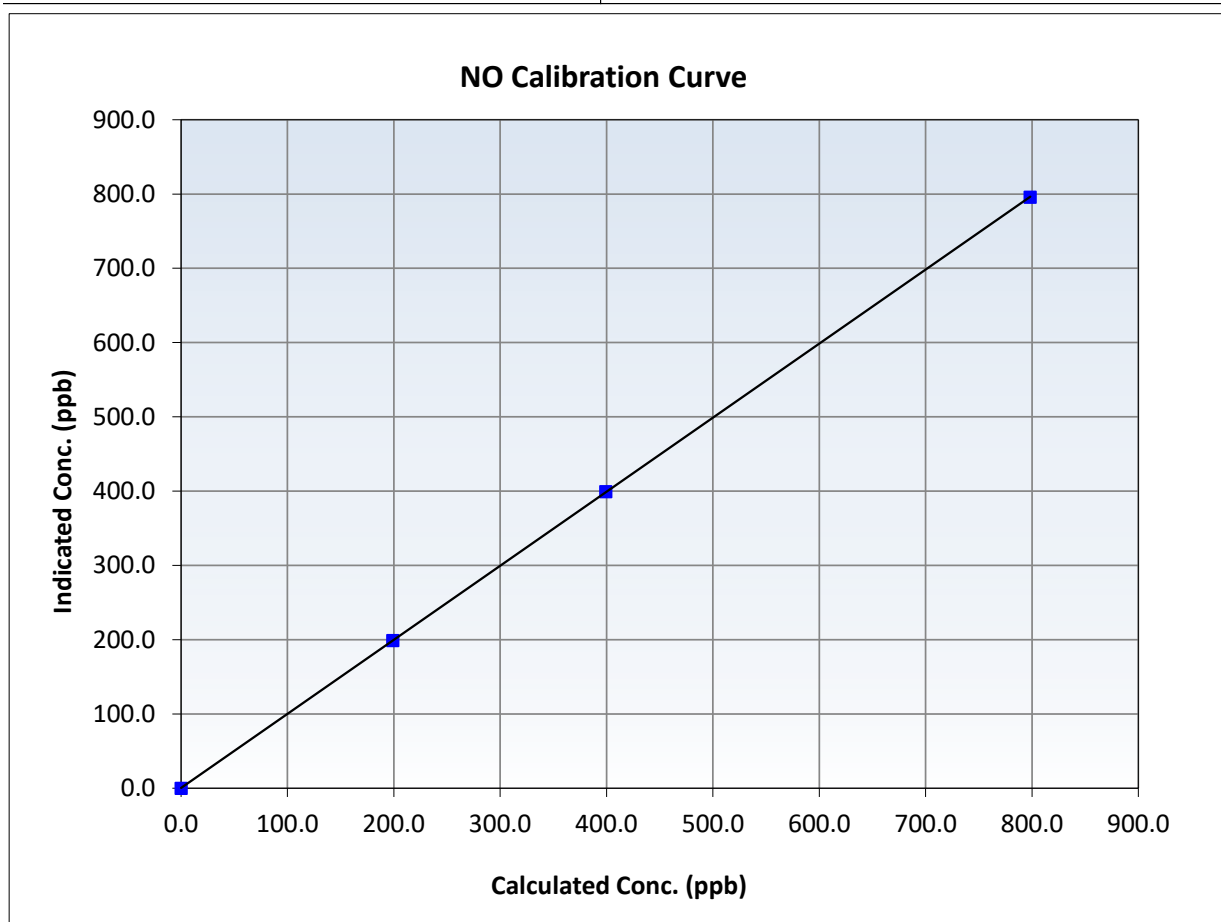
NO Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	October 16, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:40	End Time (MST):	11:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

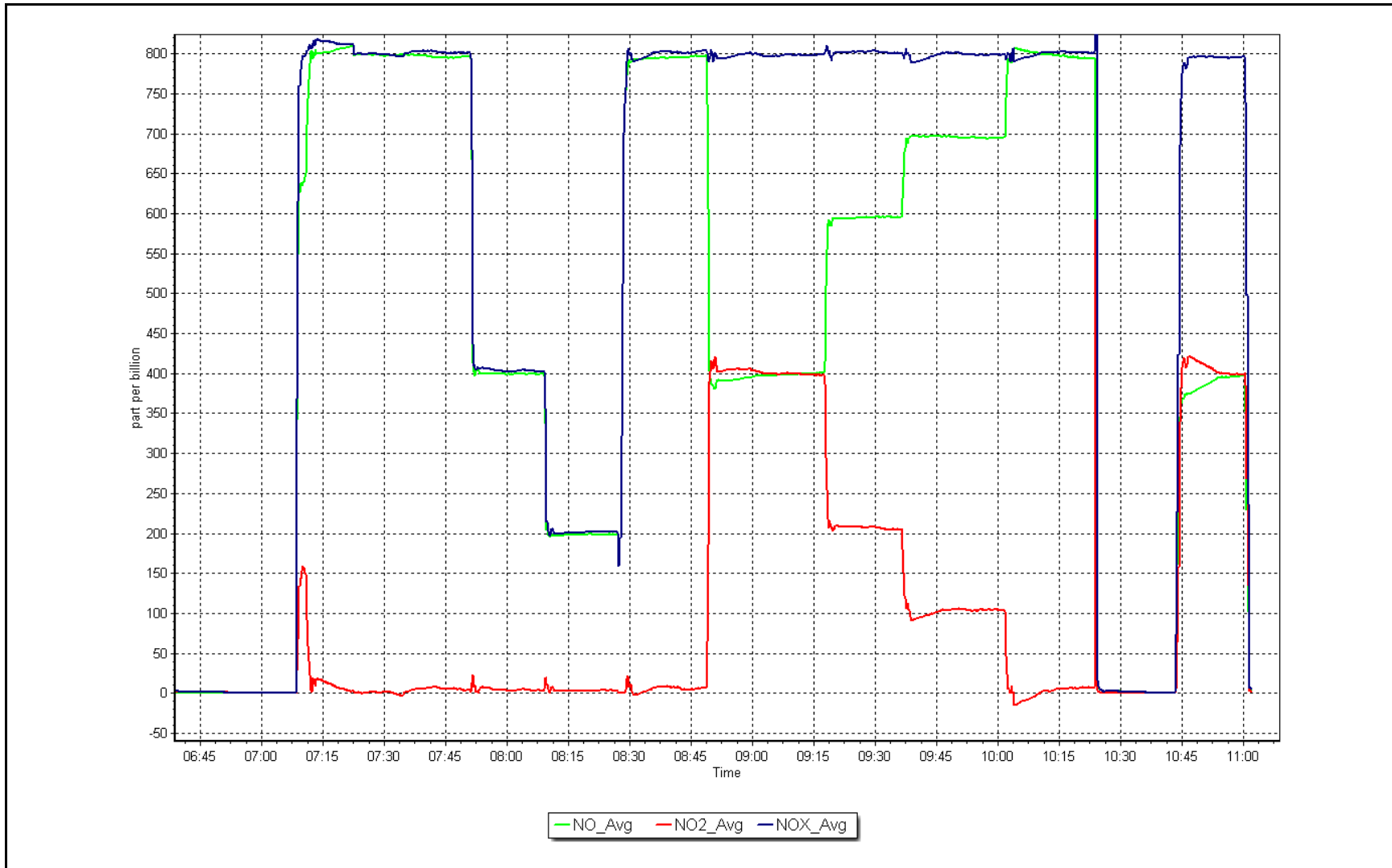
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999996	<i>≥0.995</i>
798.4	795.9	1.0031	Slope	0.996977	<i>0.90 - 1.10</i>
399.2	399.4	0.9995	Intercept	0.385657	<i>+/-20</i>
199.1	198.7	1.0020			



NO_x Calibration Plot

Date: October 17, 2024

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	October 21, 2024	Last Cal Date:	September 10, 2024
Start time (MST):	8:18	End time (MST):	11:28
Reason:	Routine		

Calibration Standards

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

Analyzer Information

Analyzer make:	API T400	Analyzer serial #:	2961
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001057	0.999486	Backgd or Offset:	-2.2
Calibration intercept:	0.640000	0.340000	Coeff or Slope:	1.020

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.7	----
As found High point	5000	996.5	400.0	397.7	1.004
As found Mid point	5000	820.1	200.0	199.4	1.000
As found Low point	5000	709.4	100.0	99.7	0.996
Baseline Corr As found:	398.4	Previous response	401.1	*% change	-0.7%
Baseline Corr 2nd AF pt:	200.1	AF Slope:	0.995571	AF Intercept:	-0.200000
Baseline Corr 3rd AF pt:	100.4	AF Correlation:	0.999992	* = > +/-5% change initiates investigation	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	5000	997.8	400.0	399.9	1.000
Mid point	5000	821.0	200.0	200.6	0.997
Low point	5000	709.6	100.0	100.5	0.995
As left zero	5000	0.0	0.0	-0.7	----
As left span	5000	997.8	400.0	402.7	0.993
Average Correction Factor					0.997

Notes: Adjusted lamp from 2891mV to 4568mV. No adjustments done.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

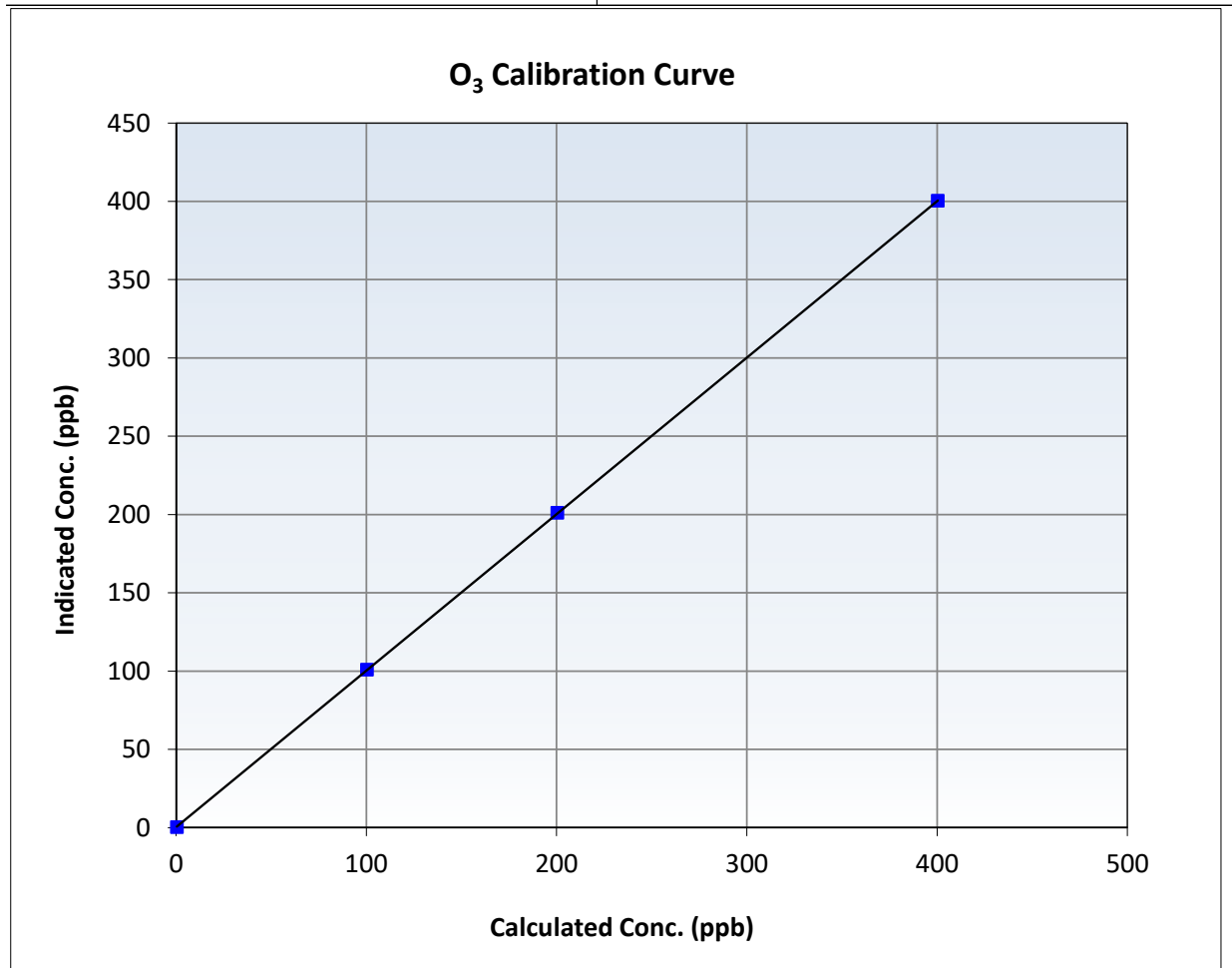
O₃ Calibration Summary

Station Information

Calibration Date:	October 21, 2024	Previous Calibration:	September 10, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:18	End Time (MST):	11:28
Analyzer make:	API T400	Analyzer serial #:	2961

Calibration Data

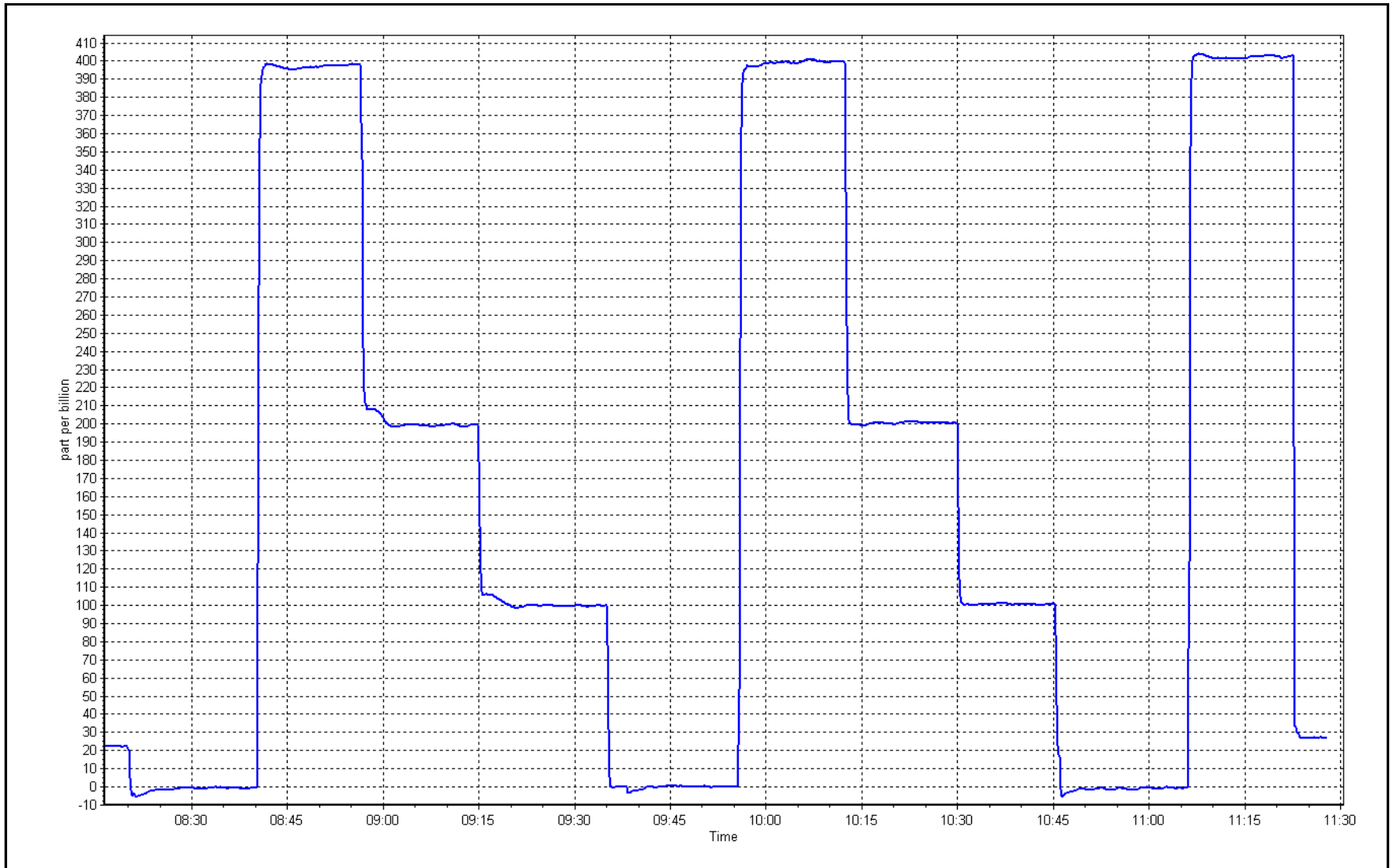
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999996	≥0.995
400.0	399.9	1.0003	Slope	0.999486	0.90 - 1.10
200.0	200.6	0.9970	Intercept	0.340000	+/- 5
100.0	100.5	0.9950			



O₃ Calibration Plot

Date: October 21, 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: October 21, 2024 Last Cal Date: September 23, 2024
 Start time (MST): 7:40 End time (MST): 8:19

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)	-3.1	-3.6	-3.1	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	731.1	733.0	731.1	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.00	4.93	5.00	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	39	----	39	<input type="checkbox"/>	>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: 6-10-2024
 Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test				<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: September 23, 2024
 Date Disposable Filter Changed: October 21, 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

Leak Check and Flow checked before and after disposable filter change. No adjustments done.

Notes:

Calibration by: Melissa Lemay



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Calibration Date:	October 23, 2024	Prev Cal Date:	September 29, 2023
Start Time (MST):	8:05	End Time (MST):	9:10
Tower Height (m):	10m	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	Y3176
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.2	0.2%
400	39.4	39.4	0.1%
600	58.6	58.6	0.1%
800	77.8	77.5	-0.3%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999996	0.999995	≥0.9995
Calculated slope	0.998429	1.002540	0.90 - 1.10
Calculated intercept	-0.012747	-0.073796	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	V11346
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	12:12:43	Calc Declination*:	13.67 Degrees
Deadband calc:	-1.2 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.0	---
90	90.1	0.0%
180	178.8	-0.3%
270	269.4	-0.2%
357	358.2	0.3%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999987	0.999982	≥0.9995
Calculated slope	0.997772	0.998102	0.90 - 1.10
Calculated intercept	0.200128	0.440370	+/- 4

Notes: Old WS removed.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Calibration Date:	October 23, 2024	Prev Cal Date:	September 29, 2023
Start Time (MST):	8:05	End Time (MST):	9:10
Tower Height (m):	10m	Reason:	Install

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P19837
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.4	-0.3%
800	77.8	77.6	-0.2%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999998	≥0.9995
Calculated slope		1.002044	0.90 - 1.10
Calculated intercept		-0.014312	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	V11346
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	12:12;43	Calc Declination*:	13.67 Degrees
Deadband calc:	357.0 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0		---
90		
180		
270		
357		

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)			≥0.9995
Calculated slope			0.90 - 1.10
Calculated intercept			+/- 4

Notes: Old WS removed. New WS installed.

Calibration Performed By: Melissa Lemay



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

**AMS05
MANNIX
OCTOBER 2024**

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	October 7, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	12:48	End time (MST):	16:42
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.006471	0.997715	Backgd or Offset:	10.0	10.2
Calibration intercept:	-1.326424	-0.285963	Coeff or Slope:	0.926	0.923

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	----
As found High point	4920	80.3	800.4	795.9	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	795.7	Previous response	804.2	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4920	80.3	800.4	798.4	1.002
Mid point	4960	40.1	399.7	398.8	1.002
Low point	4980	20.1	200.4	198.5	1.009
As left zero	5000	0.0	0.0	0.4	----
As left span	4920	80.3	800.4	799.0	1.002
Average Correction Factor:					1.005

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

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

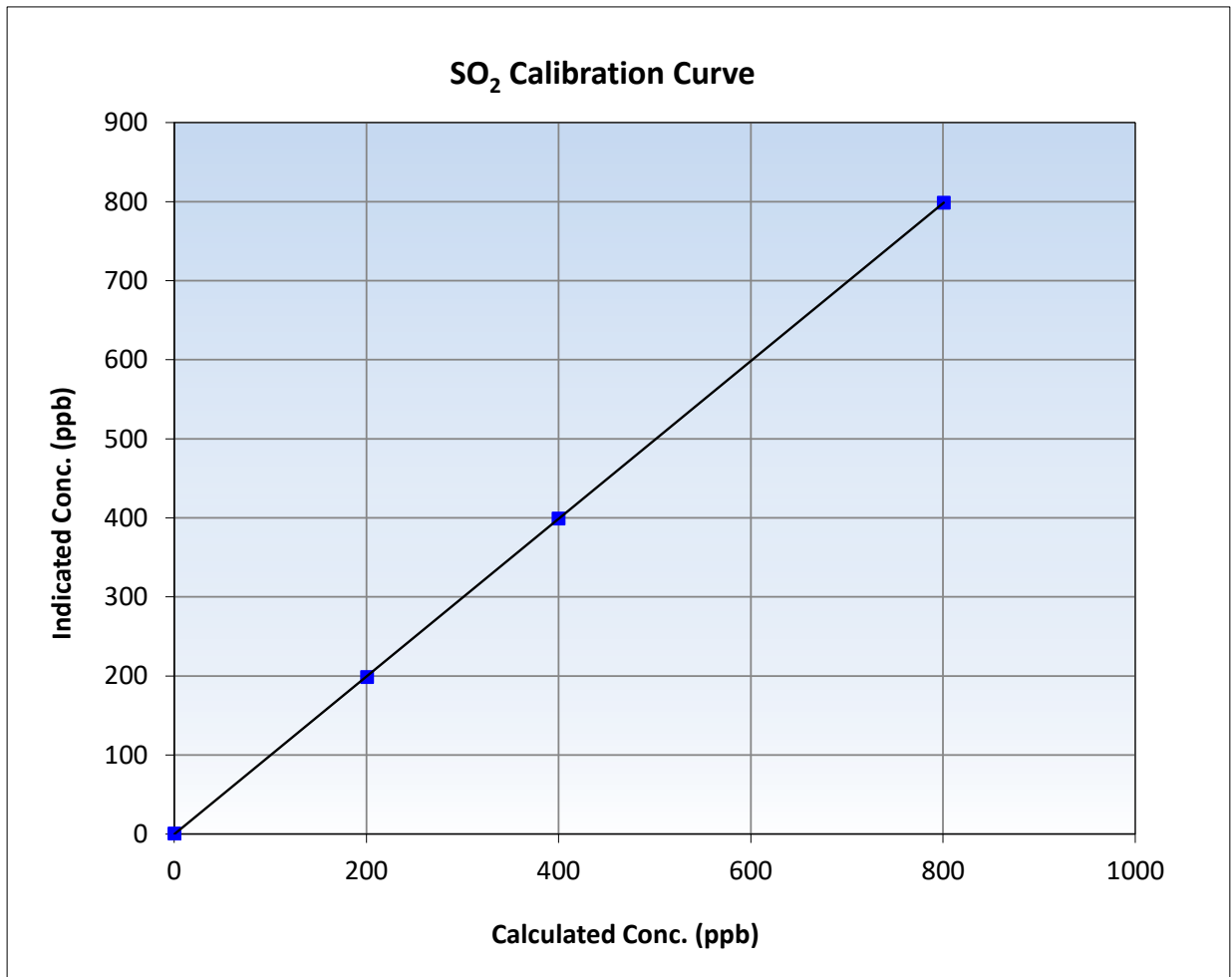
SO₂ Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 4, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	12:48	End Time (MST):	16:42
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841399

Calibration Data

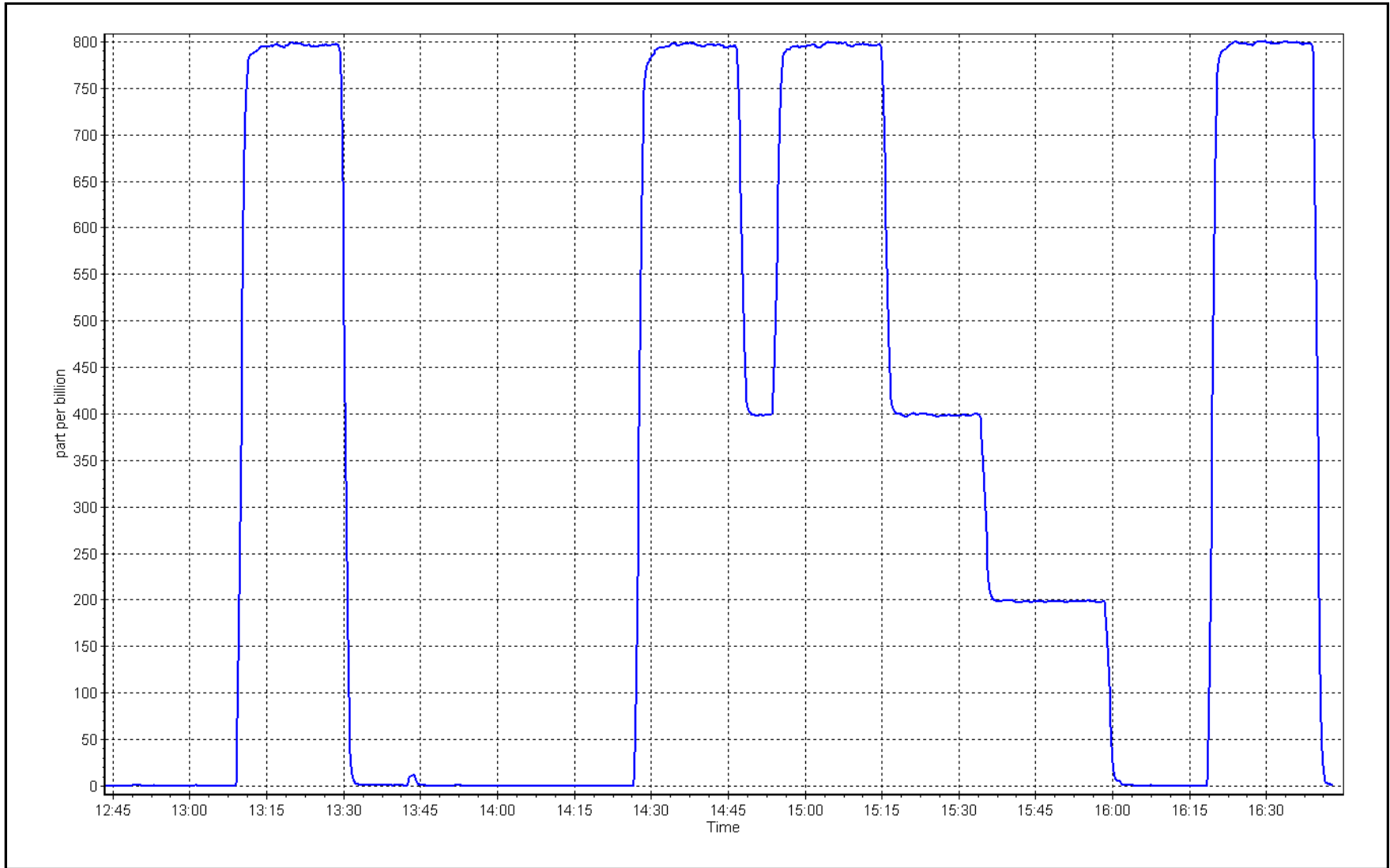
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.4	----	Correlation Coefficient	0.999995	≥0.995
800.4	798.4	1.0025	Slope	0.997715	0.90 - 1.10
399.7	398.8	1.0023	Intercept	-0.285963	+/-30
200.4	198.5	1.0093			



SO2 Calibration Plot

Date: October 7, 2024

Location: Mannix





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	October 9, 2024	Last Cal Date:	September 6, 2024
Start time (MST):	9:24	End time (MST):	13:51
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.989394	0.980961	Backgd or Offset:	1.22	1.22
Calibration intercept:	0.002555	0.122635	Coeff or Slope:	1.009	1.009

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4919	80.6	80.0	79.2	1.008
As found Mid point	4960	40.3	40.0	39.7	1.004
As found Low point	4980	20.2	20.0	19.7	1.012
New cylinder response					
Baseline Corr As found:	79.3	Prev response:	79.12	*% change:	0.2%
Baseline Corr 2nd AF pt:	39.8	AF Slope:	0.992255	AF Intercept:	-0.097575
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999992	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4919	80.6	80.0	78.4	1.020
Mid point	4960	40.3	40.0	39.7	1.007
Low point	4980	20.2	20.0	19.7	1.017
As left zero	5000	0.0	0.0	0.0	----
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	1.015
Date of last converter efficiency test:					

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

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

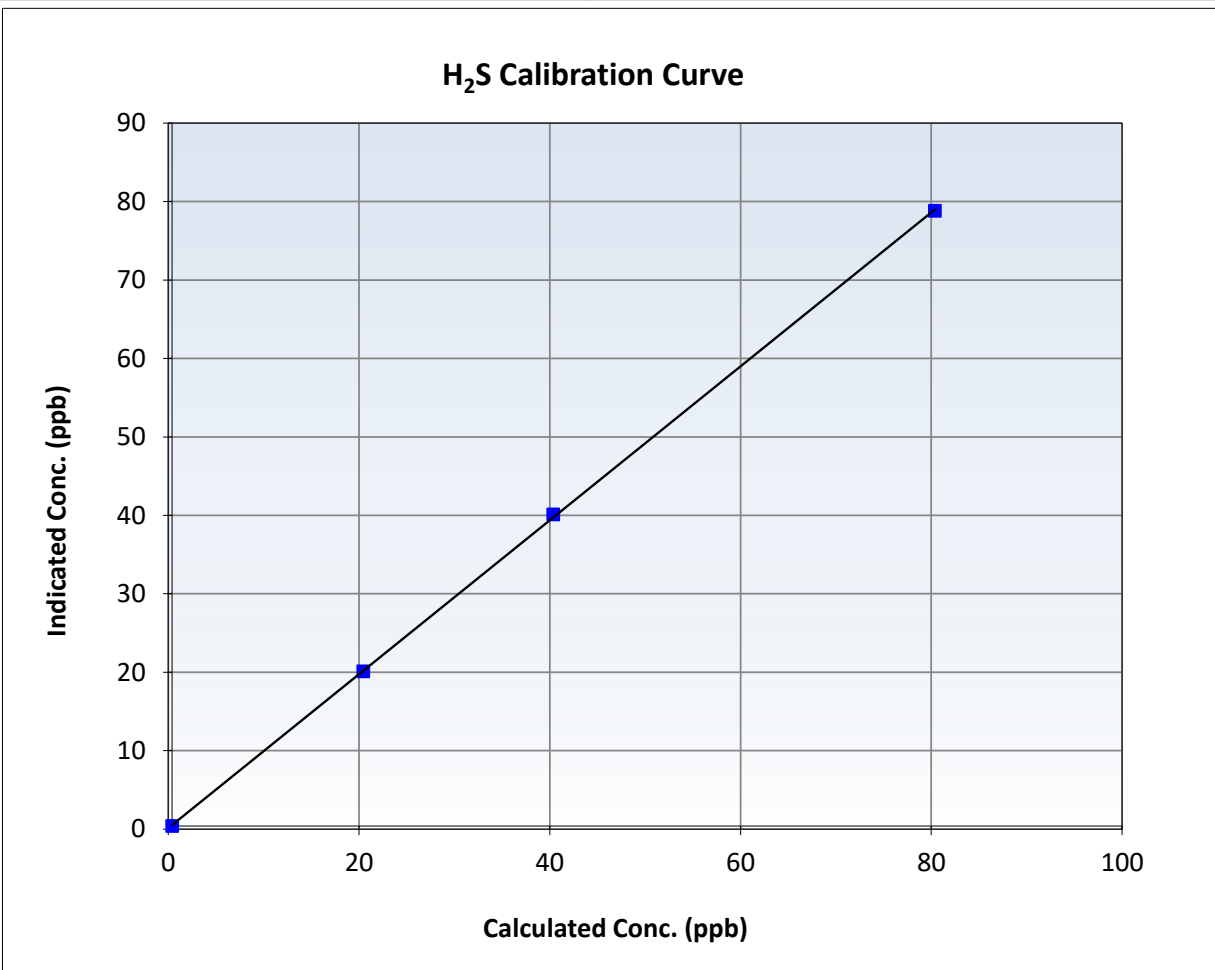
H₂S Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 6, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	9:24	End Time (MST):	13:51
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1200326169

Calibration Data

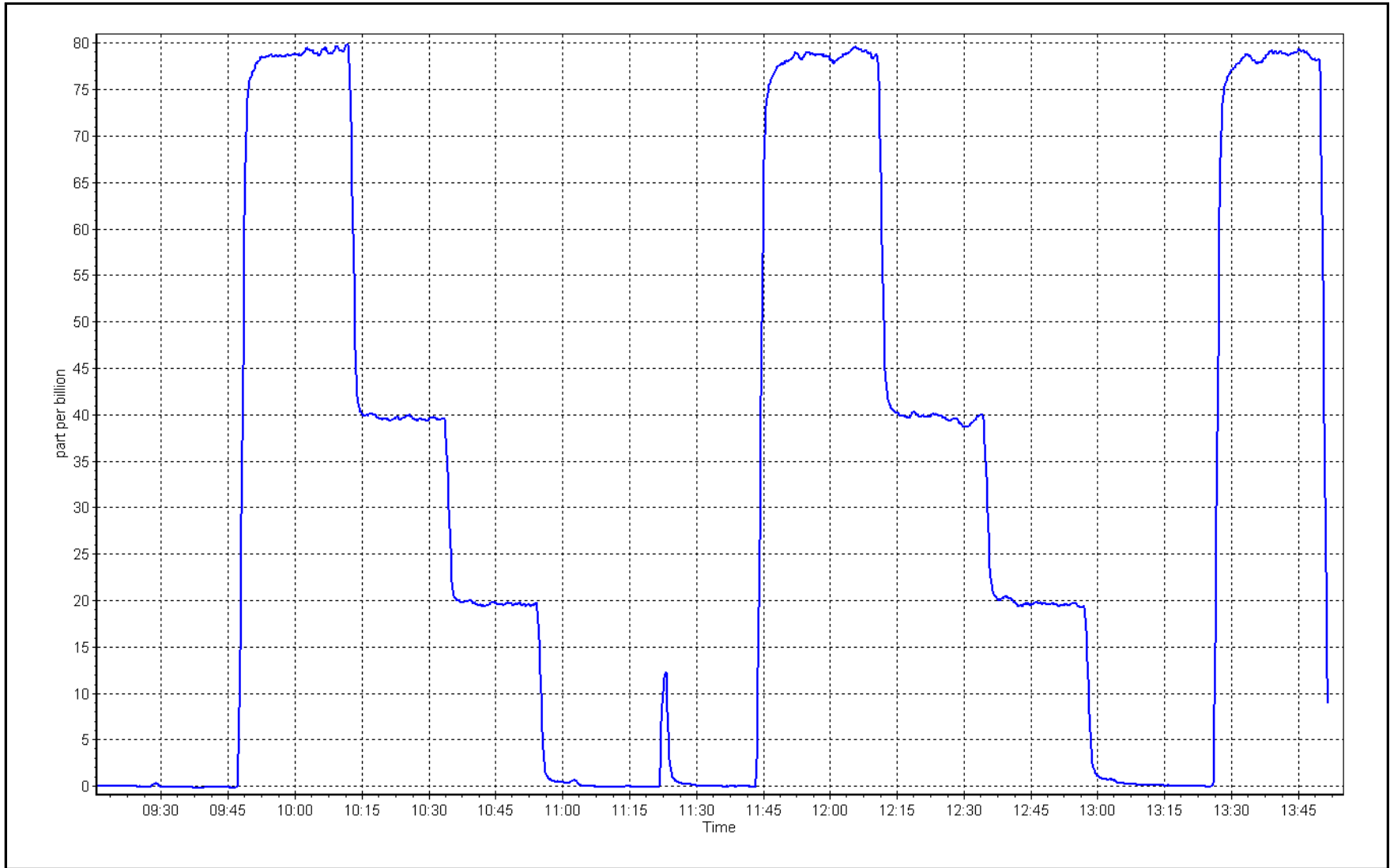
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999947	≥0.995
80.0	78.4	1.0199	Slope	0.980961	0.90 - 1.10
40.0	39.7	1.0069	Intercept	0.122635	+/-3
20.0	19.7	1.0171			



H₂S Calibration Plot

Date: October 9, 2024

Location: Mannix





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	October 7, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	10:57	End time (MST):	12:30
Reason:	Removal		

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 #: 1172750023
THC Range: 0 - 20 ppm	NMHC/CH4 Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	3.25E-04	NA	NMHC SP Ratio:	5.40E-05	NA
CH4 Retention time:	15.5	NA	NMHC Peak Area:	163844	NA
Zero Chromatogram:	ON		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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	16.99	16.92	1.004
As found Mid point	4960	40.1	8.48	8.50	0.998
As found Low point	4980	20.1	4.25	4.24	1.004
New cylinder response					
Baseline Corr AF:	16.92	Prev response	17.01	*% change	-0.5%
Baseline Corr 2nd AF:	8.50	AF Slope:	0.996493	AF Intercept:	0.009686
Baseline Corr 3rd AF:	4.24	AF Correlation:	0.999988	<i>* = > +/-5% change initiates investigation</i>	

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)) <i>Limit = 0.95-1.05</i>
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor

Notes: Removal calibration. No alarms were detected on the analyzer; it may require internal leak testing and maintenance in the workshop.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.84	8.75	1.010
As found Mid point	4960	40.1	4.42	4.41	1.002
As found Low point	4980	20.1	2.21	2.20	1.006
New cylinder response					
Baseline Corr AF:	8.75	Prev response	8.85	*% change	-1.2%
Baseline Corr 2nd AF:	4.41	AF Slope:	0.989724	AF Intercept:	0.011542
Baseline Corr 3rd AF:	2.20	AF Correlation:	0.999979	* = > +/-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)
Calibrator zero					Limit = 0.95-1.05
High point					
Mid point					
Low point					
As left zero					
As left span					

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.15	8.17	0.997
As found Mid point	4960	40.1	4.07	4.10	0.993
As found Low point	4980	20.1	2.04	2.03	1.002
New cylinder response					
Baseline Corr AF:	8.17	Prev response	8.16	*% change	0.1%
Baseline Corr 2nd AF:	4.10	AF Slope:	1.003235	AF Intercept:	-0.000455
Baseline Corr 3rd AF:	2.03	AF Correlation:	0.999989	* = > +/-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)
Calibrator zero					Limit = 0.95-1.05
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor

Calibration Statistics

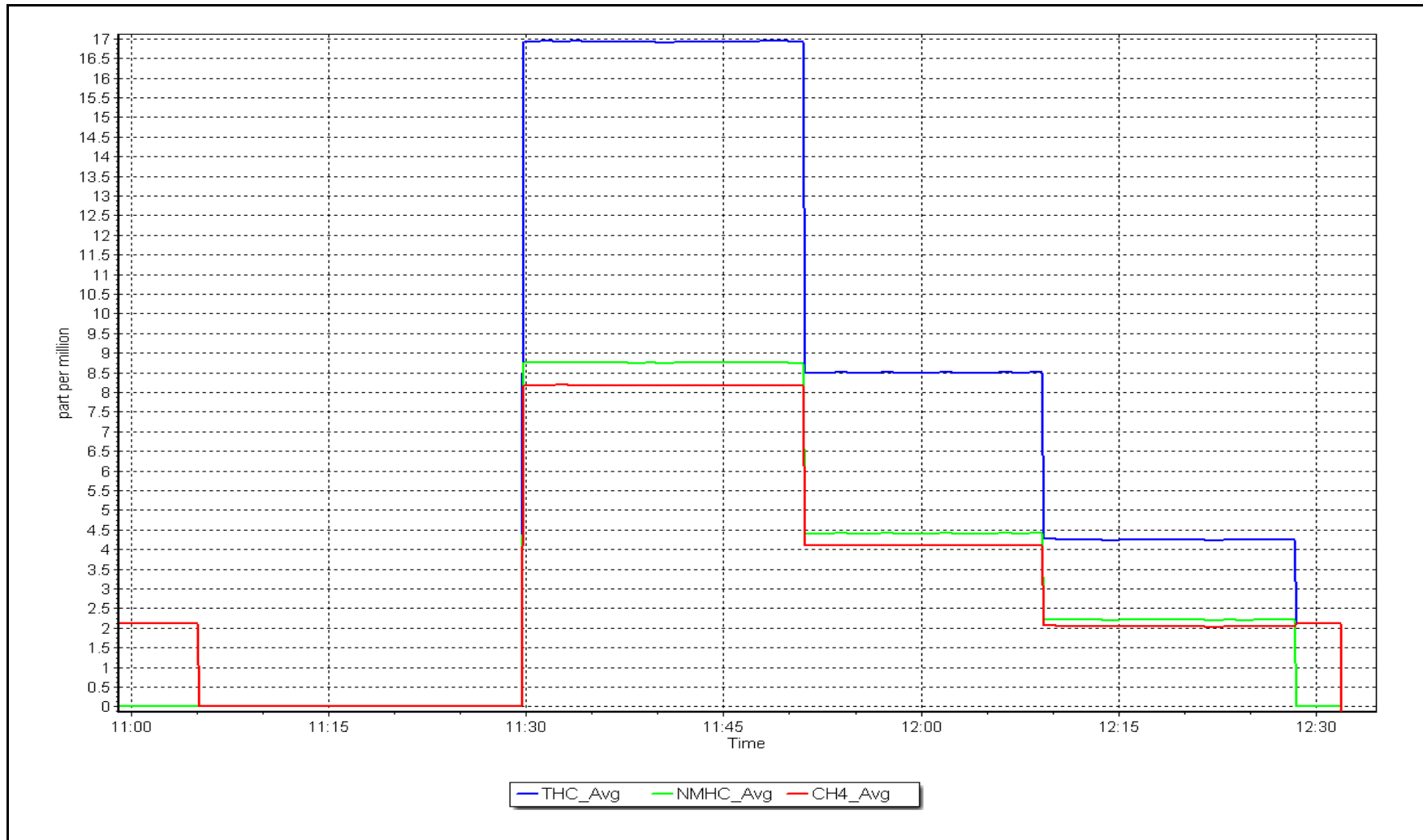
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001218	NA
THC Cal Offset:	0.006072	NA
CH ₄ Cal Slope:	1.002662	NA
CH ₄ Cal Offset:	-0.005663	NA
NMHC Cal Slope:	0.999901	NA
NMHC Cal Offset:	0.011936	NA

Calibration Performed By: Mohammed Kashif

NMHC Calibration Plot

Date: October 7, 2024

Location: Mannix





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	October 7, 2024	Last Cal Date:	NA
Start time (MST):	13:45	End time (MST):	16:42
Reason:	Install		

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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	NA	4.44E-04	NMHC SP Ratio:	NA	5.96E-05
CH4 Retention time:	NA	18.0	NMHC Peak Area:	NA	148223
Zero Chromatogram:		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)) <i>Limit = 0.90-1.10</i>
-----------	----------------------------------	--------------------------------	--	---------------------------------------	--

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)) <i>Limit = 0.95-1.05</i>
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	8.55	0.992
Low point	4980	20.1	4.25	4.29	0.992
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	16.99	17.08	0.994
Average Correction Factor					0.994

Notes: Install calibration. Changed sample inlet filter. Adjusted both zero and span.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero					Limit = 0.90-1.10
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.84	8.86	0.998
Mid point	4960	40.1	4.42	4.45	0.991
Low point	4980	20.1	2.21	2.23	0.992
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.84	8.88	0.995
Average Correction Factor					0.994

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))
As found zero					Limit = 0.90-1.10
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.15	8.15	0.999
Mid point	4960	40.1	4.07	4.10	0.993
Low point	4980	20.1	2.04	2.05	0.993
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.15	8.20	0.993
Average Correction Factor					0.995

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001218	1.001386
THC Cal Offset:	0.006072	0.022079
CH ₄ Cal Slope:	1.002662	1.000907
CH ₄ Cal Offset:	-0.005663	0.010342
NMHC Cal Slope:	0.999901	1.001827
NMHC Cal Offset:	0.011936	0.011737

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

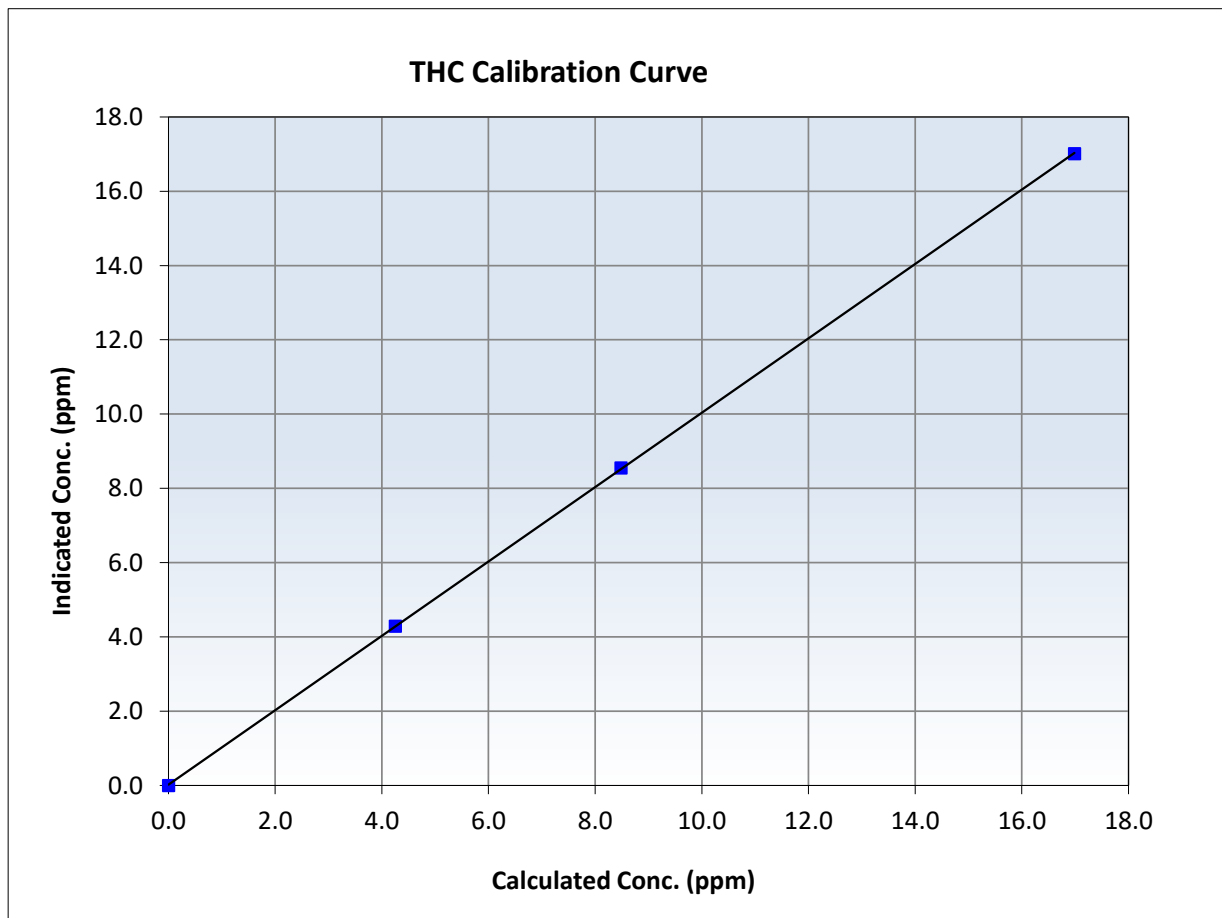
THC Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	NA
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	13:45	End Time (MST):	16:42
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999987	<i>>0.995</i>
16.99	17.01	0.9984	Slope	1.001386	<i>0.90 - 1.10</i>
8.48	8.55	0.9919	Intercept	0.022079	<i>+/-0.5</i>
4.25	4.29	0.9921			





Wood Buffalo Environmental Association

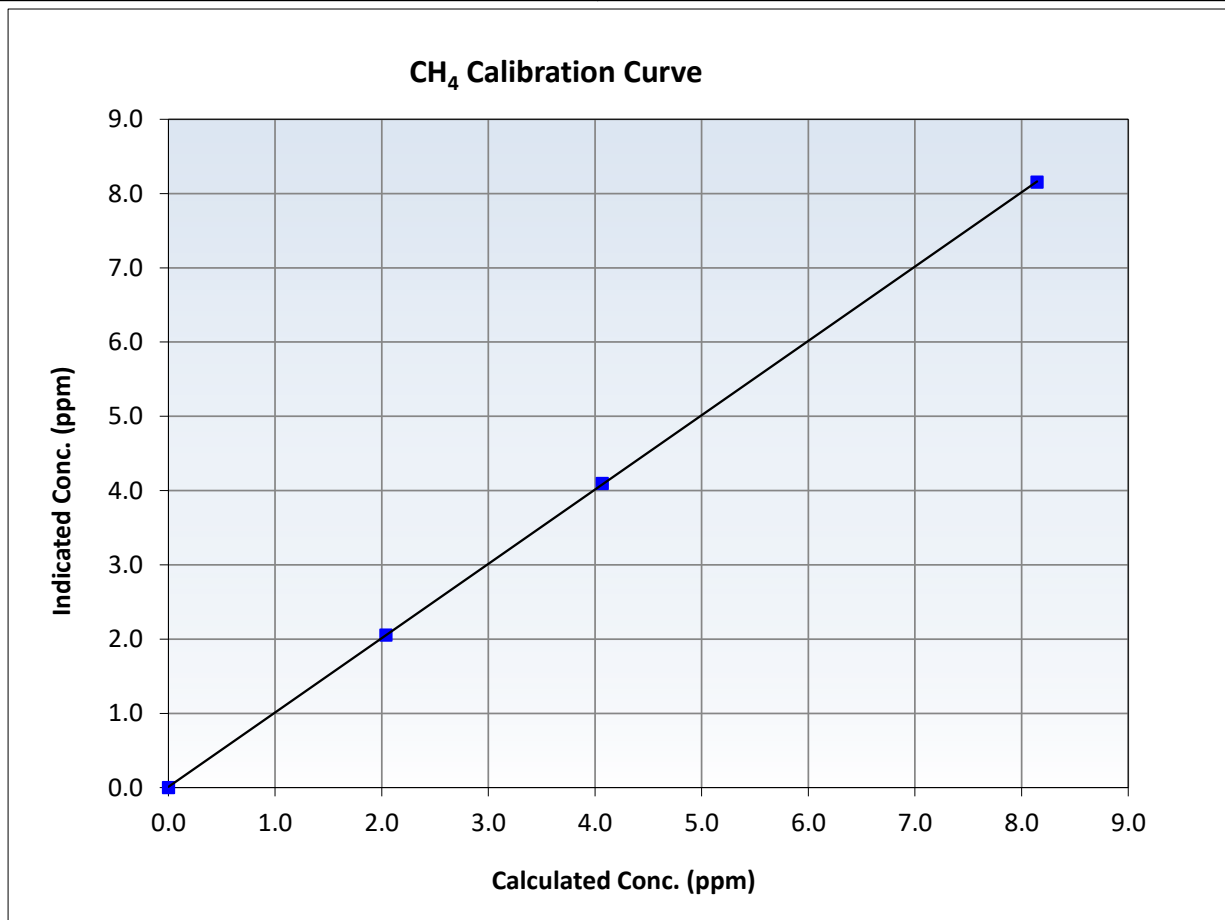
CH₄ Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	NA
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	13:45	End Time (MST):	16:42
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999987	<i>≥0.995</i>
8.15	8.15	0.9989	Slope	1.000907	<i>0.90 - 1.10</i>
4.07	4.10	0.9926	Intercept	0.010342	<i>+/-0.5</i>
2.04	2.05	0.9927			





Wood Buffalo Environmental Association

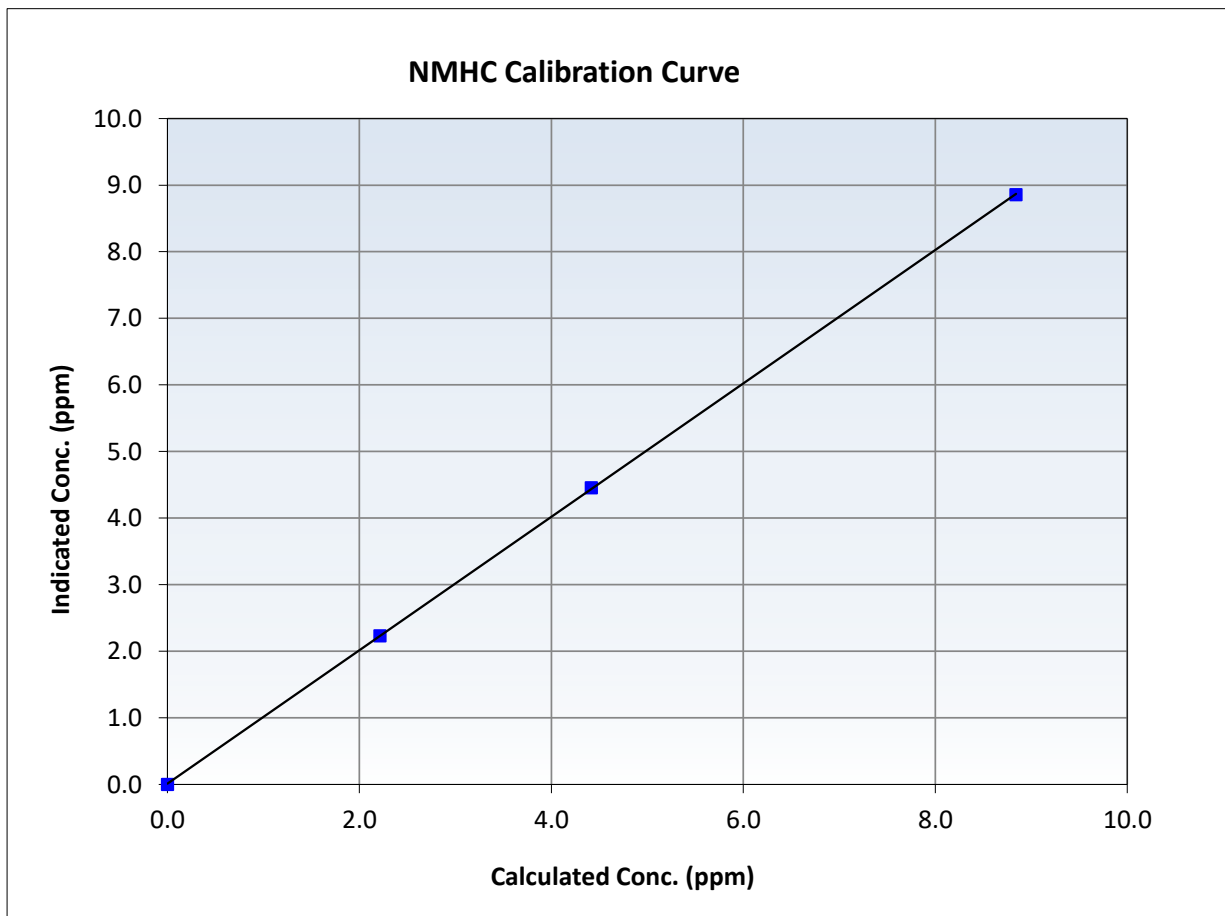
NMHC Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	NA
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	13:45	End Time (MST):	16:42
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

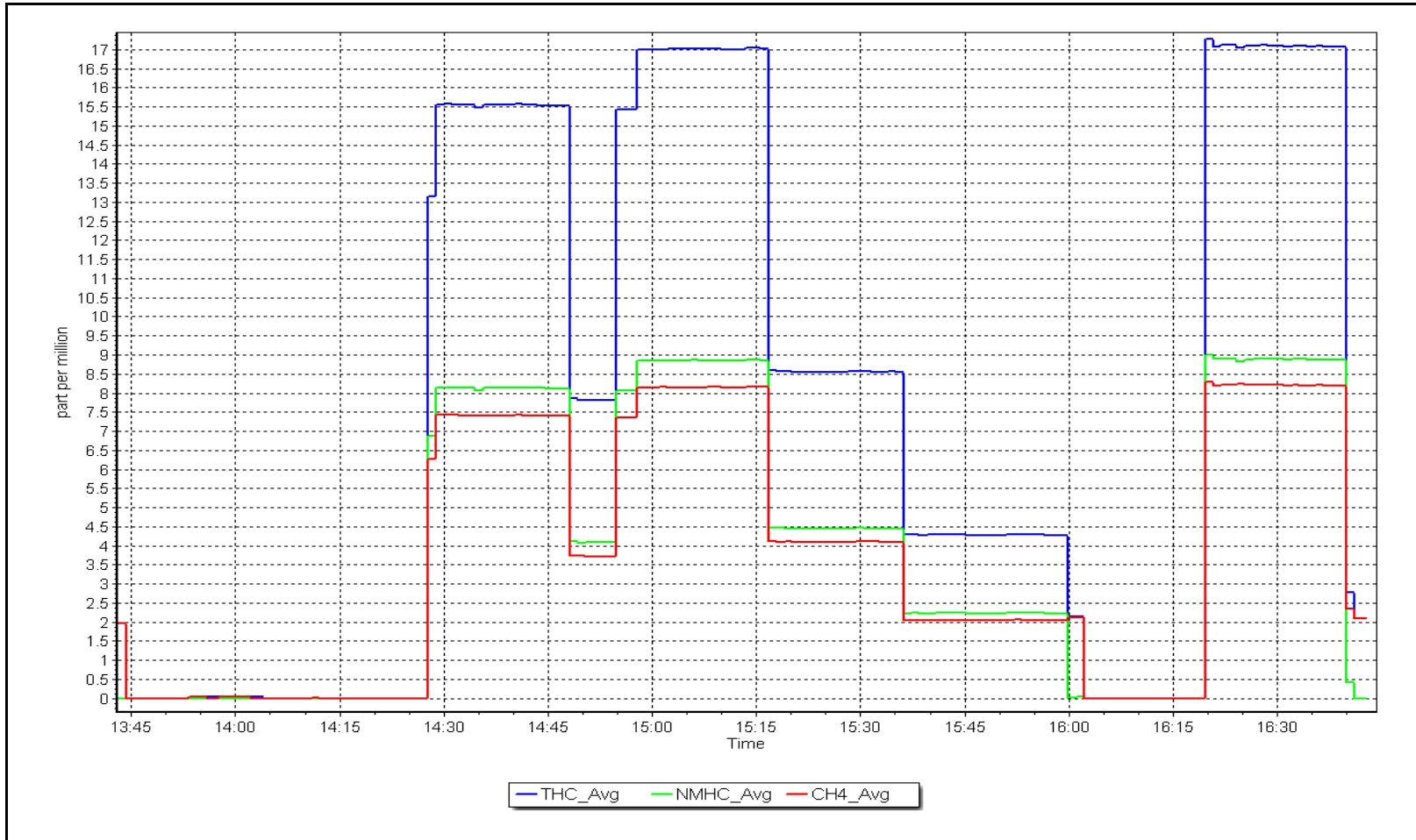
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999986	≥0.995
8.84	8.86	0.9980	Slope	1.001827	0.90 - 1.10
4.42	4.45	0.9913	Intercept	0.011737	+/-0.5
2.21	2.23	0.9916			



NMHC Calibration Plot

Date: October 7, 2024

Location: Mannix





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	October 16, 2024	Last Cal Date:	October 7, 2024
Start time (MST):	12:14	End time (MST):	15:22
Reason:	Maintenance		

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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.44E-04	2.91E-04	NMHC SP Ratio:	5.96E-05
CH4 Retention time:	18.0	15.6	NMHC Peak Area:	148223
Zero Chromatogram:	ON	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	16.99	16.09	1.056
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.09	Prev response	17.03	*% change	-5.9%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	16.99	16.96	1.002
Mid point	4960	40.1	8.48	8.47	1.002
Low point	4980	20.1	4.25	4.20	1.012
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	16.99	16.93	1.003
Average Correction Factor					1.005

Notes: Suspected leak in N2 supply. Regulator, lines and gas scrubber changed out. Carrier pressure bumped up and windows adjusted as peak close to end of window.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.84	8.57	1.032
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.57	Prev response	8.87	*% change	-3.5%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.84	8.81	1.004
Mid point	4960	40.1	4.42	4.40	1.005
Low point	4980	20.1	2.21	2.18	1.015
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.84	8.80	1.005
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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.15	7.52	1.083
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.52	Prev response	8.16	*% change	-8.5%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.15	8.15	0.999
Mid point	4960	40.1	4.07	4.07	0.998
Low point	4980	20.1	2.04	2.02	1.007
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.15	8.13	1.001
Average Correction Factor					1.002

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001386	0.999287
THC Cal Offset:	0.022079	-0.017324
CH ₄ Cal Slope:	1.000907	1.001581
CH ₄ Cal Offset:	0.010342	-0.006059
NMHC Cal Slope:	1.001827	0.997147
NMHC Cal Offset:	0.011737	-0.010665

Calibration Performed By: Ryan Power



Wood Buffalo Environmental Association

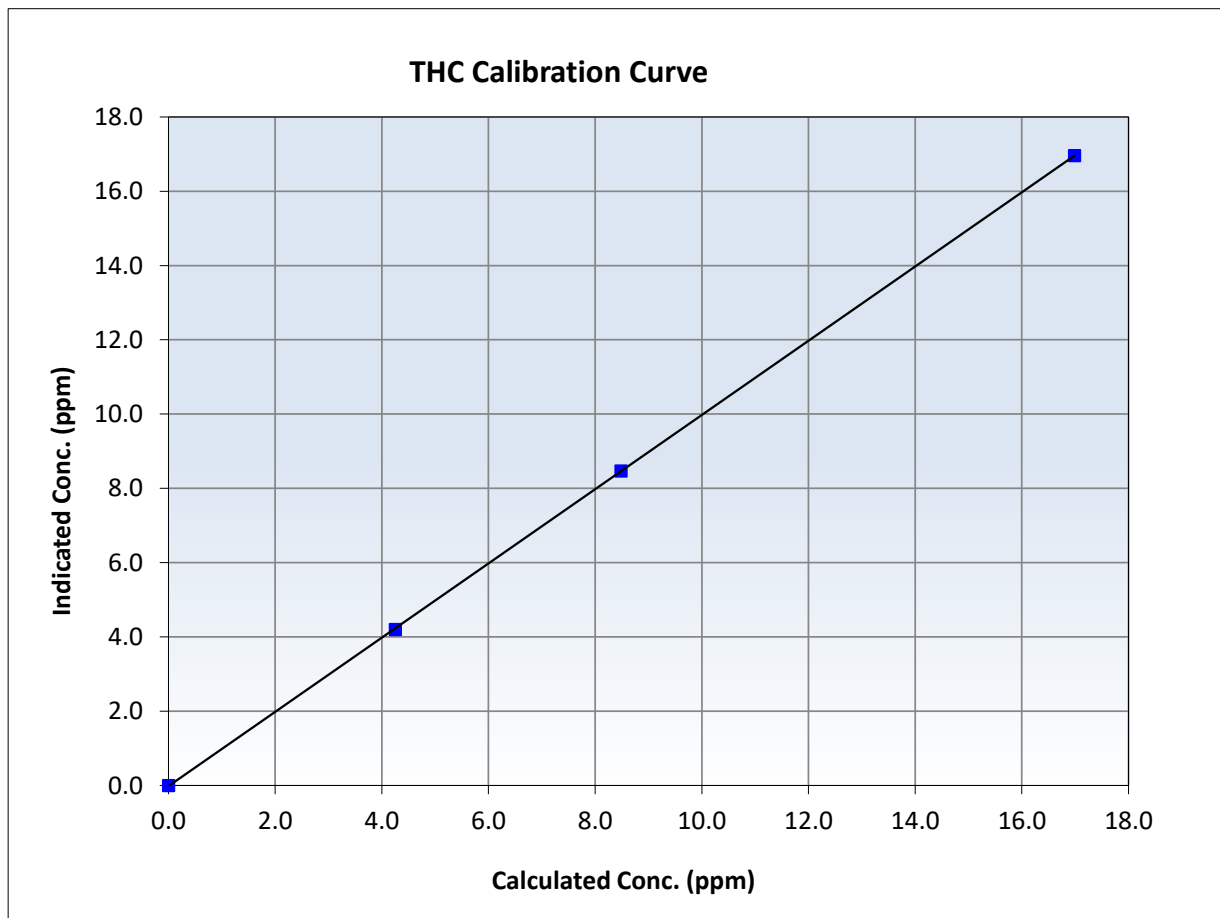
THC Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	October 7, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	12:14	End Time (MST):	15:22
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	0.999992	≥0.995
16.99	16.96	1.0016	Slope	0.999287	0.90 - 1.10
8.48	8.47	1.0018	Intercept	-0.017324	+/-0.5
4.25	4.20	1.0117			





Wood Buffalo Environmental Association

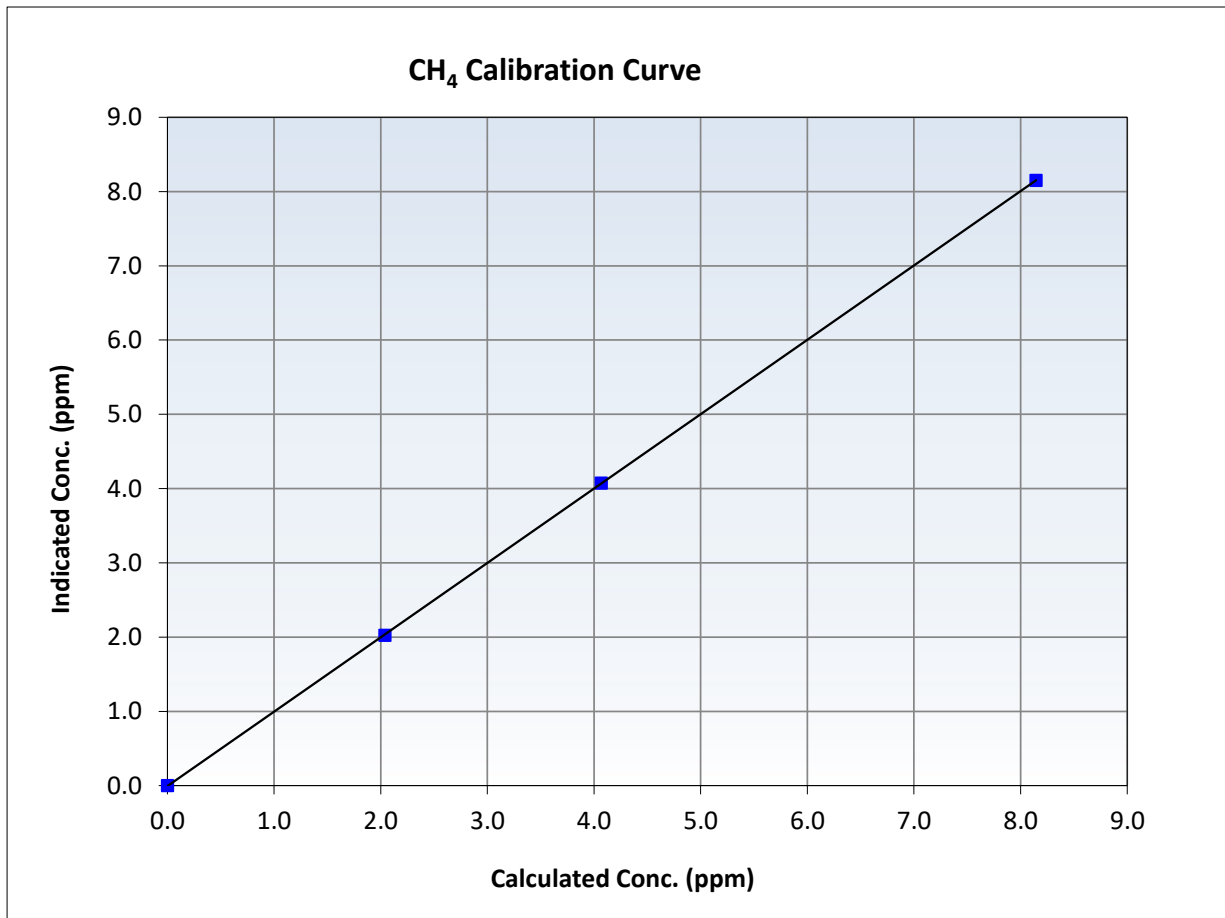
CH₄ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	October 7, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	12:14	End Time (MST):	15:22
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999994	<i>≥0.995</i>
8.15	8.15	0.9992	Slope	1.001581	<i>0.90 - 1.10</i>
4.07	4.07	0.9984	Intercept	-0.006059	<i>+/-0.5</i>
2.04	2.02	1.0074			





Wood Buffalo Environmental Association

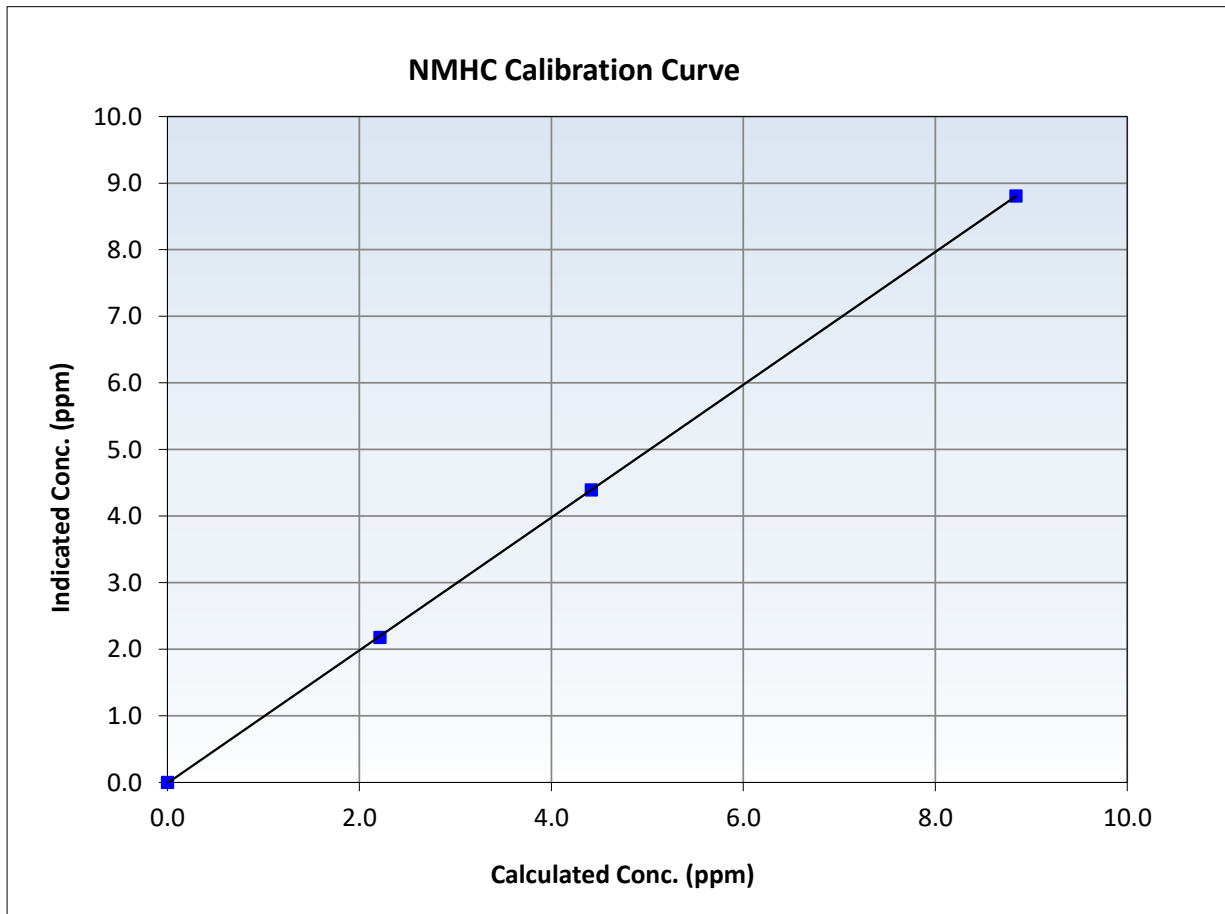
NMHC Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	October 7, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	12:14	End Time (MST):	15:22
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

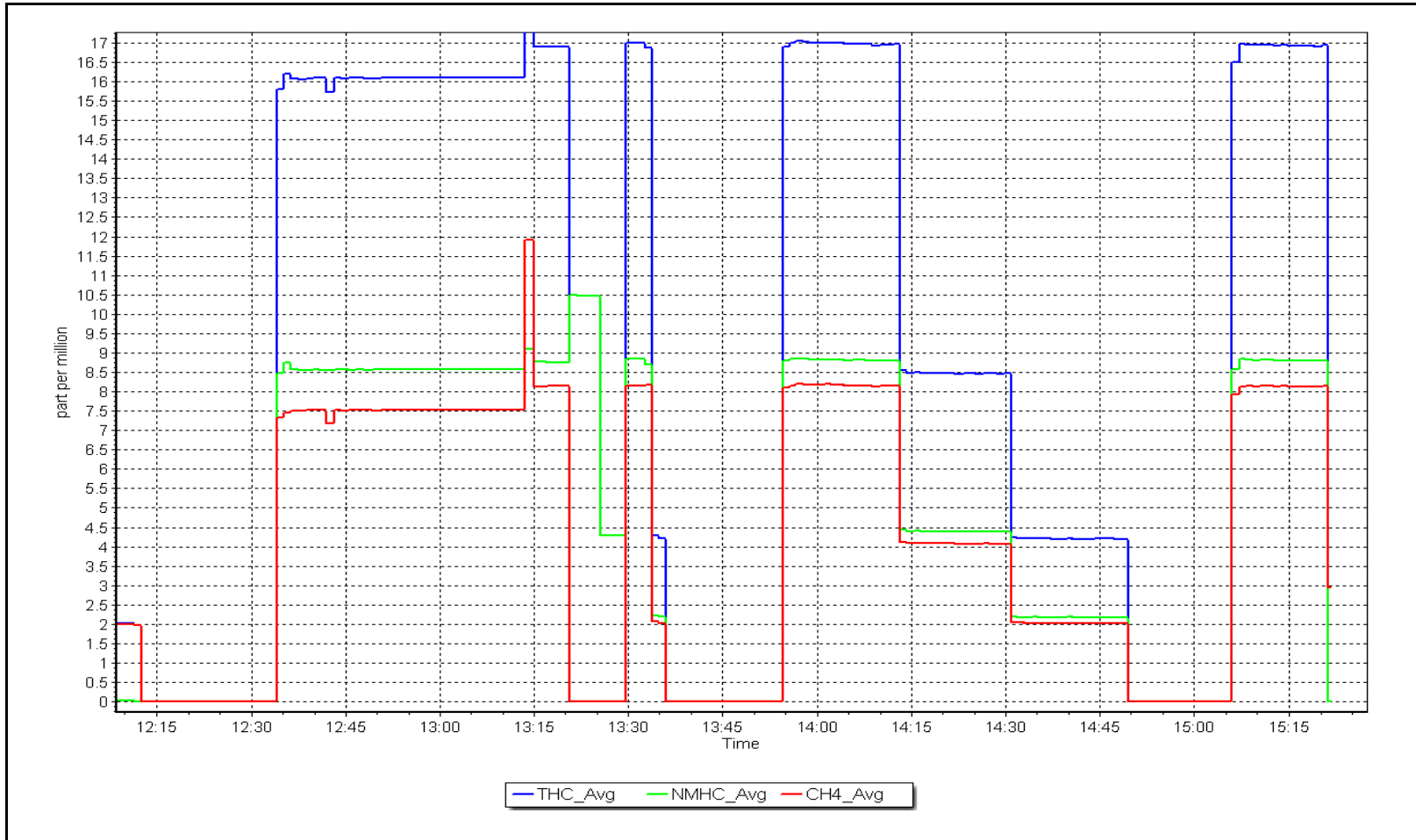
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999991	<i>≥0.995</i>
8.84	8.81	1.0038	Slope	0.997147	<i>0.90 - 1.10</i>
4.42	4.40	1.0046	Intercept	-0.010665	<i>+/-0.5</i>
2.21	2.18	1.0152			



NMHC Calibration Plot

Date: October 16, 2024

Location: Mannix





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	October 28, 2024	Last Cal Date:	October 16, 2024
Start time (MST):	10:54	End time (MST):	12:39
Reason:	Cylinder Change		

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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.91E-04	2.91E-04	NMHC SP Ratio:	5.29E-05	5.29E-05
CH4 Retention time:	15.6	15.6	NMHC Peak Area:	167221	167221
Zero Chromatogram:	ON	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	16.99	16.91	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.91	Prev response	16.96	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	16.99	16.87	1.007
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 1.007

Notes: Changed Nitrogen cylinder.



Wood Buffalo Environmental Association

THC / CH₄ / 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.84	8.81	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.81	Prev response	8.81	*% change	0.0%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.84	8.78	1.007
Mid point					
Low point					
As left zero					
As left span					

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.15	8.10	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.10	Prev response	8.15	*% change	-0.6%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.15	8.09	1.007
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 1.007

Calibration Statistics

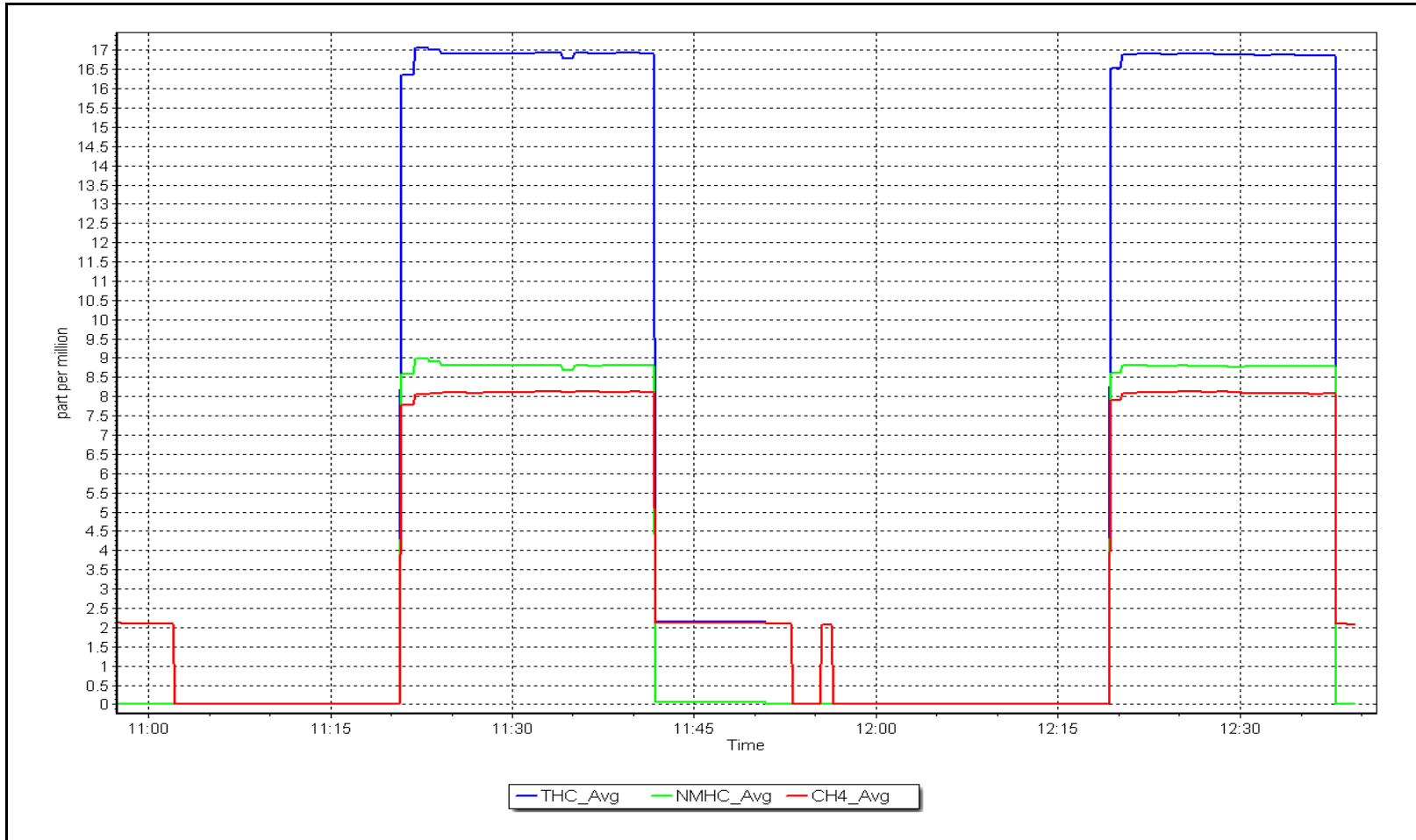
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999287	NA
THC Cal Offset:	-0.017324	NA
CH ₄ Cal Slope:	1.001581	NA
CH ₄ Cal Offset:	-0.006059	NA
NMHC Cal Slope:	0.997147	NA
NMHC Cal Offset:	-0.010665	NA

Calibration Performed By: Mohammed Kashif

NMHC Calibration Plot

Date: October 28, 2024

Location: Mannix





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS06
PATRICIA MCINNES
OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	October 4, 2024	Last Cal Date:	September 5, 2024
Start time (MST):	9:04	End time (MST):	12:41
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001060	1.004767	Backgd or Offset:	17.7	18.1
Calibration intercept:	0.700654	2.178482	Coeff or Slope:	0.901	0.910

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4919.7	80.3	799.5	795.5	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	795.8	Previous response	801.0	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	4919.7	80.3	799.5	804.0	0.994
Mid point	4959.8	40.2	400.2	406.2	0.985
Low point	4979.9	20.1	200.1	205.3	0.975
As left zero	5000	0.0	0.0	-0.1	----
As left span	4919.7	80.3	799.5	806.4	0.991
Average Correction Factor:					0.985

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

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

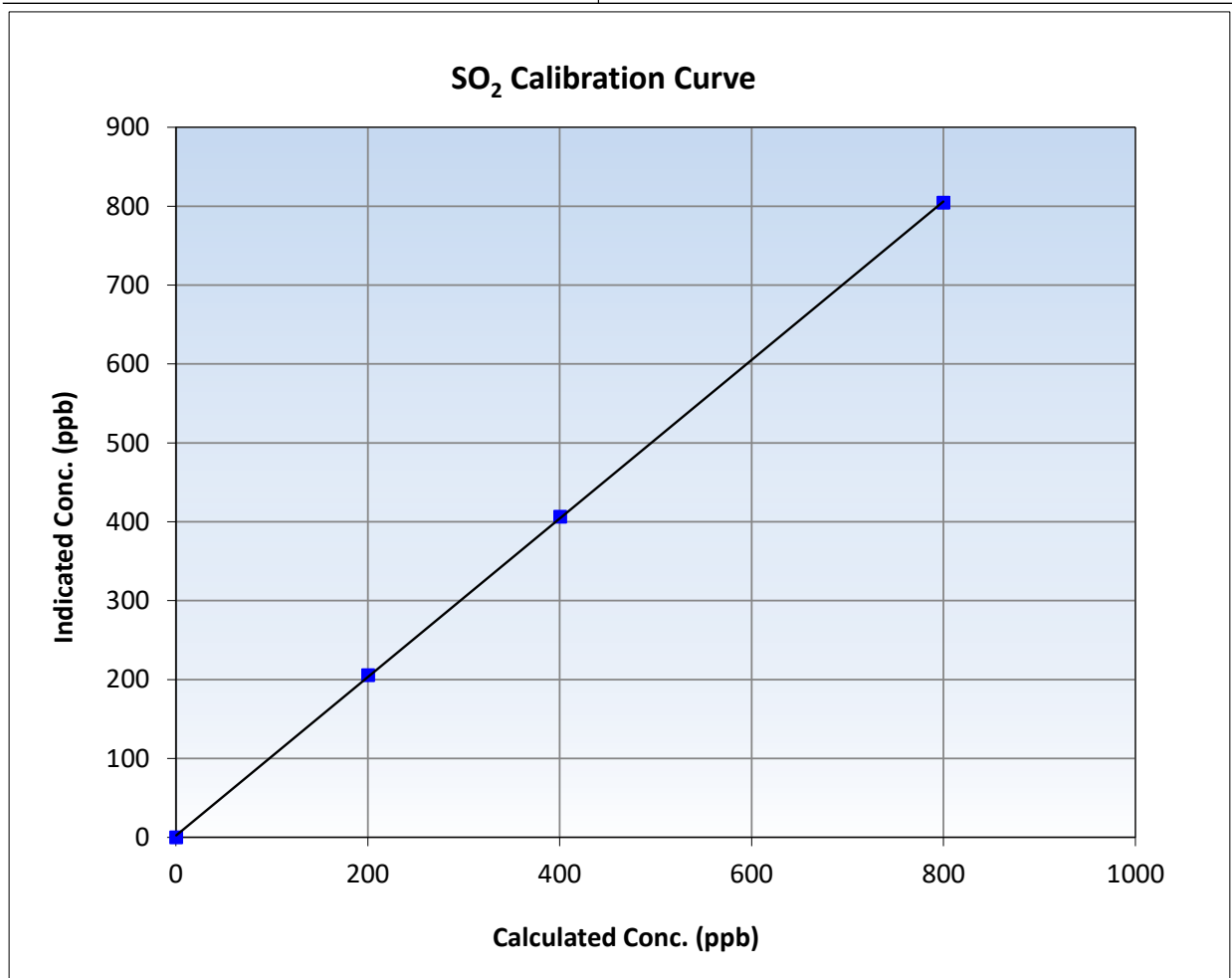
SO₂ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 5, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:04	End Time (MST):	12:41
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290013

Calibration Data

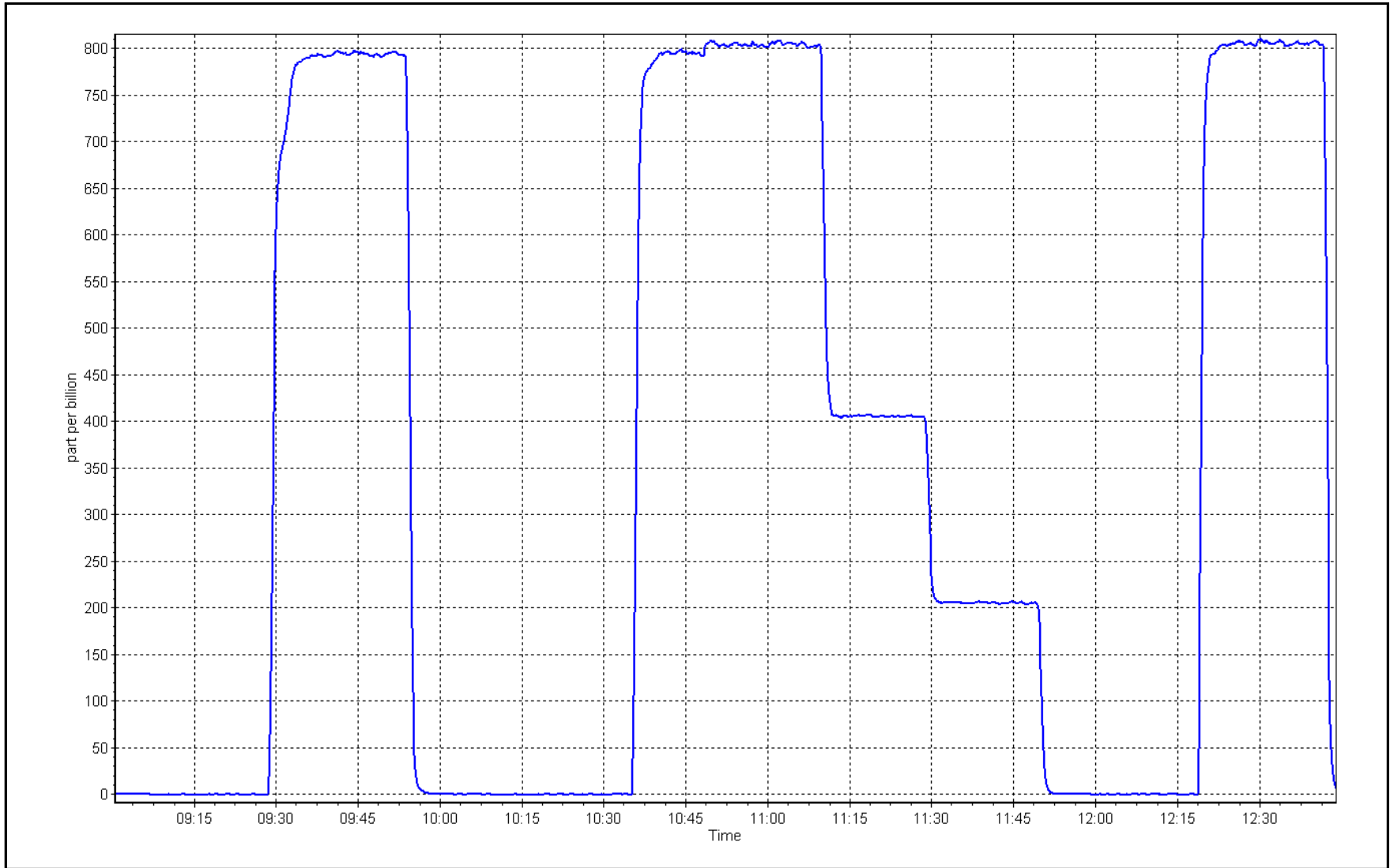
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.3	----	Correlation Coefficient	0.999955	≥0.995
799.5	804.0	0.9944	Slope	1.004767	0.90 - 1.10
400.2	406.2	0.9853	Intercept	2.178482	+/-30
200.1	205.3	0.9747			



SO2 Calibration Plot

Date: October 4, 2024

Location: Patricia McInnes





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	October 7, 2024	Last Cal Date:	September 12, 2024
Start time (MST):	9:45	End time (MST):	15:30
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.990454	0.995318	Backgd or Offset:	1.99	2.02
Calibration intercept:	-0.219616	0.160113	Coeff or Slope:	1.145	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4925	75.1	80.0	81.2	0.986
As found Mid point	4963	37.5	40.0	40.6	0.984
As found Low point	4981	18.8	20.0	19.4	1.033
New cylinder response					
Baseline Corr As found:	81.2	Prev response:	79.04	*% change:	2.7%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.018734	AF Intercept:	-0.359514
Baseline Corr 3rd AF pt:	19.4	AF Correlation:	0.999830	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4925	75.1	80.0	79.9	1.002
Mid point	4963	37.5	40.0	39.8	1.004
Low point	4981	18.8	20.0	20.0	1.002
As left zero	5000	0.0	0.0	0.5	----
As left span	4925	75.1	80.0	77.6	1.031
SO2 Scrubber Check	4920	80.3	803.0	-0.1	----
Date of last scrubber change:	December 20, 2021			Ave Corr Factor	1.002
Date of last converter efficiency test:					

Notes: Inlet filter replaced and SO2 scrubber test completed after the as founds. TRS converter temp increased to help improve linearity. Adjusted span only.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

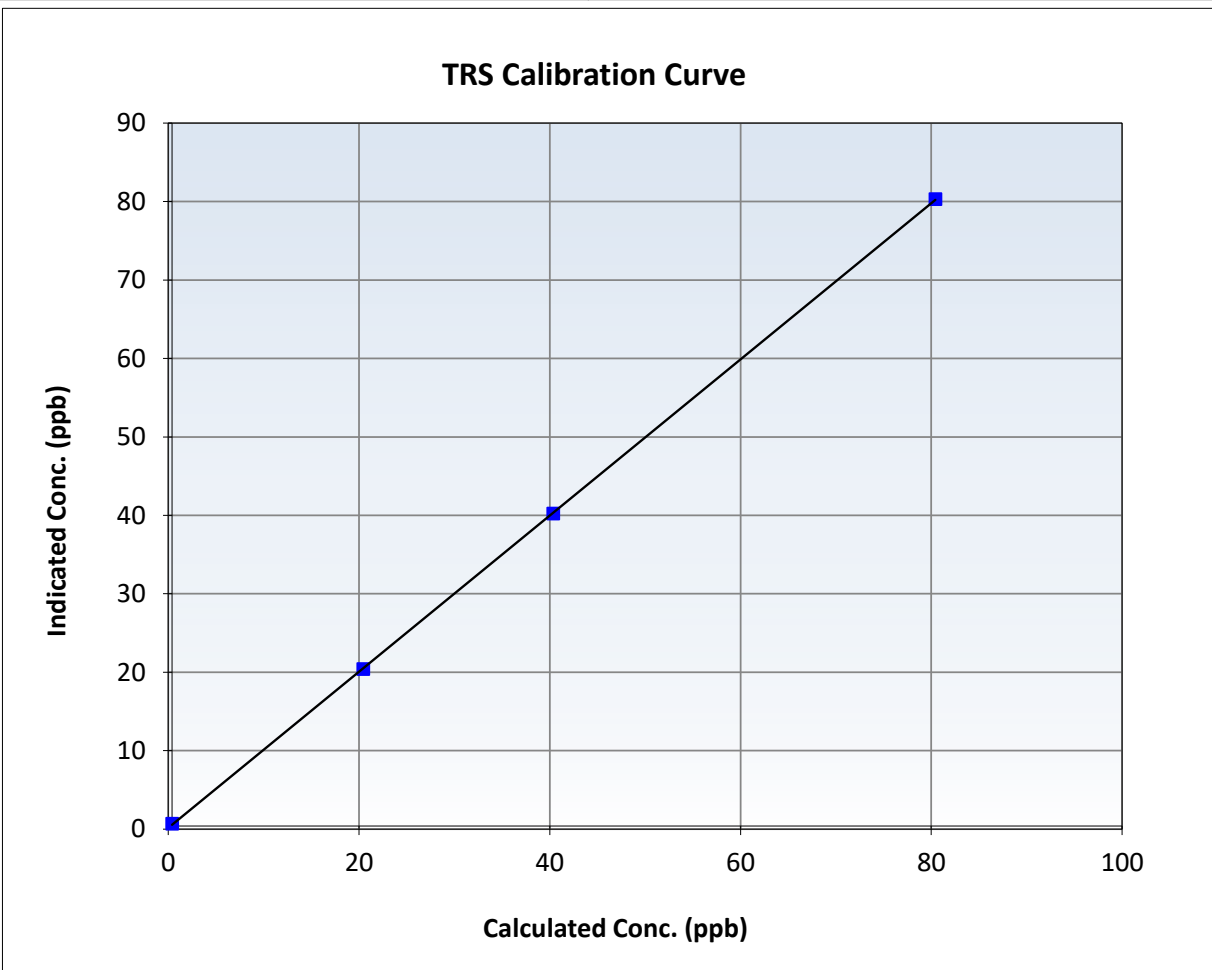
TRS Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 12, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:45	End Time (MST):	15:30
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1218153358

Calibration Data

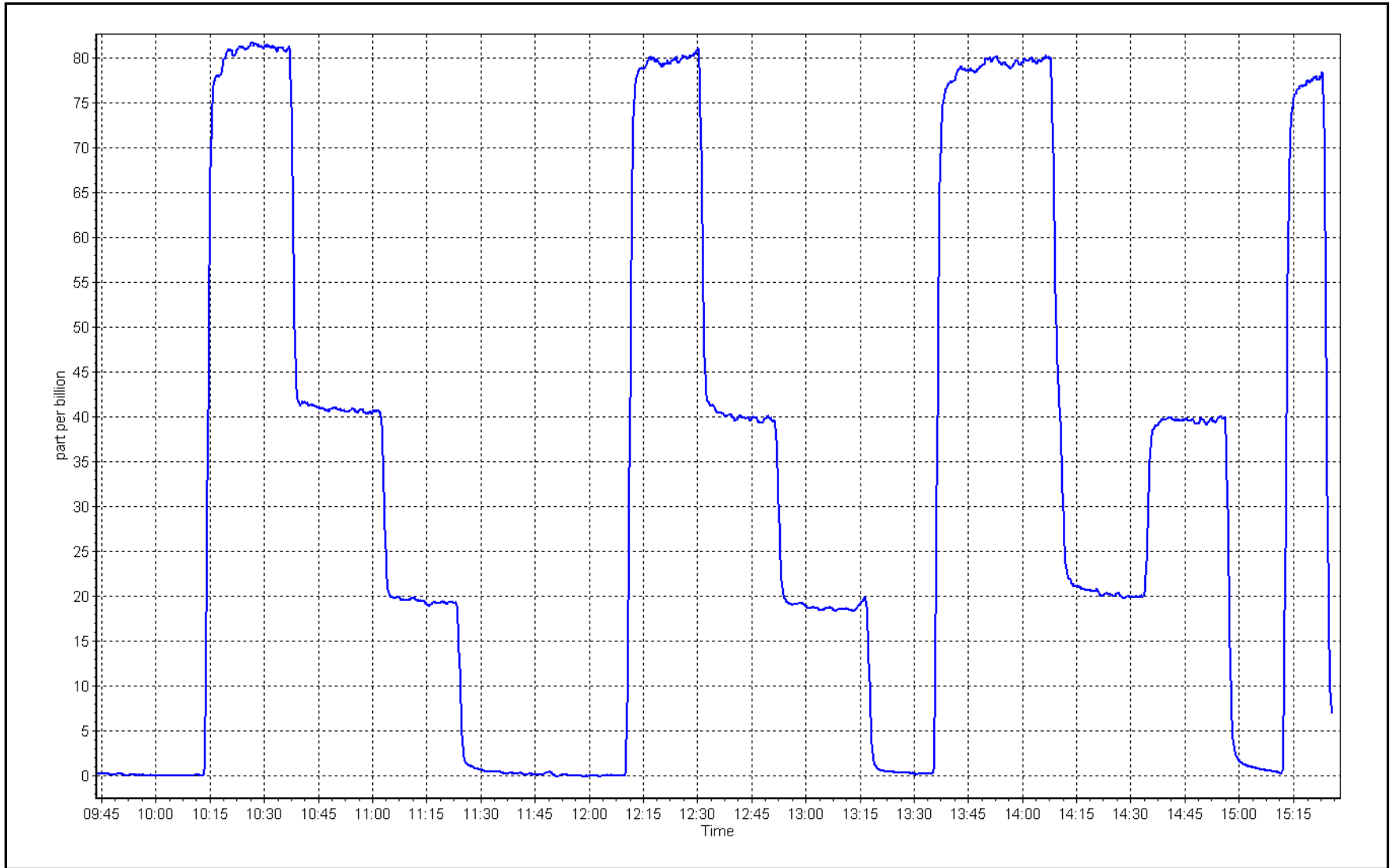
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.3	----	Correlation Coefficient	0.999984	≥ 0.995
80.0	79.9	1.0016	Slope	0.995318	$0.90 - 1.10$
40.0	39.8	1.0039	Intercept	0.160113	± 3
20.0	20.0	1.0017			



TRS Calibration Plot

Date: October 7, 2024

Location: Patricia McInnes





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	October 4, 2024	Last Cal Date:	September 15, 2024
Start time (MST):	9:04	End time (MST):	12:41
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	AAL070632	Cal Gas Expiry Date:	September 9, 2024
CH ₄ Cal Gas Conc.	501.6 ppm	CH ₄ Equiv Conc.	1066.2 ppm
C ₃ H ₈ Cal Gas Conc.	205.3 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH ₄ Conc.	501.6 ppm	CH ₄ Equiv Conc.	1066.2 ppm
Removed C ₃ H ₈ 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 #: 1118148495
THC Range: 0 - 20 ppm	NMHC/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH ₄ SP Ratio:	2.18E-04	2.29E-04	NMHC SP Ratio:	5.40E-05	5.52E-05
CH ₄ Retention time:	14.2	14.4	NMHC Peak Area:	168033	164401
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.12	16.94	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.94	Prev response	17.13	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.12	17.13	1.000
Mid point	4960	40.2	8.57	8.56	1.002
Low point	4980	20.1	4.29	4.33	0.990
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.12	17.13	1.000
Average Correction Factor					0.997

Notes: Sample inlet filters, H₂ and N₂ cylinder changed after as founds. Adjusted span only.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.07	9.16	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.16	Prev response	9.09	*% change	0.8%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.07	9.08	0.998
Mid point	4960	40.2	4.54	4.56	0.996
Low point	4980	20.1	2.27	2.31	0.982
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.07	9.12	0.995
Average Correction Factor					0.992

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.06	7.78	1.035
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.78	Prev response	8.03	*% change	-3.2%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.06	8.05	1.001
Mid point	4960	40.2	4.03	4.00	1.008
Low point	4980	20.1	2.02	2.02	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.06	8.01	1.005
Average Correction Factor					1.003

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999341	0.999473
THC Cal Offset:	0.019839	0.012843
CH ₄ Cal Slope:	0.997363	0.998241
CH ₄ Cal Offset:	-0.000147	-0.003747
NMHC Cal Slope:	0.999964	1.000467
NMHC Cal Offset:	0.021988	0.016990

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

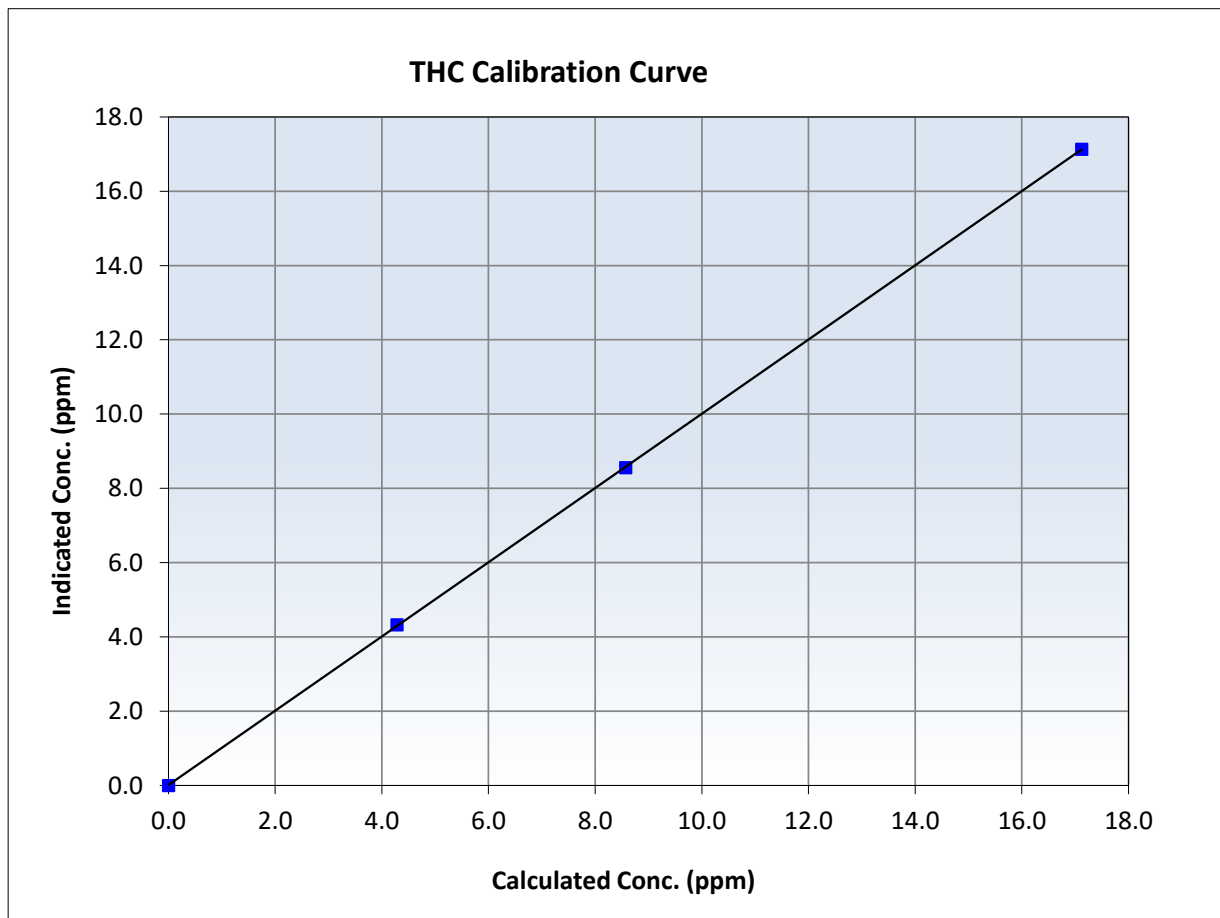
THC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 15, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:04	End Time (MST):	12:41
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999989	<i>≥0.995</i>
17.12	17.13	0.9996	Slope	0.999473	<i>0.90 - 1.10</i>
8.57	8.56	1.0017	Intercept	0.012843	<i>+/-0.5</i>
4.29	4.33	0.9901			





Wood Buffalo Environmental Association

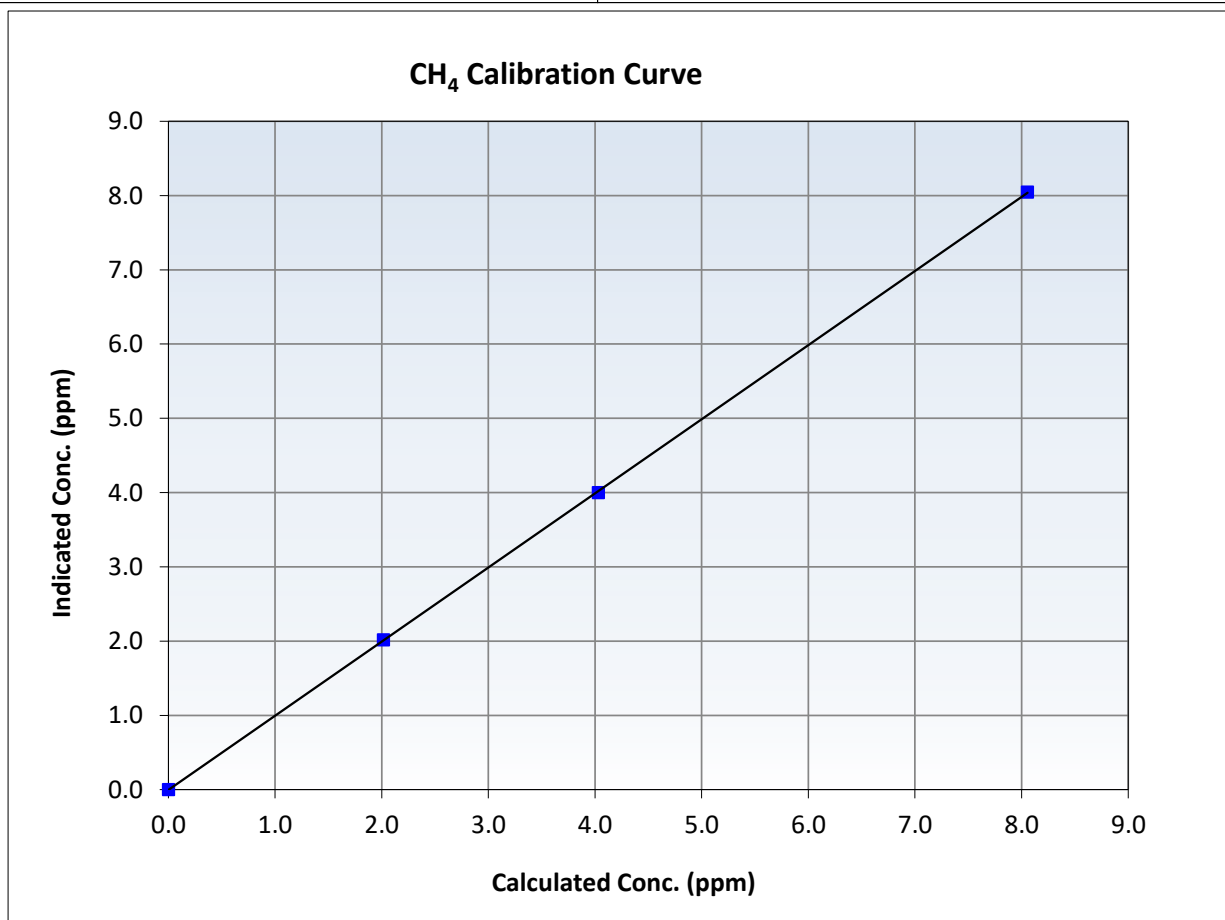
CH₄ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 15, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:04	End Time (MST):	12:41
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999983	<i>≥0.995</i>
8.06	8.05	1.0012	Slope	0.998241	<i>0.90 - 1.10</i>
4.03	4.00	1.0079	Intercept	-0.003747	<i>+/-0.5</i>
2.02	2.02	0.9992			





Wood Buffalo Environmental Association

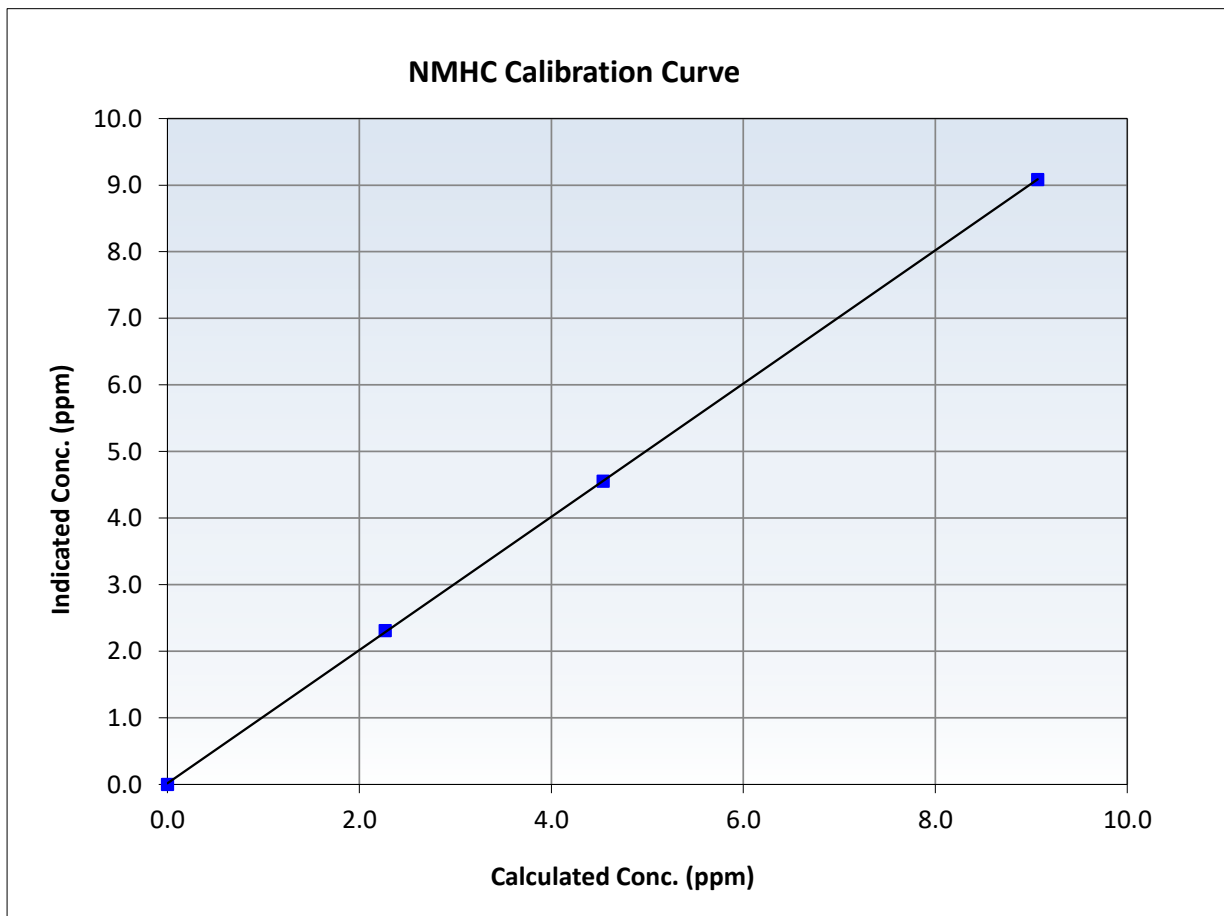
NMHC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 15, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:04	End Time (MST):	12:41
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

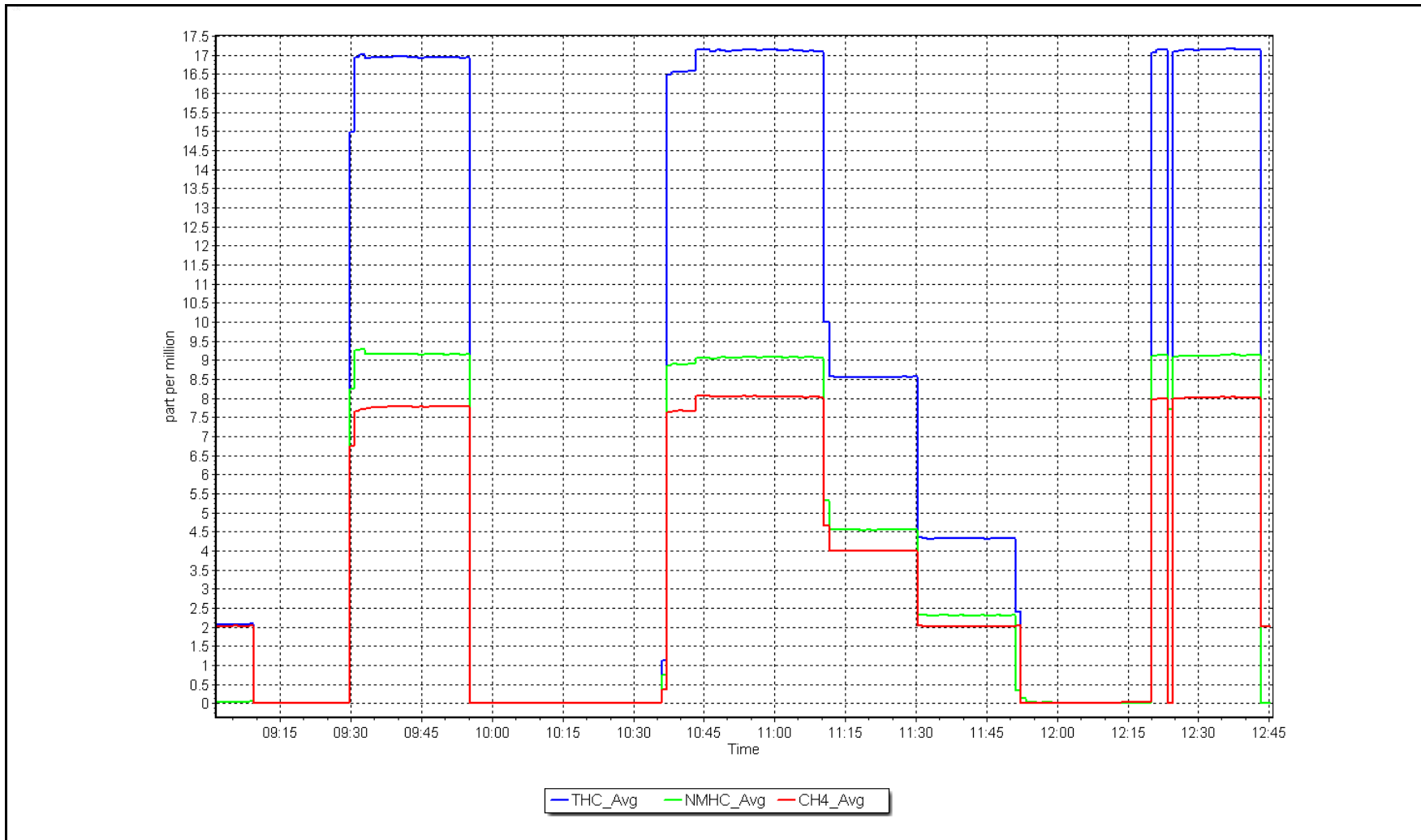
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999981	<i>≥0.995</i>
9.07	9.08	0.9982	Slope	1.000467	<i>0.90 - 1.10</i>
4.54	4.56	0.9961	Intercept	0.016990	<i>+/-0.5</i>
2.27	2.31	0.9821			



NMHC Calibration Plot

Date: October 4, 2024

Location: Patricia McInnes





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	October 8, 2024	Last Cal Date:	October 4, 2024
Start time (MST):	8:54	End time (MST):	11:51
Reason:	Maintenance		

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 #: 1118148495
THC Range: 0 - 20 ppm	NMHC/CH4 Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.29E-04	2.35E-04	NMHC SP Ratio:	5.52E-05	5.45E-05
CH4 Retention time:	14.4	14.8	NMHC Peak Area:	164401	166314
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.12	16.86	1.016
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.86	Prev response	17.13	*% change	-1.6%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.12	17.13	0.999
Mid point	4960	40.2	8.57	8.56	1.001
Low point	4980	20.1	4.29	4.33	0.990
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.12	16.89	1.014
Average Correction Factor					0.997

Notes: Maintenance calibration done due to baseline dips. Sample inlet filters changed after as founds.
Adjusted span only.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.07	9.23	0.982
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.23	Prev response	9.09	*% change	1.5%
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)
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	4.56	0.996
Low point	4980	20.1	2.27	2.31	0.985
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.07	8.93	1.015
Average Correction Factor					0.994

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.06	7.62	1.057
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.62	Prev response	8.04	*% change	-5.4%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.06	8.06	0.999
Mid point	4960	40.2	4.03	4.01	1.006
Low point	4980	20.1	2.02	2.03	0.995
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.06	7.96	1.012
Average Correction Factor					1.000

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999473	0.999654
THC Cal Offset:	0.012843	0.014241
CH ₄ Cal Slope:	0.998241	1.000299
CH ₄ Cal Offset:	-0.003747	-0.002750
NMHC Cal Slope:	1.000467	0.998980
NMHC Cal Offset:	0.016990	0.017391

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

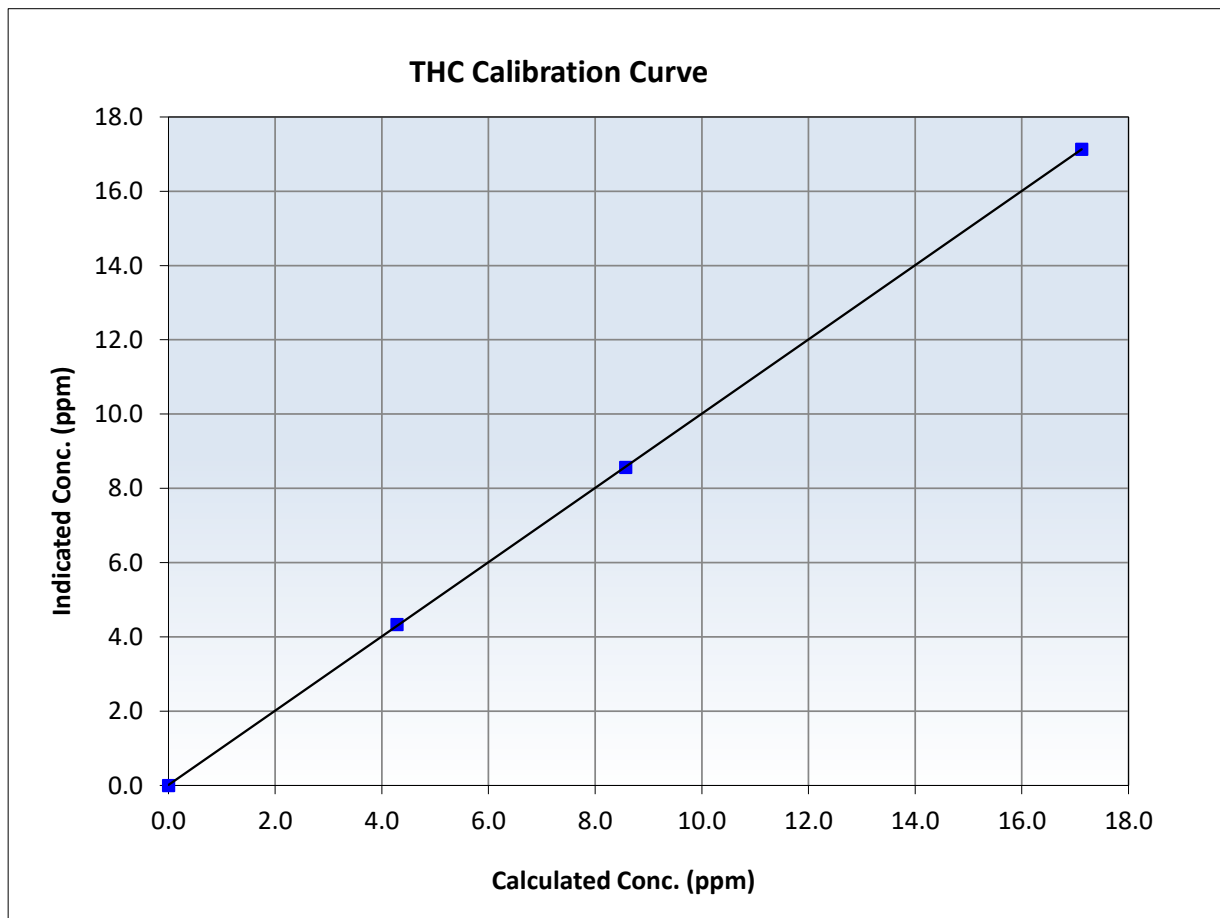
THC Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	October 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:54	End Time (MST):	11:51
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999990	<i>≥0.995</i>
17.12	17.13	0.9994	Slope	0.999654	<i>0.90 - 1.10</i>
8.57	8.56	1.0010	Intercept	0.014241	<i>+/-0.5</i>
4.29	4.33	0.9896			





Wood Buffalo Environmental Association

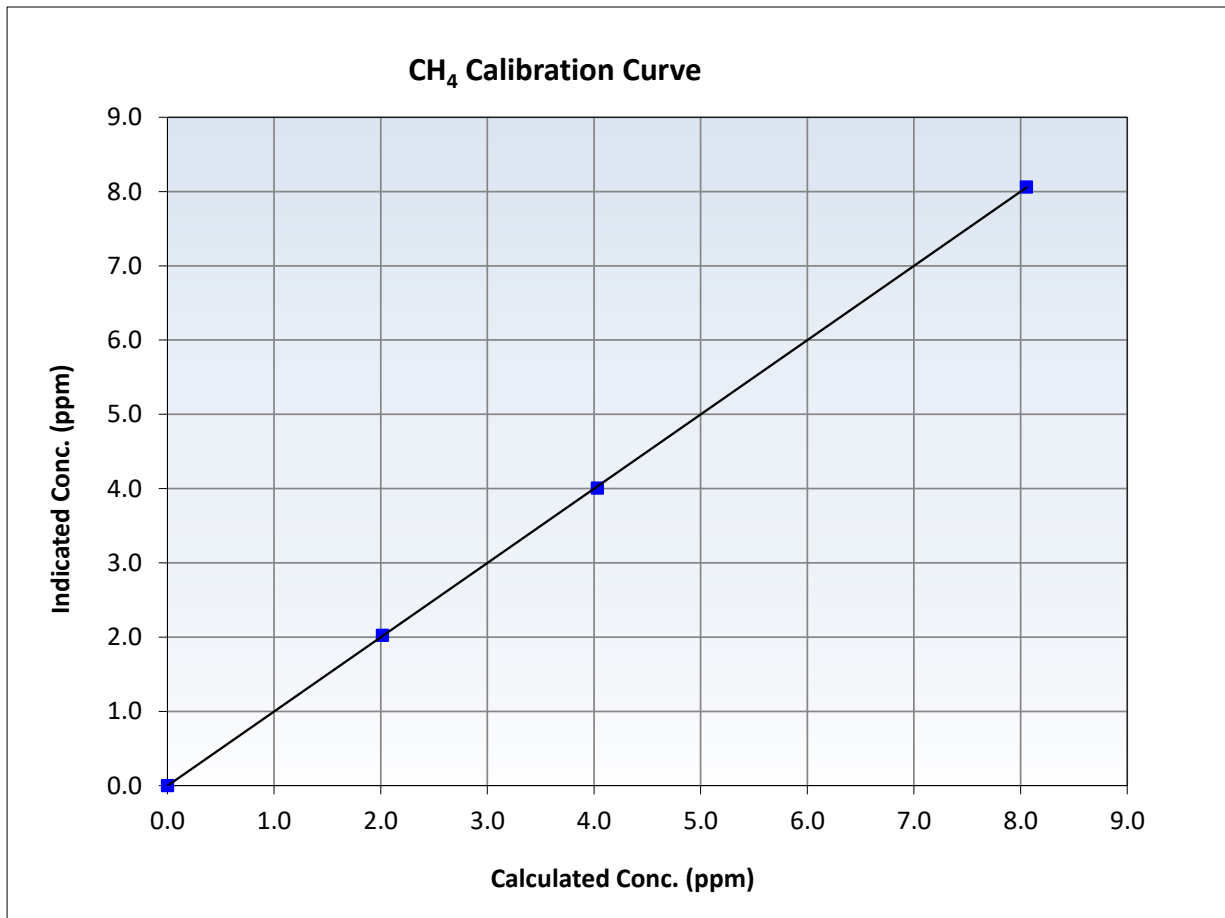
CH₄ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	October 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:54	End Time (MST):	11:51
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	≥0.995
8.06	8.06	0.9990	Slope	0.90 - 1.10
4.03	4.01	1.0062	Intercept	+/-0.5
2.02	2.03	0.9953		





Wood Buffalo Environmental Association

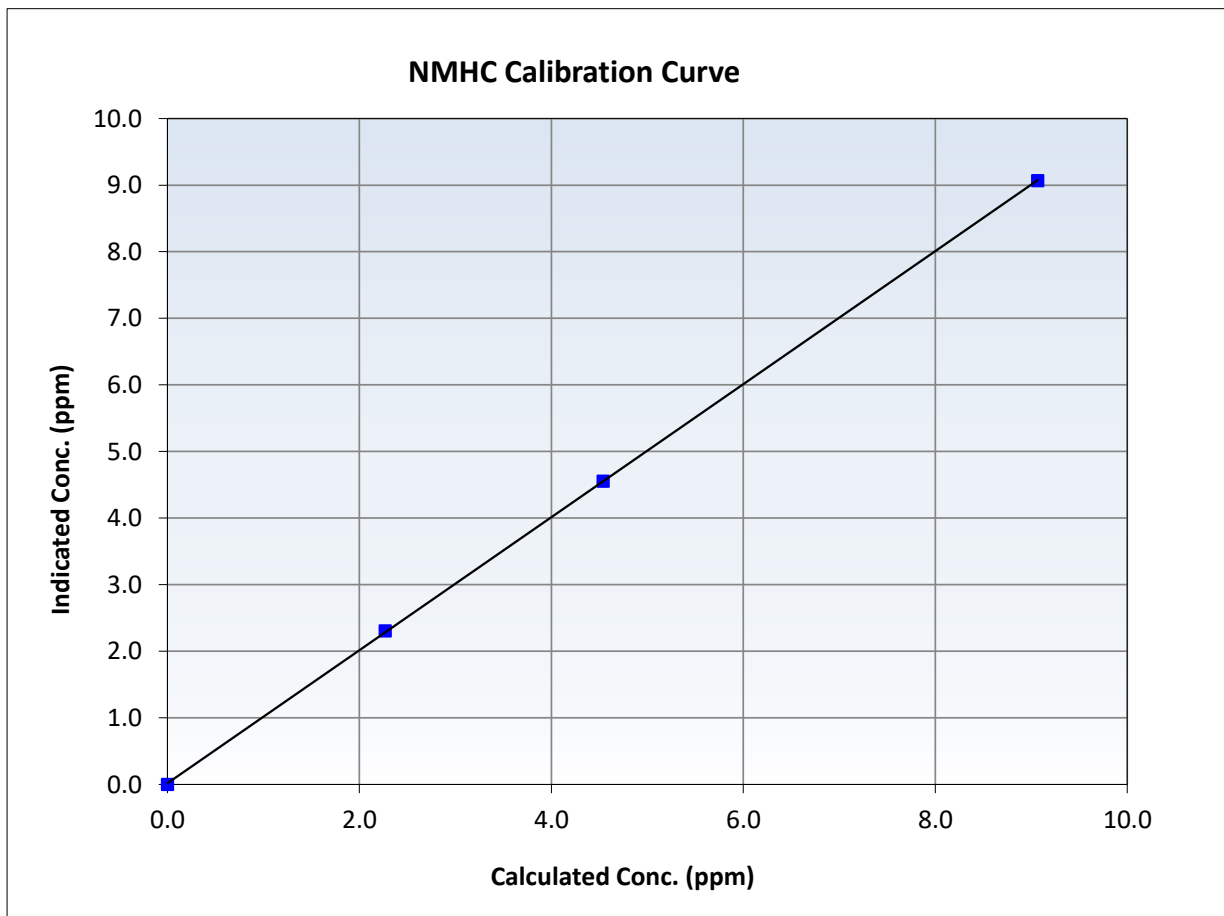
NMHC Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	October 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:54	End Time (MST):	11:51
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

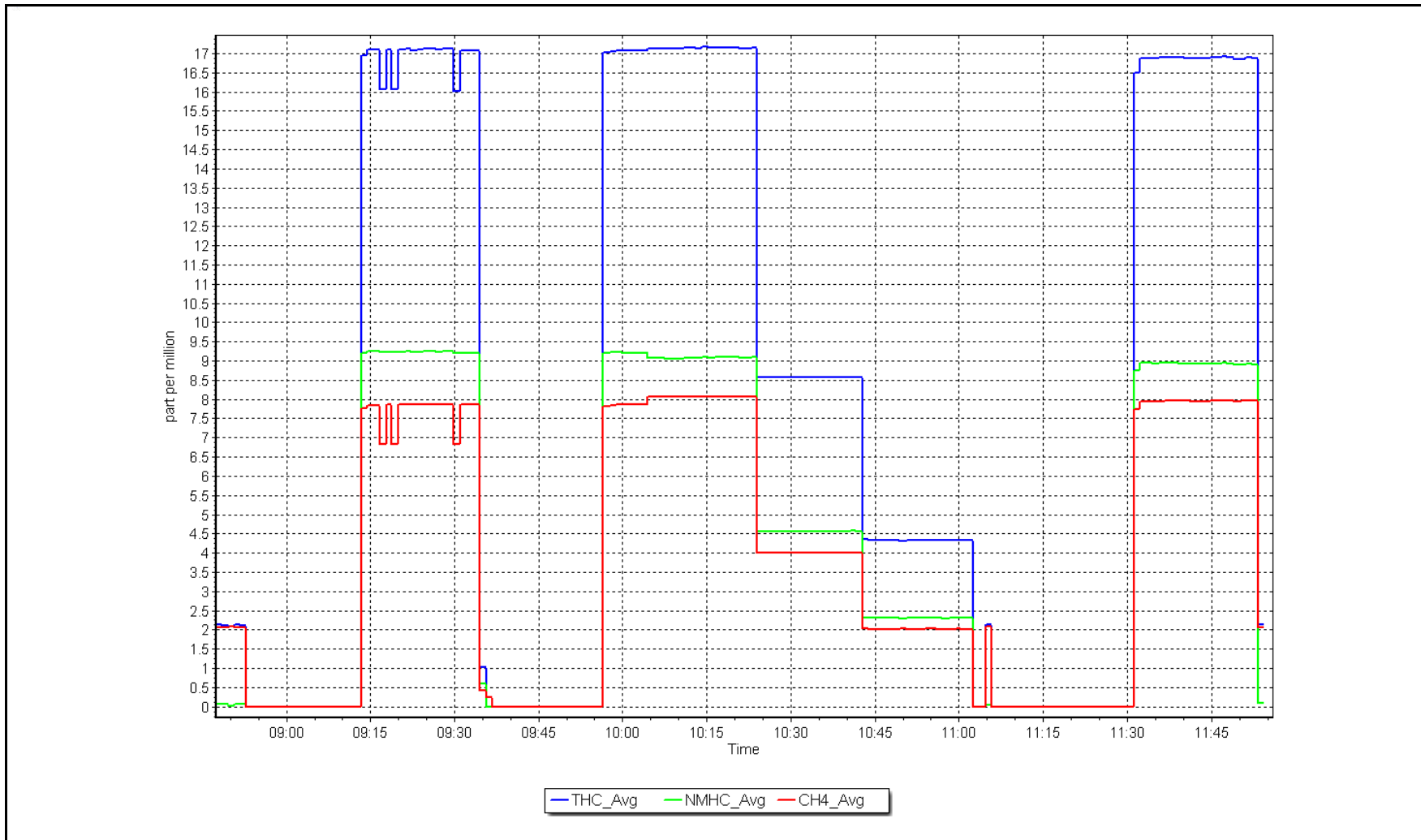
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999982	<i>≥0.995</i>
9.07	9.07	0.9999	Slope	0.998980	<i>0.90 - 1.10</i>
4.54	4.56	0.9963	Intercept	0.017391	<i>+/-0.5</i>
2.27	2.31	0.9846			



NMHC Calibration Plot

Date: October 8, 2024

Location: Patricia McInnes





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	October 23, 2024	Last Cal Date:	October 8, 2024
Start time (MST):	9:39	End time (MST):	12:52
Reason:	Maintenance		

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 #: 1118148495
THC Range: 0 - 20 ppm	NMHC/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.35E-04	2.36E-04	NMHC SP Ratio:	5.45E-05
CH4 Retention time:	14.8	15.2	NMHC Peak Area:	166314
Zero Chromatogram:	ON	ON	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.12	16.01	1.069
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.01	Prev response	17.13	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00		----
High point	4920	80.3	17.12	17.18	0.997
Mid point	4960	40.2	8.57	8.60	0.997
Low point	4980	20.1	4.29	4.36	0.984
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.12	17.11	1.001
Average Correction Factor					0.993

Notes: Maintenance calibration done due to low ch4. RT shifted causing loss of peak, windows adjusted and re-calibrated



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.07	8.81	1.029
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.81	Prev response	9.08	*% change	-3.0%
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)
Calibrator zero	5000	0.0	0.00	----	----
High point	4920	80.3	9.07	9.09	0.997
Mid point	4960	40.2	4.54	4.57	0.993
Low point	4980	20.1	2.27	2.33	0.976
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.07	9.05	1.002
Average Correction Factor					0.989

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.06	7.20	1.118
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.20	Prev response	8.06	*% change	-11.8%
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)
Calibrator zero	5000	0.0	0.00	----	----
High point	4920	80.3	8.06	8.10	0.995
Mid point	4960	40.2	4.03	4.03	1.002
Low point	4980	20.1	2.02	2.03	0.993
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.06	8.07	0.998
Average Correction Factor					0.997

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999654	0.999657
THC Cal Offset:	0.014241	0.054619
CH ₄ Cal Slope:	1.000299	1.005454
CH ₄ Cal Offset:	-0.002750	-0.009907
NMHC Cal Slope:	0.998980	0.995737
NMHC Cal Offset:	0.017391	0.061020

Calibration Performed By: Ryan Power



Wood Buffalo Environmental Association

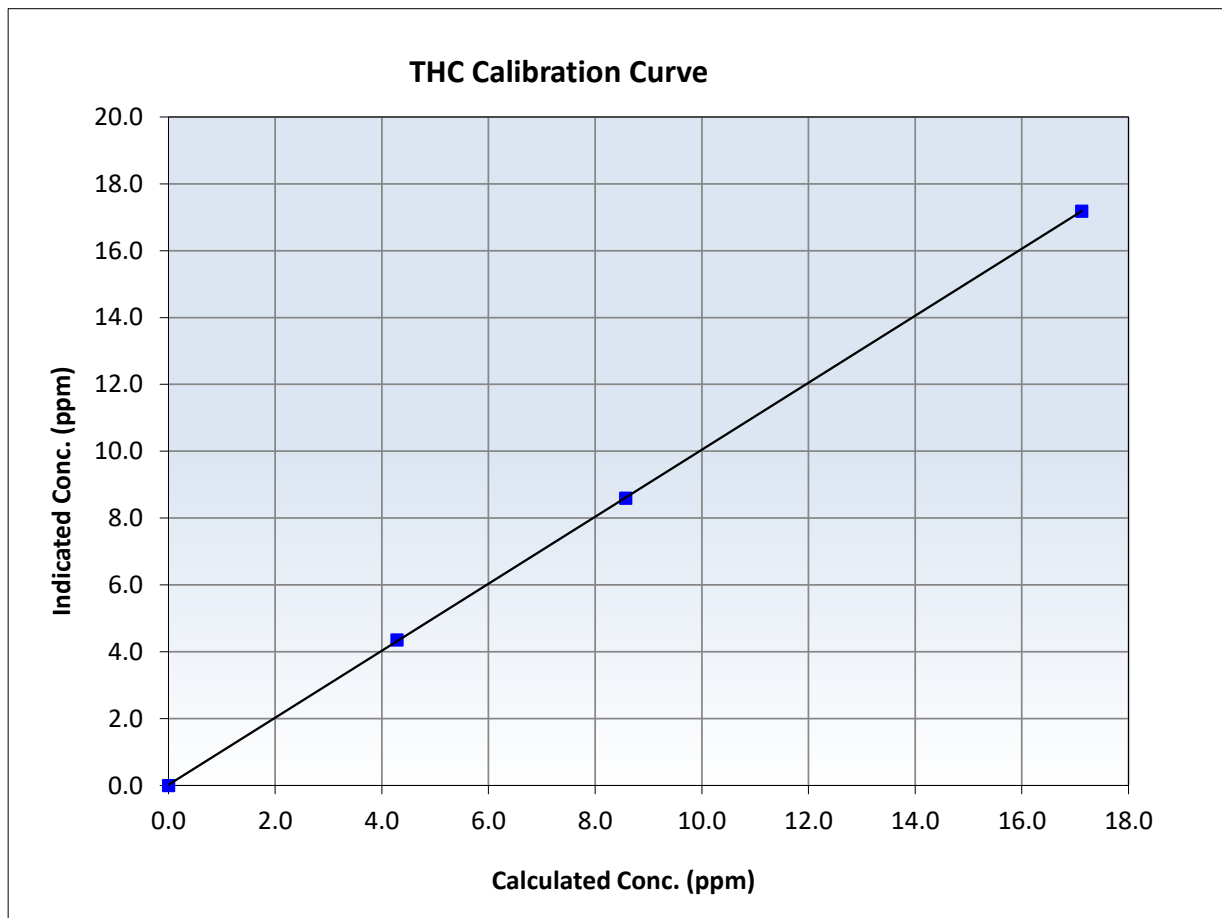
THC Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	October 8, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:39	End Time (MST):	12:52
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00		----	Correlation Coefficient	0.999988	≥0.995
17.12	17.18	0.9967	Slope	0.999657	0.90 - 1.10
8.57	8.60	0.9969	Intercept	0.054619	+/-0.5
4.29	4.36	0.9839			





Wood Buffalo Environmental Association

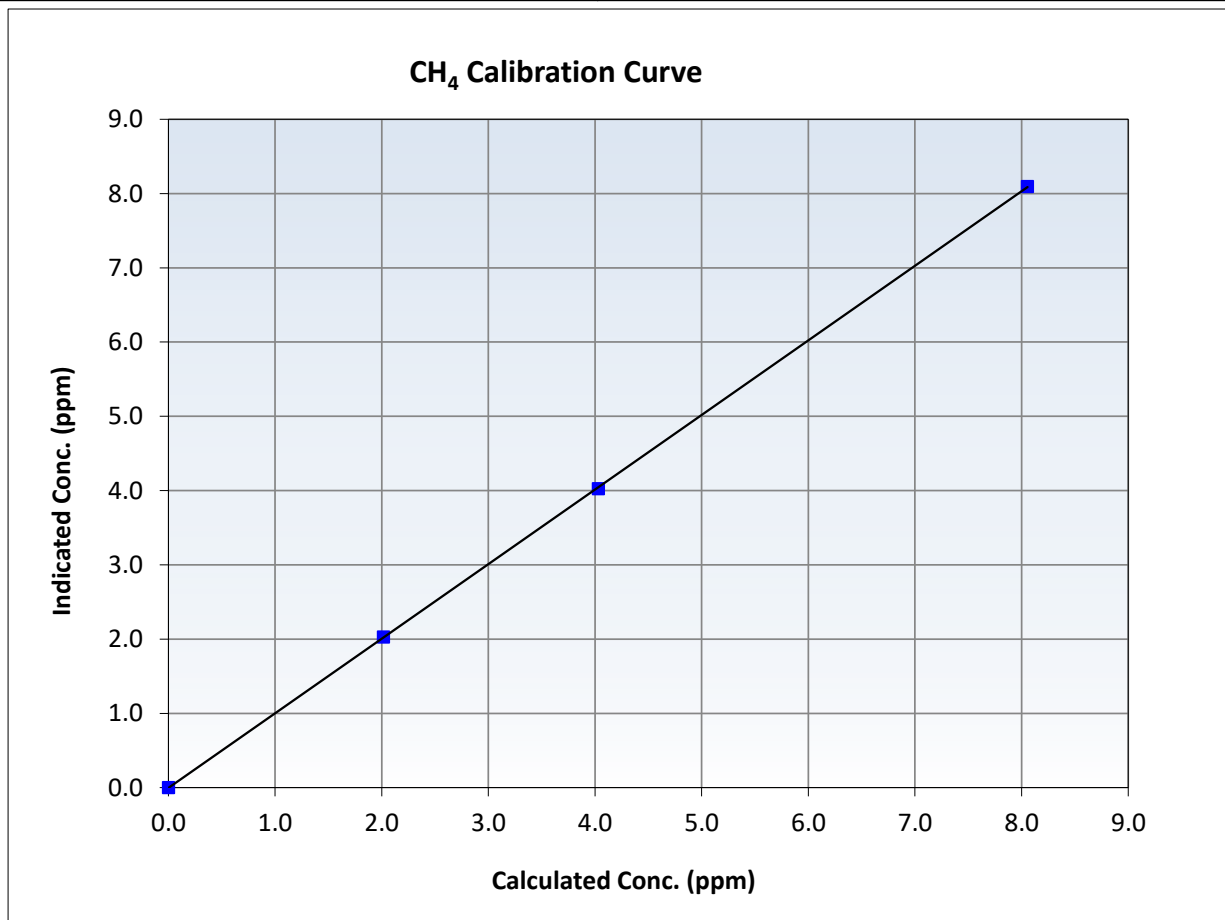
CH₄ Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	October 8, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:39	End Time (MST):	12:52
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00		----	Correlation Coefficient	0.999971	<i>≥0.995</i>
8.06	8.10	0.9950	Slope	1.005454	<i>0.90 - 1.10</i>
4.03	4.03	1.0017	Intercept	-0.009907	<i>+/-0.5</i>
2.02	2.03	0.9933			





Wood Buffalo Environmental Association

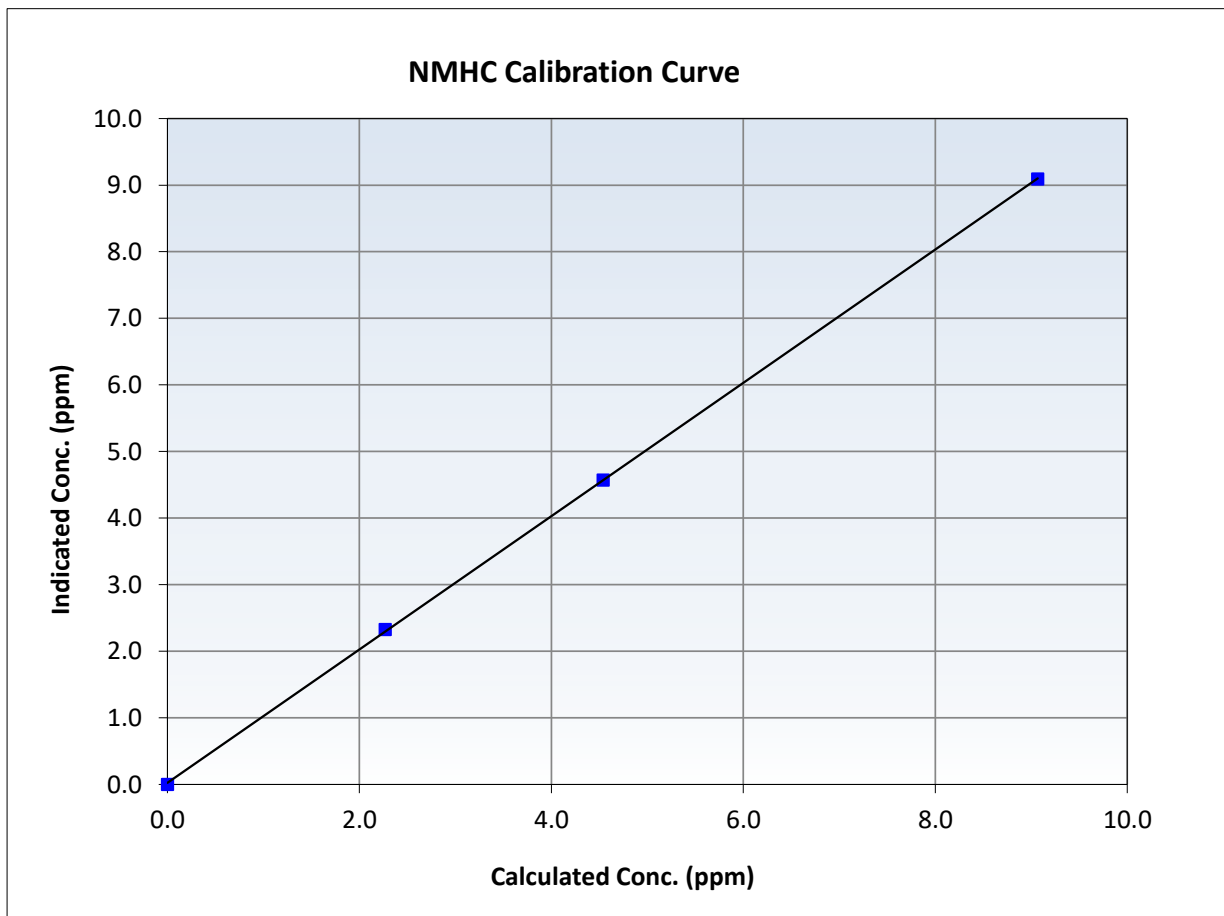
NMHC Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	October 8, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:39	End Time (MST):	12:52
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calibration Data

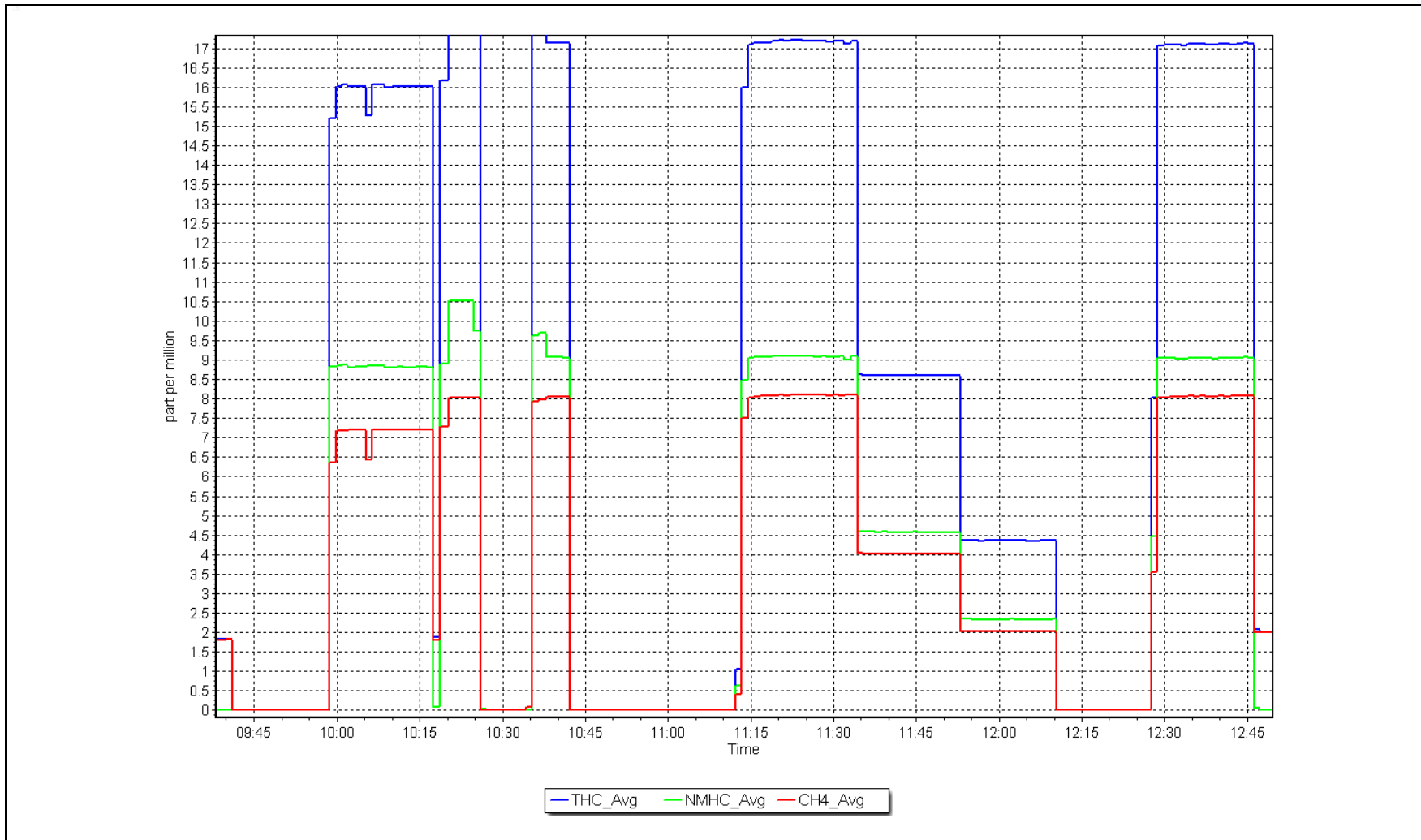
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00		----	Correlation Coefficient	0.999996 ≥0.995
9.07	9.09	0.9973	Slope	0.995737 0.90 - 1.10
4.54	4.57	0.9926	Intercept	0.061020 +/-0.5
2.27	2.33	0.9757		



NMHC Calibration Plot

Date: October 23, 2024

Location: Patricia McInnes





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Patricia McInnes
 Station number: AMS 06
 Calibration Date: October 3, 2024
 Last Cal Date: September 16, 2024
 Start time (MST): 8:33
 End time (MST): 13:13
 Reason: Routine

Calibration Standards

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

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
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	830.8	800.7	30.0	0.9936	0.9985
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO _x = 827.8 ppb	NO = 801.1 ppb	<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 0.5%
Baseline Corr 1st pt	NO _x = 831.8 ppb	NO = 800.9 ppb	<u>As Found Statistics</u>		*Percent Change	NO = 0.0%
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb	As found	NO _x r ² :	Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb	As found	NO r ² :	NO SI:	NO Int:
			As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1172750022

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.998903	1.001752
NO _x Cal Offset:	2.295640	1.915209
NO Cal Slope:	1.000545	1.001660
NO Cal Offset:	0.902692	1.162365
NO ₂ Cal Slope:	1.003618	1.002990
NO ₂ Cal Offset:	1.282880	0.278909

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
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:	153.6	155.1

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.1	-0.4	----	----
High point	4914	86.2	826.5	799.7	26.7	828.5	801.5	27.1	0.9975	0.9978
Mid point	4957	43.1	413.2	399.9	13.4	417.4	402.6	14.8	0.9900	0.9932
Low point	4978	21.6	207.1	200.4	6.7	211.6	203.0	8.5	0.9788	0.9873
As left zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.1	-0.4	----	----
As left span	4914	86.2	826.5	396.7	429.8	829.1	396.7	432.3	0.9968	1.0000
Average Correction Factor									0.9888	0.9928

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.4	----	----
High GPT point	800.1	396.8	430.0	431.3	0.9970	100.3%
Mid GPT point	800.1	604.3	222.5	223.5	0.9956	100.4%
Low GPT point	800.1	703.0	123.8	125.4	0.9874	101.3%
Average Correction Factor					0.9934	100.7%

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

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

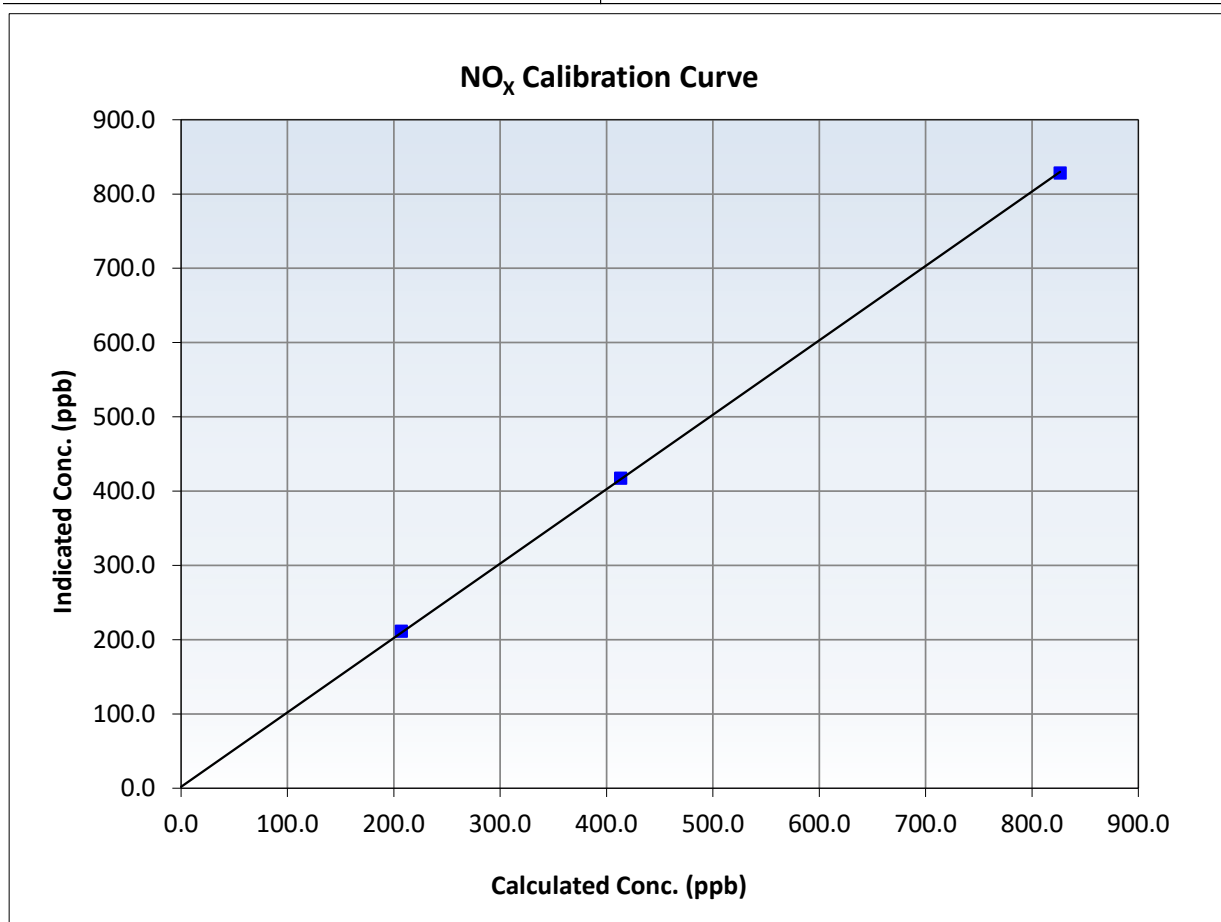
NO_x Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 16, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:33	End Time (MST):	13:13
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.5	----	Correlation Coefficient	0.999961	≥0.995
826.5	828.5	0.9975	Slope	1.001752	0.90 - 1.10
413.2	417.4	0.9900	Intercept	1.915209	+/-20
207.1	211.6	0.9788			





Wood Buffalo Environmental Association

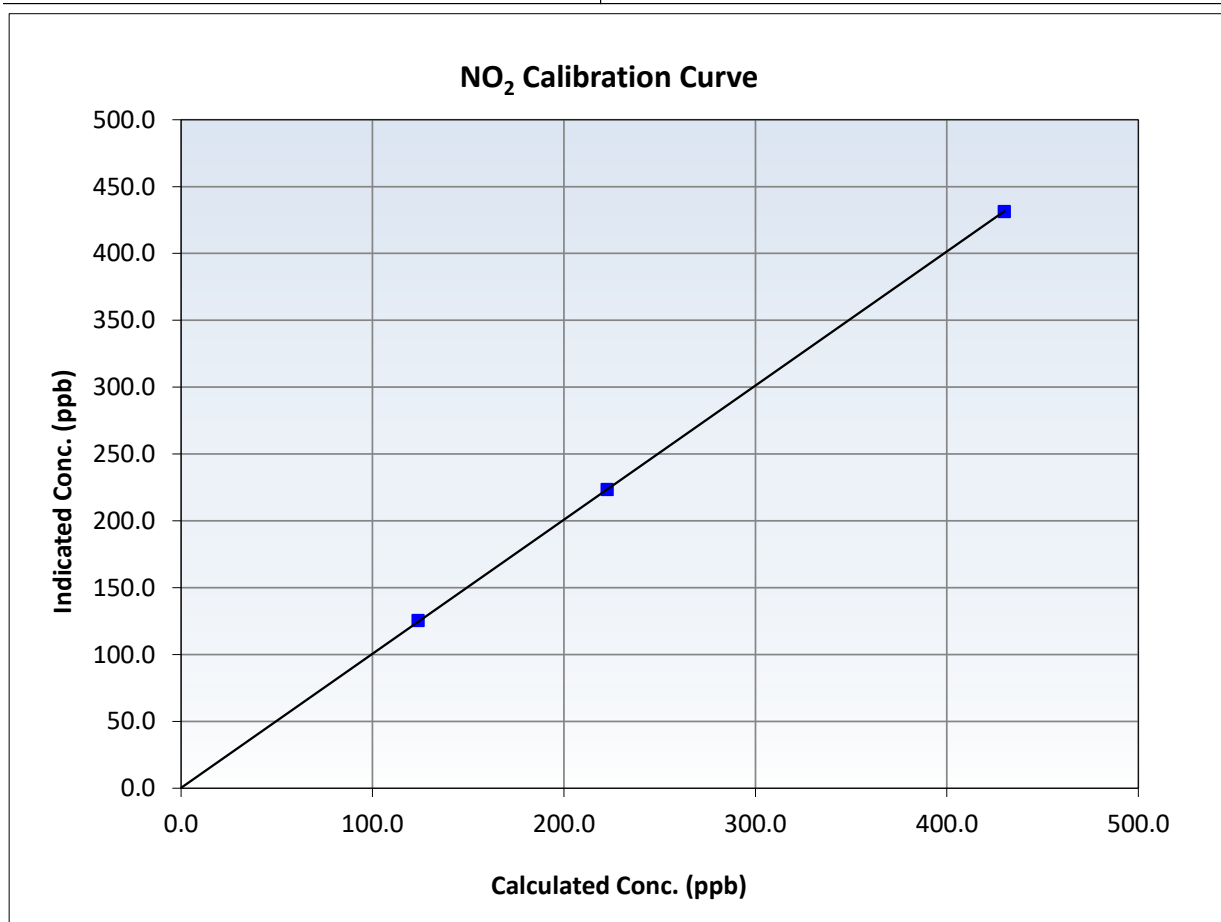
NO₂ Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 16, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:33	End Time (MST):	13:13
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.4	----	Correlation Coefficient	0.999986	≥0.995
430.0	431.3	0.9970	Slope	1.002990	0.90 - 1.10
222.5	223.5	0.9956	Intercept	0.278909	+/-20
123.8	125.4	0.9874			





Wood Buffalo Environmental Association

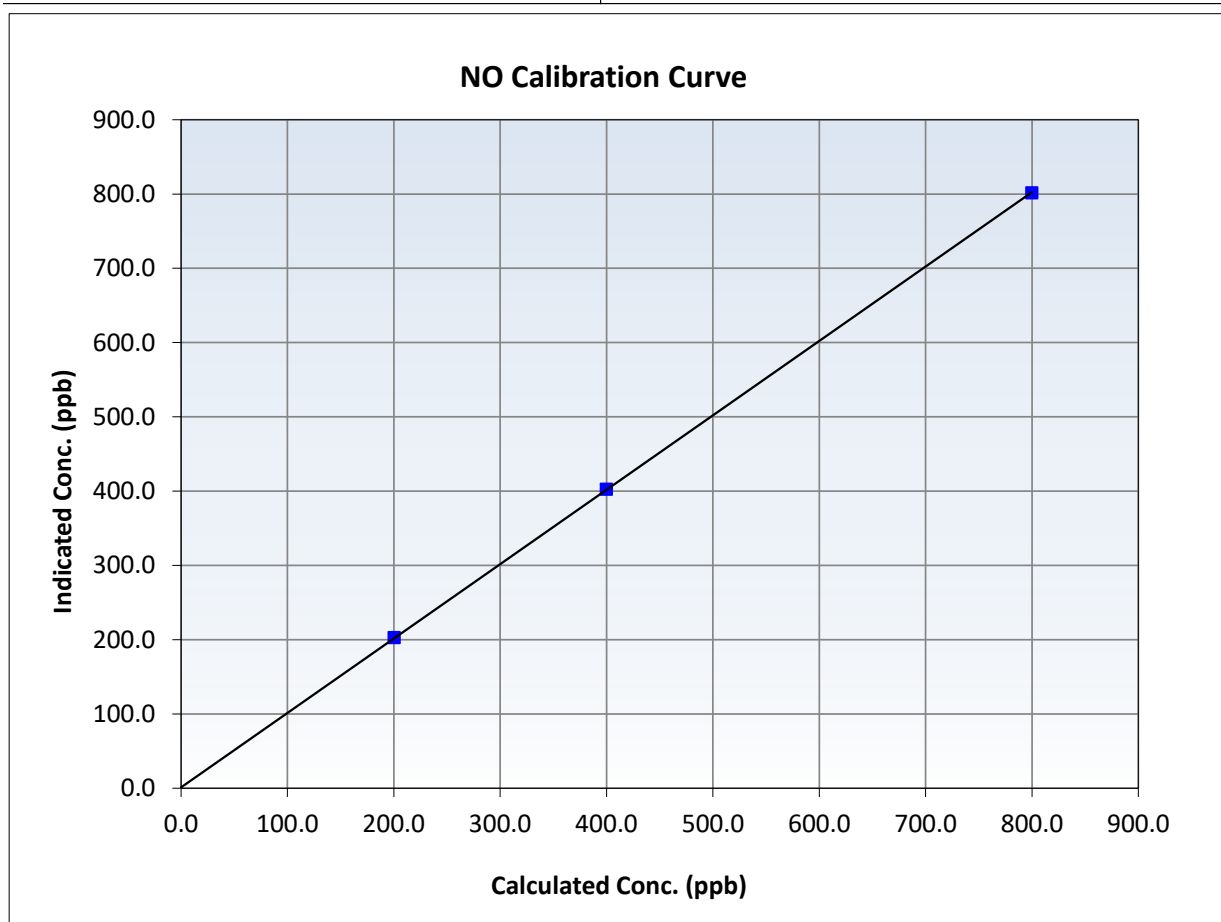
NO Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 16, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:33	End Time (MST):	13:13
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

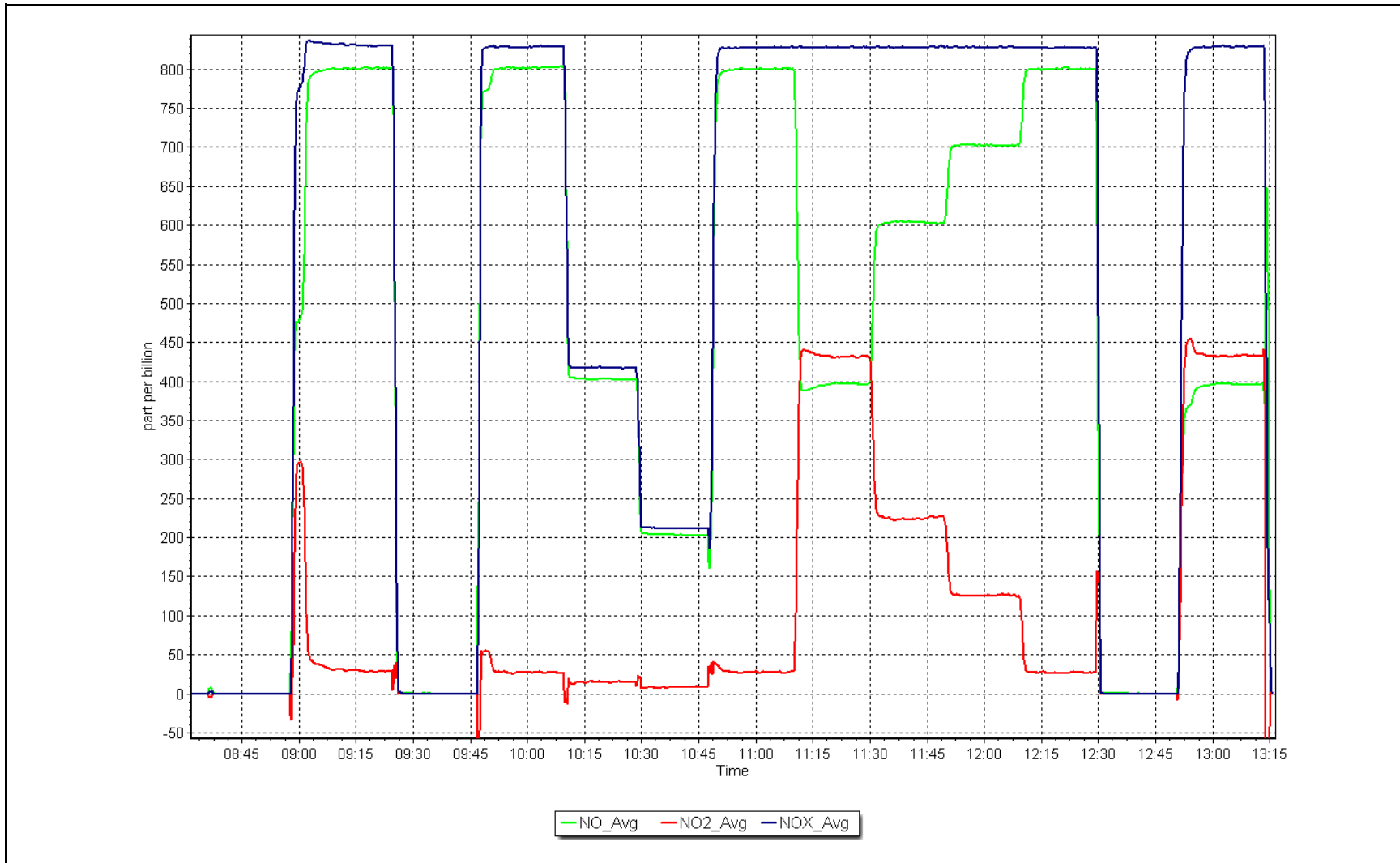
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	0.999988	≥0.995
799.7	801.5	0.9978	Slope	1.001660	0.90 - 1.10
399.9	402.6	0.9932	Intercept	1.162365	+/-20
200.4	203.0	0.9873			



NO_x Calibration Plot

Date: October 3, 2024

Location: Patricia McInnes





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	October 1, 2024	Last Cal Date:	September 6, 2024
Start time (MST):	9:45	End time (MST):	13:03
Reason:	Routine		

Calibration Standards

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

Analyzer Information

Analyzer make:	Thermo 49i	Analyzer serial #:	1300156234
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000143	0.998857	Backgd or Offset:	-0.5	-0.9
Calibration intercept:	0.100000	0.400000	Coeff or Slope:	1.020	1.020

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	800.0	0.0	-0.3	----
As found High point	5000	1032.2	400.0	400.0	0.999
As found Mid point					
As found Low point					
Baseline Corr As found:	400.3	Previous response	400.2	*% change	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	800.0	0.0	0.4	----
High point	5000	1028.8	400.0	400.0	1.000
Mid point	5000	821.4	200.0	200.0	1.000
Low point	5000	699.5	100.0	100.4	0.996
As left zero	5000	800.0	0.0	0.3	----
As left span	5000	1026.3	400.0	401.2	0.997
Average Correction Factor					0.999

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

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

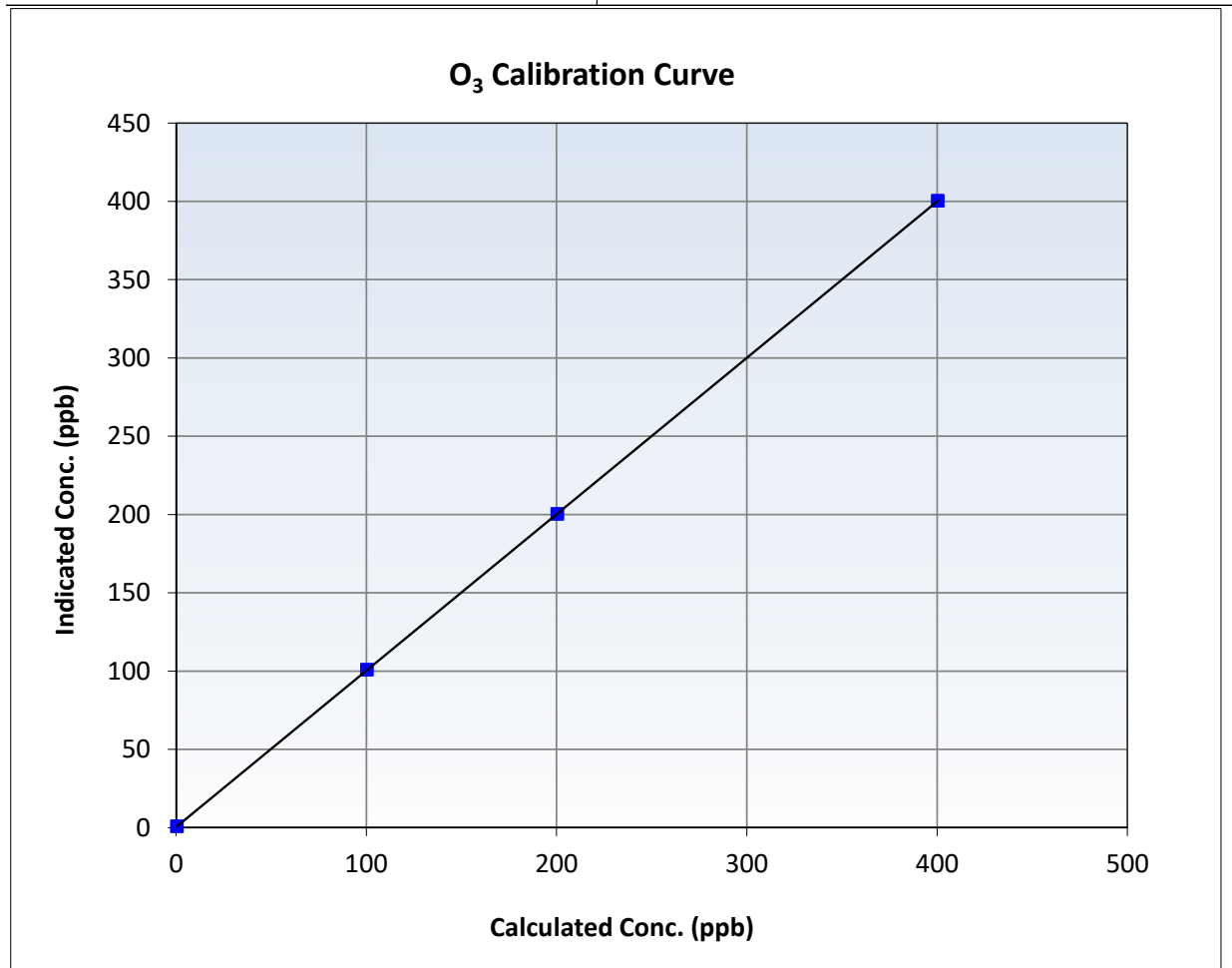
O₃ Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 6, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:45	End Time (MST):	13:03
Analyzer make:	Thermo 49i	Analyzer serial #:	1300156234

Calibration Data

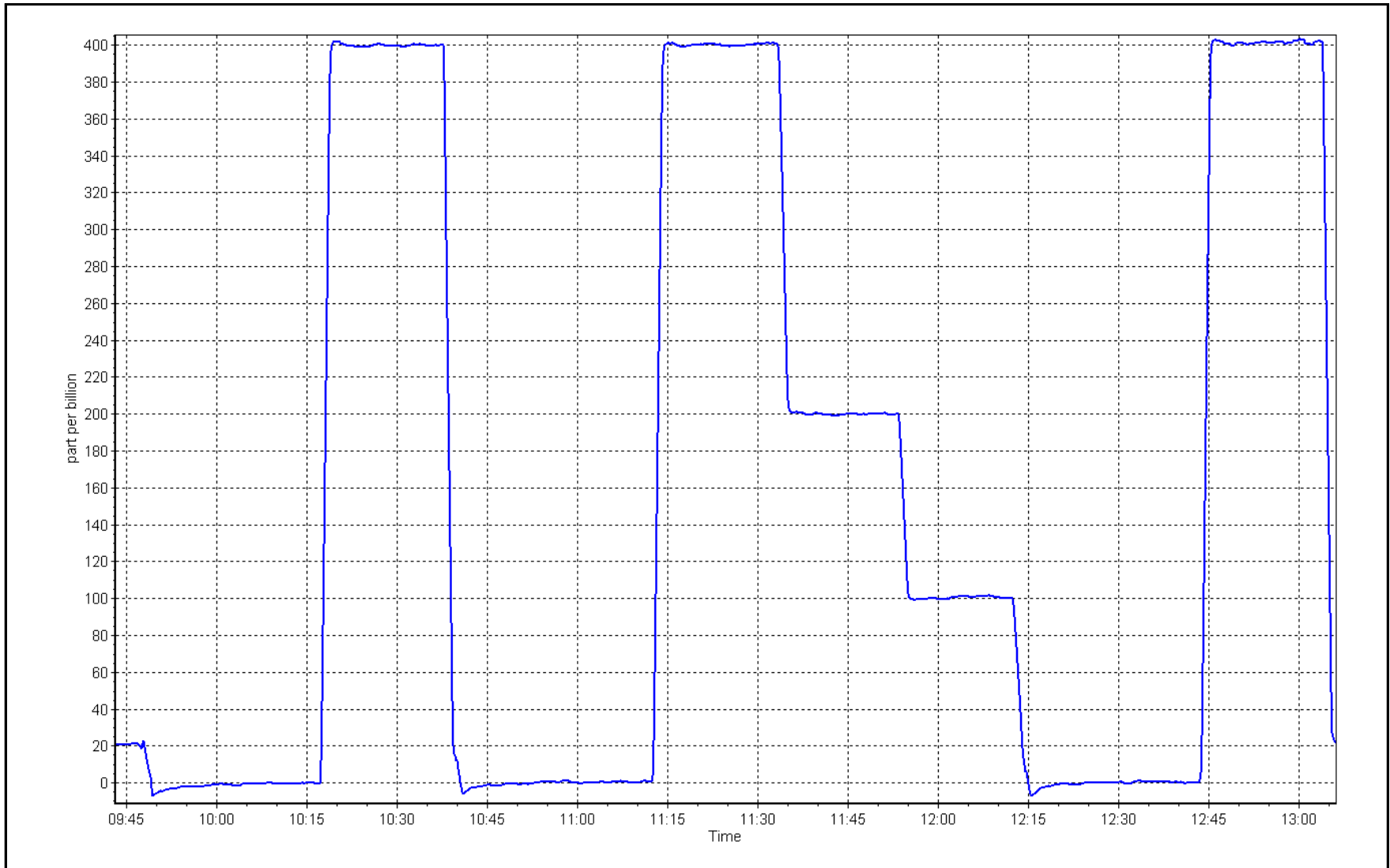
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.4	----	Correlation Coefficient	0.999999	≥0.995
400.0	400.0	1.0000	Slope	0.998857	0.90 - 1.10
200.0	200.0	1.0000	Intercept	0.400000	+/- 5
100.0	100.4	0.9960			



O₃ Calibration Plot

Date: October 1, 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: October 9, 2024 Last Cal Date: September 6, 2024
 Start time (MST): 13:07 End time (MST): 13:19

Analyzer Make: API T640 S/N: 766
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25BT S/N: 388754
 Temp/RH standard: Alicat FP-25BT S/N: 388754

Parameter	As found	Measured	As left	Adjusted	(Limits)
T (°C)	12.20	11.82	12.20	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	723.80	725.60	723.80	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.03	5.17	5.03	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	38	----	38	<input type="checkbox"/>	>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: **10.9** Expiry Date: 6-10-2024
 Lot No.: 100128-050-035

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test				<input checked="" type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: September 6, 2024
 Date Disposable Filter Changed: September 6, 2024

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

Annual Maintenance

Date Sample Tube Cleaned: April 13, 2023
 Date RH/T Sensor Cleaned: April 13, 2023

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

Calibration by: Jan Castro



Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
NOX Cal Date:	October 9, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	8:28	End time (MST):	12:59
NH3 Cal Date:	October 9, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	13:15	End time (MST):	15:53
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient:	0.986	1.009	Nt coefficient:	0.977	1.700
NOX coefficient:	0.976	1.002	NO bkgrnd:	-2.100	0.2
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	-2.000	0.1
NH3 coefficient:	0.912	1.200	Nt bkgrnd:	0.000	0.0

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.998032	1.004586
NO _x Cal Offset:	2.035807	1.115074
NO Cal Slope:	0.996759	1.005019
NO Cal Offset:	1.202925	0.261891
NO ₂ Cal Slope:	0.999656	1.004672
NO ₂ Cal Offset:	-0.498440	1.225223
NH3 Cal Slope:	0.980720	0.999207
NH3 Cal Offset:	7.323200	4.720243
Nt Cal Slope:	0.984525	1.002641
Nt Cal Offset:	7.509565	4.562161



Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

NO_x / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NO _x Correction factor (Cc/Ic) <i>Limit = 0.9 - 1.0</i>	Baseline corr NO Correction factor (Cc/Ic) <i>Limit = 0.9 - 1.0</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.8	0.6	0.4	----	----
As found span	4914	86.2	826.5	799.7	826.5	806.0	782.4	807.5	1.0254	1.0222
AF GPT span										
new NO cyl rp										

Baseline Corr As Fd Nt = 807.1 ppb NO_x = 805.2 ppb NO = 781.8 ppb
 Previous Response Nt = 821.17 ppb NO_x = 826.9 ppb NO = 798.3 ppb

*Percent Change Nt(NO) = -1.7%

*Percent Change NO_x = -2.7%

*Percent Change NO = -2.1%

**NO_x Δ (NO to GPT response) =

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

* = > +/-5% change initiates investigation

NO_x / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.4	-0.3	----	----
High point	4914	86.2	826.5	799.7	826.5	830.8	803.7	829.9	0.9948	0.9951
Mid point	4957	43.1	413.2	399.9	413.2	416.7	402.4	418.4	0.9917	0.9937
Low point	4978	21.6	207.1	200.4	207.1	210.5	202.4	212.5	0.9839	0.9902
Average Correction Factor									0.9901	0.9930

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
As Found zero	----	----	0.0	0.2	----	----
Calibration zero	----	----	0.0	0.3	----	----
High GPT point (400 ppb O3)	798.7	394.5	430.9	434.3	0.9922	100.8%
Mid GPT point (200 ppb O3)	798.7	602.1	223.3	224.0	0.9970	100.3%
Low GPT point (100 ppb O3)	798.7	701.4	124.0	128.2	0.9674	103.4%
Average Correction Factor					0.9855	101.5%



Wood Buffalo Environmental Association NH₃ - 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)) <i>Limit = 0.9 - 1.1</i>	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) <i>Limit = 0.9 - 1.1</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.4	0.8	-0.4	----	----
AF High point	3417	82.6	1800.6	0.0	1800.6	1766.6	6.2	1760.5	1.020	1.023
AF Mid point										
AF Low point										
new NH3 cyl rp										
Baseline Corr As Fd	Nt = 1766.2 ppb	NH3 = 1760.9 ppb							*Percent Change	Nt _(NH3) = -0.8%
Previous Response	Nt = 1780.3 ppb	NH3 = 1773.3 ppb							*Percent Change	NH3 = -0.7%

* => +/-5% change initiates investigation

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) <i>Limit = 0.95-1.05</i>	NH3 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.1	-0.1	----	----
High point	3417	82.6	1800.6	0.0	1800.6	1806.3	5.9	1800.3	0.997	1.000
Mid point	3454	45.9	1000.5	0.0	1000.5	1012.4	3.5	1009.1	0.988	0.991
Low point	3477	22.9	499.2	0.0	499.2	508.9	1.6	507.3	0.981	0.984
Average Correction Factor									0.9887	0.9919
NH3 Previous Converter Efficiency =	90.2 %									
NH3 Current Converter Efficiency =	90.2 %									

Notes: Sample inlet filter changed after as founds . Adjusted zero and span for NOx and TNx. Adjusted span for NH3.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

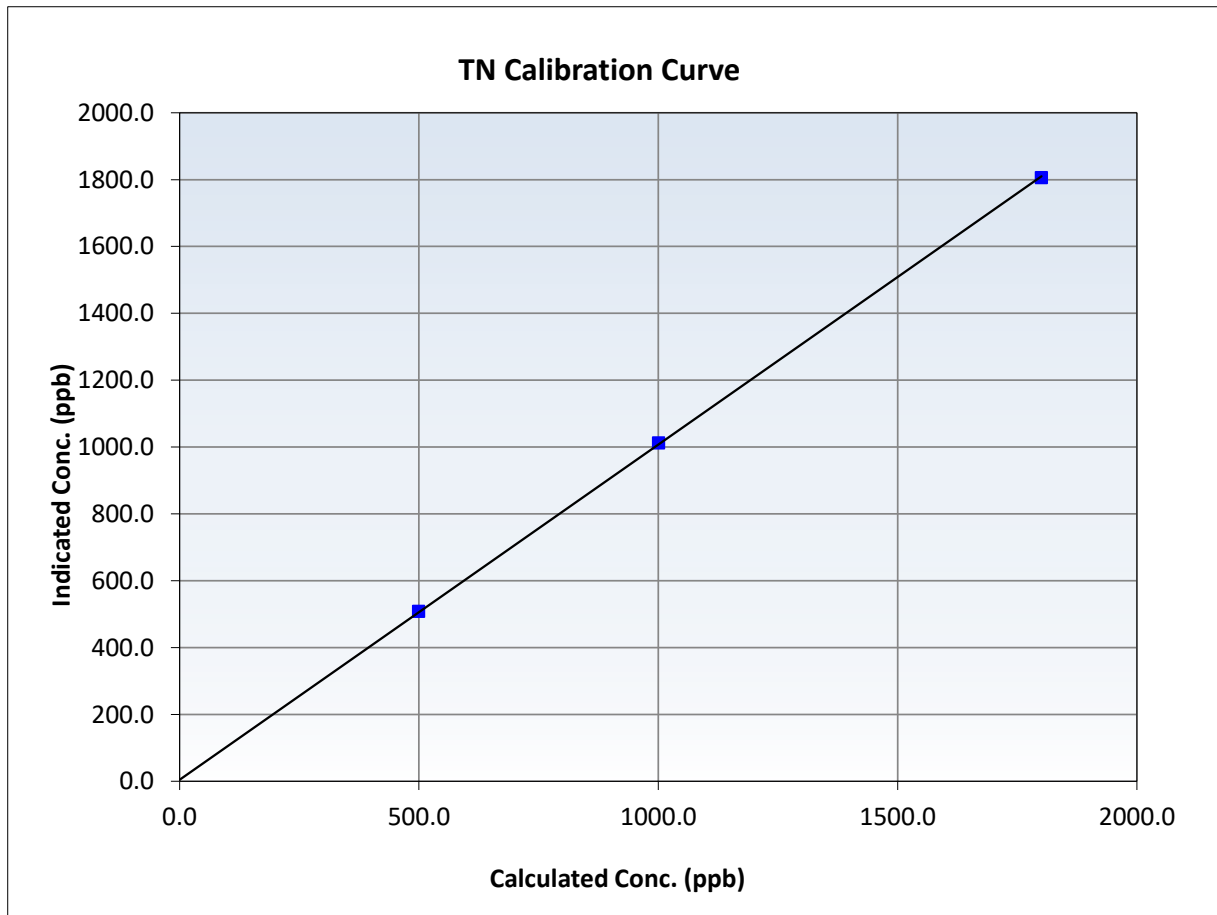
Nt Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:28	End Time (MST):	12:59
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999959	<i>≥0.995</i>
1800.6	1806.3	0.9969	Slope	1.002641	<i>0.90 - 1.10</i>
1000.5	1012.4	0.9883	Intercept	4.562161	<i>+/-20</i>
499.2	508.9	0.9809			





Wood Buffalo Environmental Association

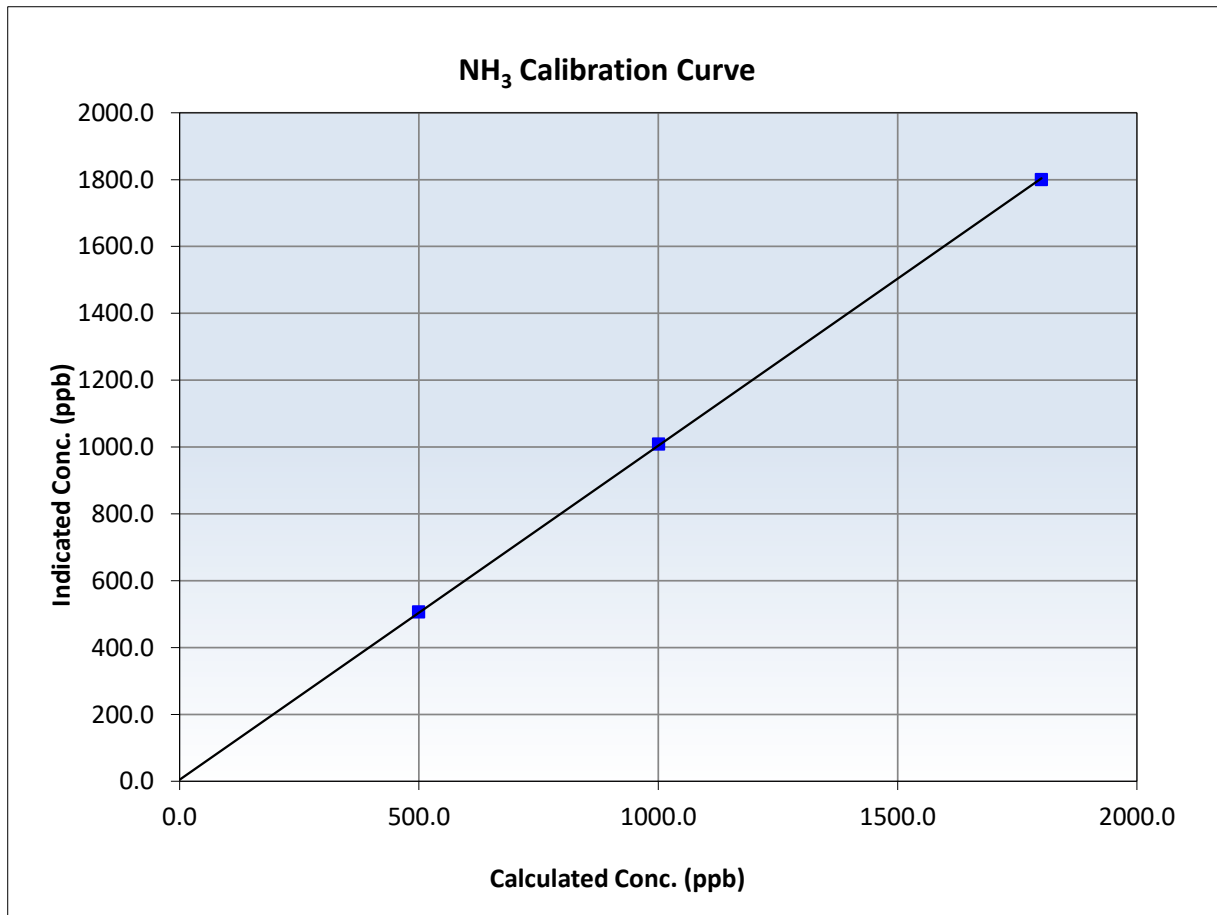
NH₃ Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:28	End Time (MST):	12:59
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999959	<i>≥0.995</i>
1800.6	1800.3	1.0002	Slope	0.999207	<i>0.90 - 1.10</i>
1000.5	1009.1	0.9915	Intercept	4.720243	<i>+/-20</i>
499.2	507.3	0.9840			





Wood Buffalo Environmental Association

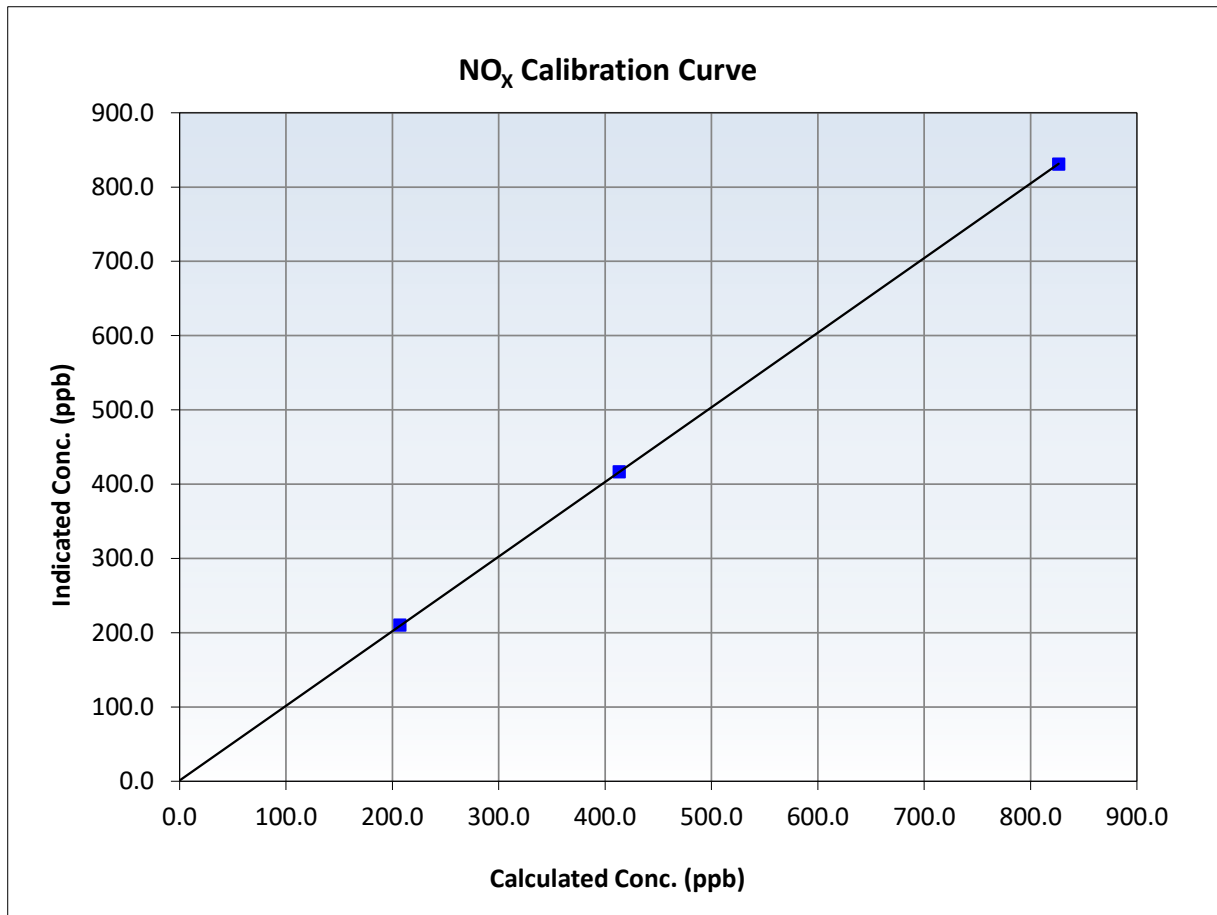
NO_x Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:28	End Time (MST):	12:59
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999990	<i>≥0.995</i>
826.5	830.8	0.9948	Slope	1.004586	<i>0.90 - 1.10</i>
413.2	416.7	0.9917	Intercept	1.115074	<i>+/-20</i>
207.1	210.5	0.9839			





Wood Buffalo Environmental Association

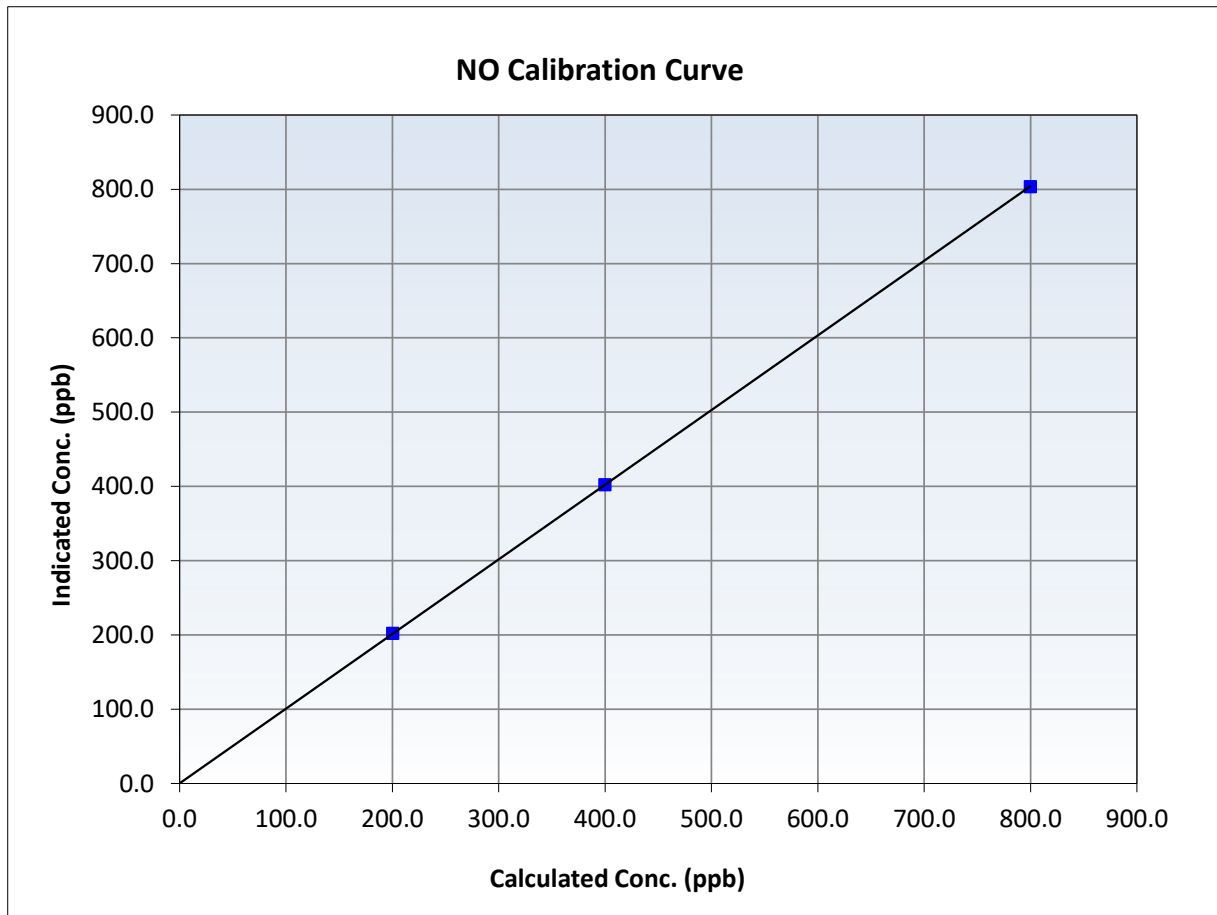
NO Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:28	End Time (MST):	12:59
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.4	----	Correlation Coefficient	0.999997	<i>≥0.995</i>
799.7	803.7	0.9951	Slope	1.005019	<i>0.90 - 1.10</i>
399.9	402.4	0.9937	Intercept	0.261891	<i>+/-20</i>
200.4	202.4	0.9902			





Wood Buffalo Environmental Association

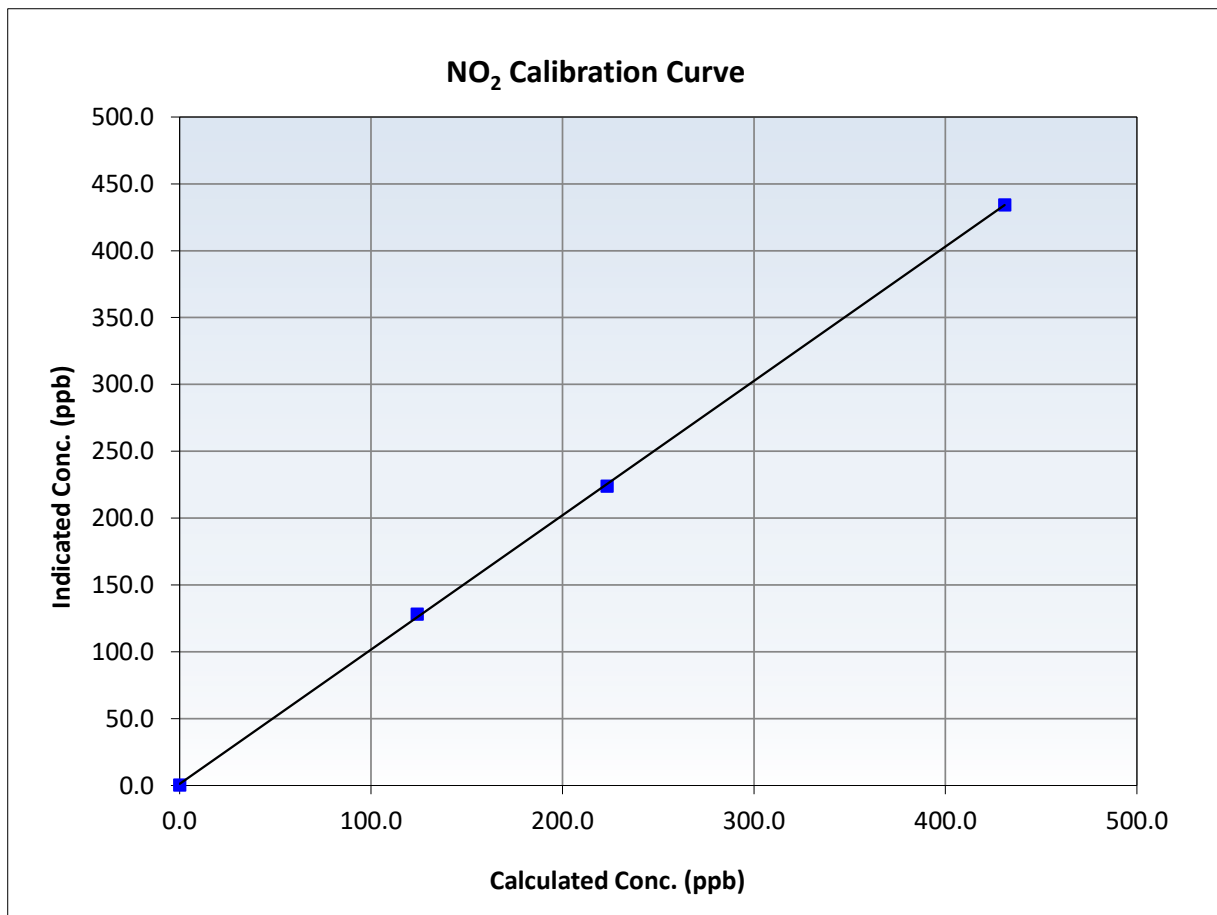
NO₂ Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:28	End Time (MST):	12:59
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

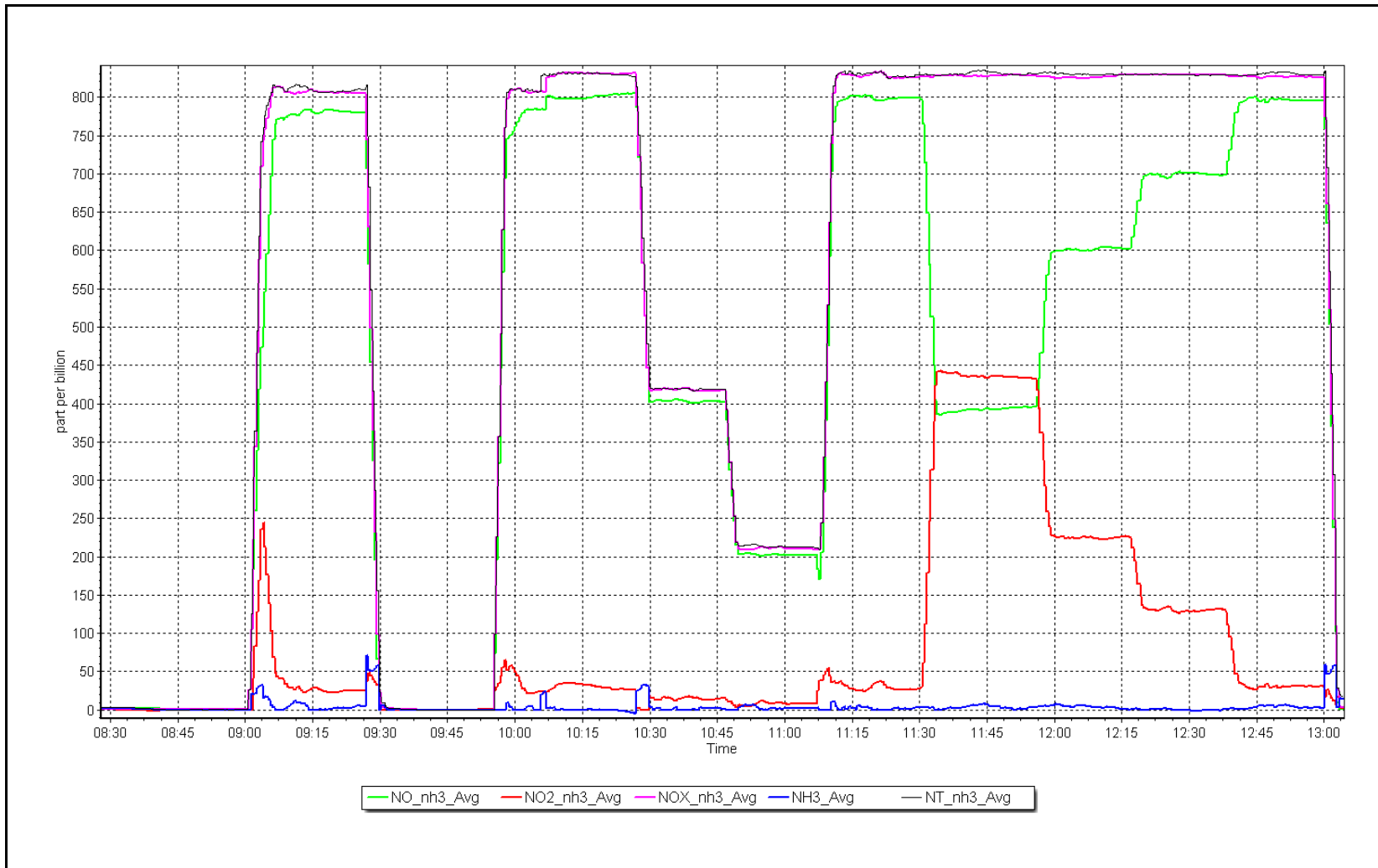
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.3	----	Correlation Coefficient	0.999910	<i>≥0.995</i>
430.9	434.3	0.9922	Slope	1.004672	<i>0.90 - 1.10</i>
223.3	224.0	0.9970	Intercept	1.225223	<i>+/-20</i>
124.0	128.2	0.9674			



NO_x Calibration Plot

Date: October 9, 2024

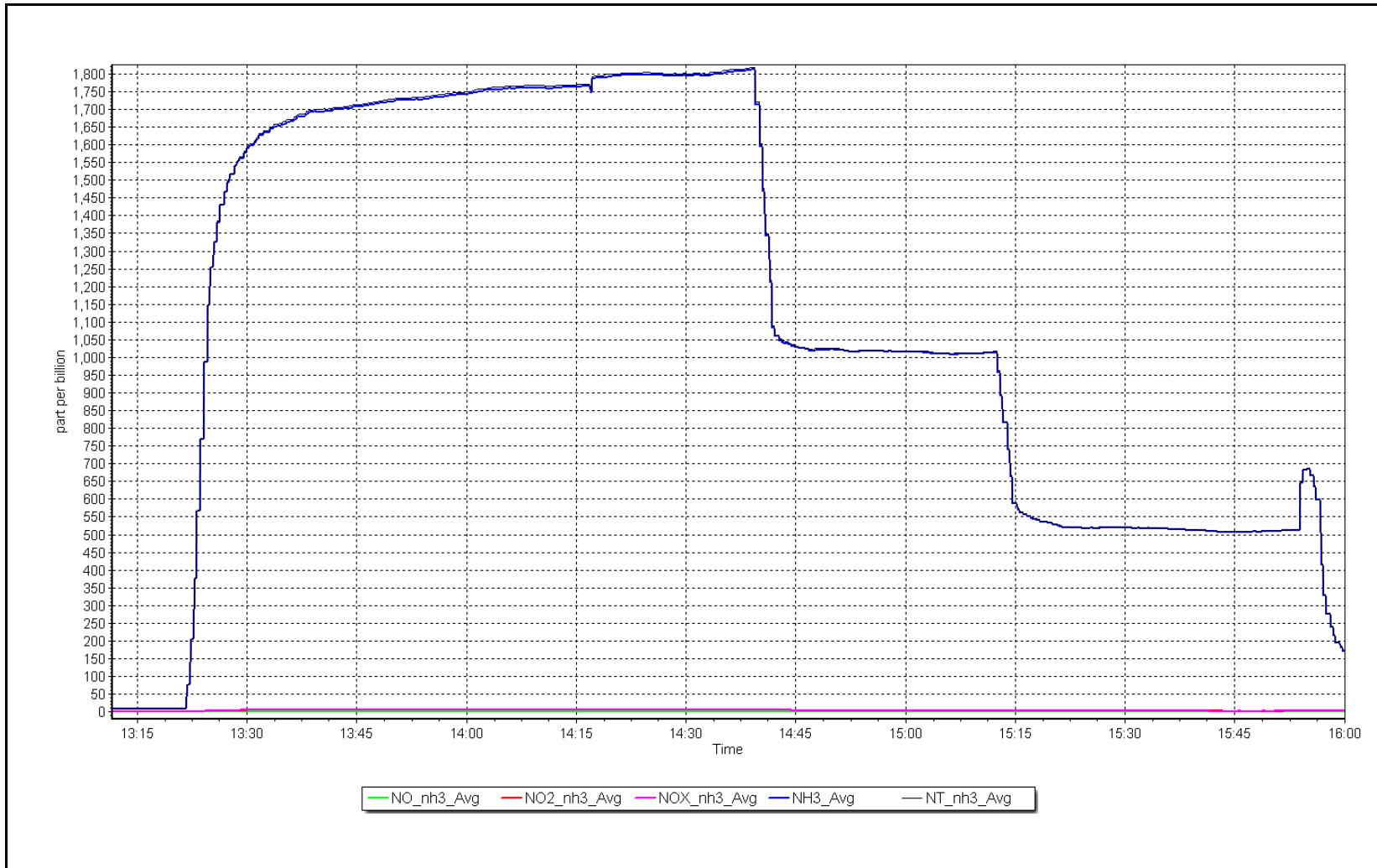
Location: Patricia McInnes



NH₃ Calibration Plot

Date: October 9, 2024

Location: Patricia McInnes





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS07 ATHABASCA VALLEY OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number: AMS07
Calibration Date:	October 3, 2024	Last Cal Date: September 4, 2024
Start time (MST):	9:50	End time (MST): 13:50
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997027	0.994596	Backgd or Offset:	2.64	2.64
Calibration intercept:	1.285471	1.885408	Coeff or Slope:	0.834	0.834

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	79.8	799.0	793.6	1.007
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	793.6	Previous response	797.9	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	79.8	799.0	795.0	1.005
Mid point	4960	39.9	399.5	402.1	0.994
Low point	4980	20.0	200.2	201.5	0.994
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	79.8	799.0	795.1	1.005
Average Correction Factor:					0.997

Notes: No adjustments performed.

Calibration Performed By: Kelly Baragar



Wood Buffalo Environmental Association

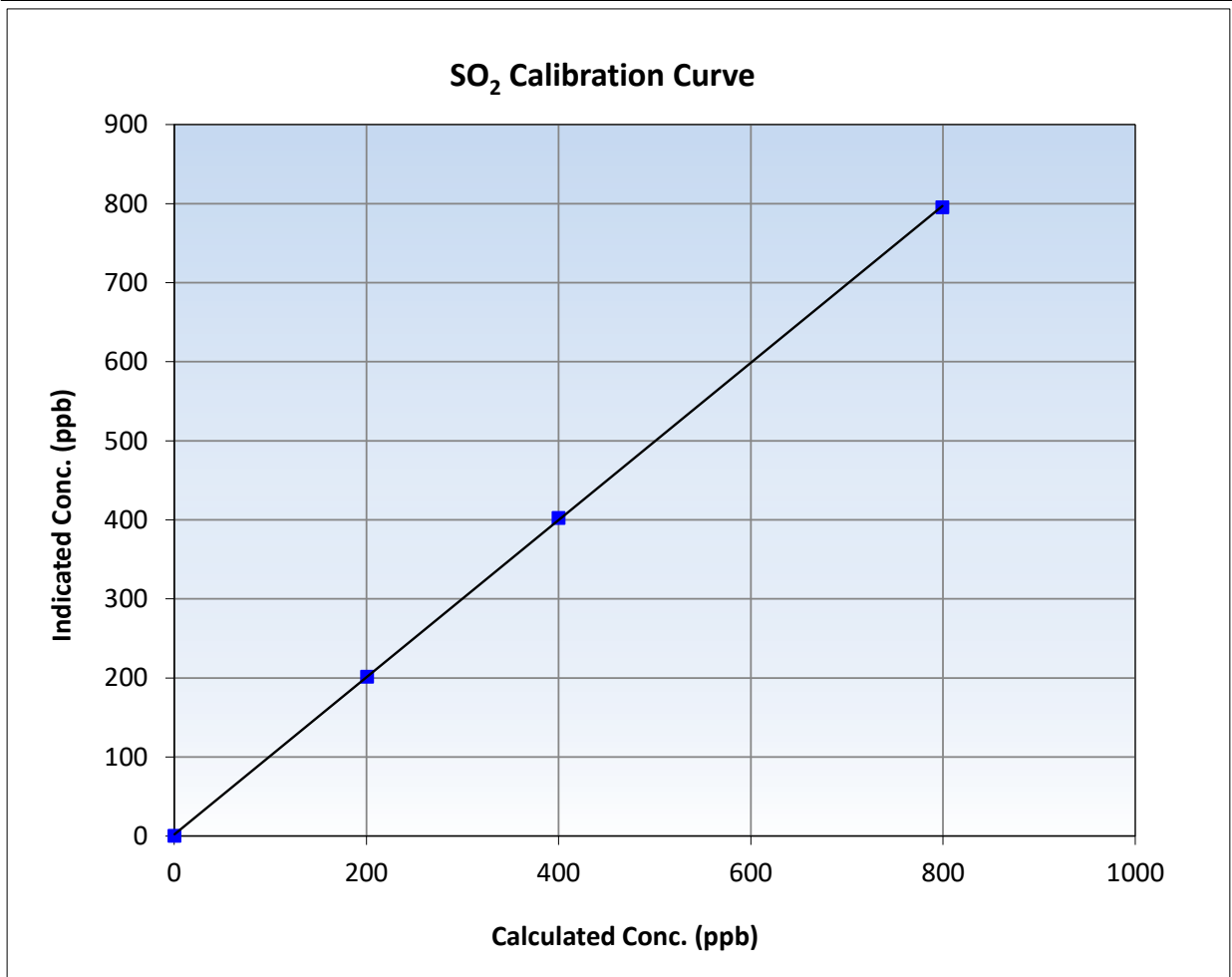
SO₂ Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 4, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	9:50	End Time (MST):	13:50
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1507864683

Calibration Data

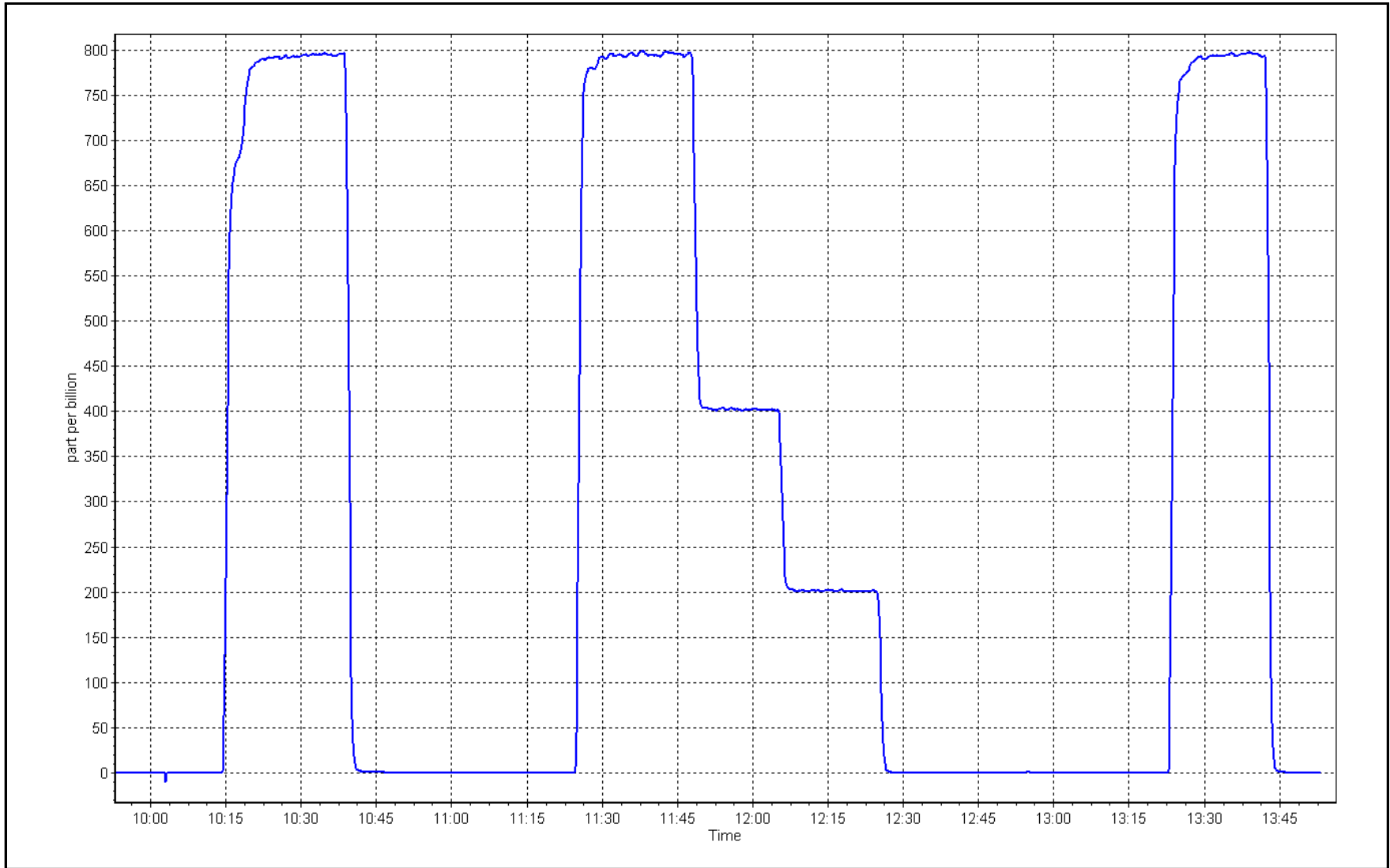
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.1	----	Correlation Coefficient	0.999959	≥0.995
799.0	795.0	1.0050	Slope	0.994596	0.90 - 1.10
399.5	402.1	0.9935	Intercept	1.885408	+/-30
200.2	201.5	0.9937			



SO2 Calibration Plot

Date: October 3, 2024

Location: Athabasca Valley





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name: Athabasca Valley	Station number: AMS07
Calibration Date: October 17, 2024	Last Cal Date: September 20, 2024
Start time (MST): 9:01	End time (MST): 13:24
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.005689	1.009293	Backgd or Offset:	2.8	2.8
Calibration intercept:	-0.242146	-0.142183	Coeff or Slope:	0.920	0.916

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4925	75.5	79.3	81.2	0.973
As found Mid point	4962	37.7	39.6	40.3	0.975
As found Low point	4981	18.9	19.8	19.9	0.982
New cylinder response					
Baseline Corr As found:	81.5	Prev response:	79.48	*% change:	2.5%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.028906	AF Intercept:	-0.402263
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999993	* = > +/-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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4925	75.5	79.3	79.9	0.993
Mid point	4962	37.7	39.6	39.9	0.993
Low point	4981	18.9	19.9	19.8	1.003
As left zero	5000	0.0	0.0	-0.1	----
As left span	4925	75.5	79.3	79.3	1.000
SO2 Scrubber Check	4920	79.2	792.1	0.0	----
Date of last scrubber change:	25-Feb-22		Ave Corr Factor		0.996
Date of last converter efficiency test:	April 22, 2022				

Notes: Sample inlet filters changed after multipoint as founds. SO2 scrubber check done after calibrator zero and passed. Span adjusted.

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

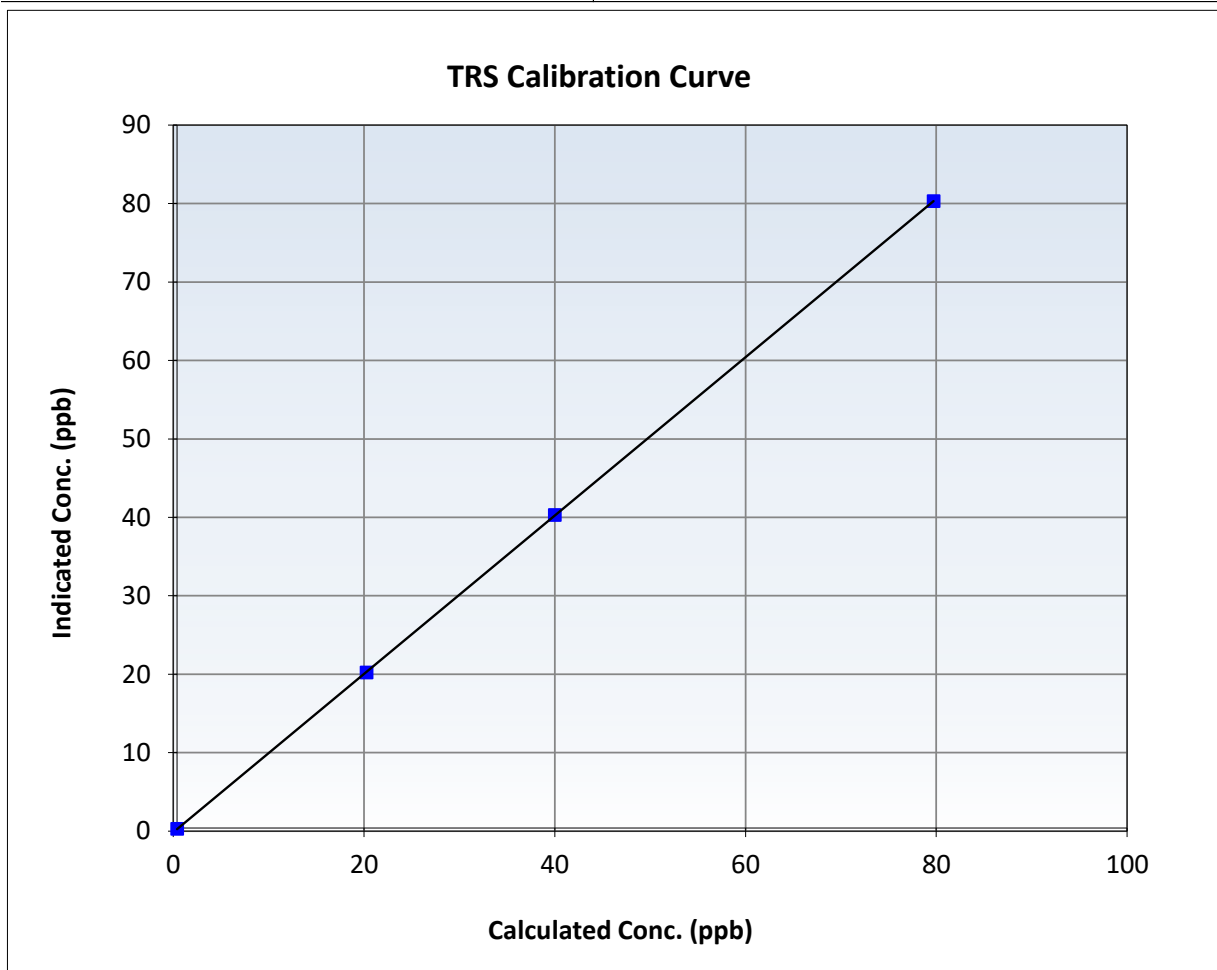
TRS Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 20, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	9:01	End Time (MST):	13:24
Analyzer make:	Thermo 43i LTE	Analyzer serial #:	1180540018

Calibration Data

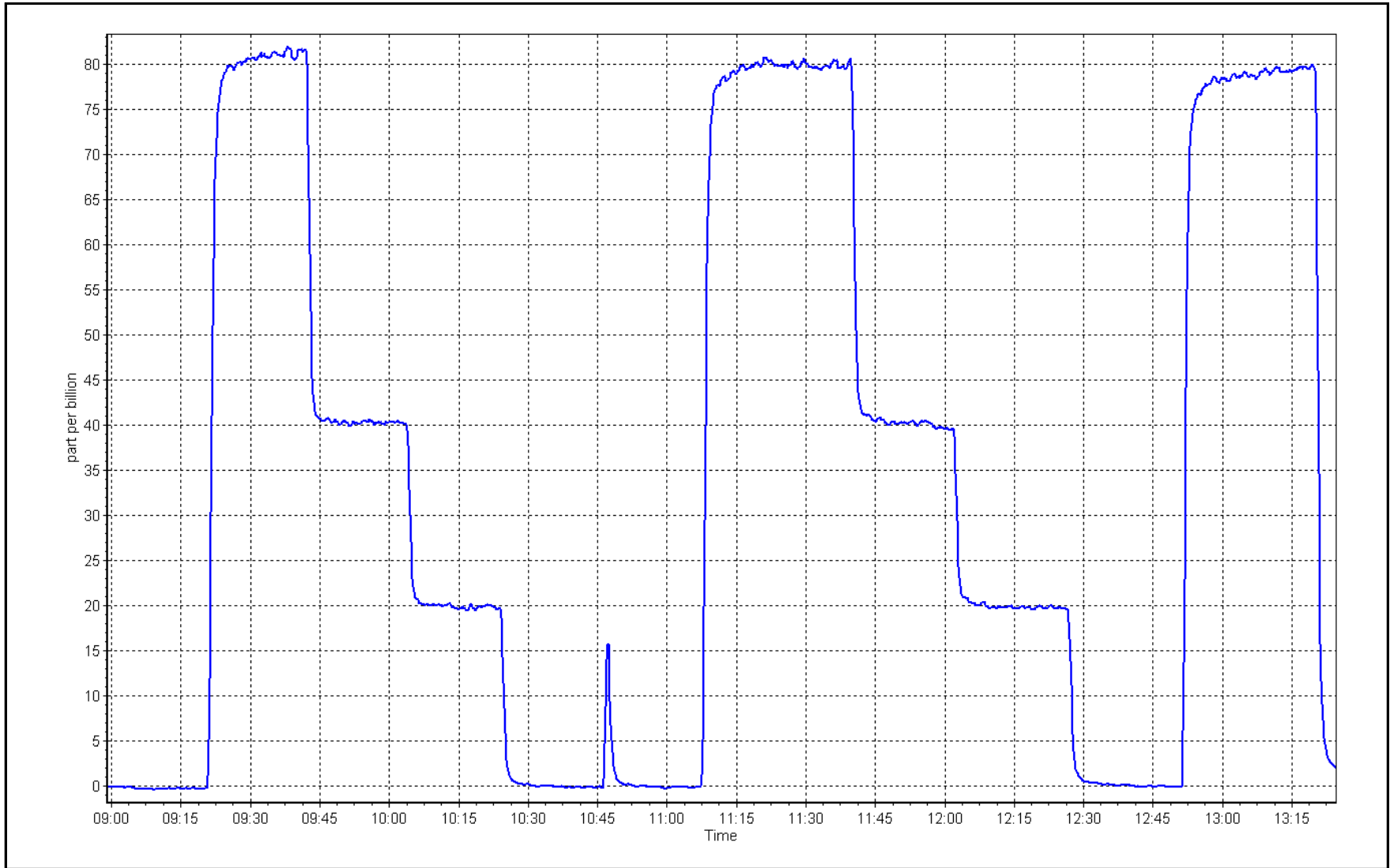
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	0.999996	≥ 0.995
79.3	79.9	0.9926	Slope	1.009293	$0.90 - 1.10$
39.6	39.9	0.9927	Intercept	-0.142183	± 3
19.9	19.8	1.0029			



TRS Calibration Plot

Date: October 17, 2024

Location: Athabasca Valley





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	October 3, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	9:50	End time (MST):	17:00
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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.94E-04	2.95E-04	NMHC SP Ratio:	6.86E-05	7.06E-05
CH4 Retention time:	13.4	13.4	NMHC Peak Area:	131117	127449
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	16.91	16.64	1.017
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.64	Prev response	16.89	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	16.91	16.85	1.004
Mid point	4960	39.9	8.46	8.38	1.009
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	16.72	1.011
Average Correction Factor					1.008

Notes: Replaced N2 carrier gas and span adjusted. Added digital pressure sensor to N2 regulator which caused unexpected sensitivity change, eventually the change settled out.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.00	8.76	1.027
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.76	Prev response	9.01	*% change	-2.8%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.00	8.94	1.007
Mid point	4960	39.9	4.50	4.48	1.004
Low point	4980	20.0	2.26	2.25	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.00	8.88	1.013
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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	7.92	7.87	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.87	Prev response	7.88	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	7.92	7.92	1.000
Mid point	4960	39.9	3.96	3.90	1.014
Low point	4980	20.0	1.98	1.94	1.022
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					1.012

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.000003	0.996758
THC Cal Offset:	-0.026337	-0.023317
CH ₄ Cal Slope:	0.998404	1.000944
CH ₄ Cal Offset:	-0.023129	-0.027931
NMHC Cal Slope:	1.001283	0.993139
NMHC Cal Offset:	-0.003208	0.004613

Calibration Performed By: Kelly Baragar



Wood Buffalo Environmental Association

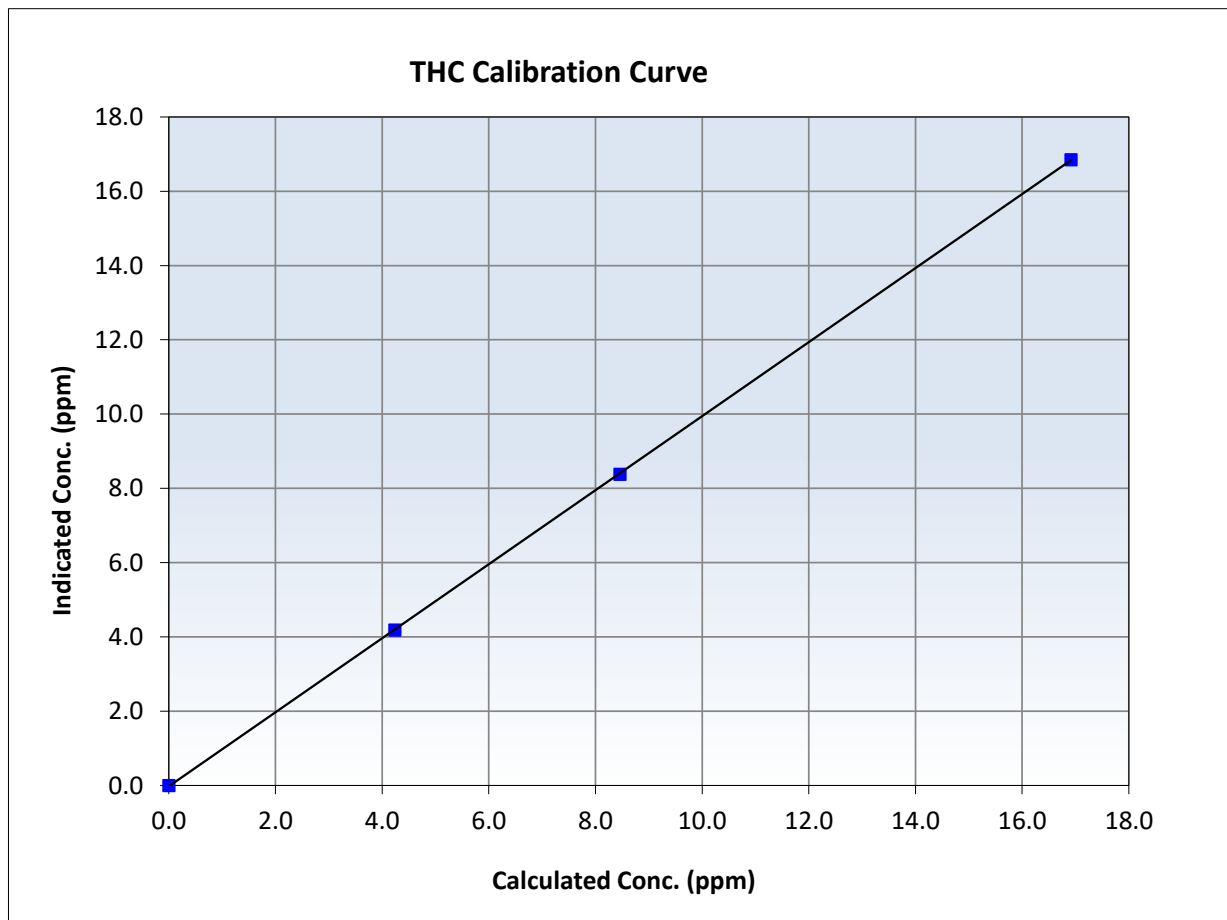
THC Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 4, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:50	End Time (MST):	17:00
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999990	<i>≥0.995</i>
16.91	16.85	1.0037	Slope	0.996758	<i>0.90 - 1.10</i>
8.46	8.38	1.0089	Intercept	-0.023317	<i>+/-0.5</i>
4.24	4.19	1.0124			





Wood Buffalo Environmental Association

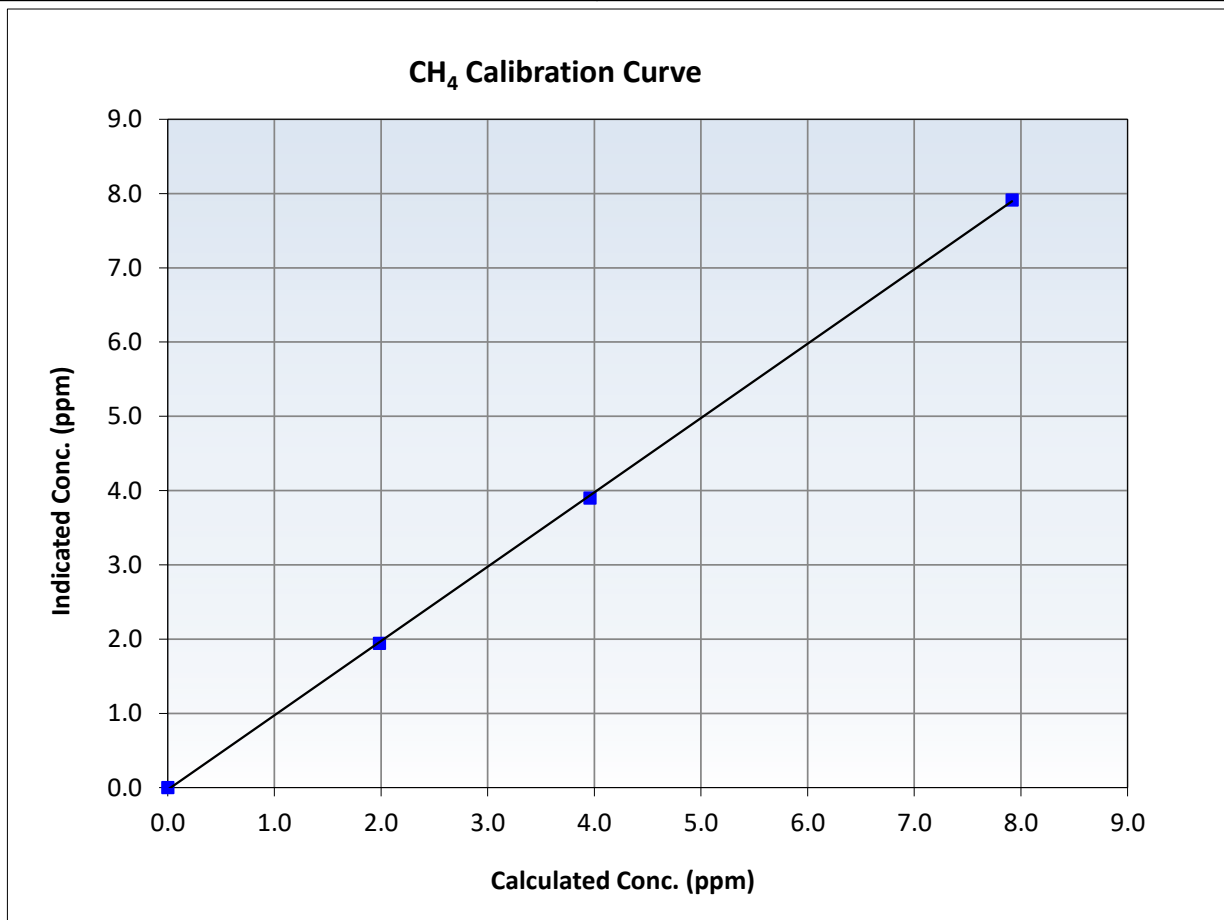
CH₄ Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 4, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:50	End Time (MST):	17:00
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999928 ≥0.995
7.92	7.92	1.0001	Slope	1.000944 0.90 - 1.10
3.96	3.90	1.0144	Intercept	-0.027931 +/-0.5
1.98	1.94	1.0216		





Wood Buffalo Environmental Association

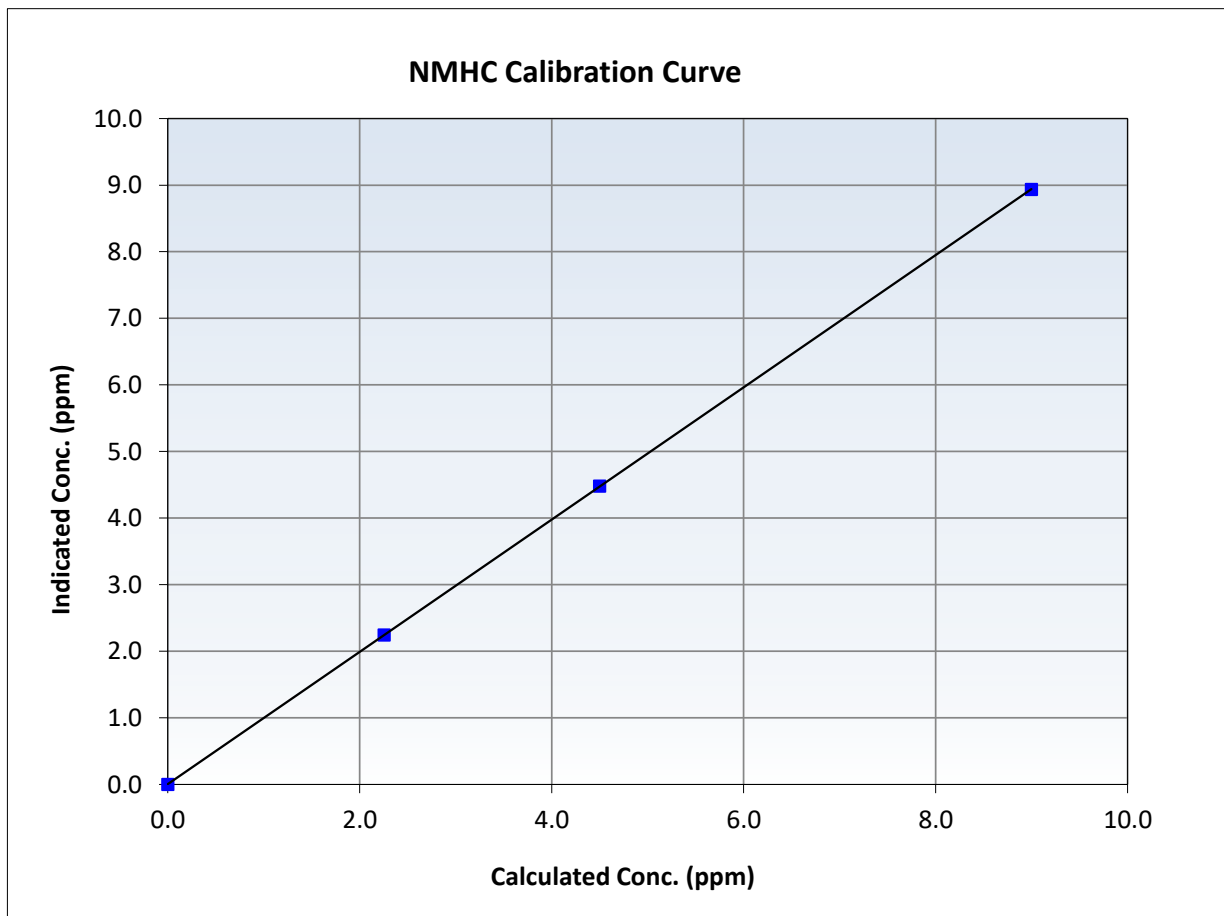
NMHC Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 4, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:50	End Time (MST):	17:00
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

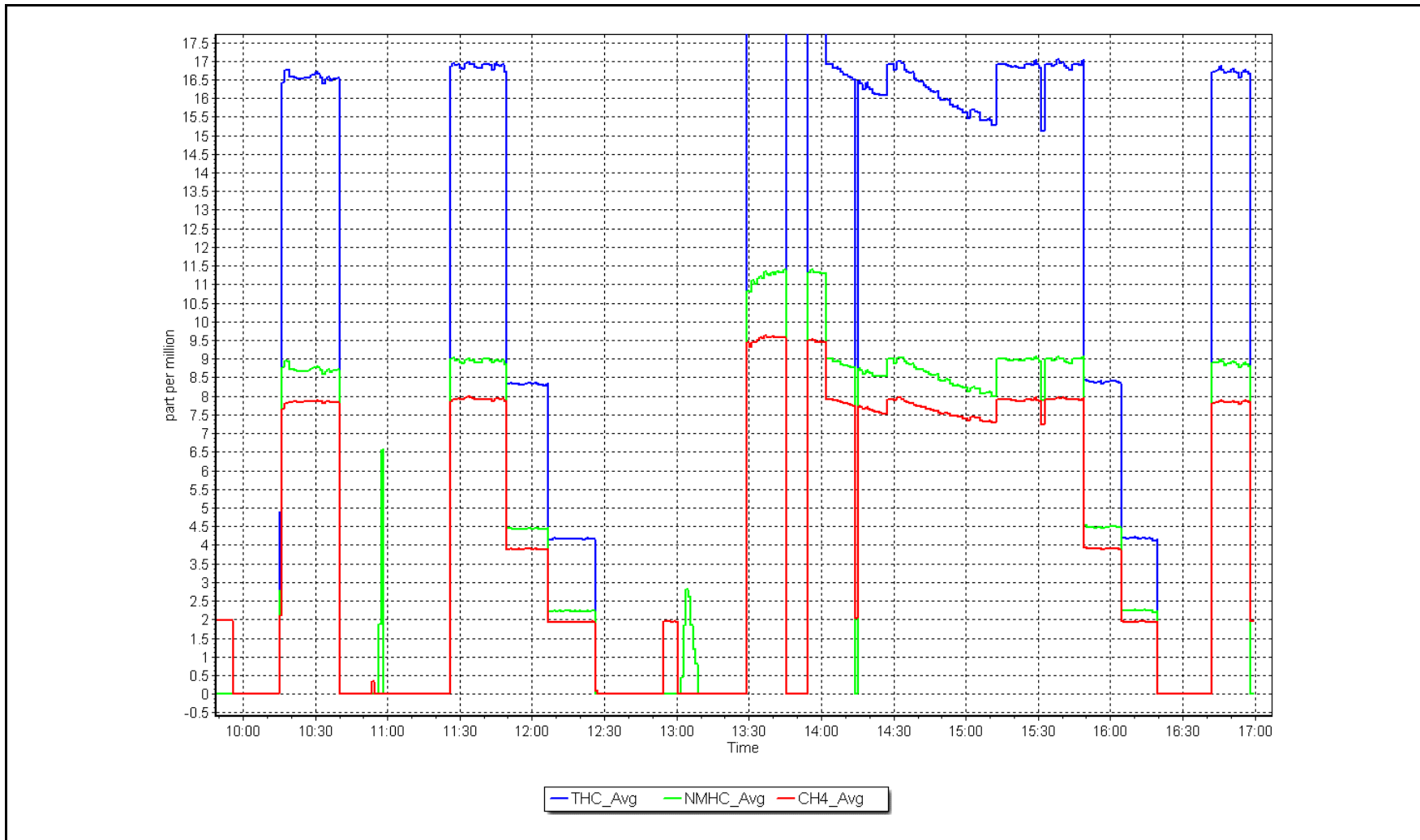
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999998	<i>≥0.995</i>
9.00	8.94	1.0068	Slope	0.993139	<i>0.90 - 1.10</i>
4.50	4.48	1.0044	Intercept	0.004613	<i>+/-0.5</i>
2.26	2.25	1.0040			



NMHC Calibration Plot

Date: October 3, 2024

Location: Athabasca Valley





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Athabasca Valley
 Station number: AMS 07
 Calibration Date: October 18, 2024
 Last Cal Date: September 13, 2024
 Start time (MST): 9:12
 End time (MST): 14:14
 Reason: Routine

Calibration Standards

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

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	----	----
AF High point	4933	66.8	803.0	800.3	2.7	788.3	782.6	5.8	1.0183	1.0226
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 801.9 ppb		NO = 798.6 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -1.7%	
Baseline Corr 1st pt	NO _x = 788.5 ppb		NO = 782.6 ppb			<u>As Found Statistics</u>		*Percent Change	NO = -2.0%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1160120024

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.995760	0.998934
NO _x Cal Offset:	2.331921	1.991909
NO Cal Slope:	0.995386	1.000813
NO Cal Offset:	1.951956	1.651919
NO ₂ Cal Slope:	1.001904	0.996399
NO ₂ Cal Offset:	0.108741	-0.236510

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.148	1.167	NO bkgnd or offset:	8.2	8.4
NOX coeff or slope:	1.002	1.000	NOX bkgnd or offset:	8.5	8.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	226.7	229.8

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.2	-0.1	----	----
High point	4933	66.8	803.0	800.3	2.7	802.8	801.4	1.2	1.0002	0.9986
Mid point	4966	33.4	401.5	400.2	1.3	405.1	404.3	0.9	0.9912	0.9898
Low point	4983	16.7	200.7	200.1	0.7	203.7	202.4	1.3	0.9855	0.9885
As left zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.0	----	----
As left span	4933	66.8	803.0	398.9	404.1	805.0	398.9	405.7	0.9975	1.0000
Average Correction Factor									0.9923	0.9923

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	802.6	398.9	406.4	404.1	1.0056	99.4%
Mid GPT point	802.6	602.2	203.1	204.0	0.9955	100.5%
Low GPT point	802.6	700.9	104.4	102.3	1.0203	98.0%
Average Correction Factor					1.0071	99.3%

Notes:

Span adjusted.

Calibration Performed By:

Aswin Sasi Kumar



Wood Buffalo Environmental Association

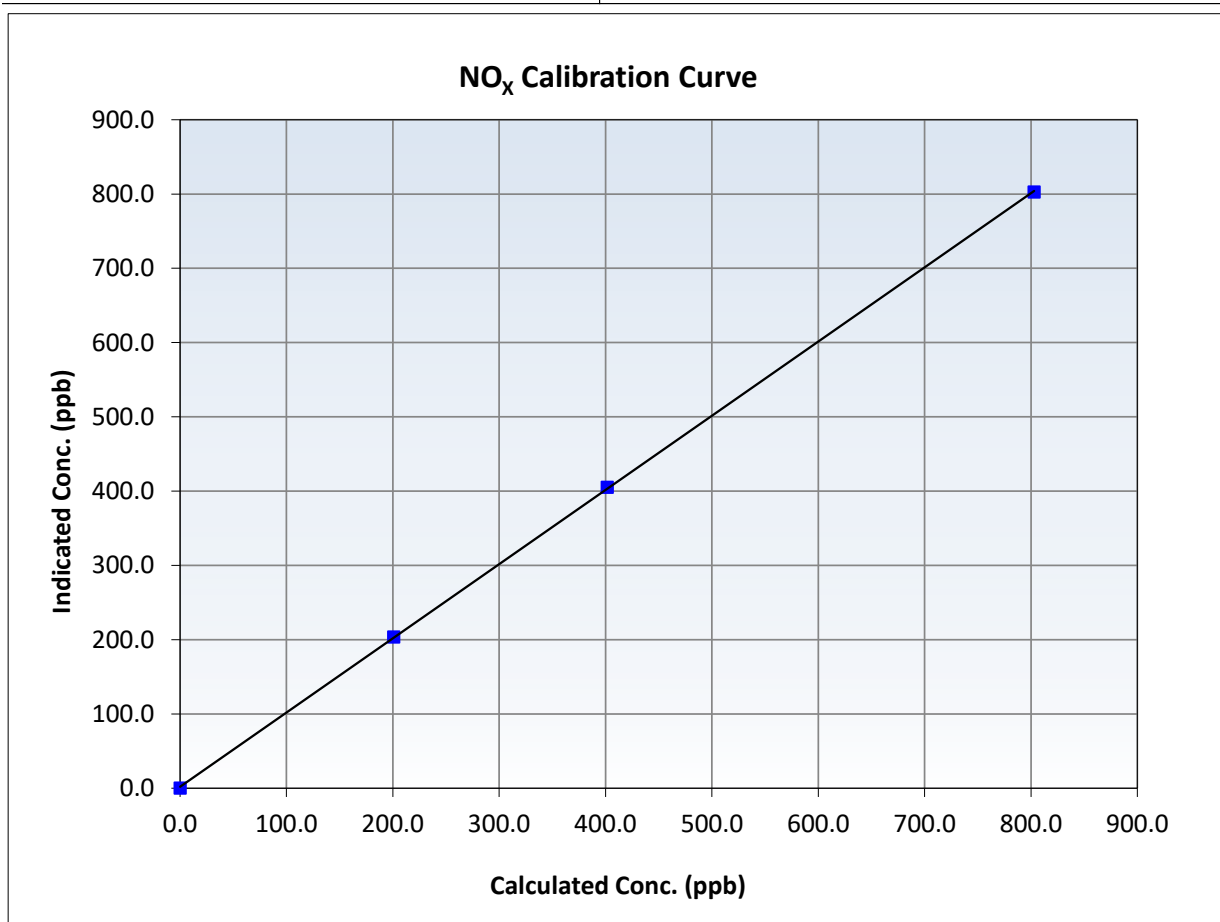
NO_x Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:12	End Time (MST):	14:14
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999969	<i>≥0.995</i>
803.0	802.8	1.0002	Slope	0.998934	<i>0.90 - 1.10</i>
401.5	405.1	0.9912	Intercept	1.991909	<i>+/-20</i>
200.7	203.7	0.9855			





Wood Buffalo Environmental Association

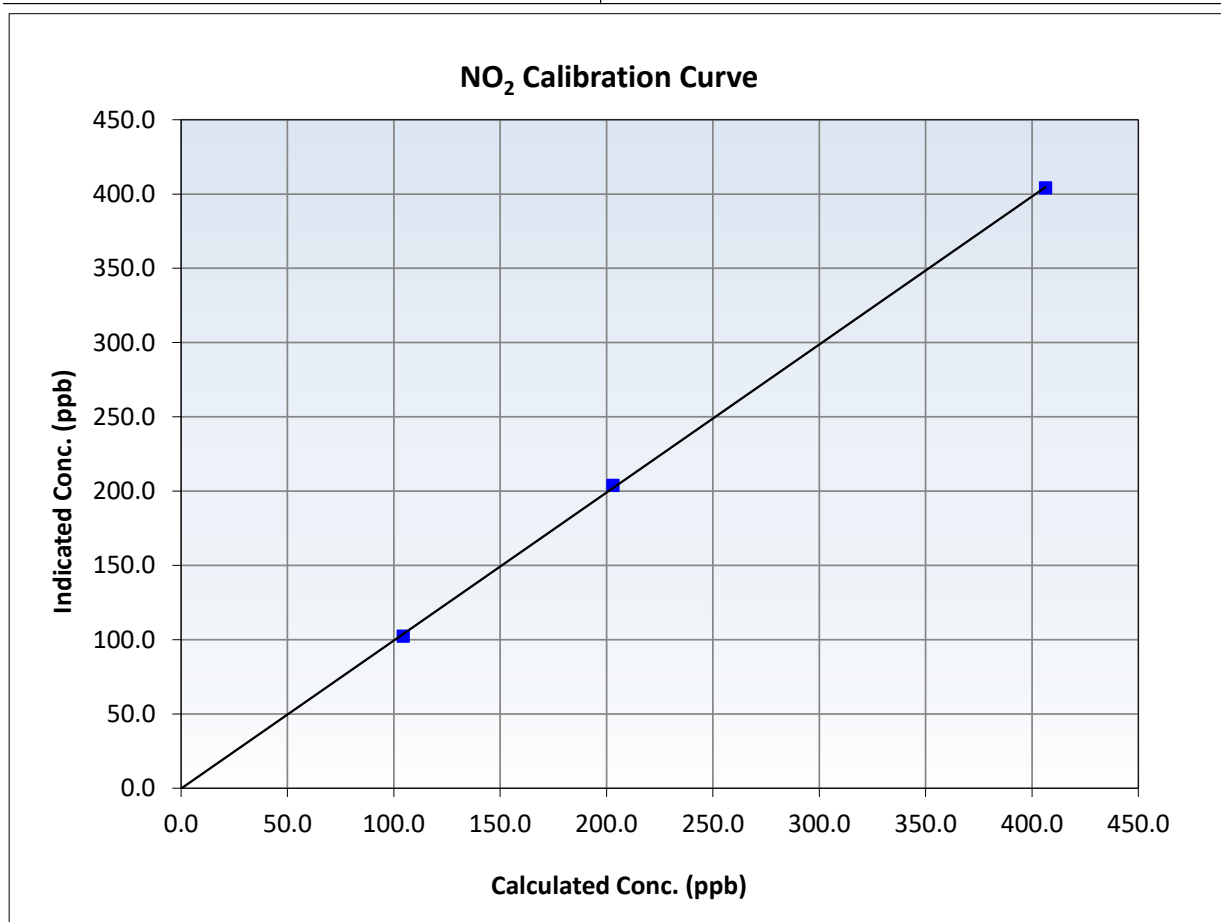
NO₂ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:12	End Time (MST):	14:14
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999932	≥0.995
406.4	404.1	1.0056	Slope	0.996399	0.90 - 1.10
203.1	204.0	0.9955	Intercept	-0.236510	+/-20
104.4	102.3	1.0203			





Wood Buffalo Environmental Association

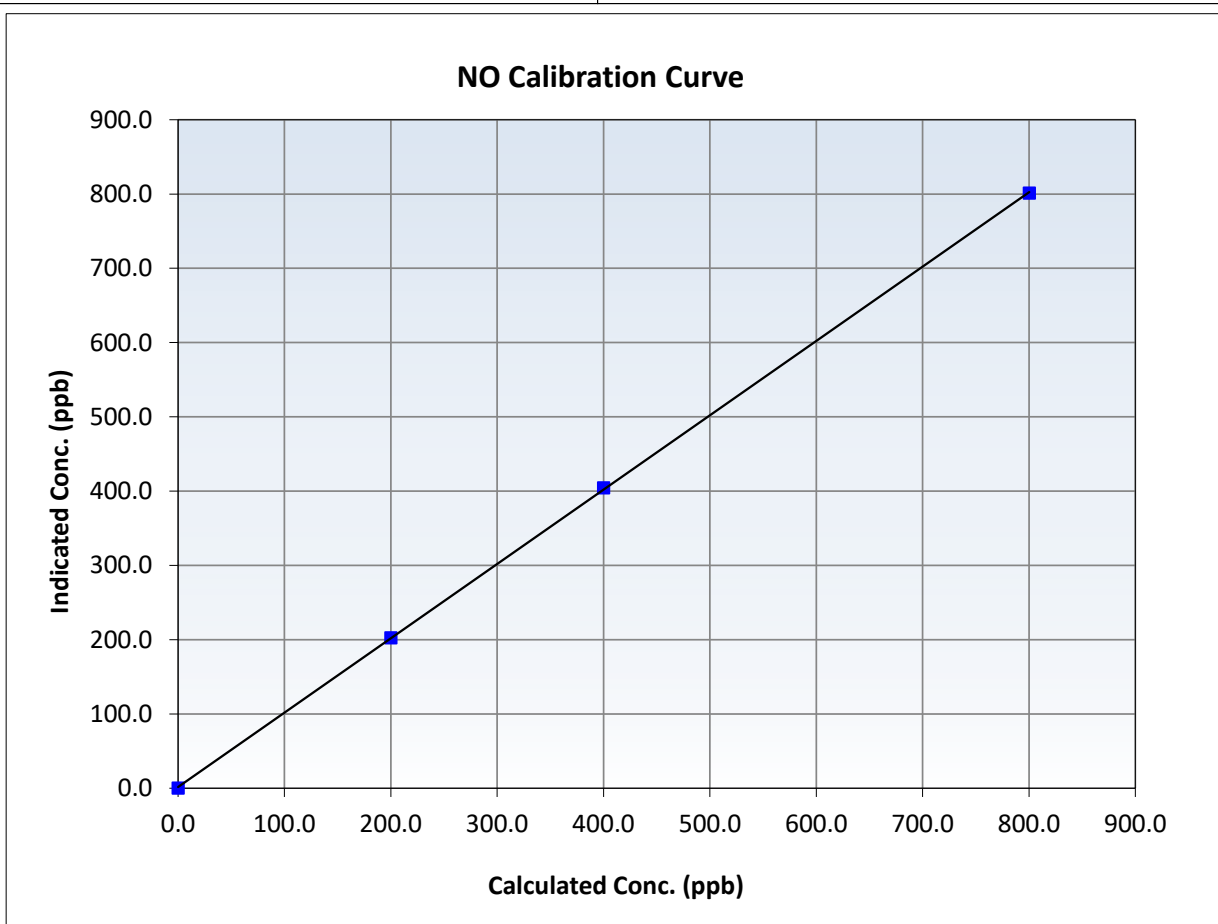
NO Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:12	End Time (MST):	14:14
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

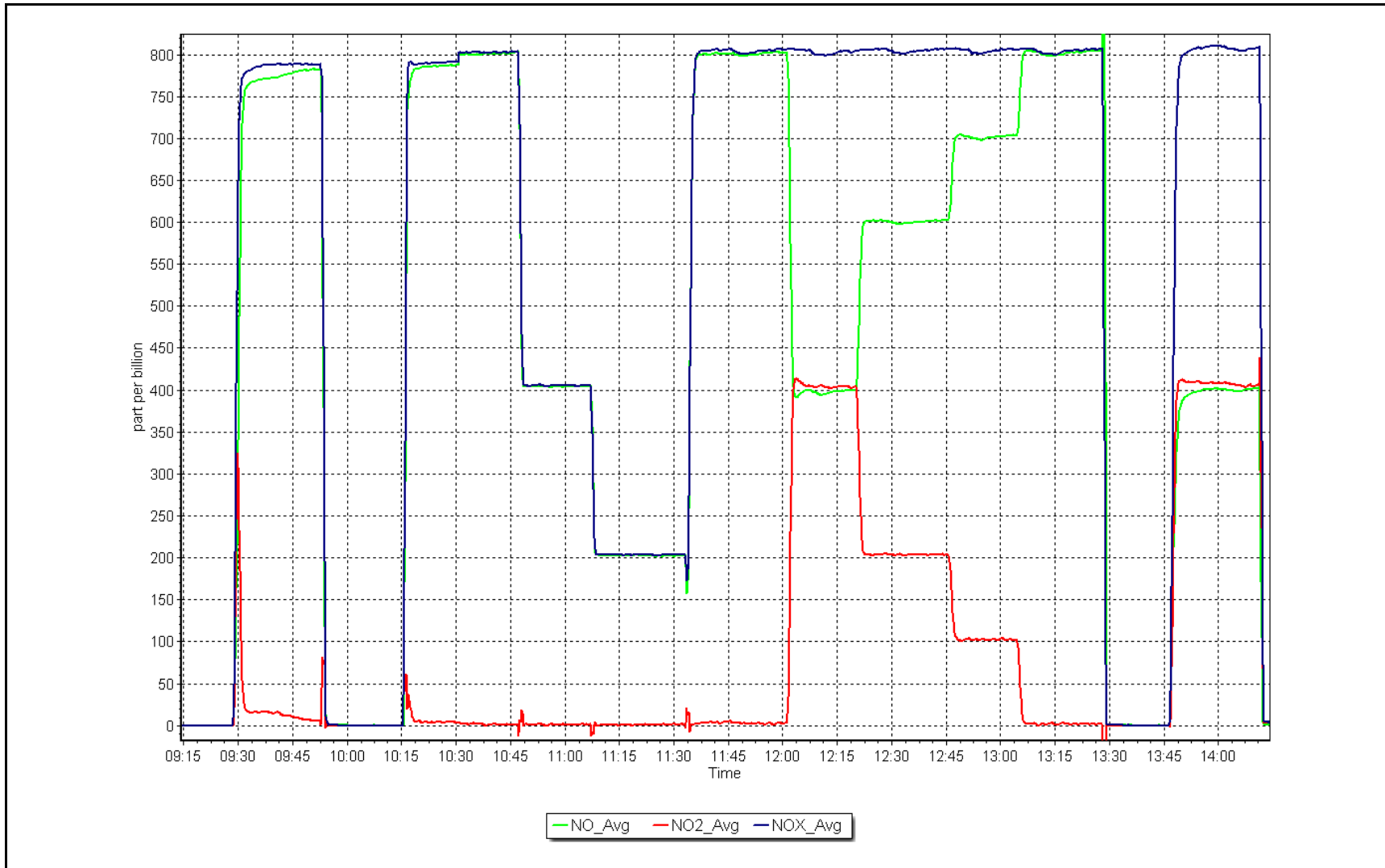
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.2	----	Correlation Coefficient	0.999976	≥0.995
800.3	801.4	0.9986	Slope	1.000813	0.90 - 1.10
400.2	404.3	0.9898	Intercept	1.651919	+/-20
200.1	202.4	0.9885			



NO_x Calibration Plot

Date: October 18, 2024

Location: Athabasca Valley





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	October 4, 2024	Last Cal Date:	September 9, 2024
Start time (MST):	9:15	End time (MST):	12:35
Reason:	Routine		

Calibration Standards

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

Analyzer Information

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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.998943	1.002029	Backgd or Offset:	-1.9	-2.0
Calibration intercept:	0.760000	1.120000	Coeff or Slope:	1.531	1.552

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	800.0	0.0	0.1	----
As found High point	5000	1582.6	400.0	393.8	1.016
As found Mid point					
As found Low point					
Baseline Corr As found:	393.7	Previous response	400.3	*% change	-1.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	800.0	0.0	0.4	----
High point	5000	1582.6	400.0	401.5	0.996
Mid point	5000	1118.0	200.0	202.1	0.990
Low point	5000	897.8	100.0	101.9	0.981
As left zero	5000	400.0	0.0	0.5	----
As left span	5000	1582.6	400.0	405.1	0.987
Average Correction Factor					0.989

Notes: Sample inlet filters changed after as founds. Span adjusted.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

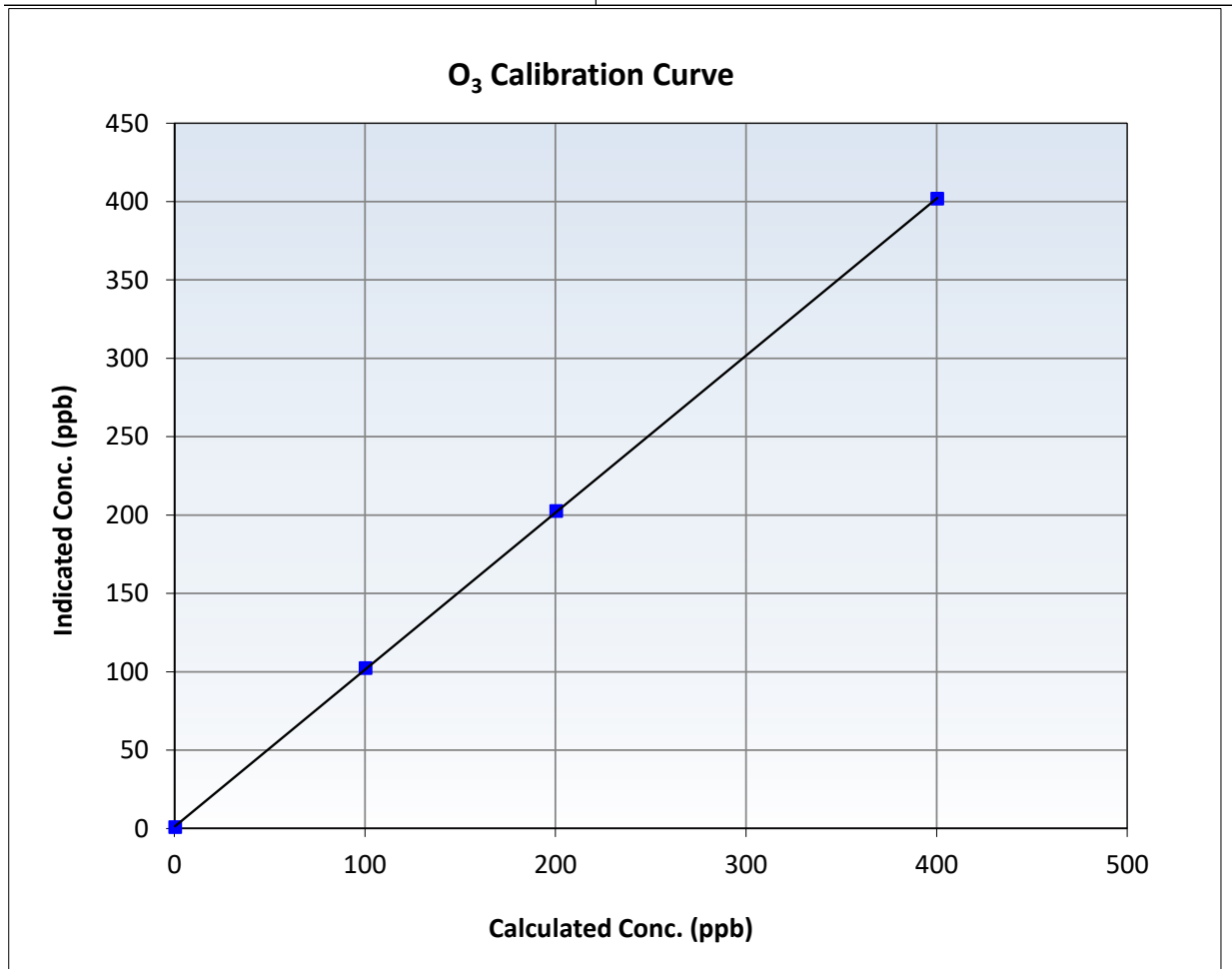
O₃ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 9, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	9:15	End Time (MST):	12:35
Analyzer make:	Thermo 49i	Analyzer serial #:	1152220023

Calibration Data

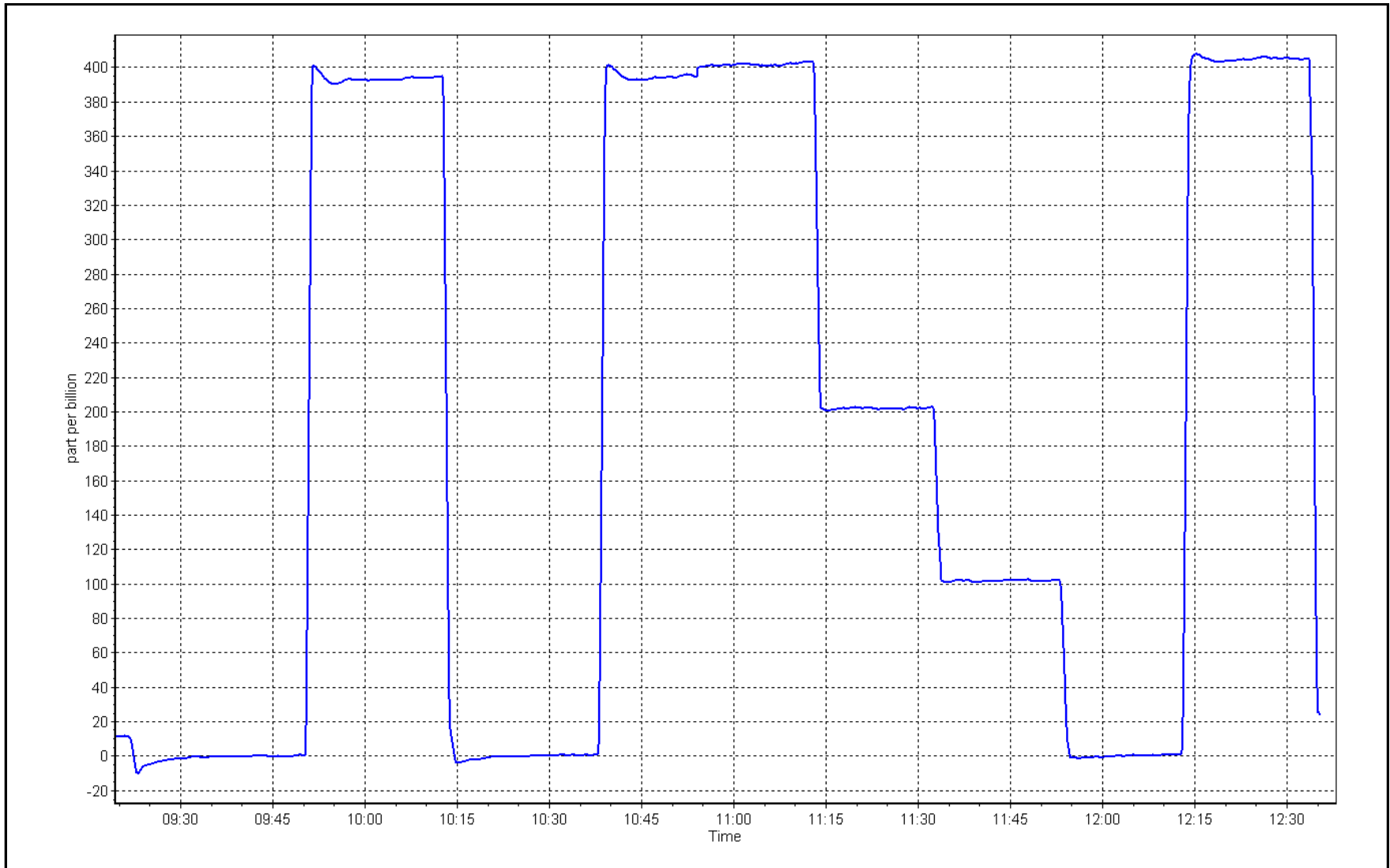
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.4	----	Correlation Coefficient	0.999984	≥0.995
400.0	401.5	0.9963	Slope	1.002029	0.90 - 1.10
200.0	202.1	0.9896	Intercept	1.120000	+/- 5
100.0	101.9	0.9814			



O₃ Calibration Plot

Date: October 4, 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: October 21, 2024 Last Cal Date: September 20, 2024
Start time (MST): 9:46 End time (MST): 10:48
Analyzer Make: API T640 S/N: 645
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)	-1.8	-2.3	-1.8	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	742.4	738.5	742.4	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.00	4.96	5.00	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	38	----	38	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	1.3	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	N/A	N/A	N/A	<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: July 8, 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: Flow, temp and pressure. Leak check passed.

Calibration by: Aswin Sasi Kumar



Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	October 3, 2024	Last Cal Date:	September 6, 2024
Start time (MST):	9:50	End time (MST):	13:18
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999837	0.997785	Backgd or Offset:	5.027	4.872
Calibration intercept:	0.146010	0.121940	Coeff or Slope:	1.069	1.043

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4932	67.8	40.0	41.0	0.978
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	40.94	Prev response:	40.18	*% 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	

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) <i>Limit = 0.95-1.05</i>
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	20.2	0.989
Low point	4983	16.9	10.0	10.1	0.991
As left zero	5000	0.0	0.0	0.0	----
As left span	4932	67.8	40.0	39.1	1.023
Average Correction Factor					0.994

Notes: Performed span adjustment.

Calibration Performed By: Kelly Baragar



Wood Buffalo Environmental Association

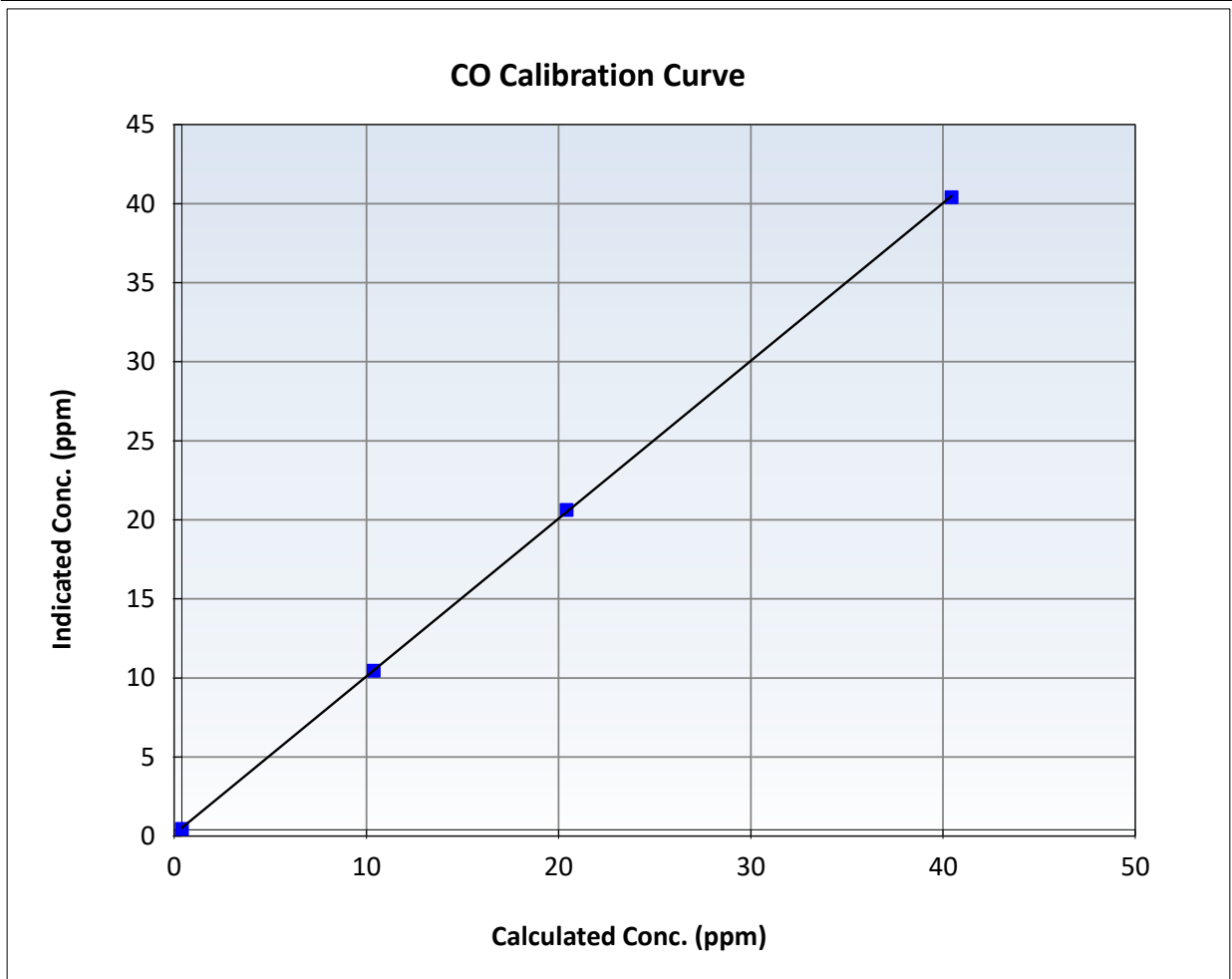
CO Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 6, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:50	End Time (MST):	13:18
Analyzer make:	Thermo 48i-TLE	Analyzer serial #:	1408761381

Calibration Data

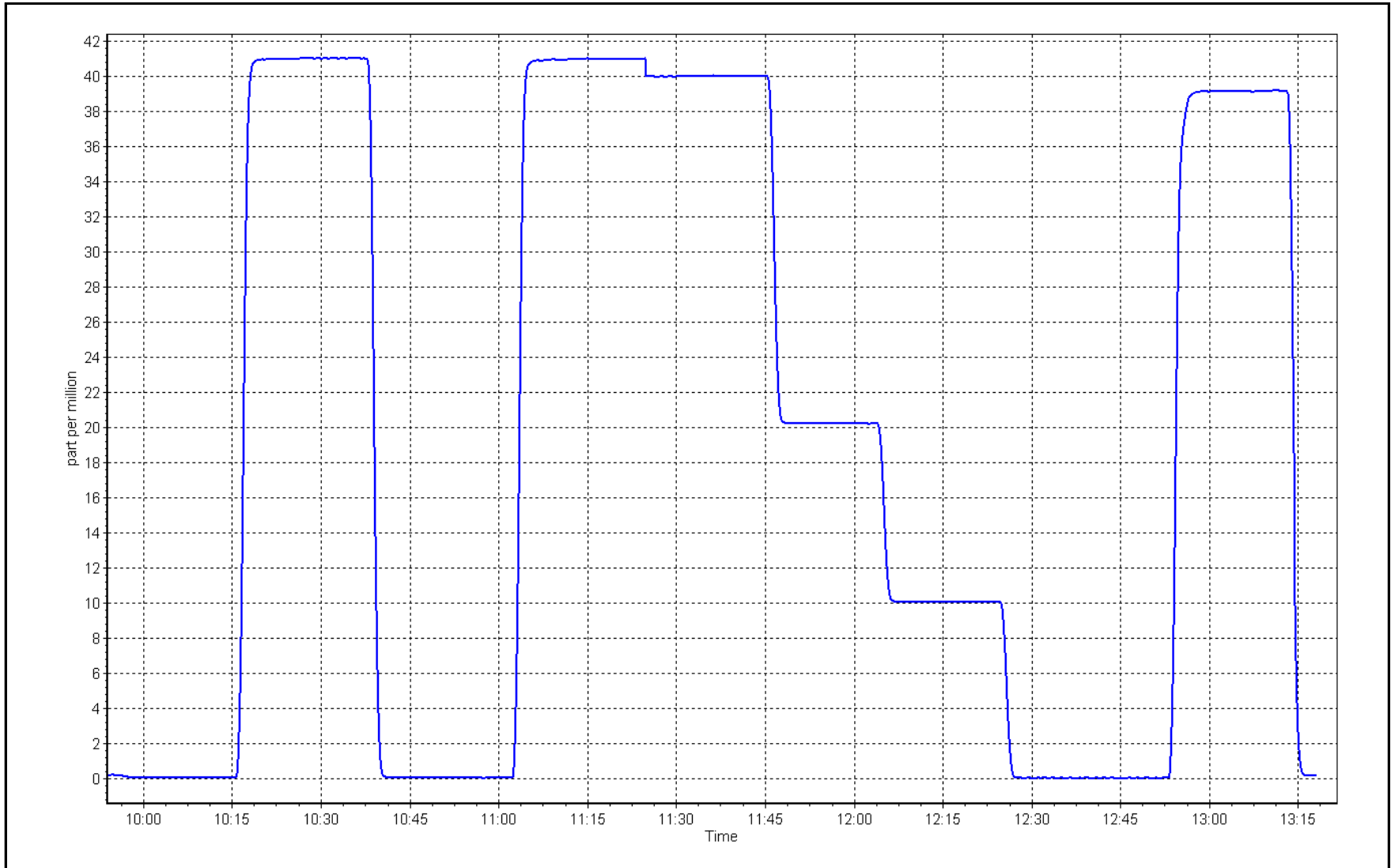
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999968	≥0.995
40.0	40.0	1.0009	Slope	0.997785	0.90 - 1.10
20.0	20.2	0.9892	Intercept	0.121940	+/-1.5
10.0	10.1	0.9912			



CO Calibration Plot

Date: October 3, 2024

Location: Athabasca Valley





Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Athabasca Valley	Station Number:	AMS 07
Calibration Date:	October 10, 2024	Prev Cal Date:	September 20, 2023
Start Time (MST):	8:35	End Time (MST):	9:37
Tower Height (m):	10.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	G3212
WS Calibrator:	Model 18811	Serial Number:	CA 05230

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.3	0.4%
400	39.4	39.4	0.1%
600	58.6	58.5	0.0%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999999	≥ 0.9995
Calculated slope		0.999569	$0.90 - 1.10$
Calculated intercept		-0.025289	± 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	D13602
As Found Declination (deg east of True North):	<u>13</u>	As Left Declination (deg east of True North):	<u>13</u>
Solar noon time (MST):	13:12	Calc Declination*:	13.42 Degrees
Deadband calc:	1.0 degrees (<i>Limit 4 deg</i>)		<small>* - calculated declination as per NOAA website</small>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.4	---
90	89.5	-0.1%
180	181.1	0.3%
270	272.1	0.6%
355	356.4	0.4%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999989	≥ 0.9995
Calculated slope		0.994857	$0.90 - 1.10$
Calculated intercept		0.021306	± 4

Notes: Replaced WS sensor bearings. No issues to note with the WD sensor.

Calibration Performed By: Braiden Boutilier, Devin Russel



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS08 FORT CHIPEWYAN OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS08
Calibration Date:	October 7, 2024	Last Cal Date:	September 2, 2024
Start time (MST):	9:26	End time (MST):	12:10
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000817	1.008151	Backgd or Offset:	1.8	1.8
Calibration intercept:	1.055474	-2.863936	Coeff or Slope:	0.959	0.959

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.5	----
As found High point	4920	80.3	800.4	803.9	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.6	Previous response	804.1	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	4920	80.3	800.4	805.9	0.993
Mid point	4960	40.2	400.7	398.1	1.007
Low point	4980	20.1	200.4	197.7	1.013
As left zero	5000	0.0	0.0	-0.3	----
As left span	4920	80.3	800.4	805.3	0.994
Average Correction Factor:					1.004

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

Calibration Performed By: Matthew Courtoreille



Wood Buffalo Environmental Association

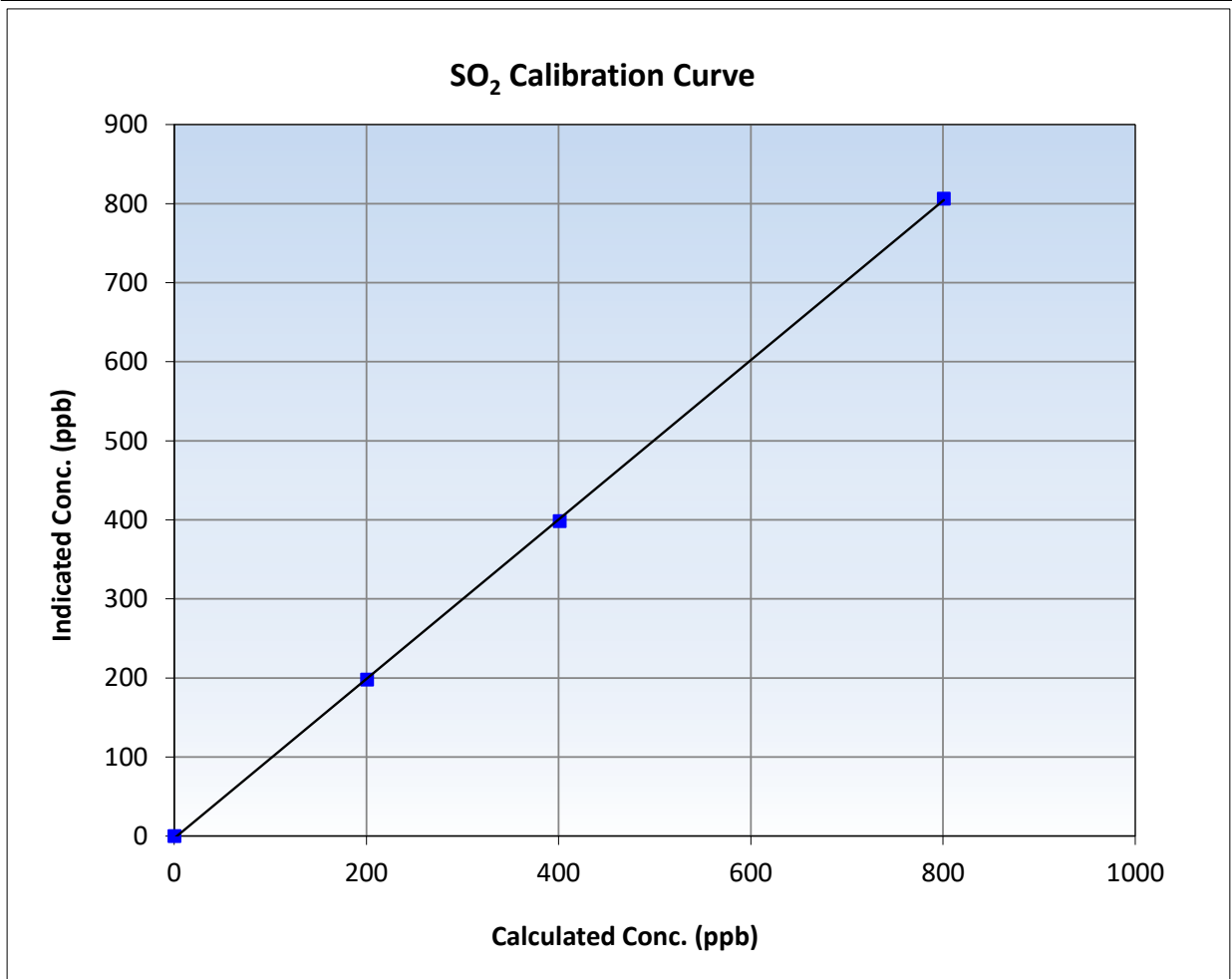
SO₂ Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 2, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS08
Start Time (MST):	9:26	End Time (MST):	12:10
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1136451241

Calibration Data

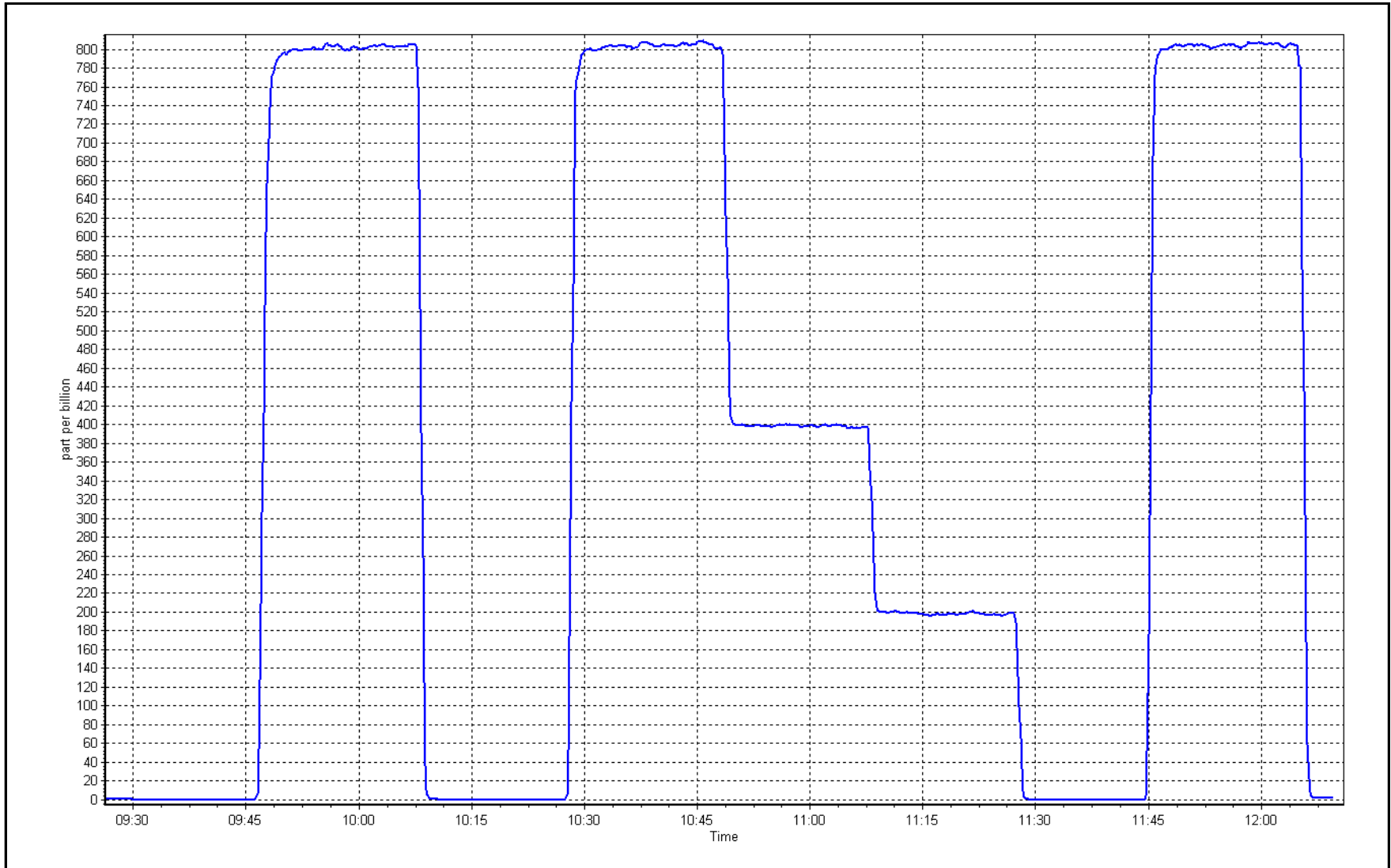
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.3	----	Correlation Coefficient	0.999941	≥0.995
800.4	805.9	0.9932	Slope	1.008151	0.90 - 1.10
400.7	398.1	1.0065	Intercept	-2.863936	+/-30
200.4	197.7	1.0134			



SO2 Calibration Plot

Date: October 7, 2024

Location: Fort Chipewyan





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name: Fort Chipewyan	Station number: AMS 08
Calibration Date: October 22, 2024	Last Cal Date: September 17, 2024
Start time (MST): 7:36	End time (MST): 11:34
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997712	1.001283	Backgd or Offset:	1.5	1.5
Calibration intercept:	0.118758	0.118812	Coeff or Slope:	0.762	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.5	80.0	81.9	0.977
As found Mid point	4960	40.2	40.0	41.2	0.970
As found Low point	4980	20.1	20.0	20.6	0.970
New cylinder response					
Baseline Corr As found:	81.9	Prev response:	79.94	*% change:	2.4%
Baseline Corr 2nd AF pt:	41.2	AF Slope:	1.023421	AF Intercept:	0.119295
Baseline Corr 3rd AF pt:	20.6	AF Correlation:	0.999983	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	80.5	80.0	80.2	0.998
Mid point	4960	40.2	40.0	40.2	0.994
Low point	4980	20.1	20.0	20.1	0.994
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	80.5	80.0	80.1	0.999
SO2 Scrubber Check	4919.7	80.3	803.0	0.0	----
Date of last scrubber change:	March 7, 2022			Ave Corr Factor	0.995
Date of last converter efficiency test:	March 15, 2022			100.7% efficiency	

Notes: Changed inlet filter after multipoint as founds. SO2 scrubber check done after calibrator zero and passed. Adjustment made to span.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur,



Wood Buffalo Environmental Association

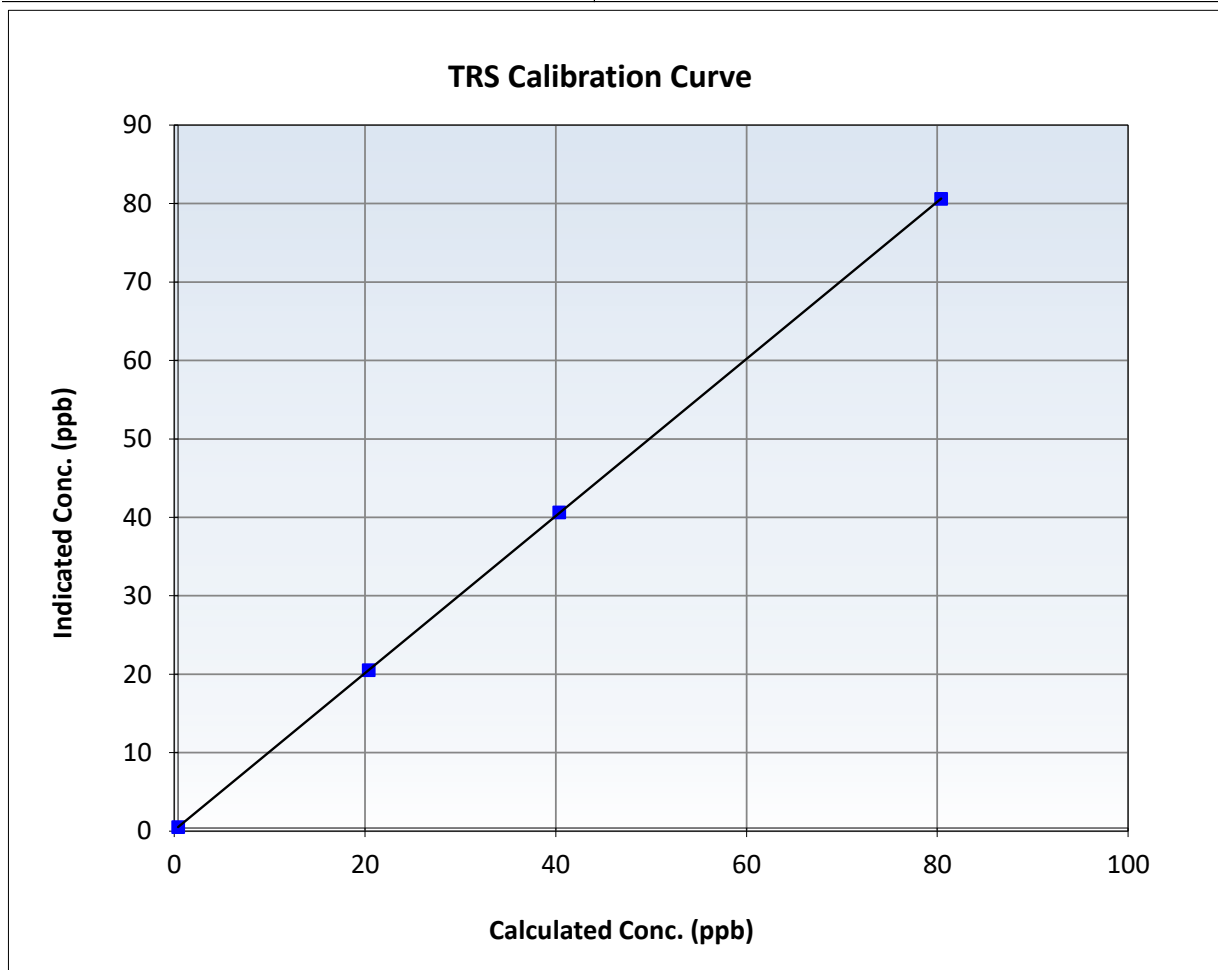
TRS Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 17, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	7:36	End Time (MST):	11:34
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1203169744

Calibration Data

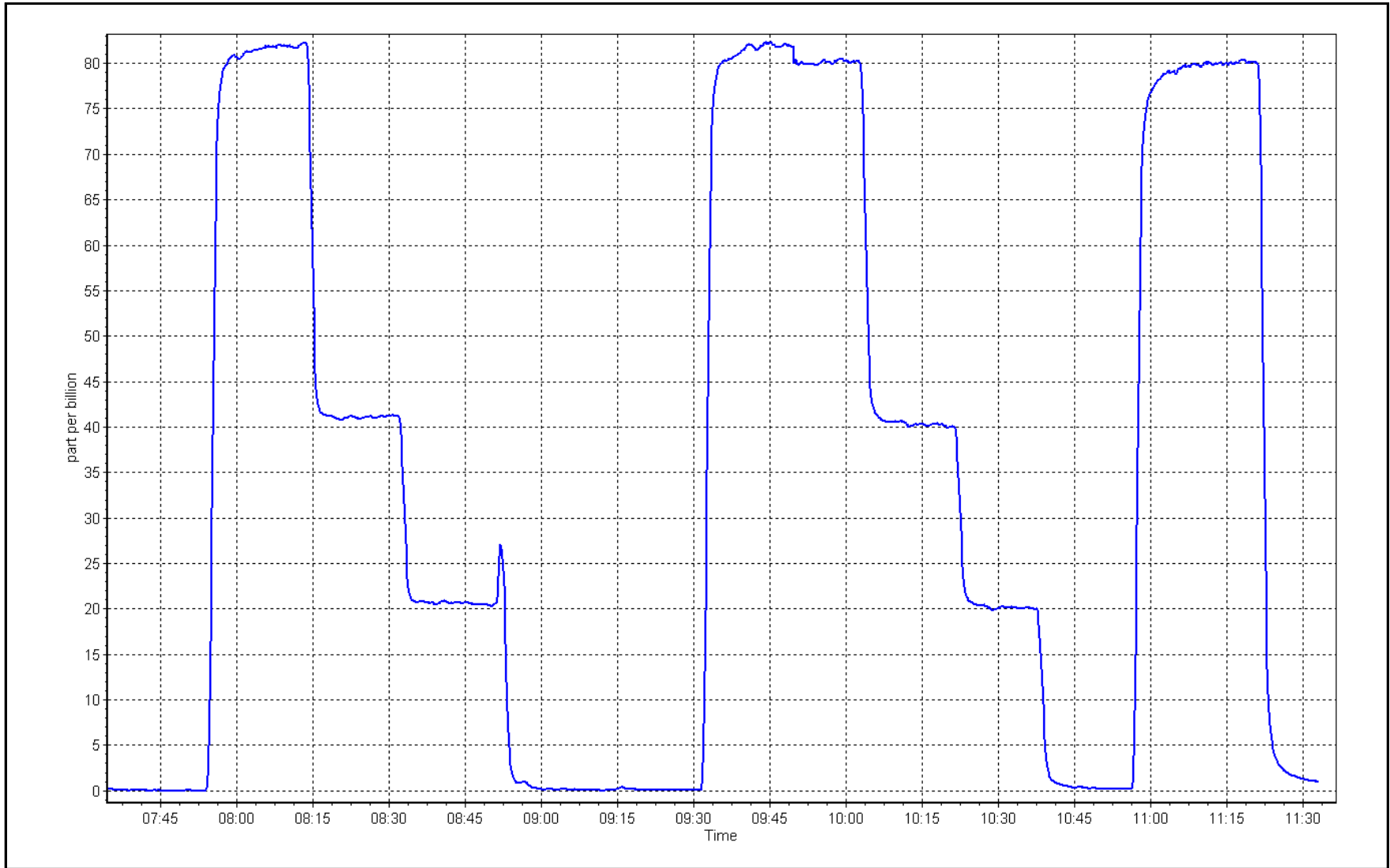
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999998	≥ 0.995
80.0	80.2	0.9976	Slope	1.001283	$0.90 - 1.10$
40.0	40.2	0.9940	Intercept	0.118812	± 3
20.0	20.1	0.9940			



TRS Calibration Plot

Date: October 22, 2024

Location: Fort Chipewyan





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Fort Chipewyan
 Station number: AMS 08
 Calibration Date: October 8, 2024
 Last Cal Date: September 17, 2024
 Start time (MST): 9:02
 End time (MST): 13:52
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: DTO046831
 NOX Cal Gas Conc: 60.20 ppm
 Removed Cylinder #: DT0046831
 Removed Gas NOX Conc: 60.20 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701H
 Cal Gas Expiry Date: January 9, 2032
 NO Cal Gas Conc: 60.00 ppm
 Removed Gas Exp Date: January 9, 2032
 Removed Gas NO Conc: 60.00 ppm
 NO gas Diff:
 Serial Number: 3252
 Serial Number: 135

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.1	-0.2	0.3	----	----
AF High point	4933	66.7	803.1	800.4	2.7	811.9	800.3	11.7	0.9893	0.9999
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 803.6 ppb	NO = 799.6 ppb				<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 1.0%	
Baseline Corr 1st pt	NO _x = 811.8 ppb	NO = 800.5 ppb				<u>As Found Statistics</u>		*Percent Change	NO = 0.1%	
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb				As found NO _x r ² :		Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb				As found NO r ² :		NO SI:	NO Int:	
						As found NO ₂ r ² :		NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 4460

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.998472	1.000518
NO _x Cal Offset:	1.713845	-1.605150
NO Cal Slope:	0.998210	1.004498
NO Cal Offset:	0.595824	-4.105817
NO ₂ Cal Slope:	0.991813	0.994192
NO ₂ Cal Offset:	2.007418	0.366290

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.228	1.220	NO bkgnd or offset:	0.0	0.0
NOX coeff or slope:	1.225	1.213	NOX bkgnd or offset:	0.1	0.1
NO2 coeff or slope:	2.100	2.100	Reaction cell Press:	2.8	2.8

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	-0.1	0.2	----	----
High point	4933	66.7	803.1	800.4	2.7	802.6	802.0	0.6	1.0006	0.9981
Mid point	4967	33.3	400.9	399.6	1.3	399.2	395.1	4.1	1.0043	1.0113
Low point	4983	16.7	201.1	200.4	0.7	197.5	193.3	4.2	1.0181	1.0367
As left zero	5000	0.0	0.0	0.0	0.0	0.3	0.1	0.2	----	----
As left span	4933	66.7	803.1	335.0	468.1	802.8	335.0	468.0	1.0004	1.0000
Average Correction Factor									1.0077	1.0154

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.2	----	----
High GPT point	801.3	335.6	468.4	466.1	1.0049	99.5%
Mid GPT point	801.3	599.8	204.2	202.9	1.0063	99.4%
Low GPT point	801.3	707.0	97.0	97.3	0.9966	100.3%
Average Correction Factor					1.0026	99.7%

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

Calibration Performed By: Matthew Courtoreille



Wood Buffalo Environmental Association

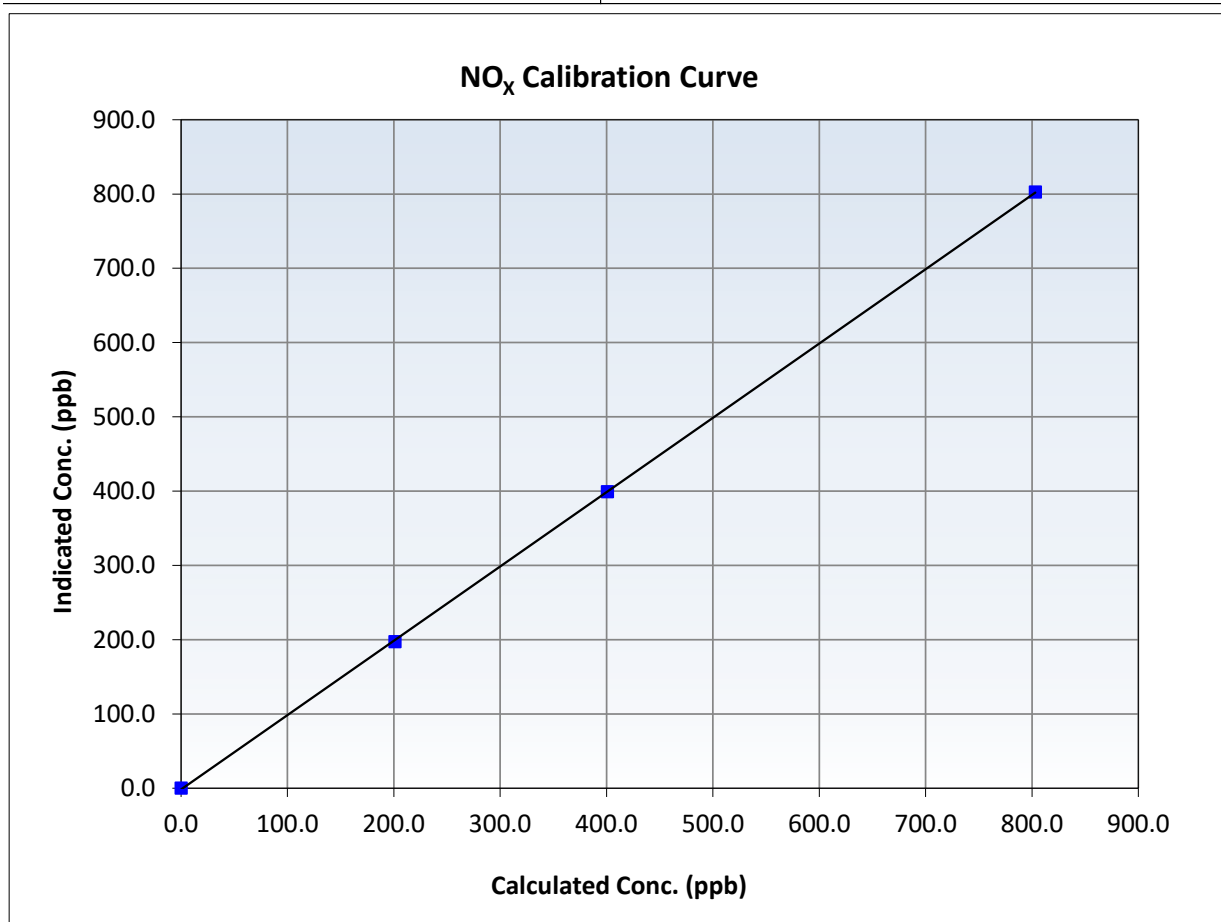
NO_x Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 17, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	9:02	End Time (MST):	13:52
Analyzer make:	Teledyne API T200	Analyzer serial #:	4460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999978	≥0.995
803.1	802.6	1.0006	Slope	1.000518	0.90 - 1.10
400.9	399.2	1.0043	Intercept	-1.605150	+/-20
201.1	197.5	1.0181			





Wood Buffalo Environmental Association

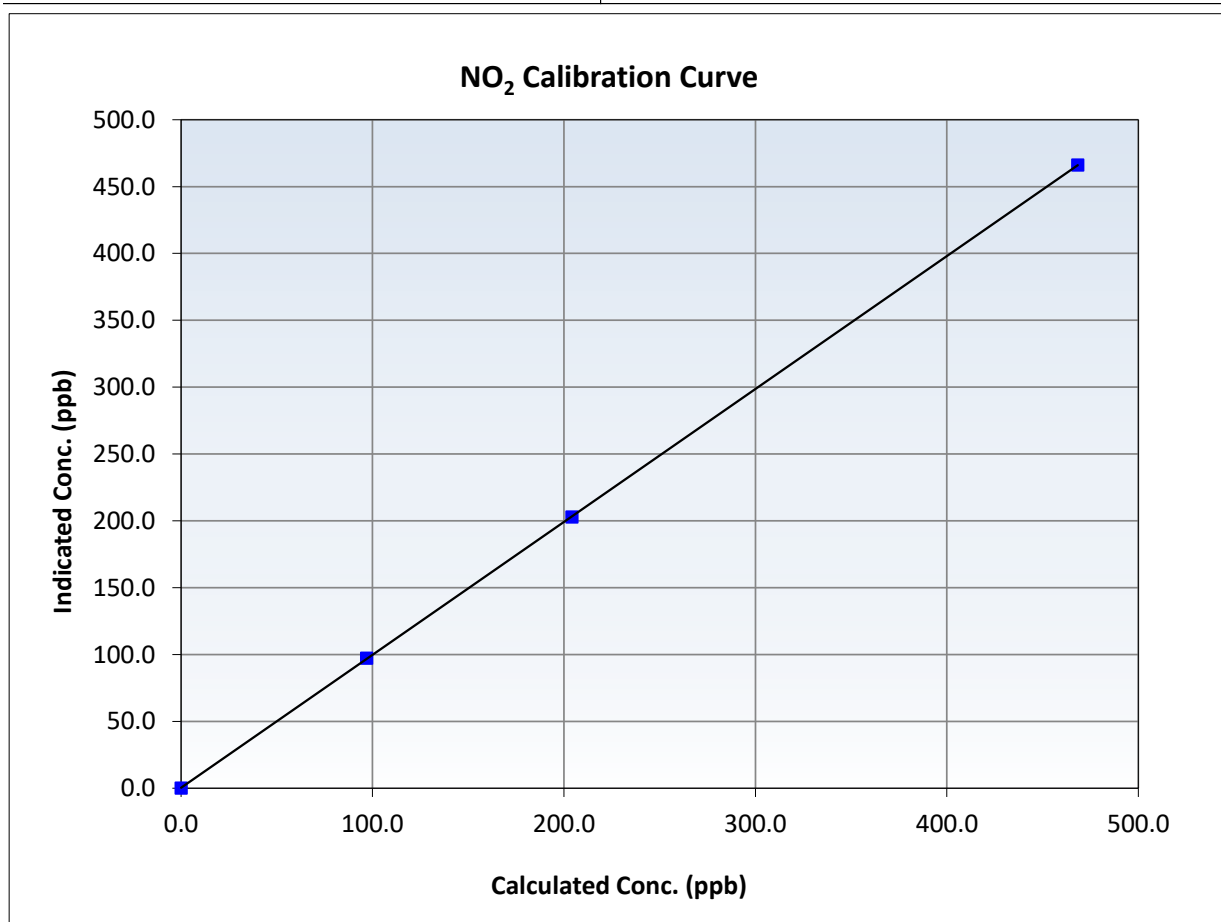
NO₂ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 17, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	9:02	End Time (MST):	13:52
Analyzer make:	Teledyne API T200	Analyzer serial #:	4460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.2	----	Correlation Coefficient	0.999996	≥0.995
468.4	466.1	1.0049	Slope	0.994192	0.90 - 1.10
204.2	202.9	1.0063	Intercept	0.366290	+/-20
97.0	97.3	0.9966			





Wood Buffalo Environmental Association

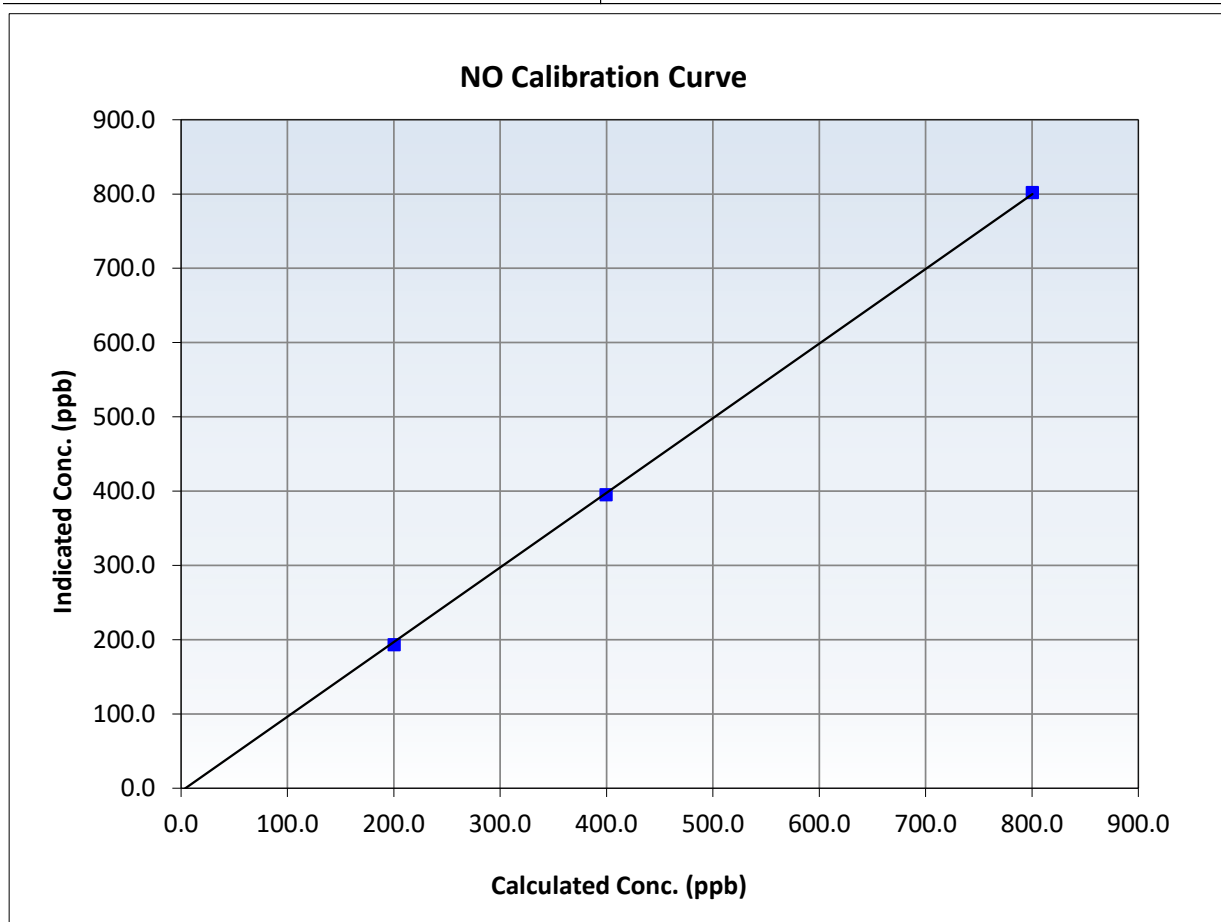
NO Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 17, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	9:02	End Time (MST):	13:52
Analyzer make:	Teledyne API T200	Analyzer serial #:	4460

Calibration Data

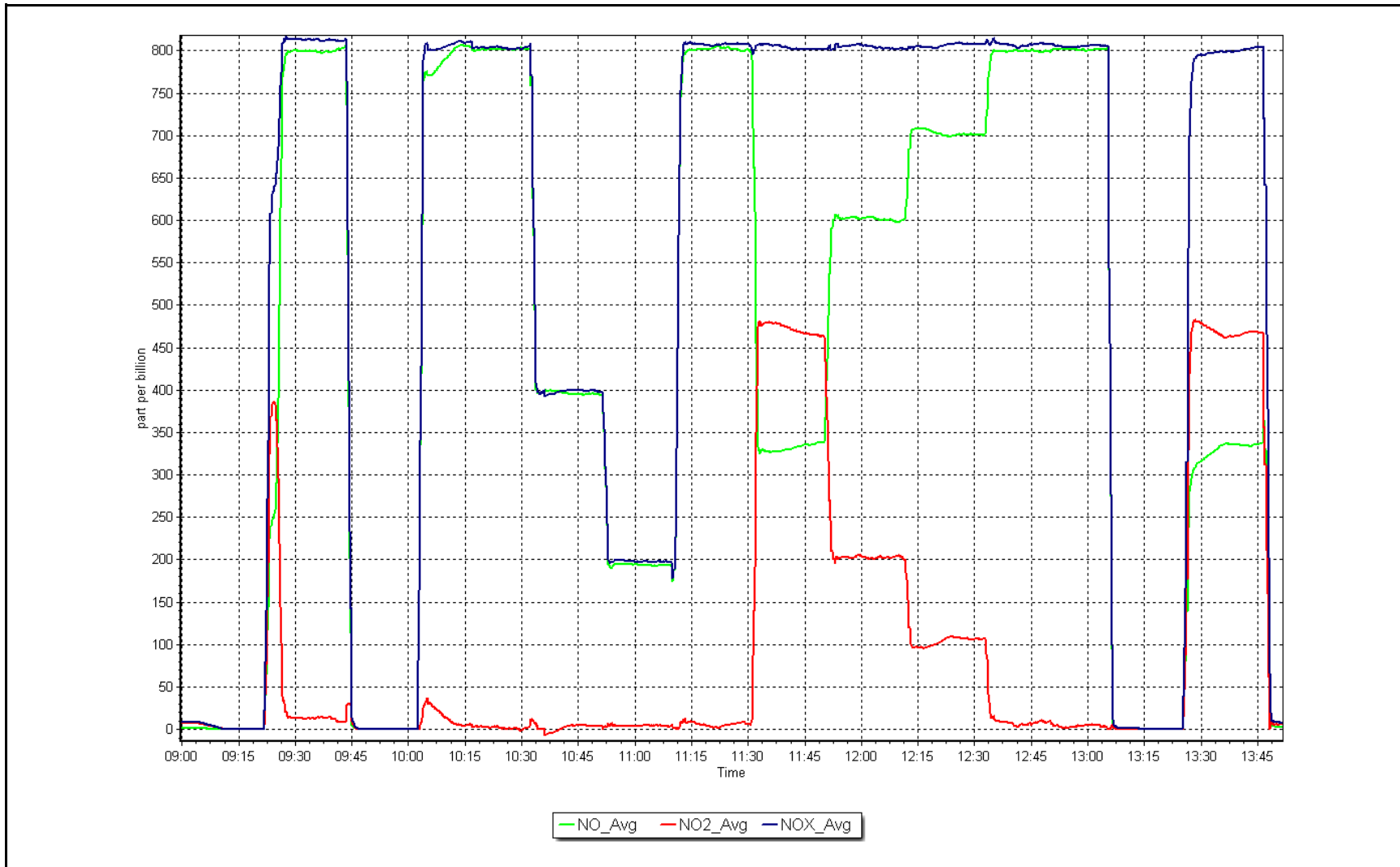
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999886	<i>≥0.995</i>
800.4	802.0	0.9981	Slope	1.004498	<i>0.90 - 1.10</i>
399.6	395.1	1.0113	Intercept	-4.105817	<i>+/-20</i>
200.4	193.3	1.0367			



NO_x Calibration Plot

Date: October 8, 2024

Location: Fort Chipewyan





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	October 17, 2024	Last Cal Date:	September 2, 2024
Start time (MST):	8:56	End time (MST):	13:03
Reason:	Routine		

Calibration Standards

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

Analyzer Information

Analyzer make:	Teledyne API T400	Analyzer serial #:	3872
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	0.996200	1.008286	Backgd or Offset:	-2.2
Calibration intercept:	-0.160000	0.700000	Coeff or Slope:	1.016
				0.982

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.6	----
As found High point	5000	913.0	400.0	411.0	0.975
As found Mid point	5000	786.0	200.0	206.3	0.972
As found Low point	5000	701.4	100.0	104.0	0.967
Baseline Corr As found:	410.4	Previous response	398.3	*% change	2.9%
Baseline Corr 2nd AF pt:	205.7	AF Slope:	1.025457	AF Intercept:	1.020000
Baseline Corr 3rd AF pt:	103.4	AF Correlation:	0.999995	<i>* = > +/-5% change initiates investigation</i>	

O₃ 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- AFzero) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.3	----
High point	5000	914.7	400.0	403.8	0.991
Mid point	5000	786.4	200.0	202.6	0.987
Low point	5000	701.3	100.0	101.9	0.981
As left zero	5000	0.0	0.0	0.5	----
As left span	5000	963.3	400.0		
Average Correction Factor					0.986

Notes: Changed out pump after three point as found and inlet filter. Adjustments made to Span.

Calibration Performed By: Morgan Voyageur, Sabian Voyageur



Wood Buffalo Environmental Association

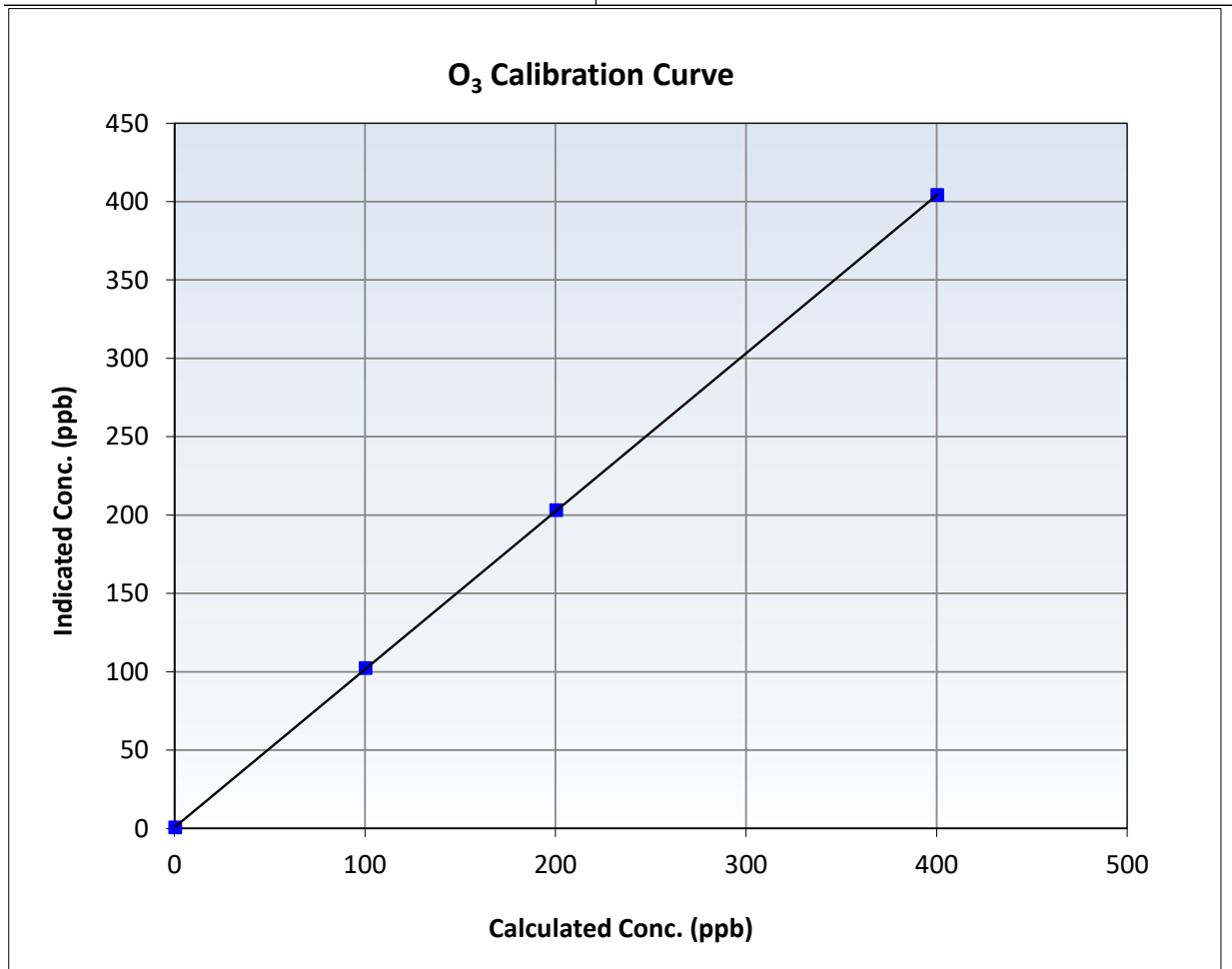
O₃ Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 2, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:56	End Time (MST):	13:03
Analyzer make:	Teledyne API T400	Analyzer serial #:	3872

Calibration Data

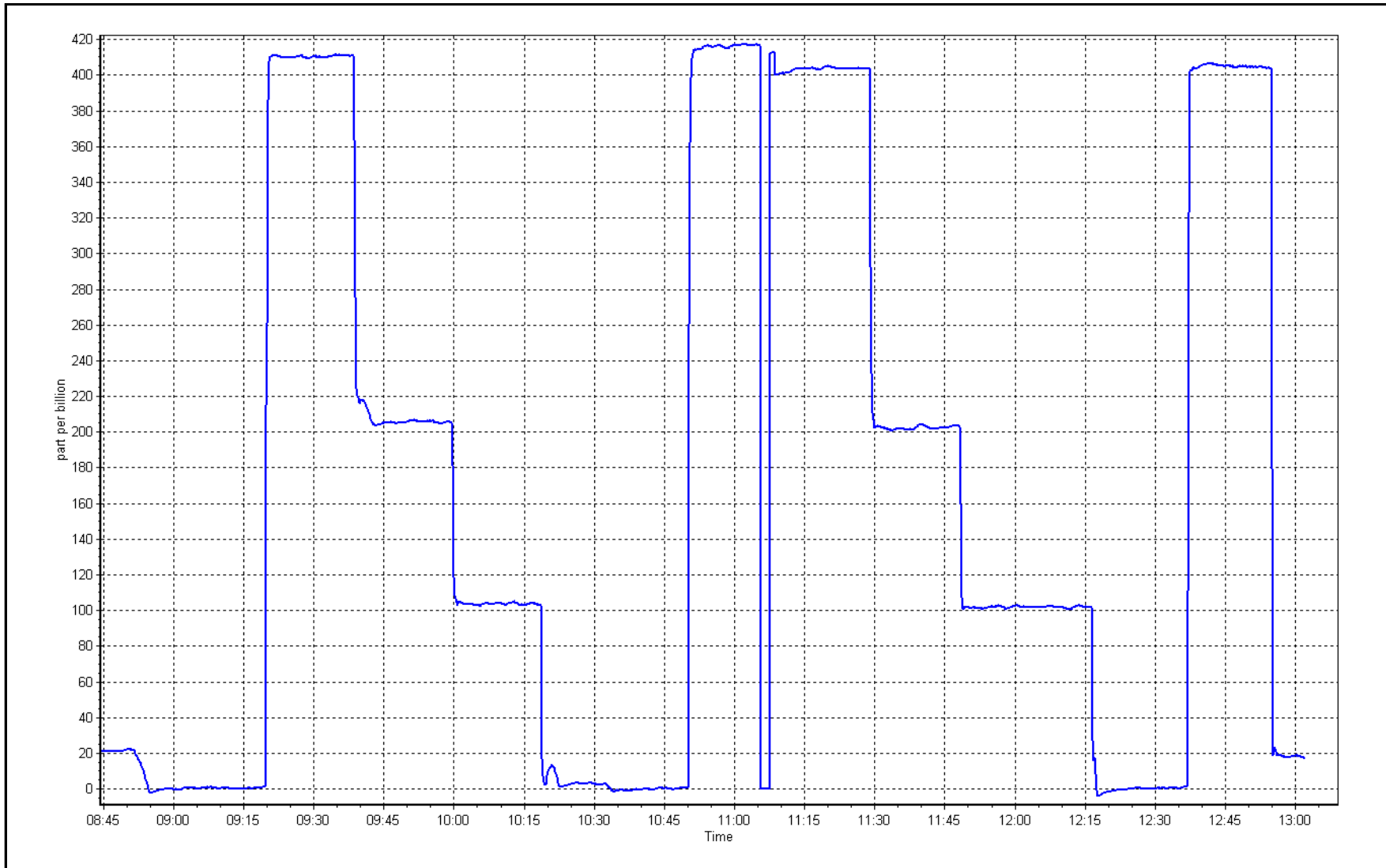
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.3	----	Correlation Coefficient	0.999995	≥0.995
400.0	403.8	0.9906	Slope	1.008286	0.90 - 1.10
200.0	202.6	0.9872	Intercept	0.700000	+/- 5
100.0	101.9	0.9814			



O₃ Calibration Plot

Date: October 17, 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: October 22, 2024 Last Cal Date: September 18, 2024
 Start time (MST): 9:54 End time (MST): 10:39

Analyzer Make: Teledyne API T640 S/N: 319
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25BT S/N: 388747
 Temp/RH standard: Alicat FP-25BT S/N: 388747

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	(Limits)
T (°C)	-2.20	-1.2	-2.20	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	735.50	736.9	735.50	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	4.97	5.08	4.97	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	39%		39%	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	3.90	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	9.00	8.80	10.80	<input checked="" type="checkbox"/>	+/- 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:	October 8, 2024	Last Cal Date:	September 18, 2024
Start time (MST):	13:55	End time (MST):	16:33
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: 3252
ZAG Make/Model:	Teledyne API T701H		Serial Number: 135

Analyzer Information

Analyzer make:	Teledyne API T300	Analyzer serial #:	3505
Analyzer Range:	0 - 50 ppm		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997708	1.005625	Backgd or Offset:	0.000	-0.015
Calibration intercept:	0.106888	-0.113073	Coeff or Slope:	1.009	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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4934	66.7	40.4	40.7	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	40.71	Prev response:	40.43	*% 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	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4934	66.7	40.4	40.6	0.996
Mid point	4966.7	33.3	20.2	20.2	0.999
Low point	4983.3	16.7	10.1	9.9	1.022
As left zero	5000	0.0	0.0	0.0	----
As left span	2960	40.0	40.4	40.4	1.001
Average Correction Factor					1.006

Notes: Changed inlet filter after as found. Adjusted span high point.

Calibration Performed By: Matthew Courtoreille



Wood Buffalo Environmental Association

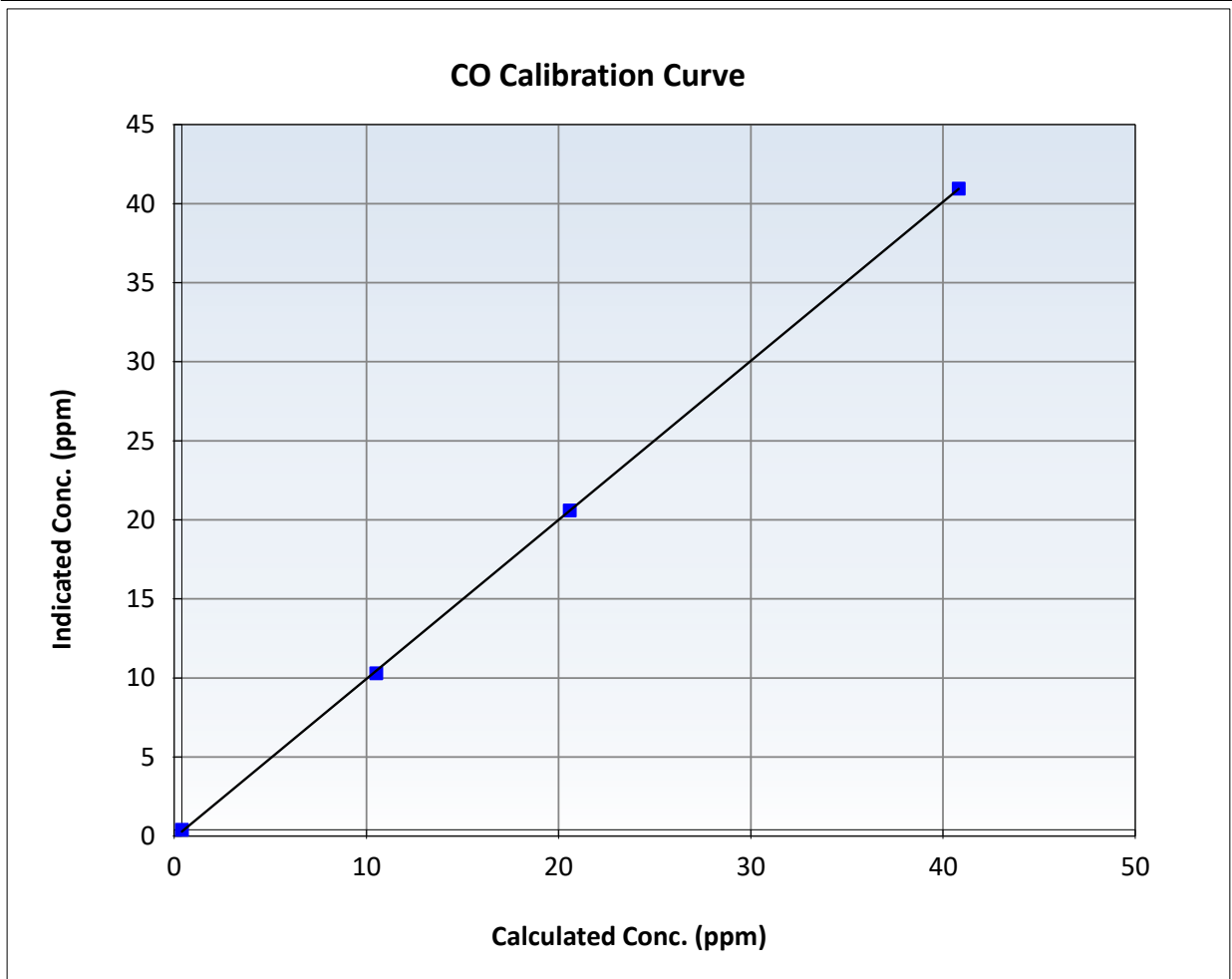
CO Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 18, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	13:55	End Time (MST):	16:33
Analyzer make:	Teledyne API T300	Analyzer serial #:	3505

Calibration Data

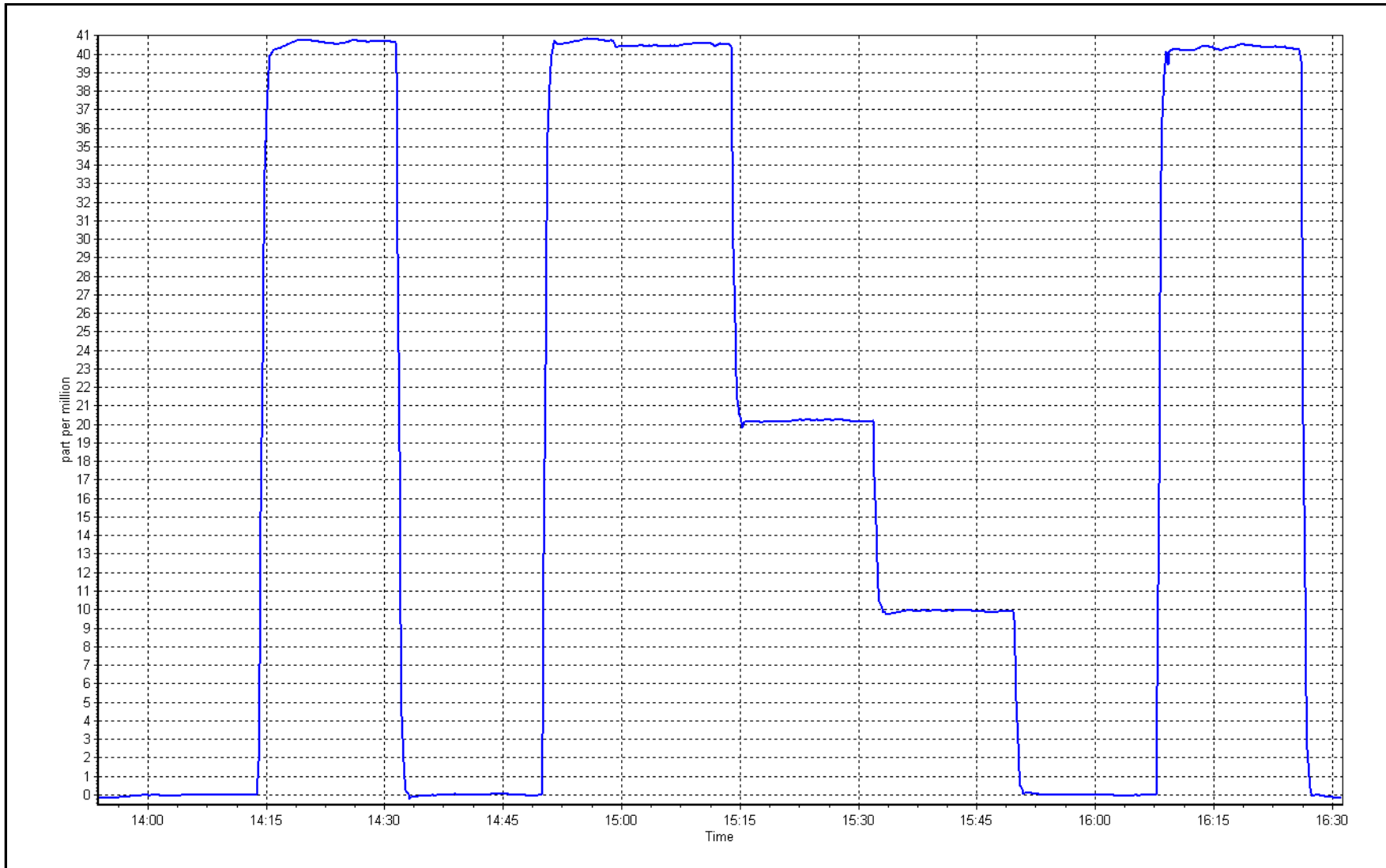
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.0	----	Correlation Coefficient	0.999955	≥0.995
40.4	40.6	0.9964	Slope	1.005625	0.90 - 1.10
20.2	20.2	0.9990	Intercept	-0.113073	+/-1.5
10.1	9.9	1.0222			



CO Calibration Plot

Date: October 8, 2024

Location: Fort Chipewyan





Wood Buffalo Environmental Association

CO₂ Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	October 17, 2024	Last Cal Date:	September 23, 2024
Start time (MST):	13:06	End time (MST):	17:09
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		

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000382	1.015235	Backgd or Offset:	-0.016
Calibration intercept:	-7.160000	-5.820000	Coeff or Slope:	1.034

CO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	3000	0.0	0.0	-0.3	----
As found High Point	2920	80.0	1605.9	1627.5	0.987
As found Mid Point					
As found Low Point					
New cylinder response					
Baseline Corr As found:	1627.8	Prev response:	1599.3	*% change:	1.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	3000	0.0	0.0	-0.2	----
High point	2920	80.0	1605.9	1630.8	0.985
Mid point	2960	40.0	802.9	796.1	1.009
Low point	2980	20.0	401.5	403.1	0.996
As left zero	3000	0.0	0.0	-0.4	----
As left span	2960	40.0	802.9	790.3	1.016
Average Correction Factor					0.996

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

Calibration Performed By: Morgan Voyageur, Sabian Voyageur



Wood Buffalo Environmental Association

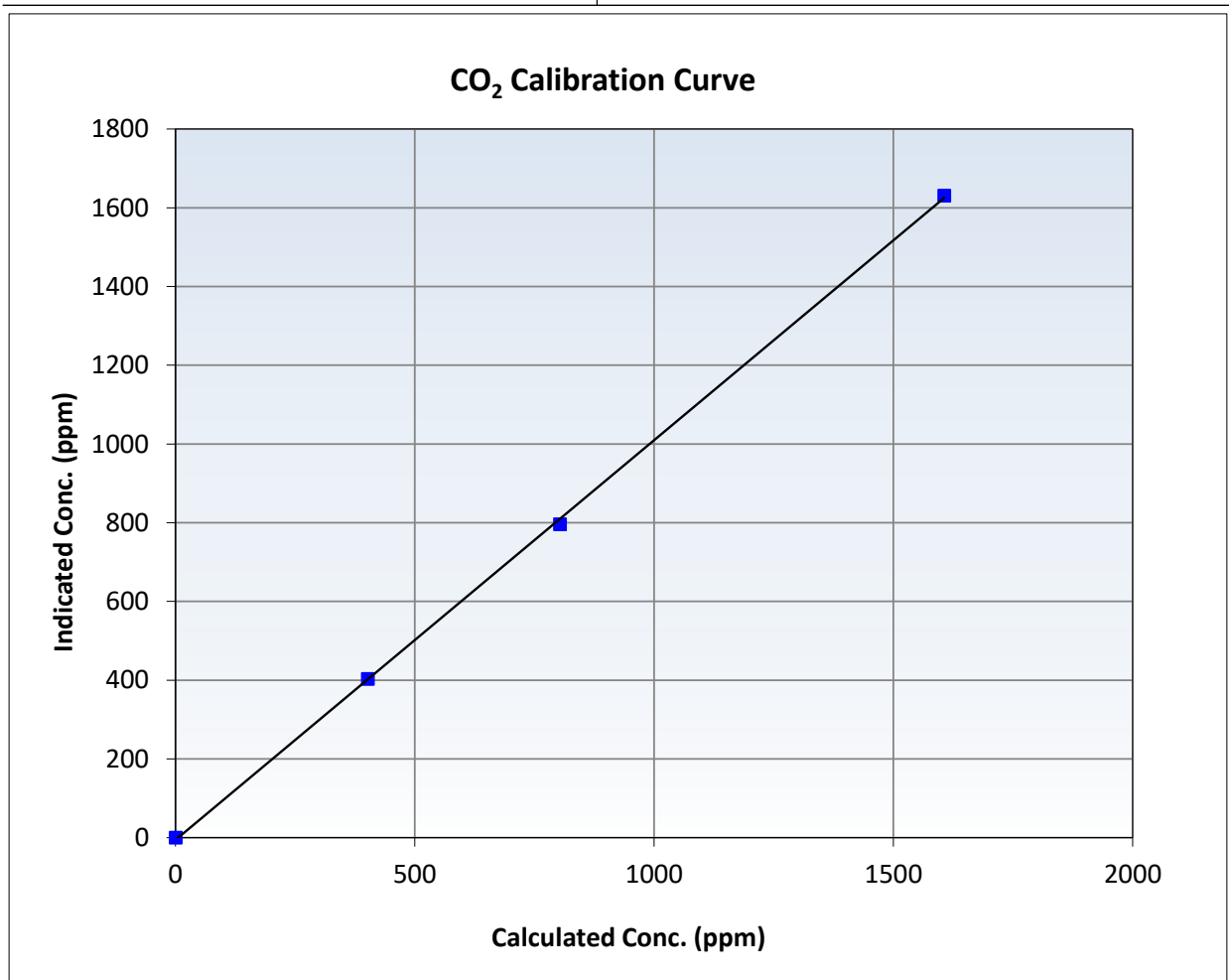
CO₂ Calibration Summary

Station Information

Calibration Date	October 17, 2024	Previous Calibration	September 23, 2024
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	13:06	End Time (MST)	17:09
Analyzer make	Teledyne API T360	Analyzer serial #	289

Calibration Data

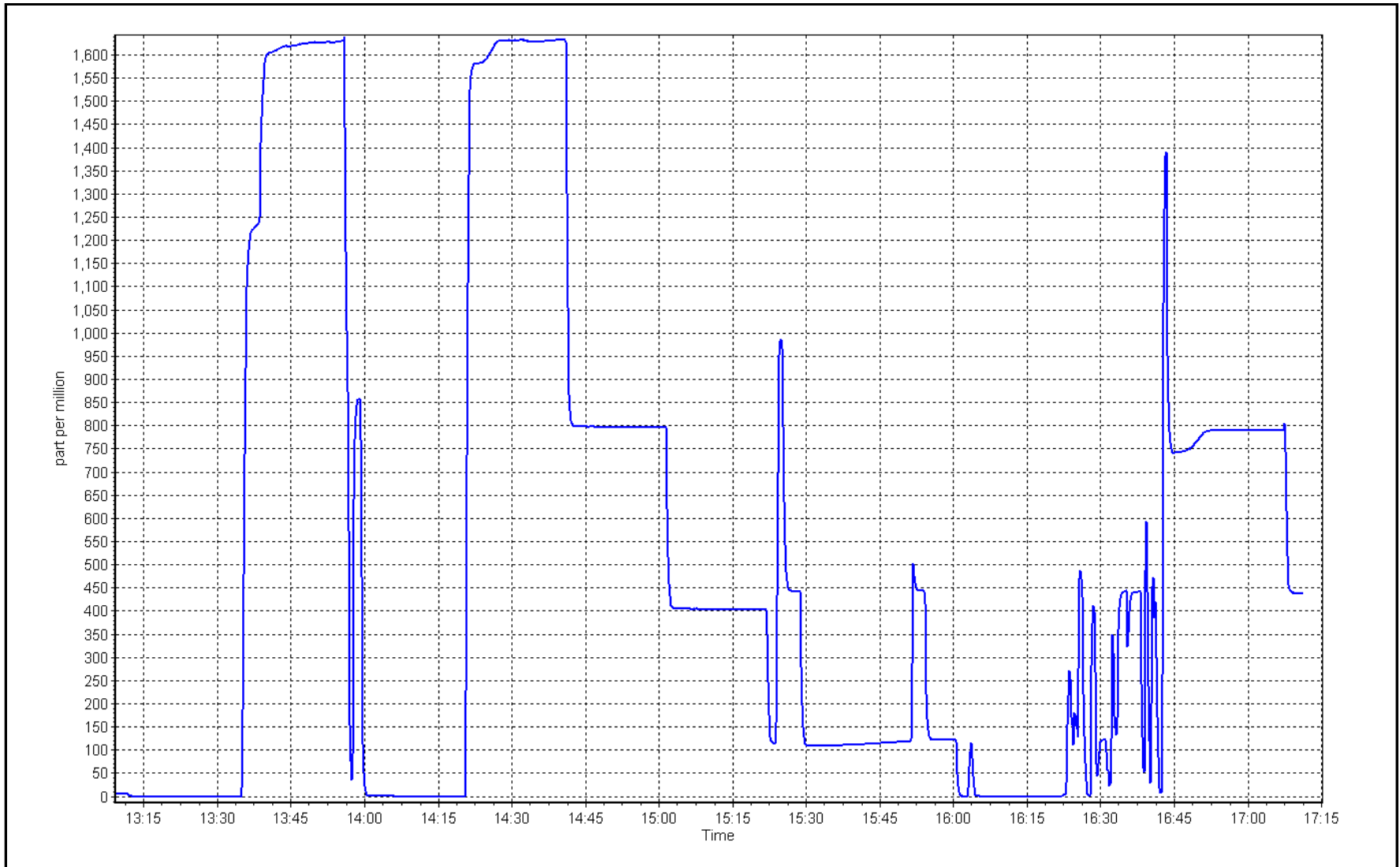
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	0.999829	≥0.995
1605.9	1630.8	0.9847	Slope	1.015235	0.90 - 1.10
802.9	796.1	1.0086	Intercept	-5.8	+/-20
401.5	403.1	0.9959			



CO₂ Calibration Plot

Date: October 17, 2024

Location: Fort Chipewyan





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS09 BARGE LANDING OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	October 4, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	8:58	End time (MST):	12:10
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003488	0.997258	Backgd or Offset:	10.2	10.2
Calibration intercept:	0.028097	0.786672	Coeff or Slope:	0.971	0.963

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.5	----
As found High point	4919	80.2	801.5	806.6	0.994
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	806.1	Previous response	804.3	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.6	----
High point	4919	80.2	801.5	800.1	1.002
Mid point	4960	40.1	400.7	400.1	1.001
Low point	4980	20.0	199.8	200.5	0.997
As left zero	5000	0.0	0.0	0.5	----
As left span	4919	80.2	801.5	800.7	1.001
Average Correction Factor:					1.000

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

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

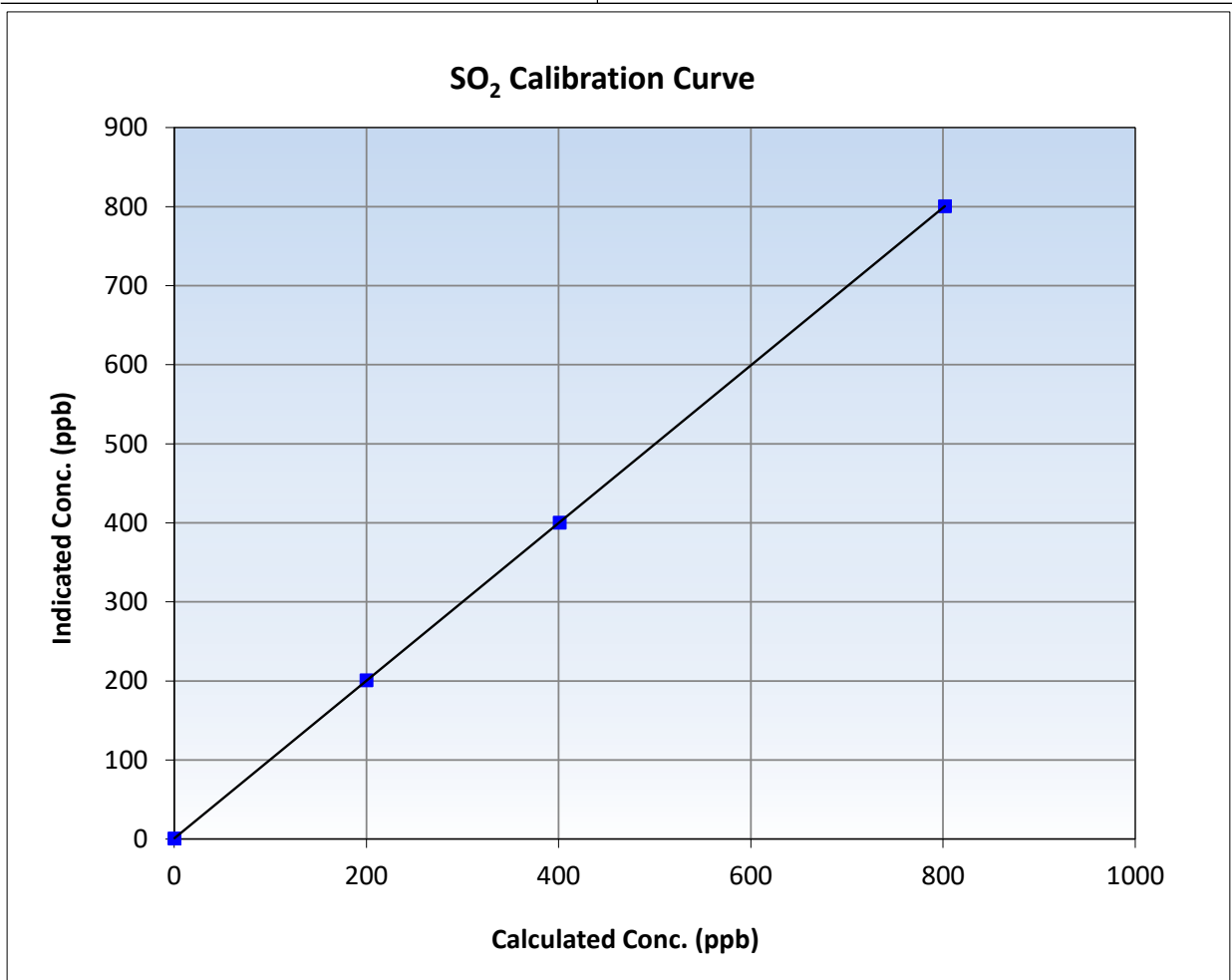
SO₂ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 4, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:58	End Time (MST):	12:10
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148498

Calibration Data

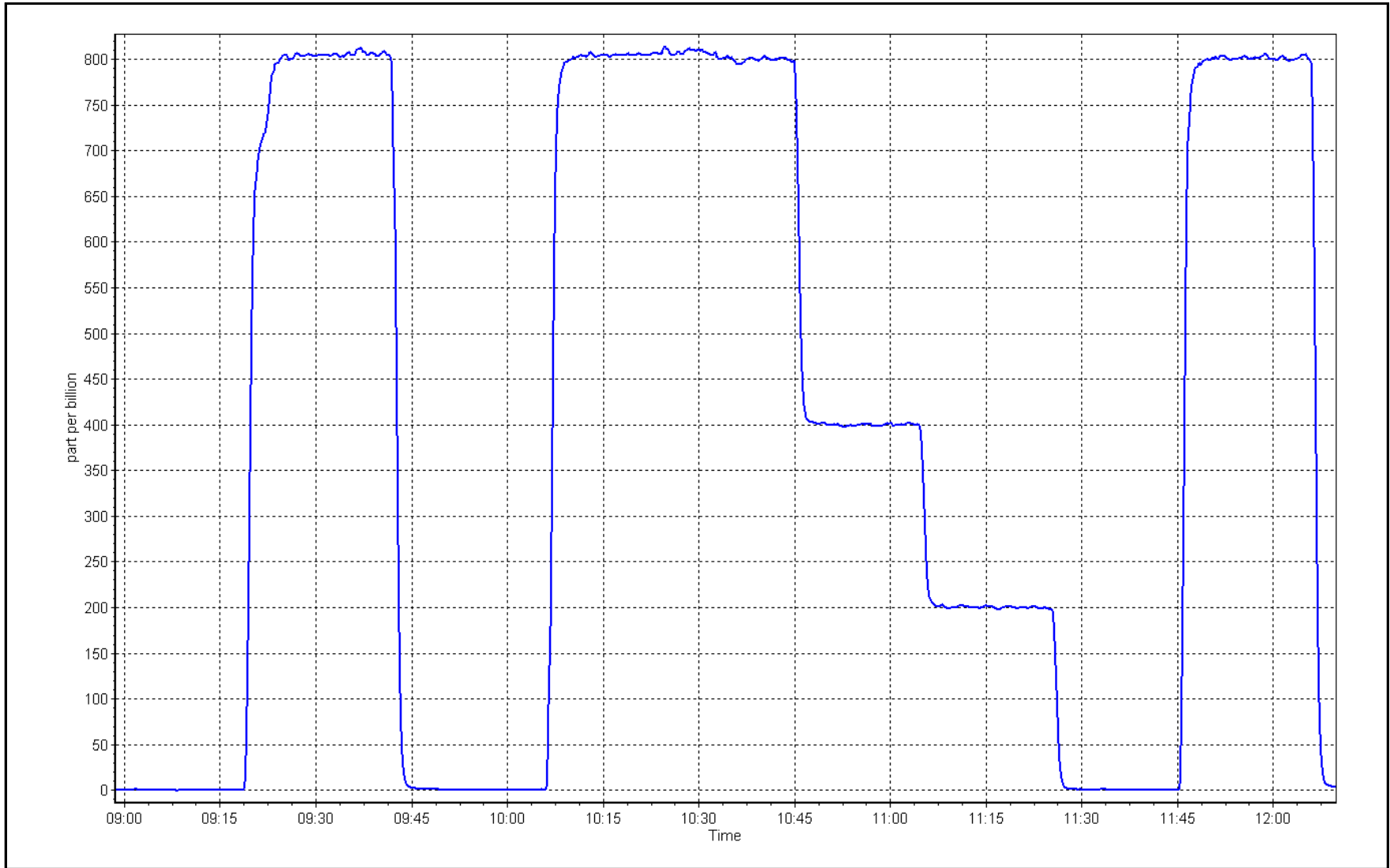
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.6	----	Correlation Coefficient	0.999999	≥0.995
801.5	800.1	1.0017	Slope	0.997258	0.90 - 1.10
400.7	400.1	1.0014	Intercept	0.786672	+/-30
199.8	200.5	0.9967			



SO2 Calibration Plot

Date: October 4, 2024

Location: Barge Landing





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	October 3, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	8:58	End time (MST):	13:09
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.010398	0.999836	Backgd or Offset:	2.970	2.860
Calibration intercept:	0.079627	0.199355	Coeff or Slope:	1.215	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4923	77.4	80.0	82.1	0.974
As found Mid point	4961	38.7	40.0	41.3	0.967
As found Low point	4981	19.3	20.0	20.5	0.969
New cylinder response					
Baseline Corr As found:	82.2	Prev response:	80.95	*% change:	1.5%
Baseline Corr 2nd AF pt:	41.4	AF Slope:	1.026958	AF Intercept:	-0.000084
Baseline Corr 3rd AF pt:	20.6	AF Correlation:	0.999984	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4923	77.4	80.0	80.1	0.999
Mid point	4961	38.7	40.0	40.5	0.988
Low point	4981	19.3	20.0	20.1	0.993
As left zero	5000	0.0	0.0	0.1	----
As left span	4923	77.4	80.0	80.1	0.999
SO2 Scrubber Check	4920	80.2	802.0	-0.1	----
Date of last scrubber change:				Ave Corr Factor	0.994
Date of last converter efficiency test:					

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

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

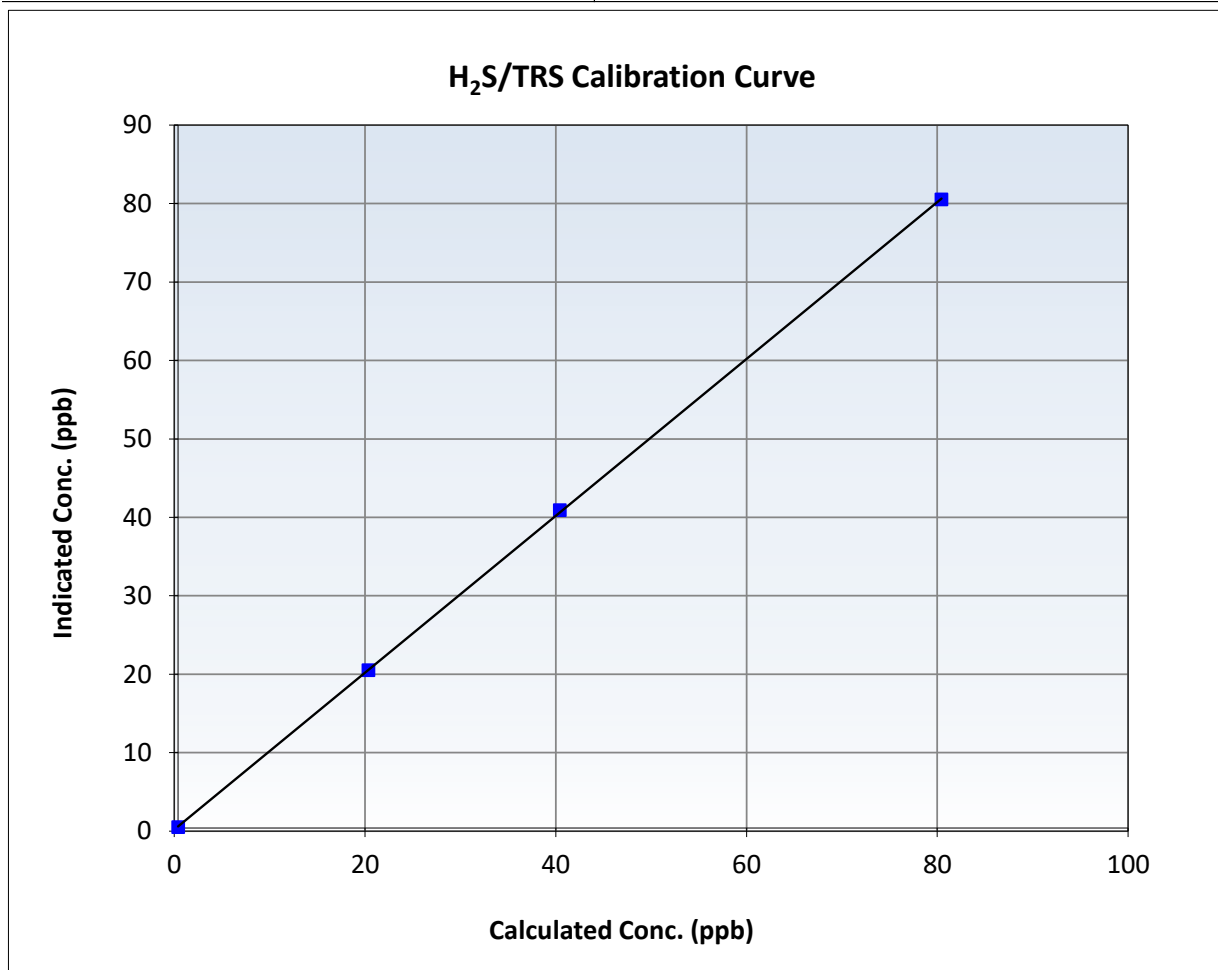
TRS Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 3, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:58	End Time (MST):	13:09
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1331259320

Calibration Data

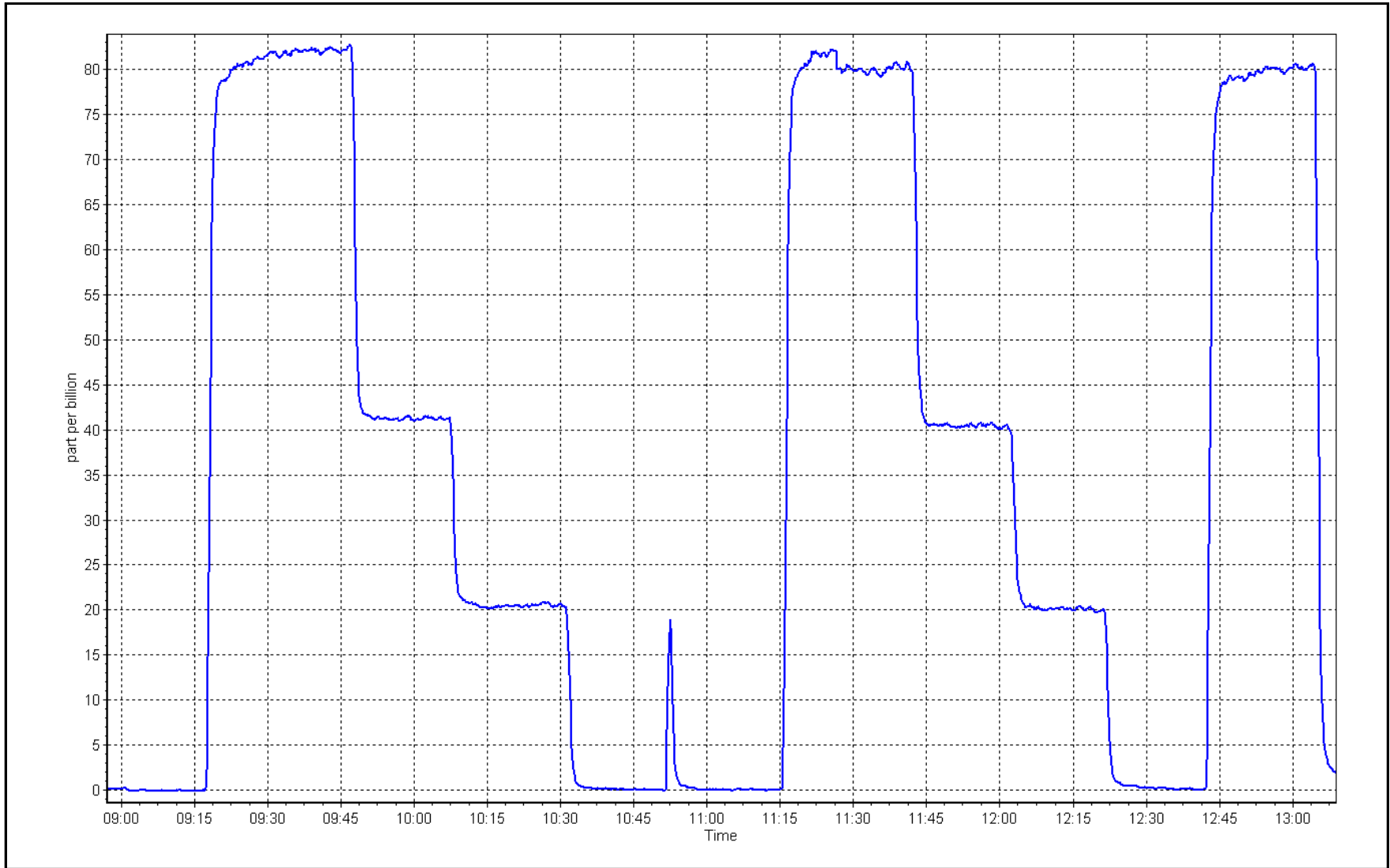
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999969	≥ 0.995
80.0	80.1	0.9993	Slope	0.999836	$0.90 - 1.10$
40.0	40.5	0.9883	Intercept	0.199355	± 3
20.0	20.1	0.9930			



TRS Calibration Plot

Date: October 3, 2024

Location: Barge Landing





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	October 4, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	8:58	End time (MST):	12:10
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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.32E-04	2.33E-04	NMHC SP Ratio:	5.61E-05	5.51E-05
CH4 Retention time:	14.0	14.0	NMHC Peak Area:	163061	165855
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	---
As found High point	4919	80.2	17.12	17.31	0.989
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.31	Prev response	17.14	*% change	1.0%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	---
High point	4919	80.2	17.12	17.11	1.000
Mid point	4960	40.1	8.56	8.58	0.998
Low point	4980	20.0	4.27	4.30	0.993
As left zero	5000	0.0	0.00	0.00	---
As left span	4919	80.2	17.12	17.11	1.001
Average Correction Factor					0.997

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



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4919	80.2	9.14	9.35	0.978
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.35	Prev response	9.17	*% change	1.9%
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)
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	4.59	0.996
Low point	4980	20.0	2.28	2.30	0.990
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					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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4919	80.2	7.98	7.96	1.003
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.96	Prev response	7.97	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	7.98	7.98	1.000
Mid point	4960	40.1	3.99	3.99	1.000
Low point	4980	20.0	1.99	2.00	0.996
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	7.98	7.96	1.002
Average Correction Factor					0.999

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.000229	0.999081
THC Cal Offset:	0.015260	0.017856
CH ₄ Cal Slope:	0.997902	0.999520
CH ₄ Cal Offset:	0.007862	0.003464
NMHC Cal Slope:	1.002388	0.998410
NMHC Cal Offset:	0.007399	0.014792

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

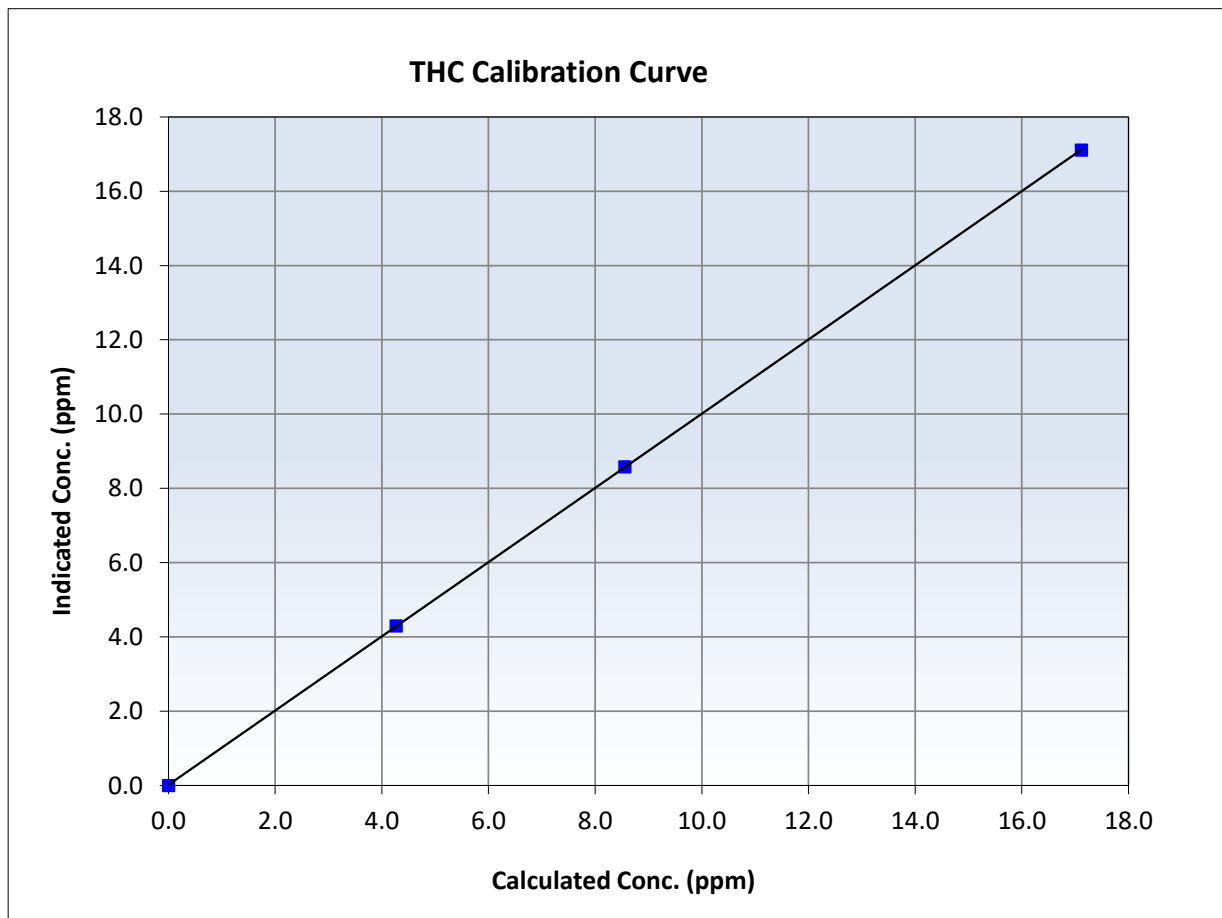
THC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 4, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:58	End Time (MST):	12:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999995	<i>≥0.995</i>
17.12	17.11	1.0004	Slope	0.999081	<i>0.90 - 1.10</i>
8.56	8.58	0.9976	Intercept	0.017856	<i>+/-0.5</i>
4.27	4.30	0.9929			





Wood Buffalo Environmental Association

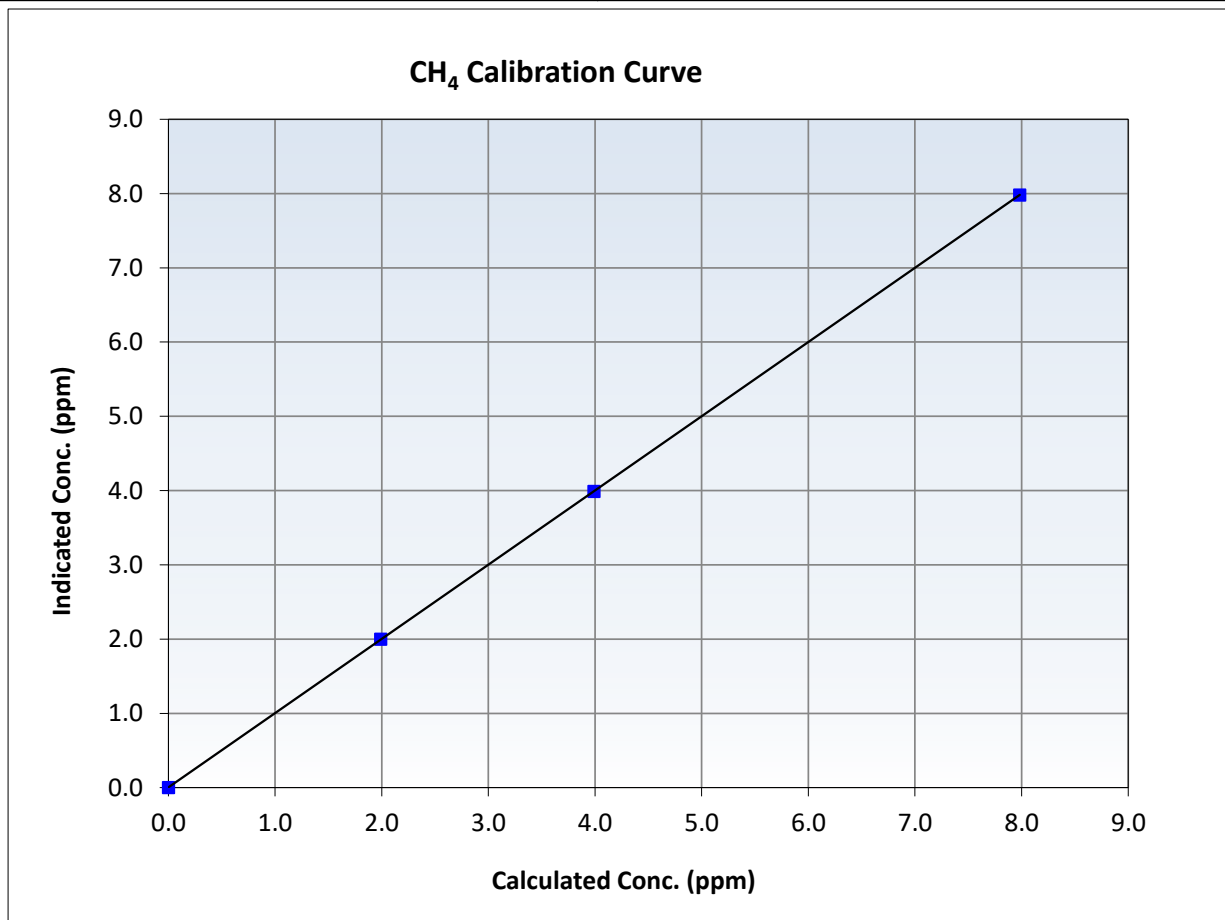
CH₄ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 4, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:58	End Time (MST):	12:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999998	≥0.995
7.98	7.98	1.0001	Slope	0.999520	0.90 - 1.10
3.99	3.99	1.0002	Intercept	0.003464	+/-0.5
1.99	2.00	0.9957			





Wood Buffalo Environmental Association

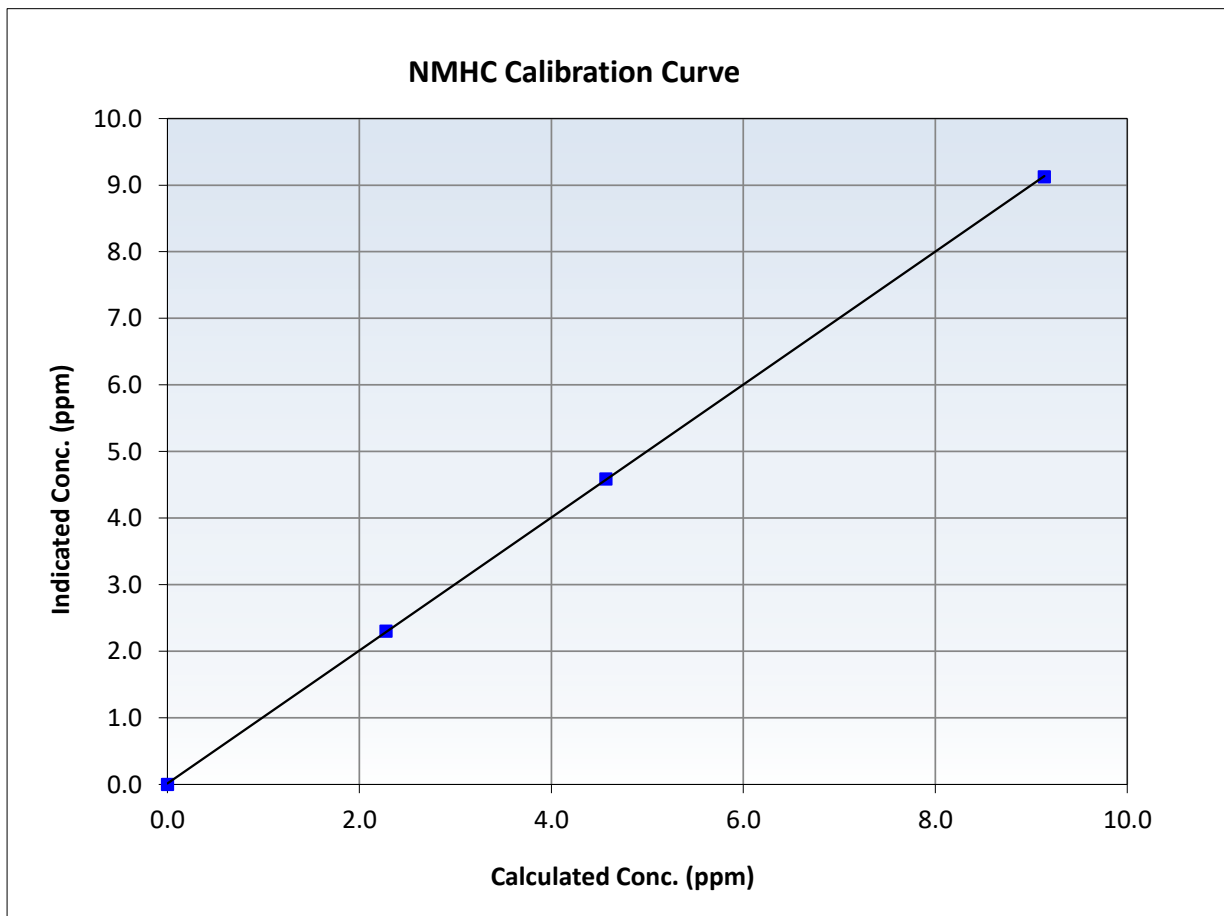
NMHC Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 4, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:58	End Time (MST):	12:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999987 ≥0.995
9.14	9.13	1.0009	Slope	0.998410 0.90 - 1.10
4.57	4.59	0.9957	Intercept	0.014792 +/-0.5
2.28	2.30	0.9900		



NMHC Calibration Plot

Date: October 4, 2024

Location: Barge Landing





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Barge Landing
 Station number: AMS 09
 Calibration Date: October 8, 2024
 Last Cal Date: September 17, 2024
 Start time (MST): 8:48
 End time (MST): 13:07
 Reason: Routine

Calibration Standards

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

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	----	----
AF High point	4915	85.3	808.3	800.7	7.5	808.9	799.5	9.4	0.9990	1.0014
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO _x = 806.5 ppb	NO = 798.8 ppb	<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 0.3%
Baseline Corr 1st pt	NO _x = 809.1 ppb	NO = 799.6 ppb	<u>As Found Statistics</u>		*Percent Change	NO = 0.1%
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb	As found	NO _x r ² :	Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb	As found	NO r ² :	NO SI:	NO Int:
			As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1426262593

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.996772	0.997339
NO _x Cal Offset:	0.818039	0.517931
NO Cal Slope:	0.998025	0.999824
NO Cal Offset:	-0.323937	-0.703748
NO ₂ Cal Slope:	0.999413	1.003274
NO ₂ Cal Offset:	-0.725562	-0.154393

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.107	1.107	NO bkgnd or offset:	10.1	10.1
NOX coeff or slope:	1.000	1.000	NOX bkgnd or offset:	10.4	10.4
NO2 coeff or slope:	0.996	0.996	Reaction cell Press:	178.0	175.9

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4915	85.3	808.3	800.7	7.5	806.4	800.2	6.0	1.0023	1.0007
Mid point	4957	42.6	403.7	400.0	3.7	403.3	399.0	4.3	1.0010	1.0024
Low point	4979	21.3	201.8	200.0	1.9	202.4	198.4	4.1	0.9972	1.0078
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	----	----
As left span	4915	85.3	808.3	413.6	394.7	803.5	413.6	389.8	1.0059	1.0000
Average Correction Factor									1.0002	1.0036

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	794.9	409.2	393.2	394.3	0.9972	100.3%
Mid GPT point	794.9	599.2	203.2	204.0	0.9961	100.4%
Low GPT point	794.9	696.3	106.1	105.9	1.0019	99.8%
Average Correction Factor					0.9984	100.2%

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

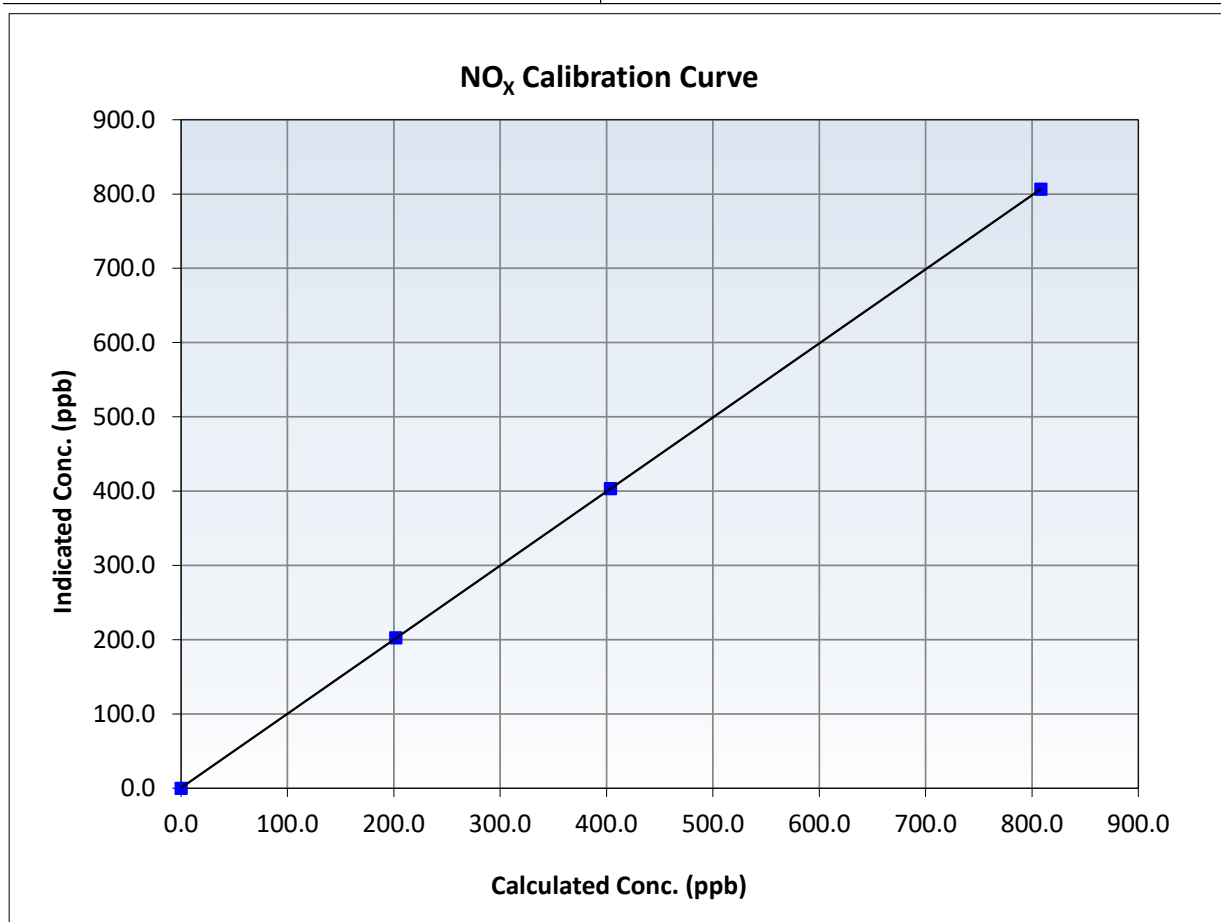
NO_x Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 17, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:48	End Time (MST):	13:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999998	≥0.995
808.3	806.4	1.0023	Slope	0.997339	0.90 - 1.10
403.7	403.3	1.0010	Intercept	0.517931	+/-20
201.8	202.4	0.9972			





Wood Buffalo Environmental Association

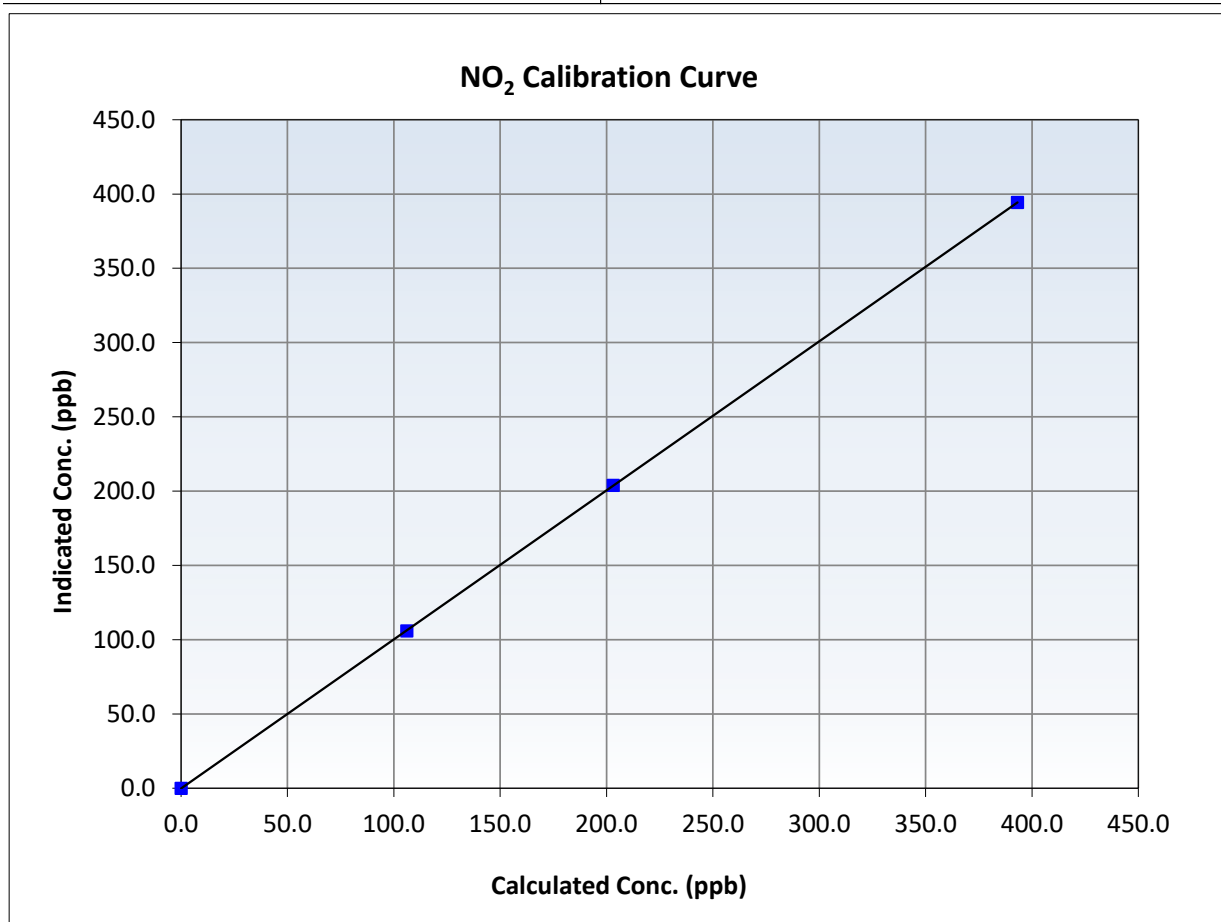
NO₂ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 17, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:48	End Time (MST):	13:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999997	≥0.995
393.2	394.3	0.9972	Slope	1.003274	0.90 - 1.10
203.2	204.0	0.9961	Intercept	-0.154393	+/-20
106.1	105.9	1.0019			





Wood Buffalo Environmental Association

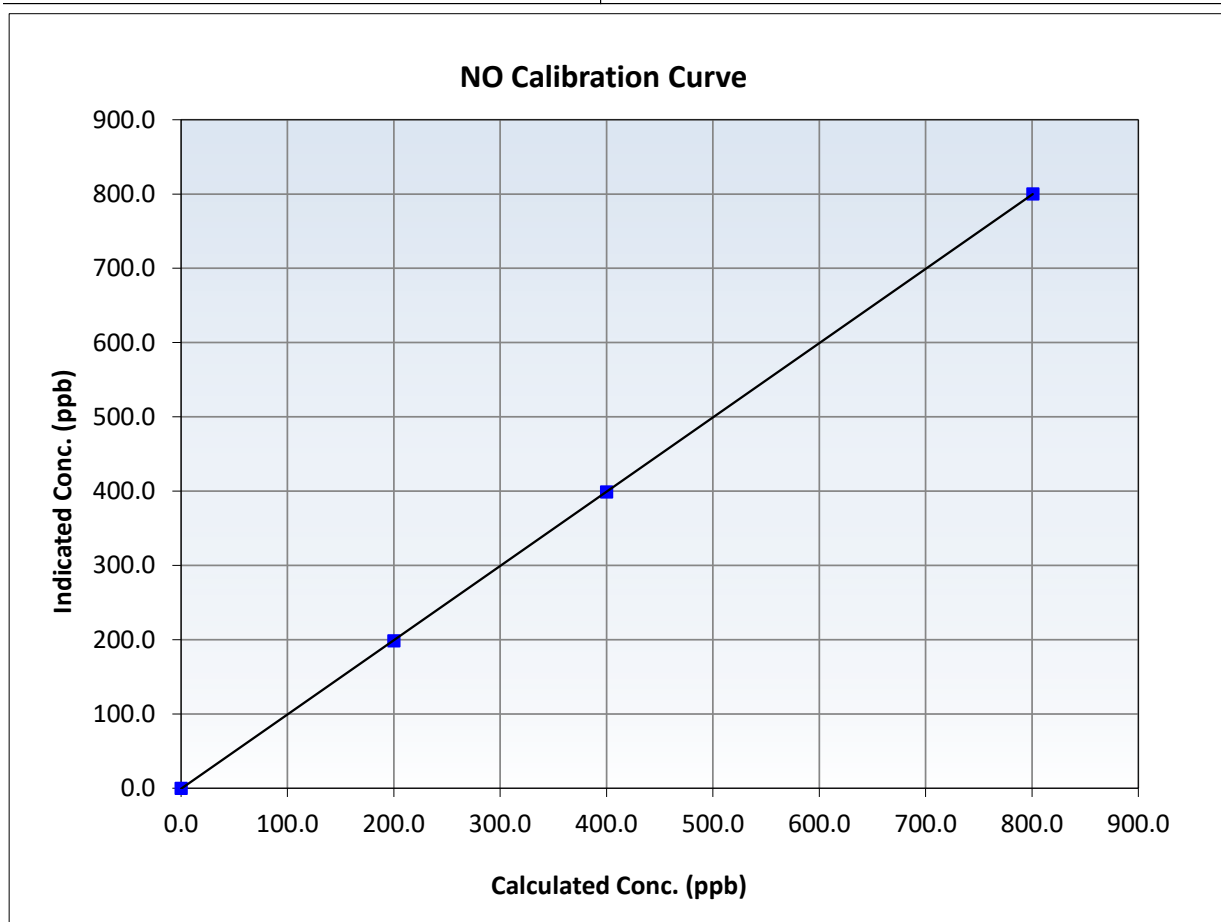
NO Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 17, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:48	End Time (MST):	13:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

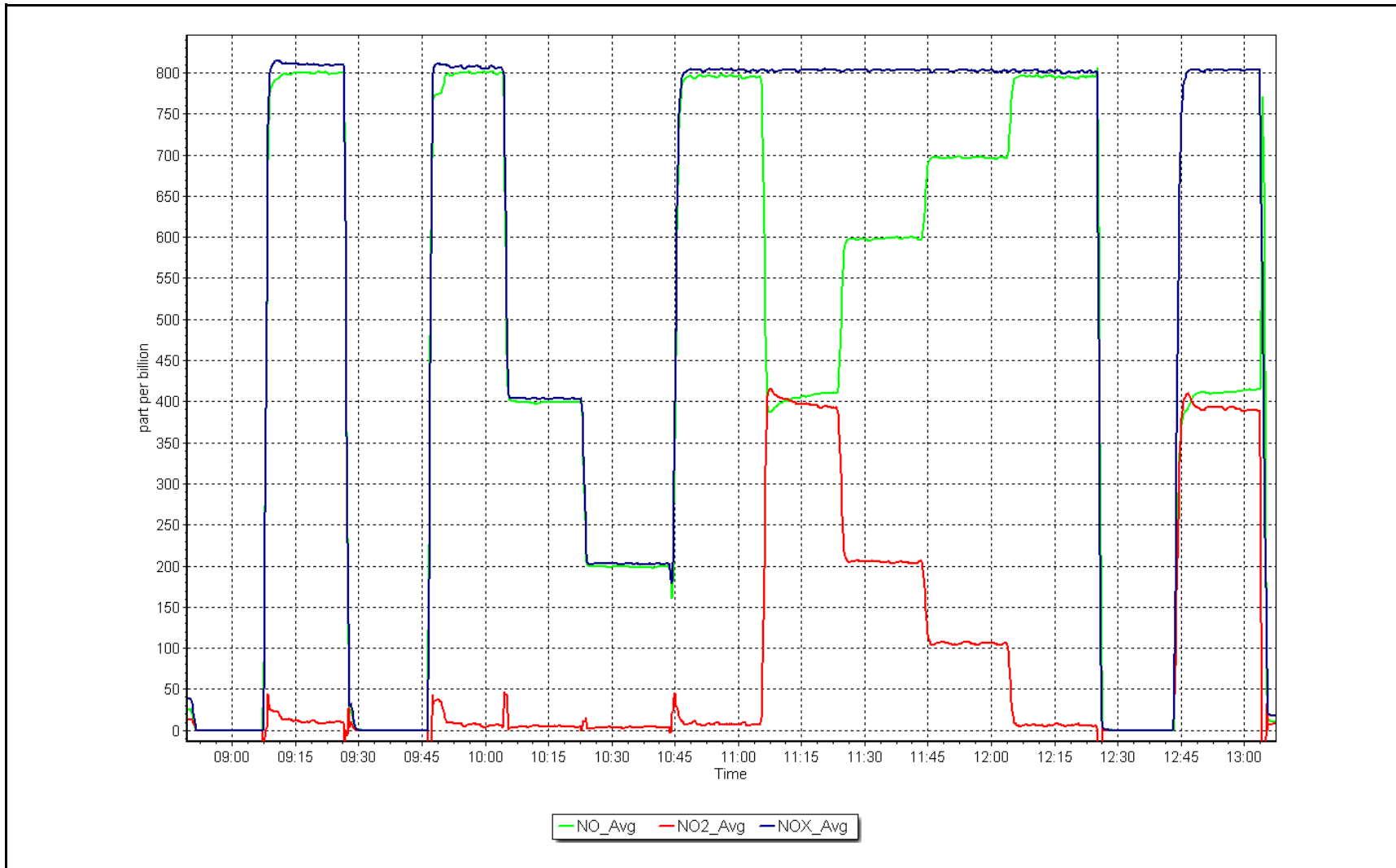
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999996	<i>≥0.995</i>
800.7	800.2	1.0007	Slope	0.999824	<i>0.90 - 1.10</i>
400.0	399.0	1.0024	Intercept	-0.703748	<i>+/-20</i>
200.0	198.4	1.0078			



NO_x Calibration Plot

Date: October 8, 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: October 18, 2024 Last Cal Date: September 17, 2024
 Start time (MST): 9:40 End time (MST): 10:46

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)	3.00	2.31	3.00	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	725.90	733.40	725.90	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.00	4.79	5.00	<input checked="" type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	37	----	37	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	4.60	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	9.00	10.80	10.80	<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: October 18, 2024
 Date Disposable Filter Changed: October 18, 2024

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

Annual Maintenance

Date Sample Tube Cleaned: October 18, 2024
 Date RH/T Sensor Cleaned: October 18, 2024

Notes: Adjusted sample flow. Leak check passed. PMT leak check was within limits after maintenance.

Calibration by: Sean Bala



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Barge Landing	Station Number:	AMS 09
Calibration Date:	October 8, 2024	Prev Cal Date:	December 1, 2023
Start Time (MST):	10:22	End Time (MST):	11:35
Tower Height (m):	10.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	B4128
WS Calibrator:	Young 18811	Serial Number:	CA 05230

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.3	0.7%
400	39.4	39.4	0.1%
600	58.6	58.7	0.2%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999998	≥0.9995
Calculated slope		0.999042	0.90 - 1.10
Calculated intercept		-0.044810	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	D14057
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	13:13	Calc Declination*:	13.62 Degrees
Deadband calc:	0.8 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.4	---
90	87.4	-0.7%
180	179.9	0.0%
270	271.3	0.4%
357	356.6	-0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999951	≥0.9995
Calculated slope		0.997315	0.90 - 1.10
Calculated intercept		0.760954	+/- 4

Notes: Bearings are good. Verify true north using compass.

Calibration Performed By: Sean Bala



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS11 LOWER CAMP OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	October 8, 2024	Last Cal Date:	September 20, 2024
Start time (MST):	9:50	End time (MST):	14:17
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000782	0.994576	Backgd or Offset:	15.8	15.9
Calibration intercept:	-0.886348	-0.962057	Coeff or Slope:	0.977	0.977

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4932	81.4	799.6	793.2	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	793.2	Previous response	799.4	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4932	81.4	799.6	795.4	1.005
Mid point	4959	40.7	400.9	396.0	1.012
Low point	4981	20.4	200.9	198.2	1.014
As left zero	5000	0.0	0.0	0.4	----
As left span	4932	81.4	799.6	797.7	1.002
Average Correction Factor:					1.010

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

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

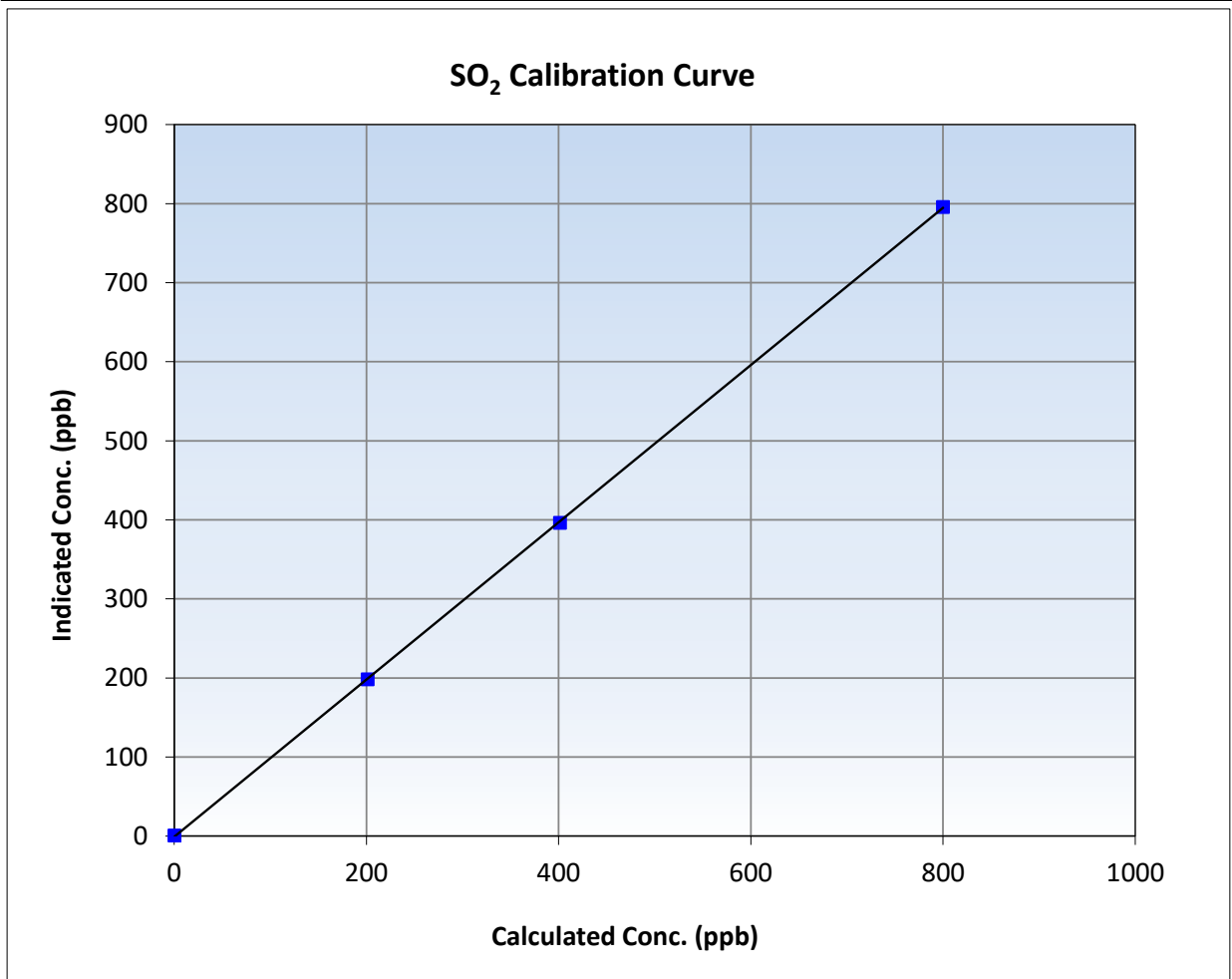
SO₂ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 20, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	9:50	End Time (MST):	14:17
Analyzer make:	Thermo 43i	Analyzer serial #:	100841398

Calibration Data

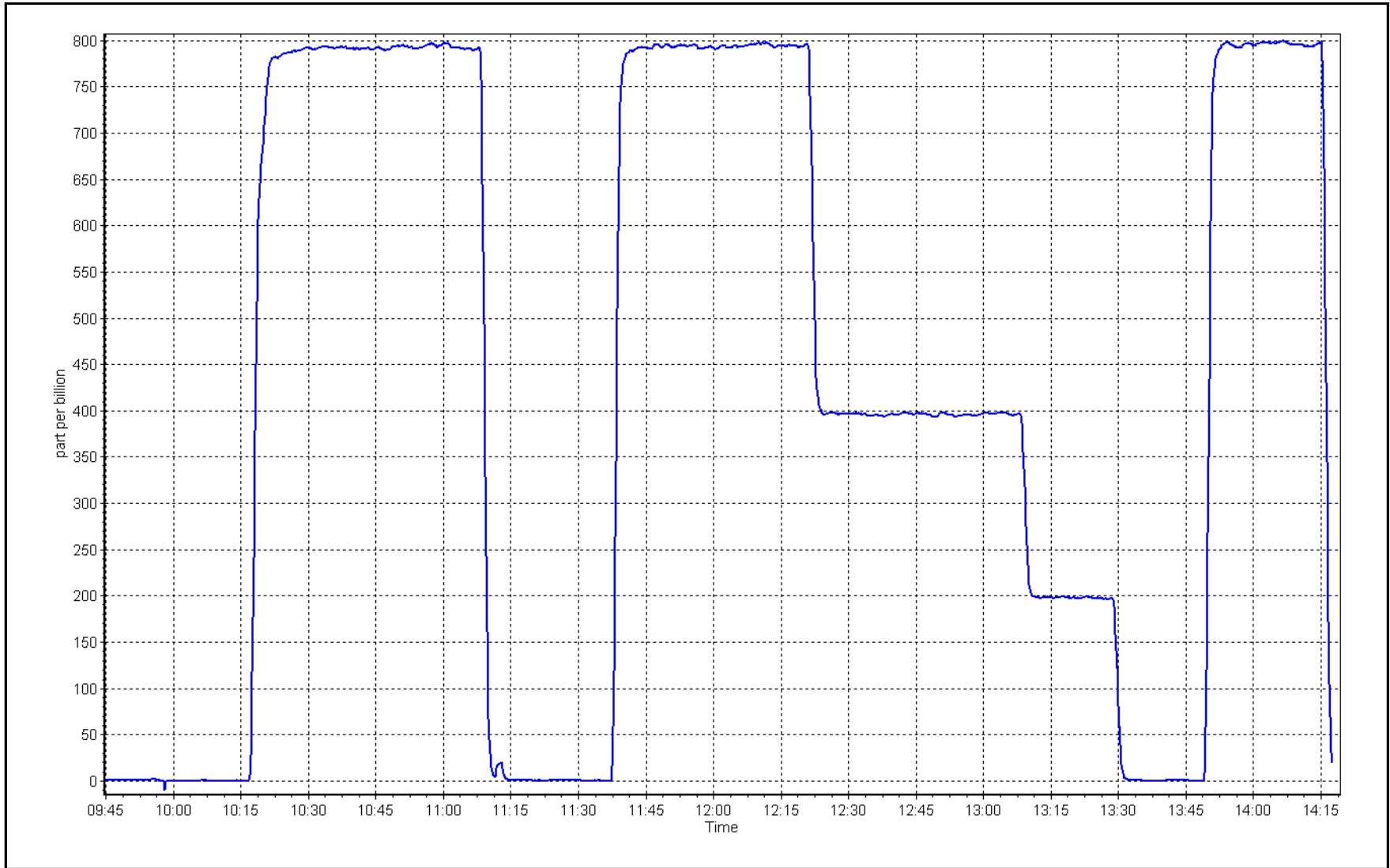
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.4	----	Correlation Coefficient	0.999981	≥0.995
799.6	795.4	1.0053	Slope	0.994576	0.90 - 1.10
400.9	396.0	1.0124	Intercept	-0.962057	+/-30
200.9	198.2	1.0135			



SO2 Calibration Plot

Date: October 8, 2024

Location: Lower Camp





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	October 30, 2024	Last Cal Date:	September 24, 2024
Start time (MST):	10:01	End time (MST):	14:17
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

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	0.994593	1.006762	Backgd or Offset:	2.2
Calibration intercept:	-0.304091	-0.205241	Coeff or Slope:	0.769

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4926	73.6	79.9	80.6	0.988
As found Mid point	4963	36.8	40.0	40.1	0.989
As found Low point	4982	18.6	20.2	20.0	0.995
New cylinder response					
Baseline Corr As found:	80.9	Prev response:	79.19	*% change:	2.1%
Baseline Corr 2nd AF pt:	40.4	AF Slope:	1.012776	AF Intercept:	-0.365838
Baseline Corr 3rd AF pt:	20.3	AF Correlation:	0.999997	* = > +/-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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4926	73.6	79.9	80.2	0.997
Mid point	4963	36.8	40.0	40.2	0.994
Low point	4982	18.6	20.2	20.0	1.010
As left zero	5000	0.0	0.0	-0.1	----
As left span	4926	73.6	79.9	79.8	1.002
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

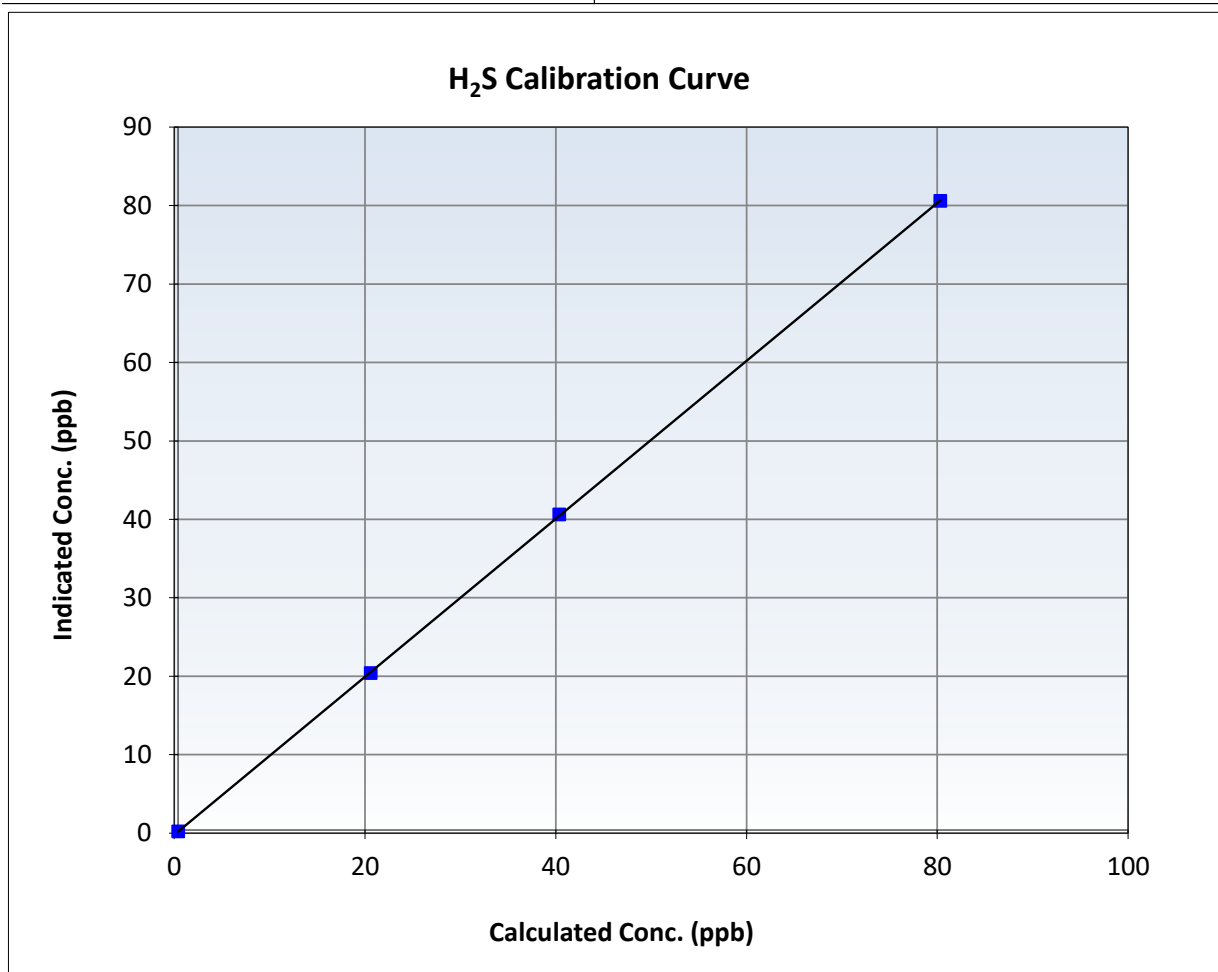
H₂S Calibration Summary

Station Information

Calibration Date:	October 30, 2024	Previous Calibration:	September 24, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:01	End Time (MST):	14:17
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1203169745

Calibration Data

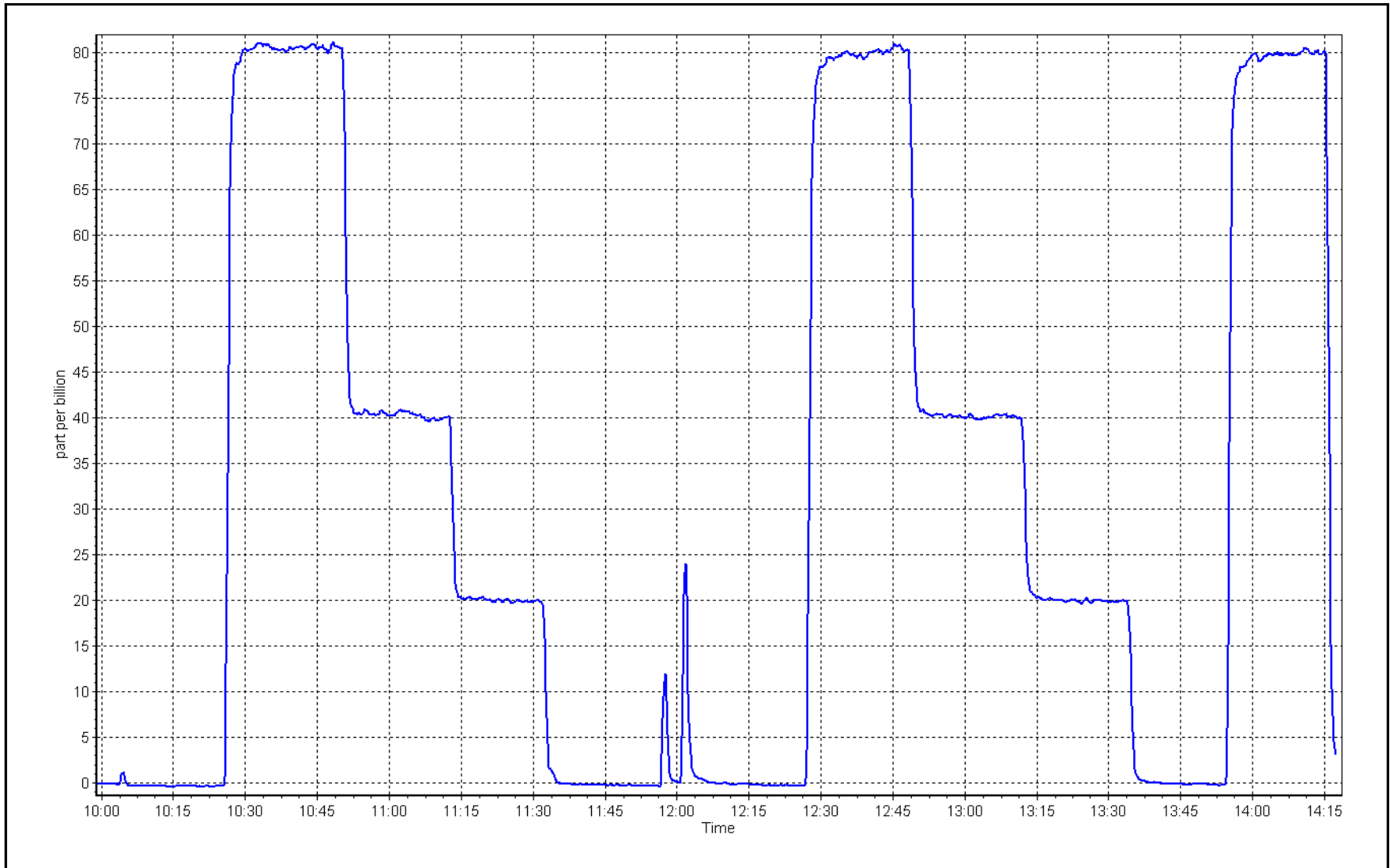
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	0.999986	≥ 0.995
79.9	80.2	0.9965	Slope	1.006762	$0.90 - 1.10$
40.0	40.2	0.9940	Intercept	-0.205241	± 3
20.2	20.0	1.0097			



H₂S Calibration Plot

Date: October 30, 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:	October 8, 2024	Last Cal Date:	September 20, 2024
Start time (MST):	9:50	End time (MST):	14:17
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

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.68E-04	2.68E-04	NMHC SP Ratio: 4.69E-05	4.57E-05
CH4 Retention time:	15.0	15.0	NMHC Peak Area: 195399	200719
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	17.33	17.68	0.980
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.68	Prev response	17.31	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	17.33	17.32	1.000
Mid point	4959	40.7	8.69	8.60	1.010
Low point	4981	20.4	4.35	4.30	1.013
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					1.008

Notes: Changed sample inlet filter and both N2 and H2 cylinders after as founds. Adjusted span only.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	9.18	9.36	0.980
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.36	Prev response	9.17	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	9.18	9.17	1.001
Mid point	4959	40.7	4.60	4.57	1.008
Low point	4981	20.4	2.31	2.27	1.014
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	9.18	9.19	0.998
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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	8.15	8.31	0.981
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.31	Prev response	8.14	*% change	2.0%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	8.15	8.15	1.000
Mid point	4959	40.7	4.09	4.03	1.013
Low point	4981	20.4	2.05	2.02	1.013
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	8.15	8.14	1.002
Average Correction Factor					1.009

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.000560	1.000114
THC Cal Offset:	-0.028731	-0.039101
CH ₄ Cal Slope:	1.000719	1.000406
CH ₄ Cal Offset:	-0.015775	-0.021157
NMHC Cal Slope:	1.000443	0.999980
NMHC Cal Offset:	-0.012558	-0.017945

Calibration Performed By:

Mohammed Kashif



Wood Buffalo Environmental Association

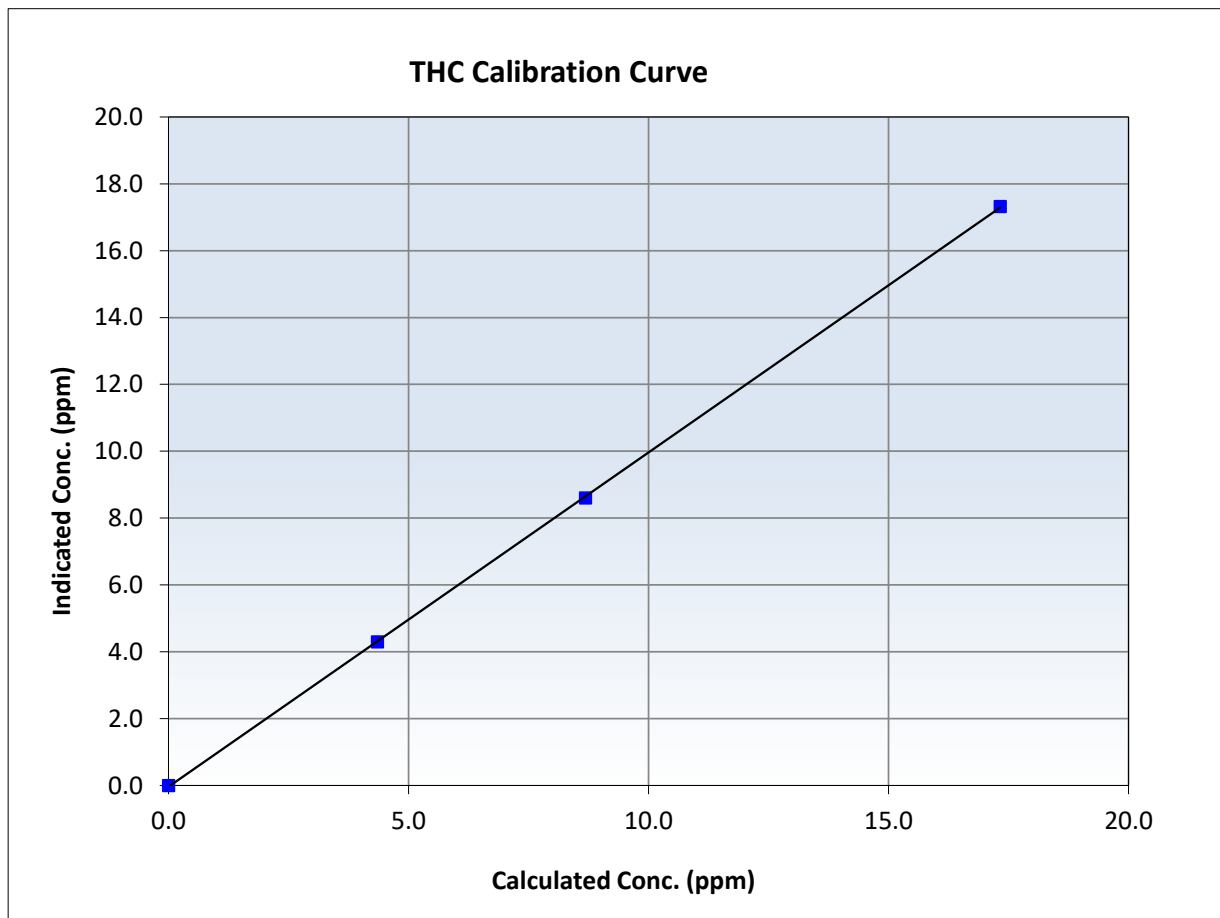
THC Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 20, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	9:50	End Time (MST):	14:17
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999968	<i>≥0.995</i>
17.33	17.32	1.0004	Slope	1.000114	<i>0.90 - 1.10</i>
8.69	8.60	1.0102	Intercept	-0.039101	<i>+/-0.5</i>
4.35	4.30	1.0134			





Wood Buffalo Environmental Association

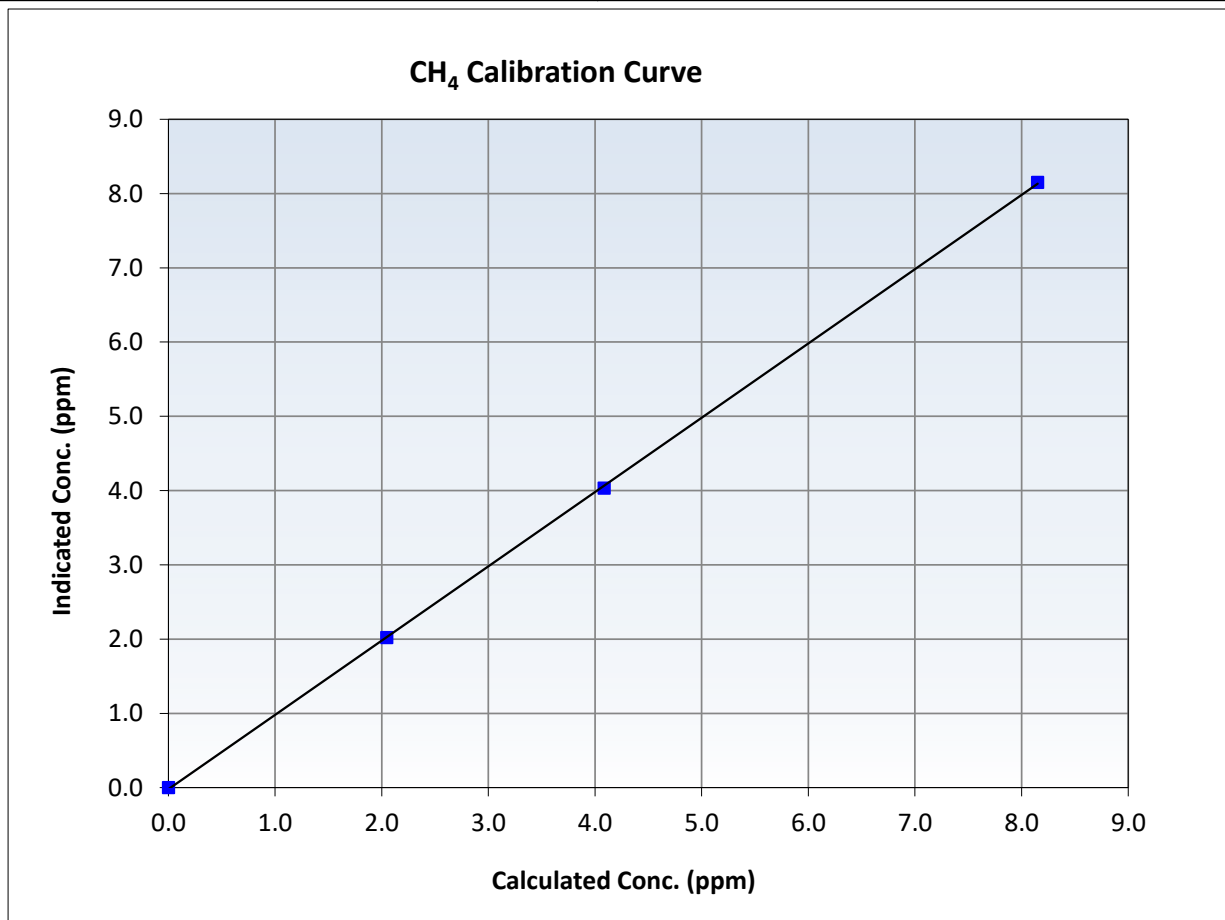
CH₄ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 20, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	9:50	End Time (MST):	14:17
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999948	<i>≥0.995</i>
8.15	8.15	1.0000	Slope	1.000406	<i>0.90 - 1.10</i>
4.09	4.03	1.0130	Intercept	-0.021157	<i>+/-0.5</i>
2.05	2.02	1.0132			





Wood Buffalo Environmental Association

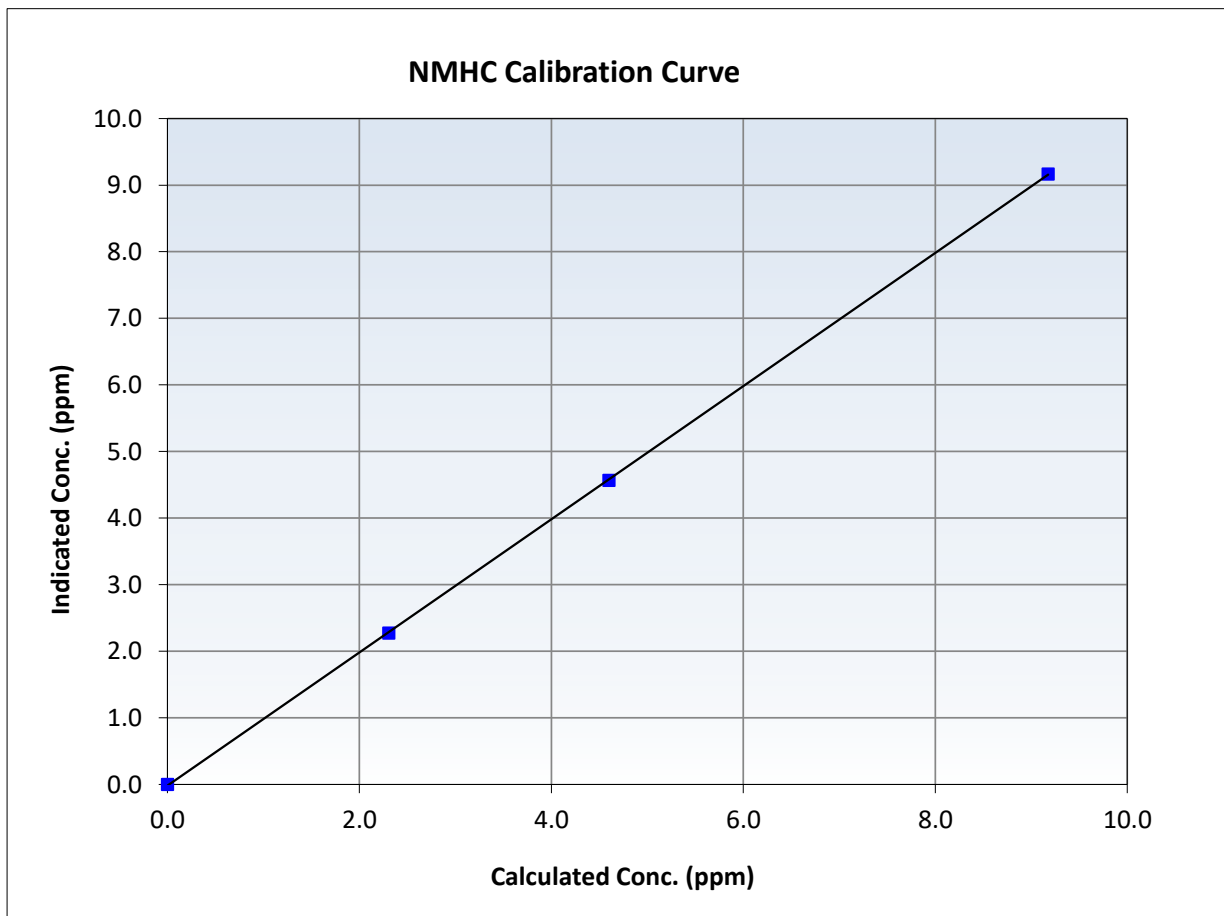
NMHC Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 20, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	9:50	End Time (MST):	14:17
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

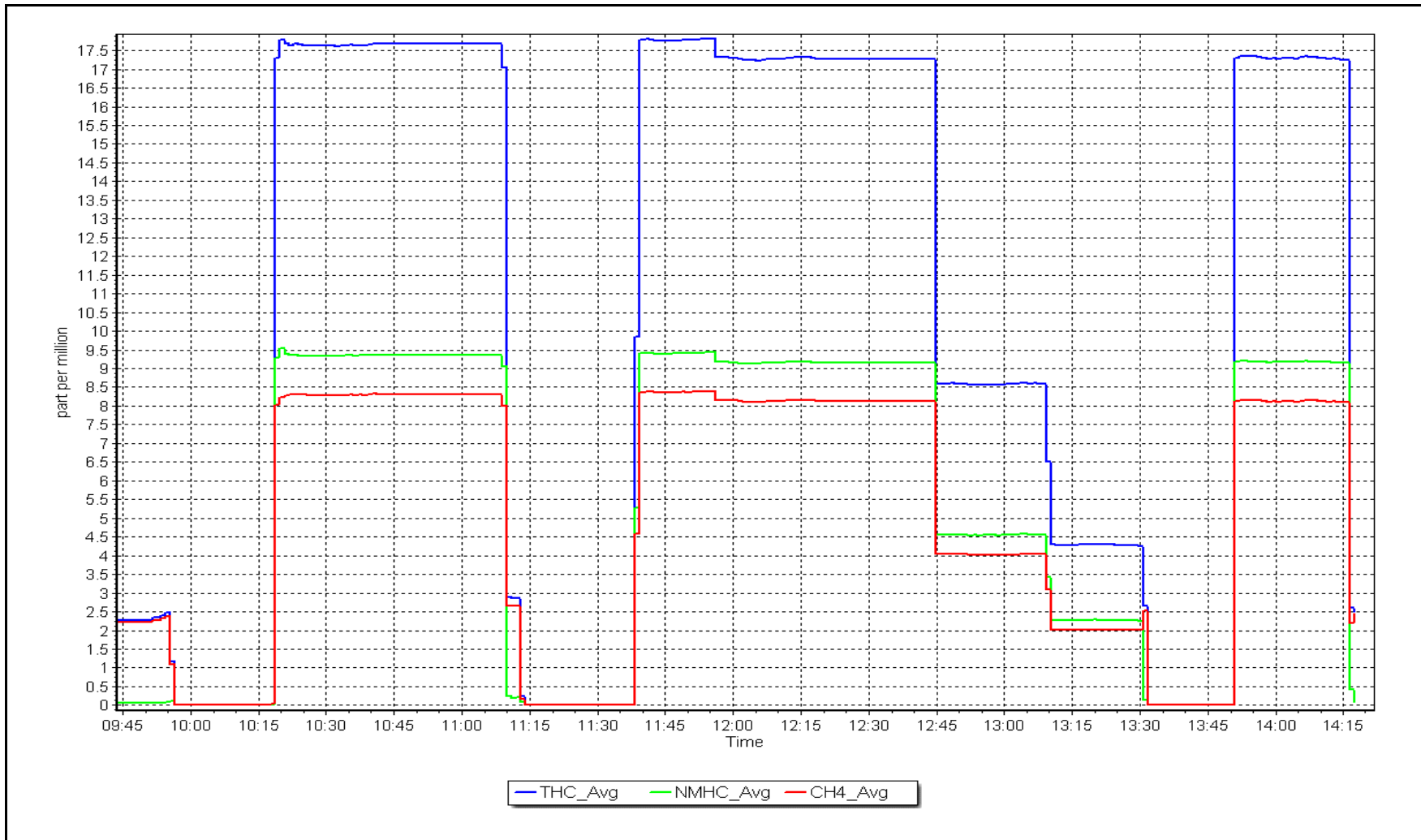
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999981 ≥0.995
9.18	9.17	1.0007	Slope	0.999980 0.90 - 1.10
4.60	4.57	1.0075	Intercept	-0.017945 +/-0.5
2.31	2.27	1.0137		



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 OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	October 9, 2024	Last Cal Date:	September 13, 2024
Start time (MST):	9:03	End time (MST):	11:55
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:	API T700		Serial Number:	2448
Zero Air Gen Model:	API T701		Serial Number:	5609

Analyzer Information

Analyzer make:	API T100	Serial Number:	599
Analyzer Range:	0 - 1000 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.006803	1.004785	Backgd or Offset:	99.5	99.5
Calibration intercept:	-2.898574	-2.717874	Coeff or Slope:	0.697	0.697

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.6	----
As found High point	4921	79.1	799.7	800.7	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	801.3	Previous response	802.2	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4921	79.1	799.7	801.8	0.997
Mid point	4961	39.5	399.3	398.0	1.003
Low point	4980	19.8	200.2	195.4	1.024
As left zero	5000	0.0	0.0	-0.3	----
As left span	4921	79.1	799.7	802.9	0.996
Average Correction Factor:					1.008

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

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

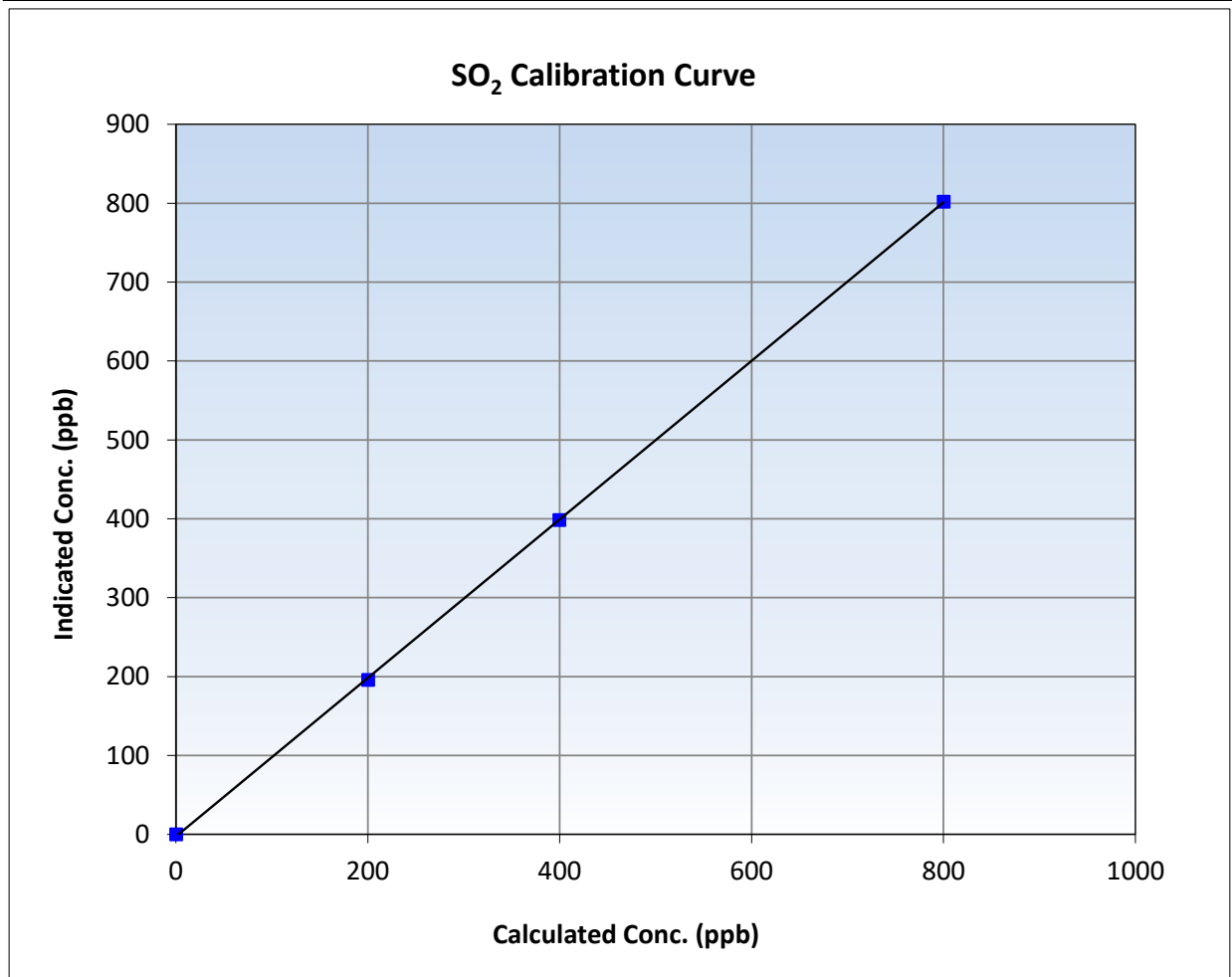
SO₂ Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 13, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:03	End Time (MST):	11:55
Analyzer make:	API T100	Analyzer serial #:	599

Calibration Data

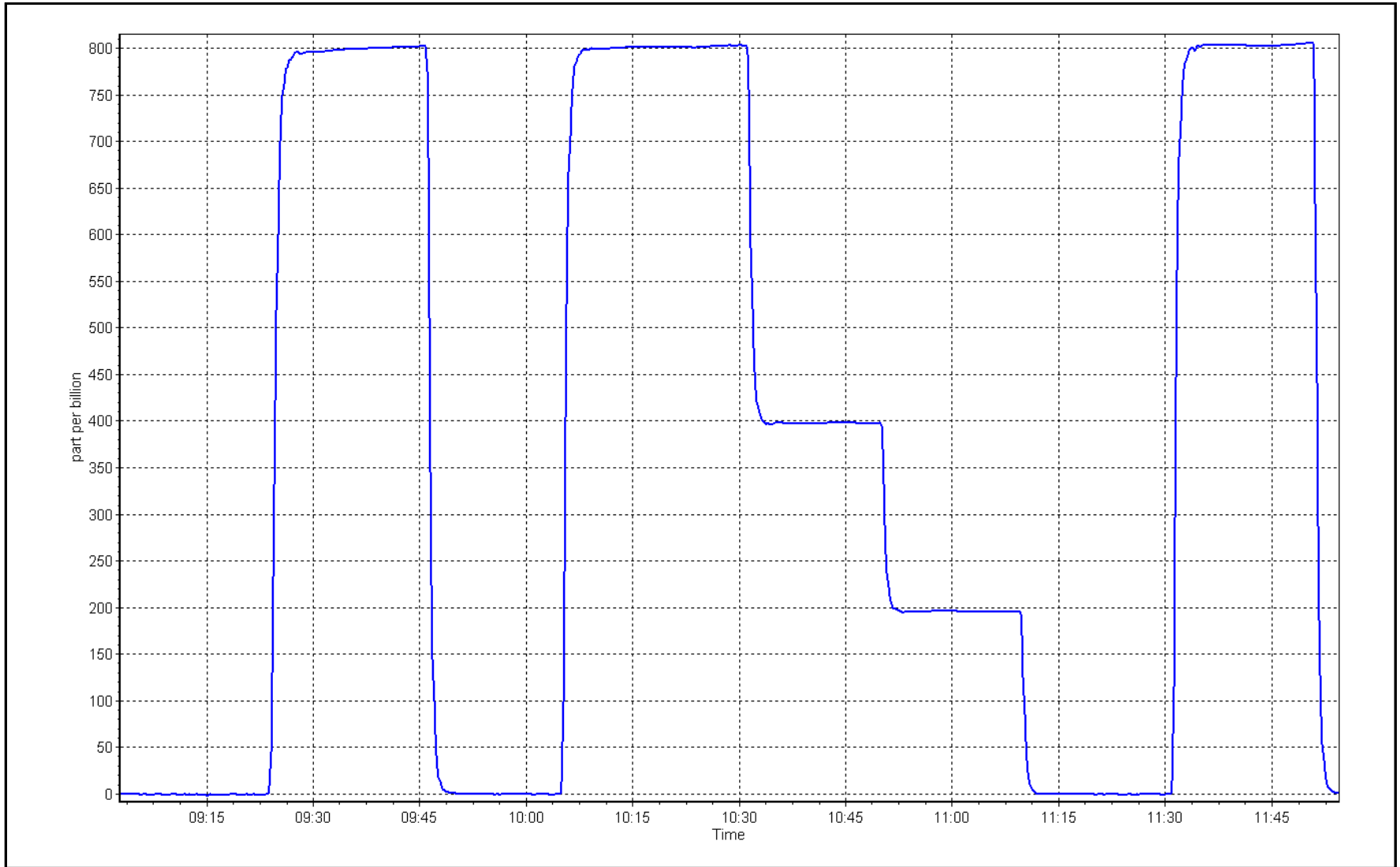
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	0.999953	≥0.995
799.7	801.8	0.9974	Slope	1.004785	0.90 - 1.10
399.3	398.0	1.0033	Intercept	-2.717874	+/-30
200.2	195.4	1.0245			



SO2 Calibration Plot

Date: October 9, 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:	October 2, 2024	Last Cal Date:	September 5, 2024
Start time (MST):	10:08	End time (MST):	14:02
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:	API T700		Serial Number:	2448
ZAG Make/Model:	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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002916	1.007024	Backgd or Offset:	3.69	3.69
Calibration intercept:	-0.322246	-0.242118	Coeff or Slope:	1.13	1.13

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4925	75.5	80.6	80.5	1.000
As found Mid point	4962	37.7	40.3	40.1	1.002
As found Low point	4981	18.9	20.2	19.8	1.014
New cylinder response					
Baseline Corr As found:	80.6	Prev response:	80.54	*% change:	0.1%
Baseline Corr 2nd AF pt:	40.2	AF Slope:	1.000788	AF Intercept:	-0.222196
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999986	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4925	75.5	80.6	81.0	0.995
Mid point	4962	37.7	40.3	40.4	0.997
Low point	4981	18.9	20.2	19.7	1.025
As left zero	5000	0.0	0.0	0.1	----
As left span	4925	75.5	80.6	80.4	1.003
SO2 Scrubber Check	4921	79.1	791.0	0.0	----
Date of last scrubber change:	20-Jan-20			Ave Corr Factor	1.006
Date of last converter efficiency test:					

Notes: Changed inlet filter after multipoint as founds. SO2 scrubber check done after calibrator zero and passed. No adjustment.

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

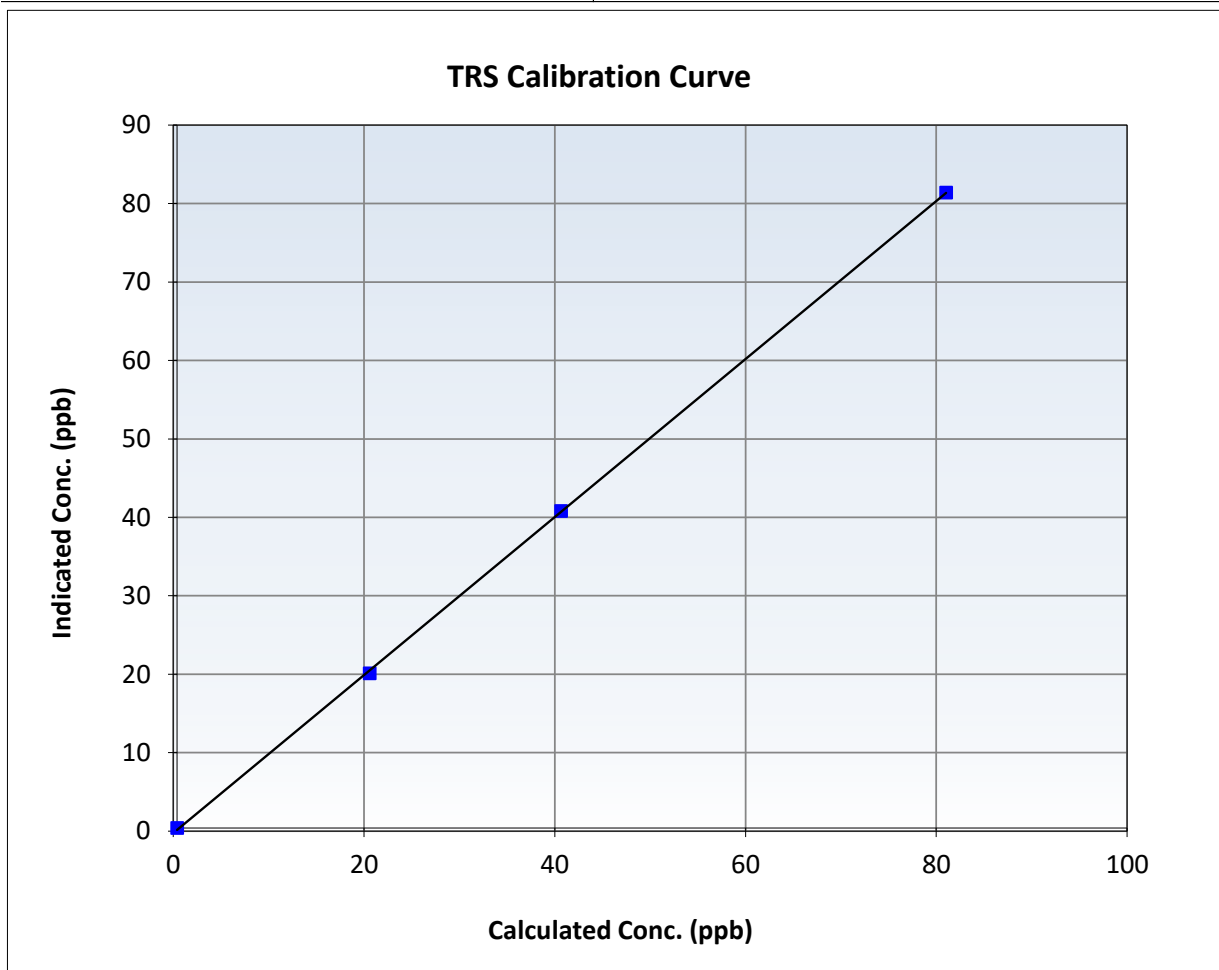
TRS Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 5, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:08	End Time (MST):	14:02
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1180540017

Calibration Data

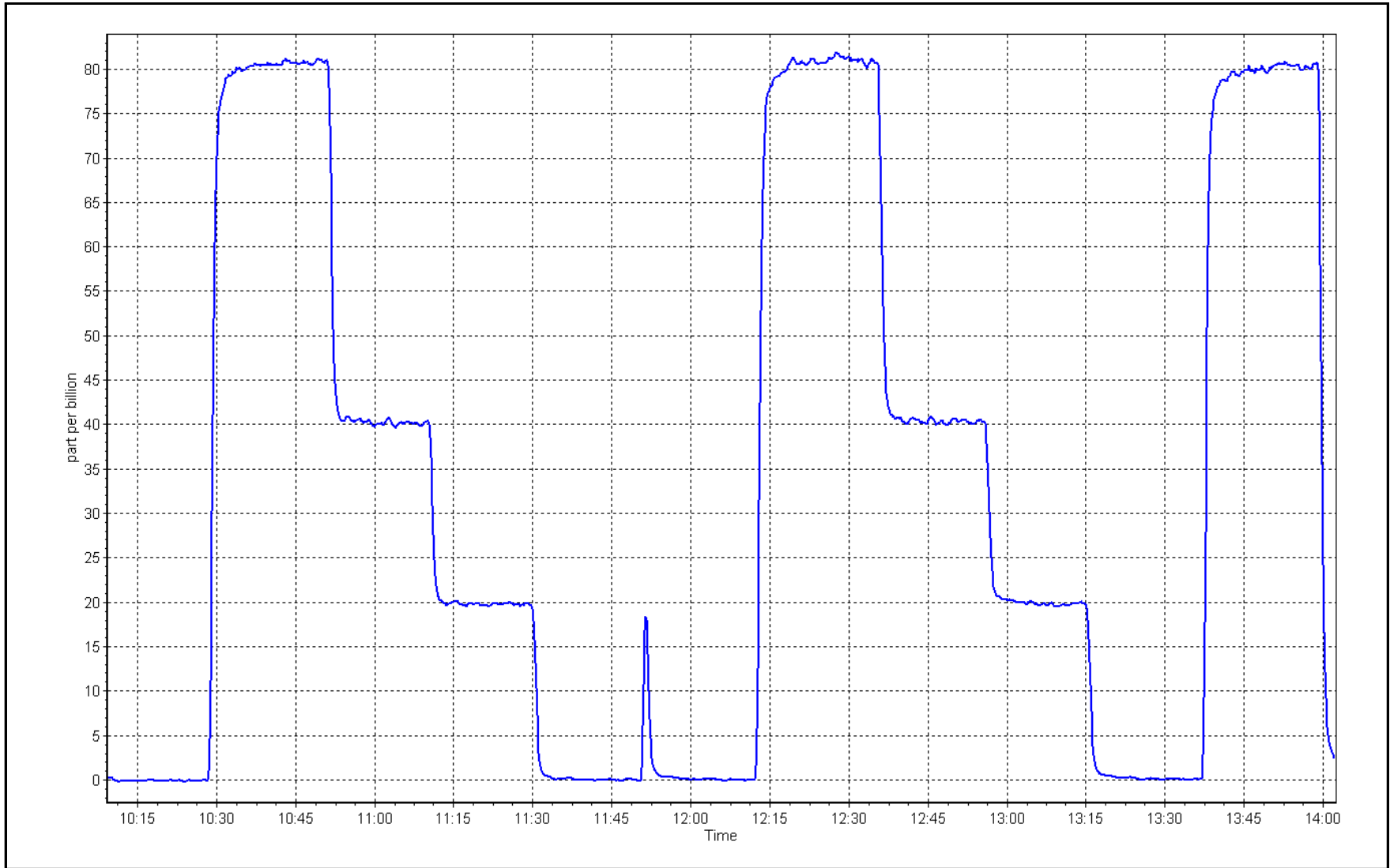
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999939	≥ 0.995
80.6	81.0	0.9954	Slope	1.007024	$0.90 - 1.10$
40.3	40.4	0.9967	Intercept	-0.242118	± 3
20.2	19.7	1.0246			



TRS Calibration Plot

Date: October 2, 2024

Location: Fort McKay South





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	October 9, 2024	Last Cal Date:	September 13, 2024
Start time (MST):	9:03	End time (MST):	11:55
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:	API T700	Serial Number:	2448
Zero Air Gen model:	API T701	Serial Number:	5609

Analyzer Information

Analyzer make: Thermo 55i	Analyzer serial #: 12227620776
THC Range: 0 - 20 ppm	NMHC/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	3.15E-04	3.19E-04	NMHC SP Ratio:	7.52E-05	7.87E-05
CH4 Retention time:	14.80	14.80	NMHC Peak Area:	120708	115427
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	---
As found High point	4921	79.1	17.05	16.49	1.034
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.49	Prev response	17.02	*% change	-3.2%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	---
High point	4921	79.1	17.05	17.01	1.002
Mid point	4961	39.5	8.51	8.43	1.010
Low point	4980	19.8	4.27	4.16	1.027
As left zero	5000	0.0	0.00	0.00	---
As left span	4921	79.1	17.05	16.93	1.007
Average Correction Factor					1.013

Notes: Adjusted span only.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	9.08	8.62	1.053
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.62	Prev response	9.06	*% change	-5.1%
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)	Baseline Adjusted Correction factor (Cc/Ic)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	9.08	9.04	1.005
Mid point	4961	39.5	4.53	4.48	1.011
Low point	4980	19.8	2.27	2.21	1.029
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	9.08	8.96	1.013
Average Correction Factor					1.015

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	7.97	7.87	1.013
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.87	Prev response	7.96	*% change	-1.2%
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)	Baseline Adjusted Correction factor (Cc/Ic)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	7.97	7.97	0.999
Mid point	4961	39.5	3.98	3.95	1.007
Low point	4980	19.8	1.99	1.95	1.023
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	7.97	7.97	1.000
Average Correction Factor					1.010

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.000629	0.999550
THC Cal Offset:	-0.033157	-0.053365
CH ₄ Cal Slope:	1.001806	1.002466
CH ₄ Cal Offset:	-0.021586	-0.025385
NMHC Cal Slope:	0.999357	0.996916
NMHC Cal Offset:	-0.011372	-0.027178

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

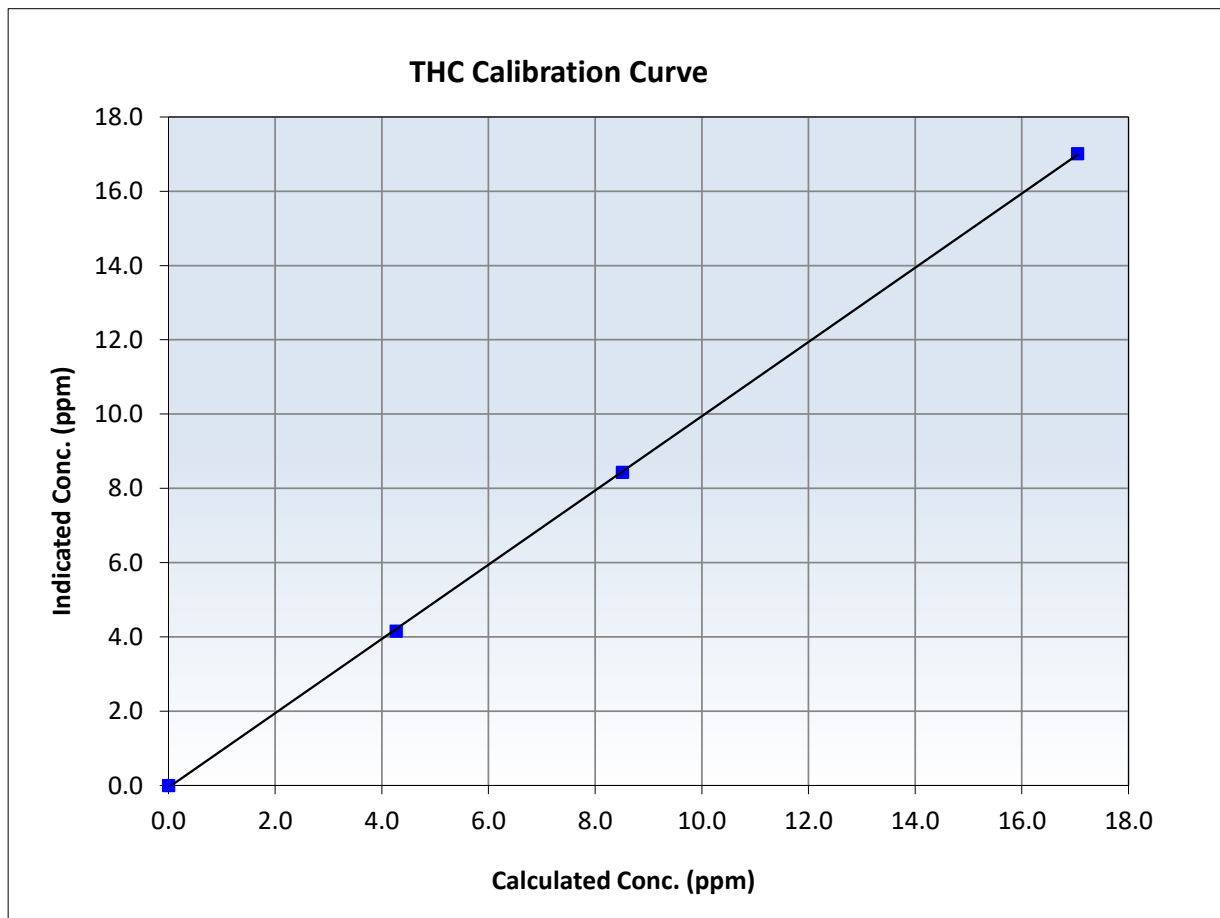
THC Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 13, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:03	End Time (MST):	11:55
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620776

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999955	<i>≥0.995</i>
17.05	17.01	1.0021	Slope	0.999550	<i>0.90 - 1.10</i>
8.51	8.43	1.0097	Intercept	-0.053365	<i>+/-0.5</i>
4.27	4.16	1.0265			





Wood Buffalo Environmental Association

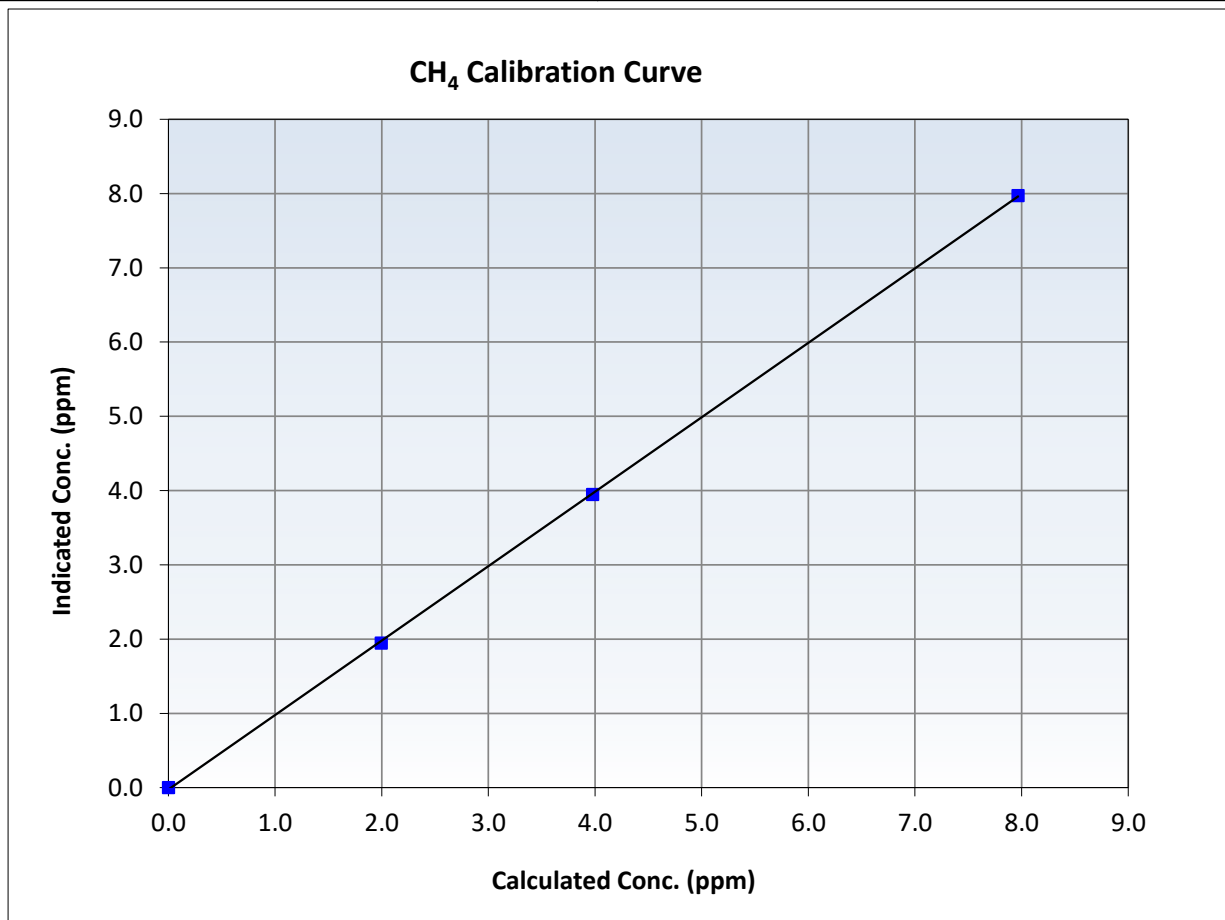
CH₄ Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 13, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:03	End Time (MST):	11:55
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620776

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999954	<i>≥0.995</i>
7.97	7.97	0.9991	Slope	1.002466	<i>0.90 - 1.10</i>
3.98	3.95	1.0074	Intercept	-0.025385	<i>+/-0.5</i>
1.99	1.95	1.0233			





Wood Buffalo Environmental Association

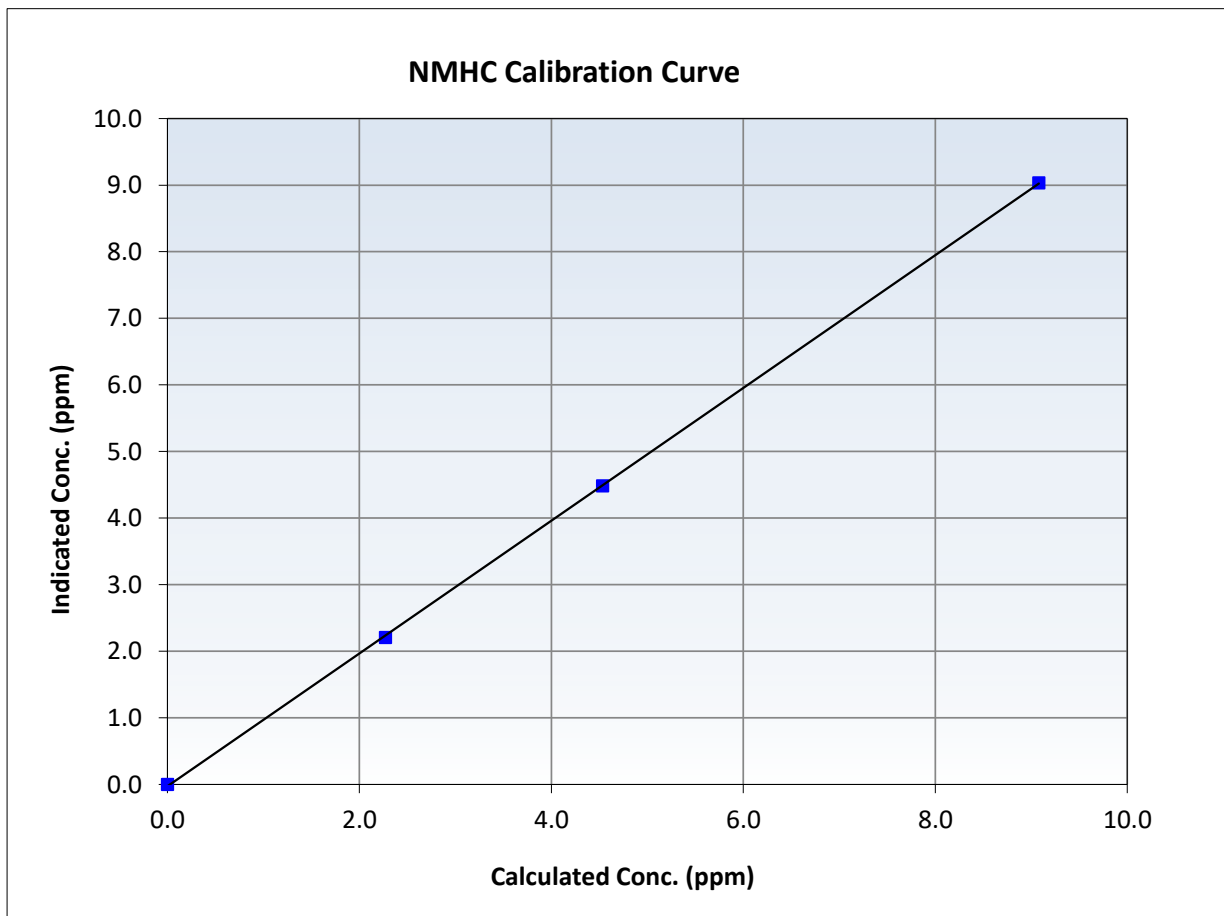
NMHC Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 13, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:03	End Time (MST):	11:55
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620776

Calibration Data

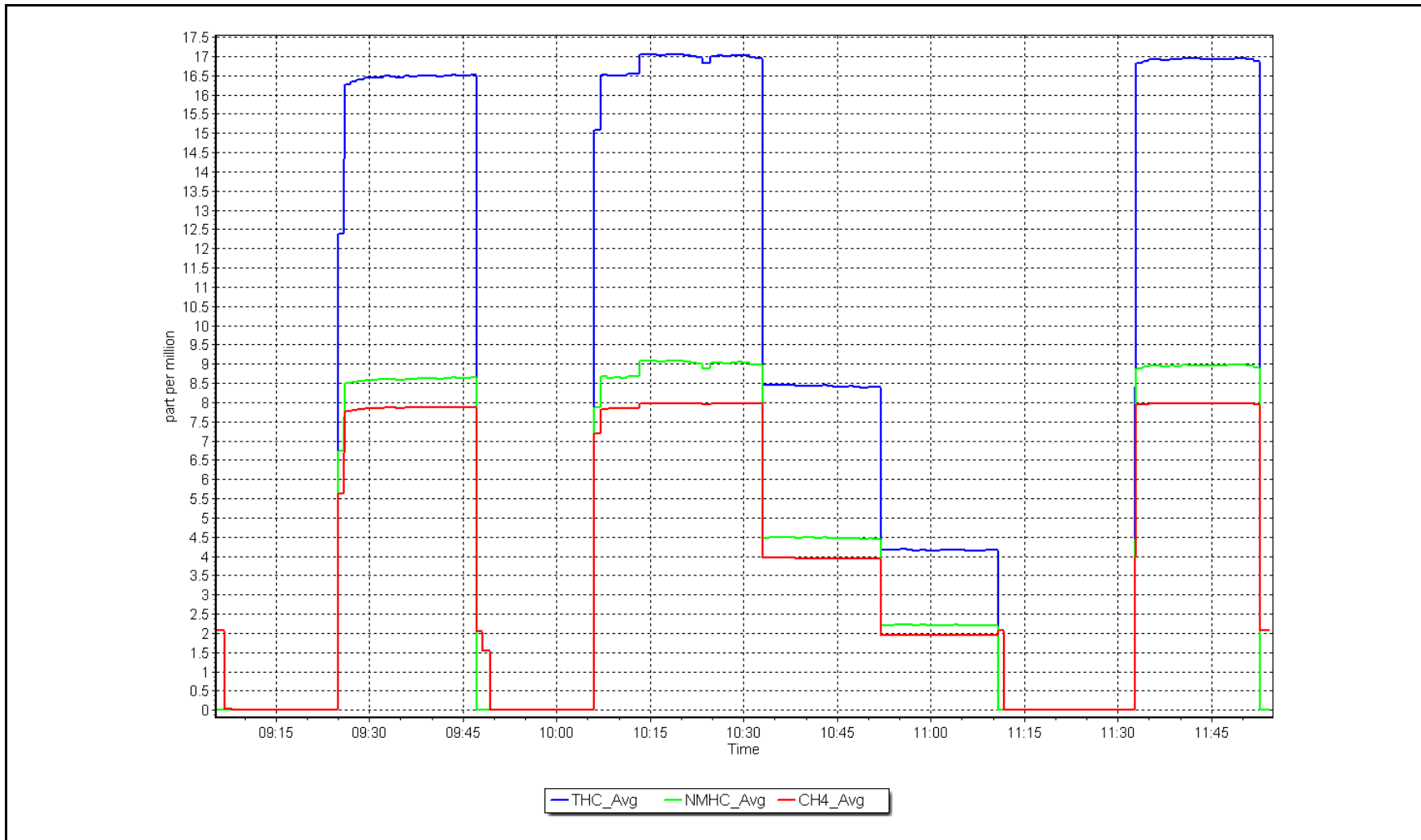
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999958	<i>≥0.995</i>
9.08	9.04	1.0048	Slope	0.996916	<i>0.90 - 1.10</i>
4.53	4.48	1.0111	Intercept	-0.027178	<i>+/-0.5</i>
2.27	2.21	1.0294			



NMHC Calibration Plot

Date: October 9, 2024

Location: Fort McKay South





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Fort McKay South
 Station number: AMS 13
 Calibration Date: October 7, 2024
 Last Cal Date: September 20, 2024
 Start time (MST): 8:58
 End time (MST): 13:09
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: T2UP1RP
 NOX Cal Gas Conc: 48.25 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 48.25 ppm
 NOX gas Diff:
 Calibrator Model: API T700
 ZAG make/model: APIT701
 Cal Gas Expiry Date: November 17, 2026
 NO Cal Gas Conc: 47.88 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 47.88 ppm
 NO gas Diff:
 Serial Number: 2448
 Serial Number: 5609

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
AF High point	4917	83.5	805.7	799.5	6.2	804.7	796.4	8.3	1.0014	1.0039
AF Mid point										
AF Low point										
New cyl resp										

Previous Response NO_x = 804.8 ppb NO = 797.9 ppb * = > +/-5% change initiates investigation *Percent Change NO_x = 0.0%

Baseline Corr 1st pt NO_x = 804.6 ppb NO = 796.4 ppb As Found Statistics *Percent Change NO = -0.2%

Baseline Corr 2nd pt NO_x = NA ppb NO = NA ppb As found NO_x r²: Nx SI: Nx Int:

Baseline Corr 3rd pt NO_x = NA ppb NO = NA ppb As found NO r²: NO SI: NO Int:

As found NO₂ r²: NO₂ SI: NO₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1410661329

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.001179	0.998739
NO _x Cal Offset:	-1.833158	-1.872630
NO Cal Slope:	1.001281	0.998579
NO Cal Offset:	-2.611239	-2.690624
NO ₂ Cal Slope:	0.999115	1.000882
NO ₂ Cal Offset:	-0.716977	-1.053016

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.148	1.148	NO bkgnd or offset:	10.2	10.2
NOX coeff or slope:	1.004	1.004	NOX bkgnd or offset:	10.4	10.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	160.5	160.8

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	----	----
High point	4917	83.5	805.7	799.5	6.2	803.8	797.0	6.8	1.0024	1.0032
Mid point	4958	41.8	403.4	400.3	3.1	400.0	395.9	4.1	1.0085	1.0111
Low point	4979	20.9	201.7	200.1	1.5	197.6	194.2	3.4	1.0207	1.0306
As left zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.5	0.0	----	----
As left span	4917	83.5	805.7	384.4	421.3	807.6	384.4	423.3	0.9976	1.0000
Average Correction Factor									1.0105	1.0150

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	796.5	379.8	422.9	422.9	0.9999	100.0%
Mid GPT point	796.5	576.2	226.5	224.8	1.0075	99.3%
Low GPT point	796.5	684.5	118.2	116.3	1.0162	98.4%
Average Correction Factor					1.0079	99.2%

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

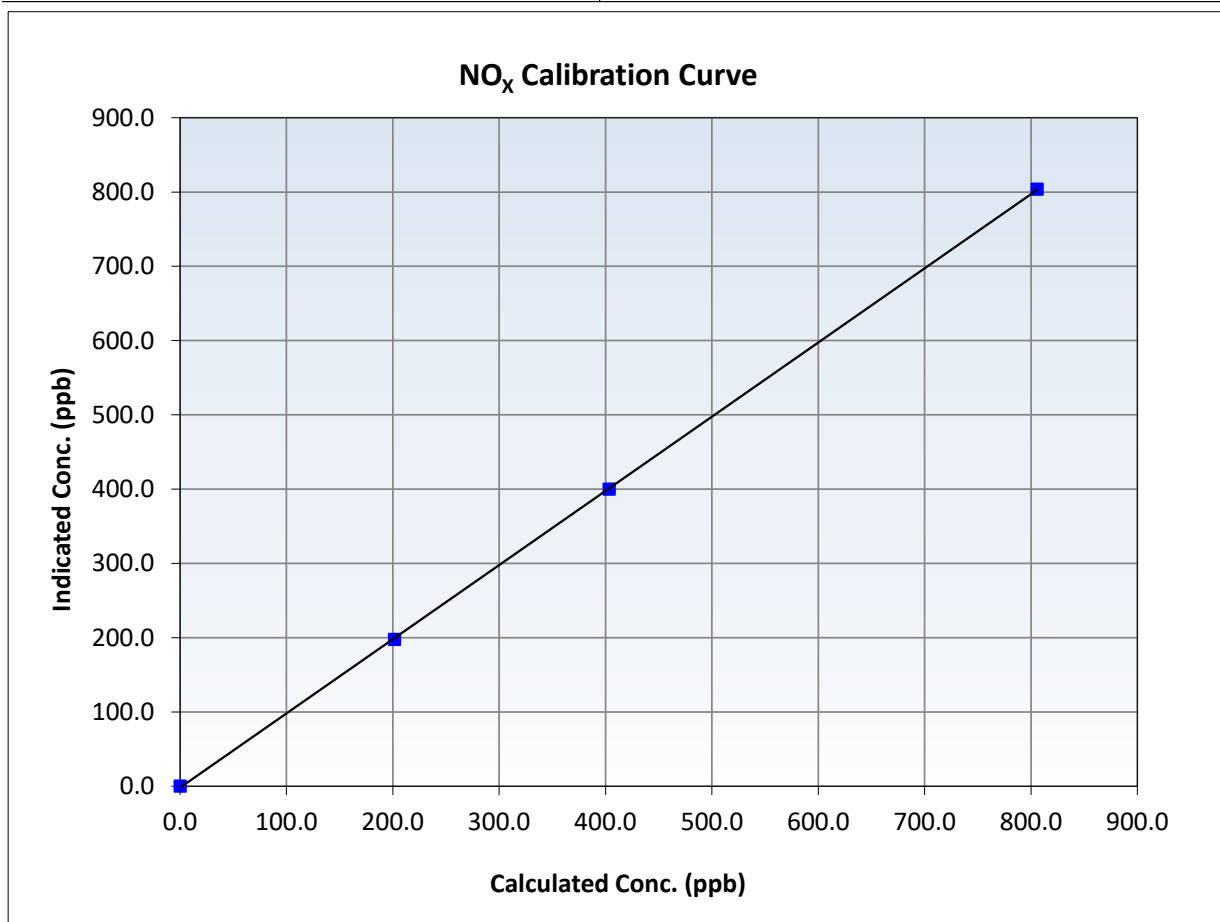
NO_x Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 20, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:58	End Time (MST):	13:09
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999972	≥0.995
805.7	803.8	1.0024	Slope	0.998739	0.90 - 1.10
403.4	400.0	1.0085	Intercept	-1.872630	+/-20
201.7	197.6	1.0207			





Wood Buffalo Environmental Association

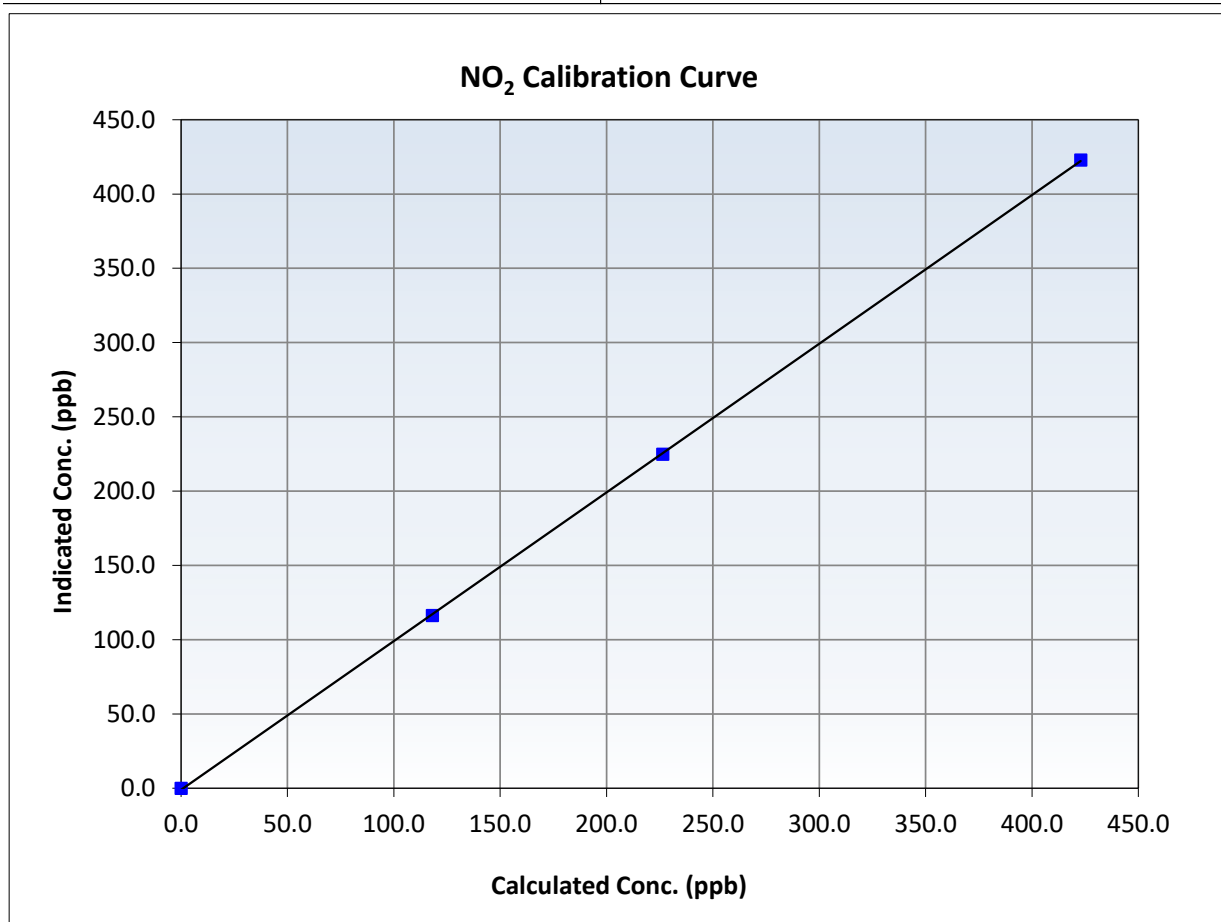
NO₂ Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 20, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:58	End Time (MST):	13:09
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999968	≥0.995
422.9	422.9	0.9999	Slope	1.000882	0.90 - 1.10
226.5	224.8	1.0075	Intercept	-1.053016	+/-20
118.2	116.3	1.0162			





Wood Buffalo Environmental Association

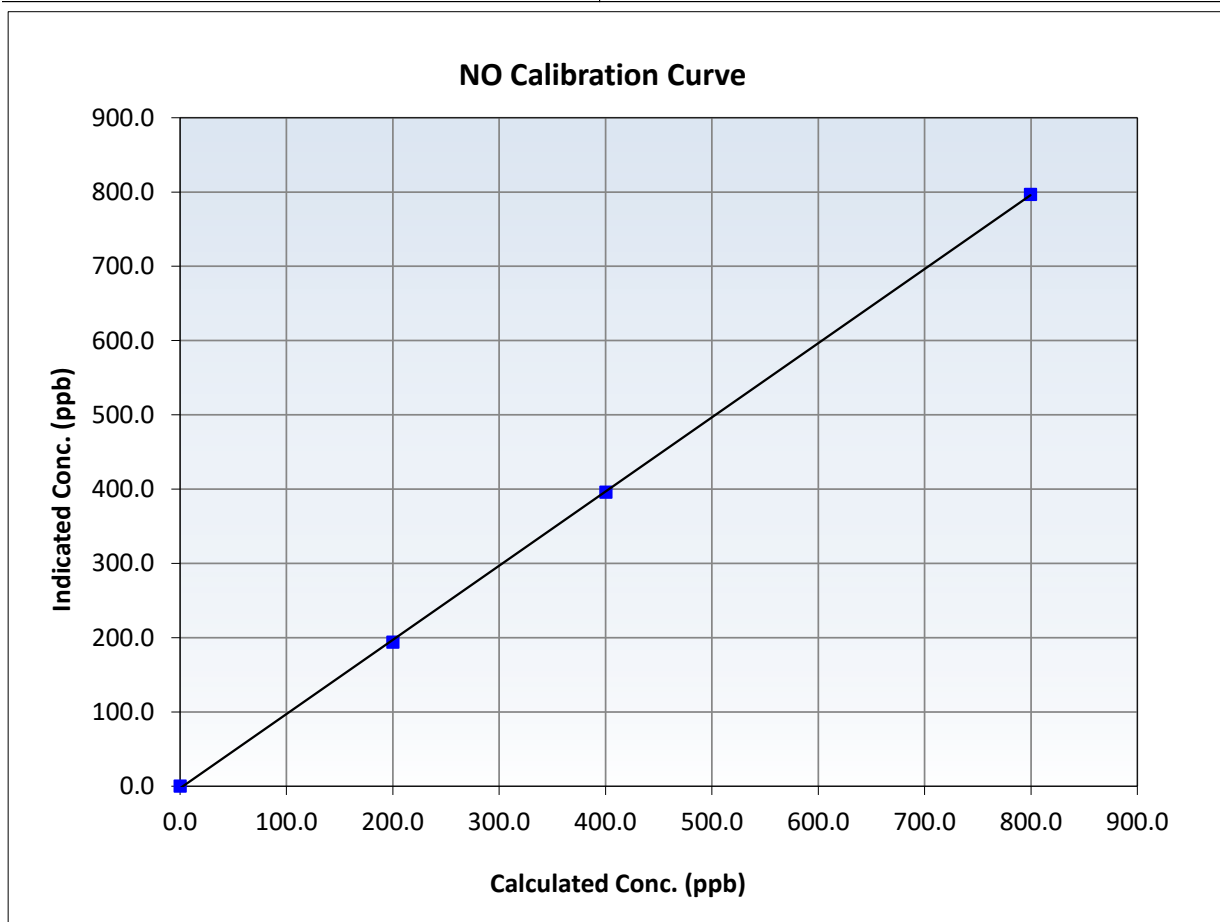
NO Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 20, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:58	End Time (MST):	13:09
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calibration Data

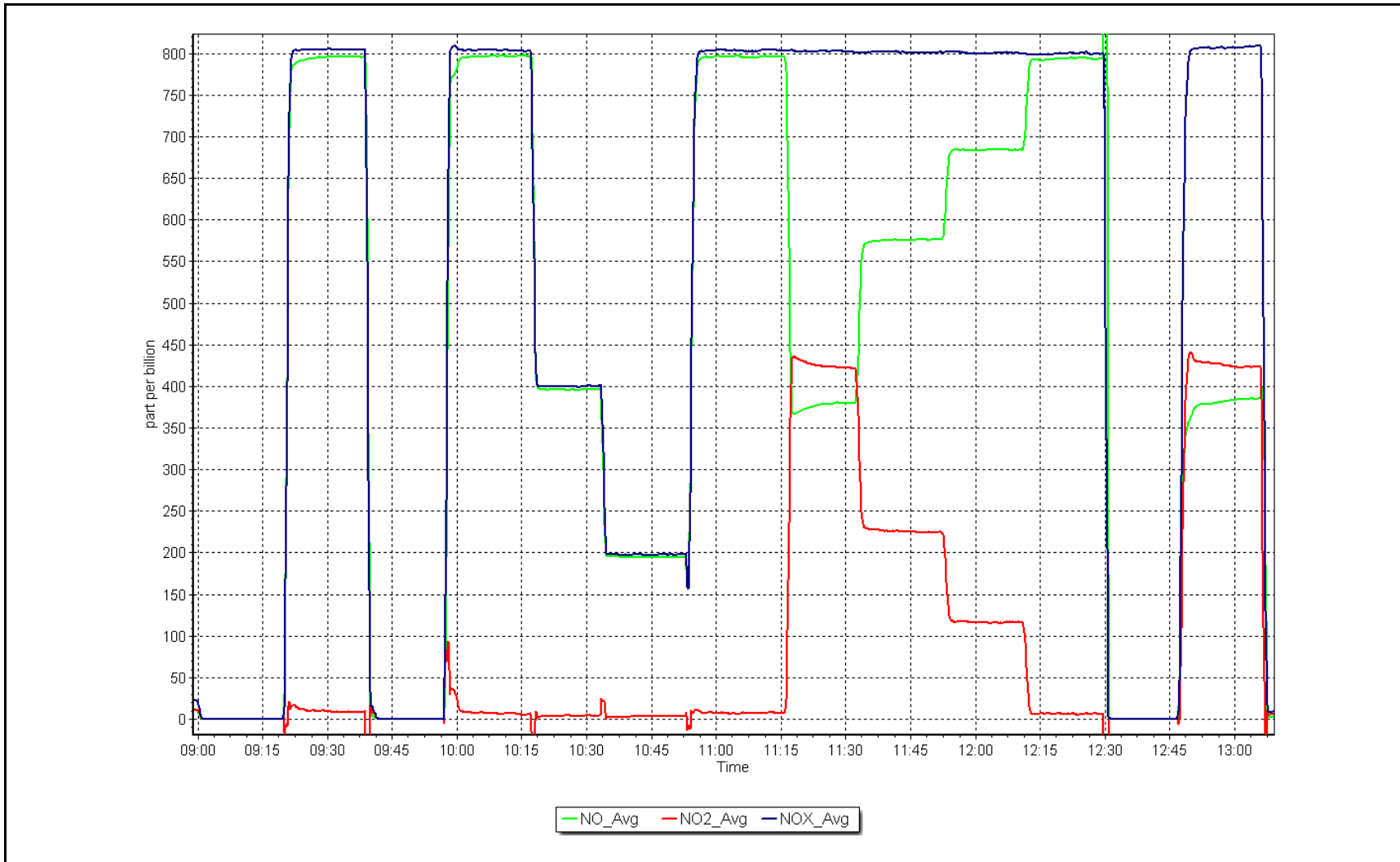
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999944	≥0.995
799.5	797.0	1.0032	Slope	0.998579	0.90 - 1.10
400.3	395.9	1.0111	Intercept	-2.690624	+/-20
200.1	194.2	1.0306			



NO_x Calibration Plot

Date: October 7, 2024

Location: Fort McKay South





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	October 1, 2024	Last Cal Date:	September 10, 2024
Start time (MST):	9:27	End time (MST):	12:29
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	2448
Calibrator Make/Model:	Teledyne API T700	Serial Number:	1117
ZAG Make/Model:	Teledyne API T701		

Analyzer Information

Analyzer make:	Teledyne API T400	Analyzer serial #:	3871
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002943	1.002286	Backgd or Offset:	2.7
Calibration intercept:	0.860000	0.800000	Coeff or Slope:	0.973

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	----
As found High point	5000	997.5	400.0	401.5	0.997
As found Mid point					
As found Low point					
Baseline Corr As found:	401.3	Previous response	402.0	*% 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	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.2	----
High point	5000	996.1	400.0	401.4	0.997
Mid point	5000	850.2	200.0	201.6	0.992
Low point	5000	751.7	100.0	101.6	0.984
As left zero	5000	0.0	0.0	0.5	----
As left span	5000	996.1	400.0	403.1	0.992
Average Correction Factor					0.991

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

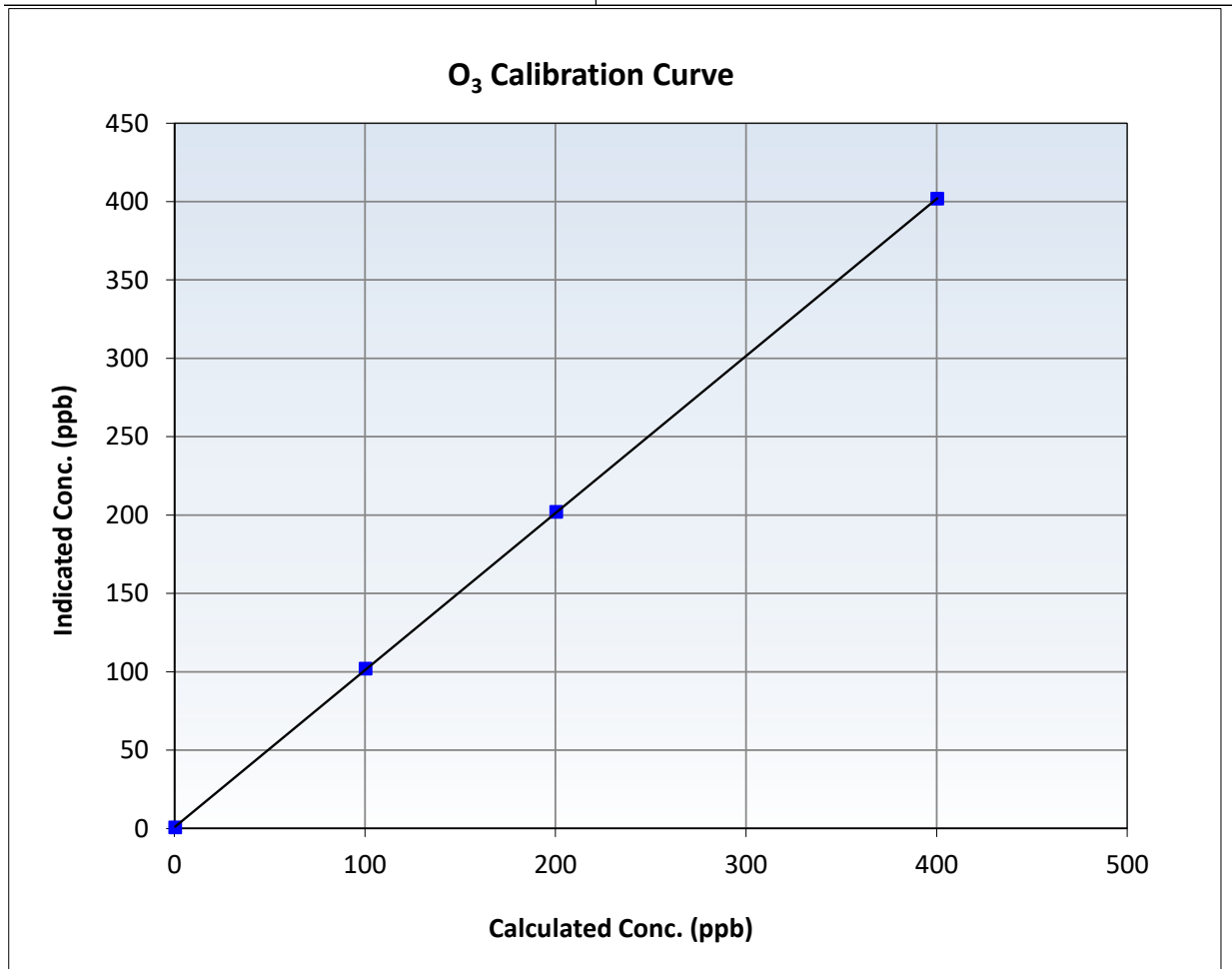
O₃ Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 10, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:27	End Time (MST):	12:29
Analyzer make:	Teledyne API T400	Analyzer serial #:	3871

Calibration Data

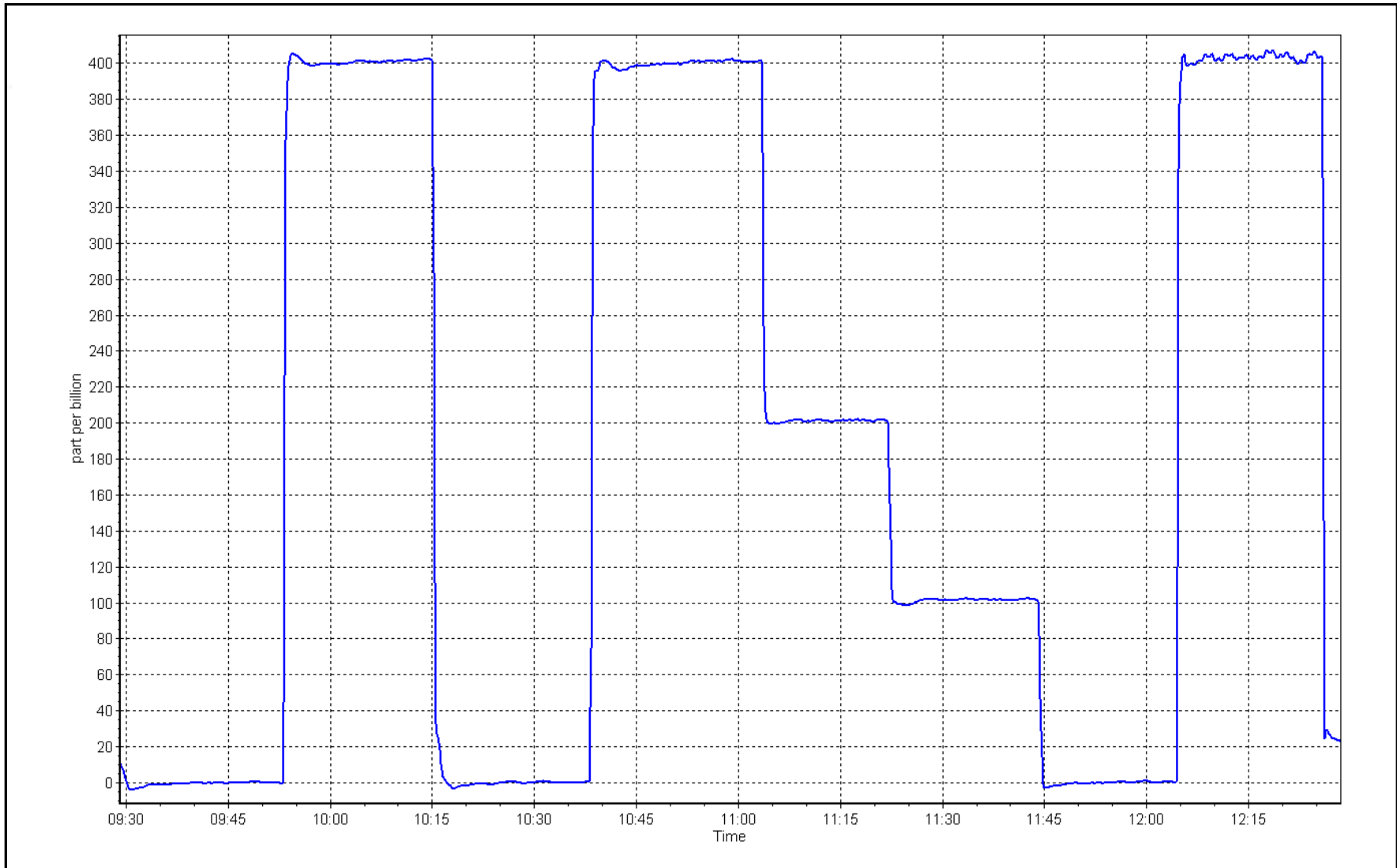
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.2	----	Correlation Coefficient	0.999990	≥0.995
400.0	401.4	0.9965	Slope	1.002286	0.90 - 1.10
200.0	201.6	0.9921	Intercept	0.800000	+/- 5
100.0	101.6	0.9843			



O₃ Calibration Plot

Date: October 1, 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: October 1, 2024 Last Cal Date: September 20, 2024
 Start time (MST): 10:18 End time (MST): 11:38

Analyzer Make: 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)	5.40	4.84	5.40	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	729.40	730.70	729.40	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	4.96	4.93	4.96	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	42	----	42	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	4.7	PM w/ HEPA: _____	0.1	<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	9.0	12.0	11.0	<input checked="" type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: _____ October 1, 2024
 Date Disposable Filter Changed: _____ October 1, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: _____ October 1, 2024
 Date RH/T Sensor Cleaned: _____ October 1, 2024

Notes: PMT peak adjusted. Leak check passed.

Calibration by: Sean Bala



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Fort McKay South	Station Number:	AMS 13
Calibration Date:	October 7, 2024	Prev Cal Date:	September 15, 2023
Start Time (MST):	10:15	End Time (MST):	11:36
Tower Height (m):	10.2	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	N10022
WS Calibrator:	Young 18811	Serial Number:	CA 05230

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.3	0.7%
400	39.4	39.4	0.1%
600	58.6	58.7	0.2%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999998	0.999998	≥0.9995
Calculated slope	1.001527	0.999451	0.90 - 1.10
Calculated intercept	-0.014138	-0.052868	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	W16101
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	13:14	Calc Declination*:	13.64 Degrees
Deadband calc:	3.1 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.1	---
90	88.2	-0.5%
180	178.3	-0.5%
270	268.3	-0.5%
357	354.0	-0.8%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999936	0.999992	≥0.9995
Calculated slope	1.015820	1.006848	0.90 - 1.10
Calculated intercept	-0.298621	0.402474	+/- 4

Notes: Bearings were good. Points were within limits. Compass was used to verify true north.

Calibration Performed By: Sean Bala



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

**AMS14
ANZAC
OCTOBER 2024**

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	October 18, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	13:03	End time (MST):	16:49
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.016425	1.009245	Backgd or Offset:	25.0	24.9
Calibration intercept:	-3.150365	-2.986479	Coeff or Slope:	1.043	1.043

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4938	80.3	799.3	805.7	0.992
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	805.9	Previous response	809.2	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.4	----
High point	4938	80.3	799.3	805.3	0.993
Mid point	4979	40.2	400.1	398.5	1.004
Low point	4998	20.2	201.1	198.0	1.015
As left zero	5000	0.0	0.0	-0.4	----
As left span	4938	80.3	799.3	808.8	0.988
Average Correction Factor:					1.004

Notes: Sample inlet filter changed after as founds. No adjustments needed.

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

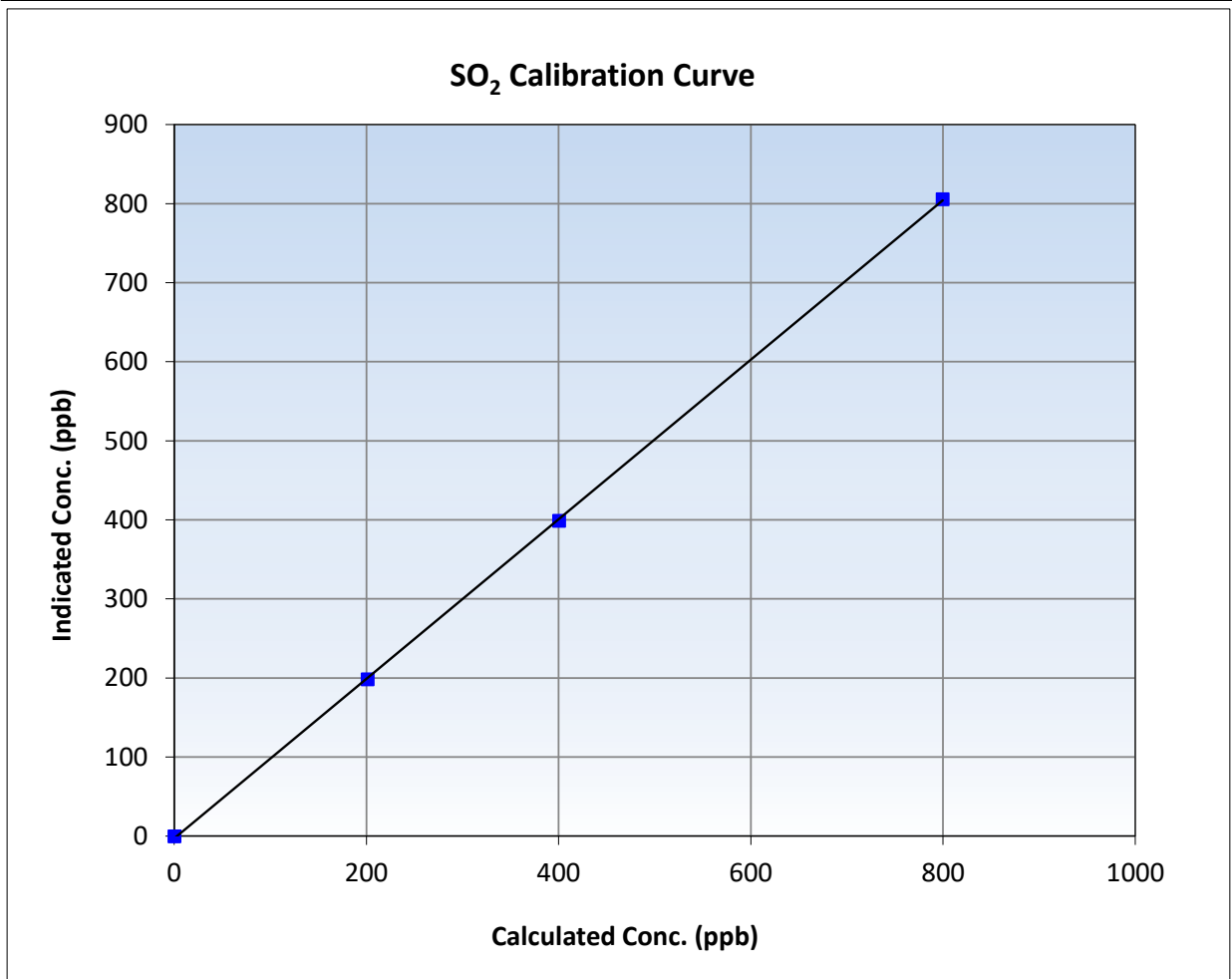
SO₂ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 3, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	13:03	End Time (MST):	16:49
Analyzer make:	Thermo 43i	Analyzer serial #:	0710321322

Calibration Data

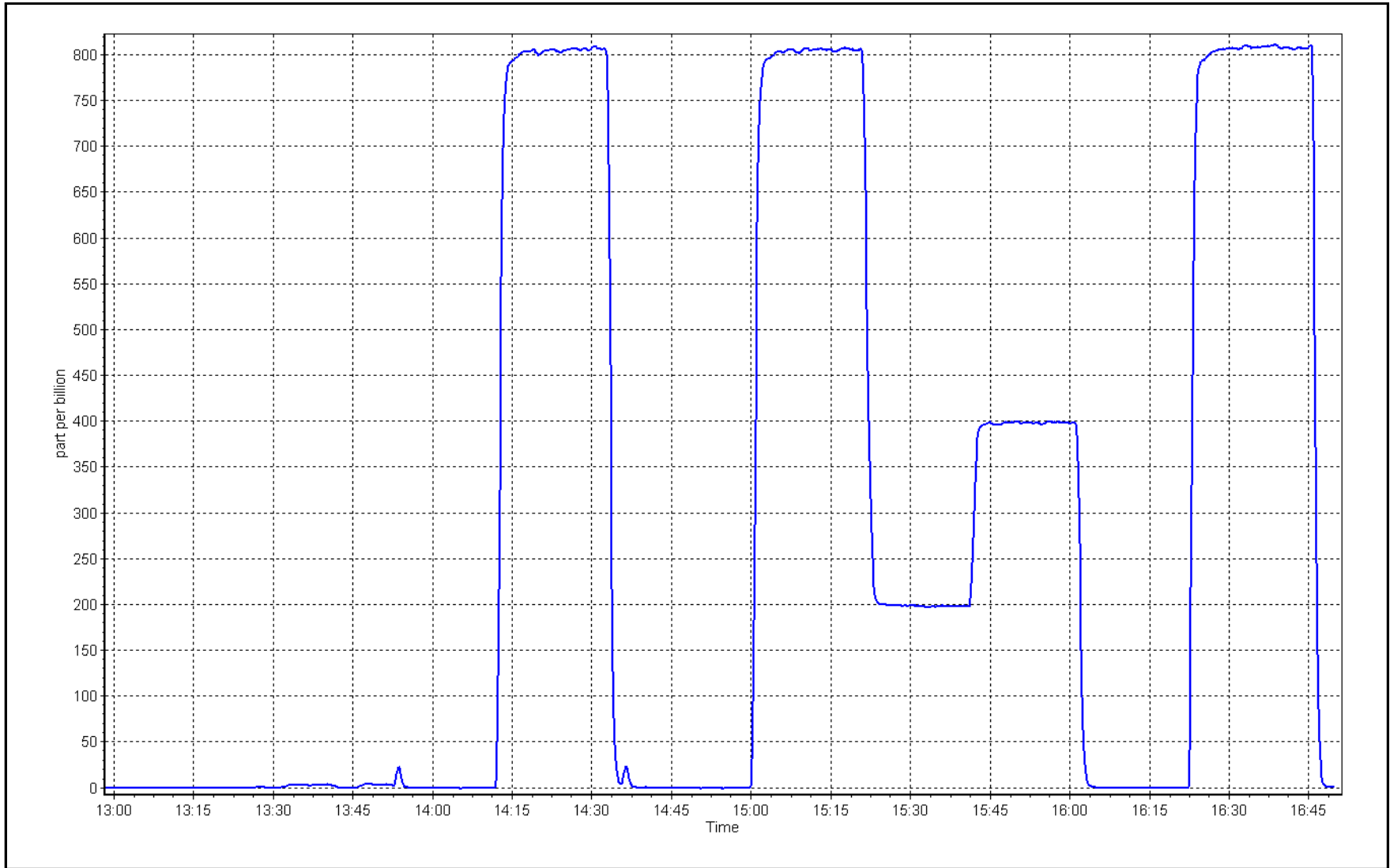
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.4	----	Correlation Coefficient	0.999949	≥0.995
799.3	805.3	0.9925	Slope	1.009245	0.90 - 1.10
400.1	398.5	1.0039	Intercept	-2.986479	+/-30
201.1	198.0	1.0155			



SO2 Calibration Plot

Date: October 18, 2024

Location: Anzac





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	October 4, 2024	Last Cal Date:	September 17, 2024
Start time (MST):	10:30	End time (MST):	15:31
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.026893	1.004736	Backgd or Offset:	2.4	2.3
Calibration intercept:	-0.145472	-0.345439	Coeff or Slope:	1.018	0.995

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4938	77.9	80.0	83.7	0.956
As found Mid point	4973	38.9	40.0	41.4	0.966
As found Low point	4997	19.5	20.0	20.3	0.986
New cylinder response					
Baseline Corr As found:	83.7	Prev response:	81.99	*% change:	2.0%
Baseline Corr 2nd AF pt:	41.4	AF Slope:	1.048645	AF Intercept:	-0.345633
Baseline Corr 3rd AF pt:	20.3	AF Correlation:	0.999922	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4938	77.9	80.0	80.2	0.997
Mid point	4973	38.9	40.0	39.5	1.012
Low point	4997	19.5	20.0	19.5	1.026
As left zero	5000	0.0	0.0	0.1	----
As left span	4938	77.9	80.0	77.9	1.026
SO2 Scrubber Check	4936	80.3	800.4	-0.1	----
Date of last scrubber change:				Ave Corr Factor	1.012
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

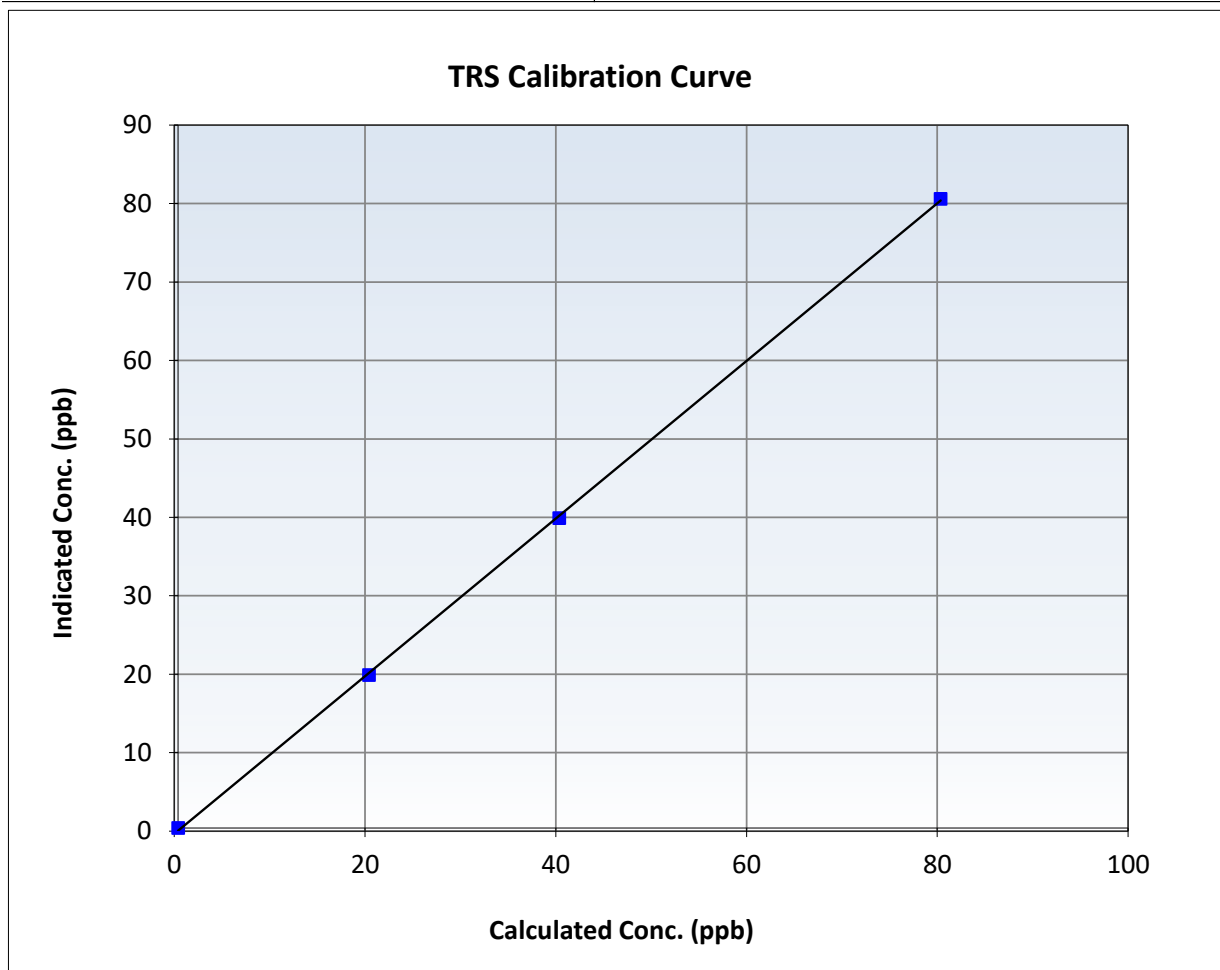
TRS Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 17, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:30	End Time (MST):	15:31
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153582

Calibration Data

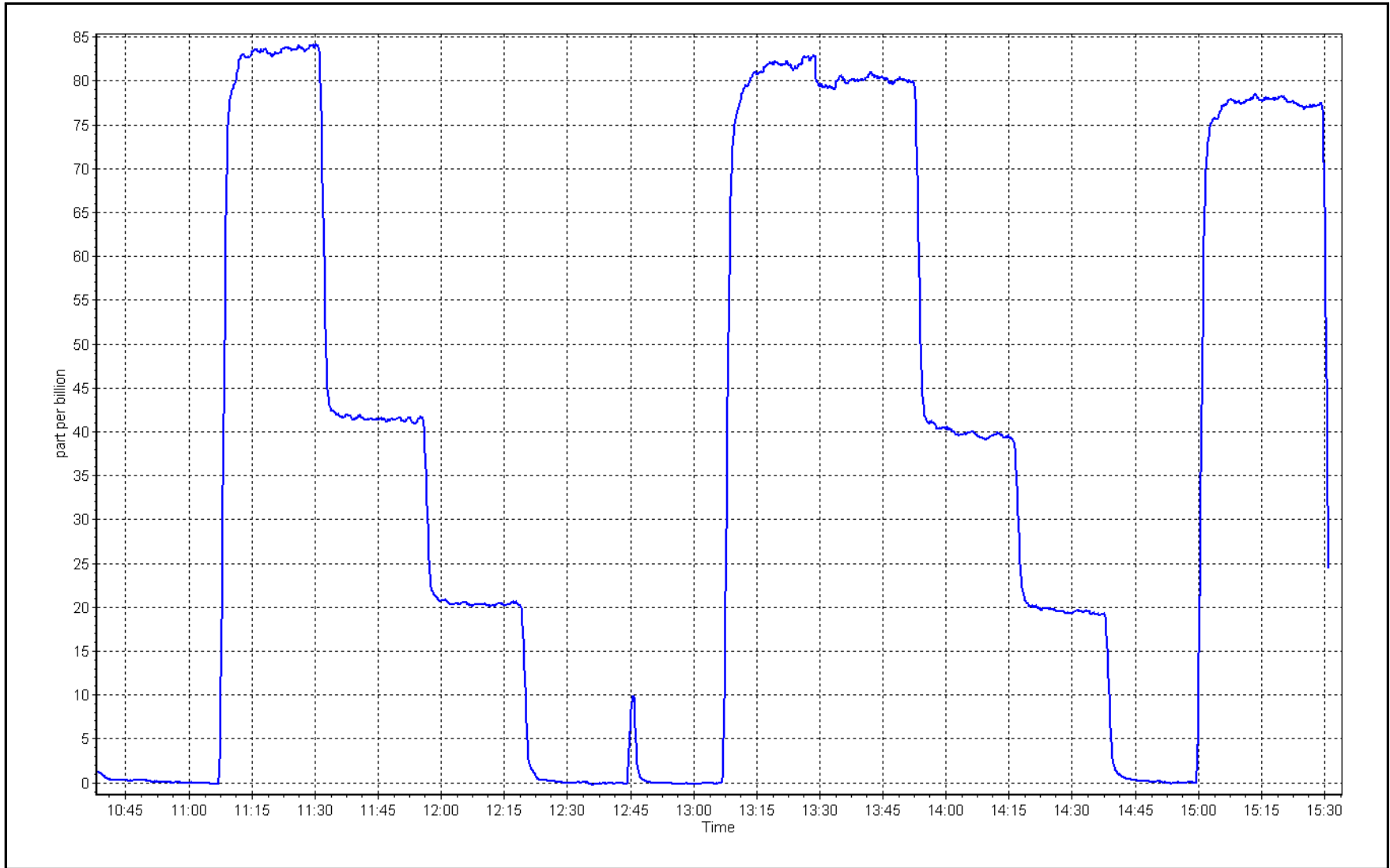
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999908	≥ 0.995
80.0	80.2	0.9969	Slope	1.004736	$0.90 - 1.10$
40.0	39.5	1.0116	Intercept	-0.345439	± 3
20.0	19.5	1.0262			



TRS Calibration Plot

Date: October 4, 2024

Location: Anzac





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	October 18, 2024	Last Cal Date:	September 21, 2024
Start time (MST):	13:03	End time (MST):	16:49
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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.10E-04	4.10E-04	NMHC SP Ratio:	4.51E-05	4.51E-05
CH4 Retention time:	14.40	14.40	NMHC Peak Area:	202367	202367
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.14	17.27	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.27	Prev response	17.14	*% change	0.7%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.21	0.996
Mid point	4960	40.1	8.57	8.55	1.003
Low point	4980	20.0	4.28	4.25	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.14	17.20	0.997
Average Correction Factor					1.002

Notes: Sample inlet filter and H2 cylinder changed after as founds. No adjustments needed.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	9.25	0.987
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.25	Prev response	9.13	*% change	1.3%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.23	0.990
Mid point	4960	40.1	4.57	4.58	0.998
Low point	4980	20.0	2.28	2.27	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.13	9.21	0.992
Average Correction Factor					0.997

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.01	8.02	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.02	Prev response	8.01	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	7.99	1.002
Mid point	4960	40.1	4.00	3.97	1.009
Low point	4980	20.0	2.00	1.98	1.011
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.01	7.99	1.002
Average Correction Factor					1.007

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001432	1.004551
THC Cal Offset:	-0.026827	-0.030216
CH ₄ Cal Slope:	1.001517	0.998221
CH ₄ Cal Offset:	-0.015051	-0.012257
NMHC Cal Slope:	1.001132	1.010564
NMHC Cal Offset:	-0.011376	-0.018558

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

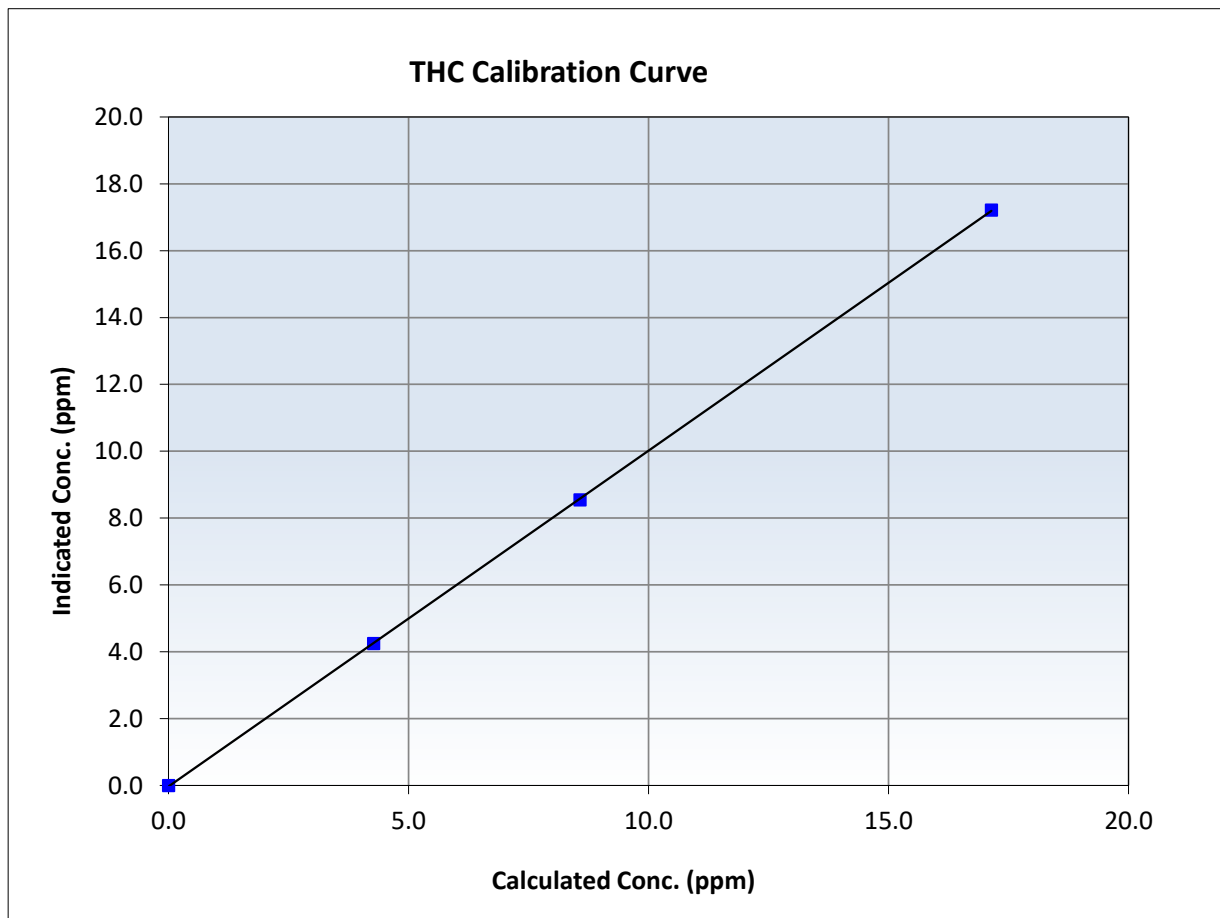
THC Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 21, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	13:03	End Time (MST):	16:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999982	<i>≥0.995</i>
17.14	17.21	0.9959	Slope	1.004551	<i>0.90 - 1.10</i>
8.57	8.55	1.0031	Intercept	-0.030216	<i>+/-0.5</i>
4.28	4.25	1.0064			





Wood Buffalo Environmental Association

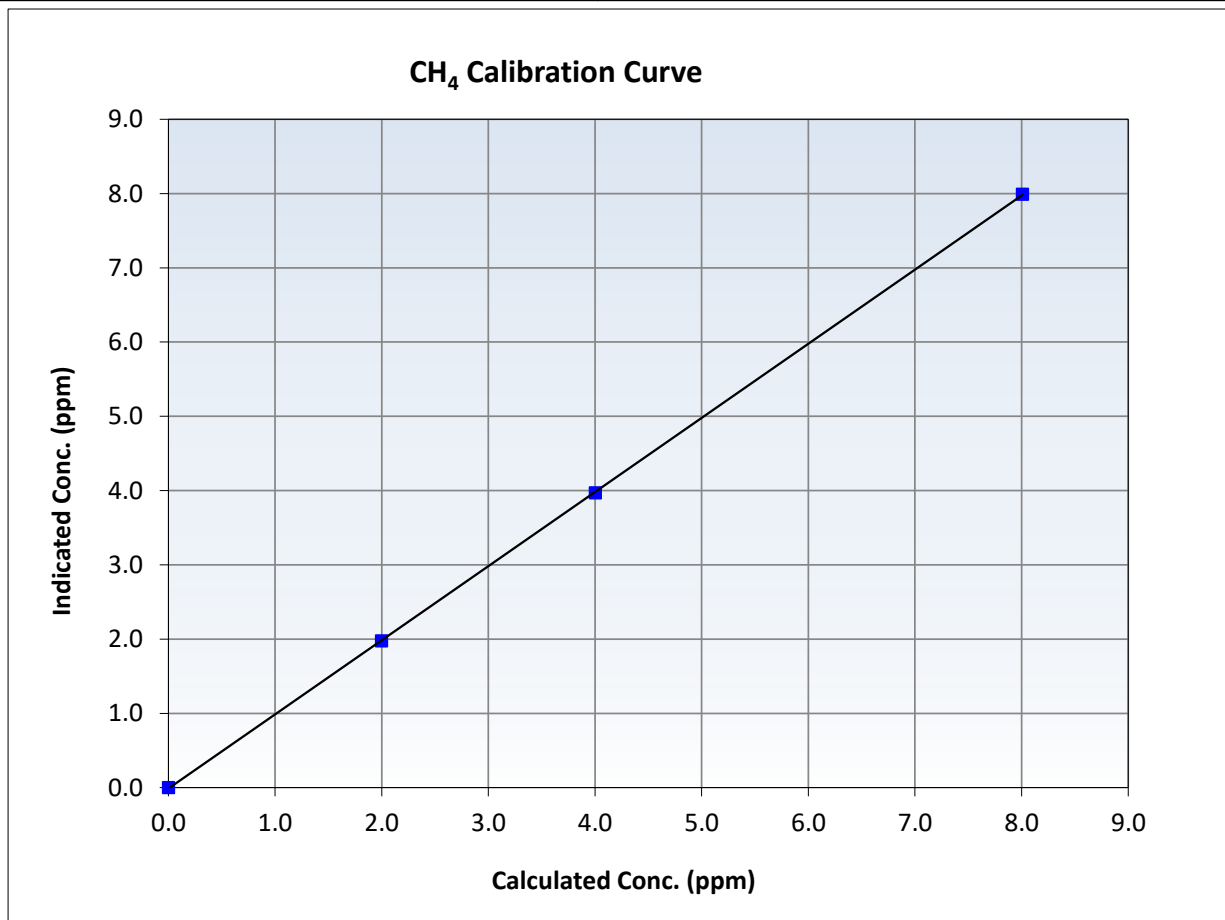
CH₄ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 21, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	13:03	End Time (MST):	16:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999986	≥0.995
8.01	7.99	1.0022	Slope	0.998221	0.90 - 1.10
4.00	3.97	1.0086	Intercept	-0.012257	+/-0.5
2.00	1.98	1.0112			





Wood Buffalo Environmental Association

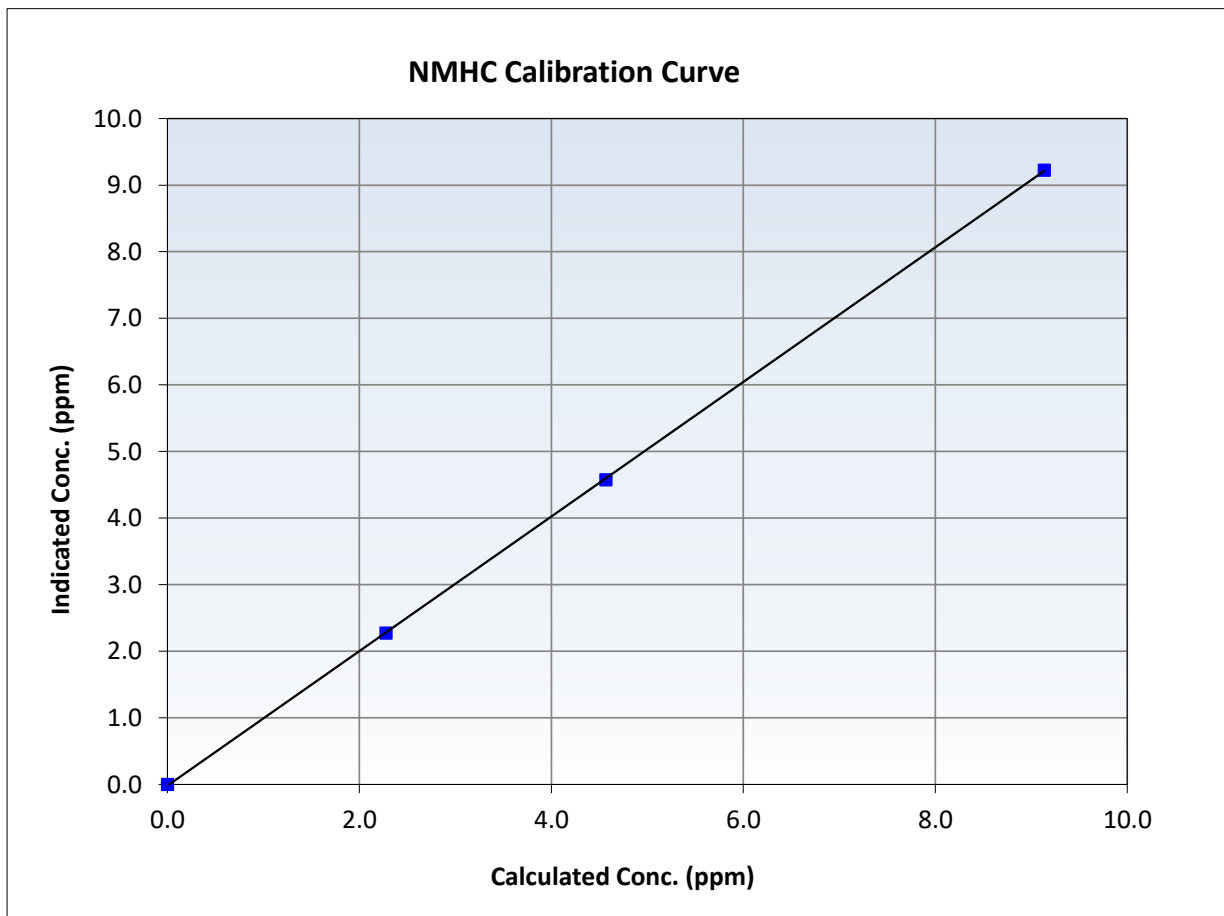
NMHC Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 21, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	13:03	End Time (MST):	16:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

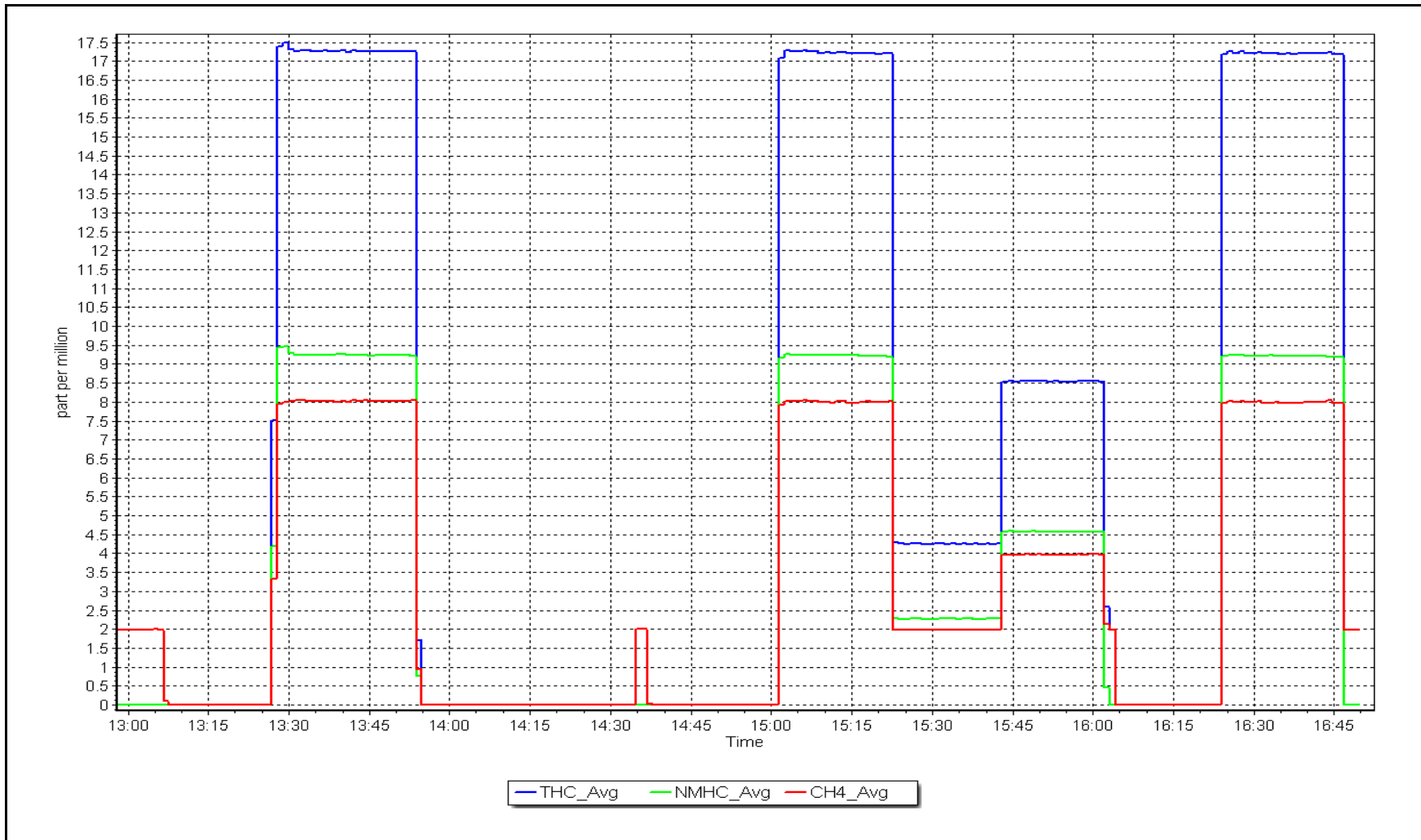
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999977	<i>≥0.995</i>
9.13	9.23	0.9901	Slope	1.010564	<i>0.90 - 1.10</i>
4.57	4.58	0.9981	Intercept	-0.018558	<i>+/-0.5</i>
2.28	2.27	1.0022			



NMHC Calibration Plot

Date: October 18, 2024

Location: Anzac





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	October 25, 2024	Last Cal Date:	October 18, 2024
Start time (MST):	9:46	End time (MST):	11:31
Reason:	Cylinder Change		

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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.10E-04	4.10E-04	NMHC SP Ratio:	4.51E-05	4.51E-05
CH4 Retention time:	14.40	14.40	NMHC Peak Area:	202367	202367
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.14	17.24	0.994
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.24	Prev response	17.19	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.21	0.996
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.996

Notes: Changed Nitrogen cylinder.



Wood Buffalo Environmental Association

THC / CH₄ / 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	9.24	0.989
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.24	Prev response	9.21	*% change	0.3%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.26	0.987
Mid point					
Low point					
As left zero					
As left span					

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.01	8.00	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.00	Prev response	7.98	*% 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	7.95	1.007
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 1.007

Calibration Statistics

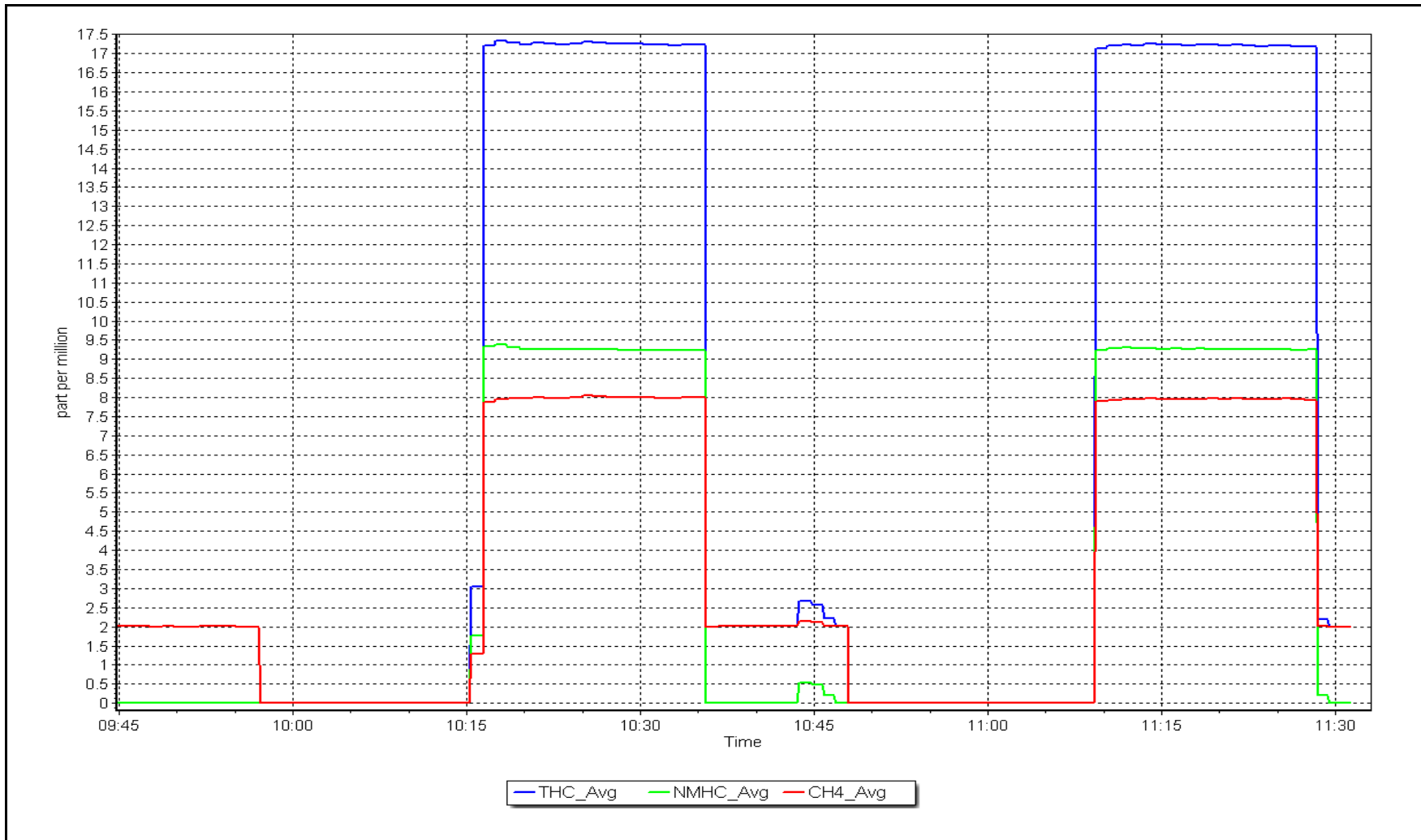
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.004551	NA
THC Cal Offset:	-0.030216	NA
CH ₄ Cal Slope:	0.998221	NA
CH ₄ Cal Offset:	-0.012257	NA
NMHC Cal Slope:	1.010564	NA
NMHC Cal Offset:	-0.018558	NA

Calibration Performed By: Mohammed Kashif

NMHC Calibration Plot

Date: October 25, 2024

Location: Anzac





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Anzac
 Station number: AMS 14
 Calibration Date: October 29, 2024
 Last Cal Date: September 12, 2024
 Start time (MST): 9:22
 End time (MST): 14:06
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: DT0037092
 NOX Cal Gas Conc: 60.7 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 60.70 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T700H
 Cal Gas Expiry Date: May 16, 2031
 NO Cal Gas Conc: 60.40 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 60.40 ppm
 NO gas Diff:
 Serial Number: 3060
 Serial Number: 357

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
AF High point	4934	66.3	804.8	800.9	4.0	806.9	801.5	5.4	0.9973	0.9991
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 806.3 ppb	NO = 803.2 ppb				<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 0.1%	
Baseline Corr 1st pt	NO _x = 807.0 ppb	NO = 801.6 ppb				<u>As Found Statistics</u>		*Percent Change	NO = -0.2%	
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb				As found NO _x r ² :		Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb				As found NO r ² :		NO SI:	NO Int:	
						As found NO ₂ r ² :		NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1152430008

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.002642	1.000426
NO _x Cal Offset:	-0.610820	-0.730542
NO Cal Slope:	1.005463	1.003525
NO Cal Offset:	-2.029391	-2.050413
NO ₂ Cal Slope:	0.994626	0.994540
NO ₂ Cal Offset:	-1.000823	-1.639659

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
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:	156.0	157.2

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
High point	4934	66.3	804.8	800.9	4.0	804.7	802.6	2.0	1.0002	0.9978
Mid point	4985	33.2	401.6	399.6	2.0	401.1	398.1	3.0	1.0012	1.0038
Low point	5004	16.7	201.9	200.9	1.0	200.1	197.4	2.7	1.0090	1.0178
As left zero	5000	0.0	0.0	0.0	0.0	0.2	0.0	0.1	----	----
As left span	4934	66.3	804.8	415.2	389.6	807.0	415.2	391.8	0.9973	1.0000
Average Correction Factor									1.0035	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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.1	----	----
High GPT point	800.7	419.2	385.5	382.7	1.0073	99.3%
Mid GPT point	800.7	602.5	202.2	198.5	1.0185	98.2%
Low GPT point	800.7	701.0	103.7	99.7	1.0399	96.2%
Average Correction Factor					1.0219	97.9%

Notes: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

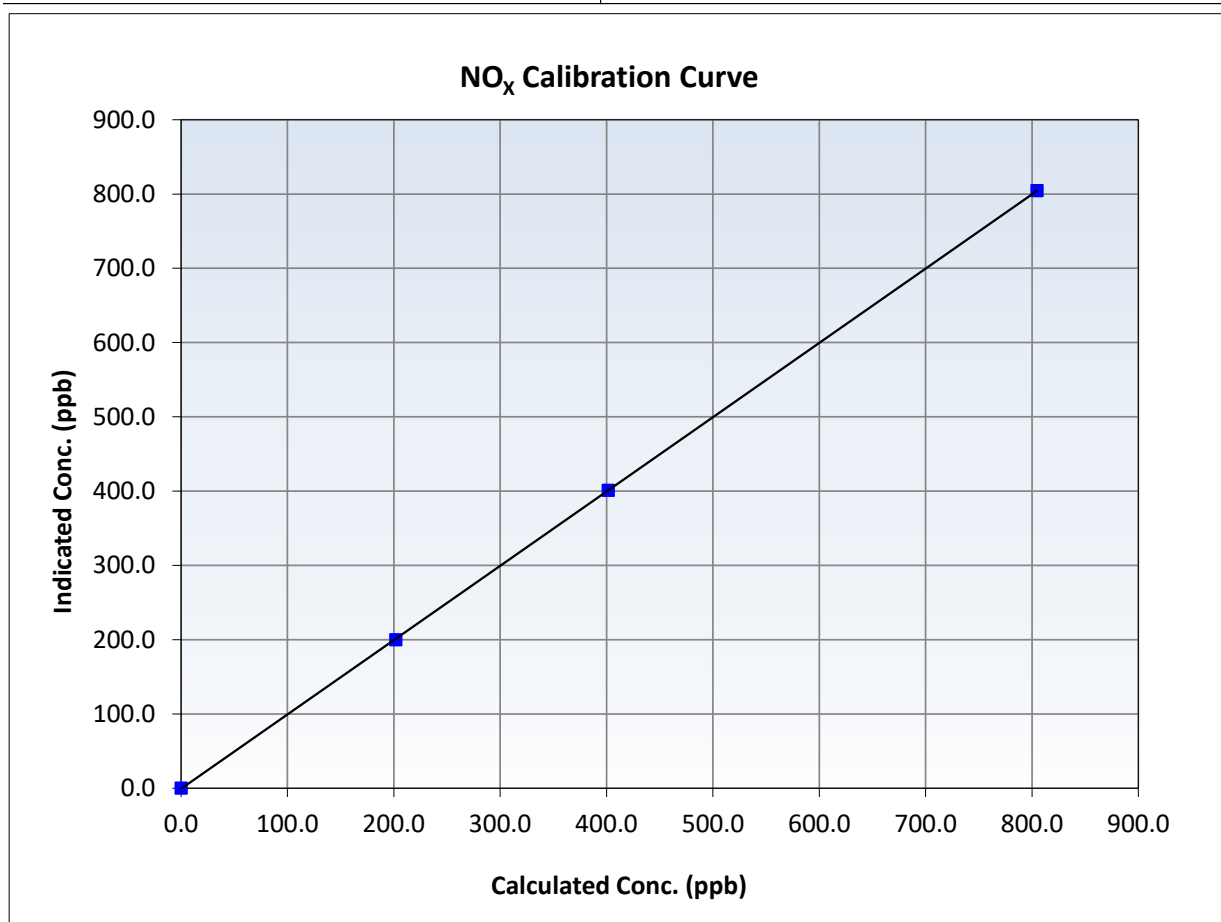
NO_x Calibration Summary

Station Information

Calibration Date:	October 29, 2024	Previous Calibration:	September 12, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:22	End Time (MST):	14:06
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999994	≥0.995
804.8	804.7	1.0002	Slope	1.000426	0.90 - 1.10
401.6	401.1	1.0012	Intercept	-0.730542	+/-20
201.9	200.1	1.0090			





Wood Buffalo Environmental Association

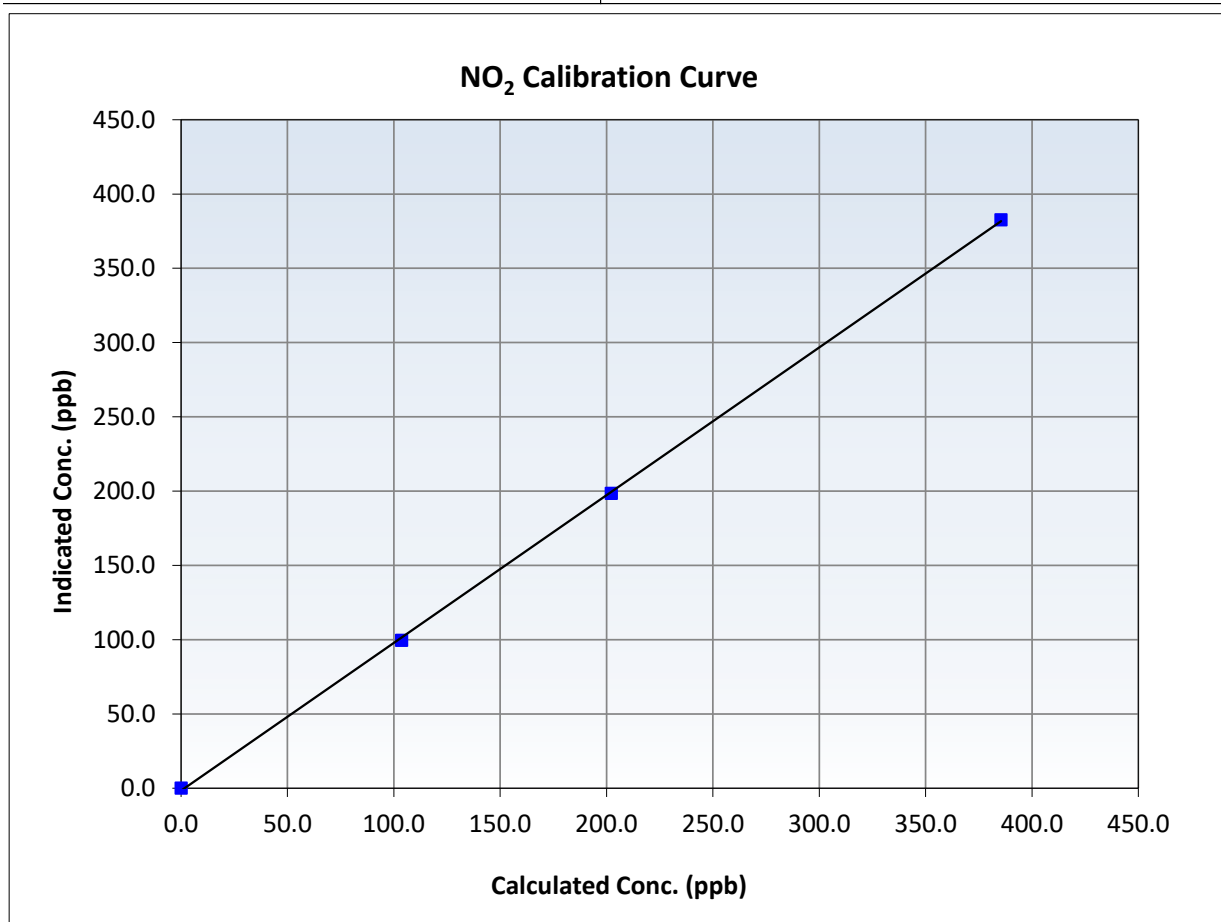
NO₂ Calibration Summary

Station Information

Calibration Date:	October 29, 2024	Previous Calibration:	September 12, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:22	End Time (MST):	14:06
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999900	≥0.995
385.5	382.7	1.0073	Slope	0.994540	0.90 - 1.10
202.2	198.5	1.0185	Intercept	-1.639659	+/-20
103.7	99.7	1.0399			





Wood Buffalo Environmental Association

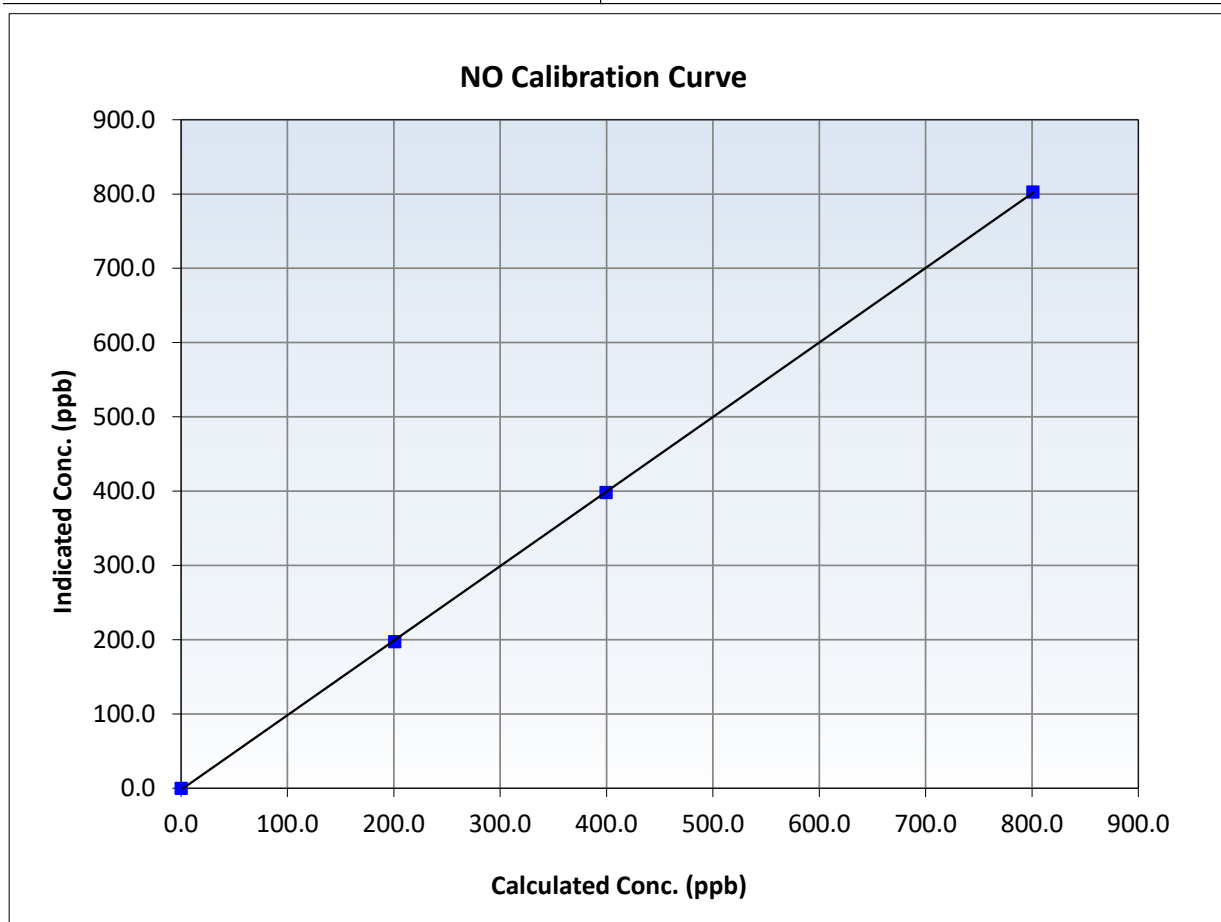
NO Calibration Summary

Station Information

Calibration Date:	October 29, 2024	Previous Calibration:	September 12, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:22	End Time (MST):	14:06
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

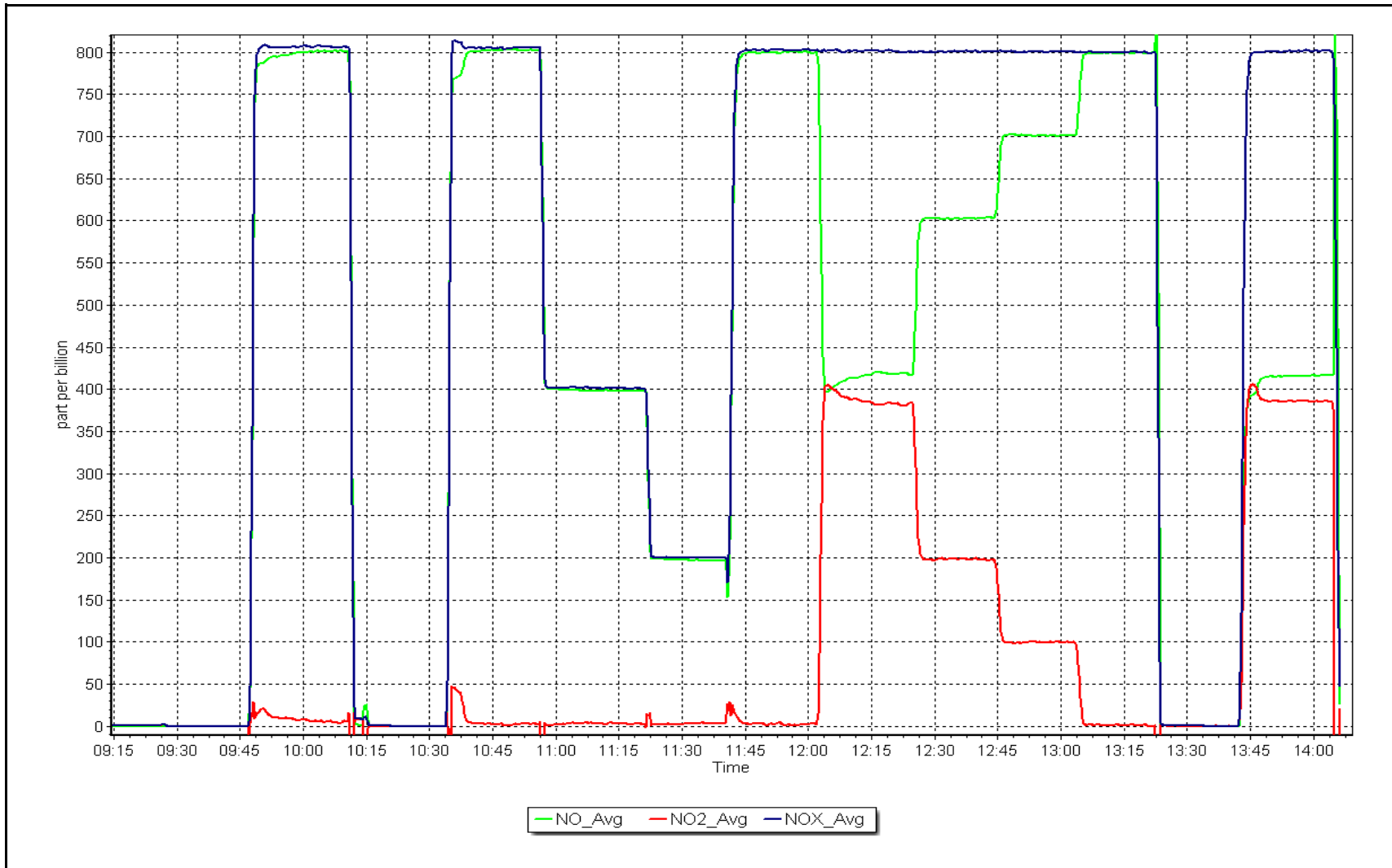
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999970	≥0.995
800.9	802.6	0.9978	Slope	1.003525	0.90 - 1.10
399.6	398.1	1.0038	Intercept	-2.050413	+/-20
200.9	197.4	1.0178			



NO_x Calibration Plot

Date: October 29, 2024

Location: Anzac





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	October 17, 2024	Last Cal Date:	September 16, 2024
Start time (MST):	9:43	End time (MST):	13:17
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	3060
Calibrator Make/Model:	API T700	Serial Number:	357
ZAG Make/Model:	API 701H		

Analyzer Information

Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.995829	1.009543	Backgd or Offset:	2.0	2.0
Calibration intercept:	0.980000	-1.120000	Coeff or Slope:	1.667	1.667

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.6	----
As found High point	5000	918.8	400.0	398.6	1.005
As found Mid point	5000	803.8	200.0	198.1	1.013
As found Low point	5000	709.8	100.0	98.0	1.027
Baseline Corr As found:	398.0	Previous response	399.3	*% change	-0.3%
Baseline Corr 2nd AF pt:	197.5	AF Slope:	0.996371	AF Intercept:	-0.540000
Baseline Corr 3rd AF pt:	97.4	AF Correlation:	0.999963	<i>* = > +/-5% change initiates investigation</i>	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.7	----
High point	5000	918.8	400.0	403.0	0.993
Mid point	5000	803.8	200.0	200.3	0.999
Low point	5000	709.8	100.0	99.6	1.004
As left zero	5000	0.0	0.0	-0.7	----
As left span	5000	918.8	400.0	405.8	0.986
Average Correction Factor					0.998

Notes: Sample inlet filter changed after multipoint asfound. Pump changed out. No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

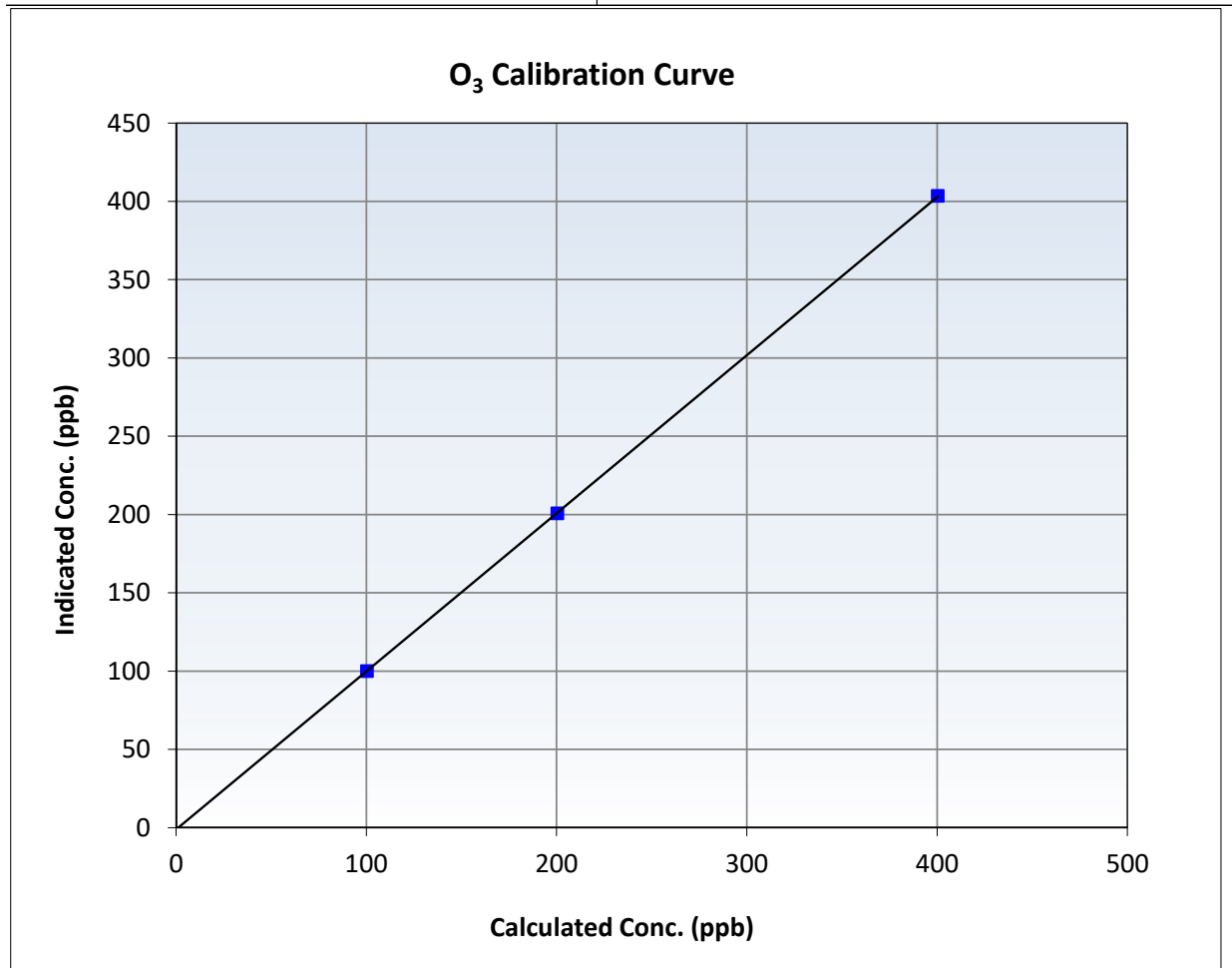
O₃ Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 16, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:43	End Time (MST):	13:17
Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595

Calibration Data

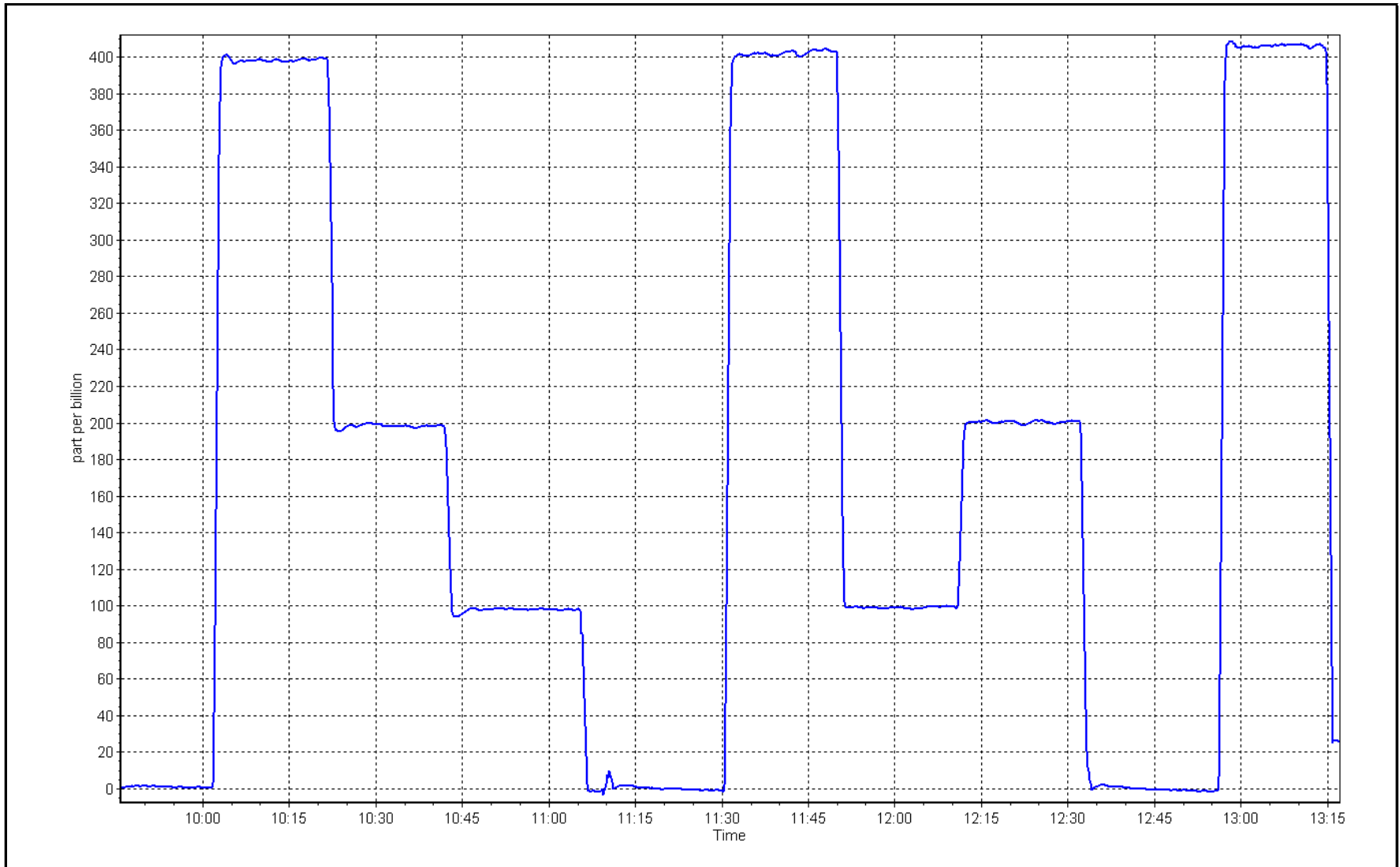
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.7	----	Correlation Coefficient	0.999994	≥0.995
400.0	403.0	0.9926	Slope	1.009543	0.90 - 1.10
200.0	200.3	0.9985	Intercept	-1.120000	+/- 5
100.0	99.6	1.0040			



O₃ Calibration Plot

Date: October 17, 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: October 29, 2024 Last Cal Date: September 23, 2024
 Start time (MST): 13:47 End time (MST): 13:58

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 (°C)	-1	-1.54	-1	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	713.1	714.11	713.1	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.02	5.005	5.02	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	38	-----	38	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	2.1	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: _____ Expiry Date: _____
 Lot No.: _____

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test				<input type="checkbox"/>	+/- 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
OCTOBER 2024**

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	October 7, 2024	Last Cal Date:	September 5, 2024
Start time (MST):	10:15	End time (MST):	13:00
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003569	0.997840	Backgd or Offset:	13.4	13.4
Calibration intercept:	-1.579875	-1.600285	Coeff or Slope:	1.109	1.109

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	----
As found High point	4921	79.4	800.0	796.7	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.5	Previous response	801.2	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4921	79.4	800.0	797.8	1.003
Mid point	4960	39.7	400.0	396.0	1.010
Low point	4980	19.8	199.5	196.0	1.018
As left zero	5000	0.0	0.0	0.5	----
As left span	4920	79.4	800.1	797.0	1.004
Average Correction Factor:					1.010

Notes: No adjustments performed.

Calibration Performed By: Kelly Baragar



Wood Buffalo Environmental Association

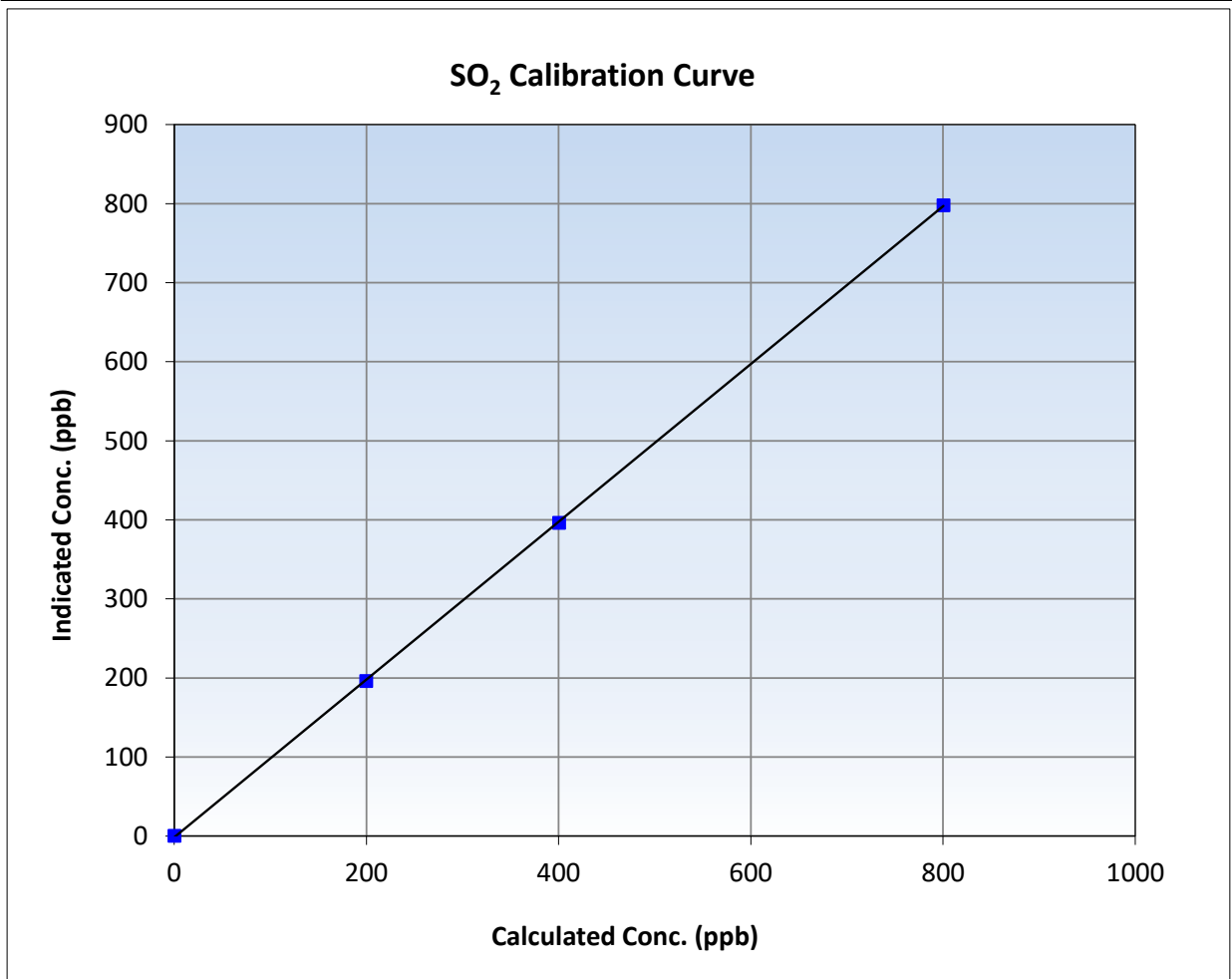
SO₂ Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 5, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	10:15	End Time (MST):	13:00
Analyzer make:	Thermo 43i	Analyzer serial #:	1218153459

Calibration Data

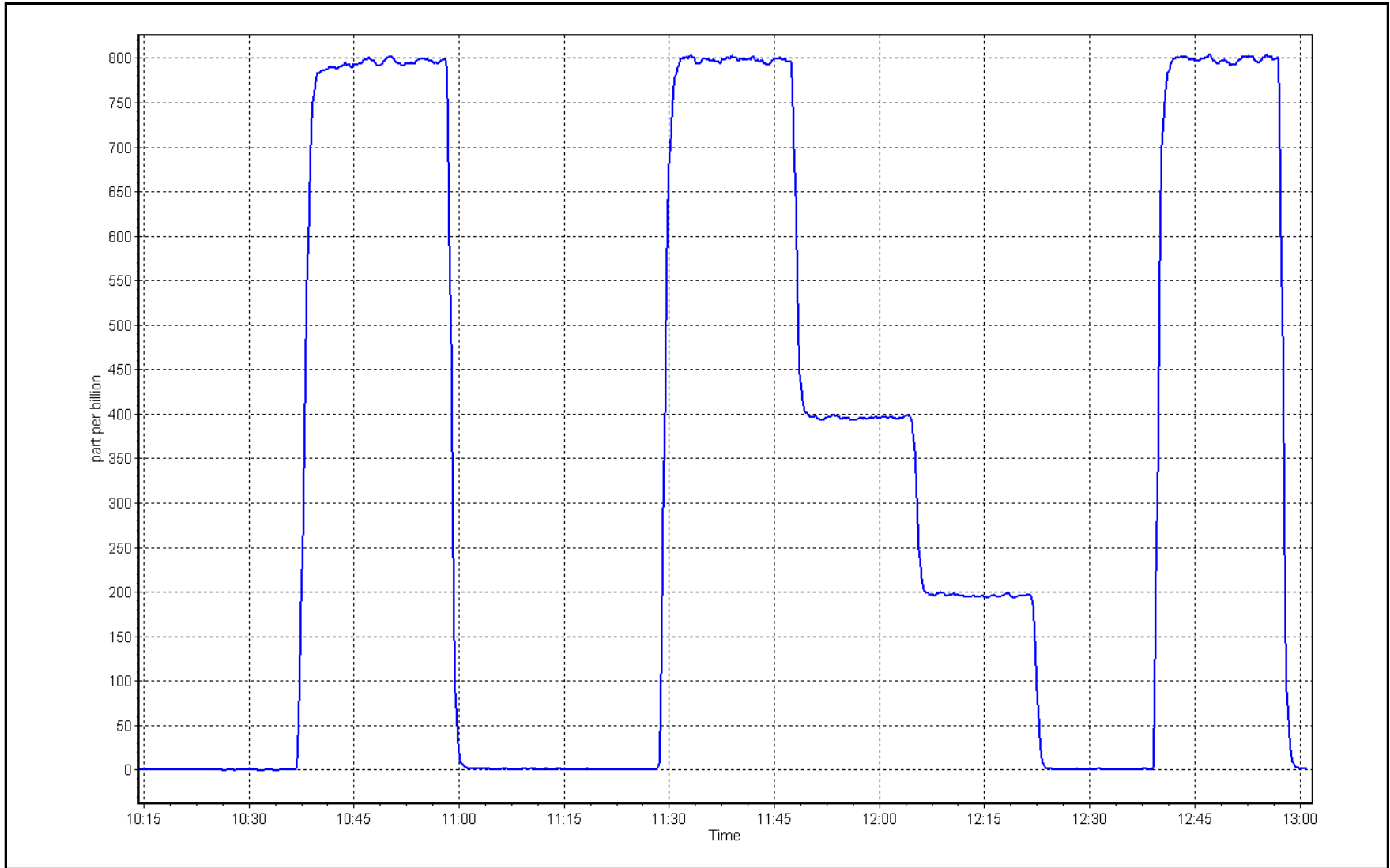
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.3	----	Correlation Coefficient	0.999972	≥0.995
800.0	797.8	1.0027	Slope	0.997840	0.90 - 1.10
400.0	396.0	1.0102	Intercept	-1.600285	+/-30
199.5	196.0	1.0179			



SO2 Calibration Plot

Date: October 7, 2024

Location: Wapasu





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	October 9, 2024	Last Cal Date:	September 12, 2024
Start time (MST):	9:20	End time (MST):	13:30
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.08	ppm	Cal Gas Exp Date:	September 16, 2024
Cal Gas Cylinder #:	CC511852			
Removed Cal Gas Conc:	5.08	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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002283	1.001854	Backgd or Offset:	13.2	13.3
Calibration intercept:	-0.479222	-0.339218	Coeff or Slope:	1.116	1.116

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4921	78.8	80.0	82.6	0.966
As found Mid point	4961	39.4	40.0	40.9	0.973
As found Low point	4980	19.7	20.0	20.1	0.985
New cylinder response					
Baseline Corr As found:	82.8	Prev response:	79.70	*% change:	3.7%
Baseline Corr 2nd AF pt:	41.1	AF Slope:	1.036282	AF Intercept:	-0.419176
Baseline Corr 3rd AF pt:	20.3	AF Correlation:	0.999968	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4921	78.8	80.0	80.1	0.999
Mid point	4961	39.4	40.0	39.3	1.018
Low point	4980	19.7	20.0	19.4	1.031
As left zero	5000	0.0	0.0	0.2	----
As left span	4921	78.8	80.0	77.1	1.038
SO2 Scrubber Check	4921	79.4	793.9	-0.1	----
Date of last scrubber change:		N/A		Ave Corr Factor	1.016
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 needed.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

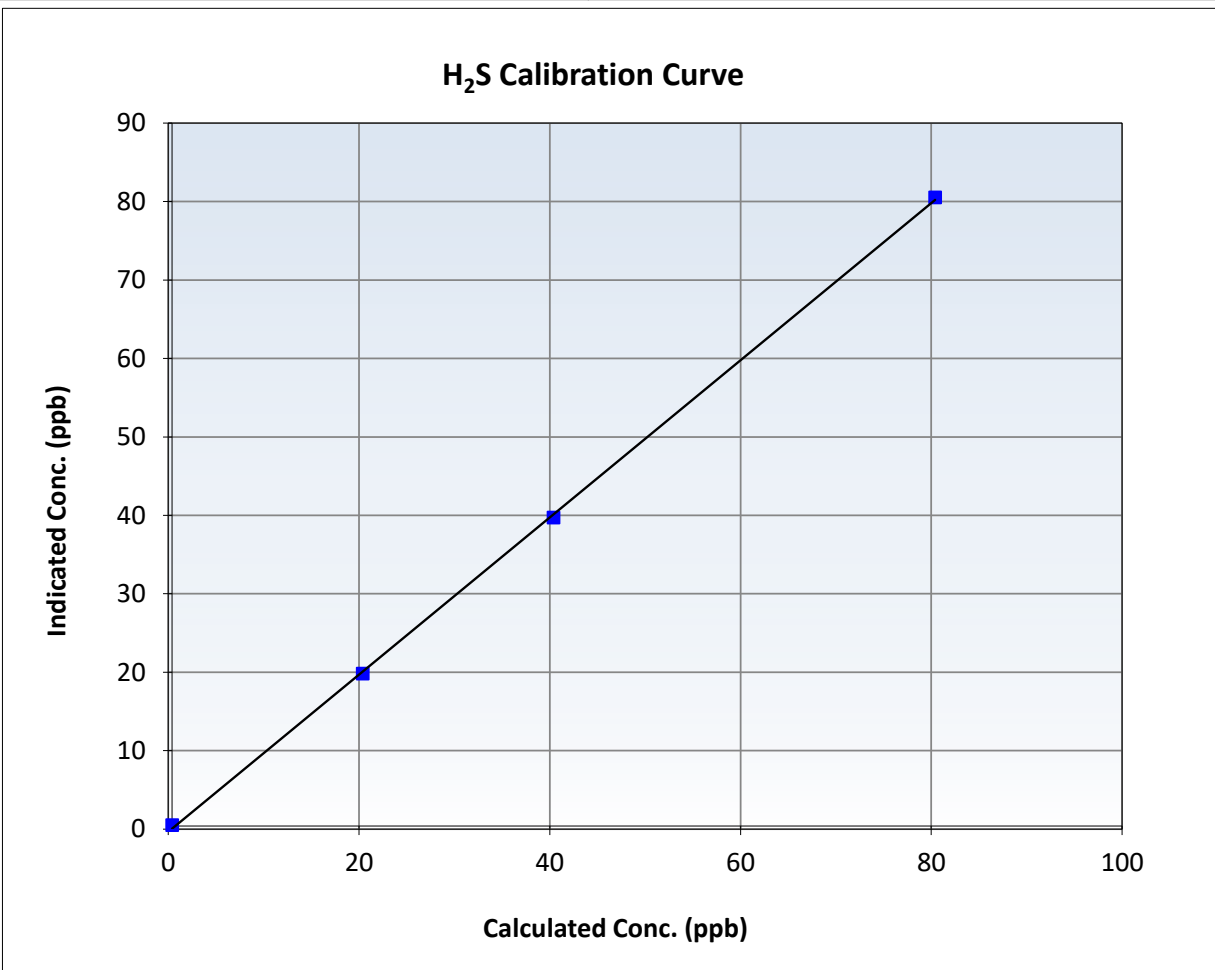
H₂S Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 12, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	9:20	End Time (MST):	13:30
Analyzer make:	Thermo 450i	Analyzer serial #:	1218153583

Calibration Data

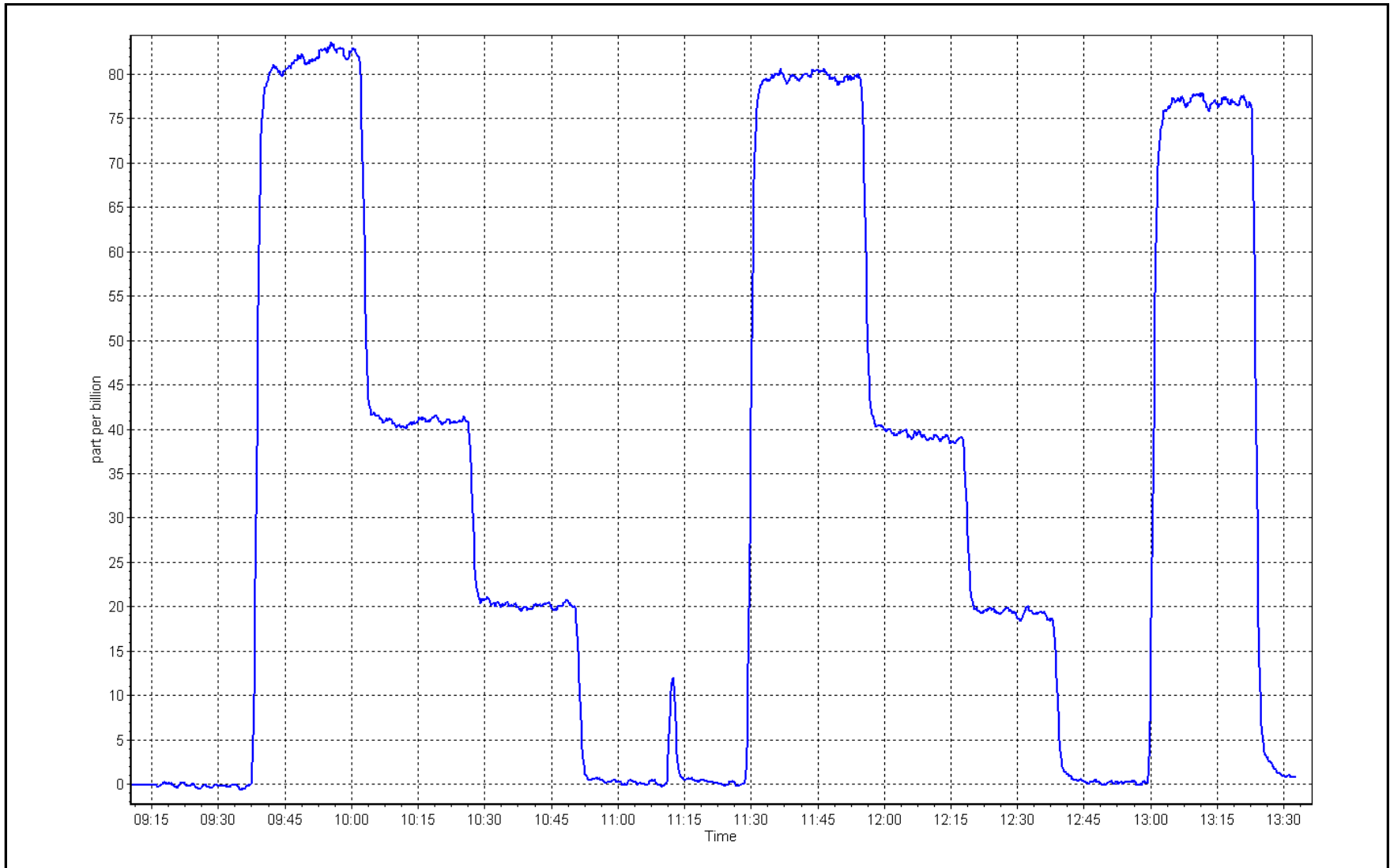
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999843	≥0.995
80.0	80.1	0.9988	Slope	1.001854	0.90 - 1.10
40.0	39.3	1.0177	Intercept	-0.339218	+/-3
20.0	19.4	1.0310			



H₂S Calibration Plot

Date: October 9, 2024

Location: Wapasu





Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	October 7, 2024	Last Cal Date:	September 5, 2024
Start time (MST):	10:15	End time (MST):	13:00
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.988287	1.004239	Background:	3.280	3.320
Calibration intercept:	0.045400	-0.142343	Coefficient:	4.444	4.505

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))
As found zero	5000	0.0	0.00	0.01	----
As found High point	4921	79.4	17.09	16.94	1.009
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	16.93	Previous response	16.94	*% 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)
Calibrator zero	5000	0.0	0.00	-0.05	----
High point	4921	79.4	17.09	17.09	1.000
Mid point	4960	39.7	8.55	8.33	1.026
Low point	4980	19.8	4.26	4.08	1.044
As left zero	5000	0.0	0.00	-0.17	----
As left span	4921	79.4	17.09	17.01	1.005
Average Correction Factor					1.023

Notes: Replaced H2 support gas following as found points. Span adjustment performed.

Calibration Performed By: Kelly Baragar



Wood Buffalo Environmental Association

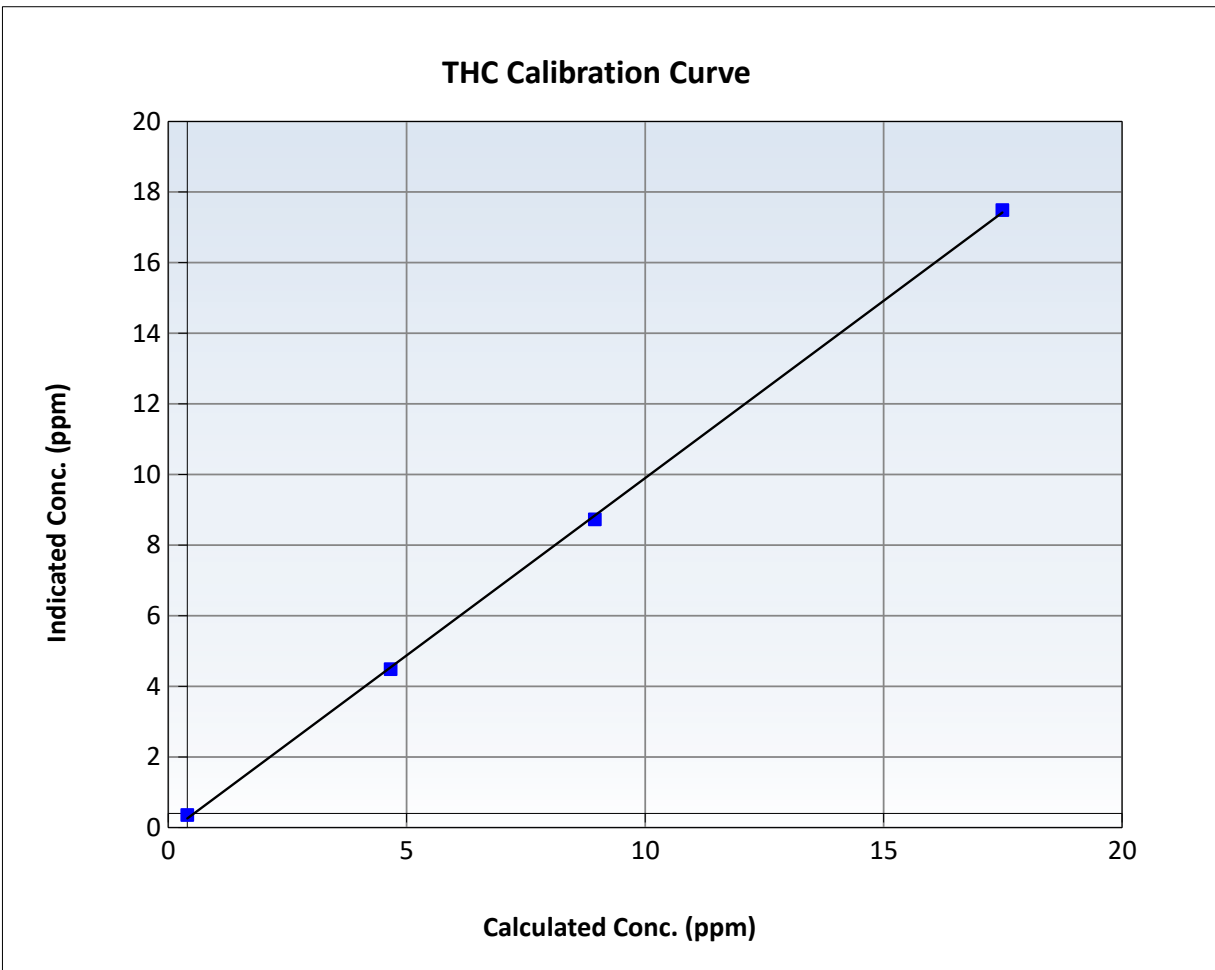
THC Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 5, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	10:15	End Time (MST):	13:00
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1218153352

Calibration Data

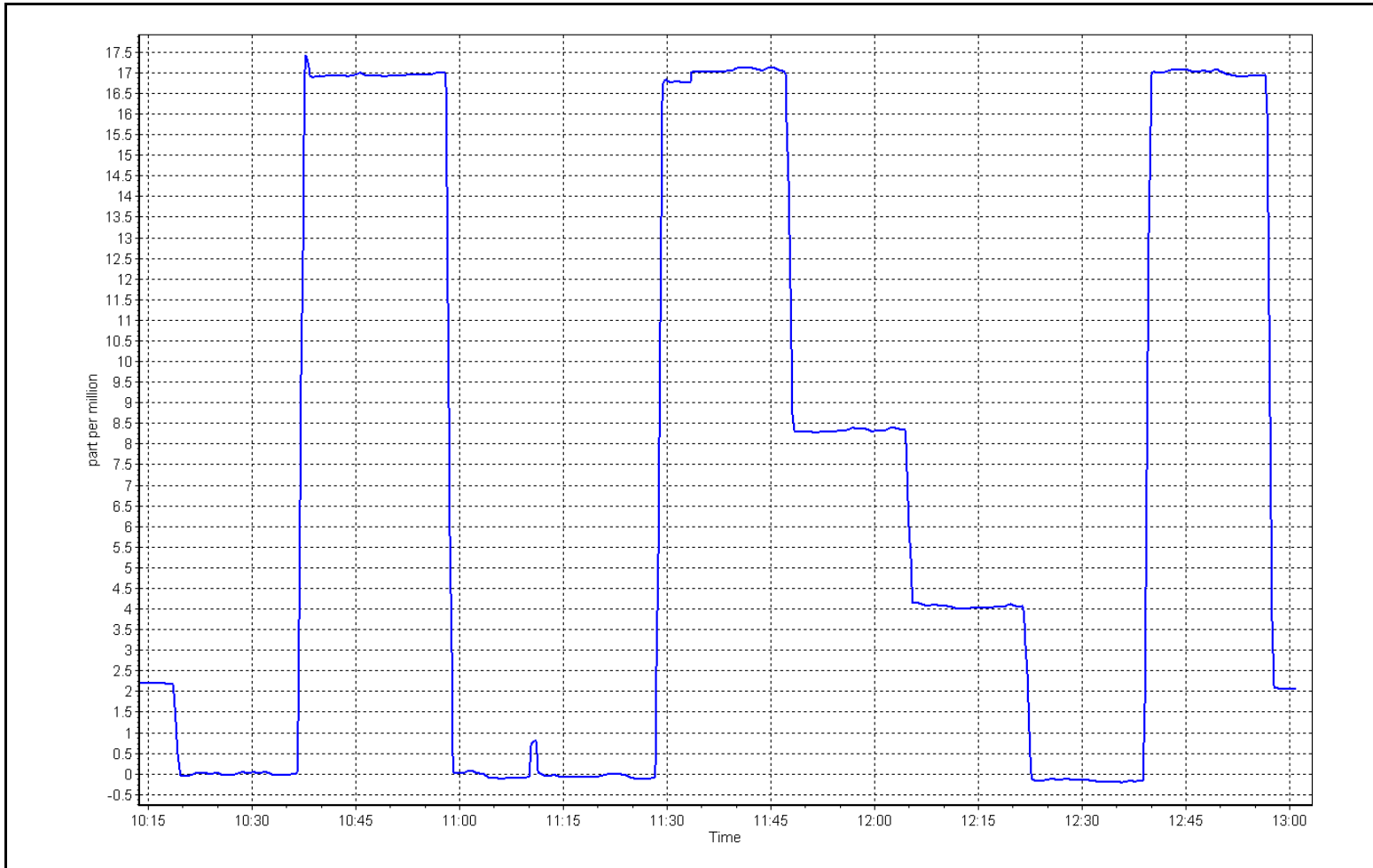
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	-0.05	----	Correlation Coefficient	0.999816	≥0.995
17.09	17.09	1.0000	Slope	1.004239	0.90 - 1.10
8.55	8.33	1.0260	Intercept	-0.142343	+/-1.5
4.26	4.08	1.0442			



THC Calibration Plot

Date: October 7, 2024

Location: Wapasu





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Wapasu
 Station number: AMS 17
 Calibration Date: October 18, 2024
 Last Cal Date: September 16, 2024
 Start time (MST): 10:15
 End time (MST): 14:38
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: T375YK8
 NOX Cal Gas Conc: 49.11 ppm
 Removed Cylinder #: N/A
 Removed Gas NOX Conc: 49.11 ppm
 NOX gas Diff:
 Calibrator Model: API T700
 ZAG make/model: API T701H
 Cal Gas Expiry Date: April 13, 2025
 NO Cal Gas Conc: 48.07 ppm
 Removed Gas Exp Date: N/A
 Removed Gas NO Conc: 48.07 ppm
 NO gas Diff:
 Serial Number: 2449
 Serial Number: 359

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.2	-0.4	----	----
AF High point	4917	83.2	817.2	799.9	17.3	819.2	800.4	18.7	0.9968	0.9991
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 816.5 ppb		NO = 797.6 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 0.4%	
Baseline Corr 1st pt	NO _x = 819.8 ppb		NO = 800.6 ppb			<u>As Found Statistics</u>		*Percent Change	NO = 0.4%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo Scientific 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1218153460

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.000361	1.001788
NO _x Cal Offset:	-1.000000	-1.160000
NO Cal Slope:	0.999072	1.001130
NO Cal Offset:	-1.500000	-1.720000
NO ₂ Cal Slope:	0.999691	1.002543
NO ₂ Cal Offset:	-0.046296	0.175219

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.094	1.094	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:	240.3	241.5

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	----	----
High point	4917	83.2	817.2	799.9	17.3	818.0	800.0	18.1	0.9990	0.9999
Mid point	4958	41.6	408.6	399.9	8.7	407.5	397.6	9.9	1.0027	1.0059
Low point	4979	20.8	204.3	200.0	4.3	202.8	196.9	6.0	1.0074	1.0156
As left zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.1	-0.3	----	----
As left span	4917	83.2	817.2	401.2	416.0	819.1	401.2	417.9	0.9977	1.0000
Average Correction Factor									1.0030	1.0071

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	798.2	400.7	414.8	415.6	0.9981	100.2%
Mid GPT point	798.2	602.4	213.1	214.6	0.9930	100.7%
Low GPT point	798.2	703.1	112.4	113.0	0.9947	100.5%
Average Correction Factor					0.9953	100.5%

Notes: Sample inlet filter changed after as founds. No adjustment needed.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

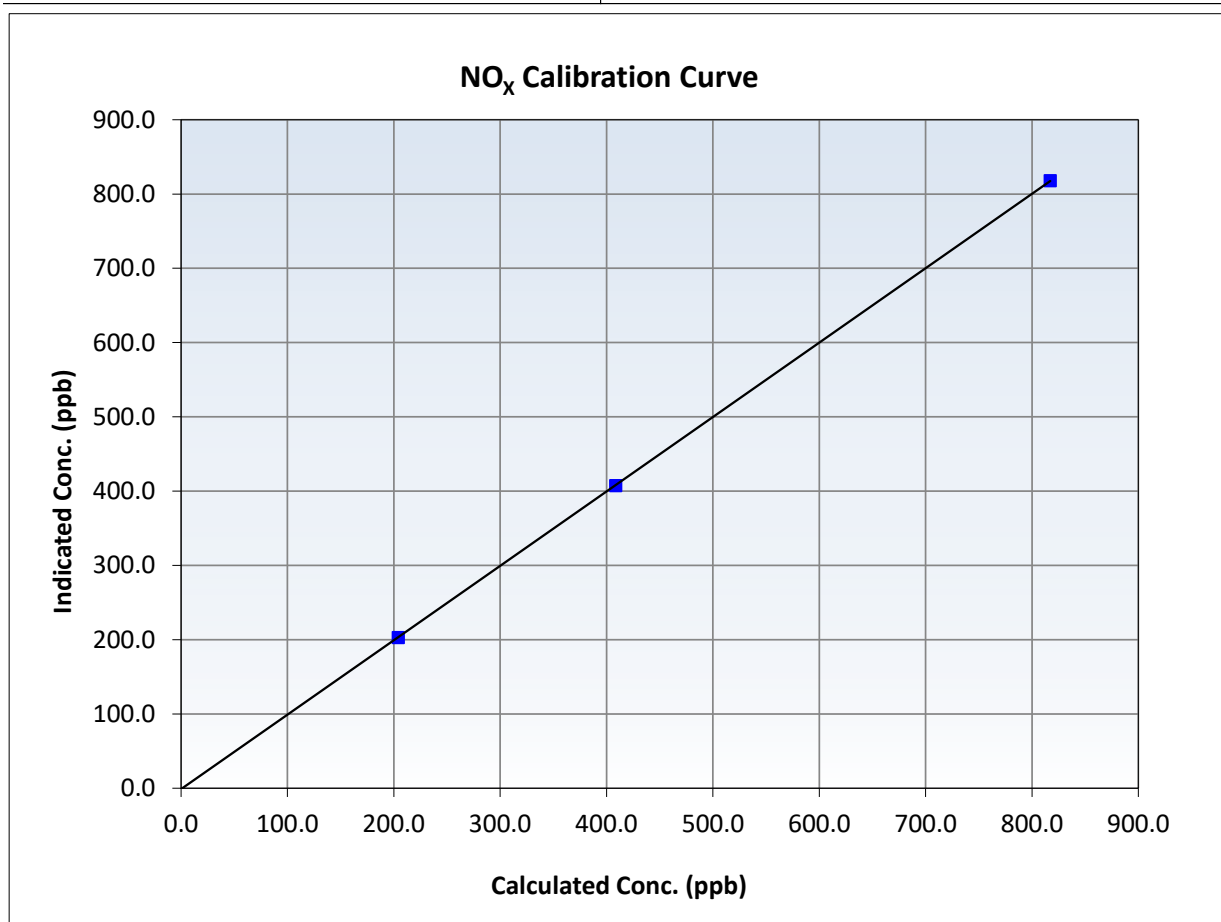
NO_x Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 16, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:15	End Time (MST):	14:38
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999995	≥0.995
817.2	818.0	0.9990	Slope	1.001788	0.90 - 1.10
408.6	407.5	1.0027	Intercept	-1.160000	+/-20
204.3	202.8	1.0074			





Wood Buffalo Environmental Association

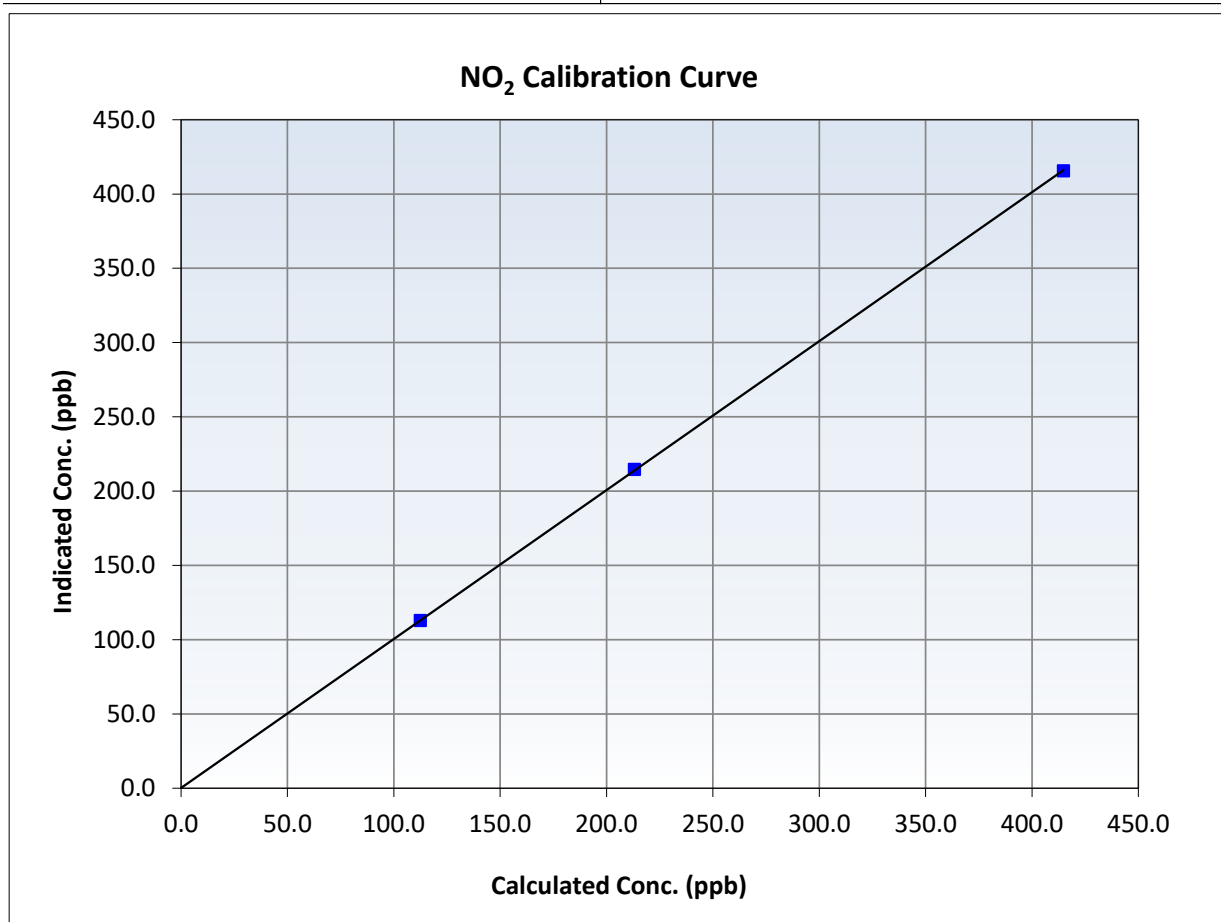
NO₂ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 16, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:15	End Time (MST):	14:38
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999989	≥0.995
414.8	415.6	0.9981	Slope	1.002543	0.90 - 1.10
213.1	214.6	0.9930	Intercept	0.175219	+/-20
112.4	113.0	0.9947			





Wood Buffalo Environmental Association

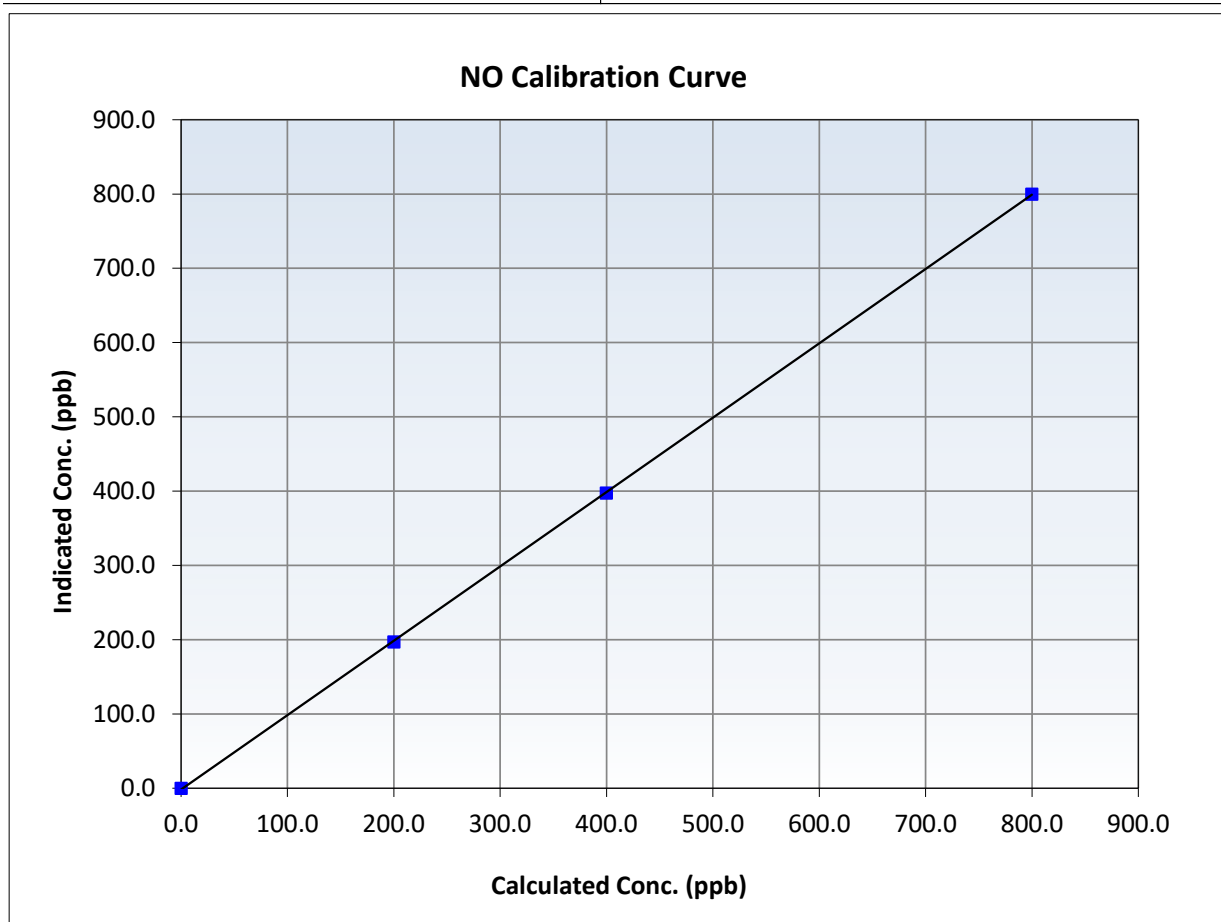
NO Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 16, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:15	End Time (MST):	14:38
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

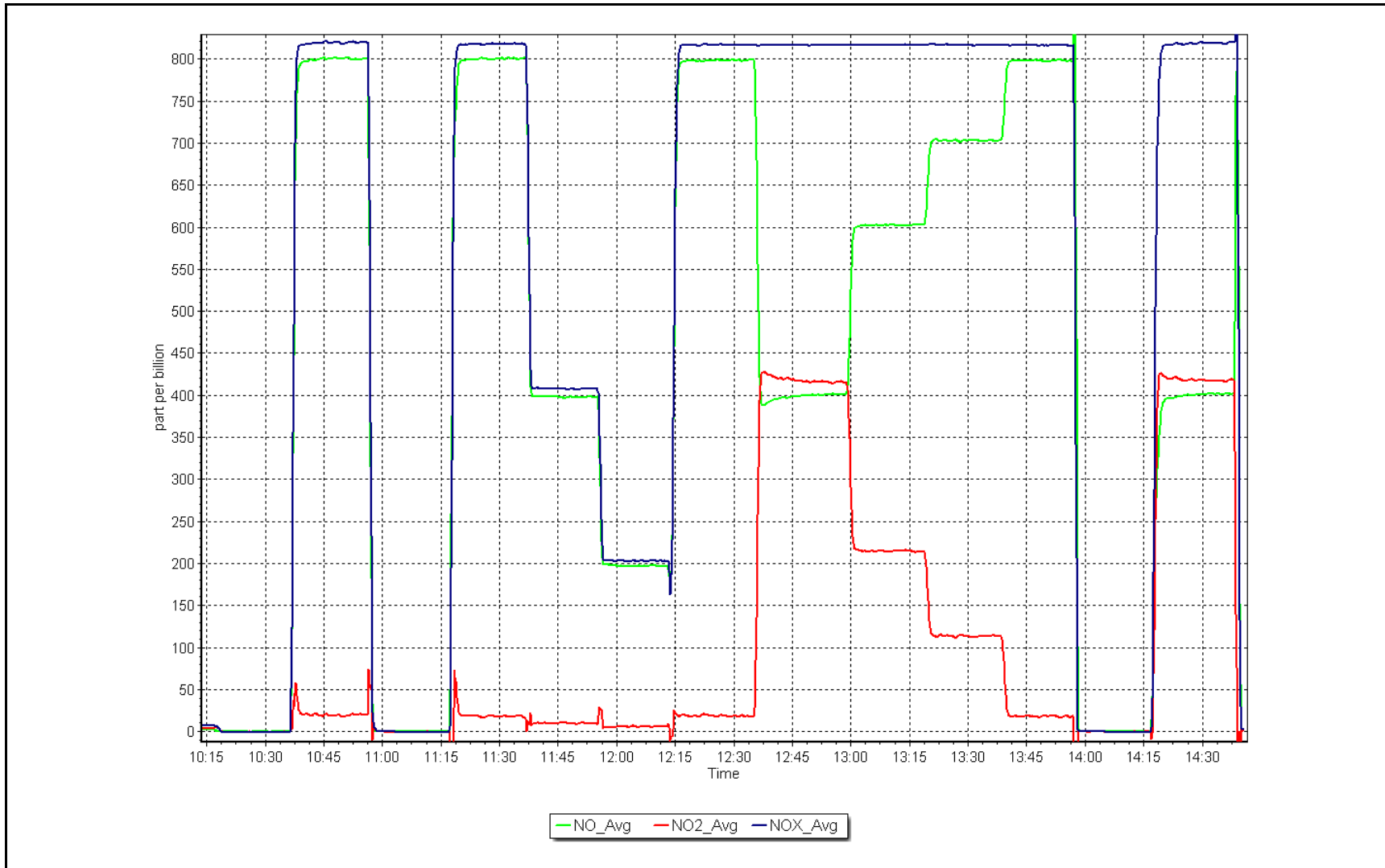
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999979	≥0.995
799.9	800.0	0.9999	Slope	1.001130	0.90 - 1.10
399.9	397.6	1.0059	Intercept	-1.720000	+/-20
200.0	196.9	1.0156			



NO_x Calibration Plot

Date: October 18, 2024

Location: Wapasu





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	October 15, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	10:05	End time (MST):	13:45
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	2449
Calibrator Make/Model:	API T700	Serial Number:	359
ZAG Make/Model:	API T701H		

Analyzer Information

Analyzer make:	API T400	Analyzer serial #:	7045
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002200	1.001229	Backgd or Offset:	-0.8	0.6
Calibration intercept:	0.740000	-0.540000	Coeff or Slope:	1.015	1.018

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.2	----
As found High point	5000	1104.7	400.0	400.7	0.998
As found Mid point					
As found Low point					
Baseline Corr As found:	400.9	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	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.5	----
High point	5000	1104.7	400.0	400.4	0.999
Mid point	5000	917.3	200.0	199.4	1.003
Low point	5000	797.9	100.0	98.4	1.016
As left zero	5000	0.0	0.0	-0.2	----
As left span	5000	1104.0	400.0	405.1	0.987
Average Correction Factor					1.006

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

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

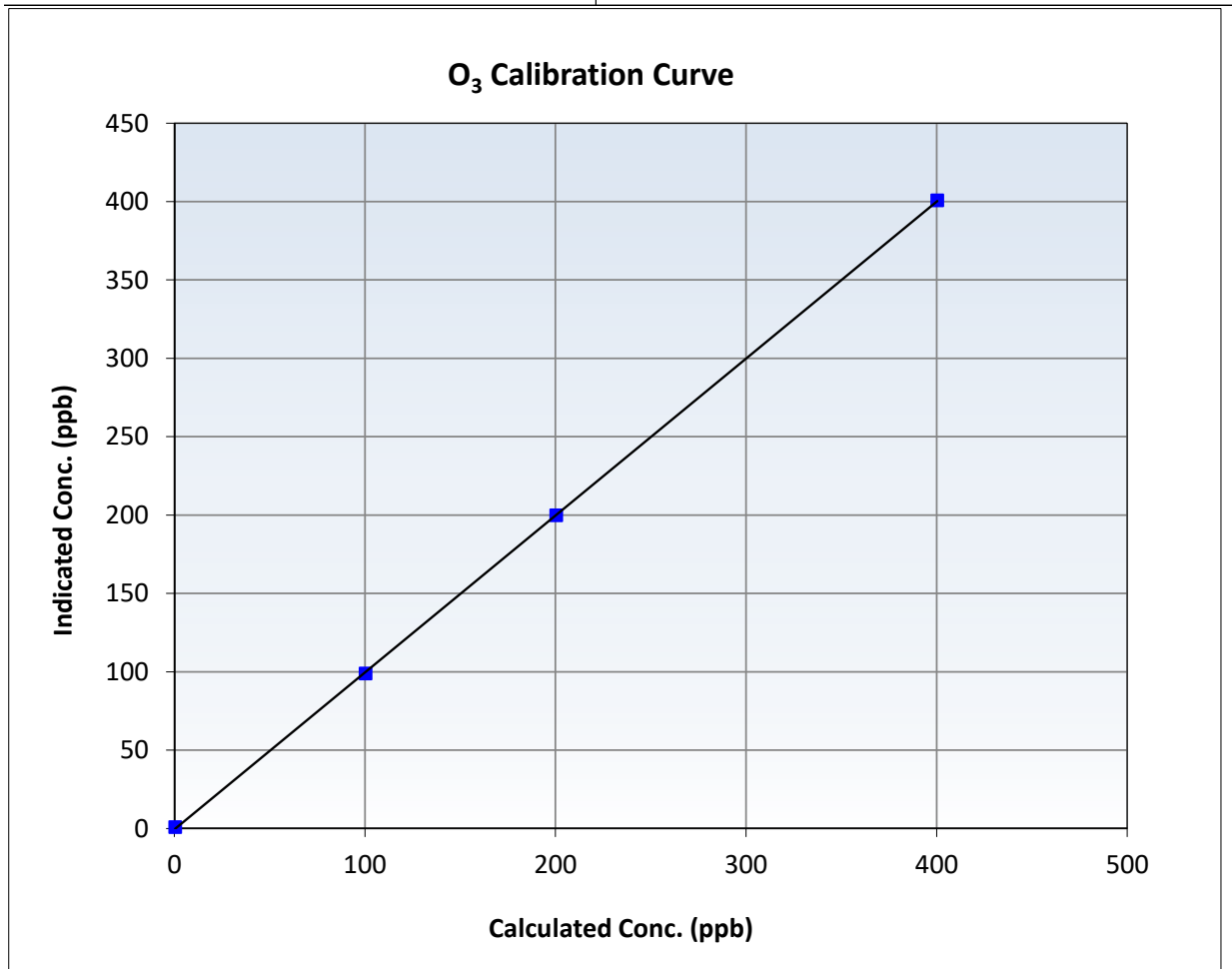
O₃ Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 11, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	10:05	End Time (MST):	13:45
Analyzer make:	API T400	Analyzer serial #:	7045

Calibration Data

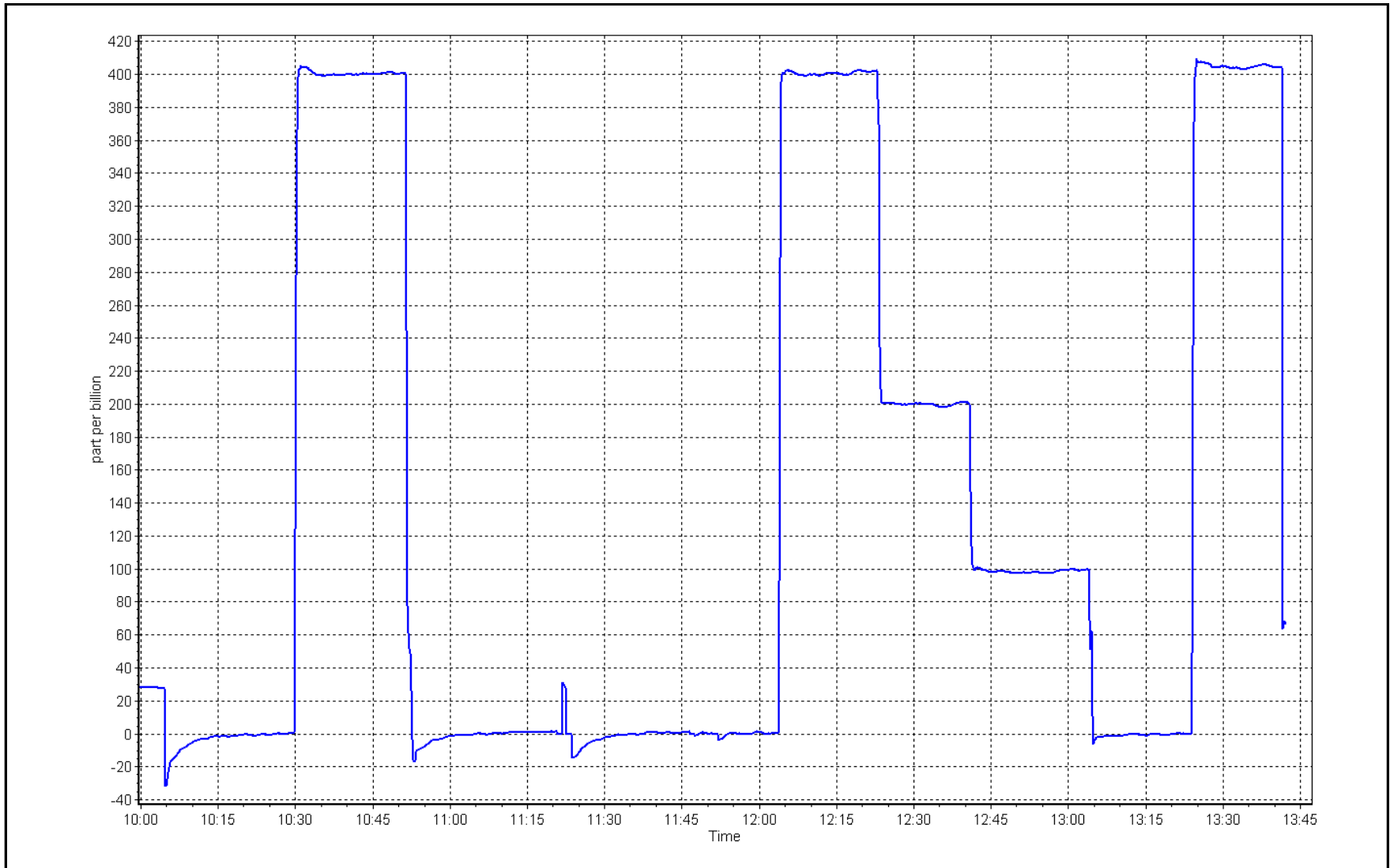
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.5	----	Correlation Coefficient	0.999968	≥0.995
400.0	400.4	0.9990	Slope	1.001229	0.90 - 1.10
200.0	199.4	1.0030	Intercept	-0.540000	+/- 5
100.0	98.4	1.0163			



O₃ Calibration Plot

Date: October 15, 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: October 18, 2024 Last Cal Date: September 16, 2024
 Start time (MST): 11:55 End time (MST): 13:03

Analyzer Make: Teledyne API T640 S/N: 1183
 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)	5.50	4.93	5.50	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	711.50	714.42	711.50	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.00	5.02	5.00	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	50	-----	50	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	2.00	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: October 6, 2024
 Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test	10.10	10.10	10.80	<input checked="" type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: October 18, 2024
 Date Disposable Filter Changed: September 16, 2024

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

Annual Maintenance

Date Sample Tube Cleaned: July 23, 2024
 Date RH/T Sensor Cleaned: July 23, 2024

Notes:

Temperature, pressure, flow and pump power checked. PMT adjusted. Leak check passed.

Calibration by: Jan Castro



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Wapasu	Station Number:	AMS 17
Calibration Date:	October 21, 2024	Prev Cal Date:	October 16, 2023
Start Time (MST):	12:26	End Time (MST):	13:25
Tower Height (m):	9.5	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	N14664
WS Calibrator:	MetOne 053	Serial Number:	CA 05230

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.3	0.4%
400	39.4	39.4	0.1%
600	58.6	58.7	0.2%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999999	≥ 0.9995
Calculated slope		0.999252	$0.90 - 1.10$
Calculated intercept		-0.033066	± 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	P19942
As Found Declination (deg east of True North):		As Left Declination (deg east of True North):	
Solar noon time (MST):		13:10 Calc Declination*:	13.34 Degrees
Deadband calc:	-0.8 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.6	---
90	90.9	0.2%
180	180.4	0.1%
270	270.0	0.0%
357	358.4	0.4%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999993	≥ 0.9995
Calculated slope		0.999194	$0.90 - 1.10$
Calculated intercept		-0.504806	± 4

Notes: Annual audit. Declination verified with compass before and after.

Calibration Performed By: Devin Russell, Braiden Boutilier



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS18 STONY MOUNTAIN OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	October 16, 2024	Last Cal Date:	September 18, 2024
Start time (MST):	9:55	End time (MST):	13:45
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.987719	1.002856	Backgd or Offset:	23.3	23.6
Calibration intercept:	0.160000	-0.640000	Coeff or Slope:	0.788	0.797

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.3	----
As found High point	4920	80.0	800.3	796.4	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.1	Previous response	790.7	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.6	----
High point	4920	80.0	800.3	801.9	0.998
Mid point	4960	40.0	400.2	402.1	0.995
Low point	4980	20.0	200.1	197.4	1.014
As left zero	5000	0.0	0.0	0.6	----
As left span	4919	81.0	810.3	794.7	1.020
Average Correction Factor:					1.002

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

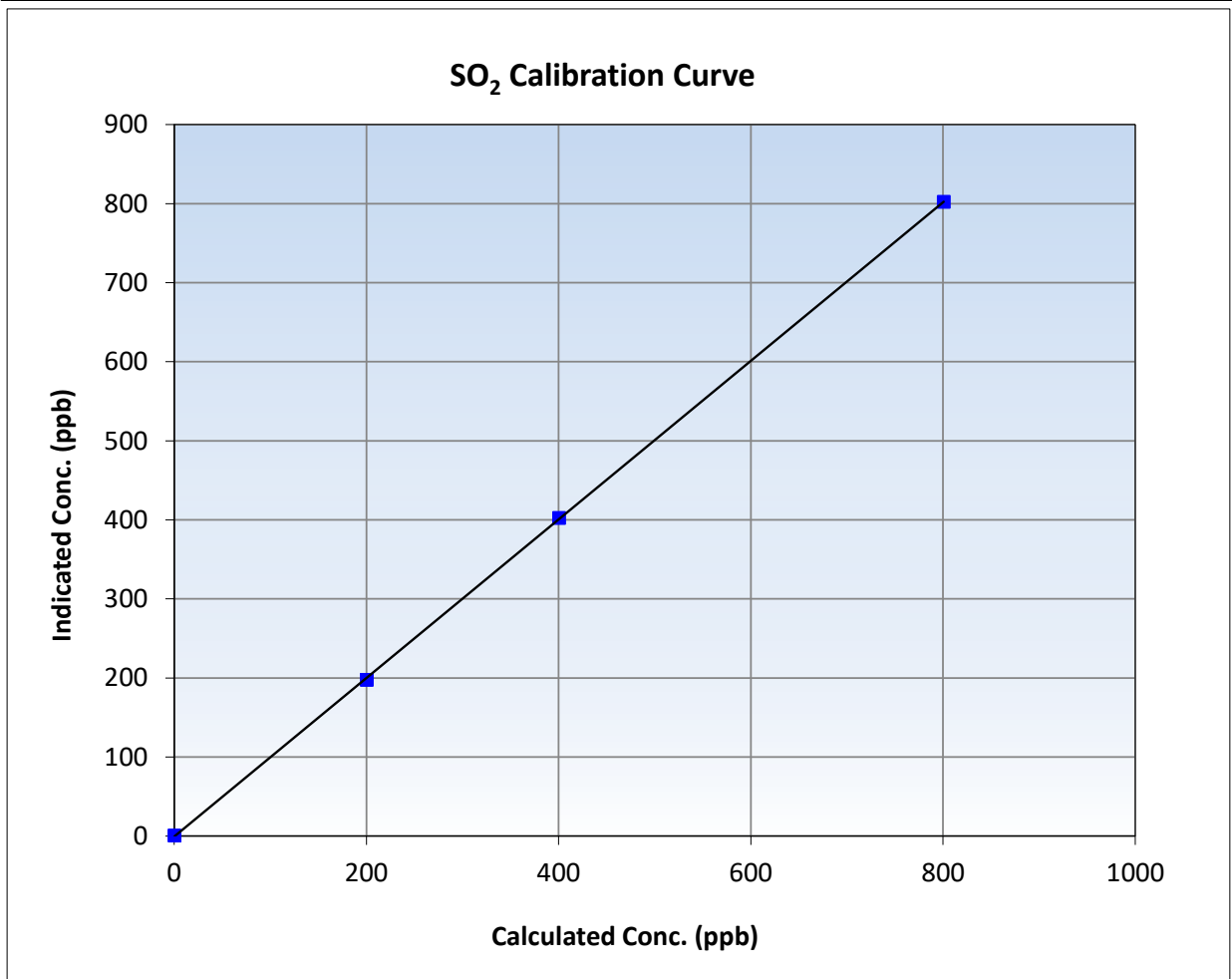
SO₂ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 18, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:55	End Time (MST):	13:45
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301453

Calibration Data

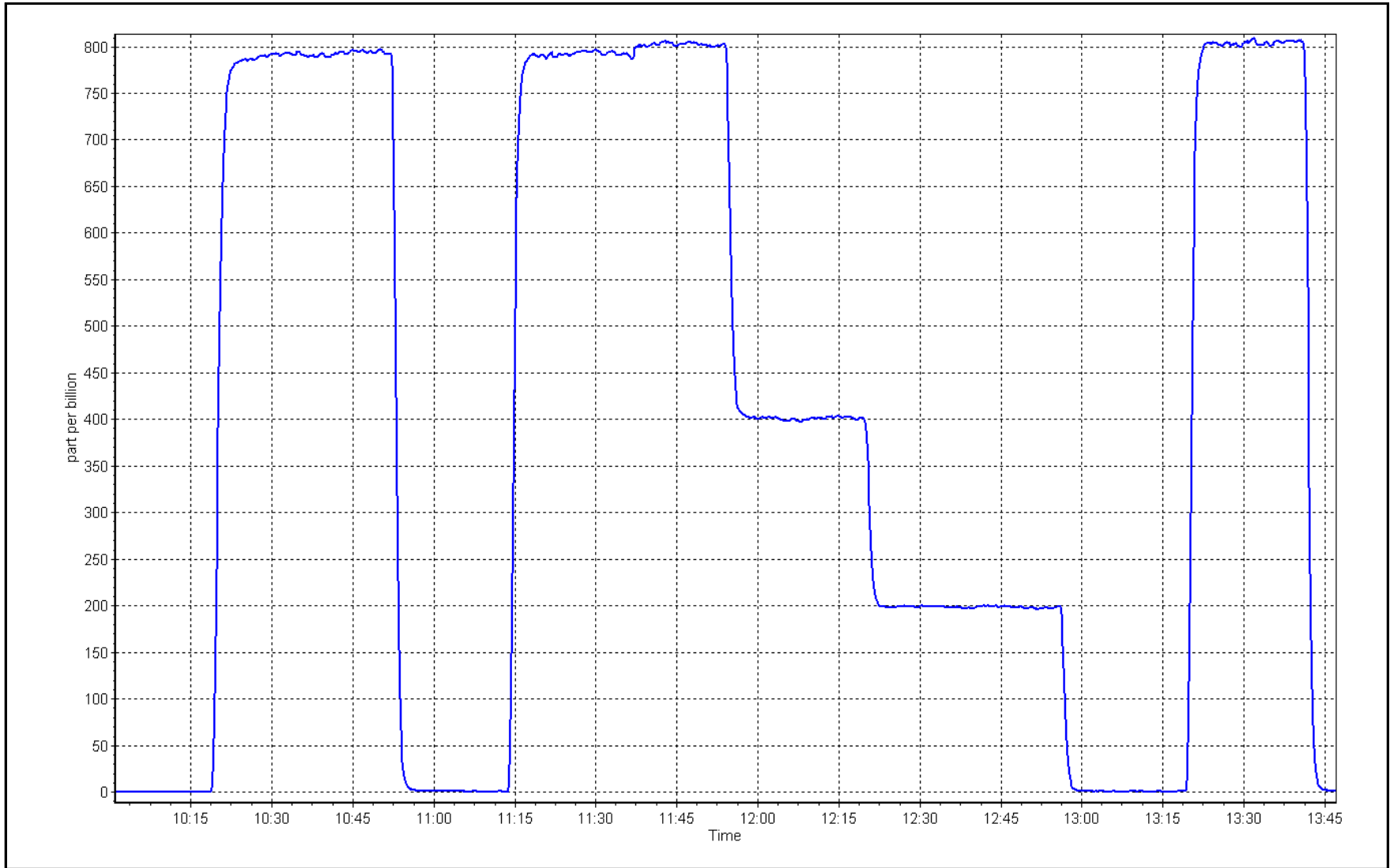
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.6	----	Correlation Coefficient	0.999970	≥0.995
800.3	801.9	0.9980	Slope	1.002856	0.90 - 1.10
400.2	402.1	0.9952	Intercept	-0.640000	+/-30
200.1	197.4	1.0136			



SO2 Calibration Plot

Date: October 16, 2024

Location: Stony Mountain





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS18
Calibration Date:	October 23, 2024	Last Cal Date:	September 24, 2024
Start time (MST):	9:18	End time (MST):	14:00
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999011	1.000868	Backgd or Offset:	3.2	3.10
Calibration intercept:	-0.098893	-0.038877	Coeff or Slope:	1.256	1.228

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4927	73.0	80.0	83.9	0.952
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	84.0	Prev response:	79.82	*% change:	5.0%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4927	73.0	80.0	80.0	1.000
Mid point	4964	36.5	40.0	40.2	0.995
Low point	4983	18.3	20.0	19.7	1.018
As left zero	5000	0.0	0.0	0.2	----
As left span	4927	73.0	80.0	79.4	1.007
SO2 Scrubber Check	4923	77.1	771.0	0.1	----
Date of last scrubber change:		17-Dec-21		Ave Corr Factor	1.004
Date of last converter efficiency test:					

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

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

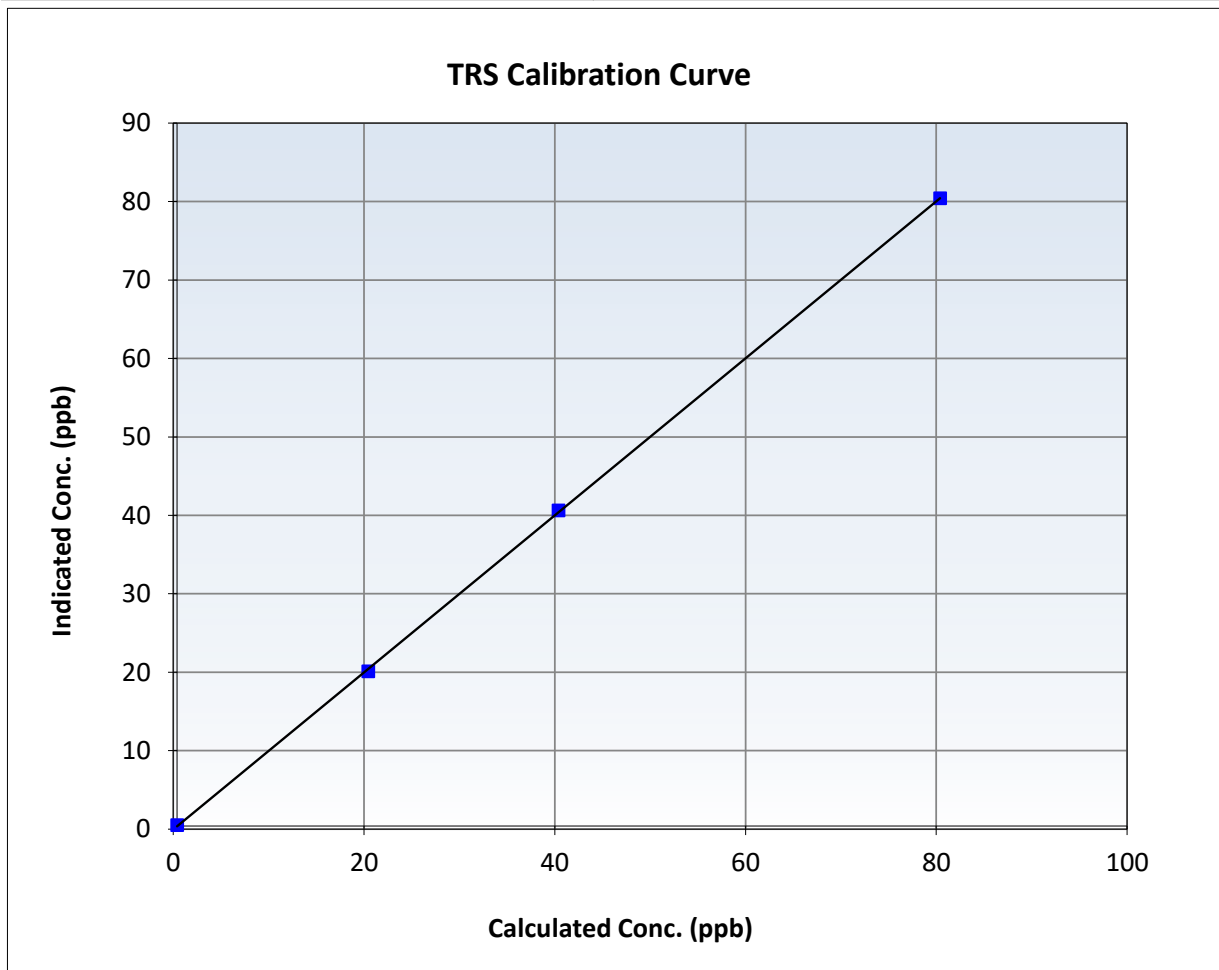
TRS Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 24, 2024
Station Name:	Stony Mountain	Station Number:	AMS18
Start Time (MST):	9:18	End Time (MST):	14:00
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153359

Calibration Data

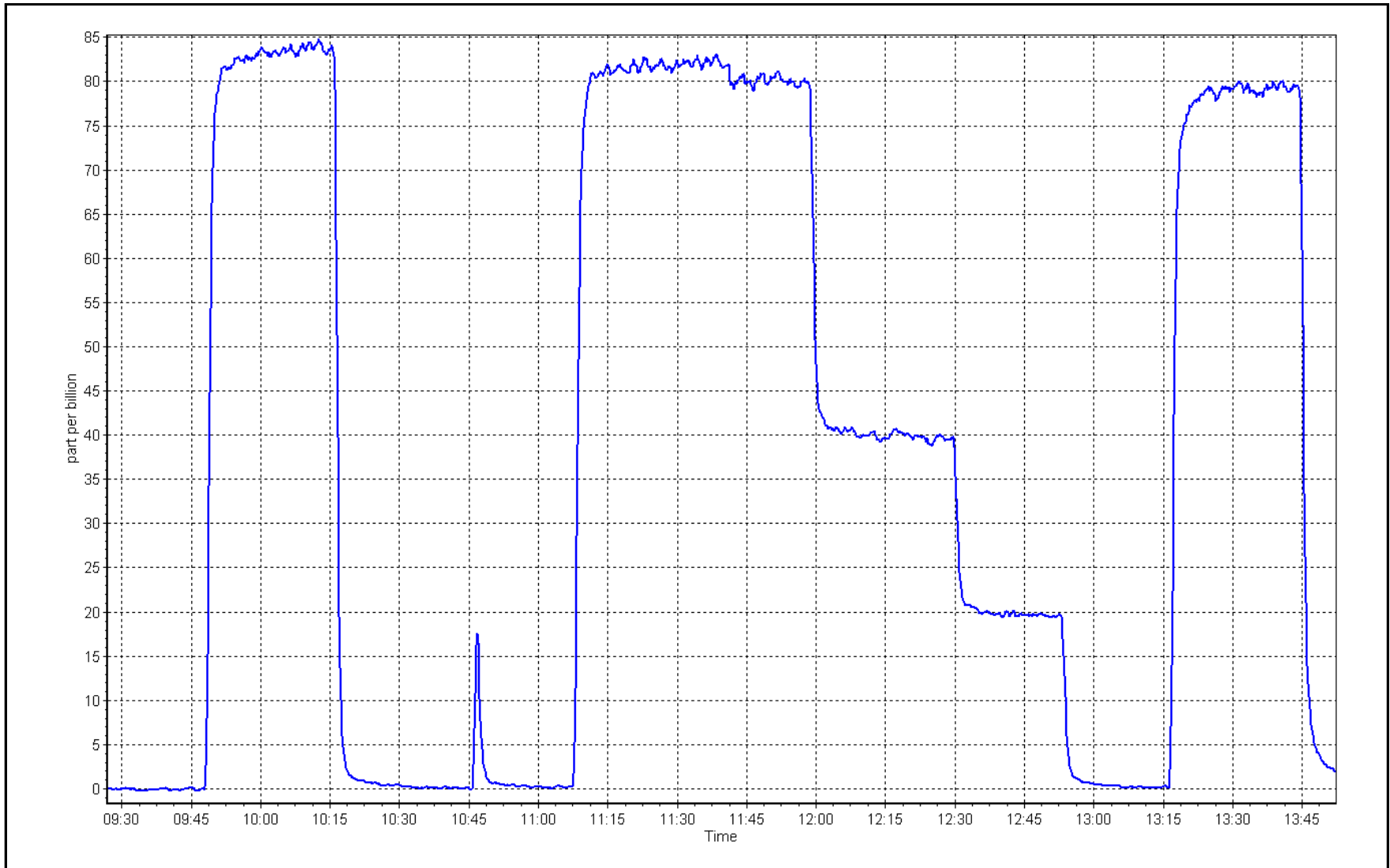
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999951	≥ 0.995
80.0	80.0	0.9999	Slope	1.000868	$0.90 - 1.10$
40.0	40.2	0.9948	Intercept	-0.038877	± 3
20.0	19.7	1.0177			



TRS Calibration Plot

Date: October 23, 2024

Location: Stony Mountain





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	October 16, 2024	Last Cal Date:	September 18, 2024
Start time (MST):	9:55	End time (MST):	13:45
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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.61E-04	2.69E-04	4.18E-05	4.16E-05
CH4 Retention time:	16.2	16.4	219103	219833
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.01	---
As found High point	4920	80.0	17.07	17.04	1.002
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.03	Prev response	17.12	*% change	-0.5%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.01	---
High point	4920	80.0	17.23	17.16	1.004
Mid point	4960	40.0	8.61	8.63	0.998
Low point	4980	20.0	4.31	4.29	1.003
As left zero	5000	0.0	0.00	0.00	---
As left span	4920	80.0	17.23	17.31	0.995
Average Correction Factor					1.002

Notes: N2 cylinder changed out after as founds. Span adjusted.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.0	9.06	9.19	0.985
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.19	Prev response	9.11	*% change	0.9%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.0	9.15	9.12	1.003
Mid point	4960	40.0	4.57	4.60	0.995
Low point	4980	20.0	2.29	2.28	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	9.15	9.18	0.996
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))
As found zero	5000	0.0	0.00	0.01	----
As found High point	4920	80.0	8.01	7.85	1.023
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.84	Prev response	8.01	*% change	-2.2%
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)
Calibrator zero	5000	0.0	0.00	0.01	----
High point	4920	80.0	8.08	8.04	1.005
Mid point	4960	40.0	4.04	4.03	1.002
Low point	4980	20.0	2.02	2.01	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	8.08	8.13	0.994
Average Correction Factor					1.004

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001443	0.995611
THC Cal Offset:	0.025000	0.019200
CH ₄ Cal Slope:	0.997581	0.993761
CH ₄ Cal Offset:	0.015000	0.011000
NMHC Cal Slope:	1.004929	0.997420
NMHC Cal Offset:	0.009200	0.008000

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

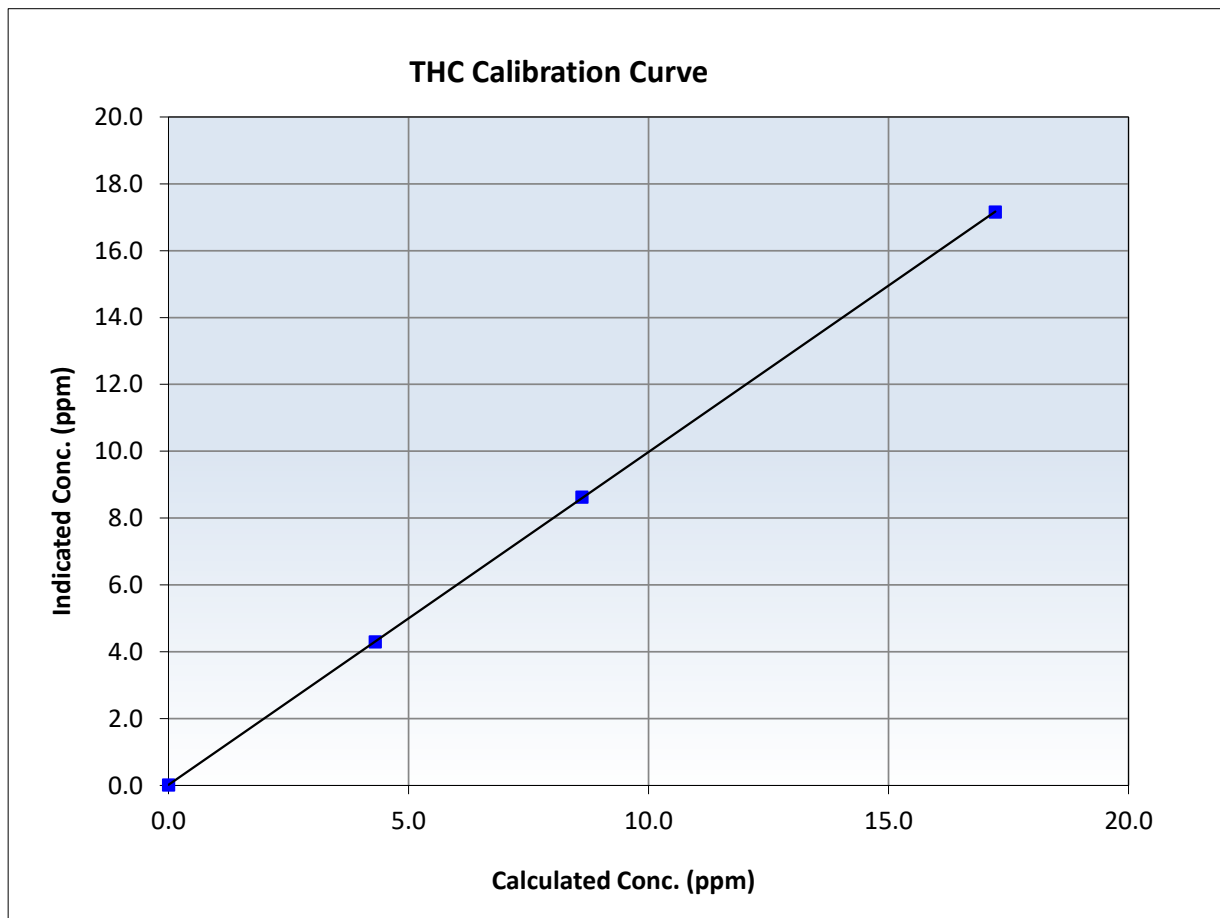
THC Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 18, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:55	End Time (MST):	13:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.01	----	Correlation Coefficient	0.999992	<i>≥0.995</i>
17.23	17.16	1.0040	Slope	0.995611	<i>0.90 - 1.10</i>
8.61	8.63	0.9985	Intercept	0.019200	<i>+/-0.5</i>
4.31	4.29	1.0029			





Wood Buffalo Environmental Association

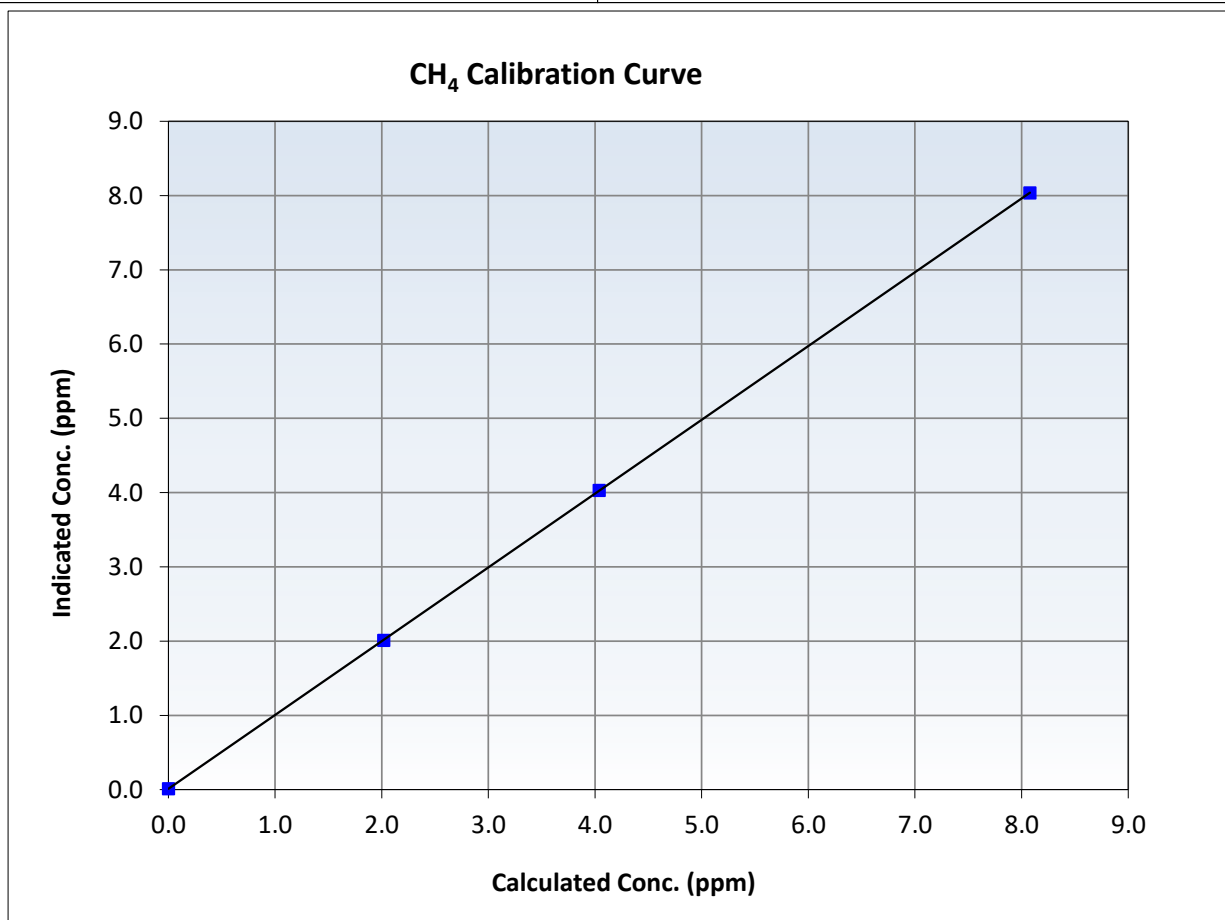
CH₄ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 18, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:55	End Time (MST):	13:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00	0.01	----	Correlation Coefficient	≥0.995
8.08	8.04	1.0050	Slope	0.90 - 1.10
4.04	4.03	1.0023	Intercept	+/-0.5
2.02	2.01	1.0038		





Wood Buffalo Environmental Association

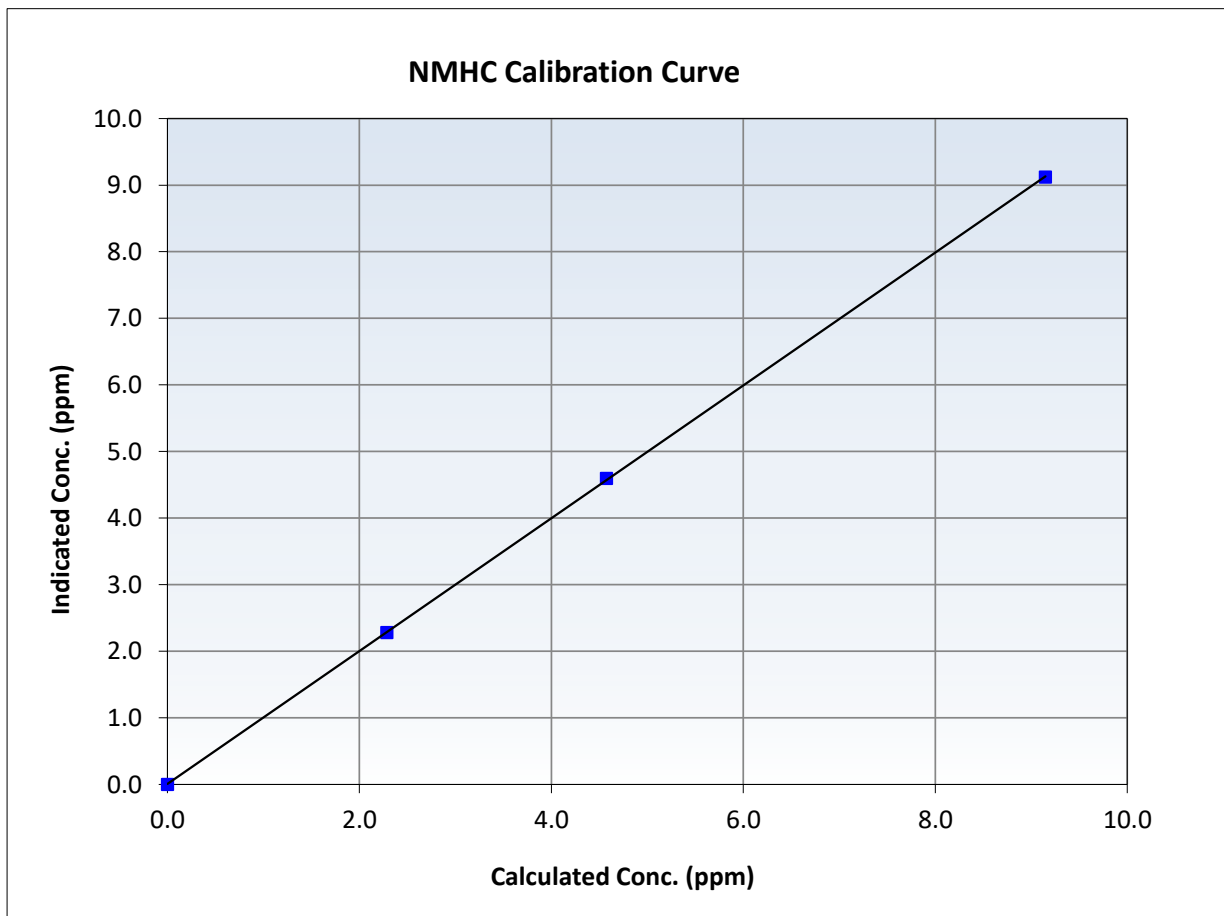
NMHC Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 18, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:55	End Time (MST):	13:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

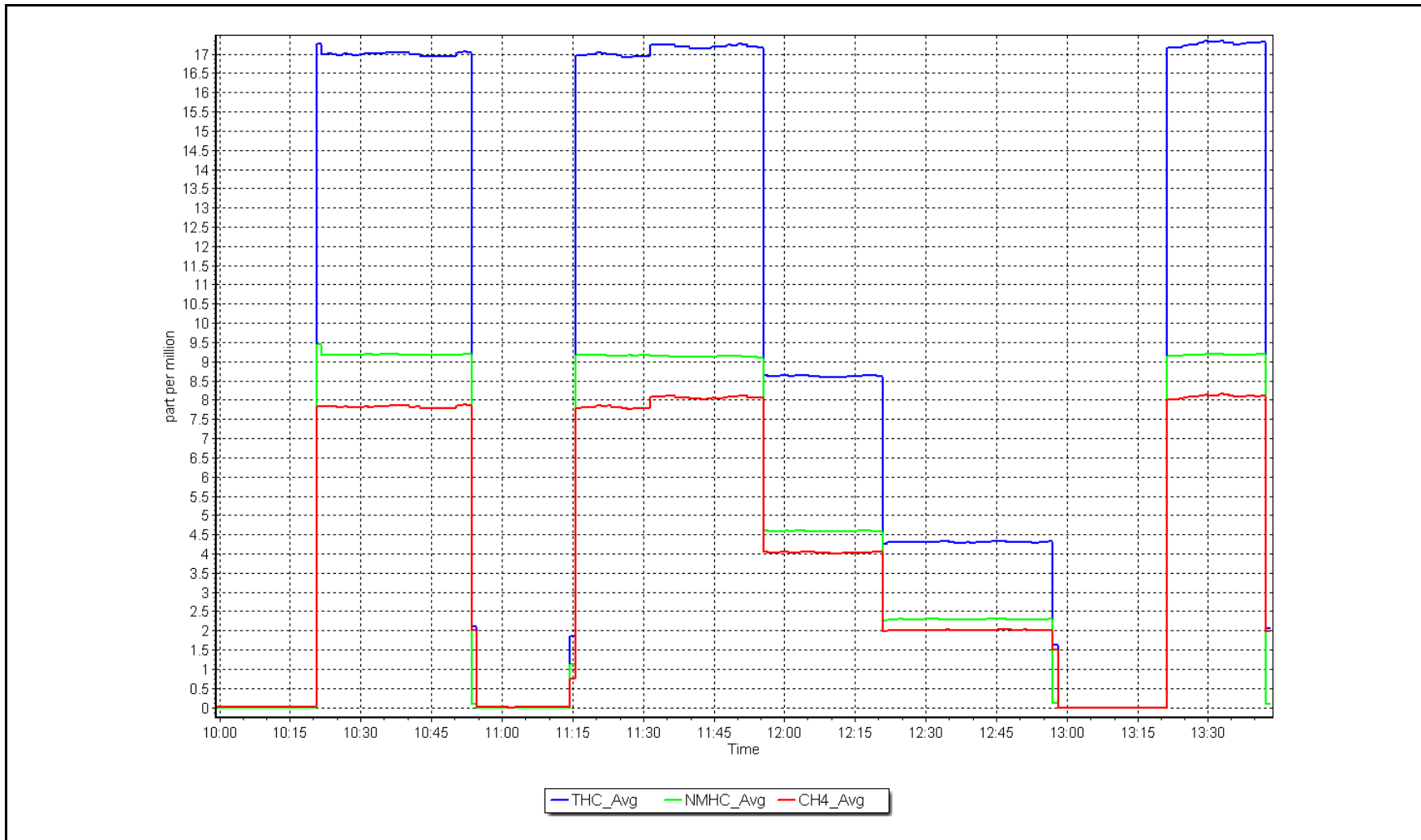
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999981	<i>≥0.995</i>
9.15	9.12	1.0029	Slope	0.997420	<i>0.90 - 1.10</i>
4.57	4.60	0.9954	Intercept	0.008000	<i>+/-0.5</i>
2.29	2.28	1.0017			



NMHC Calibration Plot

Date: October 16, 2024

Location: Stony Mountain





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Stony Mountain
 Station number: AMS 18
 Calibration Date: October 23, 2024
 Last Cal Date: September 19, 2024
 Start time (MST): 9:18
 End time (MST): 14:34
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: DT0045516
 NOX Cal Gas Conc: 60.30 ppm
 Removed Cylinder #: N/A
 Removed Gas NOX Conc: 60.30 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T750
 ZAG make/model: Teledyne API 751H
 Cal Gas Expiry Date: November 17, 2026
 NO Cal Gas Conc: 60.10 ppm
 Removed Gas Exp Date: N/A
 Removed Gas NO Conc: 60.10 ppm
 NO gas Diff:
 Serial Number: 282
 Serial Number: 321

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.2	-0.1	0.2	----	----
AF High point	4933	66.6	803.3	800.6	2.7	811.7	817.3	-5.7	0.9898	0.9794
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo 4933	NO _x = 802.2 ppb	NO = 802.7 ppb	<i>* = > +/-5% change initiates investigation</i>				*Percent Change	NO _x = 1.2%		
Baseline Corr 1st pt	NO _x = 811.5 ppb	NO = 817.4 ppb	<u>As Found Statistics</u>				*Percent Change	NO = 1.8%		
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb	As found	NO _x r ² :		Nx SI:	Nx Int:			
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb	As found	NO r ² :		NO SI:	NO Int:			
			As found	NO ₂ r ² :		NO ₂ SI:	NO ₂ Int:			

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1035

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.995337	1.002362
NO _x Cal Offset:	2.651403	0.933941
NO Cal Slope:	1.001122	1.004515
NO Cal Offset:	1.210855	0.472863
NO ₂ Cal Slope:	0.983851	1.001034
NO ₂ Cal Offset:	-0.930728	-0.074456

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	0.932	0.910	NO bkgnd or offset:	-55.2	-55.2
NOX coeff or slope:	0.923	0.909	NOX bkgnd or offset:	-54.8	-54.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	7.0	7.0

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.4	-0.5	----	----
High point	4933	66.6	803.3	800.6	2.7	805.8	804.7	1.2	0.9968	0.9949
Mid point	4967	33.3	401.6	400.2	1.3	403.3	402.4	0.8	0.9957	0.9946
Low point	4983	16.6	200.2	199.5	0.7	203.1	201.1	2.0	0.9858	0.9923
As left zero	5000	0.0	0.0	0.0	0.0	3.2	3.9	-0.7	----	----
As left span	4933	66.6	803.3	370.5	432.8	779.5	370.5	409.0	1.0305	1.0000
Average Correction Factor									0.9928	0.9939

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.5	----	----
High GPT point	798.0	403.5	397.2	397.3	0.9997	100.0%
Mid GPT point	798.0	609.9	190.8	191.1	0.9982	100.2%
Low GPT point	798.0	706.4	94.3	94.7	0.9954	100.5%
Average Correction Factor					0.9978	100.2%

Notes:

Portable setup used for calibration. Span adjusted.

Calibration Performed By:

Aswin Sasi Kumar



Wood Buffalo Environmental Association

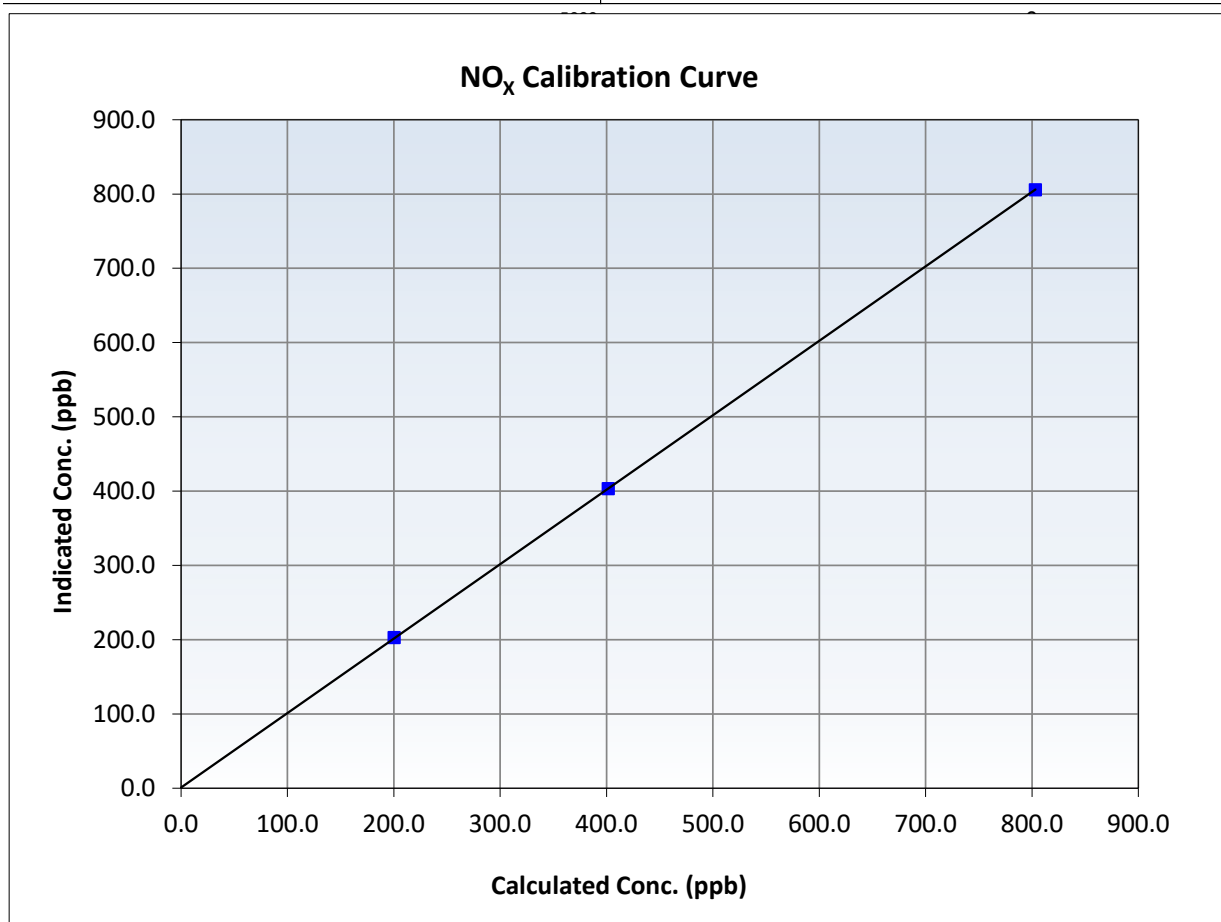
NO_x Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 19, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:18	End Time (MST):	14:34
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999990	≥0.995
803.3	805.8	0.9968	Slope	1.002362	0.90 - 1.10
401.6	403.3	0.9957	Intercept	0.933941	+/-20
200.2	203.1	0.9858			





Wood Buffalo Environmental Association

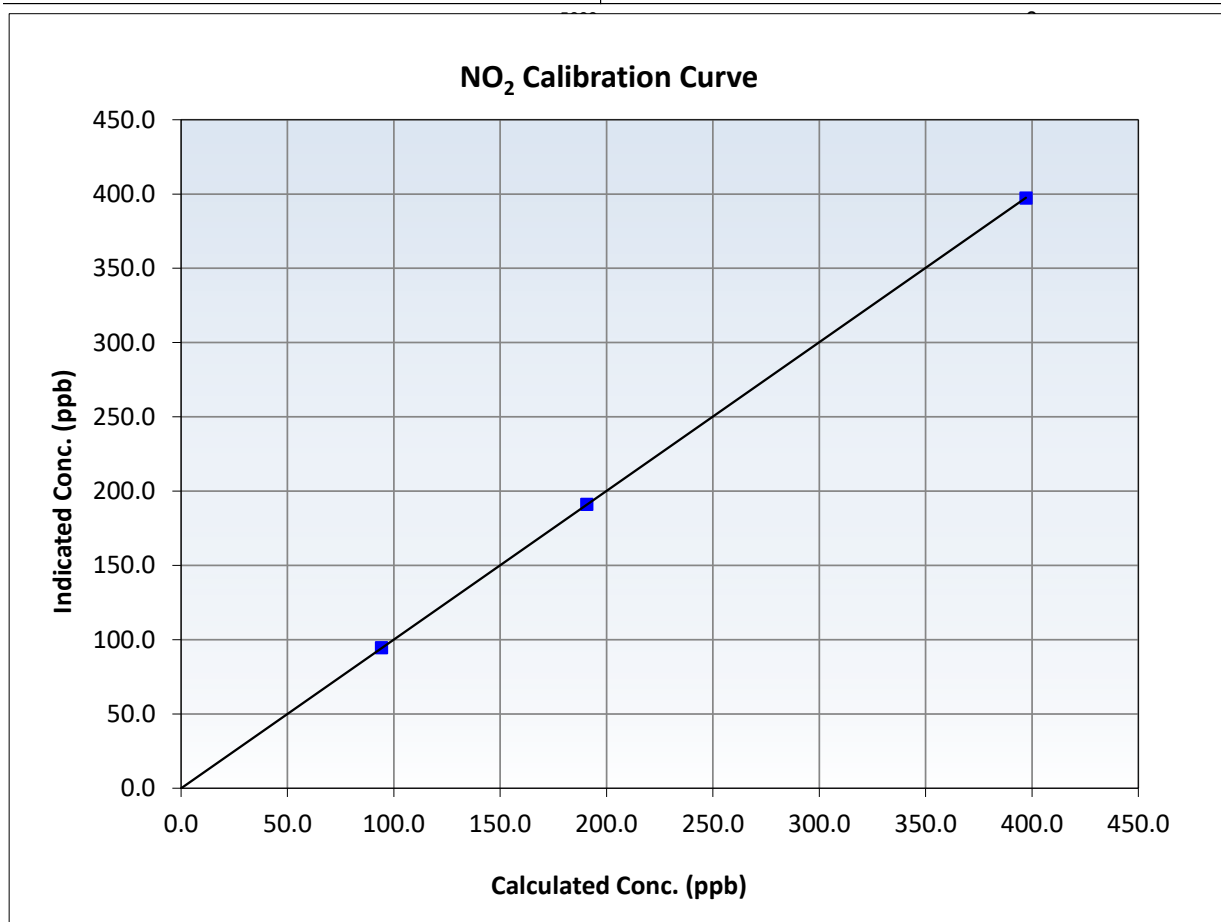
NO₂ Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 19, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:18	End Time (MST):	14:34
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.5	----	Correlation Coefficient	0.999995	<i>≥0.995</i>
397.2	397.3	0.9997	Slope	1.001034	<i>0.90 - 1.10</i>
190.8	191.1	0.9982	Intercept	-0.074456	<i>+/-20</i>
94.3	94.7	0.9954			





Wood Buffalo Environmental Association

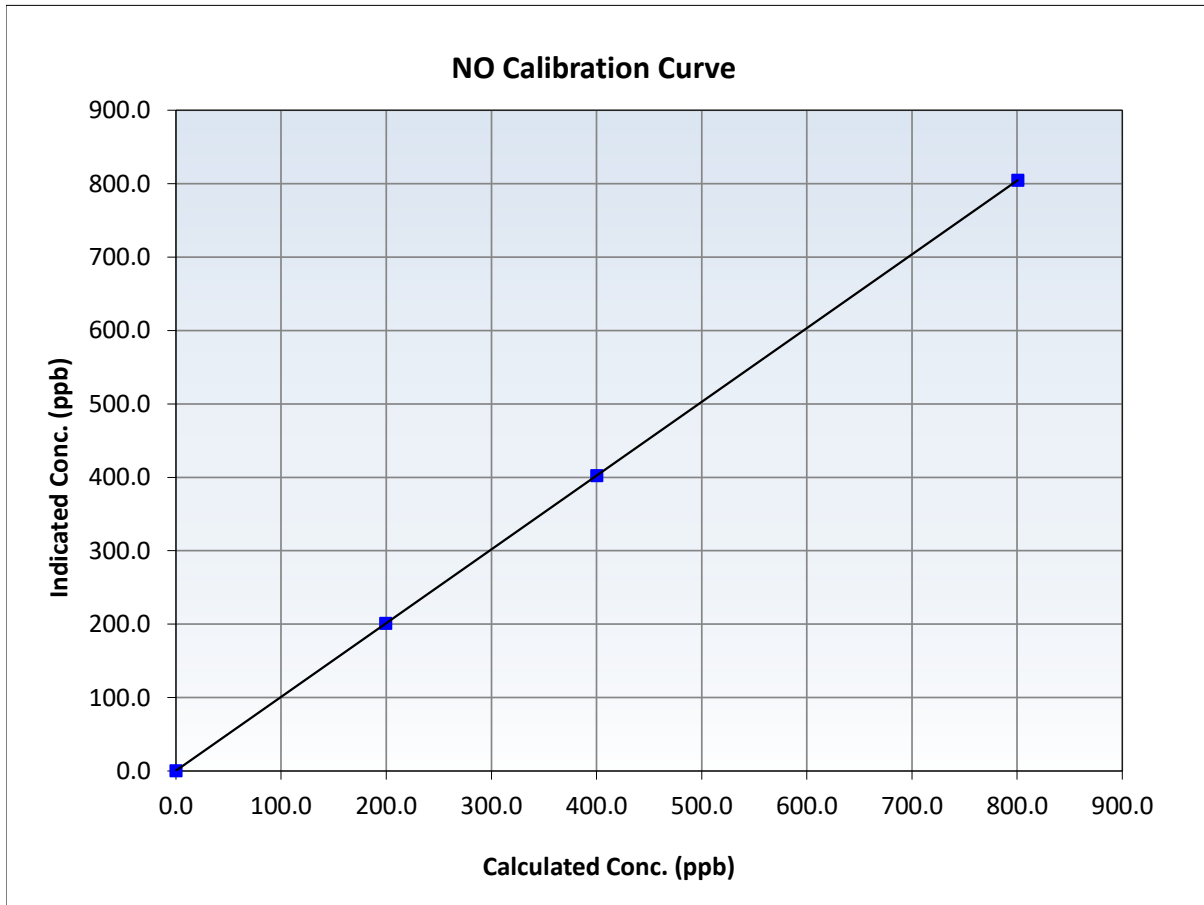
NO Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 19, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:18	End Time (MST):	14:34
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

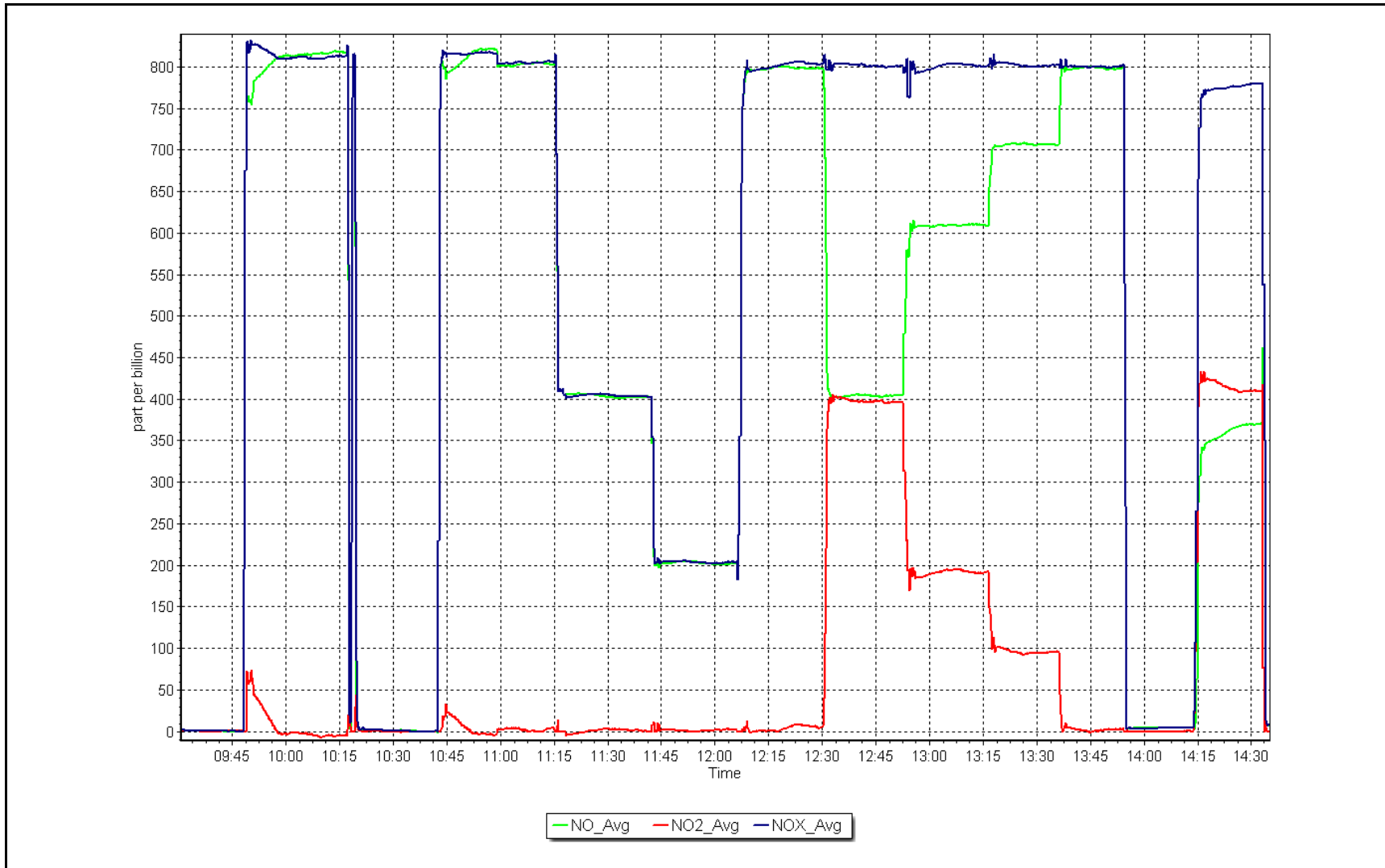
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.4	----	Correlation Coefficient	1.000000	≥0.995
800.6	804.7	0.9949	Slope	1.004515	0.90 - 1.10
400.2	402.4	0.9946	Intercept	0.472863	+/-20
199.5	201.1	0.9923			
	5000			0	
	4933			66.6	



NO_x Calibration Plot

Date: October 23, 2024

Location: Stony Mountain





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	October 22, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	11:15	End time (MST):	14:53
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	282
Calibrator Make/Model:	Teledyne API T750	Serial Number:	321
ZAG Make/Model:	Teledyne API 751H		

Analyzer Information

Analyzer make:	API T400	Analyzer serial #:	825
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001714	1.000600	Backgd or Offset:	1.1	2.8
Calibration intercept:	0.500000	-2.080000	Coeff or Slope:	0.988	1.008

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	NA	0.0	0.8	----
As found High point	4888	1138.1	400.0	394.5	1.016
As found Mid point					
As found Low point					
Baseline Corr As found:	393.7	Previous response	401.2	*% 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	

O₃ 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- AFzero) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	NA	0.0	-0.4	----
High point	4888	1138.1	400.0	399.2	1.002
Mid point	4888	884.5	200.0	196.6	1.017
Low point	4888	741.4	100.0	96.7	1.034
As left zero	5000	NA	0.0	-0.6	----
As left span	4812	1097.9	400.0	410.3	0.975
Average Correction Factor					1.018

Notes: Portable setup used for calibration. Zero and span adjusted.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

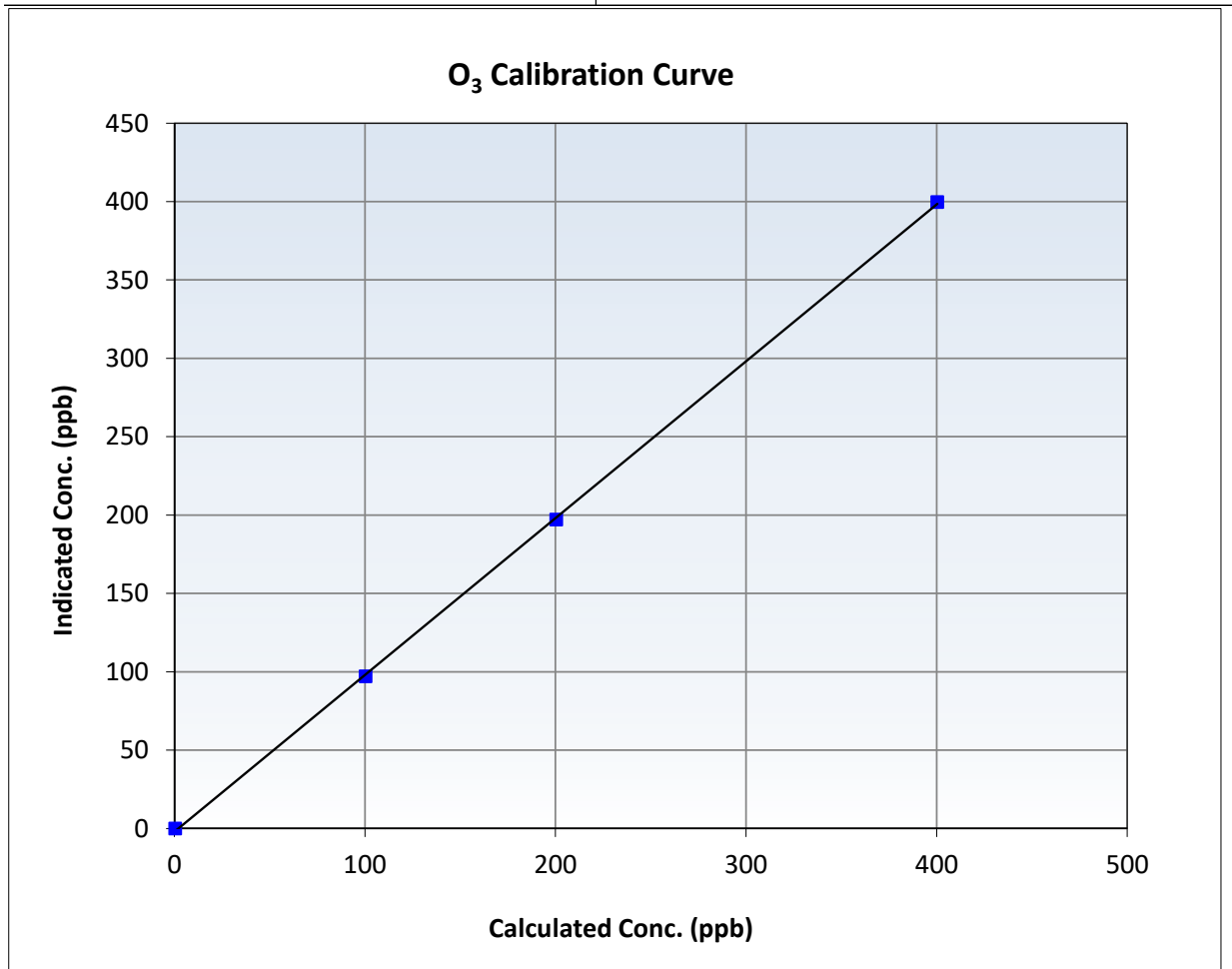
O₃ Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 3, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:15	End Time (MST):	14:53
Analyzer make:	API T400	Analyzer serial #:	825

Calibration Data

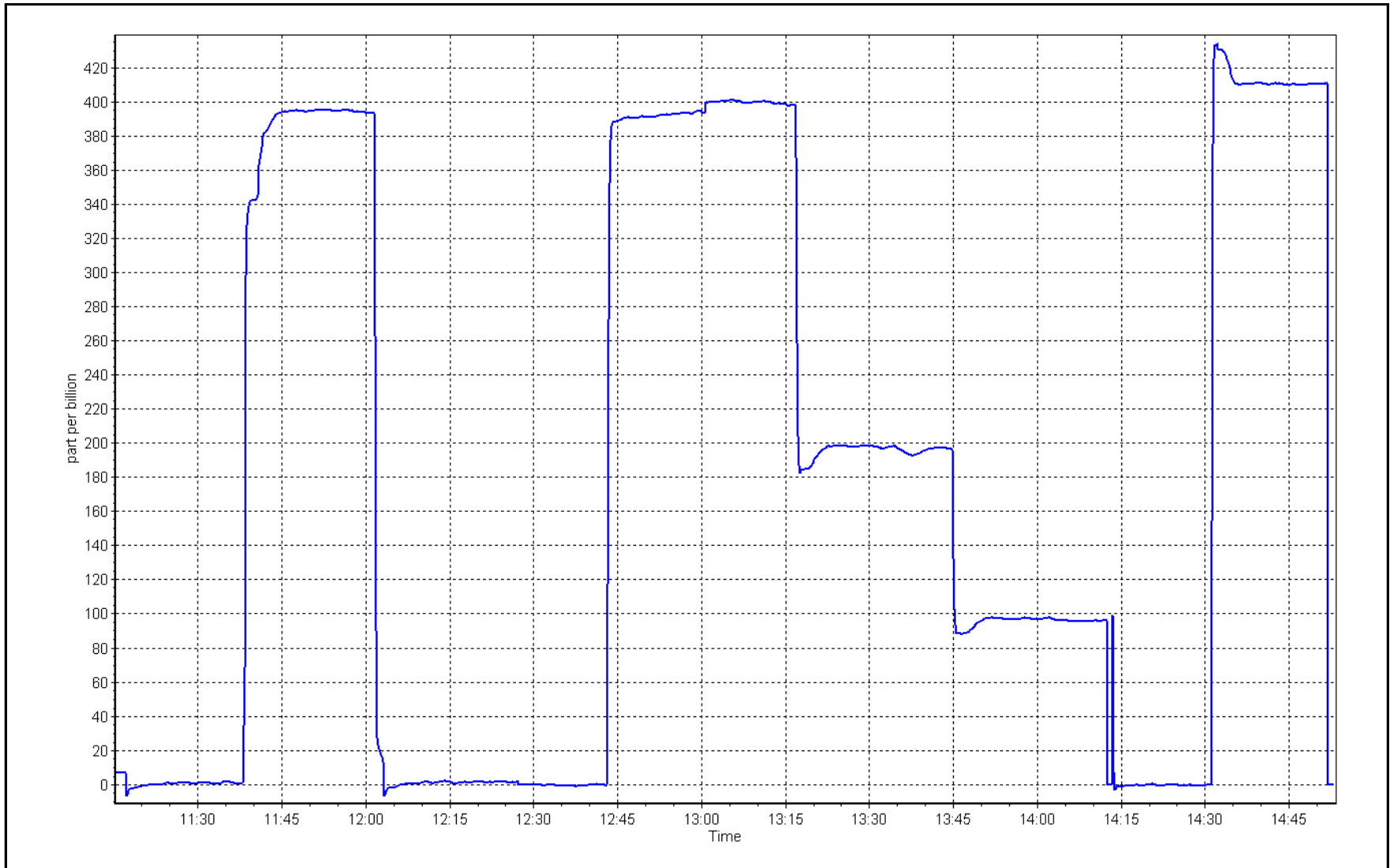
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.4	----	Correlation Coefficient	0.999913	≥0.995
400.0	399.2	1.0020	Slope	1.000600	0.90 - 1.10
200.0	196.6	1.0173	Intercept	-2.080000	+/- 5
100.0	96.7	1.0341			



O₃ Calibration Plot

Date: October 22, 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: October 31, 2024 Last Cal Date: September 24, 2024
 Start time (MST): 12:50 End time (MST): 13:27

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)	-3.3	-4.2	-3.3	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	700.9	696.30	700.9	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.02	5.08	5.02	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	37	-----	37	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	4.2	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: 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	<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: September 24, 2024
 Date Disposable Filter Changed: September 24, 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.

Calibration by: Aswin Sasi Kumar



Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	October 22, 2024	Last Cal Date:	September 20, 2024
Start time (MST):	11:00	End time (MST):	14:10
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002360	1.005783	Backgd or Offset:	-0.011	-0.011
Calibration intercept:	0.071803	0.127776	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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4933	66.7	41.1	41.3	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	41.29	Prev response:	41.26	*% 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 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4933	66.7	41.1	41.4	0.993
Mid point	4966	33.3	20.5	20.9	0.980
Low point	4983	16.7	10.3	10.4	0.985
As left zero	5000	0.0	0.0	0.0	----
As left span	4933	66.7	41.1	41.5	0.991
Average Correction Factor					0.986

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

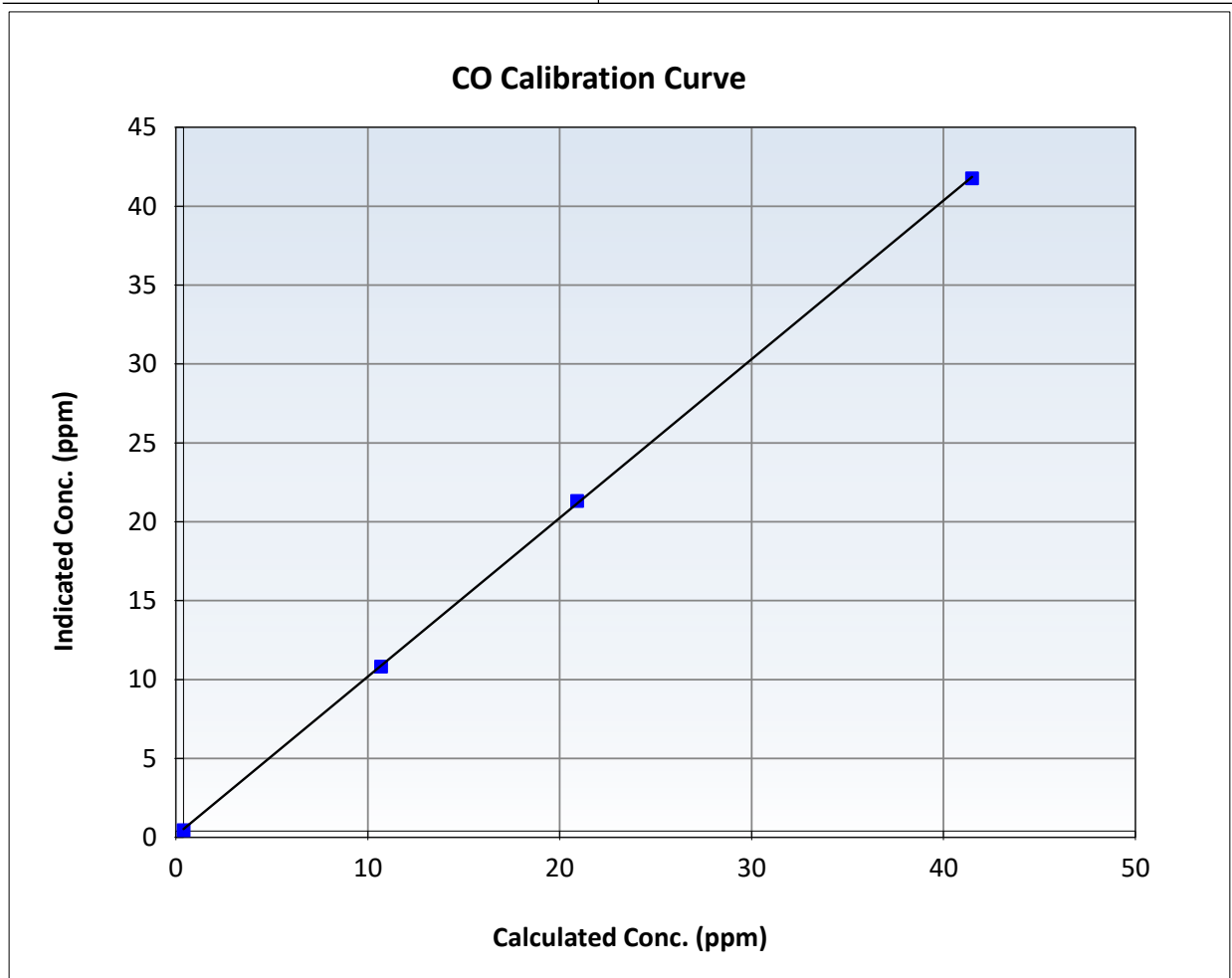
CO Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 20, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:00	End Time (MST):	14:10
Analyzer make:	Teledyne API T300	Analyzer serial #:	3504

Calibration Data

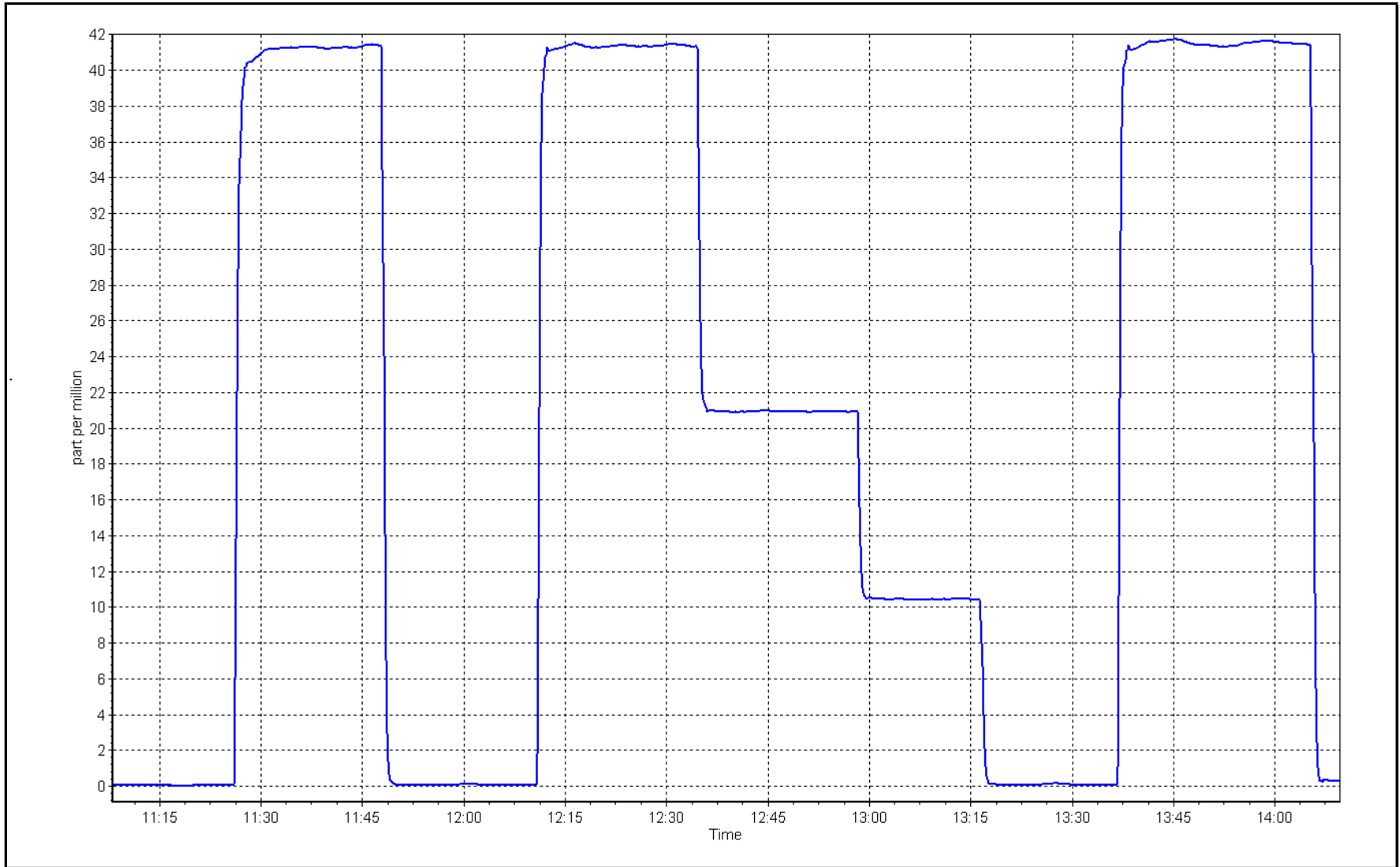
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.1	----	Correlation Coefficient	0.999959	≥0.995
41.1	41.4	0.9930	Slope	1.005783	0.90 - 1.10
20.5	20.9	0.9802	Intercept	0.127776	+/-1.5
10.3	10.4	0.9854			



CO Calibration Plot

Date: October 22, 2024

Location: Stony Mountain





Wood Buffalo Environmental Association

CO₂ Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	October 31, 2024	Last Cal Date:	September 10, 2024
Start time (MST):	10:25	End time (MST):	13:34
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	

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997752	0.999739	Backgd or Offset:	-0.068
Calibration intercept:	-4.100000	-5.220000	Coeff or Slope:	0.961

CO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	3000	0.0	0.0	-0.6	----
As found High Point	2920	80.0	1576.0	1574.0	1.001
As found Mid Point					
As found Low Point					
New cylinder response					
Baseline Corr As found:	1574.6	Prev response:	1568.4	*% 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	

CO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	3000	0.0	0.0	-0.1	----
High point	2920	80.0	1576.0	1575.4	1.000
Mid point	2960	40.0	788.0	772.6	1.020
Low point	2980	20.0	394.0	388.5	1.014
As left zero	3000	0.0	0.0	-0.6	----
As left span	2930	80.0	1570.8	1577.1	0.996
Average Correction Factor					1.011

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

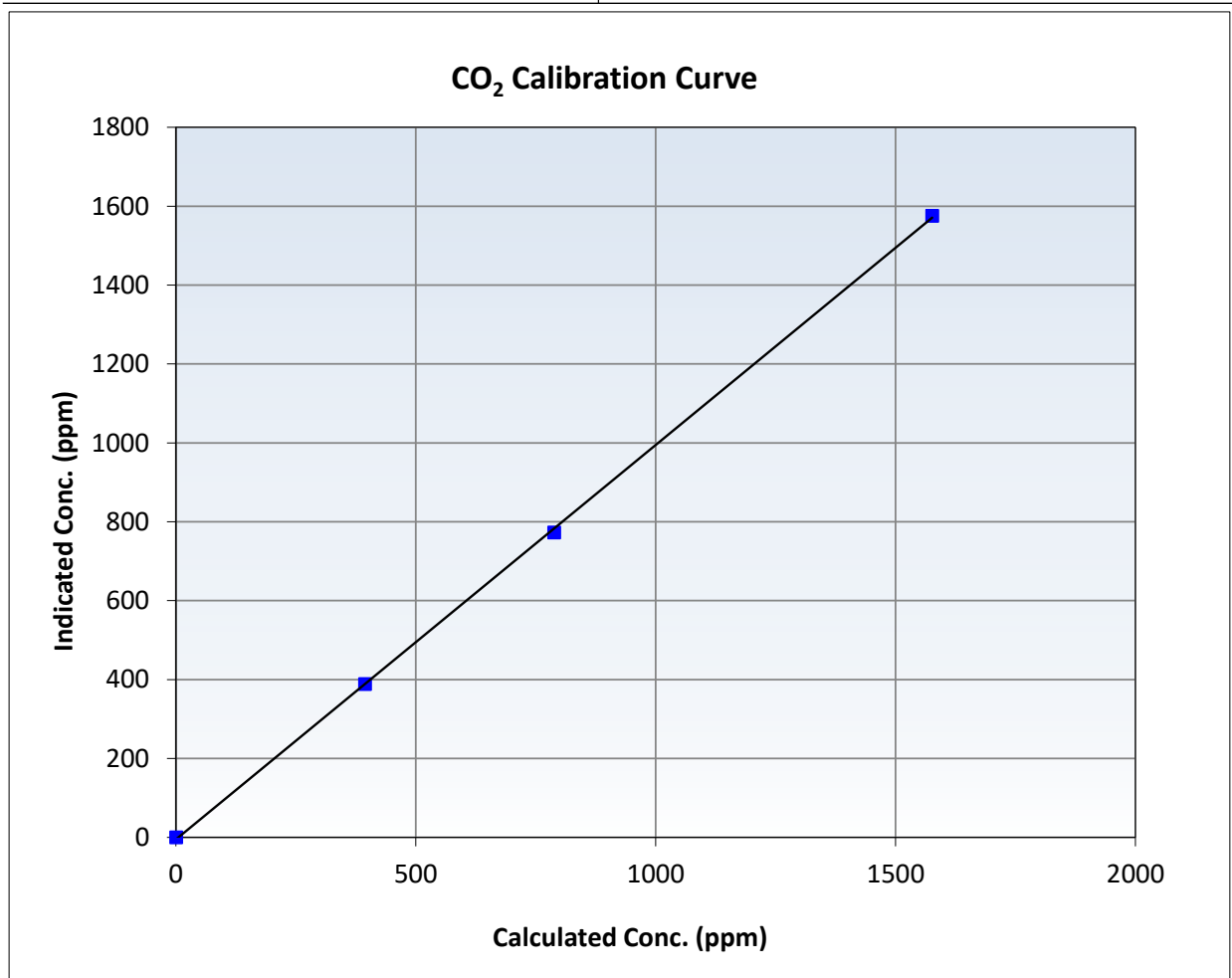
CO₂ Calibration Summary

Station Information

Calibration Date	October 31, 2024	Previous Calibration	September 10, 2024
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	10:25	End Time (MST)	13:34
Analyzer make	API T360	Analyzer serial #	489

Calibration Data

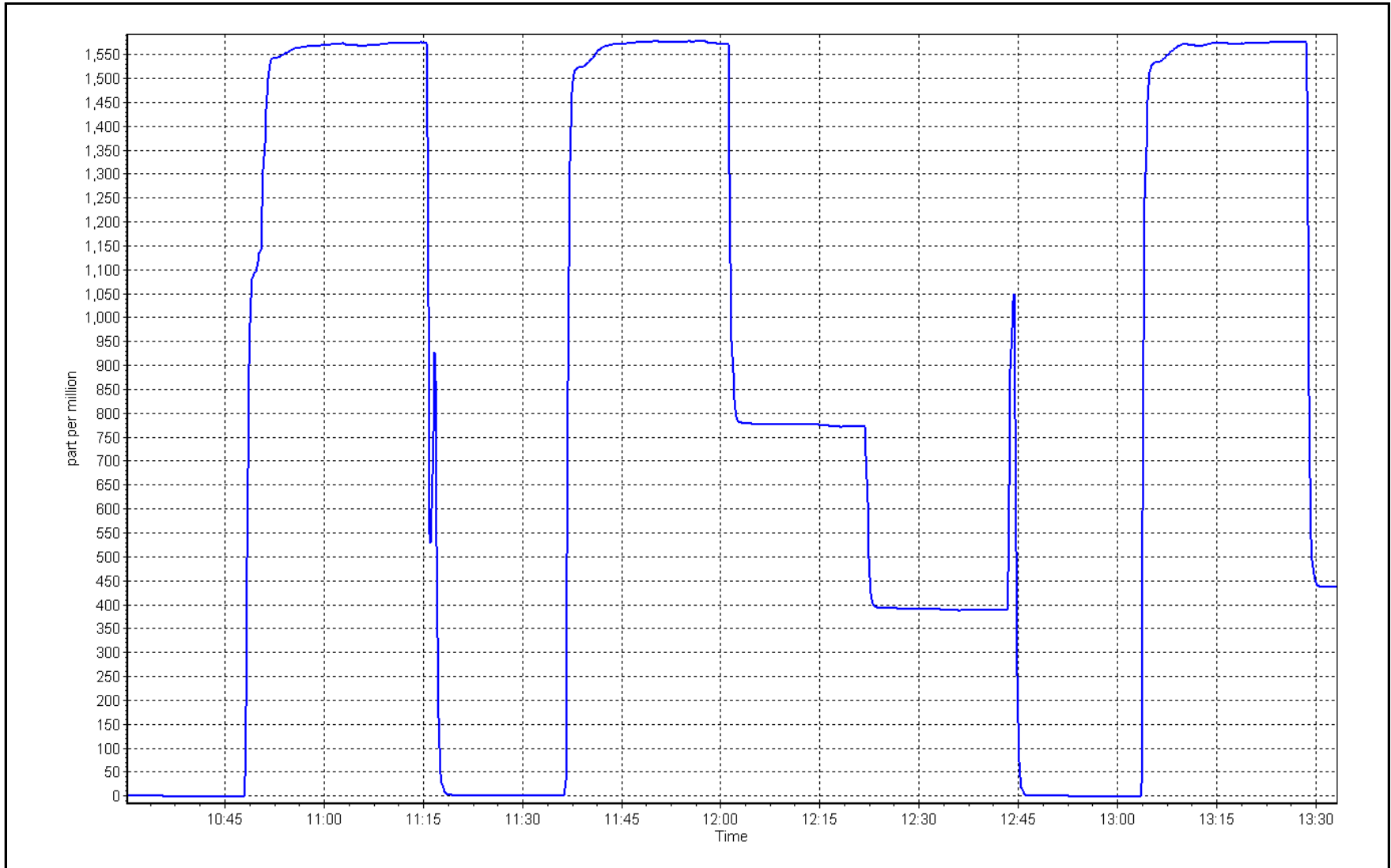
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	0.999889	≥0.995
1576.0	1575.4	1.0004	Slope	0.999739	0.90 - 1.10
788.0	772.6	1.0199	Intercept	-5.2	+/-20
394.0	388.5	1.0142			



CO₂ Calibration Plot

Date: October 31, 2024

Location: Stony Mountain





Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Stony Mountain	Station Number:	AMS 18
Calibration Date:	October 8, 2024	Prev Cal Date:	August 24, 2023
Start Time (MST):	10:40	End Time (MST):	11:20
Tower Height (m):	20.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C	Serial Number:	W23536
WS Calibrator:	RM Young 053-120	Serial Number:	CA05231

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.6	0.0%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999999	<i>≥0.9995</i>
Calculated slope		0.998857	<i>0.90 - 1.10</i>
Calculated intercept		0.030366	<i>+/- 2</i>

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	C21021
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	NA	Calc Declination*:	14 Degrees
Deadband calc:	3.0 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.2	---
90	87.4	-0.7%
180	180.1	0.0%
270	267.9	-0.6%
355	354.2	-0.2%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999961	<i>≥0.9995</i>
Calculated slope		1.001576	<i>0.90 - 1.10</i>
Calculated intercept		0.765537	<i>+/- 4</i>

Notes: Annual check. Declination confirmed with true north marker and compass

Calibration Performed By: Devin Russell/Ryan Power



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS19 FIREBAG OCTOBER 2024

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

November 29, 2024





Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	October 9, 2024	Last Cal Date:	September 10, 2024
Start time (MST):	9:47	End time (MST):	13:21
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002452	1.007593	Backgd or Offset:	10.6	10.6
Calibration intercept:	1.057039	-0.542421	Coeff or Slope:	1.000	0.989

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	4999	0.0	0.0	0.1	----
As found High point	4919	81.1	799.5	808.0	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	807.9	Previous response	802.5	*% change	0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	4999	0.0	0.0	0.4	----
High point	4919	81.1	799.5	806.0	0.992
Mid point	4959	40.6	400.3	400.7	0.999
Low point	4980	20.3	200.1	201.2	0.995
As left zero	4999	0.0	0.0	0.2	----
As left span	4919	81.1	799.5	797.7	1.002
Average Correction Factor:					0.995

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

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

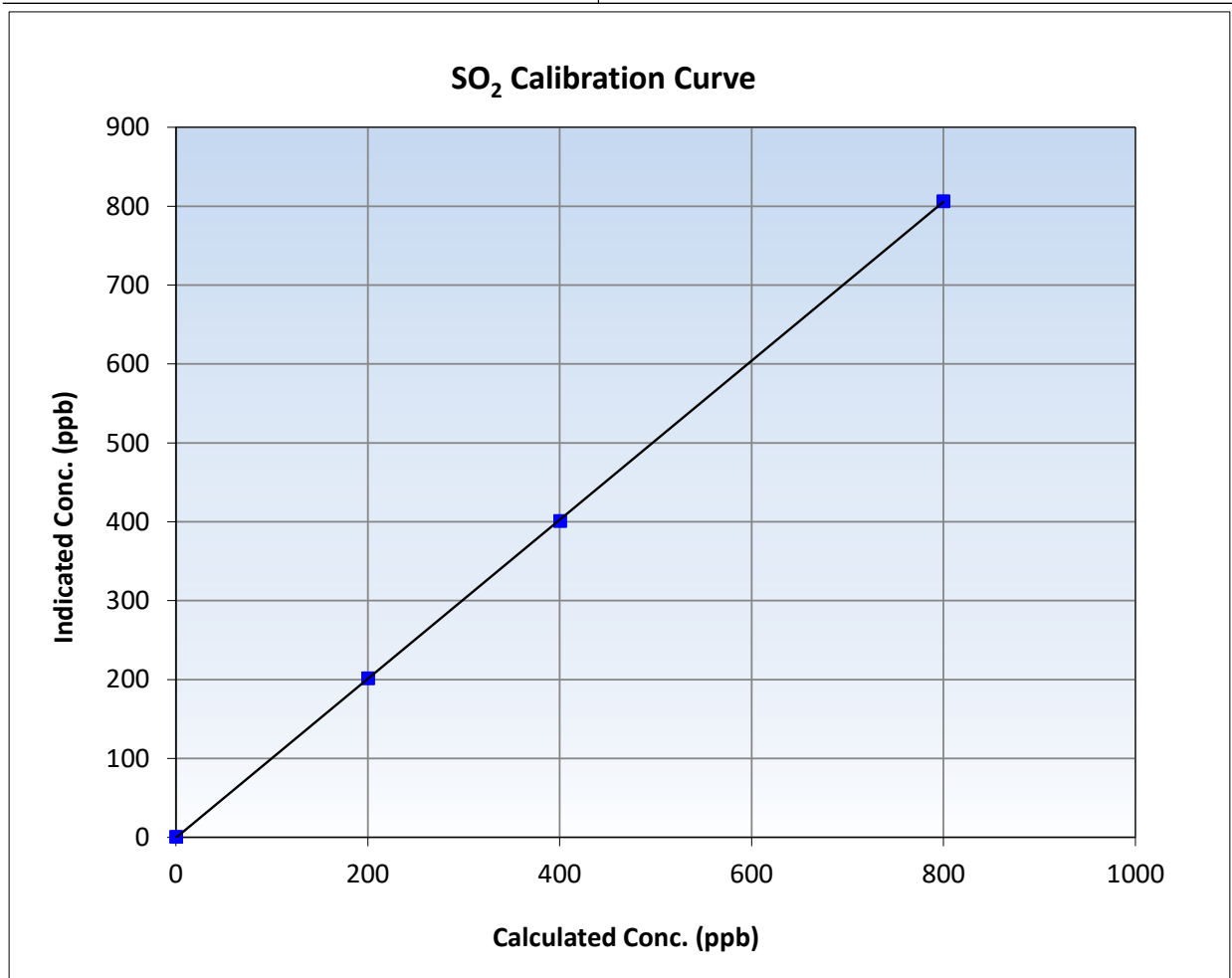
SO₂ Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 10, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	9:47	End Time (MST):	13:21
Analyzer make:	Thermo 43i	Analyzer serial #:	1410661308

Calibration Data

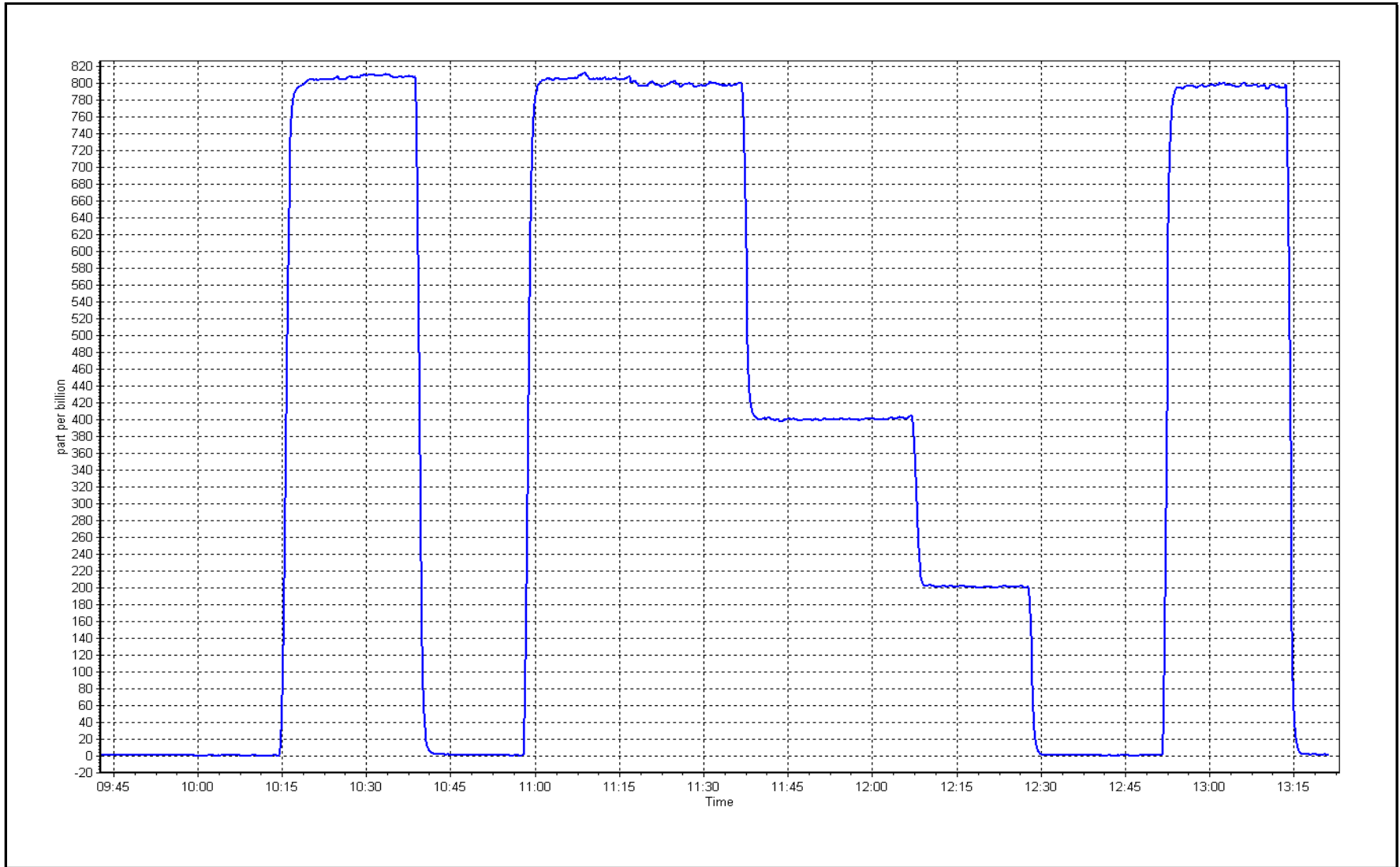
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.4	----	Correlation Coefficient	0.999983	≥0.995
799.5	806.0	0.9919	Slope	1.007593	0.90 - 1.10
400.3	400.7	0.9989	Intercept	-0.542421	+/-30
200.1	201.2	0.9946			



SO2 Calibration Plot

Date: October 9, 2024

Location: Firebag





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	October 2, 2024	Last Cal Date:	September 20, 2024
Start time (MST):	10:08	End time (MST):	15:08
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:	350 degC

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.006334	0.999333	Backgd or Offset:	2.78	2.80
Calibration intercept:	-0.240000	-0.020000	Coeff or Slope:	1.190	1.197

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4924	75.6	80.0	80.5	0.992
As found Mid point	4962	37.8	40.0	40.5	0.985
As found Low point	4981	18.9	20.0	20.2	0.985
New cylinder response					
Baseline Corr As found:	80.6	Prev response:	80.25	*% change:	0.4%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.007477	AF Intercept:	0.020000
Baseline Corr 3rd AF pt:	20.3	AF Correlation:	0.999983	* = > +/-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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4924	75.6	80.0	79.9	1.001
Mid point	4962	37.8	40.0	40.0	1.000
Low point	4981	18.9	20.0	19.9	1.005
As left zero	5000	0.0	0.0	0.0	----
As left span	4924	75.6	80.0	79.4	1.007
SO2 Scrubber Check	4922	78.3	783.0	0.0	----
Date of last scrubber change:		18-Jan-23		Ave Corr Factor	1.002
Date of last converter efficiency test:		n/a			

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

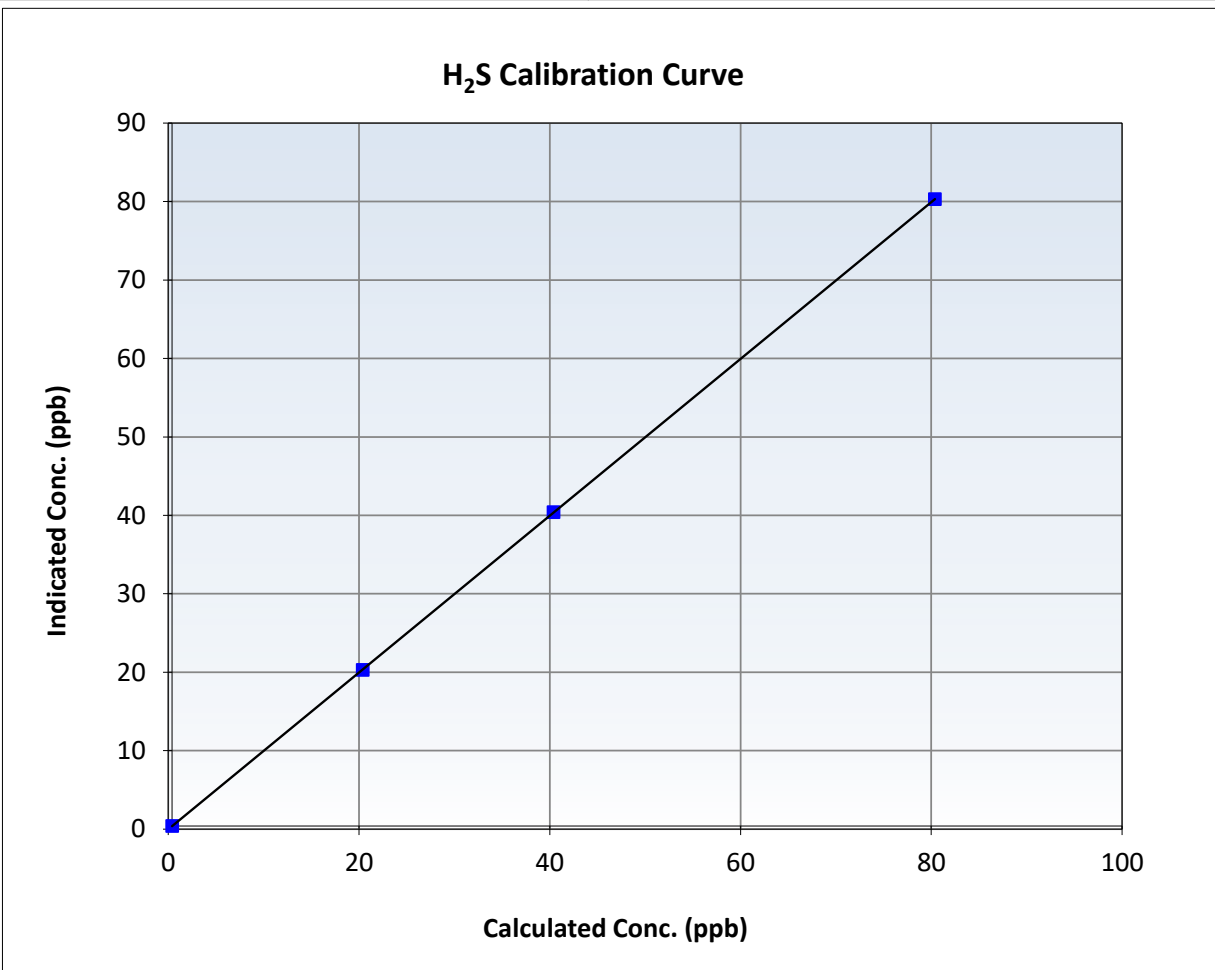
H2S Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 20, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:08	End Time (MST):	15:08
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680032

Calibration Data

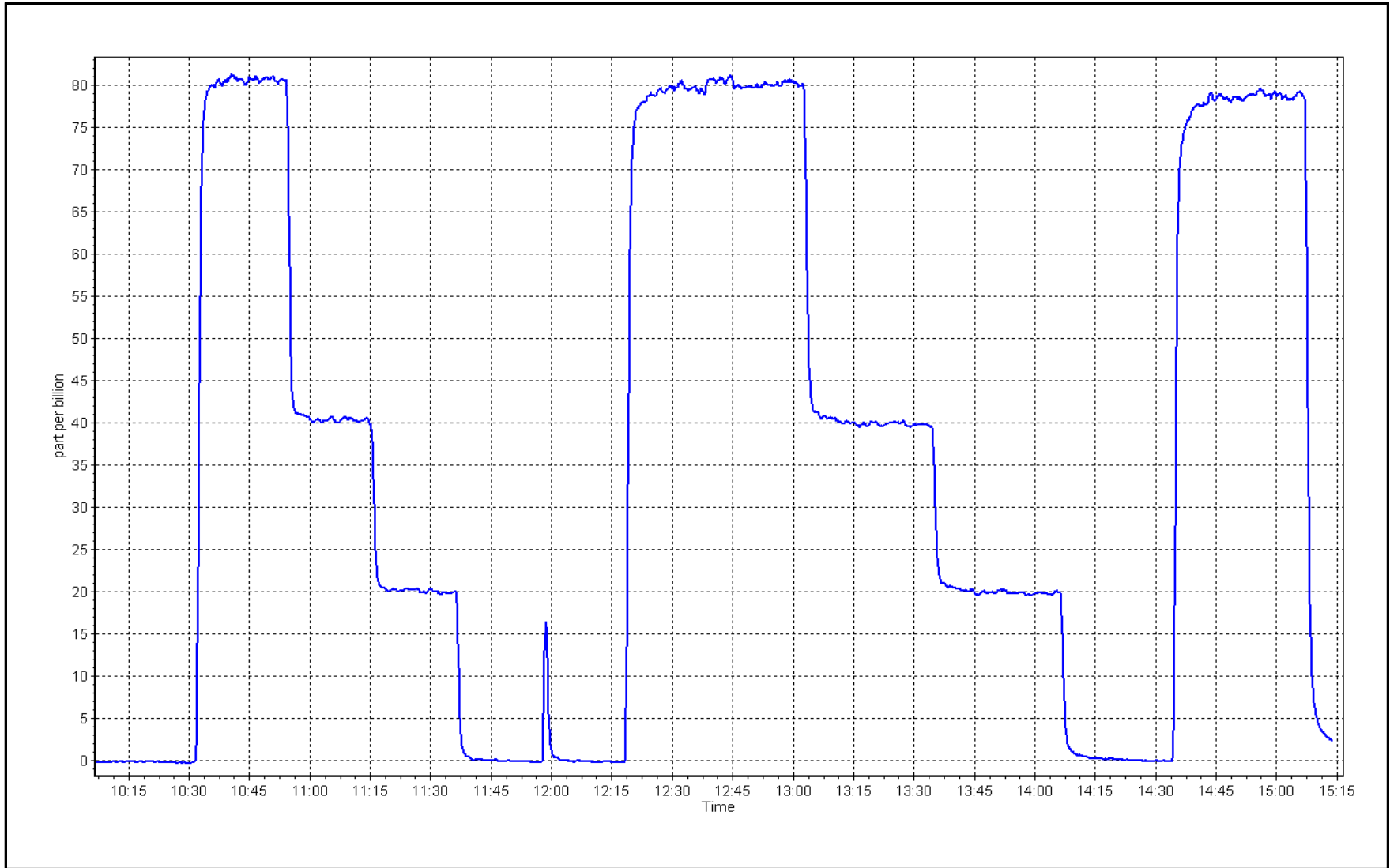
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999998	≥ 0.995
80.0	79.9	1.0011	Slope	0.999333	$0.90 - 1.10$
40.0	40.0	0.9998	Intercept	-0.020000	± 3
20.0	19.9	1.0048			



H2S Calibration Plot

Date: October 2, 2024

Location: Firebag





Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	October 9, 2024	Last Cal Date:	September 10, 2024
Start time (MST):	9:47	End time (MST):	13:21
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997445	0.991837	Background:	2.07	2.07
Calibration intercept:	0.014665	-0.023105	Coefficient:	3.835	3.835

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) <i>Limit = 0.90-1.10</i>
As found zero	4999	0.0	0.00	-0.15	----
As found High point	4919	81.1	17.31	17.07	1.005
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.22	Previous response	17.28	*% 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	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	4999	0.0	0.00	0.01	----
High point	4919	81.1	17.31	17.17	1.008
Mid point	4959	40.6	8.66	8.52	1.017
Low point	4980	20.3	4.33	4.26	1.017
As left zero	5000	0.0	0.00	-0.03	----
As left span	4919	81.1	17.31	17.31	1.000
Average Correction Factor					1.014

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

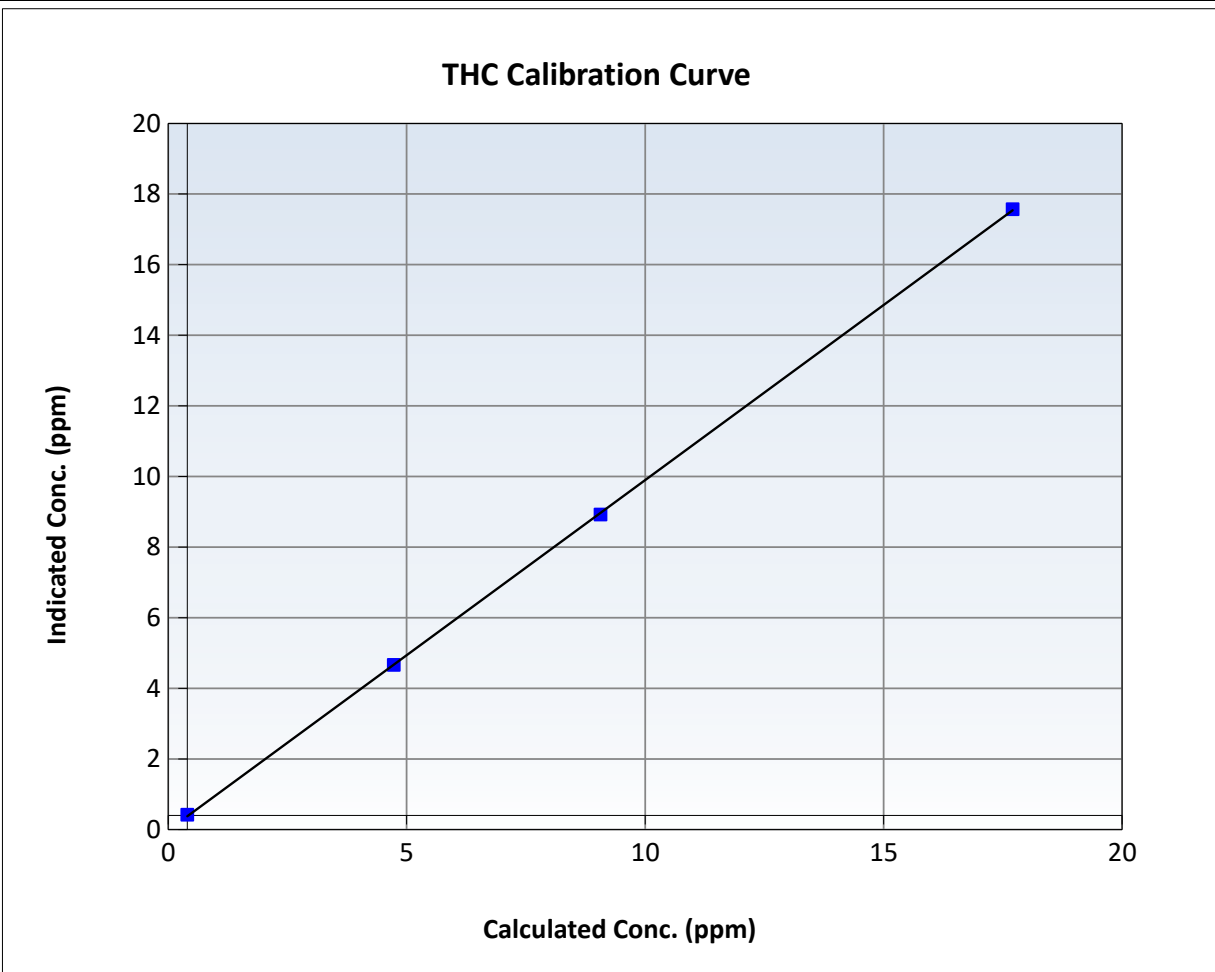
THC Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 10, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	9:47	End Time (MST):	13:21
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1336160089

Calibration Data

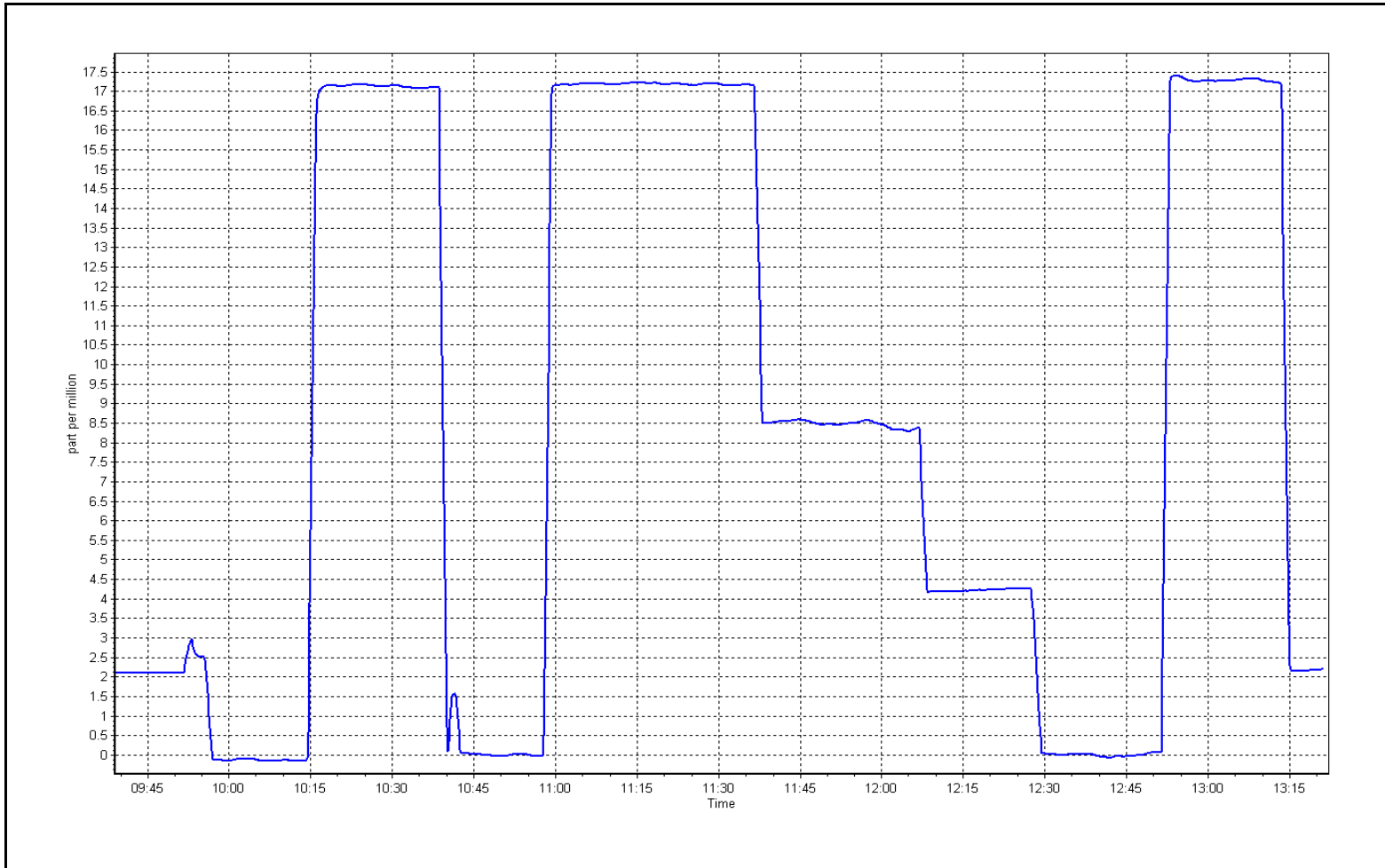
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.01	----	Correlation Coefficient	0.999969	≥0.995
17.31	17.17	1.0079	Slope	0.991837	0.90 - 1.10
8.66	8.52	1.0169	Intercept	-0.023105	+/-1.5
4.33	4.26	1.0175			



THC Calibration Plot

Date: October 9, 2024

Location: Firebag





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Firebag
 Station number: AMS 19
 Calibration Date: October 3, 2024
 Last Cal Date: September 9, 2024
 Start time (MST): 10:26
 End time (MST): 15:59
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: DT0044018
 NOX Cal Gas Conc: 48.90 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 48.90 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701H
 Cal Gas Expiry Date: November 3, 2031
 NO Cal Gas Conc: 48.70 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 48.70 ppm
 NO gas Diff:
 Serial Number: 1607
 Serial Number: 201

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
AF High point	4918	82.1	802.9	799.7	3.3	811.0	807.0	4.6	0.9899	0.9908
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO _x = 799.7 ppb	NO = 797.9 ppb	<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 1.4%
Baseline Corr 1st pt	NO _x = 811.1 ppb	NO = 807.1 ppb	<u>As Found Statistics</u>		*Percent Change	NO = 1.1%
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb	As found	NO _x r ² :	Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb	As found	NO r ² :	NO SI:	NO Int:
			As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1410661309

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.994331	1.008318
NO _x Cal Offset:	1.320201	-0.318946
NO Cal Slope:	0.997343	1.010359
NO Cal Offset:	0.420117	-0.859044
NO ₂ Cal Slope:	1.000553	0.997413
NO ₂ Cal Offset:	-0.531676	-0.644750

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	0.919	0.911	NO bkgnd or offset:	4.6	4.6
NOX coeff or slope:	0.994	0.995	NOX bkgnd or offset:	4.6	4.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	162.3	163.0

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
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	810.0	808.0	2.2	0.9913	0.9897
Mid point	4959	41.1	402.0	400.3	1.6	403.2	401.7	1.5	0.9969	0.9965
Low point	4980	20.5	200.5	199.7	0.8	202.6	201.0	1.6	0.9896	0.9934
As left zero	5000	0	0.0	0.0	0.0	0.1	-0.1	0.1	----	----
As left span	4918	82.1	802.9	411.0	391.9	799.9	411.0	388.9	1.0038	1.0000
Average Correction Factor									0.9926	0.9932

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	796.8	411.3	388.8	387.5	1.0033	99.7%
Mid GPT point	796.8	602.7	197.4	195.8	1.0081	99.2%
Low GPT point	796.8	700.8	99.3	97.8	1.0152	98.5%
Average Correction Factor					1.0089	99.1%

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

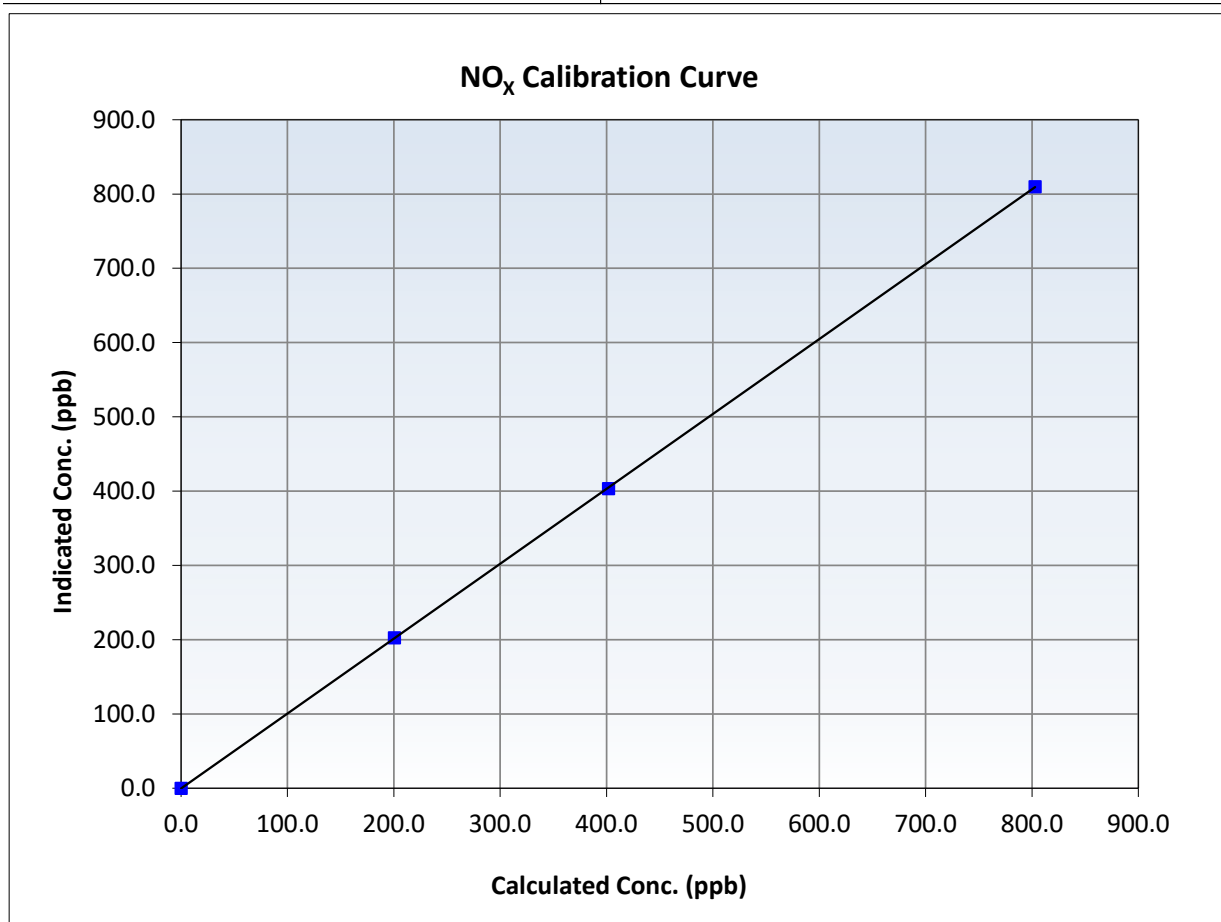
NO_x Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 9, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:26	End Time (MST):	15:59
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999988	≥0.995
802.9	810.0	0.9913	Slope	1.008318	0.90 - 1.10
402.0	403.2	0.9969	Intercept	-0.318946	+/-20
200.5	202.6	0.9896			





Wood Buffalo Environmental Association

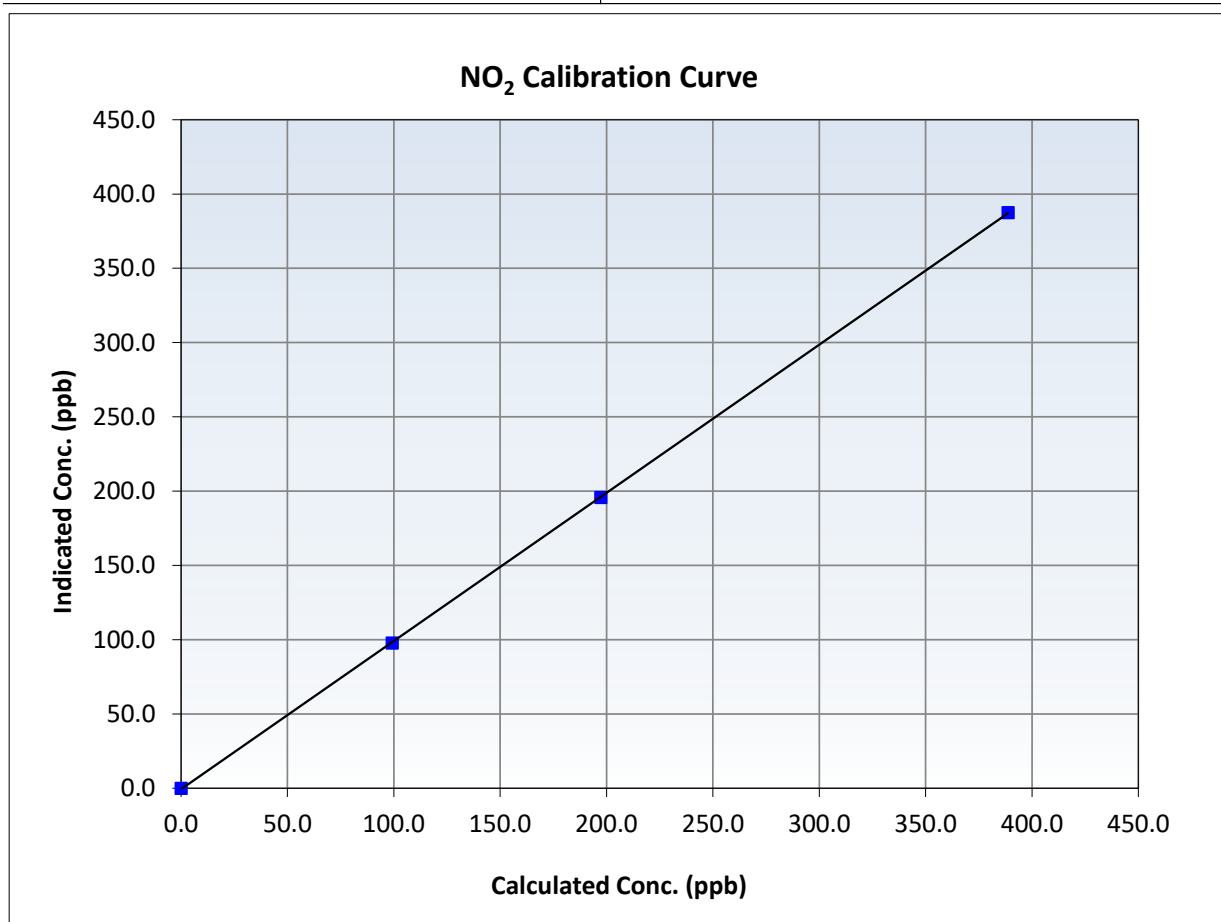
NO₂ Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 9, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:26	End Time (MST):	15:59
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999987	≥0.995
388.8	387.5	1.0033	Slope	0.997413	0.90 - 1.10
197.4	195.8	1.0081	Intercept	-0.644750	+/-20
99.3	97.8	1.0152			





Wood Buffalo Environmental Association

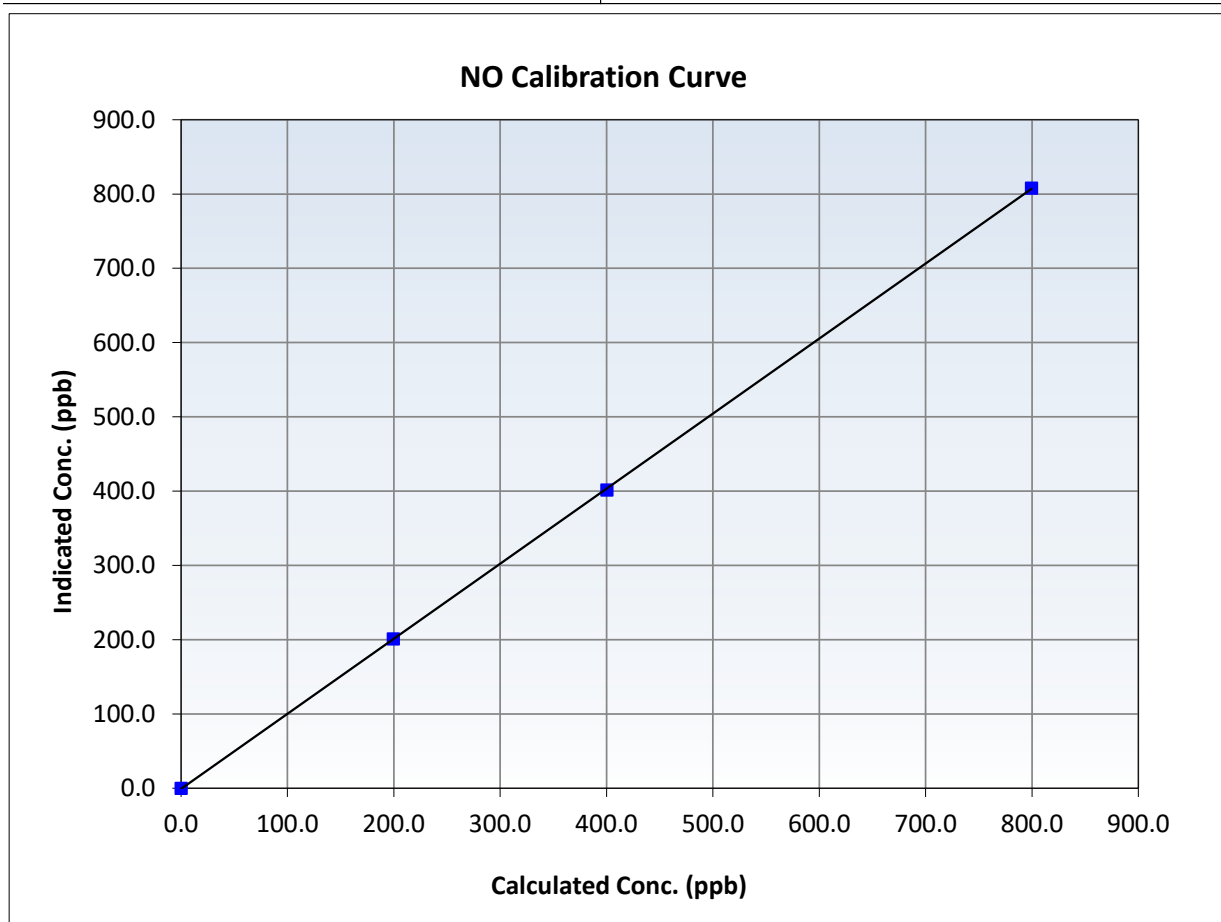
NO Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 9, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:26	End Time (MST):	15:59
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

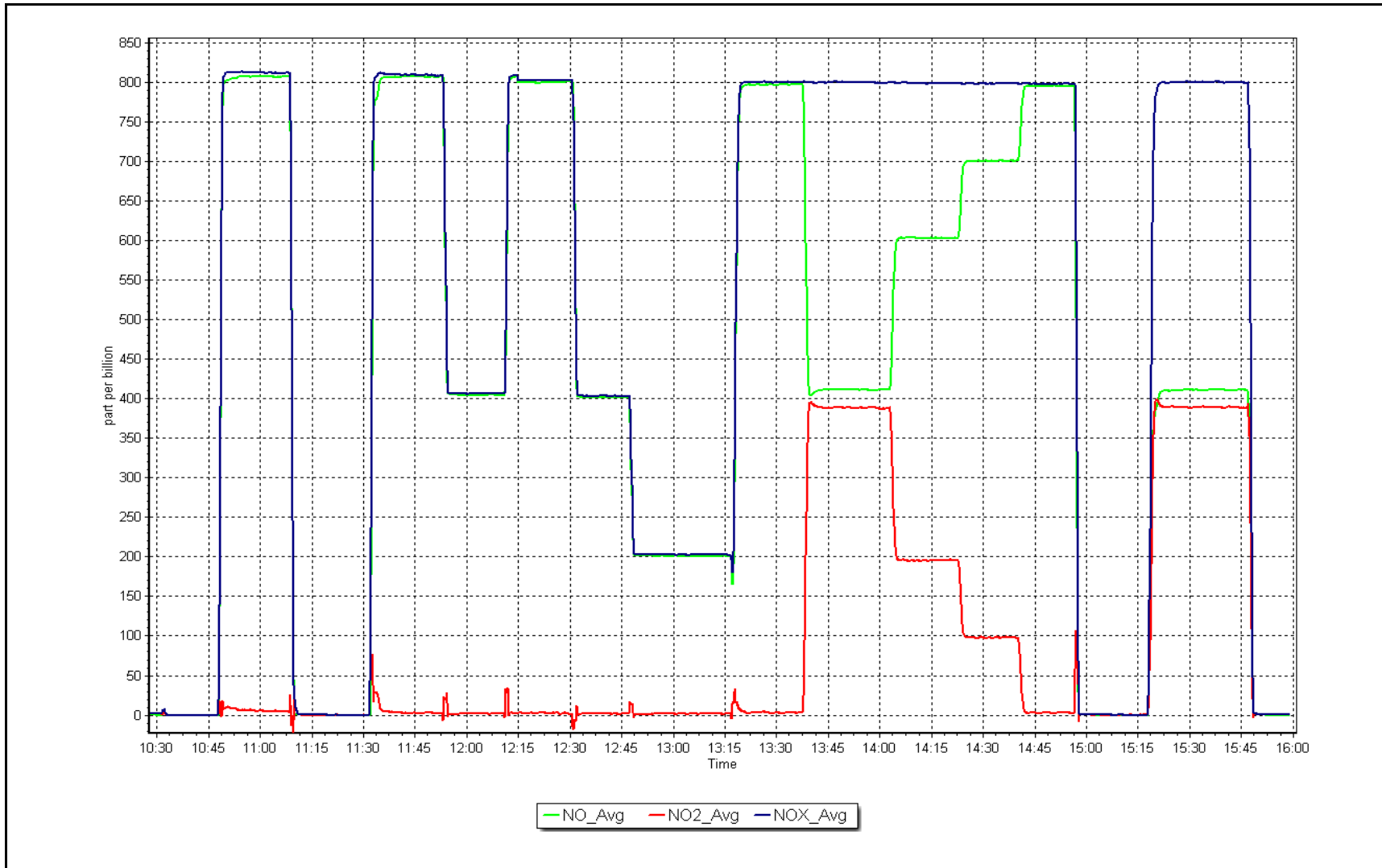
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999985	<i>≥0.995</i>
799.7	808.0	0.9897	Slope	1.010359	<i>0.90 - 1.10</i>
400.3	401.7	0.9965	Intercept	-0.859044	<i>+/-20</i>
199.7	201.0	0.9934			



NO_x Calibration Plot

Date: October 3, 2024

Location: Firebag





Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Firebag	Station Number:	AMS 19
Calibration Date:	October 3, 2024	Prev Cal Date:	May 4, 2023
Start Time (MST):	12:38	End Time (MST):	15:45
Tower Height (m):	10.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	W15276
WS Calibrator:	MetOne 053	Serial Number:	CA 03845

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.3	-0.3%
600	58.6	58.4	-0.3%
800	77.8	77.6	-0.3%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		1.000000	≥0.9995
Calculated slope		1.002571	0.90 - 1.10
Calculated intercept		0.005172	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	A23968
As Found Declination (deg east of True North):	<u>13</u>	As Left Declination (deg east of True North):	<u>12</u>
Solar noon time (MST):	13:12	Calc Declination*:	13.24 Degrees
Deadband calc:	-1.0 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	2.0	---
90	86.8	-0.9%
180	178.7	-0.4%
270	275.1	1.4%
357	360.0	0.8%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999792	≥0.9995
Calculated slope		0.988192	0.90 - 1.10
Calculated intercept		1.011495	+/- 4

Notes: WD readings were not within limits, will replace at next possible opportunity.

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Firebag	Station Number:	AMS 19
Calibration Date:	October 9, 2024	Prev Cal Date:	October 3, 2024
Start Time (MST):	10:10	End Time (MST):	11:20
Tower Height (m):	10.0	Reason:	Removal

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	W15276
WS Calibrator:	MetOne 053	Serial Number:	CA 03845

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

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)			≥0.9995
Calculated slope			0.90 - 1.10
Calculated intercept			+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	A23968
As Found Declination (deg east of True North):	<u>12</u>	As Left Declination (deg east of True North):	<u>NA</u>
Solar noon time (MST):	13:10	Calc Declination*:	13.24 Degrees
Deadband calc:	2.3 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	1.7	---
90	86.8	-0.9%
180	178.4	-0.4%
270	275.3	1.5%
355	356.4	0.4%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999771	≥0.9995
Calculated slope		0.990738	0.90 - 1.10
Calculated intercept		0.940672	+/- 4

Notes: Removal due to wind direction sensor not meeting WBEA criteria.

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Firebag	Station Number:	AMS 19
Calibration Date:	October 9, 2024	Prev Cal Date:	October 3, 2024
Start Time (MST):	11:20	End Time (MST):	13:35
Tower Height (m):	10.0	Reason:	Install

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	W15276
WS Calibrator:	MetOne 053	Serial Number:	CA 03845

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.2	0.1%
400	39.4	39.3	0.0%
600	58.6	58.5	0.0%
800	77.8	77.7	-0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		1.000000	≥ 0.9995
Calculated slope		1.000759	$0.90 - 1.10$
Calculated intercept		-0.016136	± 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	P22885
As Found Declination (deg east of True North):	<u>NA</u>	As Left Declination (deg east of True North):	<u>13</u>
Solar noon time (MST):	13:10	Calc Declination*:	13.24 Degrees
Deadband calc:	2.4 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	2.7	---
90	91.5	0.4%
180	180.4	0.1%
270	270.7	0.2%
355	357.3	0.6%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999977	≥ 0.9995
Calculated slope		1.001824	$0.90 - 1.10$
Calculated intercept		-1.849285	± 4

Notes: Replaced wind direction sensor. Verified wind speed readings after replacing bearings.

Calibration Performed By: Braiden Boutilier



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS20 MACKAY RIVER OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	October 3, 2024	Last Cal Date:	September 13, 2024
Start time (MST):	8:30	End time (MST):	11:10
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.006460	0.999050	Backgd or Offset:	18.5	18.5
Calibration intercept:	3.071466	3.491261	Coeff or Slope:	0.930	0.930

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.5	----
As found High point	4919	81.3	800.3	805.2	0.994
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	804.7	Previous response	808.5	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.6	----
High point	4919	81.3	800.3	802.0	0.998
Mid point	4959	40.7	400.7	403.9	0.992
Low point	4980	20.3	199.8	206.9	0.966
As left zero	5000	0.0	0.0	0.6	----
As left span	4919	81.3	800.3	802.7	0.997
Average Correction Factor:					0.985

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

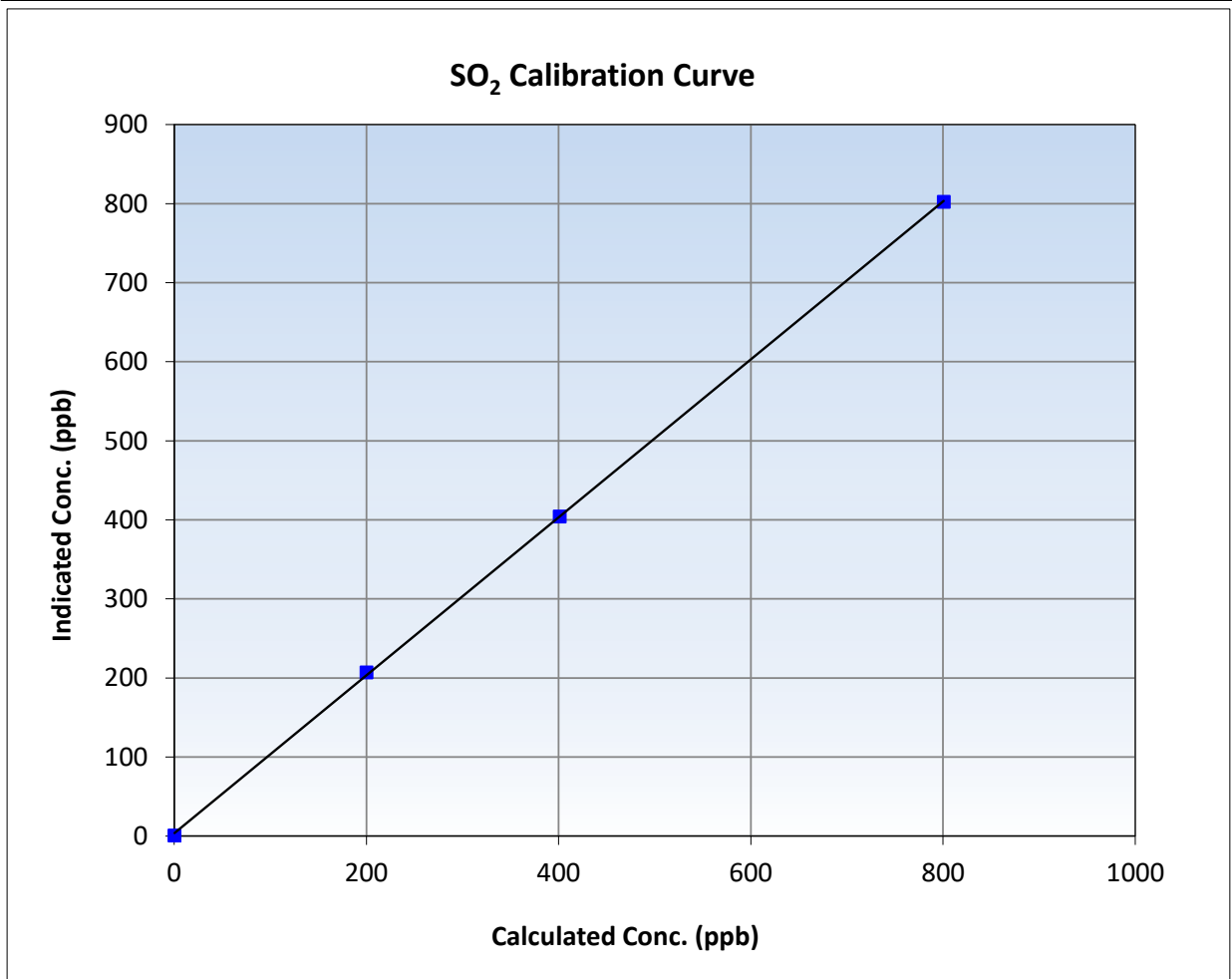
SO₂ Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 13, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:30	End Time (MST):	11:10
Analyzer make:	Thermo 43i	Analyzer serial #:	1501301450

Calibration Data

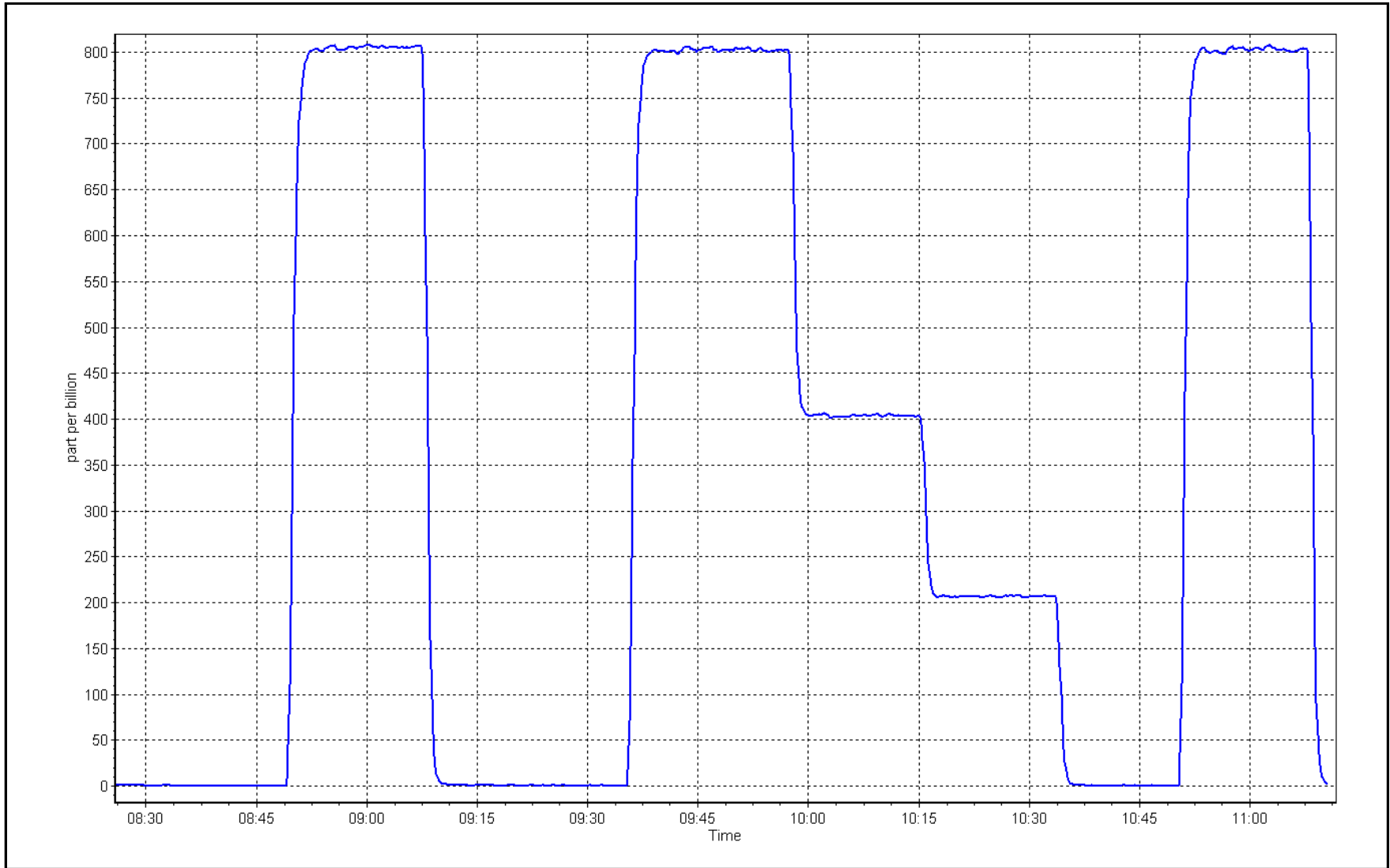
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.6	----	Correlation Coefficient	0.999932	≥0.995
800.3	802.0	0.9978	Slope	0.999050	0.90 - 1.10
400.7	403.9	0.9920	Intercept	3.491261	+/-30
199.8	206.9	0.9658			



SO2 Calibration Plot

Date: October 3, 2024

Location: MacKay River





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	October 7, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	7:21	End time (MST):	11:27
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.986589	0.977727	Backgd or Offset:	3.43	3.43
Calibration intercept:	0.599295	0.559179	Coeff or Slope:	1.051	1.051

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4922	78.1	80.0	80.0	1.001
As found Mid point	4961	39.0	39.9	40.3	0.993
As found Low point	4980	19.5	20.0	20.7	0.969
New cylinder response					
Baseline Corr As found:	79.9	Prev response:	79.50	*% change:	0.5%
Baseline Corr 2nd AF pt:	40.2	AF Slope:	0.996737	AF Intercept:	0.419423
Baseline Corr 3rd AF pt:	20.6	AF Correlation:	0.999923	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4922	78.1	80.0	78.5	1.019
Mid point	4961	39.0	39.9	40.0	0.998
Low point	4980	19.5	20.0	20.3	0.984
As left zero	5000	0.0	0.0	0.3	----
As left span	4922	78.1	80.0	77.1	1.037
SO ₂ Scrubber Check	4982	81.3	802.8	0.0	----
Date of last scrubber change:	25-May-23			Ave Corr Factor	1.000
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

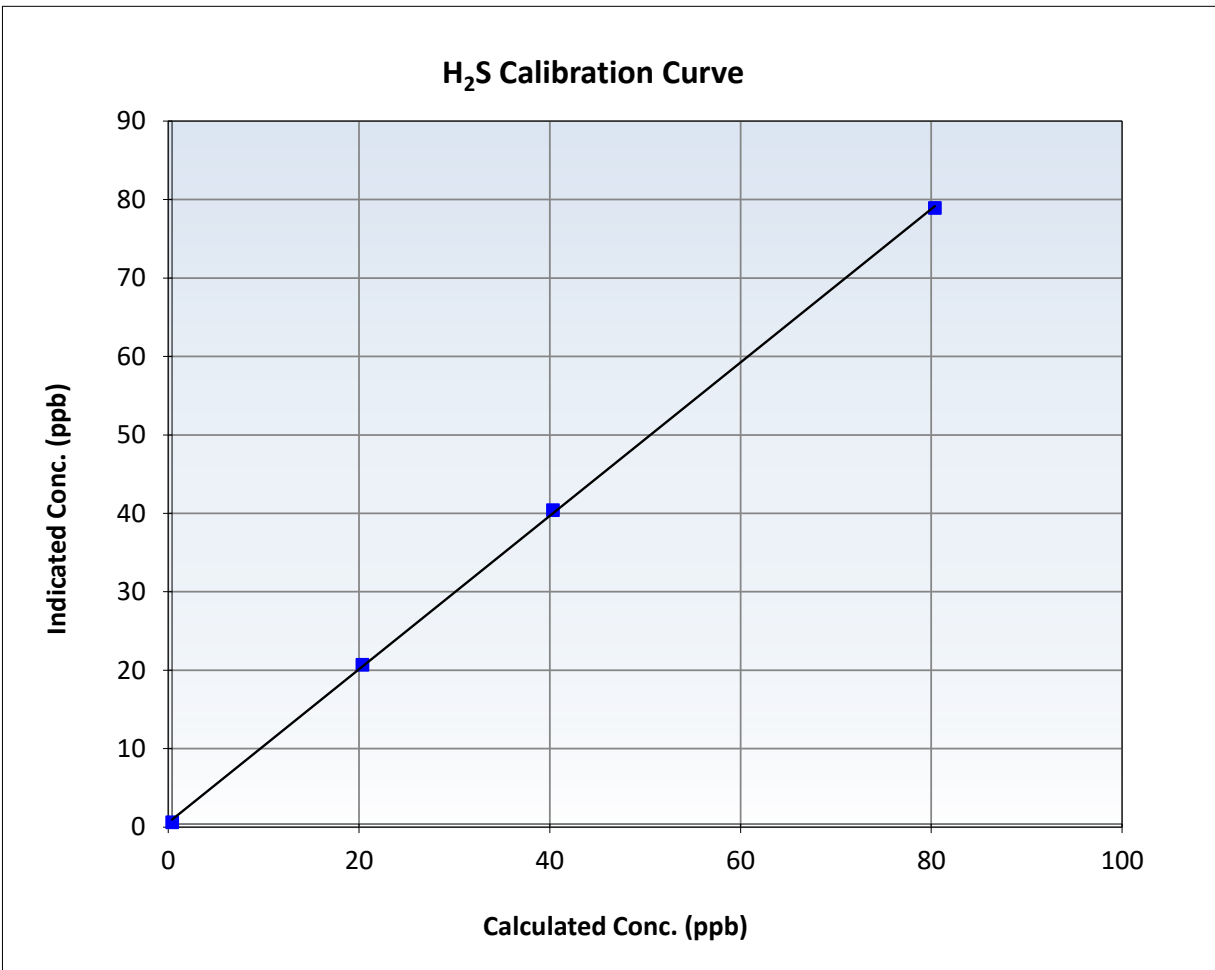
H₂S Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 11, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	7:21	End Time (MST):	11:27
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1236656117

Calibration Data

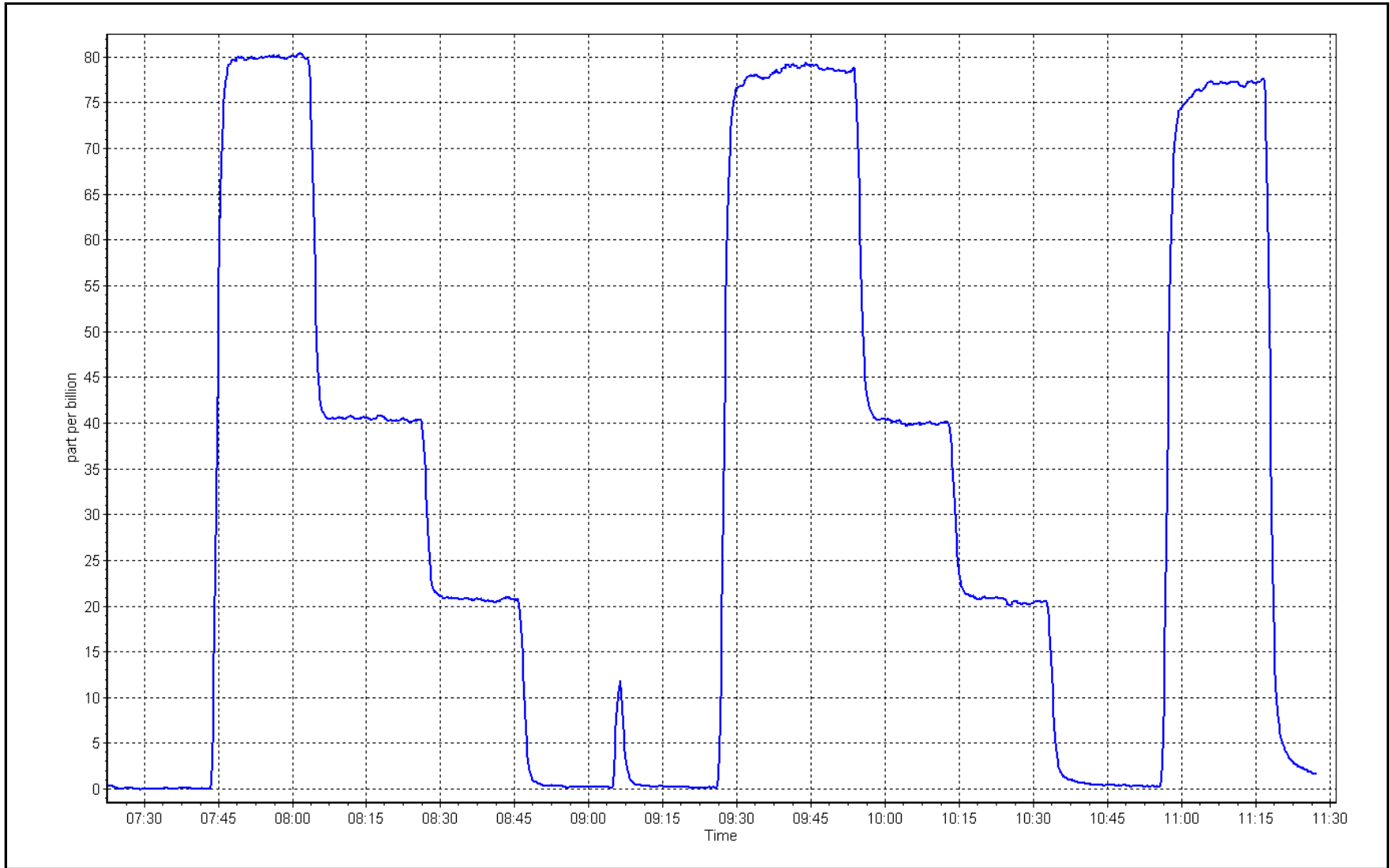
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.2	----	Correlation Coefficient	0.999882	≥0.995
80.0	78.5	1.0188	Slope	0.977727	0.90 - 1.10
39.9	40.0	0.9984	Intercept	0.559179	+/-3
20.0	20.3	0.9837			



H₂S Calibration Plot

Date: October 7, 2024

Location: MacKay River





Wood Buffalo Environmental Association

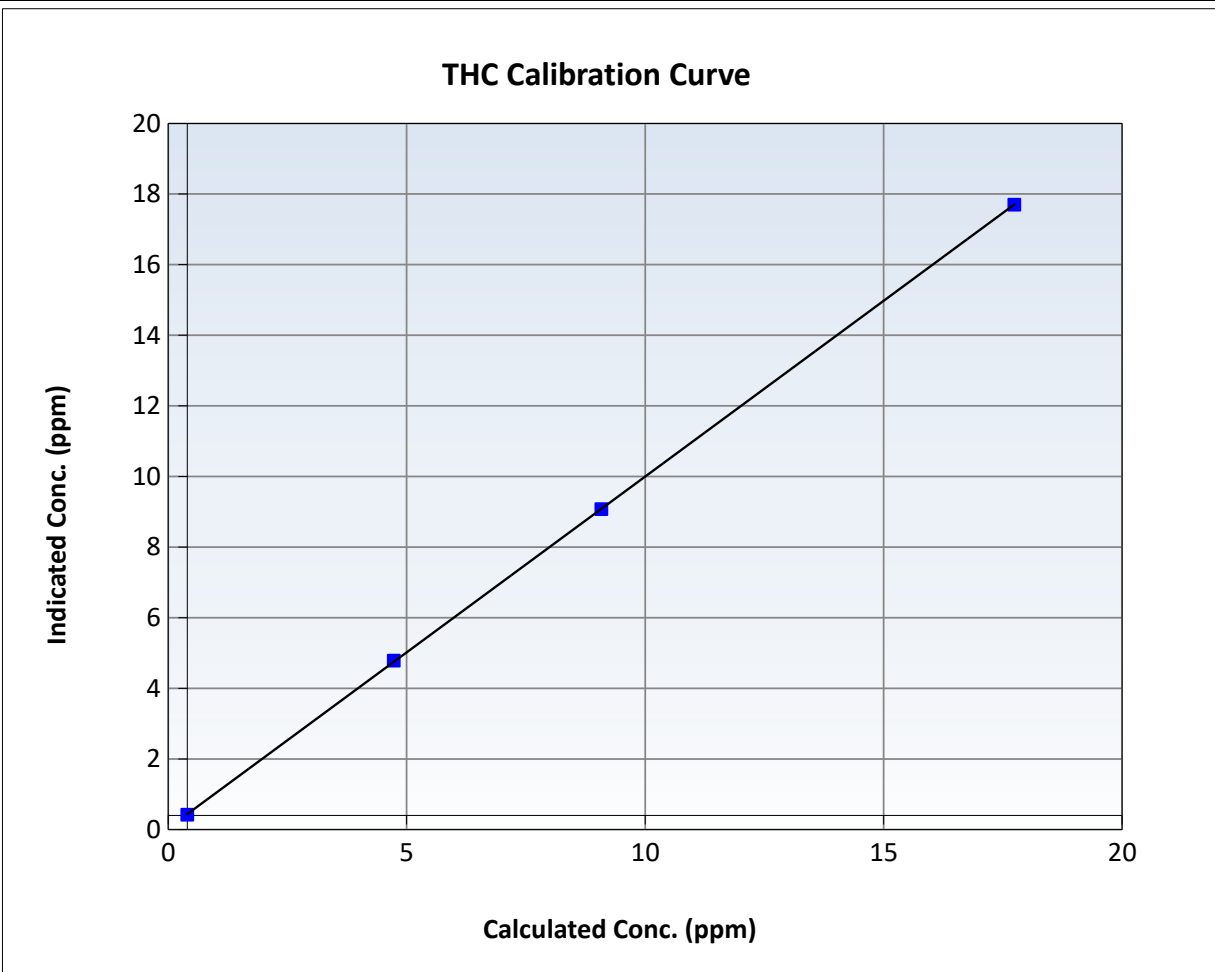
THC Calibration Summary

Station Information

Calibration Date:	October 3, 2024	Previous Calibration:	September 13, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:30	End Time (MST):	11:09
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1501663727

Calibration Data

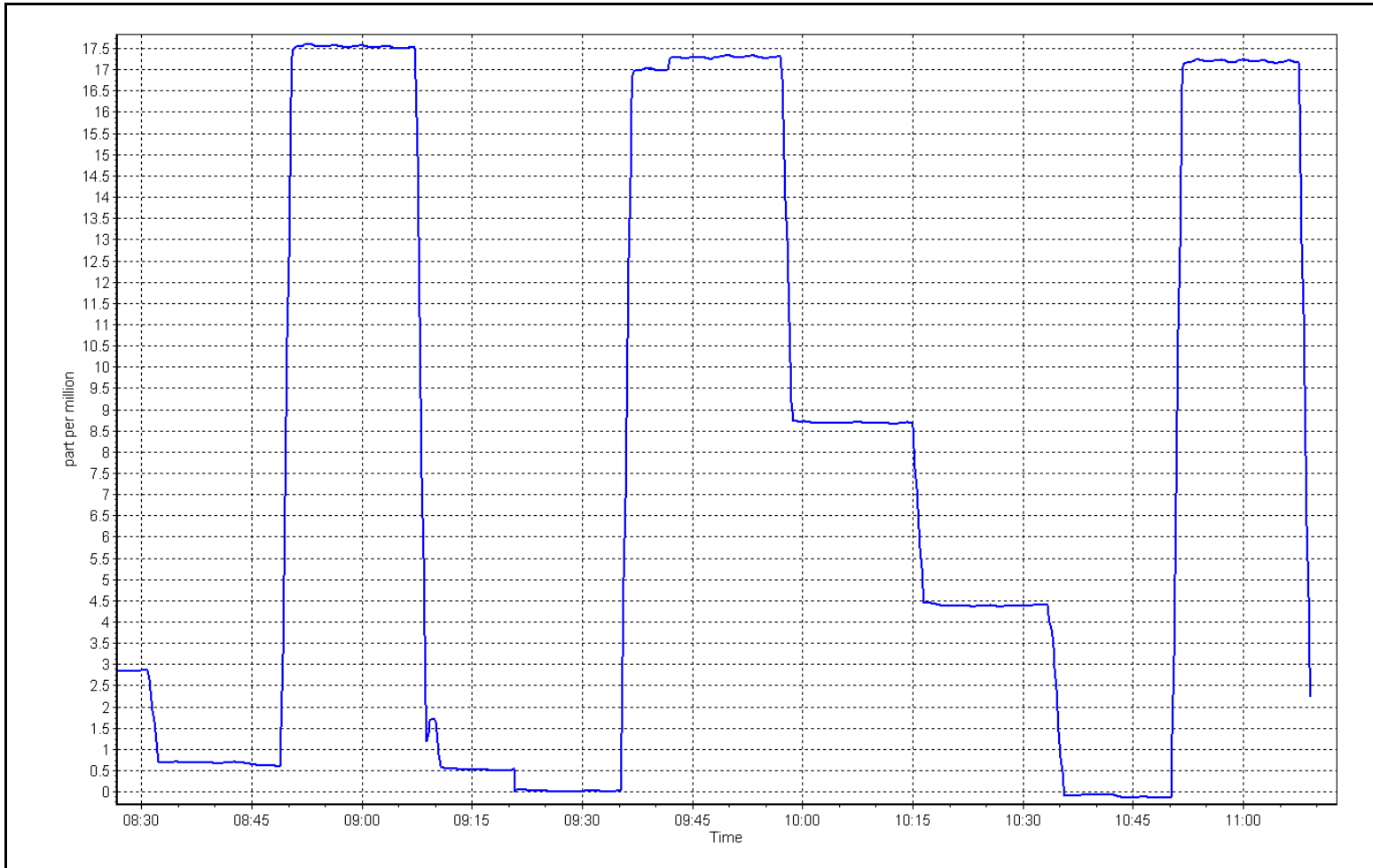
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.02	----	Correlation Coefficient	0.999989	≥0.995
17.34	17.30	1.0023	Slope	0.995690	0.90 - 1.10
8.68	8.68	1.0007	Intercept	0.039606	+/-1.5
4.33	4.39	0.9873			



THC Calibration Plot

Date: October 3, 2024

Location: MacKay River





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: MacKay River
 Station number: AMS 20
 Calibration Date: October 1, 2024
 Last Cal Date: September 9, 2024
 Start time (MST): 7:05
 End time (MST): 11:20
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: T376265
 NOX Cal Gas Conc: 49.19 ppm
 Removed Cylinder #:
 Removed Gas NOX Conc: 49.19 ppm
 NOX gas Diff:
 Calibrator Model: API T700
 ZAG make/model: API T701
 Cal Gas Expiry Date: April 13, 2025
 NO Cal Gas Conc: 48.04 ppm
 Removed Gas Exp Date:
 Removed Gas NO Conc: 48.04 ppm
 NO gas Diff:
 Serial Number: 1220
 Serial Number: 4522

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	----	----
AF High point	4917	83.3	819.5	800.3	19.2	832.9	811.6	21.2	0.9836	0.9861
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 822.2 ppb		NO = 802.0 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 1.3%	
Baseline Corr 1st pt	NO _x = 833.1 ppb		NO = 811.6 ppb			<u>As Found Statistics</u>		*Percent Change	NO = 1.2%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1505164379

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.997788	0.996267
NO _x Cal Offset:	4.602226	4.122439
NO Cal Slope:	0.997472	0.994888
NO Cal Offset:	3.702631	3.282748
NO ₂ Cal Slope:	1.000948	1.005386
NO ₂ Cal Offset:	-0.433255	-0.450485

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.013	1.001	NO bkgnd or offset:	2.8	2.8
NOX coeff or slope:	0.993	0.994	NOX bkgnd or offset:	3.1	3.0
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	160.6	160.6

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.1	-0.2	----	----
High point	4917	83.3	819.5	800.3	19.2	818.7	798.1	20.5	1.0009	1.0028
Mid point	4958	41.7	410.3	400.7	9.6	414.1	402.9	11.2	0.9907	0.9945
Low point	4979	20.8	204.6	199.9	4.8	212.8	205.7	7.1	0.9616	0.9716
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	----	----
As left span	4917	83.3	819.5	436.4	383.1	814.6	436.4	378.3	1.0060	1.0000
Average Correction Factor									0.9844	0.9896

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.2	----	----
High GPT point	792.4	437.4	374.2	375.8	0.9956	100.4%
Mid GPT point	792.4	608.1	203.5	204.2	0.9964	100.4%
Low GPT point	792.4	696.9	114.7	114.4	1.0023	99.8%
Average Correction Factor					0.9981	100.2%

Notes: No maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

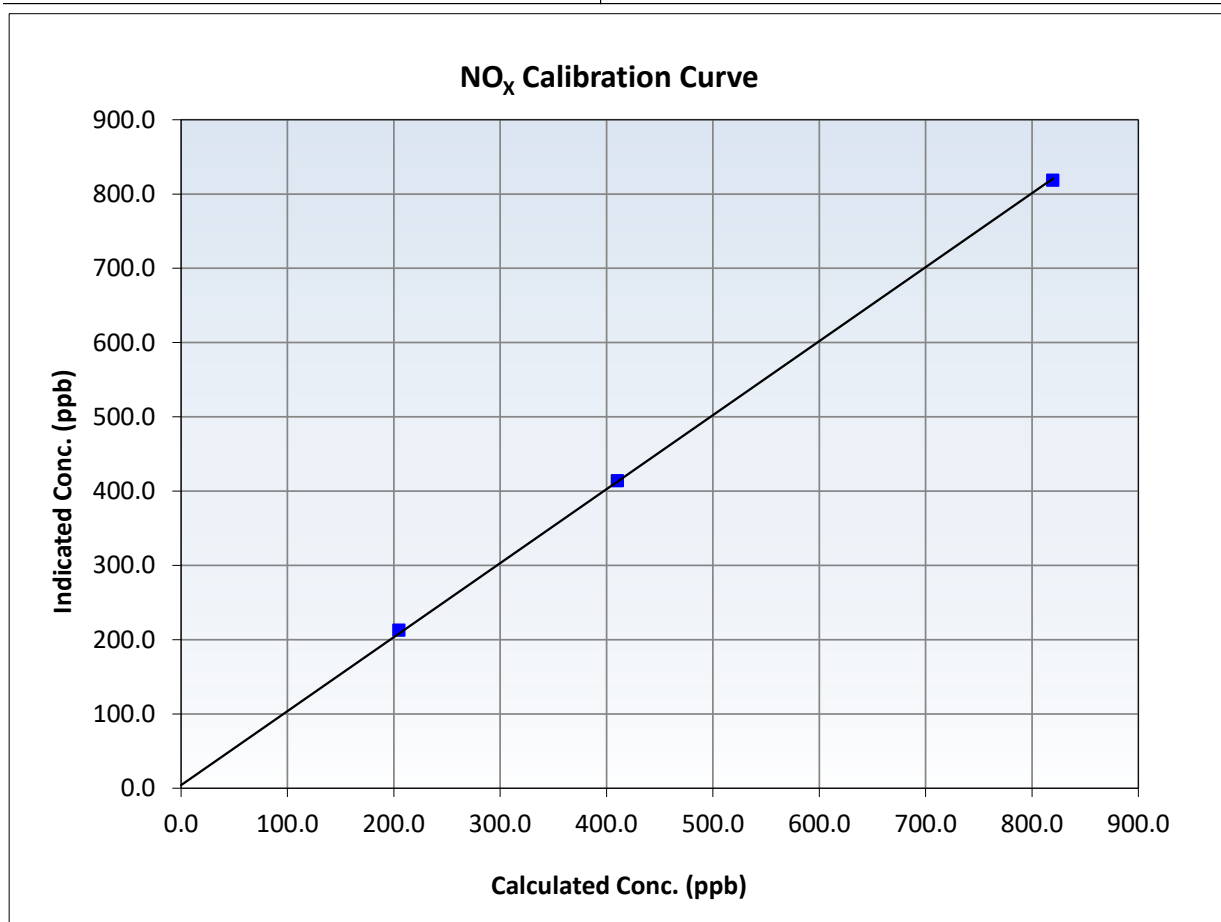
NO_x Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 9, 2024
Station Name:	Mackay River	Station Number:	AMS 20
Start Time (MST):	7:05	End Time (MST):	11:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999875	<i>≥0.995</i>
819.5	818.7	1.0009	Slope	0.996267	<i>0.90 - 1.10</i>
410.3	414.1	0.9907	Intercept	4.122439	<i>+/-20</i>
204.6	212.8	0.9616			





Wood Buffalo Environmental Association

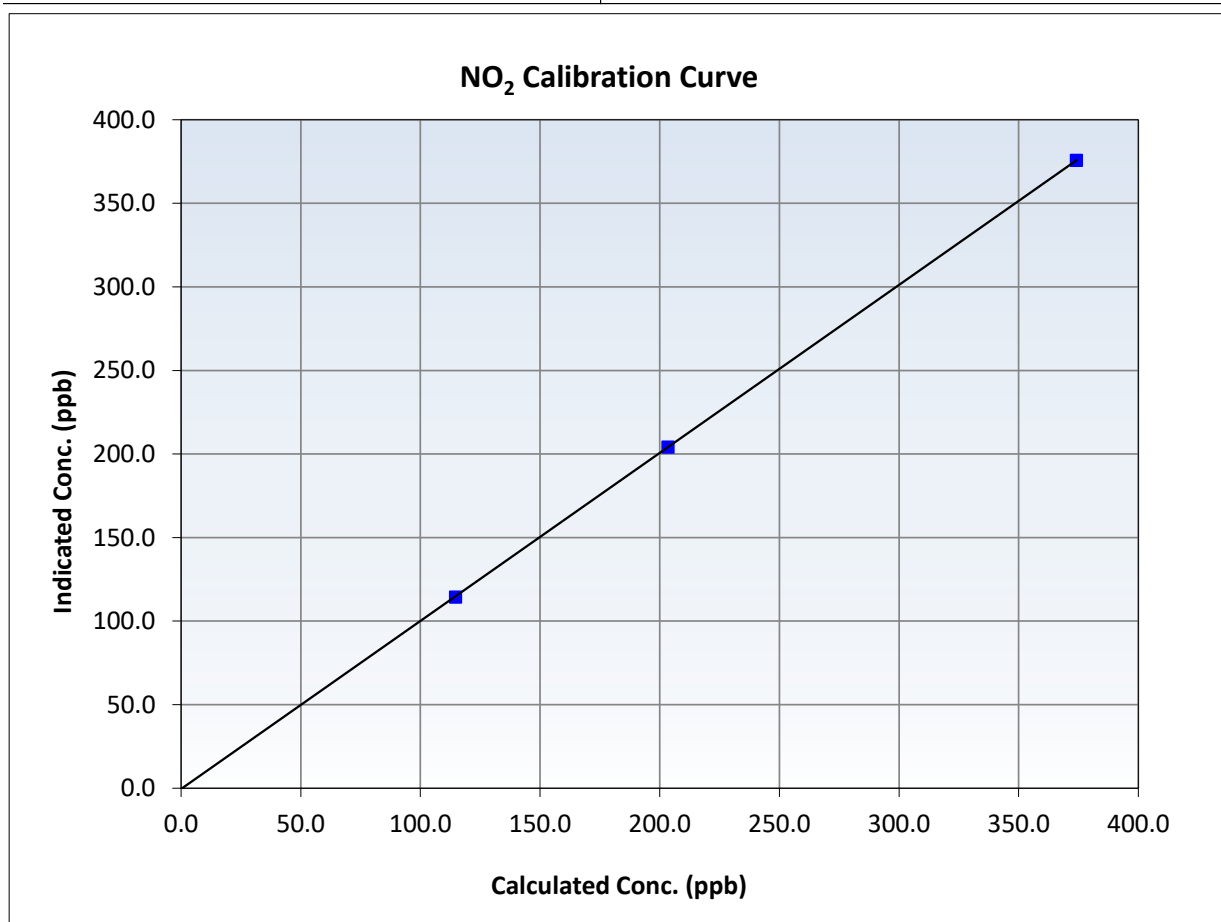
NO₂ Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 9, 2024
Station Name:	Mackay River	Station Number:	AMS 20
Start Time (MST):	7:05	End Time (MST):	11:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.2	----	Correlation Coefficient	0.999997	≥0.995
374.2	375.8	0.9956	Slope	1.005386	0.90 - 1.10
203.5	204.2	0.9964	Intercept	-0.450485	+/-20
114.7	114.4	1.0023			





Wood Buffalo Environmental Association

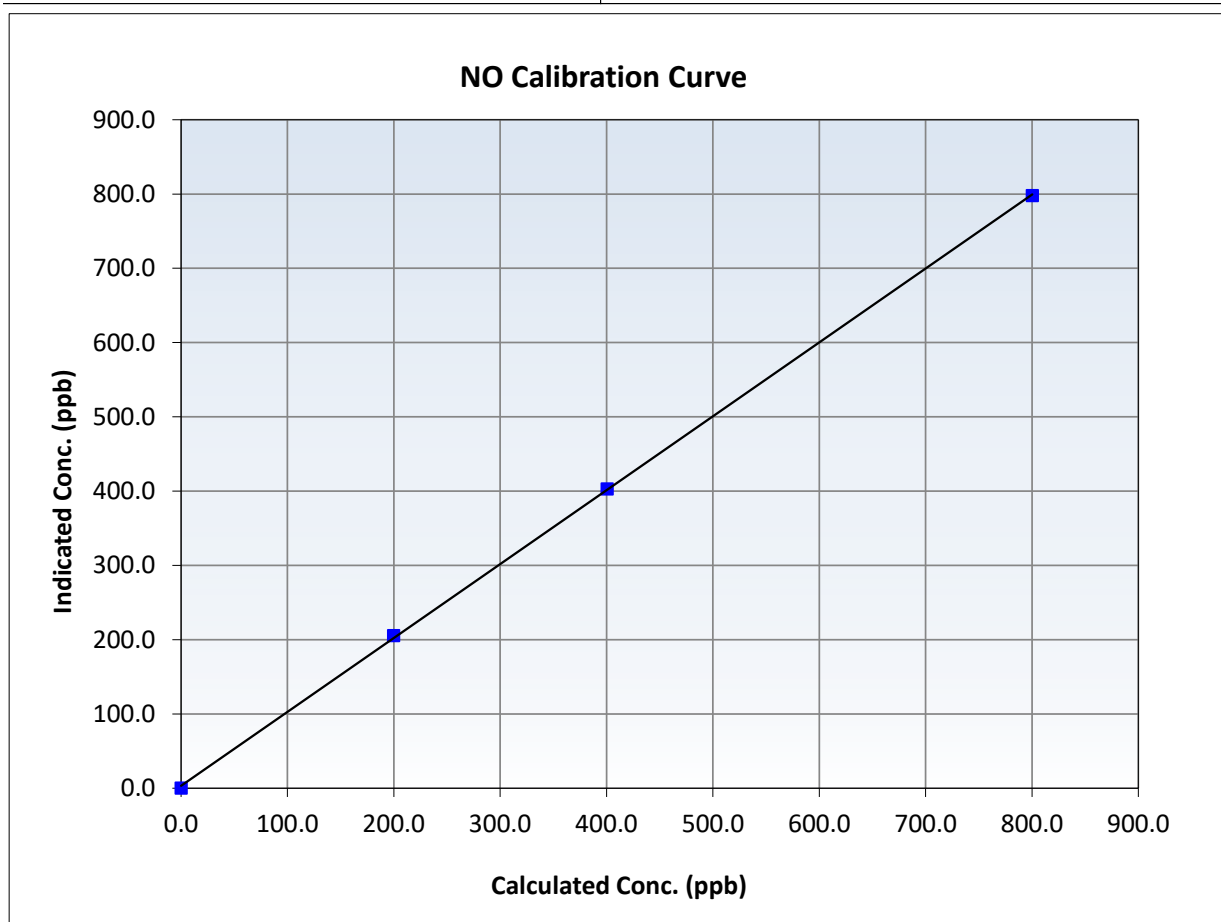
NO Calibration Summary

Station Information

Calibration Date:	October 1, 2024	Previous Calibration:	September 9, 2024
Station Name:	Mackay River	Station Number:	AMS 20
Start Time (MST):	7:05	End Time (MST):	11:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

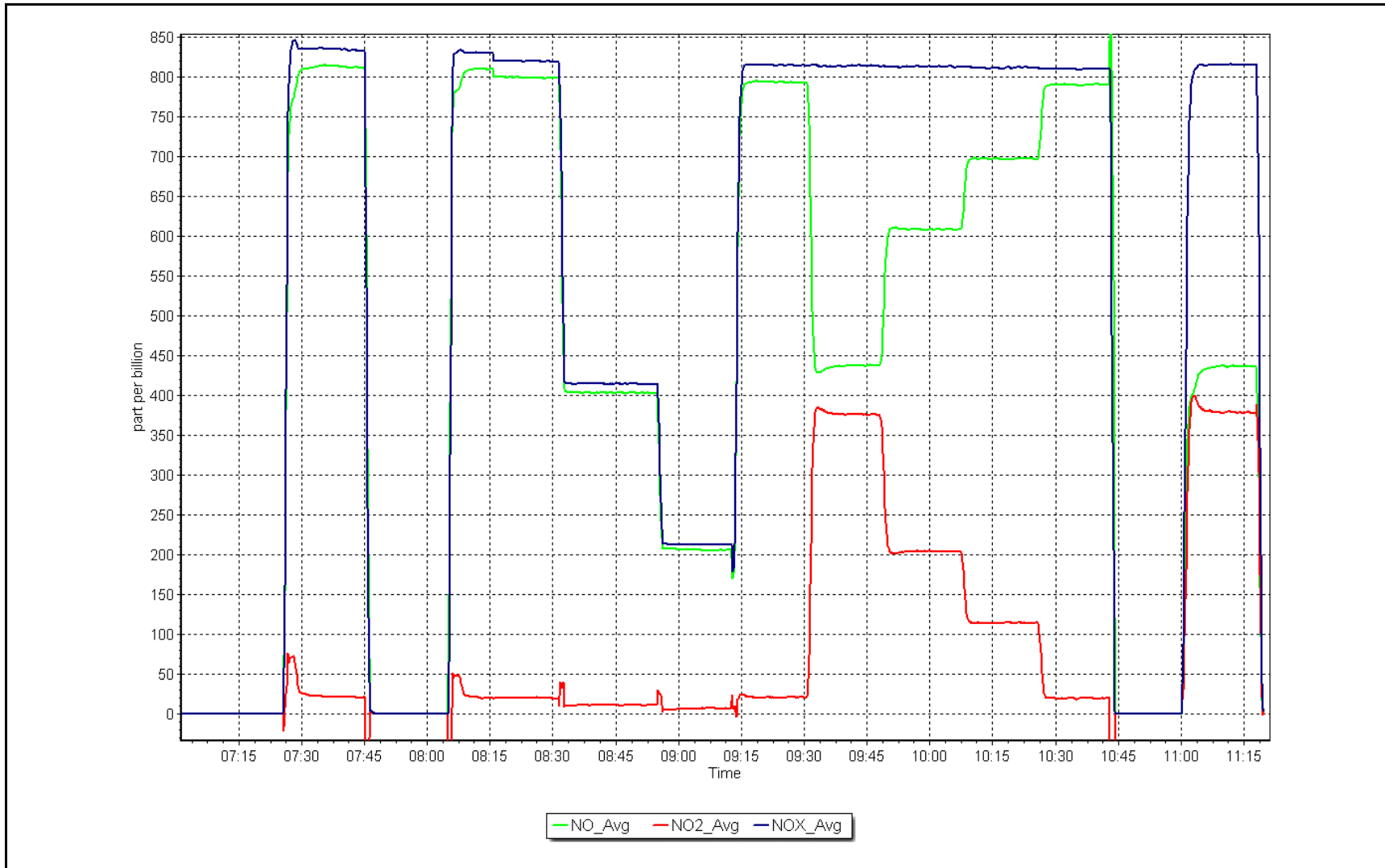
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999925	≥0.995
800.3	798.1	1.0028	Slope	0.994888	0.90 - 1.10
400.7	402.9	0.9945	Intercept	3.282748	+/-20
199.9	205.7	0.9716			



NO_x Calibration Plot

Date: October 1, 2024

Location: MacKay River





Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Mackay River	Station Number:	AMS 20
Calibration Date:	October 3, 2023	Prev Cal Date:	September 12, 2023
Start Time (MST):	6:54	End Time (MST):	7:57
Tower Height (m):	10m	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	Y18363
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.2	0.2%
400	39.4	39.4	0.1%
600	58.6	58.6	0.1%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999999	1.000000	<i>≥0.9995</i>
Calculated slope	0.998949	0.999465	<i>0.90 - 1.10</i>
Calculated intercept	-0.013169	-0.013446	<i>+/- 2</i>

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	N9937
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	12:14:42	Calc Declination*:	13.89 Degrees
Deadband calc:	<i>6.2 degrees (Limit 4 deg)</i>	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.2	---
90	89.9	0.0%
180	180.9	0.3%
270	269.4	-0.2%
357	351.0	<i>-1.7%</i>

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999969	0.999907	<i>≥0.9995</i>
Calculated slope	1.004747	1.014362	<i>0.90 - 1.10</i>
Calculated intercept	-0.011707	-1.440414	<i>+/- 4</i>

Notes: WS failed Torque Test and removed. WD failed 357deg, will be replaced.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Mackay River	Station Number:	AMS 20
Calibration Date:	October 3, 2023	Prev Cal Date:	September 12, 2023
Start Time (MST):	6:54	End Time (MST):	7:57
Tower Height (m):	10m	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P19838
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.6	0.1%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999999	≥0.9995
Calculated slope		0.998960	0.90 - 1.10
Calculated intercept		0.026359	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	N9937
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	12:14:42	Calc Declination*:	13.89 Degrees
Deadband calc:	357.0 degrees (<i>Limit 4 deg</i>)		* - calculated declination as per NOAA website

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0		---
90		
180		
270		
357		

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)			≥0.9995
Calculated slope			0.90 - 1.10
Calculated intercept			+/- 4

Notes: WS installed, removed WS failed Torque Test.

Calibration Performed By: Melissa Lemay



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

**AMS21
CONKLIN
OCTOBER 2024**

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	October 16, 2024	Last Cal Date:	September 9, 2024
Start time (MST):	9:56	End time (MST):	13:09
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.93	ppm	Cal Gas Exp Date:	January 5, 2025
Cal Gas Cylinder #:	CC259455			
Removed Cal Gas Conc:	49.93	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999945	0.998604	Backgd or Offset:	27.5	28.7
Calibration intercept:	-0.304200	0.115740	Coeff or Slope:	0.861	0.876

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.4	----
As found High point	4920	80.2	800.8	790.1	1.014
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	789.7	Previous response	800.5	*% change	-1.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4920	80.2	800.8	799.6	1.002
Mid point	4960	40.1	400.4	400.4	1.000
Low point	4980	20.0	200.1	200.1	1.000
As left zero	5005	0.0	0.0	-0.1	----
As left span	4920	80.2	800.8	802.4	0.998
Average Correction Factor:					1.001

Notes: Sample inlet filter changed after as founds. Adjusted zero and span.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

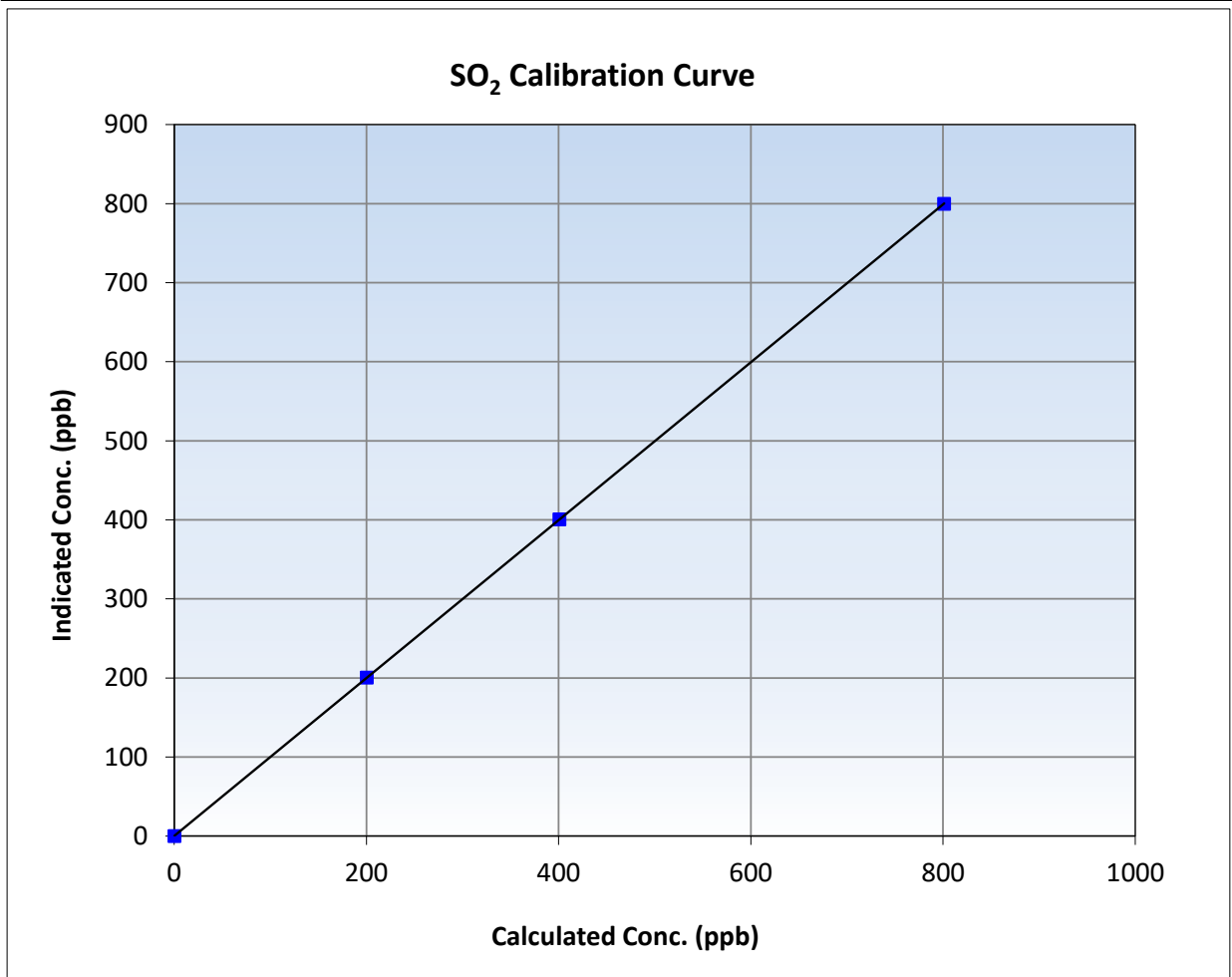
SO₂ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 9, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:56	End Time (MST):	13:09
Analyzer make:	Thermo 43i	Analyzer serial #:	1428701363

Calibration Data

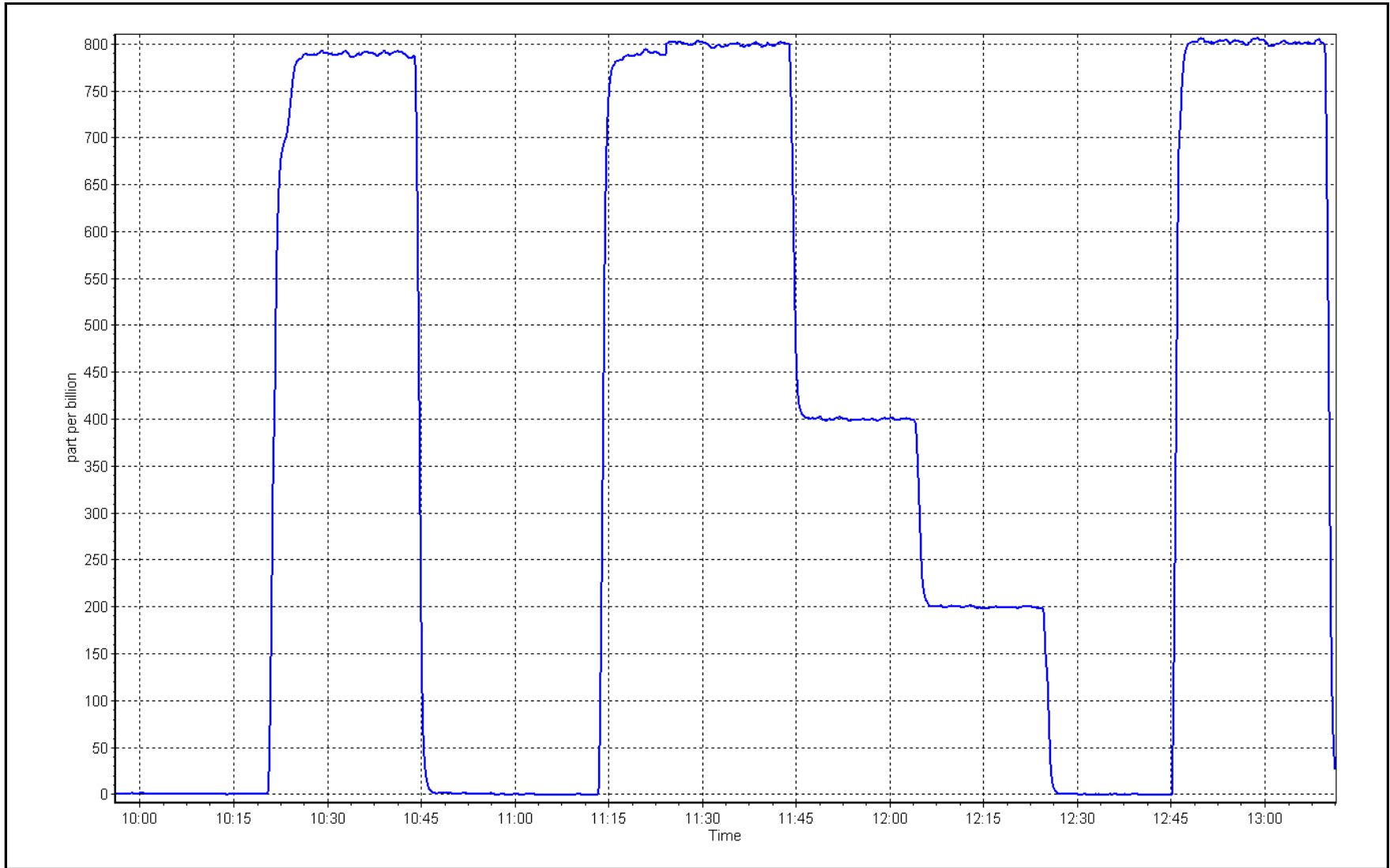
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	0.999999	≥0.995
800.8	799.6	1.0016	Slope	0.998604	0.90 - 1.10
400.4	400.4	1.0001	Intercept	0.115740	+/-30
200.1	200.1	1.0001			



SO2 Calibration Plot

Date: October 16, 2024

Location: Conklin





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	October 17, 2024	Last Cal Date:	September 12, 2024
Start time (MST):	10:08	End time (MST):	14:19
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:	800 degC

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.008143	1.001857	Backgd or Offset:	2.4	2.4
Calibration intercept:	-0.260000	-0.240000	Coeff or Slope:	1.489	1.520

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4920	80.0	80.0	78.8	1.017
As found Mid point	4960	40.0	40.0	39.4	1.018
As found Low point	4980	20.0	20.0	19.2	1.047
New cylinder response					
Baseline Corr As found:	78.7	Prev response:	80.39	*% change:	-2.1%
Baseline Corr 2nd AF pt:	39.3	AF Slope:	0.986143	AF Intercept:	-0.140000
Baseline Corr 3rd AF pt:	19.1	AF Correlation:	0.999937	<i>* = +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	80.0	80.0	80.0	1.000
Mid point	4960	40.0	40.0	40.0	1.000
Low point	4980	20.0	20.0	19.1	1.047
As left zero	5000	0.0	0.0	0.3	----
As left span	4920	80.0	80.0	80.2	0.998
SO2 Scrubber Check	4920	80.2	802.0	0.0	----
Date of last scrubber change:	July 9, 2024			Ave Corr Factor	1.016
Date of last converter efficiency test:					

Notes: Sample inlet filters was changed 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

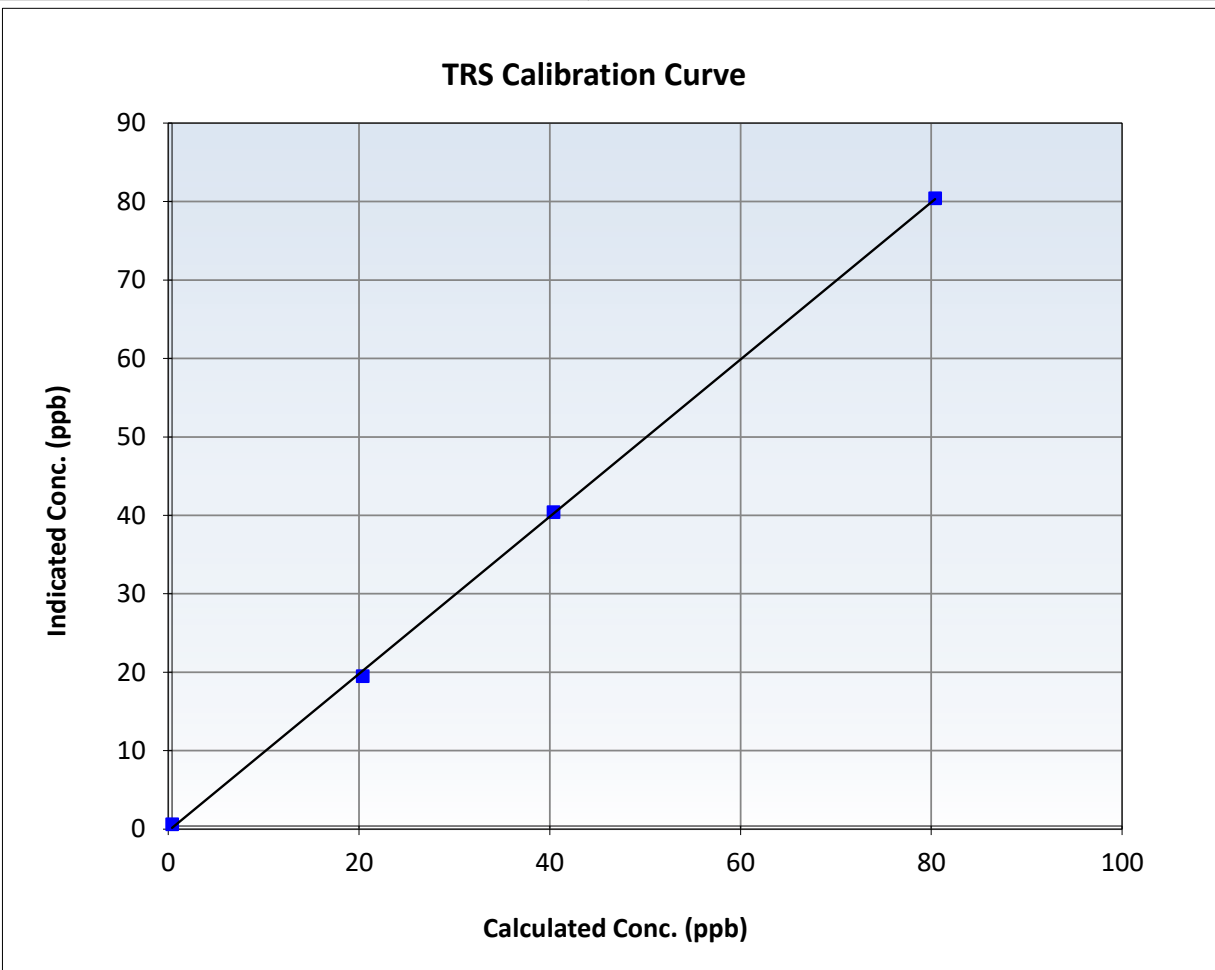
TRS Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:08	End Time (MST):	14:19
Analyzer make:	Thermo 43i-QTL	Analyzer serial #:	12228021058

Calibration Data

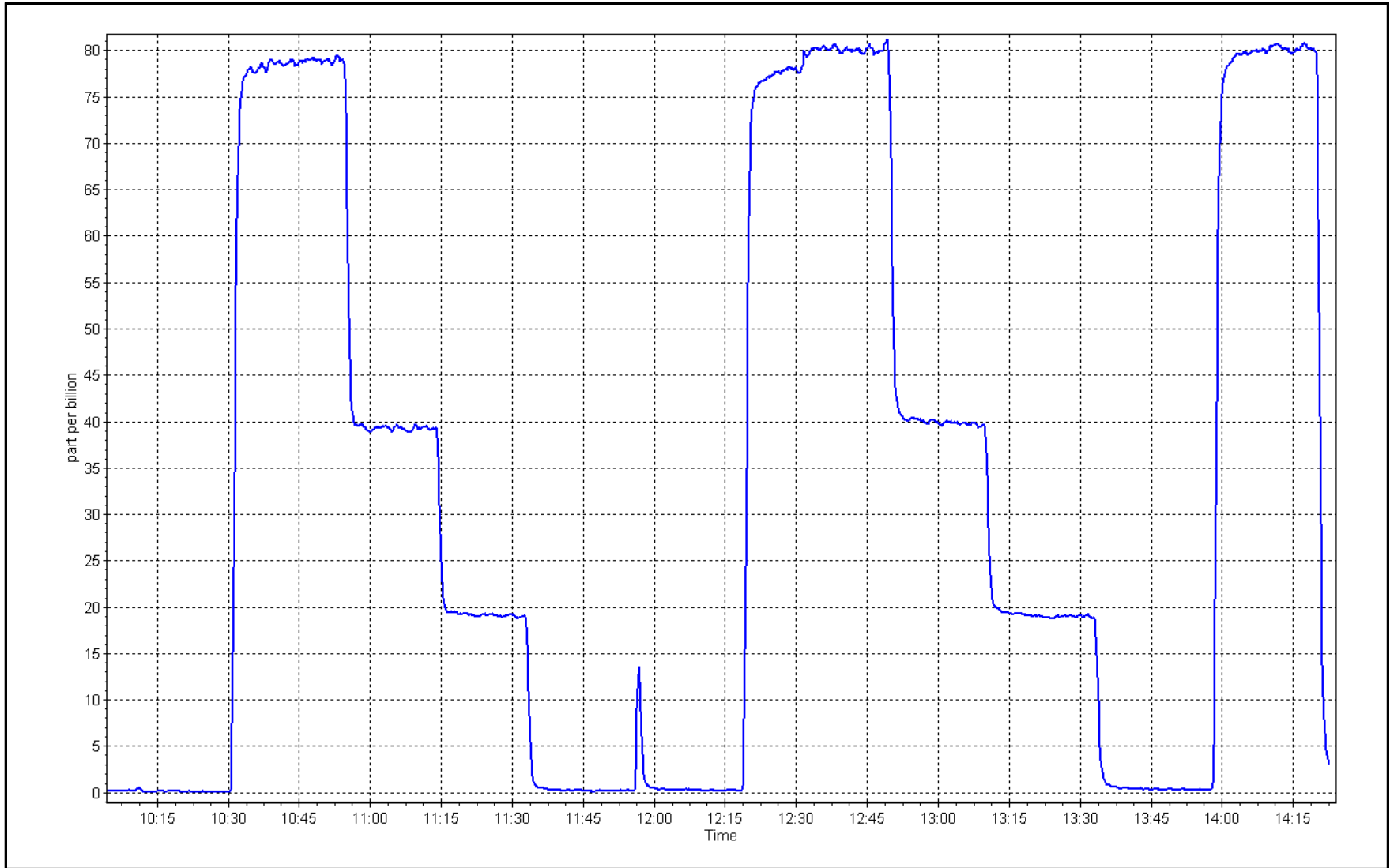
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.2	----	Correlation Coefficient	0.999796	≥ 0.995
80.0	80.0	1.0000	Slope	1.001857	$0.90 - 1.10$
40.0	40.0	1.0000	Intercept	-0.240000	± 3
20.0	19.1	1.0471			



TRS Calibration Plot

Date: October 17, 2024

Location: Conklin





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	October 16, 2024	Last Cal Date:	September 9, 2024
Start time (MST):	9:56	End time (MST):	13:09
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC259455	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	497.9 ppm	CH4 Equiv Conc.	1067.7 ppm
C3H8 Cal Gas Conc.	207.2 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	497.9 ppm	CH4 Equiv Conc.	1067.7 ppm
Removed C3H8 Conc.	207.2 ppm	Diff between cyl (THC):	
Diff between cyl (CH ₄):		Diff between cyl (NM):	
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 #: 1331259521
THC Range: 0 - 20 ppm	NMHC/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.69E-04	2.71E-04	5.48E-05	5.58E-05
CH4 Retention time:	14.0	14.0	166844	163925
Zero Chromatogram:	OFF	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.13	16.90	1.013
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.90	Prev response	17.03	*% 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.13	17.10	1.001
Mid point	4960	40.1	8.56	8.43	1.016
Low point	4980	20.0	4.28	4.18	1.023
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.13	17.08	1.002
Average Correction Factor					1.013

Notes: Sample inlet filter changed after as founds. Adjusted span only.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.14	8.97	1.019
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.97	Prev response	9.10	*% change	-1.5%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.14	9.13	1.001
Mid point	4960	40.1	4.57	4.54	1.007
Low point	4980	20.0	2.28	2.28	1.003
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.14	9.13	1.001
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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	7.99	7.93	1.007
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.93	Prev response	7.93	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	7.99	7.97	1.003
Mid point	4960	40.1	3.99	3.89	1.027
Low point	4980	20.0	2.00	1.91	1.046
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	7.99	7.96	1.004
Average Correction Factor					1.025

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.997505	0.999628
THC Cal Offset:	-0.047639	-0.060038
CH ₄ Cal Slope:	0.999008	0.999695
CH ₄ Cal Offset:	-0.046446	-0.051846
NMHC Cal Slope:	0.996430	0.999293
NMHC Cal Offset:	-0.002392	-0.007592

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

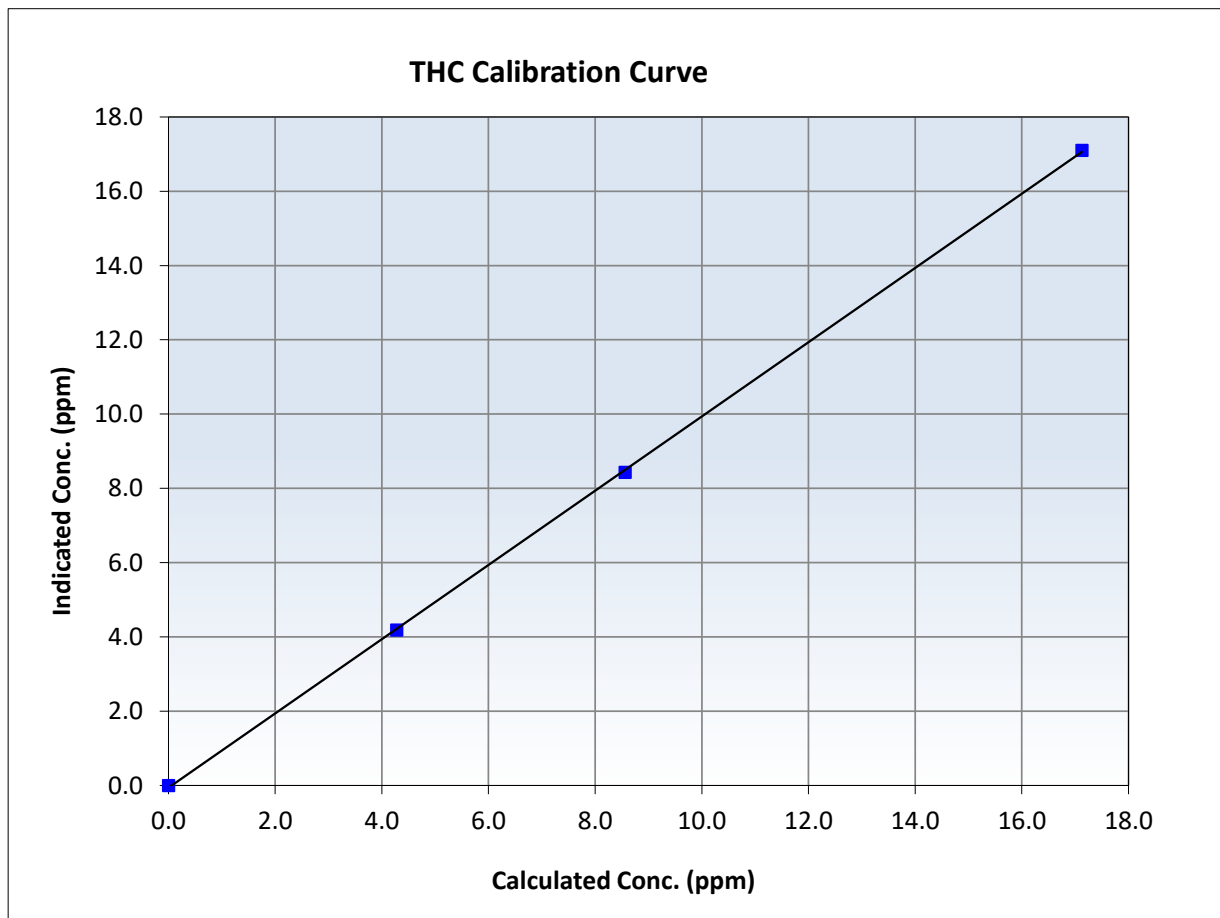
THC Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 9, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:56	End Time (MST):	13:09
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999929	<i>≥0.995</i>
17.13	17.10	1.0014	Slope	0.999628	<i>0.90 - 1.10</i>
8.56	8.43	1.0158	Intercept	-0.060038	<i>+/-0.5</i>
4.28	4.18	1.0228			





Wood Buffalo Environmental Association

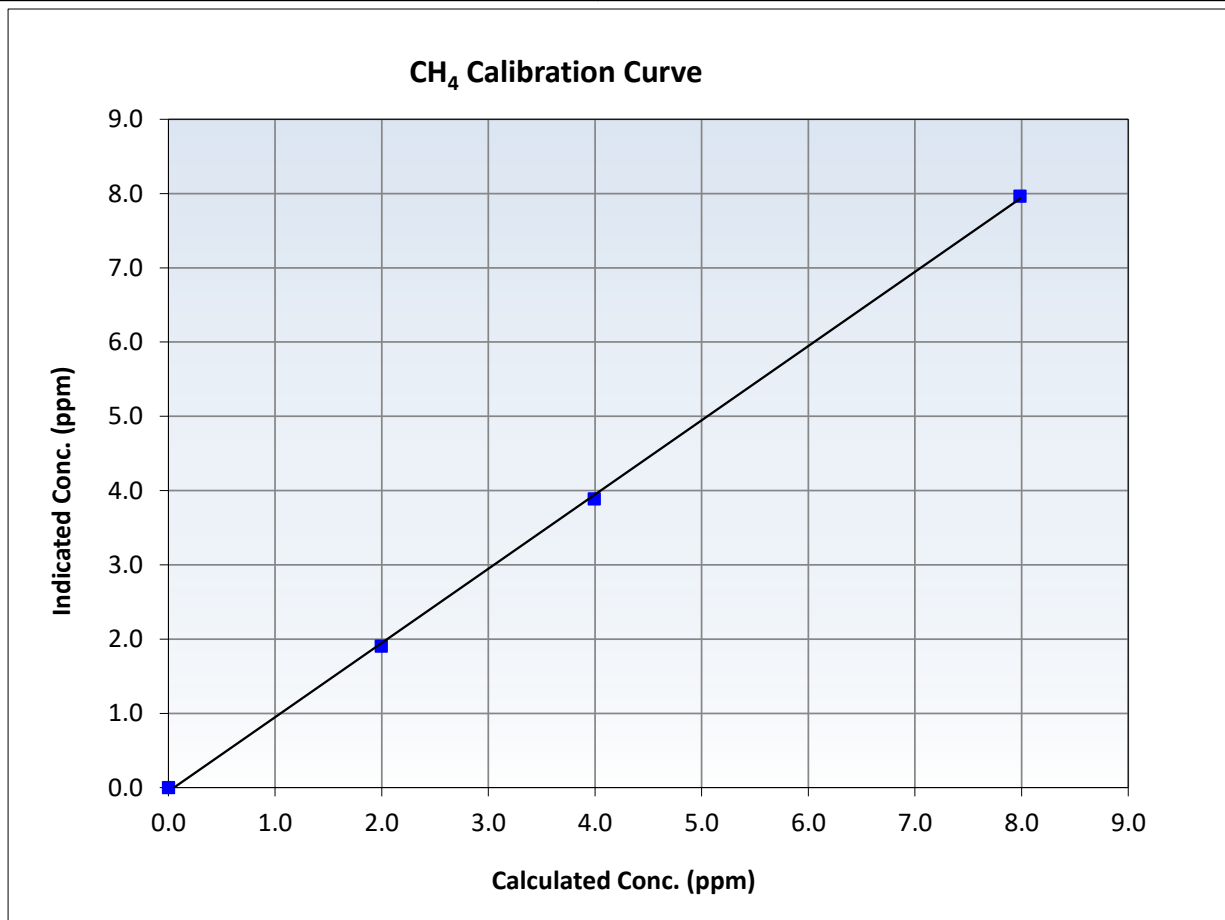
CH₄ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 9, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:56	End Time (MST):	13:09
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999779	<i>≥0.995</i>
7.99	7.97	1.0025	Slope	0.999695	<i>0.90 - 1.10</i>
3.99	3.89	1.0268	Intercept	-0.051846	<i>+/-0.5</i>
2.00	1.91	1.0459			





Wood Buffalo Environmental Association

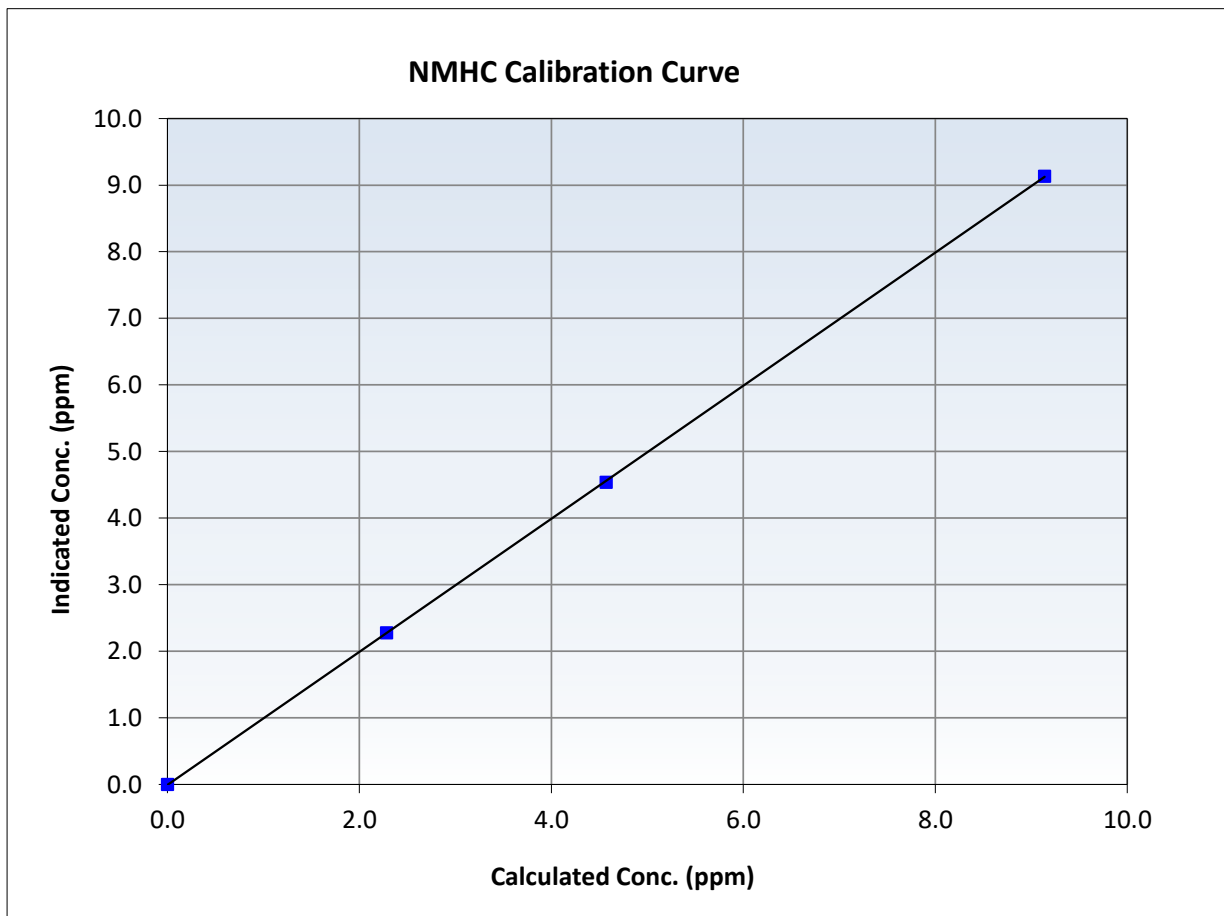
NMHC Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 9, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:56	End Time (MST):	13:09
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calibration Data

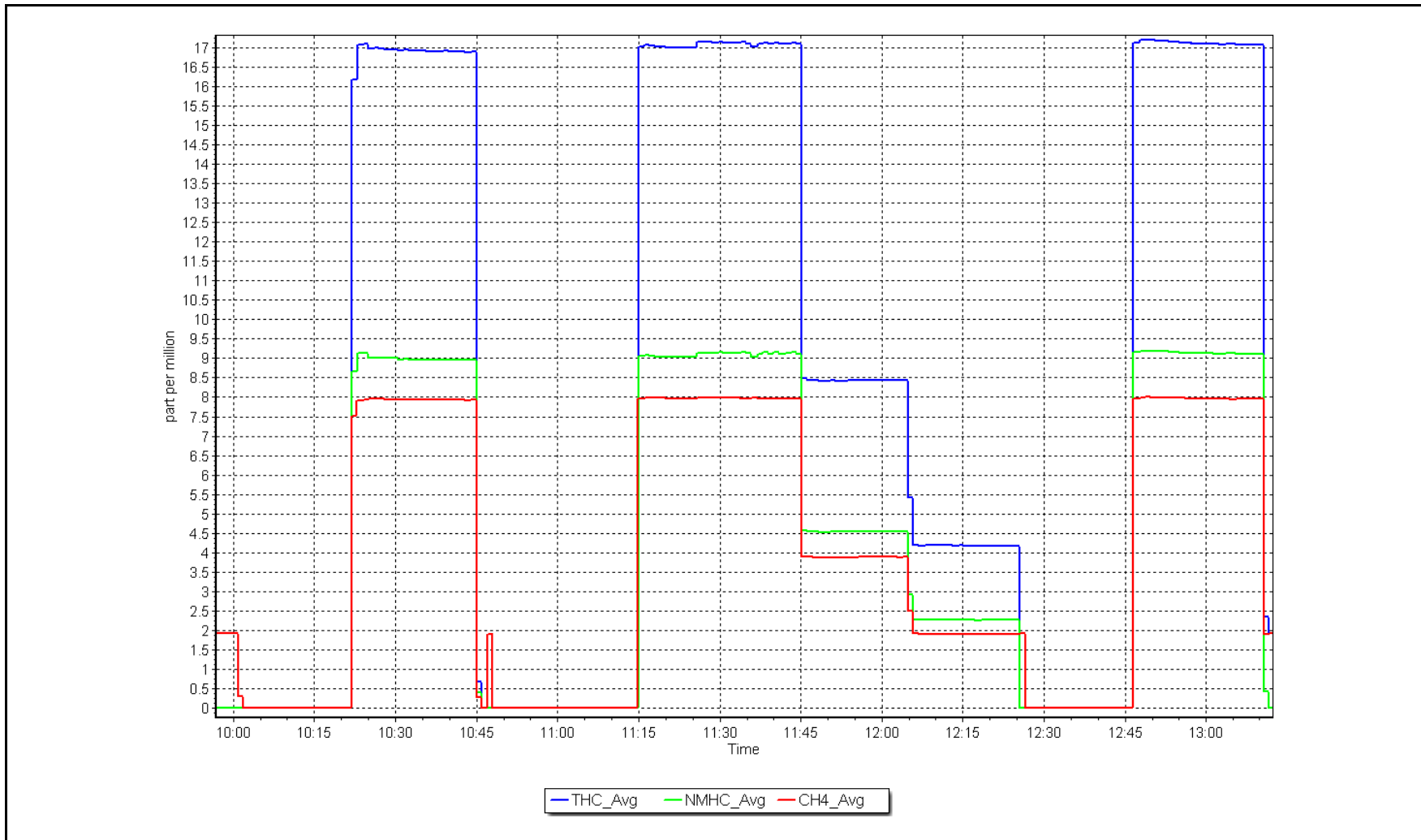
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999989	<i>≥0.995</i>
9.14	9.13	1.0006	Slope	0.999293	<i>0.90 - 1.10</i>
4.57	4.54	1.0065	Intercept	-0.007592	<i>+/-0.5</i>
2.28	2.28	1.0030			



NMHC Calibration Plot

Date: October 16, 2024

Location: Conklin





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Conklin
 Station number: AMS 21
 Calibration Date: October 22, 2024
 Last Cal Date: September 19, 2024
 Start time (MST): 9:52
 End time (MST): 14:30
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: SA18828
 NOX Cal Gas Conc: 48.90 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 48.90 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701H
 Cal Gas Expiry Date: November 3, 2031
 NO Cal Gas Conc: 48.80 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 48.80 ppm
 NO gas Diff:
 Serial Number: 5252
 Serial Number: 953

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.2	0.2	0.0	----	----
AF High point	4918	82.0	802.0	800.3	1.6	808.8	801.5	7.1	0.9918	0.9988
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 801.5 ppb		NO = 798.7 ppb			<i>* = > +/-5% change initiates investigation</i>			*Percent Change	NO _x = 0.9%
Baseline Corr 1st pt	NO _x = 808.6 ppb		NO = 801.3 ppb			<u>As Found Statistics</u>			*Percent Change	NO = 0.3%
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :		Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :		NO SI:	NO Int:
						As found	NO ₂ r ² :		NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1501663731

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.997547	1.000868
NO _x Cal Offset:	1.508015	1.268044
NO Cal Slope:	0.997421	0.999920
NO Cal Offset:	0.467984	-0.032004
NO ₂ Cal Slope:	1.002044	1.003451
NO ₂ Cal Offset:	0.101487	1.394565

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.003	1.003	NO bkgnd or offset:	9.4	9.8
NOX coeff or slope:	0.998	0.998	NOX bkgnd or offset:	9.4	9.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	147.9	148.2

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
High point	4918	82.0	802.0	800.3	1.6	803.0	800.0	2.9	0.9987	1.0004
Mid point	4959	41.0	401.0	400.2	0.8	404.0	400.7	3.3	0.9925	0.9987
Low point	4980	20.5	200.5	200.1	0.4	202.8	199.7	3.1	0.9885	1.0018
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4918	82.0	802.0	407.0	395.0	801.2	407.0	394.2	1.0009	1.0000
Average Correction Factor									0.9932	1.0003

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	798.3	384.6	415.3	417.5	0.9948	100.5%
Mid GPT point	798.3	609.9	190.0	193.0	0.9847	101.6%
Low GPT point	798.3	709.3	90.6	93.5	0.9694	103.2%
Average Correction Factor					0.9830	101.7%

Notes: Sample inlet filter changed after as founds. Adjusted zero only.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

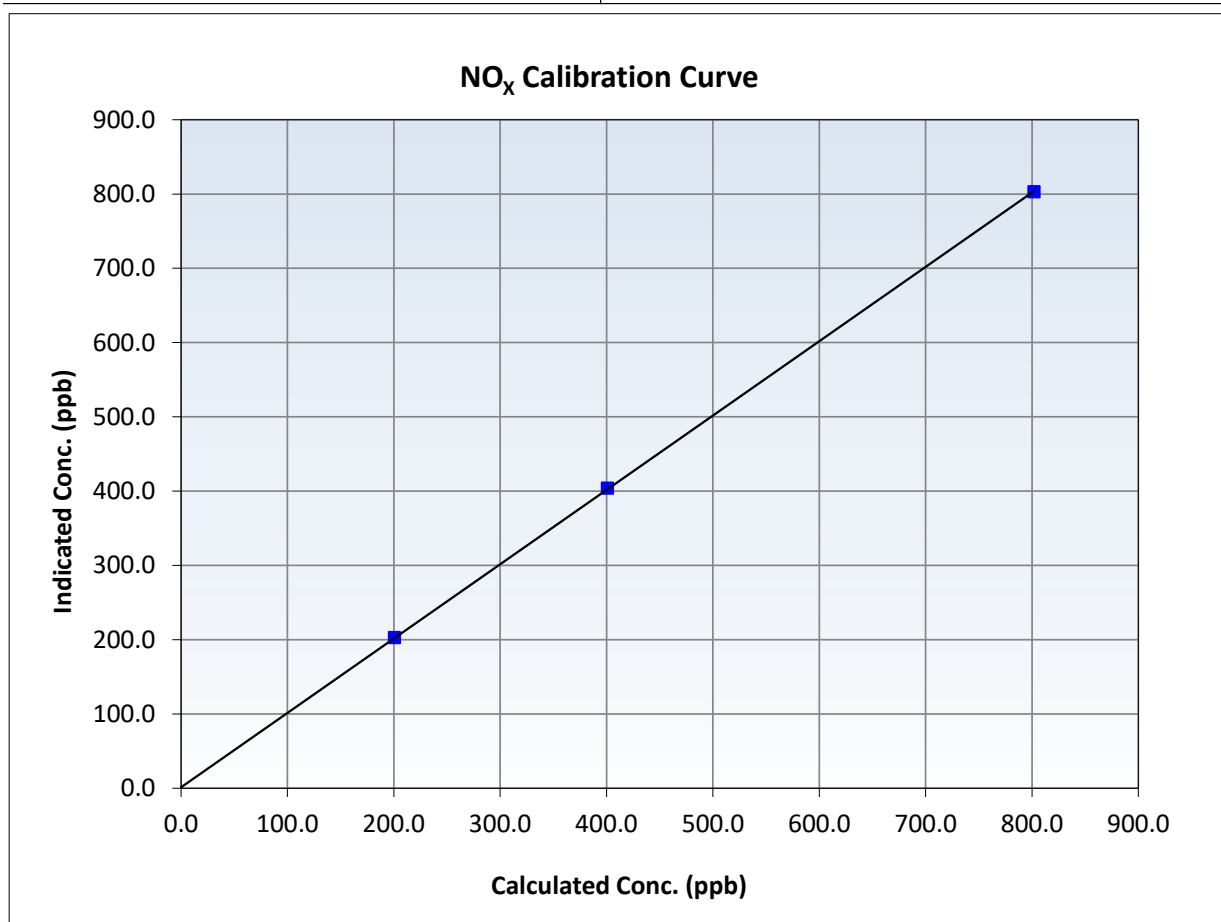
NO_x Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 19, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:52	End Time (MST):	14:30
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999984	≥0.995
802.0	803.0	0.9987	Slope	1.000868	0.90 - 1.10
401.0	404.0	0.9925	Intercept	1.268044	+/-20
200.5	202.8	0.9885			





Wood Buffalo Environmental Association

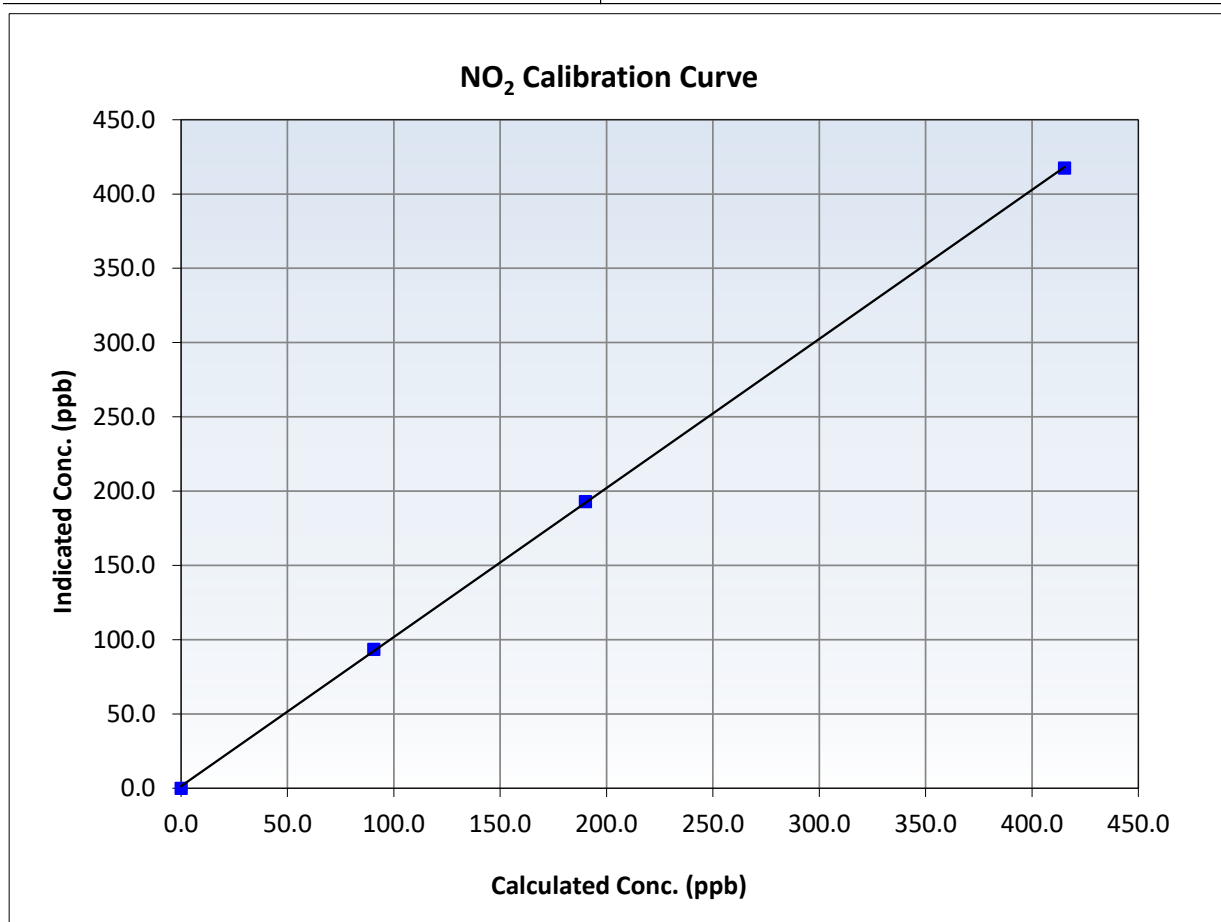
NO₂ Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 19, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:52	End Time (MST):	14:30
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999953	<i>≥0.995</i>
415.3	417.5	0.9948	Slope	1.003451	<i>0.90 - 1.10</i>
190.0	193.0	0.9847	Intercept	1.394565	<i>+/-20</i>
90.6	93.5	0.9694			





Wood Buffalo Environmental Association

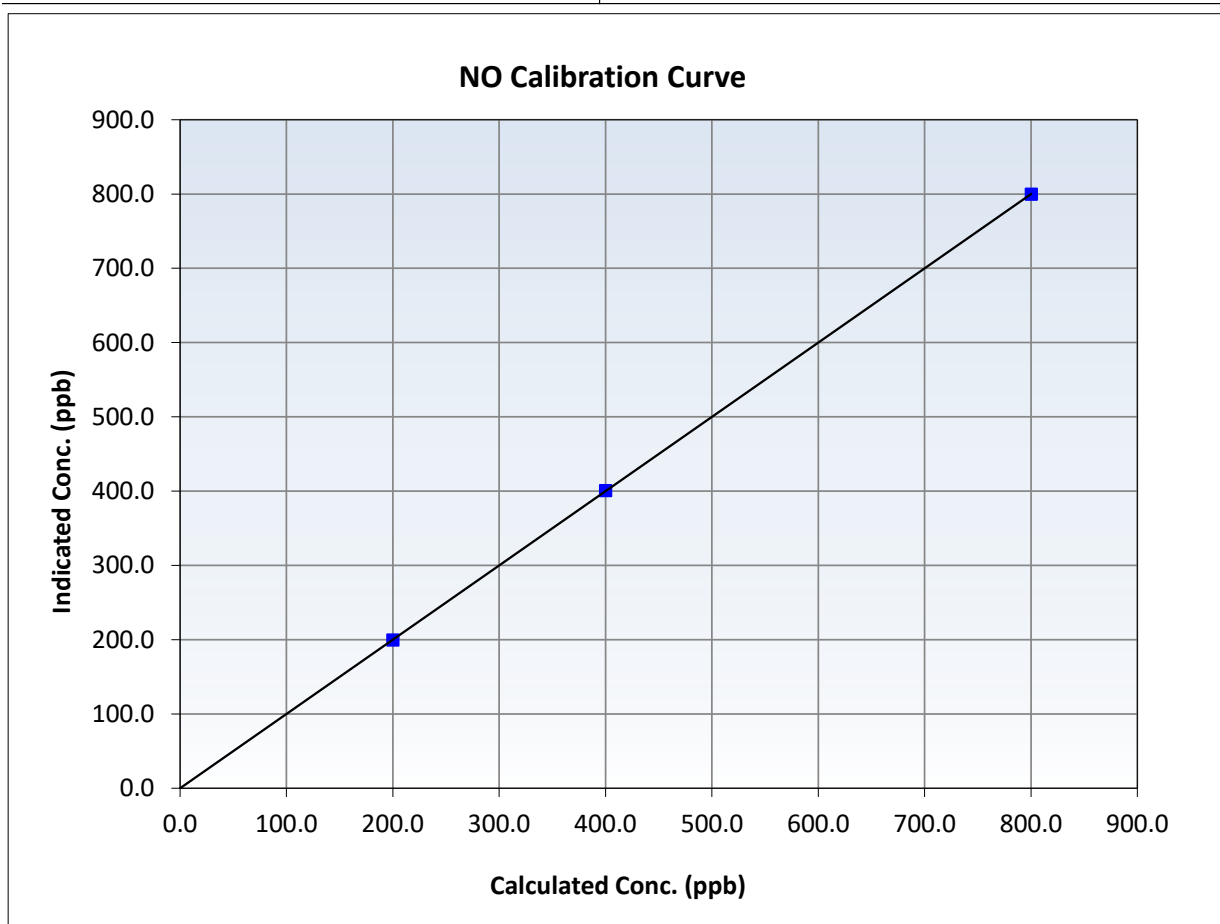
NO Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 19, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:52	End Time (MST):	14:30
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

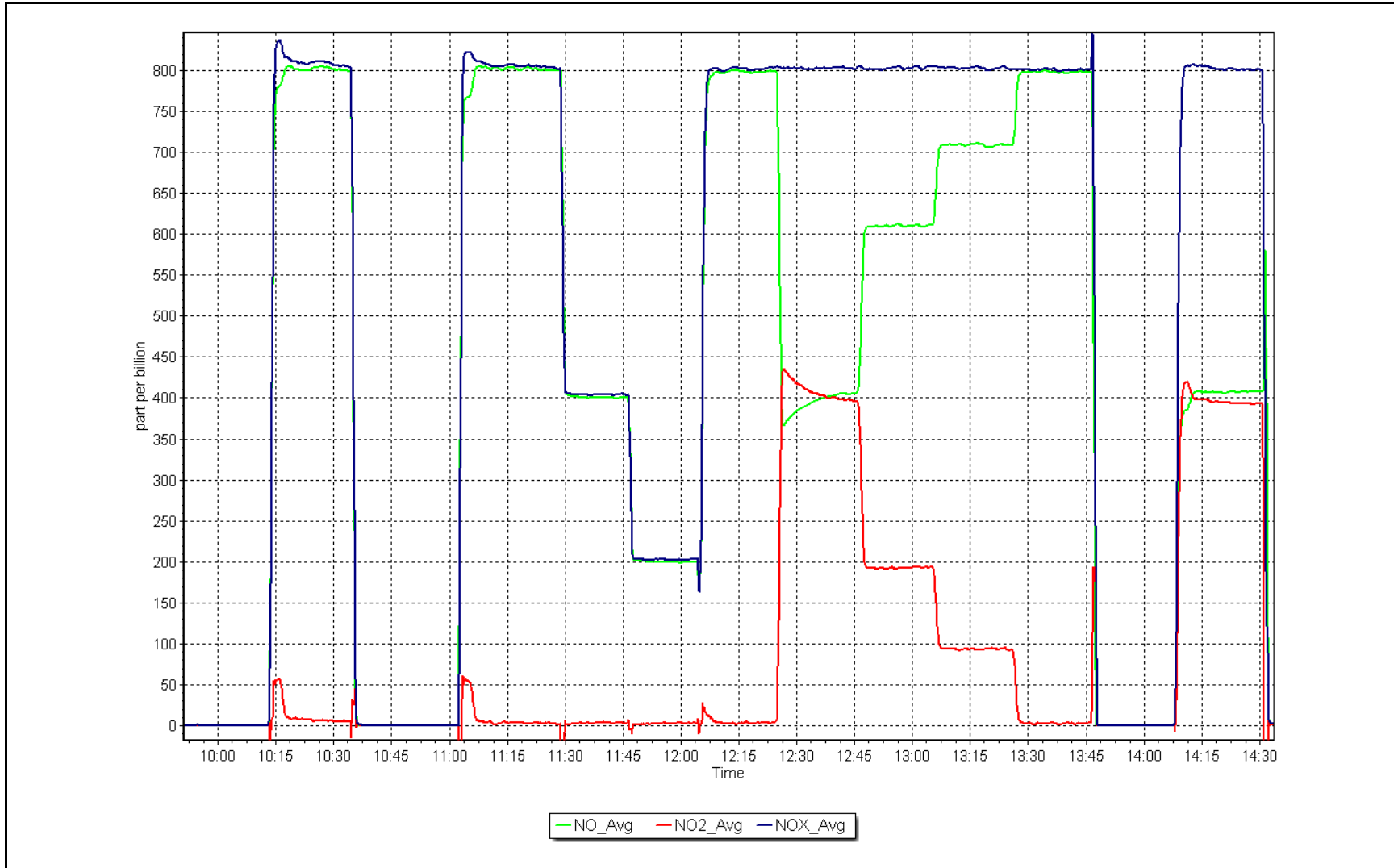
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999999	<i>≥0.995</i>
800.3	800.0	1.0004	Slope	0.999920	<i>0.90 - 1.10</i>
400.2	400.7	0.9987	Intercept	-0.032004	<i>+/-20</i>
200.1	199.7	1.0018			



NO_x Calibration Plot

Date: October 22, 2024

Location: Conklin





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	October 2, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	9:47	End time (MST):	11:13
Reason:	Removal		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	5252
Calibrator Make/Model:	Teledyne API T700	Serial Number:	953
ZAG Make/Model:	Teledyne API 701		

Analyzer Information

Analyzer make:	Thermo 49i	Analyzer serial #:	1300156233
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.004486	NA	Backgd or Offset:	-2.5	NA
Calibration intercept:	-1.060000	NA	Coeff or Slope:	1.029	NA

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	800.0	0.0	-0.4	----
As found High point	5000	921.8	400.0	403.1	0.991
As found Mid point	5000	820.4	200.0	198.9	1.004
As found Low point	5000	720.3	100.0	96.7	1.030
Baseline Corr As found:	403.5	Previous response	400.7	*% change	0.7%
Baseline Corr 2nd AF pt:	199.3	AF Slope:	1.011286	AF Intercept:	-2.400000
Baseline Corr 3rd AF pt:	97.1	AF Correlation:	0.999888	<i>* = > +/-5% change initiates investigation</i>	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor

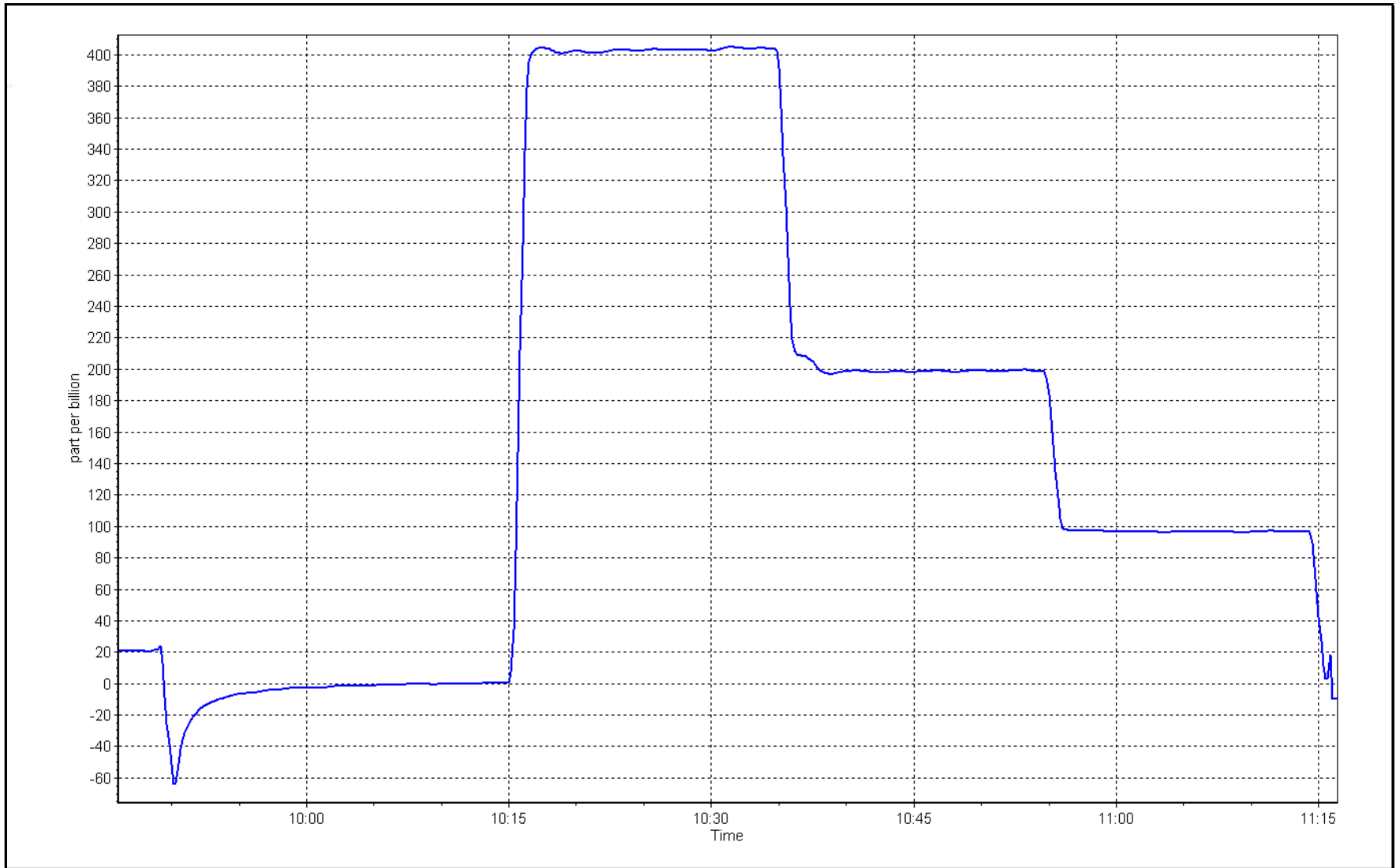
Notes: Removal done to do maintenance in the shop.

Calibration Performed By: Jan Castro

O₃ Calibration Plot

Date: October 2, 2024

Location: Conklin





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	October 2, 2024	Last Cal Date:	NA
Start time (MST):	11:53	End time (MST):	14:15
Reason:	Install		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	5252
Calibrator Make/Model:	Teledyne API T700	Serial Number:	953
ZAG Make/Model:	Teledyne API 701		

Analyzer Information

Analyzer make:	Teledyne API 7400	Analyzer serial #:	7412
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	NA	1.000943	Backgd or Offset:	NA	-6.0
Calibration intercept:	NA	-0.340000	Coeff or Slope:	NA	1.017

O₃ 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					
As found High point					
As found Mid point					
As found Low point					
Baseline Corr As found:	NA	Previous response	NA	*% change	NA
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O₃ 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	1.0	----
High point	5000	921.5	400.0	400.6	0.999
Mid point	5000	814.5	200.0	199.5	1.003
Low point	5000	719.1	100.0	98.2	1.018
As left zero	5000	800.0	0.0	2.0	----
As left span	5000	921.6	400.0	402.1	0.995
Average Correction Factor					1.006

Notes: Install calibrations. Sample inlet filter was changed before calibrator zero. Adjusted zero and span.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

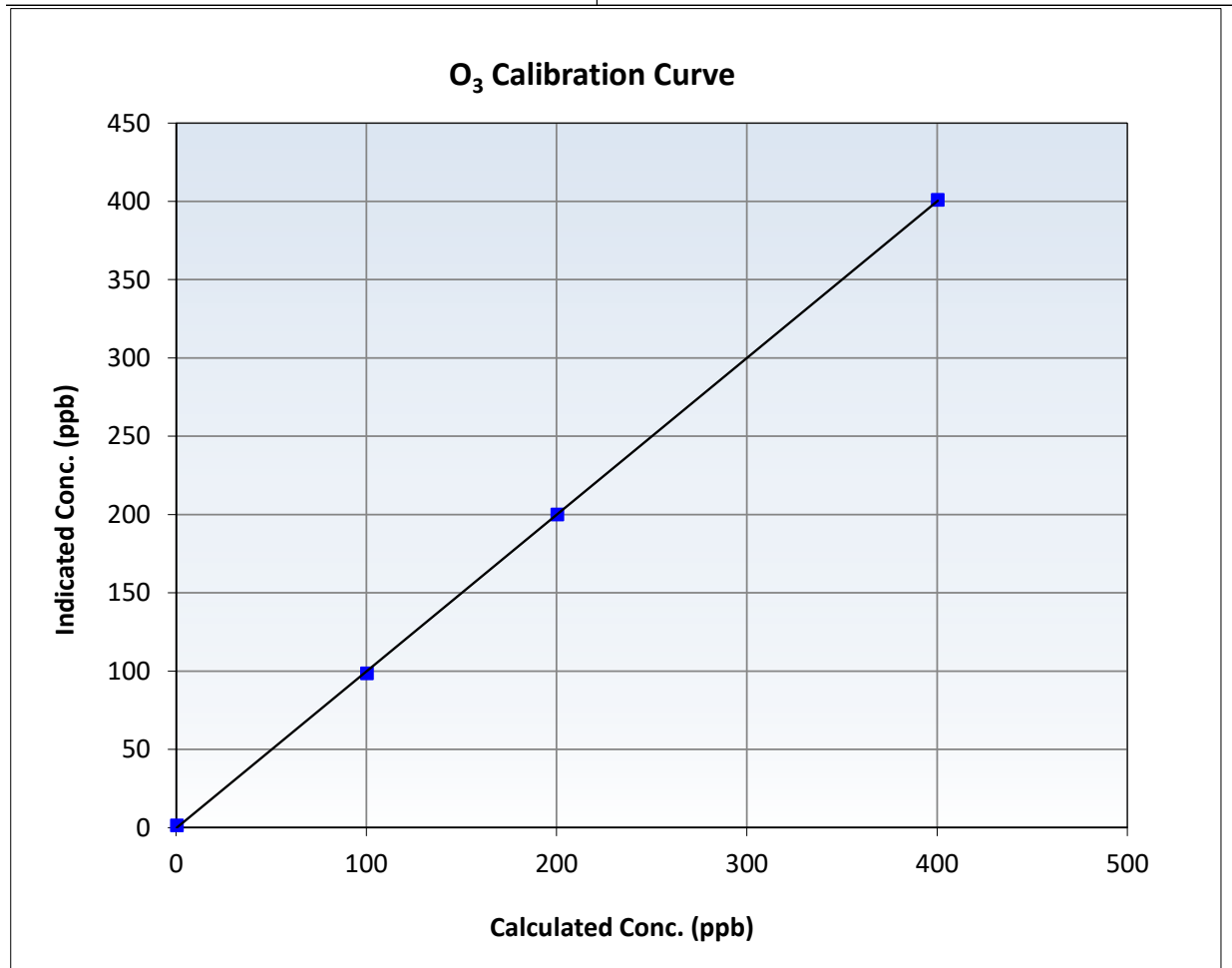
O₃ Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	NA
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:53	End Time (MST):	14:15
Analyzer make:	Teledyne API 7400	Analyzer serial #:	7412

Calibration Data

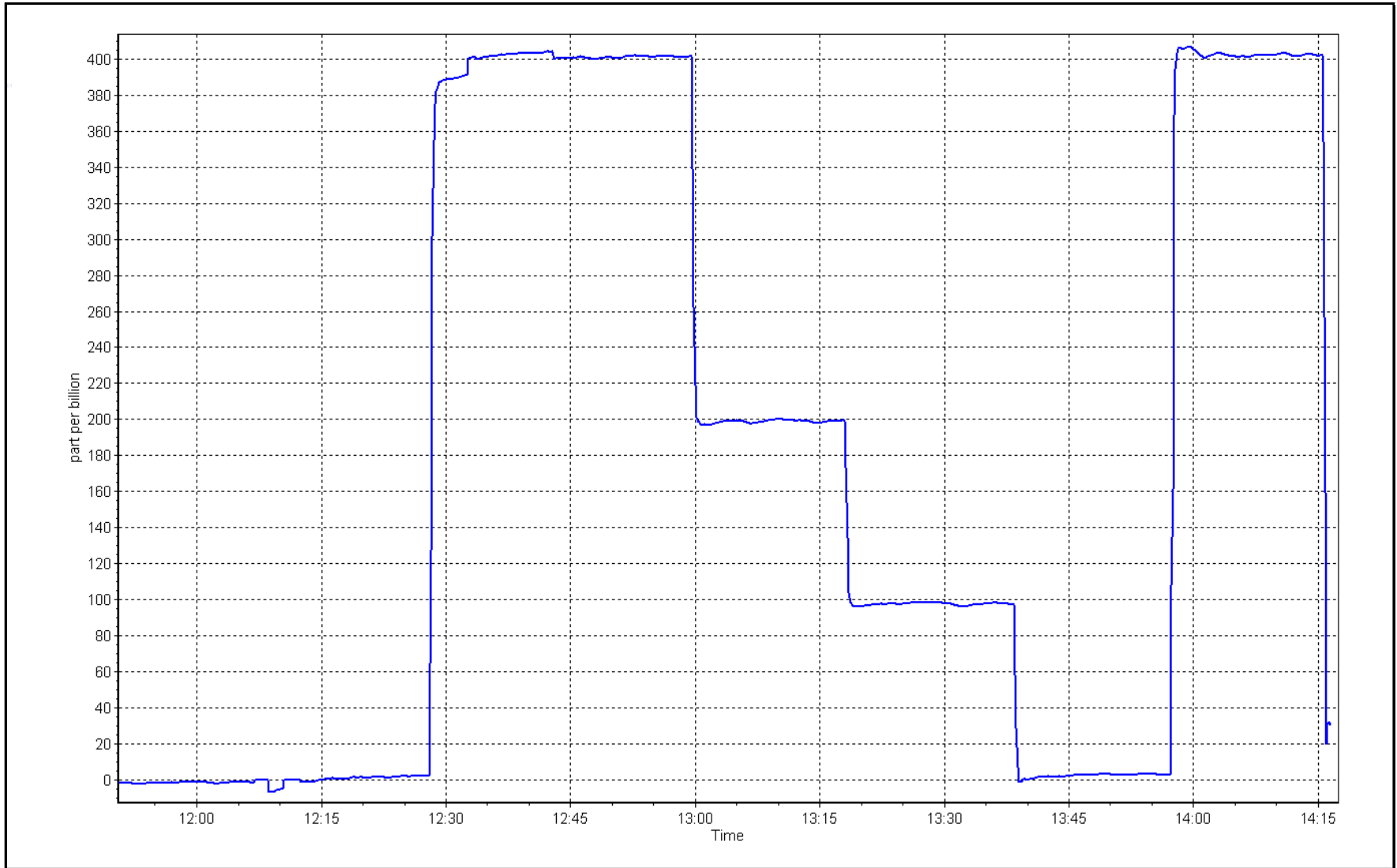
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	1.0	----	Correlation Coefficient	0.999947	≥0.995
400.0	400.6	0.9985	Slope	1.000943	0.90 - 1.10
200.0	199.5	1.0025	Intercept	-0.340000	+/- 5
100.0	98.2	1.0183			



O₃ Calibration Plot

Date: October 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: October 17, 2024 Last Cal Date: September 11, 2024
 Start time (MST): 12:40 End time (MST): 12:58

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 (°C)	6.30	5.76	6.30	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	696.10	698.21	696.10	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.04	5.12	5.04	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	39	----	39	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	3.30	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: 10.90 Expiry Date: September 29, 2024
 Lot No.: 100128-050-040

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test				<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: September 11, 2024
 Date Disposable Filter Changed: September 11, 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
OCTOBER 2024**

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	October 8, 2024	Last Cal Date:	September 25, 2024
Start time (MST):	10:32	End time (MST):	13:56
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: 4890

Analyzer Information

Analyzer make:	Thermo 43i	Serial Number:	1152430006
Analyzer Range:	0 - 1000 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000850	1.000621	Backgd or Offset:	25.4	24.8
Calibration intercept:	0.023969	0.004124	Coeff or Slope:	1.004	1.004

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.8	----
As found High point	4920	79.8	799.8	795.7	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.5	Previous response	800.5	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4920	79.8	799.8	800.2	0.999
Mid point	4960	39.9	399.9	400.2	0.999
Low point	4980	20.0	200.4	200.8	0.998
As left zero	5000	0.0	0.0	-0.1	----
As left span	4920	79.8	799.8	800.6	0.999
Average Correction Factor:					0.999

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

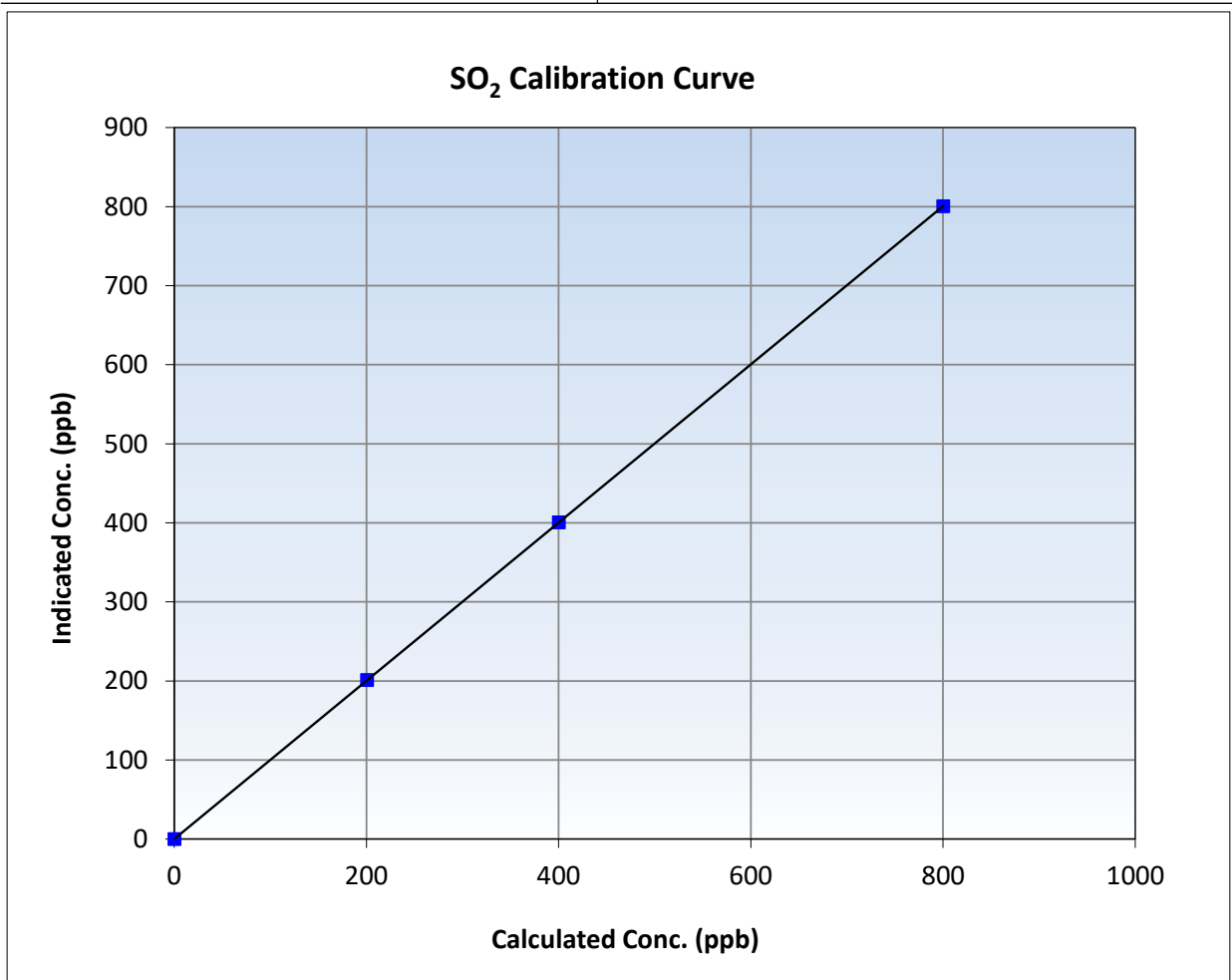
SO₂ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:32	End Time (MST):	13:56
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430006

Calibration Data

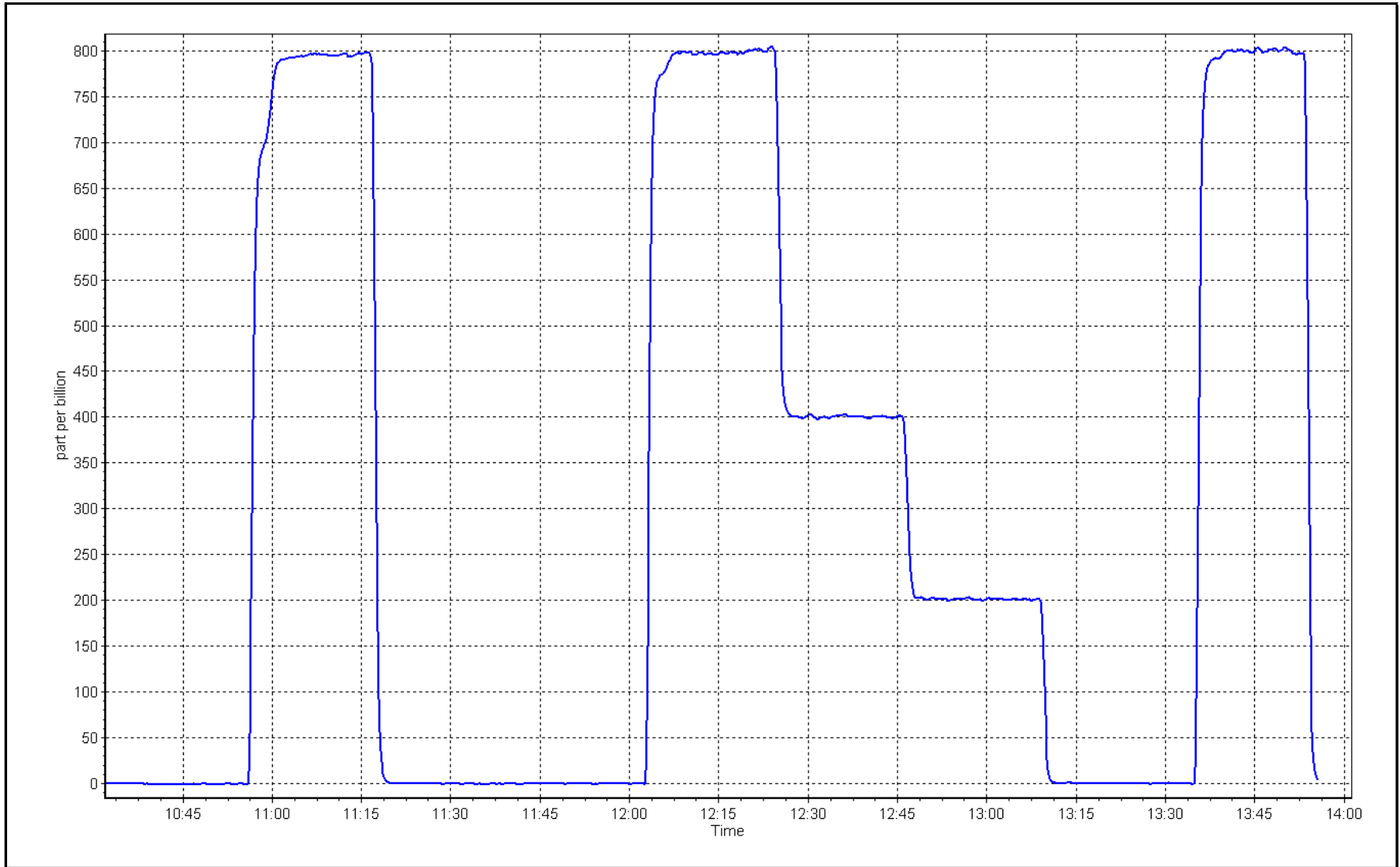
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	1.000000	≥0.995
799.8	800.2	0.9995	Slope	1.000621	0.90 - 1.10
399.9	400.2	0.9992	Intercept	0.004124	+/-30
200.4	200.8	0.9982			



SO2 Calibration Plot

Date: October 8, 2024

Location: Janvier





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	October 29, 2024	Last Cal Date:	September 26, 2024
Start time (MST):	11:29	End time (MST):	15:42
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999096	0.973815	Backgd or Offset:	3.23	3.26
Calibration intercept:	0.140534	0.600153	Coeff or Slope:	1.153	1.166

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.3	----
As found High point	4920	79.7	80.0	79.0	1.017
As found Mid point	4960	39.8	40.0	40.1	1.004
As found Low point	4980	19.9	20.0	20.1	1.009
New cylinder response					
Baseline Corr As found:	78.7	Prev response:	80.09	*% change:	-1.8%
Baseline Corr 2nd AF pt:	39.8	AF Slope:	0.983525	AF Intercept:	0.460391
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999951	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4920	79.7	80.0	78.4	1.021
Mid point	4960	39.8	40.0	39.8	1.004
Low point	4980	19.9	20.0	20.0	0.999
As left zero	5000	0.0	0.0	0.7	----
As left span	4920	79.7	80.0	77.2	1.037
SO2 Scrubber Check	4920	79.8	798.0	-0.1	----
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.
Adjusted span only.

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

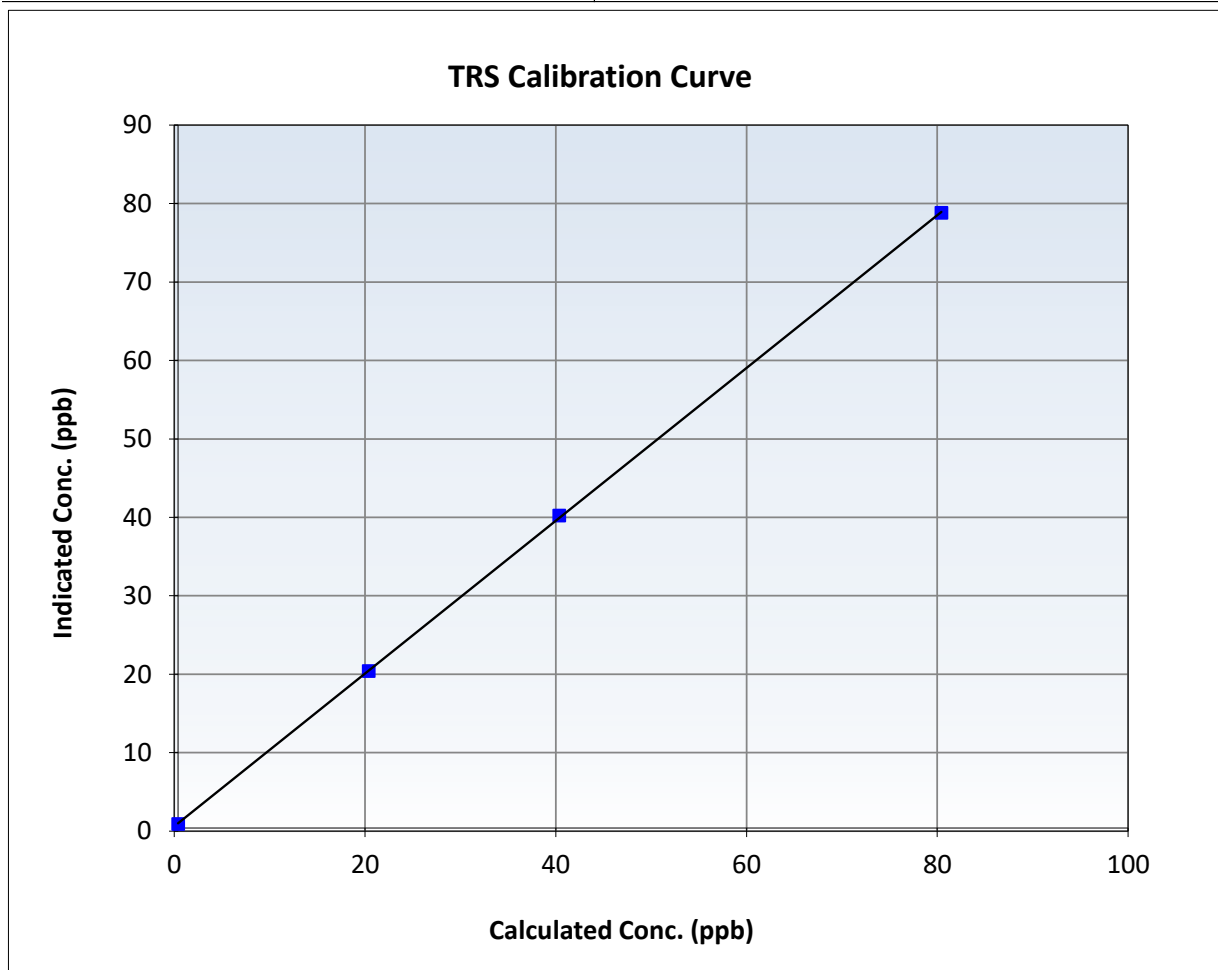
TRS Calibration Summary

Station Information

Calibration Date:	October 29, 2024	Previous Calibration:	September 26, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:29	End Time (MST):	15:42
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680031

Calibration Data

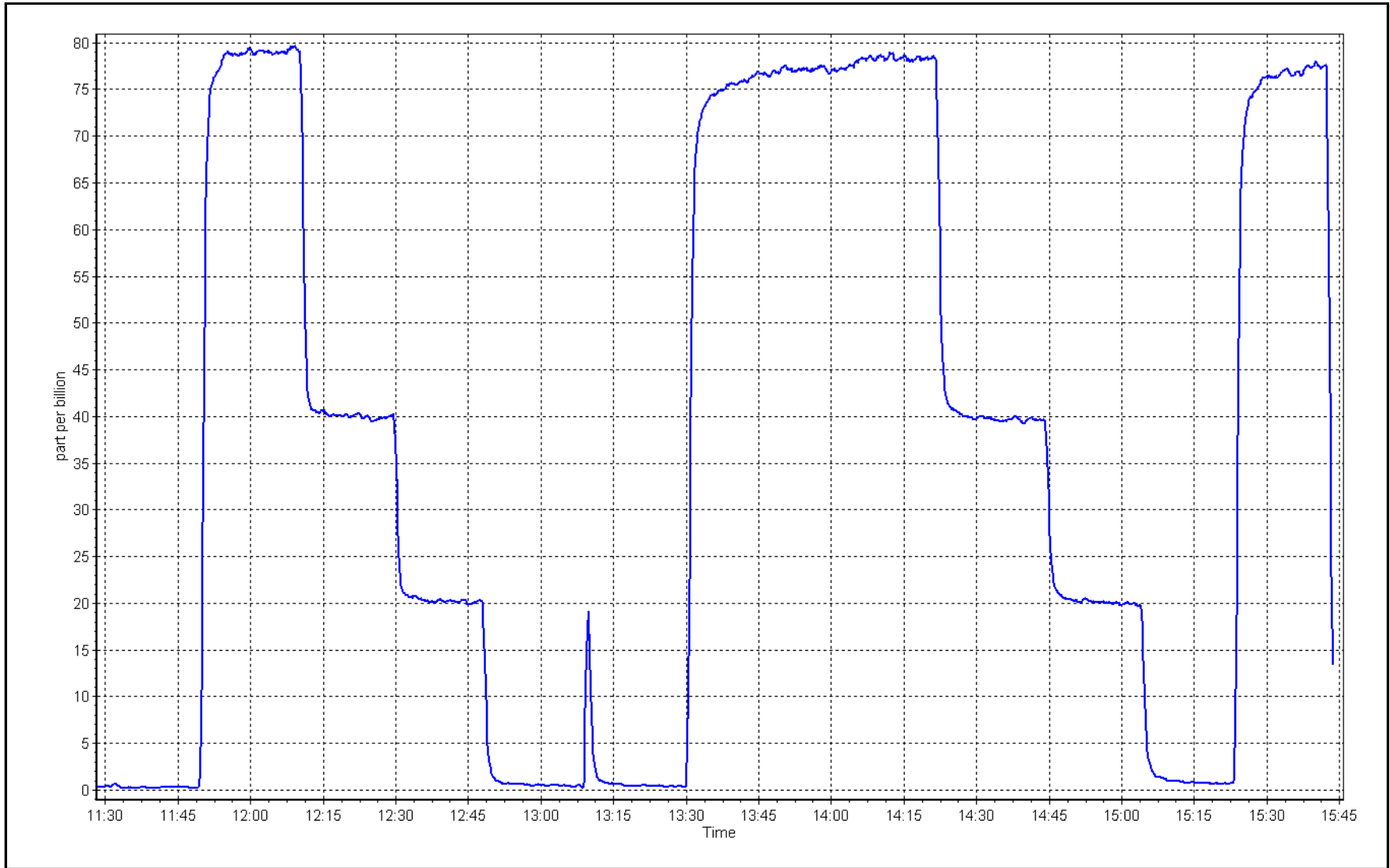
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.5	----	Correlation Coefficient	0.999967	≥ 0.995
80.0	78.4	1.0207	Slope	0.973815	$0.90 - 1.10$
40.0	39.8	1.0040	Intercept	0.600153	± 3
20.0	20.0	0.9990			



TRS Calibration Plot

Date: October 29, 2024

Location: Janvier





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	October 8, 2024	Last Cal Date:	September 25, 2024
Start time (MST):	10:32	End time (MST):	13:56
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:	4890

Analyzer Information

Analyzer make: Thermo 55i	Analyzer serial #: 1317958219
THC Range: 0 - 20 ppm	NMHC/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.47E-04	2.47E-04	NMHC SP Ratio:	5.90E-05
CH4 Retention time:	11.6	11.6	NMHC Peak Area:	155091
Zero Chromatogram:	OFF	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	---
As found High point	4920	79.8	17.17	17.29	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.29	Prev response	17.13	*% change	0.9%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	---
High point	4920	79.8	17.17	17.16	1.000
Mid point	4960	39.9	8.59	8.55	1.005
Low point	4980	20.0	4.30	4.27	1.007
As left zero	5000	0.0	0.00	0.00	---
As left span	4920	79.8	17.17	17.19	0.999
Average Correction Factor					1.004

Notes: Changed the inlet filter and N2/H2 cylinders after as founds. No adjustments made.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.15	9.24	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.24	Prev response	9.13	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.15	9.16	0.999
Mid point	4960	39.9	4.57	4.58	0.999
Low point	4980	20.0	2.29	2.29	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.15	9.15	0.999
Average Correction Factor					0.999

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	8.03	8.05	0.997
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.05	Prev response	8.00	*% change	0.6%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	8.03	8.01	1.002
Mid point	4960	39.9	4.01	3.97	1.011
Low point	4980	20.0	2.01	1.98	1.016
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	8.03	8.04	0.999
Average Correction Factor					1.010

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.998458	0.999843
THC Cal Offset:	-0.016789	-0.018195
CH ₄ Cal Slope:	0.998903	0.998291
CH ₄ Cal Offset:	-0.016556	-0.017155
NMHC Cal Slope:	0.998068	1.001205
NMHC Cal Offset:	-0.000233	-0.001040

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

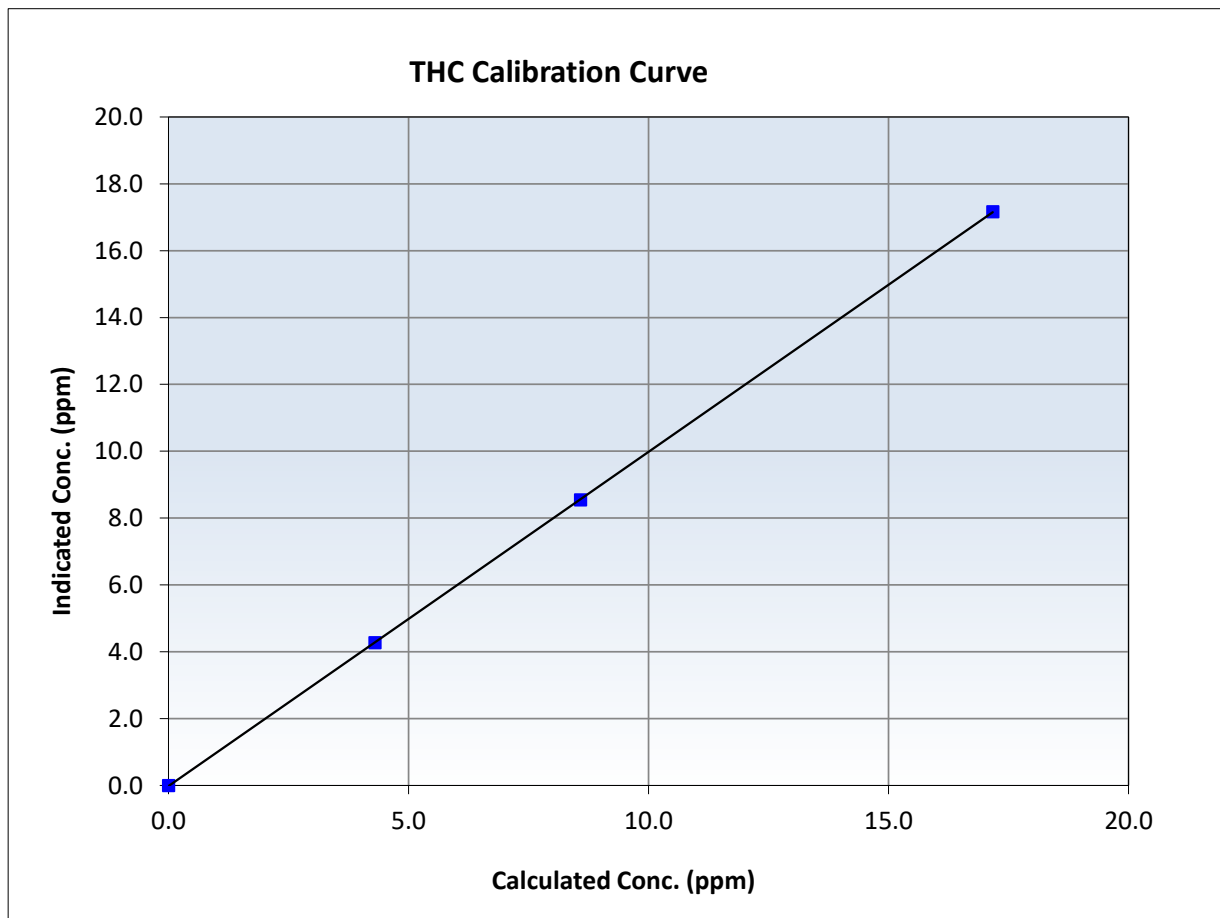
THC Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:32	End Time (MST):	13:56
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999994	<i>≥0.995</i>
17.17	17.16	1.0005	Slope	0.999843	<i>0.90 - 1.10</i>
8.59	8.55	1.0047	Intercept	-0.018195	<i>+/-0.5</i>
4.30	4.27	1.0069			





Wood Buffalo Environmental Association

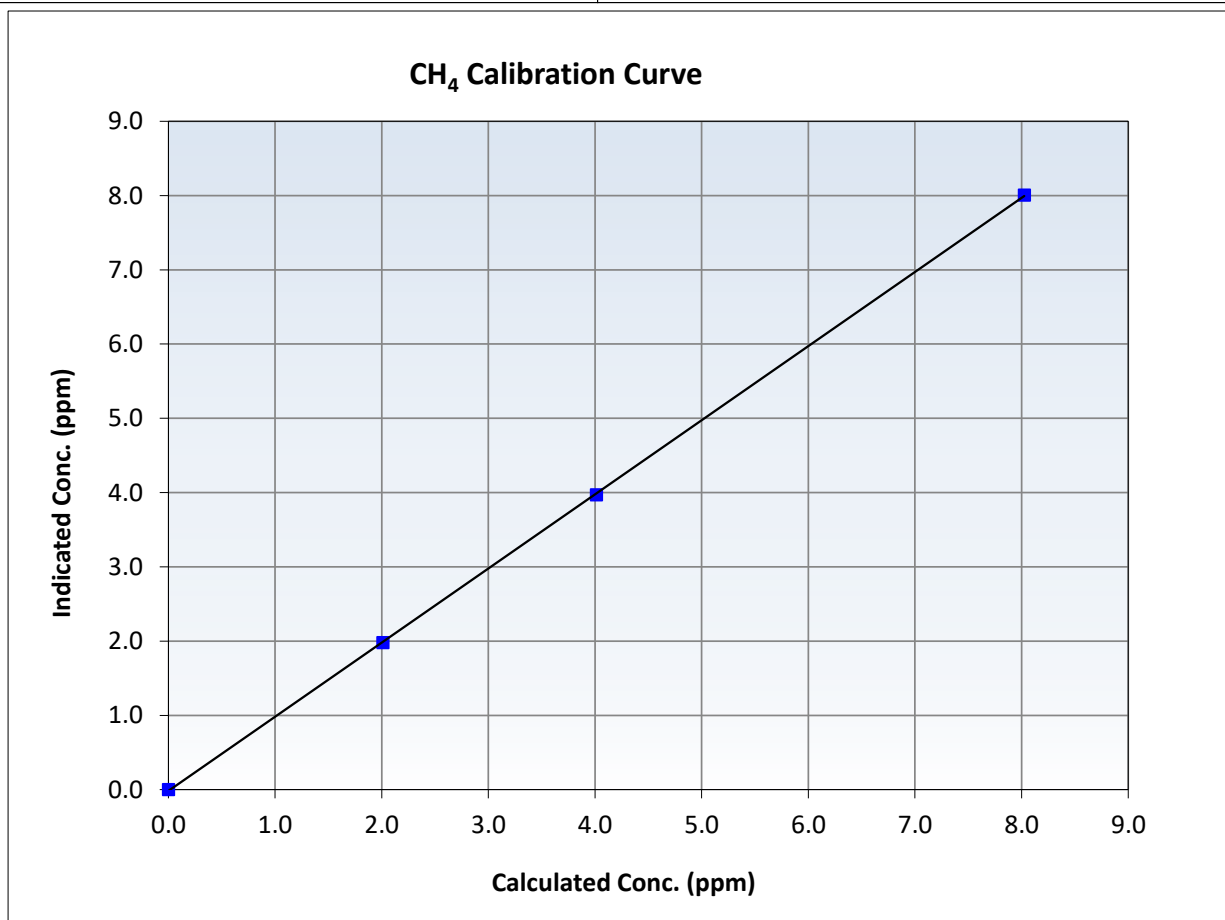
CH₄ Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:32	End Time (MST):	13:56
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999975	<i>≥0.995</i>
8.03	8.01	1.0024	Slope	0.998291	<i>0.90 - 1.10</i>
4.01	3.97	1.0107	Intercept	-0.017155	<i>+/-0.5</i>
2.01	1.98	1.0158			





Wood Buffalo Environmental Association

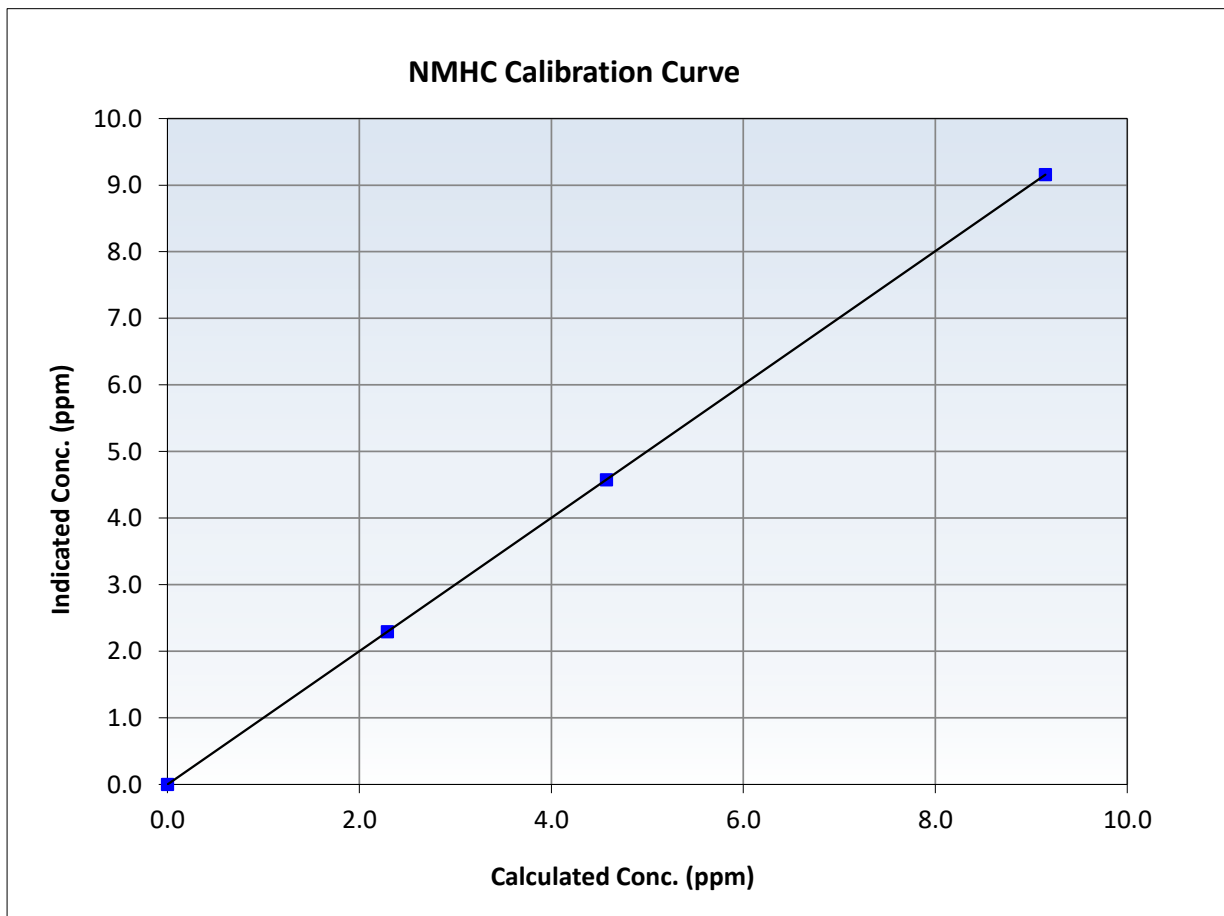
NMHC Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:32	End Time (MST):	13:56
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

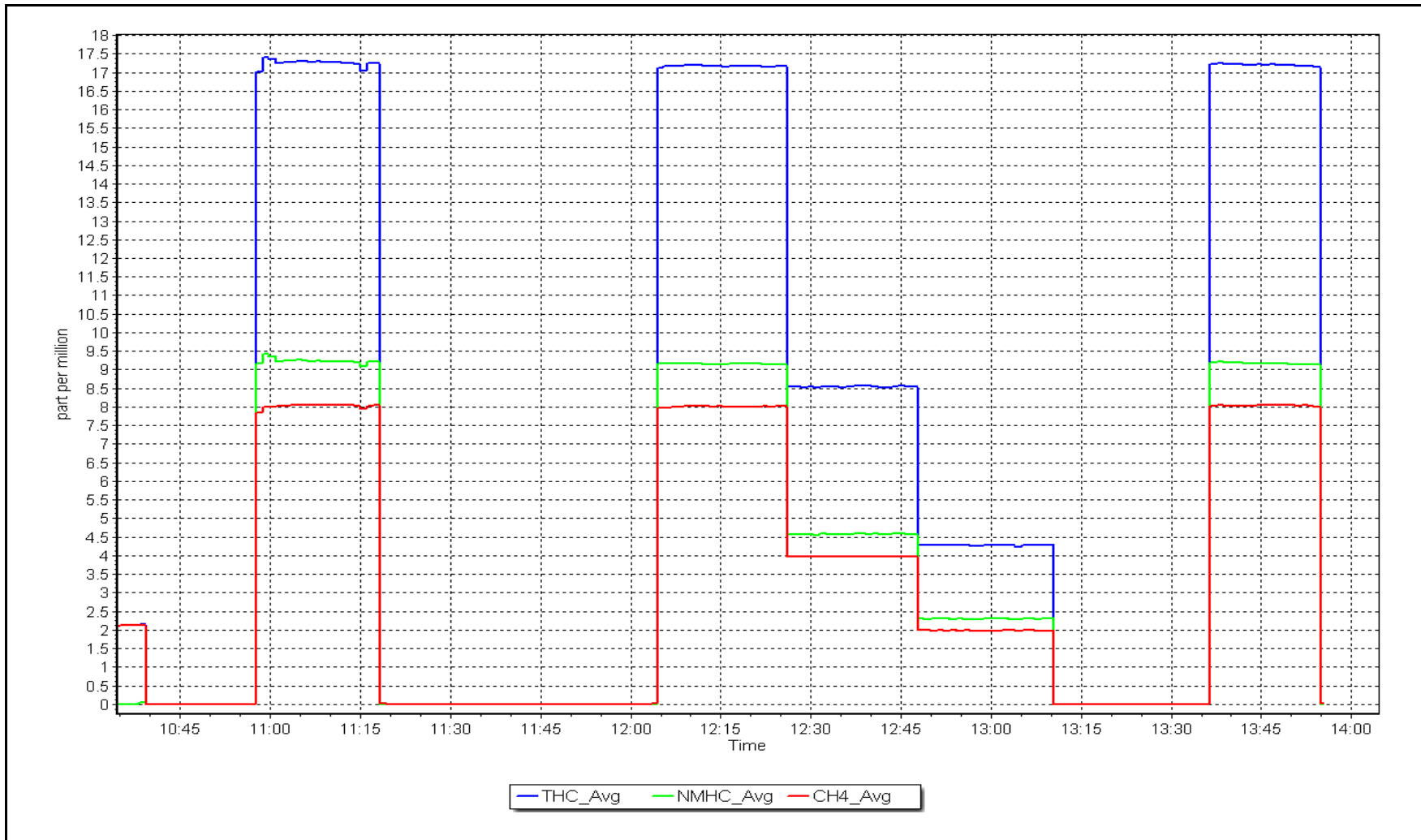
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	1.000000	<i>≥0.995</i>
9.15	9.16	0.9988	Slope	1.001205	<i>0.90 - 1.10</i>
4.57	4.58	0.9994	Intercept	-0.001040	<i>+/-0.5</i>
2.29	2.29	0.9993			



NMHC Calibration Plot

Date: October 8, 2024

Location: Janvier





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Janvier
 Station number: AMS 22
 Calibration Date: October 23, 2024
 Last Cal Date: September 27, 2024
 Start time (MST): 11:31
 End time (MST): 15:37
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: DT0047765
 NOX Cal Gas Conc: 48.90 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 48.90 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701

Cal Gas Expiry Date: March 11, 2031
 NO Cal Gas Conc: 48.80 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 48.80 ppm
 NO gas Diff:
 Serial Number: 3806
 Serial Number: 691

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.3	0.4	0.0	----	----
AF High point	4918	82.0	802.0	800.3	1.6	802.4	788.7	13.8	0.9998	1.0152
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 803.9 ppb		NO = 799.4 ppb			<i>* = > +/-5% change initiates investigation</i>			*Percent Change	NO _x = -0.2%
Baseline Corr 1st pt	NO _x = 802.1 ppb		NO = 788.3 ppb			<u>As Found Statistics</u>			*Percent Change	NO = -1.4%
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :		Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :		NO SI:	NO Int:
						As found	NO ₂ r ² :		NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 833

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.000736	0.998827
NO _x Cal Offset:	1.384212	0.904139
NO Cal Slope:	0.998132	0.993834
NO Cal Offset:	0.563984	0.043774
NO ₂ Cal Slope:	1.006805	1.015859
NO ₂ Cal Offset:	0.388240	0.165557

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
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:	7.8	8.1

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.3	-0.3	----	----
High point	4918	82.0	802.0	800.3	1.6	801.2	795.9	5.3	1.0009	1.0056
Mid point	4960	41.0	400.9	400.1	0.8	402.7	396.5	6.2	0.9955	1.0090
Low point	4980	20.5	200.5	200.1	0.4	201.3	199.3	1.9	0.9959	1.0038
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.3	-0.4	----	----
As left span	4918	82.0	802.0	396.9	405.1	797.0	396.9	400.1	1.0062	1.0000
Average Correction Factor									0.9975	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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	791.2	393.6	399.2	405.5	0.9846	101.6%
Mid GPT point	791.2	595.2	197.6	201.2	0.9823	101.8%
Low GPT point	791.2	695.0	97.8	100.0	0.9784	102.2%
Average Correction Factor					0.9818	101.9%

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

Calibration Performed By: Rene Chamberland



Wood Buffalo Environmental Association

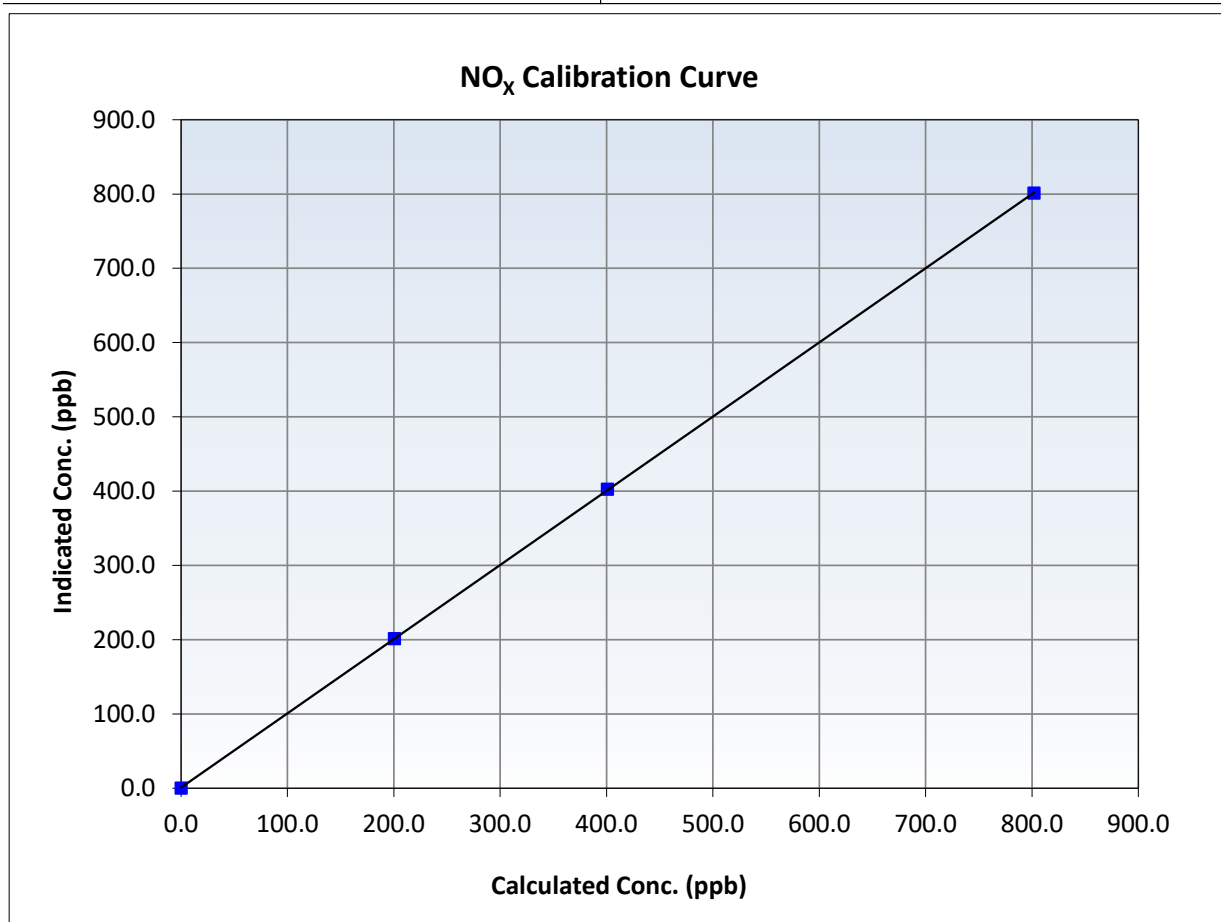
NO_x Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 27, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:31	End Time (MST):	15:37
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999991	≥0.995
802.0	801.2	1.0009	Slope	0.998827	0.90 - 1.10
400.9	402.7	0.9955	Intercept	0.904139	+/-20
200.5	201.3	0.9959			





Wood Buffalo Environmental Association

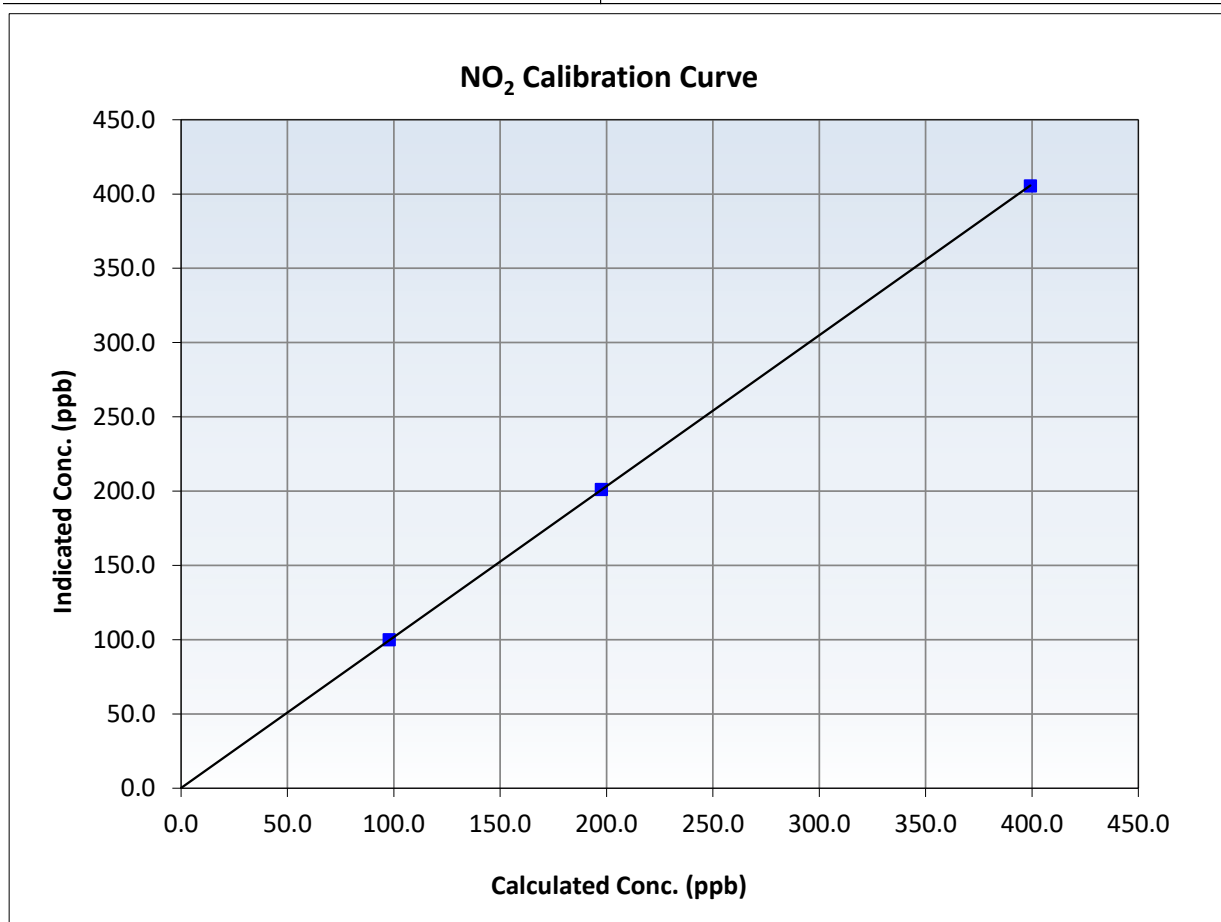
NO₂ Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 27, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:31	End Time (MST):	15:37
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999994	≥0.995
399.2	405.5	0.9846	Slope	1.015859	0.90 - 1.10
197.6	201.2	0.9823	Intercept	0.165557	+/-20
97.8	100.0	0.9784			





Wood Buffalo Environmental Association

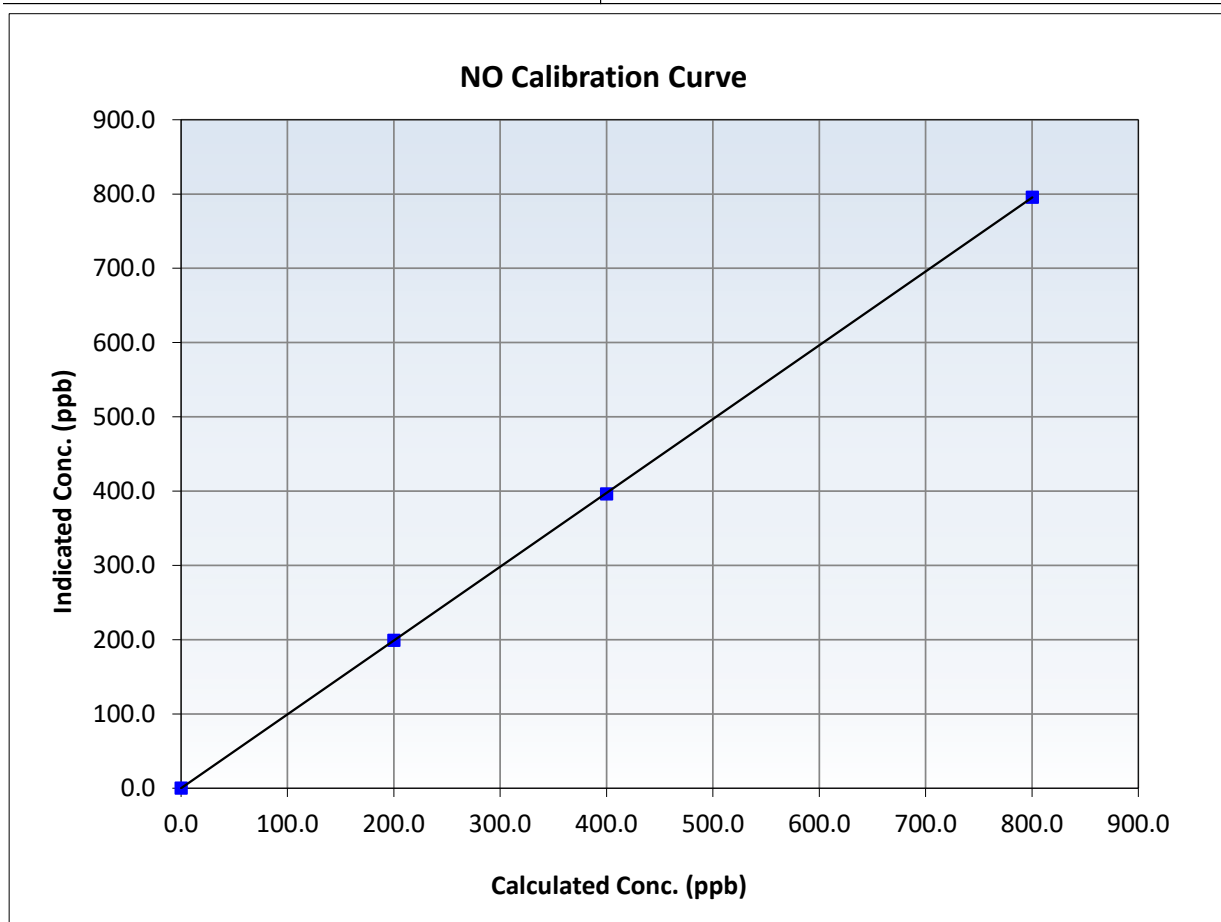
NO Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 27, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:31	End Time (MST):	15:37
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

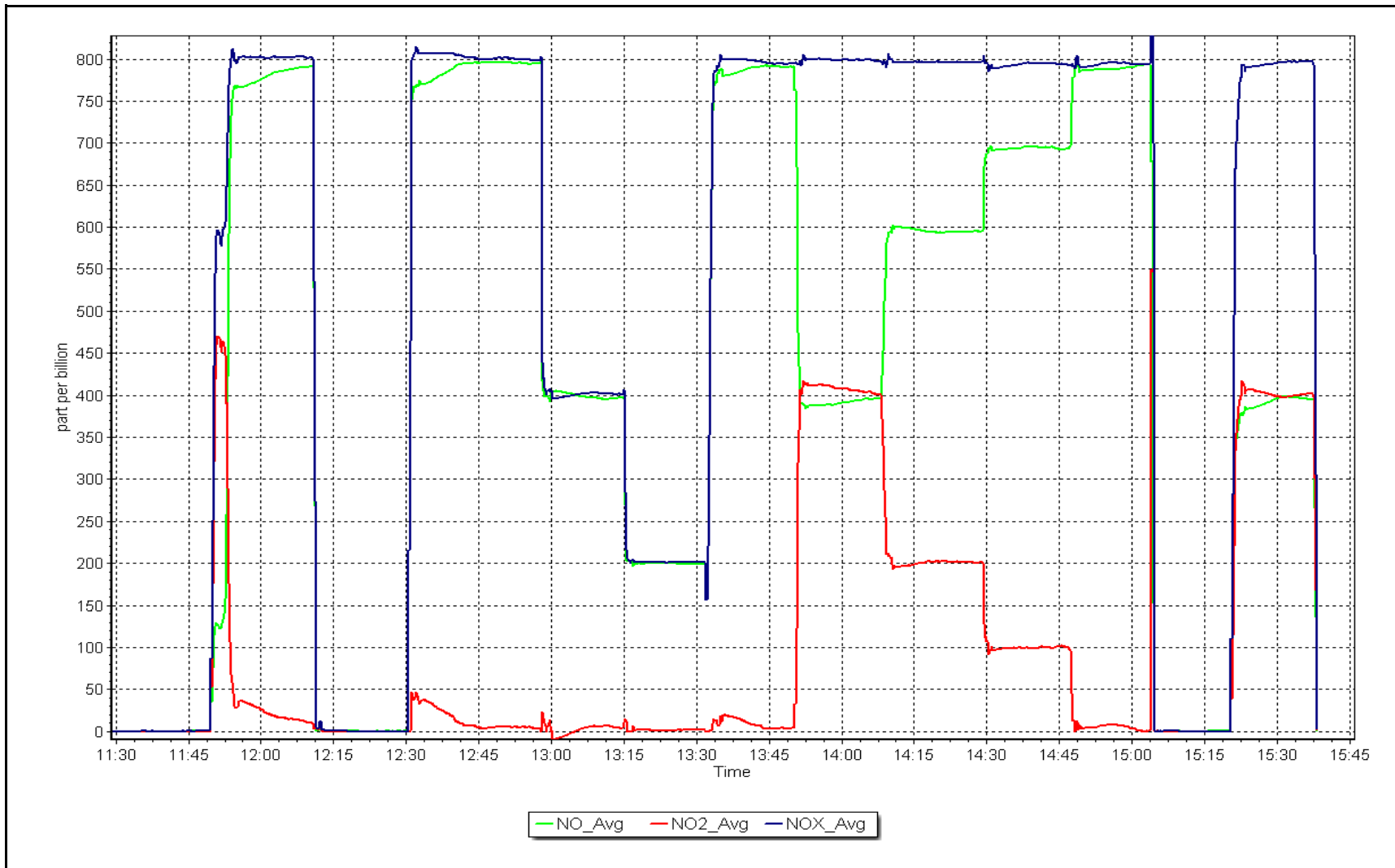
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.3	----	Correlation Coefficient	0.999995	≥0.995
800.3	795.9	1.0056	Slope	0.993834	0.90 - 1.10
400.1	396.5	1.0090	Intercept	0.043774	+/-20
200.1	199.3	1.0038			



NO_x Calibration Plot

Date: October 23, 2024

Location: Janvier





Wood Buffalo Environmental Association

O₃ Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	October 18, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	9:05	End time (MST):	12:00
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer	Serial Number:	3806
Calibrator Make/Model:	Teledyne API T700	Serial Number:	691
ZAG Make/Model:	Teledyne API T701H		

Analyzer Information

Analyzer make:	Teledyne API T400	Analyzer serial #:	7046
Analyzer Range	0 - 500 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003114	1.002314	Backgd or Offset:	2.1	2.1
Calibration intercept:	0.080000	0.220000	Coeff or Slope:	1.027	1.027

O₃ 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	800.0	0.0	-0.4	----
As found High point	5000	919.2	400.0	401.0	0.997
As found Mid point					
As found Low point					
Baseline Corr As found:	401.4	Previous response	401.3	*% 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	

O₃ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	800.0	0.0	-0.4	----
High point	5000	919.8	400.0	400.8	0.998
Mid point	5000	763.4	200.0	201.1	0.995
Low point	5000	656.1	100.0	101.0	0.990
As left zero	5000	800.0	0.0	-0.1	----
As left span	5000	916.2	400.0	403.7	0.991
Average Correction Factor					0.994

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

Calibration Performed By: Denny Ray Estador



Wood Buffalo Environmental Association

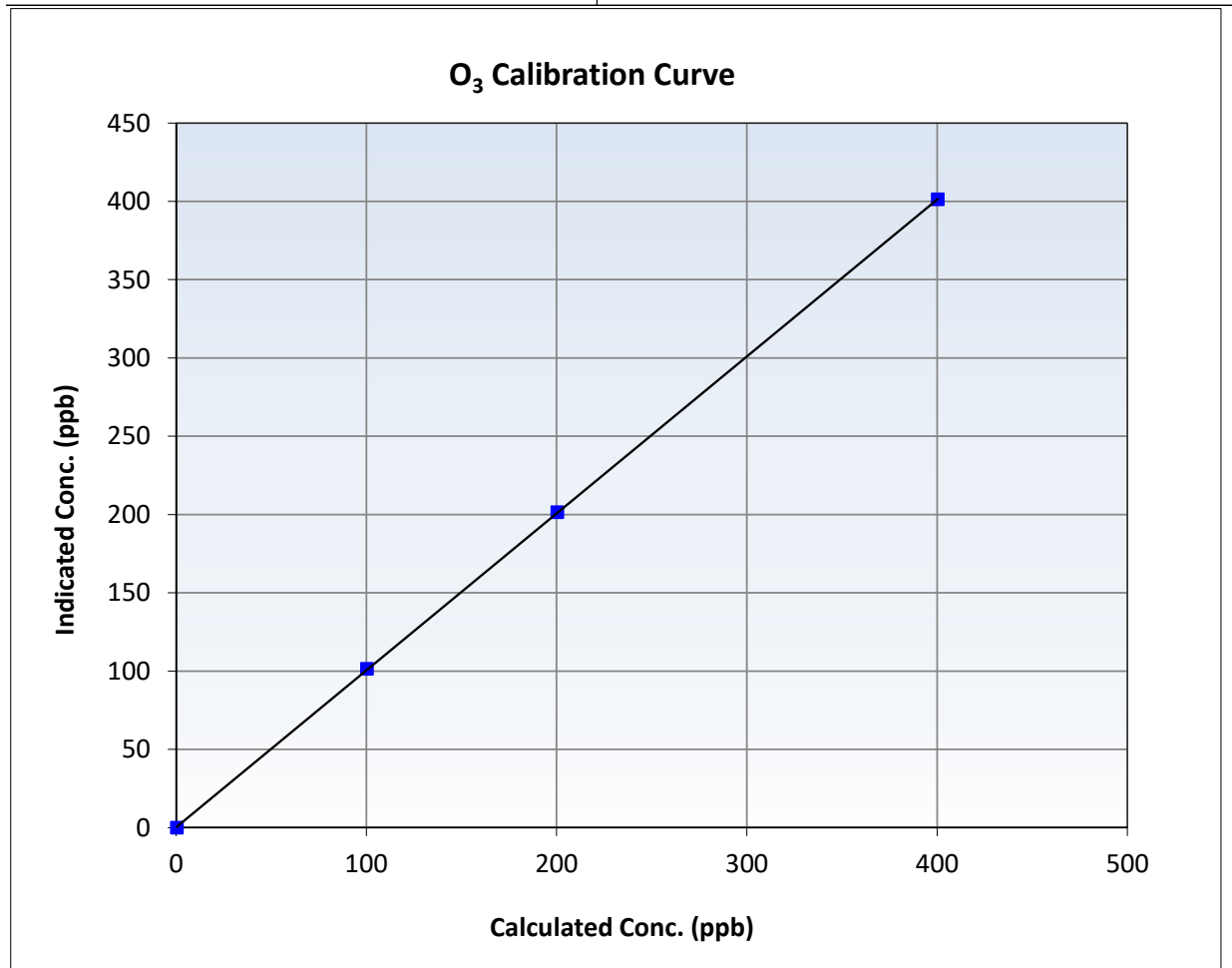
O₃ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 3, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	9:05	End Time (MST):	12:00
Analyzer make:	Teledyne API T400	Analyzer serial #:	7046

Calibration Data

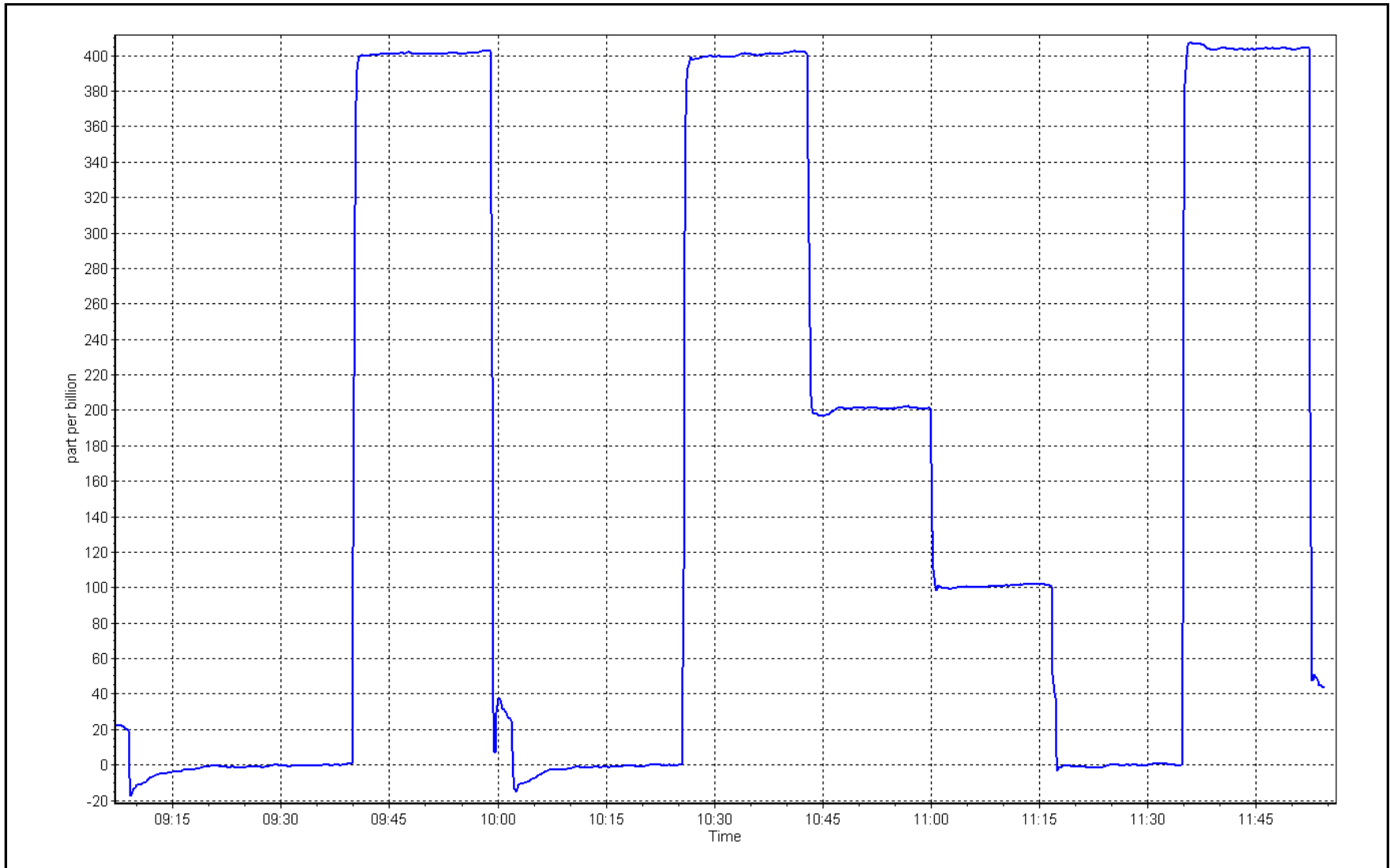
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.4	----	Correlation Coefficient	0.999989	≥0.995
400.0	400.8	0.9980	Slope	1.002314	0.90 - 1.10
200.0	201.1	0.9945	Intercept	0.220000	+/- 5
100.0	101.0	0.9901			



O₃ Calibration Plot

Date: October 18, 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: October 29, 2024 Last Cal Date: September 26, 2024
 Start time (MST): 11:37 End time (MST): 13:11

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)	-2.3	-2.79	-2.3	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	715.8	716.89	715.8	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	4.98	4.984	4.98	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	39	----	39	<input type="checkbox"/>	>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: June 10, 2024
 Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test	10.2	10.3	11.1	<input checked="" type="checkbox"/>	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. PMT peak test completed. Optical chamber, RH/T sensor, and sample tube cleaned. Disposable filter changed.

Calibration by: Rene Chamberland



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Janvier	Station Number:	AMS 22
Calibration Date:	October 8, 2024	Prev Cal Date:	August 24, 2023
Start Time (MST):	12:35	End Time (MST):	13:20
Tower Height (m):	20.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P22393
WS Calibrator:	MetOne 053	Serial Number:	P15103

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.2%
400	39.4	39.4	0.1%
600	58.6	58.5	0.0%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999999	0.999999	≥ 0.9995
Calculated slope	0.999594	0.998868	$0.90 - 1.10$
Calculated intercept	-0.028293	0.028930	± 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	D14054
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	13:25	Calc Declination*:	13.02 Degrees
Deadband calc:	1.7 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.5	---
90	87.9	-0.6%
180	177.6	-0.7%
270	272.4	0.7%
357	355.8	-0.3%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999979	0.999900	≥ 0.9995
Calculated slope	1.001480	0.998560	$0.90 - 1.10$
Calculated intercept	0.582167	0.807587	± 4

Notes: Annual WS/WD calibration.

Calibration Performed By: Devin Russell & Ryan Power



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Janvier	Station Number:	AMS 22
Calibration Date:	October 8, 2024	Prev Cal Date:	November 16, 2023
Start Time (MST):	12:27	End Time (MST):	13:45
Tower Height (m):	10.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	D16121
WS Calibrator:	MetOne 053	Serial Number:	P15103

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.2%
400	39.4	39.4	0.1%
600	58.6	58.5	0.0%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999999	0.999999	≥0.9995
Calculated slope	0.999473	0.998868	0.90 - 1.10
Calculated intercept	0.026227	0.028930	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	D14528
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	13:10	Calc Declination*:	13.02 Degrees
Deadband calc:	1.1 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.3	---
90	88.0	-0.6%
180	178.2	-0.5%
270	270.0	0.0%
357	356.2	-0.2%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999924	0.999972	≥0.9995
Calculated slope	1.008921	1.000103	0.90 - 1.10
Calculated intercept	0.114807	0.839965	+/- 4

Notes: Annual WS/WD calibration, no issues to note. Used a compass to line up the crossarm.

Calibration Performed By: Rene Chamberland



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS23 FORT HILLS OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	October 2, 2024	Last Cal Date:	September 4, 2024
Start time (MST):	7:00	End time (MST):	9:40
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.004241	0.997777	Backgd or Offset:	18.4	18.4
Calibration intercept:	-0.604468	-0.443147	Coeff or Slope:	1.046	1.046

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4920	80.3	799.1	797.5	1.002
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	797.6	Previous response	801.9	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4920	80.3	799.1	797.1	1.003
Mid point	4960	40.2	400.1	398.8	1.003
Low point	4980	20.1	200.0	198.1	1.010
As left zero	5000	0.0	0.0	0.4	----
As left span	4920	80.3	799.1	799.1	1.000
Average Correction Factor:					1.005

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

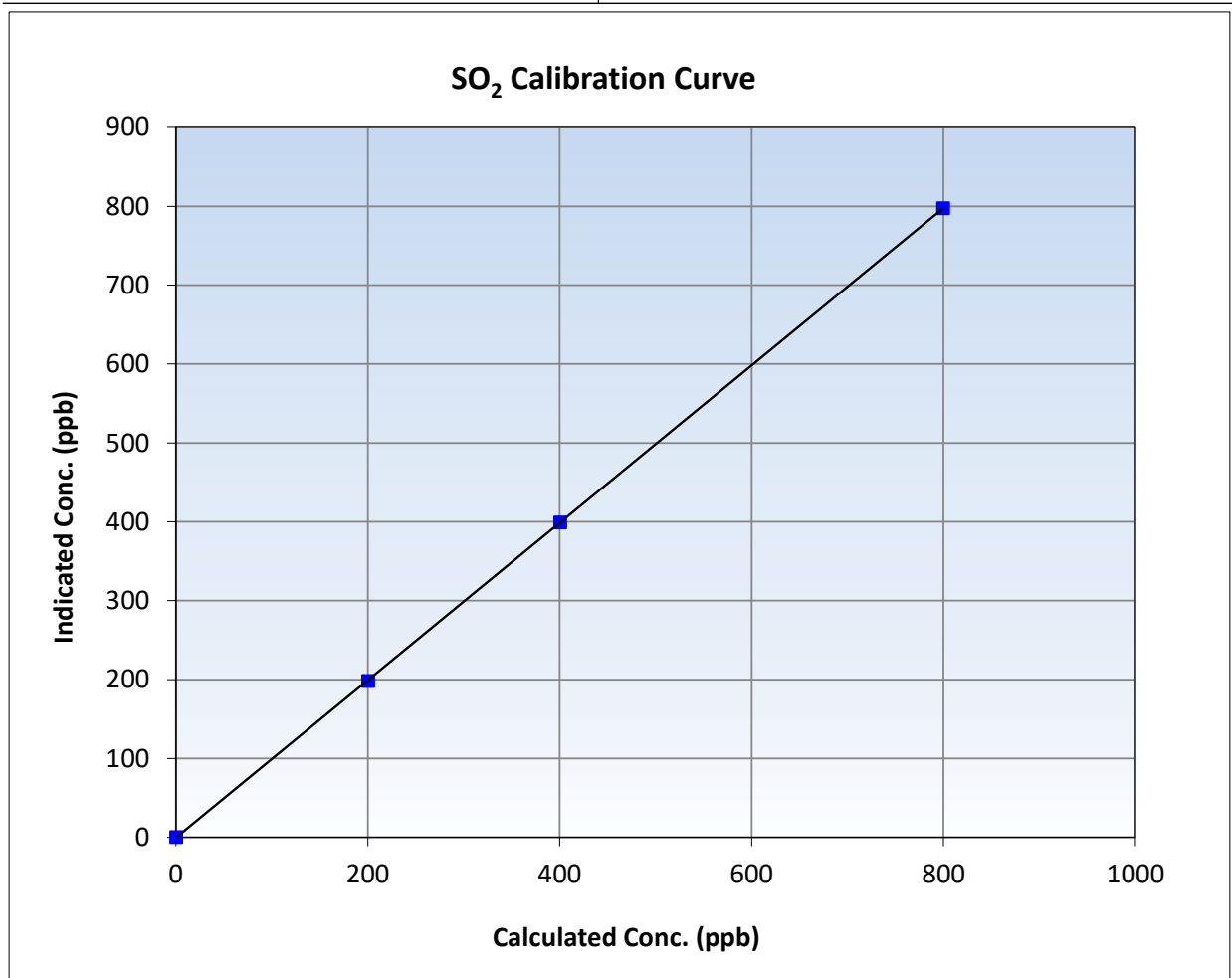
SO₂ Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 4, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:00	End Time (MST):	9:40
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290012

Calibration Data

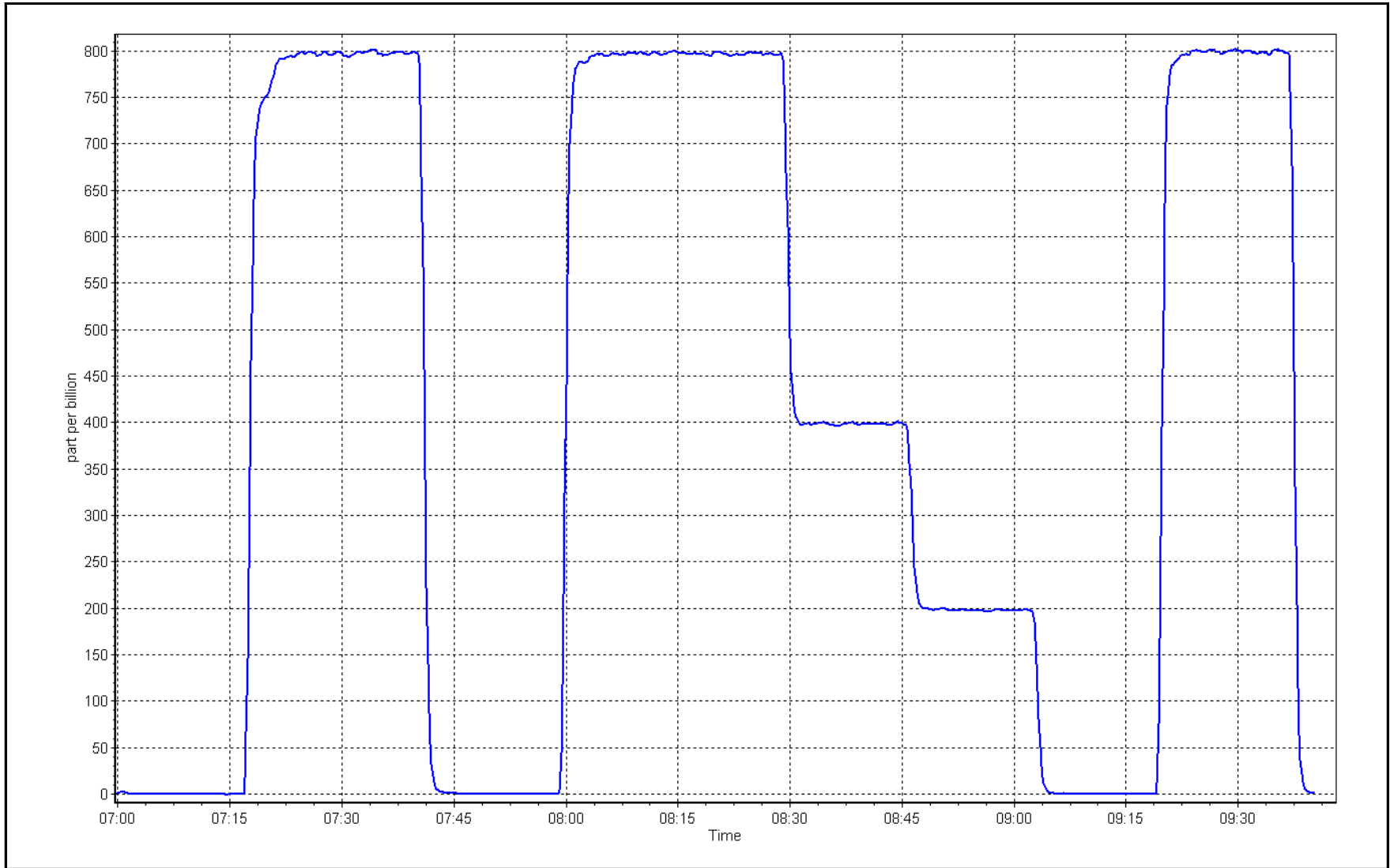
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.3	----	Correlation Coefficient	0.999995	≥0.995
799.1	797.1	1.0025	Slope	0.997777	0.90 - 1.10
400.1	398.8	1.0031	Intercept	-0.443147	+/-30
200.0	198.1	1.0097			



SO2 Calibration Plot

Date: October 2, 2024

Location: Fort Hills





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	October 11, 2024	Last Cal Date:	September 16, 2024
Start time (MST):	6:29	End time (MST):	10:14
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.20	ppm	Cal Gas Exp Date:	February 5, 2024
Cal Gas Cylinder #:	CC517372			
Removed Cal Gas Conc:	5.20	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.007633	1.007344	Backgd or Offset:	2.04	1.94
Calibration intercept:	-0.438126	-0.177989	Coeff or Slope:	1.184	1.148

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4923	77.0	80.1	81.7	0.980
As found Mid point	4962	38.5	40.0	41.0	0.976
As found Low point	4981	19.2	20.0	20.3	0.984
New cylinder response					
Baseline Corr As found:	81.7	Prev response:	80.25	*% change:	1.8%
Baseline Corr 2nd AF pt:	41.0	AF Slope:	1.020755	AF Intercept:	0.002336
Baseline Corr 3rd AF pt:	20.3	AF Correlation:	0.999993	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4923	77.0	80.1	80.5	0.995
Mid point	4962	38.5	40.0	40.2	0.996
Low point	4981	19.2	20.0	19.8	1.008
As left zero	5000	0.0	0.0	0.1	----
As left span	4923	77.0	80.1	80.5	0.995
SO2 Scrubber Check	4920	80.3	803.0	0.1	----
Date of last scrubber change:				Ave Corr Factor	1.000
Date of last converter efficiency test:	March 13, 2024			102.7%	efficiency

Notes: SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

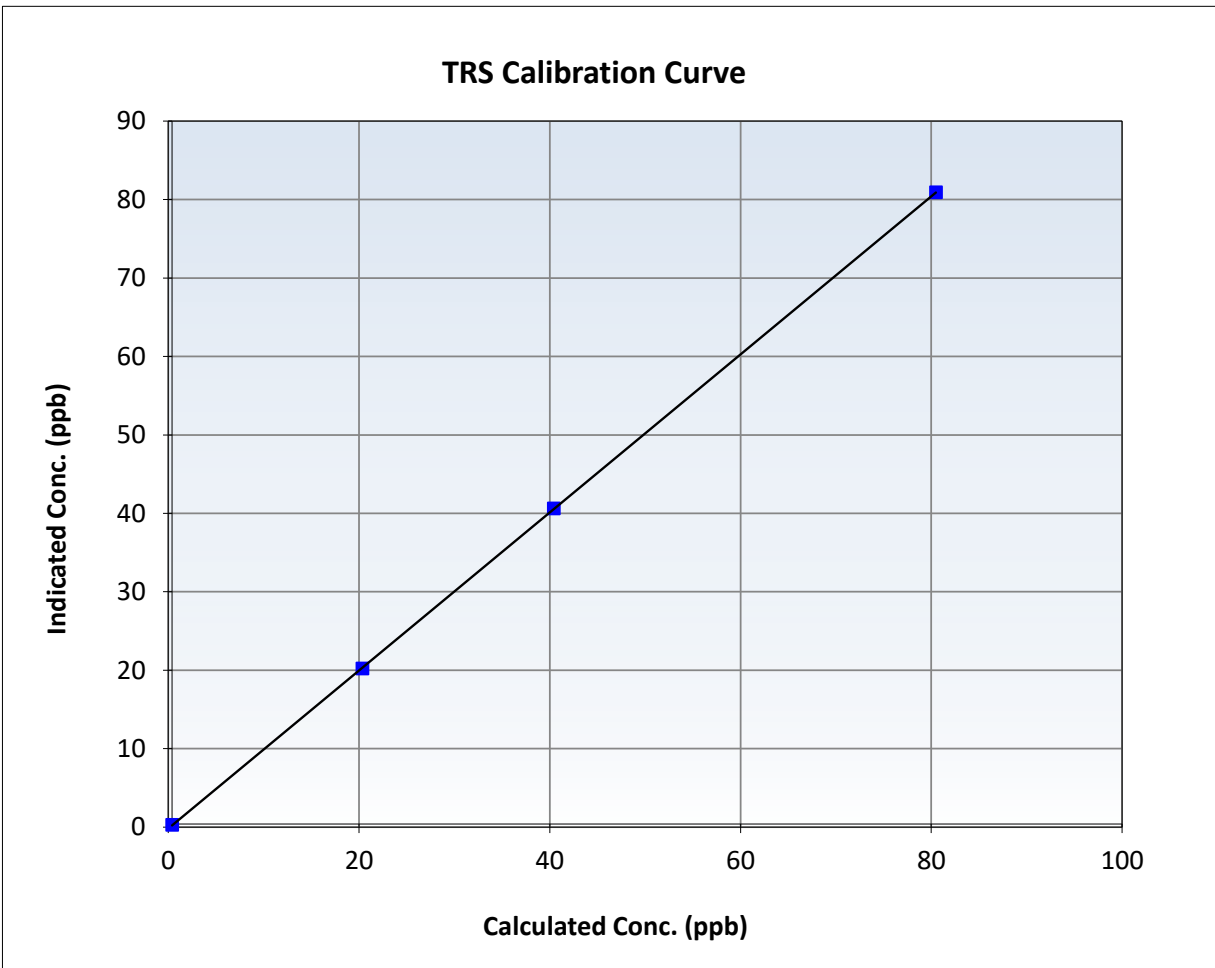
TRS Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	September 16, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:29	End Time (MST):	10:14
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1300156232

Calibration Data

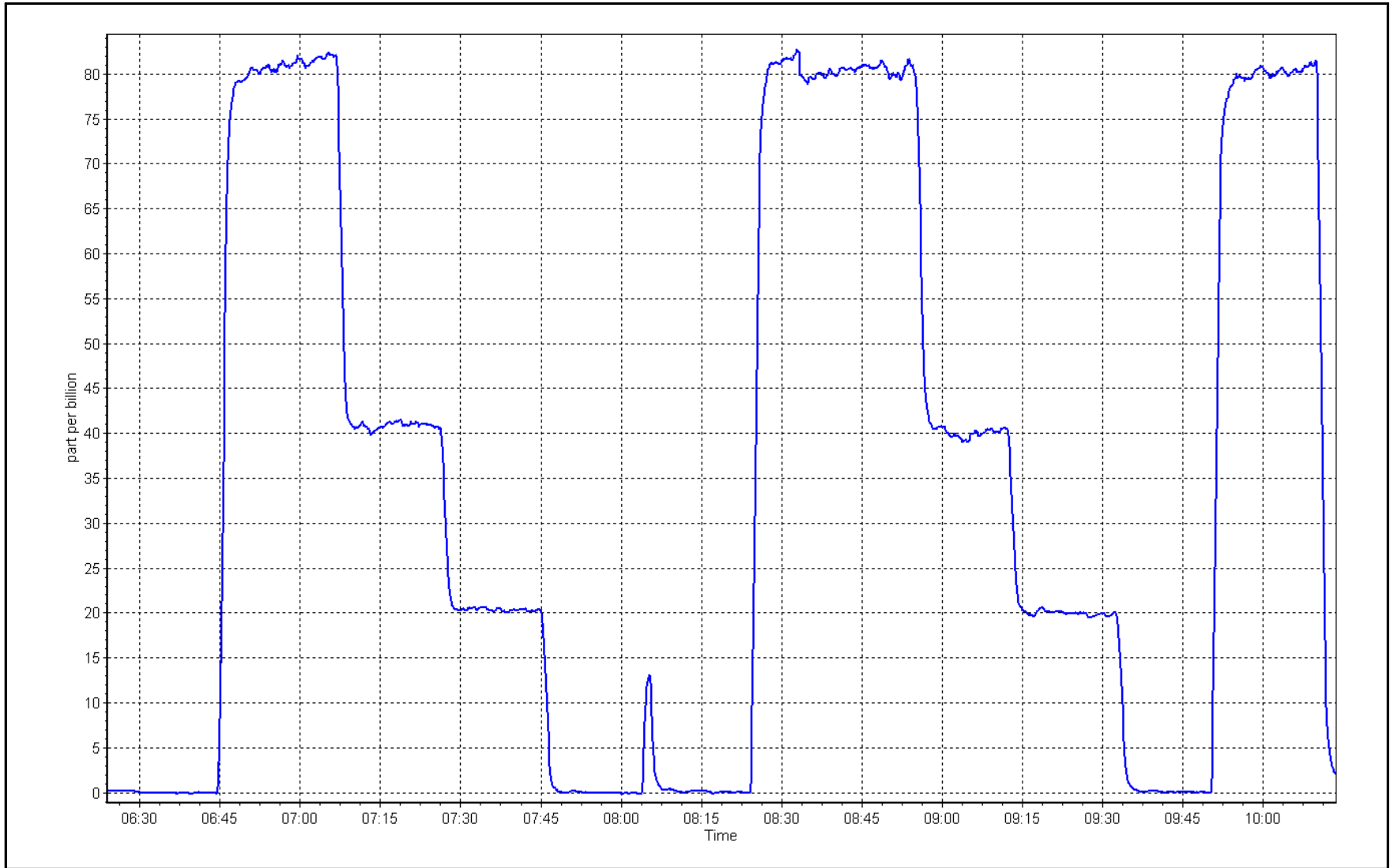
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999992	≥ 0.995
80.1	80.5	0.9948	Slope	1.007344	$0.90 - 1.10$
40.0	40.2	0.9959	Intercept	-0.177989	± 3
20.0	19.8	1.0084			



TRS Calibration Plot

Date: October 11, 2024

Location: Fort Hills





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	October 2, 2024	Last Cal Date:	September 25, 2024
Start time (MST):	7:00	End time (MST):	9:39
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.02E-04	2.02E-04	NMHC SP Ratio:	6.60E-05	6.78E-05
CH4 Retention time:	12.2	12.2	NMHC Peak Area:	138802	135181
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.19	16.89	1.018
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.89	Prev response	17.29	*% change	-2.4%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.19	17.18	1.001
Mid point	4960	40.2	8.61	8.68	0.991
Low point	4980	20.1	4.30	4.34	0.992
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.19	17.24	0.998
Average Correction Factor					0.995

Notes: No Maintenance done. Span adjusted.



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.16	8.83	1.038
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.83	Prev response	9.22	*% change	-4.5%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.16	9.16	1.000
Mid point	4960	40.2	4.59	4.67	0.982
Low point	4980	20.1	2.29	2.35	0.974
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.16	9.20	0.996
Average Correction Factor					0.986

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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.03	8.06	0.997
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.06	Prev response	8.07	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.03	8.03	1.001
Mid point	4960	40.2	4.02	4.01	1.002
Low point	4980	20.1	2.01	1.99	1.012
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.03	8.04	0.999
Average Correction Factor					1.005

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.002954	0.999197
THC Cal Offset:	0.052168	0.031191
CH ₄ Cal Slope:	1.005950	1.000060
CH ₄ Cal Offset:	-0.009658	-0.010446
NMHC Cal Slope:	1.000339	0.998416
NMHC Cal Offset:	0.062026	0.041237

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

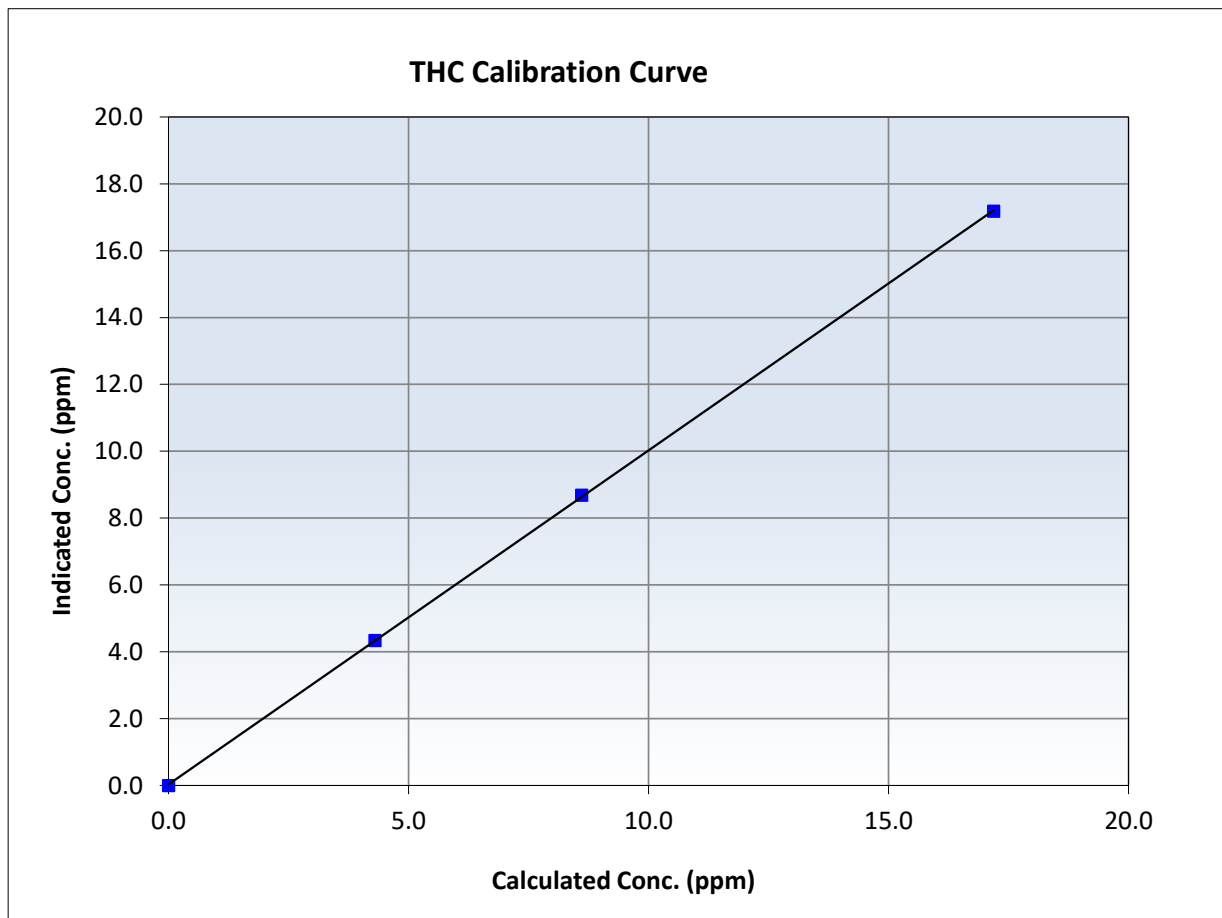
THC Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 25, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:00	End Time (MST):	9:39
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999973 ≥0.995
17.19	17.18	1.0006	Slope	0.999197 0.90 - 1.10
8.61	8.68	0.9913	Intercept	0.031191 +/-0.5
4.30	4.34	0.9918		





Wood Buffalo Environmental Association

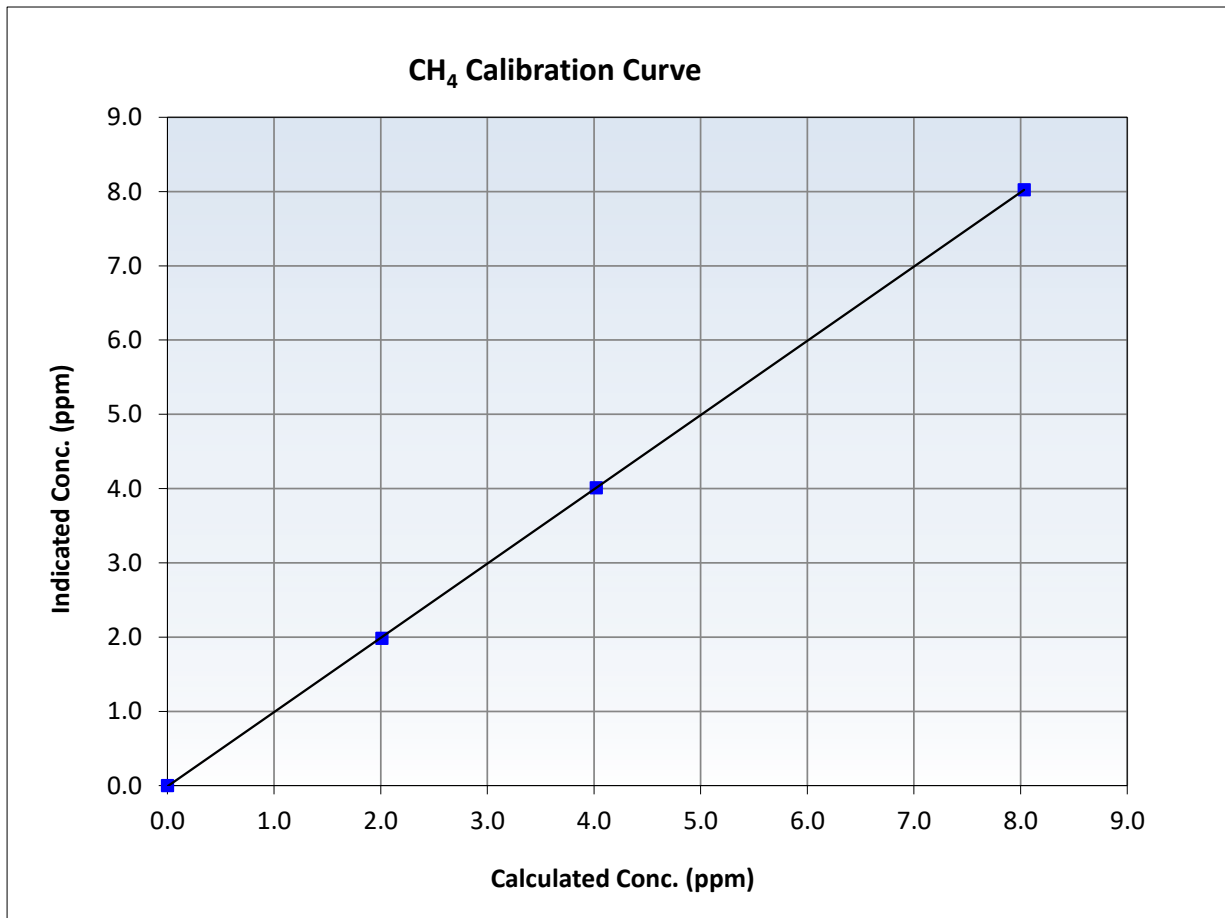
CH₄ Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 25, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:00	End Time (MST):	9:39
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999991	<i>≥0.995</i>
8.03	8.03	1.0008	Slope	1.000060	<i>0.90 - 1.10</i>
4.02	4.01	1.0024	Intercept	-0.010446	<i>+/-0.5</i>
2.01	1.99	1.0125			





Wood Buffalo Environmental Association

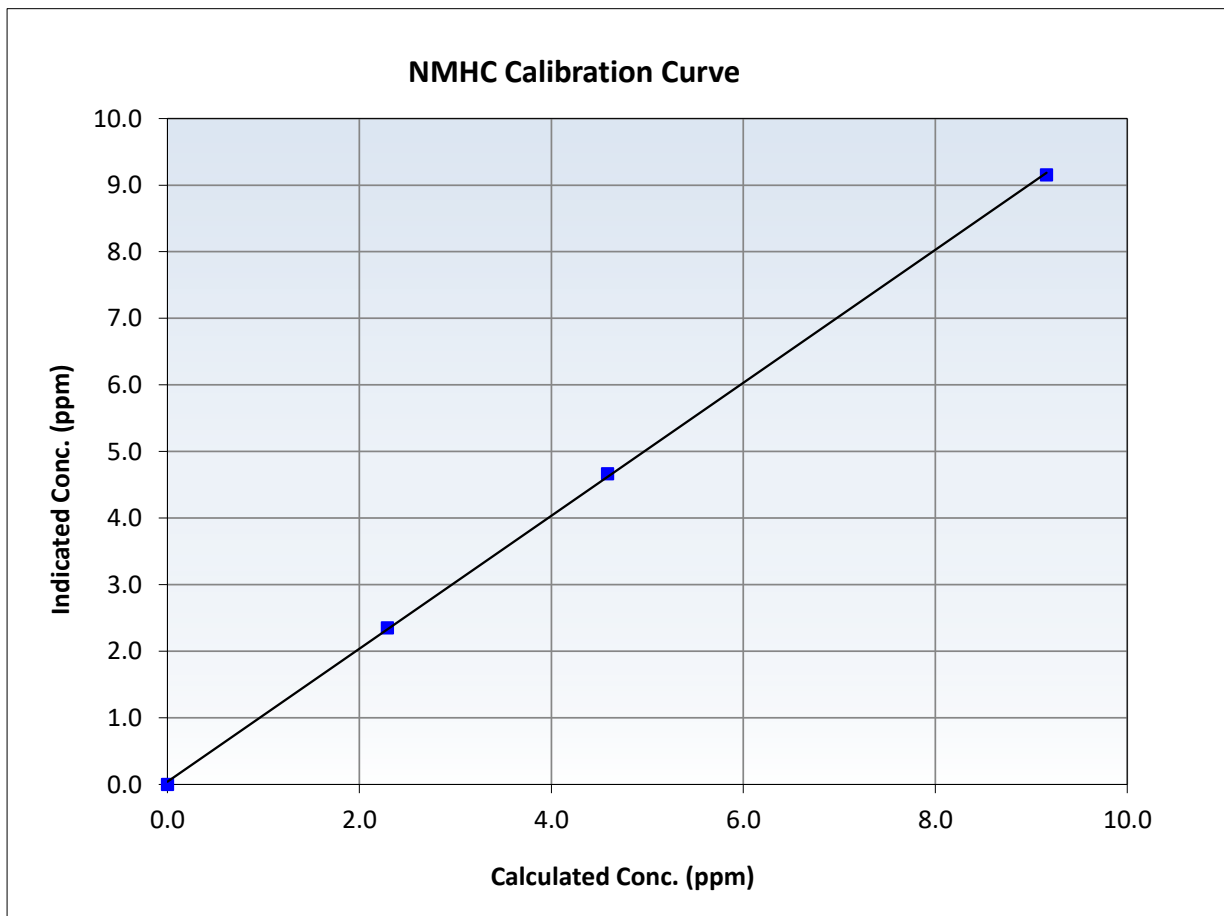
NMHC Calibration Summary

Station Information

Calibration Date:	October 2, 2024	Previous Calibration:	September 25, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:00	End Time (MST):	9:39
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

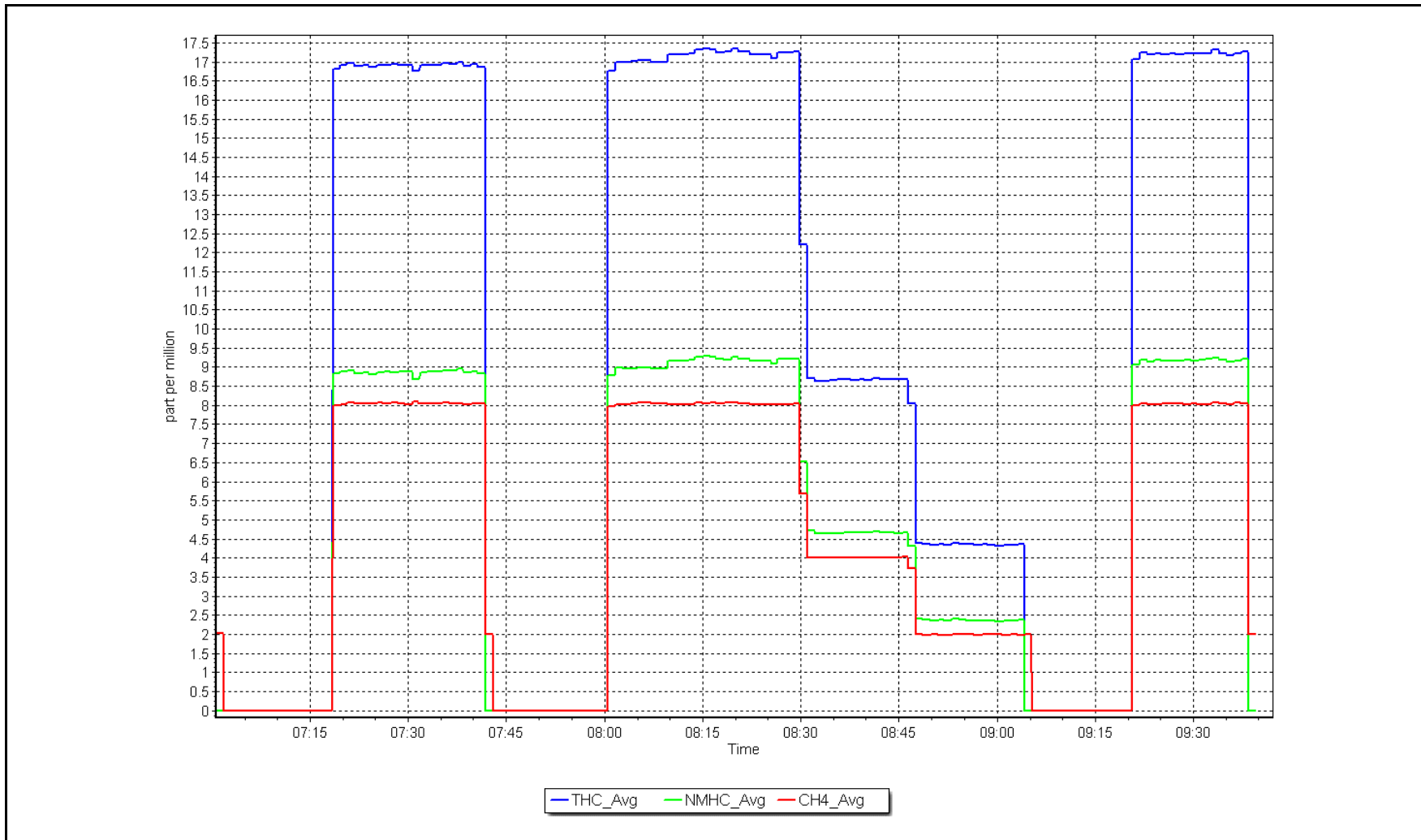
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999880	<i>≥0.995</i>
9.16	9.16	1.0004	Slope	0.998416	<i>0.90 - 1.10</i>
4.59	4.67	0.9823	Intercept	0.041237	<i>+/-0.5</i>
2.29	2.35	0.9744			



NMHC Calibration Plot

Date: October 2, 2024

Location: Fort Hills





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Fort Hills
 Station number: AMS 23
 Calibration Date: October 9, 2024
 Last Cal Date: September 12, 2024
 Start time (MST): 6:55
 End time (MST): 11:06
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: CC358149
 NOX Cal Gas Conc: 60.30 ppm
 Removed Cylinder #:
 Removed Gas NOX Conc: 60.30 ppm
 NOX gas Diff:
 Calibrator Model: API T700
 ZAG make/model: API T701
 Cal Gas Expiry Date: January 5, 1932
 NO Cal Gas Conc: 60.10 ppm
 Removed Gas Exp Date:
 Removed Gas NO Conc: 60.10 ppm
 NO gas Diff:
 Serial Number: 451
 Serial Number: 5611

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
AF High point	4934	66.3	799.5	796.9	2.7	783.1	777.9	5.2	1.0206	1.0241
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 798.9 ppb		NO = 797.0 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -2.0%	
Baseline Corr 1st pt	NO _x = 783.4 ppb		NO = 778.1 ppb			<u>As Found Statistics</u>		*Percent Change	NO = -2.4%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1152430007

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.999813	1.000056
NO _x Cal Offset:	-0.513906	0.025741
NO Cal Slope:	1.002434	1.002779
NO Cal Offset:	-1.792787	-1.712937
NO ₂ Cal Slope:	0.998755	0.997708
NO ₂ Cal Offset:	-1.443570	-0.037795

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.253	1.283	NO bkgnd or offset:	3.8	3.8
NOX coeff or slope:	0.993	0.992	NOX bkgnd or offset:	4.0	4.1
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	188.5	188.5

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	----	----
High point	4934	66.3	799.5	796.9	2.7	799.4	798.1	1.3	1.0002	0.9985
Mid point	4967	33.2	400.4	399.0	1.3	400.8	397.9	2.9	0.9989	1.0029
Low point	4983	16.6	200.2	199.5	0.7	200.3	196.6	3.7	0.9996	1.0150
As left zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
As left span	4934	66.3	799.5	402.6	396.9	802.8	402.6	400.2	0.9959	1.0000
Average Correction Factor									0.9996	1.0054

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	795.2	400.2	397.7	396.9	1.0019	99.8%
Mid GPT point	795.2	597.2	200.7	199.5	1.0058	99.4%
Low GPT point	795.2	696.1	101.8	102.0	0.9976	100.2%
Average Correction Factor					1.0017	99.8%

Notes: No Maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

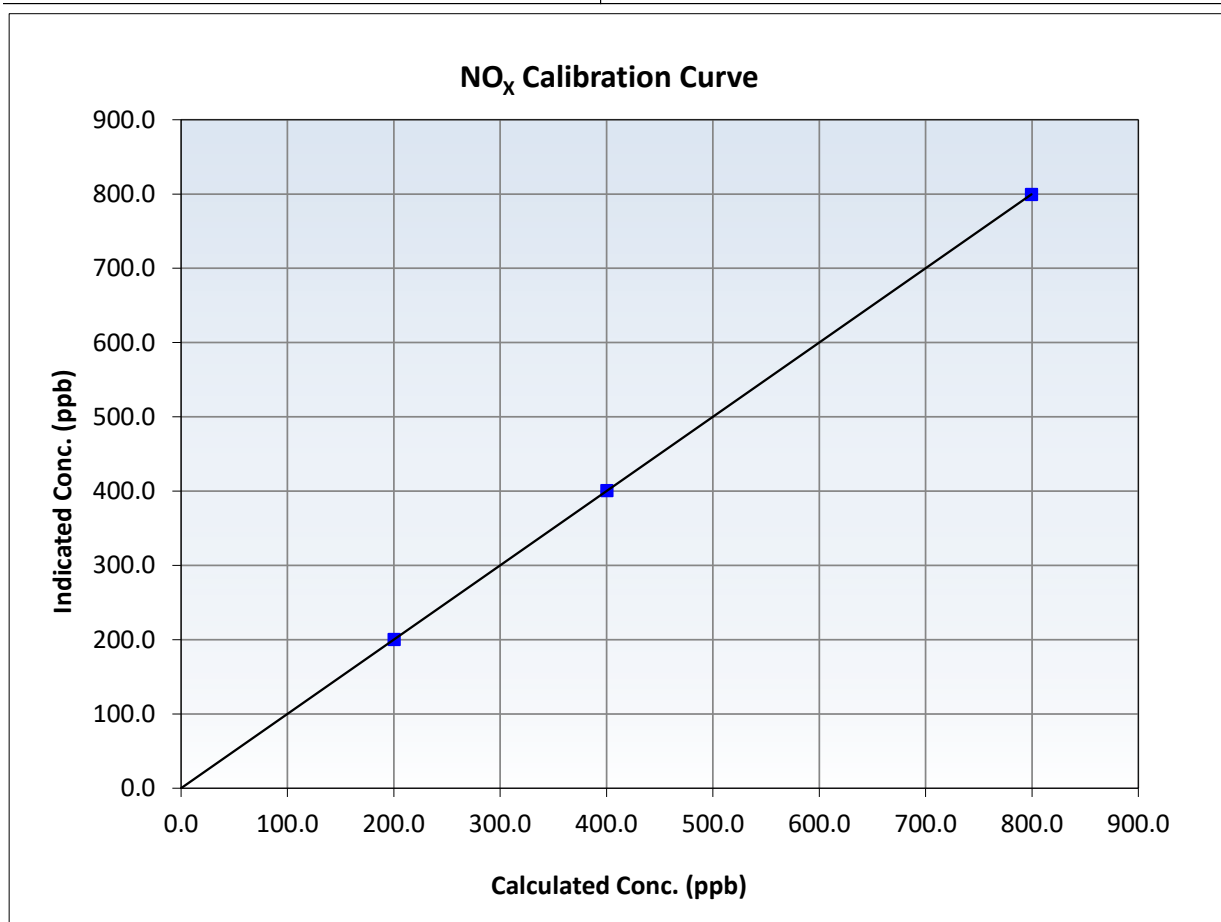
NO_x Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:55	End Time (MST):	11:06
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.2	----	Correlation Coefficient	0.999999	≥0.995
799.5	799.4	1.0002	Slope	1.000056	0.90 - 1.10
400.4	400.8	0.9989	Intercept	0.025741	+/-20
200.2	200.3	0.9996			





Wood Buffalo Environmental Association

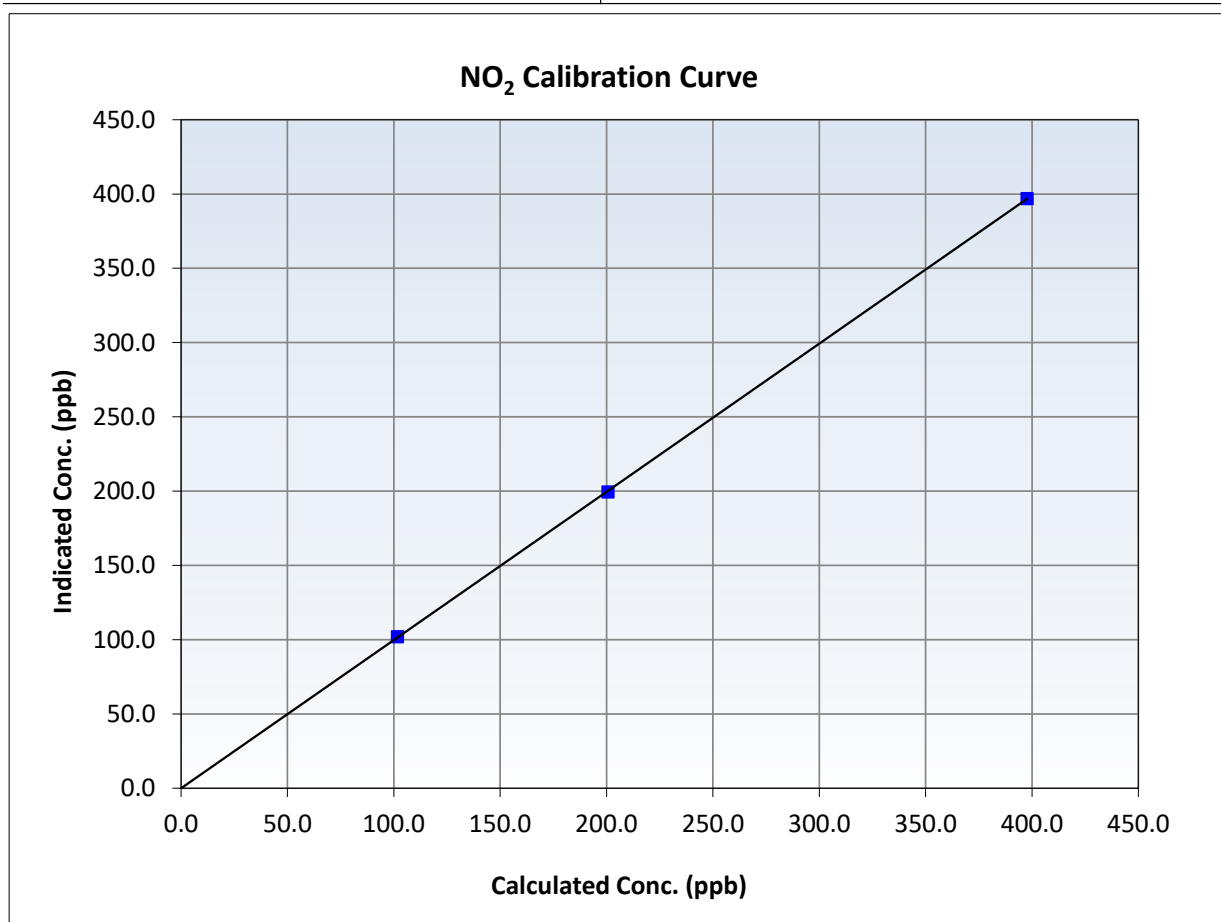
NO₂ Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:55	End Time (MST):	11:06
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999991	≥0.995
397.7	396.9	1.0019	Slope	0.997708	0.90 - 1.10
200.7	199.5	1.0058	Intercept	-0.037795	+/-20
101.8	102.0	0.9976			





Wood Buffalo Environmental Association

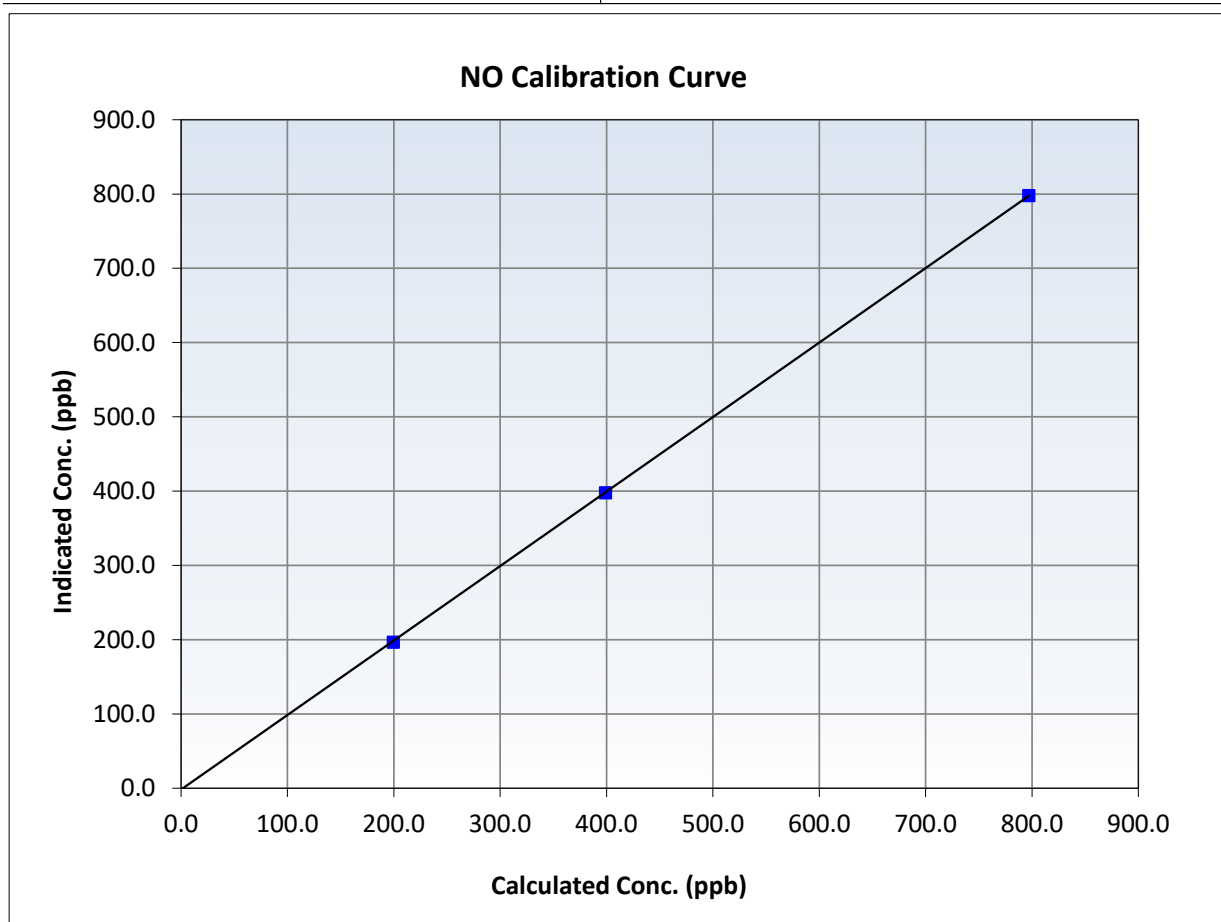
NO Calibration Summary

Station Information

Calibration Date:	October 9, 2024	Previous Calibration:	September 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:55	End Time (MST):	11:06
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

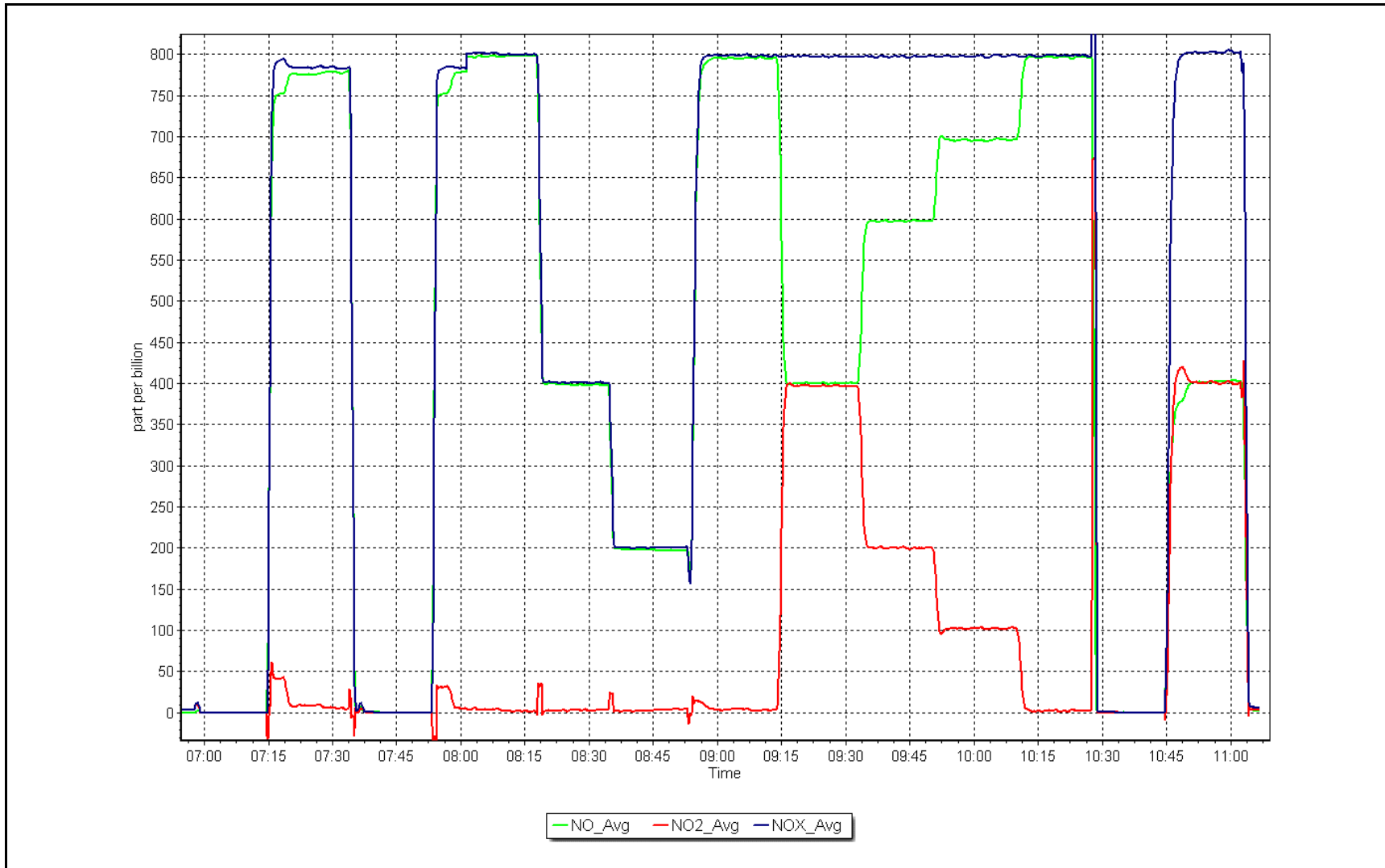
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	0.999981	≥0.995
796.9	798.1	0.9985	Slope	1.002779	0.90 - 1.10
399.0	397.9	1.0029	Intercept	-1.712937	+/-20
199.5	196.6	1.0150			



NO_x Calibration Plot

Date: October 9, 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: October 11, 2024 Last Cal Date: September 4, 2024
 Start time (MST): 6:48 End time (MST): 7:14

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)	1.0	0.4	1.0	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	739.2	738.8	739.2	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.01	4.94	5.01	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	39	----	39	<input type="checkbox"/>	>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: 10-Jun-24
 Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test				<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: September 4, 2024
 Date Disposable Filter Changed: September 4, 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. Leak check Passed. Touch Screen not working, was able to talk to it remotely.

Calibration by: Melissa Lemay



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Fort Hills	Station Number:	AMS 23
Calibration Date:	October 2, 2024	Prev Cal Date:	October 2, 2023
Start Time (MST):	9:48	End Time (MST):	10:31
Tower Height (m):	10m	Reason:	Removal

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P19837
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.6	0.1%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999999	0.999999	≥0.9995
Calculated slope	0.999473	0.998960	0.90 - 1.10
Calculated intercept	0.026227	0.026359	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	B14267
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	12:13:40	Calc Declination*:	13.76 Degrees
Deadband calc:	1.1 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.1	---
90	89.4	-0.2%
180	181.9	0.5%
270	272.4	0.7%
357	356.0	-0.3%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999993	0.999943	≥0.9995
Calculated slope	1.002788	0.998883	0.90 - 1.10
Calculated intercept	-0.640493	-0.355011	+/- 4

Notes: Checked cross arm with solarnoon before and after tower take down. WS and WD removed due to torque test fail.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Fort Hills	Station Number:	AMS 23
Calibration Date:	October 2, 2024	Prev Cal Date:	October 2, 2023
Start Time (MST):	9:48	End Time (MST):	10:31
Tower Height (m):	10m	Reason:	Install

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	B17268
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.7	0.2%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999998	≥ 0.9995
Calculated slope		0.998443	$0.90 - 1.10$
Calculated intercept		0.026636	± 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	B14267
As Found Declination (deg east of True North):	<u>14</u>	As Left Declination (deg east of True North):	<u>14</u>
Solar noon time (MST):	12:13:40	Calc Declination*:	13.76 Degrees
Deadband calc:	-0.9 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.0	---
90	89.9	0.0%
180	180.9	0.3%
270	268.7	-0.4%
357	357.9	0.3%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999980	≥ 0.9995
Calculated slope		0.999337	$0.90 - 1.10$
Calculated intercept		0.036935	± 4

Notes: Install of New WS and WD sensors. Removed failed the torque test.

Calibration Performed By: Melissa Lemay



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS25 WASKŌW OHCI PIMÂTISIWIN OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Waskow ohci Pimatisiwin	Station number: AMS 25
Calibration Date:	October 24, 2024	Last Cal Date: September 19, 2024
Start time (MST):	7:48	End time (MST): 10:37
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002542	1.002427	Backgd or Offset:	10.1	11.2
Calibration intercept:	0.140000	-0.712025	Coeff or Slope:	1.032	1.049

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.7	----
As found High point	4920	80.5	800.1	789.6	1.014
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	788.9	Previous response	802.3	*% change	-1.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	4920	80.5	800.1	801.4	0.998
Mid point	4960	40.2	399.6	400.0	0.999
Low point	4980	20.1	199.8	198.9	1.004
As left zero	5000	0.0	0.0	0.0	----
As left span	4920	80.5	800.1	804.9	0.994
Average Correction Factor:					1.001

Notes: No Maintenance done. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

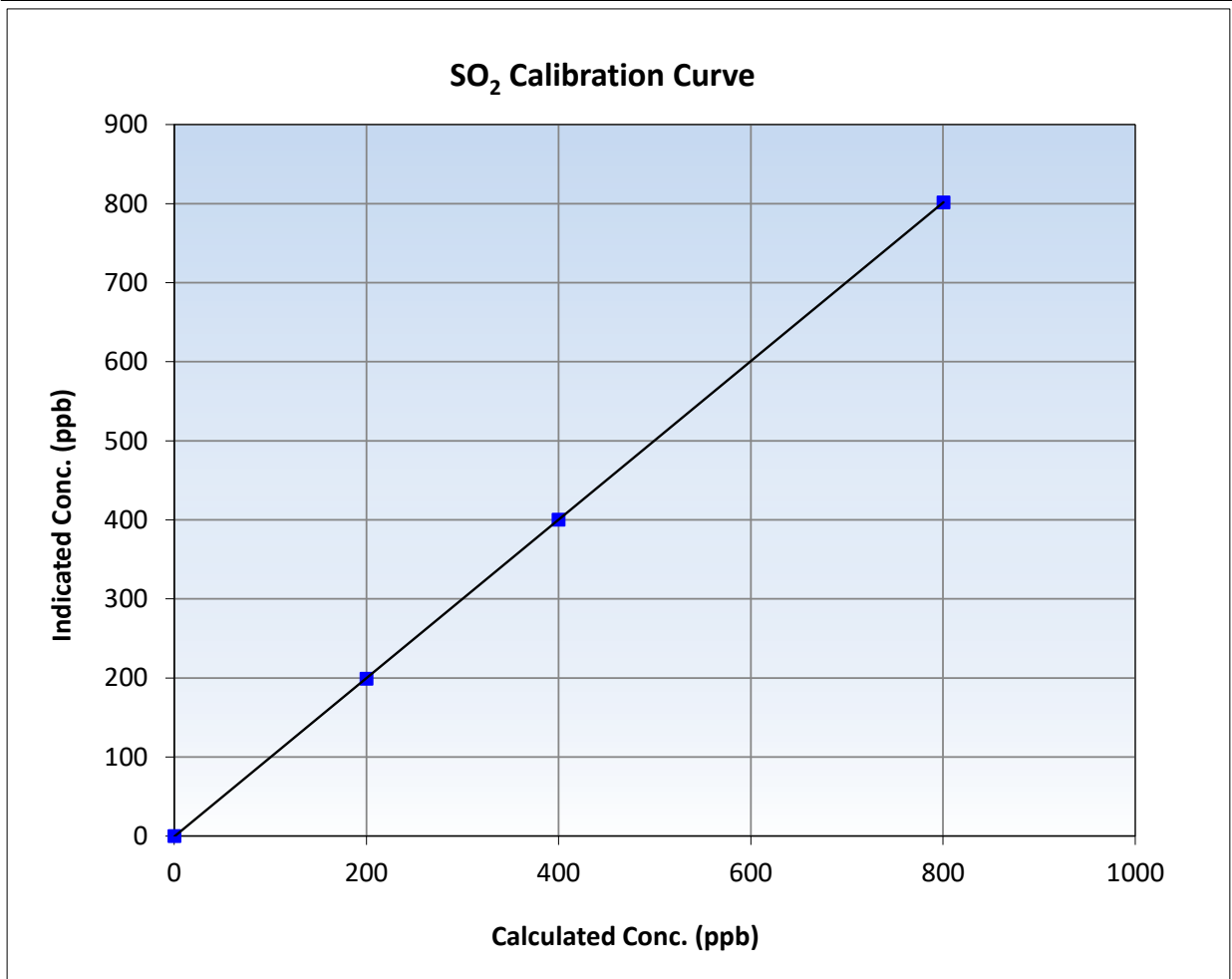
SO₂ Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	September 19, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	7:48	End Time (MST):	10:37
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148497

Calibration Data

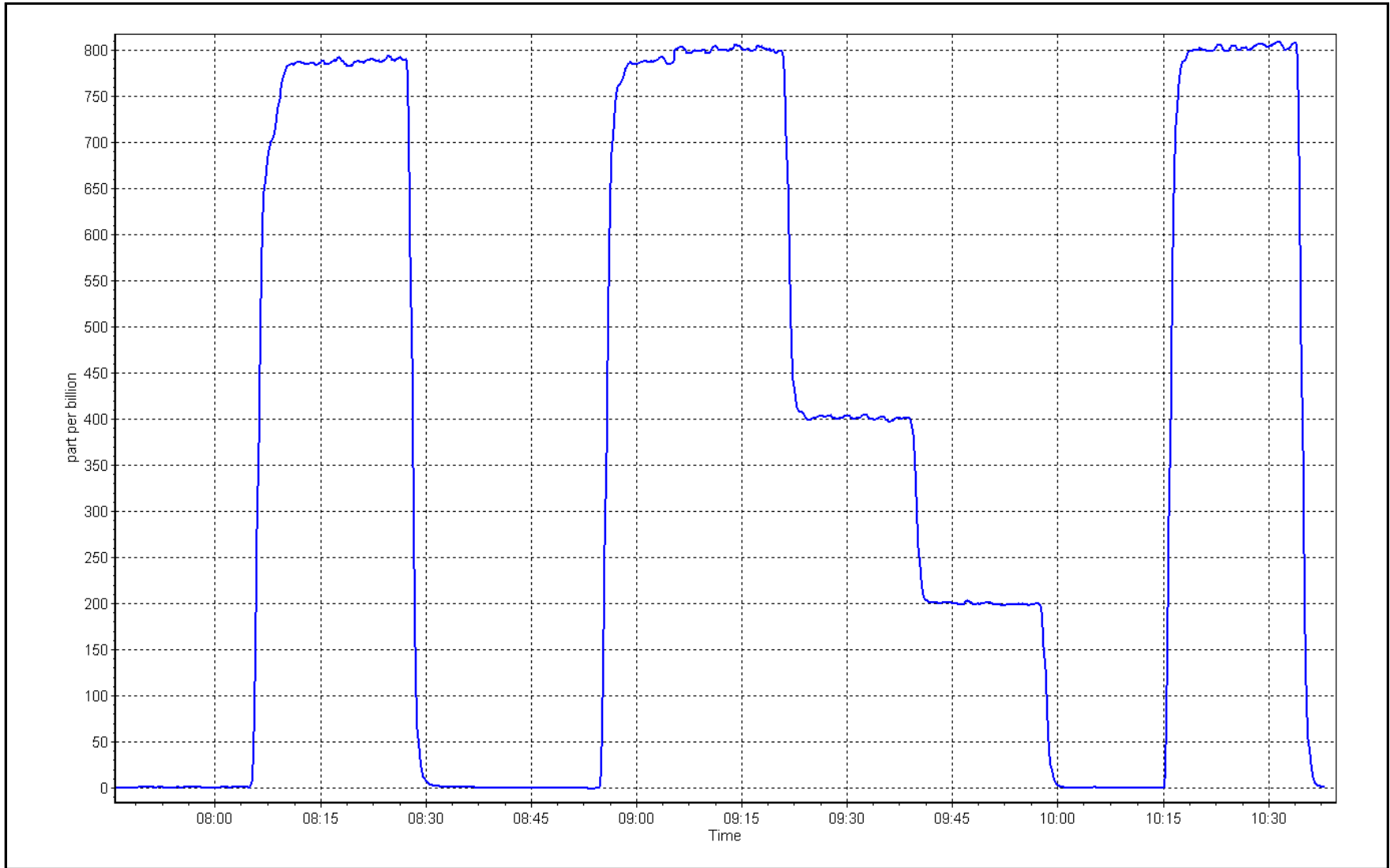
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.3	----	Correlation Coefficient	0.999998	≥0.995
800.1	801.4	0.9984	Slope	1.002427	0.90 - 1.10
399.6	400.0	0.9989	Intercept	-0.712025	+/-30
199.8	198.9	1.0045			



SO2 Calibration Plot

Date: October 24, 2024

Location: Waskow ohci Pimatisiwin





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Waskow ohci Pimatisiwin	Station number:	AMS 25
Calibration Date:	October 22, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	6:22	End time (MST):	10:57
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.014659	1.005605	Backgd or Offset:	3.10	3.42
Calibration intercept:	0.400000	-0.060000	Coeff or Slope:	1.088	1.074

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.4	----
As found High point	4920	80.0	79.5	82.3	0.971
As found Mid point	4960	40.0	39.8	41.4	0.970
As found Low point	4980	20.0	19.9	20.8	0.975
New cylinder response					
Baseline Corr As found:	81.9	Prev response:	81.09	*% change:	1.0%
Baseline Corr 2nd AF pt:	41.0	AF Slope:	1.030325	AF Intercept:	0.380000
Baseline Corr 3rd AF pt:	20.4	AF Correlation:	0.999998	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.0	79.5	80.0	0.994
Mid point	4960	40.0	39.8	39.7	1.002
Low point	4980	20.0	19.9	20.0	0.994
As left zero	5000	0.0	0.0	0.2	----
As left span	4912	88.3	800.0	800.2	1.000
SO ₂ Scrubber Check	4921	79.2	800.0	0.1	----
Date of last scrubber change:				Ave Corr Factor	0.997
Date of last converter efficiency test:					

Notes: SO_x scrubber checked after the calibrator zero. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

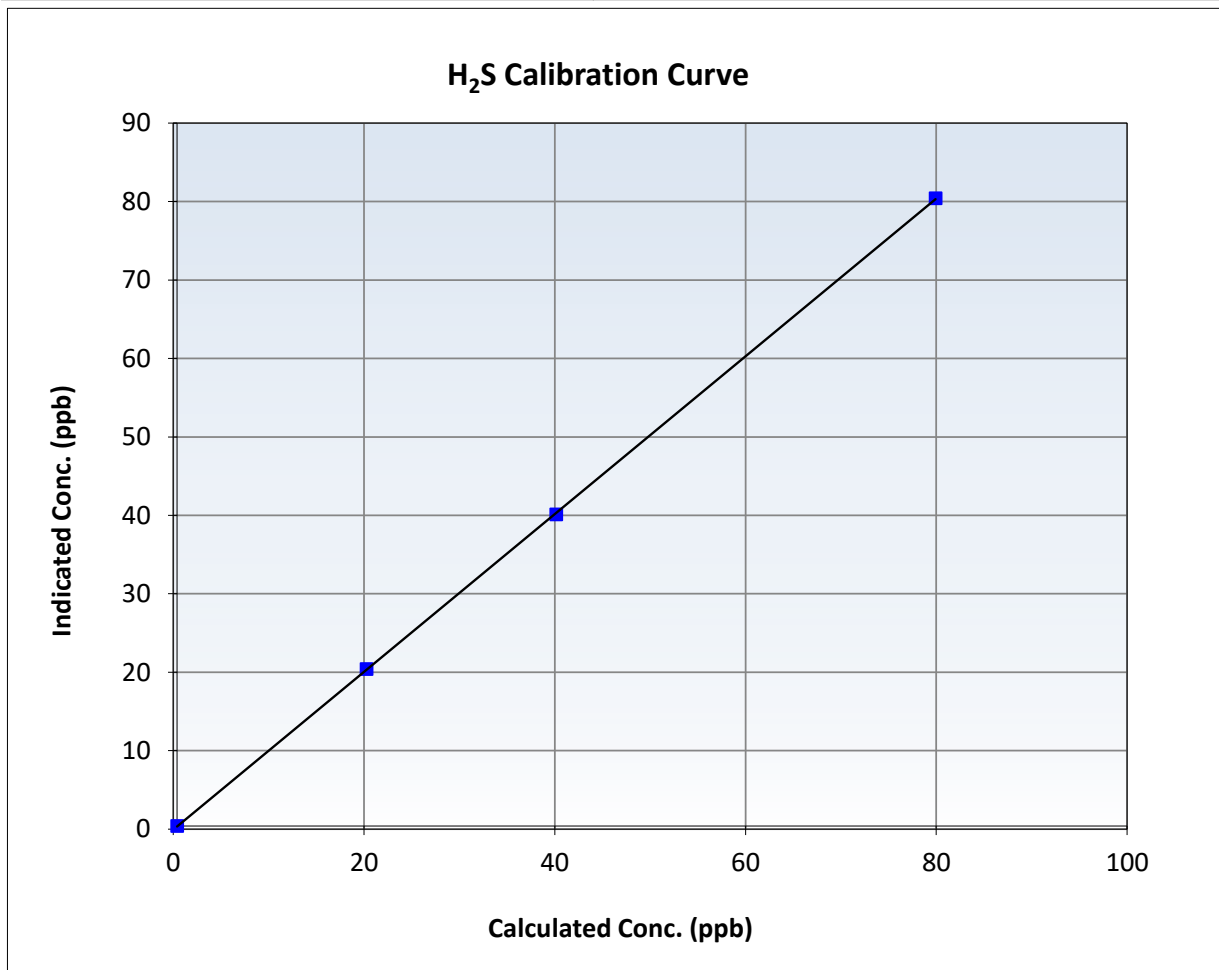
H₂S Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 3, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	6:22	End Time (MST):	10:57
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1170050146

Calibration Data

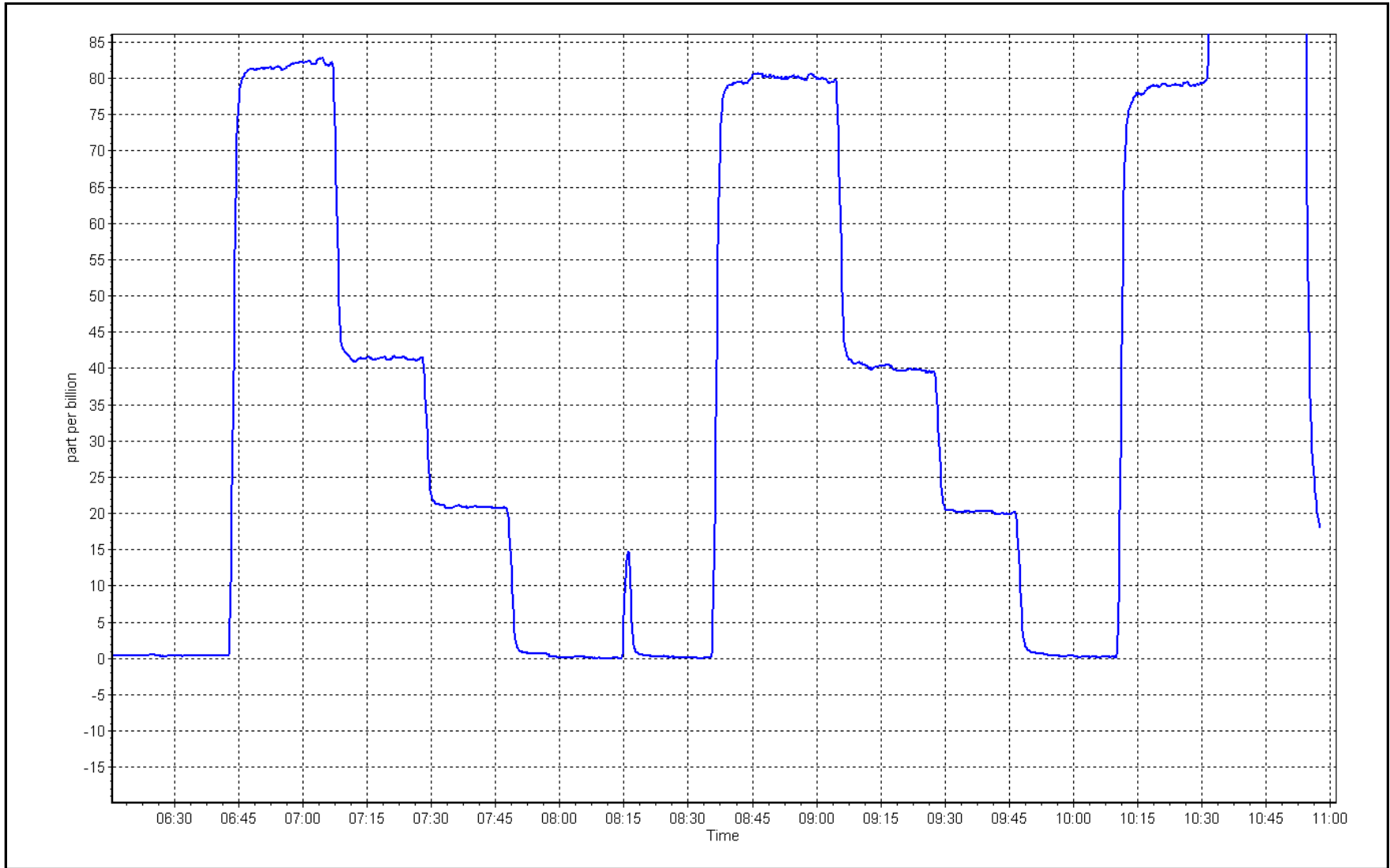
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999981	≥0.995
79.5	80.0	0.9940	Slope	1.005605	0.90 - 1.10
39.8	39.7	1.0015	Intercept	-0.060000	+/-3
19.9	20.0	0.9940			



H₂S Calibration Plot

Date: October 22, 2024

Location: Waskow ohci Pimatisiwin





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS26 CHRISTINA LAKE OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Christina Lake	Station number:	AMS 26
Calibration Date:	October 23, 2024	Last Cal Date:	September 24, 2024
Start time (MST):	10:49	End time (MST):	13:49
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:	API T700		Serial Number:	5258
Zero Air Gen Model:	API T701H		Serial Number:	832

Analyzer Information

Analyzer make:	Thermo 43i	Serial Number:	1152430005
Analyzer Range:	0- 1000 ppb		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000997	1.001596	Backgd or Offset:	28.0	29.0
Calibration intercept:	-0.673305	-1.433141	Coeff or Slope:	0.962	0.977

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.3	----
As found High point	4921	79.0	799.8	787.9	1.015
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	787.6	Previous response	799.9	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	4921	79.0	799.8	799.9	1.000
Mid point	4960	39.5	399.9	399.5	1.001
Low point	4980	19.8	200.5	197.6	1.014
As left zero	5000	0.0	0.0	0.0	----
As left span	4921	79.0	799.8	800.1	1.000
Average Correction Factor:					1.005

Notes: Sample inlet filter was changed after as founds. Adjusted zero and span.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

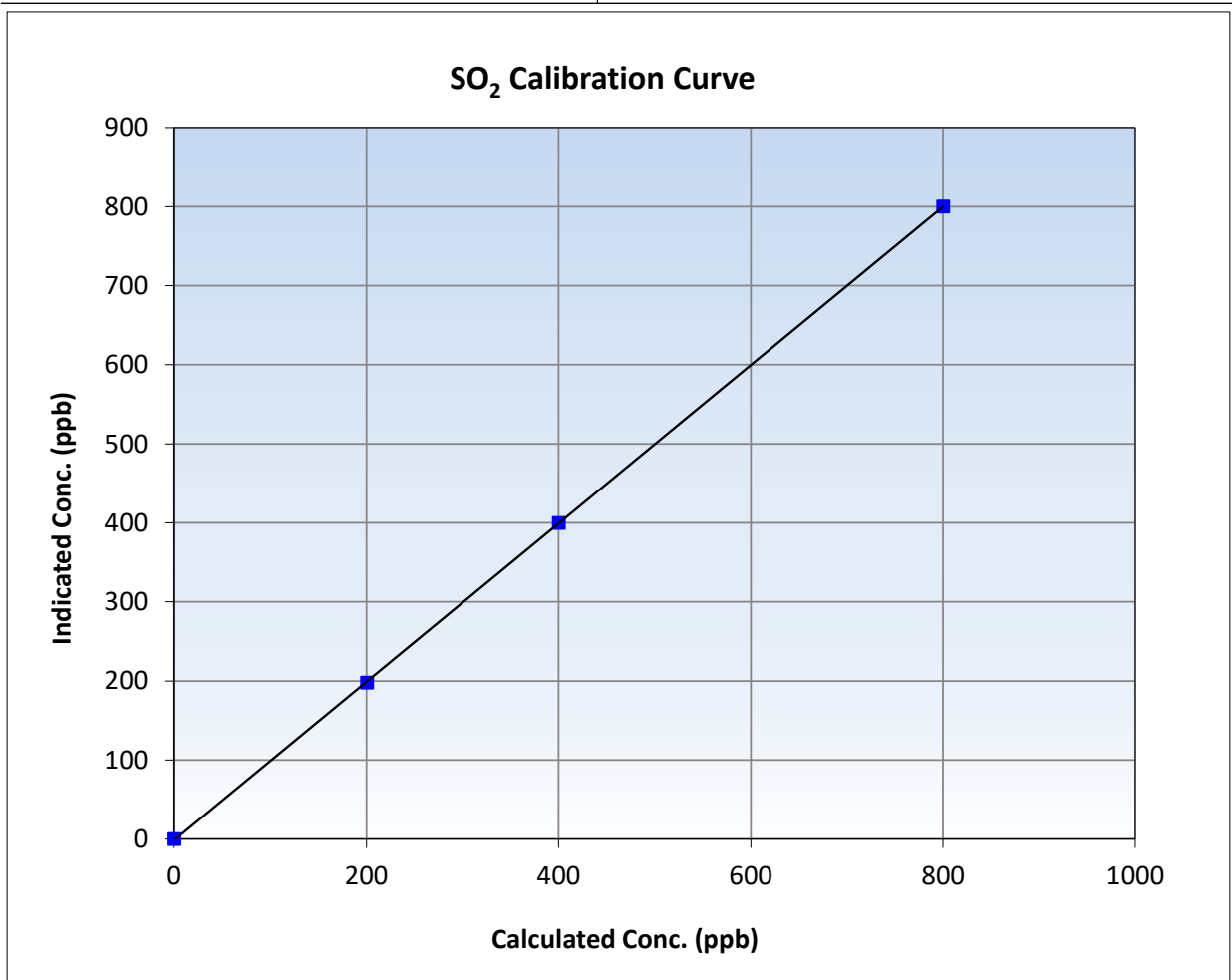
SO₂ Calibration Summary

Station Information

Calibration Date:	October 23, 2024	Previous Calibration:	September 24, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	10:49	End Time (MST):	13:49
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430005

Calibration Data

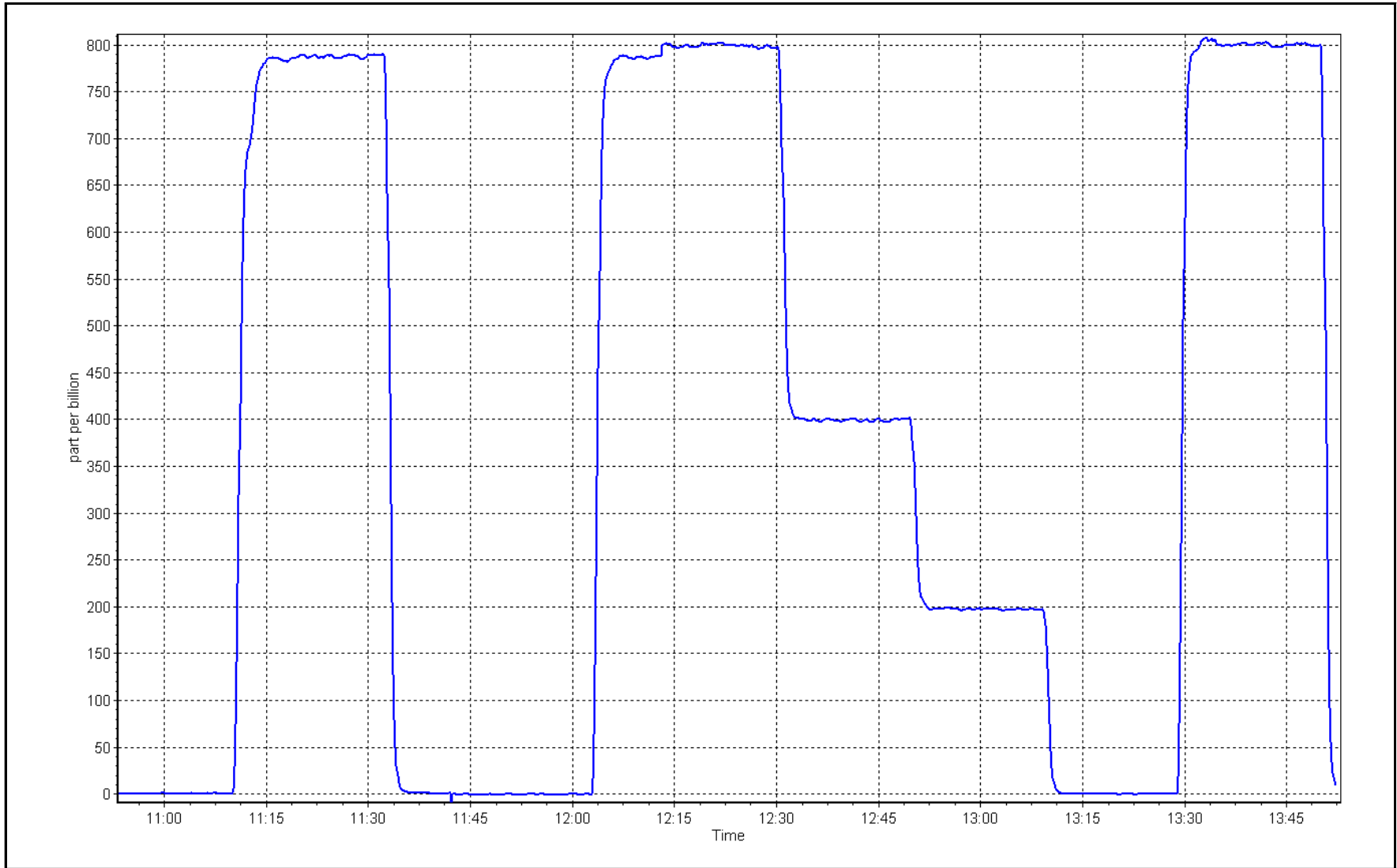
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.3	----	Correlation Coefficient	0.999987	≥0.995
799.8	799.9	0.9999	Slope	1.001596	0.90 - 1.10
399.9	399.5	1.0011	Intercept	-1.433141	+/-30
200.5	197.6	1.0145			



SO2 Calibration Plot

Date: October 23, 2024

Location: Christina Lake





Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Christina Lake	Station number: AMS 26
Calibration Date:	November 6, 2024	Last Cal Date: October 23, 2024
Start time (MST):	8:55	End time (MST): 10:18
Reason:	Removal	

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:	API T700		Serial Number: 5258
Zero Air Gen Model:	API T701H		Serial Number: 832

Analyzer Information

Analyzer make:	Thermo 43i	Serial Number: 1152430005
Analyzer Range:	0- 1000 ppb	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001596		Backgd or Offset:	29.0	NA
Calibration intercept:	-1.433141		Coeff or Slope:	0.977	NA

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	----
As found High point	4921	79.0	799.8	810.4	0.987
As found Mid point	4960	39.5	399.9	405.4	0.987
As found Low point	4980	19.8	200.5	201.1	0.997
New cylinder response					
Baseline Corr As found:	810.4	Previous response	799.6	*% change	1.3%
Baseline Corr 2nd AF pt:	405.4	AF Slope:	1.014146	AF Intercept:	-0.776000
Baseline Corr 3rd AF pt:	201.1	AF Correlation:	0.999992	<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor:

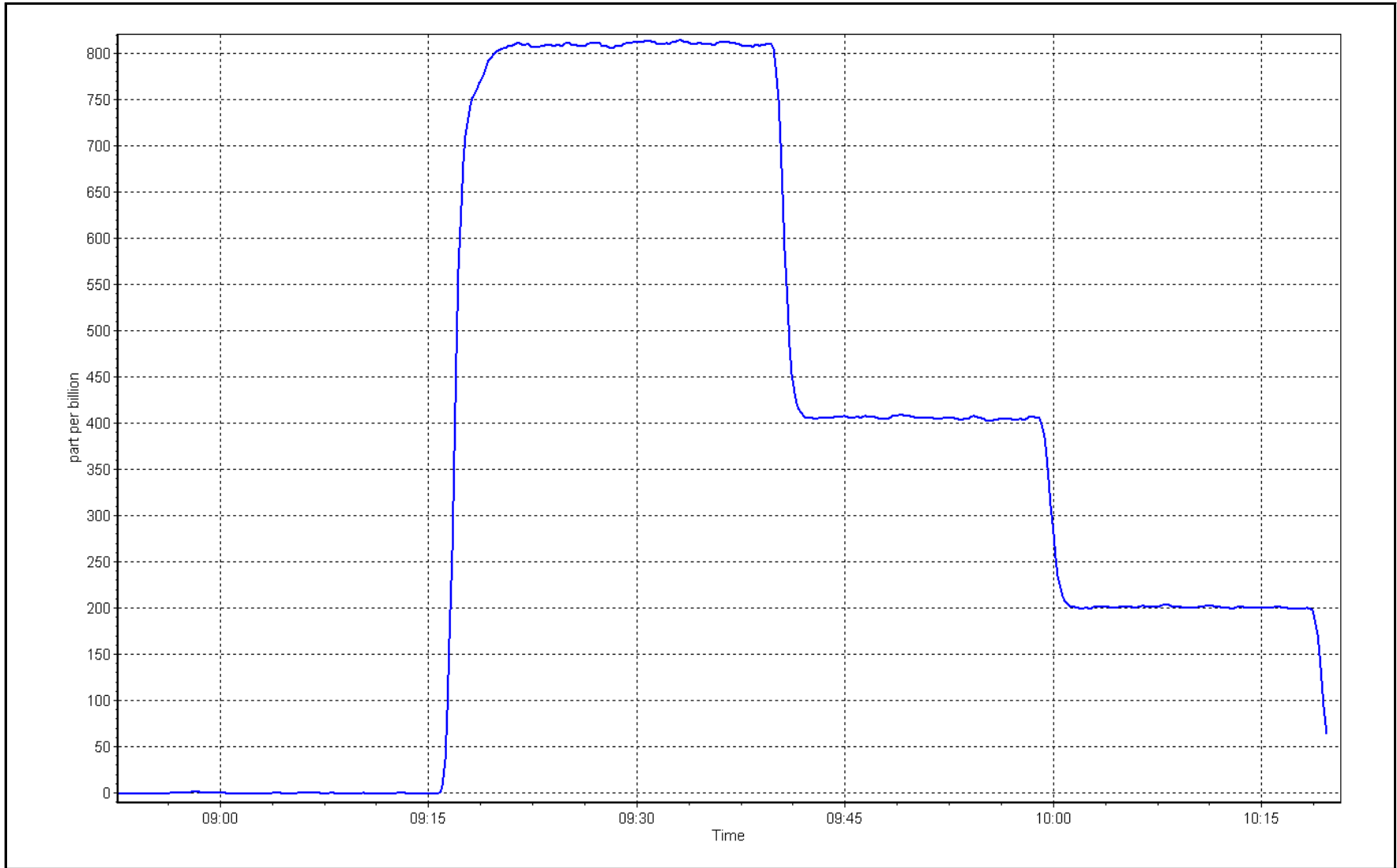
Notes: Removal calibrations done for the station move out. No issues.

Calibration Performed By: Jan Castro

SO2 Calibration Plot

Date: November 6, 2024

Location: Christina Lake





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Christina Lake	Station number:	AMS 26
Calibration Date:	October 29, 2024	Last Cal Date:	September 23, 2024
Start time (MST):	10:01	End time (MST):	13:43
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 T700		Serial Number:	5258
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.006712	1.000426	Backgd or Offset:	1.3	1.3
Calibration intercept:	-0.081615	-0.061597	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4921	79.2	80.0	80.0	0.999
As found Mid point	4960	39.6	40.0	39.8	1.002
As found Low point	4980	19.8	20.0	19.7	1.010
New cylinder response					
Baseline Corr As found:	80.1	Prev response:	80.44	*% change:	-0.4%
Baseline Corr 2nd AF pt:	39.9	AF Slope:	1.002140	AF Intercept:	-0.221598
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999989	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
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	39.9	1.002
Low point	4980	19.8	20.0	19.9	1.005
As left zero	5000	0.0	0.0	0.0	----
As left span	4921	79.2	80.0	80.3	0.996
SO2 Scrubber Check	4921	79.0	790.0	0.0	----
Date of last scrubber change:	11-Apr-24			Ave Corr Factor	1.002
Date of last converter efficiency test:					

Notes: Changed sample inlet filter after multipoint as founds. Scrubber check done after calibrator zero and passed. No adjustment made.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

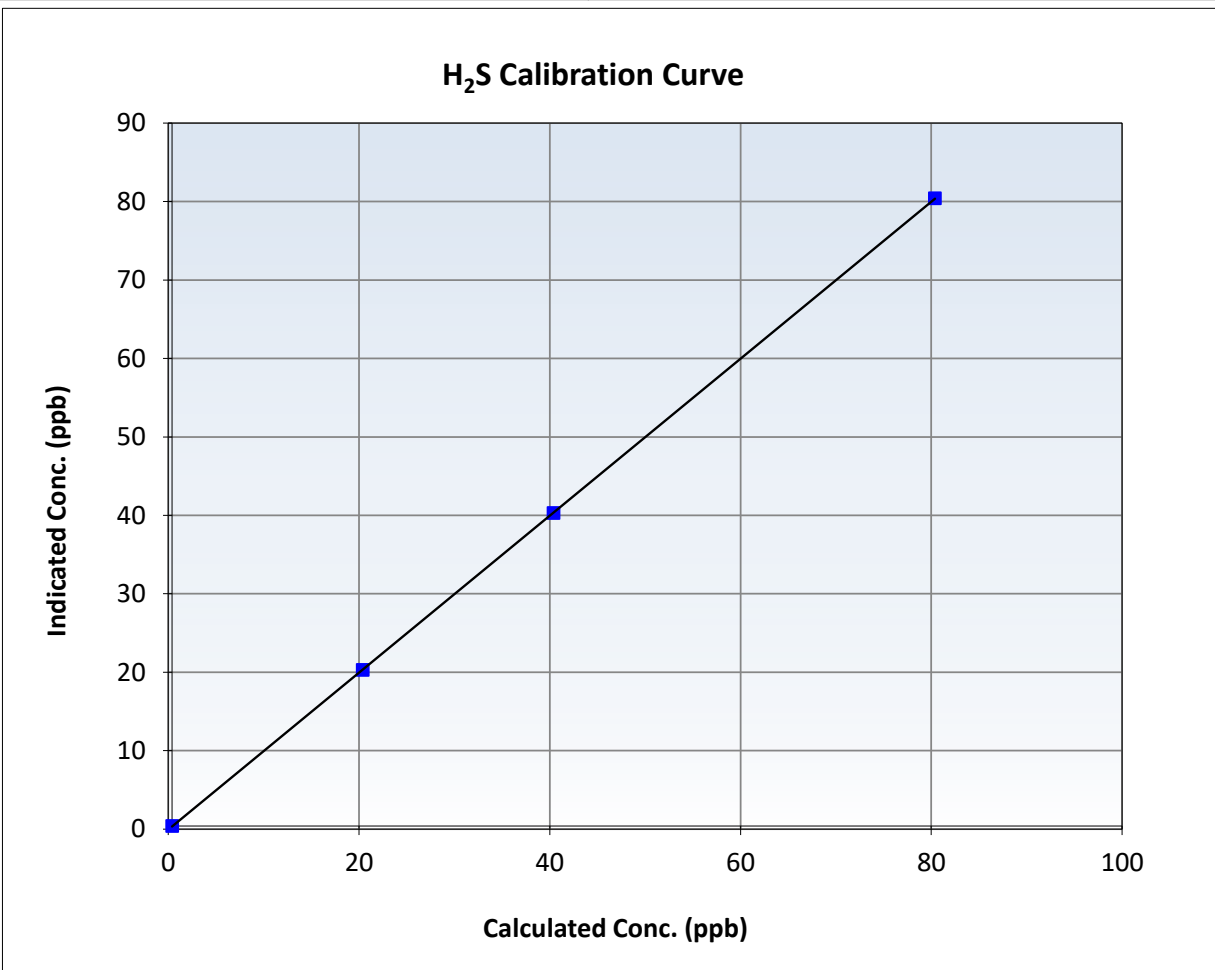
H2S Calibration Summary

Station Information

Calibration Date:	October 29, 2024	Previous Calibration:	September 23, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	10:01	End Time (MST):	13:43
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331547

Calibration Data

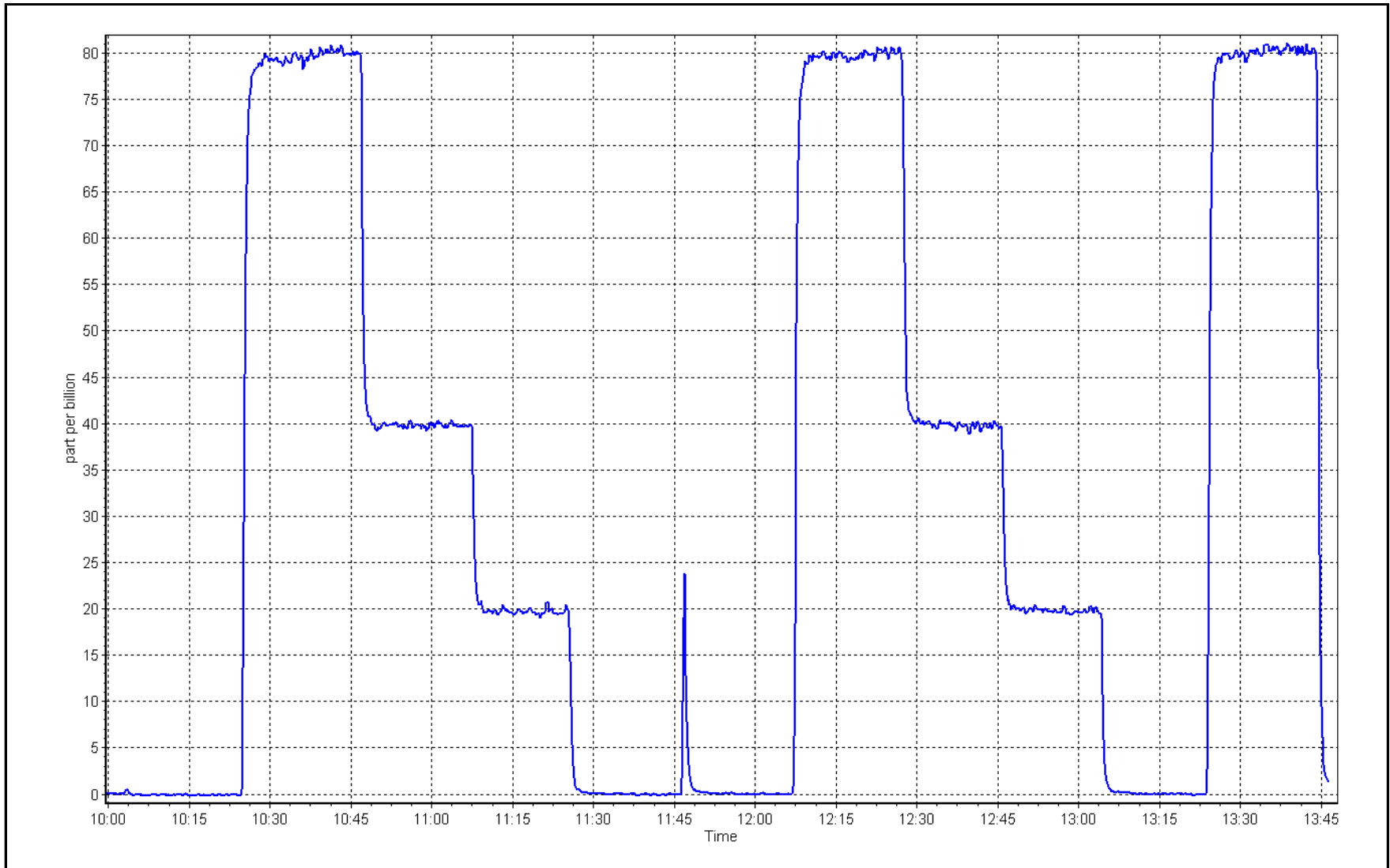
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999997	≥ 0.995
80.0	80.0	0.9999	Slope	1.000426	$0.90 - 1.10$
40.0	39.9	1.0025	Intercept	-0.061597	± 3
20.0	19.9	1.0050			



H2S Calibration Plot

Date: October 29, 2024

Location: Christina Lake





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name: Christina Lake	Station number: AMS 26
Calibration Date: November 5, 2024	Last Cal Date: October 29, 2024
Start time (MST): 14:59	End time (MST): 16:42
Reason: Removal	

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 T700	Serial Number: 5258
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

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope: 1.000426			Backgd or Offset: 1.3	NA
Calibration intercept: -0.061597			Coeff or Slope: 1.063	NA

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4921	79.2	80.0	79.5	1.005
As found Mid point	4960	39.6	40.0	39.9	1.000
As found Low point	4980	19.8	20.0	19.8	1.005
New cylinder response					
Baseline Corr As found:	79.6	Prev response:	79.96	*% change:	-0.5%
Baseline Corr 2nd AF pt:	40.0	AF Slope:	0.995425	AF Intercept:	-0.061599
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999992	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point					
Mid point					
Low point					
As left zero					
As left span					
SO2 Scrubber Check	4921	79.0	790.0	0.1	----
Date of last scrubber change:		11-Apr-24		Ave Corr Factor	
Date of last converter efficiency test:					

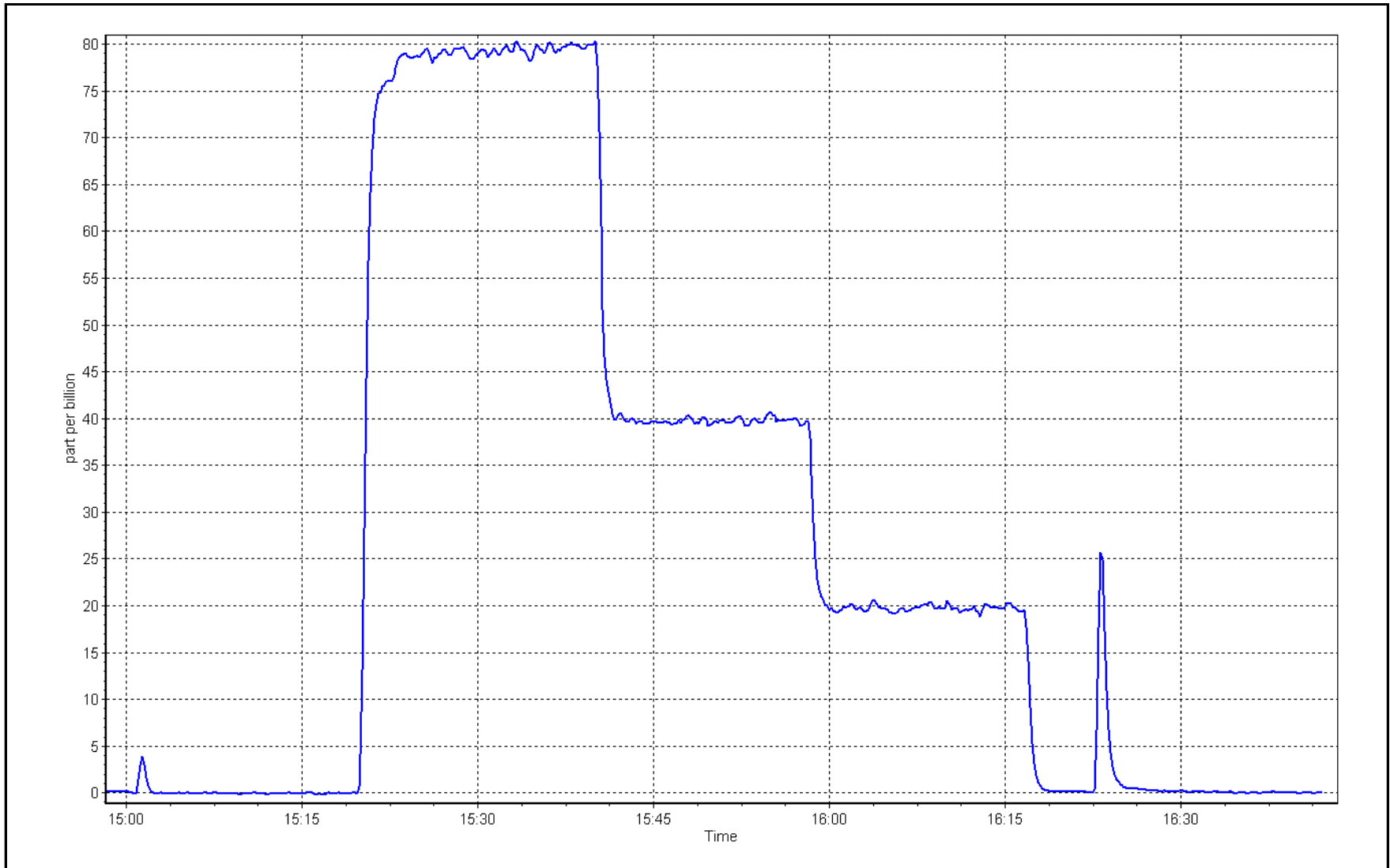
Notes: Removal calibrations done for the station move out. No issues.

Calibration Performed By: Jan Castro

H2S Calibration Plot

Date: November 5, 2024

Location: Christina Lake





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Christina Lake
 Station number: AMS 26
 Calibration Date: October 24, 2024
 Last Cal Date: September 10, 2024
 Start time (MST): 10:07
 End time (MST): 14:31
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: CC755290
 NOX Cal Gas Conc: 48.90 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 48.90 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701H
 Cal Gas Expiry Date: January 3, 2031
 NO Cal Gas Conc: 48.70 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 48.70 ppm
 NO gas Diff:
 Serial Number: 5258
 Serial Number: 832

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
AF High point	4918	82.1	802.9	799.6	3.3	800.6	796.1	4.6	1.0025	1.0042
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 801.8 ppb		NO = 798.6 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -0.1%	
Baseline Corr 1st pt	NO _x = 800.9 ppb		NO = 796.3 ppb			<u>As Found Statistics</u>		*Percent Change	NO = -0.3%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1173480006

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.999143	0.996839
NO _x Cal Offset:	-0.469414	-1.009816
NO Cal Slope:	1.000231	0.997503
NO Cal Offset:	-1.189233	-1.709874
NO ₂ Cal Slope:	1.002041	0.998084
NO ₂ Cal Offset:	-0.072219	-0.051063

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.335	1.335	NO bkgnd or offset:	2.6	2.6
NOX coeff or slope:	0.991	0.991	NOX bkgnd or offset:	2.7	2.7
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	161.6	161.6

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
High point	4918	82.1	802.9	799.6	3.3	799.7	796.6	3.1	1.0040	1.0038
Mid point	4959	41.1	401.9	400.3	1.6	399.6	397.3	2.3	1.0059	1.0076
Low point	4979	20.5	200.5	199.7	0.8	197.7	195.4	2.3	1.0142	1.0220
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
As left span	4918	82.1	802.9	374.2	428.7	792.3	374.2	418.0	1.0134	1.0000
Average Correction Factor									1.0080	1.0111

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	788.9	367.7	424.5	423.4	1.0026	99.7%
Mid GPT point	788.9	572.9	219.3	219.4	0.9995	100.1%
Low GPT point	788.9	680.5	111.7	111.1	1.0053	99.5%
Average Correction Factor					1.0024	99.8%

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

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

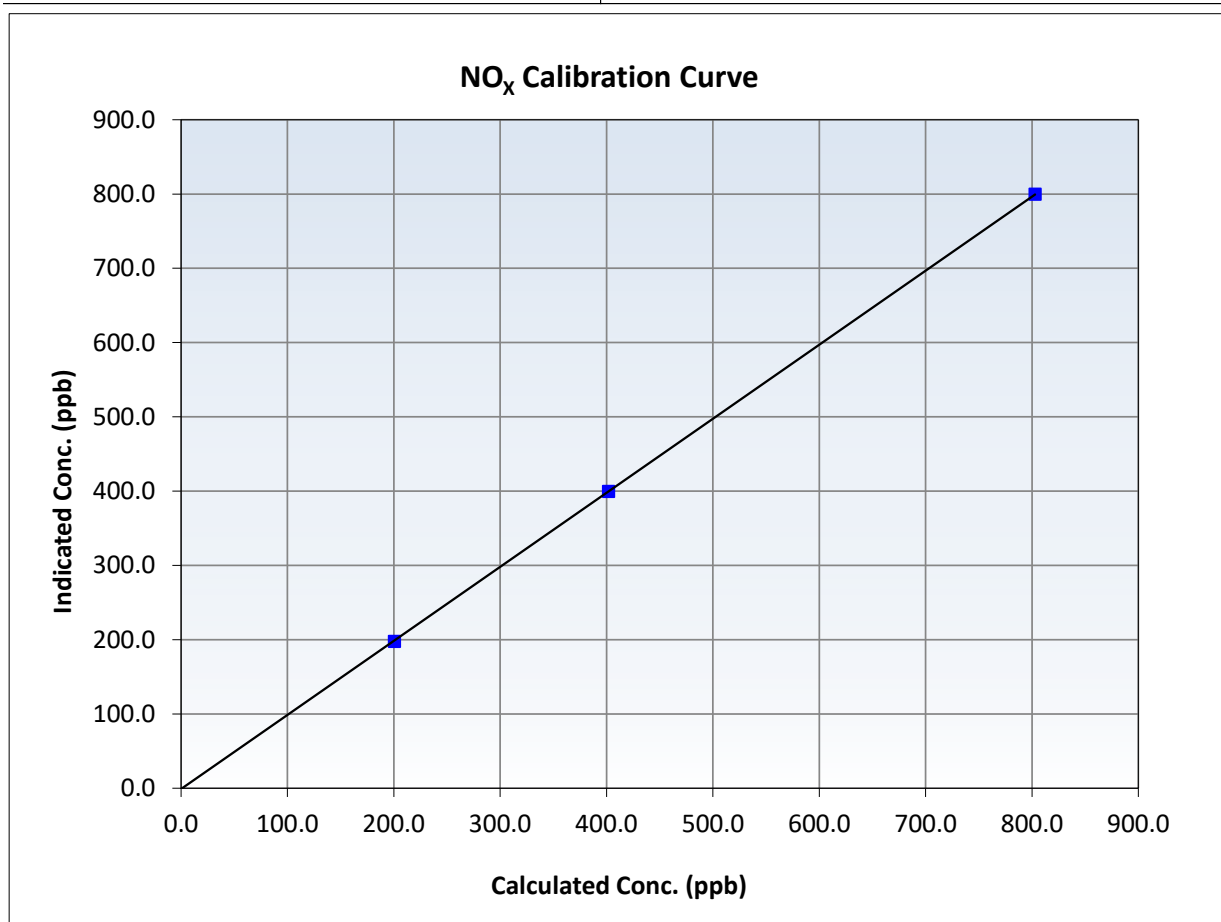
NO_x Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	September 10, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	10:07	End Time (MST):	14:31
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999993	≥0.995
802.9	799.7	1.0040	Slope	0.996839	0.90 - 1.10
401.9	399.6	1.0059	Intercept	-1.009816	+/-20
200.5	197.7	1.0142			





Wood Buffalo Environmental Association

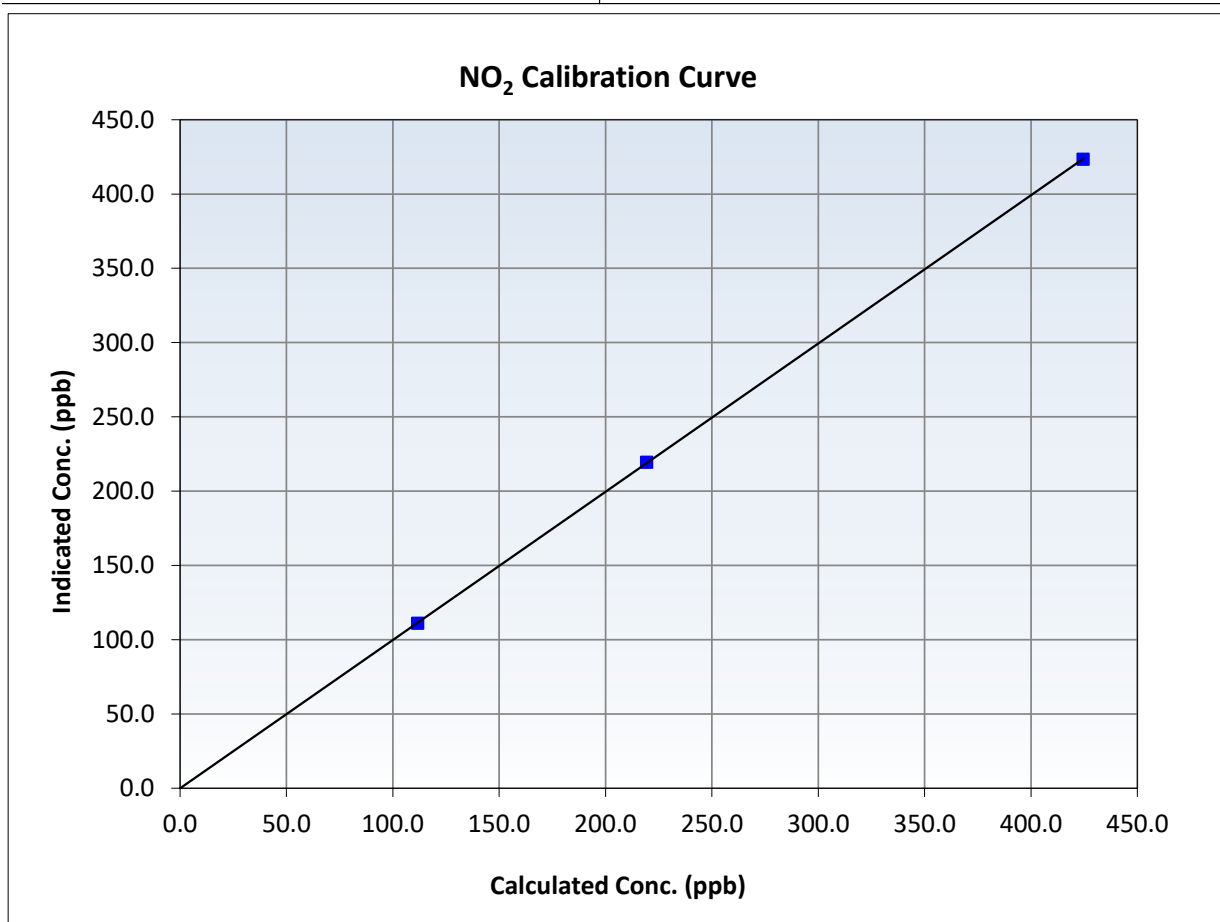
NO₂ Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	September 10, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	10:07	End Time (MST):	14:31
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999995	<i>≥0.995</i>
424.5	423.4	1.0026	Slope	0.998084	<i>0.90 - 1.10</i>
219.3	219.4	0.9995	Intercept	-0.051063	<i>+/-20</i>
111.7	111.1	1.0053			





Wood Buffalo Environmental Association

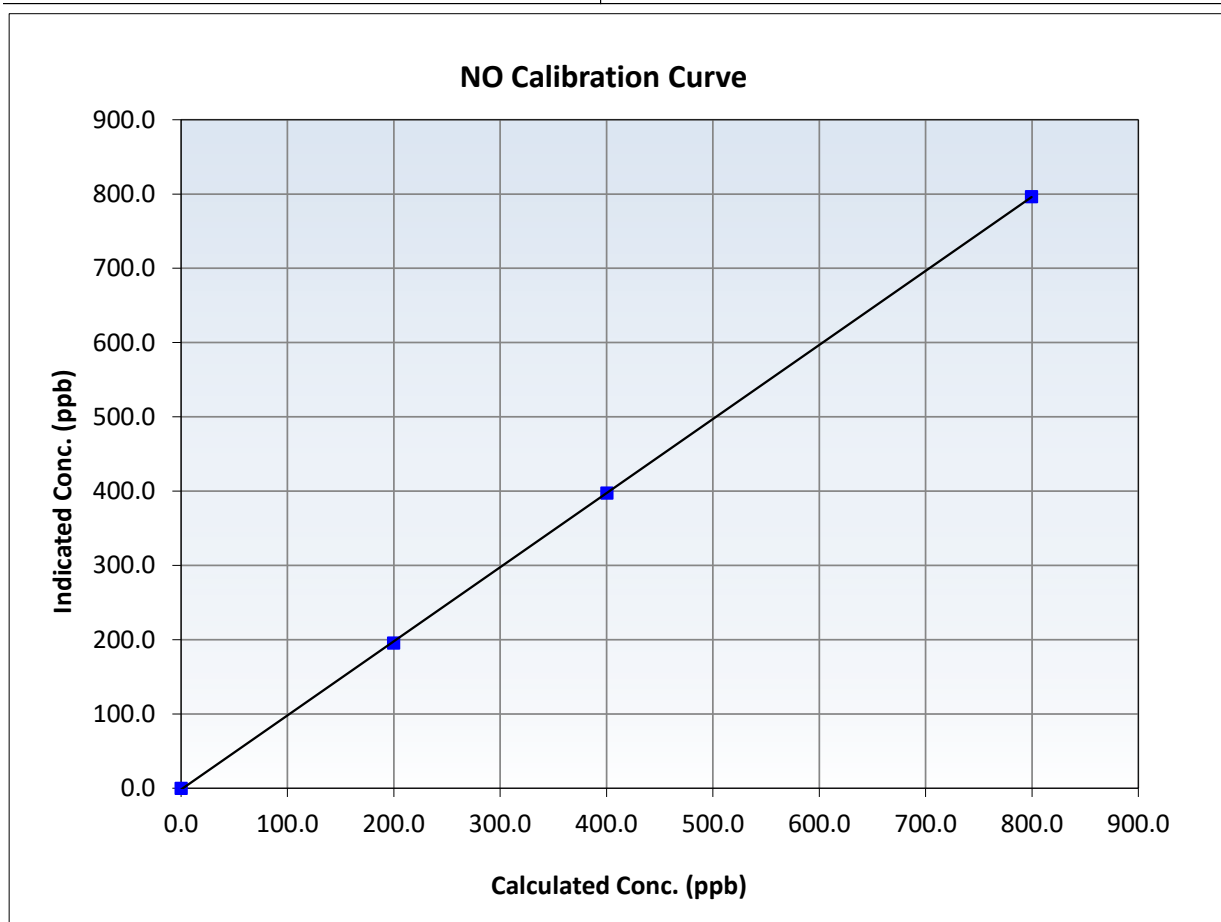
NO Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	September 10, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	10:07	End Time (MST):	14:31
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calibration Data

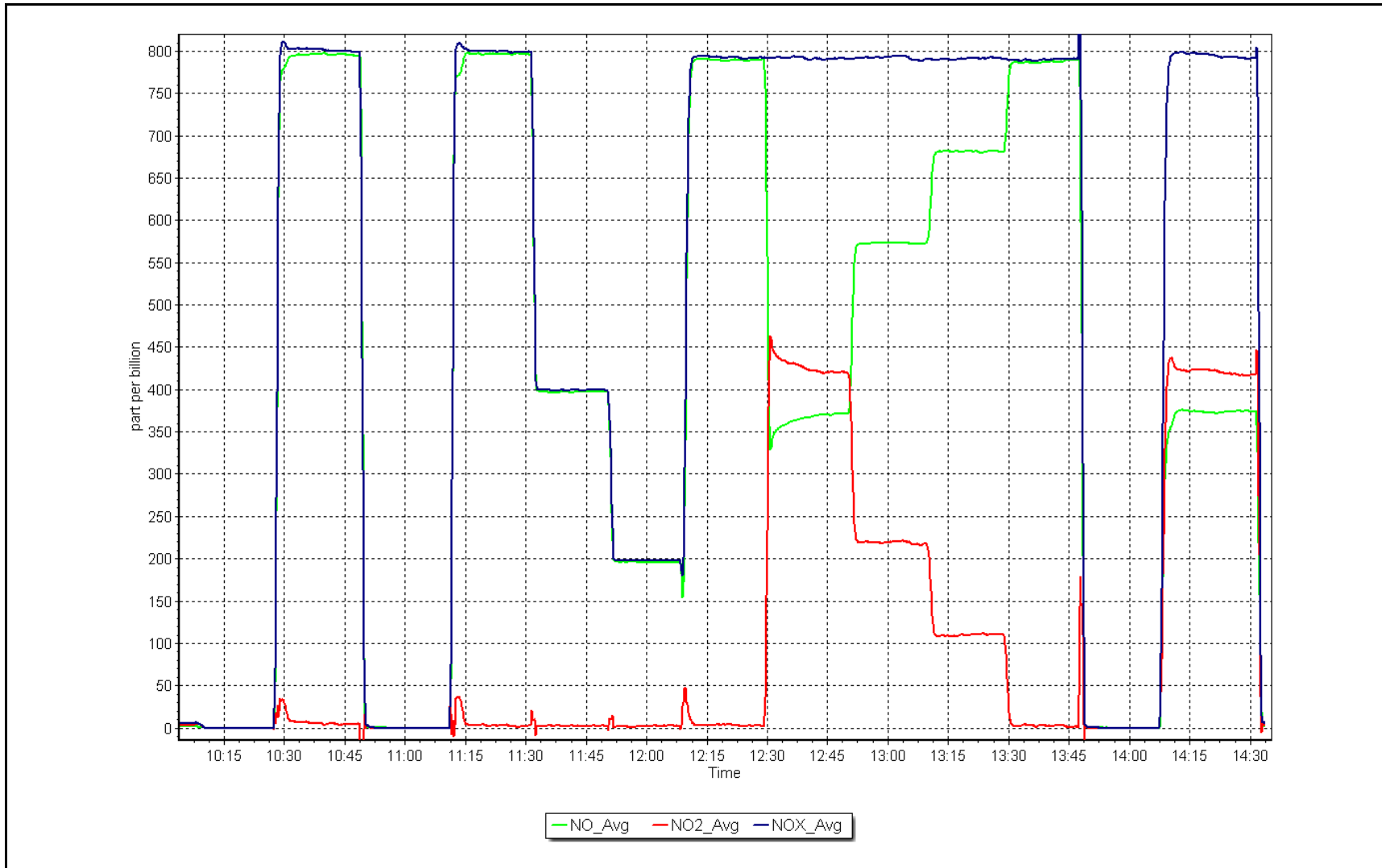
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999978	≥0.995
799.6	796.6	1.0038	Slope	0.997503	0.90 - 1.10
400.3	397.3	1.0076	Intercept	-1.709874	+/-20
199.7	195.4	1.0220			



NO_x Calibration Plot

Date: October 24, 2024

Location: Christina Lake





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Christina Lake
 Station number: AMS 26
 Calibration Date: November 5, 2024
 Last Cal Date: October 24, 2024
 Start time (MST): 12:03
 End time (MST): 14:55
 Reason: Removal

Calibration Standards

NO Gas Cylinder #: CC755290
 NOX Cal Gas Conc: 48.90 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 48.90 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701H
 Cal Gas Expiry Date: January 3, 2031
 NO Cal Gas Conc: 48.70 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 48.70 ppm
 NO gas Diff:
 Serial Number: 5258
 Serial Number: 832

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.1	-0.1	----	----
AF High point	4918	82.1	802.9	799.6	3.3	798.0	791.8	6.3	1.0058	1.0098
AF Mid point	4959	41.1	401.9	400.3	1.6	398.0	393.9	4.0	1.0092	1.0160
AF Low point	4979	20.5	200.5	199.7	0.8	198.0	195.0	3.0	1.0111	1.0235

New cyl resp

Previous Response	NO _x = 799.4 ppb	NO = 795.9 ppb	<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -0.1%
Baseline Corr 1st pt	NO _x = 798.3 ppb	NO = 791.9 ppb	<u>As Found Statistics</u>		*Percent Change	NO = -0.5%
Baseline Corr 2nd pt	NO _x = 398.3 ppb	NO = 394.0 ppb	As found	NO _x r ² : 0.999996	Nx SI: 0.994503	Nx Int: -0.989
Baseline Corr 3rd pt	NO _x = 198.3 ppb	NO = 195.1 ppb	As found	NO r ² : 0.999982	NO SI: 0.991114	NO Int: -1.649
			As found	NO ₂ r ² : 0.999857	NO ₂ SI: 1.002618	NO ₂ Int: 0.548

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
As Found GPT zero	----	----	0.0	-0.1	----	----
As found high GPT point	787.1	369.5	420.9	421.2	0.9992	100.1%
As found mid GPT point	787.1	573.3	217.1	221.4	0.9805	102.0%
As found low GPT point	787.1	681.0	109.4	109.0	1.0035	99.6%



Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1173480006

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.996839	
NO _x Cal Offset:	-1.009816	
NO Cal Slope:	0.997503	
NO Cal Offset:	-1.709874	
NO ₂ Cal Slope:	0.998084	
NO ₂ Cal Offset:	-0.051063	

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.335	NA	NO bkgnd or offset:	2.6	NA
NOX coeff or slope:	0.991	NA	NOX bkgnd or offset:	2.7	NA
NO2 coeff or slope:	1.000	NA	Reaction cell Press:	161.6	NA

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
-----------	---------------------------	-----------------------------	---	--	---	--	---------------------------------------	--	---	--

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 NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
-------------------	--	---------------------------------------	---	--	---	--

Cal zero
 High GPT point
 Mid GPT point
 Low GPT point

Average Correction Factor

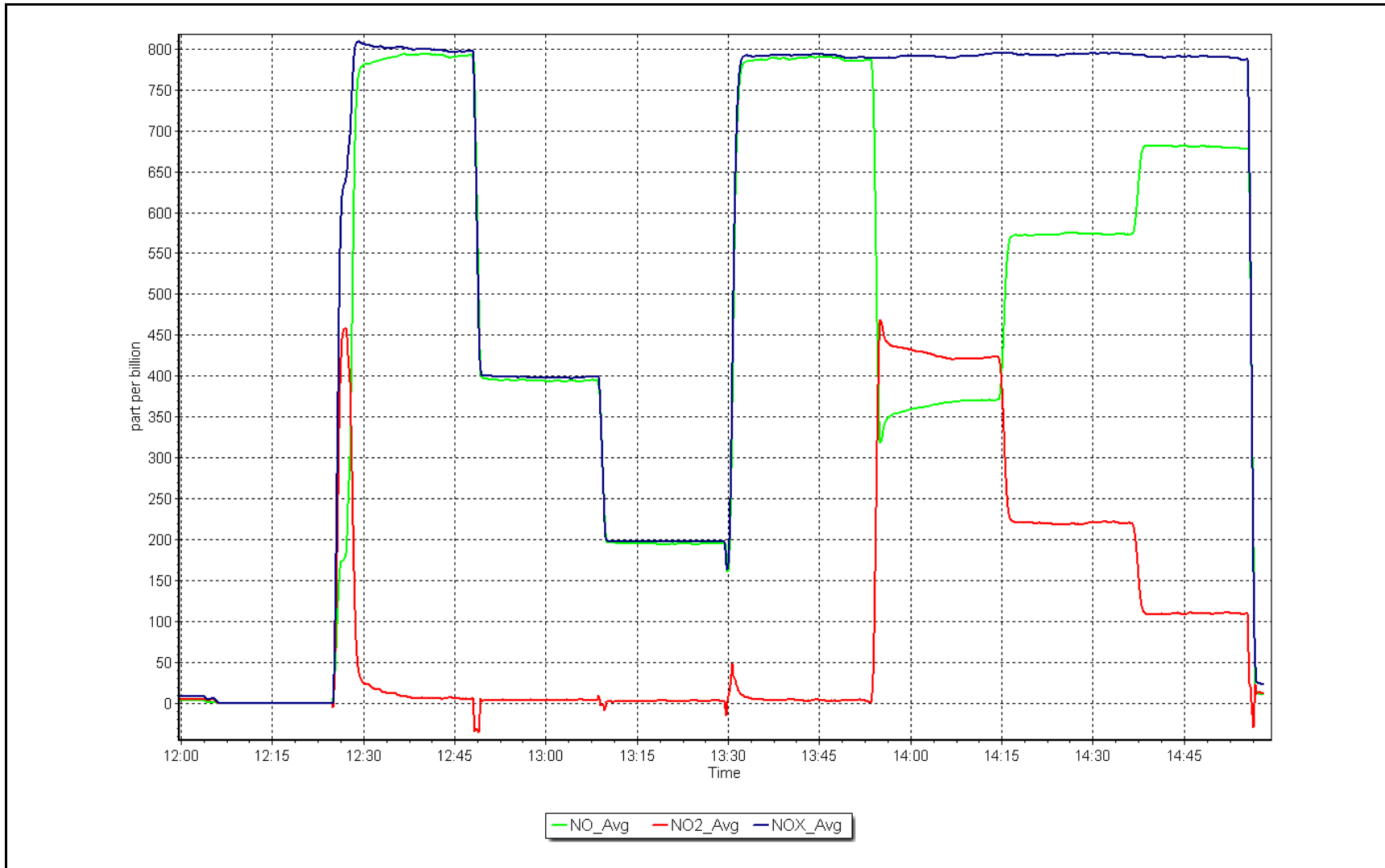
Notes: Removal calibrations done for the station move out. No issues.

Calibration Performed By: Jan Castro

NO_x Calibration Plot

Date: November 5, 2024

Location: Christina Lake





Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Christina Lake	Station Number:	AMS 26
Calibration Date:	November 5, 2024	Prev Cal Date:	August 29, 2024
Start Time (MST):	12:40	End Time (MST):	14:22
Tower Height (m):	10.0	Reason:	Removal

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	P22395
WS Calibrator:	MetOne 053	Serial Number:	CA 03988

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.5	0.0%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999999	0.999999	≥ 0.9995
Calculated slope	0.998858	0.998858	<i>0.90 - 1.10</i>
Calculated intercept	0.034341	0.034341	<i>+/- 2</i>

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	N13744
As Found Declination (deg east of True North):	<u>3.07</u>	As Left Declination (deg east of True North):	<u>NA</u>
Solar noon time (MST):	21:20	Calc Declination*:	12.93 Degrees
Deadband calc:	3.0 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	1.8	---
90	90.7	0.2%
180	181.1	0.3%
270	271.7	0.5%
356	355.8	-0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)	0.999982	0.999989	≥ 0.9995
Calculated slope	1.006575	1.003320	<i>0.90 - 1.10</i>
Calculated intercept	-1.622466	-1.618380	<i>+/- 4</i>

Notes: Removal calibrations done for the station move out. No issues.

Calibration Performed By: Jan Castro



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS27
JACKFISH 2/3
OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Jackfish 2/3	Station number:	AMS 27
Calibration Date:	October 16, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	10:12	End time (MST):	13:09
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.005137	0.998699	Backgd or Offset:	8.2	8.3
Calibration intercept:	-1.885089	-1.406165	Coeff or Slope:	0.927	0.927

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	----
As found High point	4919	79.1	800.5	797.8	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	797.6	Previous response	802.7	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4919	79.1	800.5	798.8	1.002
Mid point	4960	39.5	399.6	397.3	1.006
Low point	4979	19.8	200.3	196.4	1.020
As left zero	5000	0.0	0.0	0.5	----
As left span	4921	79.1	800.2	800.5	1.000
Average Correction Factor:					1.009

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

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

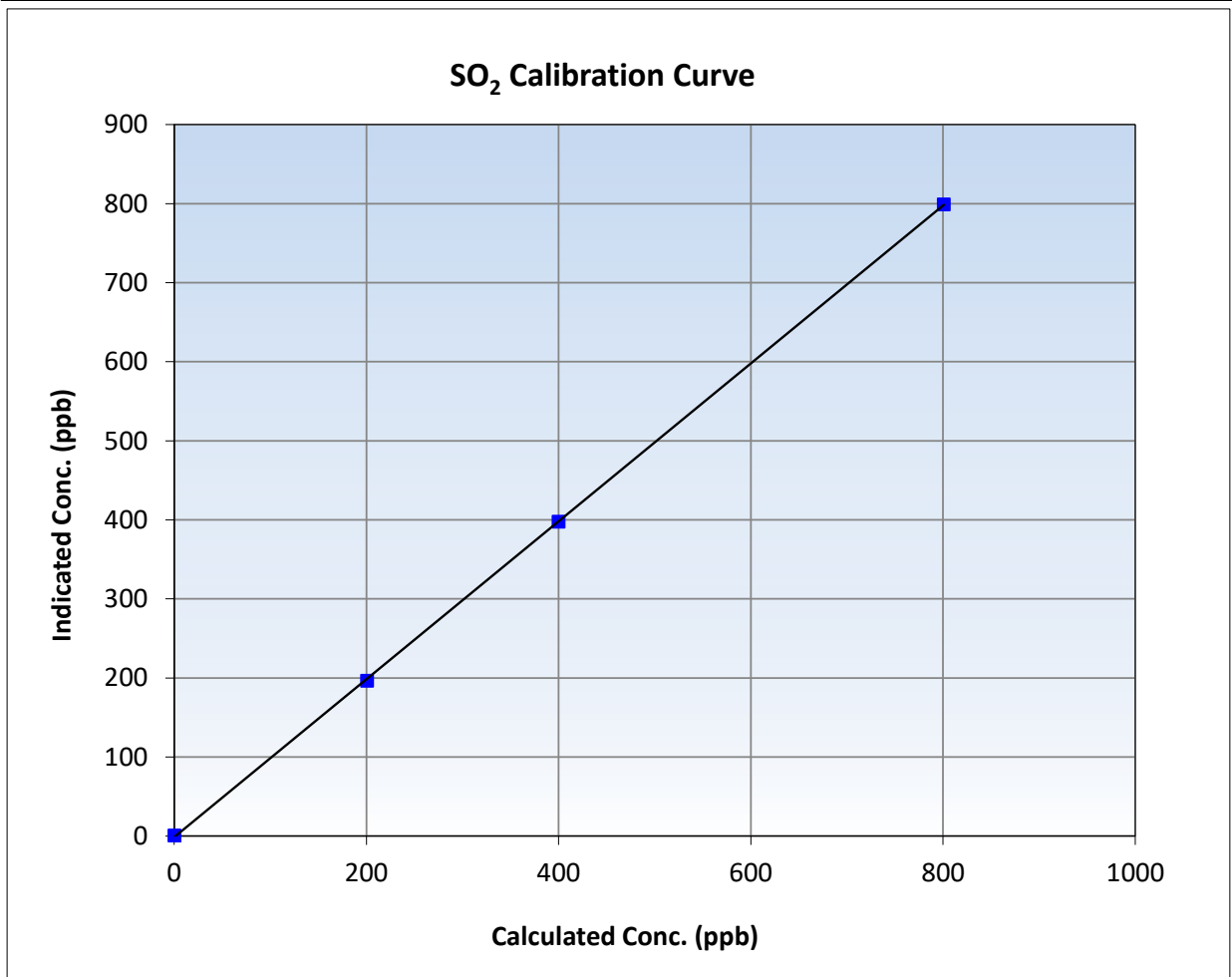
SO₂ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 11, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:12	End Time (MST):	13:09
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	12124313138

Calibration Data

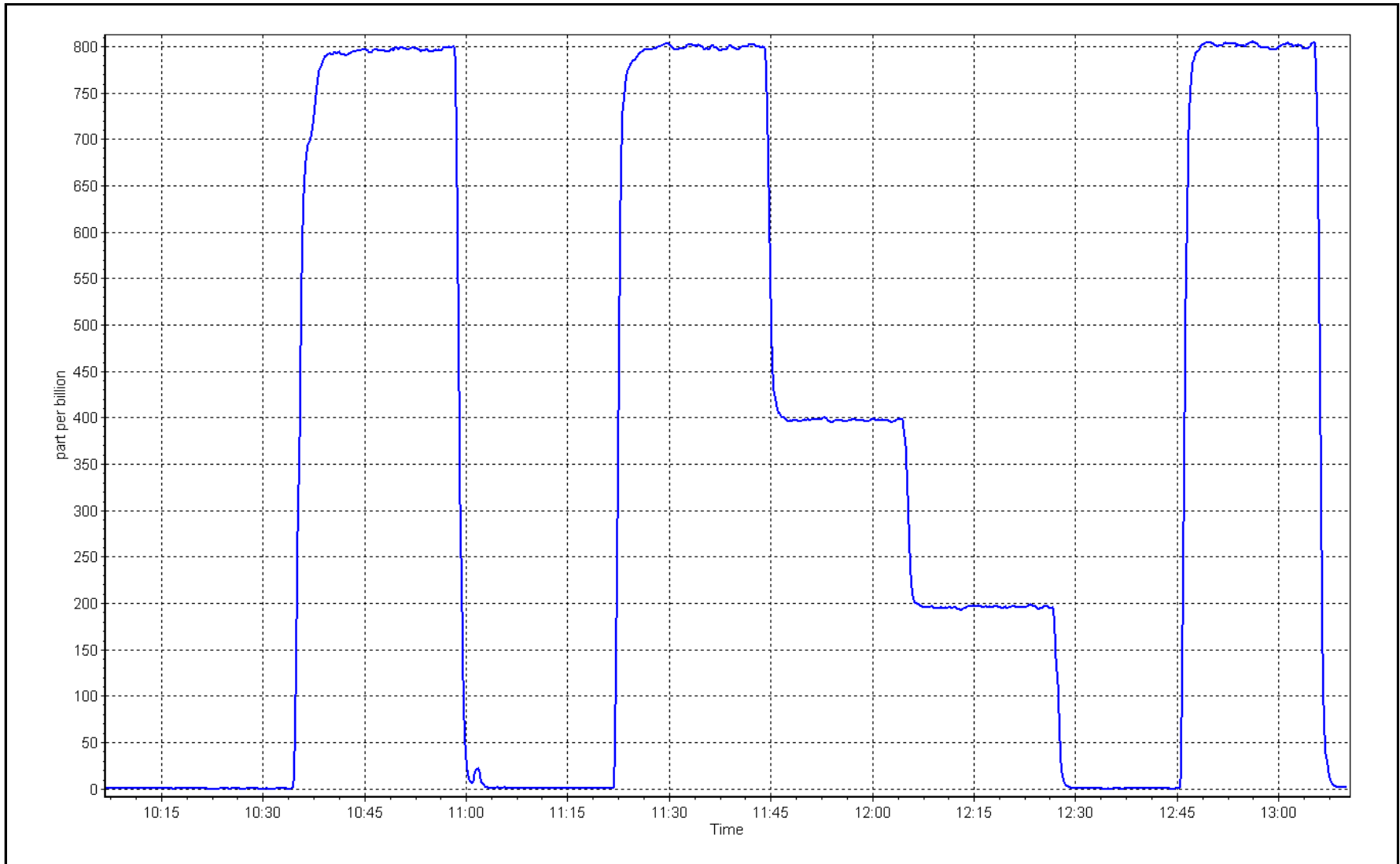
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.5	----	Correlation Coefficient	0.999973	≥0.995
800.5	798.8	1.0021	Slope	0.998699	0.90 - 1.10
399.6	397.3	1.0058	Intercept	-1.406165	+/-30
200.3	196.4	1.0201			



SO2 Calibration Plot

Date: October 16, 2024

Location: Jackfish 2/3





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Jackfish 2/3	Station number:	AMS 27
Calibration Date:	October 15, 2024	Last Cal Date:	September 18, 2024
Start time (MST):	9:59	End time (MST):	14:58
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 701		Serial Number:	268

Analyzer Information

Analyzer make:	API T101	Analyzer serial #:	621
Converter make:	NA	Converter serial #:	NA
Analyzer Range	0 - 100 ppb	Converter Temp:	316 degC

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.019581	1.015167	Backgd or Offset:	36.5	36.5
Calibration intercept:	0.082683	-0.137602	Coeff or Slope:	0.830	0.830

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4926	74.1	80.2	83.3	0.964
As found Mid point	4963	37.0	40.0	41.3	0.972
As found Low point	4982	18.5	20.0	20.2	0.996
New cylinder response					
Baseline Corr As found:	83.2	Prev response:	81.83	*% change:	1.7%
Baseline Corr 2nd AF pt:	41.2	AF Slope:	1.040115	AF Intercept:	-0.237156
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999924	* = > +/-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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4926	74.1	80.2	81.3	0.986
Mid point	4963	37.0	40.0	40.6	0.986
Low point	4982	18.5	20.0	19.8	1.011
As left zero	5000	0.0	0.0	0.1	----
As left span	4926	74.1	80.2	81.2	0.987
SO2 Scrubber Check	4921	79.1	791.0	0.1	----
Date of last scrubber change:				Ave Corr Factor	0.994
Date of last converter efficiency test:					

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

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

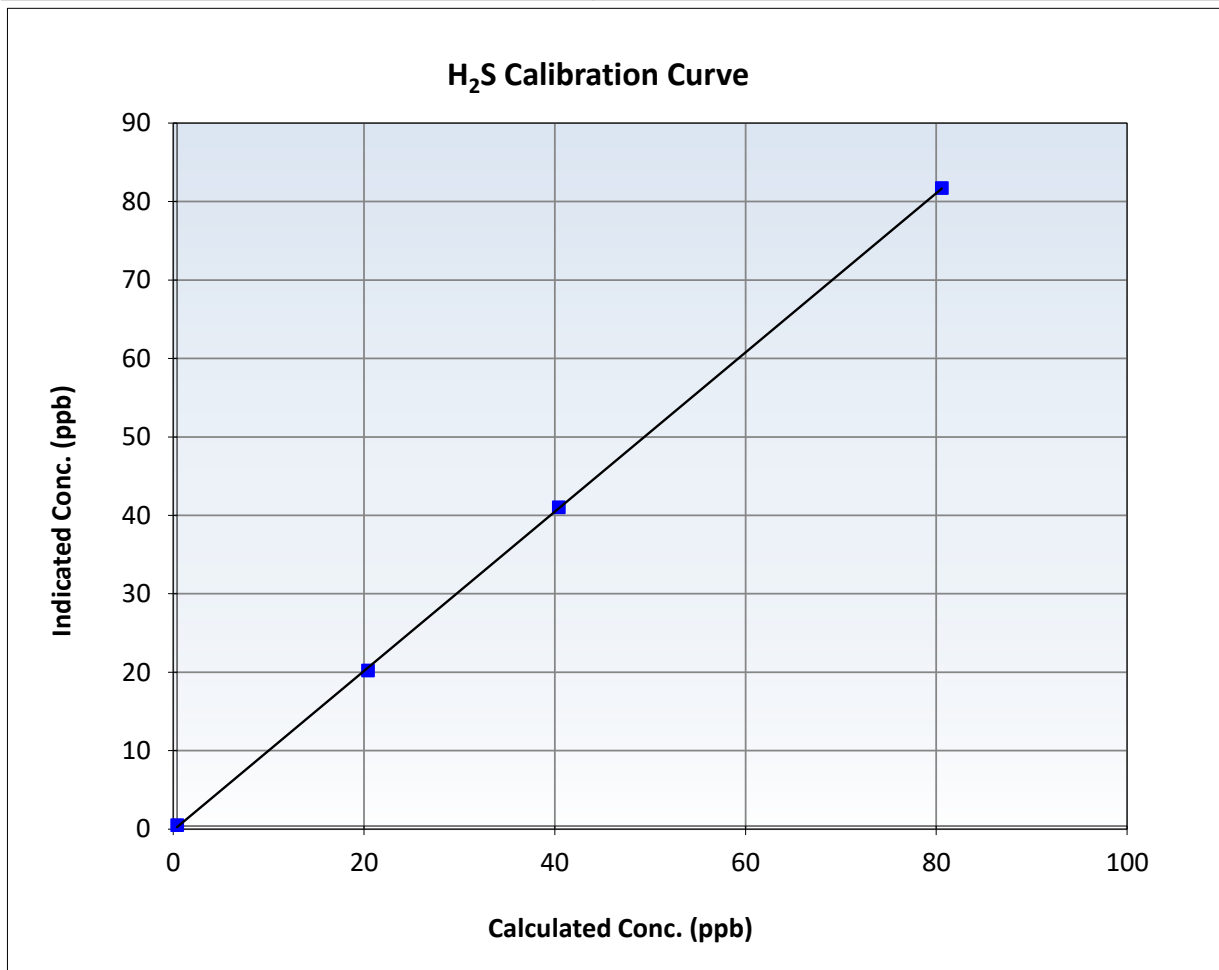
H₂S Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 18, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	9:59	End Time (MST):	14:58
Analyzer make:	API T101	Analyzer serial #:	621

Calibration Data

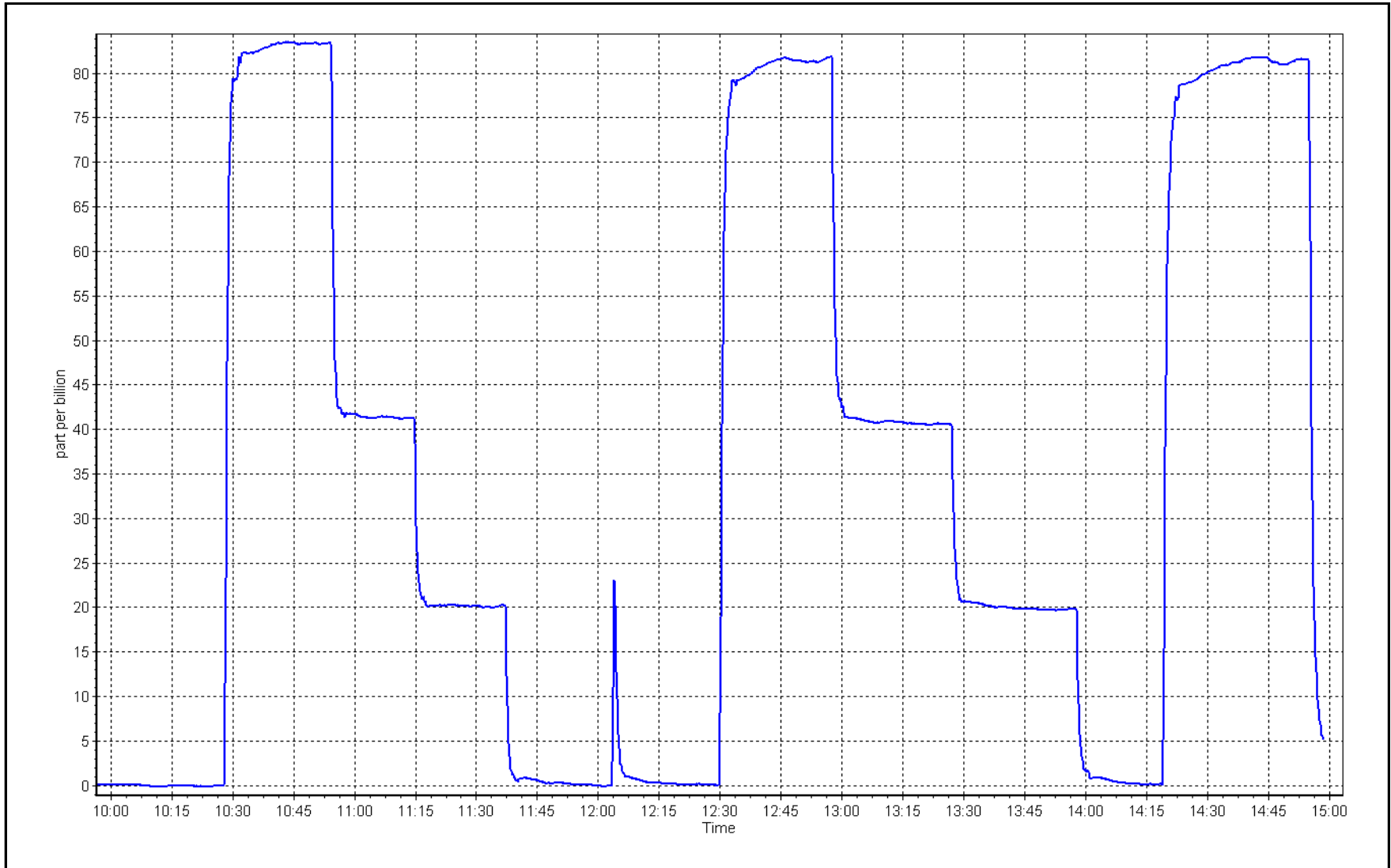
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999941	≥0.995
80.2	81.3	0.9862	Slope	1.015167	0.90 - 1.10
40.0	40.6	0.9861	Intercept	-0.137602	+/-3
20.0	19.8	1.0109			



H₂S Calibration Plot

Date: October 15, 2024

Location: Jackfish 2/3





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Jackfish 2/3
 Station number: AMS 27
 Calibration Date: October 23, 2024
 Last Cal Date: September 26, 2024
 Start time (MST): 9:55
 End time (MST): 13:24
 Reason: Removal

Calibration Standards

NO Gas Cylinder #: CC757838
 NOX Cal Gas Conc: 60.30 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 60.30 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701

Cal Gas Expiry Date: January 9, 2032
 NO Cal Gas Conc: 60.20 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 60.20 ppm
 NO gas Diff:
 Serial Number: 3811
 Serial Number: 268

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.4	0.2	----	----
AF High point	4942	66.5	800.6	799.3	1.3	782.7	767.0	15.7	1.0226	1.0415
AF Mid point	4979	33.3	400.6	399.9	0.7	385.2	384.4	0.8	1.0395	1.0393
AF Low point	4996	16.6	199.7	199.4	0.3	188.5	186.2	2.3	1.0582	1.0682
New cyl resp										
Previous Response	NO _x = 797.3 ppb	NO = 797.2 ppb				<i>* = > +/-5% change initiates investigation</i>		*Percent Change		NO _x = -1.8%
Baseline Corr 1st pt	NO _x = 782.9 ppb	NO = 767.4 ppb				<u>As Found Statistics</u>		*Percent Change		NO = -3.9%
Baseline Corr 2nd pt	NO _x = 385.4 ppb	NO = 384.8 ppb				As found	NO _x r ² : 0.999880	Nx SI: 0.979767	Nx Int: -4.097	
Baseline Corr 3rd pt	NO _x = 188.7 ppb	NO = 186.6 ppb				As found	NO r ² : 0.999944	NO SI: 0.962310	NO Int: -2.184	
						As found	NO ₂ r ² : 0.999976	NO ₂ SI: 0.976665	NO ₂ Int: 0.784	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
As Found GPT zero	----	----	0.0	0.2	----	----
As found high GPT point	780.6	397.0	384.9	376.2	1.0232	97.7%
As found mid GPT point	780.6	596.3	185.6	183.2	1.0133	98.7%
As found low GPT point	780.6	688.9	93.0	91.6	1.0156	98.5%



Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 722

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.998423	NA
NO _x Cal Offset:	-2.056065	NA
NO Cal Slope:	1.000536	NA
NO Cal Offset:	-2.515188	NA
NO ₂ Cal Slope:	0.982695	NA
NO ₂ Cal Offset:	0.889680	NA

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.428	NA	NO bkgnd or offset:	0.3	NA
NOX coeff or slope:	1.408	NA	NOX bkgnd or offset:	1.5	NA
NO2 coeff or slope:	1.000	NA	Reaction cell Press:	3.2	NA

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
-----------	---------------------------	-----------------------------	---	--	---	--	---------------------------------------	--	---	--

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 NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
-------------------	--	---------------------------------------	---	--	---	--

Cal zero
 High GPT point
 Mid GPT point
 Low GPT point

Average Correction Factor

Notes:

Removal Calibration.

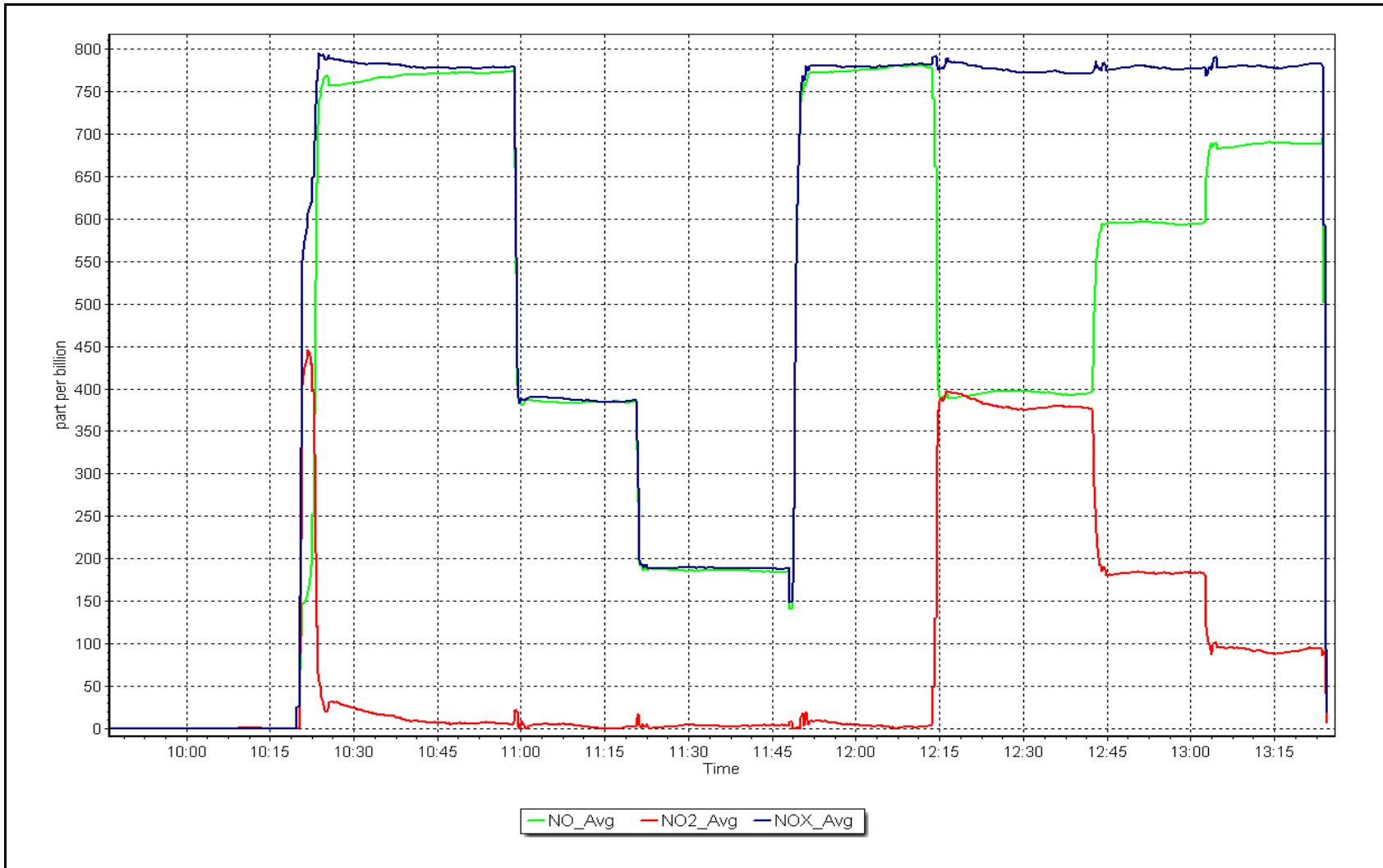
Calibration Performed By:

Mohammed Kashif

NO_x Calibration Plot

Date: October 23, 2024

Location: Jackfish 2/3





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Jackfish 2/3
 Station number: AMS 27
 Calibration Date: October 24, 2024
 Last Cal Date: NA
 Start time (MST): 10:31
 End time (MST): 14:46
 Reason: Install

Calibration Standards

NO Gas Cylinder #: CC757838
 NOX Cal Gas Conc: 60.30 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 60.30 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701
 Cal Gas Expiry Date: January 9, 2032
 NO Cal Gas Conc: 60.20 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 60.20 ppm
 NO gas Diff:
 Serial Number: 3811
 Serial Number: 268

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero))	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero))
As found zero									<i>Limit = 0.90 - 1.10</i>	<i>Limit = 0.90 - 1.10</i>
AF High point										
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = NA	ppb	NO = NA	ppb						NO _x = NA
Baseline Corr 1st pt	NO _x = NA	ppb	NO = NA	ppb						NO = NA
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										
<u>As Found Statistics</u>										
					As found	NO _x r ² :			Nx SI:	Nx Int:
					As found	NO r ² :			NO SI:	NO Int:
					As found	NO ₂ r ² :			NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero))	Converter Efficiency
As Found GPT zero					<i>Limit = 0.90 - 1.10</i>	<i>Limit = 96-104%</i>
As found high GPT point						
As found mid GPT point						
As found low GPT point						



Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1218153357

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	NA	1.001502
NO _x Cal Offset:	NA	-2.034660
NO Cal Slope:	NA	1.003711
NO Cal Offset:	NA	-3.675376
NO ₂ Cal Slope:	NA	0.983242
NO ₂ Cal Offset:	NA	2.433503

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	NA	1.360	NO bkgnd or offset:	NA	4.6
NOX coeff or slope:	NA	0.990	NOX bkgnd or offset:	NA	4.7
NO2 coeff or slope:	NA	1.000	Reaction cell Press:	NA	157.8

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	----	----
High point	4942	66.5	800.6	799.3	1.3	800.6	800.0	0.7	1.0000	0.9991
Mid point	4979	33.3	400.6	399.9	0.7	398.8	397.1	1.7	1.0045	1.0072
Low point	4996	16.6	199.7	199.4	0.3	195.5	192.1	3.4	1.0214	1.0378
As left zero	5000	0.0	0.0	0.0	0.0	1.2	0.0	1.3	----	----
As left span	4942	66.5	800.6	400.4	400.2	803.4	400.4	403.1	0.9966	1.0000
Average Correction Factor									1.0087	1.0147

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	800.5	400.5	401.3	395.6	1.0145	98.6%
Mid GPT point	800.5	609.2	192.6	194.0	0.9929	100.7%
Low GPT point	800.5	708.5	93.3	95.9	0.9732	102.8%
Average Correction Factor					0.9935	100.7%

Notes: Install calibration. Changed sample inlet filter. Adjusted both zero and span.

Calibration Performed By: Mohammed Kashif



Wood Buffalo Environmental Association

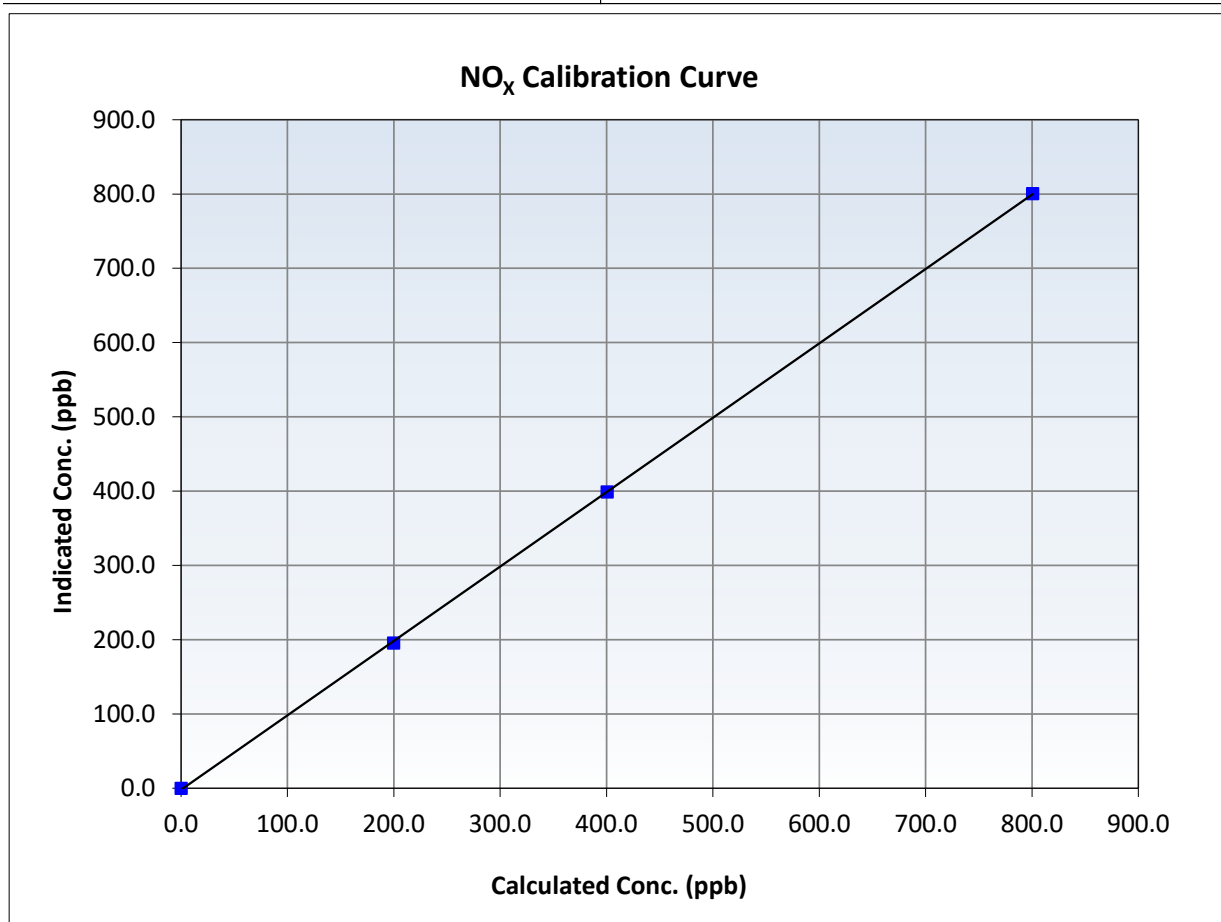
NO_x Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	NA
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:31	End Time (MST):	14:46
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999969	≥0.995
800.6	800.6	1.0000	Slope	1.001502	0.90 - 1.10
400.6	398.8	1.0045	Intercept	-2.034660	+/-20
199.7	195.5	1.0214			





Wood Buffalo Environmental Association

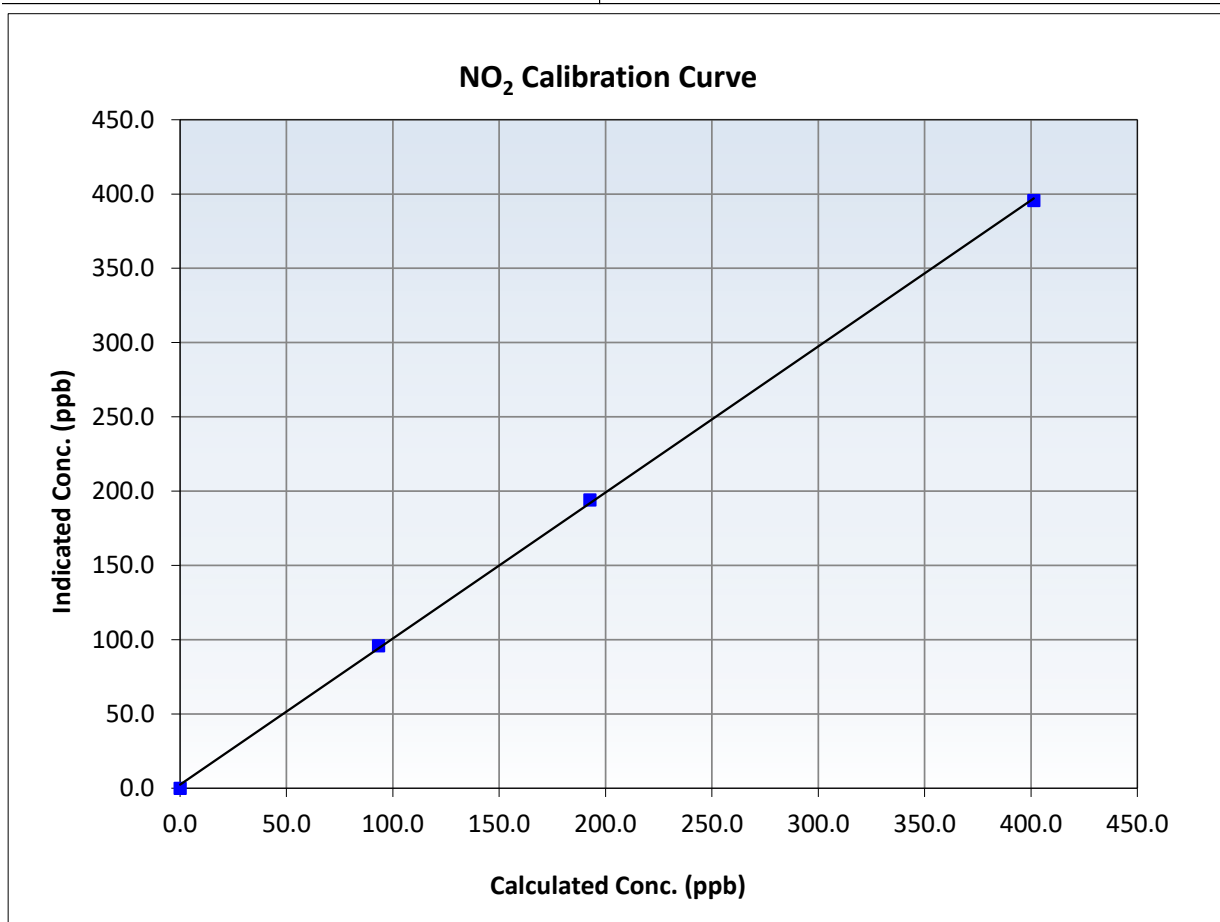
NO₂ Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	NA
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:31	End Time (MST):	14:46
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999819	≥0.995
401.3	395.6	1.0145	Slope	0.983242	0.90 - 1.10
192.6	194.0	0.9929	Intercept	2.433503	+/-20
93.3	95.9	0.9732			





Wood Buffalo Environmental Association

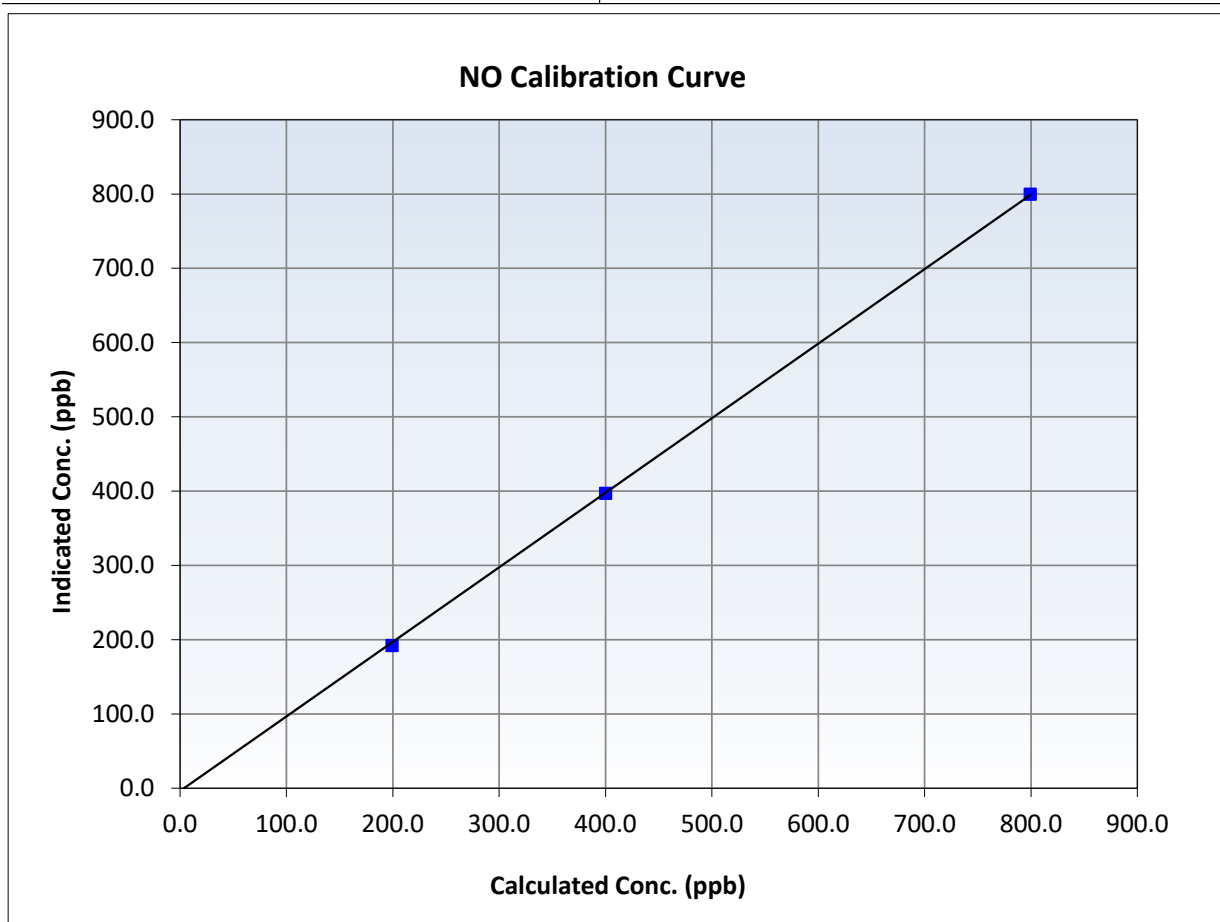
NO Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	NA
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:31	End Time (MST):	14:46
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

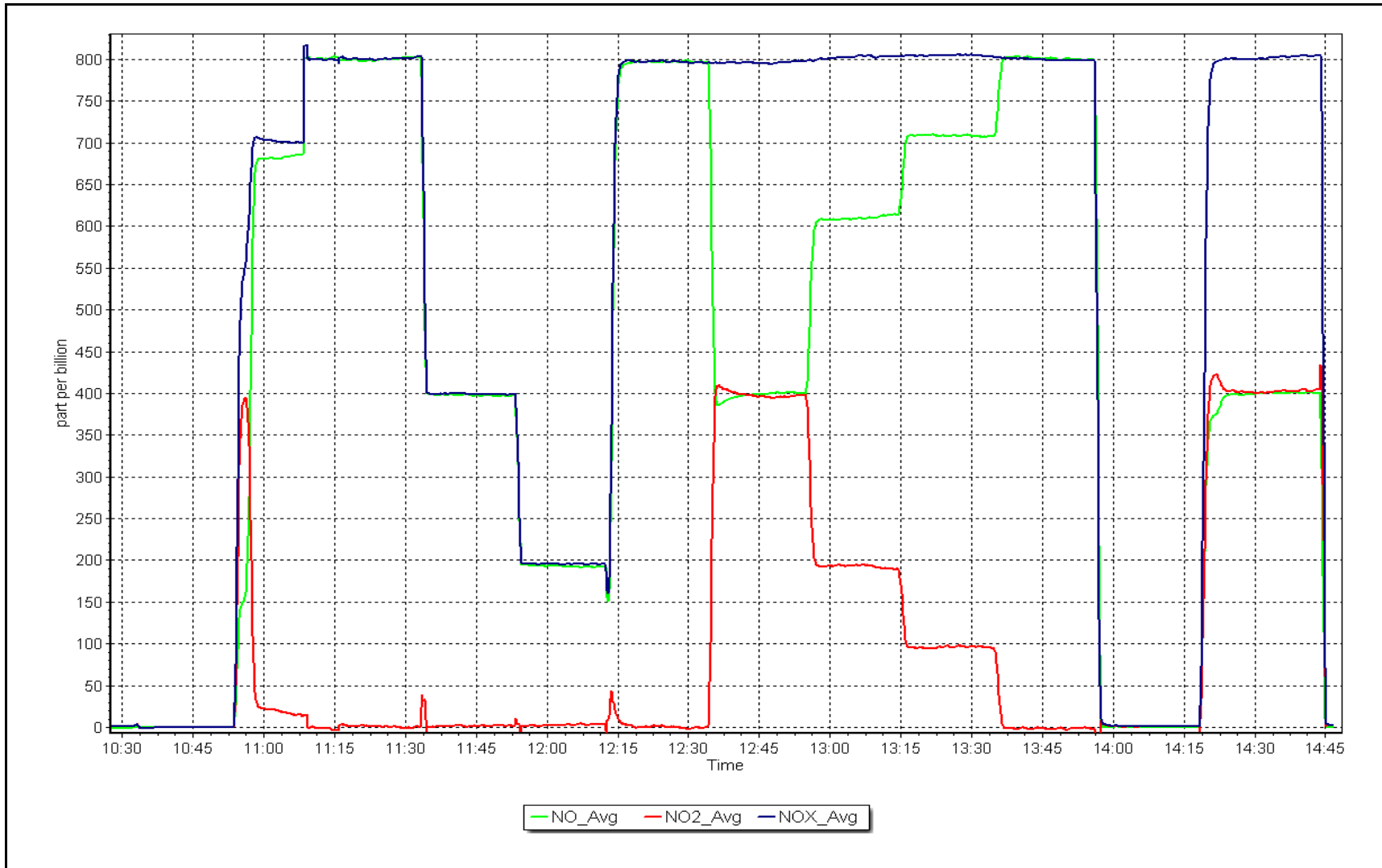
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999904	≥0.995
799.3	800.0	0.9991	Slope	1.003711	0.90 - 1.10
399.9	397.1	1.0072	Intercept	-3.675376	+/-20
199.4	192.1	1.0378			



NO_x Calibration Plot

Date: October 24, 2024

Location: Jackfish 2/3





Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Jackfish 2/3	Station Number:	AMS 30
Calibration Date:	October 15, 2024	Prev Cal Date:	August 29, 2023
Start Time (MST):	12:15	End Time (MST):	14:54
Tower Height (m):	10.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	X16480
WS Calibrator:	MetOne 053-120	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.7	0.2%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999999	≥0.9995
Calculated slope		0.998137	0.90 - 1.10
Calculated intercept		0.030641	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	X16480
As Found Declination (deg east of True North):	<u>18</u>	As Left Declination (deg east of True North):	<u>13</u>
Solar noon time (MST):	13:09	Calc Declination*:	13 Degrees
Deadband calc:	-1.2 degrees (<i>Limit 4 deg</i>)		<i>* - calculated declination as per NOAA website</i>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	-0.4	---
90	91.4	0.4%
180	180.2	0.1%
270	270.3	0.1%
355	357.9	0.8%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999977	≥0.9995
Calculated slope		0.994058	0.90 - 1.10
Calculated intercept		0.184524	+/- 4

Notes: Bearings still good. Cross arm was aligned using compass after calibration.

Calibration Performed By: Mohammed Kashif



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

**AMS29
SURMONT 2
OCTOBER 2024**

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	October 15, 2024	Last Cal Date:	September 6, 2024
Start time (MST):	9:53	End time (MST):	12:43
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003399	1.003414	Backgd or Offset:	12.9	13.0
Calibration intercept:	-1.945265	-1.825608	Coeff or Slope:	0.925	0.925

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4919	81.3	800.1	799.7	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.8	Previous response	800.9	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4919	81.3	800.1	802.0	0.998
Mid point	4959	40.7	400.6	399.2	1.003
Low point	4979	20.3	199.8	196.6	1.016
As left zero	5000	0.0	0.0	0.1	----
As left span	4919	81.3	800.1	804.0	0.995
Average Correction Factor:					1.006

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

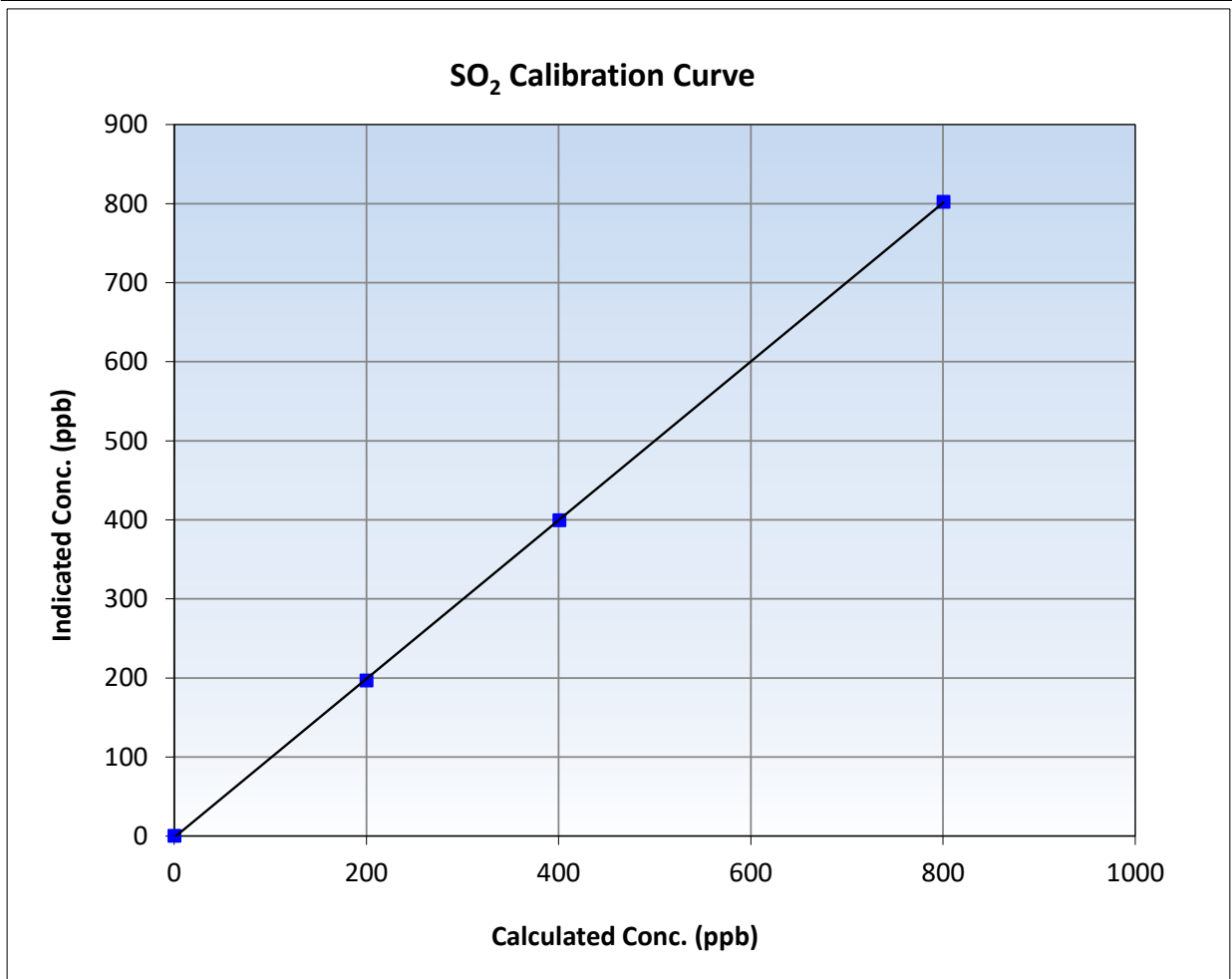
SO₂ Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 6, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:53	End Time (MST):	12:43
Analyzer make:	Thermo 43i	Analyzer serial #:	1170050150

Calibration Data

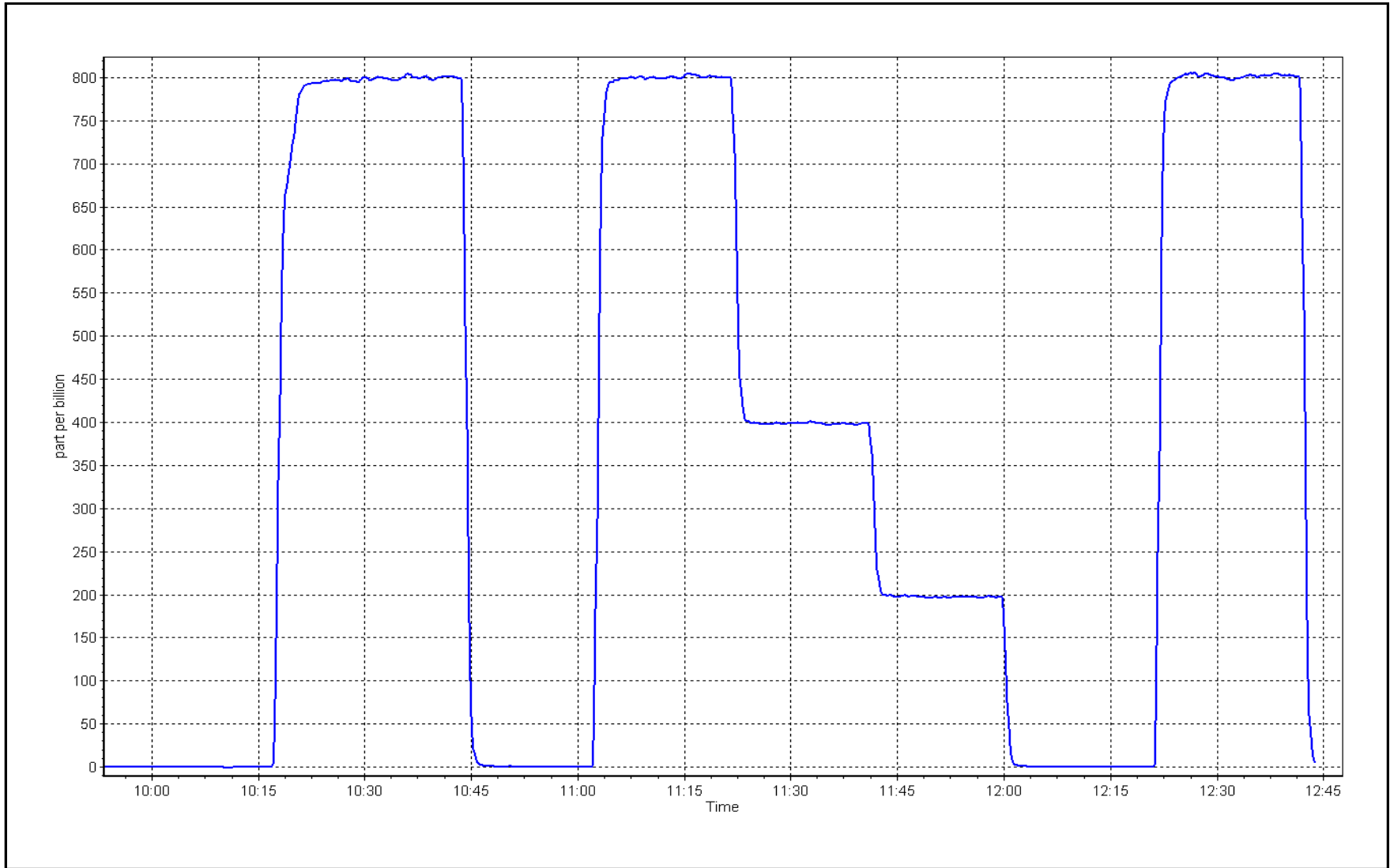
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.2	----	Correlation Coefficient	0.999971	≥0.995
800.1	802.0	0.9976	Slope	1.003414	0.90 - 1.10
400.6	399.2	1.0035	Intercept	-1.825608	+/-30
199.8	196.6	1.0164			



SO2 Calibration Plot

Date: October 15, 2024

Location: Surmont 2





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	October 8, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	10:41	End time (MST):	15:42
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	<u>5.391</u>	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	<u>CC508338</u>			
Removed Cal Gas Conc:	<u>5.391</u>	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	<u>CC508338</u>		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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002185	1.003325	Backgd or Offset:	0.88	0.89
Calibration intercept:	-0.142761	-0.182706	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4926	74.2	80.0	80.8	0.988
As found Mid point	4963	37.2	40.1	40.7	0.981
As found Low point	4982	18.6	20.1	20.2	0.983
New cylinder response					
Baseline Corr As found:	81.0	Prev response:	80.03	*% change:	1.2%
Baseline Corr 2nd AF pt:	40.9	AF Slope:	1.012481	AF Intercept:	-0.103549
Baseline Corr 3rd AF pt:	20.4	AF Correlation:	0.999984	<i>* = +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4926	74.2	80.0	80.2	0.998
Mid point	4963	37.2	40.1	39.8	1.008
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	78.3	1.022
SO2 Scrubber Check	4919	81.3	813.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.003
Date of last converter efficiency test:					

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

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

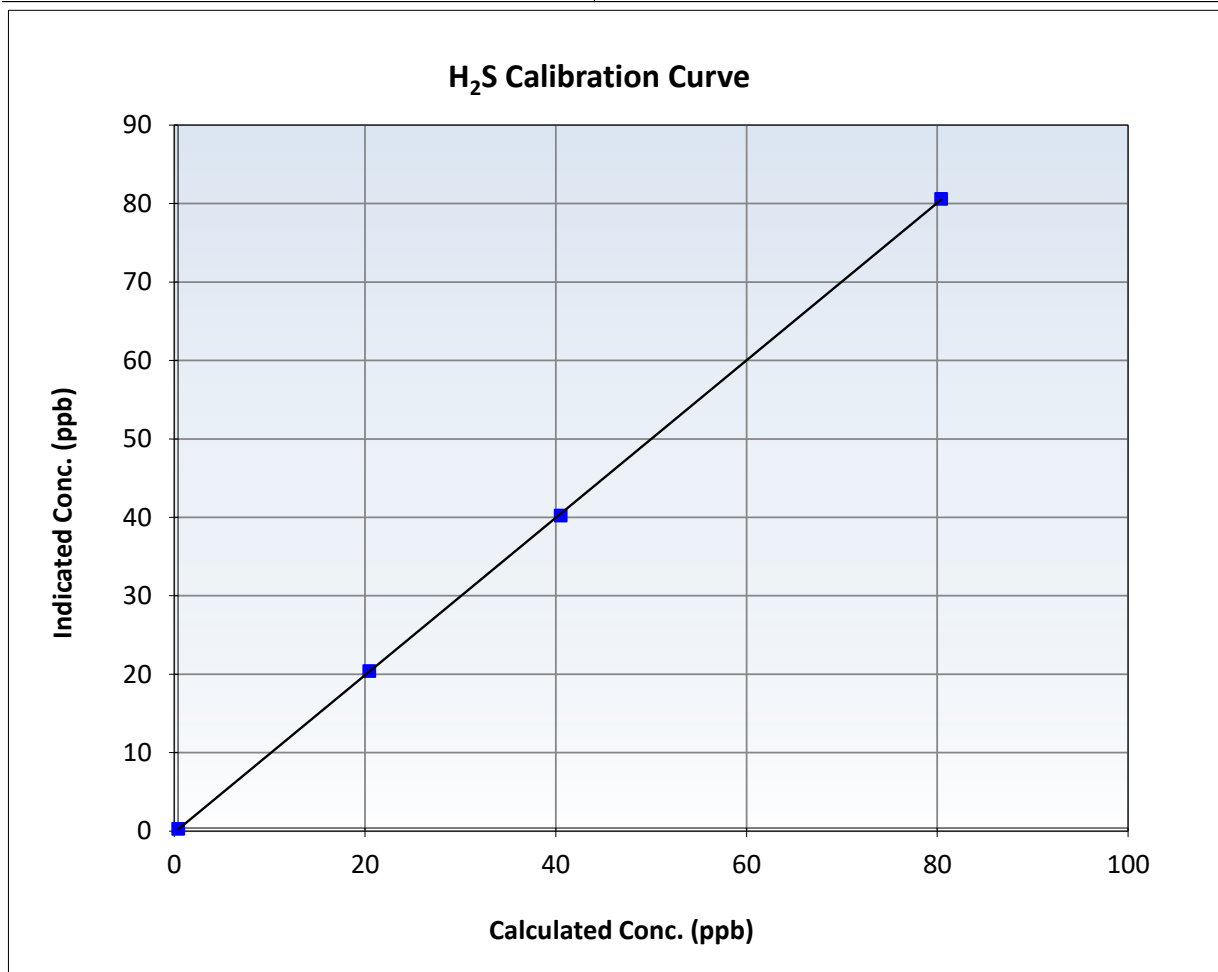
H2S Calibration Summary

Station Information

Calibration Date:	October 8, 2024	Previous Calibration:	September 3, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	10:41	End Time (MST):	15:42
Analyzer make:	Thermo 43iQ-TLE	Analyzer serial #:	1200326170

Calibration Data

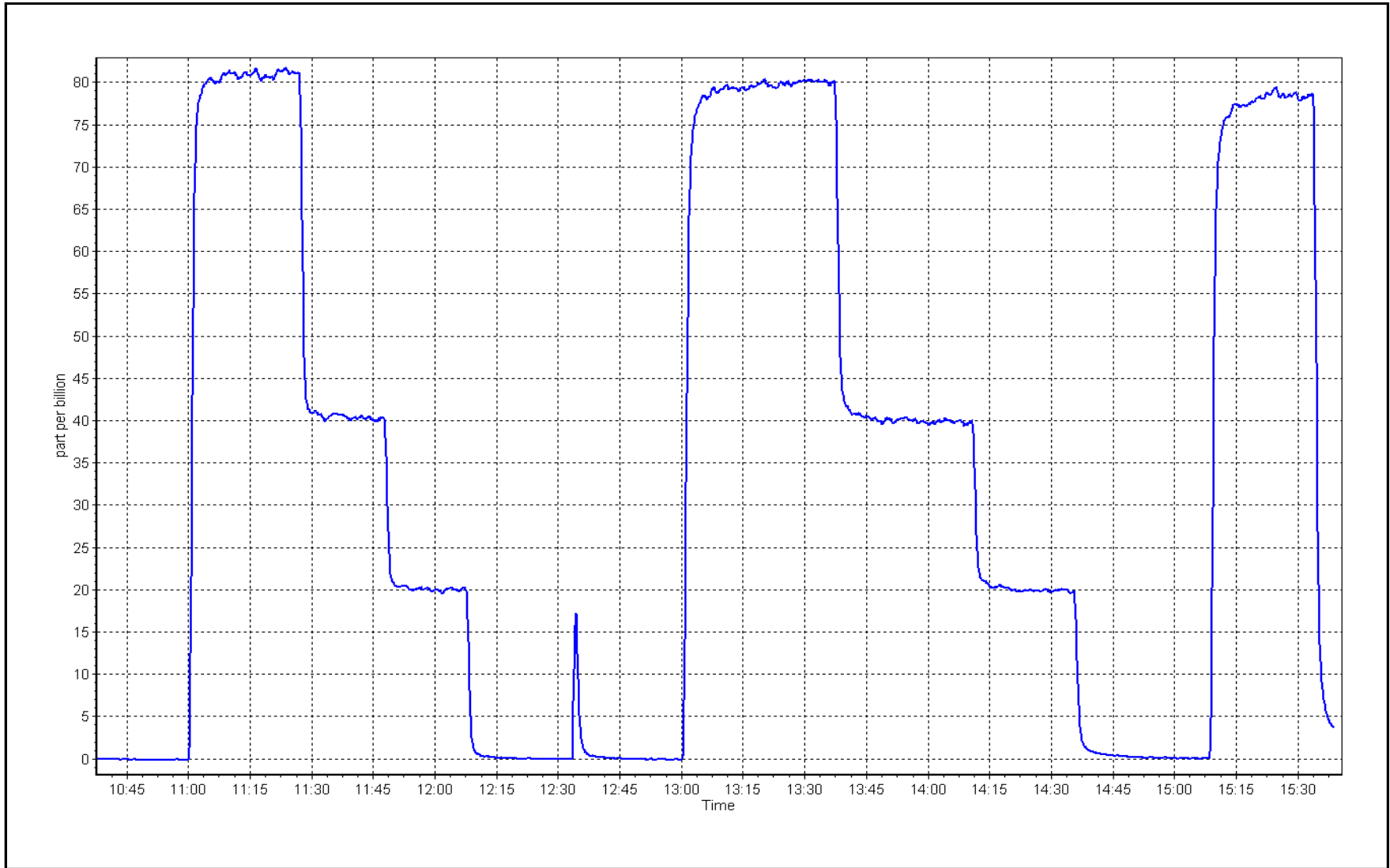
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	0.999974	≥ 0.995
80.0	80.2	0.9975	Slope	1.003325	$0.90 - 1.10$
40.1	39.8	1.0077	Intercept	-0.182706	± 3
20.1	20.0	1.0027			



H2S Calibration Plot

Date: October 8, 2024

Location: Surmont 2





Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	October 15, 2024	Last Cal Date:	September 6, 2024
Start time (MST):	9:53	End time (MST):	12:43
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC356008	Cal Gas Expiry Date:	February 23, 2025
CH4 Cal Gas Conc.	<u>499.0</u> ppm	CH4 Equiv Conc.	1064.7 ppm
C3H8 Cal Gas Conc.	<u>205.7</u> ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	<u>499.0</u> ppm	CH4 Equiv Conc.	1064.7 ppm
Removed C3H8 Conc.	<u>205.7</u> 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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.998216	0.994765	Background:	3.47	3.47
Calibration intercept:	0.055734	-0.007885	Coefficient:	3.856	3.856

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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.02	----
As found High point	4918	81.3	17.31	17.26	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.24	Previous response	17.34	*% 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.02	----
High point	4918	81.3	17.31	17.24	1.004
Mid point	4959	40.6	8.65	8.55	1.011
Low point	4979	20.3	4.32	4.28	1.010
As left zero	5000	0.0	0.00	0.01	----
As left span	4918	81.3	17.31	17.44	0.993
Average Correction Factor					1.009

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

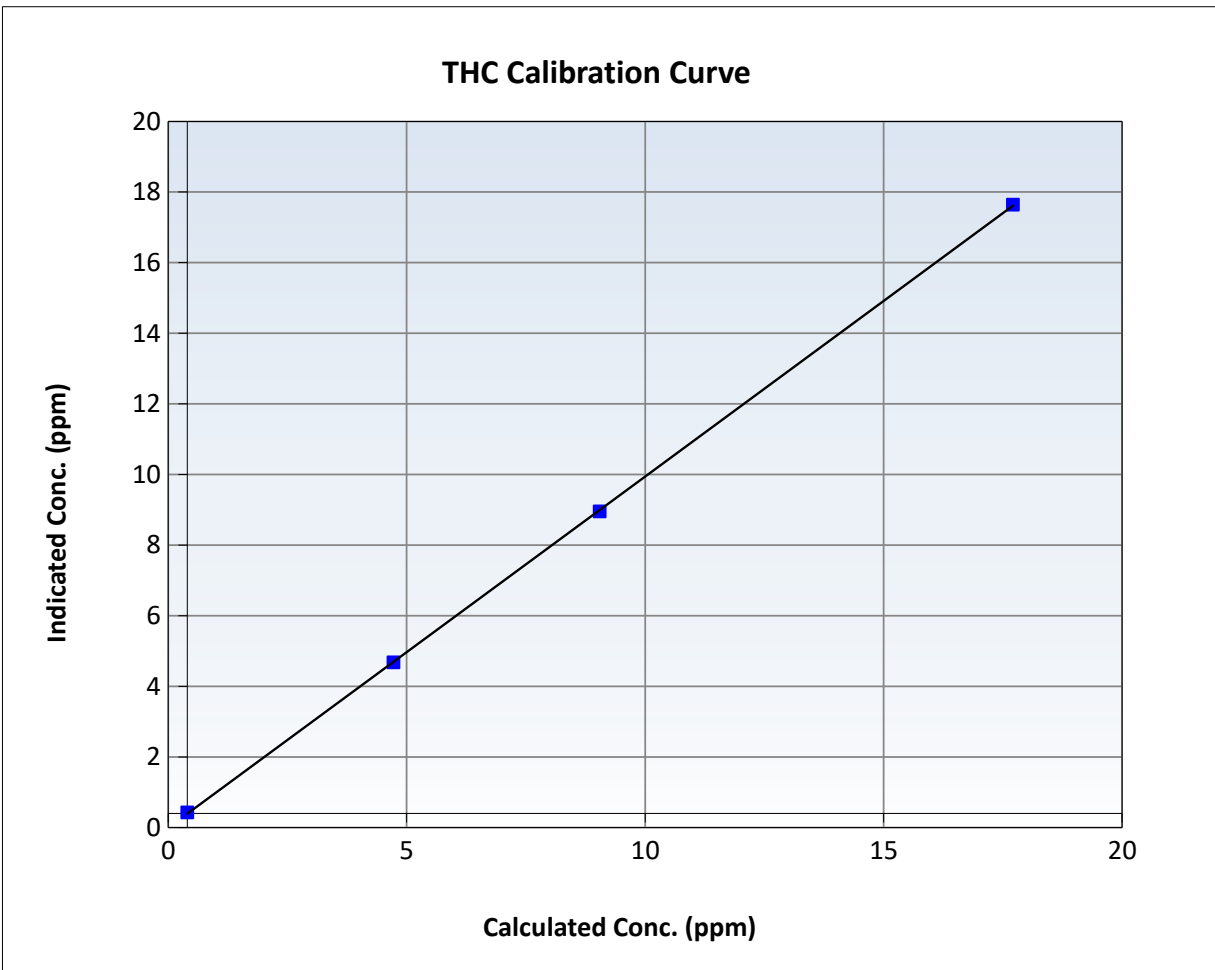
THC Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 6, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:53	End Time (MST):	12:43
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1170050149

Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.02	----	Correlation Coefficient	0.999978	≥0.995
17.31	17.24	1.0043	Slope	0.994765	0.90 - 1.10
8.65	8.55	1.0112	Intercept	-0.007885	+/-1.5
4.32	4.28	1.0101			



THC Calibration Plot

Date: October 15, 2024

Location: Surmont 2





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Surmont 2
 Station number: AMS 29
 Calibration Date: October 22, 2024
 Last Cal Date: September 19, 2024
 Start time (MST): 10:10
 End time (MST): 15:20
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: T12YYFE
 NOX Cal Gas Conc: 47.46 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 47.46 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701
 Cal Gas Expiry Date: October 30, 2024
 NO Cal Gas Conc: 47.46 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 47.46 ppm
 NO gas Diff:
 Serial Number: 5472
 Serial Number: 4698

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0	0.0	0.0	0.0	0.0	0.1	-0.1	----	----
AF High point	4916	84.3	800.1	800.1	0.0	805.0	807.0	-1.3	0.9939	0.9916
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 799.1 ppb		NO = 799.4 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 0.7%	
Baseline Corr 1st pt	NO _x = 805.0 ppb		NO = 806.9 ppb			<u>As Found Statistics</u>		*Percent Change	NO = 0.9%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1170050148

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.999522	0.996062
NO _x Cal Offset:	-0.652076	0.008054
NO Cal Slope:	1.000937	0.999208
NO Cal Offset:	-1.471932	-1.192055
NO ₂ Cal Slope:	1.001153	0.993095
NO ₂ Cal Offset:	-0.322528	-0.796261

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.646	1.630	NO bkgnd or offset:	1.4	1.4
NOX coeff or slope:	0.993	0.994	NOX bkgnd or offset:	1.5	1.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	192.3	190.7

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	----	----
High point	4916	84.2	799.2	799.2	0.0	795.8	797.7	-1.9	1.0043	1.0019
Mid point	4958	42.1	399.6	399.6	0.0	398.9	398.3	0.7	1.0018	1.0033
Low point	4979	21.1	200.3	200.3	0.0	198.8	197.2	1.6	1.0074	1.0156
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4916	84.2	799.2	409.2	390.0	793.1	409.2	383.9	1.0077	1.0000
Average Correction Factor									1.0045	1.0069

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	796.1	400.1	396.0	392.7	1.0084	99.2%
Mid GPT point	796.1	607.2	188.9	186.9	1.0107	98.9%
Low GPT point	796.1	698.2	97.9	95.3	1.0273	97.3%
Average Correction Factor					1.0155	98.5%

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

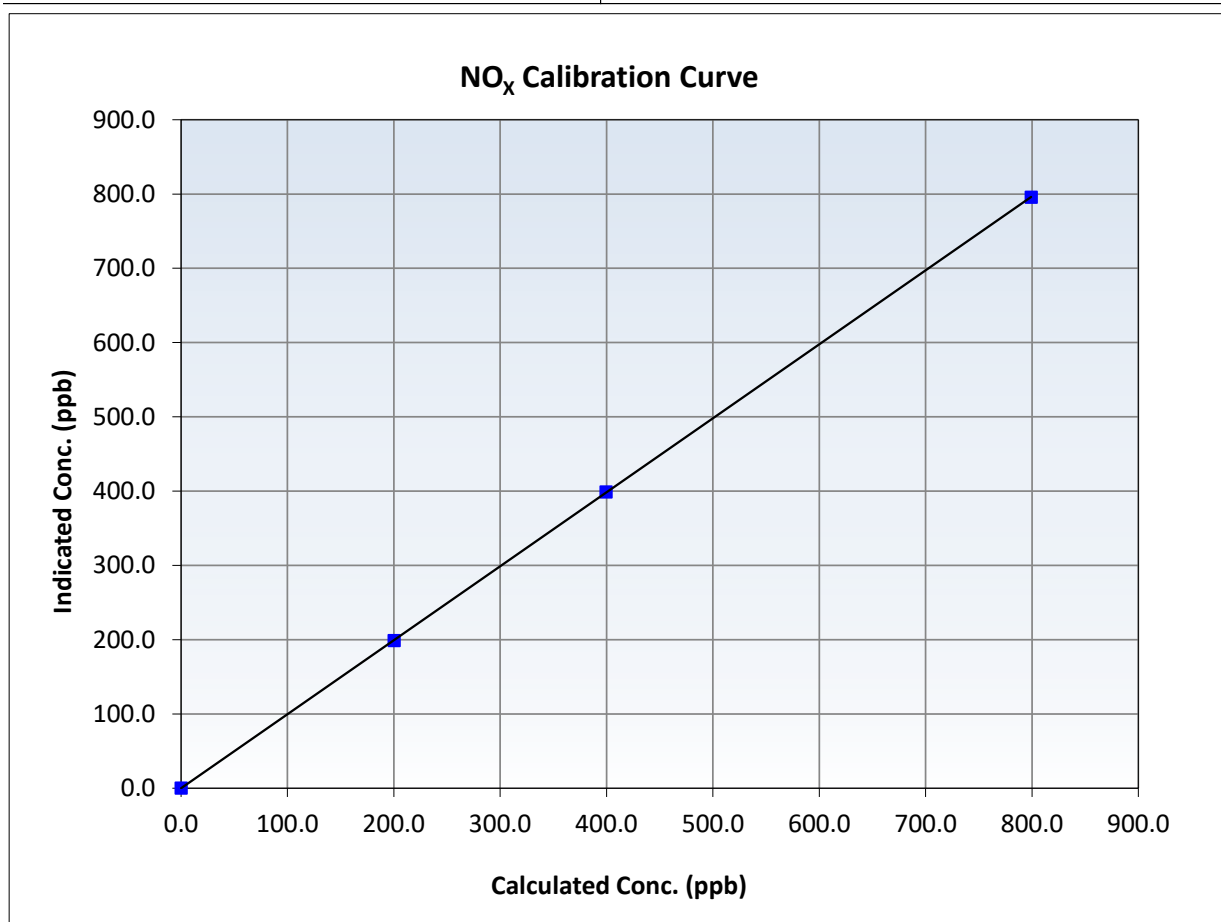
NO_x Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 19, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	10:10	End Time (MST):	15:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999996	≥0.995
799.2	795.8	1.0043	Slope	0.996062	0.90 - 1.10
399.6	398.9	1.0018	Intercept	0.008054	+/-20
200.3	198.8	1.0074			





Wood Buffalo Environmental Association

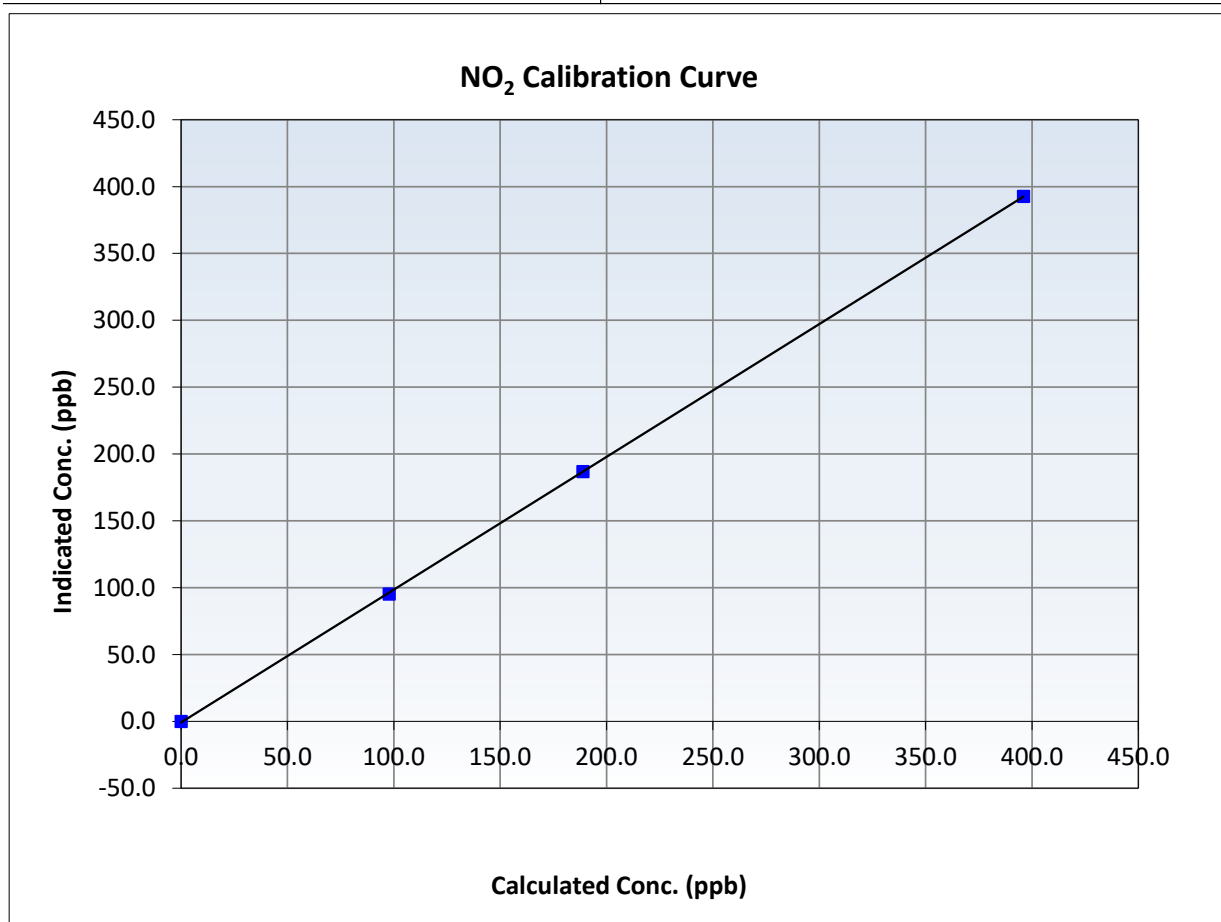
NO₂ Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 19, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	10:10	End Time (MST):	15:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999977	≥0.995
396.0	392.7	1.0084	Slope	0.993095	0.90 - 1.10
188.9	186.9	1.0107	Intercept	-0.796261	+/-20
97.9	95.3	1.0273			





Wood Buffalo Environmental Association

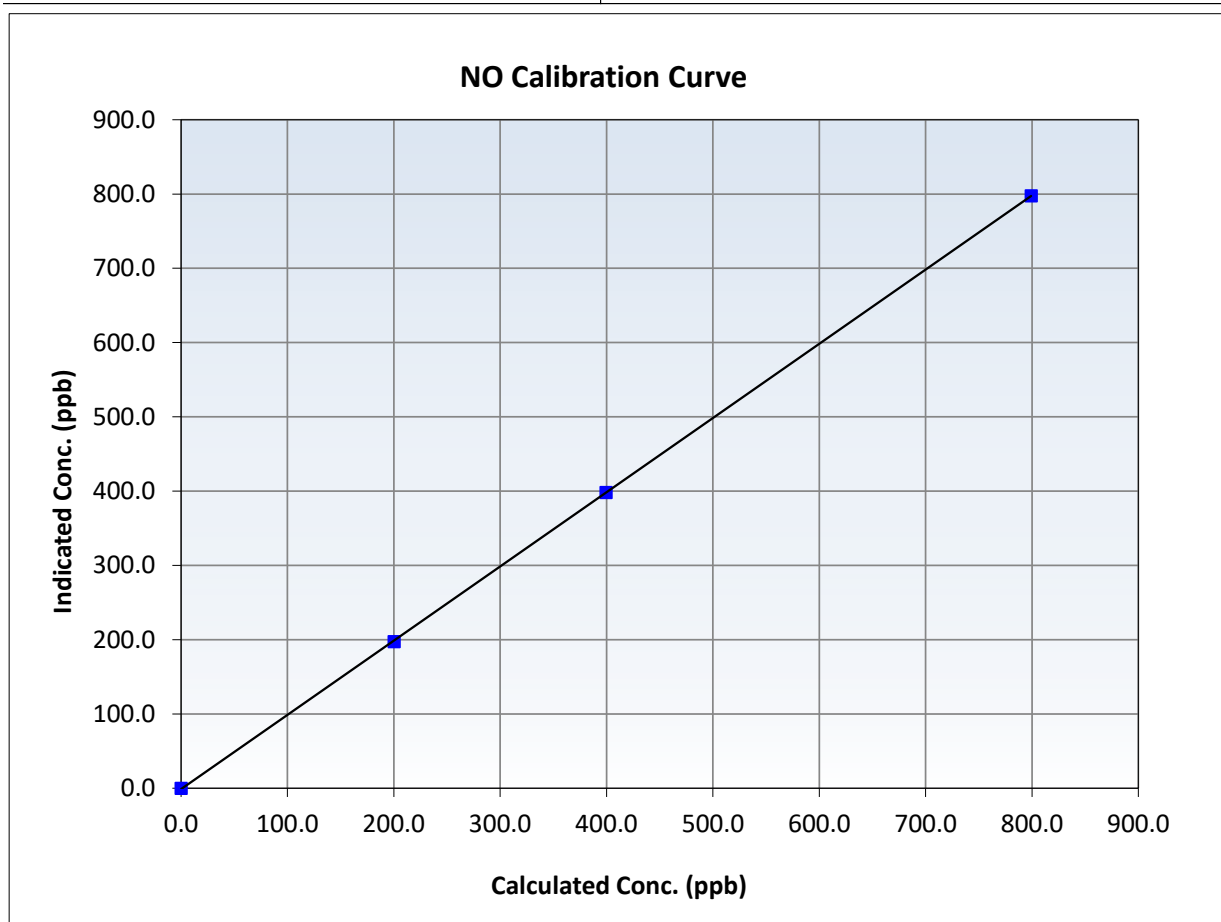
NO Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 19, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	10:10	End Time (MST):	15:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

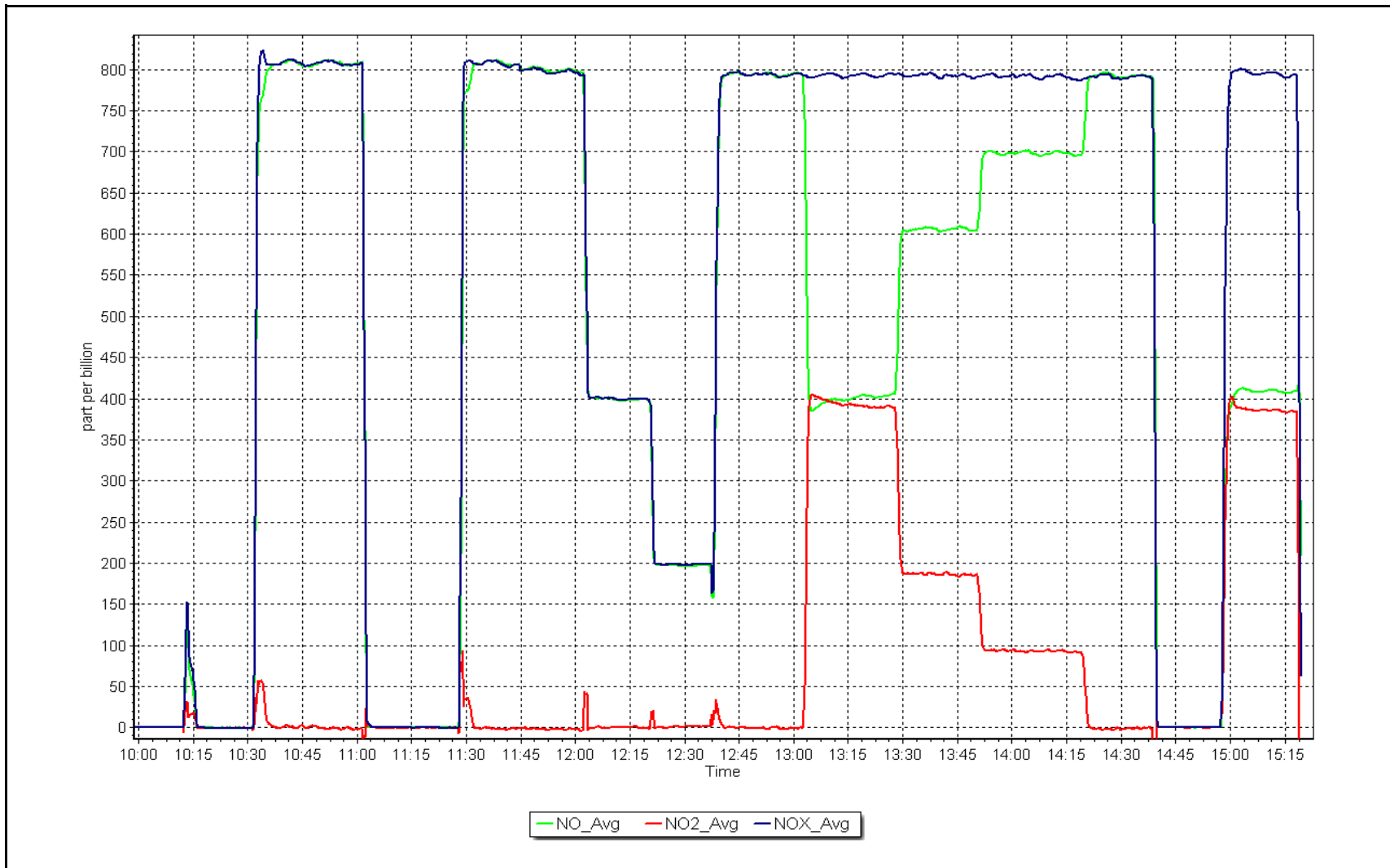
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999987	<i>≥0.995</i>
799.2	797.7	1.0019	Slope	0.999208	<i>0.90 - 1.10</i>
399.6	398.3	1.0033	Intercept	-1.192055	<i>+/-20</i>
200.3	197.2	1.0156			



NO_x Calibration Plot

Date: October 22, 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: October 30, 2024 Last Cal Date: September 19, 2024
 Start time (MST): 10:20 End time (MST): 13:00

Analyzer Make: API T640 S/N: 253
 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)	-3.8	-2.83	-3.8	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	710.9	711.70	710.9	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	4.99	5.015	4.99	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	39	----	39	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	1.2	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: June 10, 2024
 Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test	0.1	0.1	0.1	<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: _____ October 30, 2024
 Date Disposable Filter Changed: _____ October 30, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: _____ October 30, 2024
 Date RH/T Sensor Cleaned: _____ October 30, 2024

Notes: Completed monthly verifications as well as quarterly and yearly maintenance.

Calibration by: Braiden Boutilier



Wood Buffalo Environmental Association

T640 PM_{2.5} CALIBRATION

Version-01-2024

Station Information

Station Name: Surmont 2 Station number: AMS 29
 Calibration Date: October 31, 2024 Last Cal Date: October 30, 2024
 Start time (MST): 10:02 End time (MST): 13:21

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)	NA	-4.54	-4.7	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	NA	712.19	713.8	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	NA	4.958	5.00	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	NA	----	36	<input type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	3.5	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	NA	NA	10.9	<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: _____ October 31, 2024
 Date Disposable Filter Changed: _____ October 31, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: _____ October 30, 2024
 Date RH/T Sensor Cleaned: _____ October 30, 2024

Notes: Installed new T640. Ran span dust check, verified temperature, pressure and flow.

Calibration by: Braiden Boutilier



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Surmont 2	Station Number:	AMS 29
Calibration Date:	October 22, 2024	Prev Cal Date:	March 7, 2024
Start Time (MST):	10:15	End Time (MST):	12:45
Tower Height (m):	10.0	Reason:	Removal

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	W15275
WS Calibrator:		Serial Number:	

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)			≥0.9995
Calculated slope			0.90 - 1.10
Calculated intercept			+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	A2005
As Found Declination (deg east of True North):	13	As Left Declination (deg east of True North):	13
Solar noon time (MST):	13:08	Calc Declination*:	13.07 Degrees
Deadband calc:	-2.2 degrees (<i>Limit 4 deg</i>)		<small>* - calculated declination as per NOAA website</small>

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	0.2	---
90	86.1	-1.1%
180	175.6	-1.2%
270	269.4	-0.2%
355	359.4	1.2%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)			≥0.9995
Calculated slope		0.986787	0.90 - 1.10
Calculated intercept		3.207884	+/- 4

Notes: Wind direction sensor removal.

Calibration Performed By: Braiden Boutillier



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Surmont 2	Station Number:	AMS 29
Calibration Date:	October 22, 2024	Prev Cal Date:	March 7, 2024
Start Time (MST):	10:15	End Time (MST):	12:45
Tower Height (m):	10.0	Reason:	Install

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	W15275
WS Calibrator:	MetOne 053	Serial Number:	B22309

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.7	0.2%
800	77.8	77.8	0.1%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		0.999999	≥0.9995
Calculated slope		0.998137	0.90 - 1.10
Calculated intercept		0.030641	+/- 2

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	U11347
As Found Declination (deg east of True North):	13	As Left Declination (deg east of True North):	13
Solar noon time (MST):	13:08	Calc Declination*:	13.07 Degrees
Deadband calc:	3.5 degrees (<i>Limit 4 deg</i>)	<i>* - calculated declination as per NOAA website</i>	

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) <i>Limit = +/- 1.0%</i>
0	1.5	---
90	90.4	0.1%
180	179.7	-0.1%
270	268.4	-0.4%
355	353.0	-0.6%

	<u>Start</u>	<u>Finish</u>	<u>Limits</u>
Correl Coeff (r ²)		1.010156	≥0.9995
Calculated slope		1.010156	0.90 - 1.10
Calculated intercept		-1.407854	+/- 4

Notes: Replaced wind direction sensor. Verified wind speed sensor readings.

Calibration Performed By: Braiden Boutilier



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS30 ELLS RIVER OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Ells River	Station number: AMS 30
Calibration Date:	October 11, 2024	Last Cal Date: September 3, 2024
Start time (MST):	9:07	End time (MST): 12:12
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002990	1.001089	Backgd or Offset:	9.6	9.6
Calibration intercept:	-2.372034	-2.132048	Coeff or Slope:	0.992	0.992

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	----
As found High point	4918	82.0	799.5	800.0	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.8	Previous response	799.5	*% change	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4918	82.0	799.5	799.5	1.000
Mid point	4959	41.0	399.8	396.8	1.007
Low point	4980	20.5	199.9	195.4	1.023
As left zero	5000	0.0	0.0	0.3	----
As left span	4918	82.0	799.5	800.9	0.998
Average Correction Factor:					1.010

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

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

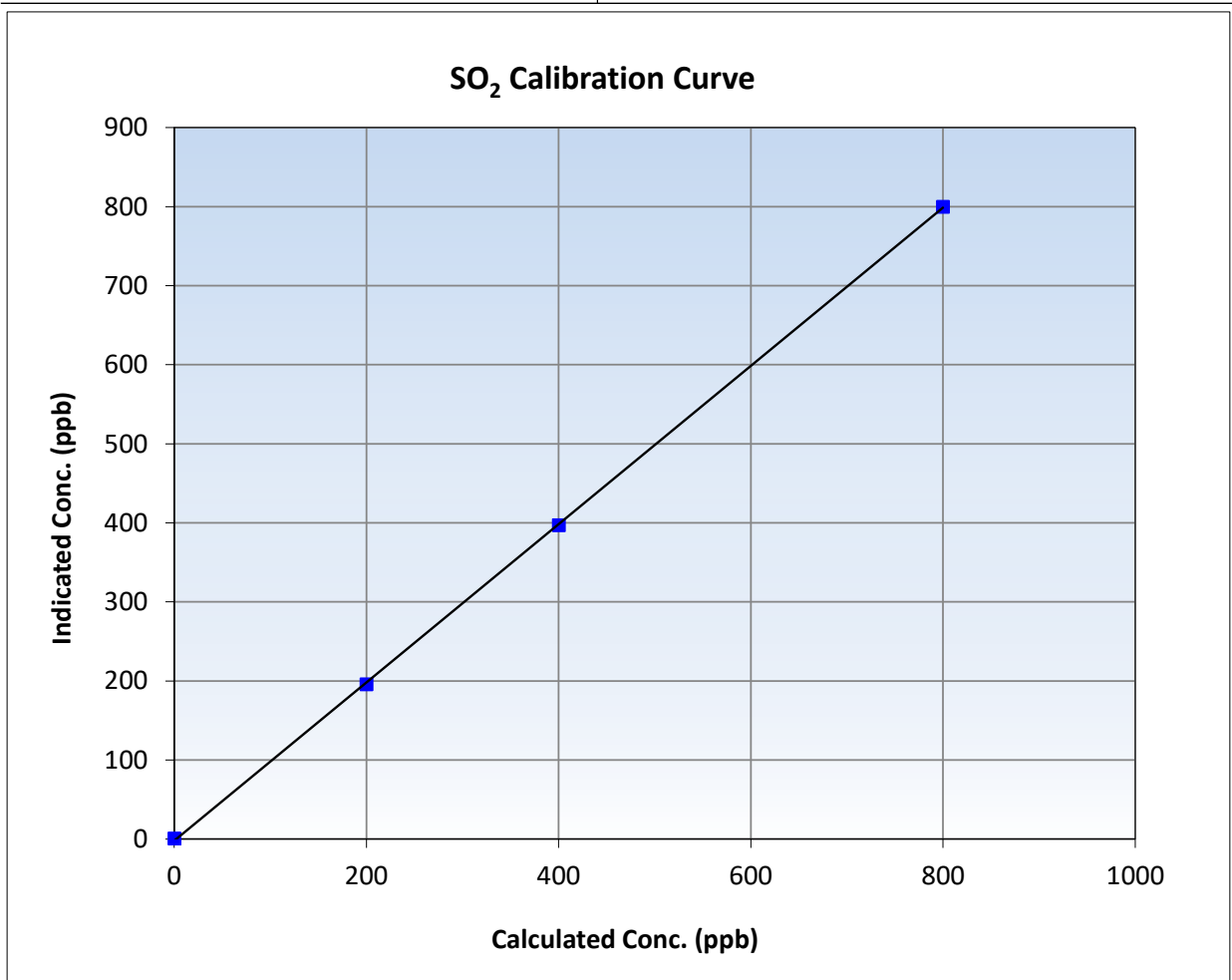
SO₂ Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	September 3, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:07	End Time (MST):	12:12
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841397

Calibration Data

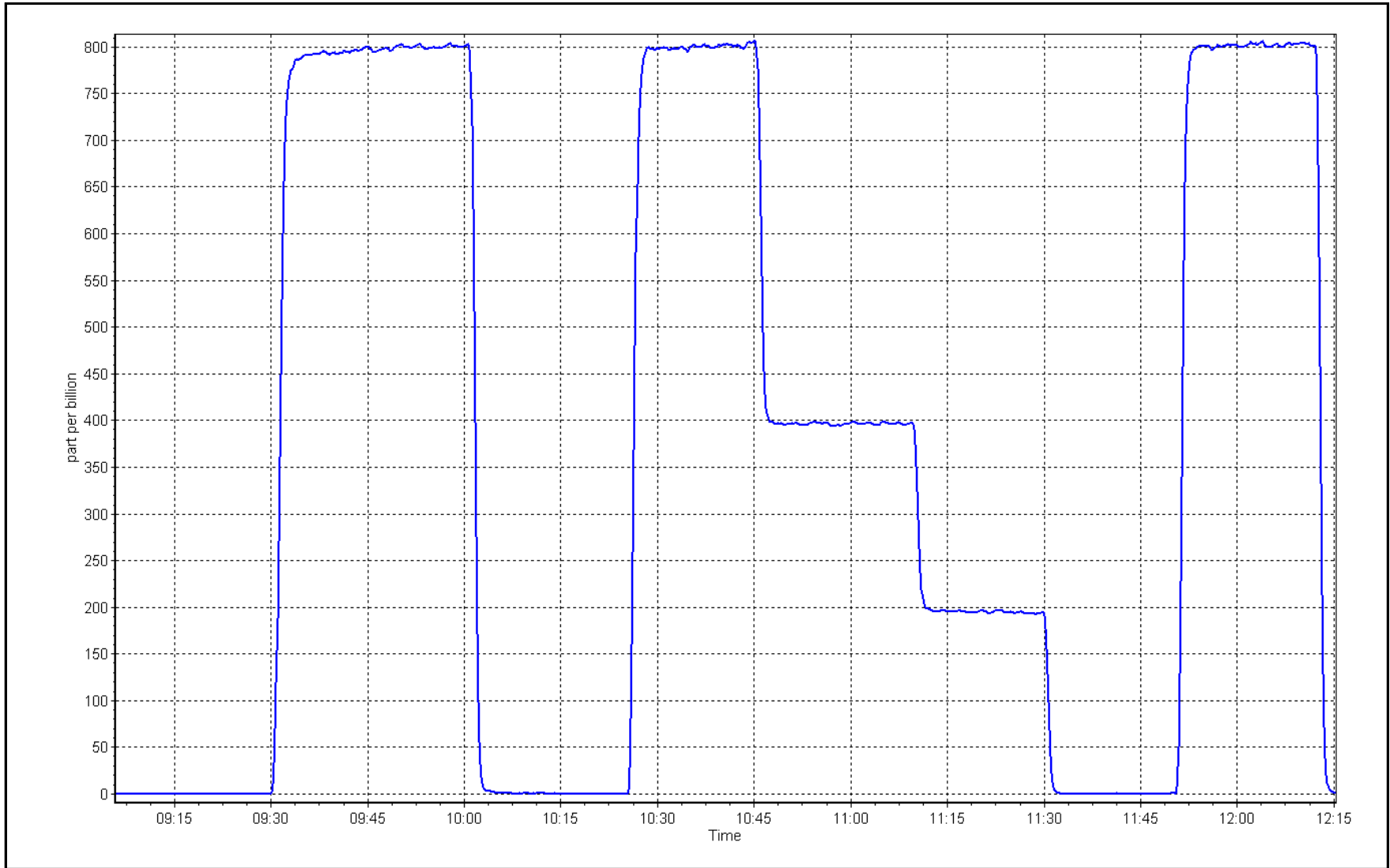
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.4	----	Correlation Coefficient	0.999954	≥0.995
799.5	799.5	1.0000	Slope	1.001089	0.90 - 1.10
399.8	396.8	1.0074	Intercept	-2.132048	+/-30
199.9	195.4	1.0228			



SO2 Calibration Plot

Date: October 11, 2024

Location: Ells River





Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	October 7, 2024	Last Cal Date:	September 9, 2024
Start time (MST):	9:34	End time (MST):	13:52
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 T700		Serial Number:	3061
ZAG Make/Model:	API T701H		Serial Number:	358

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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.007332	1.001477	Backgd or Offset:	1.7	1.7
Calibration intercept:	-0.360497	-0.080545	Coeff or Slope:	1.119	1.094

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4920	80.2	80.0	82.0	0.975
As found Mid point	4960	40.1	40.0	40.7	0.981
As found Low point	4980	20.0	20.0	20.0	0.993
New cylinder response					
Baseline Corr As found:	82.1	Prev response:	80.26	*% change:	2.2%
Baseline Corr 2nd AF pt:	40.8	AF Slope:	1.027032	AF Intercept:	-0.300091
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999973	* = > +/-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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.2	80.0	80.1	0.999
Mid point	4960	40.1	40.0	40.0	1.000
Low point	4980	20.0	20.0	19.8	1.008
As left zero	5000	0.0	0.0	0.1	----
As left span	4920	80.2	80.0	80.0	1.000
SO2 Scrubber Check	4921	79.2	792.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.003
Date of last converter efficiency test:					

Notes: Change sample inlet filters 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

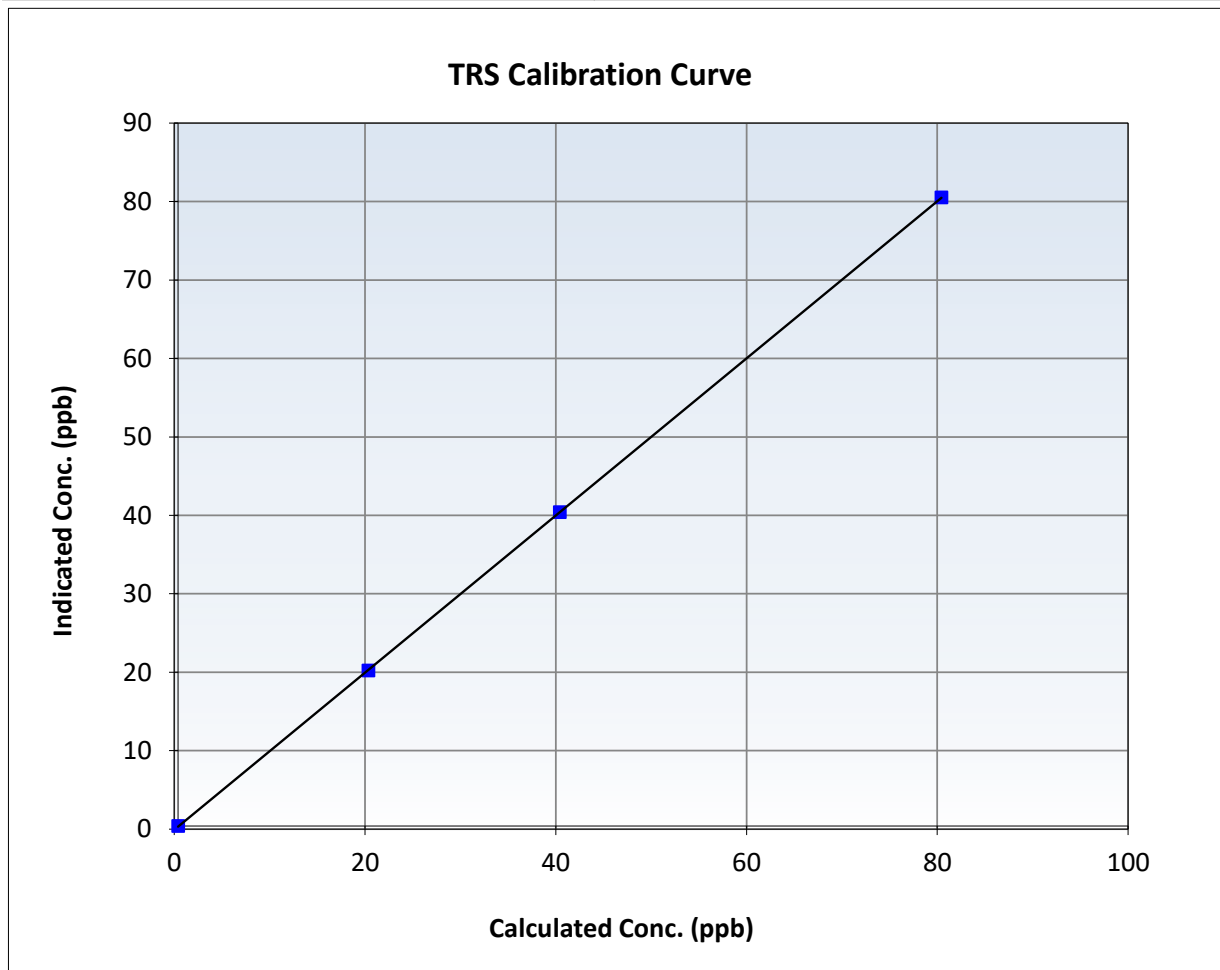
TRS Calibration Summary

Station Information

Calibration Date:	October 7, 2024	Previous Calibration:	September 9, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:34	End Time (MST):	13:52
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1410661331

Calibration Data

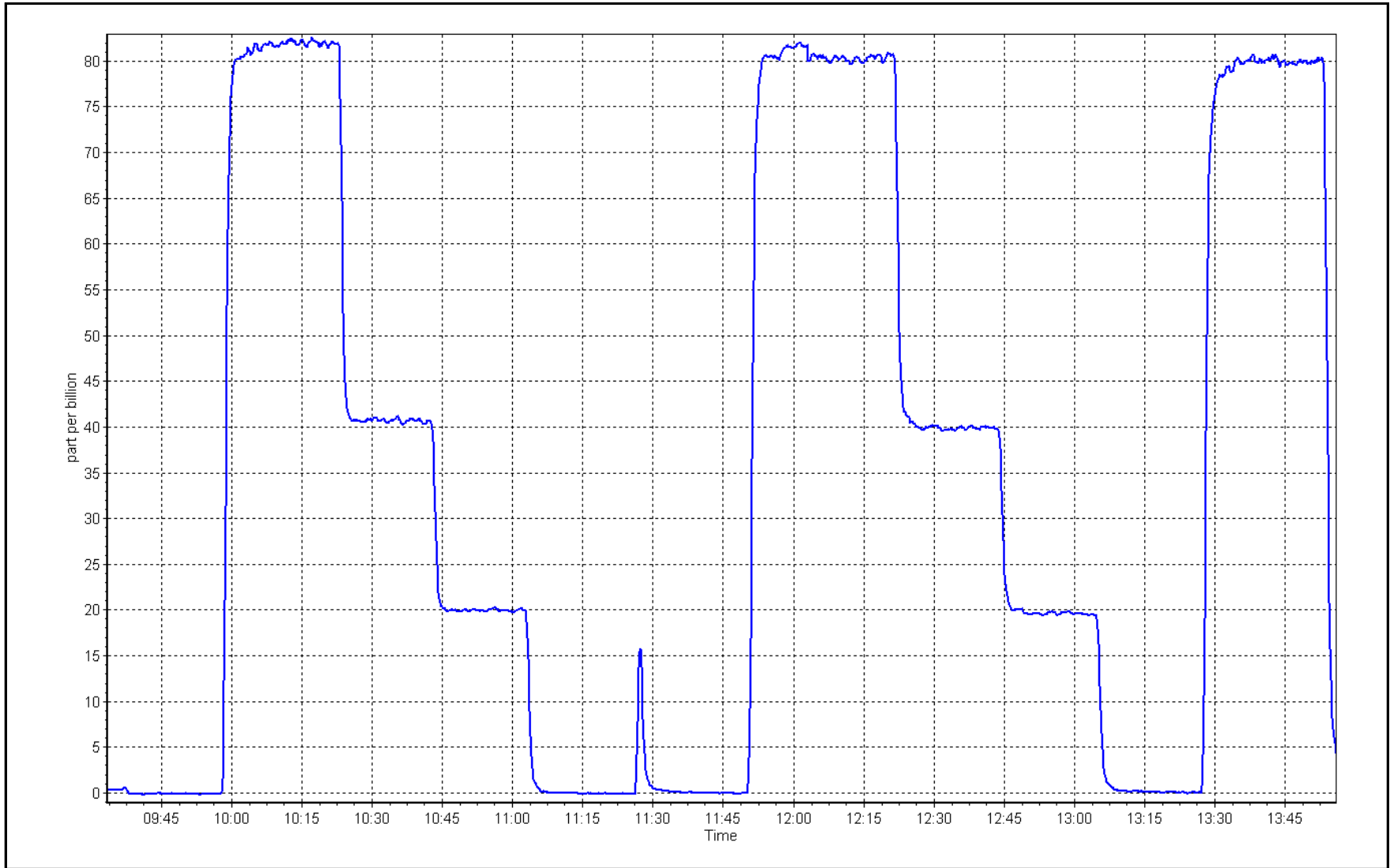
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0	----	Correlation Coefficient	0.999995	≥ 0.995
80.0	80.1	0.9992	Slope	1.001477	$0.90 - 1.10$
40.0	40.0	1.0005	Intercept	-0.080545	± 3
20.0	19.8	1.0081			



TRS Calibration Plot

Date: October 7, 2024

Location: Ells River





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	October 11, 2024	Last Cal Date:	September 3, 2024
Start time (MST):	9:07	End time (MST):	12:12
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC350110	Cal Gas Expiry Date:	March 10, 2031
CH ₄ Cal Gas Conc.	496.6 ppm	CH ₄ Equiv Conc.	1066.4 ppm
C ₃ H ₈ Cal Gas Conc.	207.2 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH ₄ Conc.	496.6 ppm	CH ₄ Equiv Conc.	1066.4 ppm
Removed C ₃ H ₈ 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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH ₄ SP Ratio:	3.12E-04	3.12E-04	5.94E-05	5.94E-05
CH ₄ Retention time:	17.6	17.6	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)) <i>Limit = 0.90-1.05</i>
As found zero	5000	0.0	0.00	0.00	---
As found High point	4918	82.0	17.49	17.58	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.58	Prev response	17.47	*% change	0.6%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	---
High point	4918	82.0	17.49	17.57	0.996
Mid point	4959	41.0	8.74	8.71	1.004
Low point	4980	20.5	4.37	4.32	1.012
As left zero	5000	0.0	0.00	0.00	---
As left span	4918	82.0	17.49	17.57	0.995
Average Correction Factor					1.004

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



Wood Buffalo Environmental Association

THC / CH₄ / 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))
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	9.34	9.45	0.989
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.45	Prev response	9.34	*% change	1.4%
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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	9.34	9.42	0.992
Mid point	4959	41.0	4.67	4.68	0.998
Low point	4980	20.5	2.34	2.33	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	9.34	9.43	0.991
Average Correction Factor					0.997

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))
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	8.14	*% 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)
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	8.14	8.14	1.000
Mid point	4959	41.0	4.07	4.03	1.010
Low point	4980	20.5	2.04	1.99	1.023
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	8.14	8.14	1.001
Average Correction Factor					1.011

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.002067	1.005243
THC Cal Offset:	-0.052625	-0.041425
CH ₄ Cal Slope:	1.002123	1.001183
CH ₄ Cal Offset:	-0.026119	-0.026519
NMHC Cal Slope:	1.001810	1.008793
NMHC Cal Offset:	-0.025907	-0.015706

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

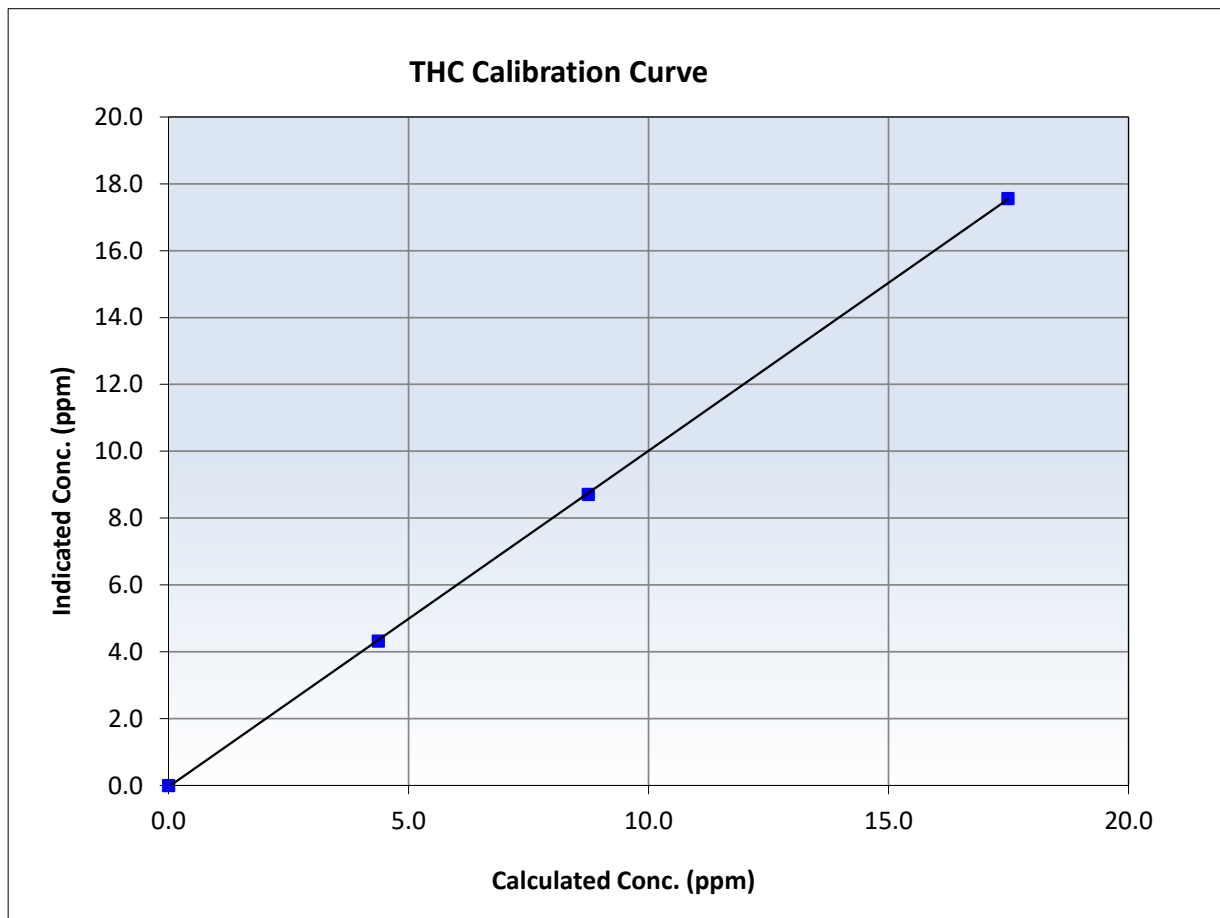
THC Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	September 3, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:07	End Time (MST):	12:12
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999972	<i>≥0.995</i>
17.49	17.57	0.9957	Slope	1.005243	<i>0.90 - 1.10</i>
8.74	8.71	1.0036	Intercept	-0.041425	<i>+/-0.5</i>
4.37	4.32	1.0115			





Wood Buffalo Environmental Association

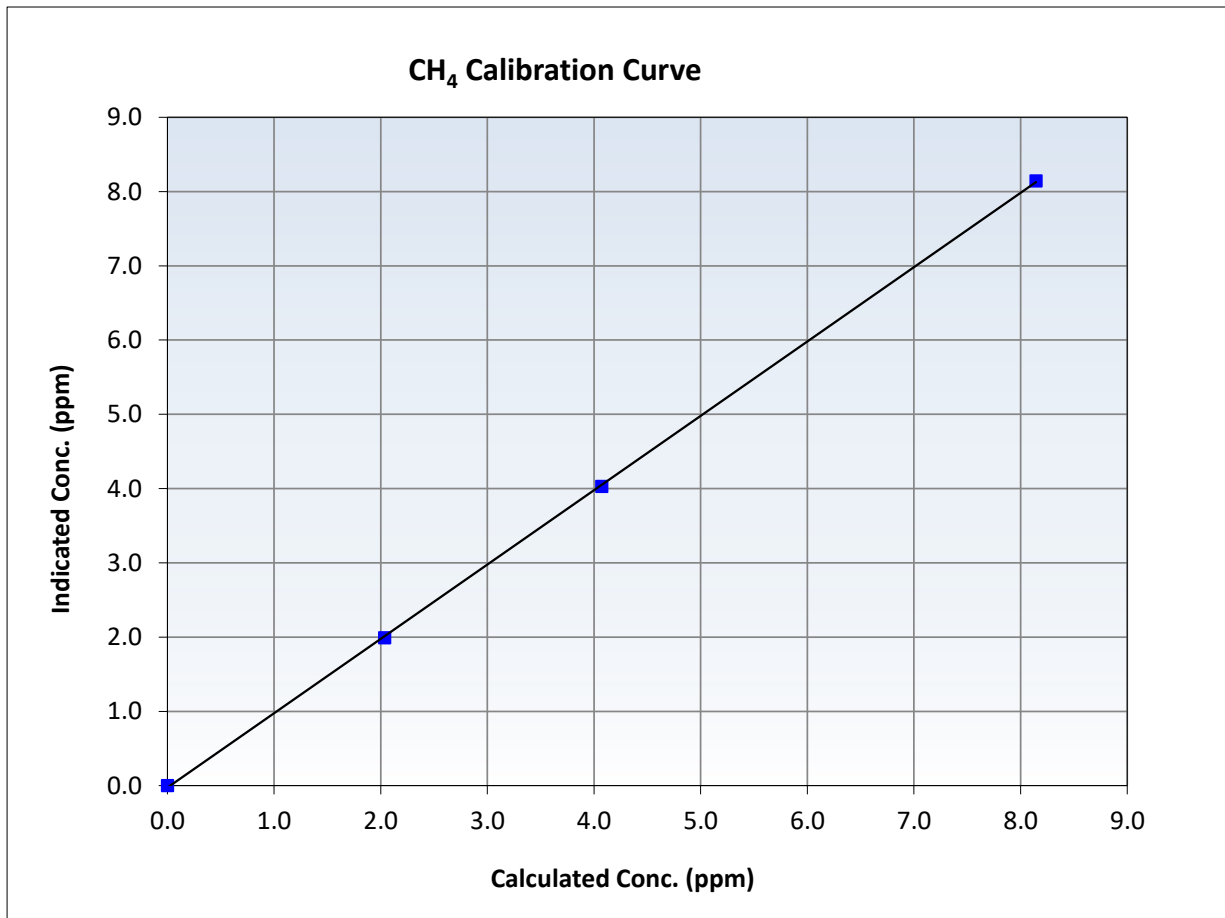
CH₄ Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	September 3, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:07	End Time (MST):	12:12
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999949	<i>≥0.995</i>
8.14	8.14	1.0002	Slope	1.001183	<i>0.90 - 1.10</i>
4.07	4.03	1.0105	Intercept	-0.026519	<i>+/-0.5</i>
2.04	1.99	1.0230			





Wood Buffalo Environmental Association

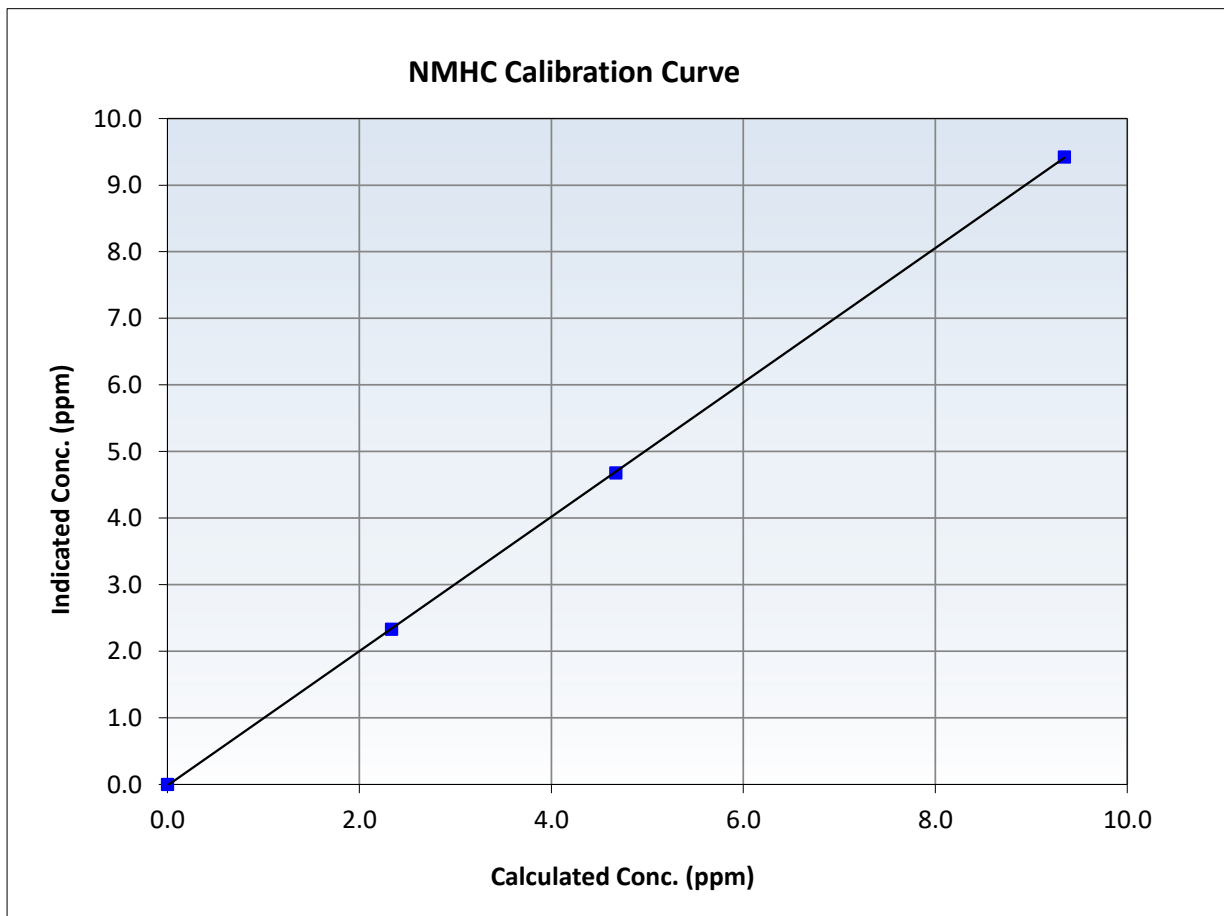
NMHC Calibration Summary

Station Information

Calibration Date:	October 11, 2024	Previous Calibration:	September 3, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:07	End Time (MST):	12:12
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

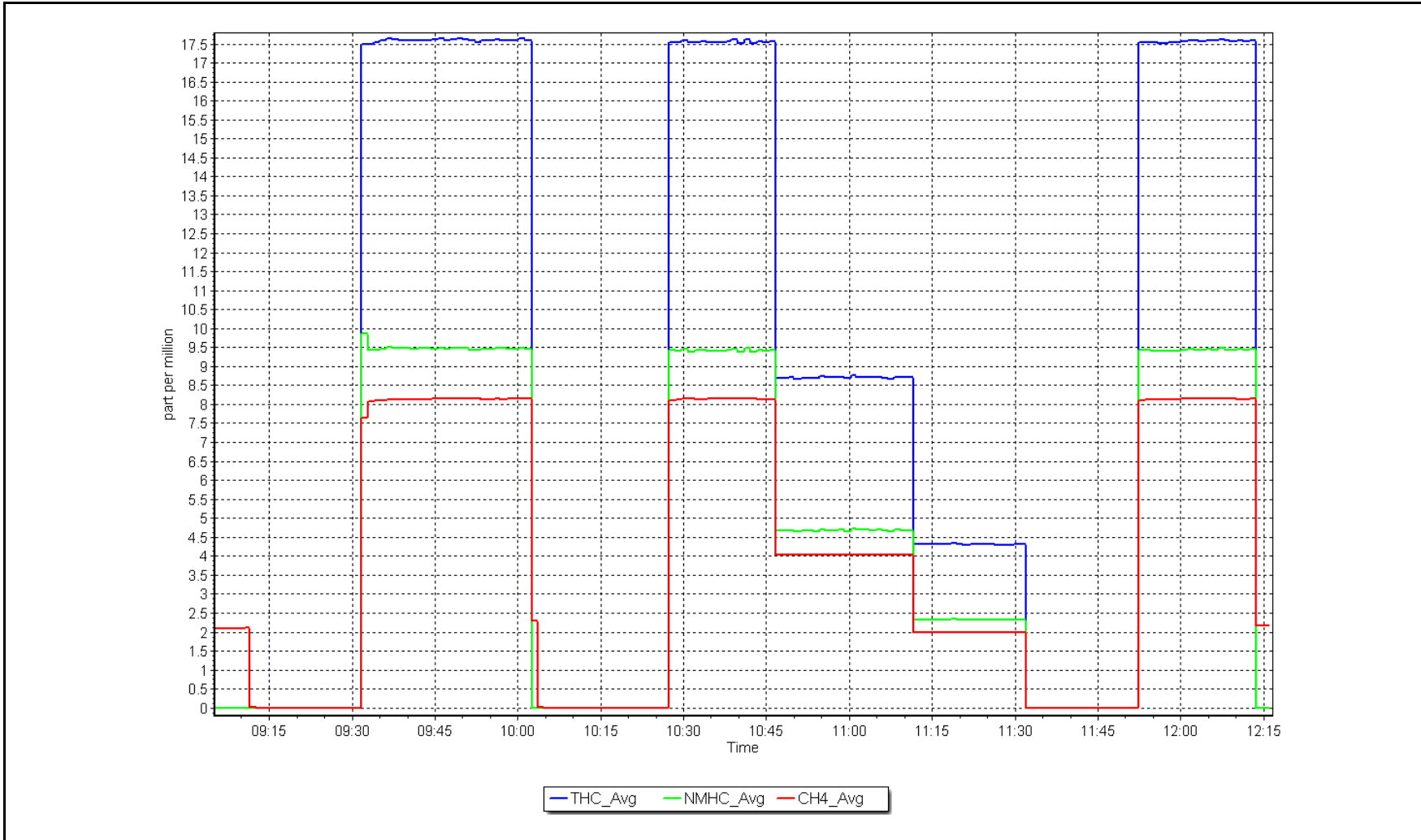
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.00	0.00	----	Correlation Coefficient	0.999985	<i>≥0.995</i>
9.34	9.42	0.9918	Slope	1.008793	<i>0.90 - 1.10</i>
4.67	4.68	0.9982	Intercept	-0.015706	<i>+/-0.5</i>
2.34	2.33	1.0021			



NMHC Calibration Plot

Date: October 11, 2024

Location: Ells River





Wood Buffalo Environmental Association

THC / CH₄ / NMHC Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	October 25, 2024	Last Cal Date:	October 11, 2024
Start time (MST):	10:03	End time (MST):	11:45
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/CH ₄ Range: 0 - 10 ppm

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	3.12E-04	3.12E-04	NMHC SP Ratio:	5.94E-05
CH4 Retention time:	17.6	17.6	NMHC Peak Area:	157107
Zero Chromatogram:	ON	ON	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	17.49	17.66	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.66	Prev response	17.57	*% change	0.6%
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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	17.49	17.62	0.993
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.993

Notes: H2 cylinder replaced after as founds. No adjustment made.



Wood Buffalo Environmental Association

THC / CH₄ / 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	9.34	9.46	0.988
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.46	Prev response	9.42	*% change	0.5%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	9.34	9.42	0.992
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.992

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	8.14	8.20	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.20	Prev response	8.14	*% change	0.7%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	8.14	8.20	0.993
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor 0.993

Calibration Statistics

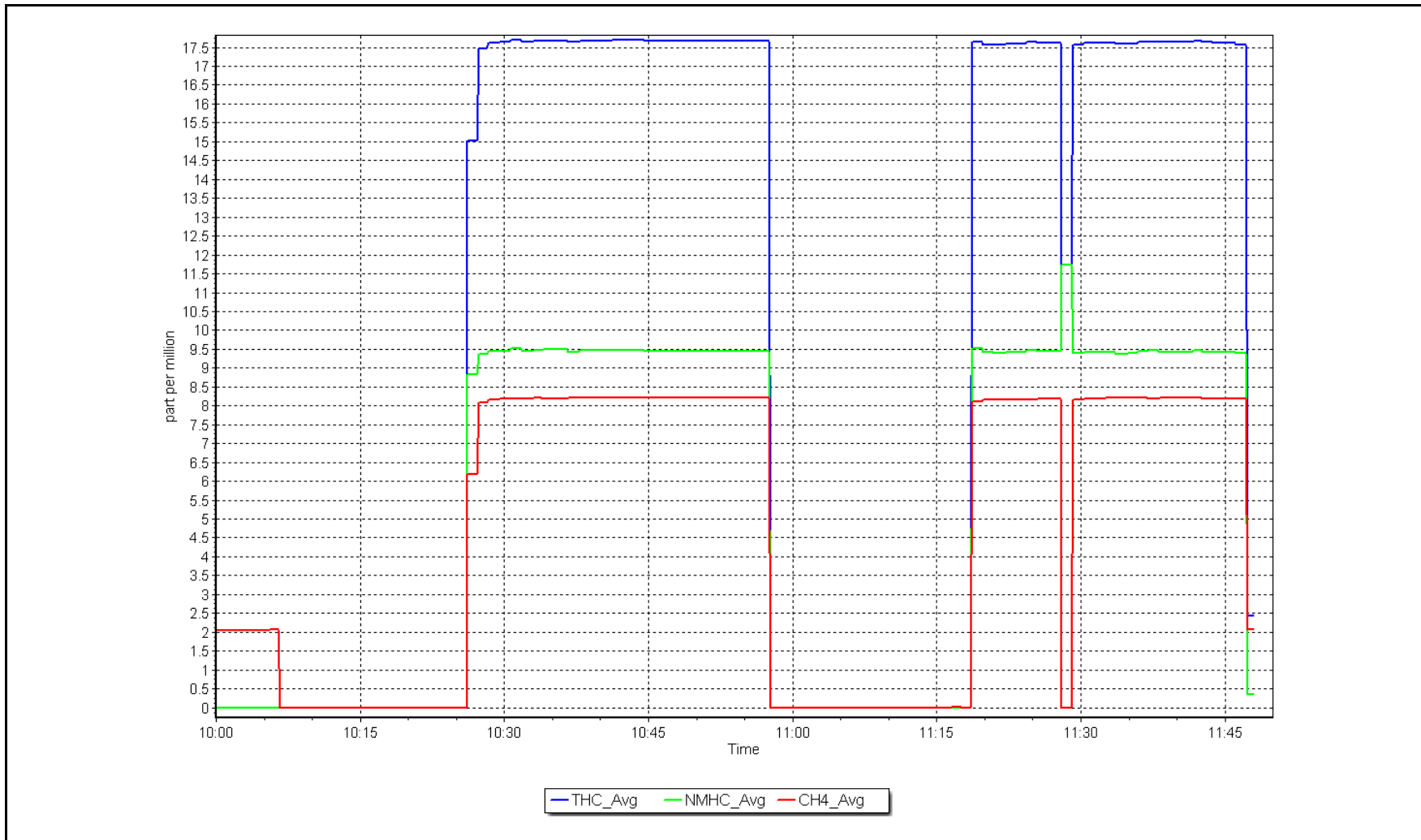
	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.004348	1.007493
THC Cal Offset:	0.000000	0.000000
CH ₄ Cal Slope:	0.999848	1.006847
CH ₄ Cal Offset:	0.000000	0.000000
NMHC Cal Slope:	1.008270	1.008270
NMHC Cal Offset:	0.000000	0.000000

Calibration Performed By: Jan Castro

NMHC Calibration Plot

Date: October 25, 2024

Location: Ells River





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Ells River
 Station number: AMS 30
 Calibration Date: October 15, 2024
 Last Cal Date: September 20, 2024
 Start time (MST): 9:38
 End time (MST): 14:18
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: DT0027487
 NOX Cal Gas Conc: 59.30 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 59.30 ppm
 NOX gas Diff:
 Calibrator Model: API T700
 ZAG make/model: API T701H
 Cal Gas Expiry Date: January 9, 2032
 NO Cal Gas Conc: 59.10 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 59.10 ppm
 NO gas Diff:
 Serial Number: 3061
 Serial Number: 358

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.1	-0.3	----	----
AF High point	4932	67.7	803.0	800.3	2.7	797.5	792.8	4.7	1.0062	1.0093
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 803.8 ppb		NO = 800.9 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = -0.7%	
Baseline Corr 1st pt	NO _x = 798.0 ppb		NO = 792.9 ppb			<u>As Found Statistics</u>		*Percent Change	NO = -1.0%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 710321429

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.002805	1.000756
NO _x Cal Offset:	-1.457944	-1.638352
NO Cal Slope:	1.003673	1.002773
NO Cal Offset:	-2.299233	-2.259187
NO ₂ Cal Slope:	1.000116	0.998303
NO ₂ Cal Offset:	0.247288	-0.976467

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.115	1.130	NO bkgnd or offset:	13.3	13.4
NOX coeff or slope:	0.994	0.992	NOX bkgnd or offset:	13.6	13.7
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	192.1	194.2

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	----	----
High point	4932	67.7	803.0	800.3	2.7	802.4	801.1	1.2	1.0007	0.9990
Mid point	4966	33.8	400.9	399.5	1.4	399.5	398.0	1.5	1.0035	1.0038
Low point	4983	16.9	200.4	199.8	0.7	197.2	195.3	1.9	1.0164	1.0228
As left zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	----	----
As left span	4932	67.7	803.0	432.7	370.3	805.4	432.7	372.7	0.9970	1.0000
Average Correction Factor									1.0069	1.0086

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	800.0	427.8	374.9	373.6	1.0035	99.7%
Mid GPT point	800.0	615.1	187.6	186.1	1.0081	99.2%
Low GPT point	800.0	706.1	96.6	94.7	1.0201	98.0%
Average Correction Factor					1.0106	99.0%

Notes: Sample inlet filters changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro



Wood Buffalo Environmental Association

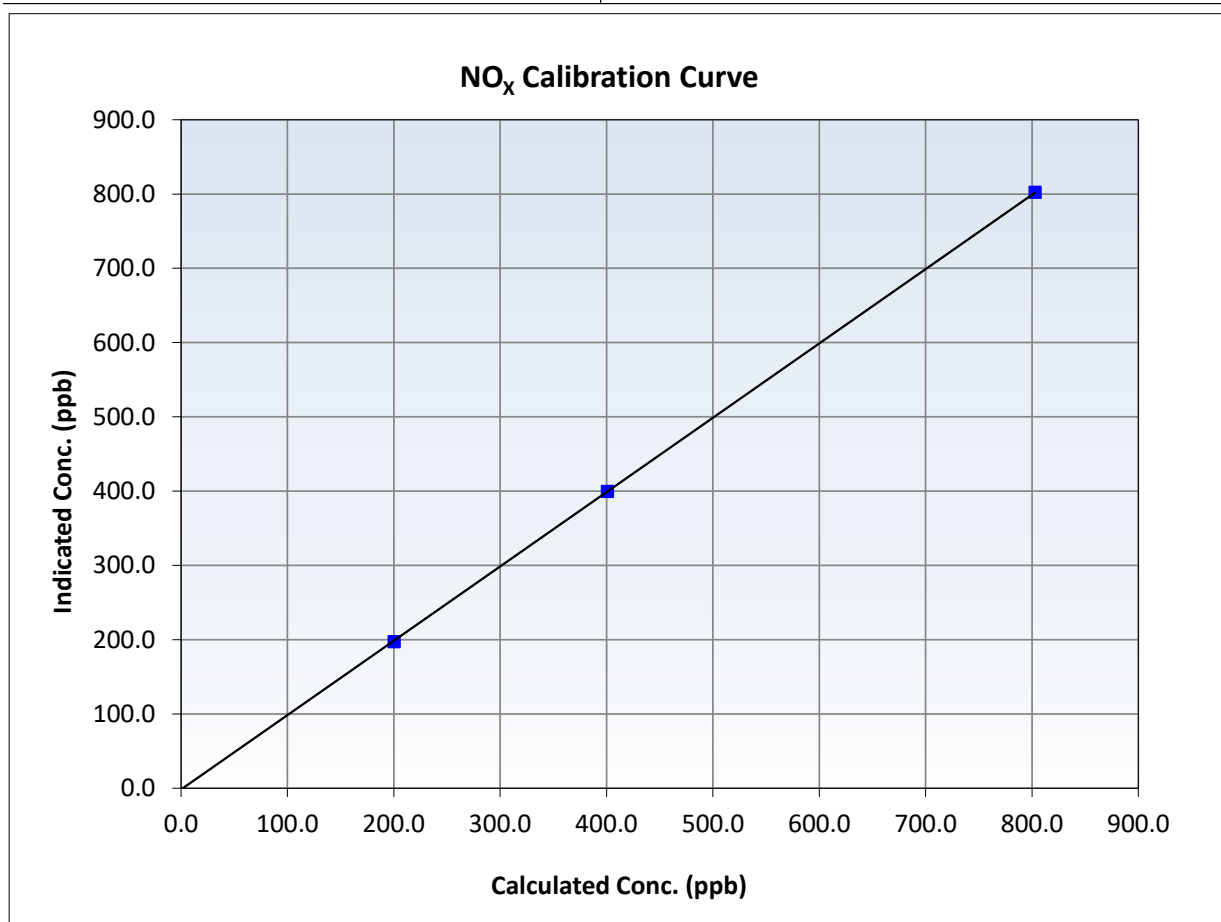
NO_x Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 20, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:38	End Time (MST):	14:18
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999986	≥0.995
803.0	802.4	1.0007	Slope	1.000756	0.90 - 1.10
400.9	399.5	1.0035	Intercept	-1.638352	+/-20
200.4	197.2	1.0164			





Wood Buffalo Environmental Association

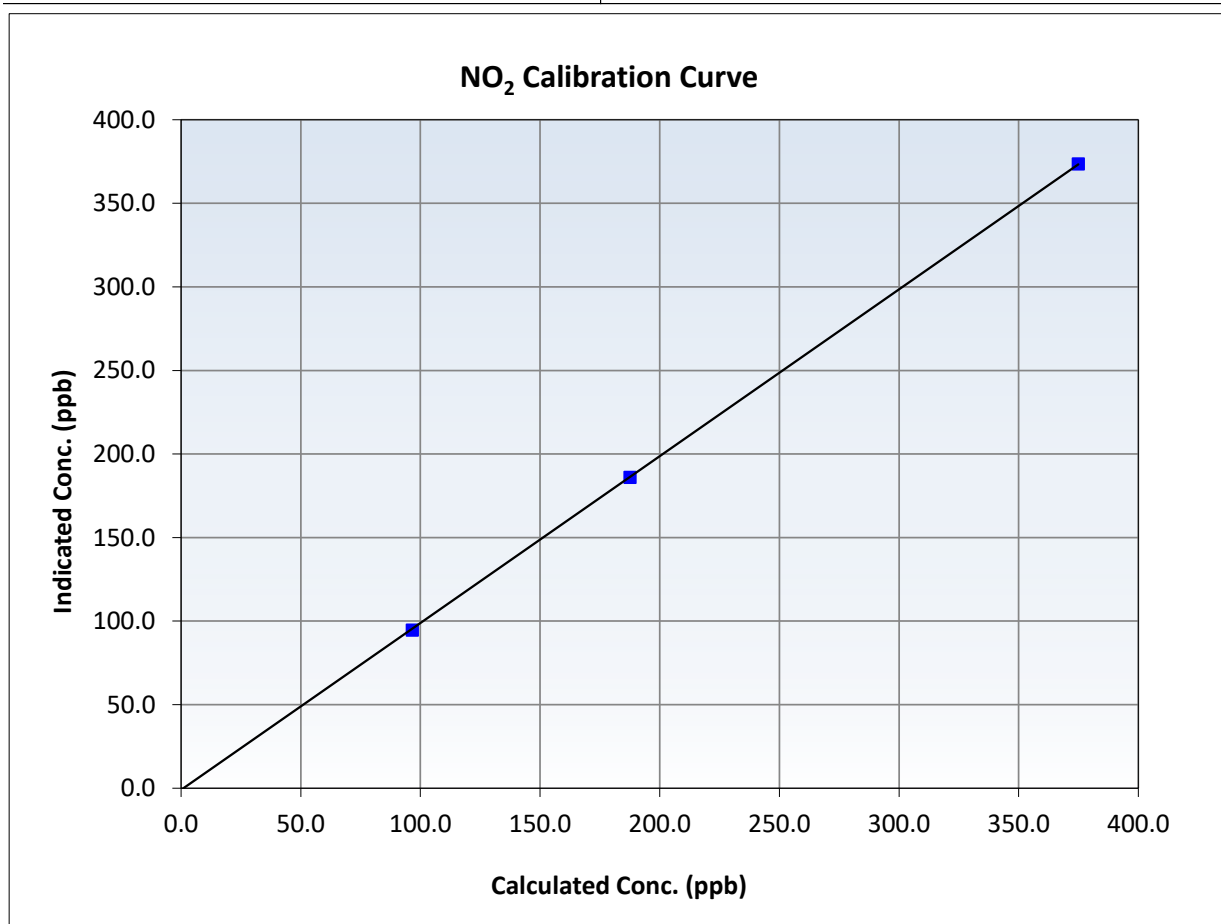
NO₂ Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 20, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:38	End Time (MST):	14:18
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999984	≥0.995
374.9	373.6	1.0035	Slope	0.998303	0.90 - 1.10
187.6	186.1	1.0081	Intercept	-0.976467	+/-20
96.6	94.7	1.0201			





Wood Buffalo Environmental Association

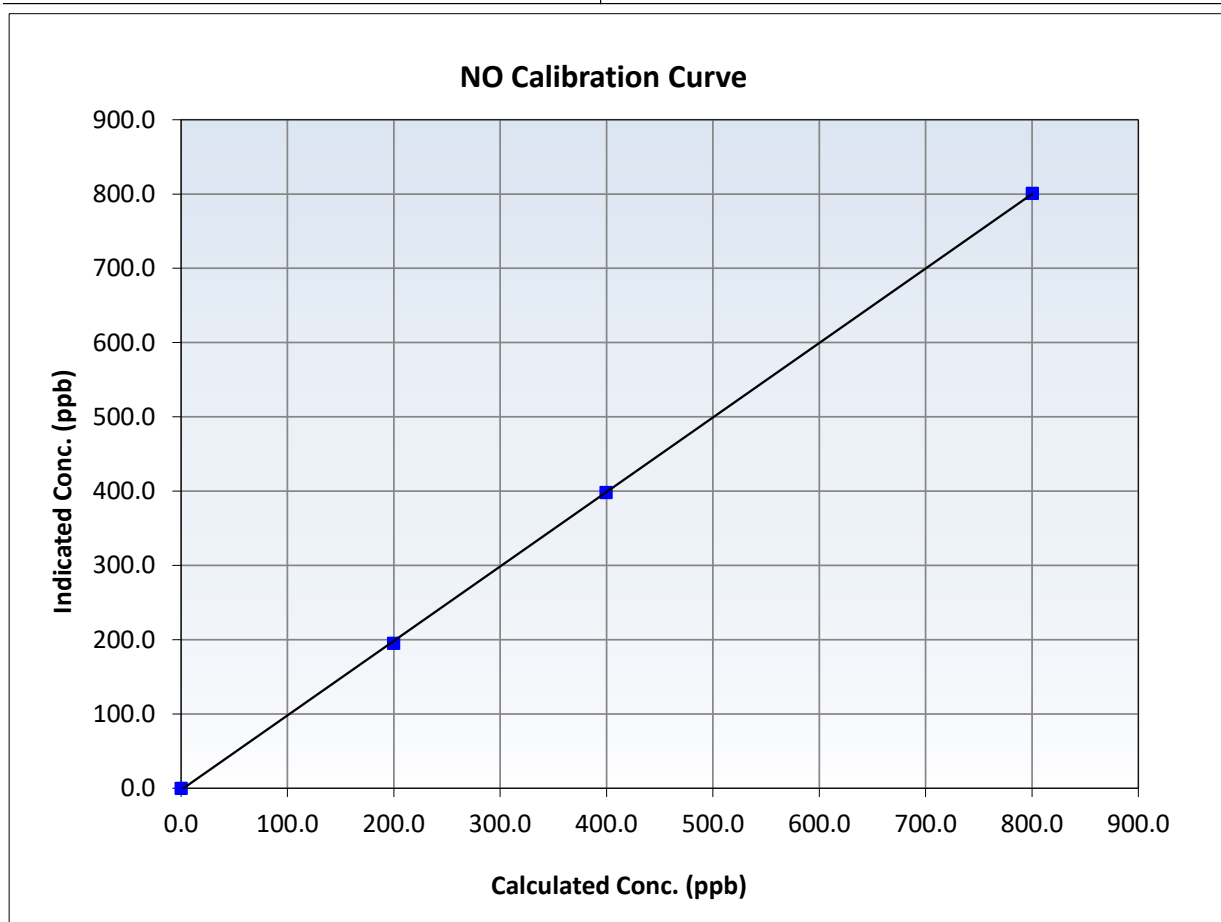
NO Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 20, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:38	End Time (MST):	14:18
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

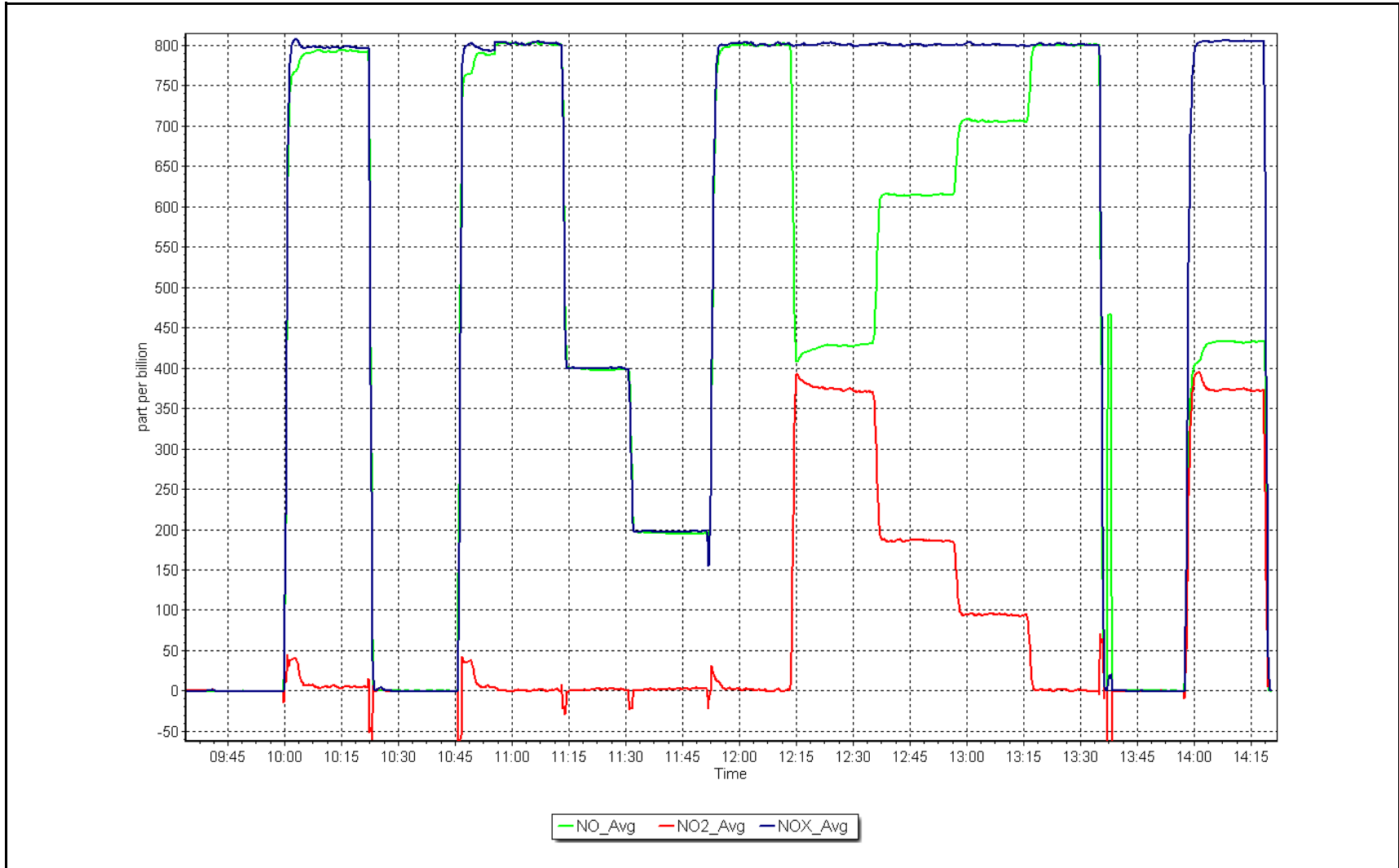
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999961	<i>≥0.995</i>
800.3	801.1	0.9990	Slope	1.002773	<i>0.90 - 1.10</i>
399.5	398.0	1.0038	Intercept	-2.259187	<i>+/-20</i>
199.8	195.3	1.0228			



NO_x Calibration Plot

Date: October 15, 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: October 11, 2024 Last Cal Date: September 20, 2024
 Start time (MST): 10:26 End time (MST): 11:34

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 (°C)	4.90	4.36	4.90	<input type="checkbox"/>	+/- 2 °C
P (mmHg)	734.60	736.42	734.60	<input type="checkbox"/>	+/- 10 mmHg
Flow (LPM)	5.00	5.04	5.00	<input type="checkbox"/>	+/- 0.25 LPM
PW% (pump)	65	-----	35	<input checked="" type="checkbox"/>	>80%
Zero Verification	PM w/o HEPA: _____	2.20	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	10.20	11.20	11.20	<input type="checkbox"/>	+/- 0.5

Date Optical Chamber Cleaned: October 11, 2024
 Date Disposable Filter Changed: October 11, 2024

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

Annual Maintenance

Date Sample Tube Cleaned: October 27, 2023
 Date RH/T Sensor Cleaned: February 23, 2024

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

Calibration by: Jan Castro



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS506
JACKFISH 1
OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Jackfish 1	Station number:	AMS 506
Calibration Date:	October 16, 2024	Last Cal Date:	September 19, 2024
Start time (MST):	10:00	End time (MST):	12:56
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002986	0.996102	Backgd or Offset:	20.0	20.1
Calibration intercept:	-0.576059	0.084032	Coeff or Slope:	0.970	0.979

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.5	----
As found High point	4921	79.2	800.2	793.3	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	793.8	Previous response	802.0	*% 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	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4921	79.2	800.2	796.9	1.004
Mid point	4960	39.6	400.2	399.2	1.002
Low point	4980	19.8	200.1	199.4	1.003
As left zero	5000	0.0	0.0	-0.3	----
As left span	4921	79.2	800.2	799.7	1.001
Average Correction Factor:					1.003

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

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

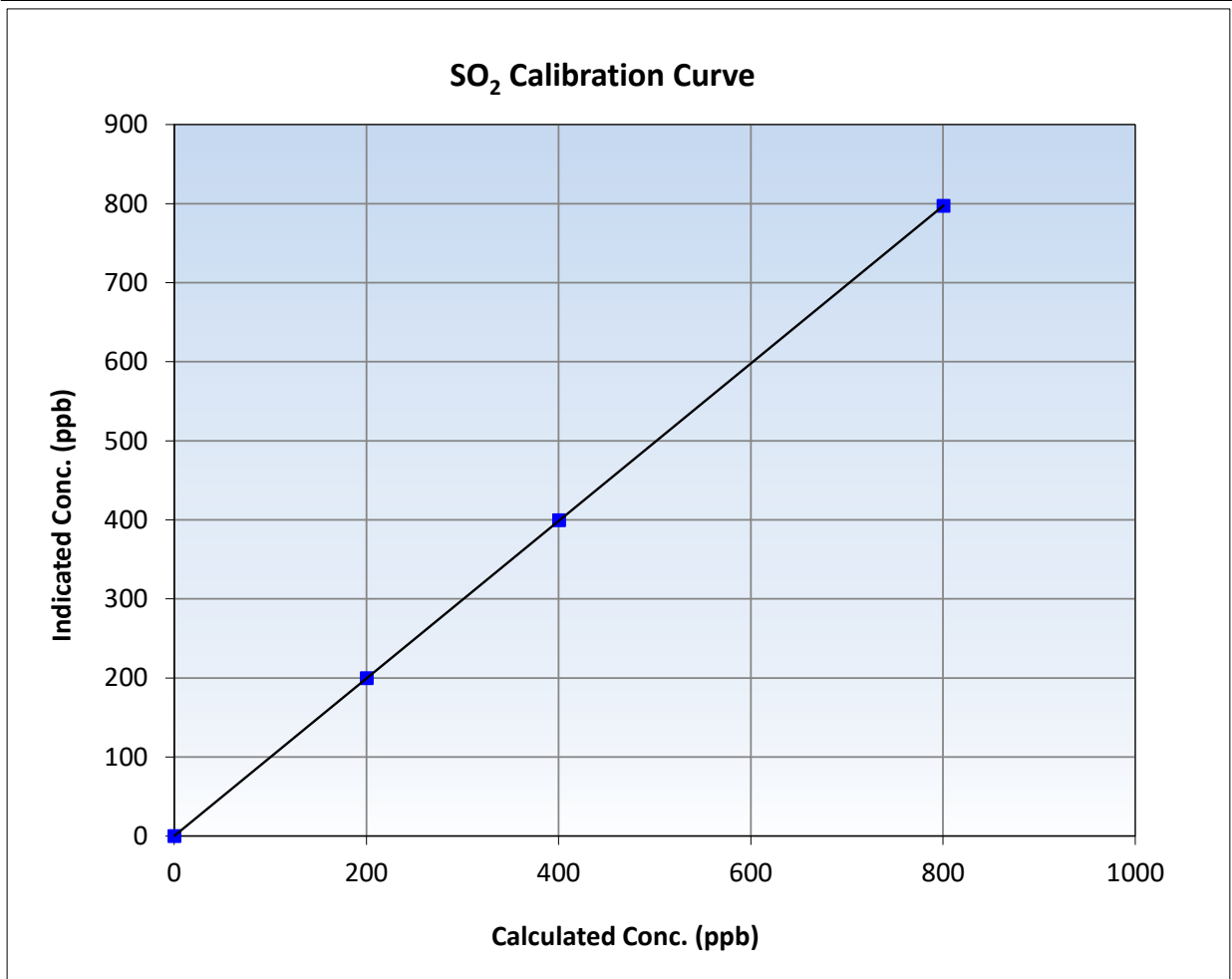
SO₂ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 19, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	10:00	End Time (MST):	12:56
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290011

Calibration Data

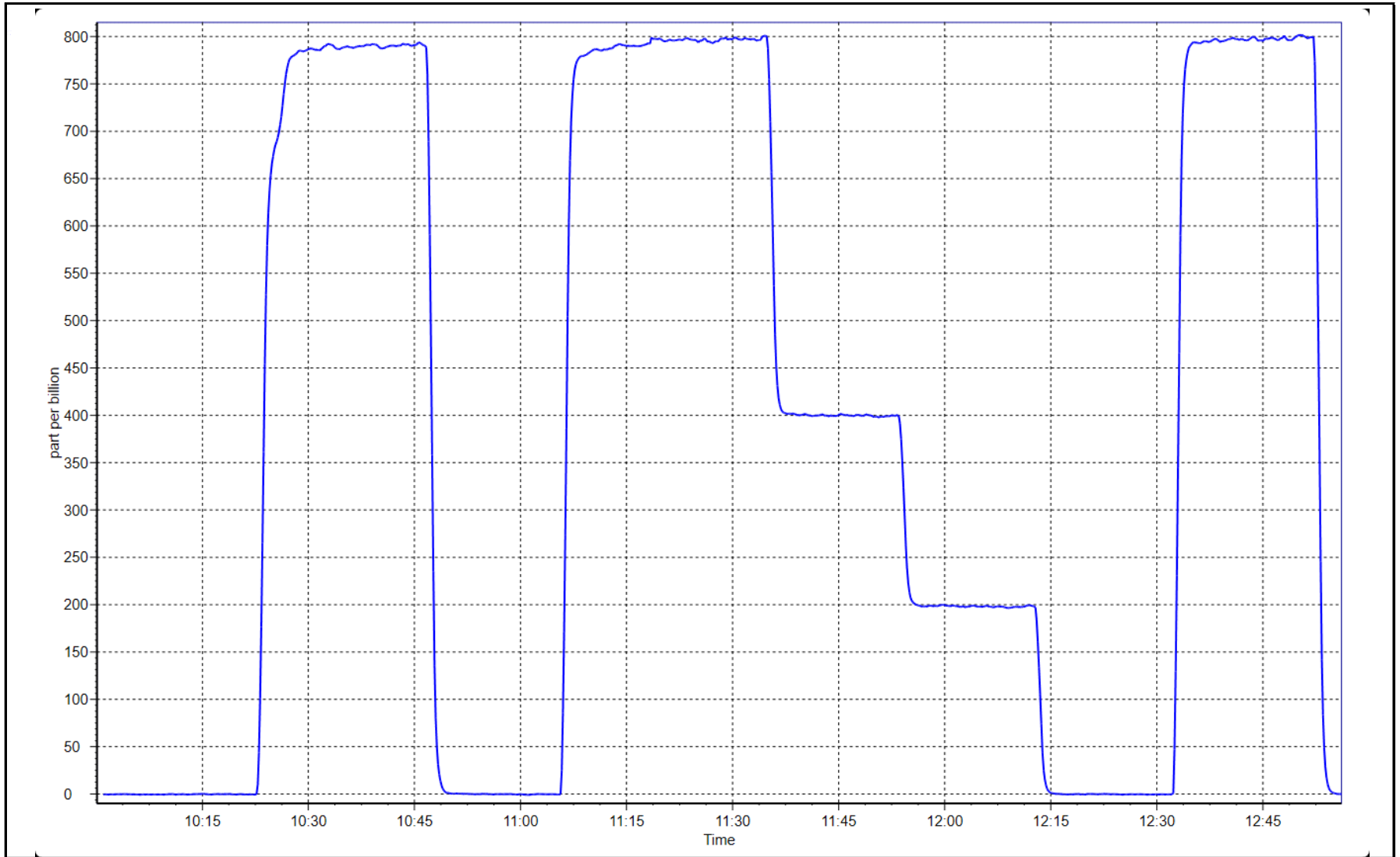
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	0.999999	≥0.995
800.2	796.9	1.0041	Slope	0.996102	0.90 - 1.10
400.2	399.2	1.0024	Intercept	0.084032	+/-30
200.1	199.4	1.0033			



SO2 Calibration Plot

Date: October 16, 2024

Location: Jackfish 1





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Jackfish 1	Station number:	AMS 506
Calibration Date:	October 24, 2024	Last Cal Date:	September 18, 2024
Start time (MST):	9:29	End time (MST):	13:43
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.14 ppm	Cal Gas Exp Date:	September 16, 2024
Cal Gas Cylinder #:	CC511843		
Removed Cal Gas Conc:	5.14 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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.992715	0.999714	Backgd or Offset:	3.48	3.56
Calibration intercept:	-0.198477	-0.118284	Coeff or Slope:	1.103	1.135

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4922	77.8	80.0	77.0	1.035
As found Mid point	4961	38.9	40.0	38.9	1.020
As found Low point	4981	19.4	19.9	19.0	1.033
New cylinder response					
Baseline Corr As found:	77.3	Prev response:	79.20	*% change:	-2.5%
Baseline Corr 2nd AF pt:	39.2	AF Slope:	0.967145	AF Intercept:	-0.179089
Baseline Corr 3rd AF pt:	19.3	AF Correlation:	0.999933	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
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	39.9	1.002
Low point	4981	19.4	19.9	19.9	1.002
As left zero	5000	0.0	0.0	-0.2	----
As left span	4922	77.8	80.0	79.8	1.002
SO2 Scrubber Check	4921	79.2	800.2	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.002
Date of last converter efficiency test:					

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

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

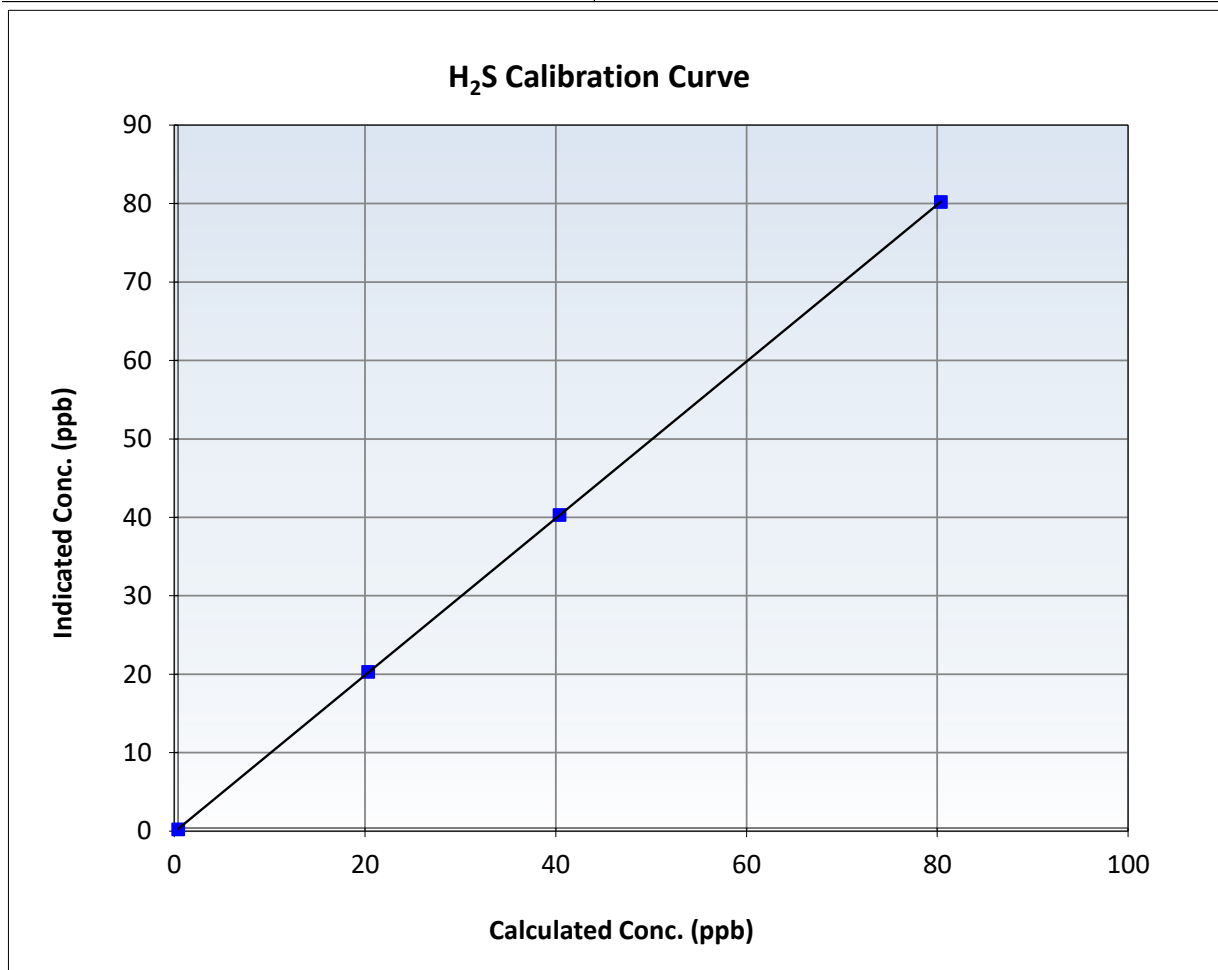
H2S Calibration Summary

Station Information

Calibration Date:	October 24, 2024	Previous Calibration:	September 18, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:29	End Time (MST):	13:43
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1180540020

Calibration Data

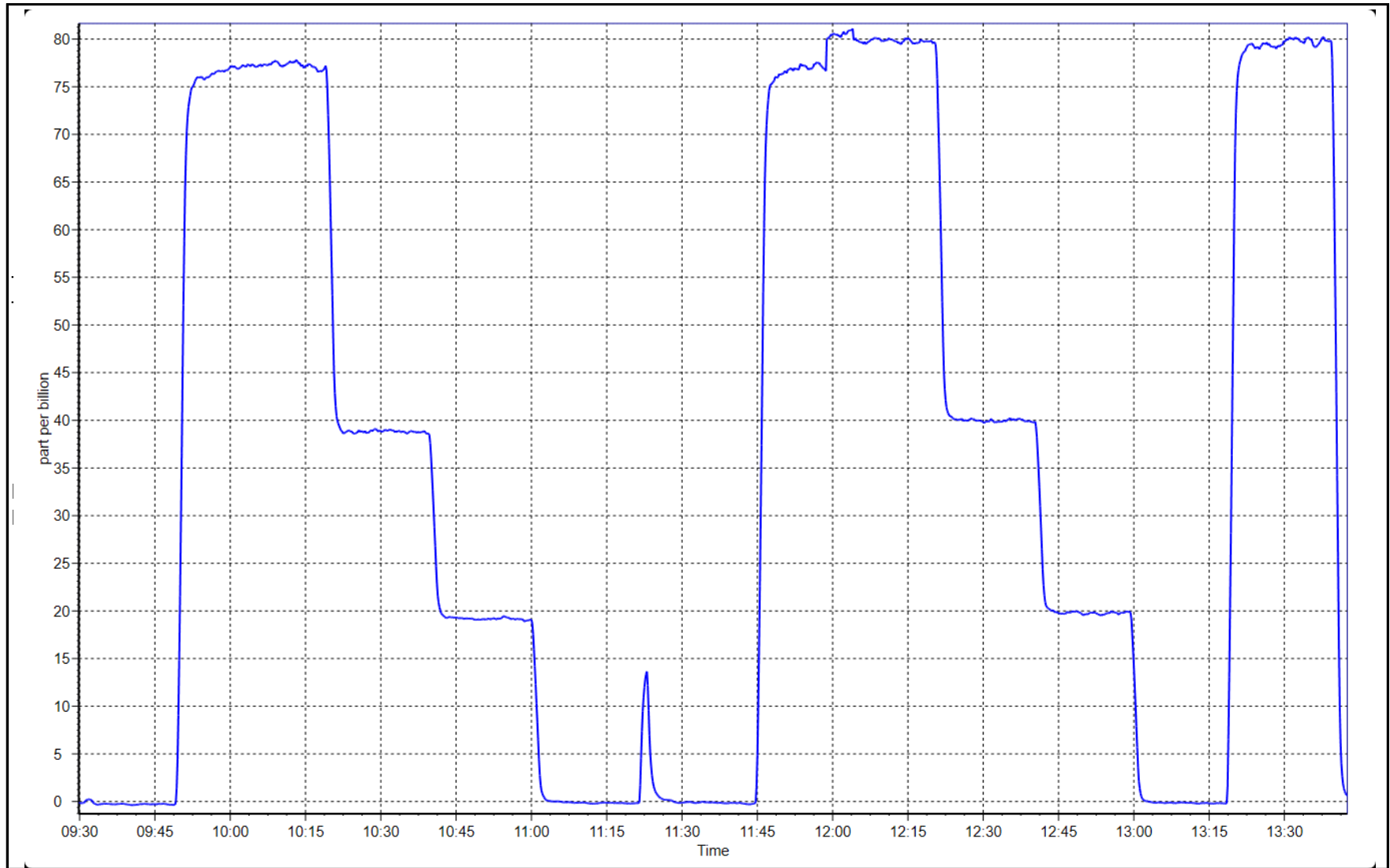
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	0.999995	≥ 0.995
80.0	79.8	1.0023	Slope	0.999714	$0.90 - 1.10$
40.0	39.9	1.0023	Intercept	-0.118284	± 3
19.9	19.9	1.0021			



H2S Calibration Plot

Date: October 24, 2024

Location: Jackfish 1



0



Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Jackfish 1
 Station number: AMS 506
 Calibration Date: October 22, 2024
 Last Cal Date: September 25, 2024
 Start time (MST): 9:16
 End time (MST): 13:50
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: T26811M
 NOX Cal Gas Conc: 47.46 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 47.46 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T750
 ZAG make/model: Teledyne API T751H
 Cal Gas Expiry Date: October 30, 2024
 NO Cal Gas Conc: 47.39 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 47.39 ppm
 NO gas Diff:
 Serial Number: 282
 Serial Number: 321

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	0.1	-0.4	----	----
AF High point	4916	84.4	801.1	799.9	1.2	868.0	866.0	2.2	0.9226	0.9238
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 800.1 ppb		NO = 797.7 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 7.9%	
Baseline Corr 1st pt	NO _x = 868.3 ppb		NO = 865.9 ppb			<u>As Found Statistics</u>		*Percent Change	NO = 7.9%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1218153356

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	0.999207	1.002459
NO _x Cal Offset:	-0.368015	-4.007952
NO Cal Slope:	0.998897	1.002654
NO Cal Offset:	-1.267980	-4.607922
NO ₂ Cal Slope:	1.003530	1.002943
NO ₂ Cal Offset:	0.120234	0.915349

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.726	1.726	NO bkgnd or offset:	5.3	5.3
NOX coeff or slope:	0.989	0.989	NOX bkgnd or offset:	6.2	6.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	167.4	167.4

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.2	0.1	-0.3	----	----
High point	4916	84.4	801.1	799.9	1.2	801.0	799.9	0.9	1.0001	1.0000
Mid point	4958	42.2	400.5	400.0	0.6	395.4	393.6	1.8	1.0130	1.0161
Low point	4979	21.1	200.3	200.0	0.3	193.1	191.5	1.6	1.0372	1.0443
As left zero	5000	0.0	0.0	0.0	0.0	0.2	0.0	0.1	----	----
As left span	4916	84.4	801.1	408.2	392.9	809.0	408.2	400.3	0.9902	1.0000
Average Correction Factor									1.0168	1.0201

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	796.2	403.4	394.0	395.5	0.9962	100.4%
Mid GPT point	796.2	608.4	189.0	191.0	0.9894	101.1%
Low GPT point	796.2	702.8	94.6	97.0	0.9751	102.6%
Average Correction Factor					0.9869	101.3%

Notes: NOx and NO percent change are over the limits, upon investigation diagnostics were fine. The possible cause was the maintenance done last month (capillaries and O-rings changed). Adjusted zero and span.

Calibration Performed By: Sean Bala



Wood Buffalo Environmental Association

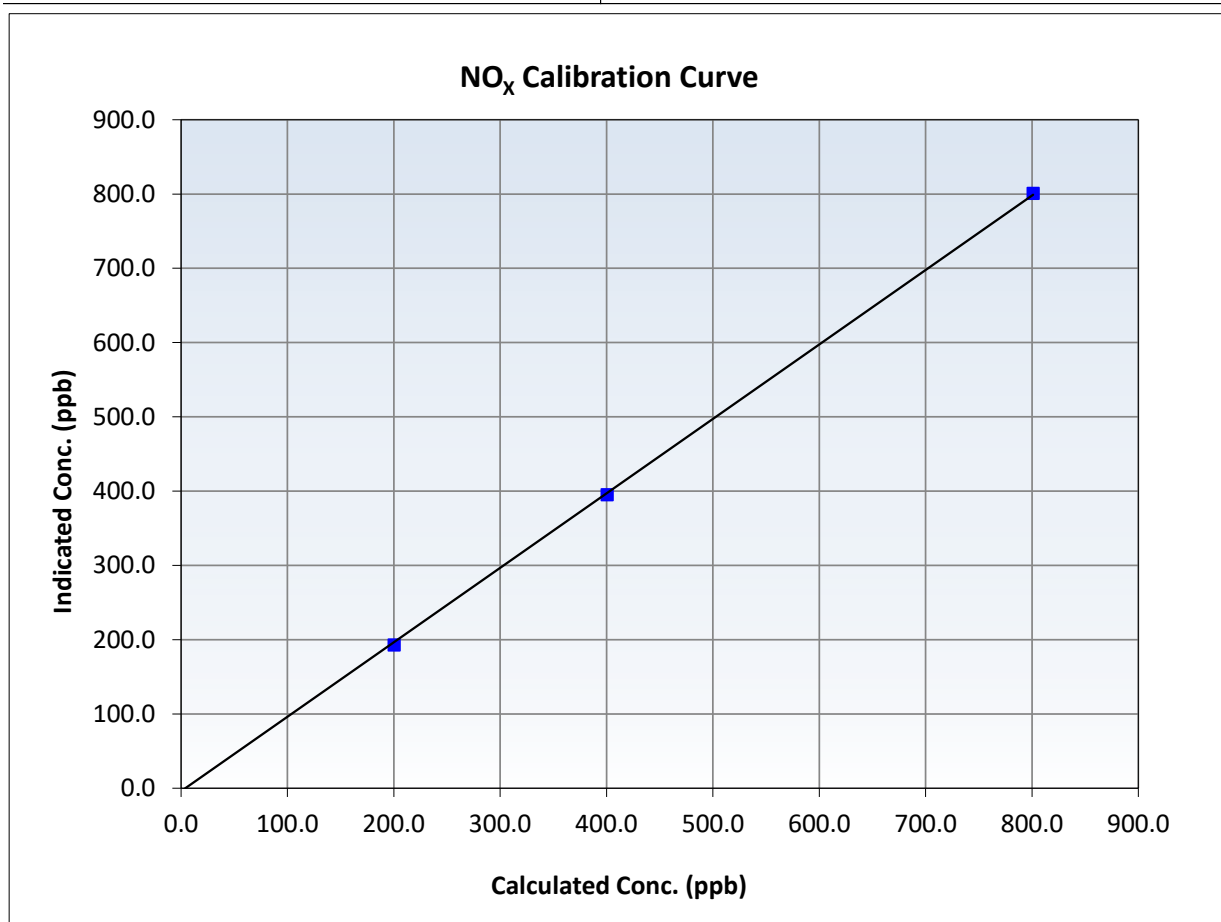
NO_x Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 25, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:16	End Time (MST):	13:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.2	----	Correlation Coefficient	0.999897	≥0.995
801.1	801.0	1.0001	Slope	1.002459	0.90 - 1.10
400.5	395.4	1.0130	Intercept	-4.007952	+/-20
200.3	193.1	1.0372			





Wood Buffalo Environmental Association

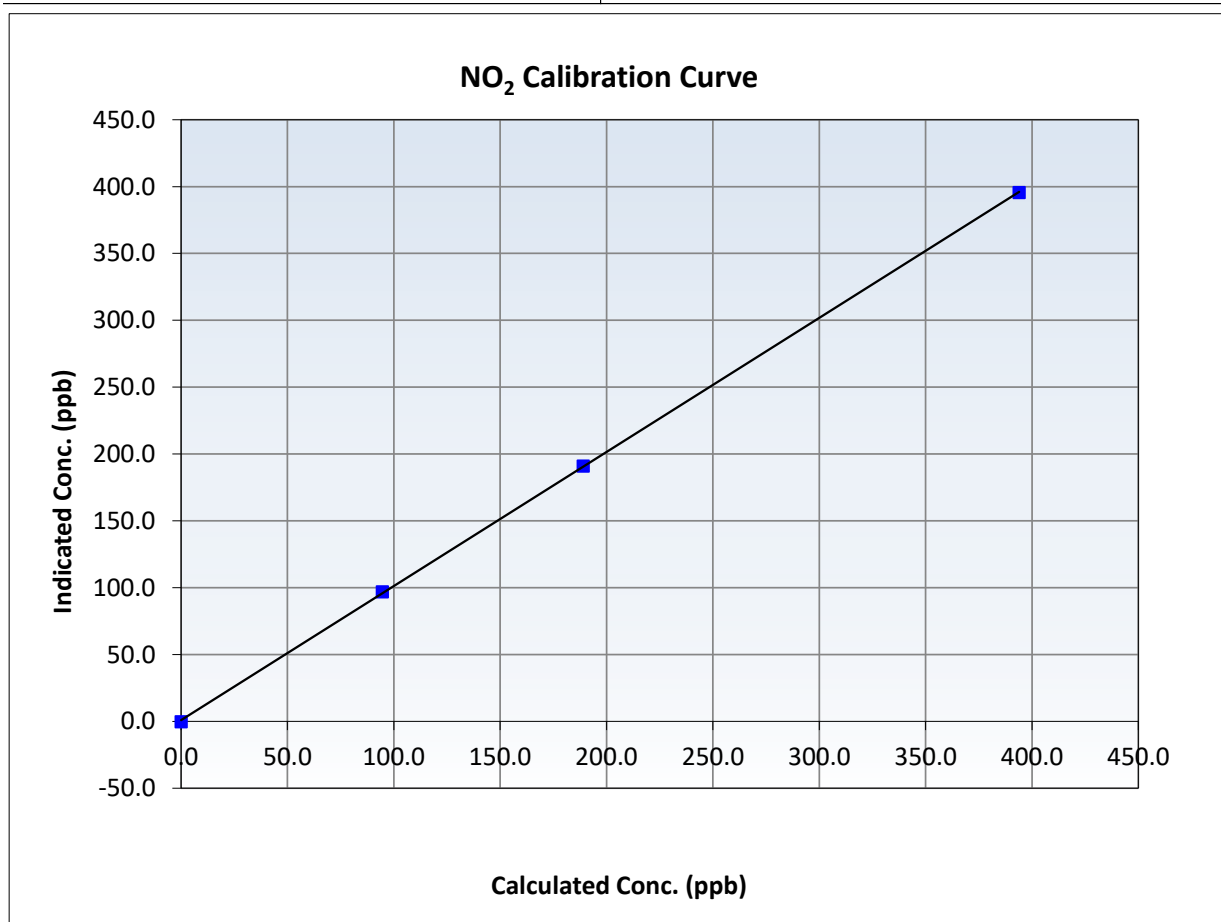
NO₂ Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 25, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:16	End Time (MST):	13:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.3	----	Correlation Coefficient	0.999958	<i>≥0.995</i>
394.0	395.5	0.9962	Slope	1.002943	<i>0.90 - 1.10</i>
189.0	191.0	0.9894	Intercept	0.915349	<i>+/-20</i>
94.6	97.0	0.9751			





Wood Buffalo Environmental Association

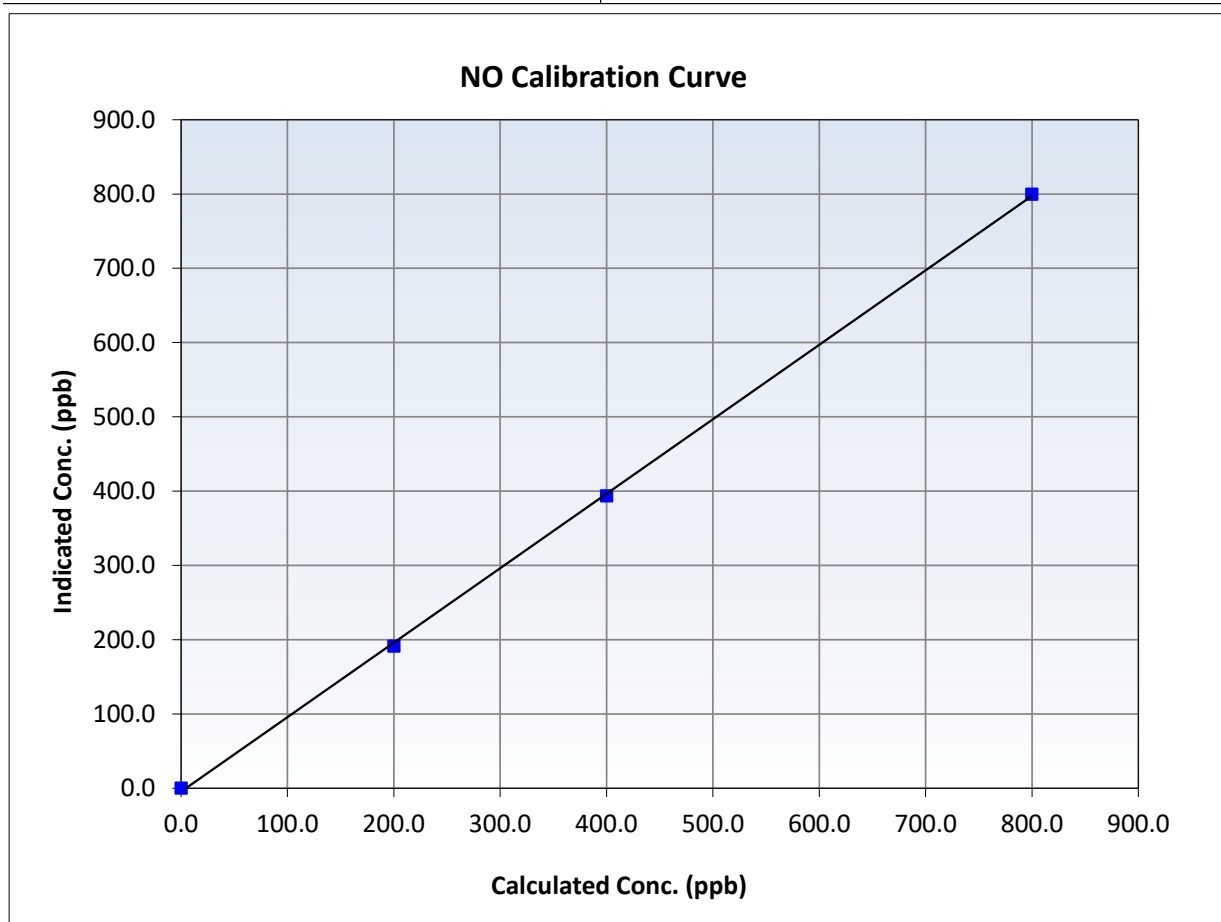
NO Calibration Summary

Station Information

Calibration Date:	October 22, 2024	Previous Calibration:	September 25, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:16	End Time (MST):	13:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356

Calibration Data

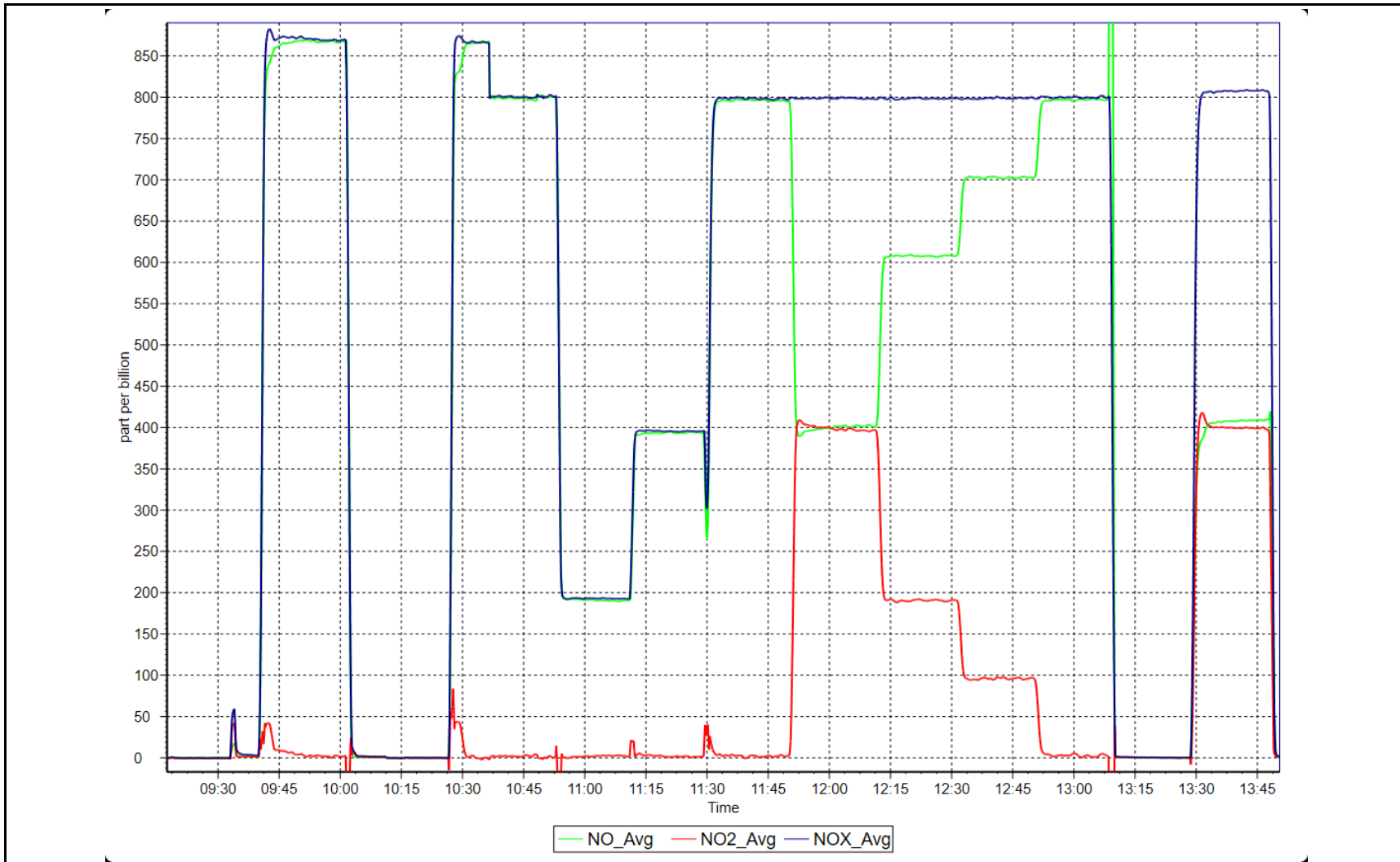
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.1	----	Correlation Coefficient	0.999842	<i>≥0.995</i>
799.9	799.9	1.0000	Slope	1.002654	<i>0.90 - 1.10</i>
400.0	393.6	1.0161	Intercept	-4.607922	<i>+/-20</i>
200.0	191.5	1.0443			



NO_x Calibration Plot

Date: October 22, 2024

Location: Jackfish 1





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS508
KIRBY NORTH
OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	October 17, 2024	Last Cal Date:	September 12, 2024
Start time (MST):	7:10	End time (MST):	11:33
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.18	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	<u>CC303554</u>			
Removed Cal Gas Conc:	49.18	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	<u>NA</u>		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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001819	1.000948	Backgd or Offset:	25.9	26.4
Calibration intercept:	0.531649	0.311461	Coeff or Slope:	1.058	1.049

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.7	----
As found High point	4919	81.3	799.6	807.0	0.992
As found Mid point	4959	40.7	400.3	404.1	0.992
As found Low point	4980	20.3	199.7	203.6	0.984
New cylinder response					
Baseline Corr As found:	806.3	Previous response	801.6	*% change	0.6%
Baseline Corr 2nd AF pt:	403.4	AF Slope:	1.007637	AF Intercept:	1.270913
Baseline Corr 3rd AF pt:	202.9	AF Correlation:	0.999994	<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4919	81.3	799.6	801.0	0.998
Mid point	4959	40.7	400.3	399.7	1.002
Low point	4980	20.3	199.7	201.6	0.990
As left zero	5000	0.0	0.0	0.2	----
As left span	4919	81.3	799.6	803.0	0.996
Average Correction Factor:					0.997

Notes: Swapped external pump after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

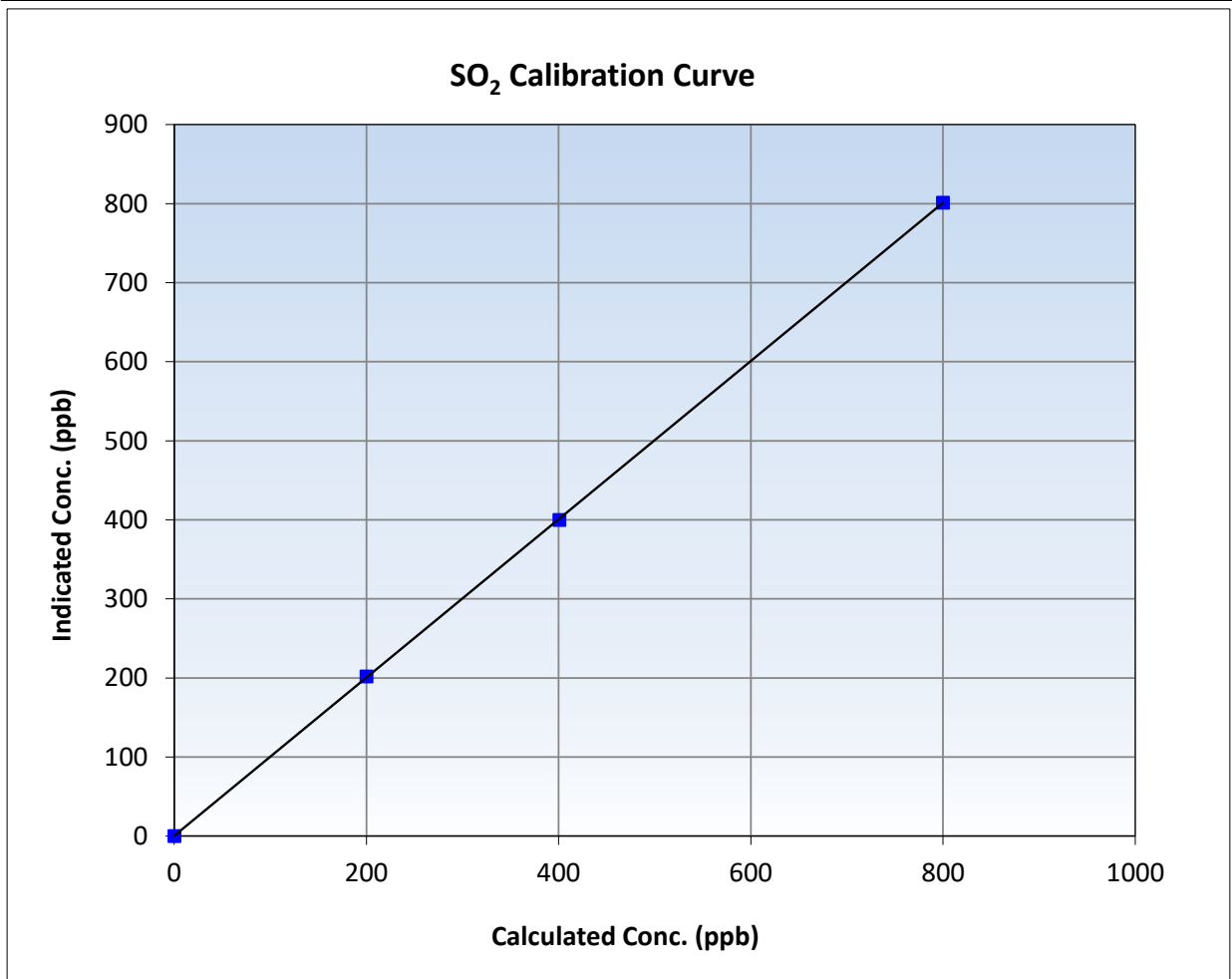
SO₂ Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 12, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	7:10	End Time (MST):	11:33
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1182340007

Calibration Data

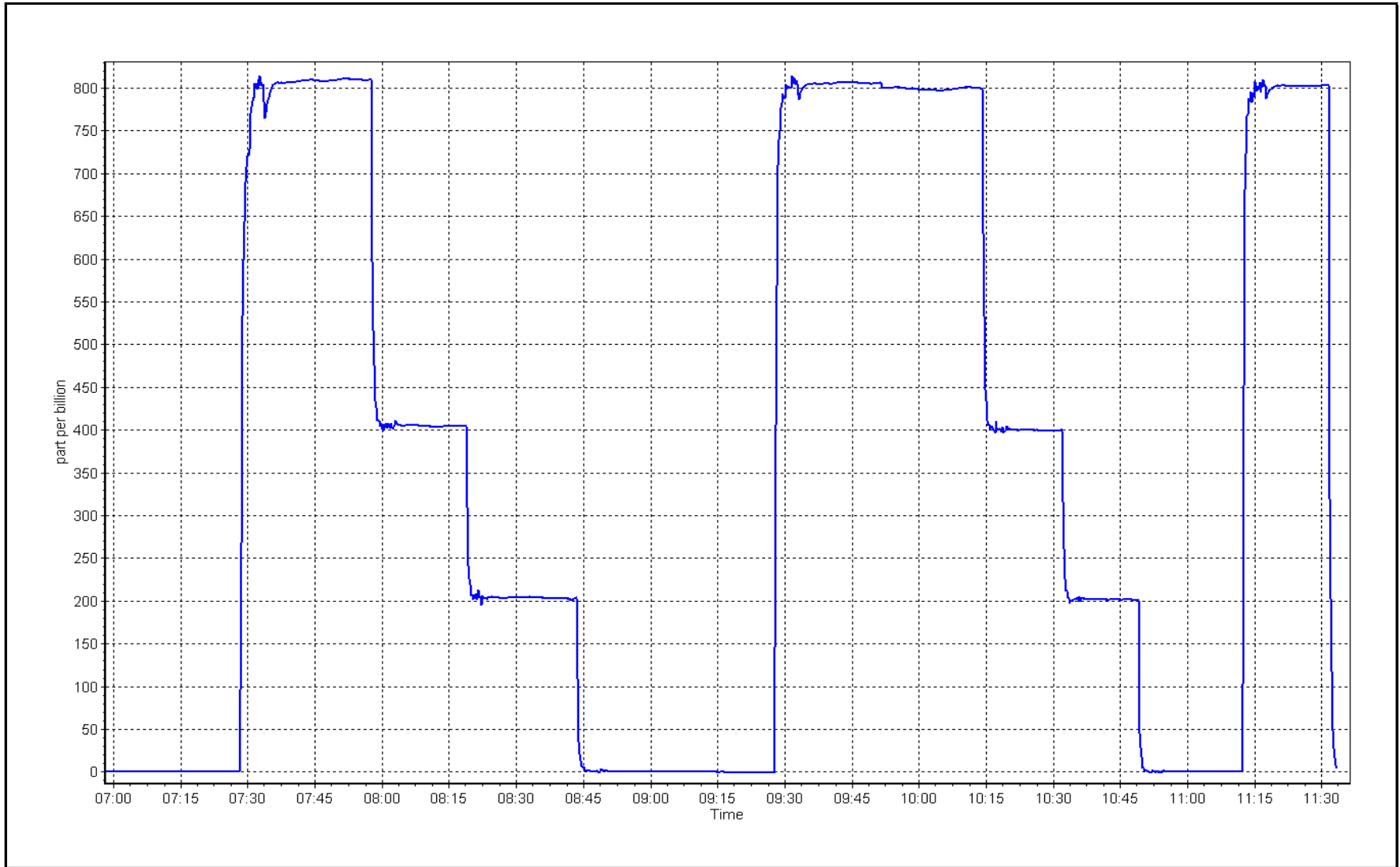
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	0.999988	≥0.995
799.6	801.0	0.9983	Slope	1.000948	0.90 - 1.10
400.3	399.7	1.0016	Intercept	0.311461	+/-30
199.7	201.6	0.9904			



SO2 Calibration Plot

Date: October 17, 2024

Location: Kirby North





Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	October 17, 2024	Last Cal Date:	September 11, 2024
Start time (MST):	11:31	End time (MST):	16:40
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.05 ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	<u>DT0019762</u>		
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:	880
ZAG Make/Model:	Teledyne API T701H	Serial Number:	5240

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

	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Calibration slope:	1.005385	1.004956	Backgd or Offset:	1.74
Calibration intercept:	-0.160963	-0.320958	Coeff or Slope:	1.036
				1.77
				1.045

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4921	79.2	80.0	80.5	0.991
As found Mid point	4960	39.6	40.0	40.3	0.988
As found Low point	4980	19.8	20.0	19.8	1.000
New cylinder response					
Baseline Corr As found:	80.7	Prev response:	80.26	*% change:	0.5%
Baseline Corr 2nd AF pt:	40.5	AF Slope:	1.009814	AF Intercept:	-0.240973
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999986	* = > +/-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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4921	79.2	80.0	80.2	0.997
Mid point	4960	39.6	40.0	39.7	1.008
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	78.9	1.014
SO2 Scrubber Check	4919	80.0	800.2	0.0	----
Date of last scrubber change:		July 25, 2023		Ave Corr Factor	1.008
Date of last converter efficiency test:		n/a			

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

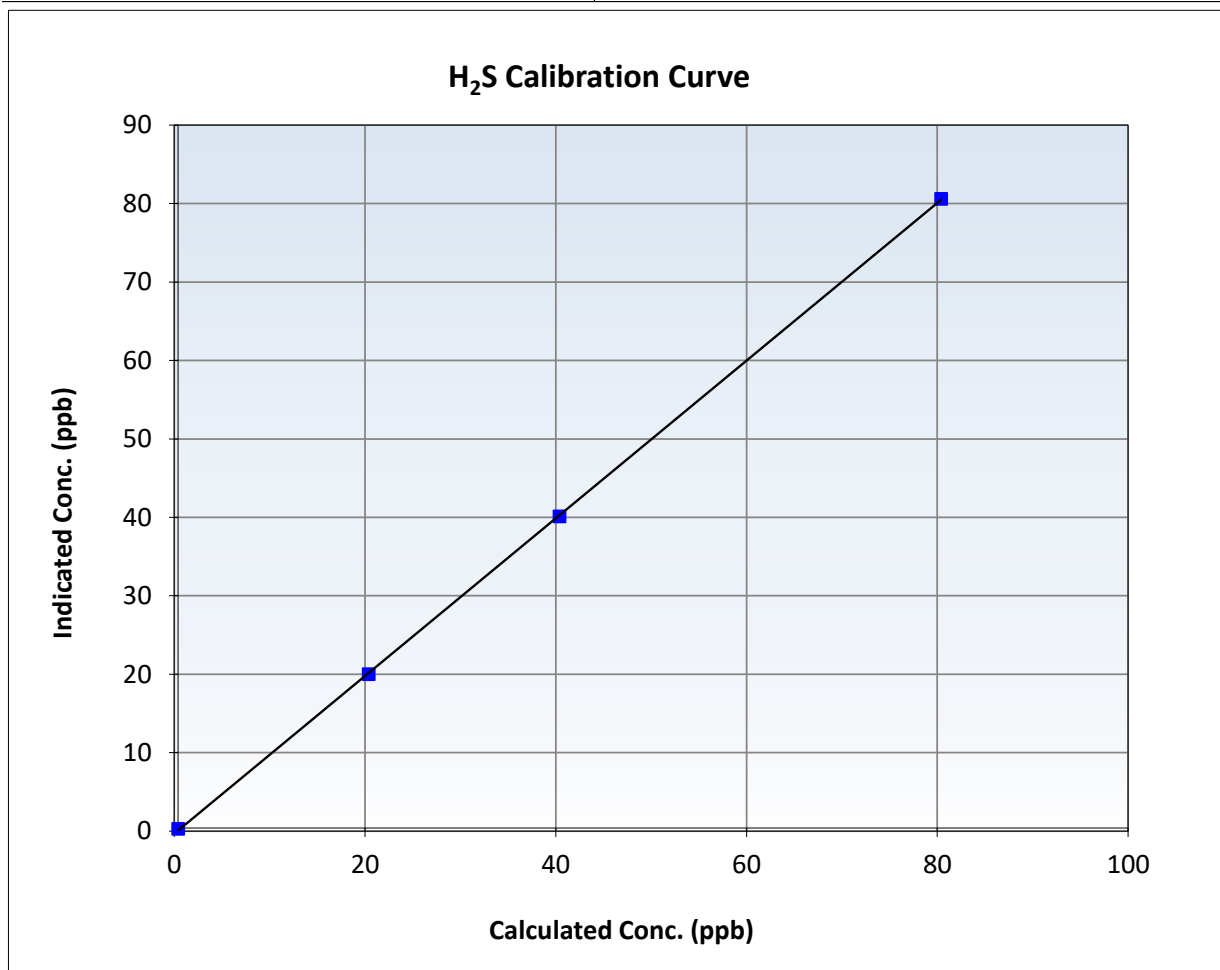
H2S Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 11, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	11:31	End Time (MST):	16:40
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1150840012

Calibration Data

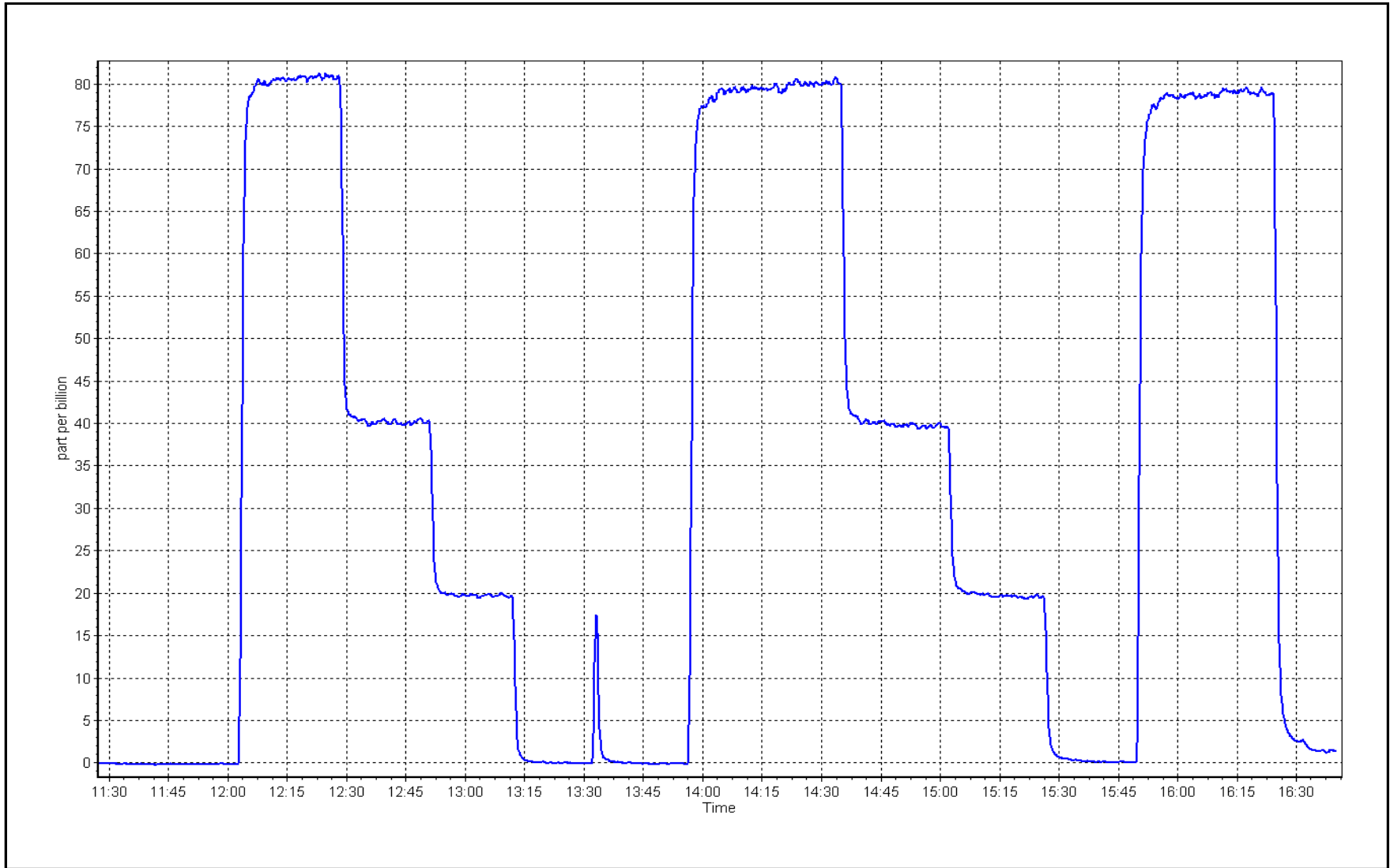
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	0.999964	≥ 0.995
80.0	80.2	0.9974	Slope	1.004956	$0.90 - 1.10$
40.0	39.7	1.0075	Intercept	-0.320958	± 3
20.0	19.6	1.0203			



H2S Calibration Plot

Date: October 17, 2024

Location: Kirby North





Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	October 17, 2024	Last Cal Date:	September 12, 2024
Start time (MST):	7:10	End time (MST):	11:33
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		

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.991845	1.001339	Background:	2.06	2.09
Calibration intercept:	0.001310	-0.029911	Coefficient:	3.663	3.715

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)
<i>Limit = 0.90-1.10</i>					
As found zero	5000	0.0	0.00	-0.14	----
As found High point	4919	81.3	17.26	17.00	1.007
As found Mid point	4959	40.7	8.64	8.47	1.004
As found Low point	4980	20.3	4.31	4.18	0.998
New cylinder response					
Baseline Corr As found:	17.14	Previous response	17.12	*% change	0.1%
Baseline Corr 2nd AF pt:	8.61	AF Slope:	0.992337	AF Intercept:	-0.118910
Baseline Corr 3rd AF pt:	4.32	AF Correlation:	0.999992	* = > +/-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)
					<i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	-0.02	
High point	4919	81.3	17.26	17.26	1.000
Mid point	4959	40.7	8.64	8.62	1.003
Low point	4980	20.3	4.31	4.28	1.007
As left zero	5000	0.0	0.00	-0.04	----
As left span	4919	81.3	17.26	17.37	0.994
Average Correction Factor					1.003

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

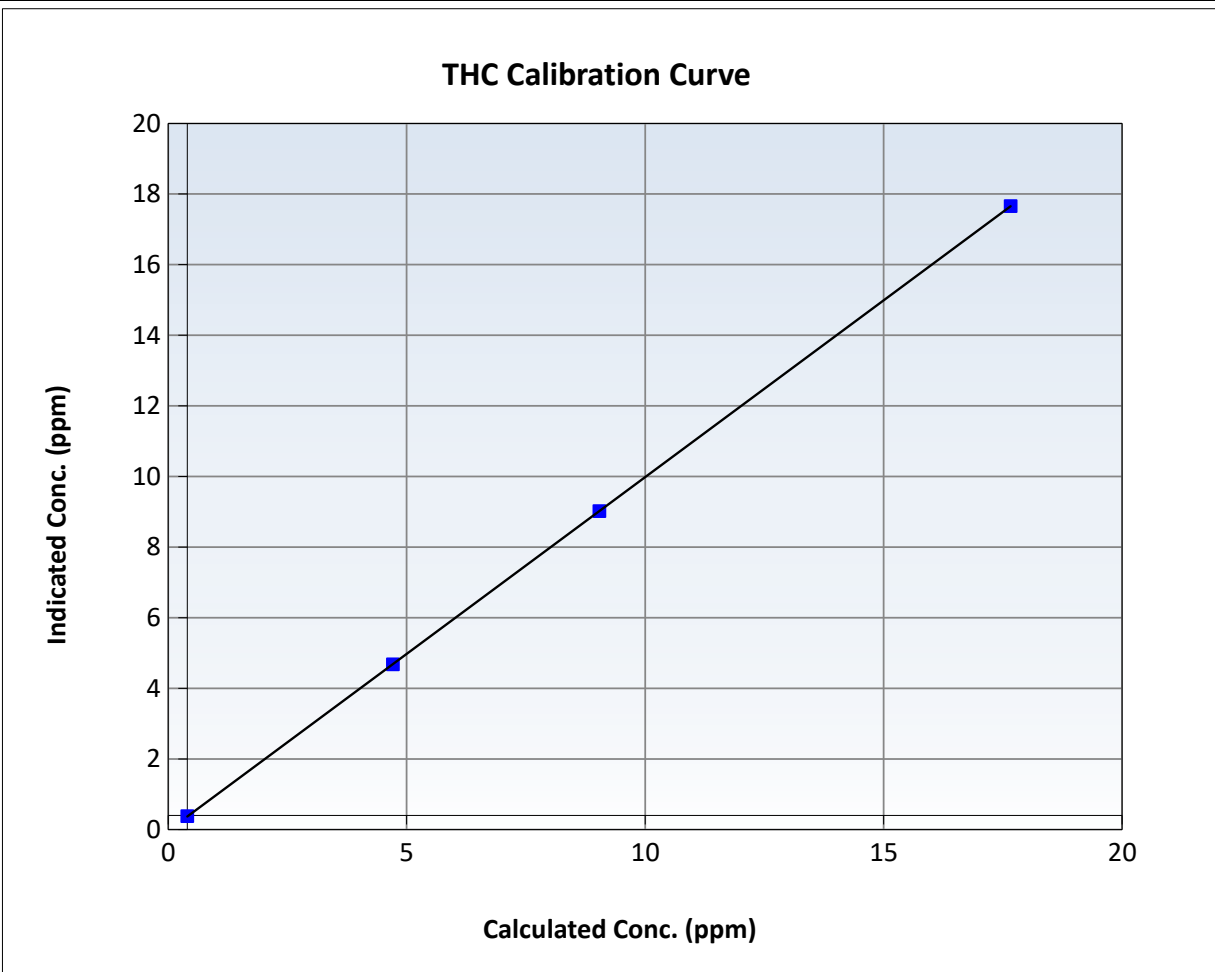
THC Calibration Summary

Station Information

Calibration Date:	October 17, 2024	Previous Calibration:	September 12, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	7:10	End Time (MST):	11:33
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1182340005

Calibration Data

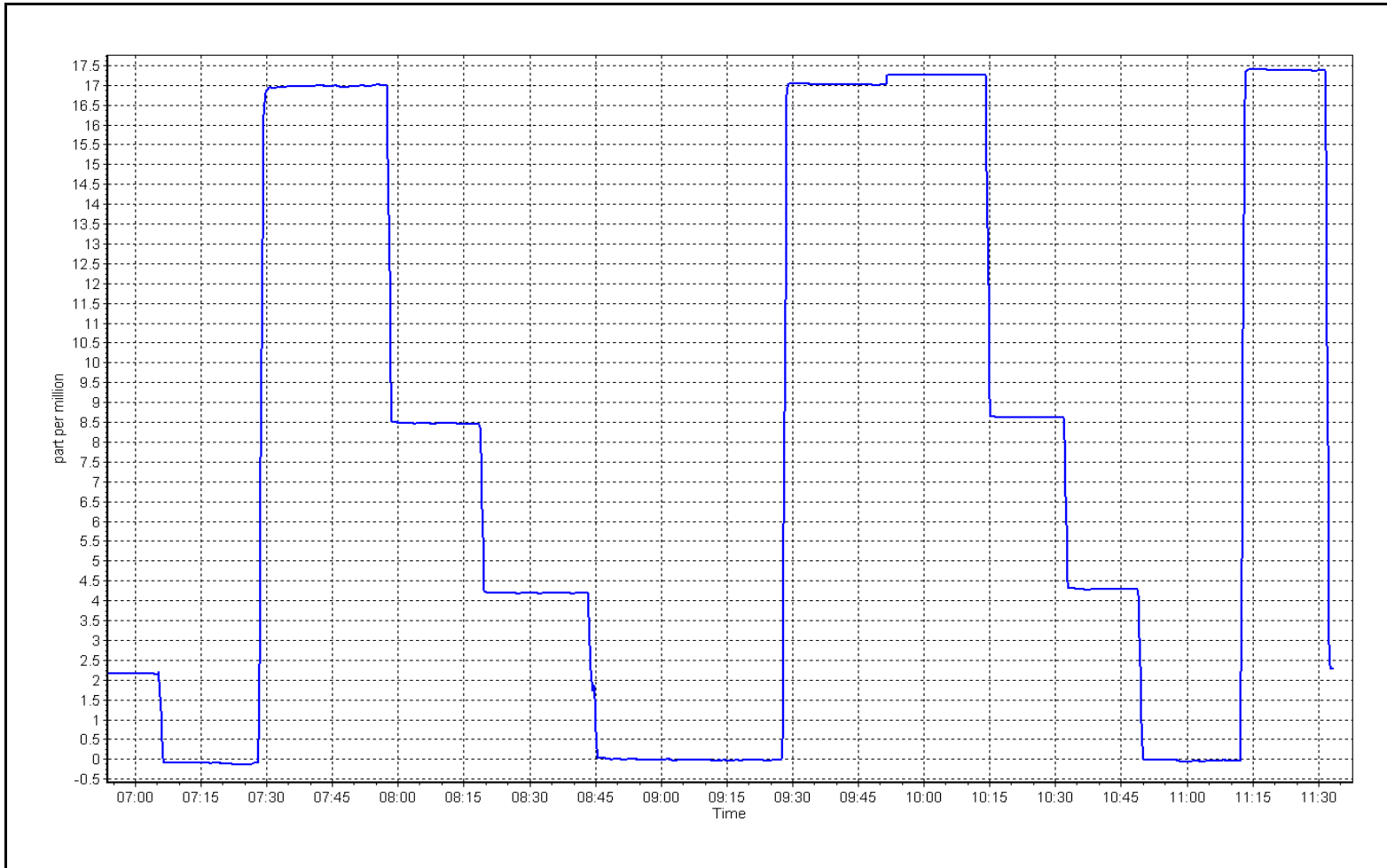
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	-0.02	----	Correlation Coefficient	0.999999	≥0.995
17.26	17.26	1.0002	Slope	1.001339	0.90 - 1.10
8.64	8.62	1.0027	Intercept	-0.029911	+/-1.5
4.31	4.28	1.0074			



THC Calibration Plot

Date: October 17, 2024

Location: Kirby North





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Kirby North
 Station number: AMS 508
 Calibration Date: October 16, 2024
 Last Cal Date: September 25, 2024
 Start time (MST): 10:18
 End time (MST): 15:18
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: T34ULGL
 NOX Cal Gas Conc: 49.39 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 49.39 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701H
 Cal Gas Expiry Date: March 8, 2025
 NO Cal Gas Conc: 49.02 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 49.02 ppm
 NO gas Diff:
 Serial Number: 5240
 Serial Number: 880

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.0	----	----
AF High point	4918	81.6	806.1	800.1	6.0	818.0	812.0	6.5	0.9858	0.9857
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO _x = 803.1 ppb		NO = 796.6 ppb			<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 1.8%	
Baseline Corr 1st pt	NO _x = 817.7 ppb		NO = 811.7 ppb			<u>As Found Statistics</u>		*Percent Change	NO = 1.9%	
Baseline Corr 2nd pt	NO _x = NA ppb		NO = NA ppb			As found	NO _x r ² :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO _x = NA ppb		NO = NA ppb			As found	NO r ² :	NO SI:	NO Int:	
						As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 1118148496

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.001980	0.999017
NO _x Cal Offset:	-4.584035	-2.864007
NO Cal Slope:	1.002130	1.001758
NO Cal Offset:	-5.164177	-4.084132
NO ₂ Cal Slope:	0.994080	1.000096
NO ₂ Cal Offset:	0.208416	0.178825

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	0.730	0.721	NO bkgnd or offset:	7.6	7.8
NOX coeff or slope:	0.995	0.993	NOX bkgnd or offset:	7.5	7.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	144.7	144.1

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4918	81.6	806.1	800.1	6.0	804.0	799.6	4.2	1.0026	1.0006
Mid point	4959	40.8	403.0	400.0	3.0	398.0	394.1	3.9	1.0127	1.0150
Low point	4980	20.4	201.5	200.0	1.5	195.8	192.5	3.2	1.0291	1.0389
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4918	81.6	806.1	406.8	399.3	802.0	406.8	394.9	1.0051	1.0000
Average Correction Factor									1.0148	1.0182

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	796.6	402.7	399.9	399.5	1.0011	99.9%
Mid GPT point	796.6	602.6	200.0	202.1	0.9898	101.0%
Low GPT point	796.6	695.4	107.2	106.4	1.0079	99.2%
Average Correction Factor					0.9996	100.0%

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

Calibration Performed By: Braiden Boutilier



Wood Buffalo Environmental Association

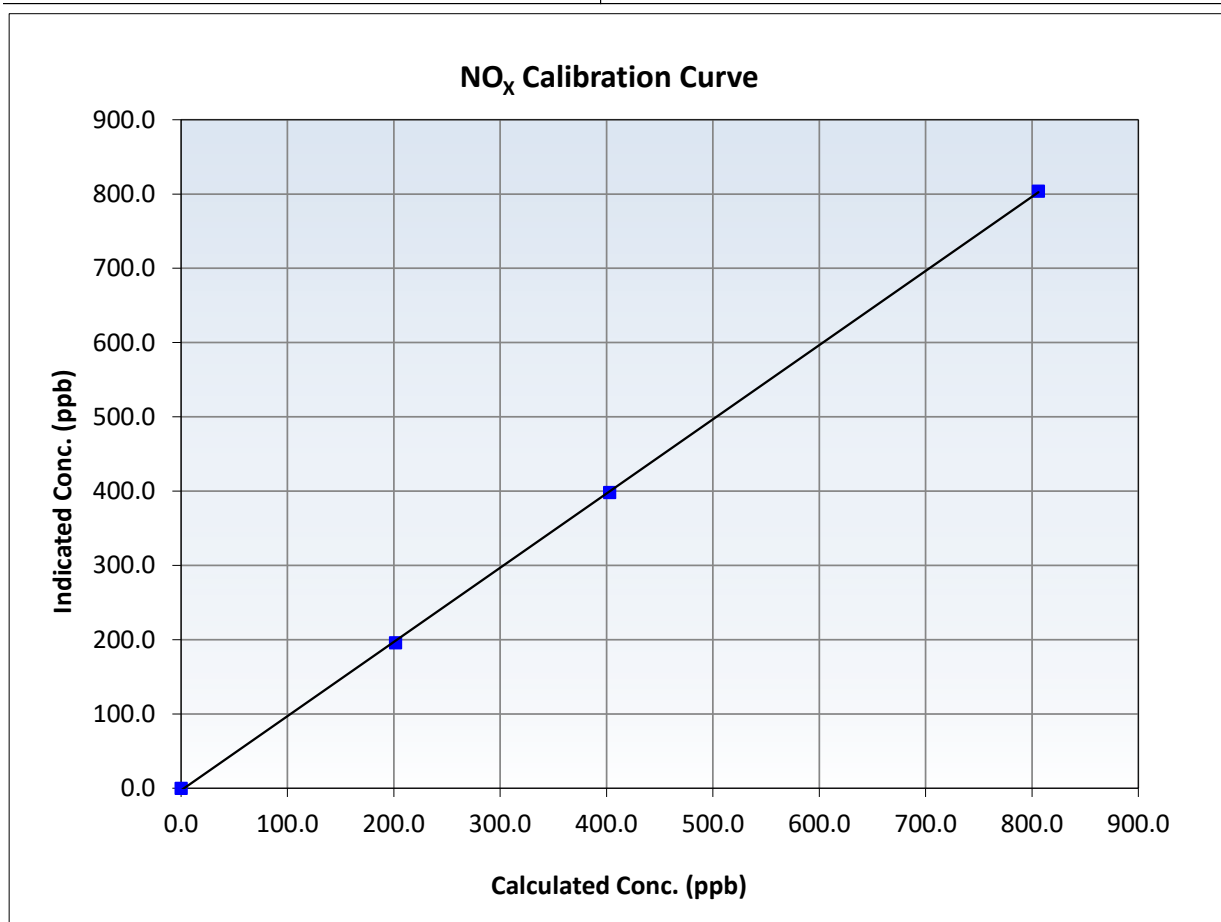
NO_x Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 25, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	10:18	End Time (MST):	15:18
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999942	<i>≥0.995</i>
806.1	804.0	1.0026	Slope	0.999017	<i>0.90 - 1.10</i>
403.0	398.0	1.0127	Intercept	-2.864007	<i>+/-20</i>
201.5	195.8	1.0291			





Wood Buffalo Environmental Association

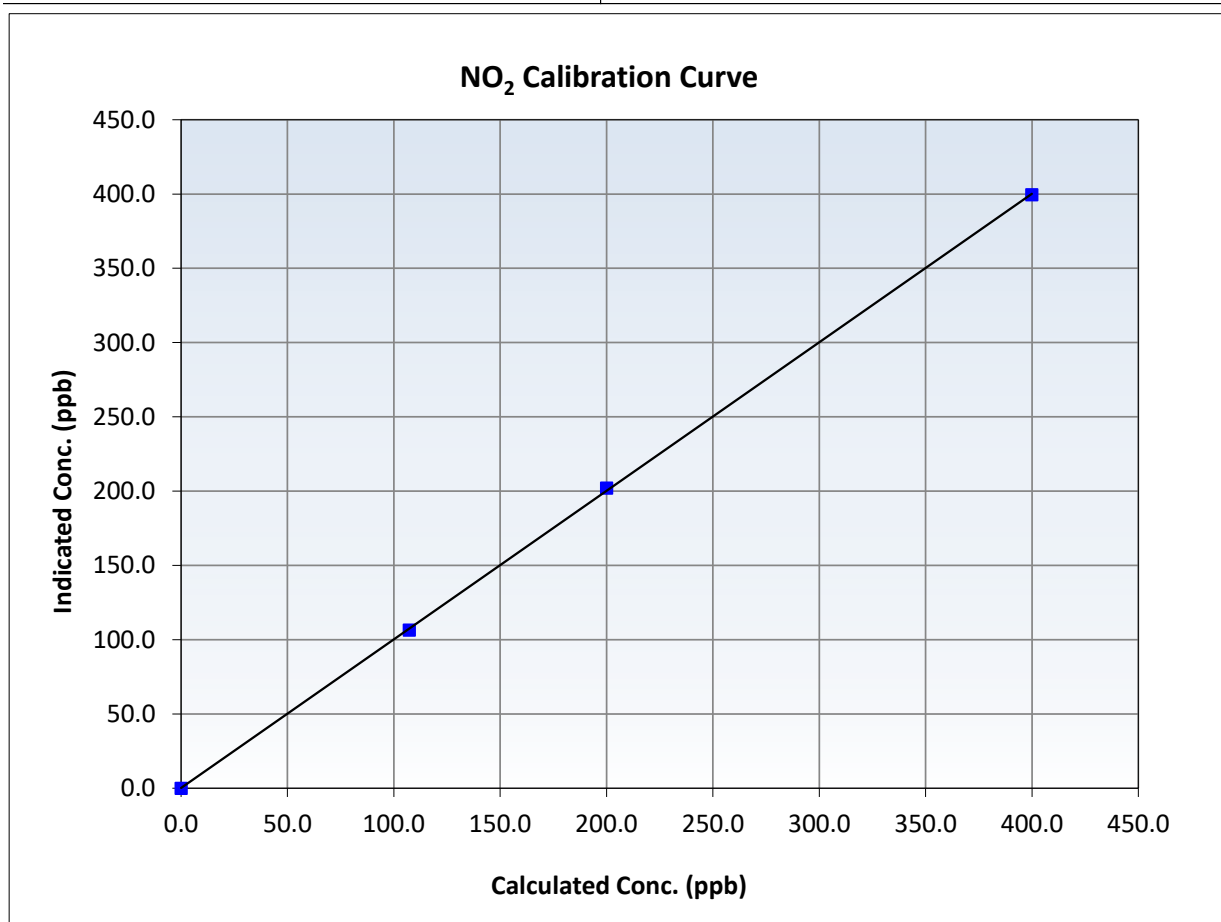
NO₂ Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 25, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	10:18	End Time (MST):	15:18
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999942	≥0.995
399.9	399.5	1.0011	Slope	1.000096	0.90 - 1.10
200.0	202.1	0.9898	Intercept	0.178825	+/-20
107.2	106.4	1.0079			





Wood Buffalo Environmental Association

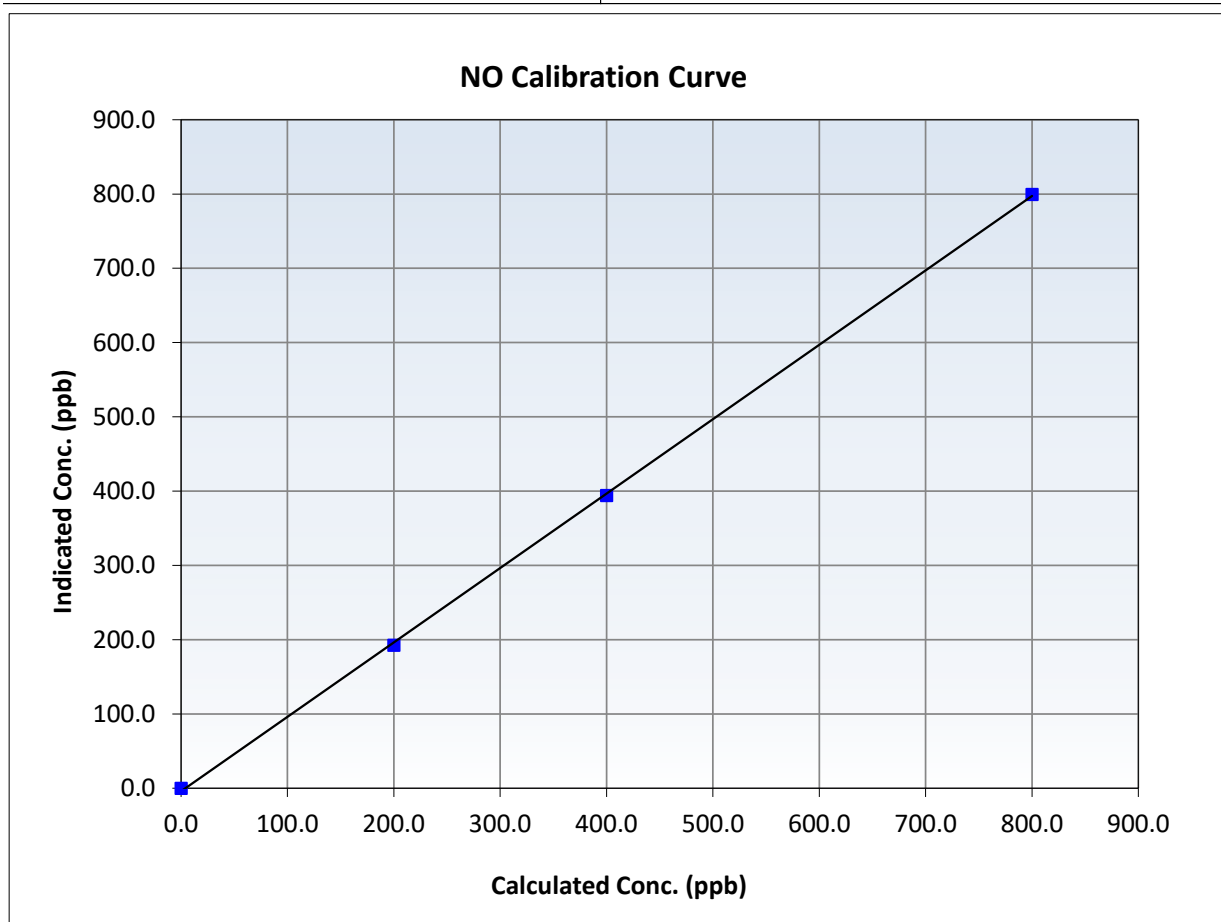
NO Calibration Summary

Station Information

Calibration Date:	October 16, 2024	Previous Calibration:	September 25, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	10:18	End Time (MST):	15:18
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

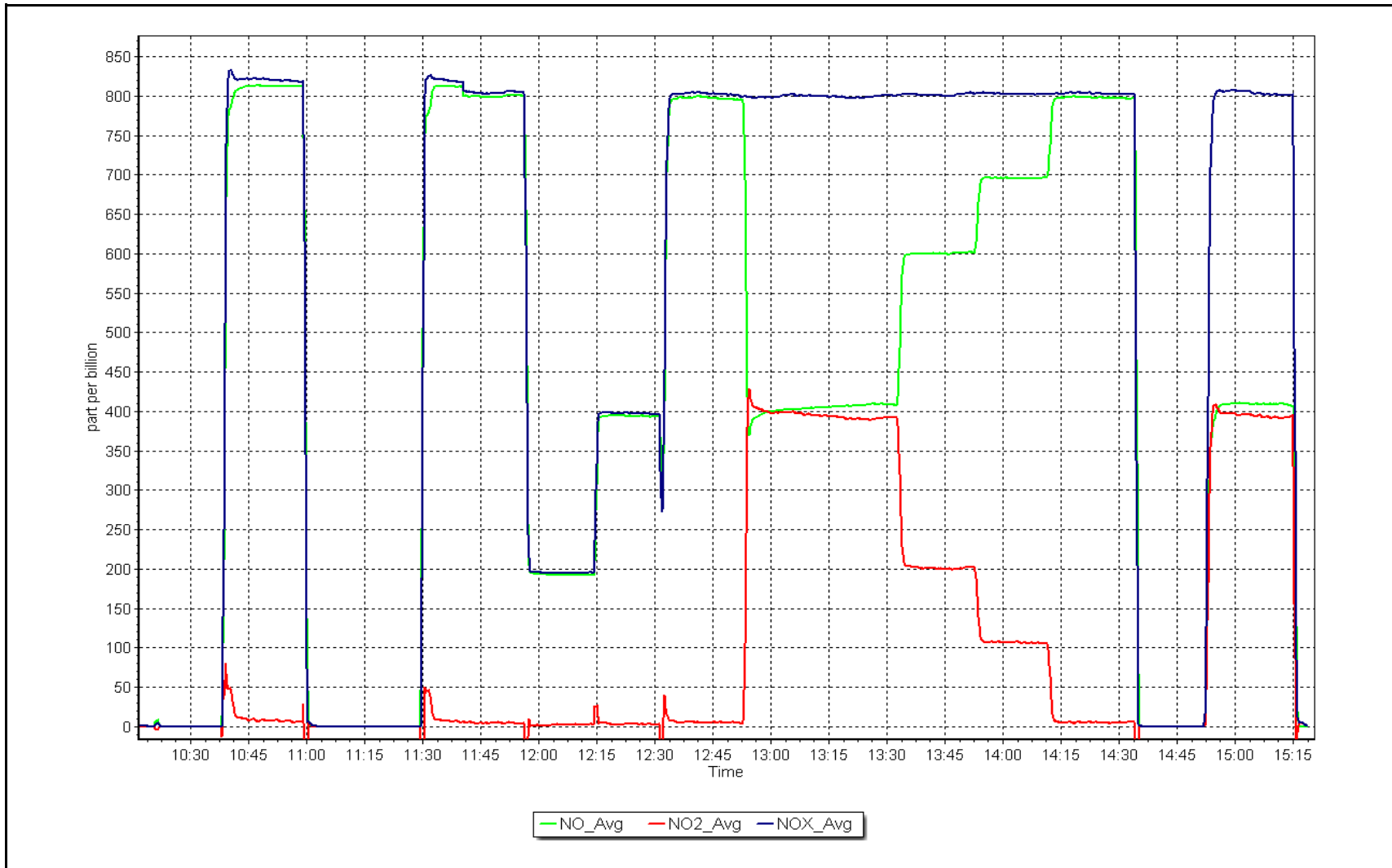
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999880	≥0.995
800.1	799.6	1.0006	Slope	1.001758	0.90 - 1.10
400.0	394.1	1.0150	Intercept	-4.084132	+/-20
200.0	192.5	1.0389			



NO_x Calibration Plot

Date: October 16, 2024

Location: Kirby North





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS512 HANGINGSTONE EXPANSION OCTOBER 2024

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

November 29, 2024



Wood Buffalo Environmental Association

SO₂ Calibration Report

Station Information

Station Name:	Hangingsstone Expansion	Station number: AMS 512
Calibration Date:	October 18, 2024	Last Cal Date: September 17, 2024
Start time (MST):	7:35	End time (MST): 10:26
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	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.004332	1.010912	Backgd or Offset:	13.1	13.6
Calibration intercept:	-1.523569	-1.623998	Coeff or Slope:	1.151	1.151

SO₂ 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.6	----
As found High point	4920	79.8	799.0	805.3	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	804.7	Previous response	800.9	*% change	0.5%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<i>* = > +/-5% change initiates investigation</i>	

SO₂ 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	79.8	799.0	806.9	0.990
Mid point	4960	39.9	399.5	401.5	0.995
Low point	4987	20.0	200.0	198.7	1.006
As left zero	5000	0.0	0.0	0.3	----
As left span	4920	79.8	799.0	810.7	0.986
Average Correction Factor:					0.997

Notes: No maintenance done. Zero adjusted

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

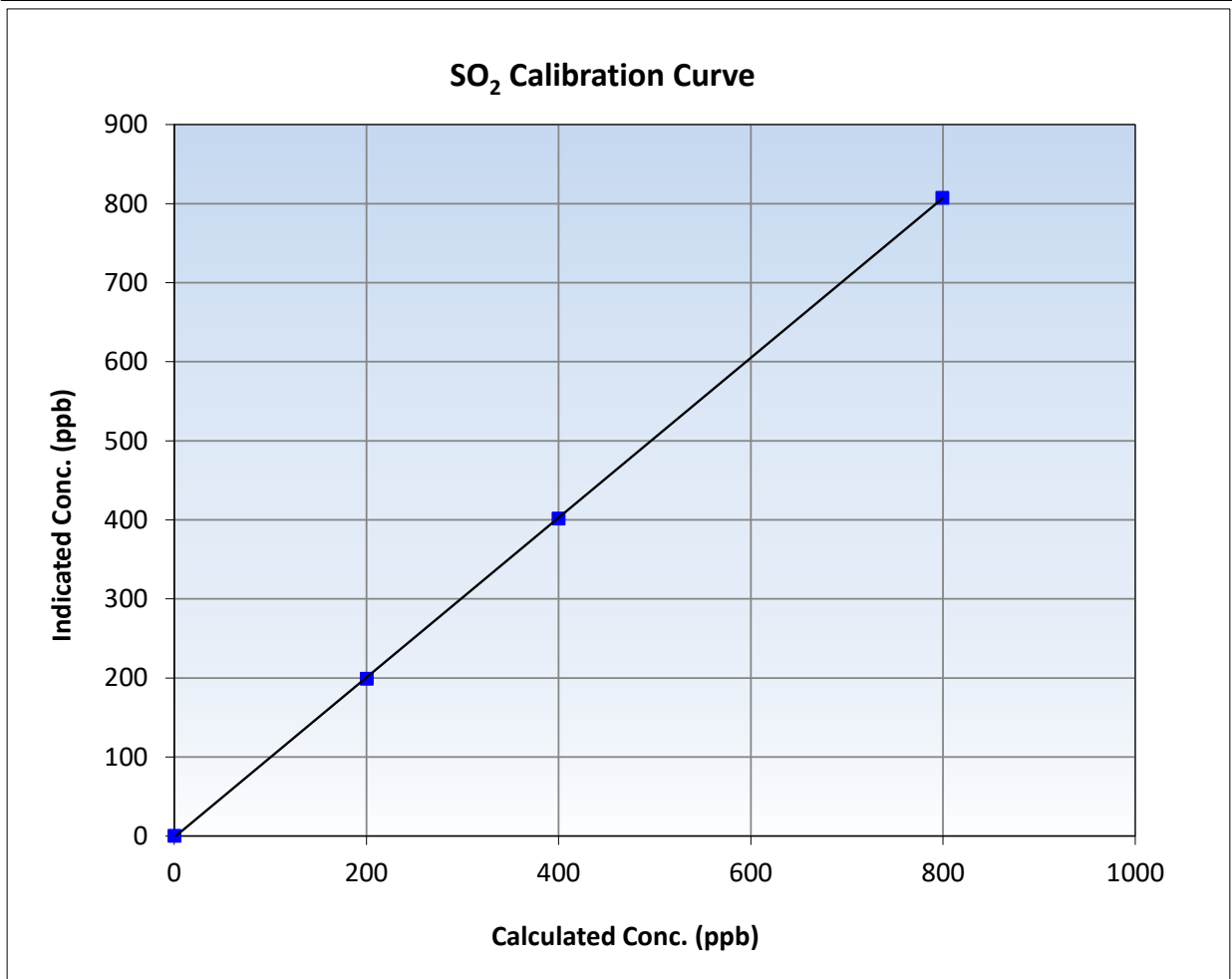
SO₂ Calibration Summary

Station Information

Calibration Date:	October 18, 2024	Previous Calibration:	September 17, 2024
Station Name:	Hangystone Expansion	Station Number:	AMS 512
Start Time (MST):	7:35	End Time (MST):	10:26
Analyzer make:	Thermo scientific	Analyzer serial #:	1173410001

Calibration Data

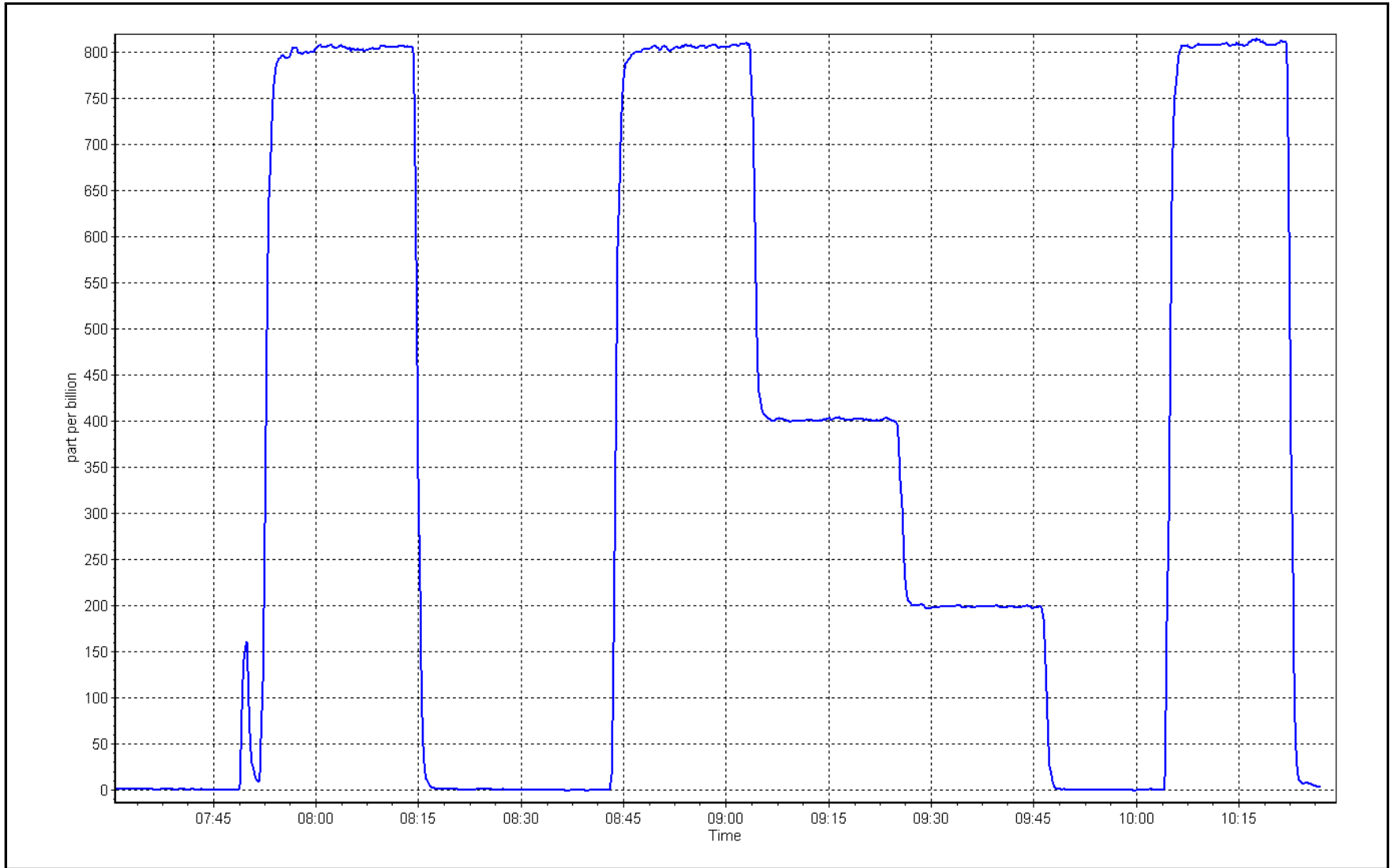
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999979	≥0.995
799.0	806.9	0.9902	Slope	1.010912	0.90 - 1.10
399.5	401.5	0.9950	Intercept	-1.623998	+/-30
200.0	198.7	1.0063			



SO2 Calibration Plot

Date: October 18, 2024

Location: Hangingstone Expansion





Wood Buffalo Environmental Association

H₂S Calibration Report

Station Information

Station Name:	Hangingstone Expansion	Station number:	AMS 512
Calibration Date:	October 15, 2024	Last Cal Date:	September 17, 2024
Start time (MST):	6:18	End time (MST):	10:44
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

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.981334	1.000346	Backgd or Offset:	3.43	3.51
Calibration intercept:	-0.018842	-0.159192	Coeff or Slope:	1.156	1.194

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	----
As found High point	4922	77.8	80.0	78.6	1.019
As found Mid point	4961	38.9	40.0	39.0	1.028
As found Low point	4981	19.5	20.0	19.3	1.044
New cylinder response					
Baseline Corr As found:	78.5	Prev response:	78.45	*% change:	0.1%
Baseline Corr 2nd AF pt:	38.9	AF Slope:	0.983191	AF Intercept:	-0.158833
Baseline Corr 3rd AF pt:	19.2	AF Correlation:	0.999950	<i>* = > +/-5% change initiates investigation</i>	

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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4922	77.8	80.0	80.0	1.000
Mid point	4961	38.9	40.0	39.6	1.010
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	81.4	0.982
SO ₂ Scrubber Check	4920	80.0	800.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.009
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

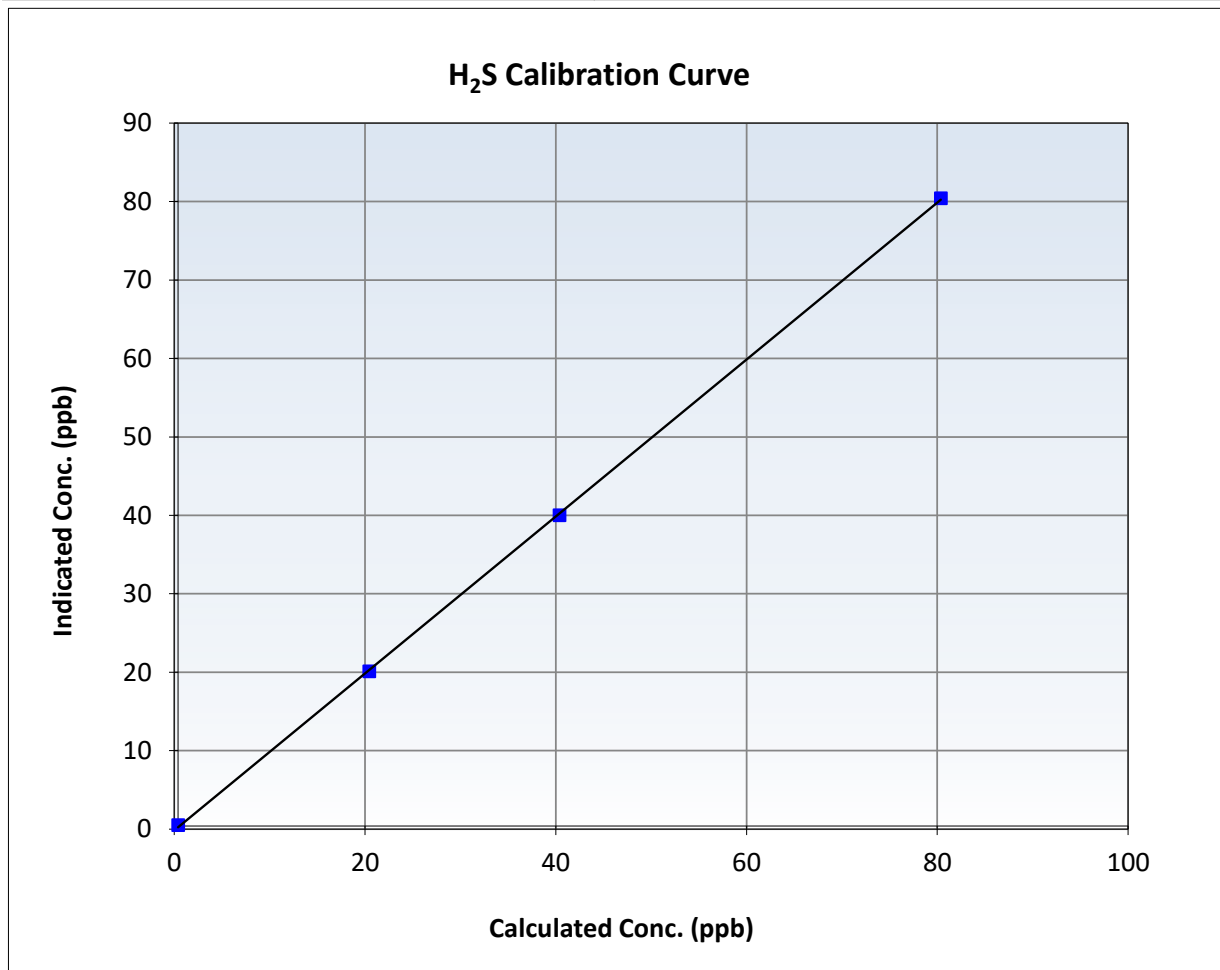
H₂S Calibration Summary

Station Information

Calibration Date:	October 15, 2024	Previous Calibration:	September 17, 2024
Station Name:	Hangingsstone Expansion	Station Number:	AMS 512
Start Time (MST):	6:18	End Time (MST):	10:44
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1336160090

Calibration Data

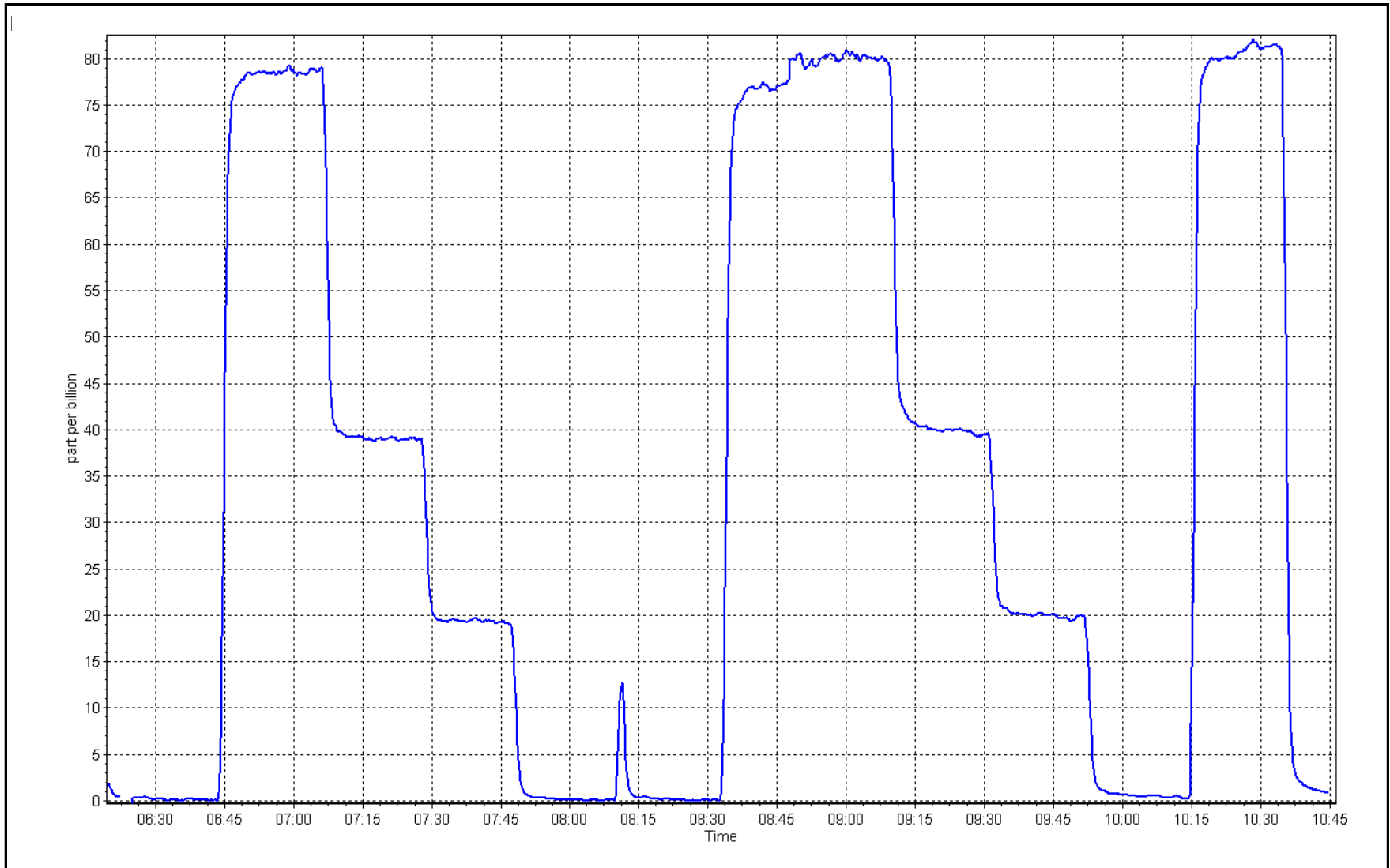
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1	----	Correlation Coefficient	0.999947	≥0.995
80.0	80.0	0.9996	Slope	1.000346	0.90 - 1.10
40.0	39.6	1.0097	Intercept	-0.159192	+/-3
20.0	19.7	1.0173			



H₂S Calibration Plot

Date: October 15, 2024

Location: Hangingstone Expansion





Wood Buffalo Environmental Association

NO_x \ NO \ NO₂ Calibration Report

Station Information

Station Name: Hangingstone Expansion
 Station number: AMS 512
 Calibration Date: October 4, 2024
 Last Cal Date: September 20, 2024
 Start time (MST): 7:10
 End time (MST): 11:30
 Reason: Routine

Calibration Standards

NO Gas Cylinder #: TOF8P52
 NOX Cal Gas Conc: 47.43 ppm
 Removed Cylinder #: NA
 Removed Gas NOX Conc: 47.43 ppm
 NOX gas Diff:
 Calibrator Model: Teledyne API T700
 ZAG make/model: Teledyne API T701
 Cal Gas Expiry Date: August 16, 2026
 NO Cal Gas Conc: 47.43 ppm
 Removed Gas Exp Date: NA
 Removed Gas NO Conc: 47.43 ppm
 NO gas Diff:
 Serial Number: 2445
 Serial Number: 138

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO _x Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
AF High point	4916	84.4	800.6	800.6	0.0	806.5	804.4	2.1	0.9923	0.9950
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO _x = 800.1 ppb	NO = 798.6 ppb	<i>* = > +/-5% change initiates investigation</i>		*Percent Change	NO _x = 0.8%
Baseline Corr 1st pt	NO _x = 806.8 ppb	NO = 804.6 ppb	<u>As Found Statistics</u>		*Percent Change	NO = 0.7%
Baseline Corr 2nd pt	NO _x = NA ppb	NO = NA ppb	As found	NO _x r ² :	Nx SI:	Nx Int:
Baseline Corr 3rd pt	NO _x = NA ppb	NO = NA ppb	As found	NO r ² :	NO SI:	NO Int:
			As found	NO ₂ r ² :	NO ₂ SI:	NO ₂ Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO ₂ concentration (ppb) (Ic)	Baseline Adjusted NO ₂ Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
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 \ NO₂ Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200
 NOX Range (ppb): 0 - 1000 ppb

Serial Number: 7029

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope:	1.001223	1.010930
NO _x Cal Offset:	-1.432793	-1.032928
NO Cal Slope:	0.999824	1.011530
NO Cal Offset:	-1.792763	-1.792911
NO ₂ Cal Slope:	1.002242	1.002679
NO ₂ Cal Offset:	-0.356996	0.689580

Instrument Settings

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coeff or slope:	1.075	1.075	NO bkgnd or offset:	0.2	0.2
NOX coeff or slope:	1.074	1.074	NOX bkgnd or offset:	0.4	0.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.6	4.6

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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
High point	4916	84.4	800.6	800.6	0.0	808.6	808.7	-0.2	0.9900	0.9899
Mid point	4958	42.2	400.3	400.3	0.0	403.6	402.7	0.9	0.9918	0.9941
Low point	4979	21.1	200.2	200.2	0.0	200.1	198.7	1.4	1.0003	1.0073
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	----	----
As left span	4916	84.4	800.6	404.7	395.9	805.0	404.7	400.3	0.9945	1.0000
Average Correction Factor									0.9941	0.9971

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) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero	----	----	0.0	0.0	----	----
High GPT point	807.0	404.5	402.5	403.9	0.9965	100.3%
Mid GPT point	807.0	617.2	189.8	191.5	0.9911	100.9%
Low GPT point	807.0	711.9	95.1	96.6	0.9845	101.6%
Average Correction Factor					0.9907	100.9%

Notes:

No maintenance or adjustments done.

Calibration Performed By:

Melissa Lemay



Wood Buffalo Environmental Association

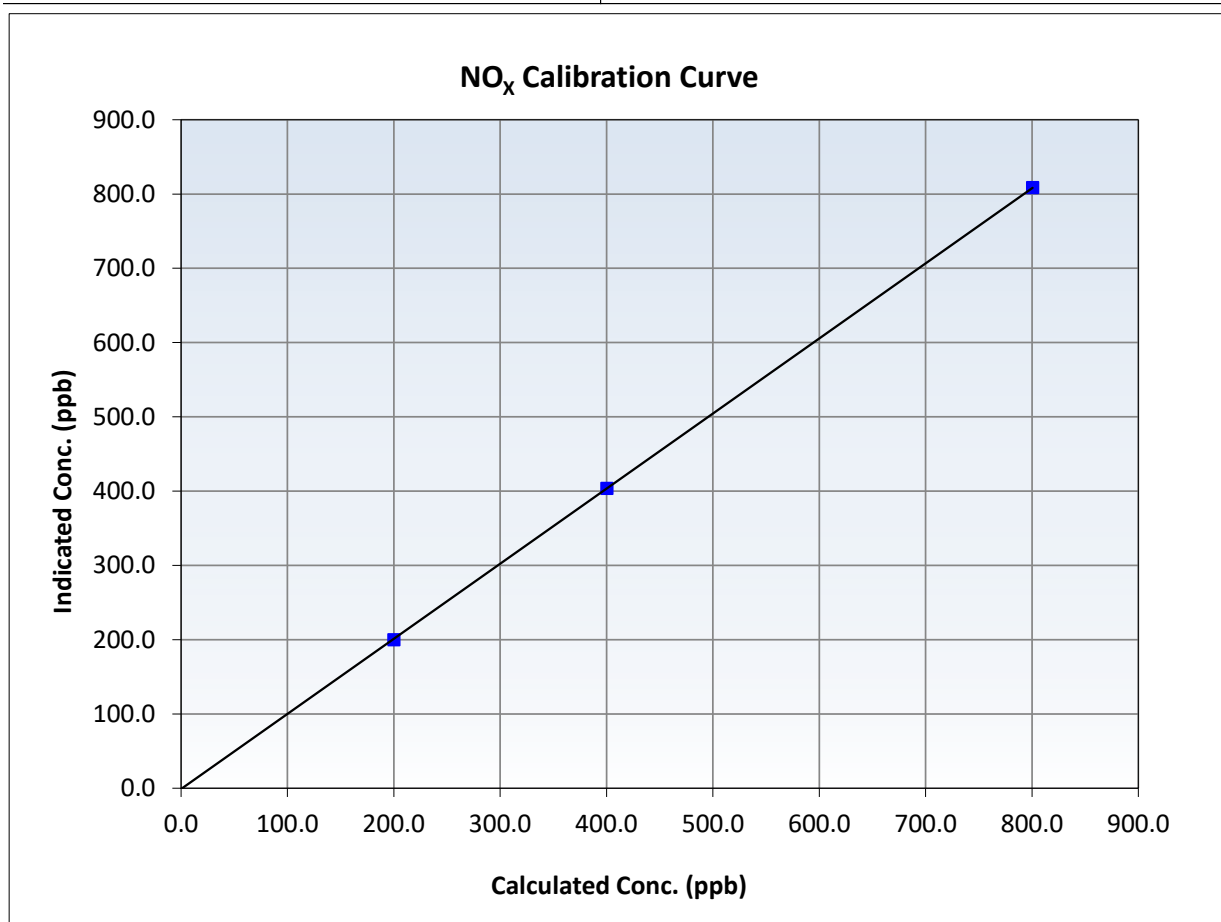
NO_x Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 20, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:10	End Time (MST):	11:30
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999993	≥0.995
800.6	808.6	0.9900	Slope	1.010930	0.90 - 1.10
400.3	403.6	0.9918	Intercept	-1.032928	+/-20
200.2	200.1	1.0003			





Wood Buffalo Environmental Association

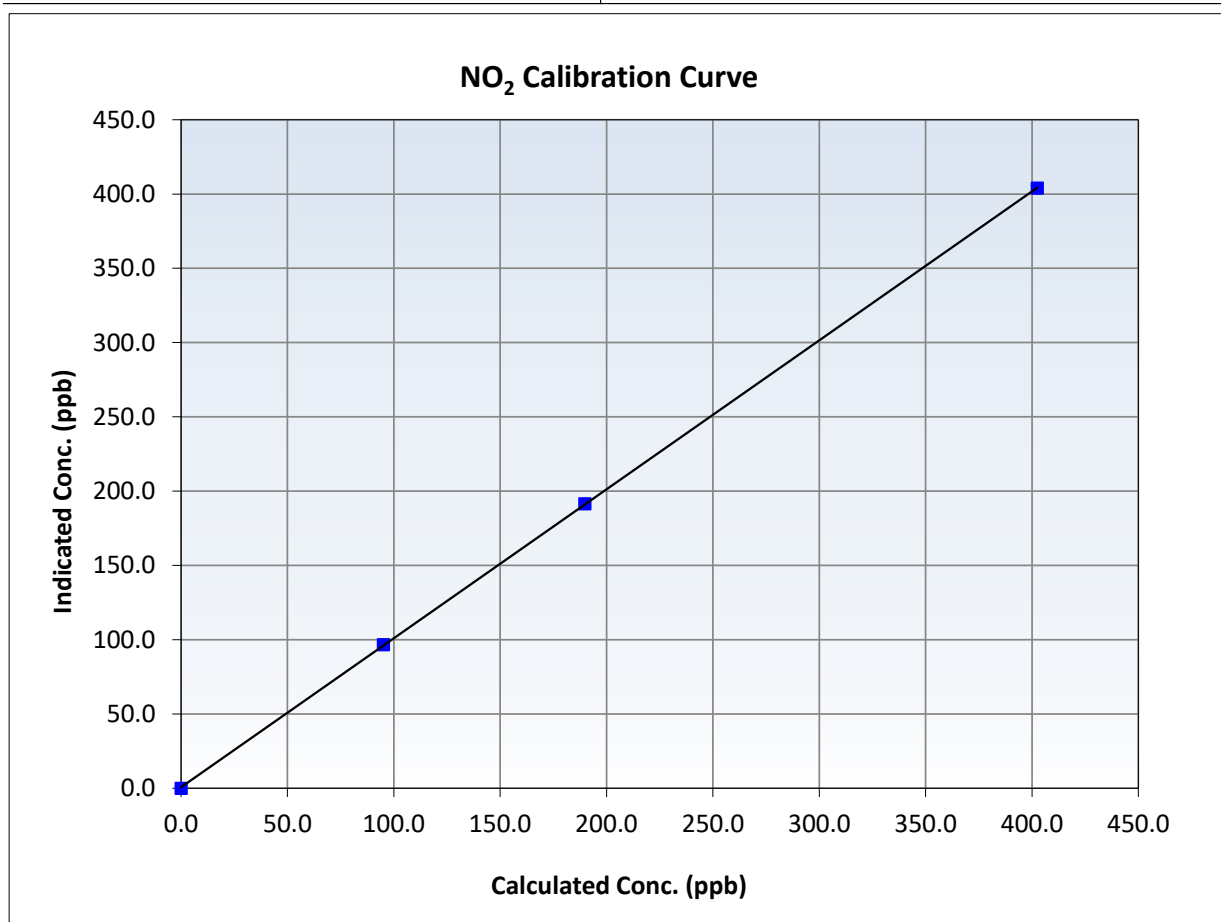
NO₂ Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 20, 2024
Station Name:	Hangingsstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:10	End Time (MST):	11:30
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	0.0	----	Correlation Coefficient	0.999987	≥0.995
402.5	403.9	0.9965	Slope	1.002679	0.90 - 1.10
189.8	191.5	0.9911	Intercept	0.689580	+/-20
95.1	96.6	0.9845			





Wood Buffalo Environmental Association

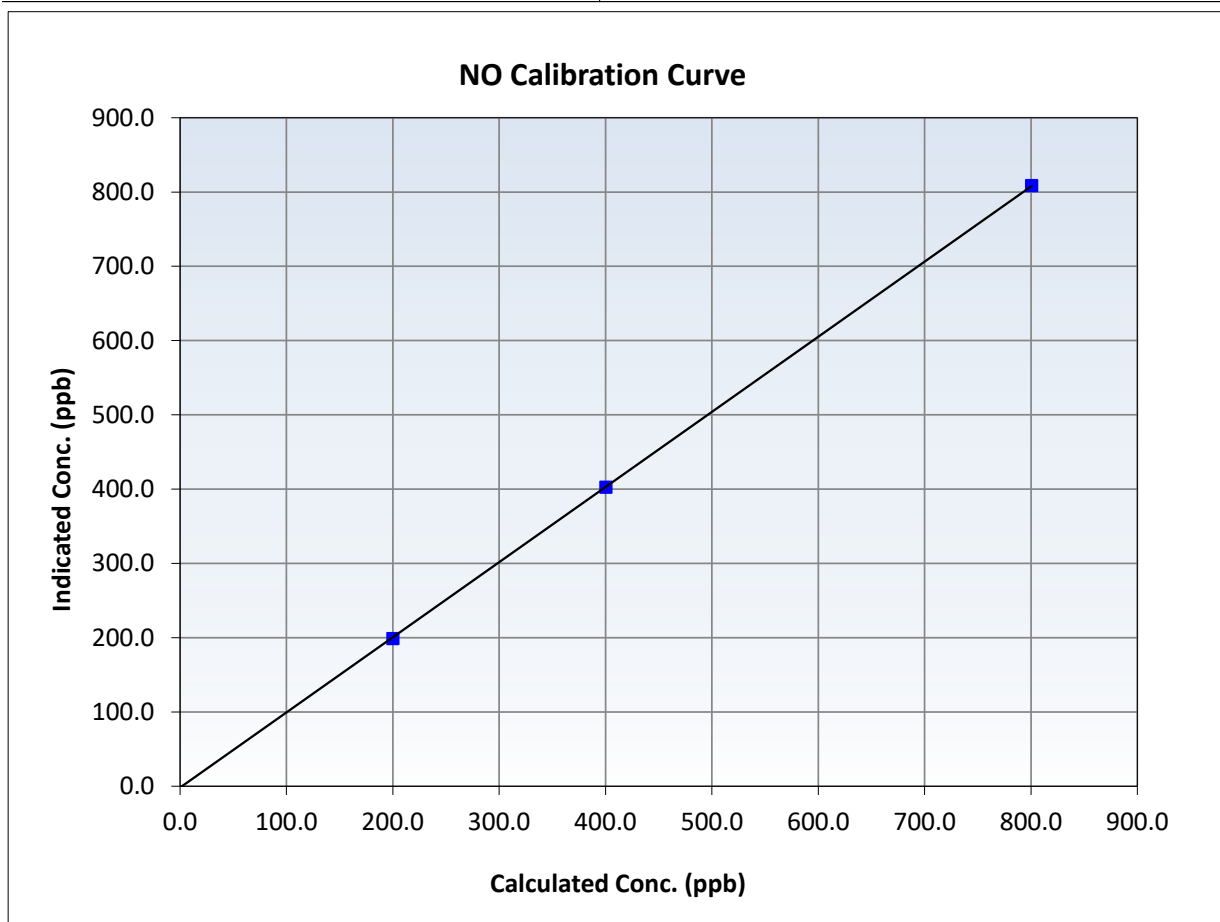
NO Calibration Summary

Station Information

Calibration Date:	October 4, 2024	Previous Calibration:	September 20, 2024
Station Name:	Hangingsstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:10	End Time (MST):	11:30
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

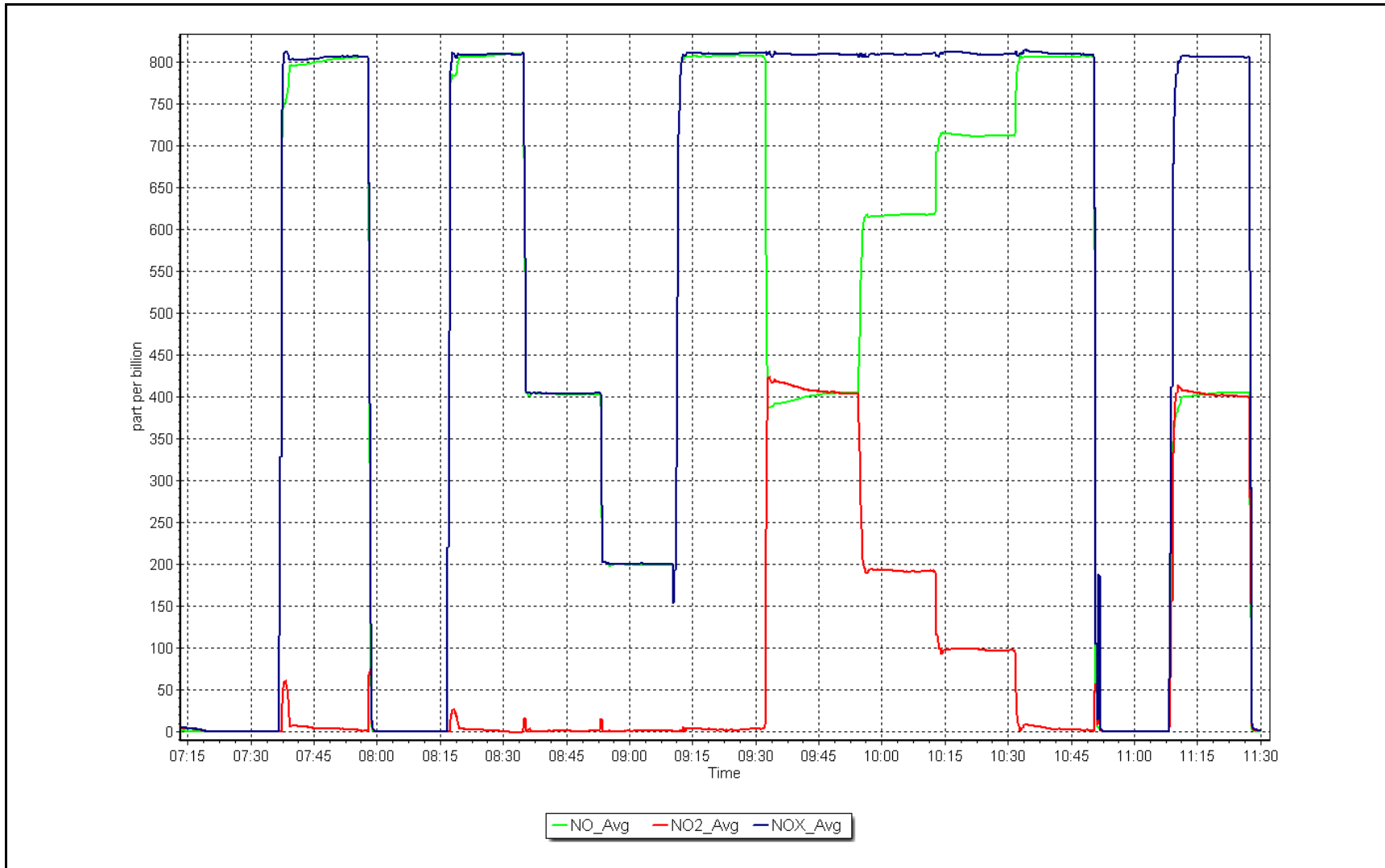
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	0.999979	≥0.995
800.6	808.7	0.9899	Slope	1.011530	0.90 - 1.10
400.3	402.7	0.9941	Intercept	-1.792911	+/-20
200.2	198.7	1.0073			



NO_x Calibration Plot

Date: October 4, 2024

Location: Hangingstone Expansion





End of Report