WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION

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Wood Buffalo Environmental Association

# FEBRUARY 2024

# MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

March 28, 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

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 11:04 | End time (MST): | 14:07 |
| 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 Make/Model: | Teledyne API T700 | | Serial Number: | 3565 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4890 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: JC1501301448

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999624 | 1.001365 | Backgd or Offset: | 19.6 | 19.7 |
| Calibration intercept: | -0.113430 | -0.173166 | Coeff or Slope: | 0.891 | 0.891 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as found span | 4918 | 81.3 | 800.3 | 799.9 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| high point | 4918 | 81.3 | 800.3 | 801.7 | 0.998 |
| second point | 4959 | 40.7 | 400.6 | 400.0 | 1.001 |
| third point | 4979 | 20.3 | 199.8 | 199.8 | 1.000 |
| as left zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as left span | 4918 | 81.3 | 800.3 | 802.8 | 0.997 |
| | | | | Average Correction Factor | 1.000 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 799.60 | Previous response | 799.85 | *% 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

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

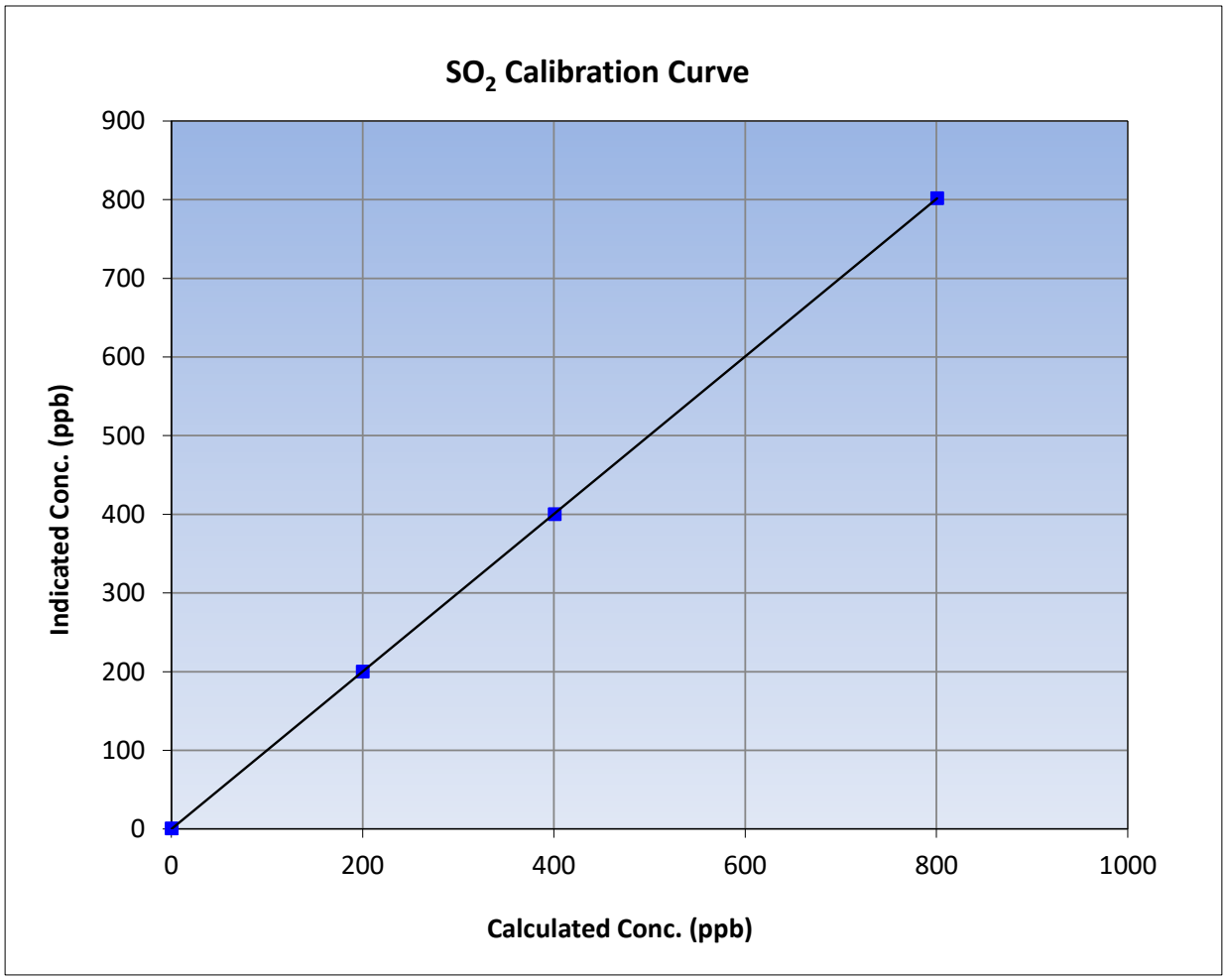
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:04 | End Time (MST): | 14:07 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1501301448 |

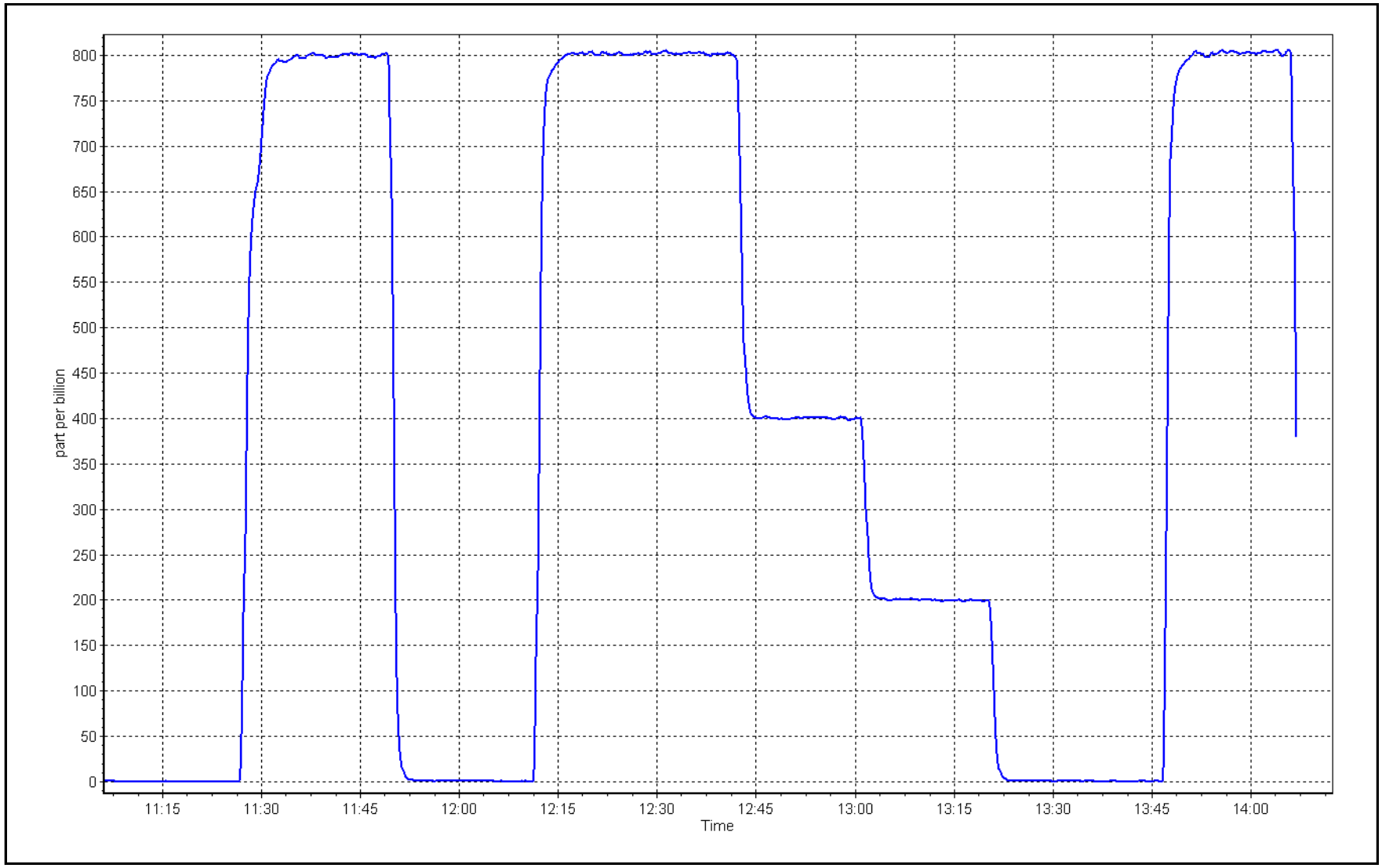
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 800.3 | 801.7 | 0.9982 |
| 400.6 | 400.0 | 1.0015 |
| 199.8 | 199.8 | 1.0001 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 1.001365 | *0.90 - 1.10* |
| Intercept | -0.173166 | *+/-30* |



**SO2 Calibration Plot** Date: January 11, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 10:02 | End time (MST): | 14:36 |
| 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: | N/A |
| Removed Gas Cyl #: | N/A | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 3565 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4890 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | | Analyzer serial #: | 1218153461 | |
| Converter make: | CD Nova | | Converter serial #: | 470 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.994364 | 0.997793 | Backgd or Offset: | 2.32 | 2.45 |
| Calibration intercept: | 0.300000 | 0.179996 | Coeff or Slope: | 0.937 | 0.937 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as found span | 4921 | 78.4 | 80.0 | 80.4 | 0.997 |
| as found 2nd point | 4960 | 39.2 | 40.0 | 40.3 | 0.997 |
| as found 3rd point | 4980 | 19.6 | 20.0 | 20.3 | 0.995 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4921 | 78.4 | 80.0 | 79.9 | 1.001 |
| second point | 4960 | 39.2 | 40.0 | 40.3 | 0.993 |
| third point | 4980 | 19.6 | 20.0 | 20.1 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4921 | 78.4 | 80.0 | 79.5 | 1.006 |
| SO2 Scrubber Check | 4919 | 81.3 | 813.0 | 0.2 | ---- |
| Date of last scrubber change: | | December 17, 2021 | | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.2 | Prev response: | 79.84 | *% change: | 0.4% |
| Baseline Corr 2nd AF pt: | 40.1 | AF Slope: | 1.002364 | AF Intercept: | 0.220000 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999999 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

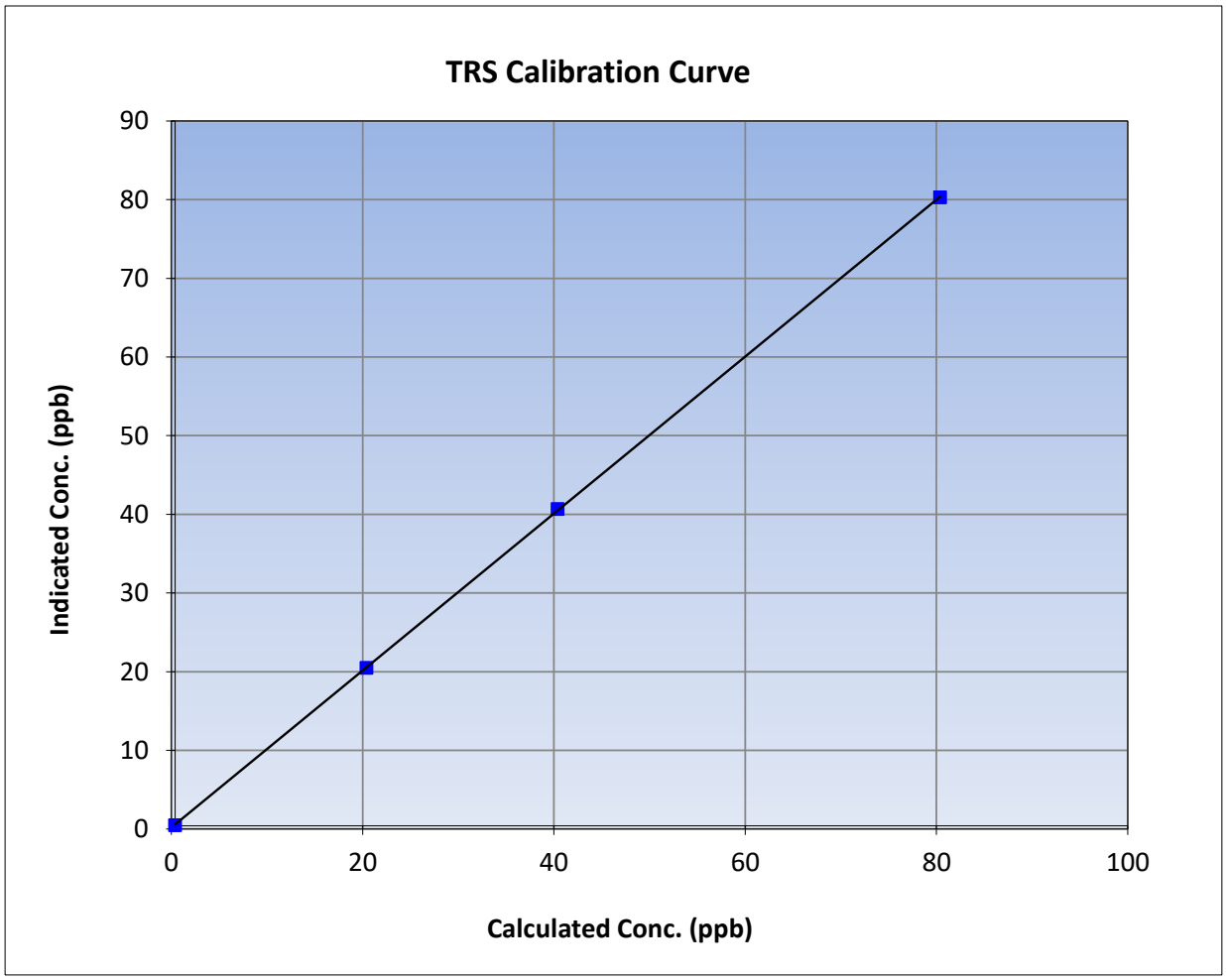
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:02 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1218153461 |

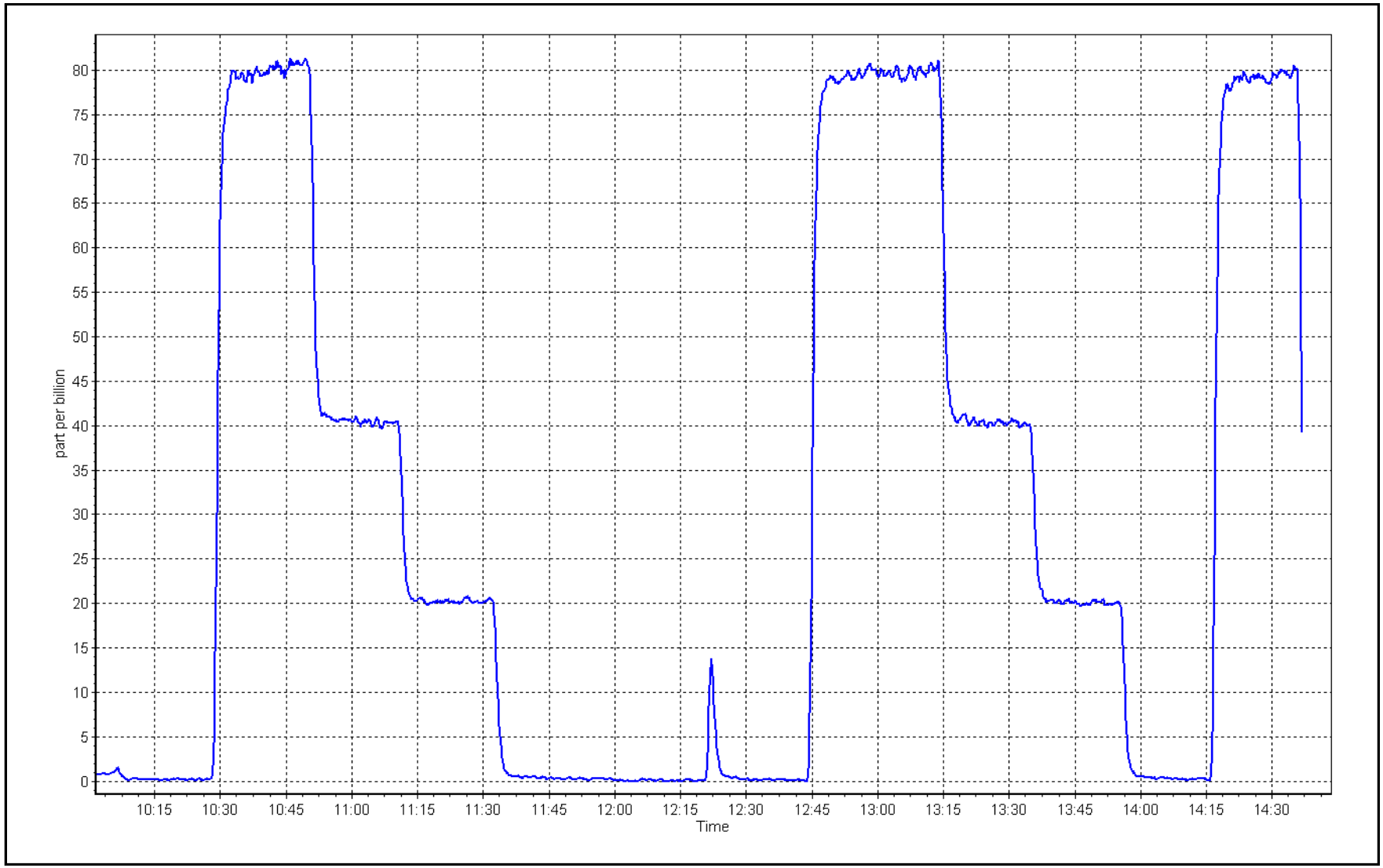
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 79.9 | 1.0012 |
| 40.0 | 40.3 | 0.9925 |
| 20.0 | 20.1 | 0.9949 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999982 | *≥0.995* |
| Slope | 0.997793 | *0.90 - 1.10* |
| Intercept | 0.179996 | *+/-3* |



**TRS Calibration Plot** Date: February 7, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 10:02 | End time (MST): | 14:36 |
| 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: | N/A |
| Removed Gas Cyl #: | N/A | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 3565 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4890 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43iQTL | | Analyzer serial #: | 1200326167 | |
| Converter make: | Global | | Converter serial #: | 2022-221 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.998712 | 1.002571 | Backgd or Offset: | 2.45 | 2.04 |
| Calibration intercept: | 0.176812 | 0.116774 | Coeff or Slope: | 0.992 | 0.992 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.4 | ---- |
| as found span | 4922 | 78.4 | 80.0 | 80.4 | 0.990 |
| as found 2nd point | 4960 | 39.2 | 40.0 | 40.0 | 0.990 |
| as found 3rd point | 4980 | 19.6 | 20.0 | 19.7 | 0.995 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4922 | 78.4 | 80.0 | 80.2 | 0.997 |
| second point | 4960 | 39.2 | 40.0 | 40.4 | 0.990 |
| third point | 4980 | 19.6 | 20.0 | 20.2 | 0.990 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4922 | 78.4 | 80.0 | 80.2 | 0.997 |
| SO2 Scrubber Check | 4919 | 81.3 | 813.0 | 0.4 | ---- |
| Date of last scrubber change: | | January 25, 2024 | | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.8 | Prev response: | 80.04 | *% change: | 0.9% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.010914 | AF Intercept: | -0.443233 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999998 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

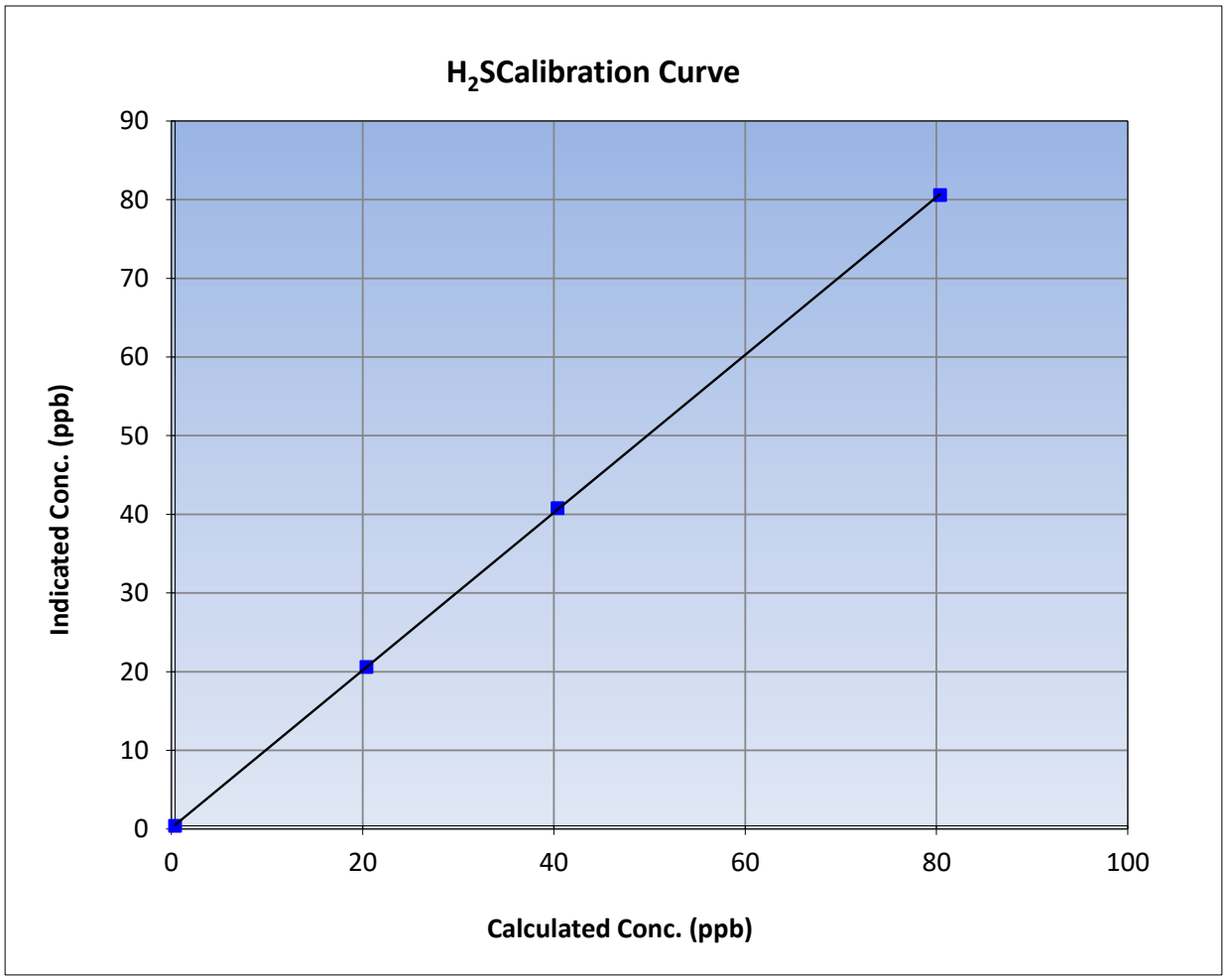
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:02 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 43iQTL | Analyzer serial #: | 1200326167 |

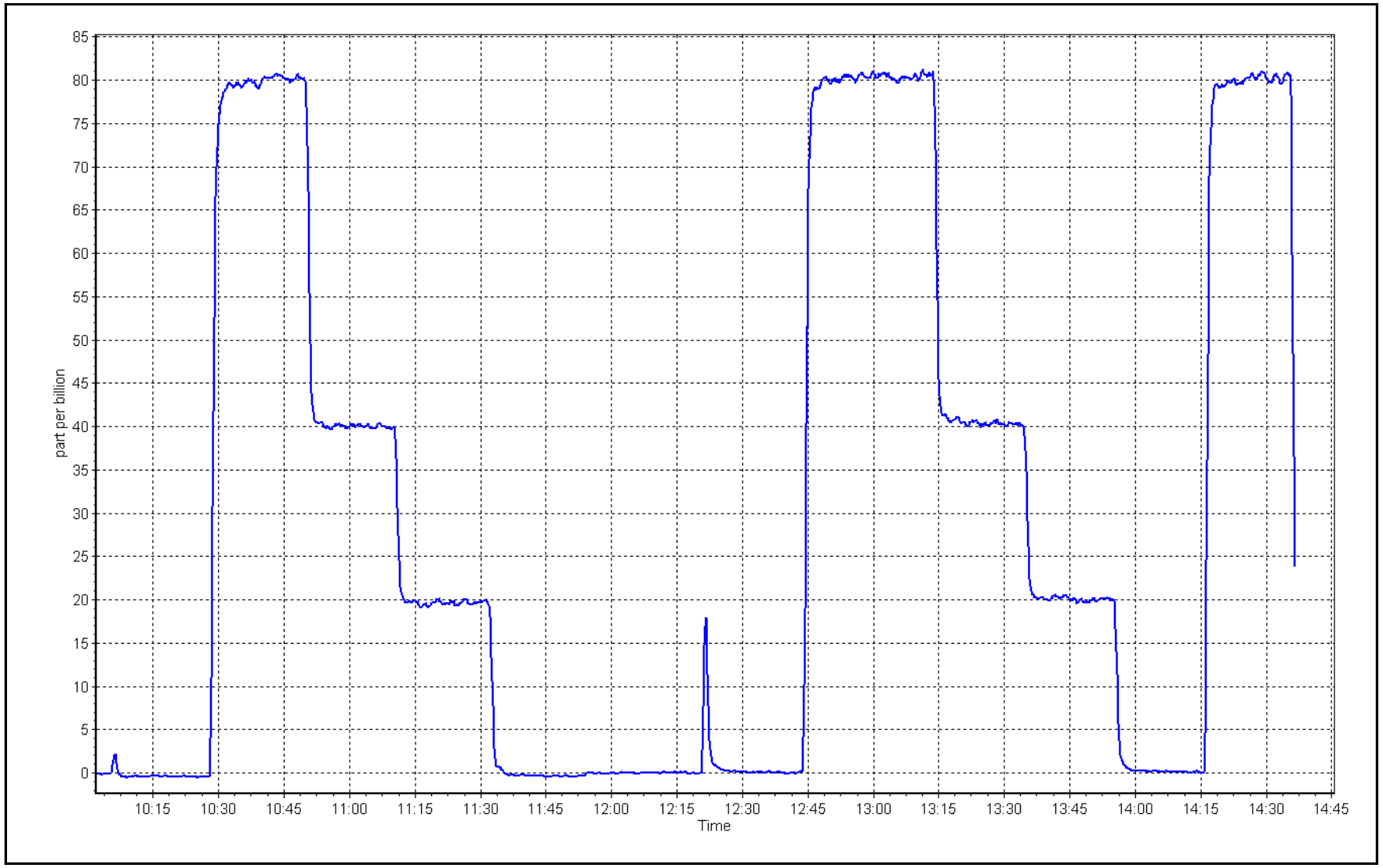
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.2 | 0.9972 |
| 40.0 | 40.4 | 0.9901 |
| 20.0 | 20.2 | 0.9900 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999984 | *≥0.995* |
| Slope | 1.002571 | *0.90 - 1.10* |
| Intercept | 0.116774 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 7, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 11:04 | End time (MST): | 14:07 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC418809 | Cal Gas Expiry Date: | March 10, 2031 | |
| CH4 Cal Gas Conc. | 497.2 | ppm | CH4 Equiv Conc. | 1061.8 | ppm |
| C3H8 Cal Gas Conc. | 205.3 | ppm | | | |
| Removed Gas Cert: | | NA | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 497.2 | ppm | CH4 Equiv Conc. | 1061.8 | ppm |
| Removed C3H8 Conc. | 205.3 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3565 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4890 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1180320040 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 4.37E-04 | 4.30E-04 | NMHC SP Ratio: | 7.11E-05 | 7.18E-05 |
| CH4 Retention time: | 16.7 | 16.7 | NMHC Peak Area: | 129269 | 127929 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4918 | 81.3 | 17.27 | 17.38 | 0.994 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4918 | 81.3 | 17.27 | 17.28 | 0.999 |
| second point | 4959 | 40.7 | 8.64 | 8.50 | 1.017 |
| third point | 4980 | 20.3 | 4.31 | 4.28 | 1.006 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4918 | 81.3 | 17.27 | 17.28 | 0.999 |
| | | | | Average Correction Factor | 1.007 |
| Baseline Corr AF: | 17.38 | Prev response | 17.18 | *% change | 1.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| as found span | 4918 | 81.3 | 9.18 | 9.12 | 1.007 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4918 | 81.3 | 9.18 | 9.17 | 1.001 |
| second point | 4959 | 40.7 | 4.60 | 4.55 | 1.011 |
| third point | 4980 | 20.3 | 2.29 | 2.30 | 0.998 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4918 | 81.3 | 9.18 | 9.21 | 0.997 |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 9.12 | Prev response | 9.15 | *% change | -0.3% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4918 | 81.3 | 8.09 | 8.26 | 0.978 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4918 | 81.3 | 8.09 | 8.11 | 0.997 |
| second point | 4959 | 40.7 | 4.05 | 3.96 | 1.023 |
| third point | 4980 | 20.3 | 2.02 | 1.99 | 1.016 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4918 | 81.3 | 8.09 | 8.07 | 1.002 |
| | | | | Average Correction Factor | 1.012 |
| Baseline Corr AF: | 8.26 | Prev response | 8.05 | *% change | 2.6% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.996788 | 1.000371 |
| THC Cal Offset: | -0.028998 | -0.041569 |
| CH4 Cal Slope: | 0.998653 | 1.002874 |
| CH4 Cal Offset: | -0.029405 | -0.035591 |
| NMHC Cal Slope: | 0.996266 | 0.998167 |
| NMHC Cal Offset: | -0.001592 | -0.005978 |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## THC Calibration Summary

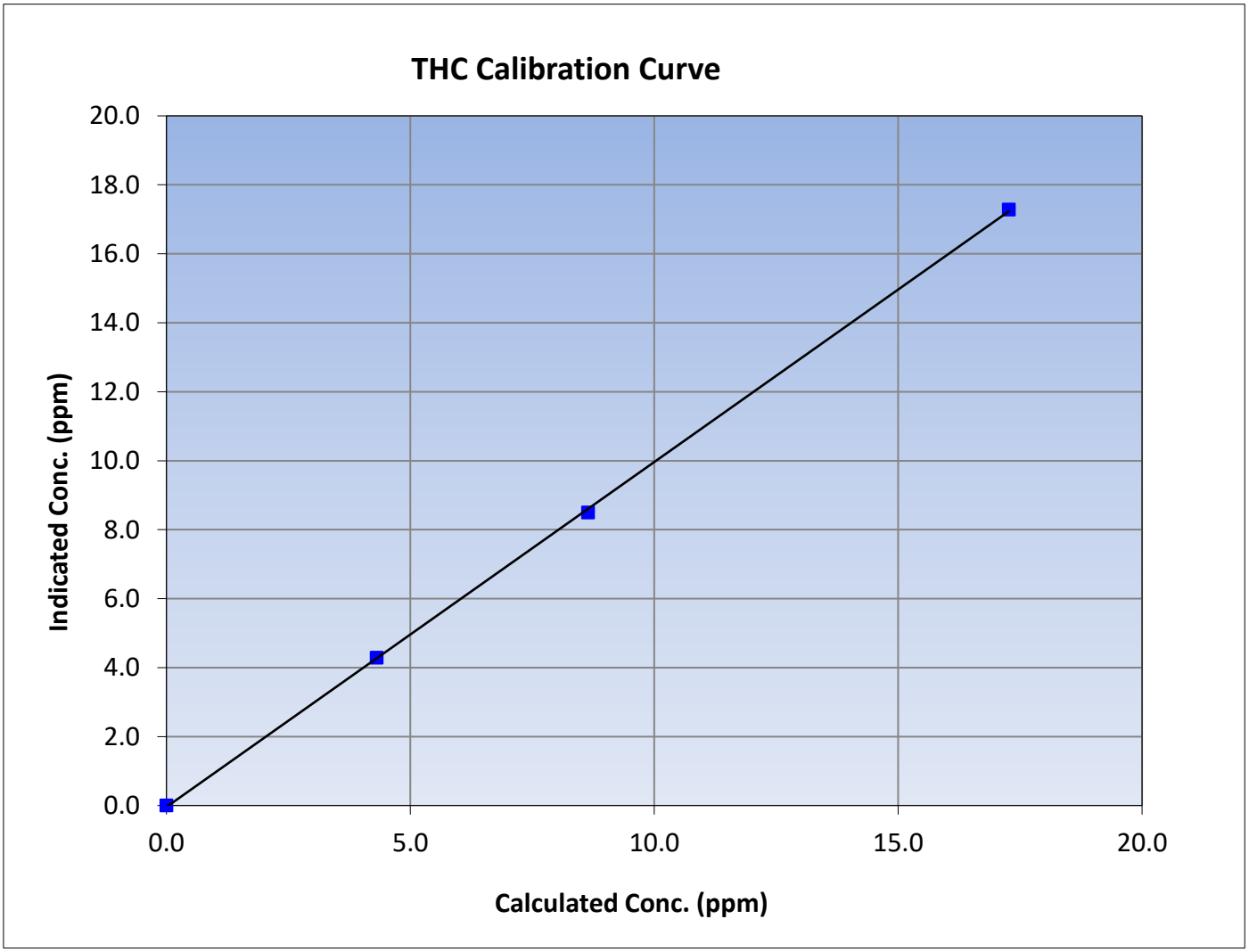
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:04 | End Time (MST): | 14:07 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320040 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999909 | *≥0.995* |
| 17.27 | 17.28 | 0.9992 | | | |
| 8.64 | 8.50 | 1.0166 | Slope | 1.000371 | *0.90 - 1.10* |
| 4.31 | 4.28 | 1.0063 | | | |
| | | | Intercept | -0.041569 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

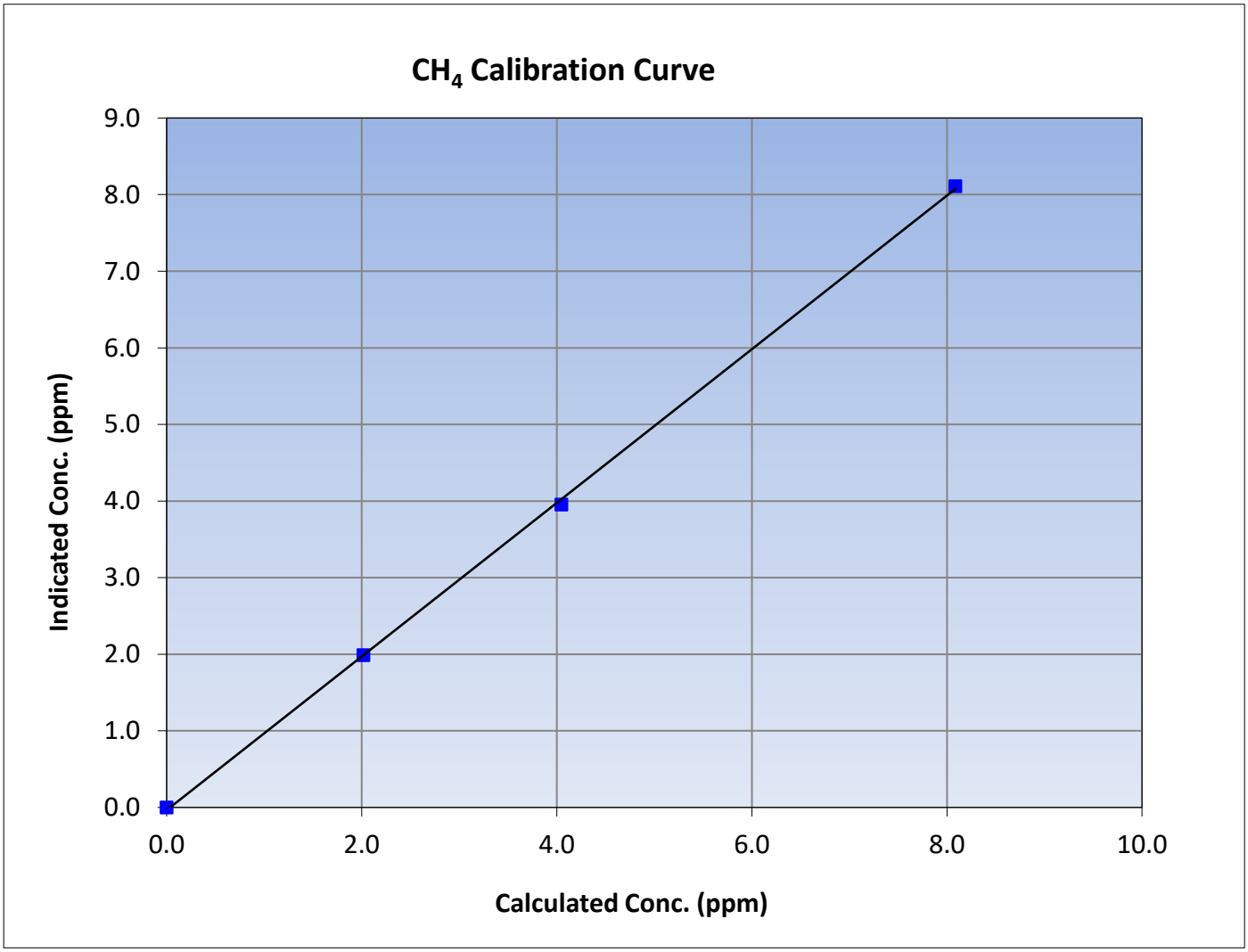
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:04 | End Time (MST): | 14:07 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320040 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999801 | *≥0.995* |
| 8.09 | 8.11 | 0.9972 | | | |
| 4.05 | 3.96 | 1.0234 | Slope | 1.002874 | *0.90 - 1.10* |
| 2.02 | 1.99 | 1.0159 | | | |
| | | | Intercept | -0.035591 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

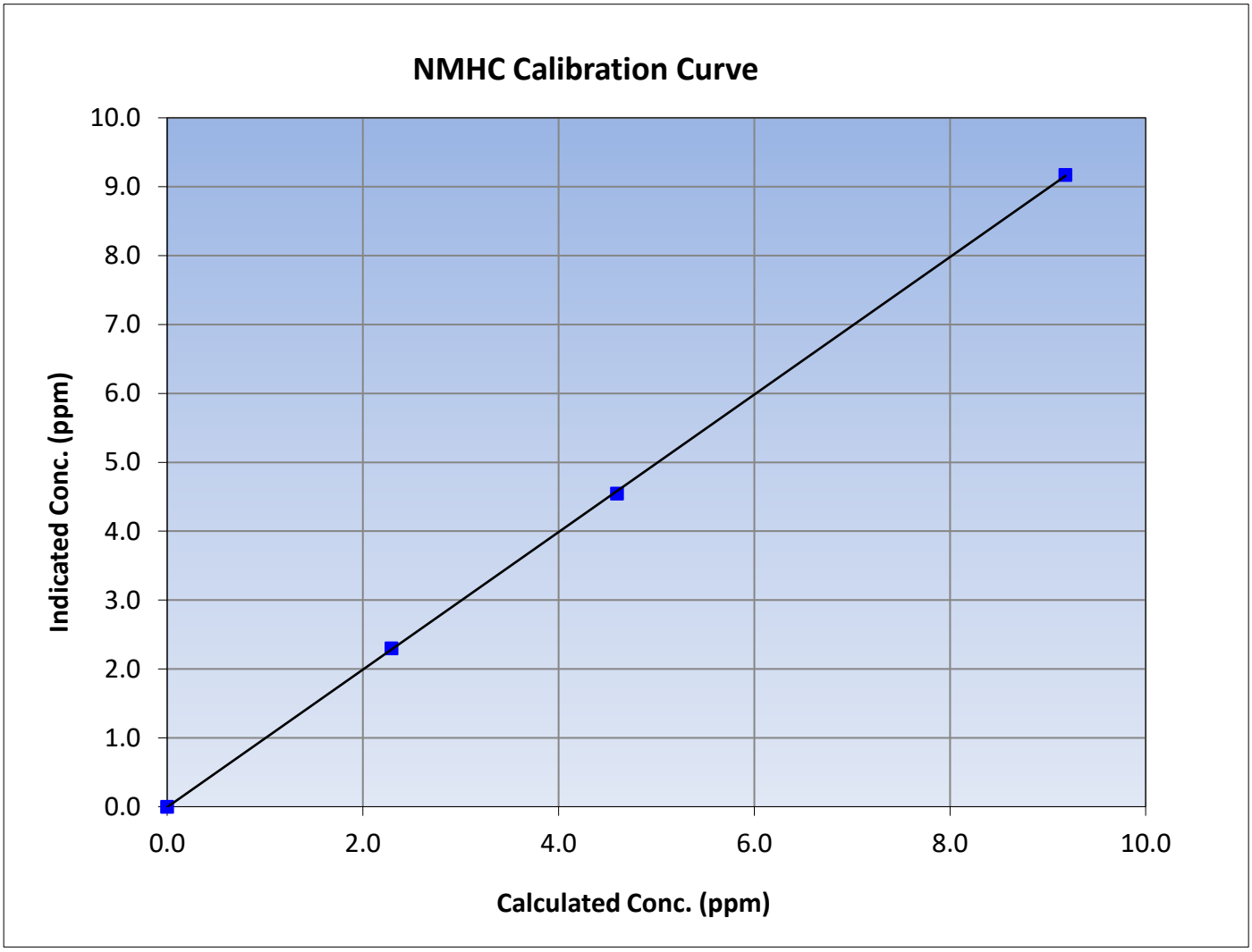
Version-06-2022

### Station Information

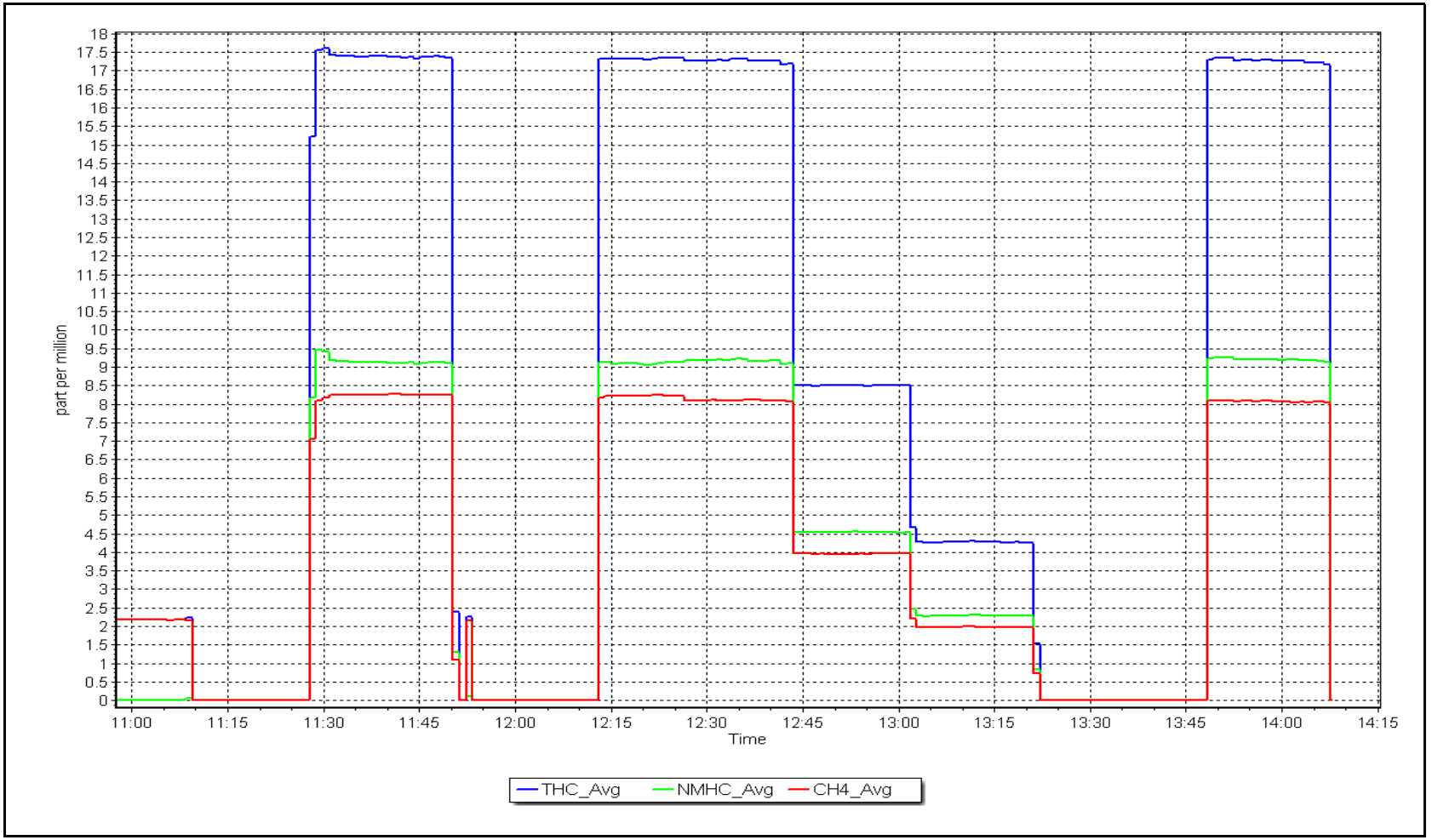
| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:04 | End Time (MST): | 14:07 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320040 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999964 | ≥0.995 |
| 9.18 | 9.17 | 1.0010 | | | |
| 4.60 | 4.55 | 1.0108 | Slope | 0.998167 | 0.90 - 1.10 |
| 2.29 | 2.30 | 0.9979 | | | |
| | | | Intercept | -0.005978 | +/-0.5 |



**NMHC Calibration Plot** Date: February 5, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 26, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 10:29 | End time (MST): | 16:46 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | | CC335700 | Cal Gas Expiry Date: | September 1, 2032 | |
| NOX Cal Gas Conc: | 59.40 | ppm | NO Cal Gas Conc: | 59.20 | ppm |
| Removed Cylinder #: | | T2Y1P9L | Removed Gas Exp Date: | December 11, 2023 | |
| Removed Gas NOX Conc: | 50.84 | ppm | Removed Gas NO Conc: | 50.04 | ppm |
| NOX gas Diff: | -2.2% | | NO gas Diff: | -0.7% | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3565 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4890 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153357 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.442 | 1.556 | NO bkgnd or offset: | 7.1 | 7.6 |
| NOX coeff or slope: | 0.992 | 0.999 | NOX bkgnd or offset: | 7.2 | 7.6 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 199.2 | 208.1 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000562 | 1.000310 |
| $NO_X$ Cal Offset: | 0.220000 | -0.160000 |
| NO Cal Slope: | 0.999101 | 1.001719 |
| NO Cal Offset: | -0.740000 | -0.920000 |
| $NO_2$ Cal Slope: | 1.003895 | 0.995800 |
| $NO_2$ Cal Offset: | 0.627156 | -0.397873 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 | ---- | ---- |
| as found span | 4920 | 80.0 | 813.4 | 800.6 | 12.8 | 761.9 | 744.1 | 17.8 | 1.0676 | 1.0760 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4932 | 67.6 | 803.1 | 800.4 | 2.7 | 737.2 | 739.2 | -2.0 | 1.0894 | 1.0828 |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.1 | ---- | ---- |
| high point | 4932 | 67.6 | 803.1 | 800.4 | 2.7 | 803.8 | 801.8 | 2.1 | 0.9991 | 0.9982 |
| second point | 4966 | 33.8 | 401.5 | 400.2 | 1.4 | 400.0 | 398.2 | 1.8 | 1.0039 | 1.0050 |
| third point | 4983 | 16.9 | 200.8 | 200.1 | 0.7 | 201.2 | 199.2 | 2.1 | 0.9979 | 1.0045 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | ---- | ---- |
| as left span | 4932 | 67.6 | 803.1 | 393.2 | 409.9 | 797.3 | 390.7 | 406.6 | 1.0073 | 1.0064 |
| | | | | | | | | Average Correction Factor | 1.0003 | 1.0026 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 762.0 ppb | NO = 744.1 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -6.8% |
| Previous Response | $NO_X$ = 814.1 ppb | NO = 799.2 ppb | | | *Percent Change | NO = | -7.4% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 797.9 | 390.7 | 409.9 | 407.9 | 1.0049 | 99.5% |
| 2nd GPT point (200 ppb O3) | 797.9 | 594.8 | 205.8 | 204.7 | 1.0054 | 99.5% |
| 3rd GPT point (100 ppb O3) | 797.9 | 697.1 | 103.5 | 101.9 | 1.0157 | 98.5% |
| | | | | Average Correction Factor | 1.0087 | 99.1% |

Notes: Changed the NO calibration gas cylinder after as founds. Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

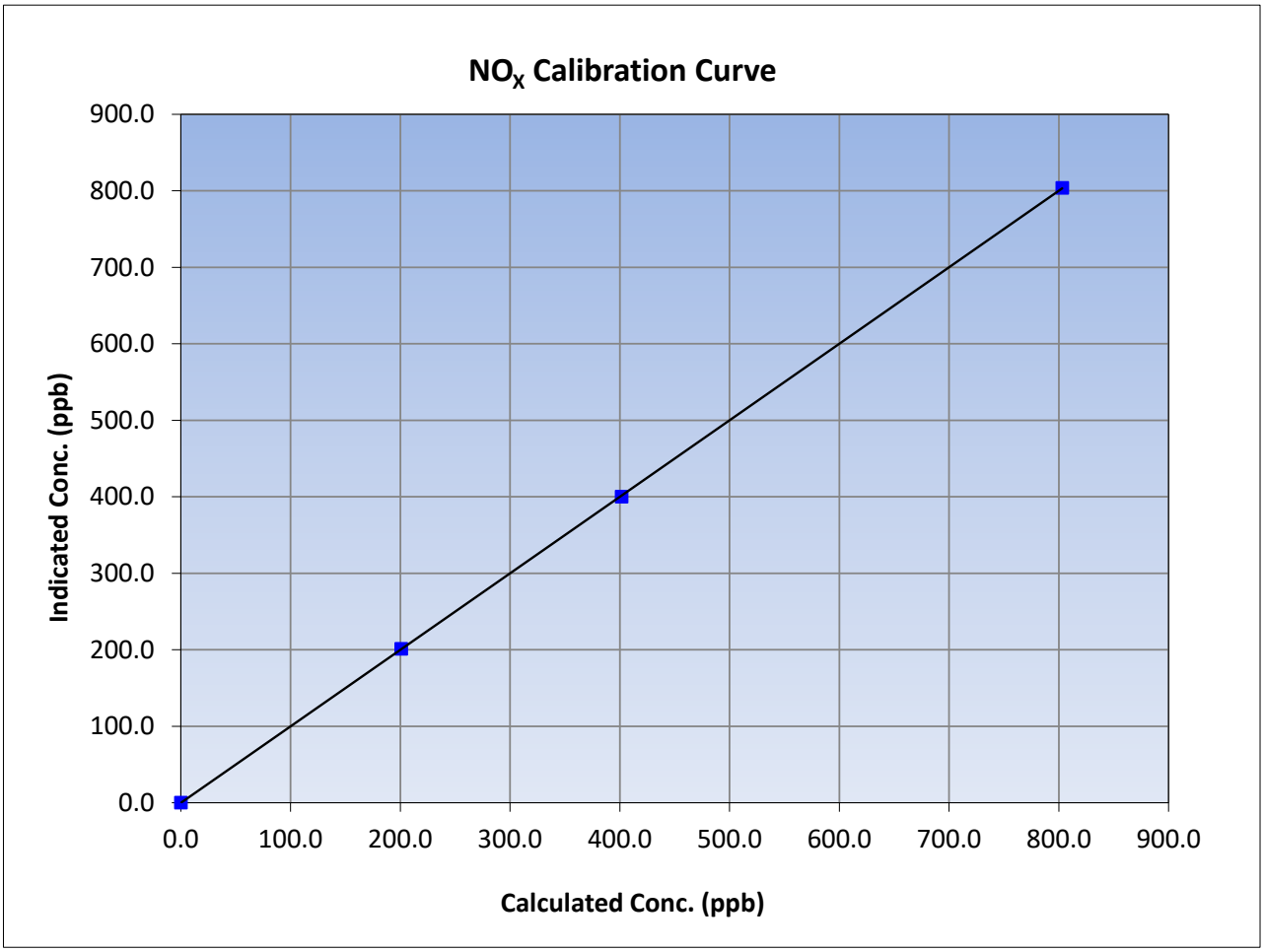
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 26, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:29 | End Time (MST): | 16:46 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153357 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.2 | ---- | Correlation Coefficient | 0.999991 | ≥0.995 |
| 803.1 | 803.8 | 0.9991 | | | |
| 401.5 | 400.0 | 1.0039 | Slope | 1.000310 | 0.90 - 1.10 |
| 200.8 | 201.2 | 0.9979 | | | |
| | | | Intercept | -0.160000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

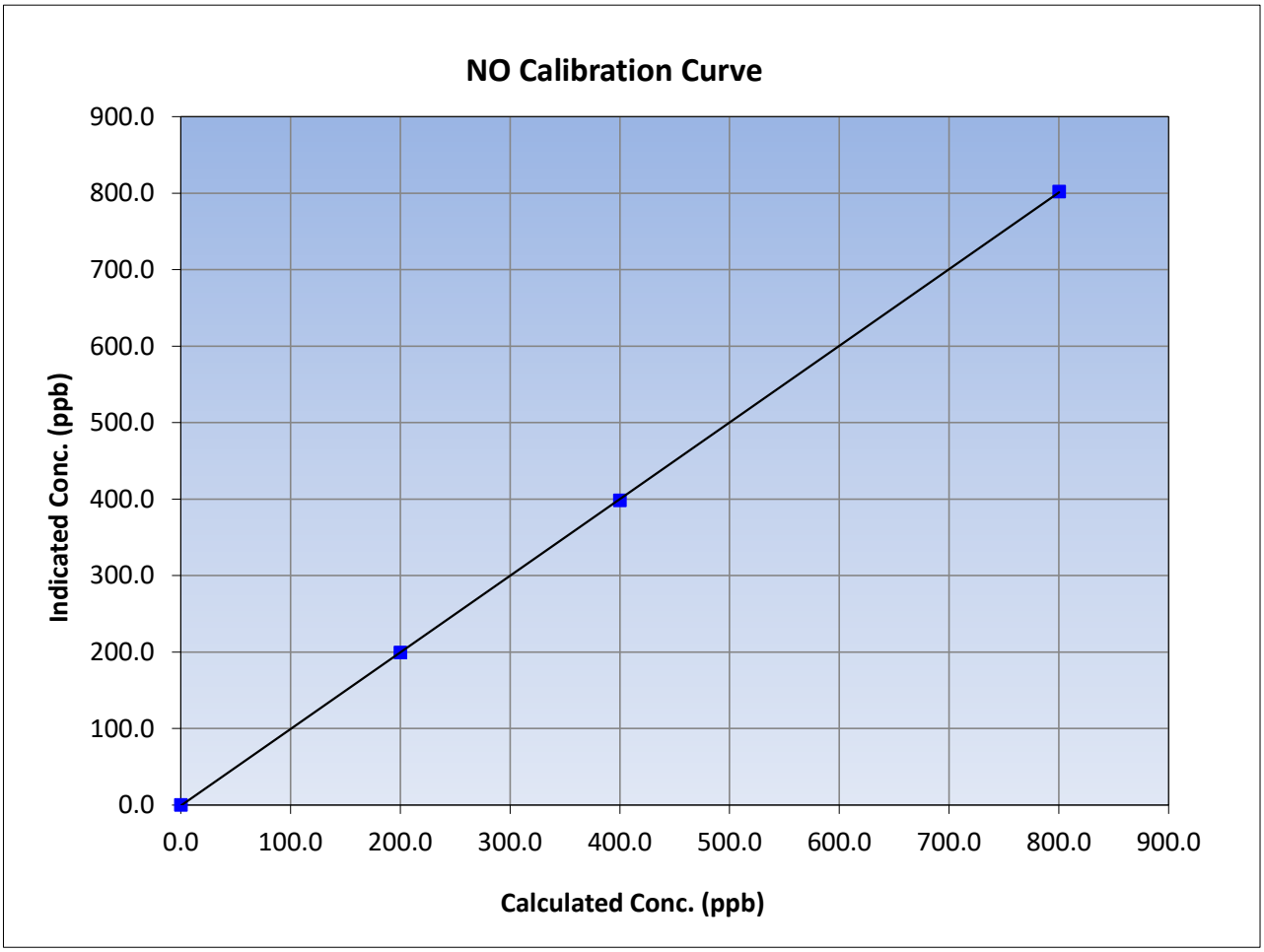
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 26, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:29 | End Time (MST): | 16:46 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153357 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.2 | ---- | Correlation Coefficient | 0.999985 | ≥0.995 |
| 800.4 | 801.8 | 0.9982 | | | |
| 400.2 | 398.2 | 1.0050 | Slope | 1.001719 | 0.90 - 1.10 |
| 200.1 | 199.2 | 1.0045 | | | |
| | | | Intercept | -0.920000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

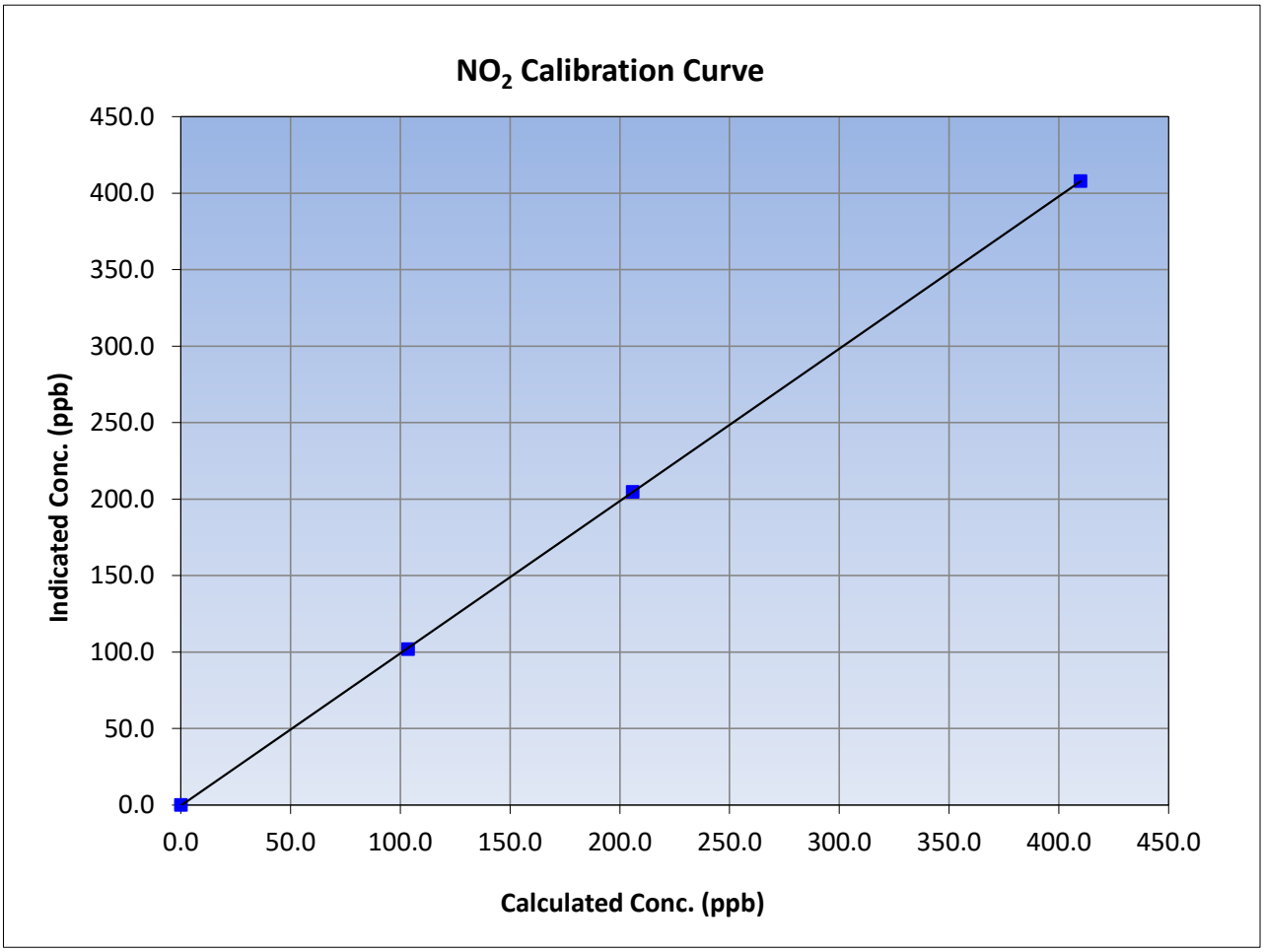
Version-04-2020

### Station Information

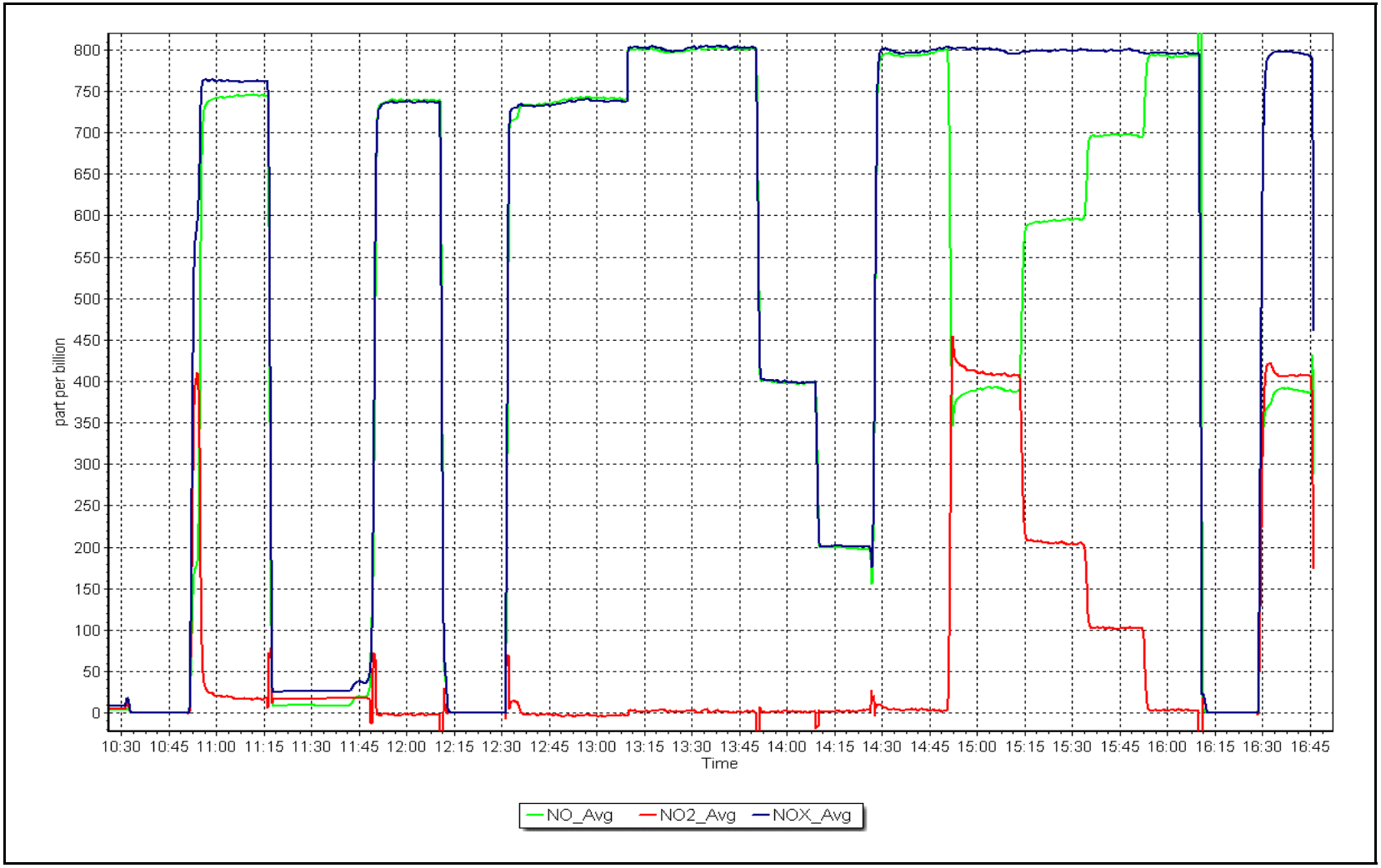
| | | | |
|---|---|---|---|
| Calibration Date: | February 26, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:29 | End Time (MST): | 16:46 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153357 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999990 | ≥0.995 |
| 409.9 | 407.9 | 1.0049 | | | |
| 205.8 | 204.7 | 1.0054 | Slope | 0.995800 | 0.90 - 1.10 |
| 103.5 | 101.9 | 1.0157 | | | |
| | | | Intercept | -0.397873 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 26, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 11:06 | End time (MST): | 14:10 |
| 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: | 4890 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 1107 |
| Analyzer Range | 0 - 500 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999800 | 0.999143 | Backgd or Offset: | 4.8 | 5.3 |
| Calibration intercept: | 0.360000 | 1.000000 | Coeff or Slope: | 1.014 | 1.015 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| as found span | 5000 | 863.1 | 400.0 | 400.5 | 0.999 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| high point | 5000 | 863.1 | 400.0 | 400.3 | 0.999 |
| second point | 5000 | 742.5 | 200.0 | 201.3 | 0.994 |
| third point | 5000 | 651.7 | 100.0 | 101.4 | 0.986 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 5000 | 863.1 | 400.0 | 405.6 | 0.986 |
| | | | | Average Correction Factor | 0.993 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 399.9 | Previous response | 400.3 | *% 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

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

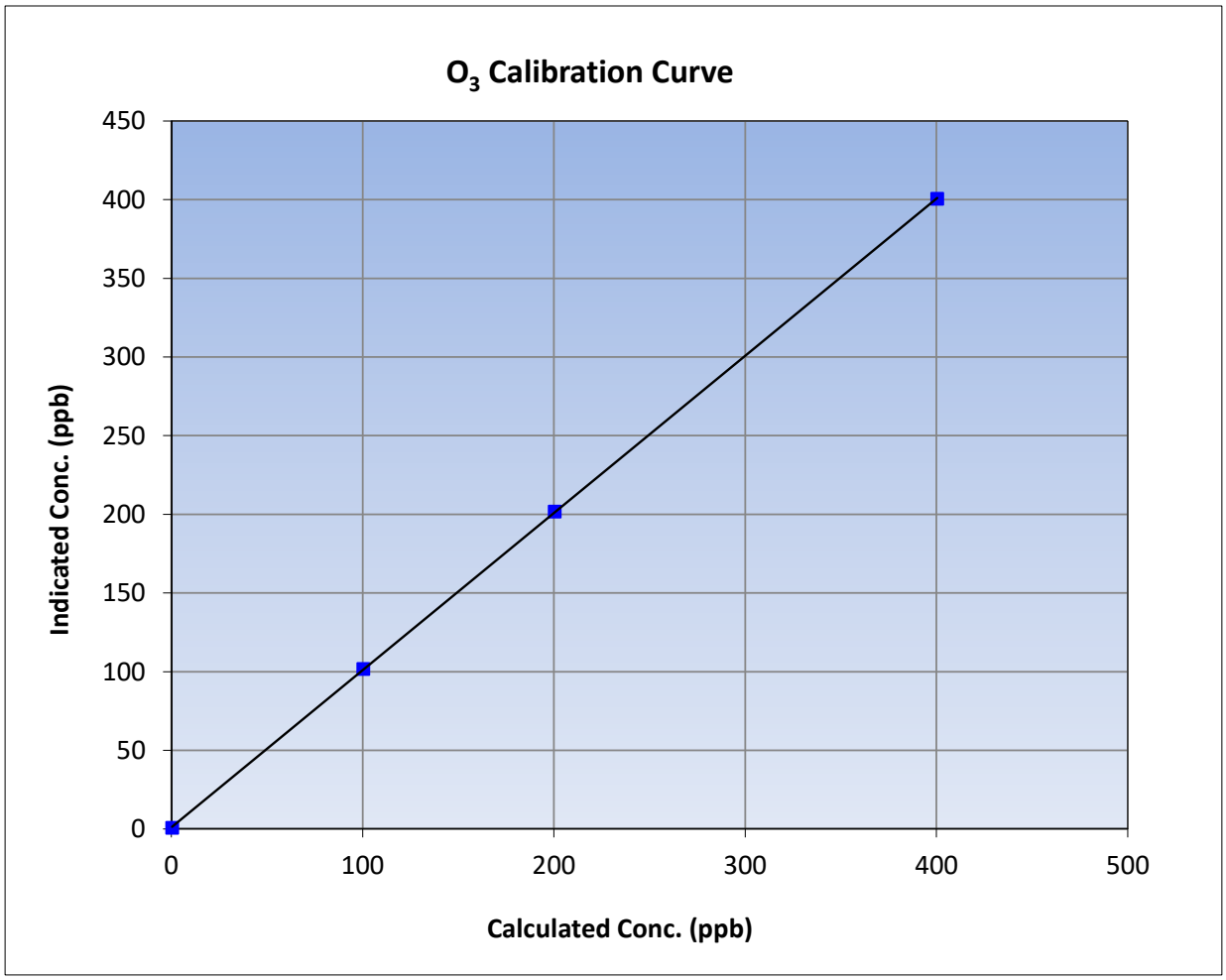
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:06 | End Time (MST): | 14:10 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 1107 |

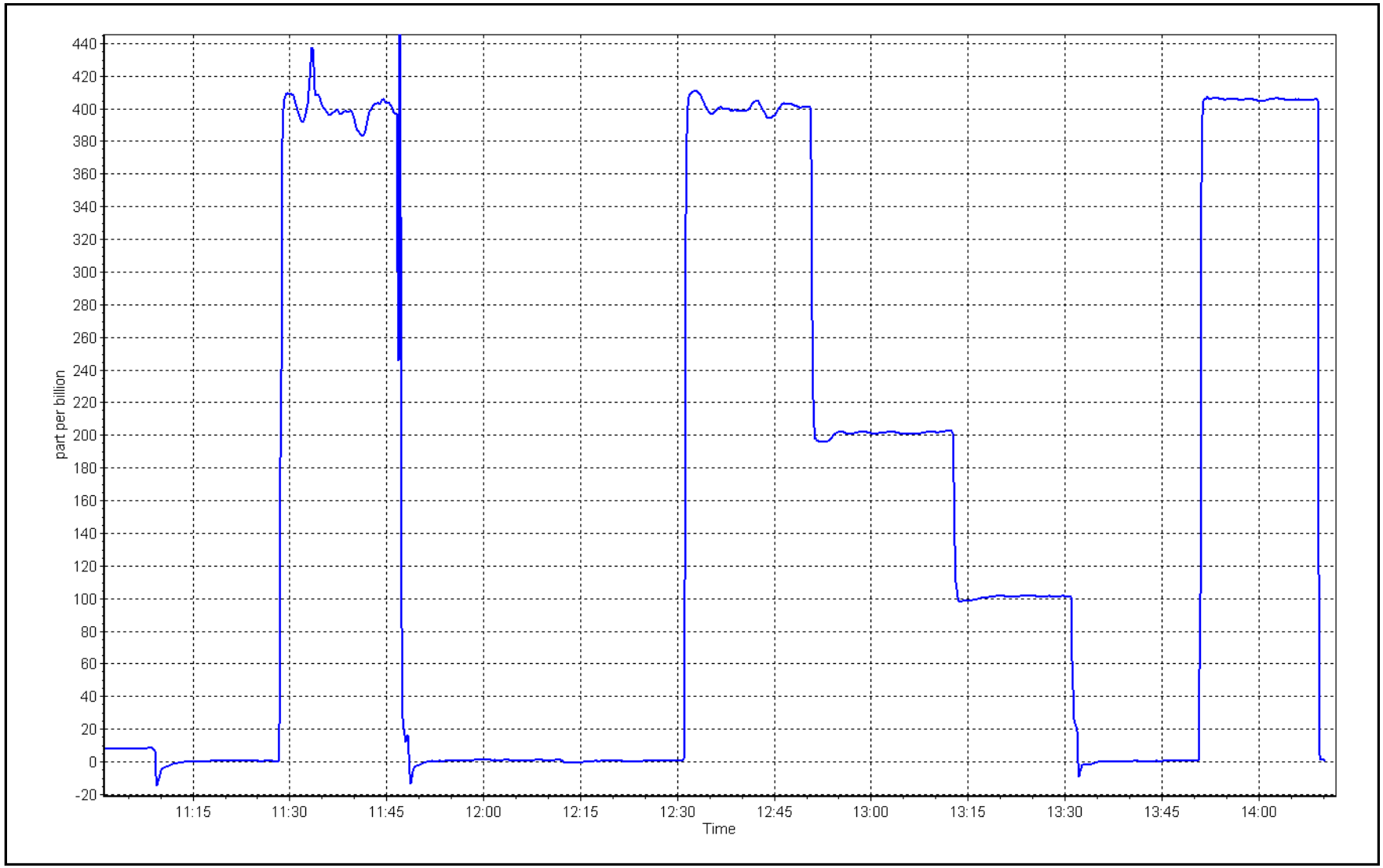
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 400.0 | 400.3 | 0.9993 |
| 200.0 | 201.3 | 0.9935 |
| 100.0 | 101.4 | 0.9862 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999989 | *≥0.995* |
| Slope | 0.999143 | *0.90 - 1.10* |
| Intercept | 1.000000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 2, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay - Bertha Ganter | Station number: | AMS 01 |
| Calibration Date: | February 27, 2024 | Last Cal Date: | January 26, 2024 |
| Start time (MST): | 12:47 | End time (MST): | 13:39 |
| Analyzer Make: | Teledyne API T640 | S/N: | 324 |
| 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) | -15.5 | -16.21 | -15.5 | ☐ | +/- 2 °C |
| P (mmHg) | 742.2 | 741.64 | 742.2 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.99 | 5.137 | 4.99 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 43 | ----- | 43 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 3.1 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

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

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

Date Optical Chamber Cleaned: January 26, 2024

Date Disposable Filter Changed: January 26, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: September 14, 2023

Date RH/T Sensor Cleaned: January 26, 2024

Notes: Verified flow, temperature, and pressure. Leak check passed.

Calibration by: Rene Chamberland

# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 10:42 | End time (MST): | 13:39 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 3040 | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #: | ALM042207 | | | |
| Removed Cal Gas Conc: | 3040 | 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: | 4890 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Teledyne API T300 | | Analyzer serial #: | 3520 | |
| Analyzer Range: | 0 - 50 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.000186 | 1.001370 | Backgd or Offset: | -0.013 | -0.013 |
| Calibration intercept: | 0.241822 | 0.145823 | Coeff or Slope: | 0.983 | 0.989 |

### CO Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as found span | 4933 | 66.7 | 40.6 | 41.0 | 0.988 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4933 | 66.7 | 40.6 | 40.6 | 0.998 |
| second point | 4966 | 33.3 | 20.2 | 20.7 | 0.979 |
| third point | 4983 | 16.7 | 10.2 | 10.3 | 0.985 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 2960 | 40.0 | 40.5 | 40.2 | 1.010 |
| | | | | Average Correction Factor | 0.987 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 40.70 | Prev response: | 40.81 | *% 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

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

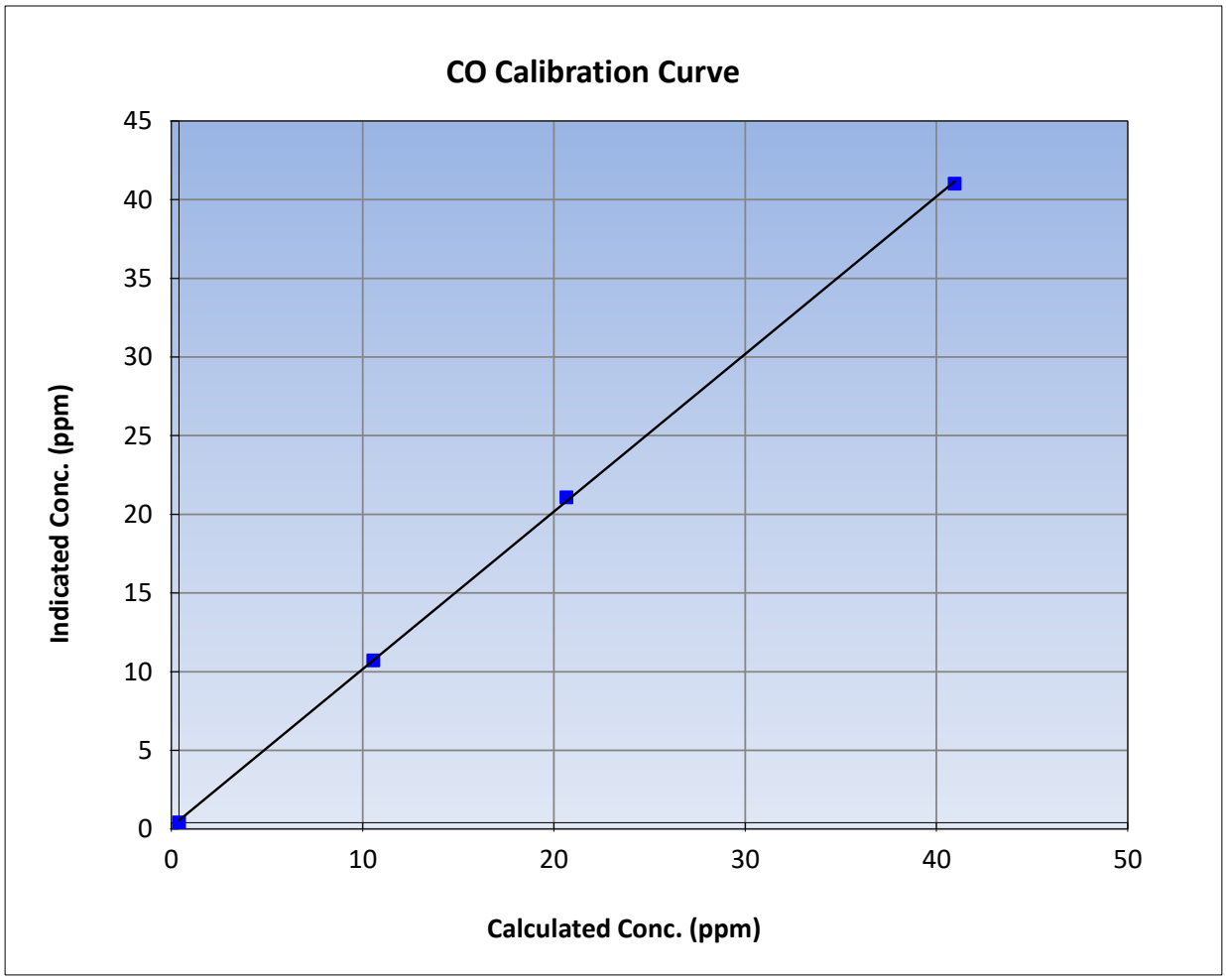
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:42 | End Time (MST): | 13:39 |
| Analyzer make: | Teledyne API T300 | Analyzer serial #: | 3520 |

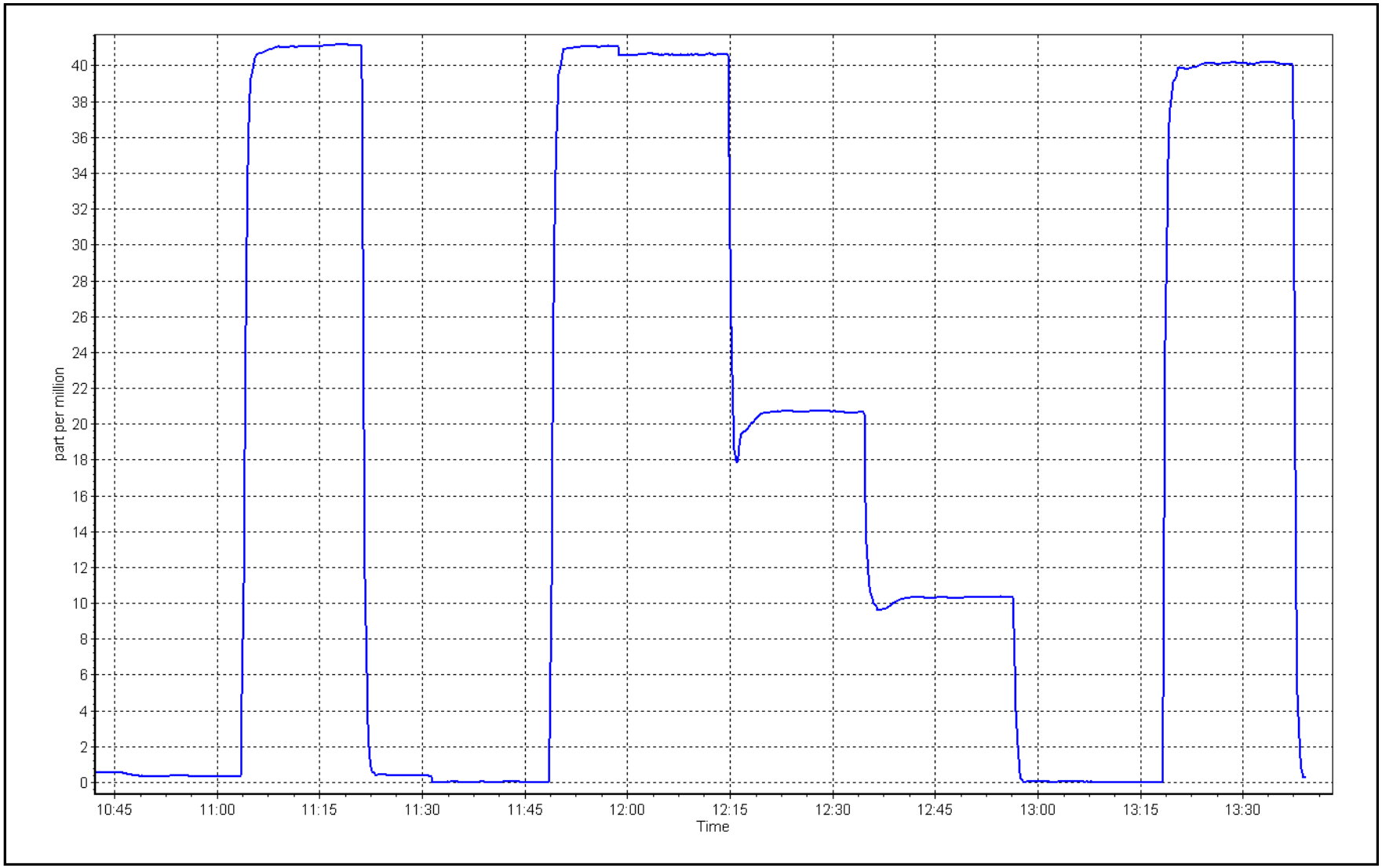
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 40.6 | 40.6 | 0.9982 |
| 20.2 | 20.7 | 0.9792 |
| 10.2 | 10.3 | 0.9849 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999891 | *≥0.995* |
| Slope | 1.001370 | *0.90 - 1.10* |
| Intercept | 0.145823 | *+/-1.5* |



**CO Calibration Plot** Date: February 21, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## $CO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 9:59 | End time (MST): | 12:52 |
| 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 Sci NG5000 | | Serial Number: | 7220900034 |

### Analyzer Information

Analyzer make: Teledyne API 360 — Analyzer serial #: 442

Analyzer Range 0 - 2,000 ppm

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.001967 | 0.998372 | Backgd or Offset: | 0.045 | 0.045 |
| Calibration intercept: | -5.940000 | -5.840000 | Coeff or Slope: | 0.876 | 0.876 |

### $CO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 3000 | 0.0 | 0.0 | -0.2 | ---- |
| as found span | 2920 | 80.0 | 1605.3 | 1596.8 | 1.005 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 3000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 2920 | 80.0 | 1605.3 | 1599.2 | 1.004 |
| second point | 2960 | 40.0 | 802.7 | 794.5 | 1.010 |
| third point | 2980 | 20.0 | 401.3 | 387.6 | 1.035 |
| as left zero | 3000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 2960 | 40.0 | 802.7 | 784.0 | 1.024 |
| | | | | Average Correction Factor | 1.017 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 1597.00 | Prev response: | 1602.55 | *% 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

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $CO_2$ Calibration Summary

Version-01-2020

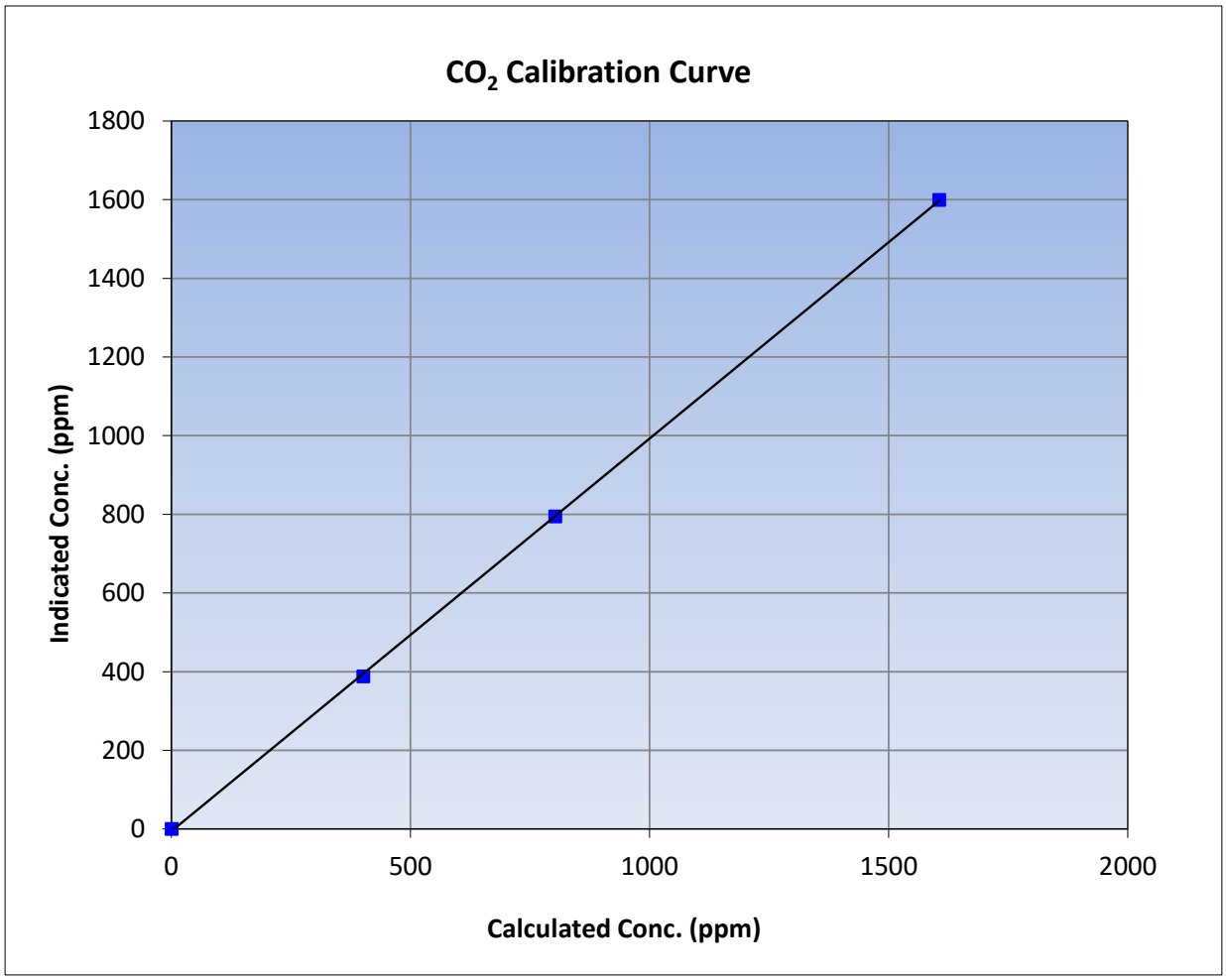
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date | February 6, 2024 | Previous Calibration | January 5, 2024 |
| Station Name | Bertha Ganter-Fort McKay | Station Number | AMS01 |
| Start Time (MST) | 9:59 | End Time (MST) | 12:52 |
| Analyzer make | Teledyne API 360 | Analyzer serial # | 442 |

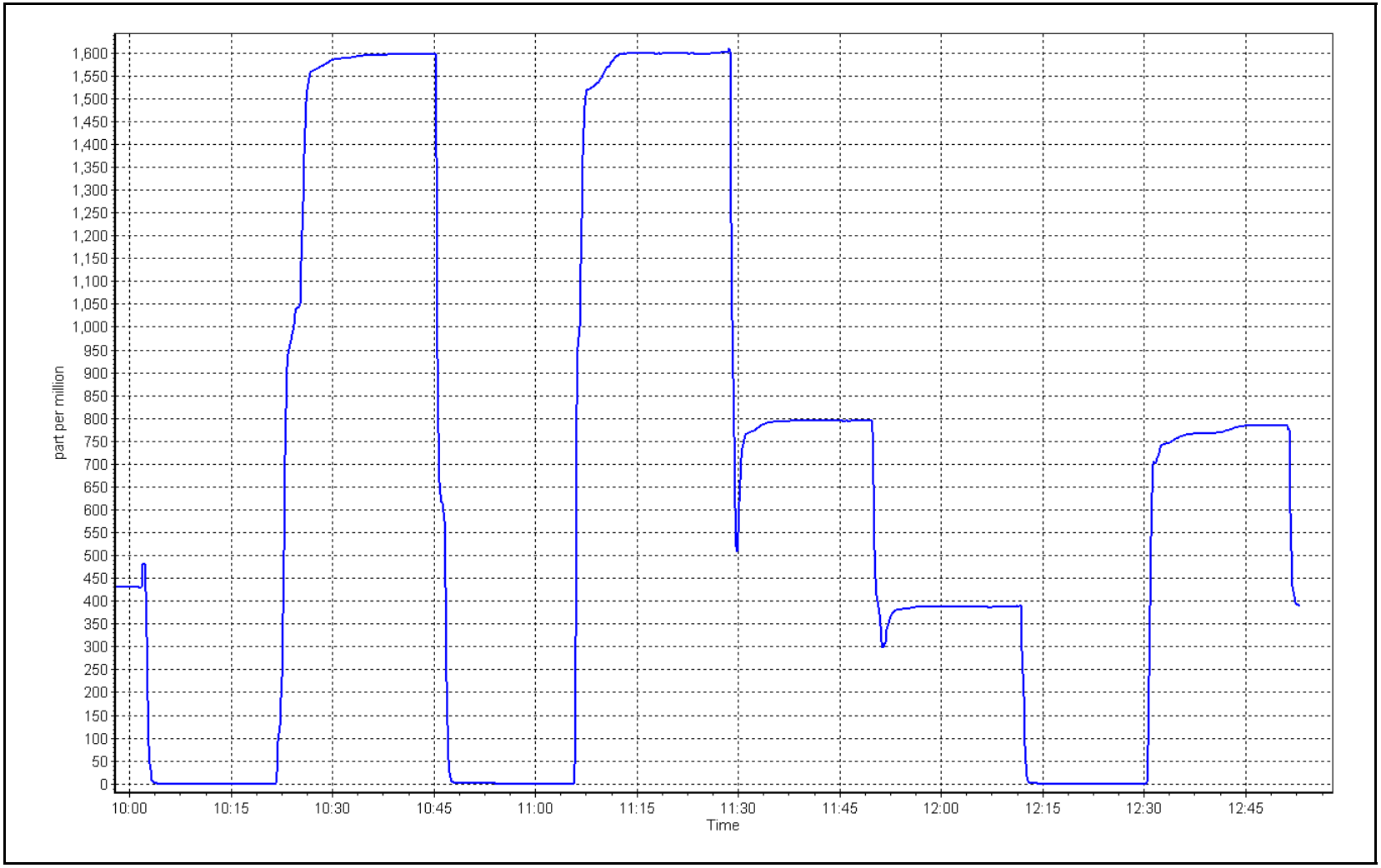
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 1605.3 | 1599.2 | 1.0038 |
| 802.7 | 794.5 | 1.0103 |
| 401.3 | 387.6 | 1.0354 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999933 | *≥0.995* |
| Slope | 0.998372 | *0.90 - 1.10* |
| Intercept | -5.840000 | *+/-10* |



**$CO_2$ Calibration Plot** Date: February 6, 2024 Location: Bertha Ganter-Fort McKay



# Wood Buffalo Environmental Association

## TN - $NO_X$ - $NH_3$ Calibration Report

Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| NOX Cal Date: | February 27, 2024 | Last Cal Date: | January 9, 2024 |
| Start time (MST): | 11:26 | End time (MST): | 16:30 |
| NH3 Cal Date: | February 27, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 16:50 | End time (MST): | 18:26 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| NOX Cal Gas Conc: | 59.40 | ppm | NO Gas Cylinder #: | CC335700 |
| NO Cal Gas Conc: | 59.20 | ppm | NO Cal Gas Expiry: | September 1, 2032 |
| Removed NOX Conc: | 59.40 | ppm | Removed Cylinder #: | NA |
| Removed NO Conc: | 59.20 | ppm | Removed cyl Expiry: | NA |
| NOX gas Diff: | | | NO gas Diff: | |
| NH3 Cal Gas Conc: | 76.58 | ppm | NH3 Gas Cylinder #: | CC743587 |
| | | | NH3 Cal Gas Expiry: | August 22, 2024 |
| Removed NH3 Conc: | 76.58 | ppm | Removed Cylinder #: | NA |
| NH3 gas Diff: | | | Removed cyl Expiry: | NA |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3565 |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4890 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer model: | Teledyne API T201 | Analyzer serial #: | 475 |
| Converter model: | Teledyne API T501 | Converter serial #: | 824 |
| NH3 Range (ppb): | 0 - 2000 ppb | Reaction cell Press: | 6.10 |
| NOX Range (ppb): | 0 - 1000 ppb | Sample Flow: | 519 |

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| NO coefficient: | 0.964 | 0.956 | TN coefficient: | 0.968 | 0.968 |
| NOX coefficient: | 0.967 | 0.962 | NO bkgrnd: | -0.9 | -0.9 |
| NO2 coefficient: | 1.000 | 1.000 | NOX bkgrnd: | -0.3 | -0.3 |
| NH3 coefficient: | 0.932 | 0.946 | TN bkgrnd: | 1.2 | 1.2 |

### Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998960 | 0.999528 |
| $NO_X$ Cal Offset: | -2.460000 | -1.960000 |
| NO Cal Slope: | 0.998530 | 0.999963 |
| NO Cal Offset: | -2.840000 | -2.580000 |
| $NO_2$ Cal Slope: | 0.997727 | 0.992493 |
| $NO_2$ Cal Offset: | -0.655687 | -0.912249 |
| NH3 Cal Slope: | 1.004832 | 1.004564 |
| NH3 Cal Offset: | -8.183521 | -0.612859 |
| TN Cal Slope: | 1.007188 | 1.007097 |
| TN Cal Offset: | -8.051061 | -0.451064 |

# Wood Buffalo Environmental Association

## TN - NOX - $NH_3$ Calibration Report

Version-05-2023

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated TN concentration (ppb) (Cc) | Calculated NOX concentration (ppb) (Cc) | Calculated NH3 concentration (ppb) (Cc) | Indicated TN concentration (ppb) (Ic) | Indicated NOX concentration (ppb) (Ic) | Indicated NH3 concentration (ppb) (Ic) | TN Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.3 | -0.1 | ---- | ---- |
| as found NO | 4932 | 67.6 | 803.1 | 803.1 | ---- | 804.6 | 806.0 | -1.4 | 0.998 | ---- |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | -0.2 | 0.1 | ---- | ---- |
| high NO point | 4932 | 67.6 | 803.1 | 803.1 | ---- | 803.0 | 801.7 | 1.5 | 1.000 | ---- |
| NO/O3 point | 4932 | 67.6 | 803.1 | 803.1 | ---- | 798.0 | 794.6 | 3.3 | 1.006 | ---- |
| as found NH3 | 3416 | 84.1 | 1840.1 | ---- | 1840.1 | 1812.4 | ---- | 1807.6 | 1.015 | 1.018 |
| new NH3 cyl rp | | | | | | | ---- | | | |
| first NH3 | 3418 | 82.2 | 1798.5 | ---- | 1798.5 | 1815.9 | ---- | 1811.4 | 0.990 | 0.993 |
| second NH3 | 3454 | 45.7 | 1000.0 | ---- | 1000.0 | 993.8 | ---- | 991.0 | 1.006 | 1.009 |
| third NH3 | 3477 | 22.8 | 498.9 | ---- | 498.9 | 509.5 | ---- | 507.5 | 0.979 | 0.983 |
| | | | | | | | | Average Correction Factor | 1.0032 | 0.9950 |

Corrected As found TN = 805 ppb $NO_X$ = 806.3 ppb NH3 = 1807.7 ppb *Percent Change TN = 0.5%

Previous Response TN = 800.8 ppb $NO_X$ = 799.8 ppb NH3 = 1840.8 ppb *Percent Change $NO_X$ = 0.8%

*Percent Change NH3 = -1.8%

* = > +/-5% change initiates investigation

NH3 Previous Converter Efficiency = 93.2%

NH3 Current Converter Efficiency = 94.6%

# Wood Buffalo Environmental Association

# $NO_X$ - NO - $NO_2$ Calibration Report

Version-05-2023

## 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 TN concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated TN concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.2 | -0.4 | ---- | ---- |
| as found span | 4932 | 67.6 | 803.1 | 800.4 | 803.1 | 806.0 | 797.9 | 804.6 | 0.9964 | 1.0031 |
| new NO cyl rp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | -0.1 | -0.2 | ---- | ---- |
| high point | 4932 | 67.6 | 803.1 | 800.4 | 803.1 | 801.7 | 799.4 | 803.0 | 1.0017 | 1.0012 |
| second point | 4966 | 33.8 | 401.5 | 400.2 | 401.5 | 398.3 | 395.2 | 397.7 | 1.0081 | 1.0126 |
| third point | 4983 | 16.9 | 200.8 | 200.1 | 200.8 | 197.1 | 195.8 | 197.1 | 1.0186 | 1.0219 |
| | | | | | | | | Average Correction Factor | 1.0095 | 1.0119 |

Baseline Corr As fnd TN = 805 ppb $NO_X$ = 806.3 ppb NO = 798.1 ppb

Previous Response TN = 800.8 ppb $NO_X$ = 799.8 ppb NO = 796.4 ppb

*Percent Change TN = 0.5%

*Percent Change $NO_X$ = 0.8%

*Percent Change NO = 0.2%

* = > +/-5% change initiates investigation

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found zero | ---- | ---- | 0.0 | -0.1 | ---- | ---- |
| calibration zero | ---- | ---- | 0.0 | -0.2 | ---- | ---- |
| 1st GPT point (400 ppb O3) | 795.6 | 386.8 | 411.5 | 407.8 | 1.0091 | 99.1% |
| 2nd GPT point (200 ppb O3) | 795.6 | 590.4 | 207.9 | 205.3 | 1.0127 | 98.7% |
| 3rd GPT point (100 ppb O3) | 795.6 | 690.0 | 108.3 | 105.7 | 1.0246 | 97.6% |
| | | | | Average Correction Factor | 1.0155 | 98.5% |

Notes: Changed the inlet filter after as founds. Adjusted the NOx/TN span. Adjusted the NH3 span.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## TN Calibration Summary

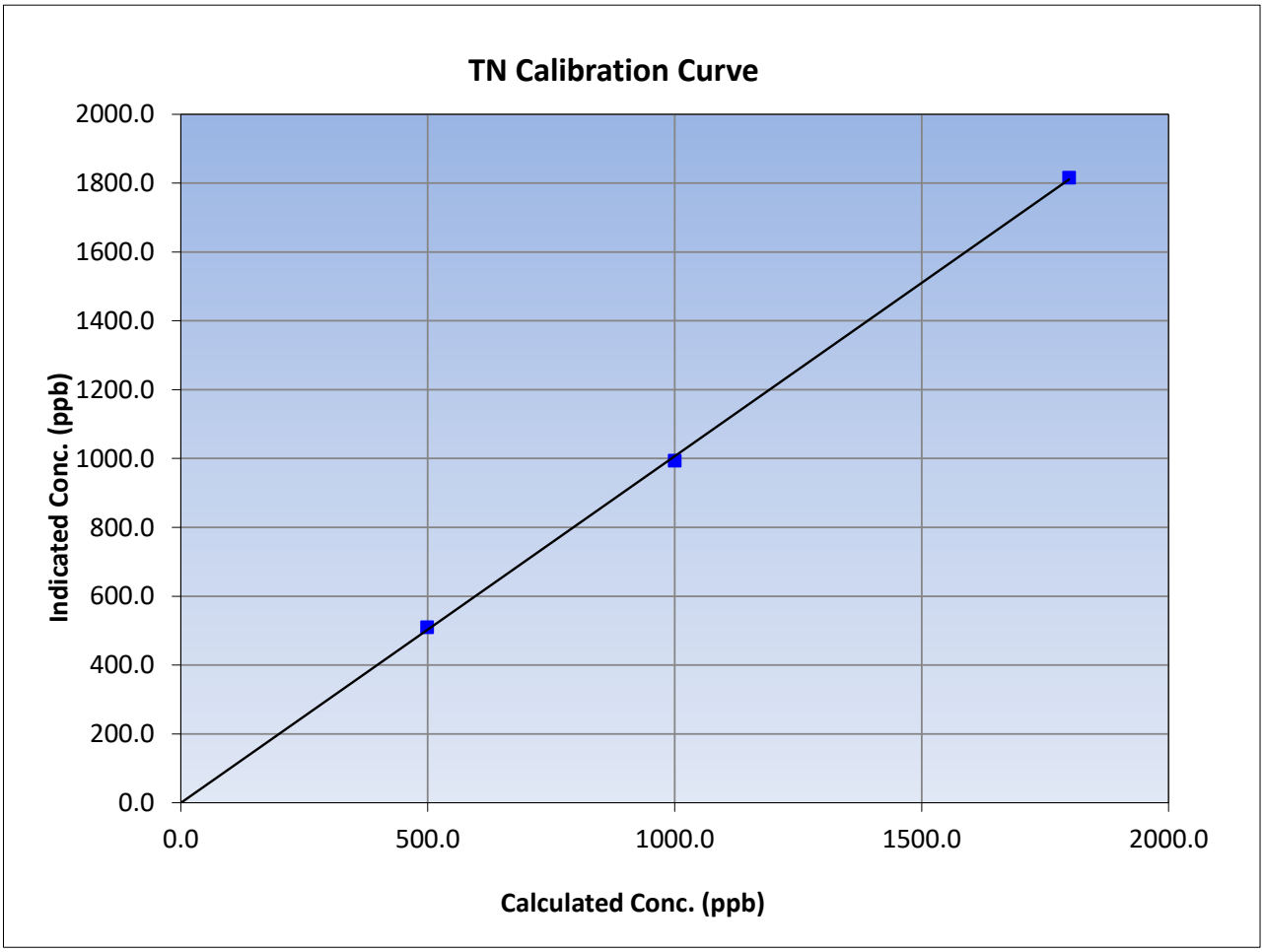
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 16:50 | End Time (MST): | 18:26 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 475 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999862 | ≥0.995 |
| 1798.5 | 1815.9 | 0.9904 | | | |
| 1000.0 | 993.8 | 1.0062 | Slope | 1.007097 | 0.90 - 1.10 |
| 498.9 | 509.5 | 0.9791 | | | |
| | | | Intercept | -0.451064 | +/-20 |



# Wood Buffalo Environmental Association

## $NH_3$ Calibration Summary

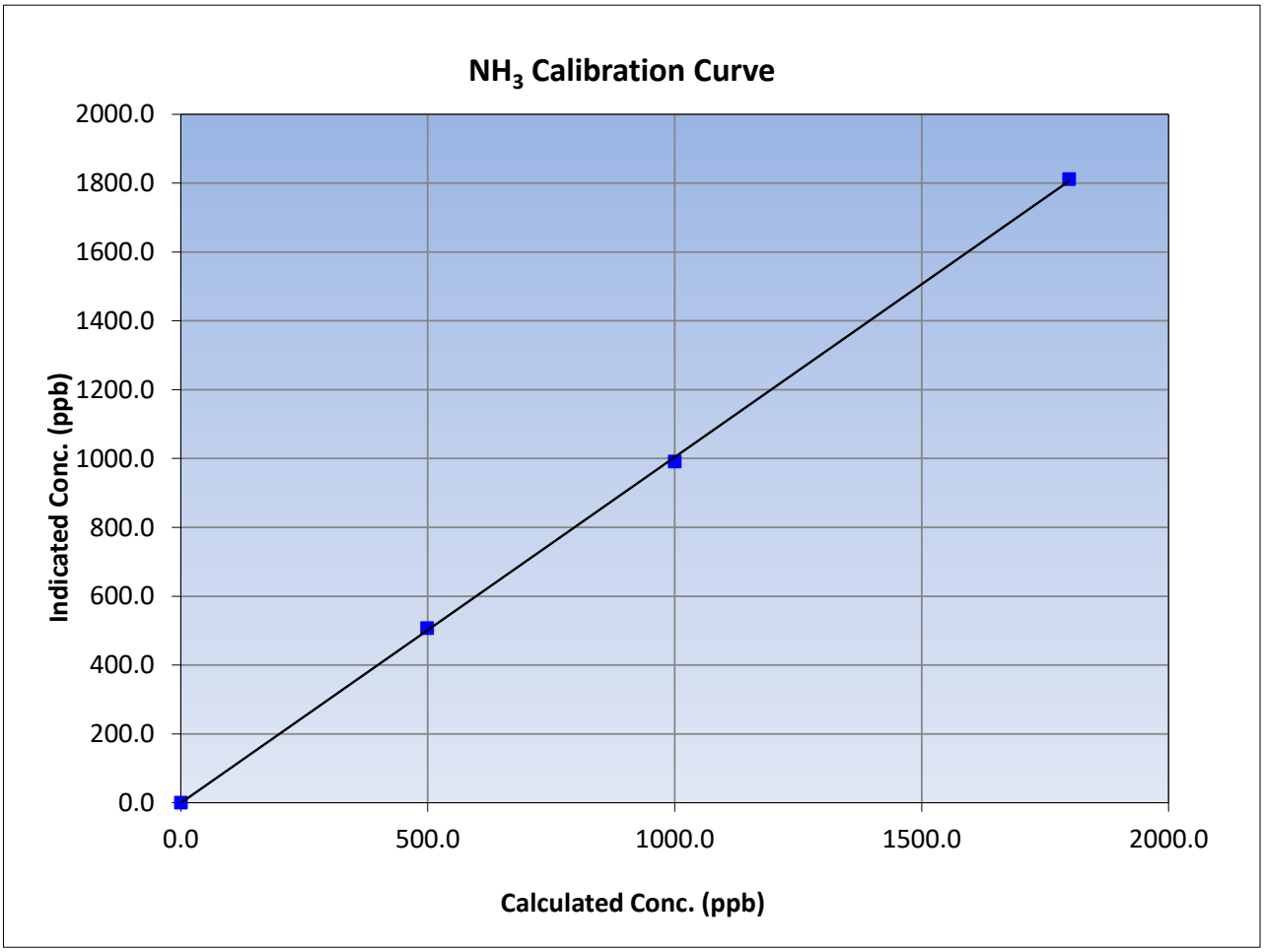
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 16:50 | End Time (MST): | 18:26 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 475 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999863 | *≥0.995* |
| 1798.5 | 1811.4 | 0.9929 | | | |
| 1000.0 | 991.0 | 1.0091 | Slope | 1.004564 | *0.90 - 1.10* |
| 498.9 | 507.5 | 0.9830 | | | |
| | | | Intercept | -0.612859 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

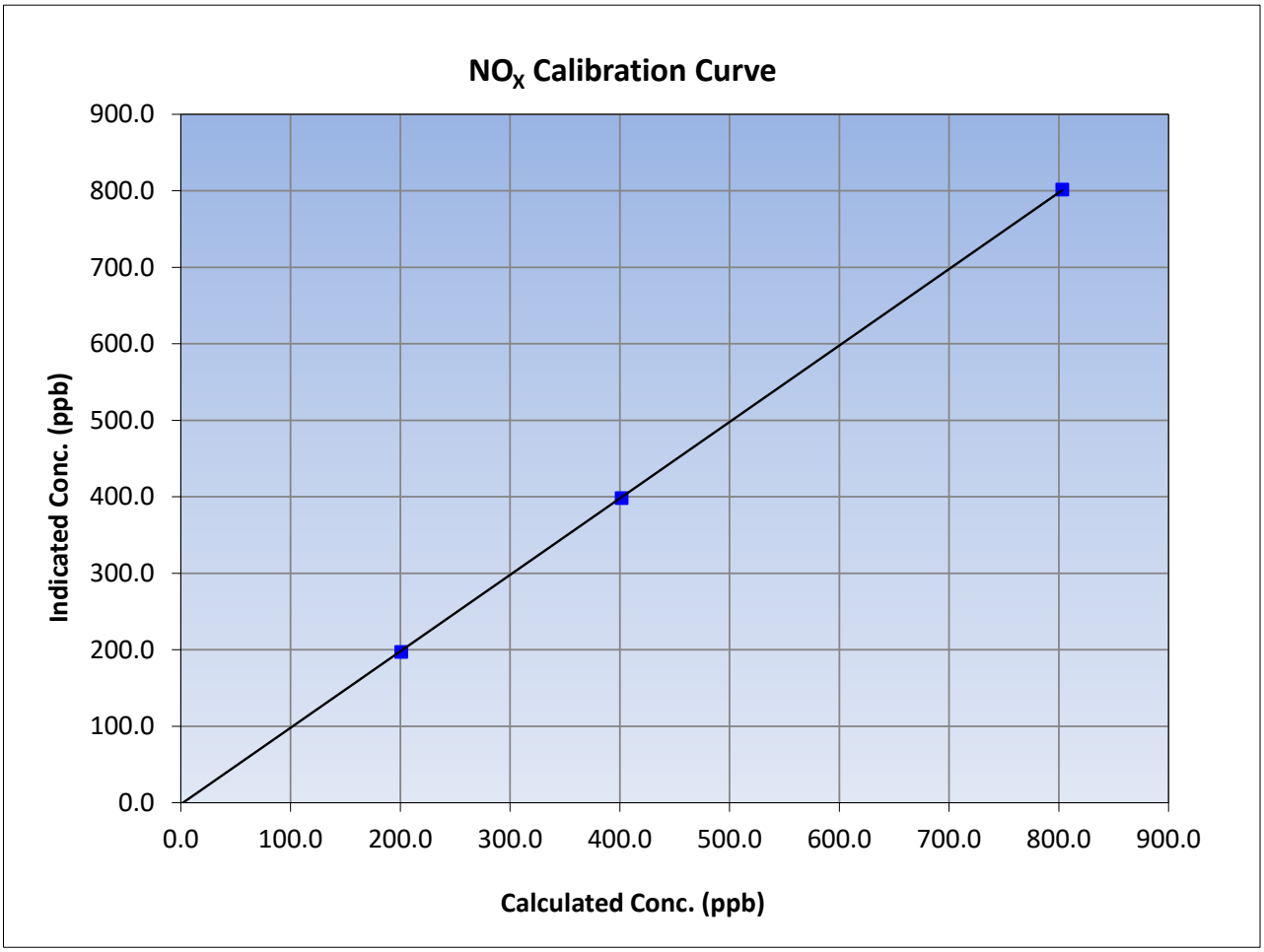
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:26 | End Time (MST): | 16:30 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 475 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999978 | ≥0.995 |
| 803.1 | 801.7 | 1.0017 | | | |
| 401.5 | 398.3 | 1.0081 | Slope | 0.999528 | 0.90 - 1.10 |
| 200.8 | 197.1 | 1.0186 | | | |
| | | | Intercept | -1.960000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

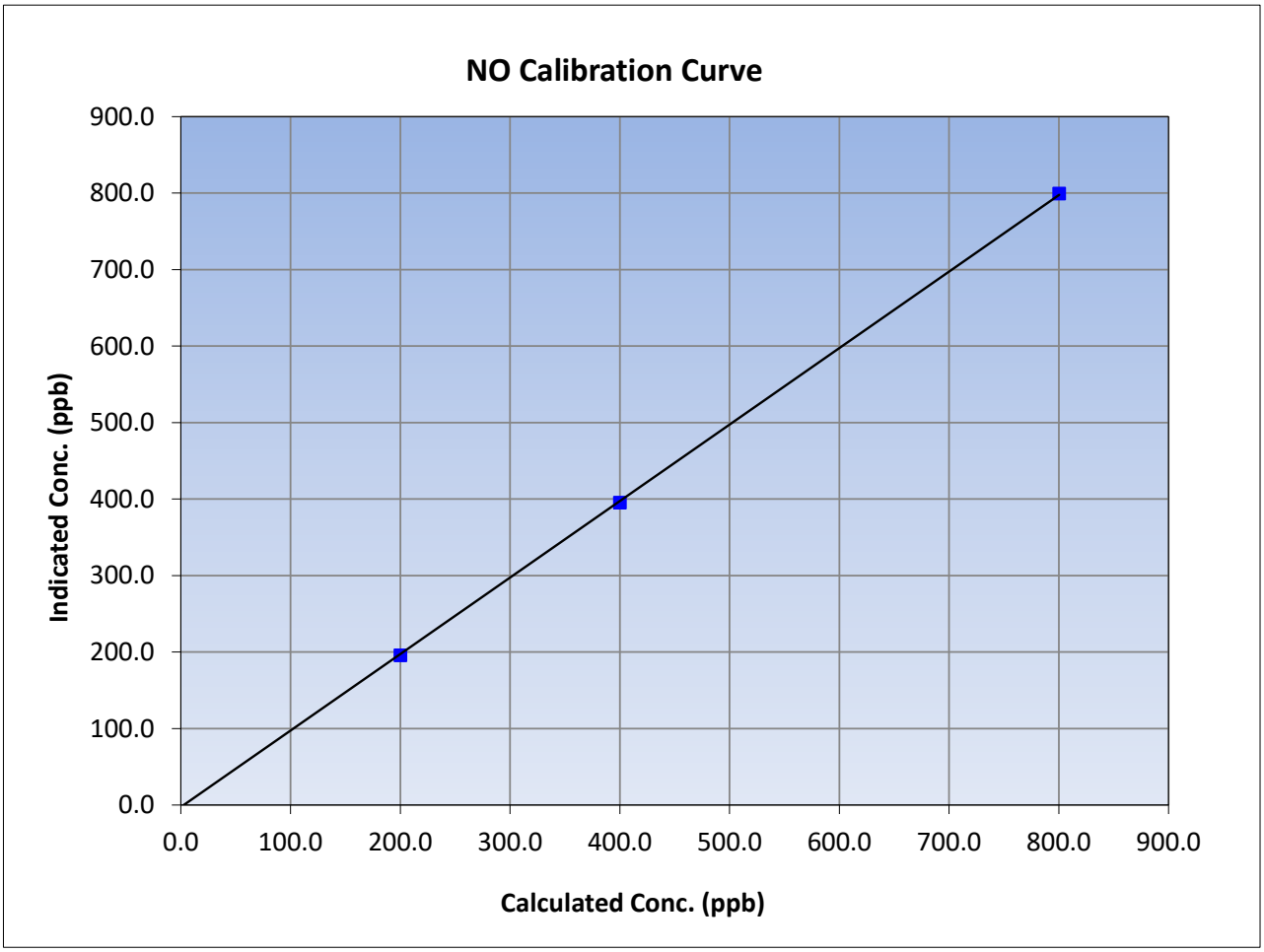
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:26 | End Time (MST): | 16:30 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 475 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999950 | ≥0.995 |
| 800.4 | 799.4 | 1.0012 | | | |
| 400.2 | 395.2 | 1.0126 | Slope | 0.999963 | 0.90 - 1.10 |
| 200.1 | 195.8 | 1.0219 | | | |
| | | | Intercept | -2.580000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

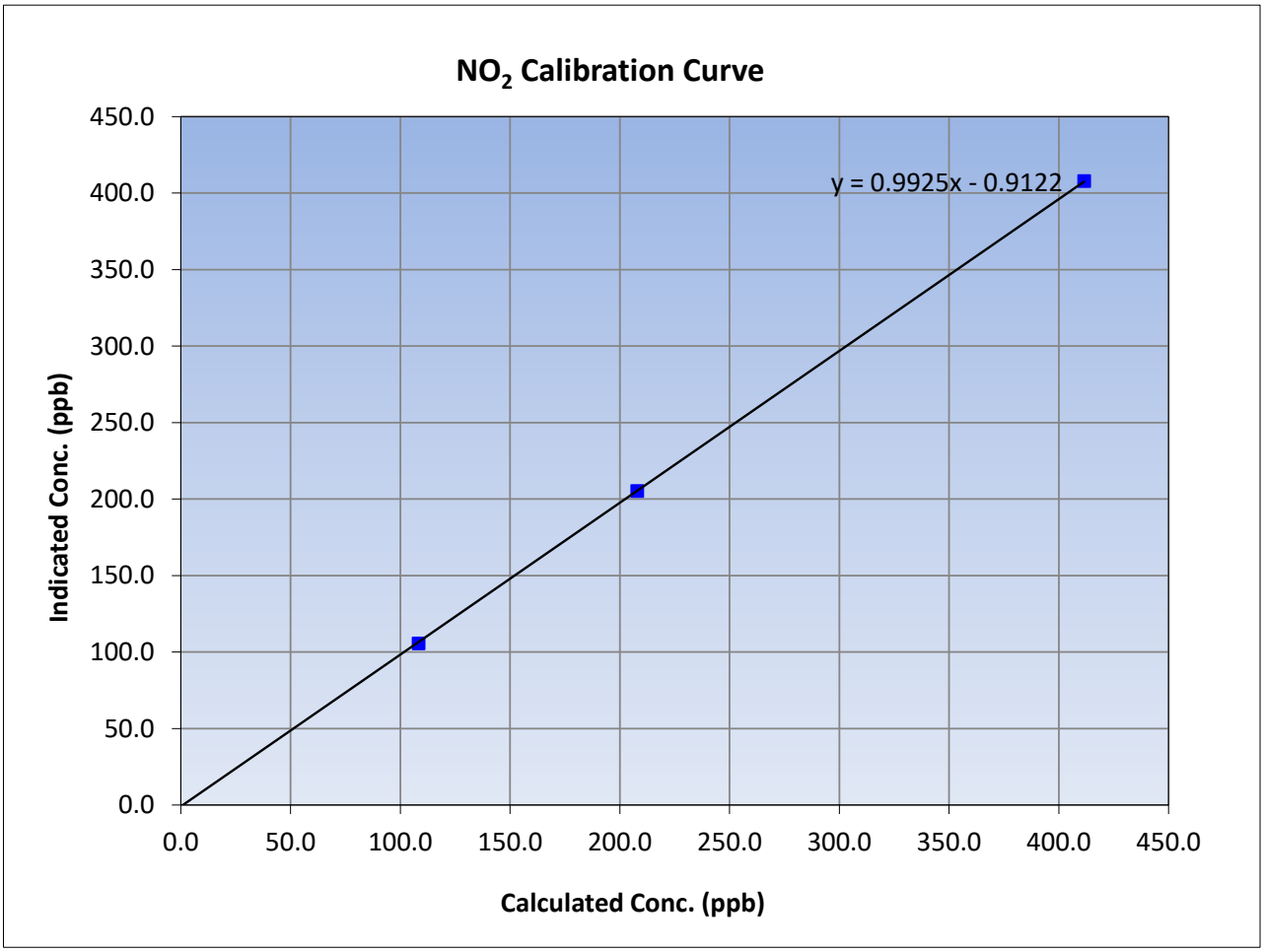
Version-05-2023

### Station Information

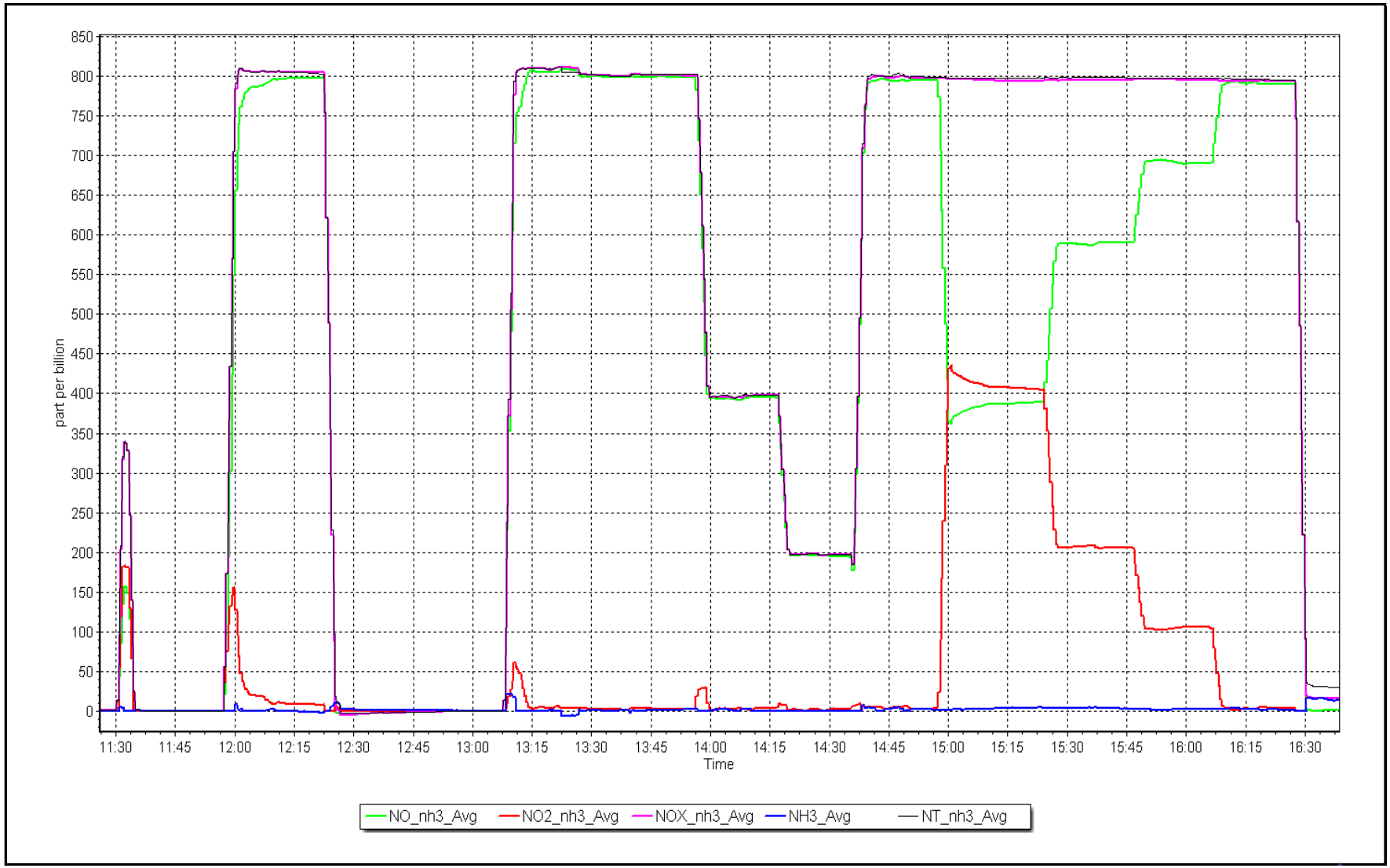
| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:26 | End Time (MST): | 16:30 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 475 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999985 | ≥0.995 |
| 411.5 | 407.8 | 1.0091 | | | |
| 207.9 | 205.3 | 1.0127 | Slope | 0.992493 | 0.90 - 1.10 |
| 108.3 | 105.7 | 1.0246 | | | |
| | | | Intercept | -0.912249 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 27, 2024 Location: Bertha Ganter-Fort McKay



**$NH_3$ Calibration Plot** Date: February 27, 2024 Location: Bertha Ganter-Fort McKay

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS02
## MILDRED LAKE
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mildred Lake | Station number: | AMS02 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 1, 2024 |
| Start time (MST): | 10:35 | End time (MST): | 13:02 |
| 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 Make/Model: | API T700 | | Serial Number: | 1185 |
| ZAG Make/Model: | API T701 | | Serial Number: | 4891 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: JC1404901075

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.994869 | 0.998019 | Backgd or Offset: | 18.4 | 18.4 |
| Calibration intercept: | 0.074375 | -0.505025 | Coeff or Slope: | 0.795 | 0.795 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as found span | 4920 | 80.2 | 801.6 | 806.8 | 0.994 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4920 | 80.2 | 801.6 | 800.4 | 1.002 |
| second point | 4960 | 40.1 | 400.8 | 397.6 | 1.008 |
| third point | 4980 | 20.0 | 199.9 | 199.5 | 1.002 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4920 | 80.2 | 801.6 | 796.5 | 1.006 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 806.60 | Previous response | 797.61 | *% 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

Notes: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

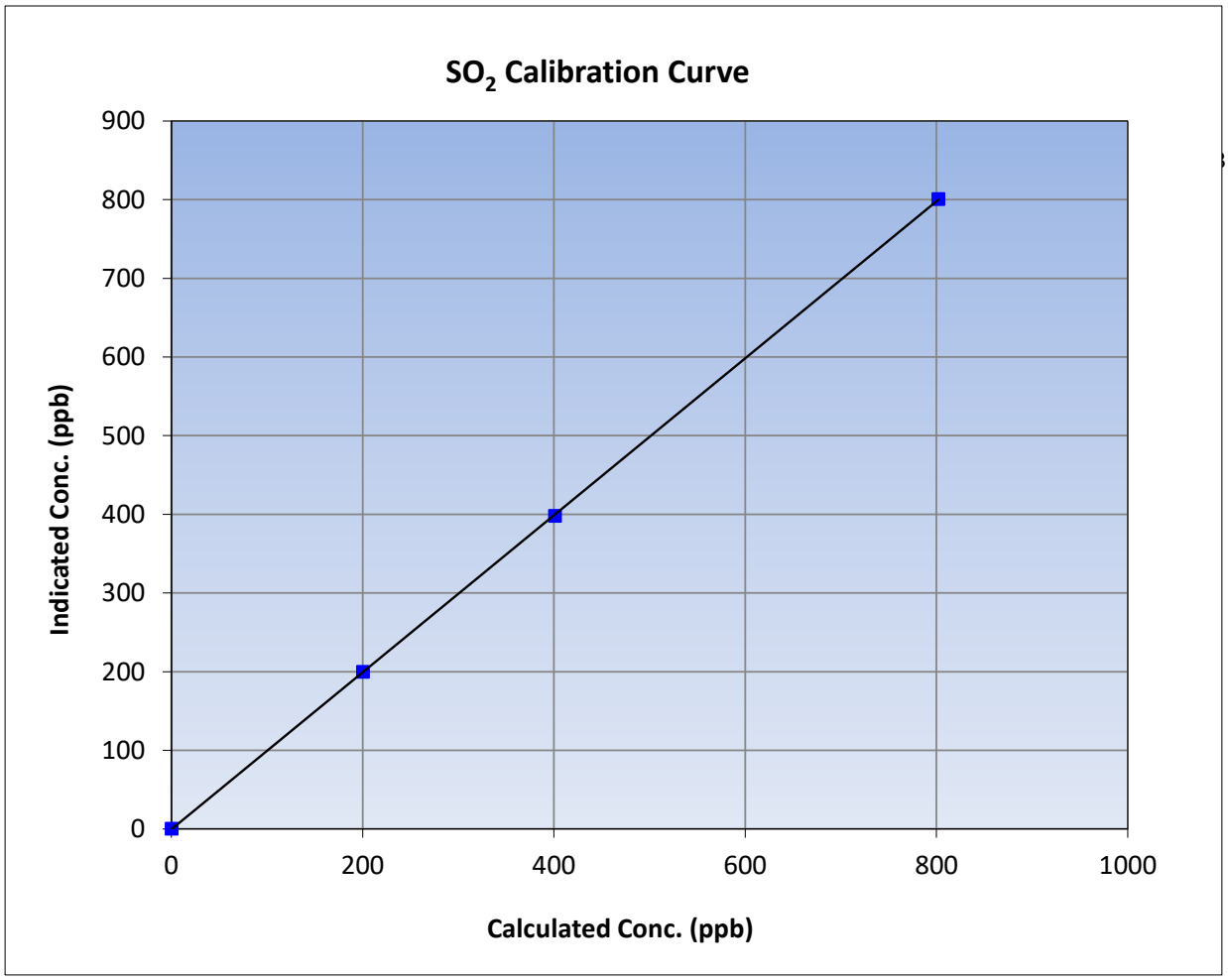
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 1, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:35 | End Time (MST): | 13:02 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1404901075 |

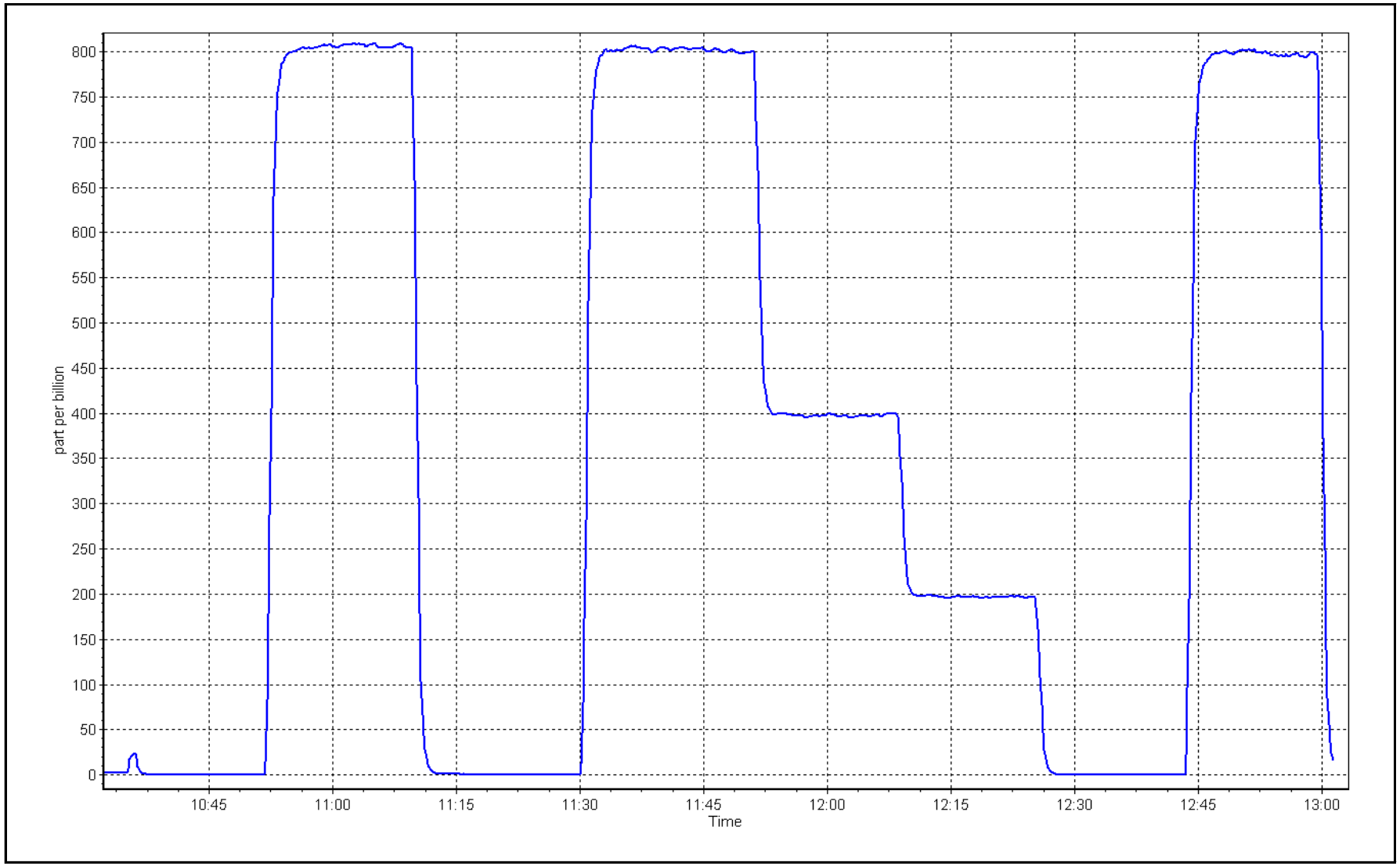
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 801.6 | 800.4 | 1.0016 |
| 400.8 | 397.6 | 1.0081 |
| 199.9 | 199.5 | 1.0021 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999986 | ≥0.995 |
| Slope | 0.998019 | 0.90 - 1.10 |
| Intercept | -0.505025 | +/-30 |



**SO2 Calibration Plot** Date: February 15, 2024 Location: Mildred Lake



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mildred Lake | Station number: | AMS02 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 10:56 | End time (MST): | 16:00 |
| 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: | API T700 | | Serial Number: | 1185 |
| ZAG Make/Model: | API T701 | | Serial Number: | 5608 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43iQTL | | Analyzer serial #: | 12113311966 | |
| Converter make: | Global G150 | | Converter serial #: | 2022-198 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.001107 | 0.998393 | Backgd or Offset: | 1.68 | 1.68 |
| Calibration intercept: | 0.040801 | -0.039204 | Coeff or Slope: | 0.740 | 0.731 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4924 | 75.6 | 80.0 | 81.4 | 0.983 |
| as found 2nd point | 4962 | 37.8 | 40.0 | 40.5 | 0.988 |
| as found 3rd point | 4981 | 18.9 | 20.0 | 19.9 | 1.005 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4924 | 75.6 | 80.0 | 79.9 | 1.001 |
| second point | 4962 | 37.8 | 40.0 | 39.8 | 1.005 |
| third point | 4981 | 18.9 | 20.0 | 19.8 | 1.010 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4924 | 75.6 | 80.0 | 79.9 | 1.001 |
| SO2 Scrubber Check | 4920 | 80.2 | 802.0 | 0.0 | ---- |
| Date of last scrubber change: | | 20-Sep-23 | | Ave Corr Factor | 1.005 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.4 | Prev response: | 80.12 | *% change: | 1.6% |
| Baseline Corr 2nd AF pt: | 40.5 | AF Slope: | 1.019252 | AF Intercept: | -0.219189 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999965 | | |

* = > +/-5% change initiates investigation

Notes: Reset analyzer after MPAF's due to screen freeze after station power reset. Adjusted span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

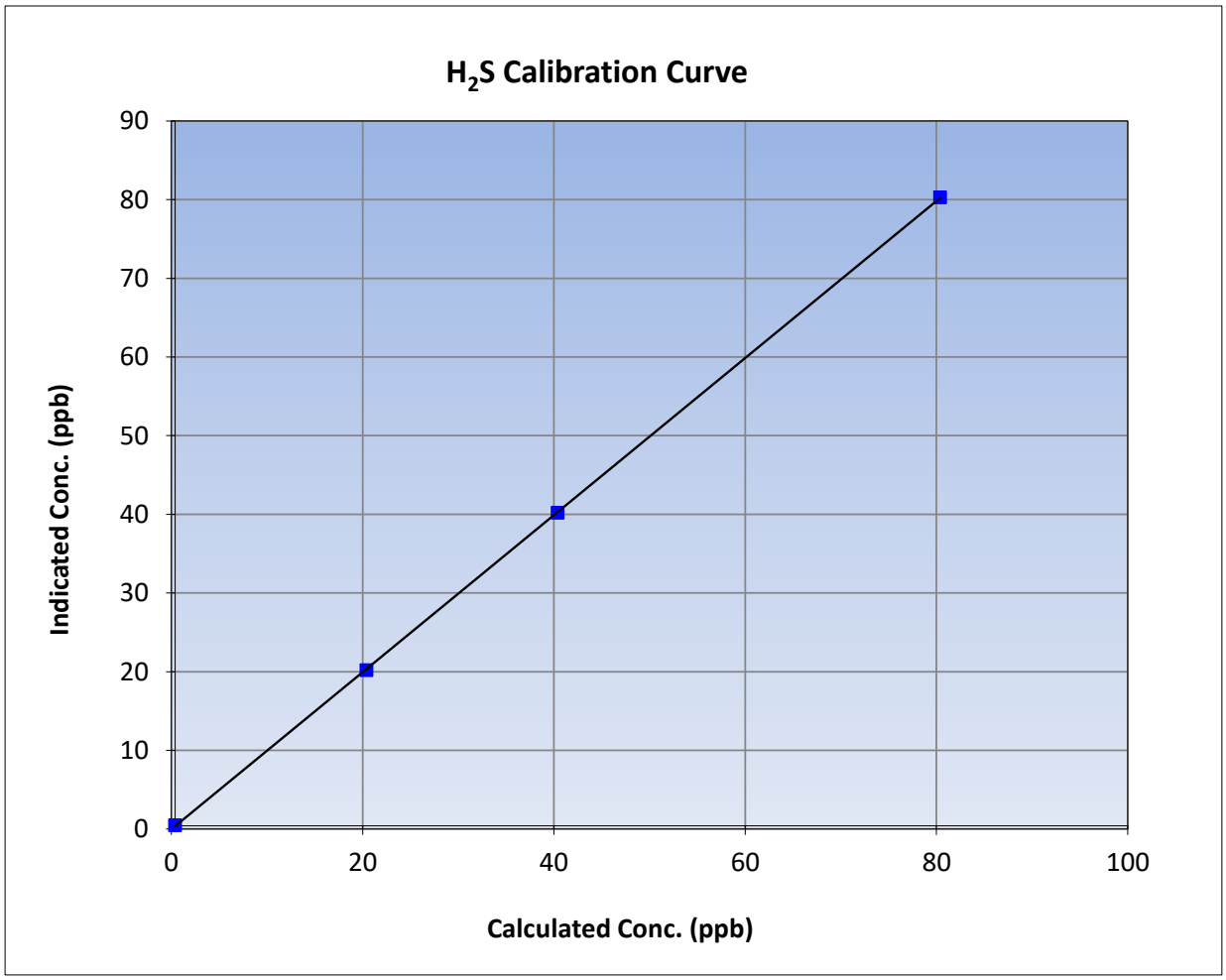
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:56 | End Time (MST): | 16:00 |
| Analyzer make: | Thermo 43iQTL | Analyzer serial #: | 12113311966 |

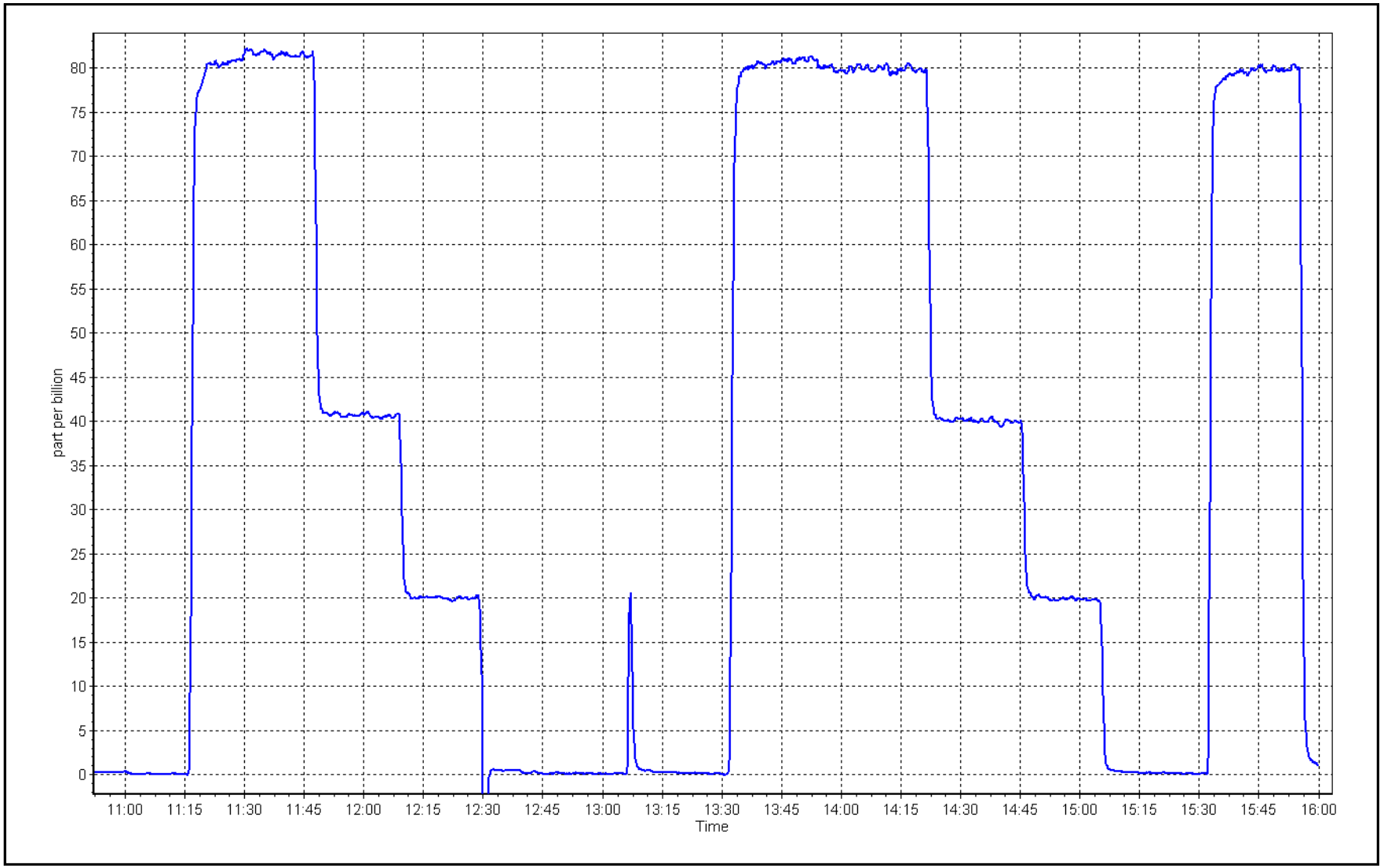
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 79.9 | 1.0011 |
| 40.0 | 39.8 | 1.0049 |
| 20.0 | 19.8 | 1.0099 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999986 | *≥0.995* |
| Slope | 0.998393 | *0.90 - 1.10* |
| Intercept | -0.039204 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 2, 2024 Location: Mildred Lake



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mildred Lake | Station number: | AMS02 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 7:47 | End time (MST): | 10:41 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC501209 | Cal Gas Expiry Date: | August 12, 2024 | |
| CH4 Cal Gas Conc. | 500.2 | ppm | CH4 Equiv Conc. | 1048.6 | ppm |
| C3H8 Cal Gas Conc. | 199.4 | ppm | | | |
| Removed Gas Cert: | | NA | Removed Gas Expiry: | | |
| 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 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4891 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1180320039 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.62E-04 | 2.73E-04 | NMHC SP Ratio: | 6.08E-05 | 6.17E-05 |
| CH4 Retention time: | 15.5 | 15.9 | NMHC Peak Area: | 144769 | 142620 |
| Zero Chromatogram: | OFF | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 16.82 | 16.48 | 1.021 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 16.82 | 16.79 | 1.002 |
| second point | 4960 | 40.1 | 8.41 | 8.35 | 1.007 |
| third point | 4980 | 20.0 | 4.19 | 4.15 | 1.010 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 16.82 | 16.80 | 1.001 |
| | | | | Average Correction Factor | 1.006 |
| 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 | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 8.80 | 8.75 | 1.006 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 8.80 | 8.76 | 1.004 |
| second point | 4960 | 40.1 | 4.40 | 4.37 | 1.006 |
| third 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 | 8.76 | 1.004 |
| | | | | Average Correction Factor | 1.007 |
| Baseline Corr AF: | 8.75 | Prev response | 8.80 | *% 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 8.02 | 7.73 | 1.038 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 8.02 | 8.02 | 1.000 |
| second point | 4960 | 40.1 | 4.01 | 3.98 | 1.007 |
| third point | 4980 | 20.0 | 2.00 | 1.98 | 1.009 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 8.02 | 8.03 | 0.999 |
| | | | | Average Correction Factor | 1.005 |
| Baseline Corr AF: | 7.73 | Prev response | 8.02 | *% change | -3.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.999652 | 0.998749 |
| THC Cal Offset: | 0.005690 | -0.021919 |
| CH4 Cal Slope: | 1.000099 | 1.000498 |
| CH4 Cal Offset: | -0.001651 | -0.013049 |
| NMHC Cal Slope: | 0.999219 | 0.996921 |
| NMHC Cal Offset: | 0.006941 | -0.008470 |

Notes: Zero chromatogram turned on. Zero and span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

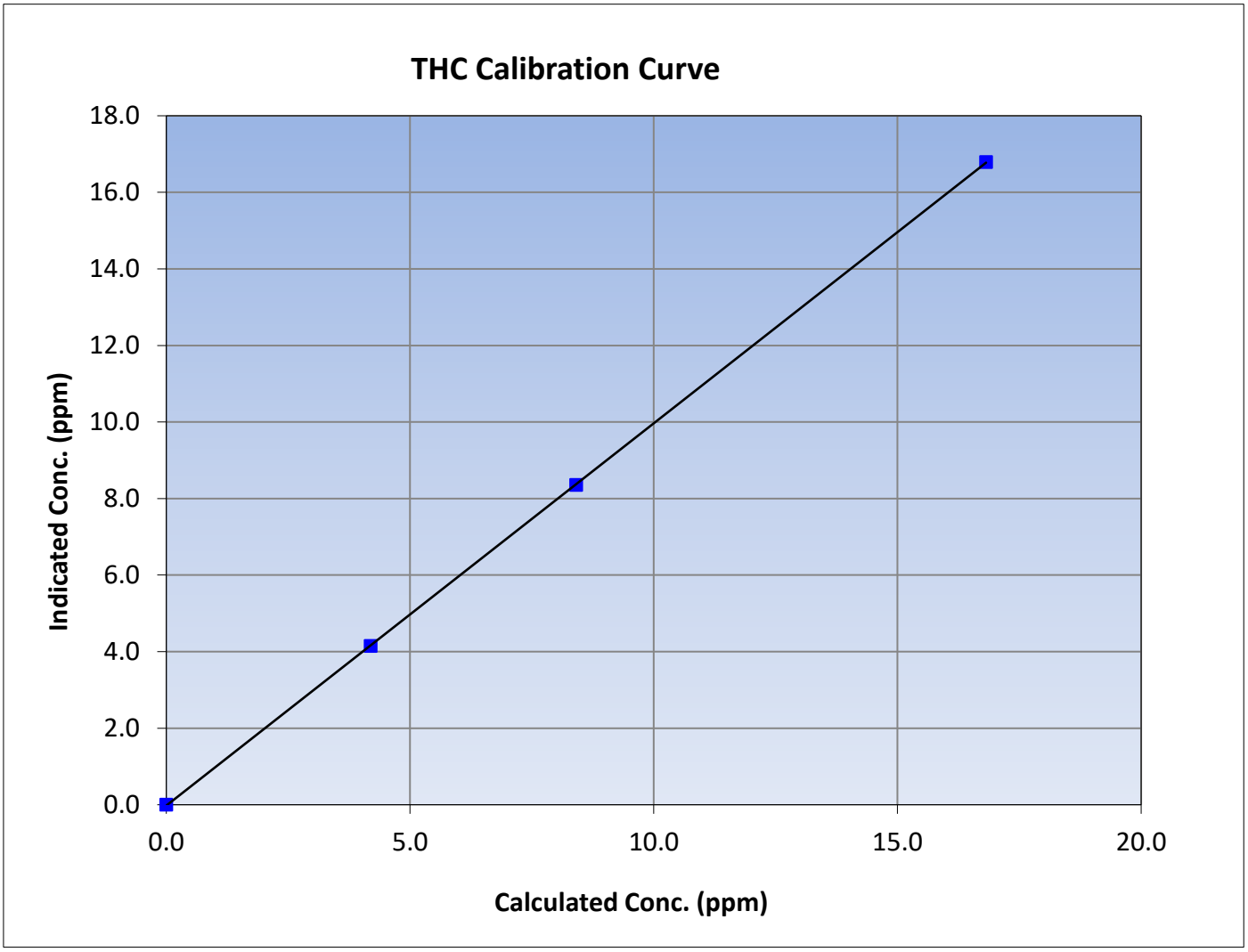
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 7:47 | End Time (MST): | 10:41 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320039 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999991 | *≥0.995* |
| 16.82 | 16.79 | 1.0017 | | | |
| 8.41 | 8.35 | 1.0066 | Slope | 0.998749 | *0.90 - 1.10* |
| 4.19 | 4.15 | 1.0099 | | | |
| | | | Intercept | -0.021919 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

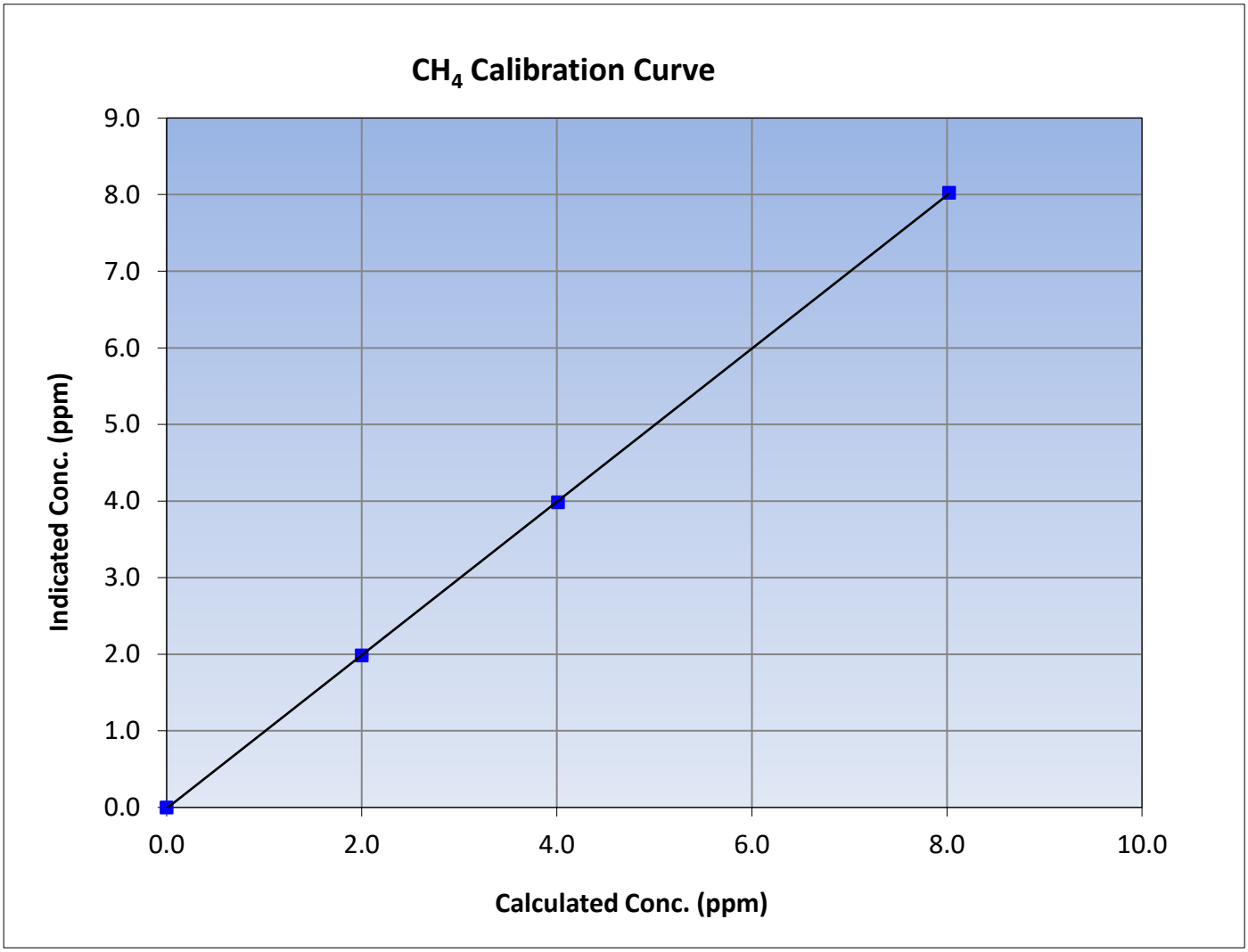
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 7:47 | End Time (MST): | 10:41 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320039 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999983 | *≥0.995* |
| 8.02 | 8.02 | 0.9999 | | | |
| 4.01 | 3.98 | 1.0072 | Slope | 1.000498 | *0.90 - 1.10* |
| 2.00 | 1.98 | 1.0090 | | | |
| | | | Intercept | -0.013049 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

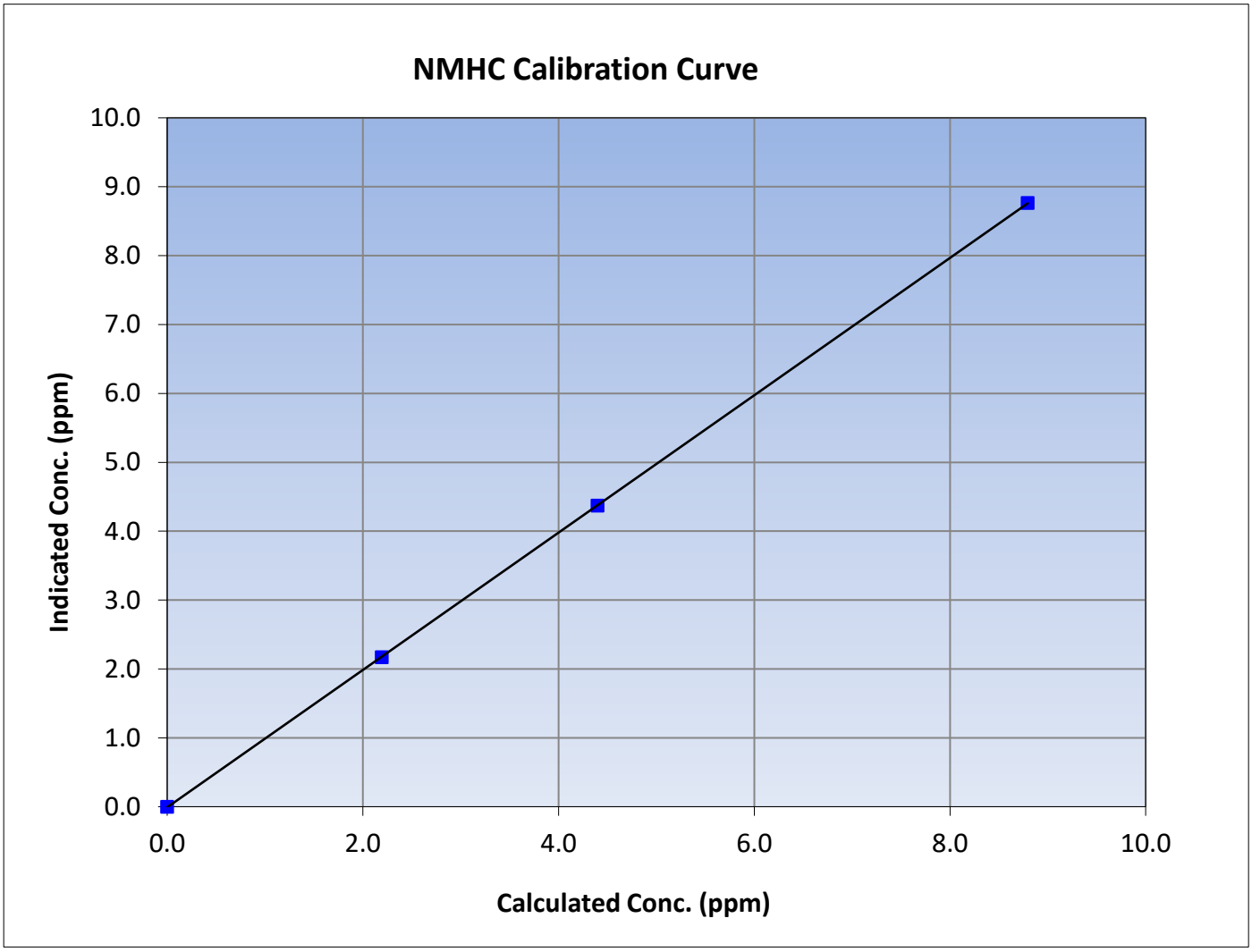
Version-06-2022

### Station Information

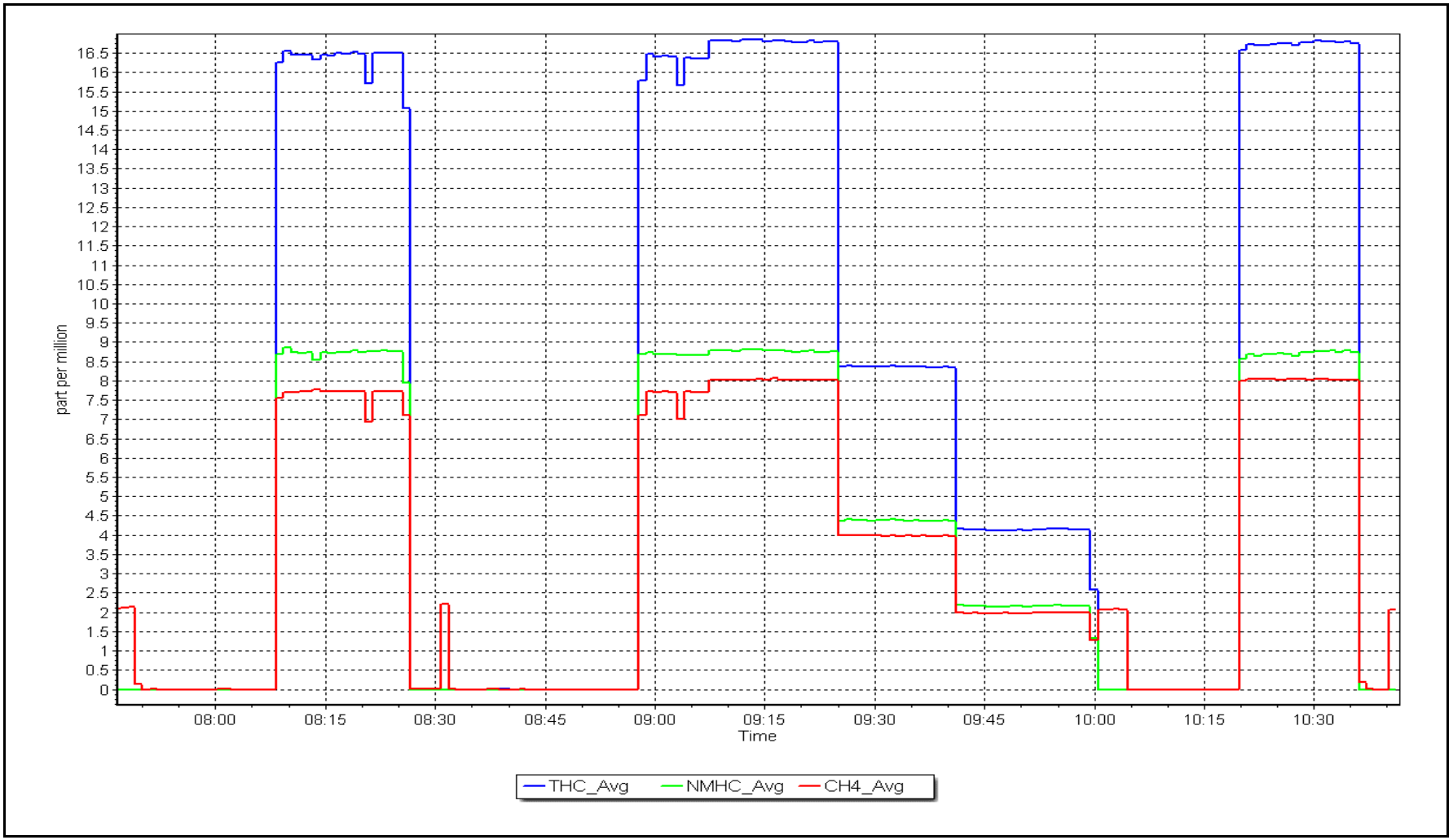
| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 7:47 | End Time (MST): | 10:41 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320039 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999996 | *≥0.995* |
| 8.80 | 8.76 | 1.0036 | | | |
| 4.40 | 4.37 | 1.0061 | Slope | 0.996921 | *0.90 - 1.10* |
| 2.19 | 2.17 | 1.0108 | | | |
| | | | Intercept | -0.008470 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 15, 2024 Location: Mildred Lake



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mildred Lake | Station number: | AMS02 |
| Calibration Date: | February 28, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 12:00 | End time (MST): | 13:46 |
| Reason: | Cylinder Change | | |

### 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: | | |
| 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 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4891 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1180320039 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.73E-04 | 2.73E-04 | NMHC SP Ratio: | 6.17E-05 | 6.17E-05 |
| CH4 Retention time: | 15.9 | 15.9 | NMHC Peak Area: | 142620 | 142620 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 16.82 | 16.64 | 1.011 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 16.82 | 16.78 | 1.002 |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 16.64 | Prev response | 16.78 | *% change | -0.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 8.80 | 8.71 | 1.010 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 8.80 | 8.86 | 0.993 |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 8.71 | Prev response | 8.76 | *% 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 8.02 | 7.93 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 8.02 | 7.93 | 1.012 |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 7.93 | Prev response | 8.01 | *% change | -1.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

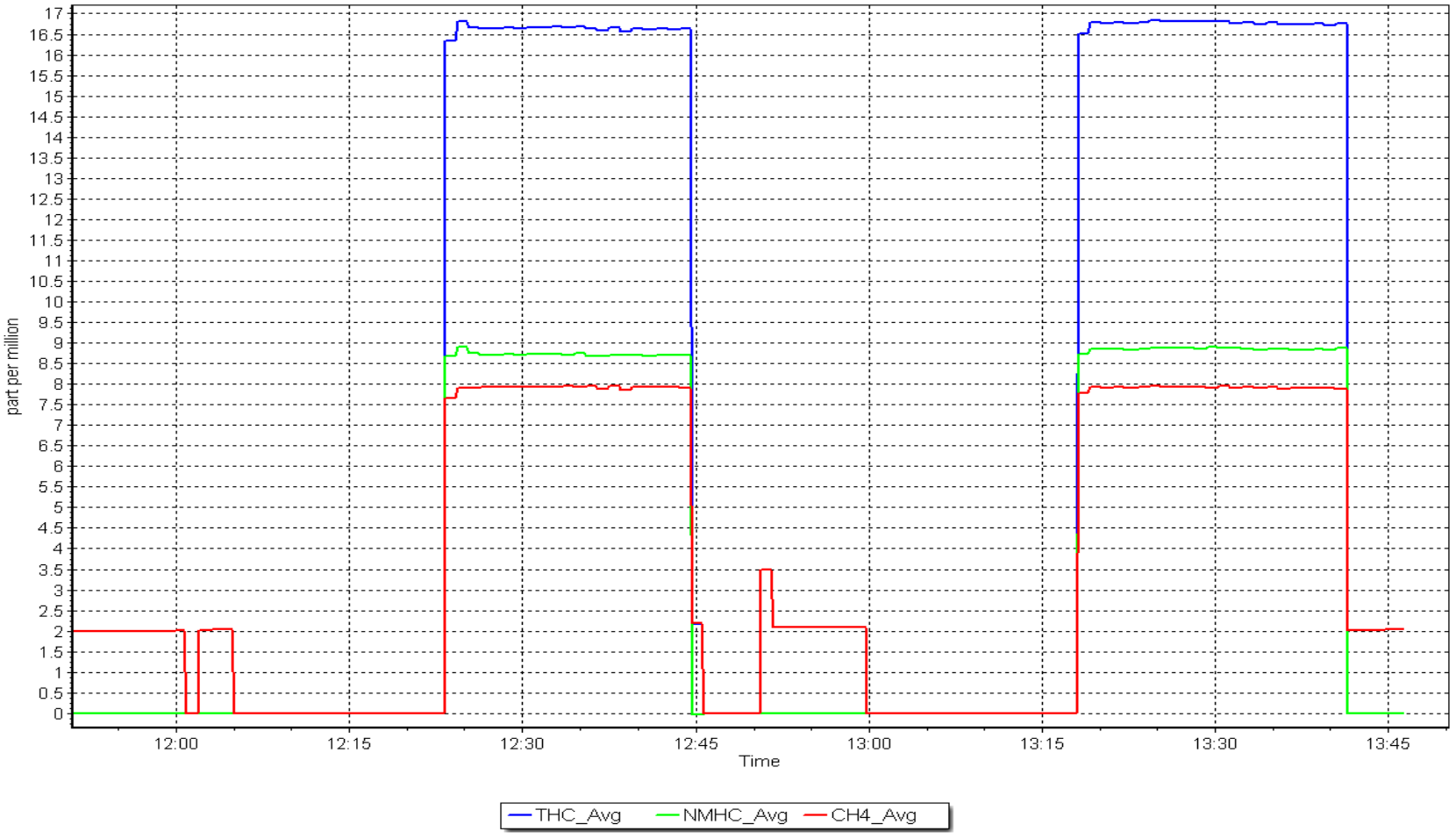
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.998749 | |
| THC Cal Offset: | -0.021919 | |
| CH4 Cal Slope: | 1.000498 | |
| CH4 Cal Offset: | -0.013049 | |
| NMHC Cal Slope: | 0.996921 | |
| NMHC Cal Offset: | -0.008470 | |

Notes: Changed nitrogen cylinder.

Calibration Performed By: Braiden Boutilier

**NMHC Calibration Plot** Date: February 28, 2024 Location: Mildred Lake



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS04
## BUFFALO VIEWPOINT
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 9, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 7:17 | End time (MST): | 10:03 |
| 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: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3808 |
| ZAG Make/Model: | API T701 | | Serial Number: | 362 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: JC1327300932

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.986256 | 0.999358 | Backgd or Offset: | 23.8 | 24.1 |
| Calibration intercept: | 0.211572 | 0.554368 | Coeff or Slope: | 0.864 | 0.875 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as found span | 4921 | 78.6 | 799.7 | 790.2 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| high point | 4921 | 78.6 | 799.7 | 799.5 | 1.000 |
| second point | 4961 | 39.3 | 399.8 | 400.9 | 0.997 |
| third point | 4980 | 19.6 | 199.4 | 199.4 | 1.000 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4921 | 78.6 | 799.7 | 802.2 | 0.997 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 790.00 | Previous response | 788.96 | *% 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

Notes: Span adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

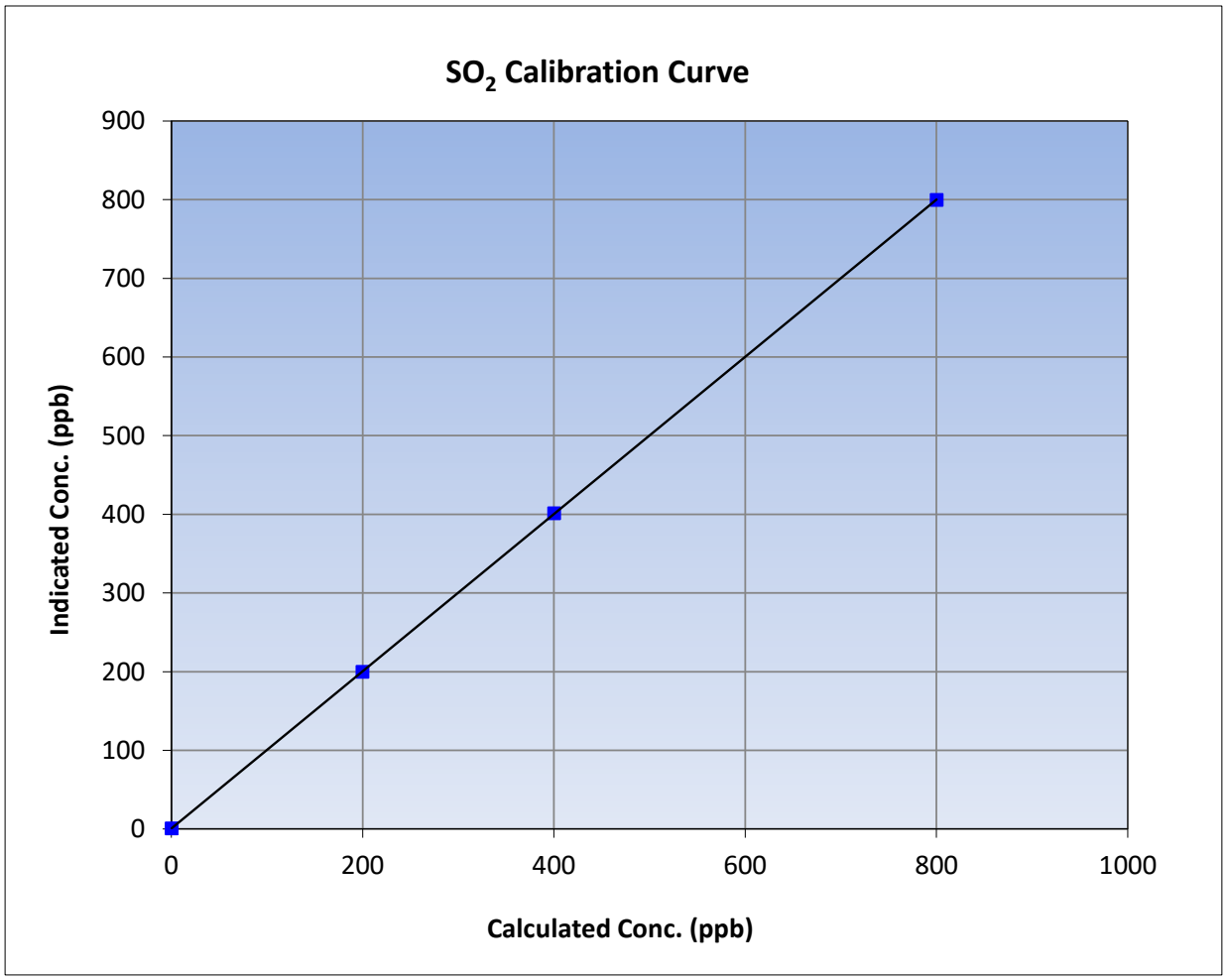
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 9, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:17 | End Time (MST): | 10:03 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1327300932 |

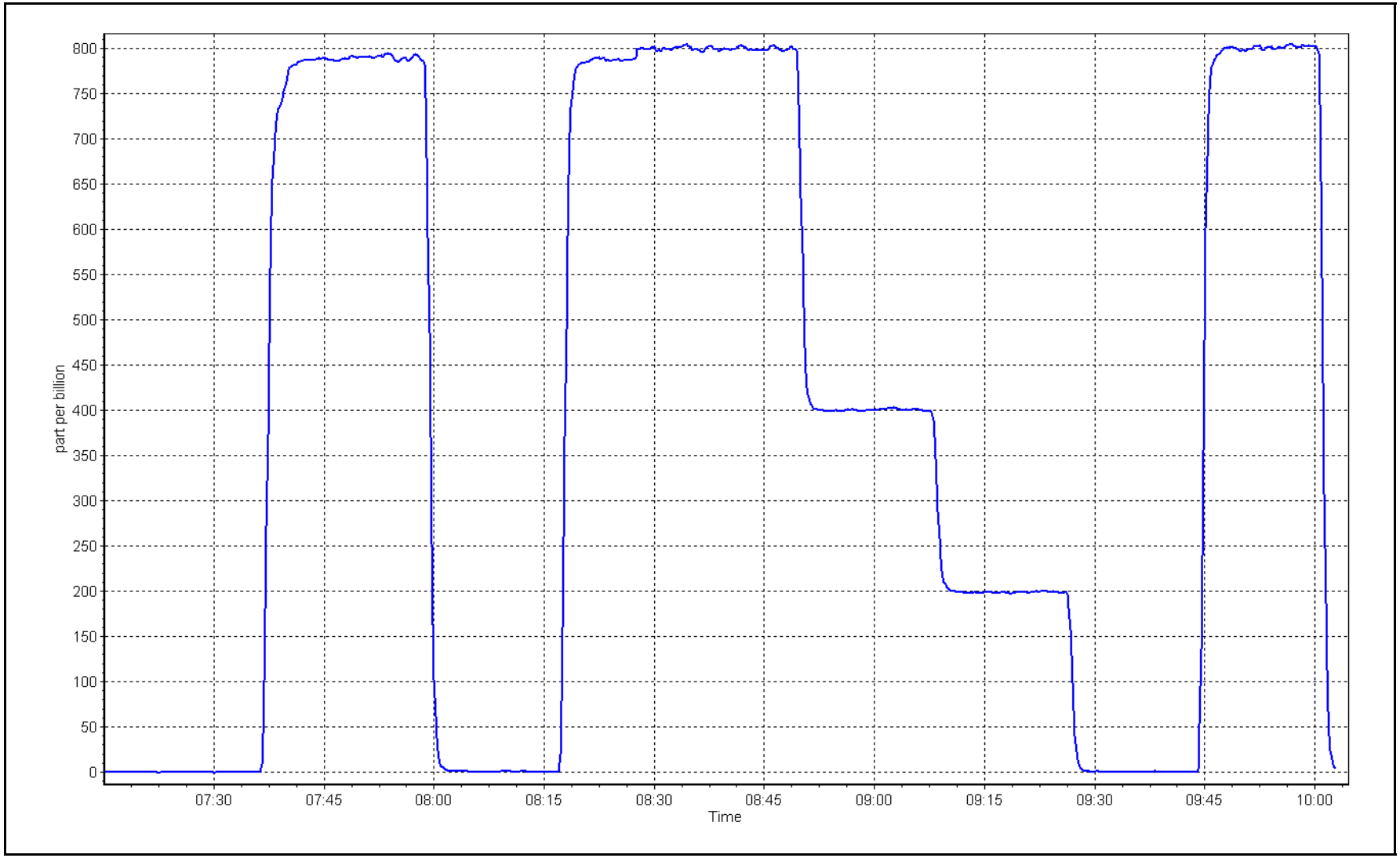
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.5 | ---- |
| 799.7 | 799.5 | 1.0003 |
| 399.8 | 400.9 | 0.9973 |
| 199.4 | 199.4 | 1.0001 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999997 | *≥0.995* |
| Slope | 0.999358 | *0.90 - 1.10* |
| Intercept | 0.554368 | *+/-30* |



**SO2 Calibration Plot** Date: February 9, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 23, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 7:20 | End time (MST): | 11:29 |
| 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: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3808 |
| ZAG Make/Model: | 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 | | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.996076 | 0.994653 | Backgd or Offset: | 1.87 | 1.98 |
| Calibration intercept: | 0.242122 | 0.142076 | Coeff or Slope: | 1.143 | 1.182 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as found span | 4926 | 74.1 | 80.3 | 78.0 | 1.032 |
| as found 2nd point | 4963 | 37.0 | 40.1 | 39.2 | 1.028 |
| as found 3rd point | 4982 | 18.5 | 20.1 | 19.5 | 1.039 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4926 | 74.1 | 80.3 | 80.0 | 1.004 |
| second point | 4963 | 37.0 | 40.1 | 40.2 | 0.998 |
| third point | 4982 | 18.5 | 20.1 | 19.9 | 1.008 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4926 | 74.1 | 80.3 | 82.9 | 0.969 |
| SO2 Scrubber Check | 4920 | 80.0 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | 16-May-23 | | Ave Corr Factor | 1.003 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 77.8 | Prev response: | 80.25 | *% change: | -3.1% |
| Baseline Corr 2nd AF pt: | 39.0 | AF Slope: | 0.969328 | AF Intercept: | 0.181522 |
| Baseline Corr 3rd AF pt: | 19.3 | AF Correlation: | 0.999989 | | |

* = > +/-5% change initiates investigation

Notes: Sox scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

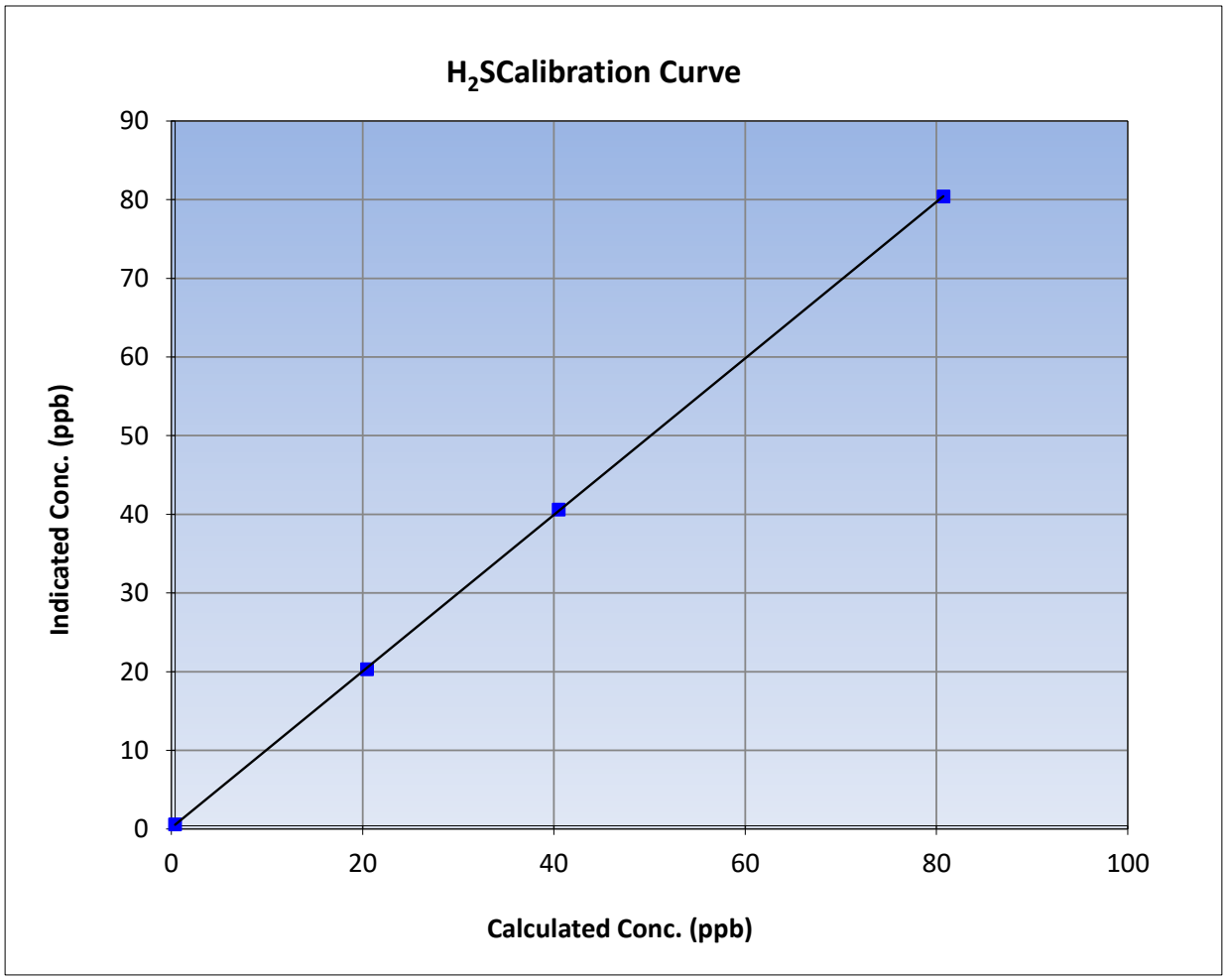
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:20 | End Time (MST): | 11:29 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1008841400 |

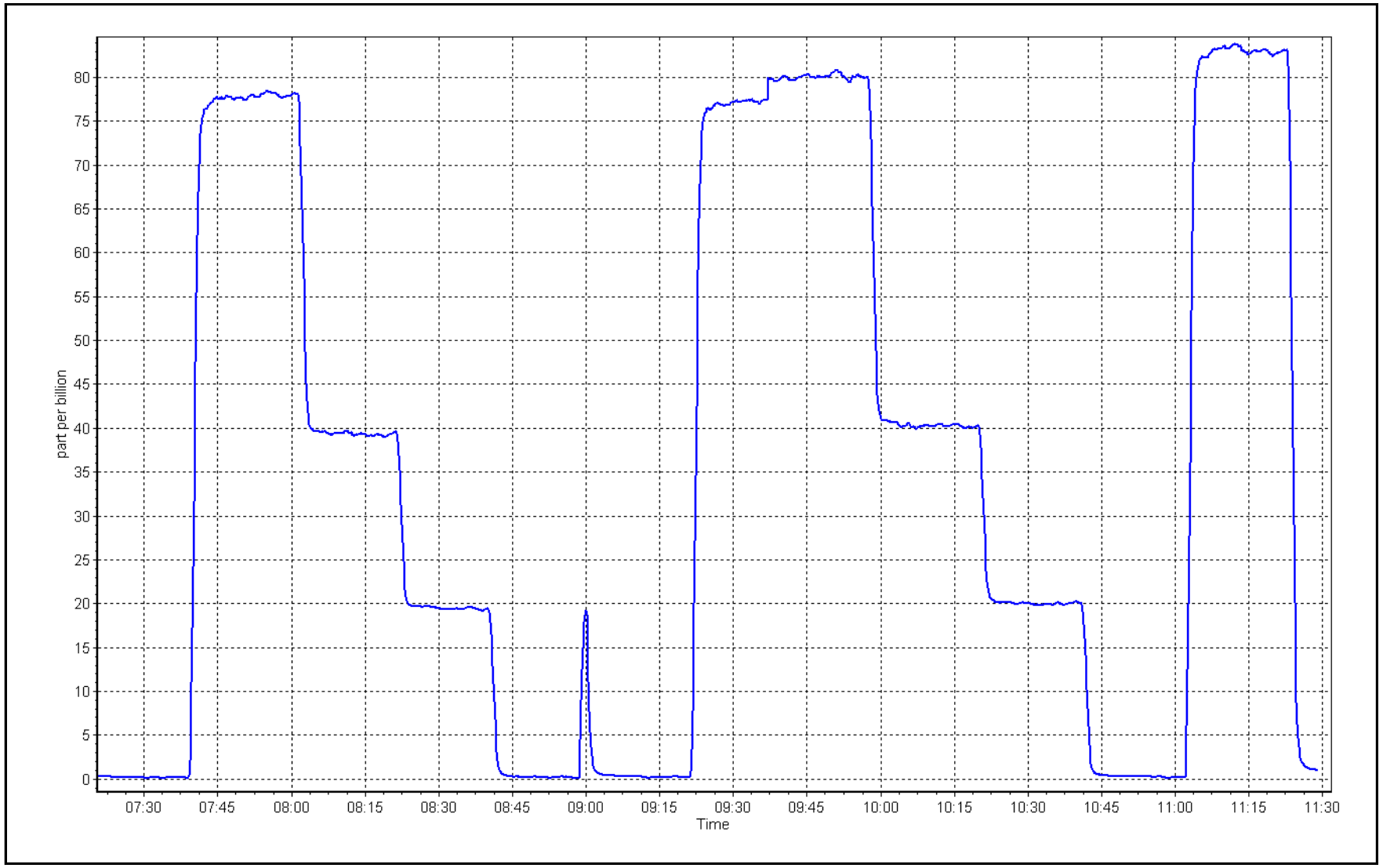
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.3 | 80.0 | 1.0040 |
| 40.1 | 40.2 | 0.9977 |
| 20.1 | 19.9 | 1.0076 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999981 | *≥0.995* |
| Slope | 0.994653 | *0.90 - 1.10* |
| Intercept | 0.142076 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 23, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 29, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 7:15 | End time (MST): | 11:59 |
| Reason: | Maintenance | | |

### 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: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3808 |
| ZAG Make/Model: | 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.994653 | 0.997925 | Backgd or Offset: | 1.98 | 1.09 |
| Calibration intercept: | 0.142076 | 0.202175 | Coeff or Slope: | 1.182 | 1.130 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4926 | 74.1 | 80.3 | 76.8 | 1.047 |
| as found 2nd point | 4963 | 37.0 | 40.1 | 38.5 | 1.044 |
| as found 3rd point | 4982 | 18.5 | 20.1 | 19.1 | 1.055 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4926 | 74.1 | 80.3 | 80.3 | 1.000 |
| second point | 4963 | 37.0 | 40.1 | 40.4 | 0.993 |
| third point | 4982 | 18.5 | 20.1 | 20.1 | 0.998 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4926 | 74.1 | 80.3 | 80.0 | 1.004 |

SO2 Scrubber Check

| | | | |
|---|---|---|---|
| Date of last scrubber change: | 16-May-23 | Ave Corr Factor | 0.997 |
| Date of last converter efficiency test: | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 76.7 | Prev response: | 80.04 | *% change: | -4.3% |
| Baseline Corr 2nd AF pt: | 38.4 | AF Slope: | 0.955670 | AF Intercept: | 0.061201 |
| Baseline Corr 3rd AF pt: | 19.0 | AF Correlation: | 0.999991 | | |

* = > +/-5% change initiates investigation

Notes: Nightly span higher then the span through the filter. Filter holder and External Valve replaced. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

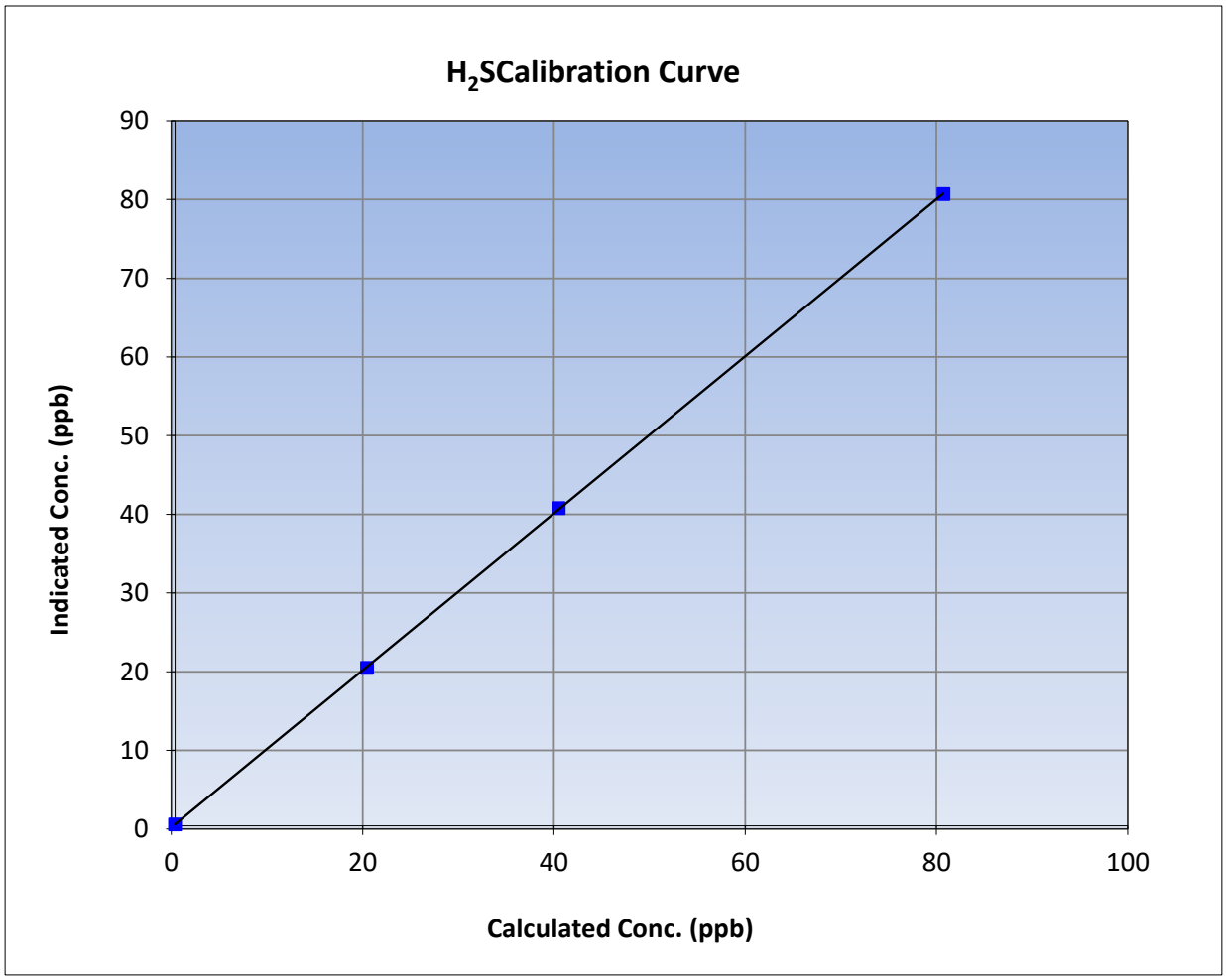
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 29, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:15 | End Time (MST): | 11:59 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1008841400 |

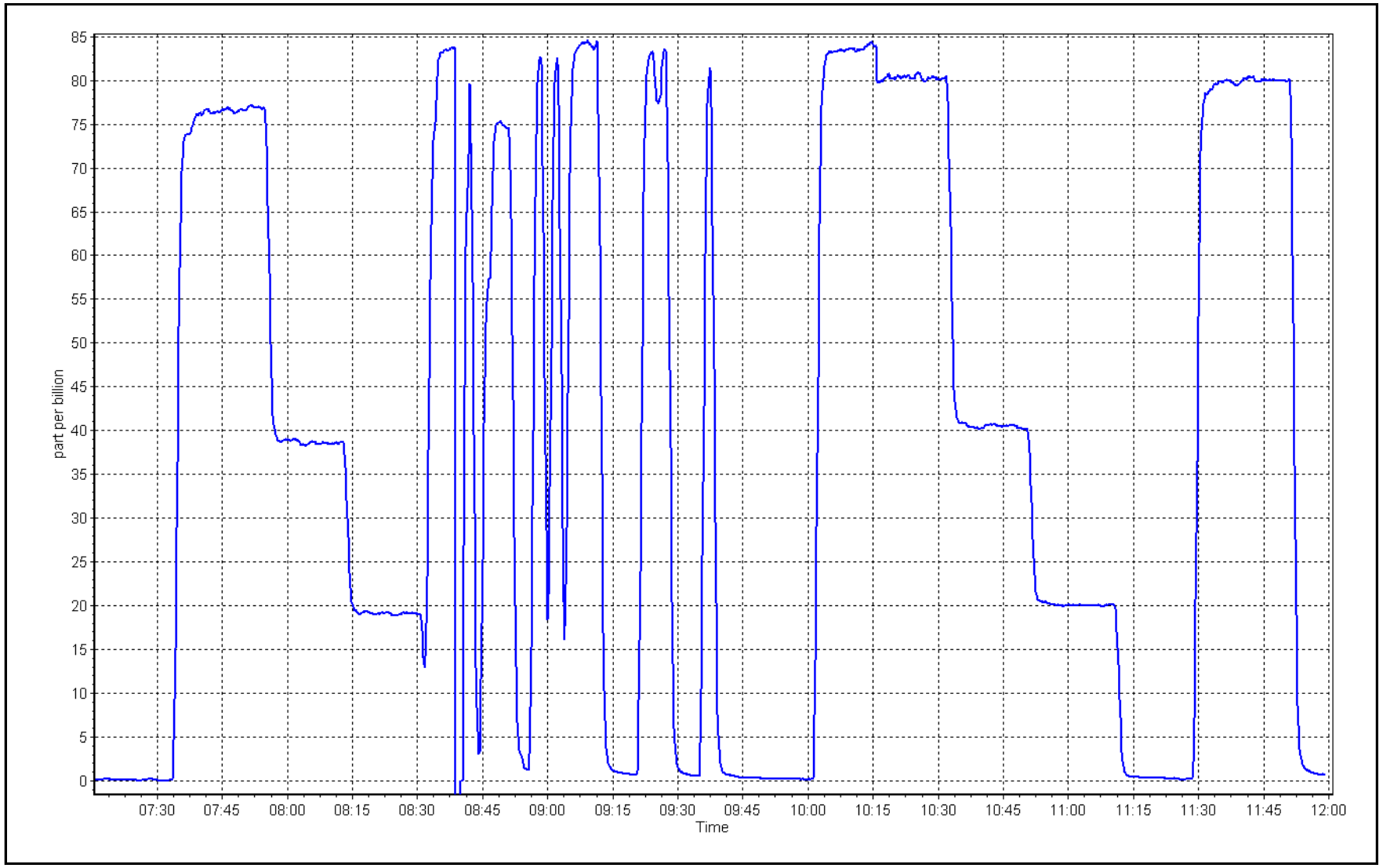
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.3 | 80.3 | 1.0003 |
| 40.1 | 40.4 | 0.9928 |
| 20.1 | 20.1 | 0.9976 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999987 | *≥0.995* |
| Slope | 0.997925 | *0.90 - 1.10* |
| Intercept | 0.202175 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 29, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 7:29 | End time (MST): | 8:37 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | NA | Cal Gas Expiry Date: | March 10, 1931 | |
| CH4 Cal Gas Conc. | 497.2 | ppm | CH4 Equiv Conc. | 1058.2 | ppm |
| C3H8 Cal Gas Conc. | 204.0 | ppm | | | |
| Removed Gas Cert: | | NA | 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 362 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1222762077 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.10E-04 | 2.10E-04 | NMHC SP Ratio: | 4.60E-05 | 4.60E-05 |
| CH4 Retention time: | 11.8 | 11.8 | NMHC Peak Area: | 191608 | 191608 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | ON | ON |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 78.6 | 16.64 | 16.30 | 1.020 |
| as found 2nd point | 4961 | 39.3 | 8.32 | 8.00 | 1.040 |
| as found 3rd point | 4980 | 19.6 | 4.15 | 3.94 | 1.053 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 16.30 | Prev response | 16.58 | *% change | -1.7% |
| Baseline Corr 2nd AF: | 8.0 | AF Slope: | 0.981627 | AF Intercept: | -0.081248 |
| Baseline Corr 3rd AF: | 3.9 | AF Correlation: | 0.999868 | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 78.6 | 8.82 | 8.67 | 1.017 |
| as found 2nd point | 4961 | 39.3 | 4.41 | 4.29 | 1.027 |
| as found 3rd point | 4980 | 19.6 | 2.20 | 2.12 | 1.040 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 8.67 | Prev response | 8.79 | *% change | -1.3% |
| Baseline Corr 2nd AF: | 4.3 | AF Slope: | 0.984795 | AF Intercept: | -0.027881 |
| Baseline Corr 3rd AF: | 2.1 | AF Correlation: | 0.999951 | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 78.6 | 7.82 | 7.63 | 1.024 |
| as found 2nd point | 4961 | 39.3 | 3.91 | 3.71 | 1.054 |
| as found 3rd point | 4980 | 19.6 | 1.95 | 1.82 | 1.070 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 7.63 | Prev response | 7.79 | *% change | -2.1% |
| Baseline Corr 2nd AF: | 3.71 | AF Slope: | 0.978507 | AF Intercept: | -0.054166 |
| Baseline Corr 3rd AF: | 1.82 | AF Correlation: | 0.999713 | * = > +/-5% change initiates investigation | |

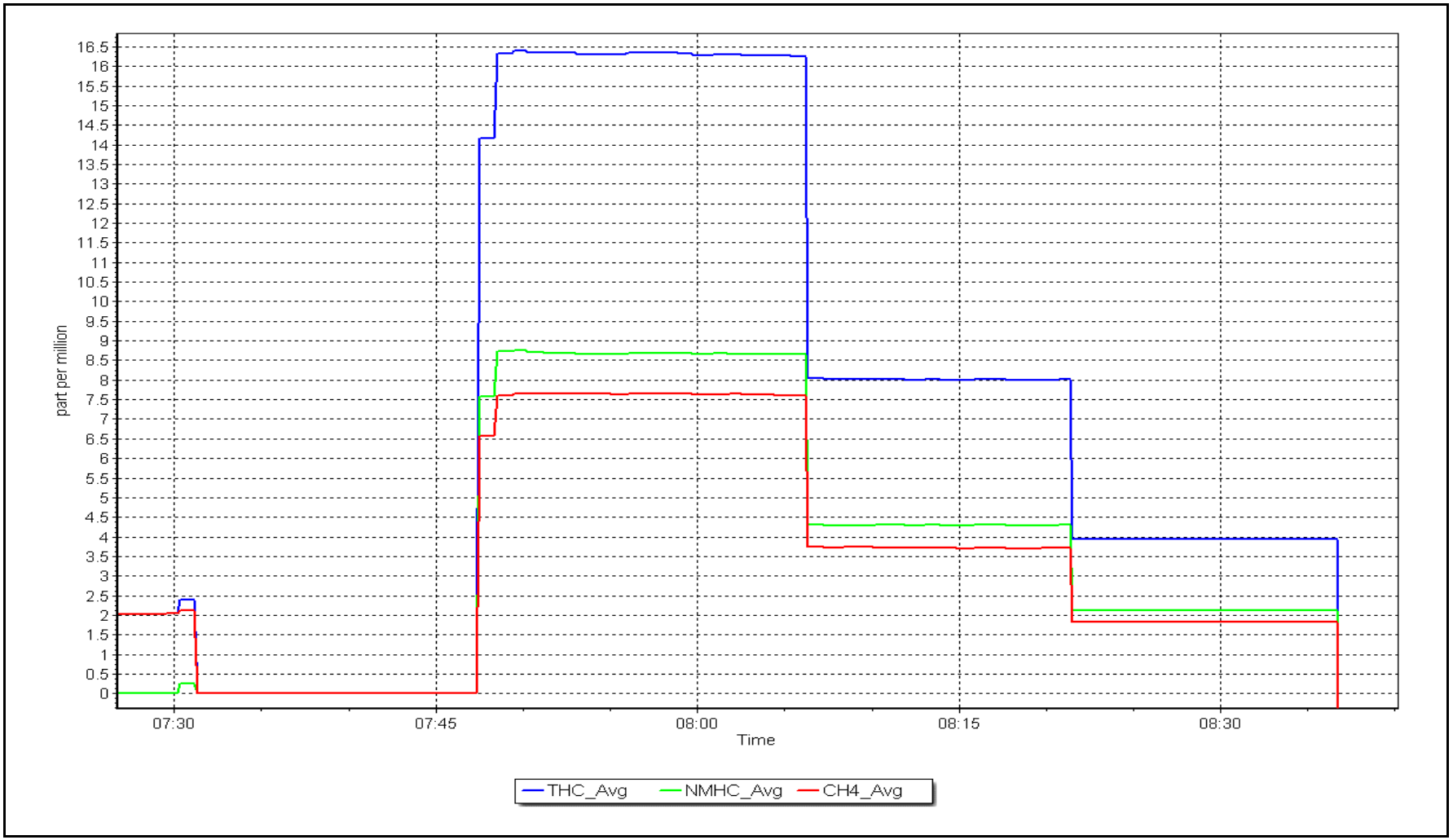
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.000639 | |
| THC Cal Offset: | -0.067561 | |
| CH4 Cal Slope: | 1.002348 | |
| CH4 Cal Offset: | -0.043914 | |
| NMHC Cal Slope: | 0.999123 | |
| NMHC Cal Offset: | -0.023647 | |

Notes: Removal due to pump not coming out to be replaced and ignitor connector on board breaking.

Calibration Performed By: Melissa Lemay

**NMHC Calibration Plot** Date: February 6, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | |
| Start time (MST): | 11:00 | End time (MST): | 12:54 |
| Reason: | Install | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | NA | Cal Gas Expiry Date: | March 10, 1931 | |
| CH4 Cal Gas Conc. | 497.2 | ppm | CH4 Equiv Conc. | 1058.2 | ppm |
| C3H8 Cal Gas Conc. | 204.0 | ppm | | | |
| Removed Gas Cert: | | NA | 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 362 | |

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| CH4 SP Ratio: | | 4.32E-04 | NMHC SP Ratio: | | 1.12E-04 |
| CH4 Retention time: | | 13.7 | NMHC Peak Area: | | 78857 |
| Zero Chromatogram: | | OFF | Flat Baseline: | | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 78.6 | 16.64 | 16.61 | 1.002 |
| second point | 4961 | 39.3 | 8.32 | 8.35 | 0.997 |
| third point | 4980 | 19.6 | 4.15 | 4.17 | 0.995 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 16.64 | 16.84 | 0.988 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| 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 | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 78.6 | 8.82 | 8.79 | 1.003 |
| second point | 4961 | 39.3 | 4.41 | 4.44 | 0.992 |
| third point | 4980 | 19.6 | 2.20 | 2.23 | 0.988 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 8.82 | 8.98 | 0.983 |
| | | | | Average Correction Factor | 0.995 |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 78.6 | 7.82 | 7.81 | 1.000 |
| second point | 4961 | 39.3 | 3.91 | 3.90 | 1.001 |
| third point | 4980 | 19.6 | 1.95 | 1.94 | 1.003 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 7.82 | 7.87 | 0.994 |
| | | | | Average Correction Factor | 1.001 |
| 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 | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | | 0.997969 |
| THC Cal Offset: | | 0.019863 |
| CH4 Cal Slope: | | 0.999698 |
| CH4 Cal Offset: | | -0.002104 |
| NMHC Cal Slope: | | 0.996112 |
| NMHC Cal Offset: | | 0.022966 |

Notes: Install due to other analyzer not working.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

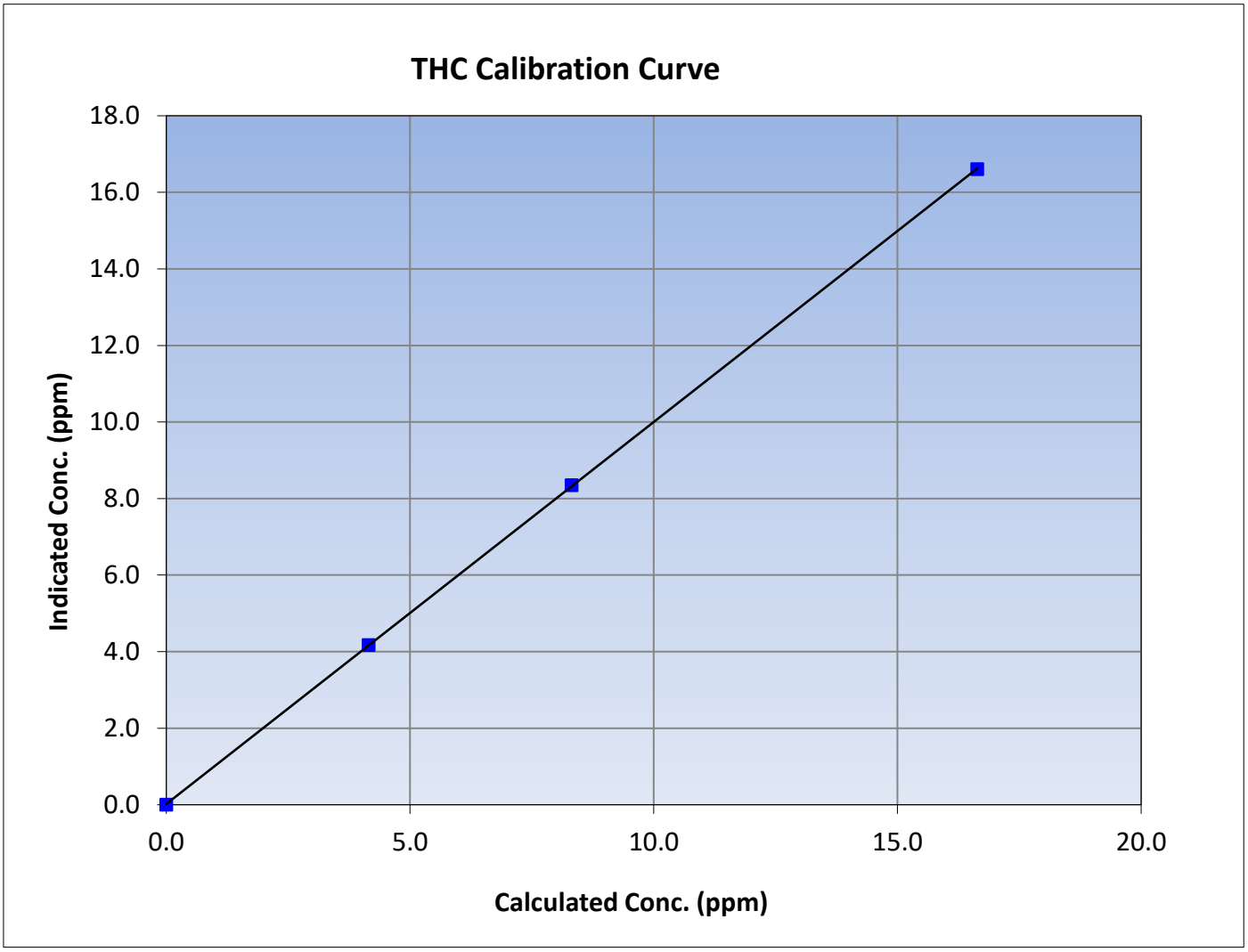
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 11:00 | End Time (MST): | 12:54 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999991 | ≥0.995 |
| 16.64 | 16.61 | 1.0018 | | | |
| 8.32 | 8.35 | 0.9965 | Slope | 0.997969 | 0.90 - 1.10 |
| 4.15 | 4.17 | 0.9951 | | | |
| | | | Intercept | 0.019863 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

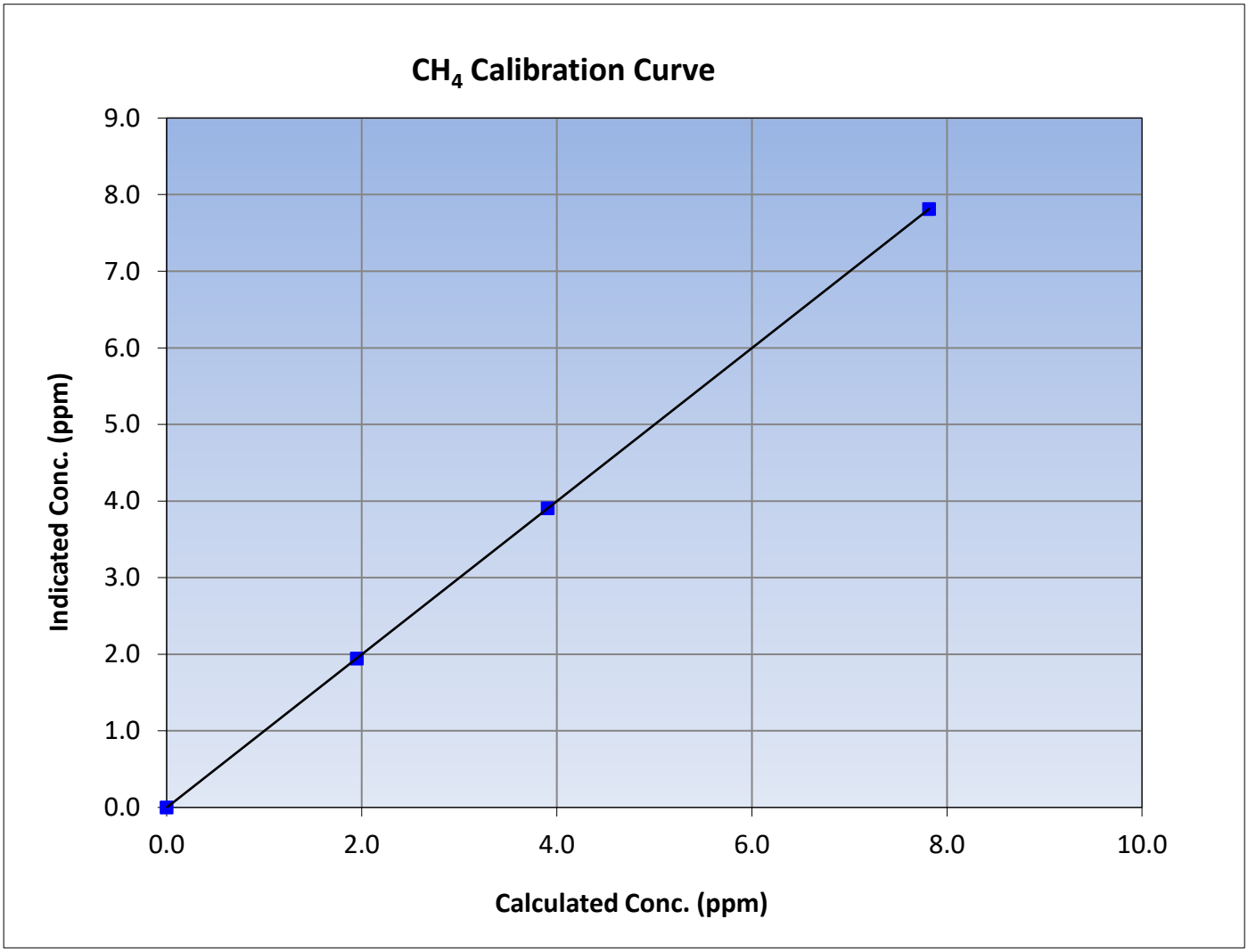
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 11:00 | End Time (MST): | 12:54 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 1.000000 | *≥0.995* |
| 7.82 | 7.81 | 1.0005 | | | |
| 3.91 | 3.90 | 1.0010 | Slope | 0.999698 | *0.90 - 1.10* |
| 1.95 | 1.94 | 1.0027 | | | |
| | | | Intercept | -0.002104 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

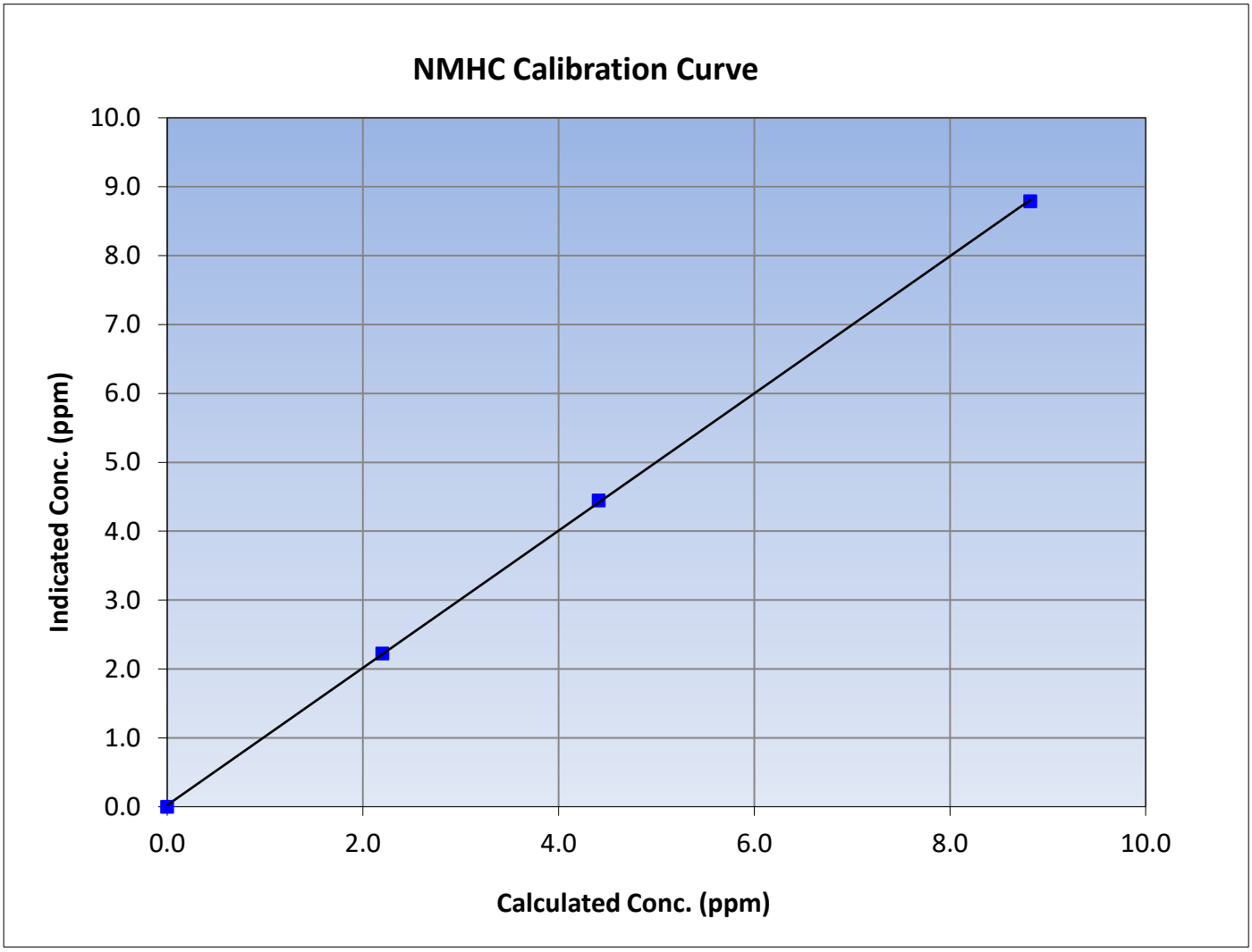
Version-06-2022

### Station Information

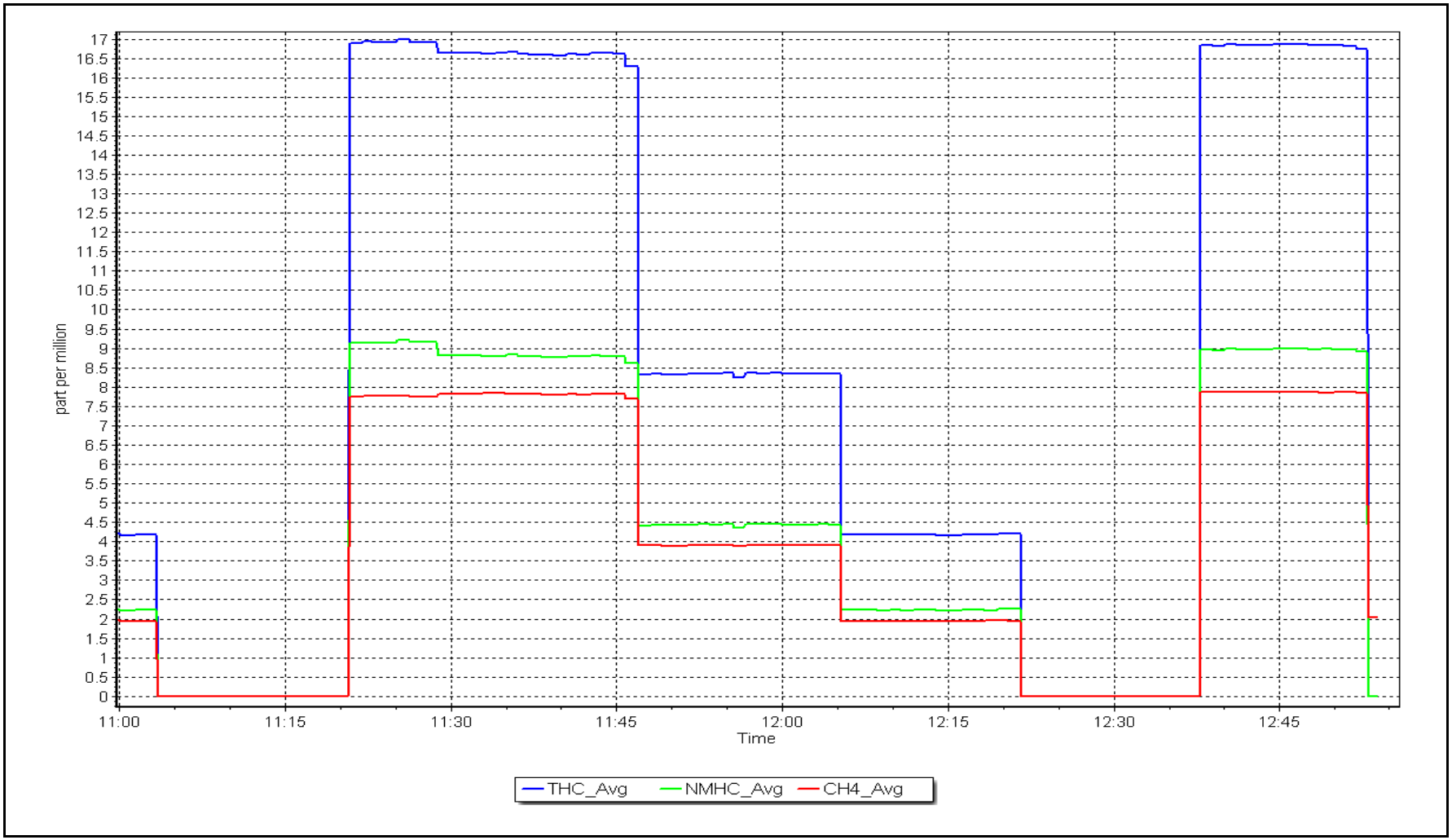
| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 11:00 | End Time (MST): | 12:54 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999958 | ≥0.995 |
| 8.82 | 8.79 | 1.0033 | | | |
| 4.41 | 4.44 | 0.9922 | Slope | 0.996112 | 0.90 - 1.10 |
| 2.20 | 2.23 | 0.9884 | | | |
| | | | Intercept | 0.022966 | +/-0.5 |



**NMHC Calibration Plot** Date: February 6, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 9, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 7:17 | End time (MST): | 10:02 |
| Reason: | Maintenance | recalibrated after having a few days to settle | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | NA | Cal Gas Expiry Date: | March 10, 1931 | |
| CH4 Cal Gas Conc. | 497.2 | ppm | CH4 Equiv Conc. | 1058.2 | ppm |
| C3H8 Cal Gas Conc. | 204.0 | ppm | | | |
| Removed Gas Cert: | | NA | 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 362 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1426262594 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 4.32E-04 | 4.21E-04 | NMHC SP Ratio: | 1.12E-04 | 1.08E-04 |
| CH4 Retention time: | 13.7 | 13.7 | NMHC Peak Area: | 78857 | 81432 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 78.6 | 16.64 | 17.18 | 0.969 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 78.6 | 16.64 | 16.60 | 1.002 |
| second point | 4961 | 39.3 | 8.32 | 8.32 | 0.999 |
| third point | 4980 | 19.6 | 4.15 | 4.16 | 0.998 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 16.64 | 16.64 | 1.000 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 17.18 | Prev response | 16.62 | *% change | 3.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 78.6 | 8.82 | 9.13 | 0.966 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 78.6 | 8.82 | 8.80 | 1.003 |
| second point | 4961 | 39.3 | 4.41 | 4.42 | 0.997 |
| third point | 4980 | 19.6 | 2.20 | 2.22 | 0.992 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 8.82 | 8.81 | 1.001 |
| | | | | Average Correction Factor | 0.997 |
| Baseline Corr AF: | 9.13 | Prev response | 8.81 | *% change | 3.5% |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 78.6 | 7.82 | 8.05 | 0.971 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 78.6 | 7.82 | 7.81 | 1.001 |
| second point | 4961 | 39.3 | 3.91 | 3.90 | 1.001 |
| third point | 4980 | 19.6 | 1.95 | 1.94 | 1.006 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 7.82 | 7.82 | 0.999 |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 8.05 | Prev response | 7.81 | *% change | 3.0% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.997969 | 0.997921 |
| THC Cal Offset: | 0.019863 | 0.010460 |
| CH4 Cal Slope: | 0.999698 | 0.999537 |
| CH4 Cal Offset: | -0.002104 | -0.004306 |
| NMHC Cal Slope: | 0.996112 | 0.996864 |
| NMHC Cal Offset: | 0.022966 | 0.013566 |

Notes: Recalibrated due to having a few days to settle. Span Adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

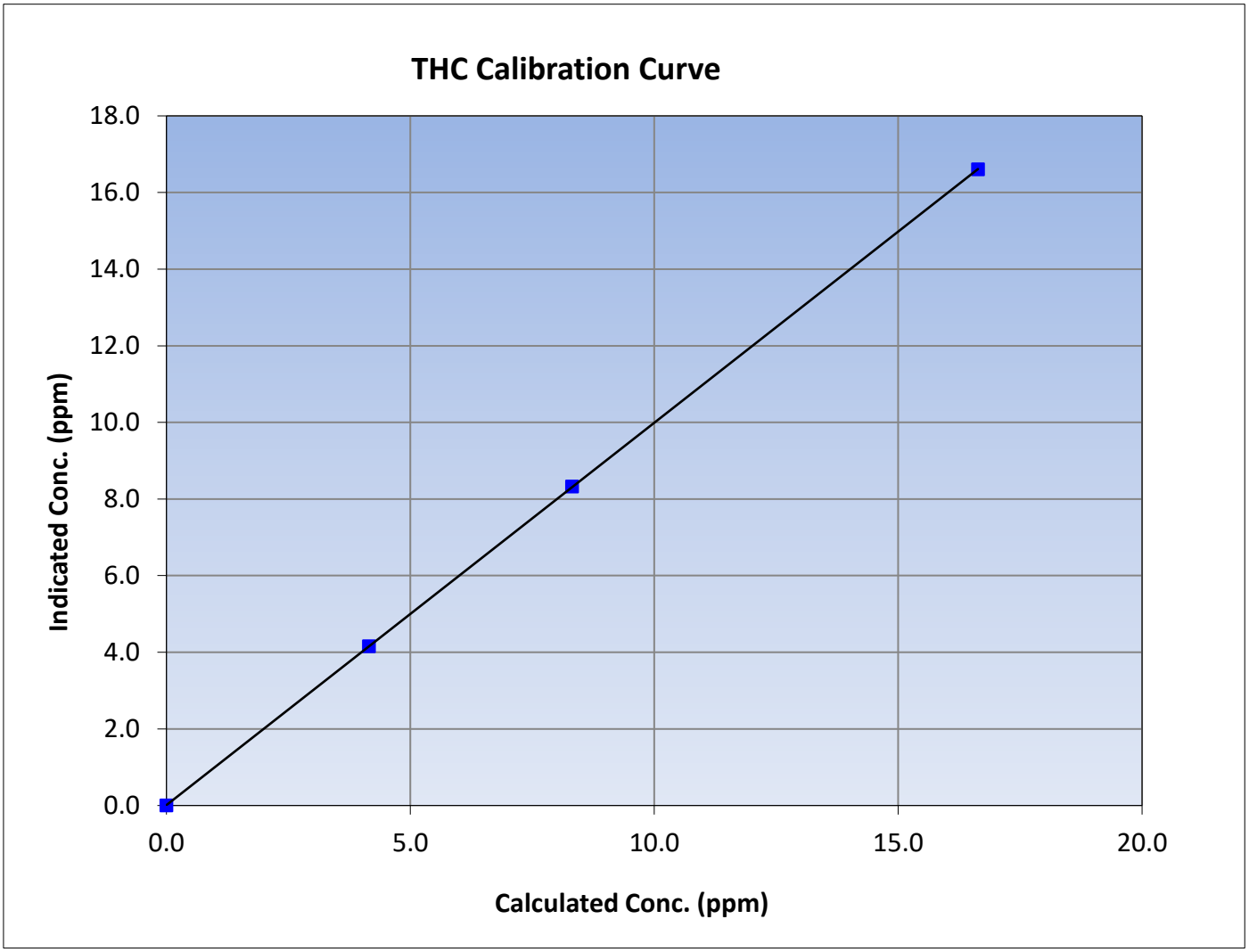
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 9, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:17 | End Time (MST): | 10:02 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999997 | ≥0.995 |
| 16.64 | 16.60 | 1.0019 | | | |
| 8.32 | 8.32 | 0.9992 | Slope | 0.997921 | 0.90 - 1.10 |
| 4.15 | 4.16 | 0.9984 | | | |
| | | | Intercept | 0.010460 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

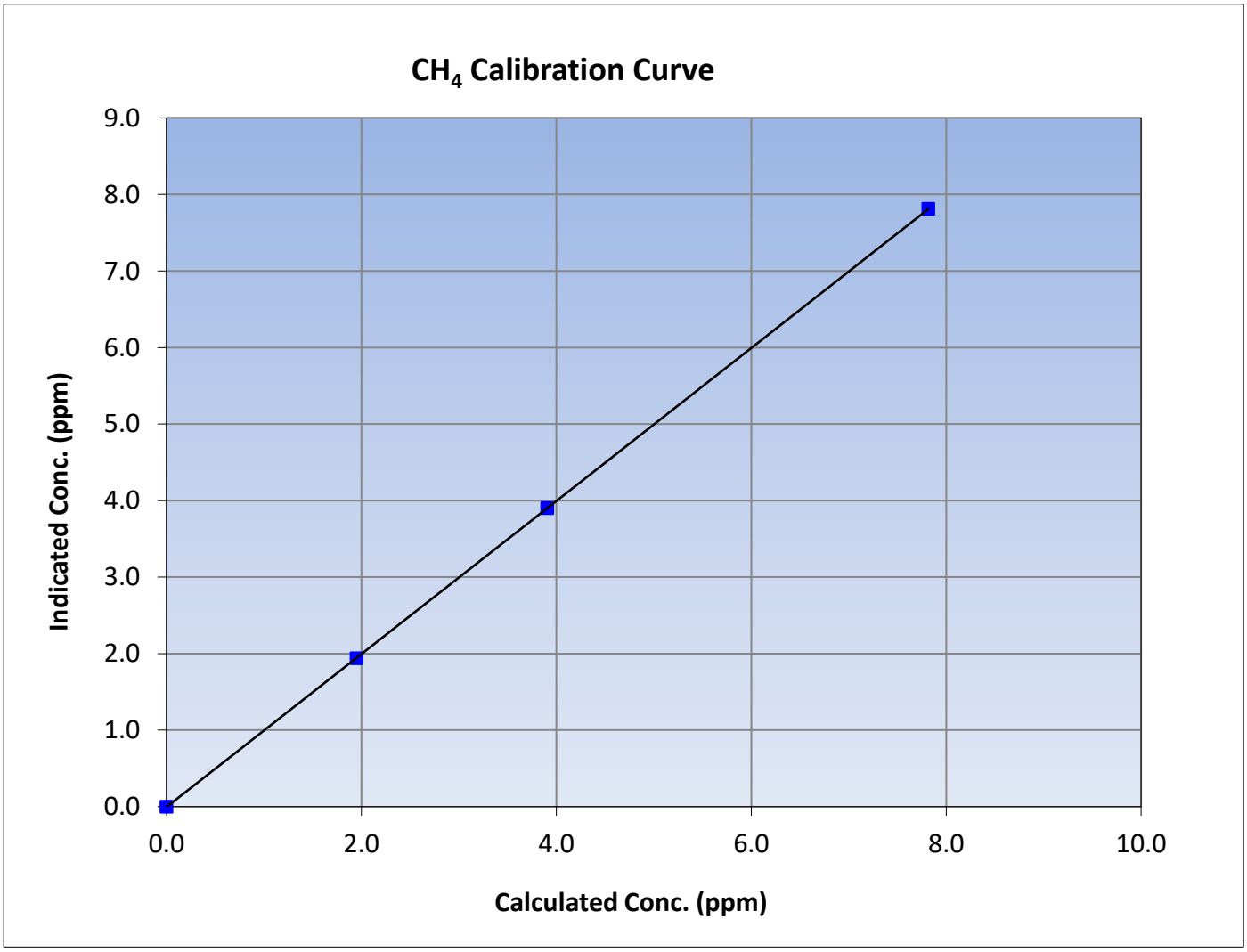
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 9, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:17 | End Time (MST): | 10:02 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 7.82 | 7.81 | 1.0008 | | | |
| 3.91 | 3.90 | 1.0015 | Slope | 0.999537 | *0.90 - 1.10* |
| 1.95 | 1.94 | 1.0058 | | | |
| | | | Intercept | -0.004306 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

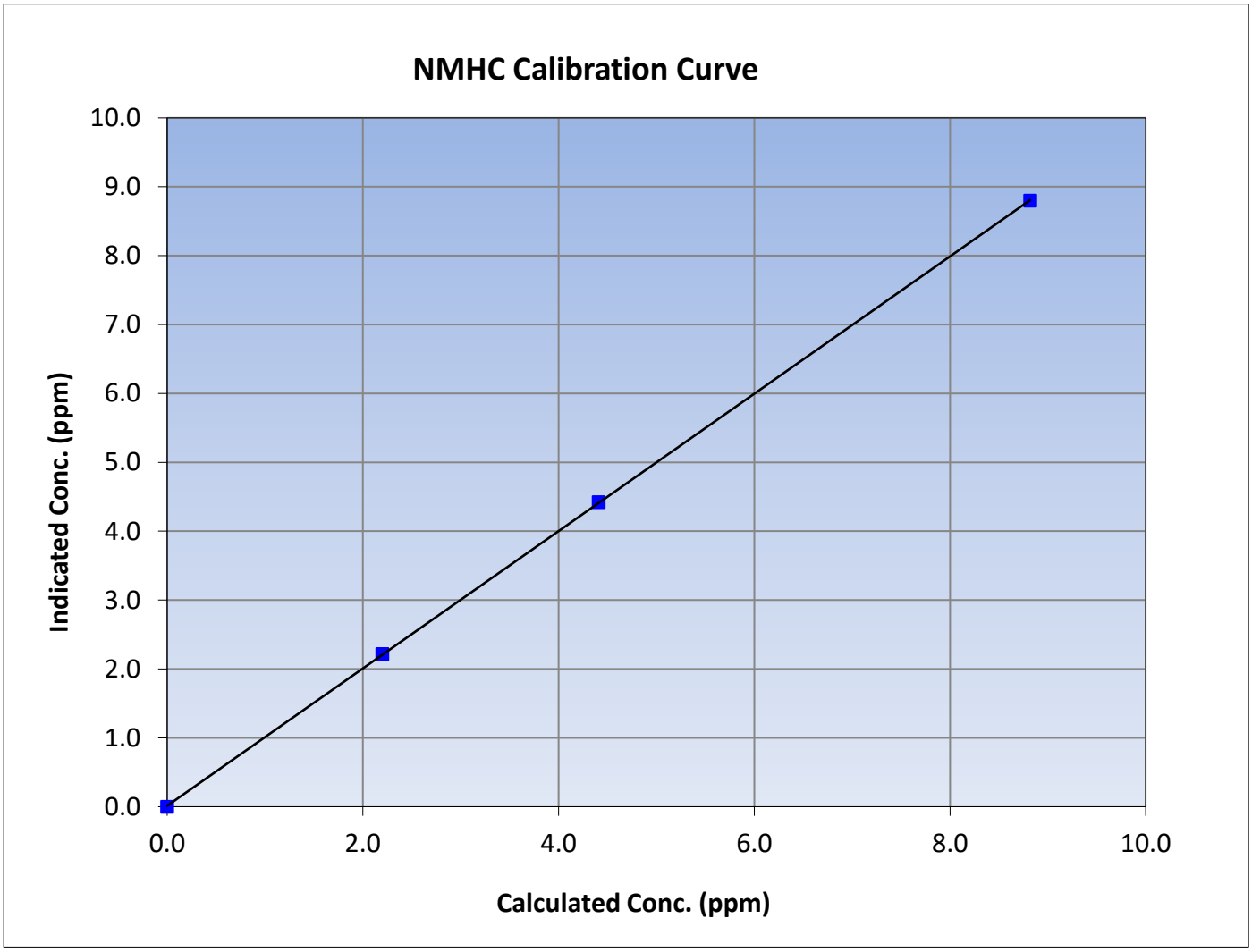
Version-06-2022

### Station Information

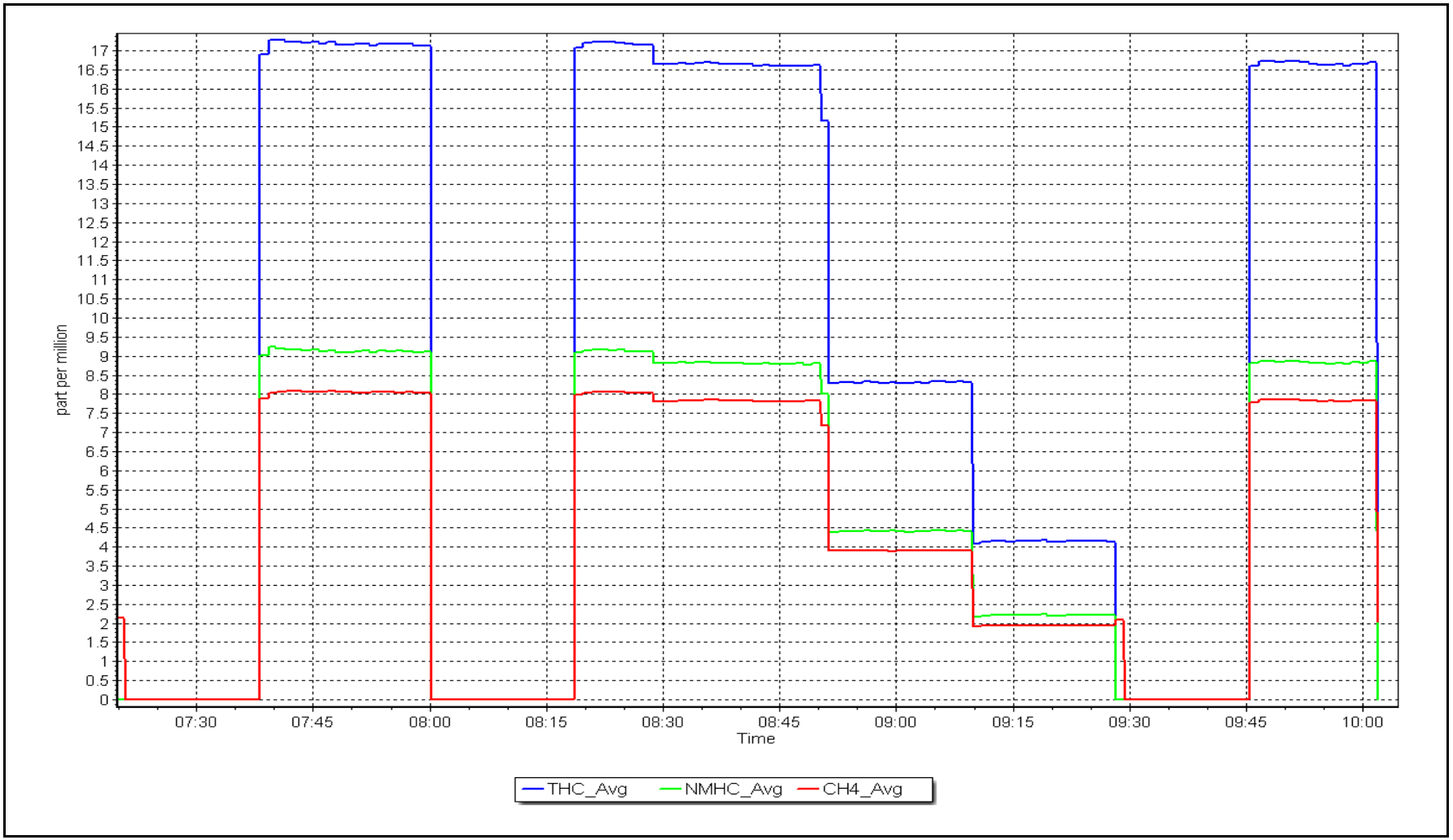
| | | | |
|---|---|---|---|
| Calibration Date: | February 9, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:17 | End Time (MST): | 10:02 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999988 | ≥0.995 |
| 8.82 | 8.80 | 1.0026 | | | |
| 4.41 | 4.42 | 0.9973 | Slope | 0.996864 | 0.90 - 1.10 |
| 2.20 | 2.22 | 0.9925 | | | |
| | | | Intercept | 0.013566 | +/-0.5 |



**NMHC Calibration Plot** Date: February 9, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 12, 2024 |
| Start time (MST): | 7:45 | End time (MST): | 12:52 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | CC324979 | | Cal Gas Expiry Date: | November 3, 1932 | |
| NOX Cal Gas Conc: | 48.90 | ppm | NO Cal Gas Conc: | 48.80 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 48.90 | ppm | Removed Gas NO Conc: | 48.80 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 3808 | |
| ZAG make/model: | API T701 | | Serial Number: | 362 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | API T200 | | Analyzer serial #: | 721 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.182 | 1.162 | NO bkgnd or offset: | -0.6 | -0.6 |
| NOX coeff or slope: | 1.169 | 1.154 | NOX bkgnd or offset: | -0.3 | -0.3 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 4.3 | 4.3 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000181 | 1.001294 |
| $NO_X$ Cal Offset: | -0.473674 | -0.213331 |
| NO Cal Slope: | 1.002304 | 0.999626 |
| NO Cal Offset: | -1.574438 | -0.914344 |
| $NO_2$ Cal Slope: | 0.987754 | 0.997058 |
| $NO_2$ Cal Offset: | -0.437615 | -0.192985 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.3 | 0.0 | ---- | ---- |
| as found span | 4918 | 81.8 | 800.0 | 798.4 | 1.6 | 808.6 | 805.6 | 3.0 | 0.9894 | 0.9911 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4918 | 81.8 | 800.0 | 798.4 | 1.6 | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.8 | -0.3 | ---- | ---- |
| high point | 4918 | 81.8 | 800.0 | 798.4 | 1.6 | 801.2 | 798.3 | 2.9 | 0.9985 | 1.0001 |
| second point | 4959 | 40.9 | 400.0 | 399.2 | 0.8 | 400.0 | 396.5 | 3.4 | 1.0000 | 1.0068 |
| third point | 4980 | 20.4 | 199.5 | 199.1 | 0.4 | 198.8 | 196.9 | 1.8 | 1.0035 | 1.0111 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 1.2 | -0.4 | ---- | ---- |
| as left span | 4918 | 81.8 | 800.0 | 404.7 | 395.3 | 792.3 | 398.9 | 393.4 | 1.0098 | 1.0145 |
| | | | | | | | | Average Correction Factor | 1.0007 | 1.0060 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 808.3 ppb | NO = 805.3 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.1% |
| Previous Response | $NO_X$ = 799.7 ppb | NO = 798.7 ppb | | *Percent Change | NO = | 0.8% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 795.4 | 401.7 | 395.3 | 393.9 | 1.0036 | 99.6% |
| 2nd GPT point (200 ppb O3) | 795.4 | 600.9 | 196.1 | 195.5 | 1.0033 | 99.7% |
| 3rd GPT point (100 ppb O3) | 795.4 | 696.4 | 100.6 | 100.2 | 1.0044 | 99.6% |
| | | | | Average Correction Factor | 1.0038 | 99.6% |

Notes: Span adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

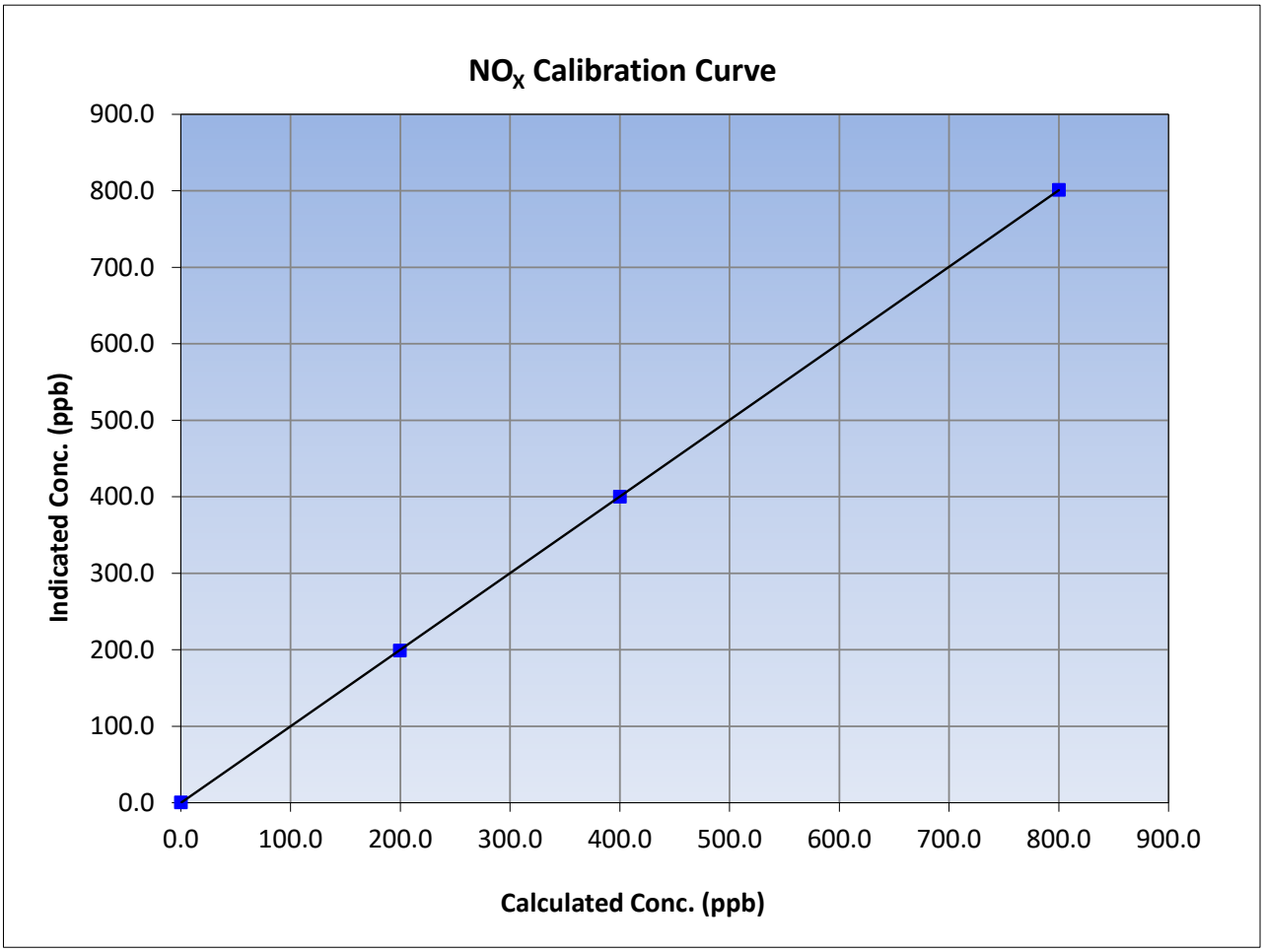
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 12, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:52 |
| Analyzer make: | API T200 | Analyzer serial #: | 721 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.5 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 800.0 | 801.2 | 0.9985 | | | |
| 400.0 | 400.0 | 1.0000 | Slope | 1.001294 | 0.90 - 1.10 |
| 199.5 | 198.8 | 1.0035 | | | |
| | | | Intercept | -0.213331 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

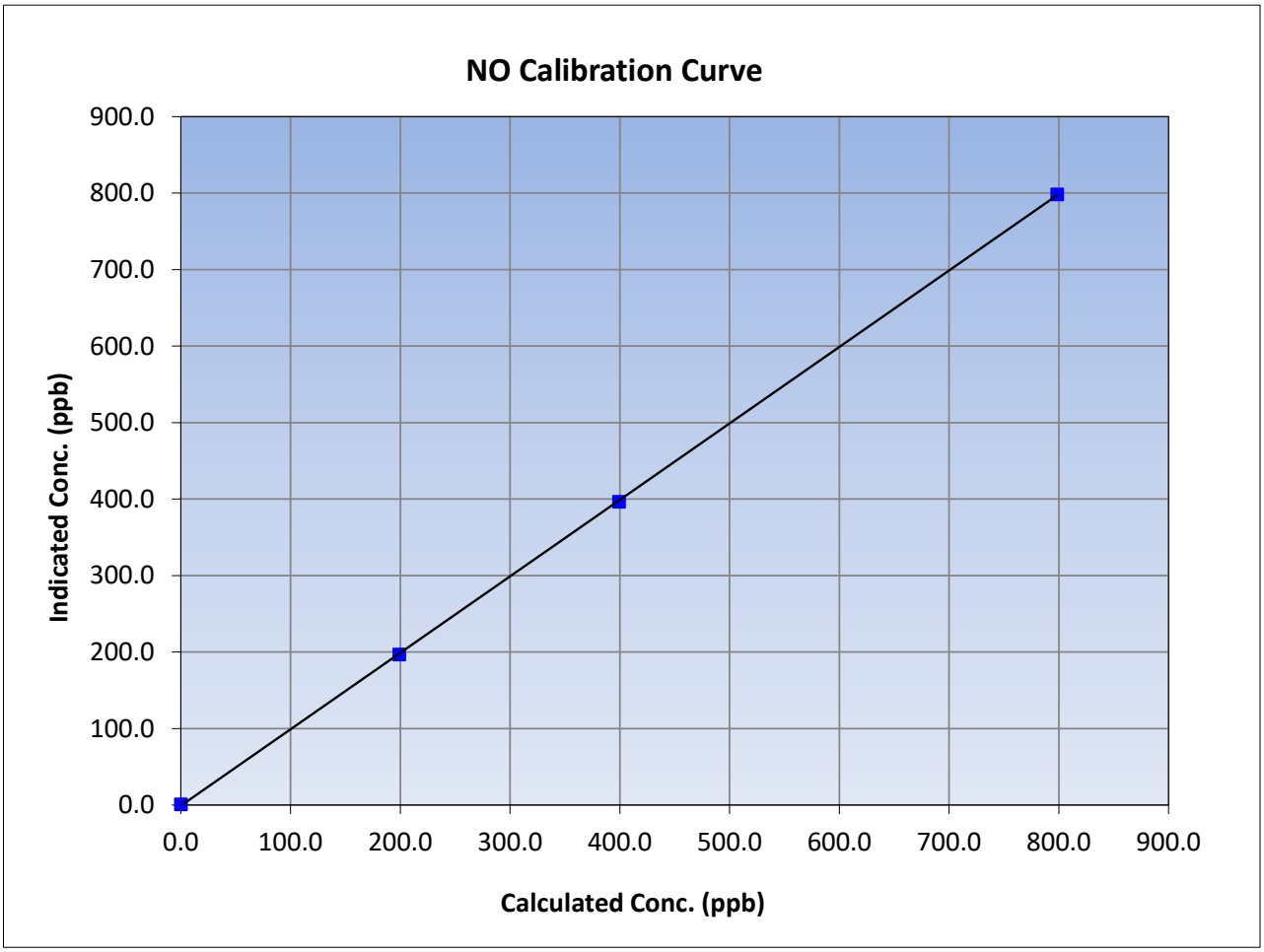
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 12, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:52 |
| Analyzer make: | API T200 | Analyzer serial #: | 721 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.8 | ---- | Correlation Coefficient | 0.999976 | ≥0.995 |
| 798.4 | 798.3 | 1.0001 | | | |
| 399.2 | 396.5 | 1.0068 | Slope | 0.999626 | 0.90 - 1.10 |
| 199.1 | 196.9 | 1.0111 | | | |
| | | | Intercept | -0.914344 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

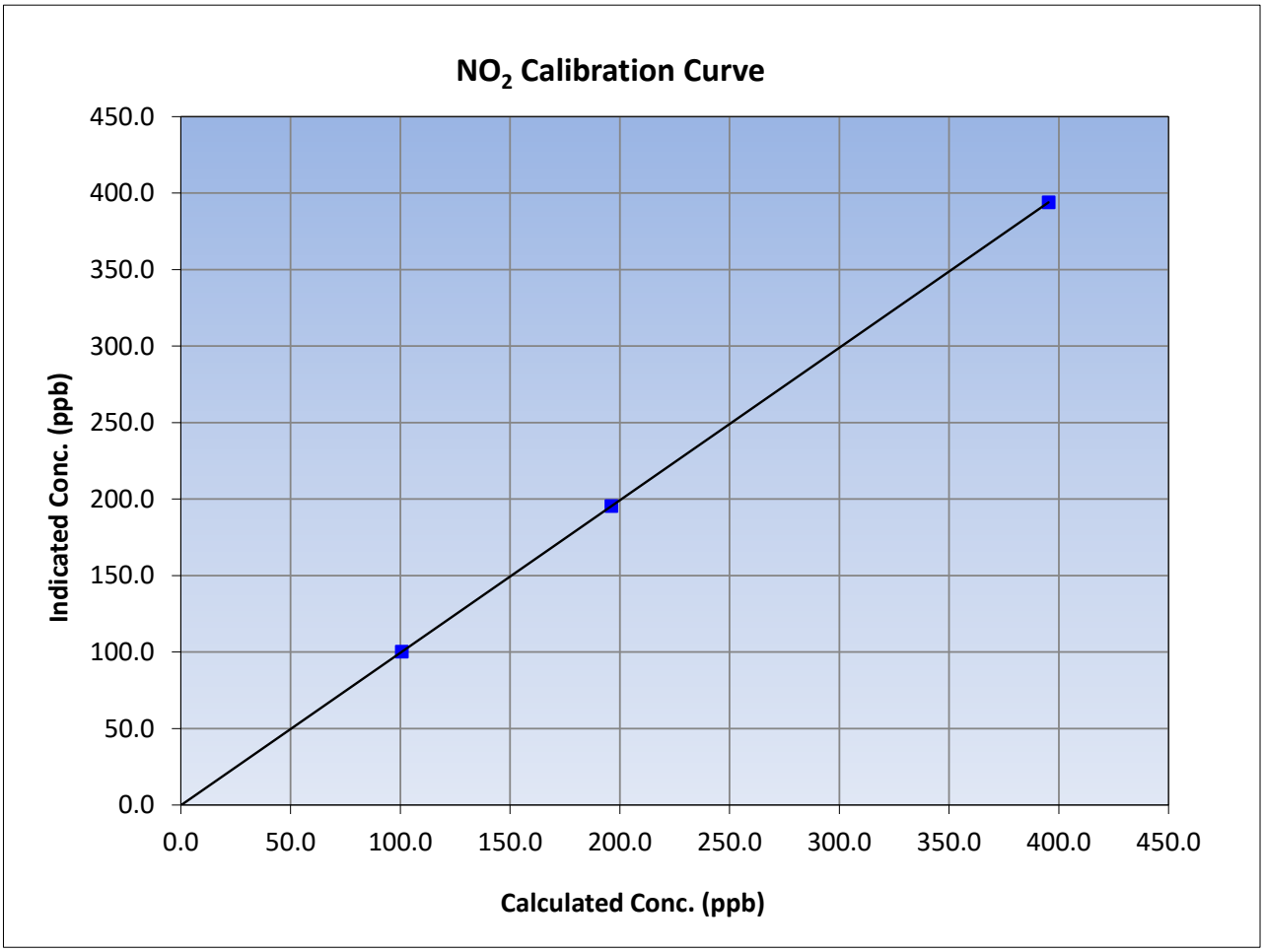
Version-04-2020

### Station Information

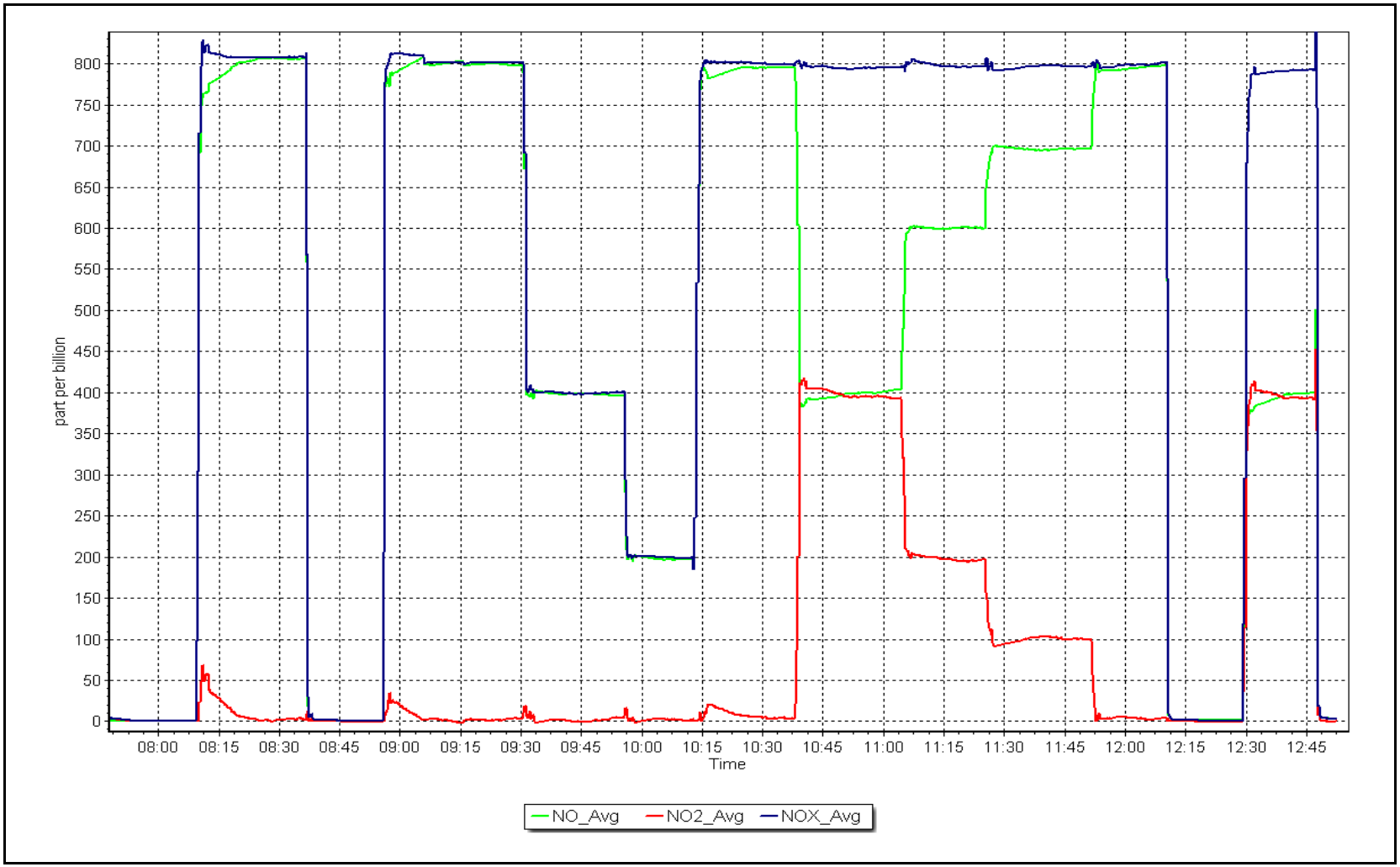
| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 12, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:52 |
| Analyzer make: | API T200 | Analyzer serial #: | 721 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.3 | ---- | Correlation Coefficient | 1.000000 | ≥0.995 |
| 395.3 | 393.9 | 1.0036 | | | |
| 196.1 | 195.5 | 1.0033 | Slope | 0.997058 | 0.90 - 1.10 |
| 100.6 | 100.2 | 1.0044 | | | |
| | | | Intercept | -0.192985 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 12, 2024 Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | February 9, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 10:01 | End time (MST): | 12:47 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.002571 | 0.999029 | Backgd or Offset: | -3.5 | -2.2 |
| Calibration intercept: | 0.800000 | 0.420000 | Coeff or Slope: | 1.011 | 1.011 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 1.0 | ---- |
| as found span | 5000 | 986.1 | 400.0 | 399.1 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 5000 | 986.7 | 400.0 | 399.9 | 1.000 |
| second point | 5000 | 816.9 | 200.0 | 200.3 | 0.999 |
| third point | 5000 | 707.0 | 100.0 | 100.7 | 0.993 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 5000 | 987.9 | 400.0 | 401.9 | 0.995 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 398.1 | Previous response | 401.8 | *% change | -0.9% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: No Maintenance done. Zero adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

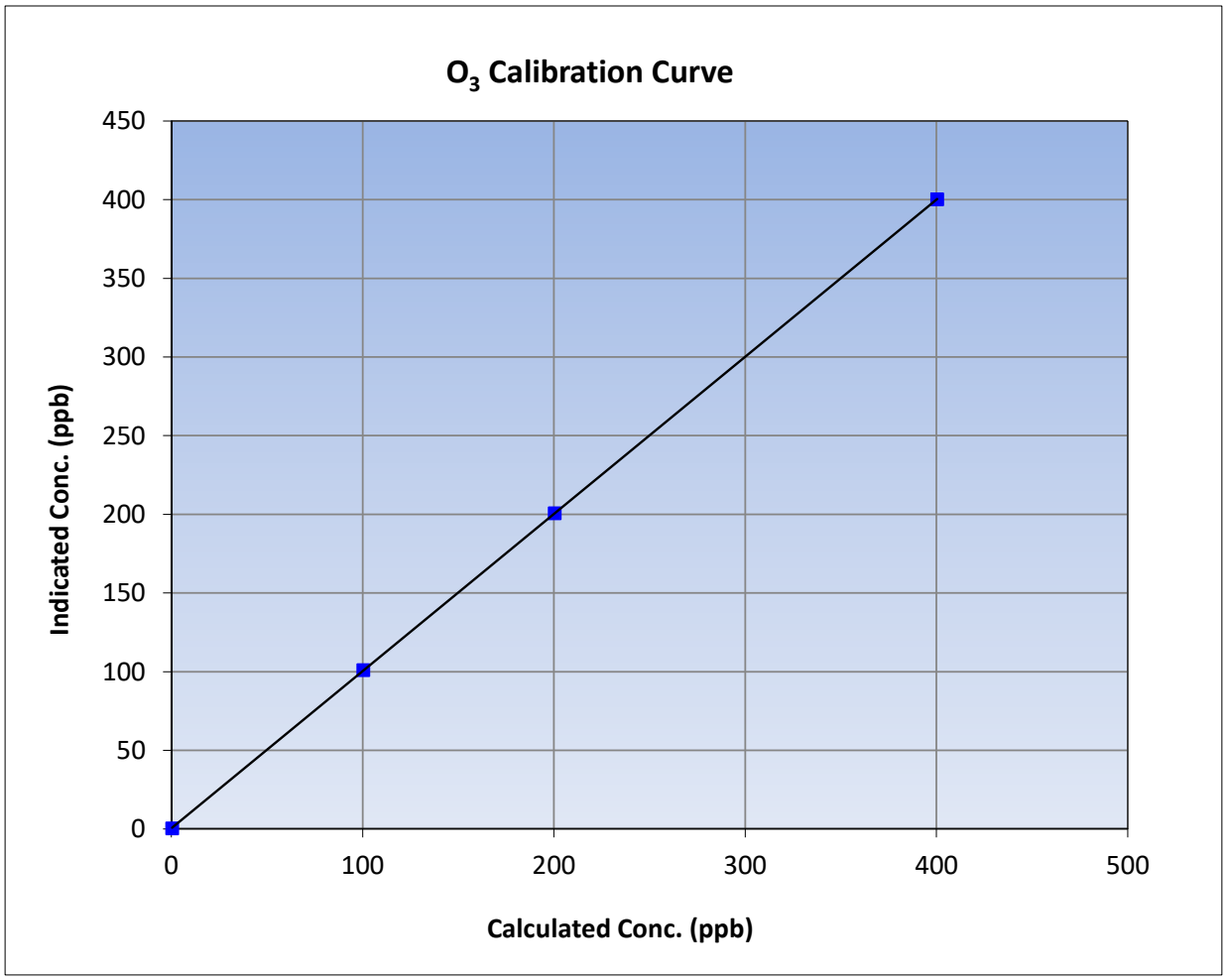
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 9, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 10:01 | End Time (MST): | 12:47 |
| Analyzer make: | API T400 | Analyzer serial #: | 2961 |

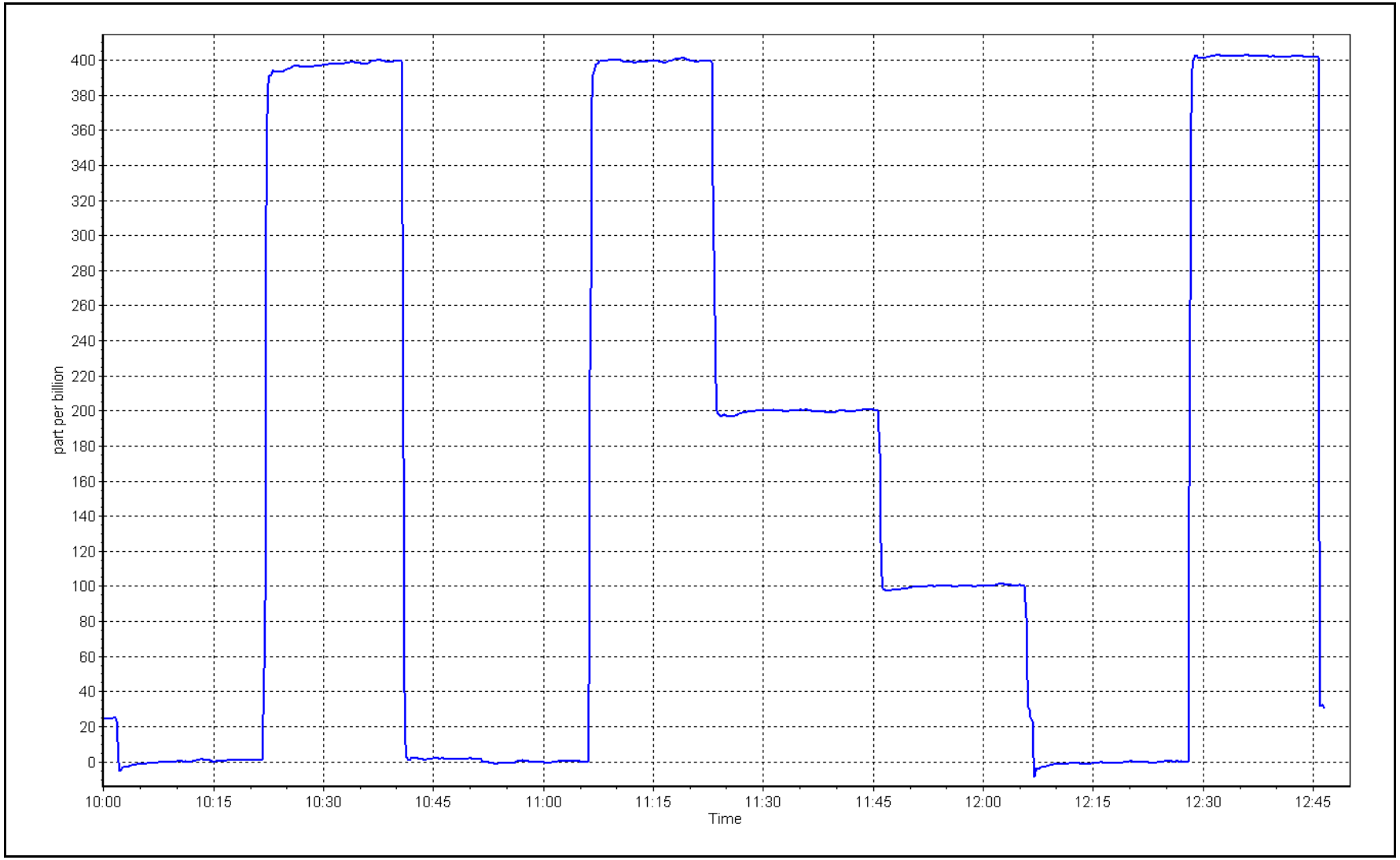
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 400.0 | 399.9 | 1.0003 |
| 200.0 | 200.3 | 0.9985 |
| 100.0 | 100.7 | 0.9930 |
| | | |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999997 | ≥0.995 |
| Slope | 0.999029 | 0.90 - 1.10 |
| Intercept | 0.420000 | +/- 5 |



**$O_3$ Calibration Plot** Date: February 9, 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: | February 27, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 9:18 | End time (MST): | 10:21 |
| Analyzer Make: | API T640 | S/N: | 321 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 1451 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 1451 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| T (°C) | -22 | -22.9 | -22 | ☐ | +/- 2 °C |
| P (mmHg) | 734.4 | 736.3 | 734.4 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 5.2 | 5.01 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 43 | ----- | 43 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 22.0 | 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: 6-10-2024 — Lot No.: 100128-050-042

| Parameter | As found | Post maintenance | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| PMT Peak Test | 11 | 11 | 11 | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: February 27, 2024

Date Disposable Filter Changed: February 27, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0 <0.2 ug/m3

### Annual Maintenance

Date Sample Tube Cleaned: February 27, 2024

Date RH/T Sensor Cleaned: February 27, 2024

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

Calibration by: Melissa Lemay

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS05
## MANNIX
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS05 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 19, 2024 |
| Start time (MST): | 9:52 | 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 #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 621 |
| ZAG Make/Model: | API T701H | | Serial Number: | 832 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1008841399

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.003770 | 1.004227 | Backgd or Offset: | 9.1 | 9.1 |
| Calibration intercept: | 0.040000 | -0.020000 | Coeff or Slope: | 0.944 | 0.944 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as found span | 4920 | 80.0 | 800.3 | 800.1 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| high point | 4920 | 80.0 | 800.3 | 804.2 | 0.995 |
| second point | 4960 | 40.0 | 400.2 | 400.9 | 0.998 |
| third point | 4980 | 20.0 | 200.1 | 200.7 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.9 | ---- |
| as left span | 4920 | 80.0 | 800.3 | 806.7 | 0.992 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 799.60 | Previous response | 803.38 | *% 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

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

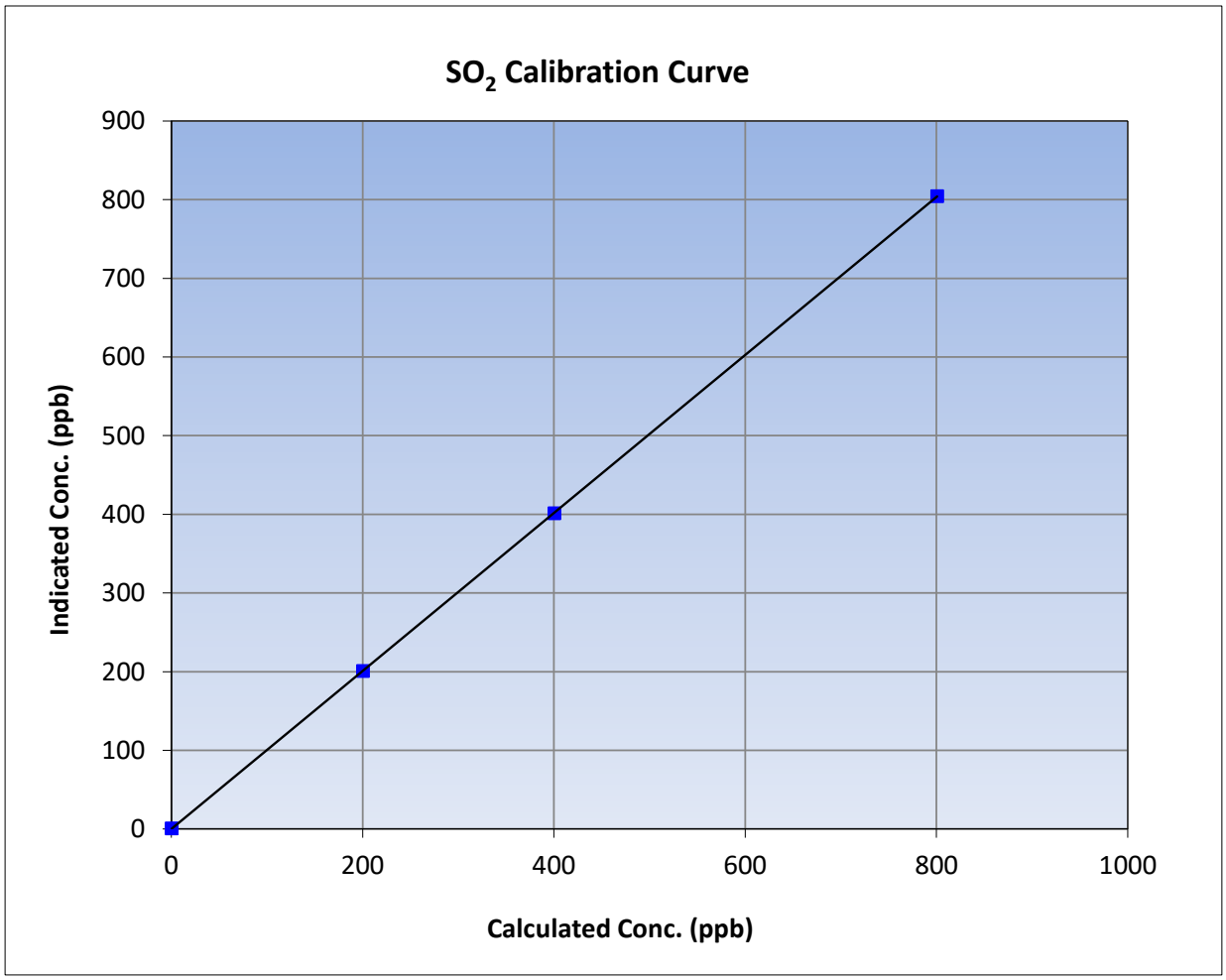
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Mannix | Station Number: | AMS05 |
| Start Time (MST): | 9:52 | End Time (MST): | 13:45 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1008841399 |

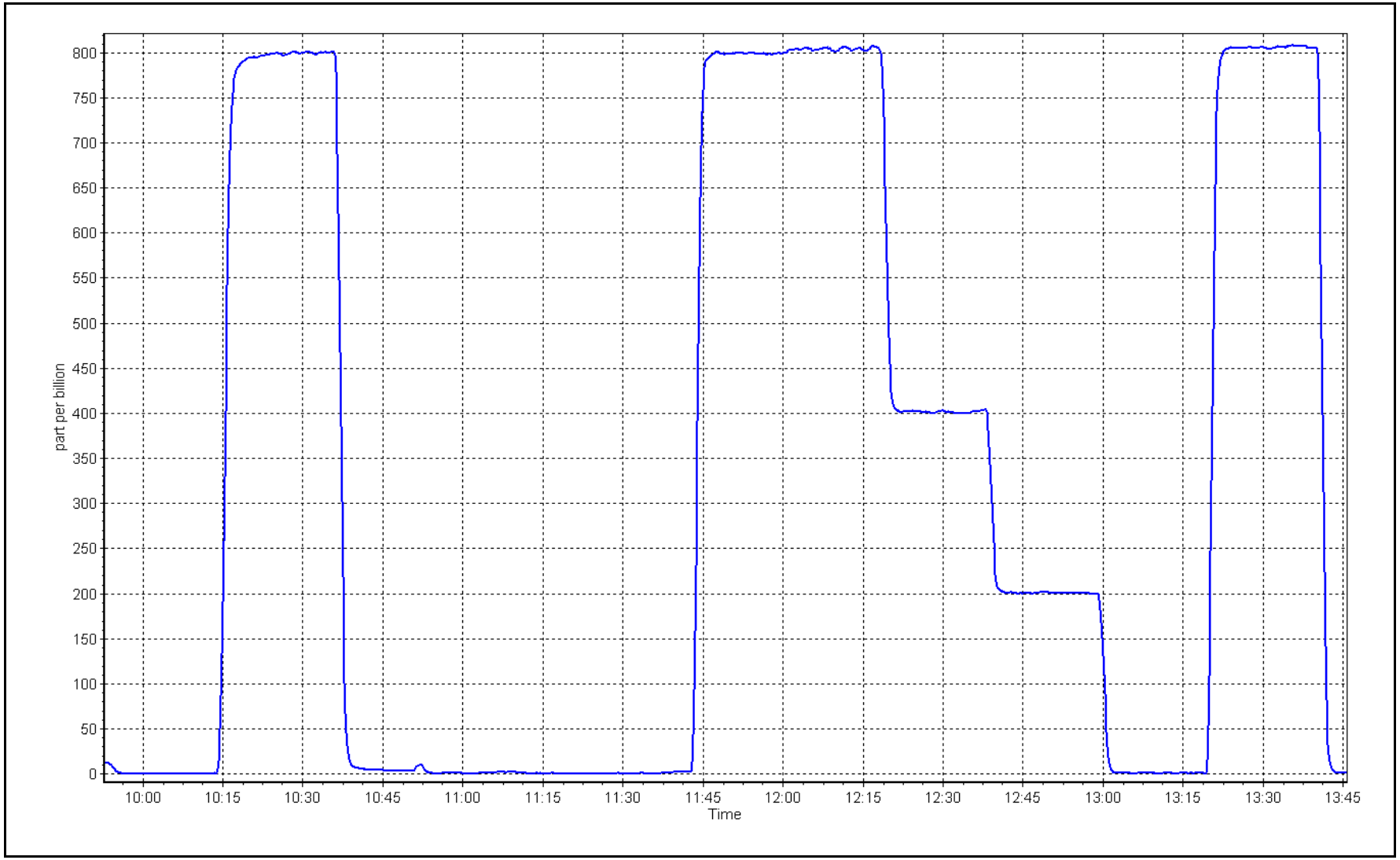
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 800.3 | 804.2 | 0.9952 |
| 400.2 | 400.9 | 0.9982 |
| 200.1 | 200.7 | 0.9969 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 1.004227 | *0.90 - 1.10* |
| Intercept | -0.020000 | *+/-30* |



**SO2 Calibration Plot** Date: February 2, 2024 Location: Mannix



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS05 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 9:48 | End time (MST): | 14:13 |
| 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: | |
| Removed Gas Cyl #: | | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 1845 |
| ZAG Make/Model: | API T701H | | Serial Number: | 832 |

### Analyzer Information

| | | | | |
|---|---|---|---|---|
| Analyzer make: | Thermo 43iQTL | | Analyzer serial #: | 1200326169 |
| Converter make: | Global | | Converter serial #: | 2022225 |
| Analyzer Range | 0 - 100 ppb | | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999261 | 1.008837 | Backgd or Offset: | 1.27 | 1.24 |
| Calibration intercept: | 0.182265 | 0.022150 | Coeff or Slope: | 1.022 | 0.998 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4919 | 80.6 | 80.0 | 82.7 | 0.967 |
| as found 2nd point | 4960 | 40.3 | 40.0 | 40.9 | 0.977 |
| as found 3rd point | 4980 | 20.2 | 20.0 | 20.7 | 0.968 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4919 | 80.6 | 80.0 | 80.7 | 0.991 |
| second point | 4960 | 40.3 | 40.0 | 40.4 | 0.989 |
| third point | 4980 | 20.2 | 20.0 | 20.1 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 80.6 | 80.0 | 80.4 | 0.995 |
| SO2 Scrubber Check | 4920 | 80.0 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 82.7 | Prev response: | 80.08 | *% change: | 3.2% |
| Baseline Corr 2nd AF pt: | 40.9 | AF Slope: | 1.033715 | AF Intercept: | -0.098418 |
| Baseline Corr 3rd AF pt: | 20.7 | AF Correlation: | 0.999962 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

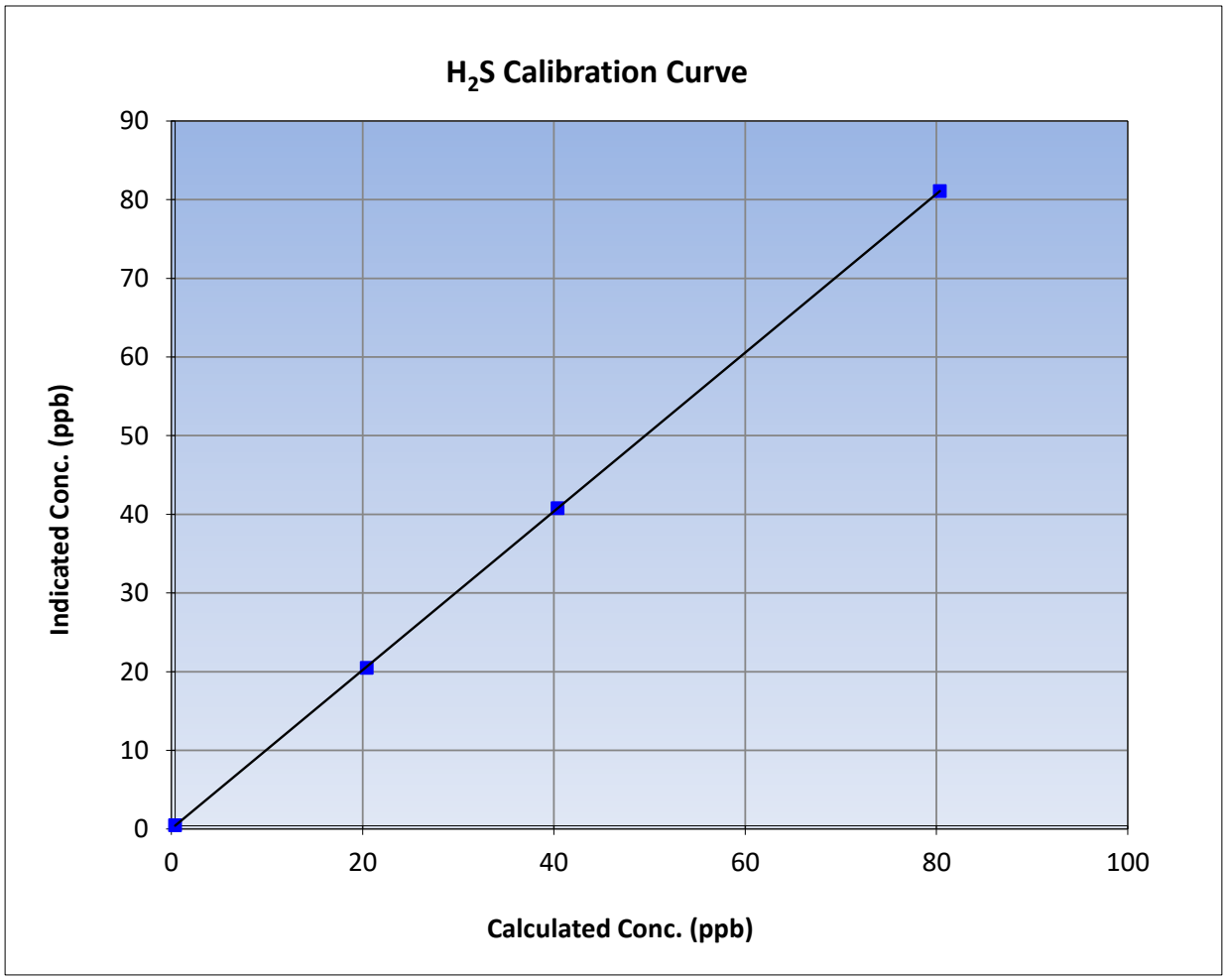
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Mannix | Station Number: | AMS05 |
| Start Time (MST): | 9:48 | End Time (MST): | 14:13 |
| Analyzer make: | Thermo 43iQTL | Analyzer serial #: | 1200326169 |

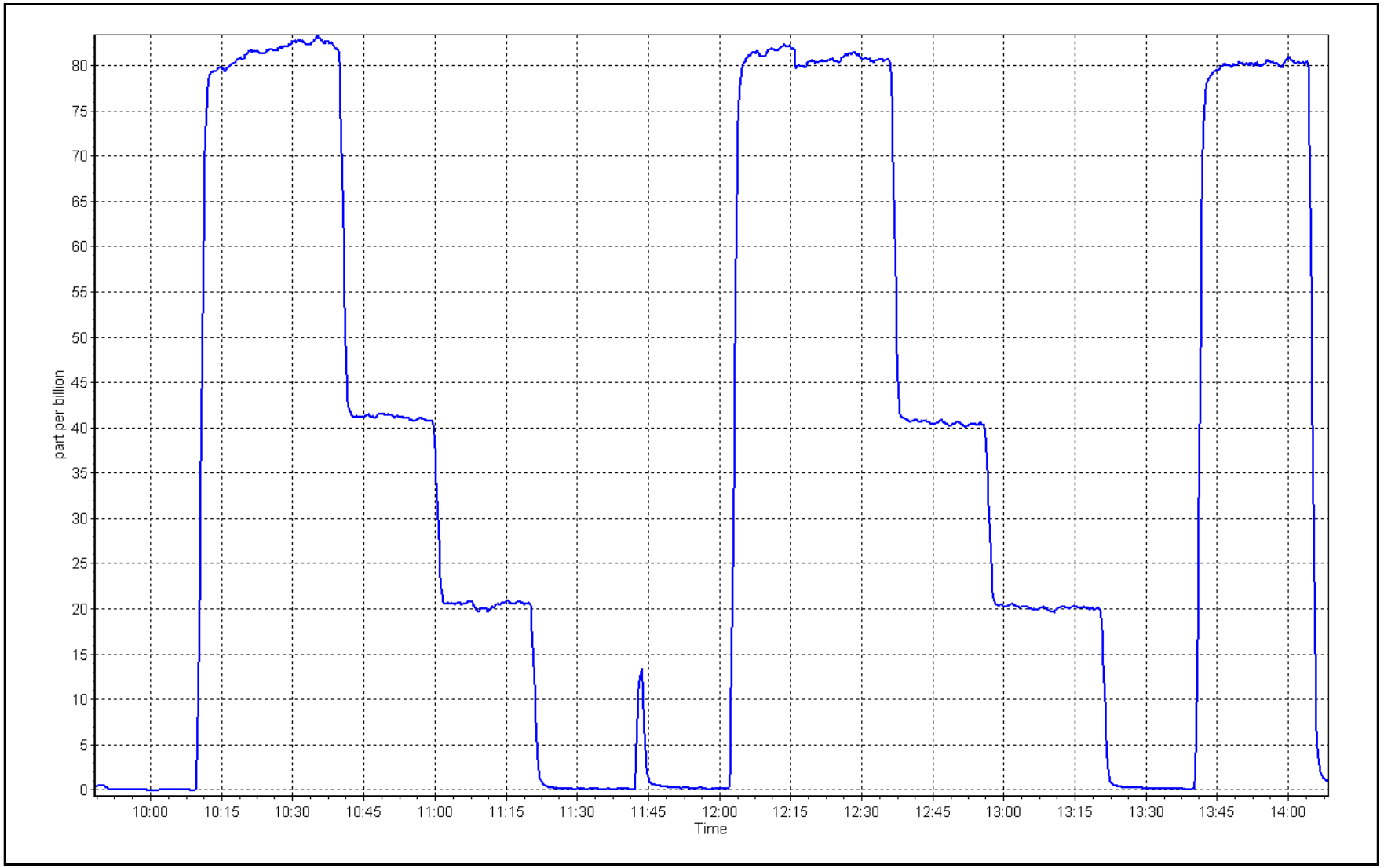
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 80.7 | 0.9909 |
| 40.0 | 40.4 | 0.9895 |
| 20.0 | 20.1 | 0.9969 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 1.008837 | *0.90 - 1.10* |
| Intercept | 0.022150 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 15, 2024 Location: Mannix



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS 05 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 19, 2024 |
| Start time (MST): | 9:52 | End time (MST): | 13:45 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | XCO268098 | | 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: | | | Removed Gas Expiry: | | |
| Removed CH4 Conc. | 504.9 | ppm | CH4 Equiv Conc. | 1076.6 | ppm |
| Removed C3H8 Conc. | 207.9 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | API T700 | | Serial Number: | 621 | |
| ZAG make/model: | API T701 | | Serial Number: | 5613 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1152430011 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.64E-05 | 2.71E-05 | NMHC SP Ratio: | 4.43E-05 | 4.49E-05 |
| CH4 Retention time: | 15.2 | 15.4 | NMHC Peak Area: | 206470 | 203563 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.0 | 17.23 | 16.96 | 1.016 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.02 | ---- |
| high point | 4920 | 80.0 | 17.23 | 17.19 | 1.002 |
| second point | 4960 | 40.0 | 8.61 | 8.60 | 1.001 |
| third point | 4980 | 20.0 | 4.31 | 4.31 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 17.23 | 17.26 | 0.998 |
| | | | | Average Correction Factor | 1.001 |
| Baseline Corr AF: | 16.96 | Prev response | 17.23 | *% change | -1.6% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.0 | 9.15 | 9.10 | 1.005 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 9.15 | 9.18 | 0.997 |
| second point | 4960 | 40.0 | 4.57 | 4.59 | 0.996 |
| third point | 4980 | 20.0 | 2.29 | 2.31 | 0.992 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 9.15 | 9.22 | 0.993 |
| | | | | Average Correction Factor | 0.995 |
| Baseline Corr AF: | 9.10 | Prev response | 9.15 | *% 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.0 | 8.08 | 7.86 | 1.028 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.02 | ---- |
| high point | 4920 | 80.0 | 8.08 | 8.01 | 1.009 |
| second point | 4960 | 40.0 | 4.04 | 4.01 | 1.008 |
| third point | 4980 | 20.0 | 2.02 | 2.00 | 1.010 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 8.08 | 8.04 | 1.004 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 7.86 | Prev response | 8.08 | *% change | -2.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.000521 | 0.996805 |
| THC Cal Offset: | -0.007800 | 0.014200 |
| CH4 Cal Slope: | 1.001401 | 0.989588 |
| CH4 Cal Offset: | -0.007000 | 0.009000 |
| NMHC Cal Slope: | 0.999969 | 1.002817 |
| NMHC Cal Offset: | -0.001200 | 0.005400 |

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## THC Calibration Summary

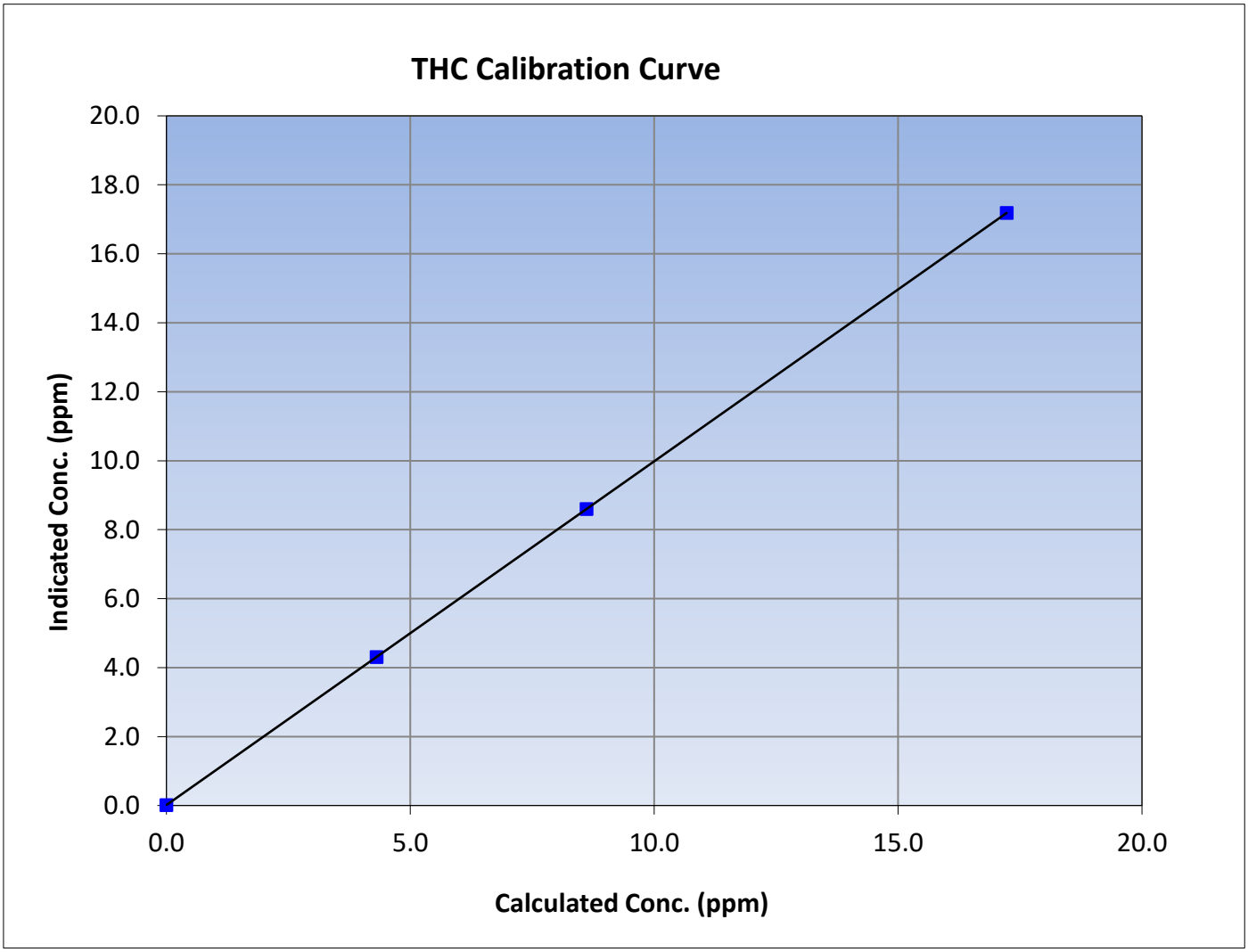
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 9:52 | End Time (MST): | 13:45 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.02 | ---- | Correlation Coefficient | 1.000000 | *≥0.995* |
| 17.23 | 17.19 | 1.0024 | | | |
| 8.61 | 8.60 | 1.0014 | Slope | 0.996805 | *0.90 - 1.10* |
| 4.31 | 4.31 | 1.0003 | | | |
| | | | Intercept | 0.014200 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

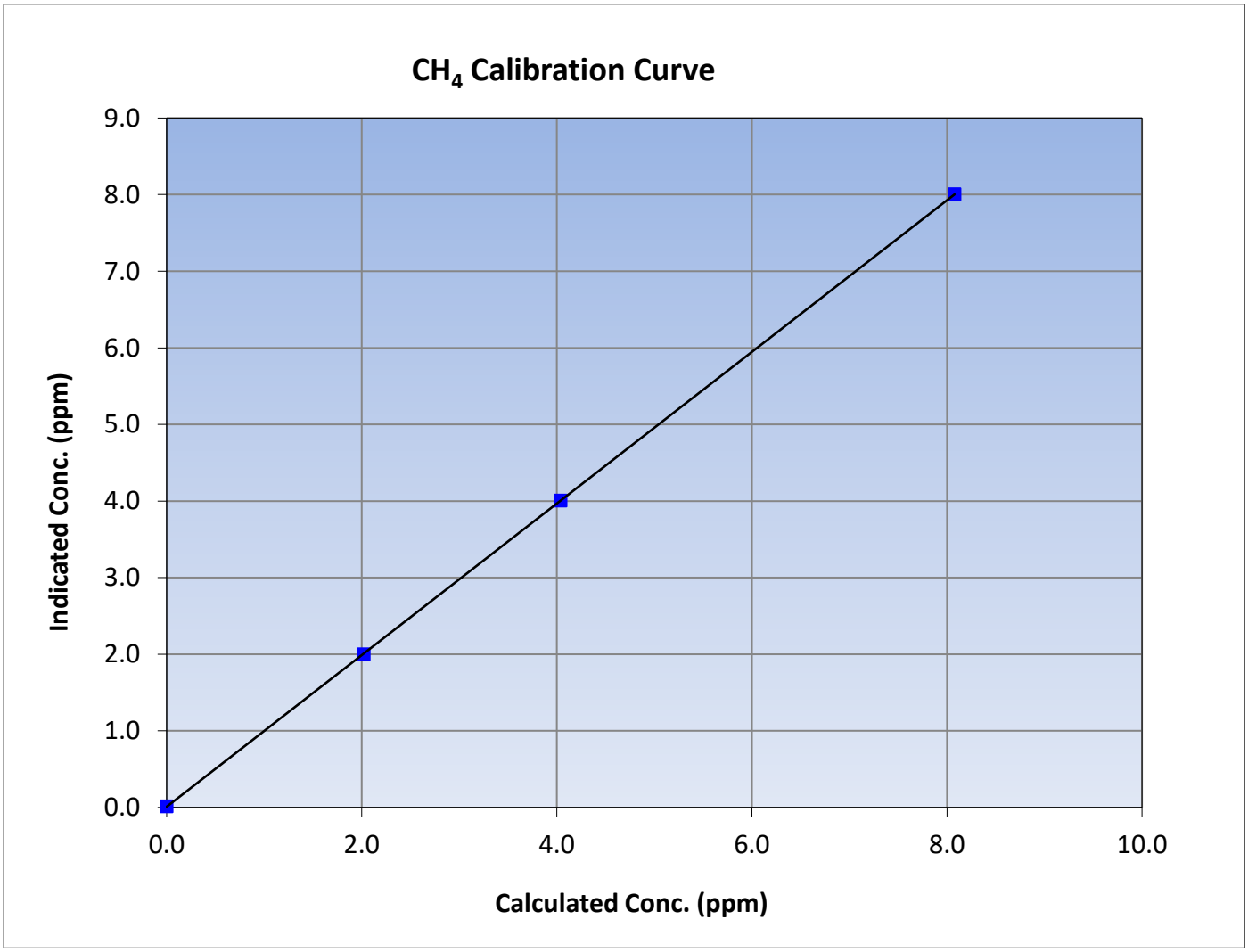
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 9:52 | End Time (MST): | 13:45 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.02 | ---- | Correlation Coefficient | 0.999997 | *≥0.995* |
| 8.08 | 8.01 | 1.0092 | | | |
| 4.04 | 4.01 | 1.0080 | Slope | 0.989588 | *0.90 - 1.10* |
| 2.02 | 2.00 | 1.0103 | | | |
| | | | Intercept | 0.009000 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

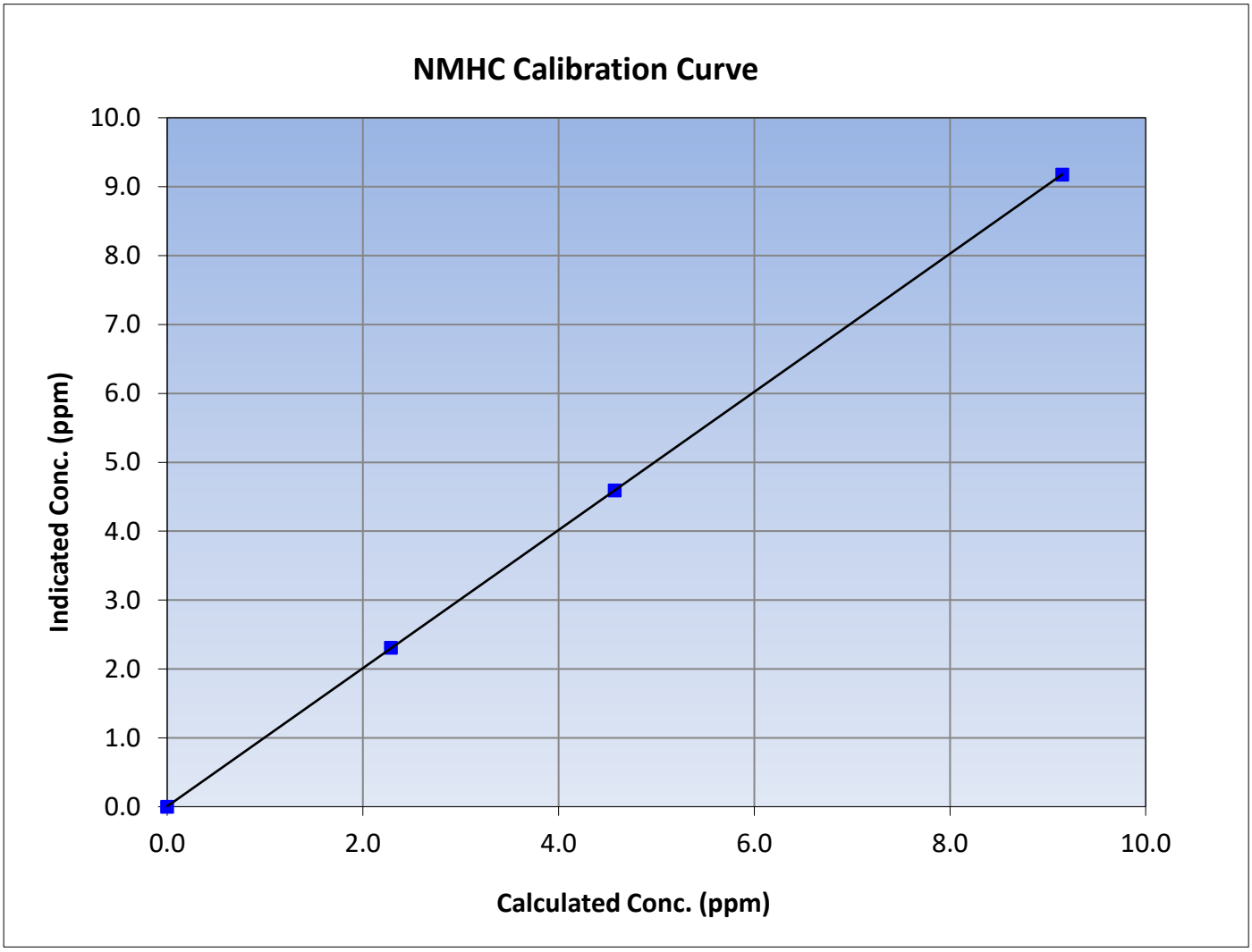
Version-06-2022

### Station Information

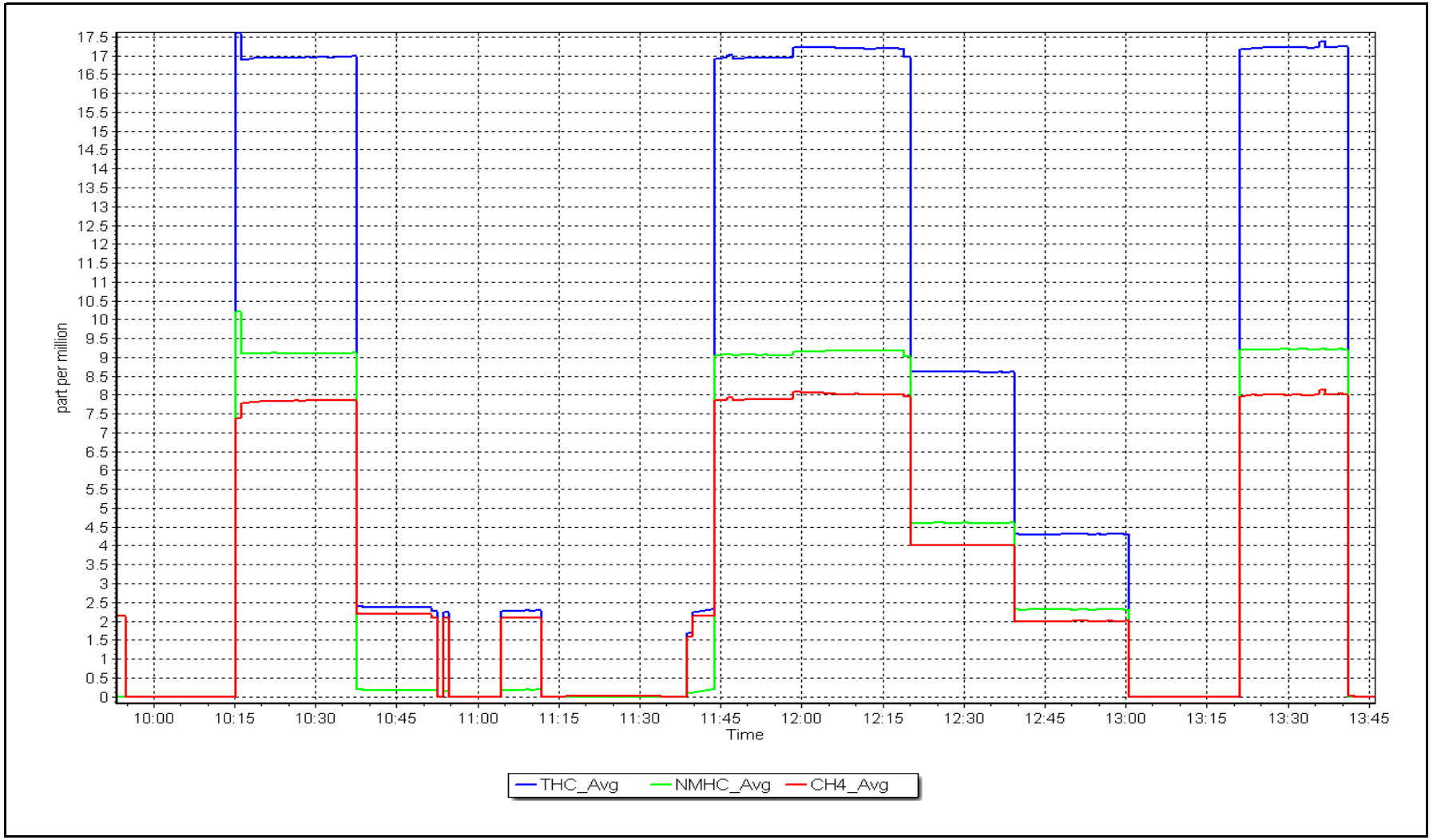
| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 9:52 | End Time (MST): | 13:45 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 9.15 | 9.18 | 0.9968 | | | |
| 4.57 | 4.59 | 0.9960 | Slope | 1.002817 | *0.90 - 1.10* |
| 2.29 | 2.31 | 0.9917 | | | |
| | | | Intercept | 0.005400 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 2, 2024 Location: Mannix



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS 05 |
| Calibration Date: | February 8, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 11:05 | End time (MST): | 14:05 |
| Reason: | Maintenance | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | XCO268098 | | 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: | | | Removed Gas Expiry: | | |
| Removed CH4 Conc. | 504.9 | ppm | CH4 Equiv Conc. | 1076.6 | ppm |
| Removed C3H8 Conc. | 207.9 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | API T700 | | Serial Number: | 621 | |
| ZAG make/model: | API T701 | | Serial Number: | 5613 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |
| THC Range (ppm): | 0 - 20 ppm | | |
| NMHC Range (ppm): | 0 - 10 ppm | CH4 Range (ppm): | 0 - 10 ppm |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| CH4 SP Ratio: | 2.71E-05 | 2.70E-05 | NMHC SP Ratio: | 4.49E-05 | 4.40E-05 |
| CH4 Retention time: | 15.4 | 15.6 | NMHC Peak Area: | 203563 | 208017 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 17.23 | 17.22 | 1.000 |
| second point | 4960 | 40.0 | 8.61 | 8.60 | 1.002 |
| third point | 4980 | 20.0 | 4.31 | 4.28 | 1.006 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 17.23 | 16.93 | 1.017 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| 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 | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 9.15 | 9.13 | 1.002 |
| second point | 4960 | 40.0 | 4.57 | 4.57 | 1.002 |
| third point | 4980 | 20.0 | 2.29 | 2.28 | 1.004 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 9.15 | 8.98 | 1.019 |
| | | | | Average Correction Factor | 1.003 |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 8.08 | 8.09 | 0.999 |
| second point | 4960 | 40.0 | 4.04 | 4.03 | 1.002 |
| third point | 4980 | 20.0 | 2.02 | 2.00 | 1.008 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 8.08 | 7.94 | 1.017 |
| | | | | Average Correction Factor | 1.003 |
| 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 | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.996805 | 1.000056 |
| THC Cal Offset: | 0.014200 | -0.011800 |
| CH4 Cal Slope: | 0.989588 | 1.001500 |
| CH4 Cal Offset: | 0.009000 | -0.009600 |
| NMHC Cal Slope: | 1.002817 | 0.998520 |
| NMHC Cal Offset: | 0.005400 | -0.002400 |

Notes: Pump was dead upon arrival. Changed the pump and adjusted the span.

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## THC Calibration Summary

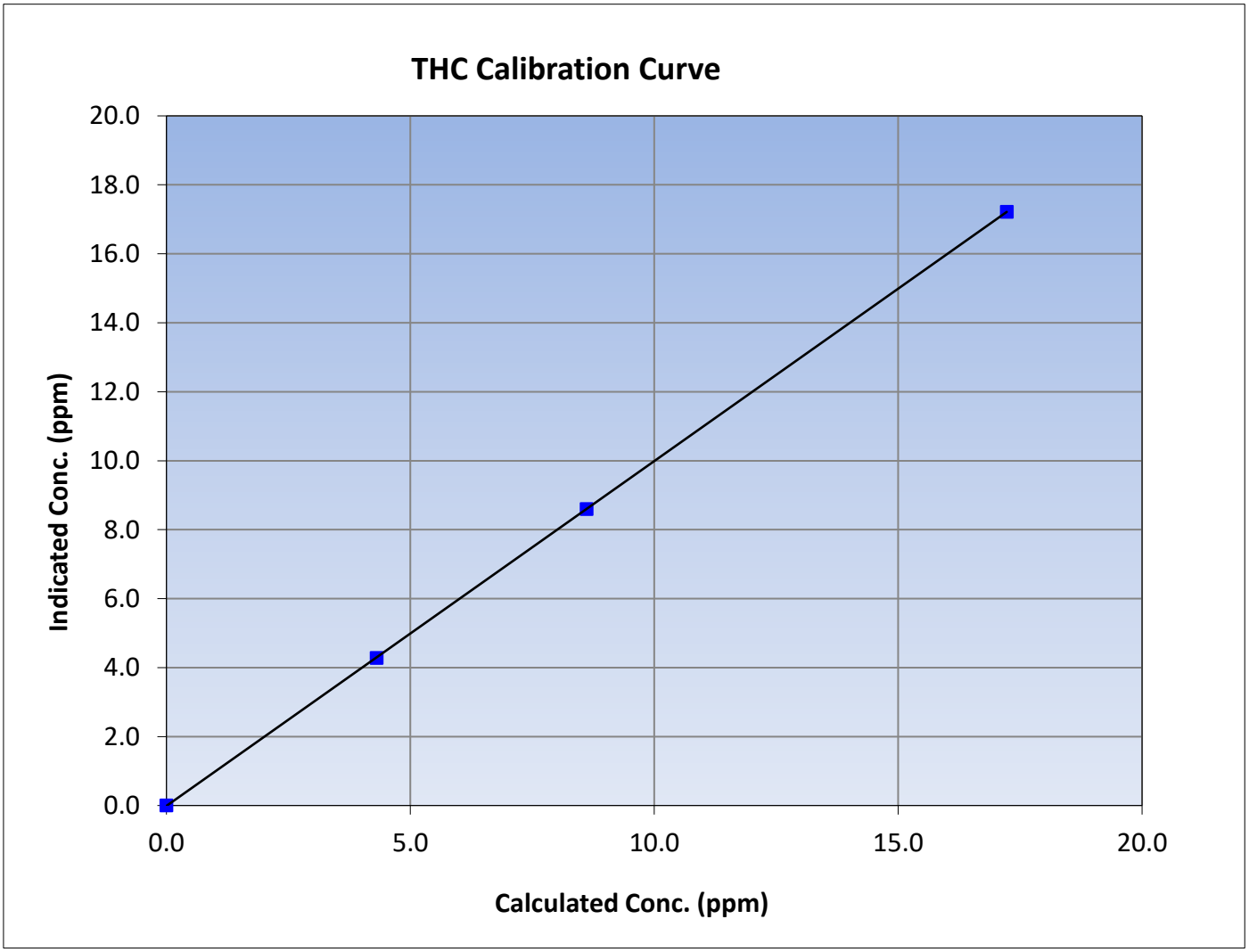
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 11:05 | End Time (MST): | 14:05 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 17.23 | 17.22 | 1.0003 | | | |
| 8.61 | 8.60 | 1.0016 | Slope | 1.000056 | *0.90 - 1.10* |
| 4.31 | 4.28 | 1.0060 | | | |
| | | | Intercept | -0.011800 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

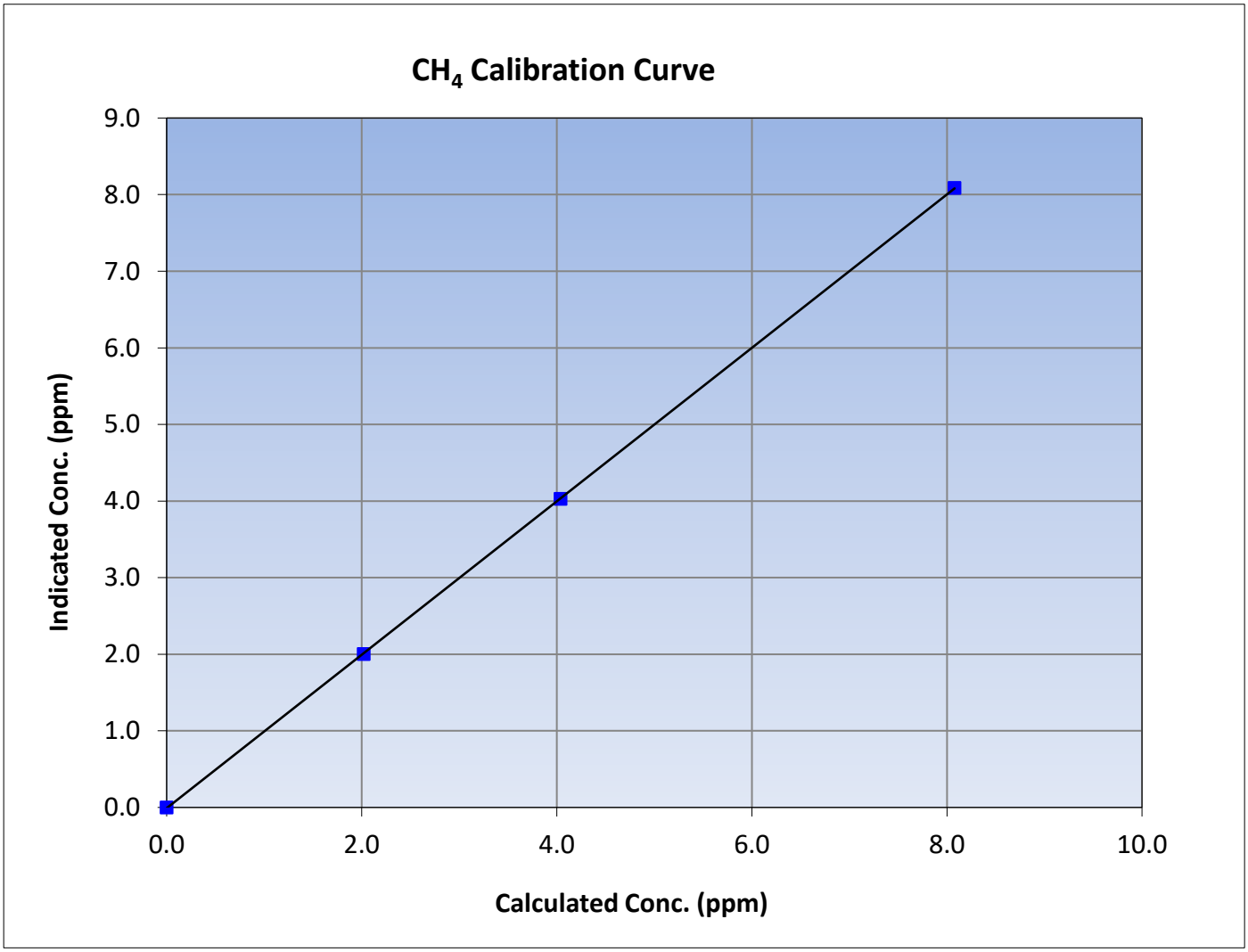
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 11:05 | End Time (MST): | 14:05 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999994 | *≥0.995* |
| 8.08 | 8.09 | 0.9991 | | | |
| 4.04 | 4.03 | 1.0023 | Slope | 1.001500 | *0.90 - 1.10* |
| 2.02 | 2.00 | 1.0078 | | | |
| | | | Intercept | -0.009600 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

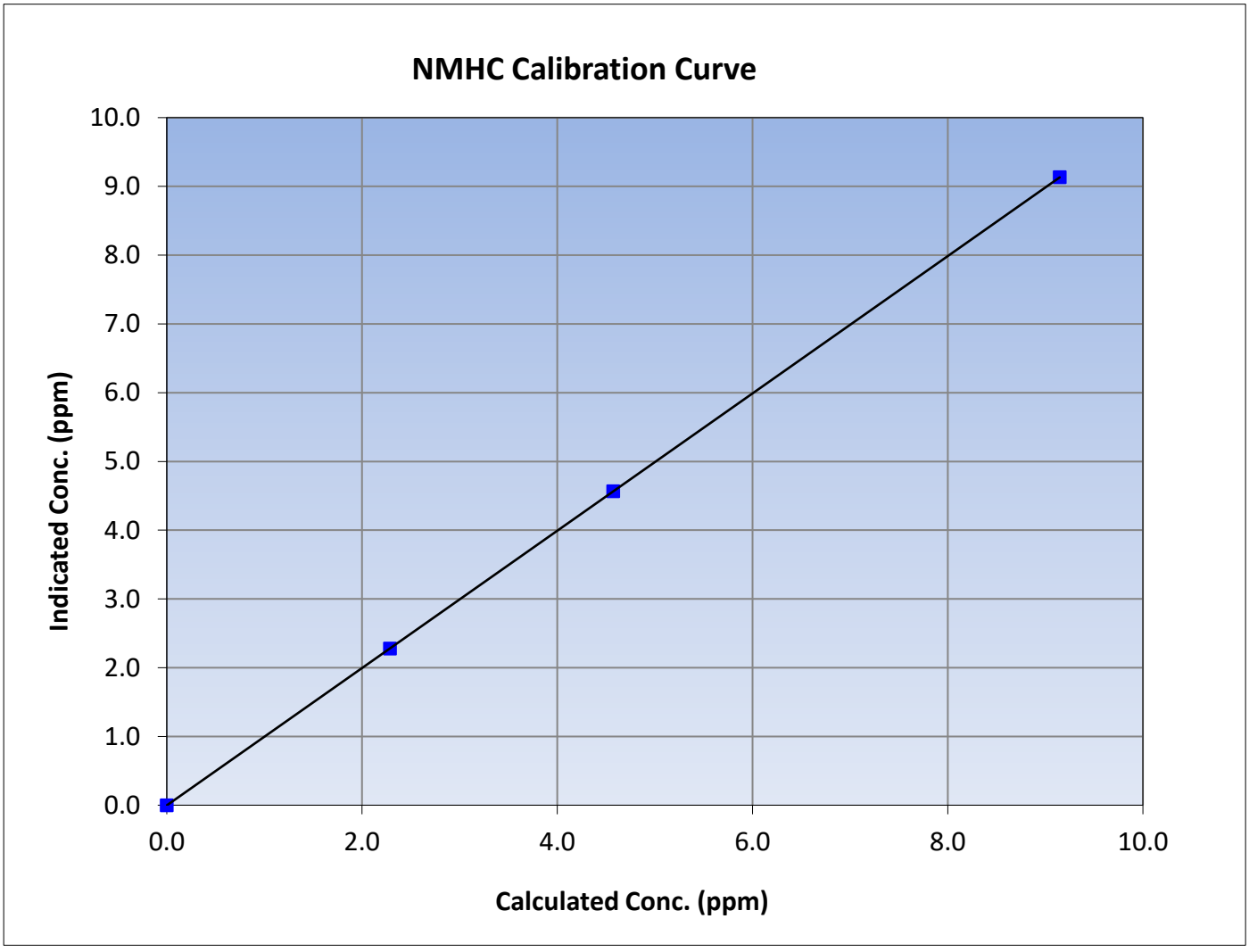
Version-06-2022

### Station Information

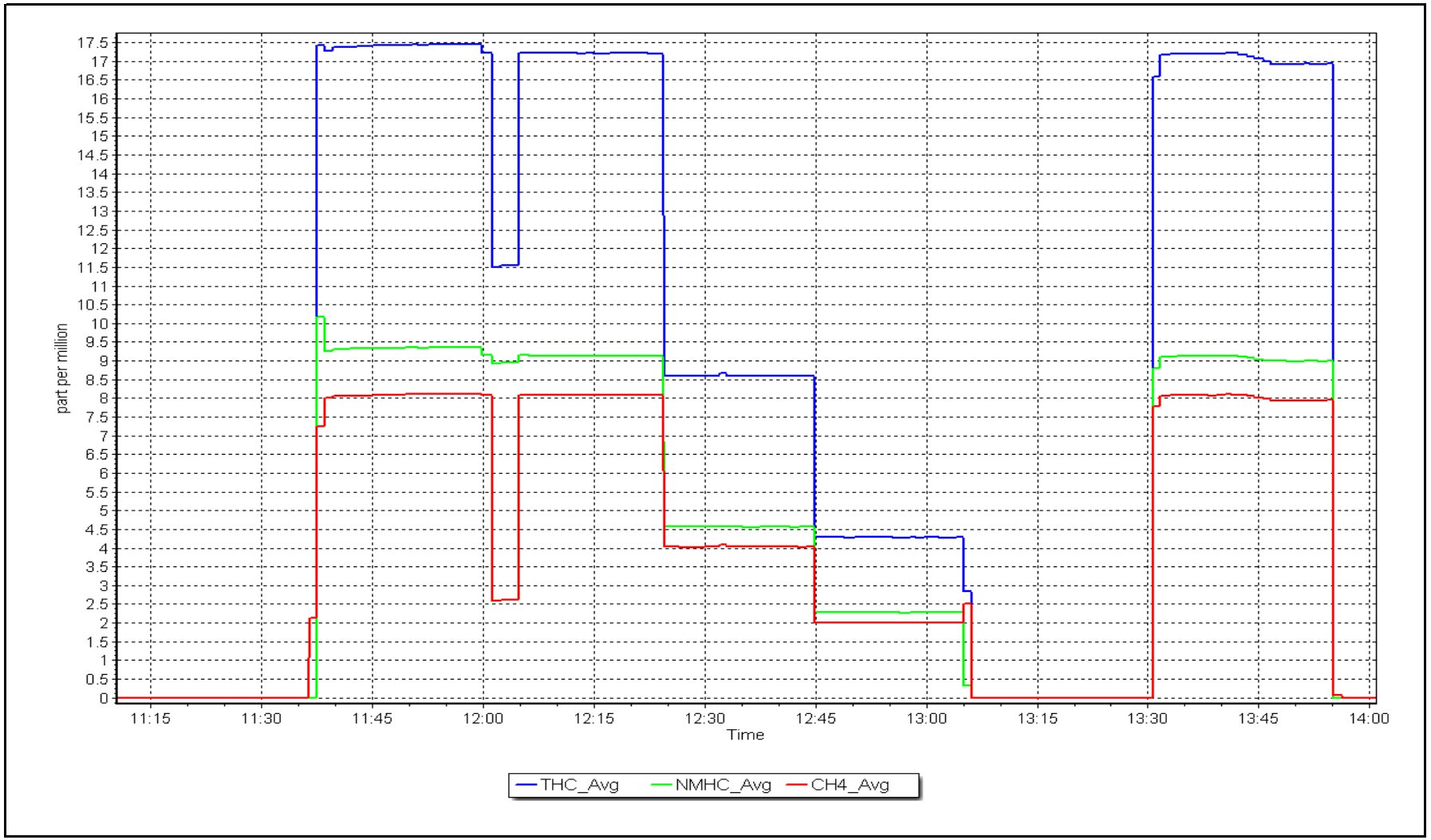
| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 11:05 | End Time (MST): | 14:05 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 9.15 | 9.13 | 1.0017 | | | |
| 4.57 | 4.57 | 1.0017 | Slope | 0.998520 | *0.90 - 1.10* |
| 2.29 | 2.28 | 1.0043 | | | |
| | | | Intercept | -0.002400 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 8, 2024 Location: Mannix



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS 05 |
| Calibration Date: | February 27, 2024 | Last Cal Date: | February 8, 2024 |
| Start time (MST): | 10:01 | End time (MST): | 15:13 |
| Reason: | Maintenance and cylinder change | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | XCO268098 | | 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: | | | Removed Gas Expiry: | | |
| Removed CH4 Conc. | 504.9 | ppm | CH4 Equiv Conc. | 1076.6 | ppm |
| Removed C3H8 Conc. | 207.9 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | API T700 | | Serial Number: | 621 | |
| ZAG make/model: | API T701 | | Serial Number: | 5613 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1152430011 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.70E-05 | 2.98E-05 | NMHC SP Ratio: | 4.40E-05 | 4.94E-05 |
| CH4 Retention time: | 15.6 | 16.4 | NMHC Peak Area: | 208017 | 185404 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.0 | 17.23 | 16.21 | 1.063 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 17.23 | 17.24 | 0.999 |
| second point | 4960 | 40.0 | 8.61 | 8.63 | 0.998 |
| third point | 4980 | 20.0 | 4.31 | 4.32 | 0.996 |
| as left zero | 5000 | 0.0 | 0.00 | 0.02 | ---- |
| as left span | 4920 | 80.0 | 17.23 | 17.27 | 0.997 |
| | | | | Average Correction Factor | 0.998 |
| Baseline Corr AF: | 16.21 | Prev response | 17.22 | *% change | -6.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.0 | 9.15 | 9.00 | 1.016 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 9.15 | 9.16 | 0.999 |
| second point | 4960 | 40.0 | 4.57 | 4.56 | 1.003 |
| third 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 | 9.12 | 1.003 |
| | | | | Average Correction Factor | 1.001 |
| Baseline Corr AF: | 9.00 | Prev response | 9.13 | *% change | -1.5% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.0 | 8.08 | 7.21 | 1.120 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.0 | 8.08 | 8.08 | 1.000 |
| second point | 4960 | 40.0 | 4.04 | 4.07 | 0.991 |
| third point | 4980 | 20.0 | 2.02 | 2.04 | 0.990 |
| as left zero | 5000 | 0.0 | 0.00 | 0.02 | ---- |
| as left span | 4920 | 80.0 | 8.08 | 8.16 | 0.990 |
| | | | | Average Correction Factor | 0.994 |
| Baseline Corr AF: | 7.21 | Prev response | 8.08 | *% change | -12.0% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.000056 | 1.000620 |
| THC Cal Offset: | -0.011800 | 0.007200 |
| CH4 Cal Slope: | 1.001500 | 0.999873 |
| CH4 Cal Offset: | -0.009600 | 0.014400 |
| NMHC Cal Slope: | 0.998520 | 1.001368 |
| NMHC Cal Offset: | -0.002400 | -0.006800 |

Notes: CH4 channel drifted down and the instrument started dipping. Completed an investigation. No multipoint as founds since as found span is outside of limits. Changed the N2 cylinder, increased the zag pressure, adjusted window timings and the span. See docit note for details.

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## THC Calibration Summary

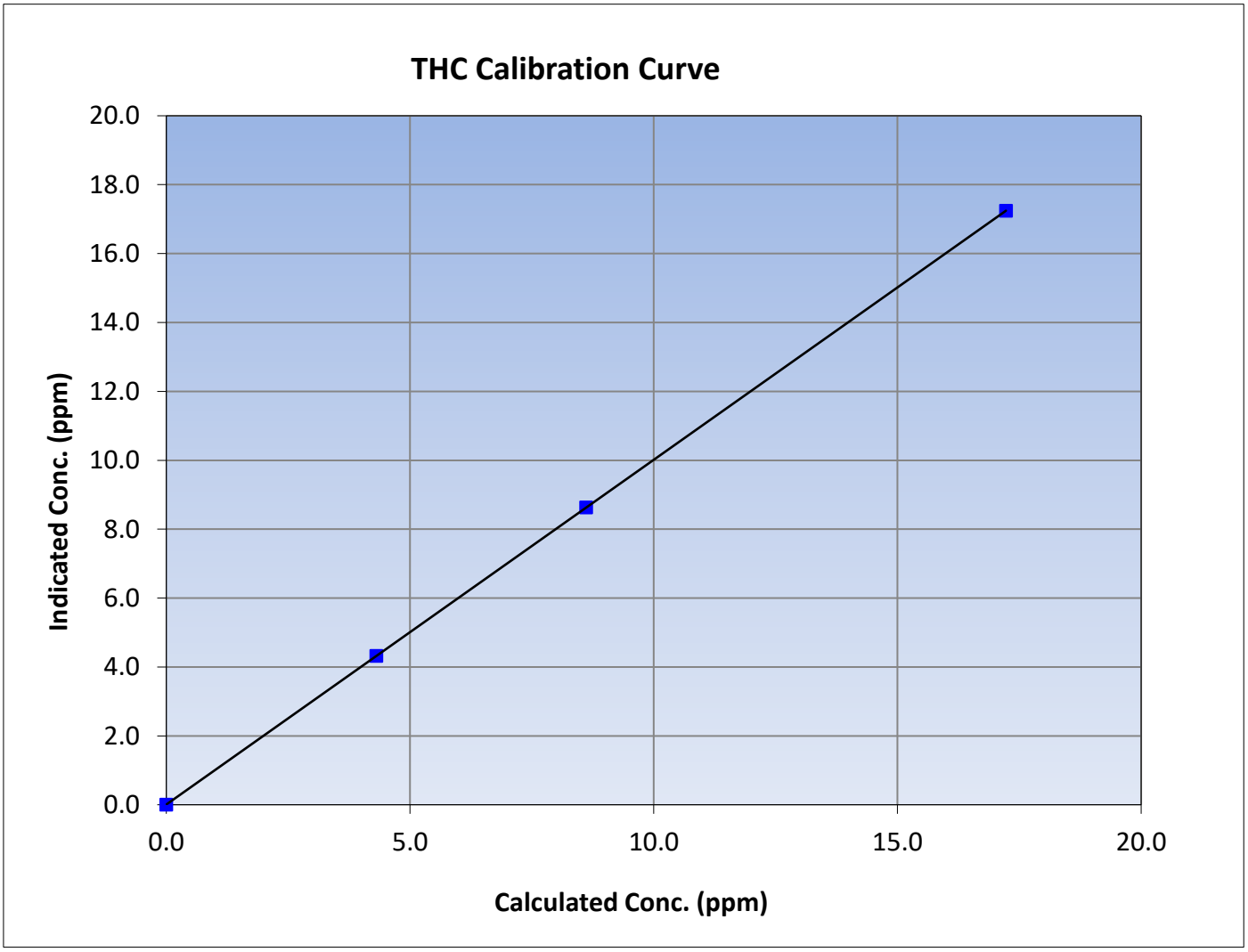
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 10:01 | End Time (MST): | 15:13 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | ≥0.995 |
| 17.23 | 17.24 | 0.9992 | | | |
| 8.61 | 8.63 | 0.9980 | Slope | 1.000620 | 0.90 - 1.10 |
| 4.31 | 4.32 | 0.9962 | | | |
| | | | Intercept | 0.007200 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

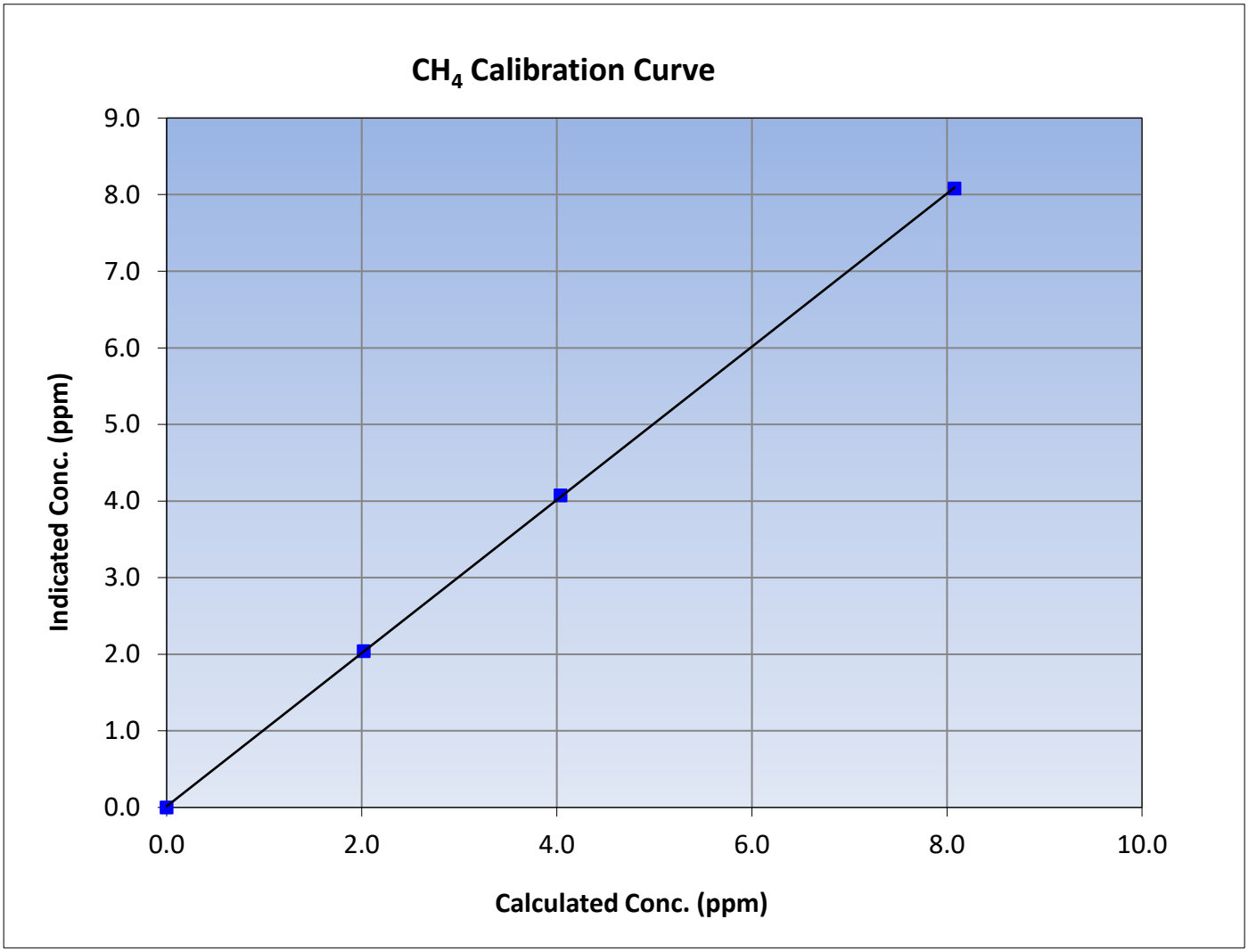
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 10:01 | End Time (MST): | 15:13 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999977 | ≥0.995 |
| 8.08 | 8.08 | 0.9998 | | | |
| 4.04 | 4.07 | 0.9915 | Slope | 0.999873 | 0.90 - 1.10 |
| 2.02 | 2.04 | 0.9905 | | | |
| | | | Intercept | 0.014400 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

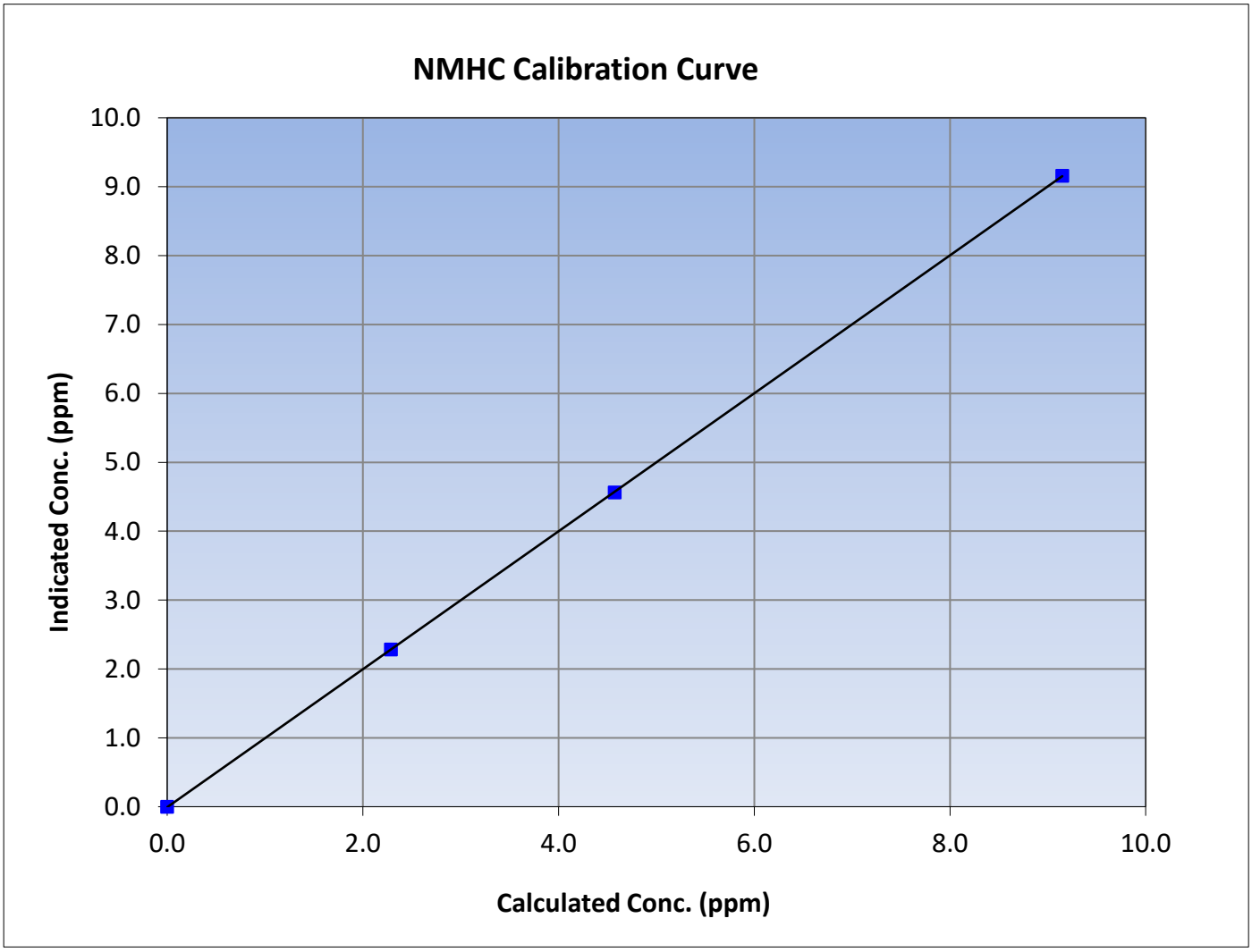
Version-06-2022

### Station Information

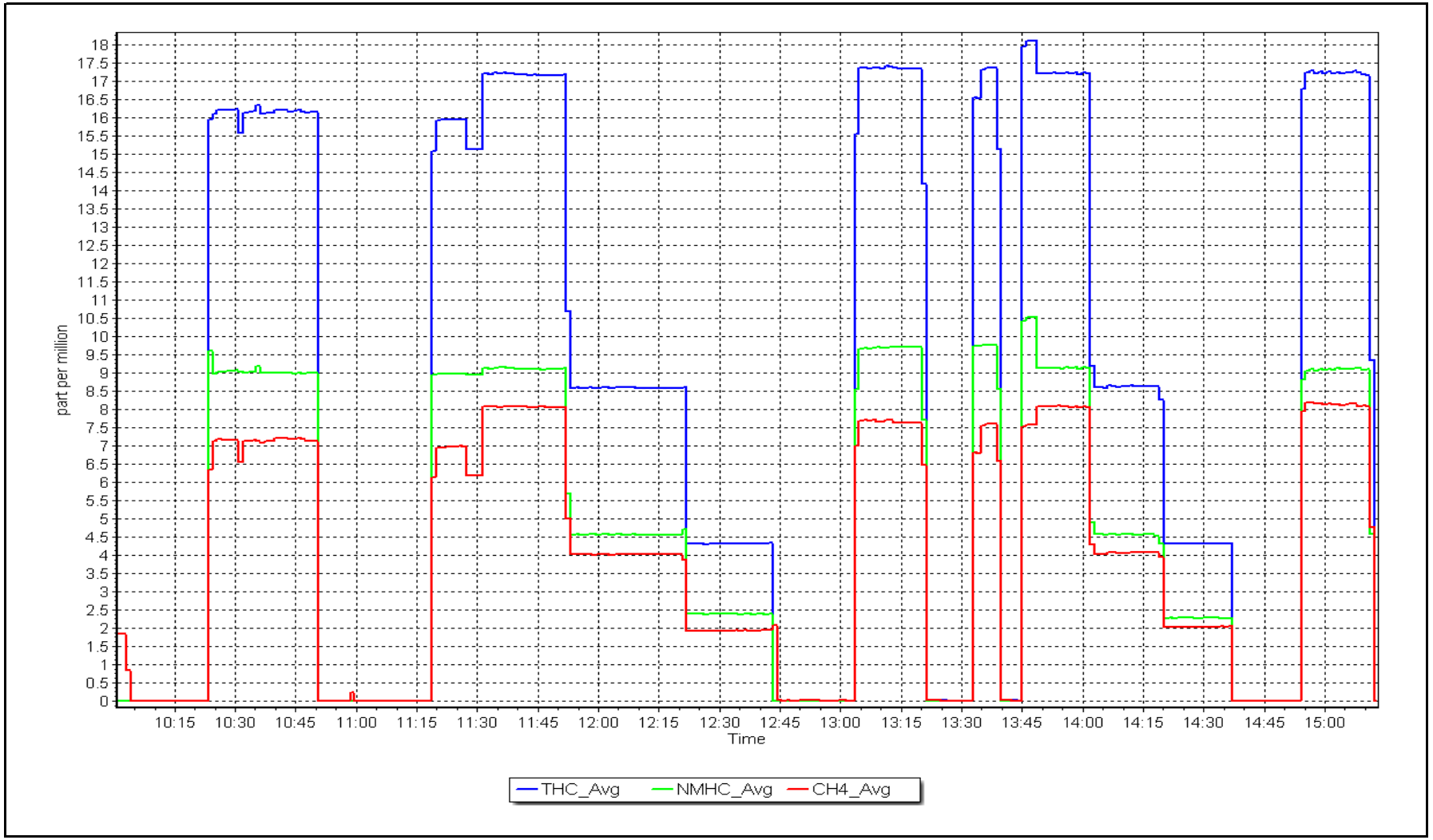
| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 10:01 | End Time (MST): | 15:13 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999994 | *≥0.995* |
| 9.15 | 9.16 | 0.9986 | | | |
| 4.57 | 4.56 | 1.0030 | Slope | 1.001368 | *0.90 - 1.10* |
| 2.29 | 2.28 | 1.0017 | | | |
| | | | Intercept | -0.006800 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 27, 2024 Location: Mannix



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS06
## PATRICIA MCINNES
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS06 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 10:30 | End time (MST): | 14:16 |
| 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: | 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: | 5608 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1160290013

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999660 | 0.996386 | Backgd or Offset: | 17.7 | 17.7 |
| Calibration intercept: | 1.240714 | 1.161262 | Coeff or Slope: | 0.922 | 0.922 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4920 | 80.3 | 799.5 | 798.2 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4920 | 80.3 | 799.5 | 797.4 | 1.003 |
| second point | 4960 | 40.2 | 400.2 | 399.8 | 1.001 |
| third point | 4980 | 20.1 | 200.1 | 202.2 | 0.990 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4920 | 80.3 | 799.5 | 798.2 | 1.002 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 798.20 | Previous response | 800.44 | *% 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

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

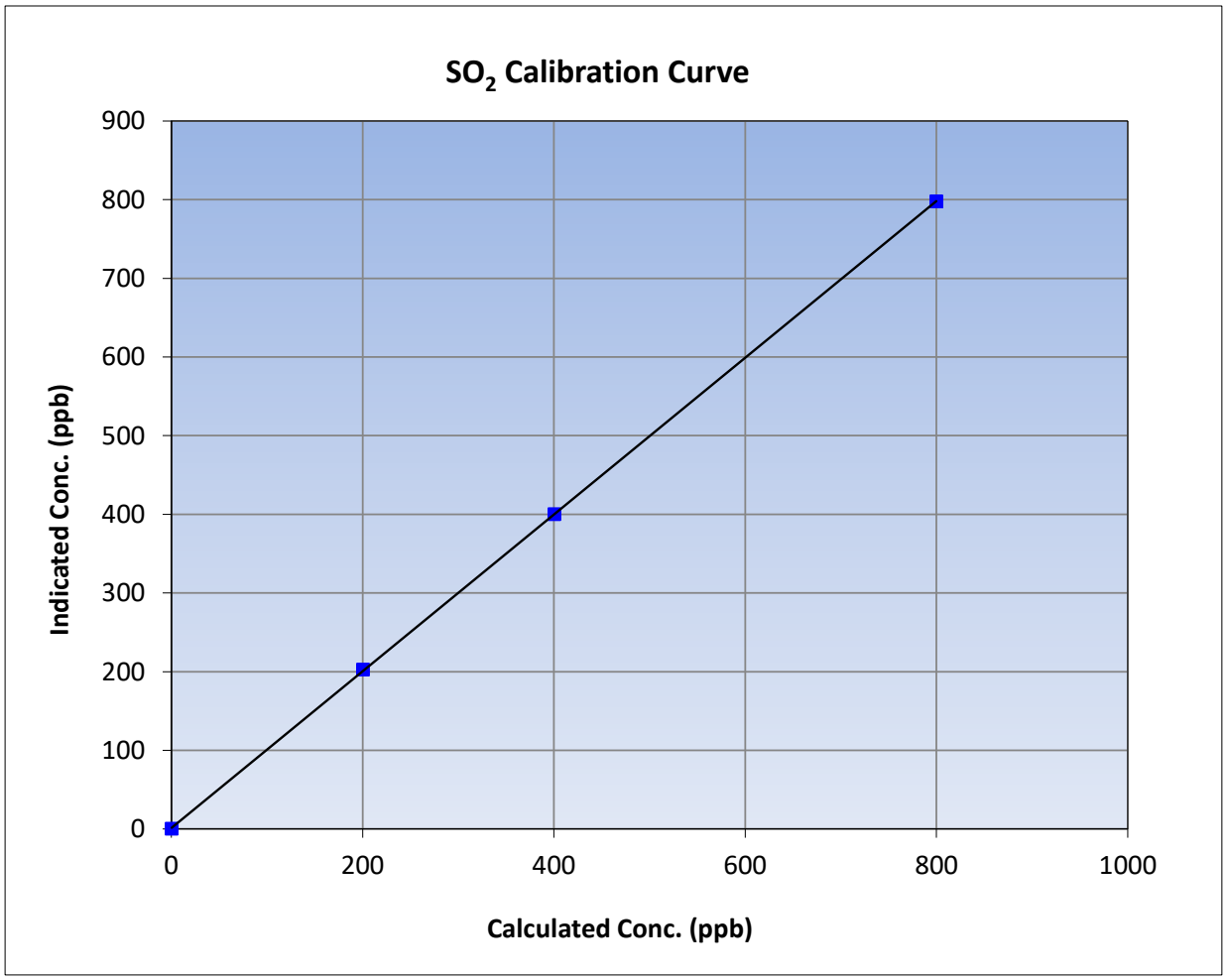
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:30 | End Time (MST): | 14:16 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1160290013 |

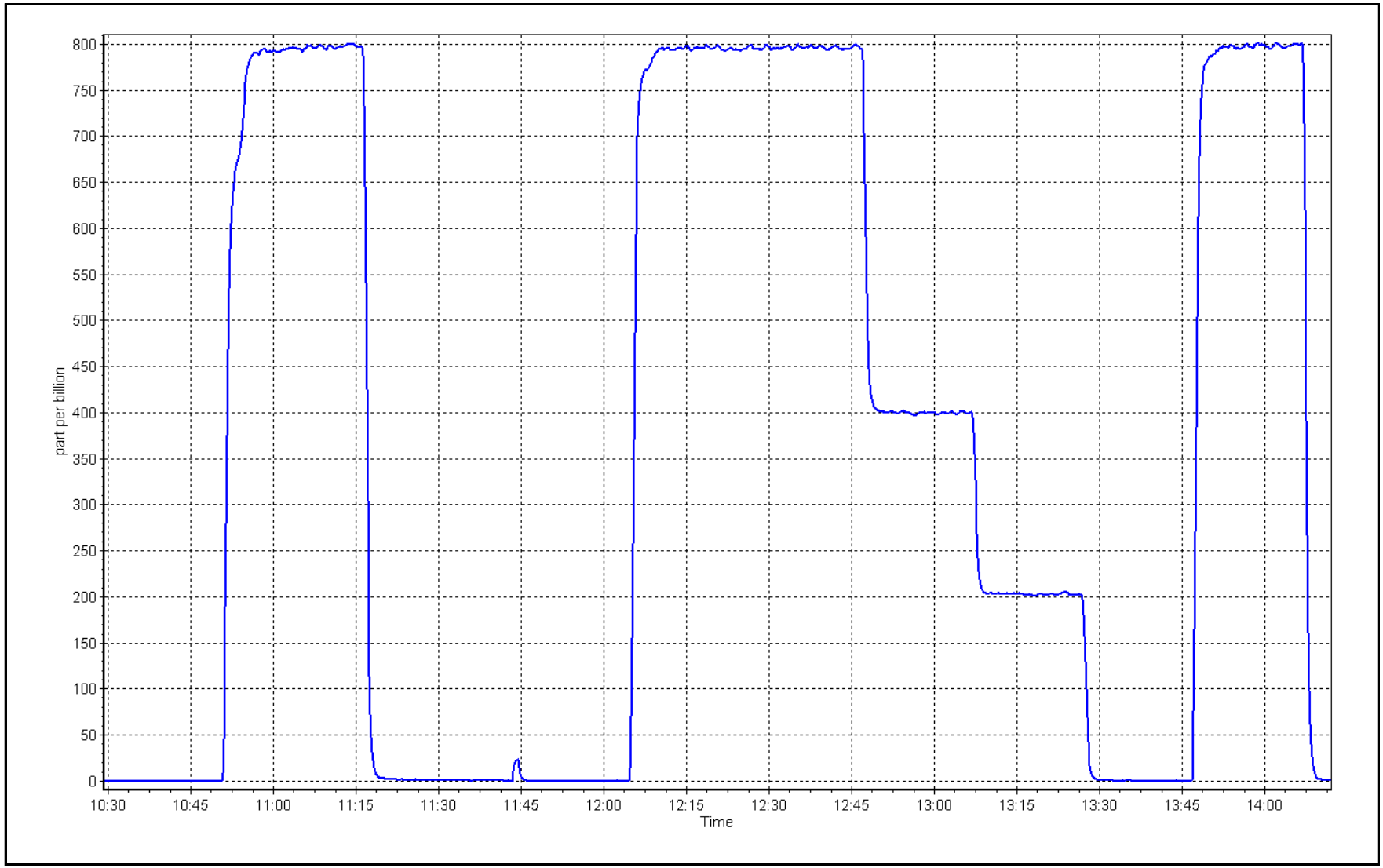
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 799.5 | 797.4 | 1.0026 |
| 400.2 | 399.8 | 1.0011 |
| 200.1 | 202.2 | 0.9897 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999988 | *≥0.995* |
| Slope | 0.996386 | *0.90 - 1.10* |
| Intercept | 1.161262 | *+/-30* |



**SO2 Calibration Plot** Date: February 6, 2024 Location: Patricia McInnes



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS 06 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 9:56 | End time (MST): | 14:18 |
| 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.002314 | 0.994029 | Backgd or Offset: | 1.95 | 1.95 |
| Calibration intercept: | 0.440228 | 0.280242 | Coeff or Slope: | 1.150 | 1.150 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4925 | 75.1 | 80.0 | 79.6 | 1.007 |
| as found 2nd point | 4963 | 37.5 | 40.0 | 40.3 | 0.994 |
| as found 3rd point | 4981 | 18.8 | 20.0 | 20.4 | 0.987 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4925 | 75.1 | 80.0 | 79.7 | 1.004 |
| second point | 4963 | 37.5 | 40.0 | 40.2 | 0.994 |
| third point | 4981 | 18.8 | 20.0 | 20.3 | 0.987 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4925 | 75.1 | 80.0 | 79.9 | 1.002 |
| SO2 Scrubber Check | 4920 | 80.3 | 803.0 | 0.1 | ---- |
| Date of last scrubber change: | | December 20, 2021 | | Ave Corr Factor | 0.995 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 79.5 | Prev response: | 80.65 | *% change: | -1.4% |
| Baseline Corr 2nd AF pt: | 40.2 | AF Slope: | 0.992457 | AF Intercept: | 0.360275 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999940 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

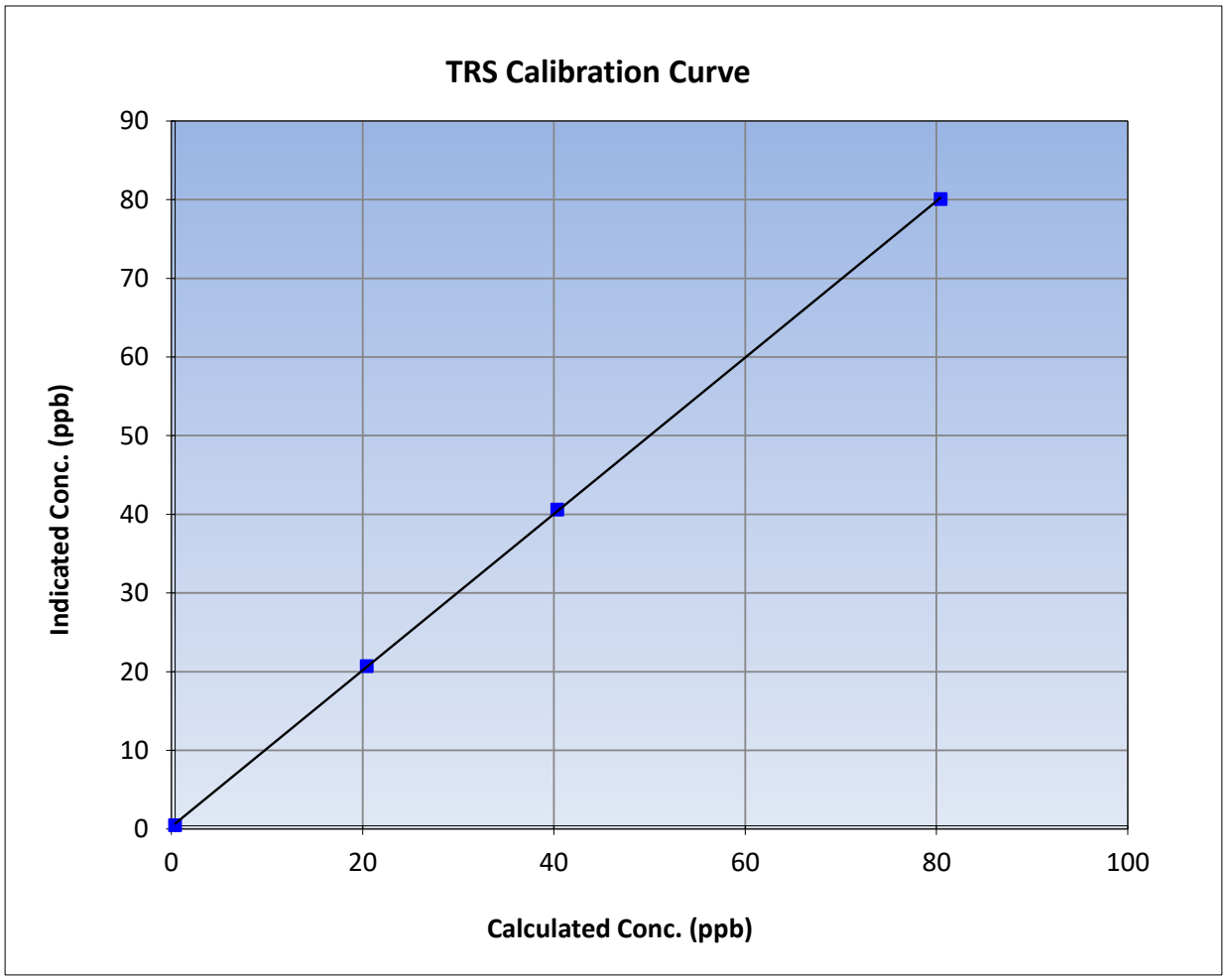
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:56 | End Time (MST): | 14:18 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1218153358 |

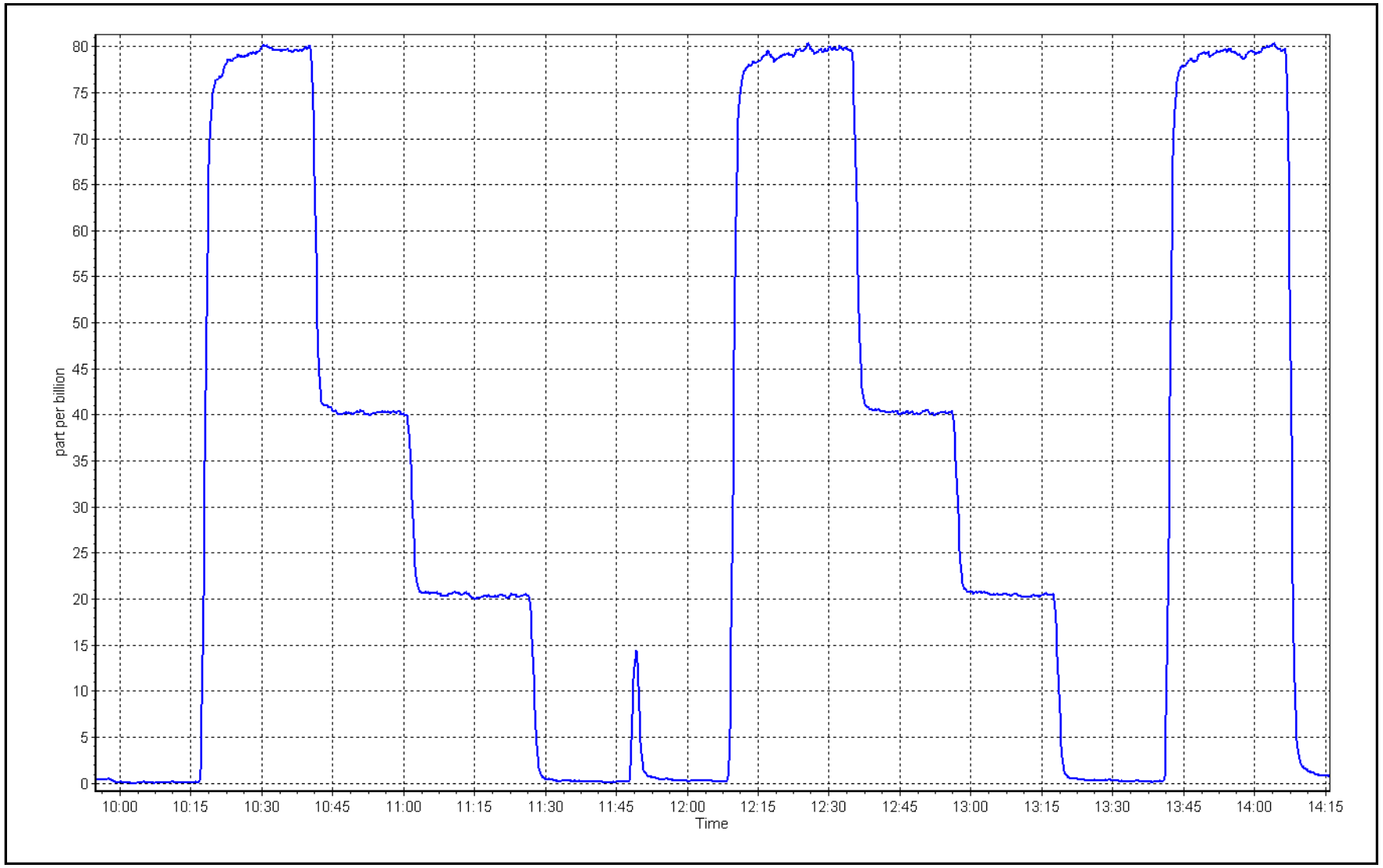
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 79.7 | 1.0041 |
| 40.0 | 40.2 | 0.9939 |
| 20.0 | 20.3 | 0.9869 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999971 | *≥0.995* |
| Slope | 0.994029 | *0.90 - 1.10* |
| Intercept | 0.280242 | *+/-3* |



**TRS Calibration Plot** Date: February 7, 2024 Location: Patricia McInnes



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS06 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 10:30 | End time (MST): | 14:15 |
| Reason: | Routine | | |

### 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 4602 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1118148495 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.17E-04 | 2.15E-04 | NMHC SP Ratio: | 4.81E-05 | 4.71E-05 |
| CH4 Retention time: | 14.0 | 14.2 | NMHC Peak Area: | 188492 | 192619 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.3 | 17.12 | 17.09 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.3 | 17.12 | 17.05 | 1.004 |
| second point | 4960 | 40.2 | 8.57 | 8.52 | 1.006 |
| third point | 4980 | 20.1 | 4.29 | 4.31 | 0.995 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 17.12 | 16.88 | 1.014 |
| | | | | Average Correction Factor | 1.002 |
| Baseline Corr AF: | 17.08 | Prev response | 17.20 | *% change | -0.7% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919.7 | 80.3 | 9.07 | 9.08 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919.7 | 80.3 | 9.07 | 9.04 | 1.003 |
| second point | 4960 | 40.2 | 4.54 | 4.53 | 1.002 |
| third point | 4980 | 20.1 | 2.27 | 2.30 | 0.987 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919.7 | 80.3 | 9.07 | 8.93 | 1.015 |
| | | | | Average Correction Factor | 0.997 |
| Baseline Corr AF: | 9.08 | Prev response | 9.11 | *% change | -0.3% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919.7 | 80.3 | 8.06 | 8.00 | 1.007 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919.7 | 80.3 | 8.06 | 8.01 | 1.006 |
| second point | 4960 | 40.2 | 4.03 | 3.99 | 1.011 |
| third point | 4980 | 20.1 | 2.02 | 2.01 | 1.005 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919.7 | 80.3 | 8.06 | 7.95 | 1.013 |
| | | | | Average Correction Factor | 1.007 |
| Baseline Corr AF: | 8.00 | Prev response | 8.09 | *% change | -1.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.000106 | 0.994828 |
| THC Cal Offset: | 0.074604 | 0.012664 |
| CH4 Cal Slope: | 0.999043 | 0.993816 |
| CH4 Cal Offset: | 0.039427 | -0.003140 |
| NMHC Cal Slope: | 1.001025 | 0.995576 |
| NMHC Cal Offset: | 0.034777 | 0.016404 |

Notes: Changed the inlet filter and N2 cylinder after as founds. Adjusted the span only.

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## THC Calibration Summary

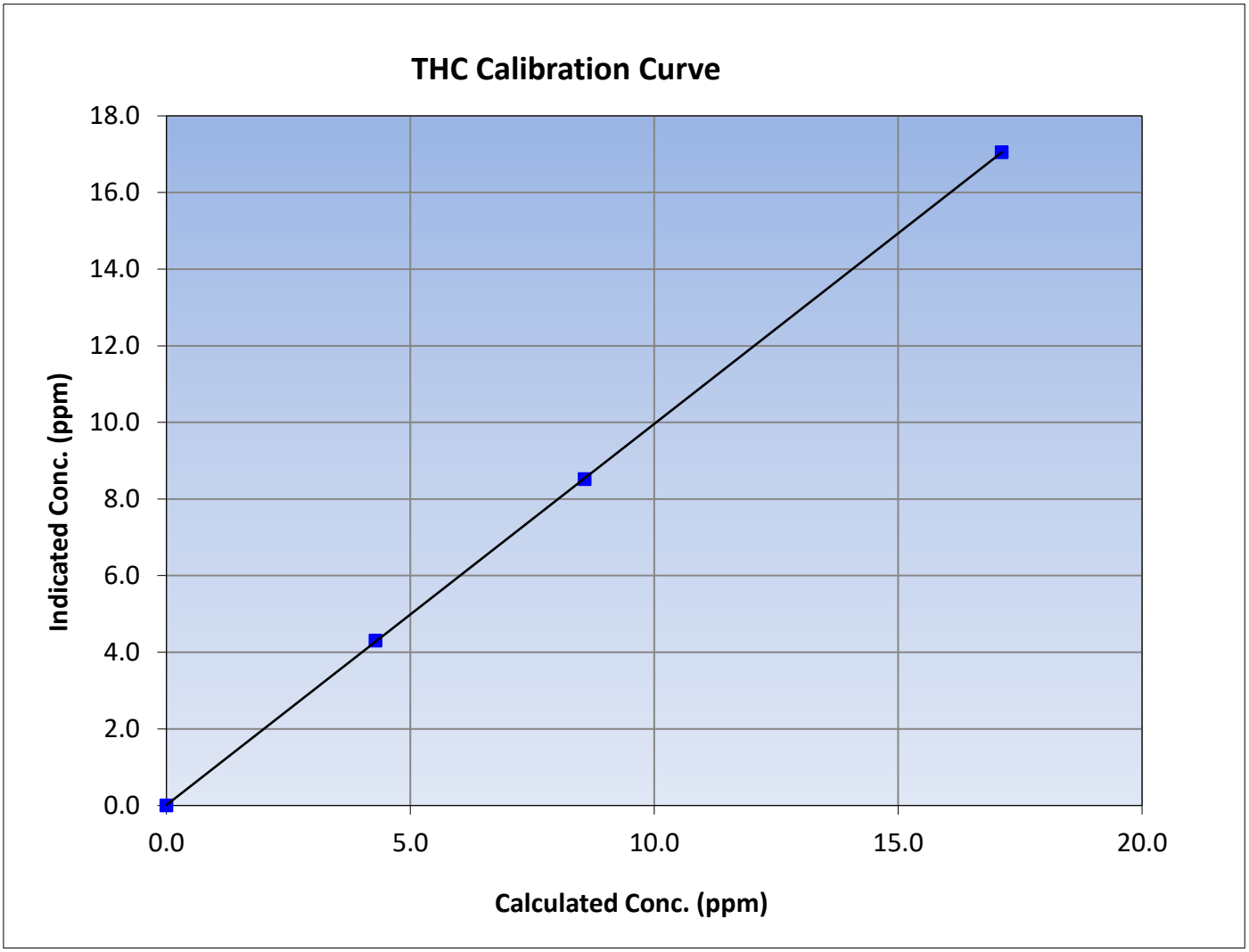
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:30 | End Time (MST): | 14:15 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148495 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999990 | *≥0.995* |
| 17.12 | 17.05 | 1.0042 | | | |
| 8.57 | 8.52 | 1.0064 | Slope | 0.994828 | *0.90 - 1.10* |
| 4.29 | 4.31 | 0.9953 | | | |
| | | | Intercept | 0.012664 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

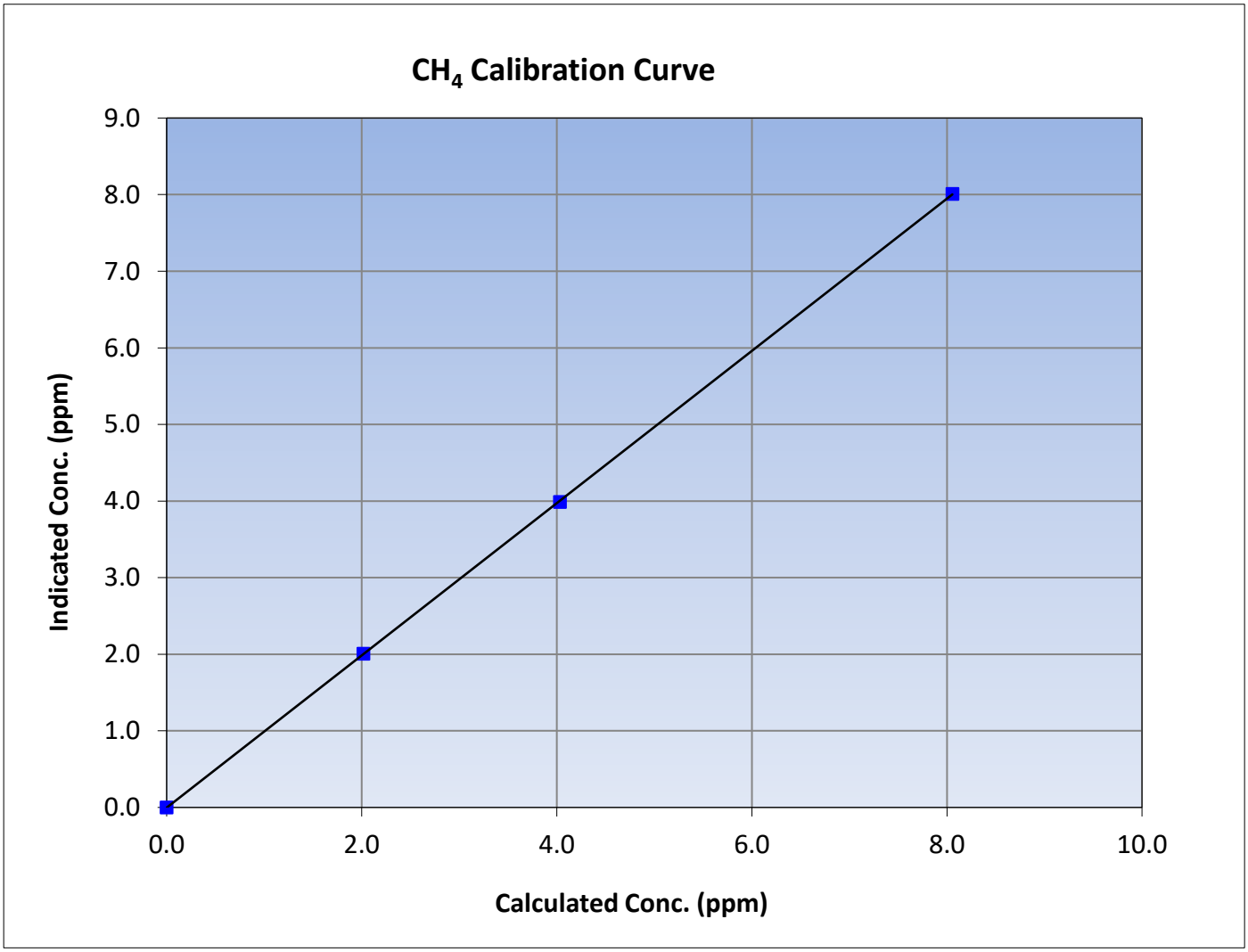
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:30 | End Time (MST): | 14:15 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148495 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999991 | *≥0.995* |
| 8.06 | 8.01 | 1.0058 | | | |
| 4.03 | 3.99 | 1.0110 | Slope | 0.993816 | *0.90 - 1.10* |
| 2.02 | 2.01 | 1.0047 | | | |
| | | | Intercept | -0.003140 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

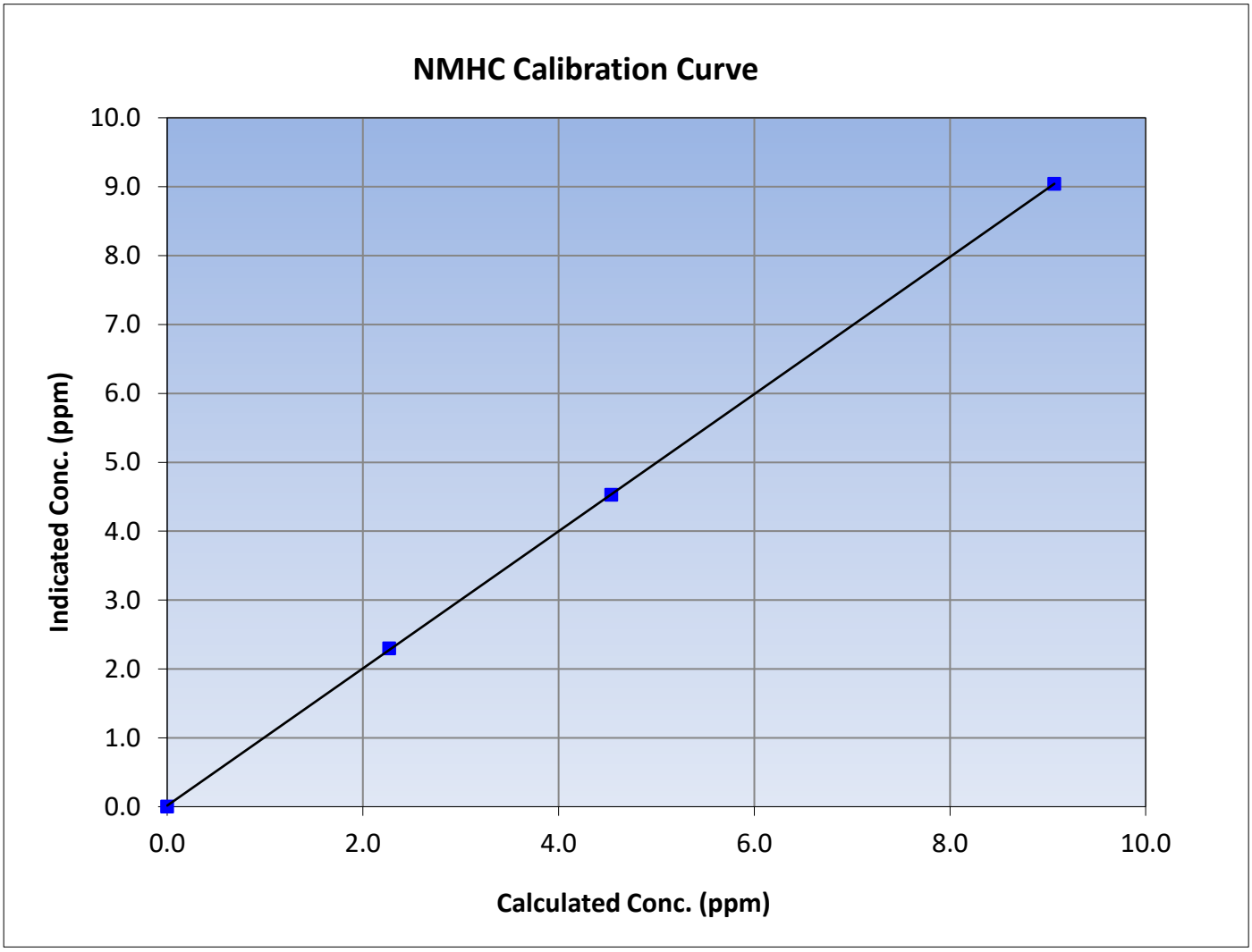
Version-06-2022

### Station Information

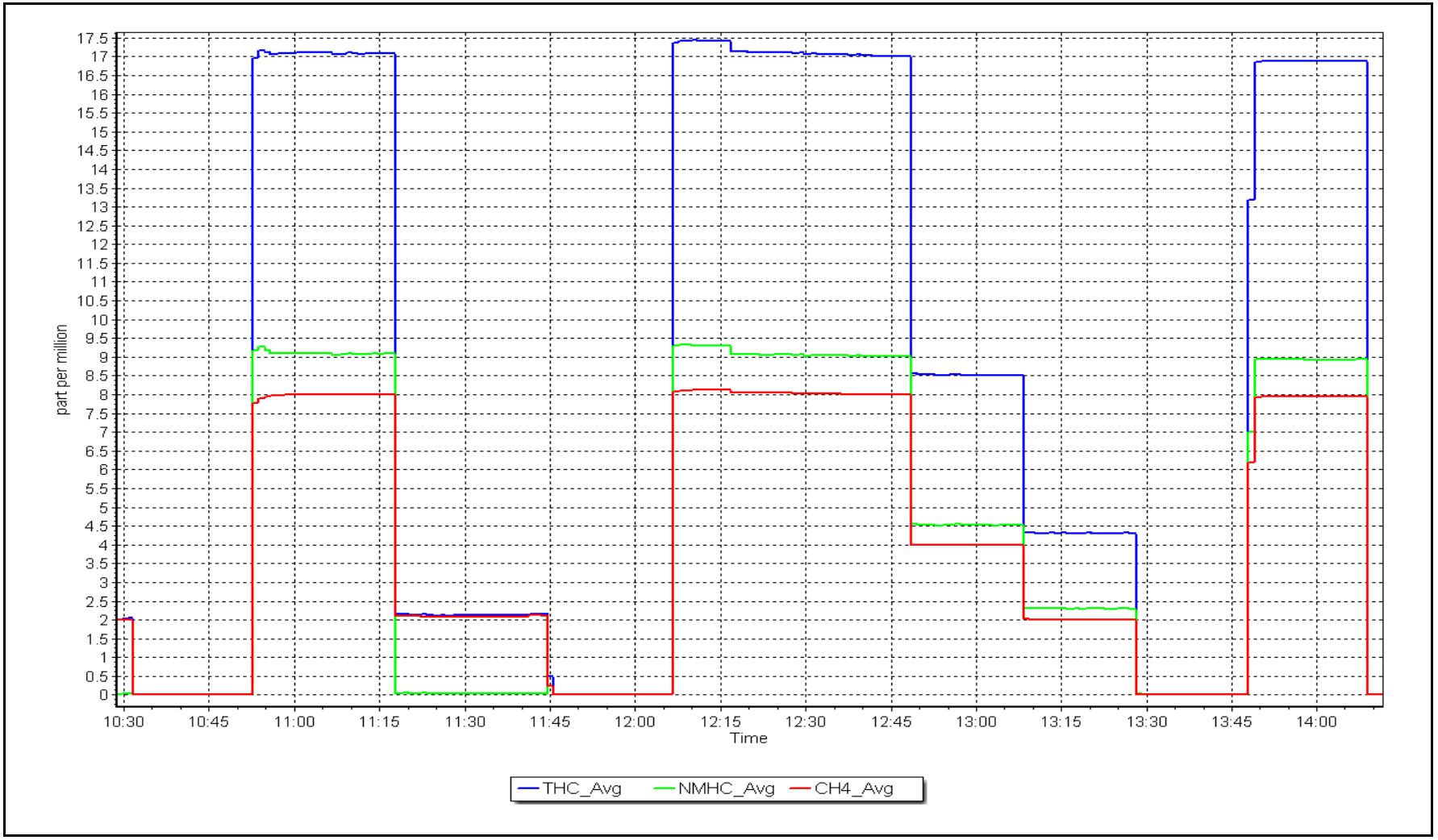
| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:30 | End Time (MST): | 14:15 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148495 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999981 | ≥0.995 |
| 9.07 | 9.04 | 1.0029 | | | |
| 4.54 | 4.53 | 1.0024 | Slope | 0.995576 | 0.90 - 1.10 |
| 2.27 | 2.30 | 0.9868 | | | |
| | | | Intercept | 0.016404 | +/-0.5 |



**NMHC Calibration Plot** Date: February 6, 2024 Location: Patricia McInnes



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS06 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 10:25 | End time (MST): | 15:05 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1172750022 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 0.825 | 0.825 | NO bkgnd or offset: | 3.2 | 3.2 |
| NOX coeff or slope: | 0.987 | 0.987 | NOX bkgnd or offset: | 3.9 | 3.9 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 157.2 | 157.2 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998293 | 1.000023 |
| $NO_X$ Cal Offset: | 1.916153 | 2.315635 |
| NO Cal Slope: | 0.999944 | 1.002417 |
| NO Cal Offset: | 1.062930 | 1.022423 |
| $NO_2$ Cal Slope: | 0.999549 | 0.999140 |
| $NO_2$ Cal Offset: | -1.654321 | -0.524585 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | 0.2 | -0.4 | ---- | ---- |
| as found span | 4914 | 86.2 | 826.5 | 799.7 | 26.7 | 829.1 | 799.5 | 29.7 | 0.9968 | 1.0003 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.4 | -0.2 | ---- | ---- |
| high point | 4914 | 86.2 | 826.5 | 799.7 | 26.7 | 827.8 | 802.4 | 25.5 | 0.9984 | 0.9967 |
| second point | 4957 | 43.1 | 413.2 | 399.9 | 13.4 | 416.5 | 402.1 | 14.4 | 0.9922 | 0.9945 |
| third point | 4978 | 21.6 | 207.1 | 200.4 | 6.7 | 211.5 | 202.6 | 8.9 | 0.9793 | 0.9892 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.5 | -0.3 | ---- | ---- |
| as left span | 4914 | 86.2 | 826.5 | 401.9 | 424.5 | 826.1 | 404.2 | 422.0 | 1.0004 | 0.9944 |
| | | | | | | | | Average Correction Factor | 0.9899 | 0.9935 |

Corrected As found $NO_X$ = 829.3 ppb NO = 799.3 ppb

Previous Response $NO_X$ = 827.0 ppb NO = 800.8 ppb

Baseline Corr 2nd pt $NO_X$ = NA ppb NO = NA ppb

Baseline Corr 3rd pt $NO_X$ = NA ppb NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change $NO_X$ = 0.3%

*Percent Change NO = -0.2%

As found $NO_X$ $r^2$: Nx Sl: Nx Int:

As found NO $r^2$: NO Sl: NO Int:

As found $NO_2$ $r^2$: NO2 Sl: $NO_2$ Int:

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 800.8 | 403.0 | 424.5 | 423.8 | 1.0017 | 99.8% |
| 2nd GPT point (200 ppb O3) | 800.8 | 603.0 | 224.5 | 223.7 | 1.0037 | 99.6% |
| 3rd GPT point (100 ppb O3) | 800.8 | 703.5 | 124.0 | 123.0 | 1.0083 | 99.2% |
| | | | | Average Correction Factor | 1.0046 | 99.5% |

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

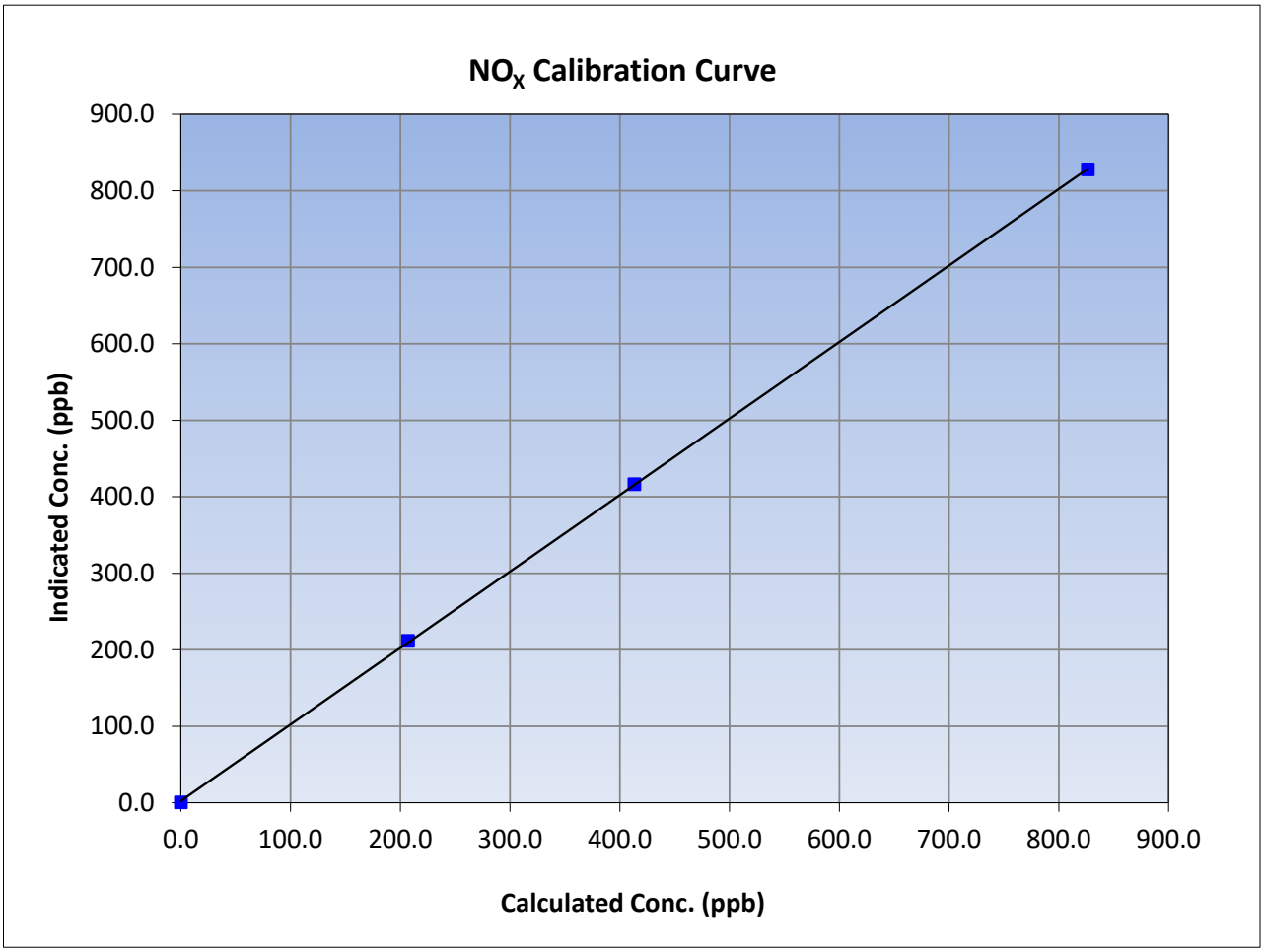
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:25 | End Time (MST): | 15:05 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1172750022 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.3 | ---- | Correlation Coefficient | 0.999973 | *≥0.995* |
| 826.5 | 827.8 | 0.9984 | | | |
| 413.2 | 416.5 | 0.9922 | Slope | 1.000023 | *0.90 - 1.10* |
| 207.1 | 211.5 | 0.9793 | | | |
| | | | Intercept | 2.315635 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

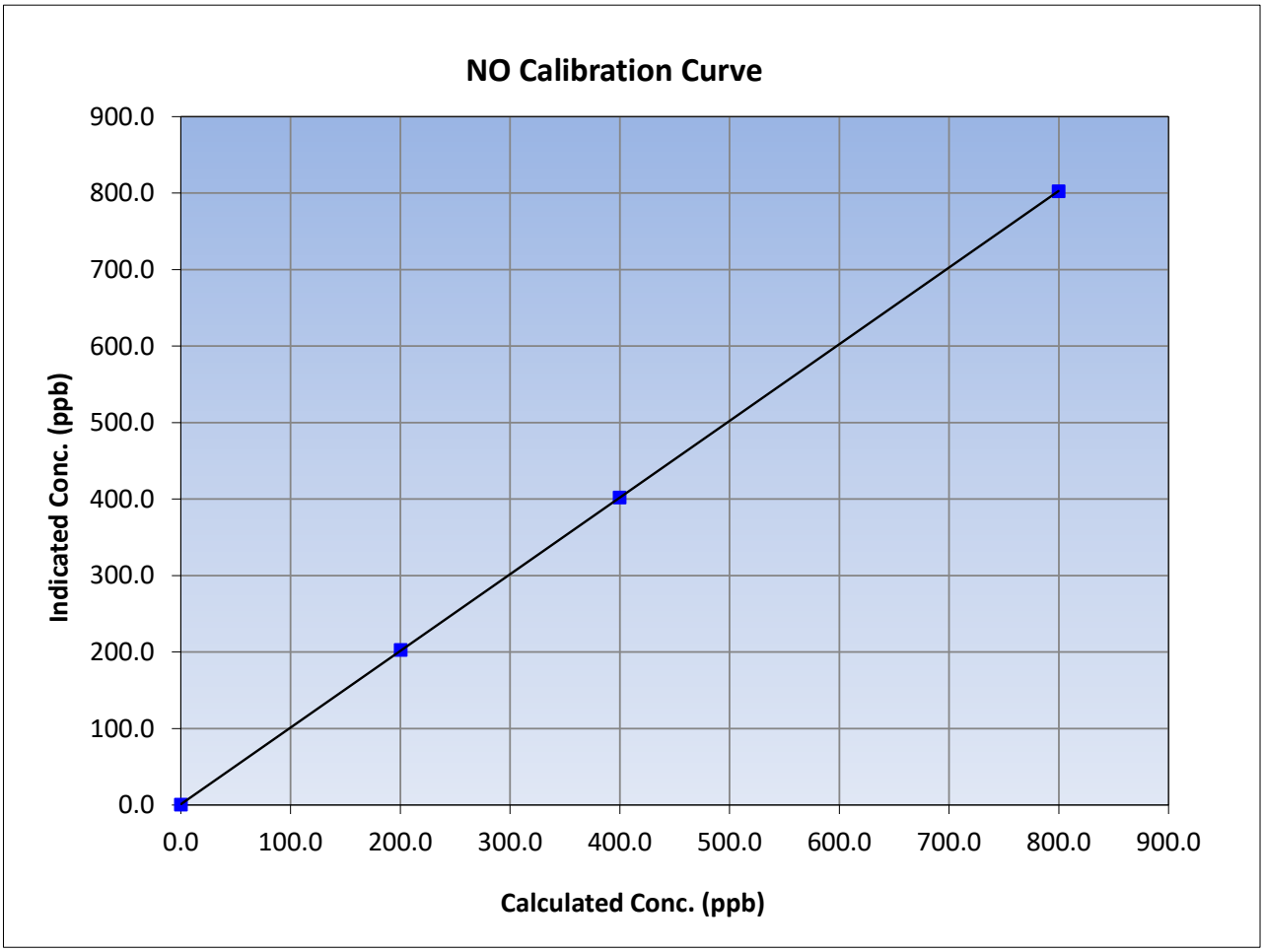
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:25 | End Time (MST): | 15:05 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1172750022 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.4 | ---- | Correlation Coefficient | 0.999997 | ≥0.995 |
| 799.7 | 802.4 | 0.9967 | | | |
| 399.9 | 402.1 | 0.9945 | Slope | 1.002417 | 0.90 - 1.10 |
| 200.4 | 202.6 | 0.9892 | | | |
| | | | Intercept | 1.022423 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

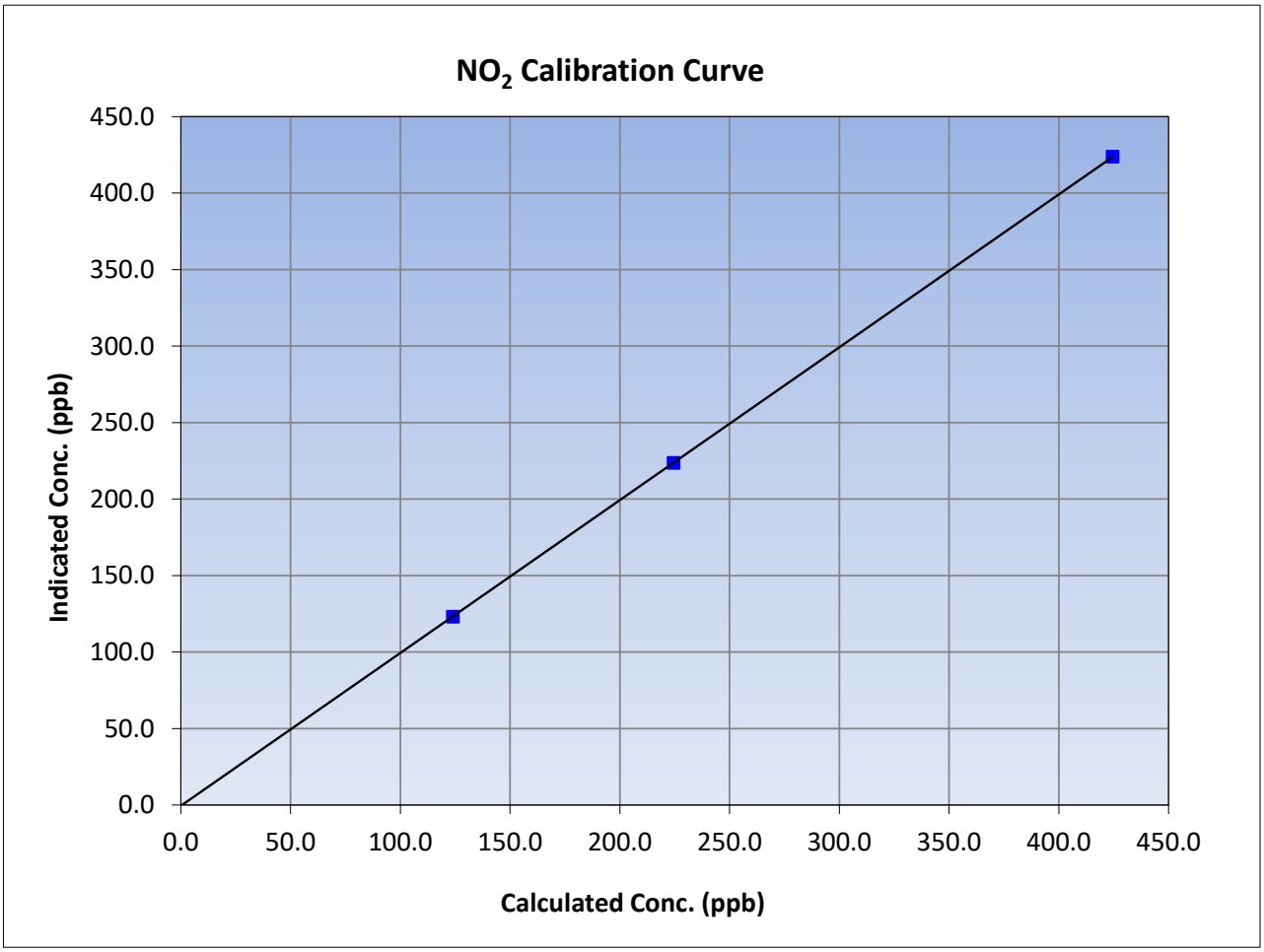
Version-04-2020

### Station Information

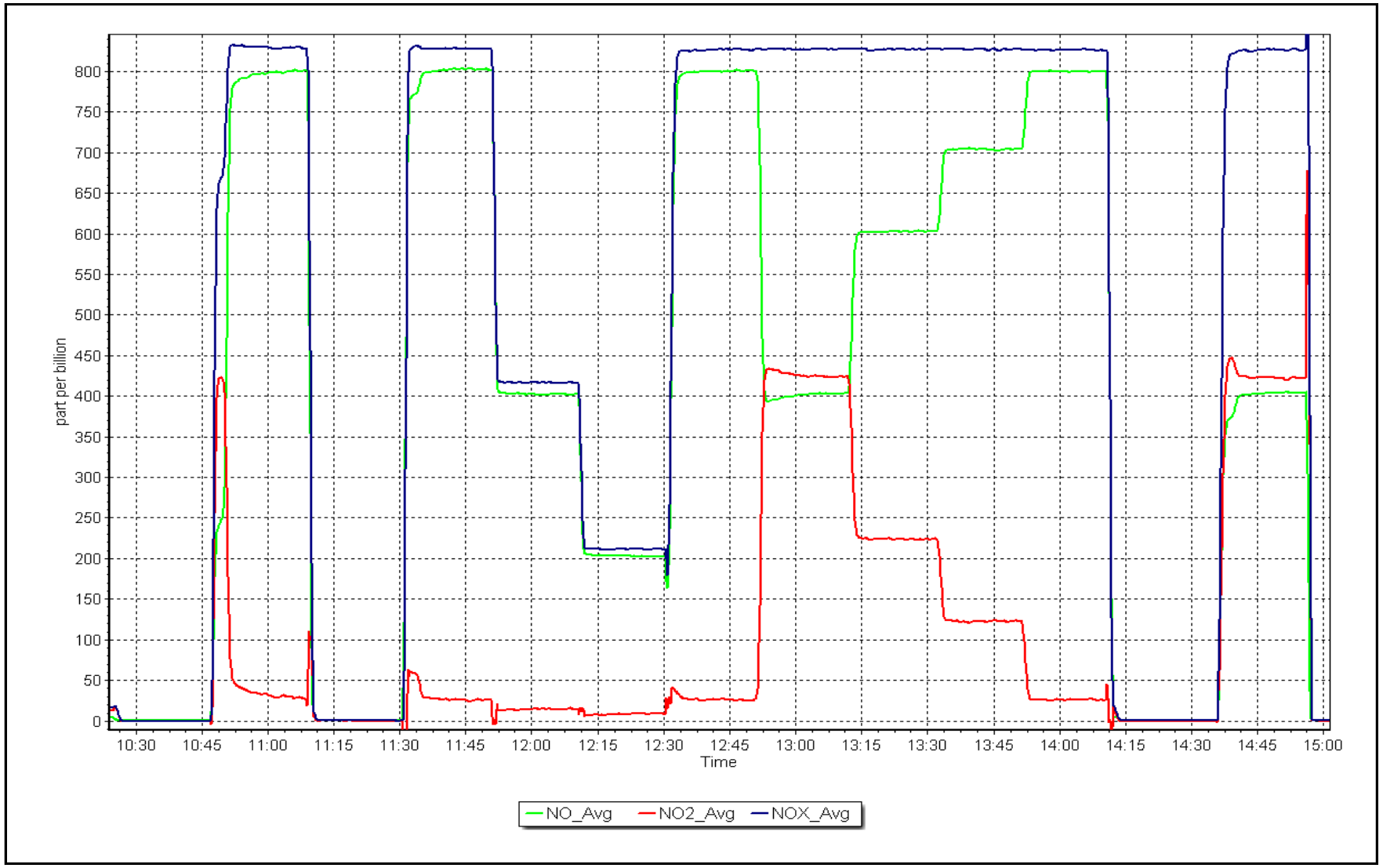
| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:25 | End Time (MST): | 15:05 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1172750022 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999997 | *≥0.995* |
| 424.5 | 423.8 | 1.0017 | | | |
| 224.5 | 223.7 | 1.0037 | Slope | 0.999140 | *0.90 - 1.10* |
| 124.0 | 123.0 | 1.0083 | | | |
| | | | Intercept | -0.524585 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 5, 2024 Location: Patricia McInnes



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS06 |
| Calibration Date: | February 16, 2024 | Last Cal Date: | January 2, 2024 |
| Start time (MST): | 9:41 | End time (MST): | 13:00 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.003886 | 1.003629 | Backgd or Offset: | -0.2 | -0.2 |
| Calibration intercept: | -1.480000 | -0.860000 | Coeff or Slope: | 1.026 | 1.026 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 800.0 | 0.0 | -0.1 | ---- |
| as found span | 5000 | 1303.0 | 400.0 | 401.1 | 0.997 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 800.0 | 0.0 | 0.0 | ---- |
| high point | 5000 | 1303.0 | 400.0 | 401.1 | 0.997 |
| second point | 5000 | 966.5 | 200.0 | 199.2 | 1.004 |
| third point | 5000 | 794.3 | 100.0 | 98.8 | 1.012 |
| as left zero | 5000 | 800.0 | 0.0 | -0.2 | ---- |
| as left span | 5000 | 1303.0 | 400.0 | 403.2 | 0.992 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 401.2 | Previous response | 400.1 | *% 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

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

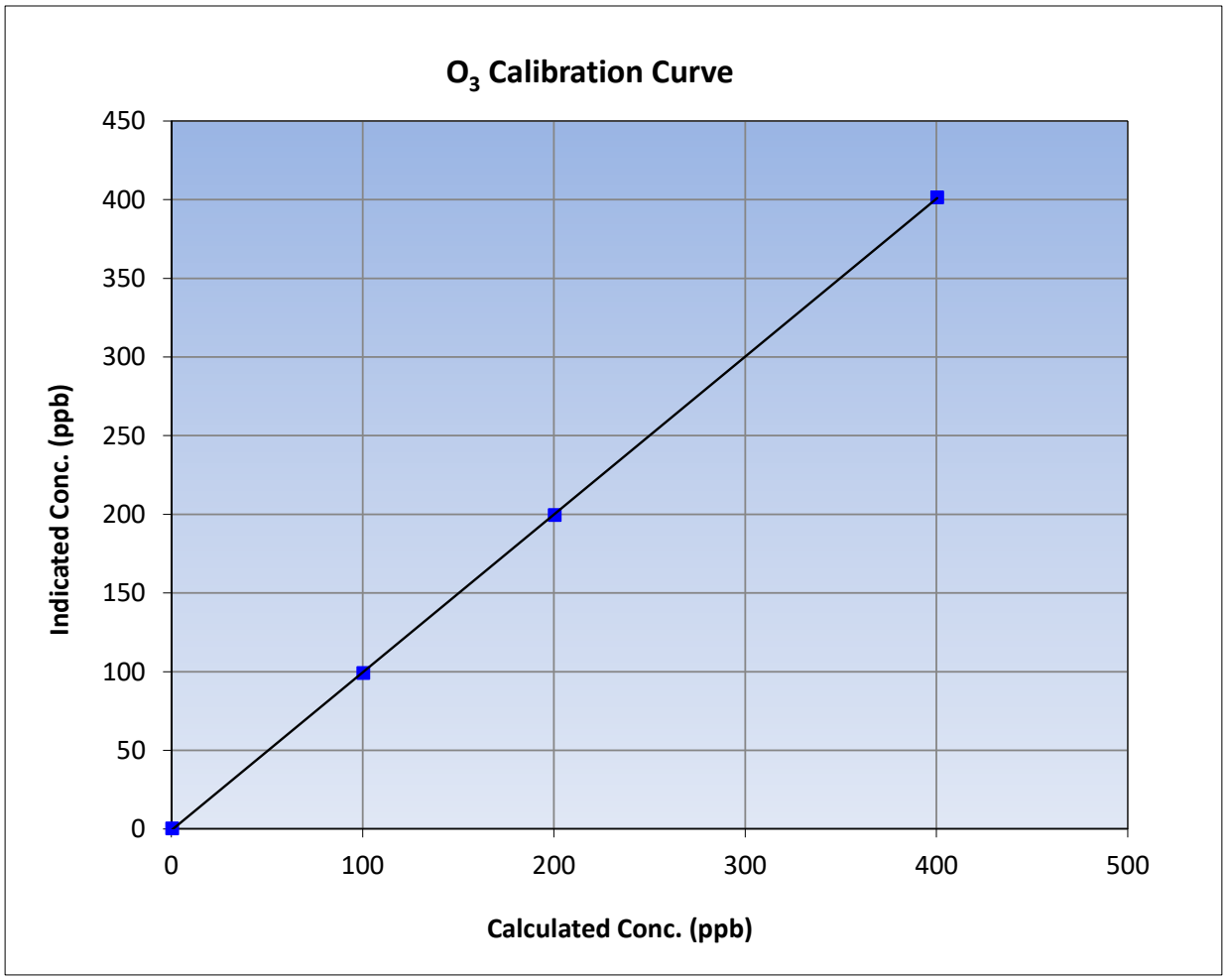
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 2, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 9:41 | End Time (MST): | 13:00 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1300156234 |

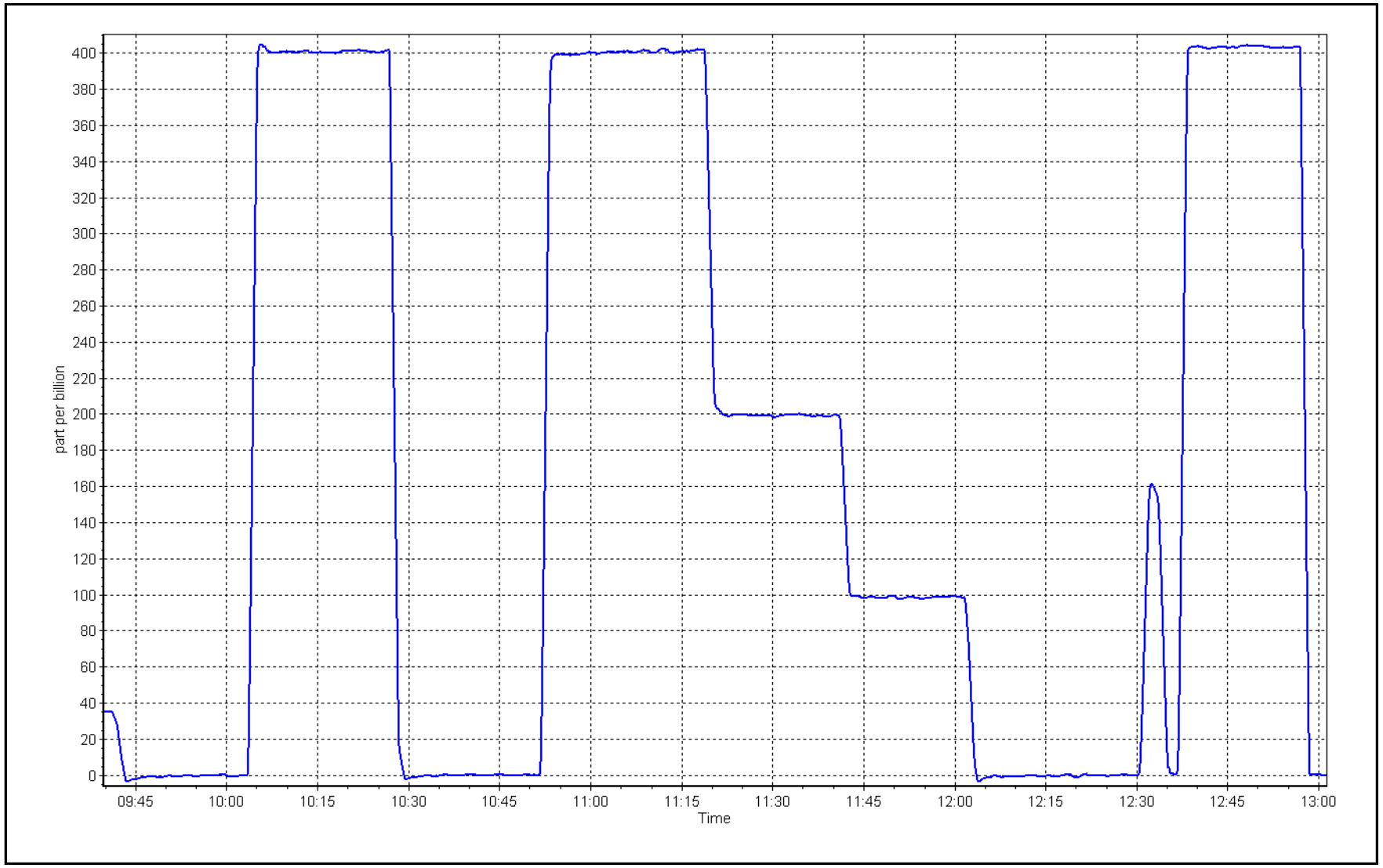
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 400.0 | 401.1 | 0.9973 |
| 200.0 | 199.2 | 1.0040 |
| 100.0 | 98.8 | 1.0121 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999978 | *≥0.995* |
| Slope | 1.003629 | *0.90 - 1.10* |
| Intercept | -0.860000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 16, 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: | February 16, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 14:17 | End time (MST): | 14:39 |
| Analyzer Make: | API T640 | S/N: | 766 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 388755 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 388755 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| T (°C) | 3.6 | 3.1 | 3.6 | ☐ | +/- 2 °C |
| P (mmHg) | 728.1 | 730.7 | 728.1 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.02 | 5.11 | 5.02 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 39 | ----- | 39 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 4.8 | 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: — Lot No.:

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

Date Optical Chamber Cleaned: December 1, 2023

Date Disposable Filter Changed: December 1, 2023

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: Quarterly calibrations completed in December. Leak check passed, no adjustments made.

Calibration by: Max Farrell

# Wood Buffalo Environmental Association

## TN - $NO_X$ - $NH_3$ Calibration Report

Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS 06 |
| NOX Cal Date: | February 21, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 8:55 | End time (MST): | 13:13 |
| NH3 Cal Date: | February 21, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 13:30 | End time (MST): | 15:15 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| NOX Cal Gas Conc: | 47.94 | ppm | NO Gas Cylinder #: | T30YCWN |
| NO Cal Gas Conc: | 46.39 | ppm | NO Cal Gas Expiry: | April 11, 2025 |
| Removed NOX Conc: | 47.94 | ppm | Removed Cylinder #: | NA |
| Removed NO Conc: | 46.39 | ppm | Removed cyl Expiry: | NA |
| NOX gas Diff: | | | NO gas Diff: | |
| NH3 Cal Gas Conc: | 76.29 | ppm | NH3 Gas Cylinder #: | EB0108520 |
| | | | NH3 Cal Gas Expiry: | August 22, 2024 |
| Removed NH3 Conc: | 76.29 | ppm | Removed Cylinder #: | NA |
| NH3 gas Diff: | | | Removed cyl Expiry: | NA |
| Calibrator Model: | API T700 | | Serial Number: | 3566 |
| ZAG make/model: | API T701 | | Serial Number: | 4602 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer model: | Teledyne API T201 | Analyzer serial #: | 808 |
| Converter model: | Teledyne API T501 | Converter serial #: | 484 |
| NH3 Range (ppb): | 0 - 2000 ppb | Reaction cell Press: | 4.80 |
| NOX Range (ppb): | 0 - 1000 ppb | Sample Flow: | 26.6 |

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| NO coefficient: | 0.854 | 0.854 | TN coefficient: | 0.849 | 0.849 |
| NOX coefficient: | 0.848 | 0.848 | NO bkgrnd: | -0.985 | -0.985 |
| NO2 coefficient: | 1.000 | 1.000 | NOX bkgrnd: | -0.562 | -0.562 |
| NH3 coefficient: | 0.891 | 0.891 | TN bkgrnd: | 5.018 | 5.018 |

### Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000699 | 0.995140 |
| $NO_X$ Cal Offset: | 1.395952 | 2.256598 |
| NO Cal Slope: | 1.003275 | 0.997671 |
| NO Cal Offset: | 0.522150 | 1.183452 |
| $NO_2$ Cal Slope: | 0.994054 | 0.997218 |
| $NO_2$ Cal Offset: | -1.155779 | 0.194612 |
| NH3 Cal Slope: | 1.000855 | 1.010551 |
| NH3 Cal Offset: | 2.210125 | 1.110139 |
| TN Cal Slope: | 1.008599 | 1.017335 |
| TN Cal Offset: | 2.771030 | 2.438080 |

# Wood Buffalo Environmental Association

## TN - NOX - $NH_3$ Calibration Report

Version-05-2023

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated TN concentration (ppb) (Cc) | Calculated NOX concentration (ppb) (Cc) | Calculated NH3 concentration (ppb) (Cc) | Indicated TN concentration (ppb) (Ic) | Indicated NOX concentration (ppb) (Ic) | Indicated NH3 concentration (ppb) (Ic) | TN Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -1.8 | 0.1 | -1.8 | ---- | ---- |
| as found NO | 4914 | 86.2 | 826.5 | 826.5 | ---- | 825.5 | 826.0 | -0.7 | 1.001 | ---- |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -1.1 | 0.5 | -1.6 | ---- | ---- |
| high NO point | 4914 | 86.2 | 826.5 | 826.5 | ---- | 826.4 | 824.0 | 2.2 | 1.000 | ---- |
| NO/O3 point | 4914 | 86.2 | 826.5 | 826.5 | ---- | 822.6 | 819.6 | 2.8 | 1.005 | ---- |
| as found NH3 | 3417 | 82.6 | 1800.6 | ---- | 1800.6 | 1833.6 | ---- | 1820.6 | 0.982 | 0.989 |
| new NH3 cyl rp | 3417 | 82.6 | 1800.6 | ---- | 1800.6 | | ---- | | | |
| first NH3 | 3417 | 82.6 | 1800.6 | ---- | 1800.6 | 1833.6 | ---- | 1820.6 | 0.982 | 0.989 |
| second NH3 | 3454 | 45.9 | 1000.5 | ---- | 1000.5 | 1018.6 | ---- | 1009.9 | 0.982 | 0.991 |
| third NH3 | 3477 | 22.9 | 499.2 | ---- | 499.2 | 516.2 | ---- | 510.7 | 0.967 | 0.977 |
| | | | | | | | | Average Correction Factor | 1.0024 | 0.9857 |

Corrected As found TN = 827.3 ppb $NO_X$ = 825.9 ppb NH3 = 1822.4 ppb

Previous Response TN = 836.3 ppb $NO_X$ = 828.4 ppb NH3 = 1804.4 ppb

*Percent Change TN = -1.1%

*Percent Change $NO_X$ = -0.3%

*Percent Change NH3 = 1.0%

* = > +/-5% change initiates investigation

NH3 Previous Converter Efficiency = 89.1%

NH3 Current Converter Efficiency = 89.1%

# Wood Buffalo Environmental Association

# $NO_X$ - NO - $NO_2$ Calibration Report

Version-05-2023

## 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 TN concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated TN concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | -1.8 | ---- | ---- |
| as found span | 4914 | 86.2 | 826.5 | 799.7 | 826.5 | 826.0 | 798.7 | 825.5 | 1.0005 | 1.0013 |
| new NO cyl rp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.3 | -1.1 | ---- | ---- |
| high point | 4914 | 86.2 | 826.5 | 799.7 | 826.5 | 824.0 | 798.4 | 826.4 | 1.0030 | 1.0017 |
| second point | 4957 | 43.1 | 413.2 | 399.9 | 413.2 | 413.8 | 401.2 | 416.5 | 0.9986 | 0.9967 |
| third point | 4978 | 21.6 | 207.1 | 200.4 | 207.1 | 210.5 | 201.6 | 209.6 | 0.9839 | 0.9942 |
| | | | | | | | | Average Correction Factor | 0.9952 | 0.9975 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Baseline Corr As fnd | TN = | 827.3 ppb | $NO_X$ = | 825.9 ppb | NO = | 798.6 ppb | *Percent Change TN = -1.1% |
| Previous Response | TN = | 836.3 ppb | $NO_X$ = | 828.4 ppb | NO = | 802.9 ppb | *Percent Change $NO_X$ = -0.3% |
| | | | | | | | *Percent Change NO = -0.5% |

* = > +/-5% change initiates investigation

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found zero | ---- | ---- | 0.0 | 0.0 | ---- | ---- |
| calibration zero | ---- | ---- | 0.0 | 0.2 | ---- | ---- |
| 1st GPT point (400 ppb O3) | 794.2 | 396.0 | 424.9 | 423.8 | 1.0026 | 99.7% |
| 2nd GPT point (200 ppb O3) | 794.2 | 597.9 | 223.0 | 223.0 | 1.0001 | 100.0% |
| 3rd GPT point (100 ppb O3) | 794.2 | 699.3 | 121.6 | 121.2 | 1.0035 | 99.7% |
| | | | | Average Correction Factor | 1.0021 | 99.8% |

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## TN Calibration Summary

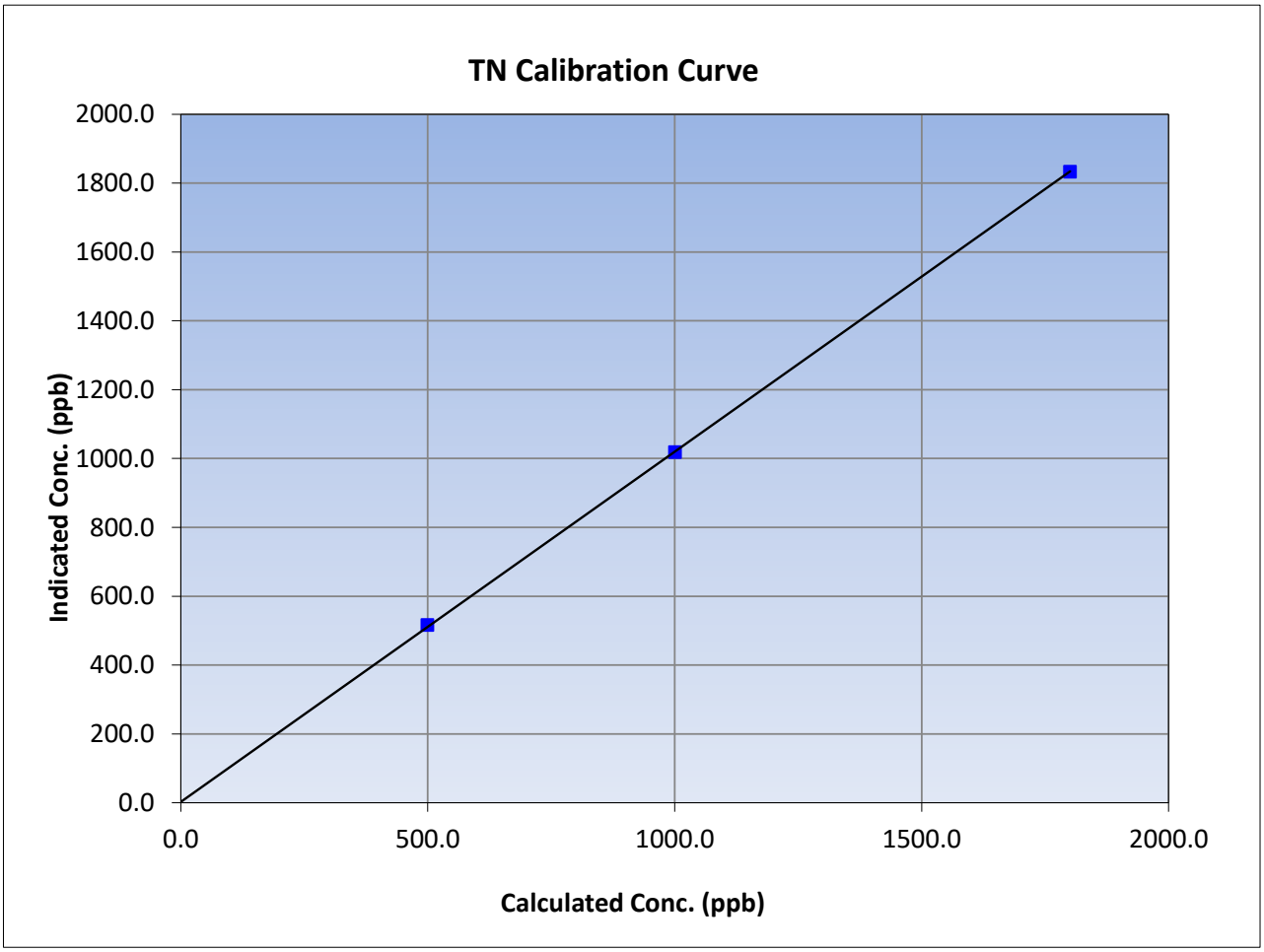
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 8:55 | End Time (MST): | 13:13 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 808 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -1.1 | ---- | Correlation Coefficient | 0.999972 | *≥0.995* |
| 1800.6 | 1833.6 | 0.9820 | | | |
| 1000.5 | 1018.6 | 0.9822 | Slope | 1.017335 | *0.90 - 1.10* |
| 499.2 | 516.2 | 0.9670 | | | |
| | | | Intercept | 2.438080 | *+/-20* |



# Wood Buffalo Environmental Association

## $NH_3$ Calibration Summary

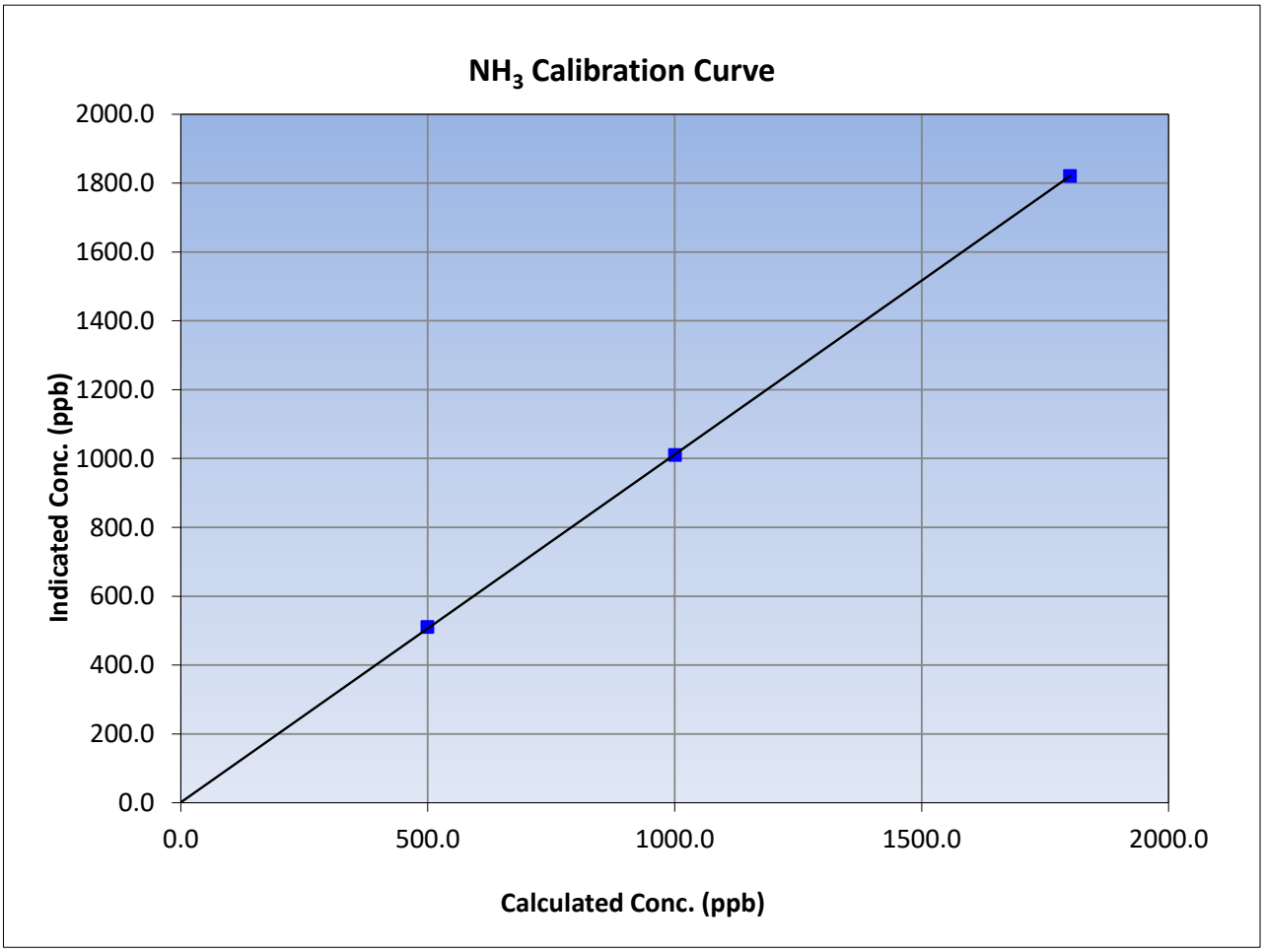
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 8:55 | End Time (MST): | 13:13 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 808 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -1.6 | ---- | Correlation Coefficient | 0.999978 | ≥0.995 |
| 1800.6 | 1820.6 | 0.9890 | | | |
| 1000.5 | 1009.9 | 0.9907 | Slope | 1.010551 | 0.90 - 1.10 |
| 499.2 | 510.7 | 0.9774 | | | |
| | | | Intercept | 1.110139 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

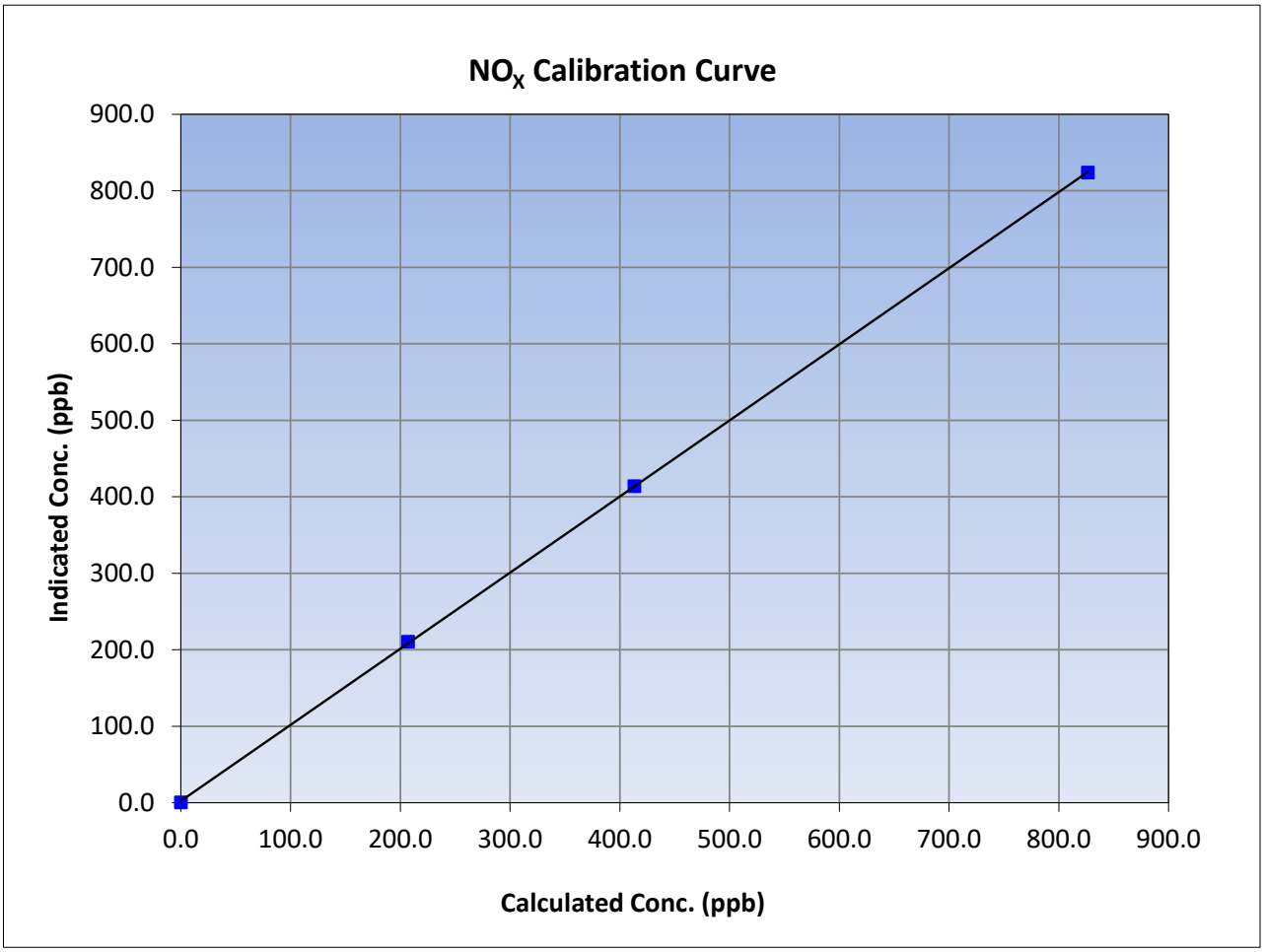
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 8:55 | End Time (MST): | 13:13 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 808 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.5 | ---- | Correlation Coefficient | 0.999978 | ≥0.995 |
| 826.5 | 824.0 | 1.0030 | | | |
| 413.2 | 413.8 | 0.9986 | Slope | 0.995140 | 0.90 - 1.10 |
| 207.1 | 210.5 | 0.9839 | | | |
| | | | Intercept | 2.256598 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

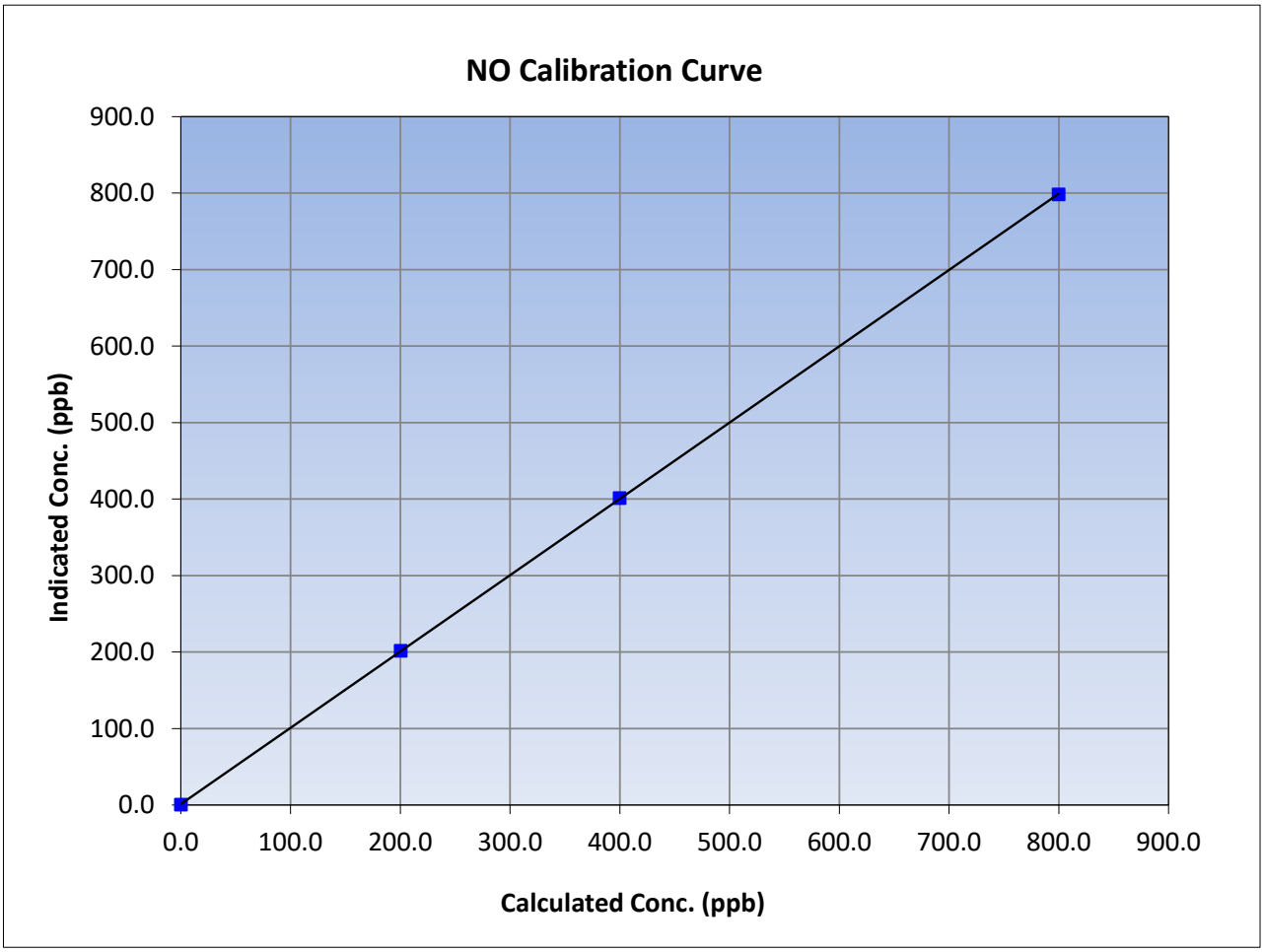
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 8:55 | End Time (MST): | 13:13 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 808 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.3 | ---- | Correlation Coefficient | 0.999993 | *≥0.995* |
| 799.7 | 798.4 | 1.0017 | | | |
| 399.9 | 401.2 | 0.9967 | Slope | 0.997671 | *0.90 - 1.10* |
| 200.4 | 201.6 | 0.9942 | | | |
| | | | Intercept | 1.183452 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

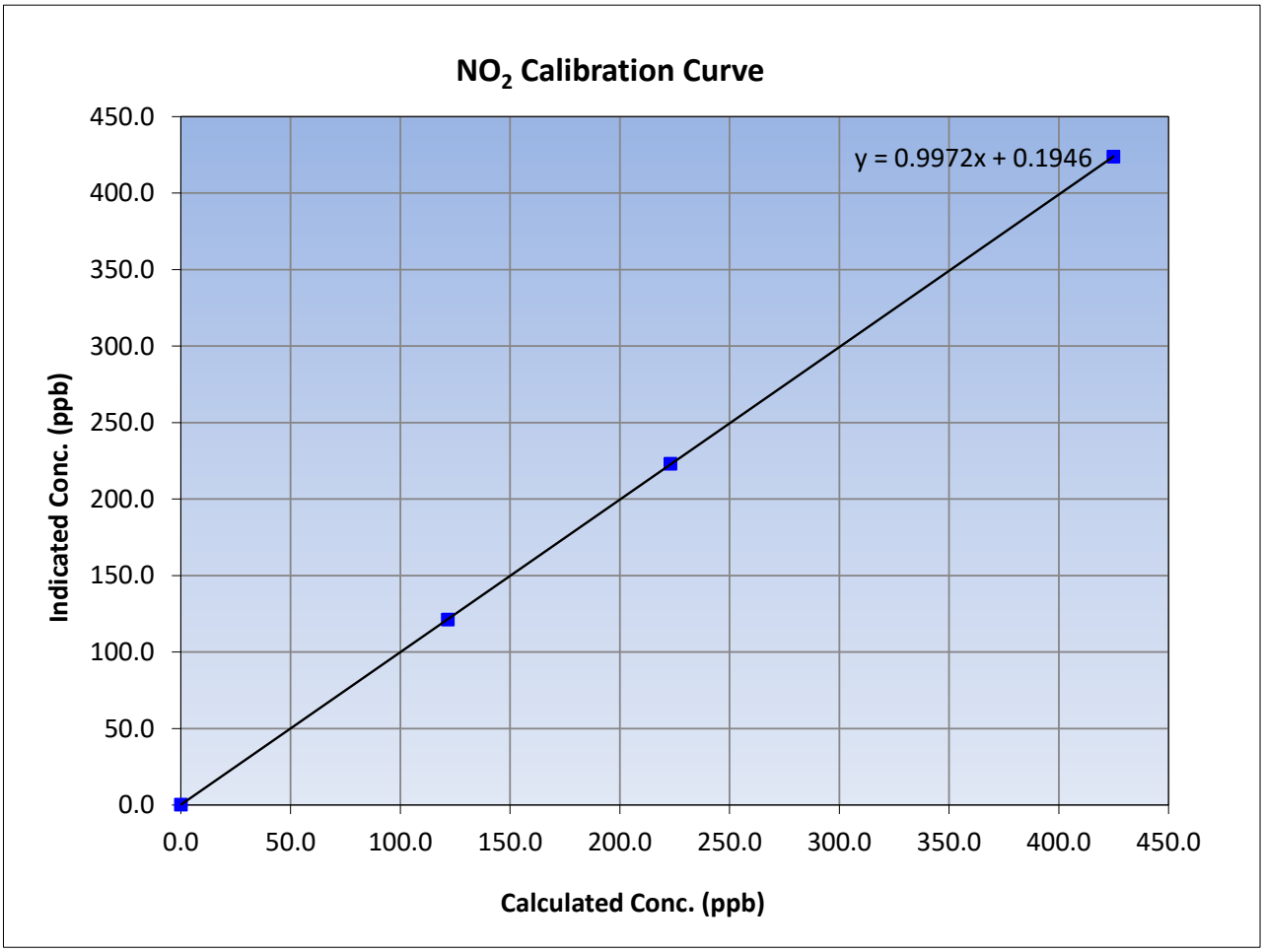
Version-05-2023

### Station Information

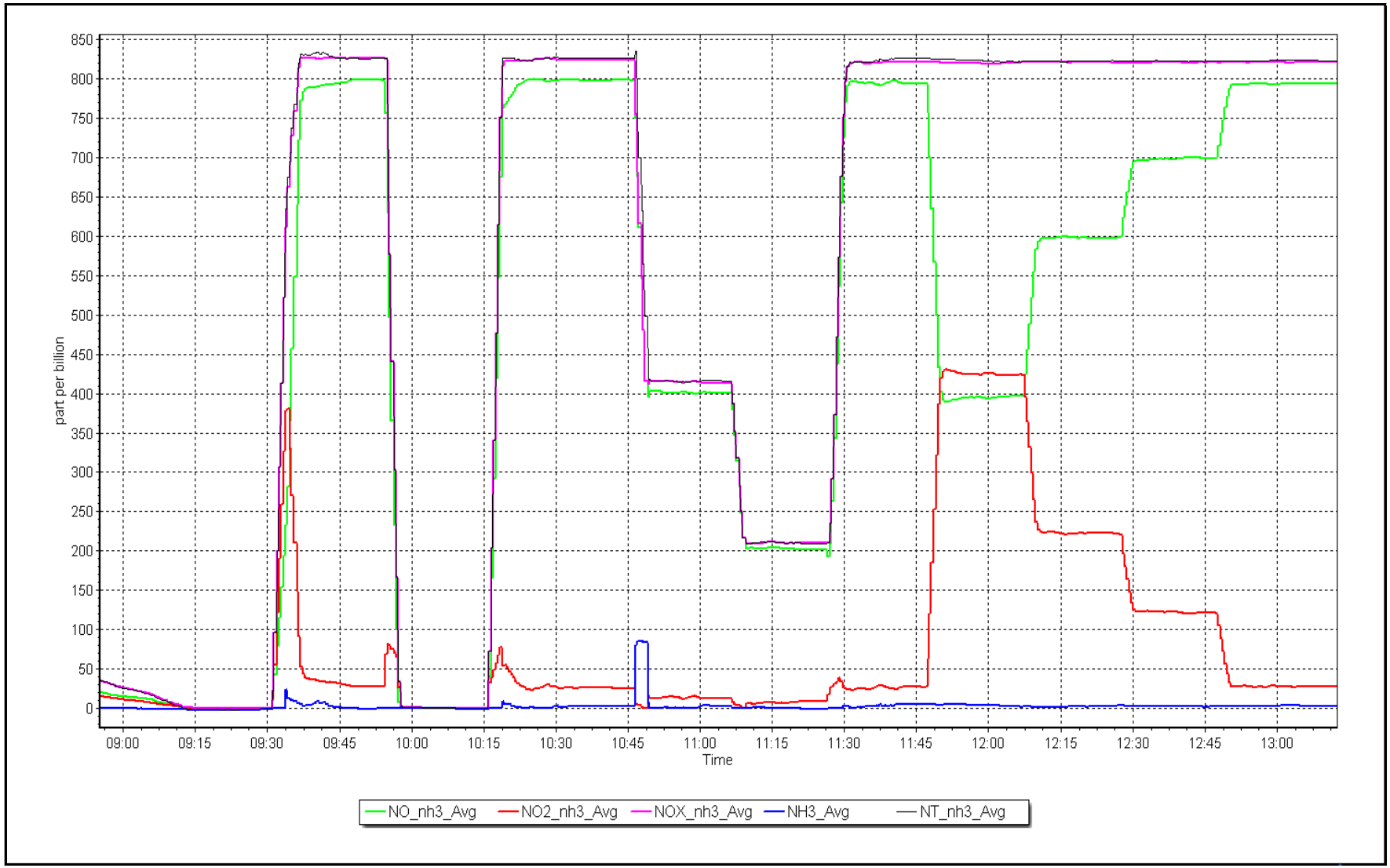
| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 8:55 | End Time (MST): | 13:13 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 808 |

### Calibration Data

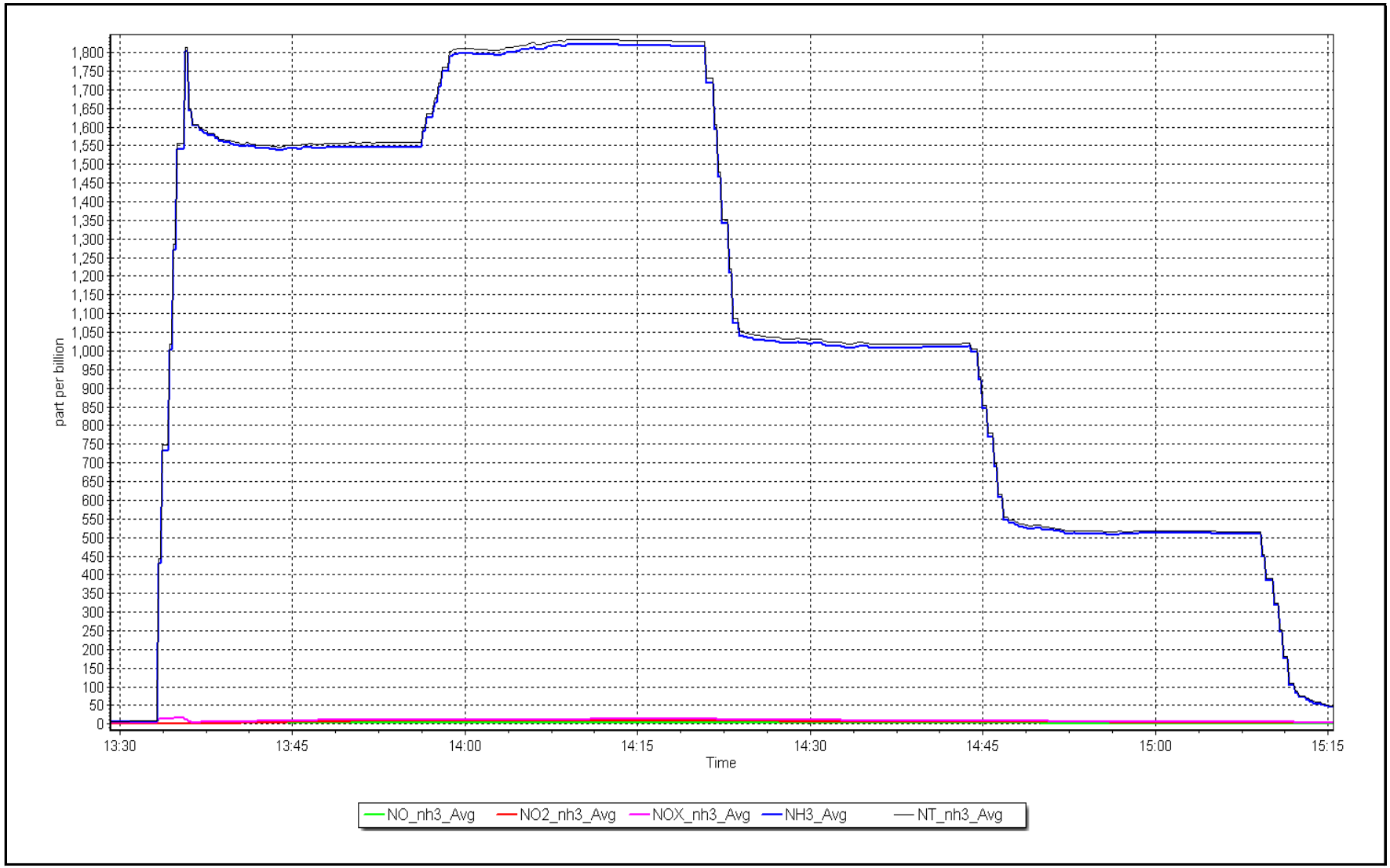
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.2 | ---- | Correlation Coefficient | 0.999997 | *≥0.995* |
| 424.9 | 423.8 | 1.0026 | | | |
| 223.0 | 223.0 | 1.0001 | Slope | 0.997218 | *0.90 - 1.10* |
| 121.6 | 121.2 | 1.0035 | | | |
| | | | Intercept | 0.194612 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 21, 2024 Location: Patricia McInnes



**$NH_3$ Calibration Plot** Date: February 21, 2024 Location: Patricia McInnes



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS07
## ATHABASCA VALLEY
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 10:13 | End time (MST): | 14:36 |
| 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 Make/Model: | API T700 | | Serial Number: | 3805 |
| ZAG Make/Model: | API 701H | | Serial Number: | 198 |

### Analyzer Information

Analyzer make: Thermo 43i-LTE  Analyzer serial #: 1507864683

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.003653 | 1.002036 | Backgd or Offset: | 2.62 | 2.70 |
| Calibration intercept: | 2.143576 | 1.783896 | Coeff or Slope: | 0.846 | 0.852 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4920 | 79.8 | 799.0 | 806.9 | 0.990 |
| as found 2nd point | 4960 | 39.9 | 399.5 | 407.4 | 0.981 |
| as found 3rd point | 4980 | 20.0 | 200.2 | 205.1 | 0.976 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4920 | 79.8 | 799.0 | 801.0 | 0.997 |
| second point | 4960 | 39.9 | 399.5 | 404.6 | 0.987 |
| third point | 4980 | 20.0 | 200.2 | 203.0 | 0.986 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4920 | 79.8 | 799.0 | 801.8 | 0.996 |
| | | | | Average Correction Factor | 0.990 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 806.90 | Previous response | 804.05 | *% change | 0.4% |
| Baseline Corr 2nd AF pt: | 407.40 | AF Slope: | 1.009233 | AF Intercept: | 1.942240 |
| Baseline Corr 3rd AF pt: | 205.10 | AF Correlation: | 0.999966 | | |

* = > +/-5% change initiates investigation

Notes: Pump swapped out after as founds. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

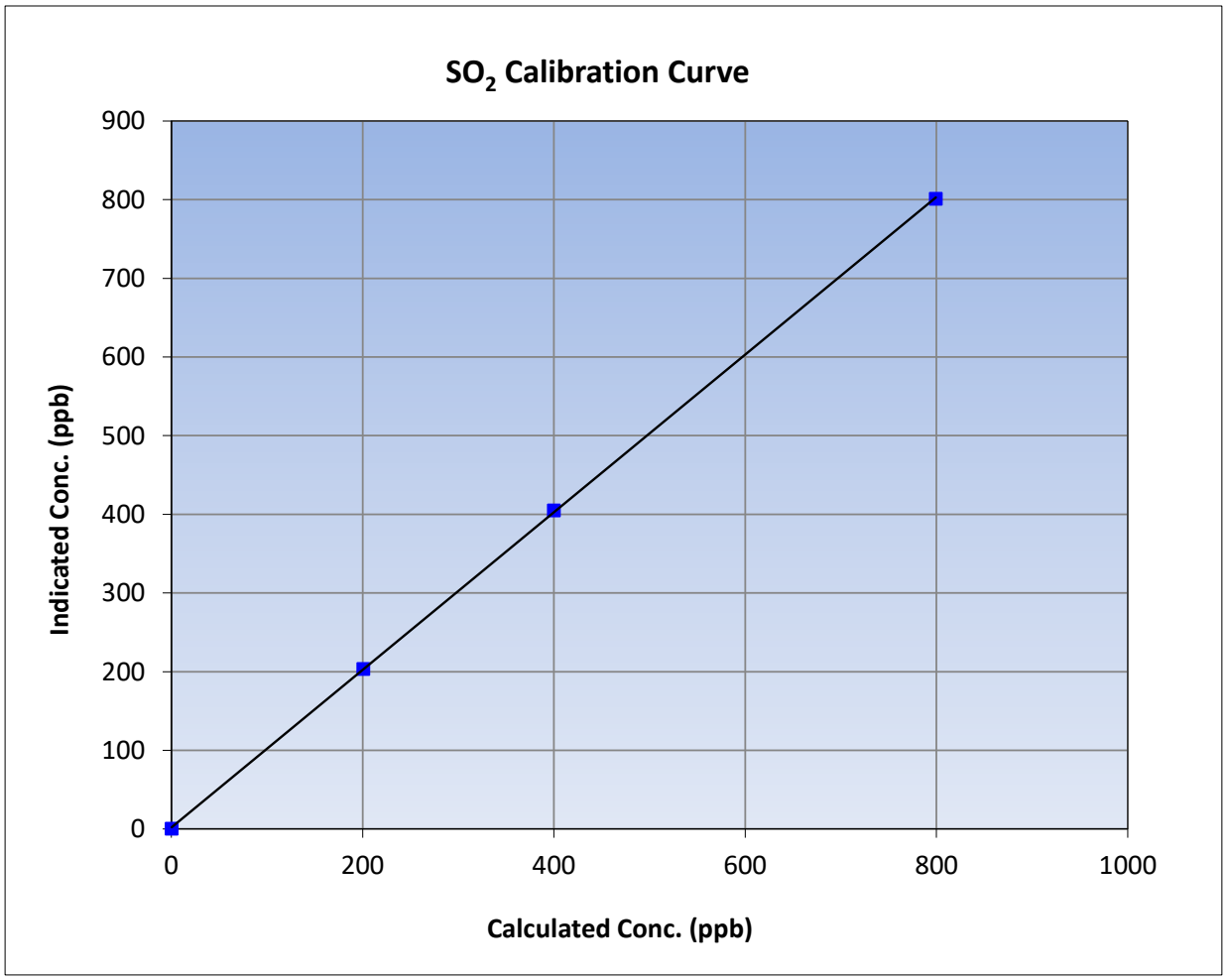
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:13 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1507864683 |

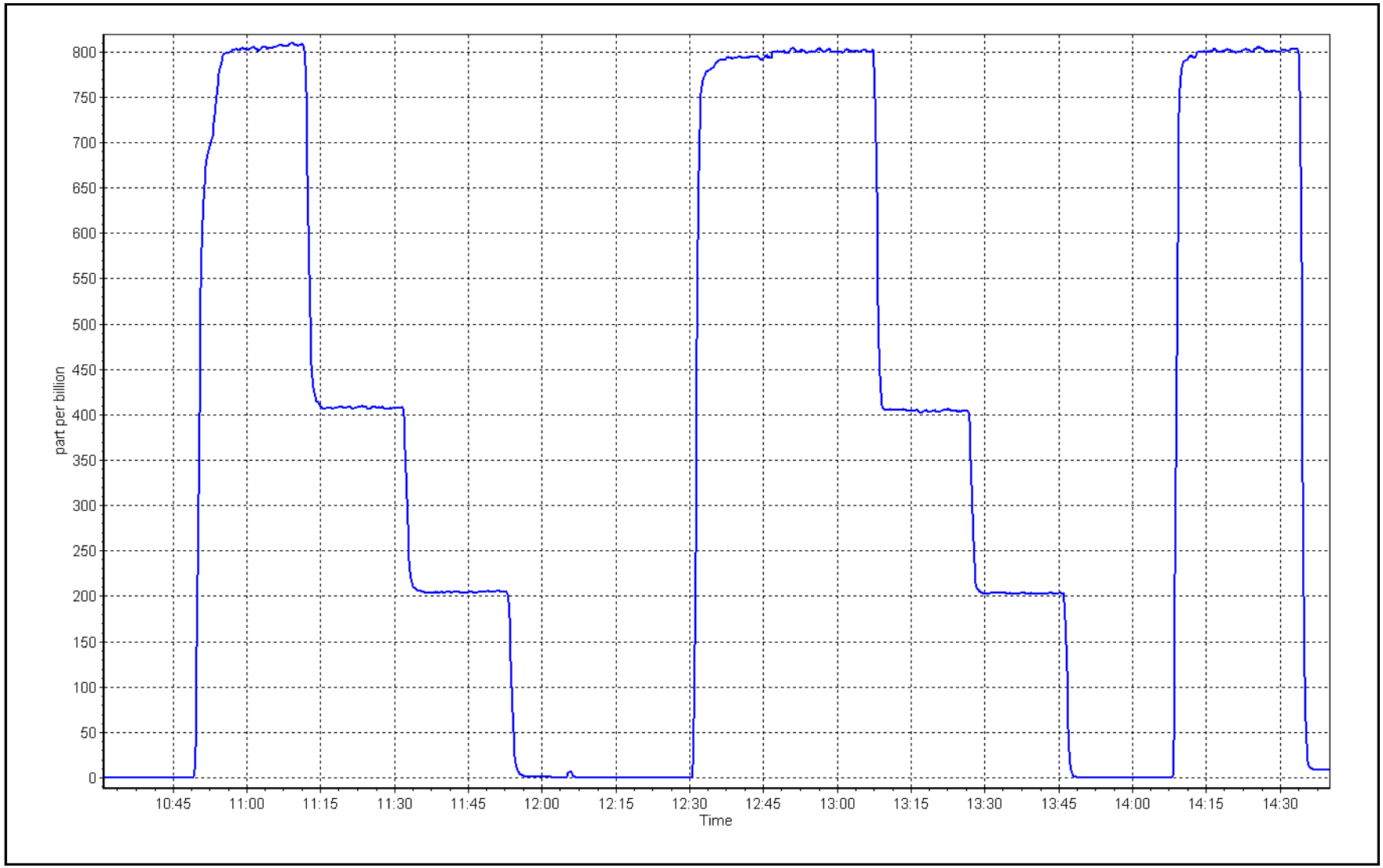
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 799.0 | 801.0 | 0.9975 |
| 399.5 | 404.6 | 0.9874 |
| 200.2 | 203.0 | 0.9864 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999967 | ≥0.995 |
| Slope | 1.002036 | 0.90 - 1.10 |
| Intercept | 1.783896 | +/-30 |



**SO2 Calibration Plot** Date: February 2, 2024 Location: Athabasca Valley



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 22, 2024 | Last Cal Date: | January 9, 2024 |
| Start time (MST): | 11:02 | End time (MST): | 15:40 |
| 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.004826 | 1.017941 | Backgd or Offset: | 2.40 | 2.40 |
| Calibration intercept: | 0.237795 | 0.157770 | Coeff or Slope: | 0.906 | 0.901 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4925 | 75.5 | 79.3 | 81.2 | 0.977 |
| as found 2nd point | 4962 | 37.7 | 39.6 | 40.4 | 0.982 |
| as found 3rd point | 4981 | 18.9 | 19.8 | 20.3 | 0.982 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4925 | 75.5 | 79.3 | 80.9 | 0.980 |
| second point | 4962 | 37.7 | 39.6 | 40.5 | 0.978 |
| third point | 4981 | 18.9 | 19.9 | 20.3 | 0.978 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4925 | 75.5 | 79.3 | 80.1 | 0.990 |
| SO2 Scrubber Check | 4920 | 79.2 | 800.4 | 0.1 | ---- |
| Date of last scrubber change: | | 25-Feb-22 | | Ave Corr Factor | 0.979 |
| Date of last converter efficiency test: | | April 22, 2022 | | 92.6% | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.1 | Prev response: | 79.89 | *% change: | 1.5% |
| Baseline Corr 2nd AF pt: | 40.3 | AF Slope: | 1.023284 | AF Intercept: | 0.017677 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999992 | | |

* = > +/-5% change initiates investigation

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

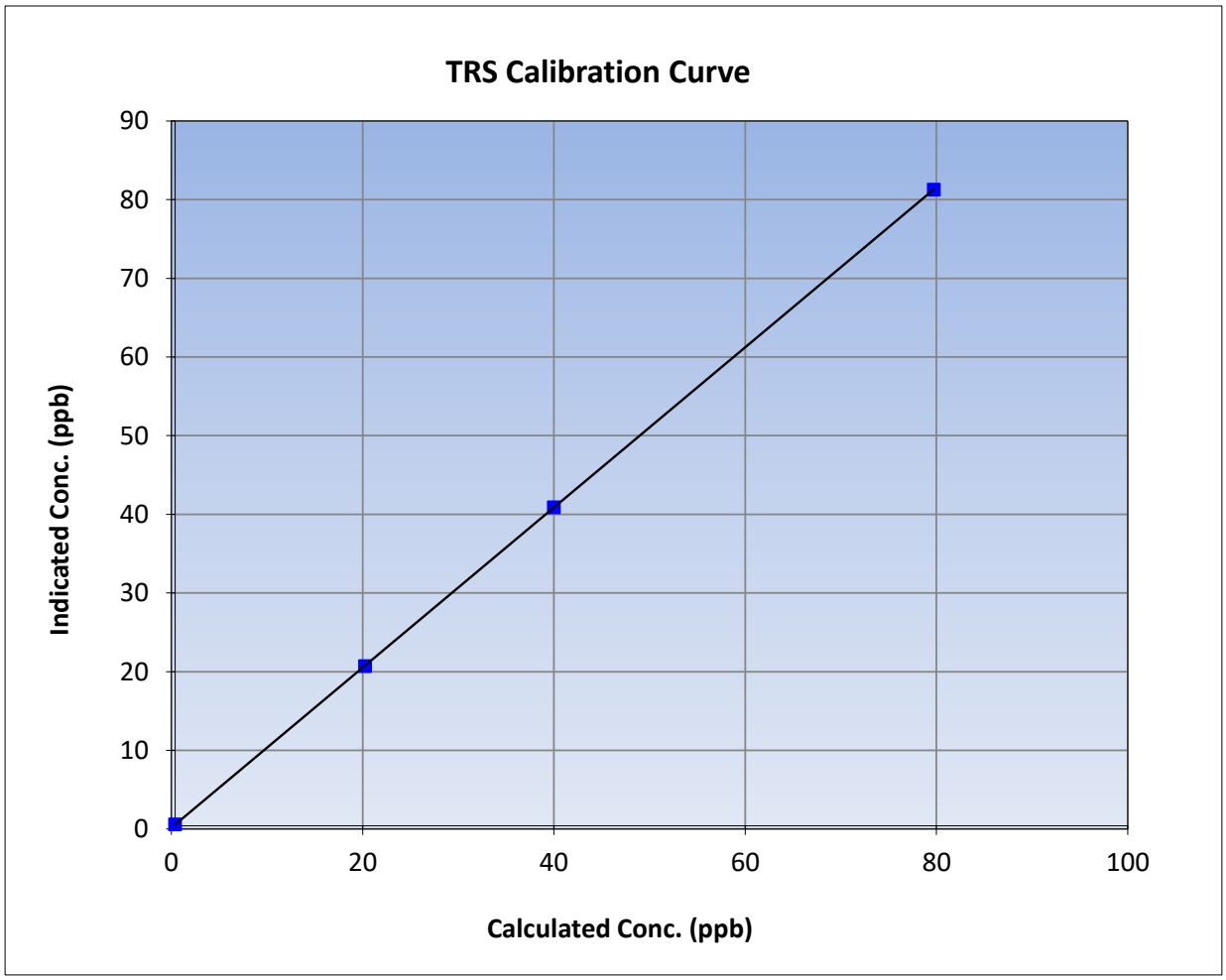
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:02 | End Time (MST): | 15:40 |
| Analyzer make: | CDN-101 | Analyzer serial #: | 551 |

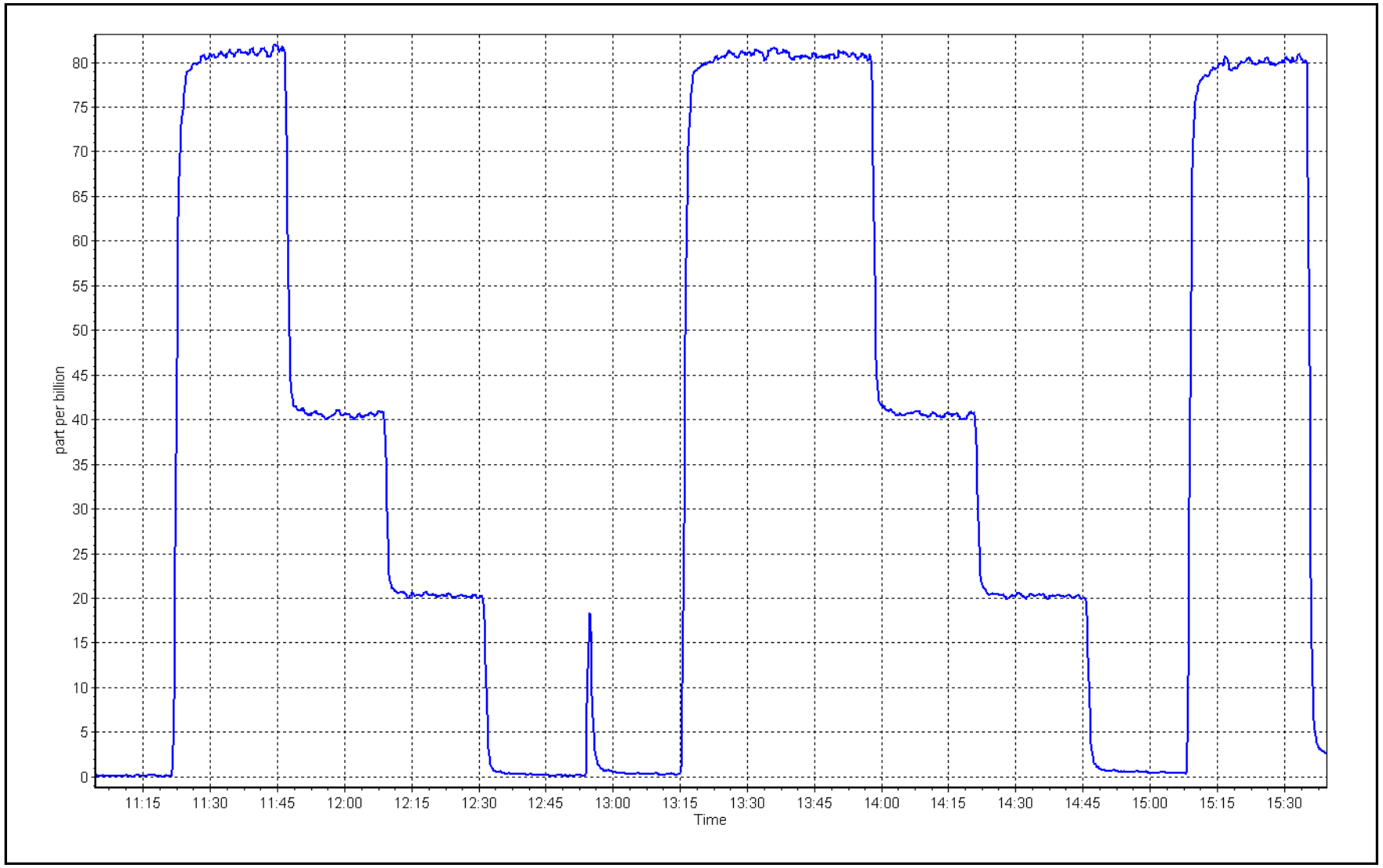
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 79.3 | 80.9 | 0.9804 |
| 39.6 | 40.5 | 0.9780 |
| 19.9 | 20.3 | 0.9782 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.017941 | *0.90 - 1.10* |
| Intercept | 0.157770 | *+/-3* |



**TRS Calibration Plot** Date: February 22, 2024 Location: Athabasca Valley



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 10:13 | End time (MST): | 14:36 |
| 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: | API T700 | | Serial Number: | 3805 | |
| ZAG make/model: | API 701H | | Serial Number: | 198 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1152430012 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | N/A | 2.49E-04 | NMHC SP Ratio: | N/A | 4.43E-05 |
| CH4 Retention time: | N/A | 13.8 | NMHC Peak Area: | N/A | 203131 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 16.91 | 16.59 | 1.019 |
| as found 2nd point | 4960 | 39.9 | 8.46 | 8.30 | 1.019 |
| as found 3rd point | 4980 | 20.0 | 4.24 | 4.13 | 1.026 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 16.91 | 17.03 | 0.993 |
| second point | 4960 | 39.9 | 8.46 | 8.51 | 0.993 |
| third point | 4980 | 20.0 | 4.24 | 4.24 | 0.999 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 16.91 | 17.03 | 0.993 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.59 | Prev response | 17.02 | *% change | -2.6% |
| Baseline Corr 2nd AF: | 8.3 | AF Slope: | 0.981619 | AF Intercept: | -0.009252 |
| Baseline Corr 3rd AF: | 4.1 | AF Correlation: | 0.999996 | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 9.00 | 8.80 | 1.022 |
| as found 2nd point | 4960 | 39.9 | 4.50 | 4.44 | 1.014 |
| as found 3rd point | 4980 | 20.0 | 2.26 | 2.24 | 1.008 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 9.00 | 9.11 | 0.988 |
| second point | 4960 | 39.9 | 4.50 | 4.59 | 0.981 |
| third point | 4980 | 20.0 | 2.26 | 2.31 | 0.975 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.00 | 9.11 | 0.988 |
| | | | | Average Correction Factor | 0.981 |
| Baseline Corr AF: | 8.80 | Prev response | 9.11 | *% change | -3.5% |
| Baseline Corr 2nd AF: | 4.4 | AF Slope: | 0.977272 | AF Intercept: | 0.019843 |
| Baseline Corr 3rd AF: | 2.2 | AF Correlation: | 0.999973 | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 7.92 | 7.79 | 1.016 |
| as found 2nd point | 4960 | 39.9 | 3.96 | 3.86 | 1.025 |
| as found 3rd point | 4980 | 20.0 | 1.98 | 1.90 | 1.046 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 7.92 | 7.92 | 0.999 |
| second point | 4960 | 39.9 | 3.96 | 3.93 | 1.008 |
| third point | 4980 | 20.0 | 1.98 | 1.93 | 1.028 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 7.92 | 7.92 | 1.000 |
| | | | | Average Correction Factor | 1.012 |
| Baseline Corr AF: | 7.79 | Prev response | 7.91 | *% change | -1.5% |
| Baseline Corr 2nd AF: | 3.86 | AF Slope: | 0.986387 | AF Intercept: | -0.029495 |
| Baseline Corr 3rd AF: | 1.90 | AF Correlation: | 0.999934 | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.006214 | 1.007382 |
| THC Cal Offset: | -0.000562 | -0.009960 |
| CH4 Cal Slope: | 1.002531 | 1.002574 |
| CH4 Cal Offset: | -0.029927 | -0.029327 |
| NMHC Cal Slope: | 1.009365 | 1.011409 |
| NMHC Cal Offset: | 0.028966 | 0.019168 |

Notes: H2 swapped out after as founds. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## THC Calibration Summary

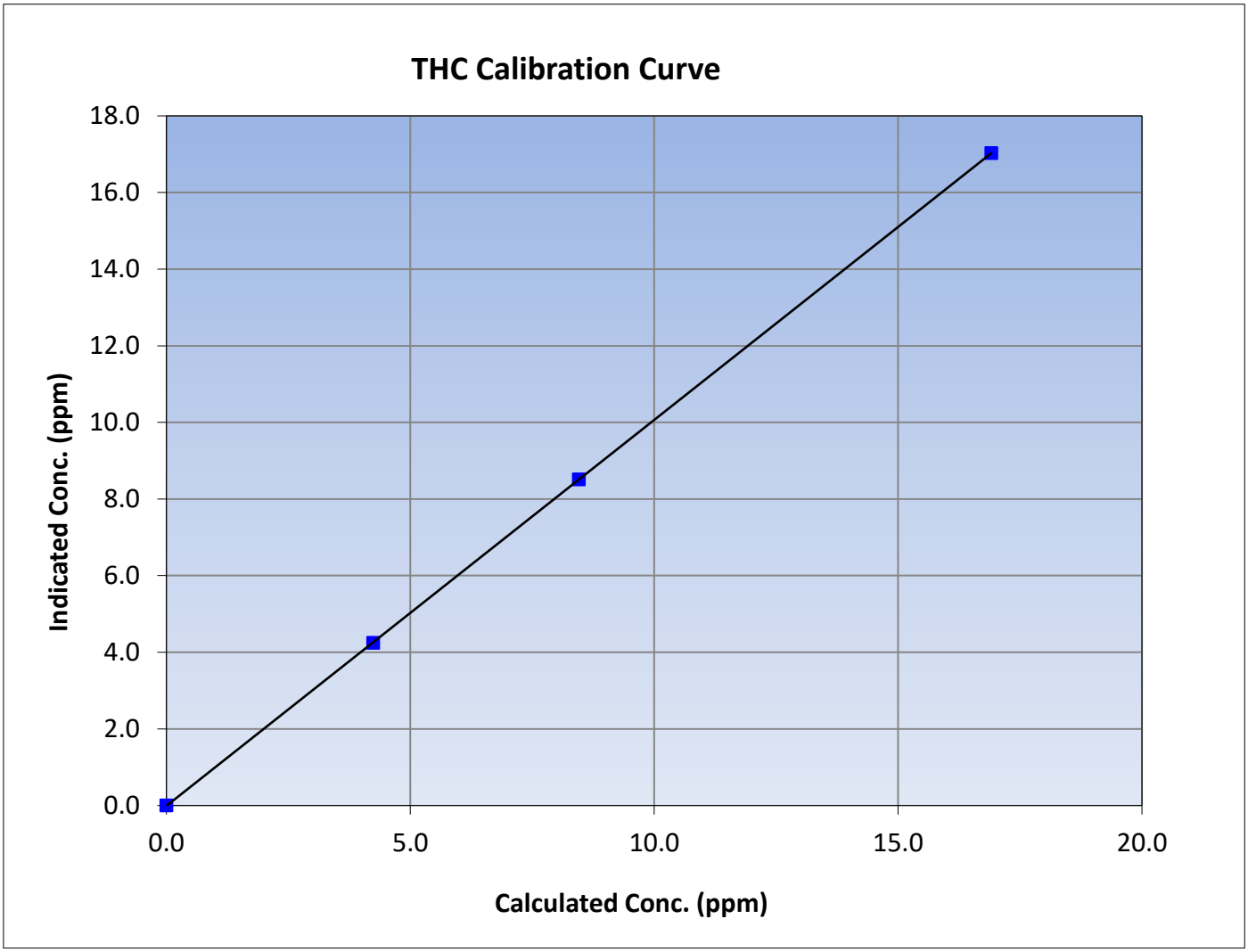
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:13 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430012 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | ≥0.995 |
| 16.91 | 17.03 | 0.9931 | | | |
| 8.46 | 8.51 | 0.9933 | Slope | 1.007382 | 0.90 - 1.10 |
| 4.24 | 4.24 | 0.9988 | | | |
| | | | Intercept | -0.009960 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

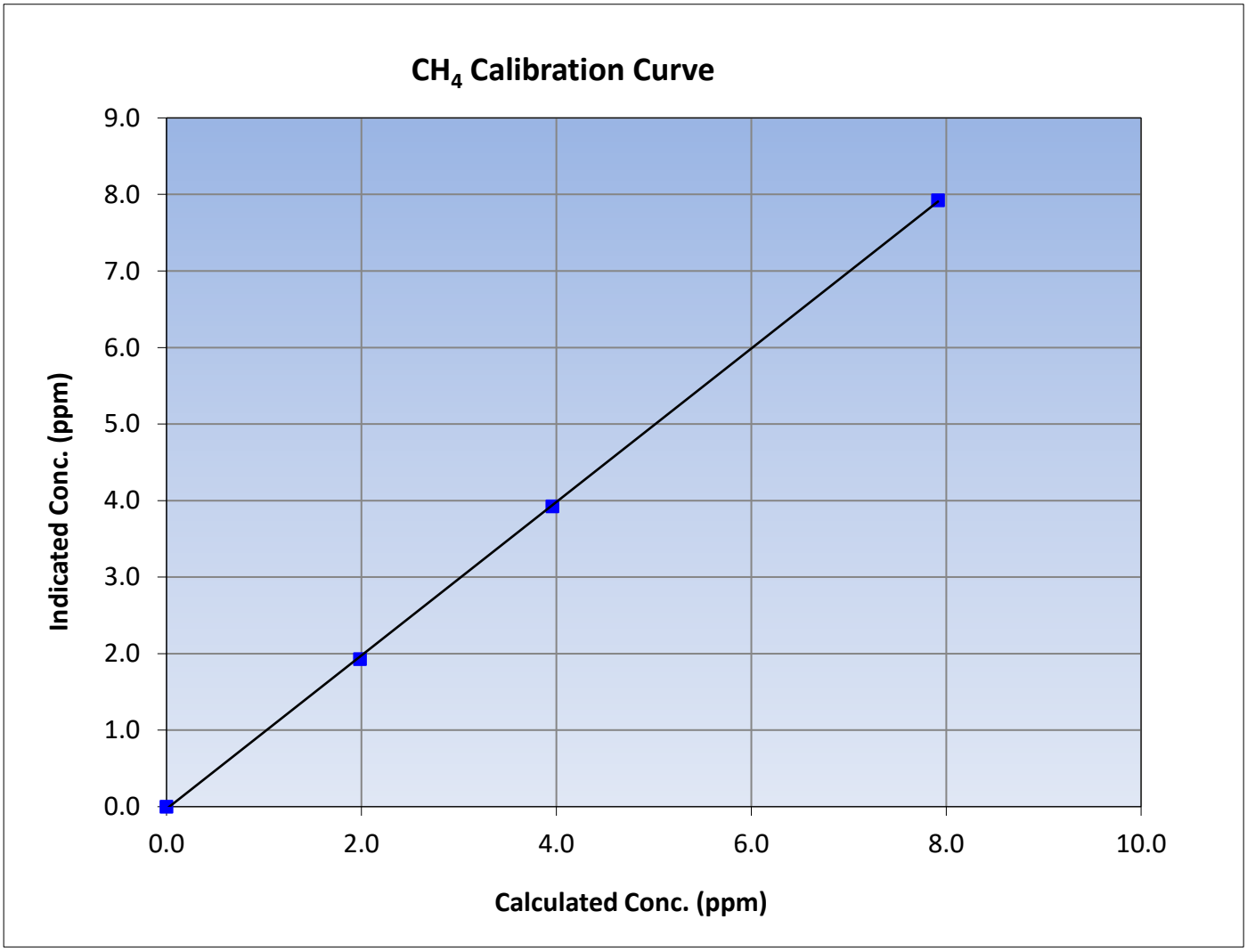
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:13 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430012 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999937 | ≥0.995 |
| 7.92 | 7.92 | 0.9993 | | | |
| 3.96 | 3.93 | 1.0084 | Slope | 1.002574 | 0.90 - 1.10 |
| 1.98 | 1.93 | 1.0280 | | | |
| | | | Intercept | -0.029327 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

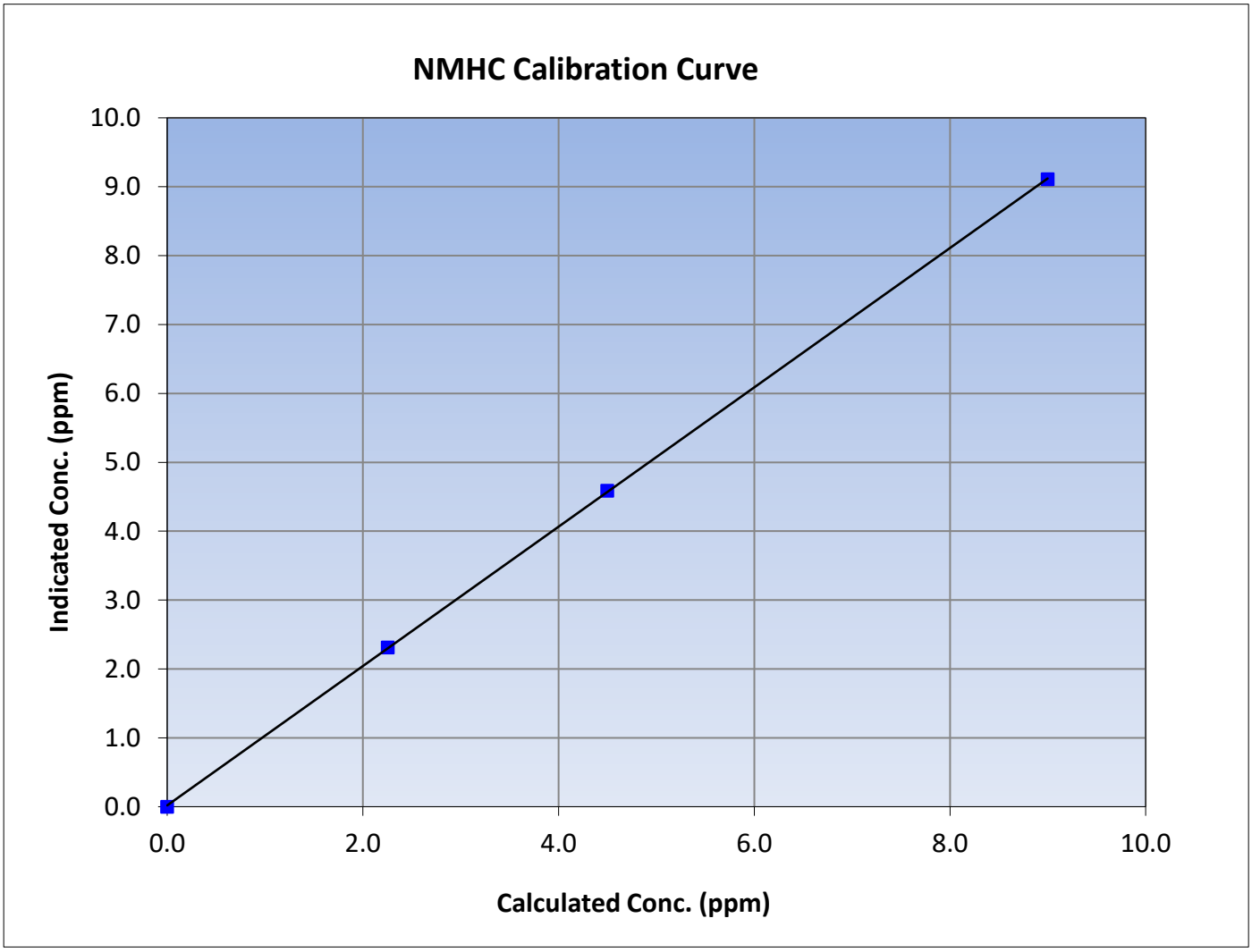
Version-06-2022

### Station Information

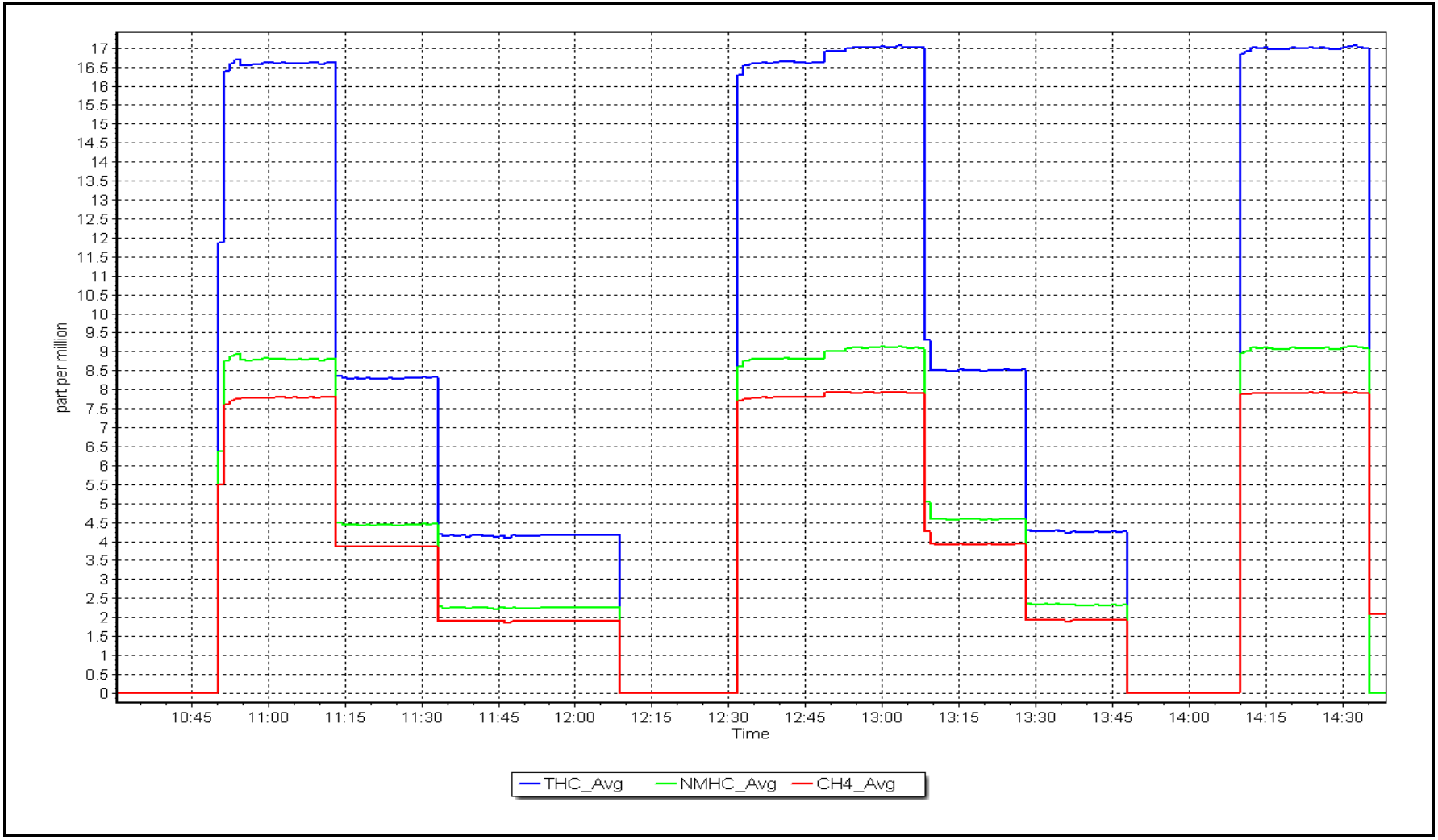
| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:13 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430012 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999977 | ≥0.995 |
| 9.00 | 9.11 | 0.9880 | | | |
| 4.50 | 4.59 | 0.9806 | Slope | 1.011409 | 0.90 - 1.10 |
| 2.26 | 2.31 | 0.9749 | | | |
| | | | Intercept | 0.019168 | +/-0.5 |



**NMHC Calibration Plot** Date: February 2, 2024 Location: Athabasca Valley



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | NA |
| Start time (MST): | 11:15 | End time (MST): | 13:25 |
| Reason: | Install | | |

### 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: | API T700 | | Serial Number: | 3805 | |
| ZAG make/model: | API 701H | | Serial Number: | 198 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 12227620777 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | N/A | 2.45E-04 | NMHC SP Ratio: | N/A | 4.93E-05 |
| CH4 Retention time: | N/A | 13.4 | NMHC Peak Area: | N/A | 182375 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 16.91 | 16.95 | 0.998 |
| second point | 4960 | 39.9 | 8.46 | 8.50 | 0.995 |
| third point | 4980 | 20.0 | 4.24 | 4.28 | 0.991 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 16.91 | 16.91 | 1.000 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| 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 | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 9.00 | 9.04 | 0.995 |
| second point | 4960 | 39.9 | 4.50 | 4.55 | 0.990 |
| third point | 4980 | 20.0 | 2.26 | 2.29 | 0.985 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.00 | 9.02 | 0.998 |
| | | | | Average Correction Factor | 0.990 |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 7.92 | 7.91 | 1.001 |
| second point | 4960 | 39.9 | 3.96 | 3.95 | 1.002 |
| third point | 4980 | 20.0 | 1.98 | 1.99 | 0.998 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 7.92 | 7.89 | 1.003 |
| | | | | Average Correction Factor | 1.000 |
| 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 | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | NA | 1.001667 |
| THC Cal Offset: | NA | 0.015848 |
| CH4 Cal Slope: | NA | 0.999012 |
| CH4 Cal Offset: | NA | 0.001263 |
| NMHC Cal Slope: | NA | 1.004116 |
| NMHC Cal Offset: | NA | 0.014385 |

Notes: Installation calibration

Calibration Performed By: Devin Russell

# Wood Buffalo Environmental Association

## THC Calibration Summary

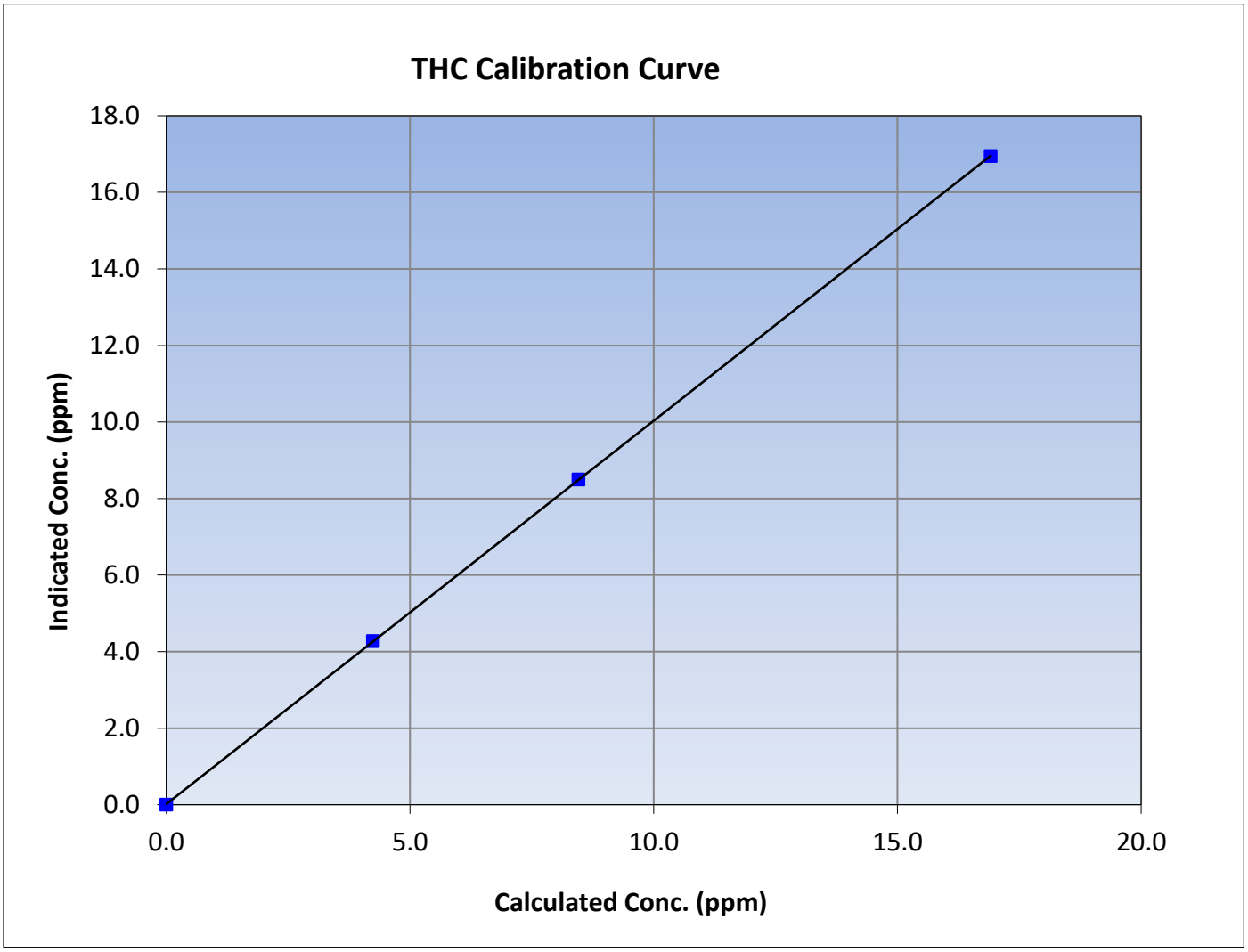
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | NA |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:15 | End Time (MST): | 13:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 12227620777 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 16.91 | 16.95 | 0.9979 | | | |
| 8.46 | 8.50 | 0.9954 | Slope | 1.001667 | 0.90 - 1.10 |
| 4.24 | 4.28 | 0.9911 | | | |
| | | | Intercept | 0.015848 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

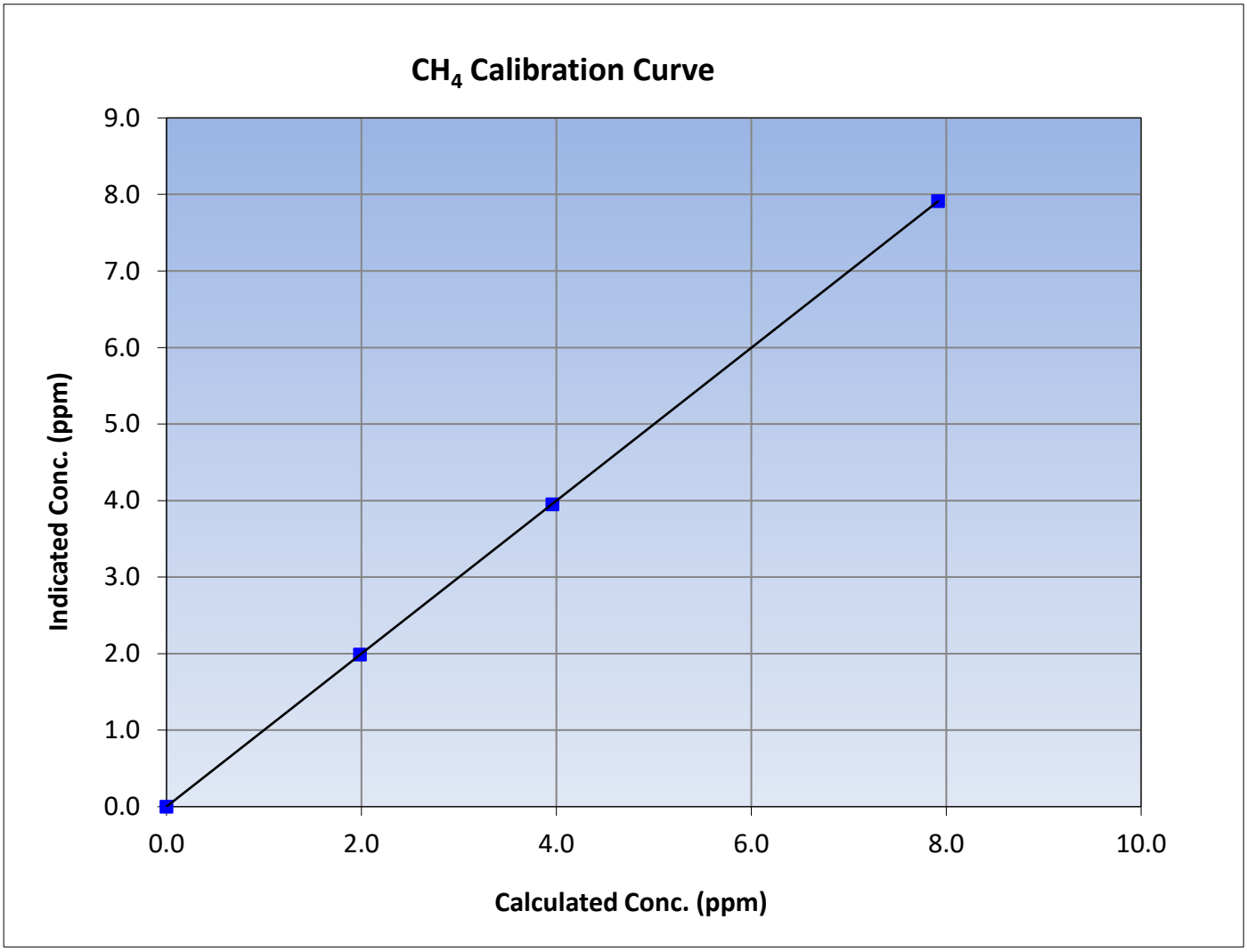
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | NA |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:15 | End Time (MST): | 13:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 12227620777 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 7.92 | 7.91 | 1.0007 | | | |
| 3.96 | 3.95 | 1.0018 | Slope | 0.999012 | *0.90 - 1.10* |
| 1.98 | 1.99 | 0.9980 | | | |
| | | | Intercept | 0.001263 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

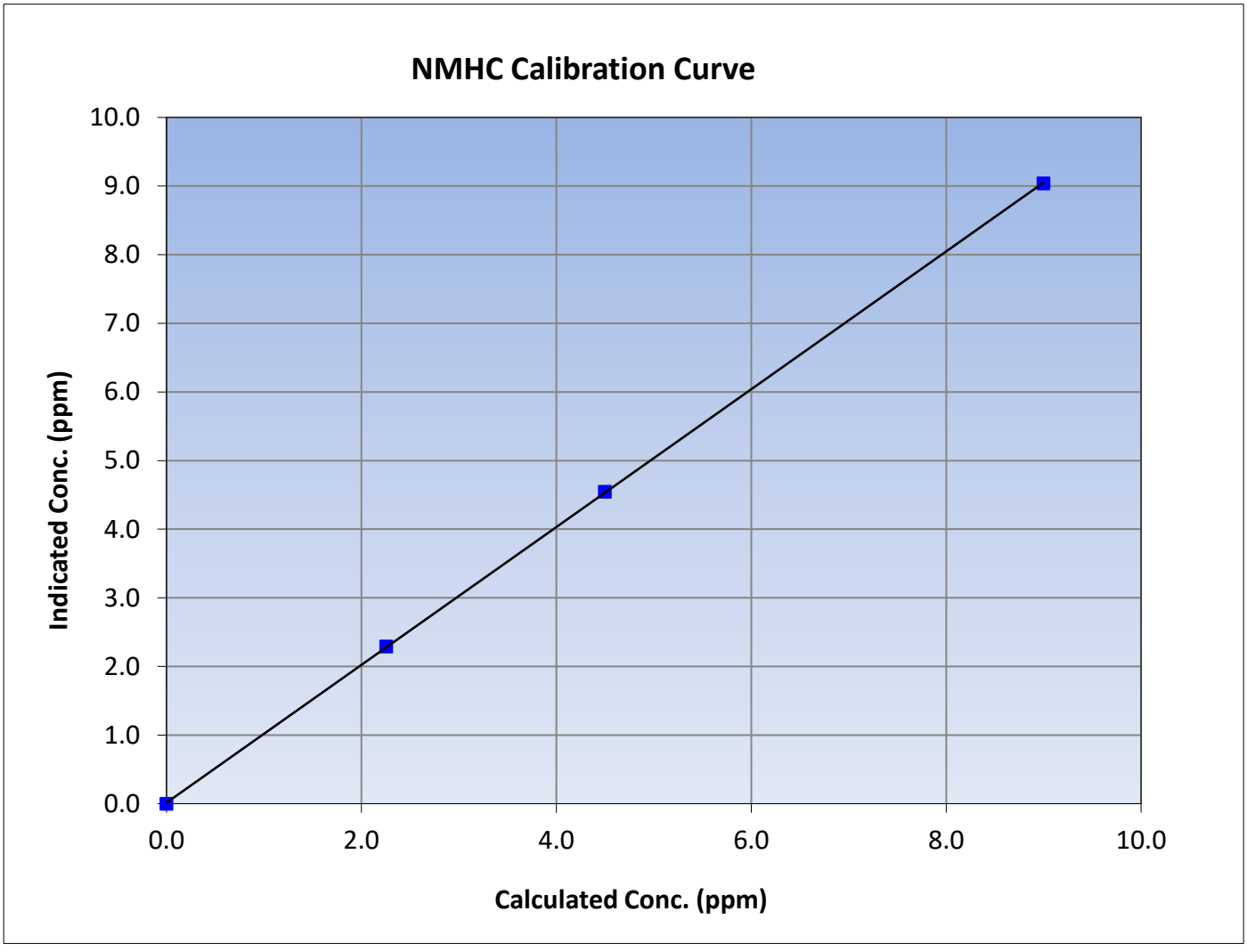
Version-06-2022

### Station Information

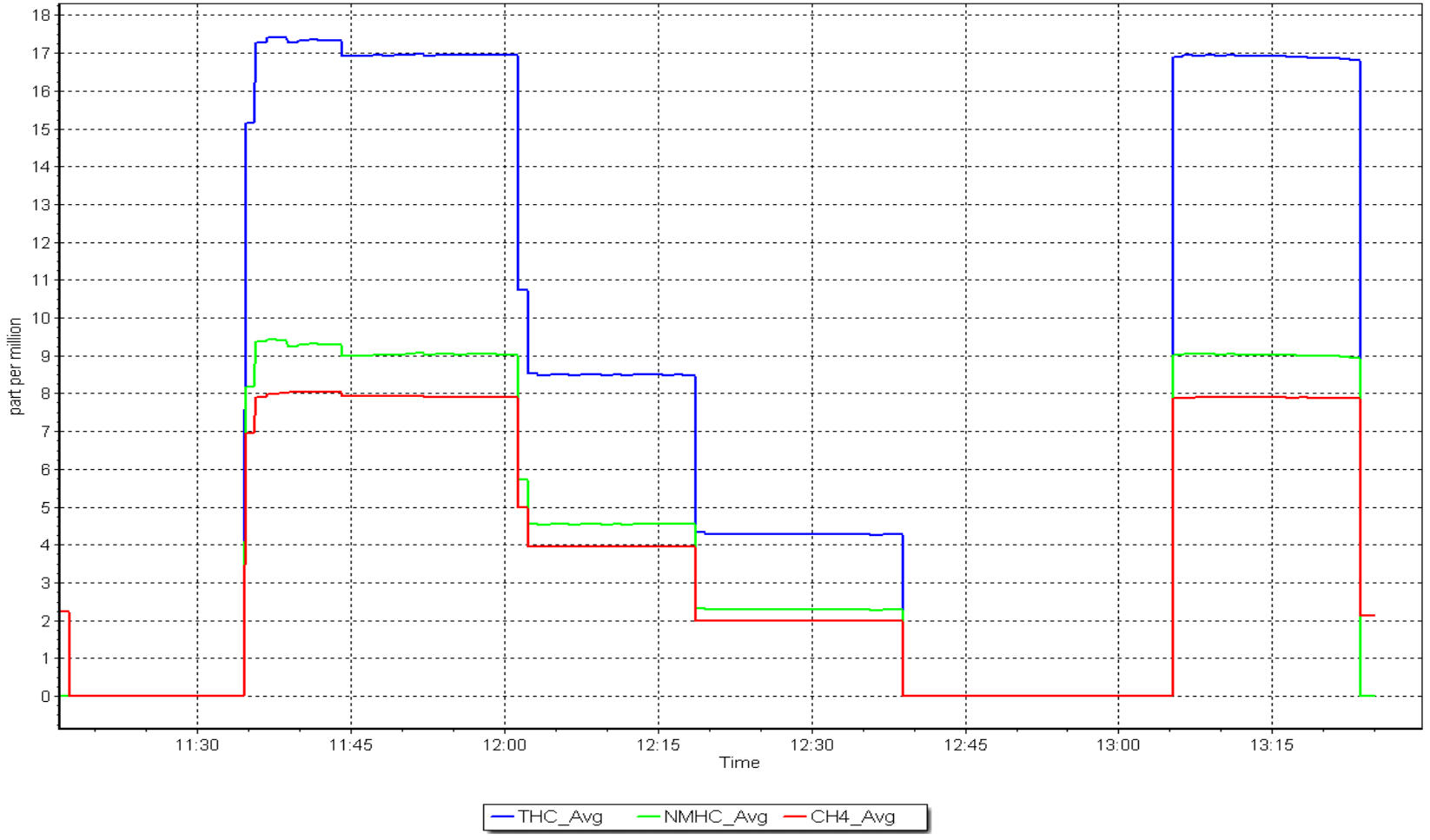
| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | NA |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:15 | End Time (MST): | 13:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 12227620777 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999987 | ≥0.995 |
| 9.00 | 9.04 | 0.9953 | | | |
| 4.50 | 4.55 | 0.9898 | Slope | 1.004116 | 0.90 - 1.10 |
| 2.26 | 2.29 | 0.9851 | | | |
| | | | Intercept | 0.014385 | +/-0.5 |



**NMHC Calibration Plot** Date: February 20, 2024 Location: Athabasca Valley



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 27, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 16:55 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | DT0033919 | | Cal Gas Expiry Date: | January 9, 2032 | |
| NOX Cal Gas Conc: | 59.90 | ppm | NO Cal Gas Conc: | 59.90 | ppm |
| Removed Cylinder #: | T2Y1KA4 | | Removed Gas Exp Date: | November 30, 2023 | |
| Removed Gas NOX Conc: | 50.92 | ppm | Removed Gas NO Conc: | 49.92 | ppm |
| NOX gas Diff: | 1.1% | | NO gas Diff: | 0.4% | |
| Calibrator Model: | API T700 | | Serial Number: | 3805 | |
| ZAG make/model: | API T701H | | Serial Number: | 198 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1160120024 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.092 | 1.079 | NO bkgnd or offset: | 7.7 | 7.6 |
| NOX coeff or slope: | 0.994 | 0.990 | NOX bkgnd or offset: | 7.9 | 7.8 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 216.3 | 214.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998118 | 0.995415 |
| $NO_X$ Cal Offset: | 1.478599 | 2.191943 |
| NO Cal Slope: | 1.000317 | 0.999970 |
| NO Cal Offset: | 1.135182 | 2.371891 |
| $NO_2$ Cal Slope: | 1.000671 | 0.995591 |
| $NO_2$ Cal Offset: | 0.394845 | -1.458446 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | -0.1 | -0.1 | ---- | ---- |
| as found span | 4920 | 80.2 | 816.7 | 800.7 | 16.0 | 824.1 | 806.0 | 18.2 | 0.9910 | 0.9934 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4933 | 66.8 | 800.3 | 800.3 | 0.0 | 816.3 | 808.6 | 7.6 | 0.9804 | 0.9897 |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ---- | ---- |
| high point | 4933 | 66.8 | 800.3 | 800.3 | 0.0 | 797.2 | 800.8 | -3.8 | 1.0039 | 0.9994 |
| second point | 4966 | 33.4 | 400.2 | 400.2 | 0.0 | 403.2 | 405.7 | -2.4 | 0.9925 | 0.9864 |
| third point | 4983 | 16.7 | 200.1 | 200.1 | 0.0 | 202.5 | 203.5 | -1.0 | 0.9880 | 0.9832 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 | -0.2 | ---- | ---- |
| as left span | 4933 | 66.8 | 800.3 | 399.5 | 400.8 | 795.7 | 400.2 | 395.6 | 1.0058 | 0.9982 |
| | | | | | | | | Average Correction Factor | 0.9948 | 0.9896 |

Corrected As found $NO_X$ = 824.3 ppb NO = 806.1 ppb

Previous Response $NO_X$ = 816.7 ppb NO = 802.1 ppb

Baseline Corr 2nd pt $NO_X$ = NA ppb NO = NA ppb

Baseline Corr 3rd pt $NO_X$ = NA ppb NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change $NO_X$ = 0.9%

*Percent Change NO = 0.5%

As found $NO_X$ $r^2$: Nx Sl: Nx Int:

As found NO $r^2$: NO Sl: NO Int:

As found $NO_2$ $r^2$: NO2 Sl: $NO_2$ Int:

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 800.5 | 399.7 | 400.8 | 398.1 | 1.0068 | 99.3% |
| 2nd GPT point (200 ppb O3) | 800.5 | 603.3 | 197.2 | 194.7 | 1.0128 | 98.7% |
| 3rd GPT point (100 ppb O3) | 800.5 | 703.0 | 97.5 | 93.8 | 1.0394 | 96.2% |
| | | | | Average Correction Factor | 1.0197 | 98.1% |

Notes: Calibration gas cylinder changed out as part of QA audit follow-up. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

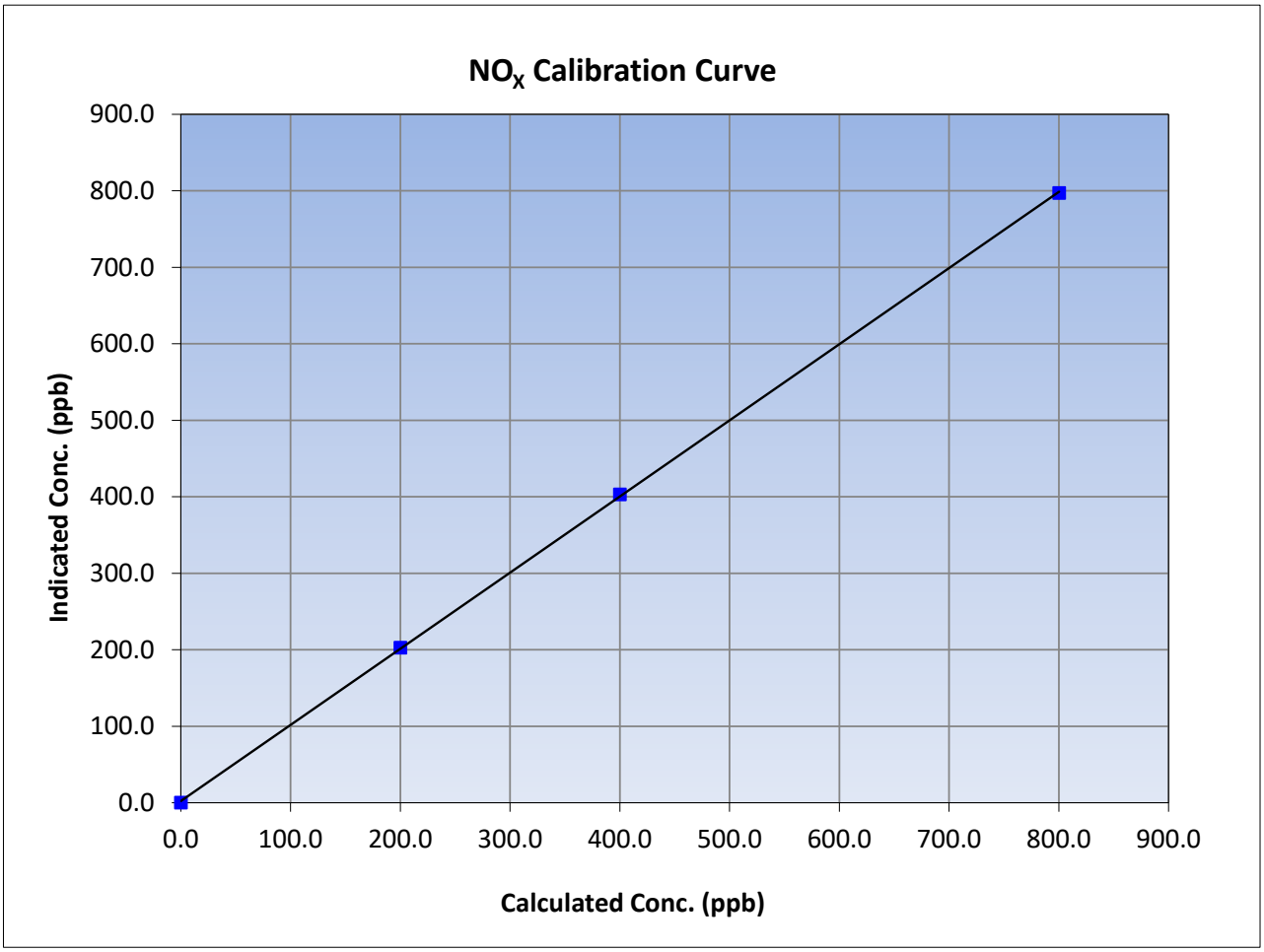
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:15 | End Time (MST): | 16:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1160120024 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999954 | *≥0.995* |
| 800.3 | 797.2 | 1.0039 | | | |
| 400.2 | 403.2 | 0.9925 | Slope | 0.995415 | *0.90 - 1.10* |
| 200.1 | 202.5 | 0.9880 | | | |
| | | | Intercept | 2.191943 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

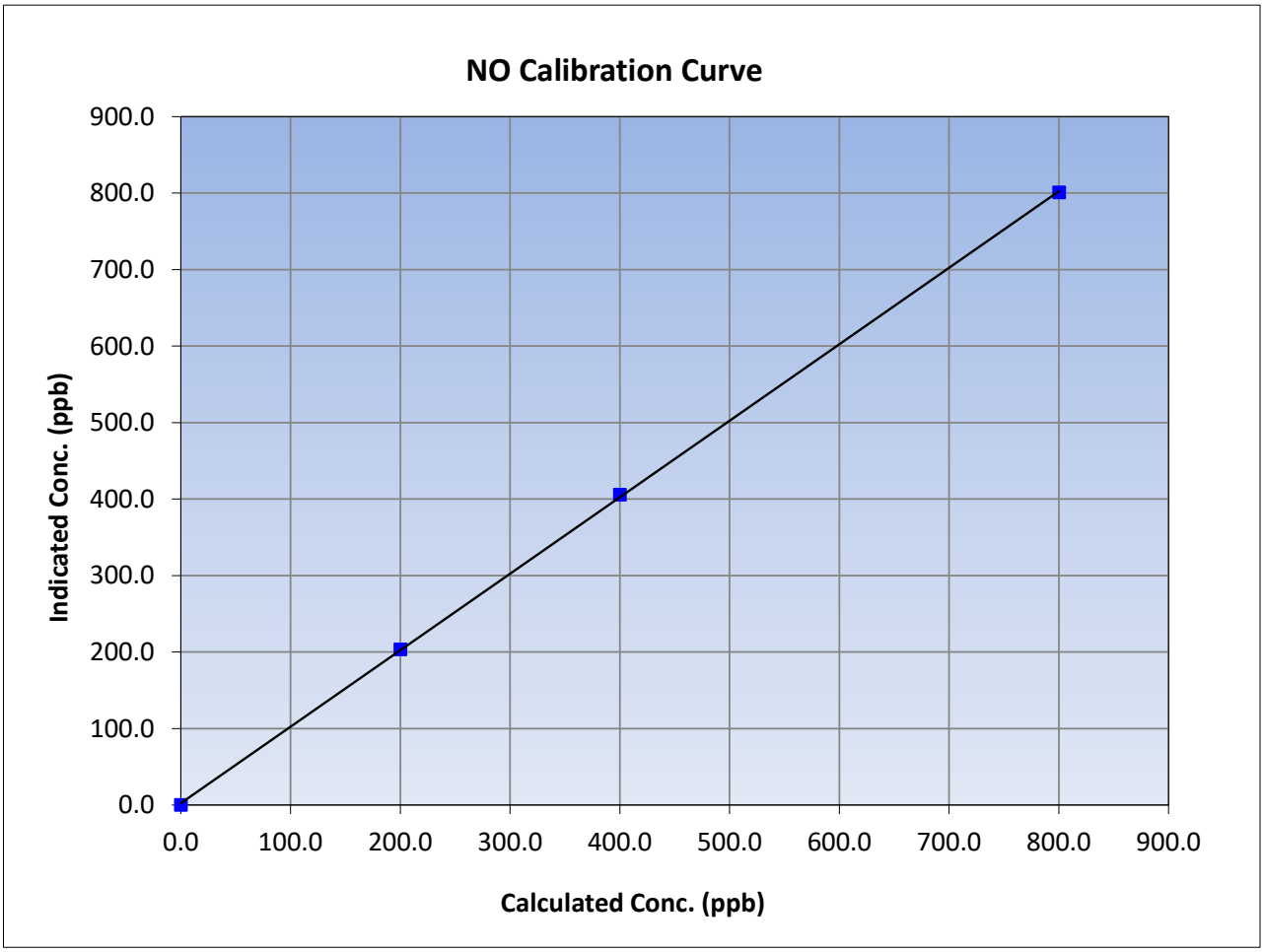
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:15 | End Time (MST): | 16:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1160120024 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999943 | ≥0.995 |
| 800.3 | 800.8 | 0.9994 | | | |
| 400.2 | 405.7 | 0.9864 | Slope | 0.999970 | 0.90 - 1.10 |
| 200.1 | 203.5 | 0.9832 | | | |
| | | | Intercept | 2.371891 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

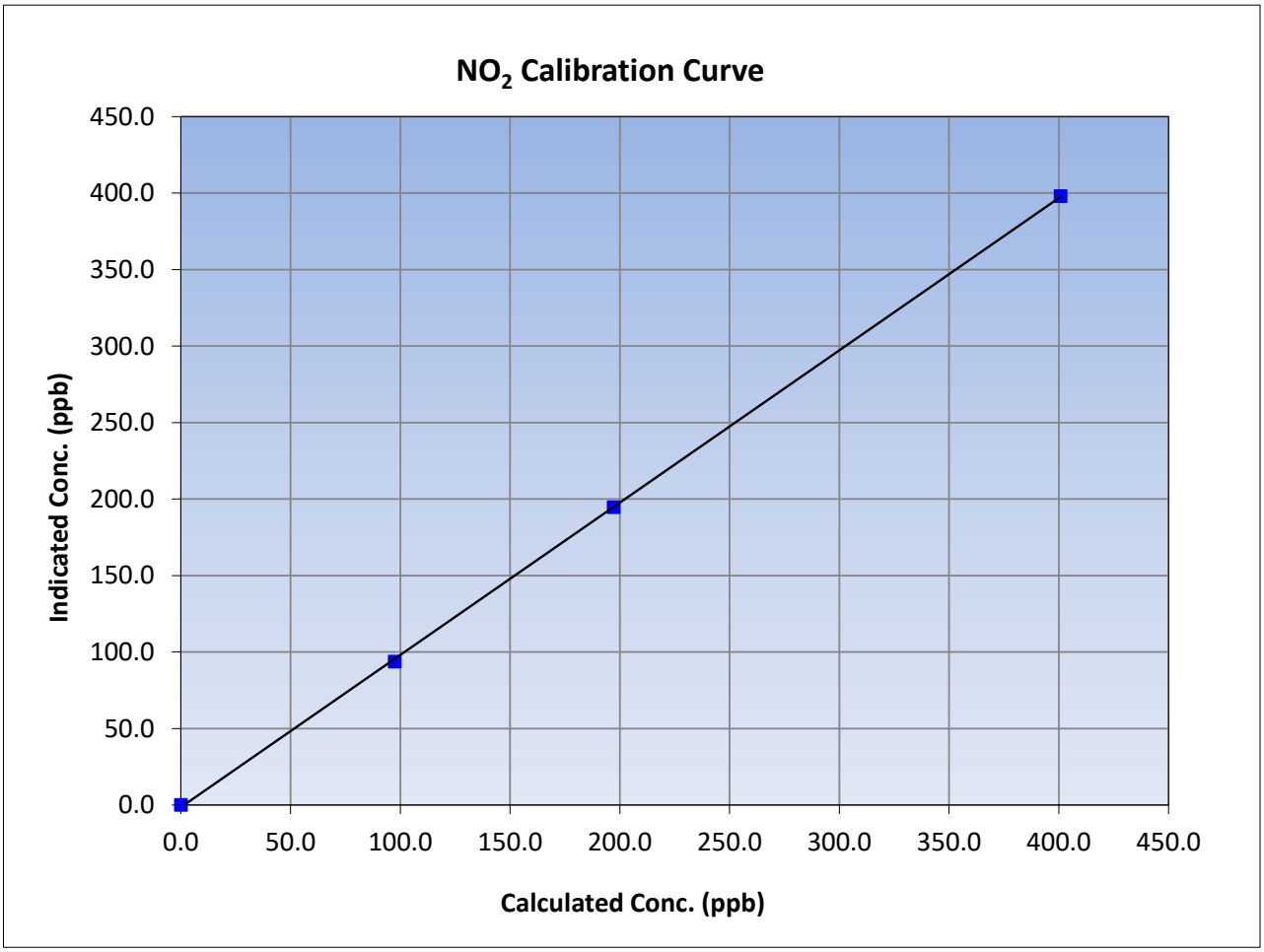
Version-04-2020

### Station Information

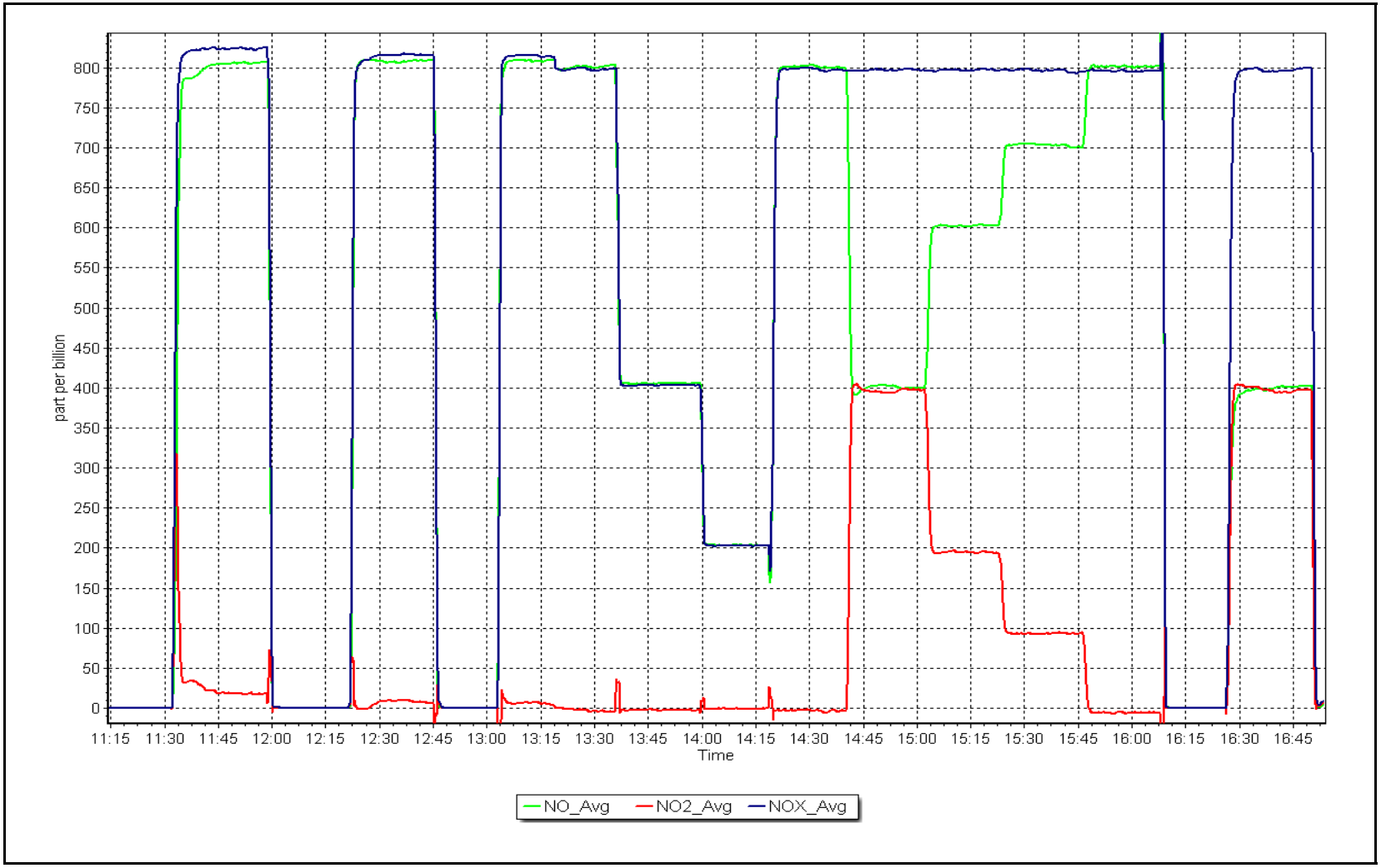
| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 11:15 | End Time (MST): | 16:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1160120024 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999935 | *≥0.995* |
| 400.8 | 398.1 | 1.0068 | | | |
| 197.2 | 194.7 | 1.0128 | Slope | 0.995591 | *0.90 - 1.10* |
| 97.5 | 93.8 | 1.0394 | | | |
| | | | Intercept | -1.458446 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 27, 2024 Location: Athabasca Valley



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 16, 2024 | Last Cal Date: | January 12, 2024 |
| Start time (MST): | 10:24 | End time (MST): | 14:22 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.995143 | 0.993286 | Backgd or Offset: | -1.6 | -1.6 |
| Calibration intercept: | 0.500000 | 0.100000 | Coeff or Slope: | 1.549 | 1.549 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| as found span | 5000 | 1414.8 | 400.0 | 395.8 | 1.011 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.5 | ---- |
| high point | 5000 | 1415.7 | 400.0 | 397.0 | 1.008 |
| second point | 5000 | 1039.9 | 200.0 | 199.4 | 1.003 |
| third point | 5000 | 856.2 | 100.0 | 99.8 | 1.002 |
| as left zero | 5000 | 0.0 | 0.0 | -0.7 | ---- |
| as left span | 5000 | 1416.0 | 400.0 | 398.8 | 1.003 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 396.1 | Previous response | 398.6 | *% 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

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

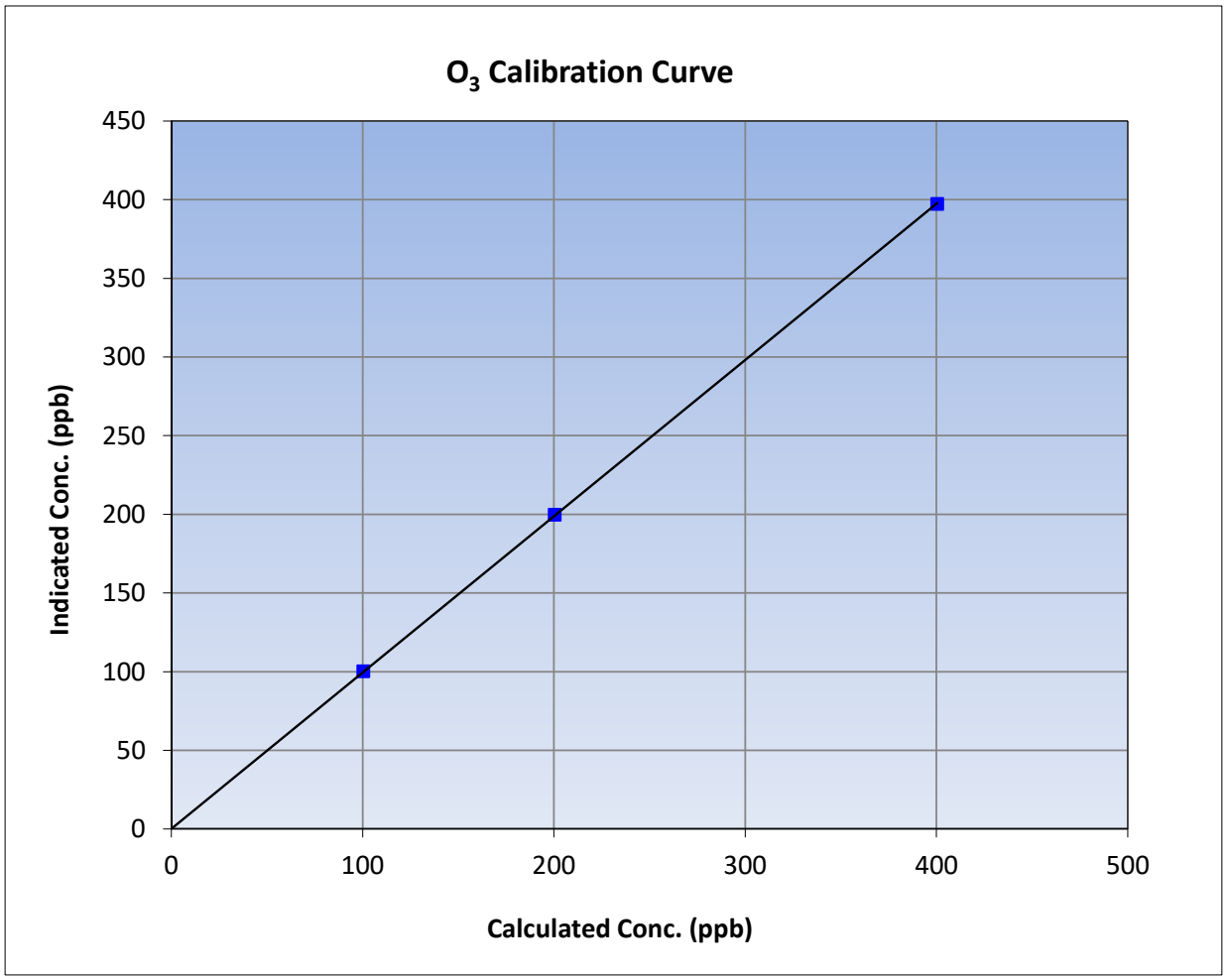
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 12, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:24 | End Time (MST): | 14:22 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1152220023 |

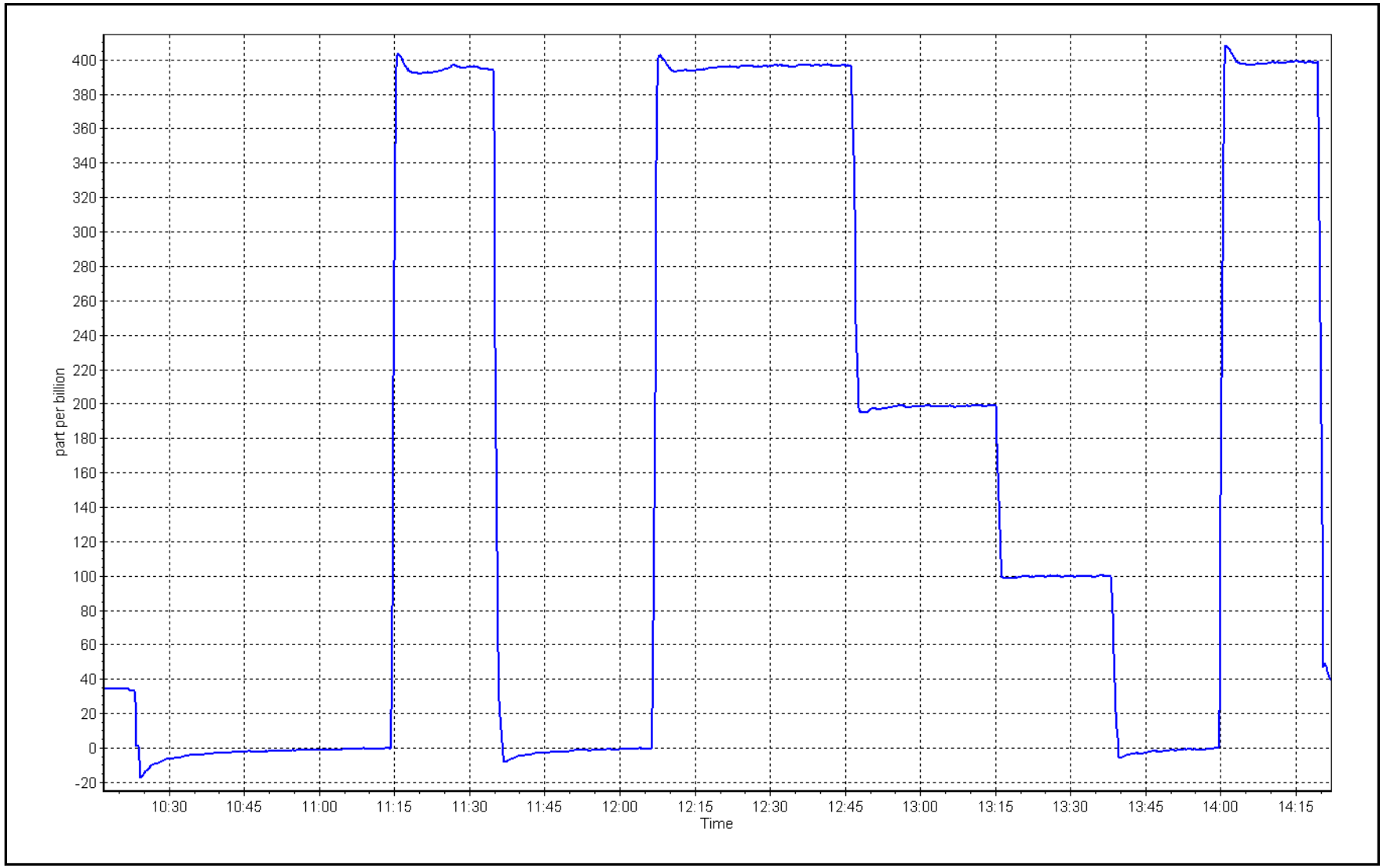
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.5 | ---- |
| 400.0 | 397.0 | 1.0076 |
| 200.0 | 199.4 | 1.0030 |
| 100.0 | 99.8 | 1.0020 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999987 | *≥0.995* |
| Slope | 0.993286 | *0.90 - 1.10* |
| Intercept | 0.100000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 16, 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: | February 27, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 14:40 | End time (MST): | 16:49 |
| Analyzer Make: | | S/N: | 645 |
| 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) | -13 | -14.2 | -13 | ☐ | +/- 2 °C |
| P (mmHg) | 743.1 | 742.3 | 743.1 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.94 | 4.95 | 4.94 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 34 | ----- | 34 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 2.7 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

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

| Parameter | As found | Post maintenance | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| PMT Peak Test | 13.0 | 11.0 | 11.0 | ☑ | +/- 0.5 |

Date Optical Chamber Cleaned: February 27, 2024

Date Disposable Filter Changed: February 27, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: December 5, 2022

Date RH/T Sensor Cleaned: December 5, 2022

Notes: Temp, flow and pressure check. Quarterly maintenace carried out. PMT adjusted.

Calibration by: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | February 23, 2024 | Last Cal Date: | January 2, 2024 |
| Start time (MST): | 12:41 | End time (MST): | 15:55 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 3,000 | ppm | Cal Gas Exp Date: | December 12, 2026 |
| Cal Gas Cylinder #: | LL66942 | | | |
| Removed Cal Gas Conc: | 3,000 | 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 700H | | Serial Number: | 198 |

### Analyzer Information

Analyzer make: Thermo 48i-LTE
Analyzer Range: 0 - 50 ppm
Analyzer serial #: 1408761381

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.993944 | 0.996688 | Backgd or Offset: | 4.425 | 4.651 |
| Calibration intercept: | 0.080556 | 0.062533 | Coeff or Slope: | 1.087 | 1.087 |

### CO Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4933 | 66.7 | 40.0 | 40.2 | 0.995 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4933 | 66.7 | 40.0 | 39.9 | 1.003 |
| second point | 4967 | 33.3 | 20.0 | 20.1 | 0.995 |
| third point | 4983 | 16.7 | 10.0 | 10.1 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4933 | 66.7 | 40.0 | 39.8 | 1.005 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 40.08 | Prev response: | 39.86 | *% 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

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

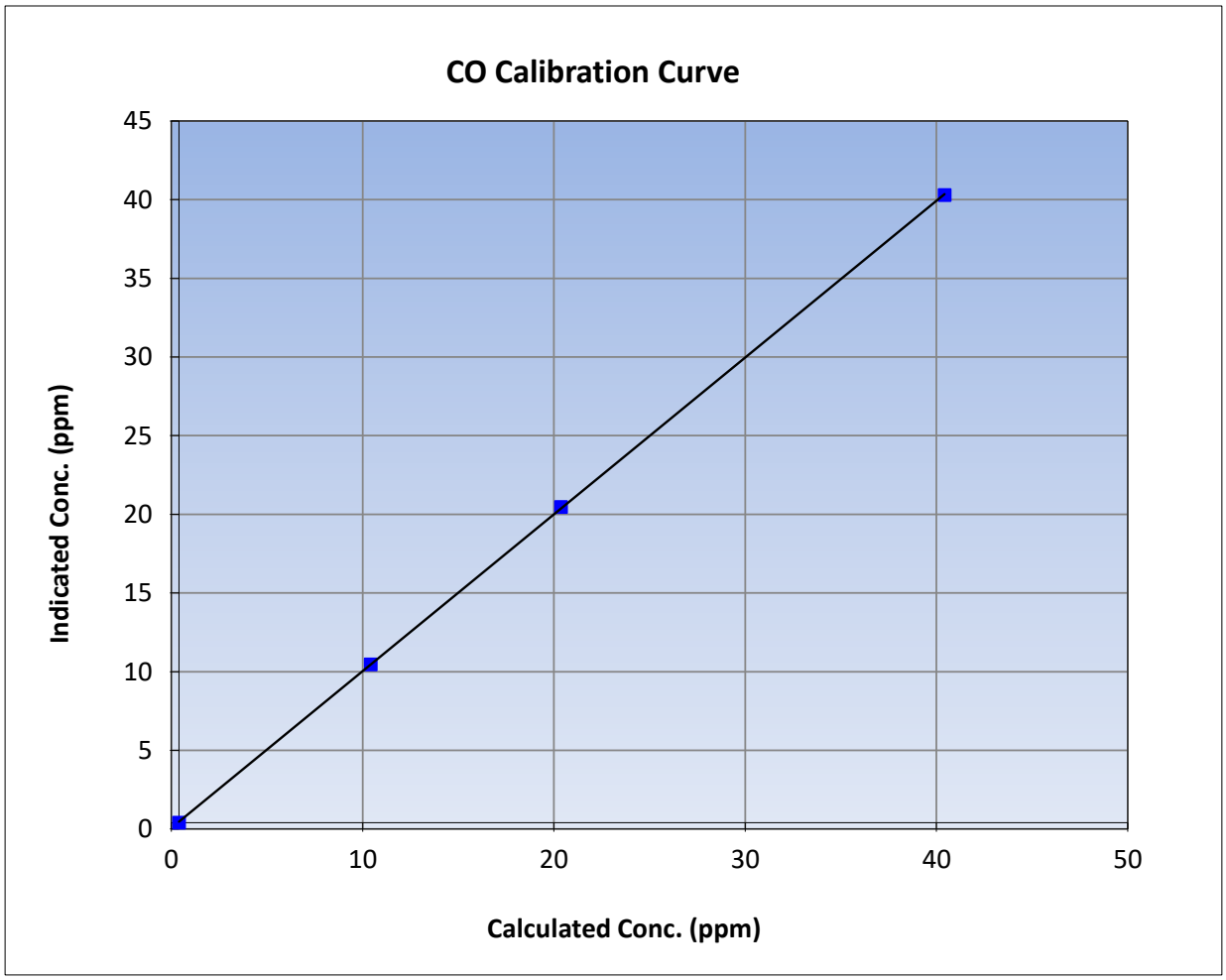
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 2, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 12:41 | End Time (MST): | 15:55 |
| Analyzer make: | Thermo 48i-LTE | Analyzer serial #: | 1408761381 |

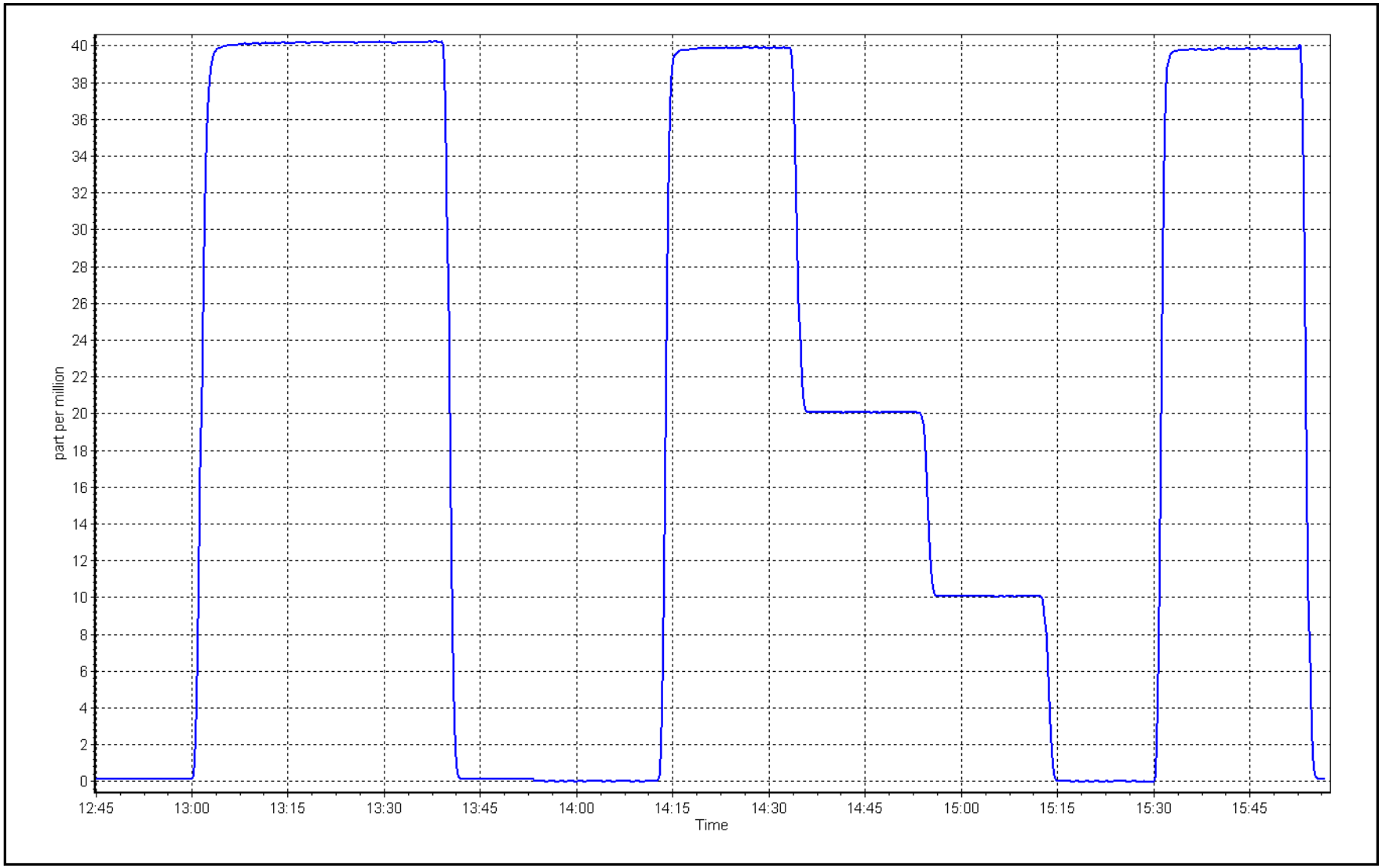
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 40.0 | 39.9 | 1.0031 |
| 20.0 | 20.1 | 0.9955 |
| 10.0 | 10.1 | 0.9951 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999982 | ≥0.995 |
| Slope | 0.996688 | 0.90 - 1.10 |
| Intercept | 0.062533 | +/-1.5 |



**CO Calibration Plot** Date: February 23, 2024 Location: Athabasca Valley



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS08
## FORT CHIPEWYAN
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 31, 2024 |
| Start time (MST): | 13:18 | End time (MST): | 15:41 |
| Reason: | Maintenance | | |

### 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 Make/Model: | Teledyne API T700 | | Serial Number: | 3252 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 135 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1136451241 |
| Analyzer Range | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.995420 | 0.994207 | Backgd or Offset: | 1.86 | 1.83 |
| Calibration intercept: | 1.396452 | 1.596267 | Coeff or Slope: | 0.989 | 0.989 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.4 | ---- |
| as found span | 4920 | 80.3 | 800.4 | 795.7 | 1.006 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| high point | 4920 | 80.3 | 800.4 | 796.6 | 1.005 |
| second point | 4960 | 40.2 | 400.7 | 400.3 | 1.001 |
| third point | 4980 | 20.1 | 200.4 | 203.1 | 0.986 |
| as left zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| as left span | 4920 | 80.3 | 800.4 | 799.2 | 1.001 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 796.10 | Previous response | 798.11 | *% change | -0.3% |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

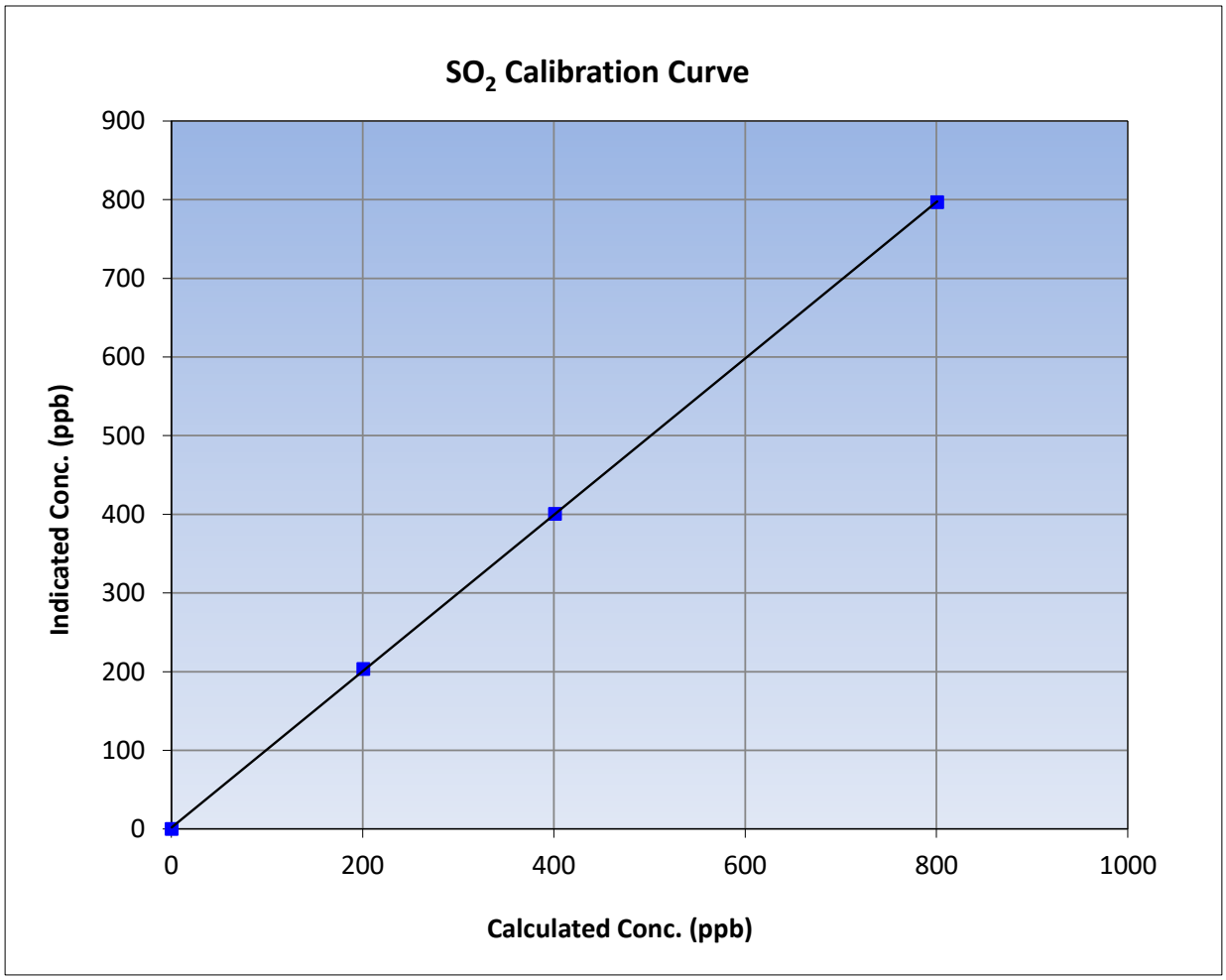
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 31, 2024 |
| Station Name: | December 13, 2023 | Station Number: | Fort Chipewyan |
| Start Time (MST): | 13:18 | End Time (MST): | 15:41 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1136451241 |

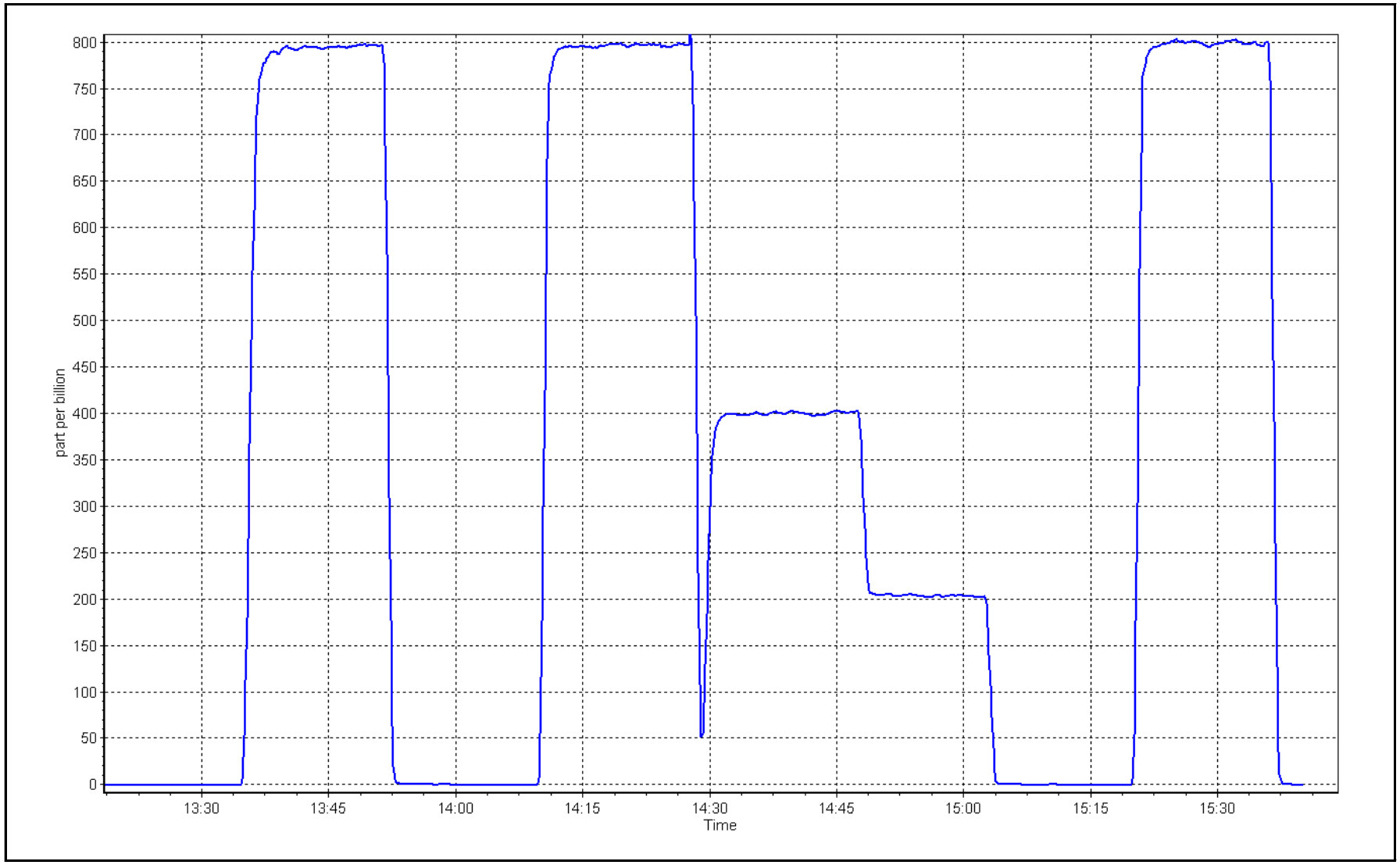
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.3 | ---- |
| 800.4 | 796.6 | 1.0047 |
| 400.7 | 400.3 | 1.0010 |
| 200.4 | 203.1 | 0.9865 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999972 | *≥0.995* |
| Slope | 0.994207 | *0.90 - 1.10* |
| Intercept | 1.596267 | *+/-30* |



**SO2 Calibration Plot** Date: February 15, 2024 Location: Fort Chipewyan



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 26, 2024 |
| Start time (MST): | 8:59 | End time (MST): | 12:46 |
| 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: | 3252 |
| 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 | | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.988284 | 0.991000 | Backgd or Offset: | 0.99 | 0.98 |
| Calibration intercept: | 0.598606 | 0.578560 | Coeff or Slope: | 0.741 | 0.741 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as found span | 4920 | 80.5 | 80.0 | 79.2 | 1.017 |
| as found 2nd point | 4960 | 40.2 | 40.0 | 40.1 | 1.009 |
| as found 3rd point | 4980 | 20.1 | 20.0 | 20.4 | 1.004 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| high point | 4920 | 80.5 | 80.0 | 79.9 | 1.001 |
| second point | 4960 | 40.2 | 40.0 | 40.1 | 0.996 |
| third point | 4980 | 20.1 | 20.0 | 20.4 | 0.979 |
| as left zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| as left span | 4920 | 80.5 | 80.0 | 79.8 | 1.003 |
| SO2 Scrubber Check | 4919.7 | 80.3 | 803.0 | 0.0 | ---- |

| | | | |
|---|---|---|---|
| Date of last scrubber change: | March 7, 2022 | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: | March 15, 2022 | 100.7% | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 78.7 | Prev response: | 79.67 | *% change: | -1.2% |
| Baseline Corr 2nd AF pt: | 39.6 | AF Slope: | 0.982998 | AF Intercept: | 0.658541 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999978 | | |

* = > +/-5% change initiates investigation

Notes: Sampled inlet filter changed after as founds. Scrubber check passed.

Calibration Performed By: Matthew Courtoreille

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

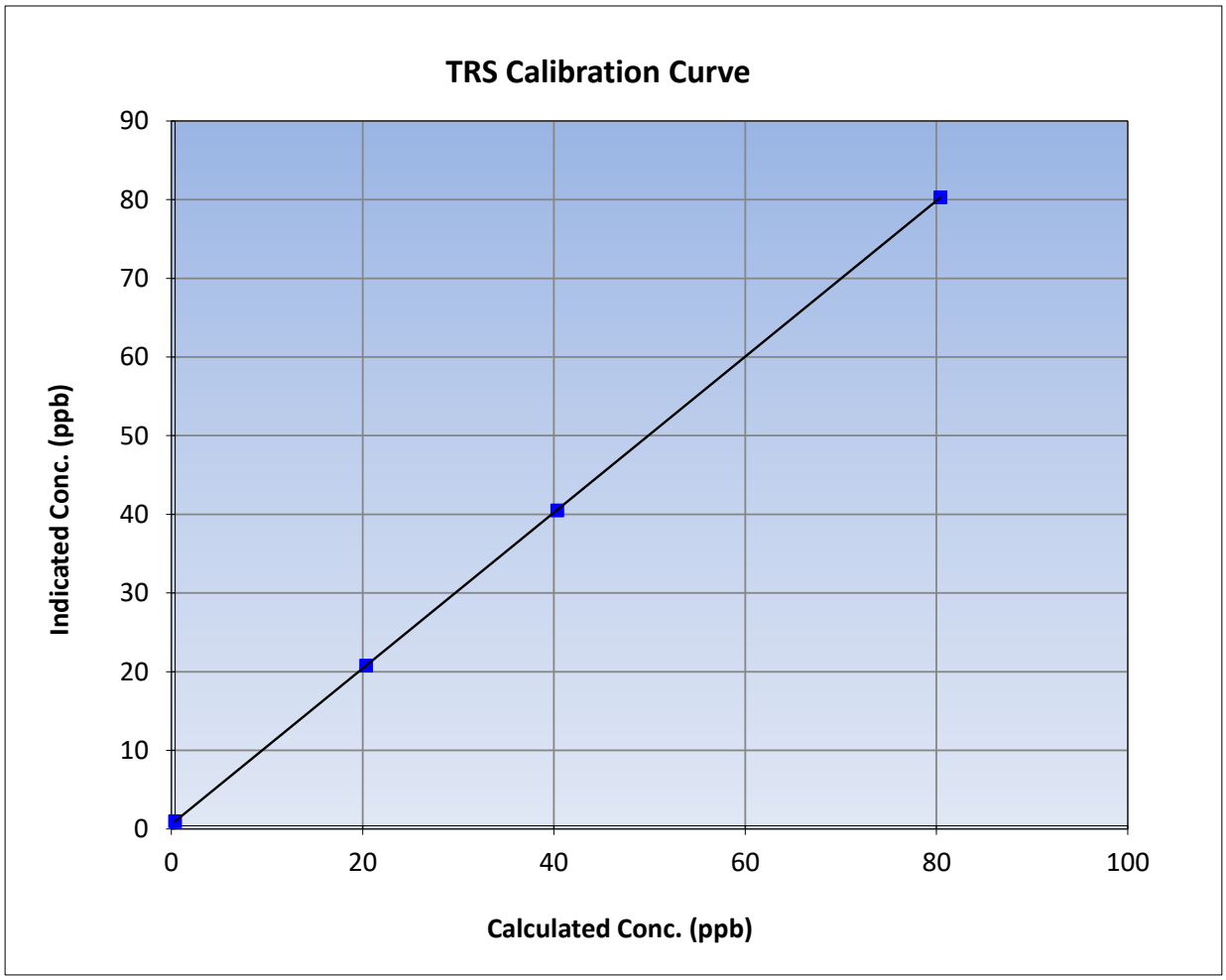
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 26, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 8:59 | End Time (MST): | 12:46 |
| Analyzer make: | Thermo 43iQ-TL | Analyzer serial #: | 1203169744 |

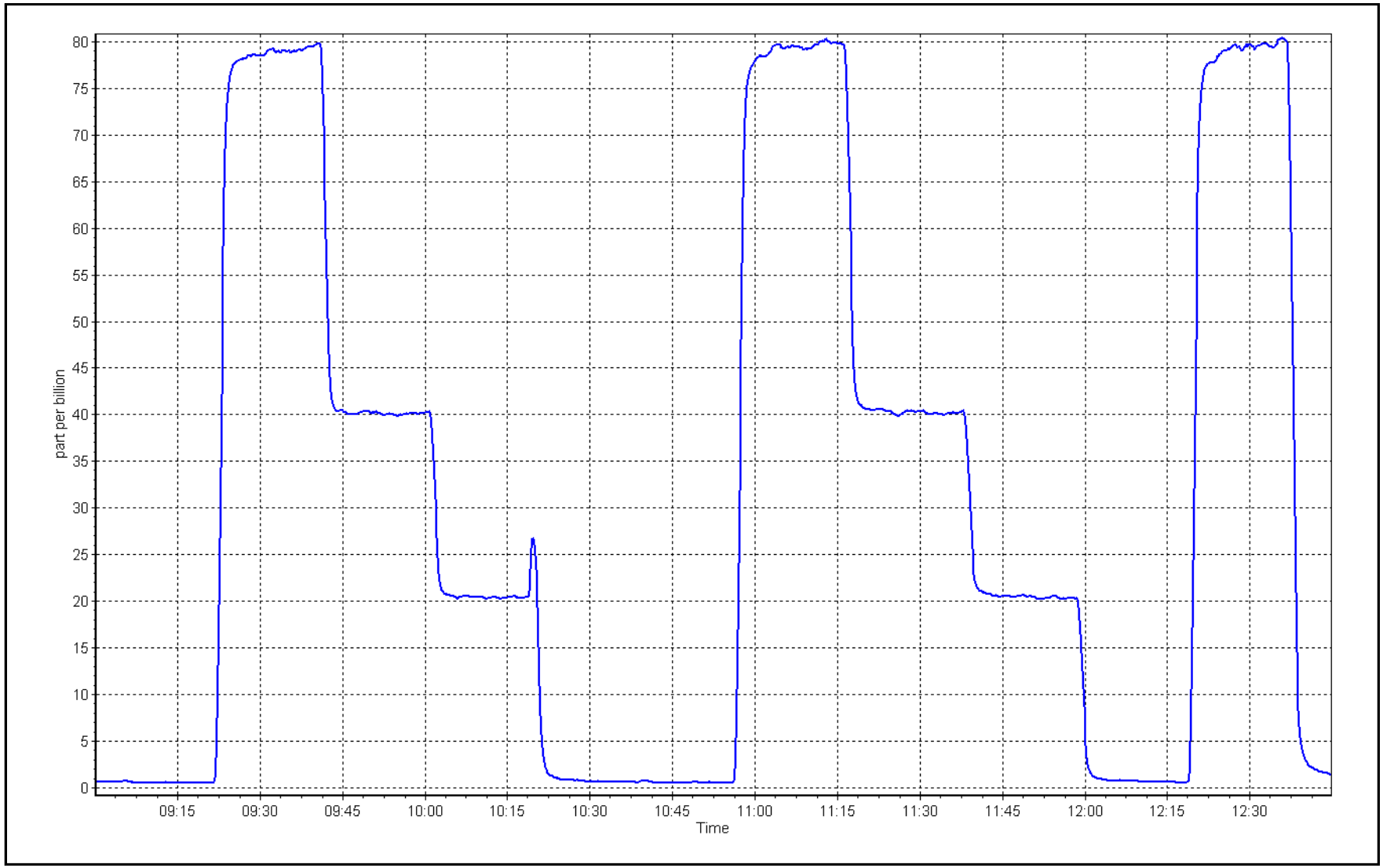
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 80.0 | 79.9 | 1.0014 |
| 40.0 | 40.1 | 0.9964 |
| 20.0 | 20.4 | 0.9794 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 0.991000 | *0.90 - 1.10* |
| Intercept | 0.578560 | *+/-3* |



**TRS Calibration Plot** Date: February 13, 2024 Location: Fort Chipewyan



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | NA |
| Start time (MST): | 14:02 | End time (MST): | 16:34 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | CC363447 | | Cal Gas Expiry Date: | February 2, 2024 | |
| NOX Cal Gas Conc: | 48.80 | ppm | NO Cal Gas Conc: | 48.80 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 48.80 | ppm | Removed Gas NO Conc: | 48.80 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3252 | |
| ZAG make/model: | Teledyne API T701H | | Serial Number: | 135 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262592 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.138 | NA | NO bkgnd or offset: | 10.3 | NA |
| NOX coeff or slope: | 0.992 | NA | NOX bkgnd or offset: | 11.3 | NA |
| NO2 coeff or slope: | 1.000 | NA | Reaction cell Press: | 141.2 | NA |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.009182 | NA |
| $NO_X$ Cal Offset: | 1.020000 | NA |
| NO Cal Slope: | 1.007925 | NA |
| NO Cal Offset: | 1.260000 | NA |
| $NO_2$ Cal Slope: | 1.010781 | NA |
| $NO_2$ Cal Offset: | -3.206174 | NA |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 1.3 | -1.0 | ---- | ---- |
| as found span | 4918 | 82.0 | 800.3 | 800.3 | 0.0 | 741.1 | 737.4 | 3.7 | 1.0799 | 1.0853 |
| as found 2nd | 4959 | 41.0 | 400.2 | 400.2 | 0.0 | 380.5 | 378.3 | 2.2 | 1.0517 | 1.0578 |
| as found 3rd | 4980 | 20.5 | 200.1 | 200.1 | 0.0 | 193.5 | 192.3 | 1.3 | 1.0340 | 1.0405 |
| new cyl resp | | | | | | | | | | |
| calibrator zero | | | | | | | | | | |
| high point | | | | | | | | | | |
| second point | | | | | | | | | | |
| third point | | | | | | | | | | |
| as left zero | | | | | | | | | | |
| as left span | | | | | | | | | | |
| | | | | | | | | Average Correction Factor | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 740.8 ppb | NO = 736.1 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = -9.2% | | |
| Previous Response | $NO_X$ = 808.7 ppb | NO = 807.9 ppb | | *Percent Change | NO = -9.8% | | |
| Baseline Corr 2nd pt | $NO_X$ = 380.2 ppb | NO = 377.0 ppb | As found | $NO_X$ $r^2$: 0.999734 | Nx Sl: 0.923602 | Nx Int: 5.460 | |
| Baseline Corr 3rd pt | $NO_X$ = 193.2 ppb | NO = 191.0 ppb | As found | NO $r^2$: 0.999782 | NO Sl: 0.918047 | NO Int: 5.880 | |
| | | | As found | $NO_2$ $r^2$: 1.000000 | NO2 Sl: 0.993120 | $NO_2$ Int: -1.000 | |

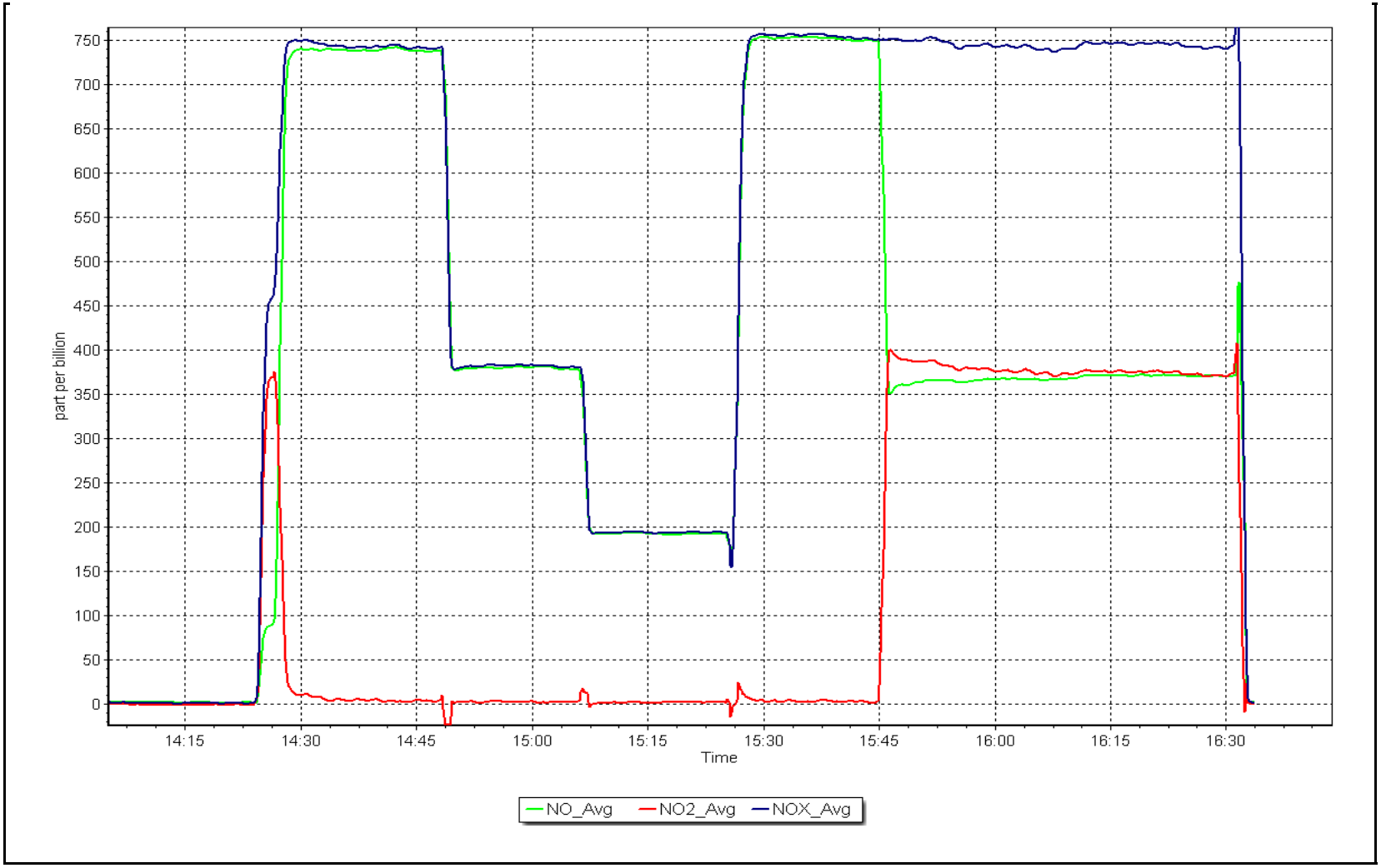
## GPT Calibration Data

| 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | ---- | ---- | 0.0 | -1.0 | ---- | ---- |
| as found GPT point (400 ppb NO2) | 749.2 | 371.3 | 377.9 | 374.3 | 1.0096 | 99.0% |
| as found GPT point (200 ppb NO2) | 749.2 | | | | | |
| as found GPT point (100 ppb NO2) | 749.2 | | | | | |
| 1st GPT point (400 ppb O3) | | | | | | |
| 2nd GPT point (200 ppb O3) | | | | | | |
| 3rd GPT point (100 ppb O3) | | | | | | |
| | | | | Average Correction Factor | | |

Notes: Removal multipoint as founds done.

Calibration Performed By: Jan Castro and Braiden Boutilier

**$NO_X$ Calibration Plot** Date: February 20, 2024 Location: Fort Chipewyan



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | NA |
| Start time (MST): | 7:45 | End time (MST): | 12:10 |
| Reason: | Install | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | DT0046831 | | Cal Gas Expiry Date: | January 9, 2032 | |
| NOX Cal Gas Conc: | 60.20 | ppm | NO Cal Gas Conc: | 60.00 | ppm |
| Removed Cylinder #: | CC363447 | | Removed Gas Exp Date: | February 2, 2024 | |
| Removed Gas NOX Conc: | 48.80 | ppm | Removed Gas NO Conc: | 48.80 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3252 | |
| ZAG make/model: | Teledyne API T701H | | Serial Number: | 135 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | API T200 | Analyzer serial #: | 4460 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | NA | 1.154 | NO bkgnd or offset: | NA | -2.5 |
| NOX coeff or slope: | NA | 1.152 | NOX bkgnd or offset: | NA | -2.2 |
| NO2 coeff or slope: | NA | 1.000 | Reaction cell Press: | NA | 2.9 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | NA | 0.997032 |
| $NO_X$ Cal Offset: | NA | 2.294675 |
| NO Cal Slope: | NA | 0.998455 |
| NO Cal Offset: | NA | 1.134987 |
| $NO_2$ Cal Slope: | NA | 1.001043 |
| $NO_2$ Cal Offset: | NA | 0.109543 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | | | | | | | | | | |
| as found span | | | | | | | | | | |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.3 | 0.1 | ---- | ---- |
| high point | 4933 | 66.7 | 803.1 | 800.4 | 2.7 | 802.0 | 799.7 | 2.4 | 1.0014 | 1.0009 |
| second point | 4967 | 33.3 | 400.9 | 399.6 | 1.3 | 403.2 | 401.2 | 2.0 | 0.9943 | 0.9960 |
| third point | 4983 | 16.7 | 201.1 | 200.4 | 0.7 | 204.5 | 201.6 | 2.9 | 0.9832 | 0.9940 |
| as left zero | | | | | | | | | | |
| as left span | | | | | | | | | | |
| | | | | | | | | Average Correction Factor | 0.9930 | 0.9970 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = | NA | ppb | NO = | NA | ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | NA |
| Previous Response | $NO_X$ = | NA | ppb | NO = | NA | ppb | | | *Percent Change | NO = | NA |
| Baseline Corr 2nd pt | $NO_X$ = | NA | ppb | NO = | NA | ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = | NA | ppb | NO = | NA | ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | | | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 798.0 | 393.0 | 407.7 | 407.5 | 1.0004 | 100.0% |
| 2nd GPT point (200 ppb O3) | 798.0 | 588.8 | 211.9 | 214.2 | 0.9891 | 101.1% |
| 3rd GPT point (100 ppb O3) | 798.0 | 694.0 | 106.7 | 105.6 | 1.0101 | 99.0% |
| | | | | Average Correction Factor | 0.9999 | 100.0% |

Notes: Install calibrations. Sample inlet filters changed before calibrator zero. Adjusted zero and span.

Calibration Performed By: Jan Castro and Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

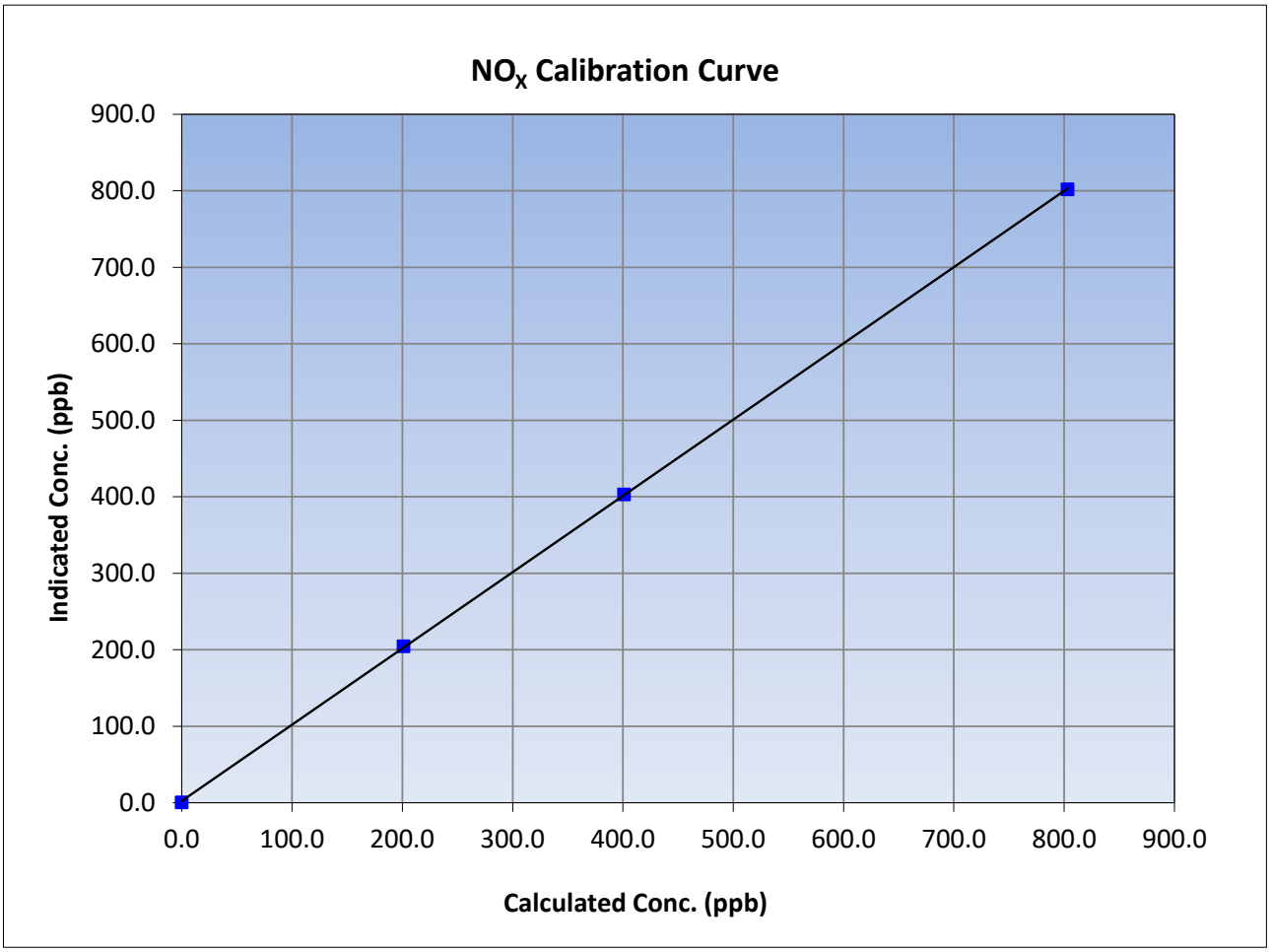
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | NA |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:10 |
| Analyzer make: | API T200 | Analyzer serial #: | 13806 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.4 | ---- | Correlation Coefficient | 0.999974 | ≥0.995 |
| 803.1 | 802.0 | 1.0014 | | | |
| 400.9 | 403.2 | 0.9943 | Slope | 0.997032 | 0.90 - 1.10 |
| 201.1 | 204.5 | 0.9832 | | | |
| | | | Intercept | 2.294675 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

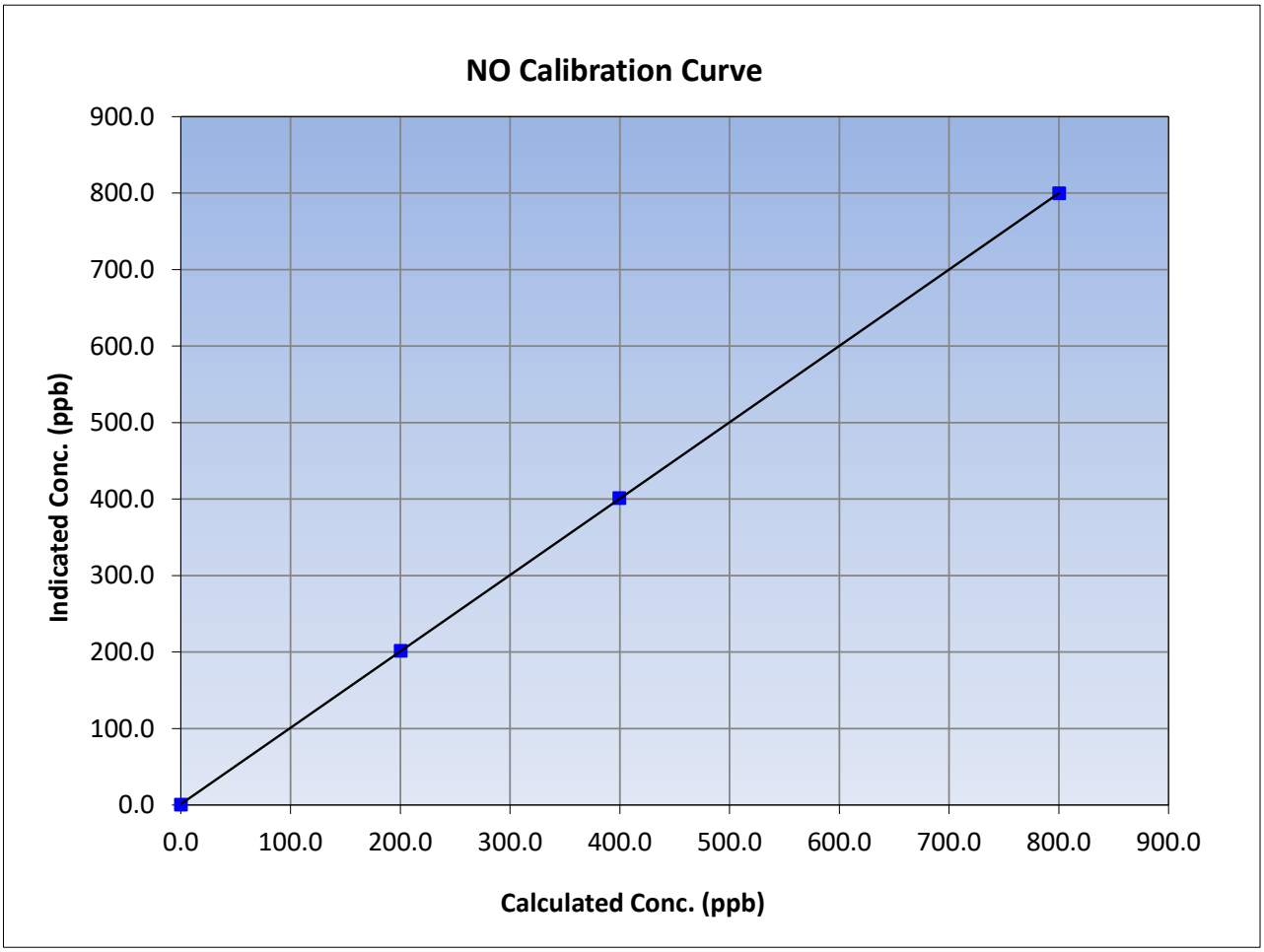
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | NA |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:10 |
| Analyzer make: | API T200 | Analyzer serial #: | 13806 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.3 | ---- | Correlation Coefficient | 0.999993 | ≥0.995 |
| 800.4 | 799.7 | 1.0009 | | | |
| 399.6 | 401.2 | 0.9960 | Slope | 0.998455 | 0.90 - 1.10 |
| 200.4 | 201.6 | 0.9940 | | | |
| | | | Intercept | 1.134987 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

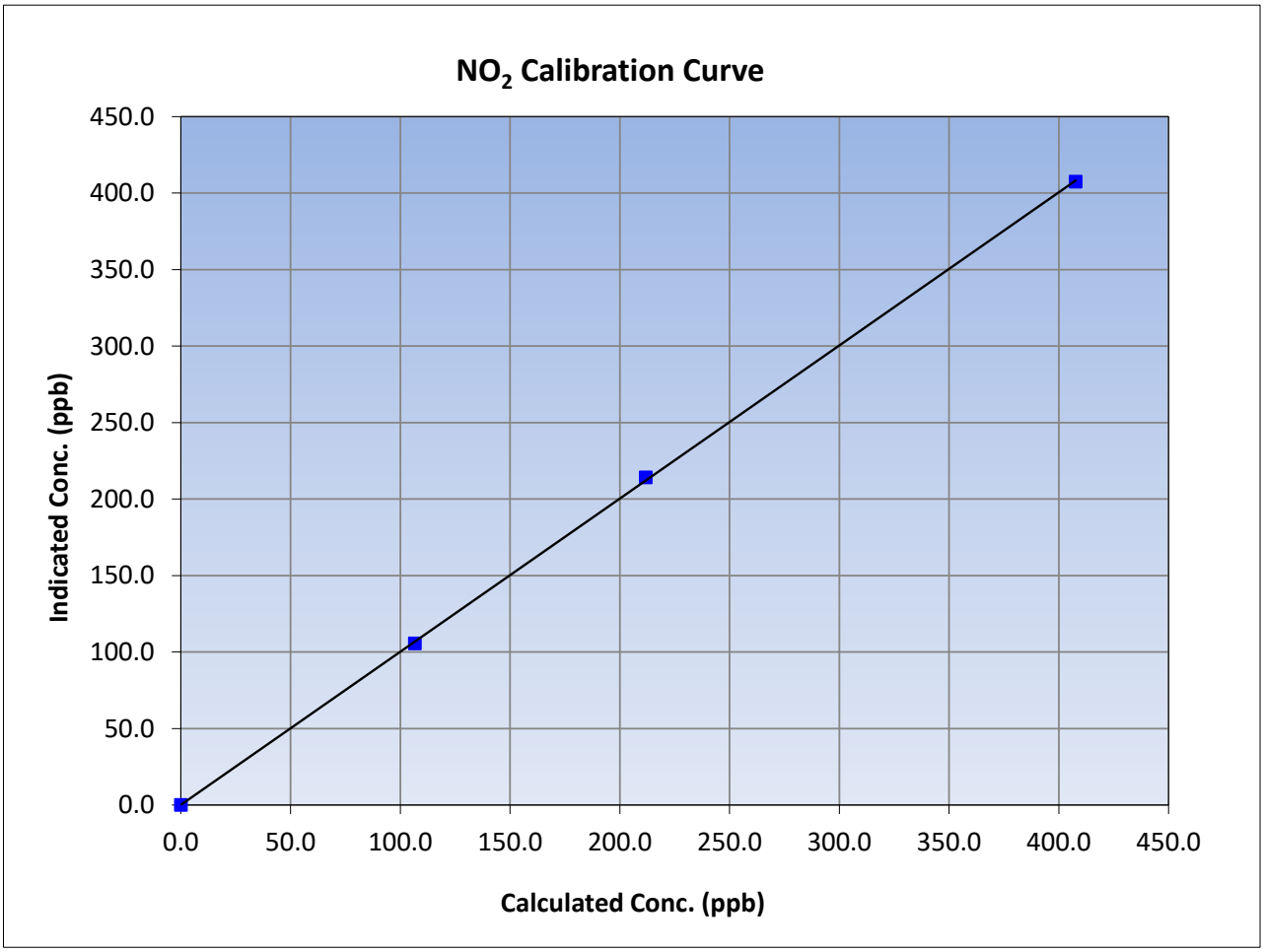
Version-04-2020

### Station Information

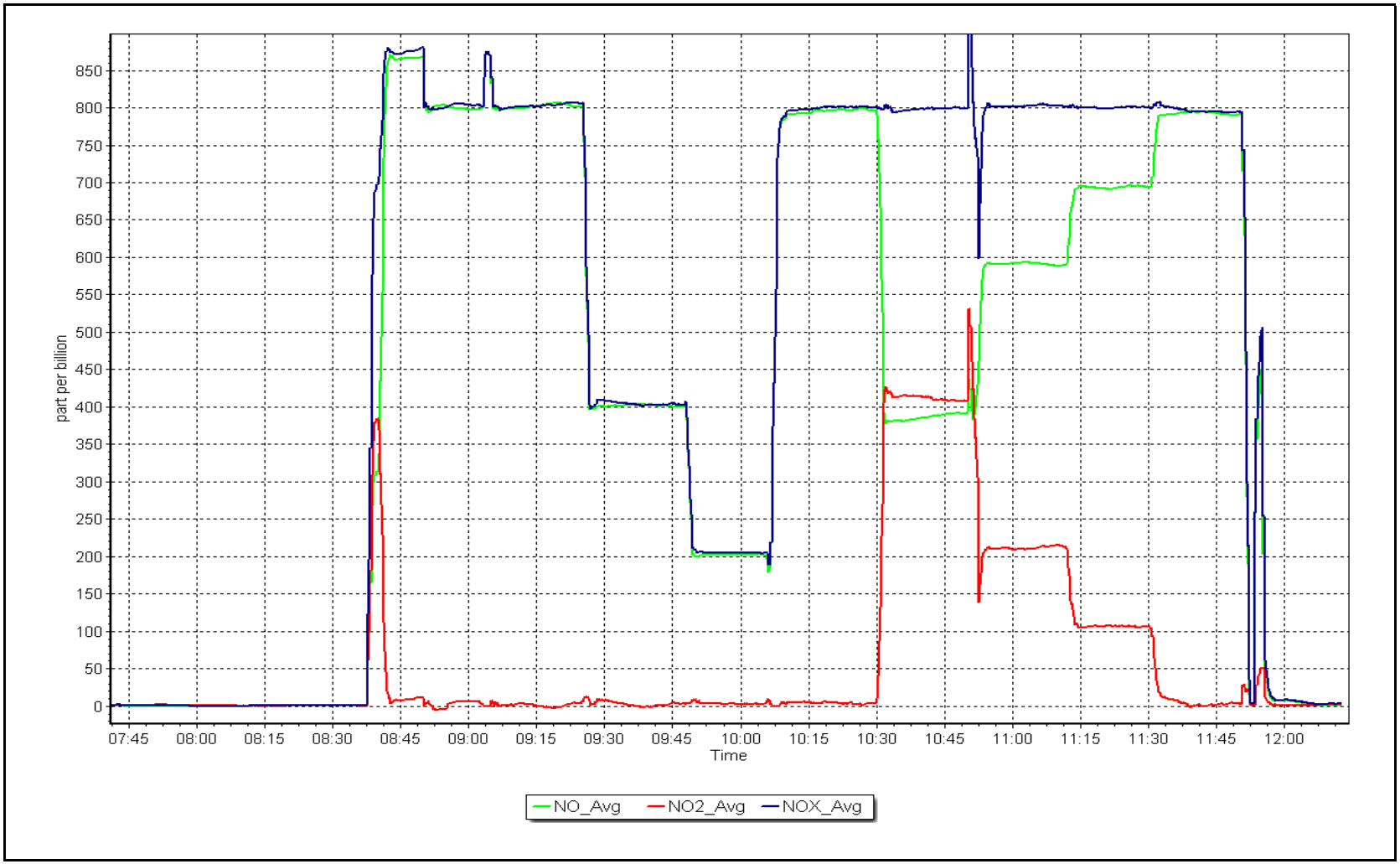
| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | NA |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:10 |
| Analyzer make: | API T200 | Analyzer serial #: | 13806 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999932 | ≥0.995 |
| 407.7 | 407.5 | 1.0004 | | | |
| 211.9 | 214.2 | 0.9891 | Slope | 1.001043 | 0.90 - 1.10 |
| 106.7 | 105.6 | 1.0101 | | | |
| | | | Intercept | 0.109543 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 21, 2024 Location: Fort Chipewyan



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 15:27 | End time (MST): | 17:38 |
| Reason: | Routine | | |

### Calibration Standards

| | | | |
|---|---|---|---|
| O3 generation mode: | Photometer | | |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number: | 3252 |
| ZAG Make/Model: | Teledyne API T701 | Serial Number: | 135 |

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.976343 | 1.027914 | Backgd or Offset: | -2.0 | -2.0 |
| Calibration intercept: | 0.340000 | 0.240000 | Coeff or Slope: | 1.036 | 1.036 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as found span | 5000 | 913.0 | 400.0 | 408.1 | 0.980 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| high point | 5000 | 914.7 | 400.0 | 411.6 | 0.972 |
| second point | 5000 | 786.4 | 200.0 | 205.6 | 0.973 |
| third point | 5000 | 701.3 | 100.0 | 102.7 | 0.974 |
| as left zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as left span | 5000 | 963.3 | 400.0 | 408.1 | 0.980 |
| | | | | Average Correction Factor | 0.973 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 407.7 | Previous response | 390.9 | *% change | 4.1% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

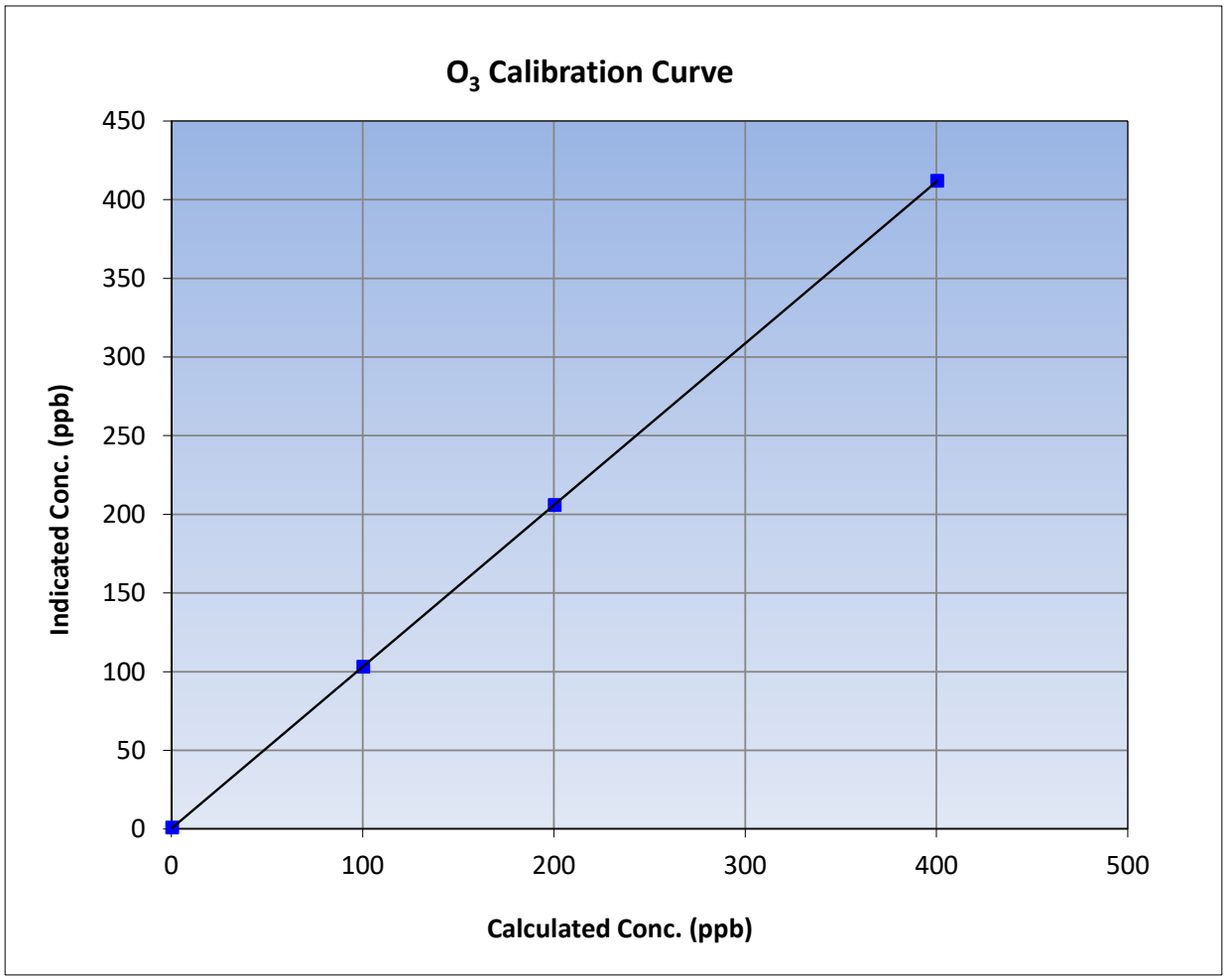
Version-01-2020

### Station Information

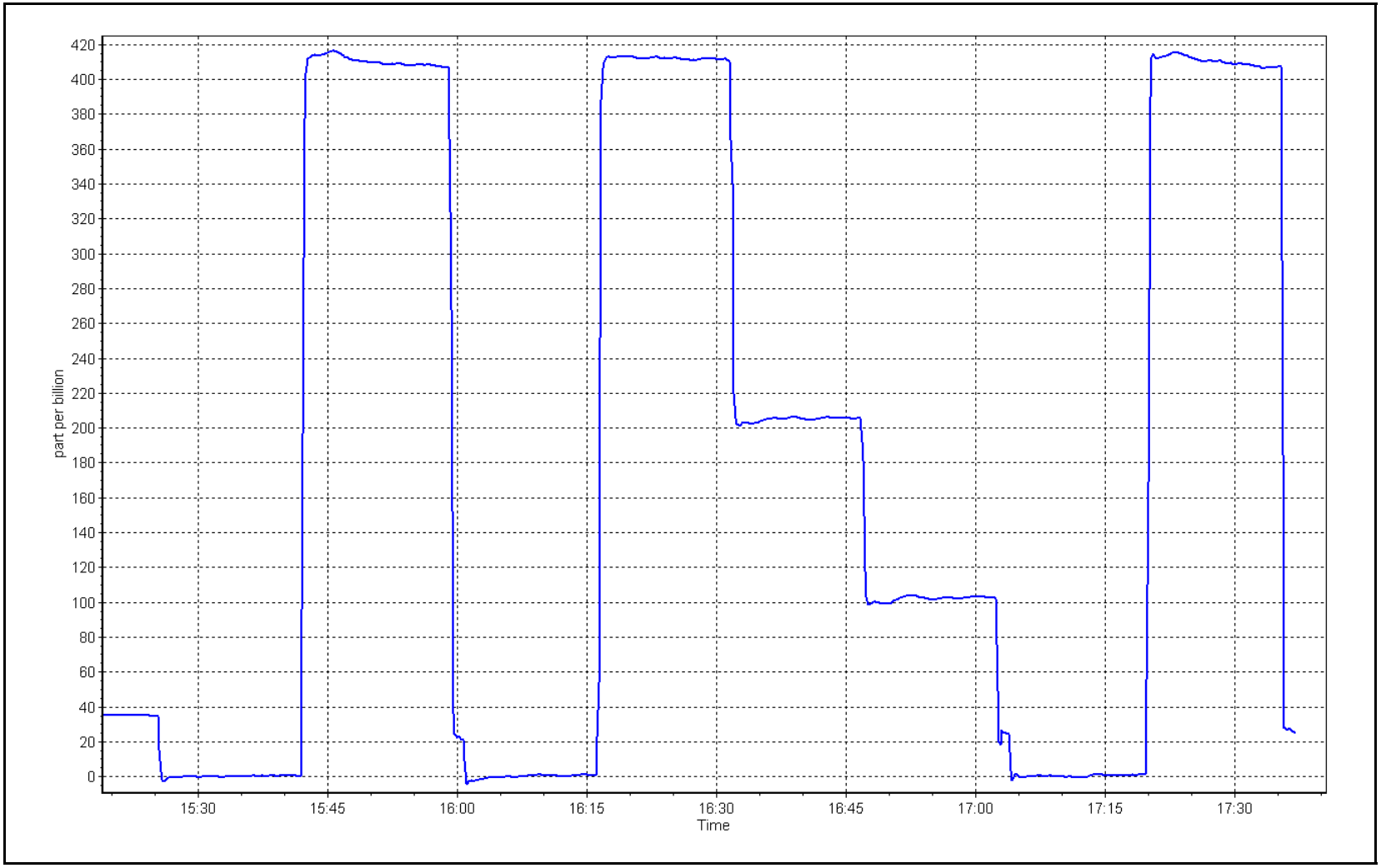
| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 15:27 | End Time (MST): | 17:38 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 3872 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.6 | ---- | Correlation Coefficient | 0.999996 | *≥0.995* |
| 400.0 | 411.6 | 0.9718 | | | |
| 200.0 | 205.6 | 0.9728 | Slope | 1.027914 | *0.90 - 1.10* |
| 100.0 | 102.7 | 0.9737 | | | |
| | | | Intercept | 0.240000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 6, 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: | February 20, 2024 | Last Cal Date: | January 31, 2024 |
| Start time (MST): | 15:25 | End time (MST): | 16:10 |
| Analyzer Make: | Teledyne API T640 | S/N: | 319 |
| 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) | -11.80 | -12.05 | -11.80 | ☐ | +/- 2 °C |
| P (mmHg) | 735.20 | 736.58 | 735.20 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.00 | 5.02 | 5.00 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 42.00 | ----- | 42.00 | ☐ | >80% |

Zero Verification — PM w/o HEPA: 3.40 — PM w/ HEPA: 0.00 — <0.2 ug/m3

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

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

### Quarterly Calibration Test

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

| Parameter | As found | Post maintenance | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| PMT Peak Test | 11.10 | 10.90 | 10.90 | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: February 20, 2024

Date Disposable Filter Changed: February 20, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: July 25, 2023

Date RH/T Sensor Cleaned: July 25, 2023

Notes: Leak check passed. Flow, temperature, and pressure checked. No adjustments needed.

Calibration by: Jan Castro and Braiden Boutilier

# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 13:07 | End time (MST): | 15:21 |
| 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: | API T700 | | Serial Number: | 3252 |
| ZAG Make/Model: | API T701H | | Serial Number: | 135 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | API T300 | | Analyzer serial #: | 3505 | |
| Analyzer Range: | 0 - 50 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.989053 | 0.994000 | Backgd or Offset: | -0.014 | -0.014 |
| Calibration intercept: | 0.314884 | 0.374934 | Coeff or Slope: | 0.998 | 0.998 |

### CO Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.20 | ---- |
| as found span | 4933 | 66.7 | 40.4 | 40.4 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4934 | 66.7 | 40.4 | 40.4 | 0.999 |
| second point | 4967 | 33.3 | 20.2 | 20.6 | 0.980 |
| third point | 4983 | 16.7 | 10.1 | 10.5 | 0.961 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 2960 | 40.0 | 40.4 | 40.3 | 1.004 |
| | | | | Average Correction Factor | 0.980 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 40.24 | Prev response: | 40.30 | *% 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

Notes: Changed inlet filter after as founds. no adjustments made.

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

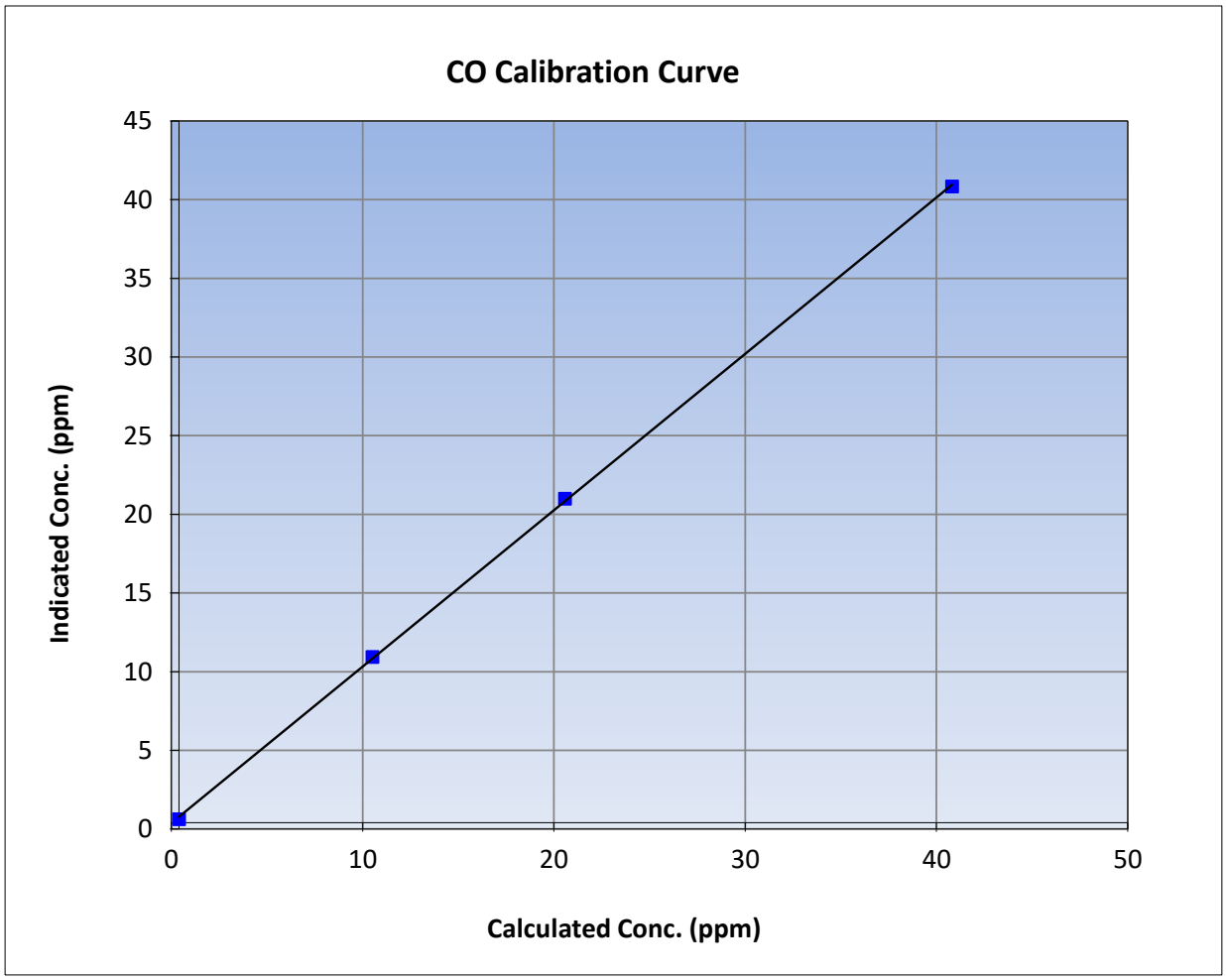
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 13:07 | End Time (MST): | 15:21 |
| Analyzer make: | API T300 | Analyzer serial #: | 3505 |

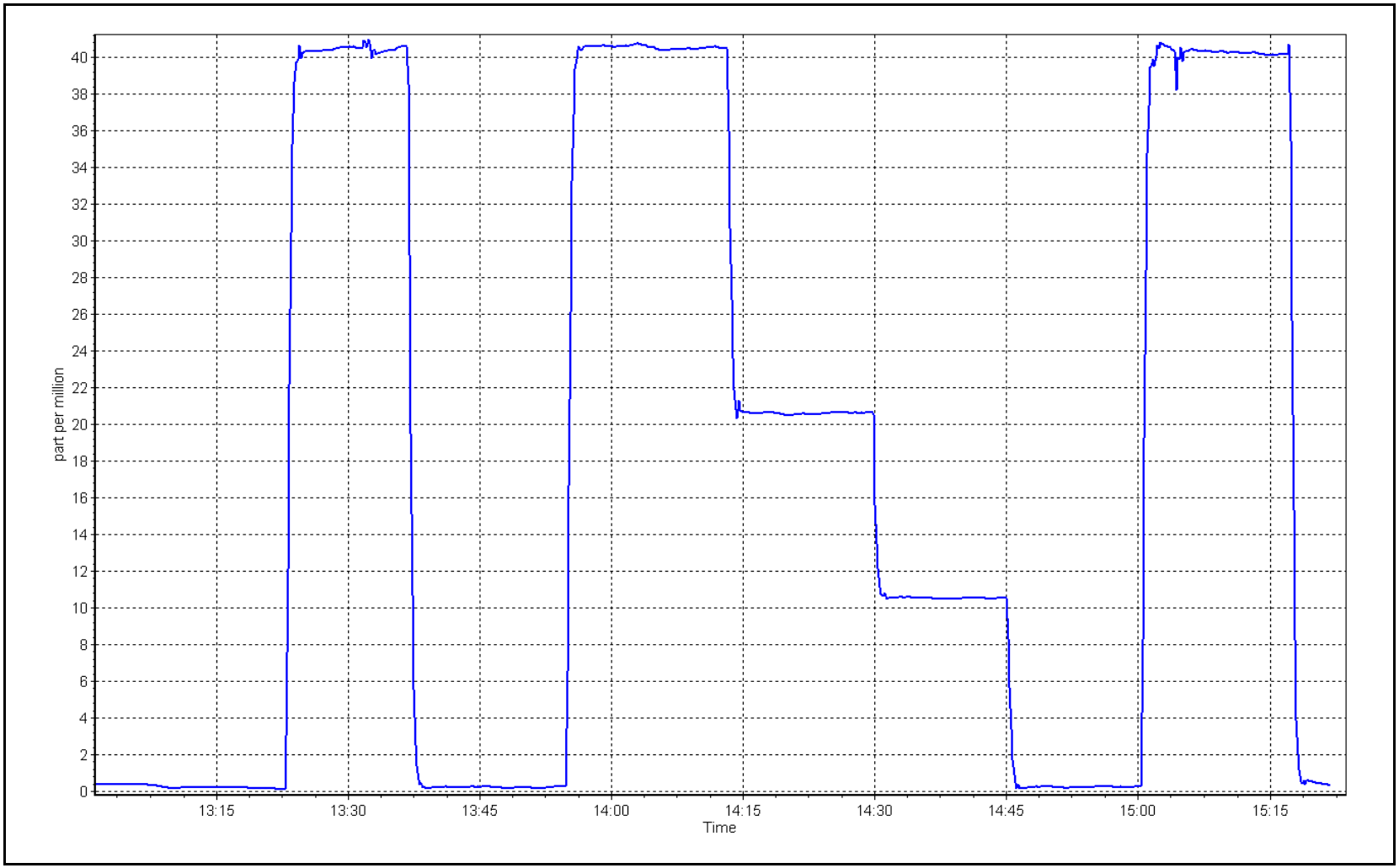
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 40.4 | 40.4 | 0.9994 |
| 20.2 | 20.6 | 0.9796 |
| 10.1 | 10.5 | 0.9611 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999918 | *≥0.995* |
| Slope | 0.994000 | *0.90 - 1.10* |
| Intercept | 0.374934 | *+/-1.5* |



**CO Calibration Plot** Date: February 6, 2024 Location: Fort Chipewyan



# Wood Buffalo Environmental Association

## $CO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 9:02 | End time (MST): | 12:57 |
| 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: | 3252 |
| N2 Gen Make/Model: | NG 5000 | | Serial Number: | 135 |

### Analyzer Information

Analyzer make: Teledyne API T360 — Analyzer serial #: 289

Analyzer Range 0 - 2,000 ppm

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.994632 | 1.000467 | Backgd or Offset: | -0.063 | -0.063 |
| Calibration intercept: | -6.520000 | -10.320000 | Coeff or Slope: | 1.085 | 1.094 |

### $CO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 3000 | 0.0 | 0.0 | -3.3 | ---- |
| as found span | 2920 | 80.0 | 1605.9 | 1536.9 | 1.045 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 3000 | 0.0 | 0.0 | -1.7 | ---- |
| high point | 2920 | 80.0 | 1605.9 | 1606.6 | 1.000 |
| second point | 2960 | 40.0 | 802.9 | 770.7 | 1.042 |
| third point | 2980 | 20.0 | 401.5 | 394.7 | 1.017 |
| as left zero | 3000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 2960 | 40.0 | 802.9 | 768.5 | 1.045 |
| | | | | Average Correction Factor | 1.020 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 1540.20 | Prev response: | 1590.73 | *% change: | -3.3% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: Changed inlet filter after as found. Made adjustments to span. Operator error well adjusting span fix porblem restarted back to zero cal.

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## $CO_2$ Calibration Summary

Version-01-2020

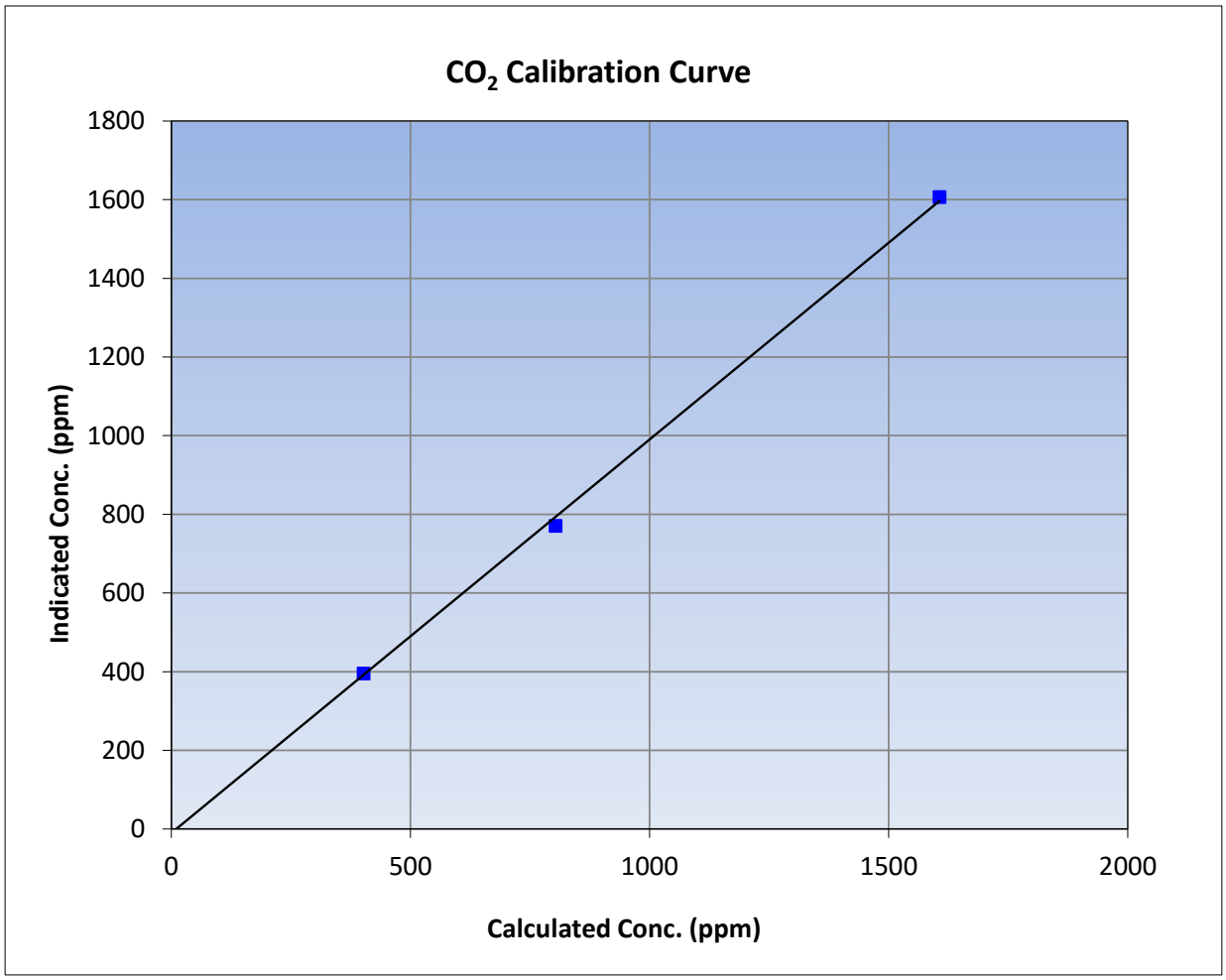
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date | February 6, 2024 | Previous Calibration | January 18, 2024 |
| Station Name | Fort Chipewyan | Station Number | AMS08 |
| Start Time (MST) | 9:02 | End Time (MST) | 12:57 |
| Analyzer make | Teledyne API T360 | Analyzer serial # | 289 |

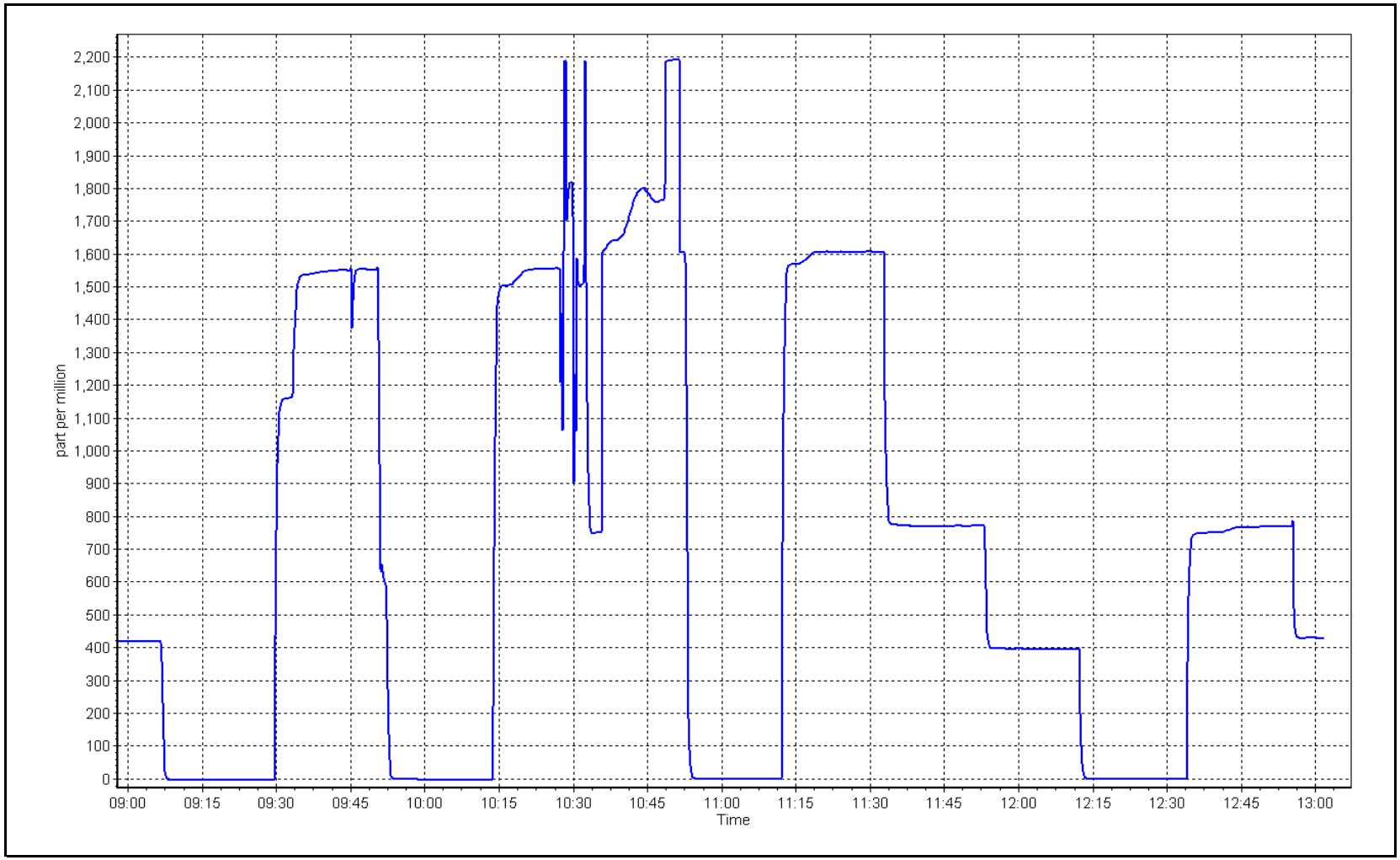
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -1.7 | ---- |
| 1605.9 | 1606.6 | 0.9995 |
| 802.9 | 770.7 | 1.0418 |
| 401.5 | 394.7 | 1.0171 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999512 | *≥0.995* |
| Slope | 1.000467 | *0.90 - 1.10* |
| Intercept | -10.320000 | *+/-20* |



**$CO_2$ Calibration Plot** Date: February 6, 2024 Location: Fort Chipewyan



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS09
## BARGE LANDING
## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Barge Landing | Station number: | AMS09 |
| Calibration Date: | February 16, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 10:23 | End time (MST): | 13:33 |
| 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 Make/Model: | API T700 | | Serial Number: | 3812 |
| ZAG Make/Model: | API T701 | | Serial Number: | 4888 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1118148498

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.997105 | 0.999855 | Backgd or Offset: | 10.2 | 10.2 |
| Calibration intercept: | 0.270160 | 0.931270 | Coeff or Slope: | 0.955 | 0.963 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4919 | 80.2 | 801.5 | 795.8 | 1.007 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| high point | 4919 | 80.2 | 801.5 | 802.0 | 0.999 |
| second point | 4959 | 40.1 | 400.8 | 402.0 | 0.997 |
| third point | 4980 | 20.0 | 199.8 | 201.2 | 0.993 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4919 | 80.2 | 801.5 | 801.9 | 0.999 |
| | | | | Average Correction Factor | 0.996 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 795.70 | Previous response | 799.44 | *% 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

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

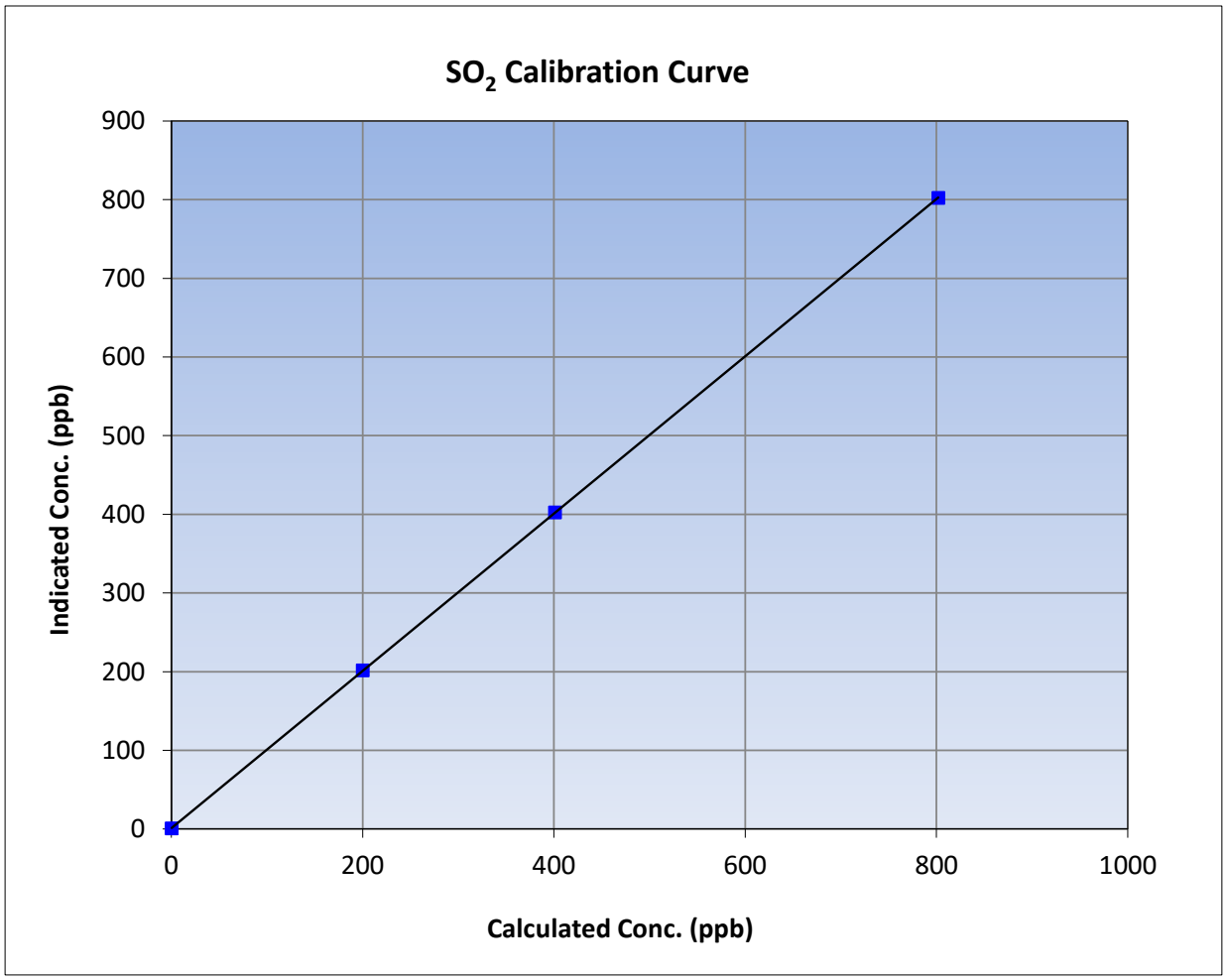
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:33 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1118148498 |

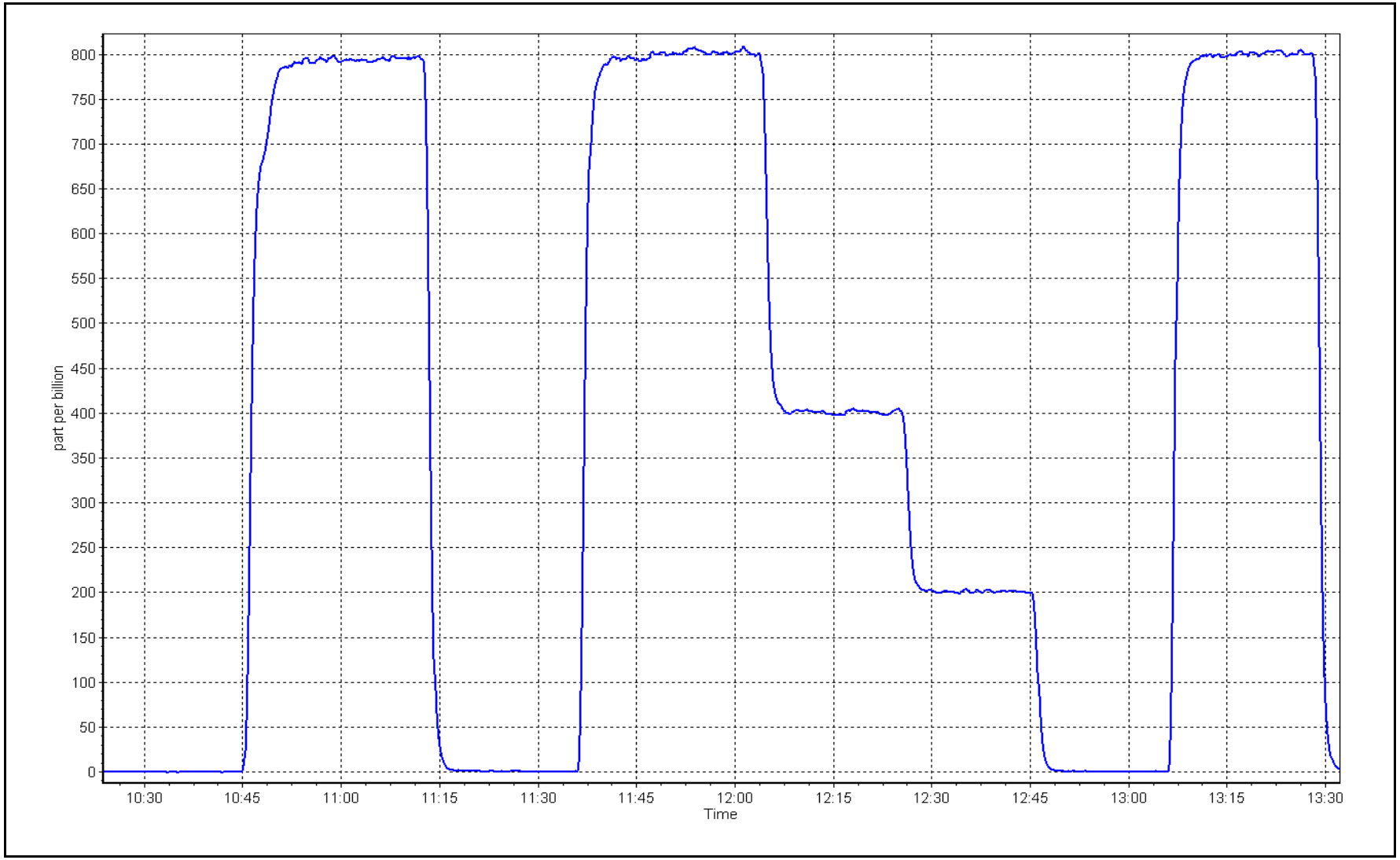
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 801.5 | 802.0 | 0.9994 |
| 400.8 | 402.0 | 0.9969 |
| 199.8 | 201.2 | 0.9932 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 0.999855 | *0.90 - 1.10* |
| Intercept | 0.931270 | *+/-30* |



**SO2 Calibration Plot** Date: February 16, 2024 Location: Barge Landing



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Barge Landing | Station number: | AMS09 |
| Calibration Date: | February 1, 2024 | Last Cal Date: | January 9, 2024 |
| Start time (MST): | 9:46 | End time (MST): | 14:02 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.171 | ppm | Cal Gas Exp Date: | August 22, 2026 |
| Cal Gas Cylinder #: | CC511415 | | | |
| Removed Cal Gas Conc: | 5.171 | 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.008544 | 0.999264 | Backgd or Offset: | 2.88 | 2.93 |
| Calibration intercept: | 0.119536 | 0.119396 | Coeff or Slope: | 1.176 | 1.201 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4923 | 77.4 | 80.0 | 77.8 | 1.029 |
| as found 2nd point | 4961 | 38.7 | 40.0 | 38.9 | 1.029 |
| as found 3rd point | 4981 | 19.3 | 20.0 | 19.4 | 1.029 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4923 | 77.4 | 80.0 | 80.0 | 1.001 |
| second point | 4961 | 38.7 | 40.0 | 40.3 | 0.993 |
| third 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 | 79.7 | 1.004 |
| SO2 Scrubber Check | 4920 | 80.2 | 802.0 | 0.0 | ---- |
| Date of last scrubber change: | | 28-Feb-23 | | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 77.8 | Prev response: | 80.84 | *% change: | -3.9% |
| Baseline Corr 2nd AF pt: | 38.9 | AF Slope: | 0.971999 | AF Intercept: | -0.001140 |
| Baseline Corr 3rd AF pt: | 19.4 | AF Correlation: | 1.000000 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. SOx scrubber check done after calibrator zero. Adjusted span only.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

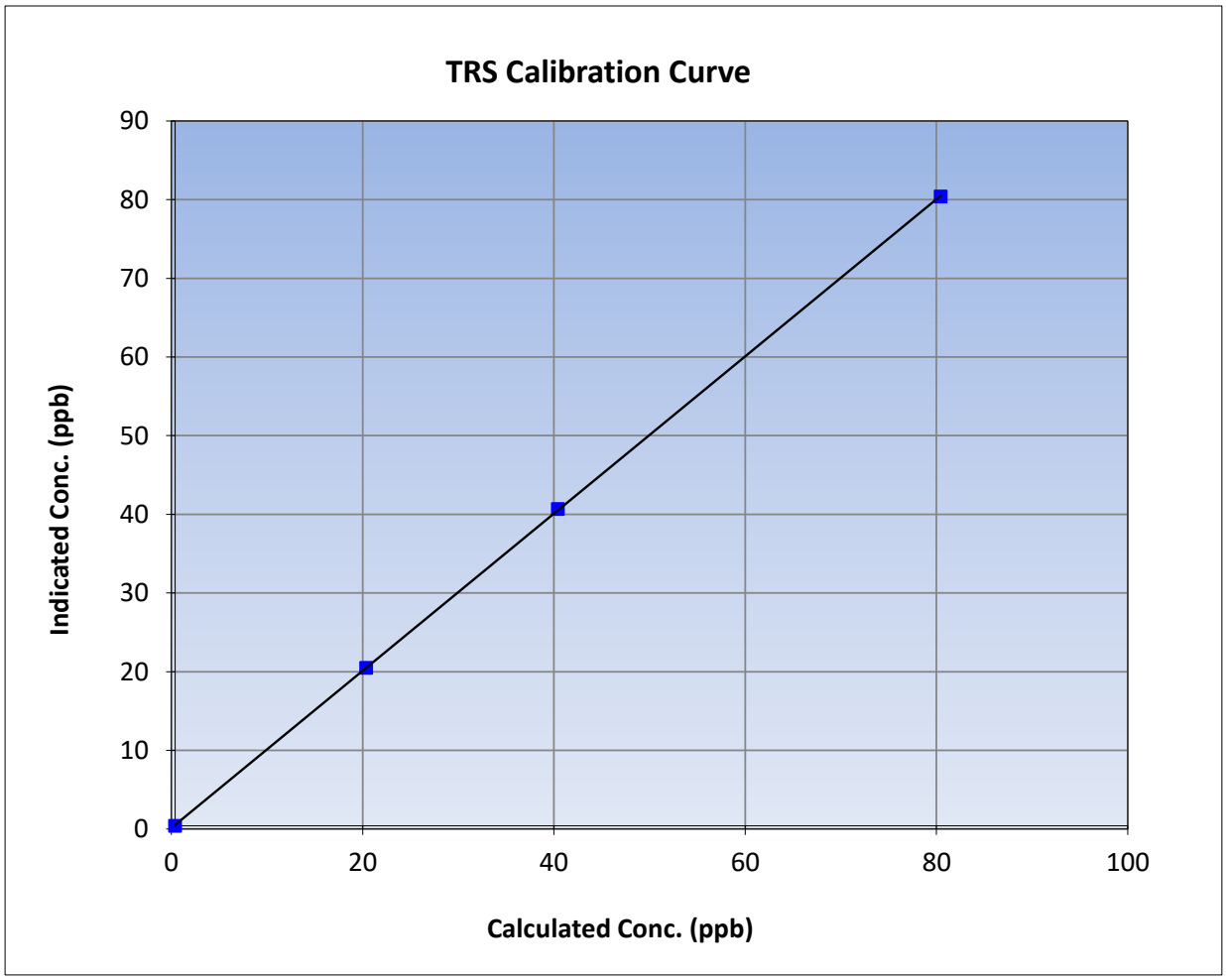
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 9:46 | End Time (MST): | 14:02 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1331259320 |

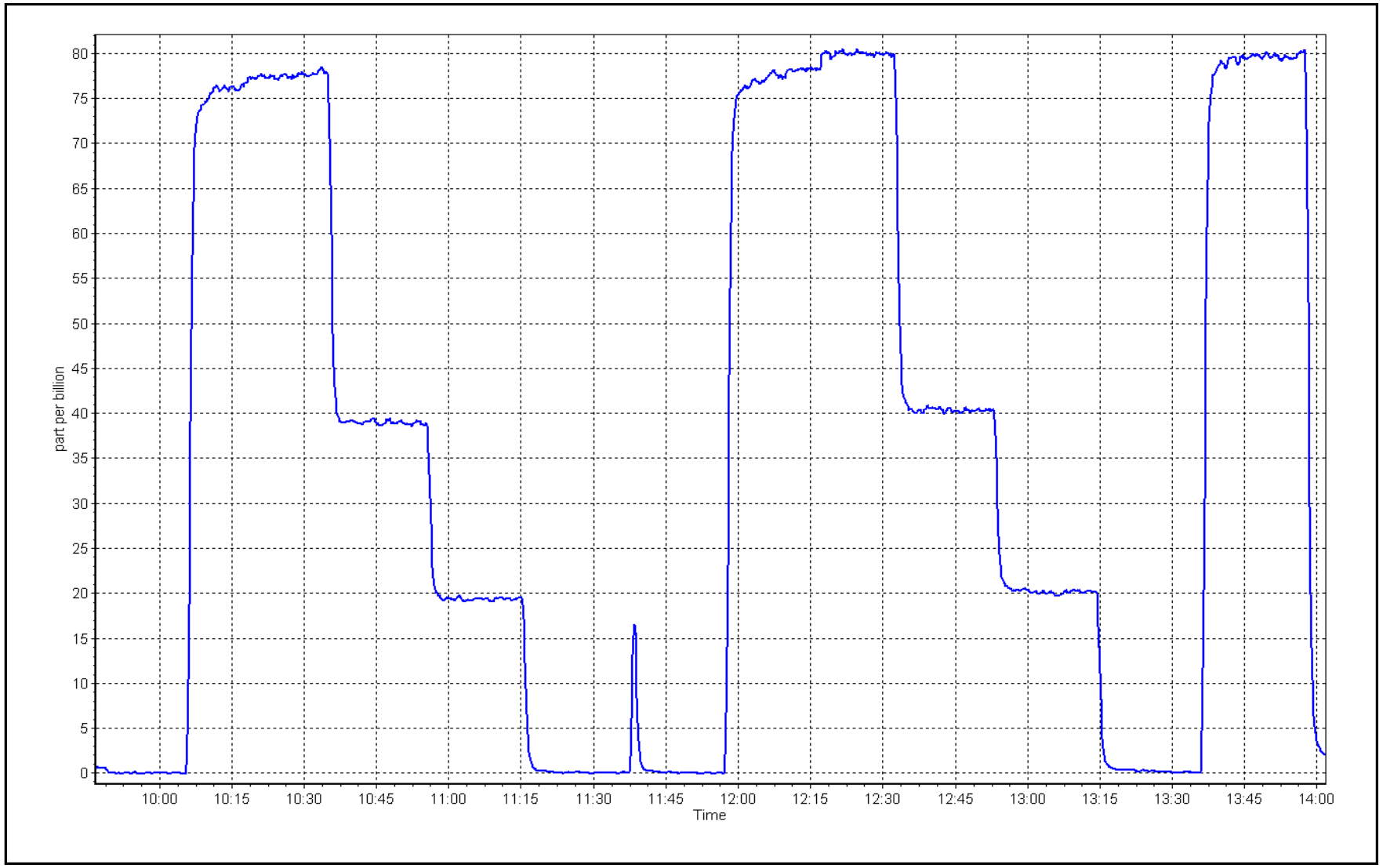
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.0 | 1.0005 |
| 40.0 | 40.3 | 0.9932 |
| 20.0 | 20.1 | 0.9930 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999983 | *≥0.995* |
| Slope | 0.999264 | *0.90 - 1.10* |
| Intercept | 0.119396 | *+/-3* |



**TRS Calibration Plot** Date: February 1, 2024 Location: Barge Landing



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Barge Landing | Station number: | AMS09 |
| Calibration Date: | February 16, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 10:23 | End time (MST): | 13:33 |
| 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 4888 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259521 |
| THC Range (ppm): | 0 - 20 ppm | | |
| NMHC Range (ppm): | 0 - 10 ppm | CH4 Range (ppm): | 0 - 10 ppm |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| CH4 SP Ratio: | 2.58E-04 | 2.58E-04 | NMHC SP Ratio: | 4.37E-05 | 4.37E-05 |
| CH4 Retention time: | 15.00 | 15.00 | NMHC Peak Area: | 209298 | 209298 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919 | 80.2 | 17.12 | 17.18 | 0.997 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 80.2 | 17.12 | 17.11 | 1.000 |
| second point | 4960 | 40.1 | 8.56 | 8.57 | 0.999 |
| third point | 4980 | 20.0 | 4.27 | 4.29 | 0.995 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 80.2 | 17.12 | 17.17 | 0.997 |
| | | | | ge Correction Factor | 0.998 |
| Baseline Corr AF: | 17.18 | Prev response | 17.14 | *% change | 0.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919 | 80.2 | 9.14 | 9.14 | 0.999 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 80.2 | 9.14 | 9.11 | 1.003 |
| second point | 4960 | 40.1 | 4.57 | 4.56 | 1.002 |
| third point | 4980 | 20.0 | 2.28 | 2.28 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 80.2 | 9.14 | 9.13 | 1.001 |
| | | | | Average Correction Factor | 1.002 |
| Baseline Corr AF: | 9.14 | Prev response | 9.13 | *% change | 0.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919 | 80.2 | 7.98 | 8.03 | 0.994 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 80.2 | 7.98 | 8.00 | 0.998 |
| second point | 4960 | 40.1 | 3.99 | 4.01 | 0.995 |
| third point | 4980 | 20.0 | 1.99 | 2.01 | 0.990 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 80.2 | 7.98 | 8.04 | 0.993 |
| | | | | Average Correction Factor | 0.995 |
| Baseline Corr AF: | 8.03 | Prev response | 8.00 | *% change | 0.3% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.000804 | 0.999215 |
| THC Cal Offset: | 0.005458 | 0.010853 |
| CH4 Cal Slope: | 1.001867 | 1.001638 |
| CH4 Cal Offset: | 0.006270 | 0.008070 |
| NMHC Cal Slope: | 0.999587 | 0.997023 |
| NMHC Cal Offset: | -0.000411 | 0.003583 |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## THC Calibration Summary

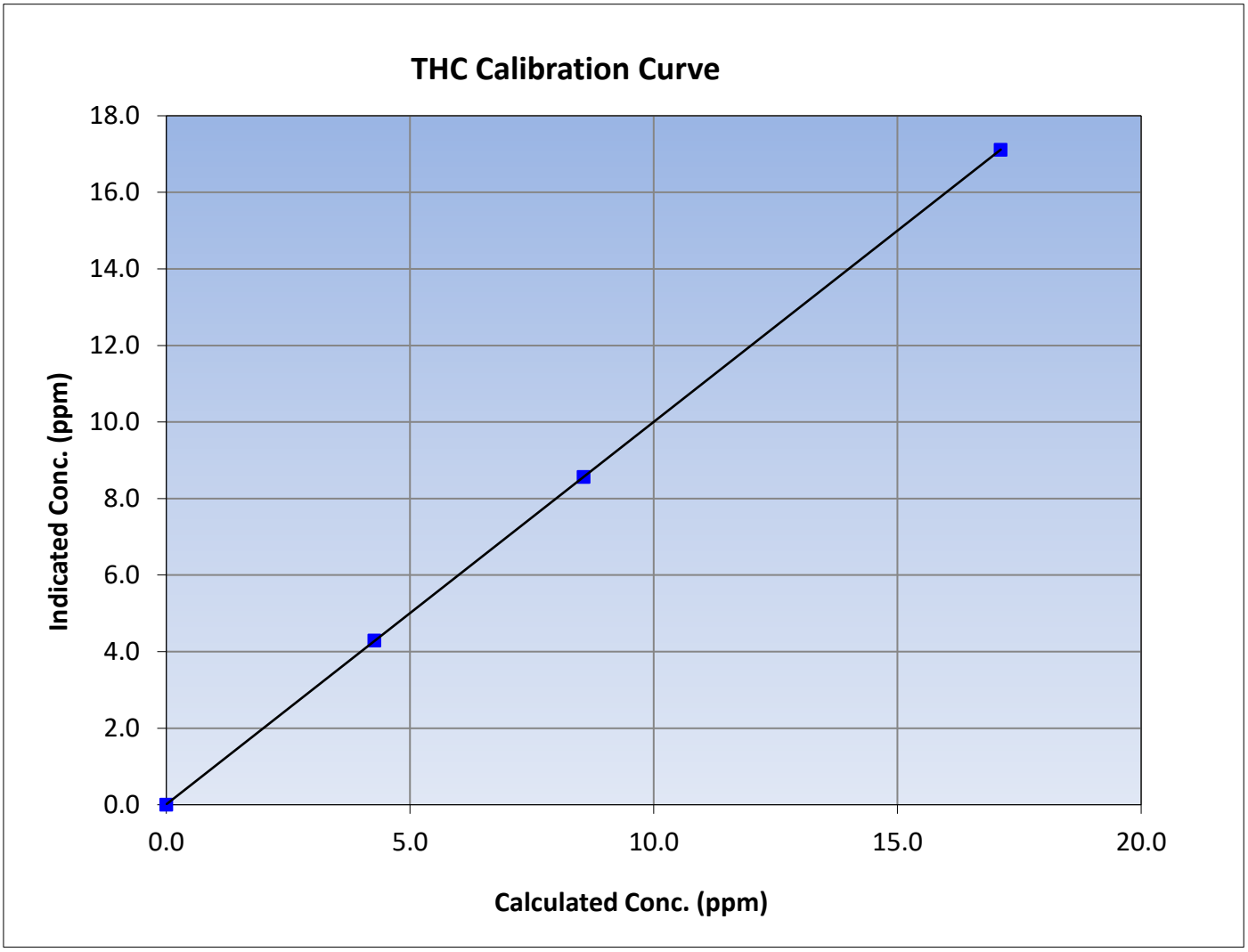
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:33 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259521 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 17.12 | 17.11 | 1.0004 | | | |
| 8.56 | 8.57 | 0.9991 | Slope | 0.999215 | *0.90 - 1.10* |
| 4.27 | 4.29 | 0.9955 | | | |
| | | | Intercept | 0.010853 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

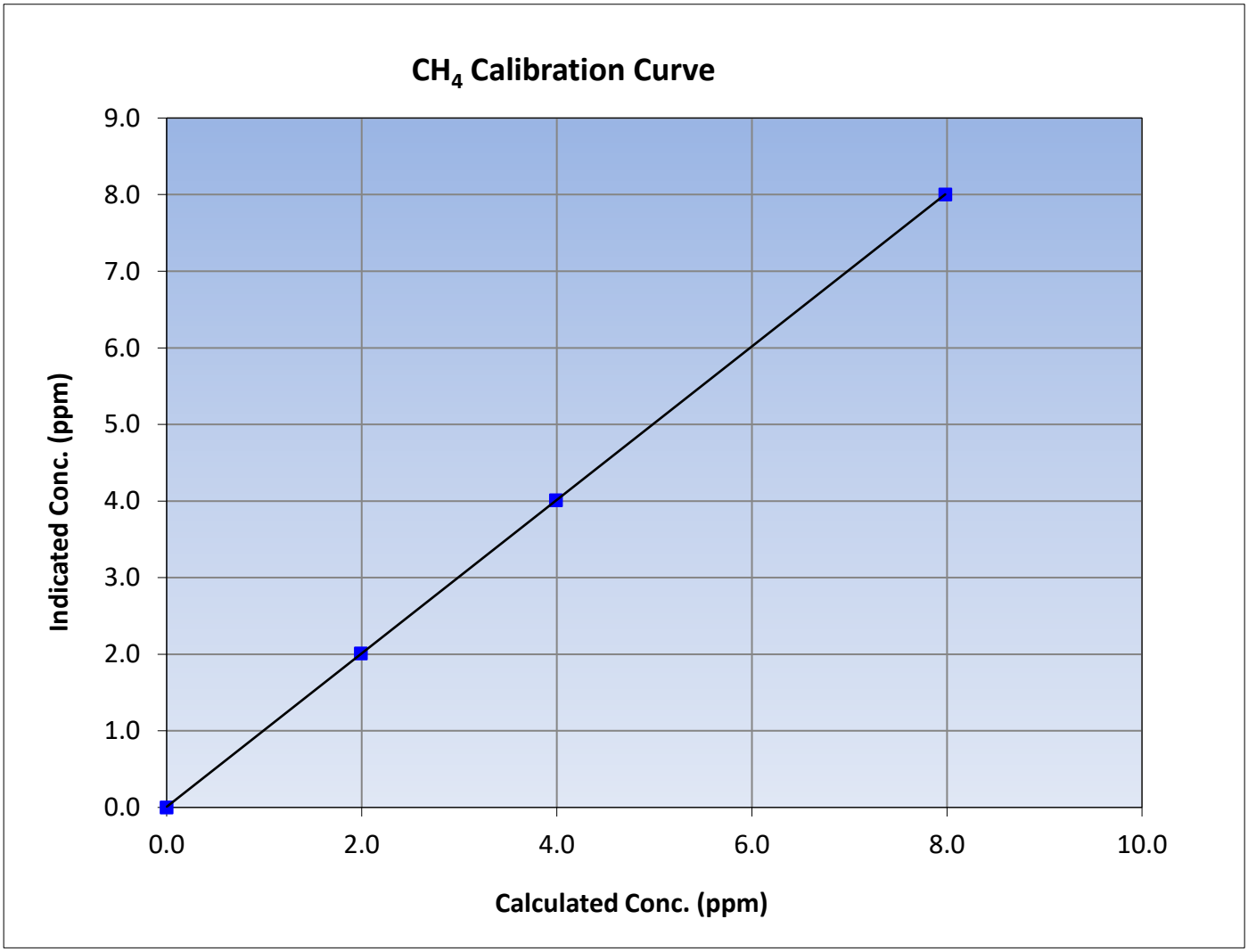
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:33 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259521 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999995 | *≥0.995* |
| 7.98 | 8.00 | 0.9978 | | | |
| 3.99 | 4.01 | 0.9954 | Slope | 1.001638 | *0.90 - 1.10* |
| 1.99 | 2.01 | 0.9902 | | | |
| | | | Intercept | 0.008070 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

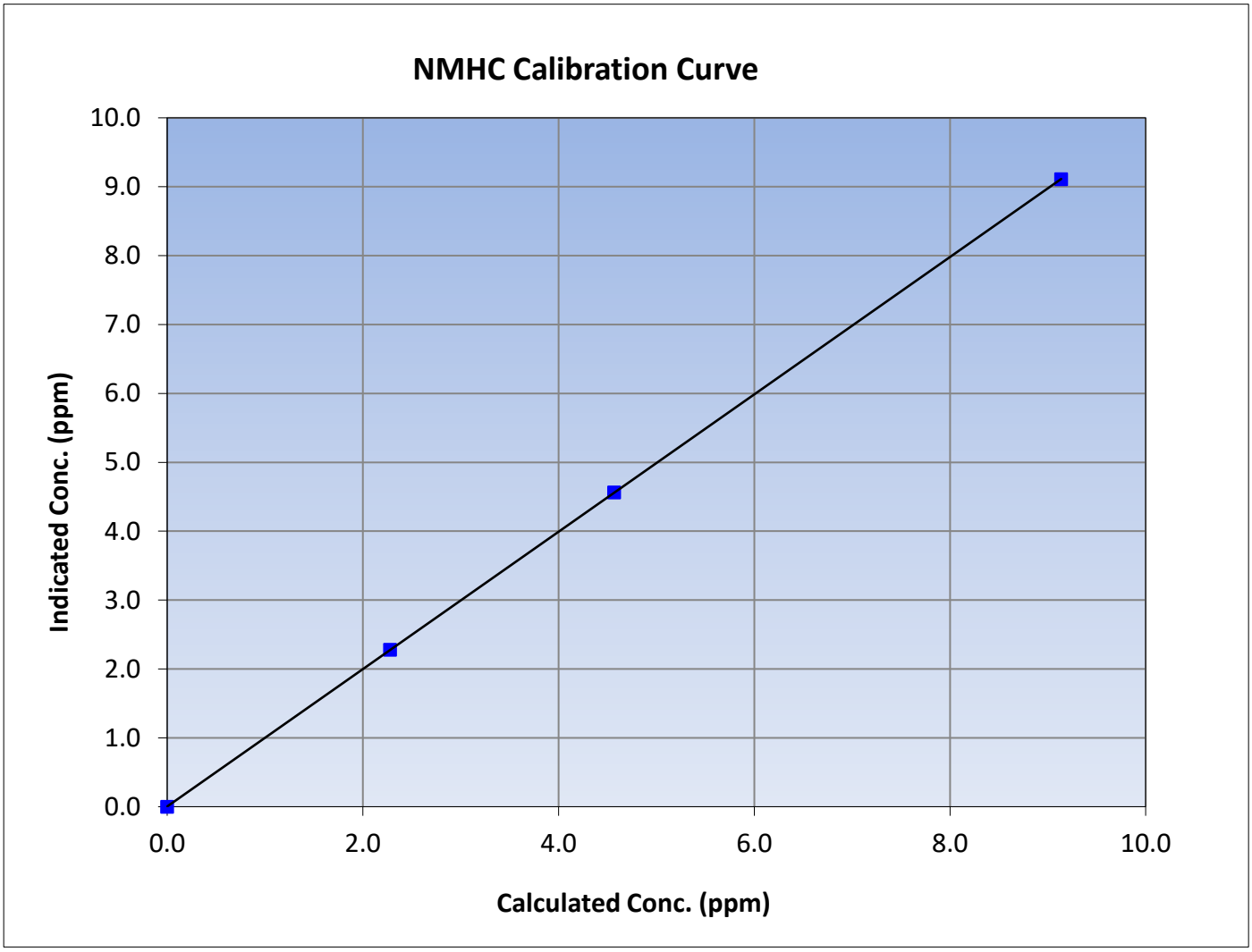
Version-06-2022

### Station Information

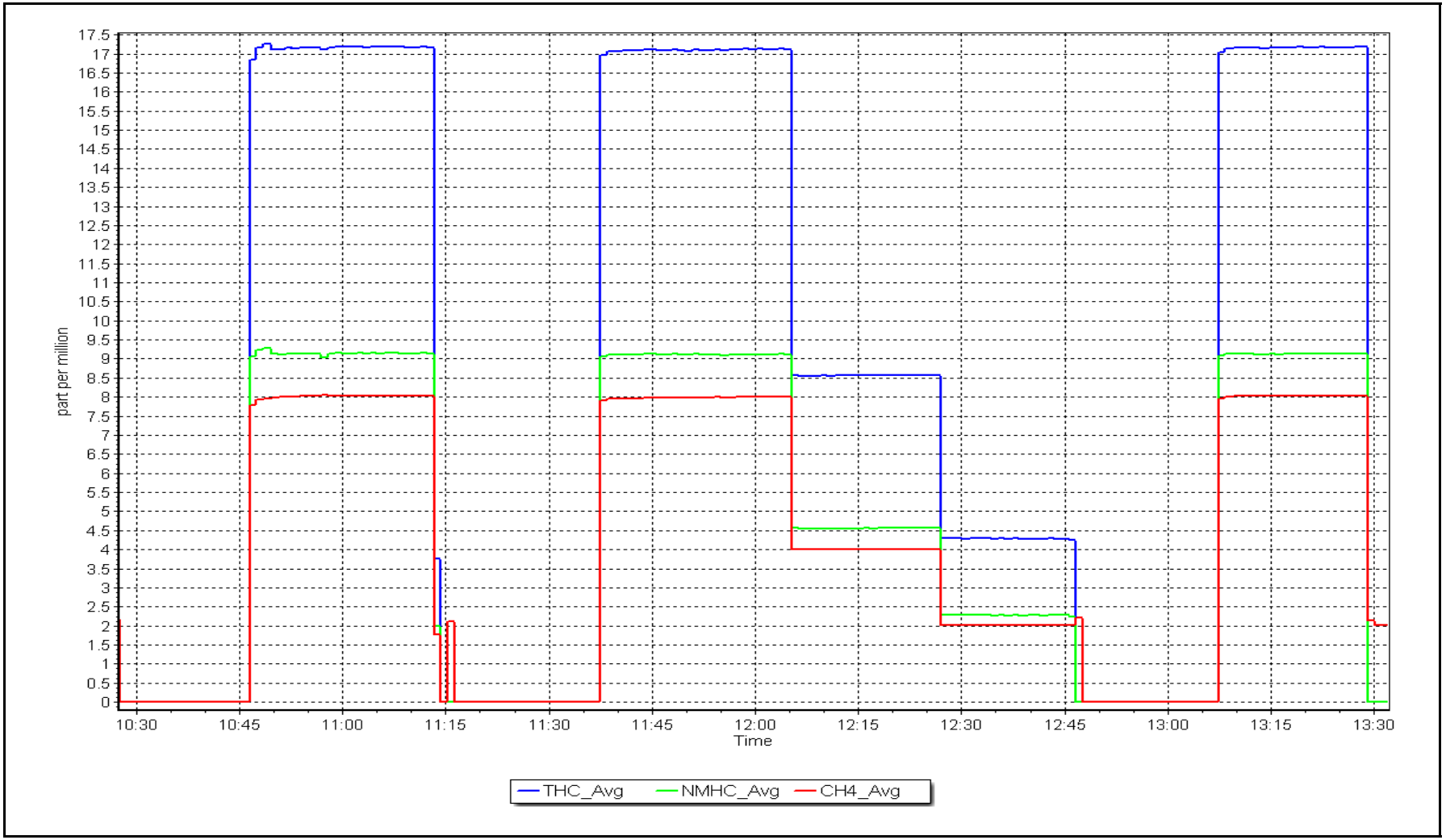
| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:33 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259521 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 9.14 | 9.11 | 1.0028 | | | |
| 4.57 | 4.56 | 1.0016 | Slope | 0.997023 | *0.90 - 1.10* |
| 2.28 | 2.28 | 1.0000 | | | |
| | | | Intercept | 0.003583 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 16, 2024 Location: Barge Landing



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Barge Landing | Station number: | AMS09 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 10:07 | End time (MST): | 14:26 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262593 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.092 | 1.120 | NO bkgnd or offset: | 10.0 | 10.3 |
| NOX coeff or slope: | 0.998 | 0.998 | NOX bkgnd or offset: | 10.3 | 10.6 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 180.1 | 176.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.999176 | 0.999459 |
| $NO_X$ Cal Offset: | 0.418407 | 0.518402 |
| NO Cal Slope: | 0.999039 | 0.998611 |
| NO Cal Offset: | -0.303738 | -0.704018 |
| $NO_2$ Cal Slope: | 1.005229 | 1.004419 |
| $NO_2$ Cal Offset: | 0.853830 | 0.978163 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.2 | -0.2 | ---- | ---- |
| as found span | 4915 | 85.3 | 808.3 | 800.7 | 7.5 | 791.0 | 780.7 | 10.3 | 1.022 | 1.026 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | -0.1 | ---- | ---- |
| high point | 4915 | 85.3 | 808.3 | 800.7 | 7.5 | 808.0 | 799.3 | 8.8 | 1.000 | 1.002 |
| second point | 4957 | 42.6 | 403.7 | 400.0 | 3.7 | 404.4 | 398.3 | 6.1 | 0.998 | 1.004 |
| third point | 4979 | 21.3 | 201.8 | 200.0 | 1.9 | 202.8 | 198.3 | 4.5 | 0.995 | 1.008 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 | -0.1 | ---- | ---- |
| as left span | 4915 | 85.3 | 808.3 | 414.9 | 393.3 | 804.6 | 410.7 | 393.9 | 1.005 | 1.010 |
| | | | | | | | | Average Correction Factor | 0.998 | 1.005 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 791.4 ppb | NO = 780.9 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -2.1% |
| Previous Response | $NO_X$ = 808.0 ppb | NO = 799.7 ppb | | | *Percent Change | NO = | -2.4% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 793.8 | 408.0 | 393.3 | 395.6 | 0.994 | 100.6% |
| 2nd GPT point (200 ppb O3) | 793.8 | 601.9 | 199.4 | 201.4 | 0.990 | 101.0% |
| 3rd GPT point (100 ppb O3) | 793.8 | 699.4 | 101.9 | 104.7 | 0.973 | 102.7% |
| | | | | Average Correction Factor | 0.986 | 101.4% |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

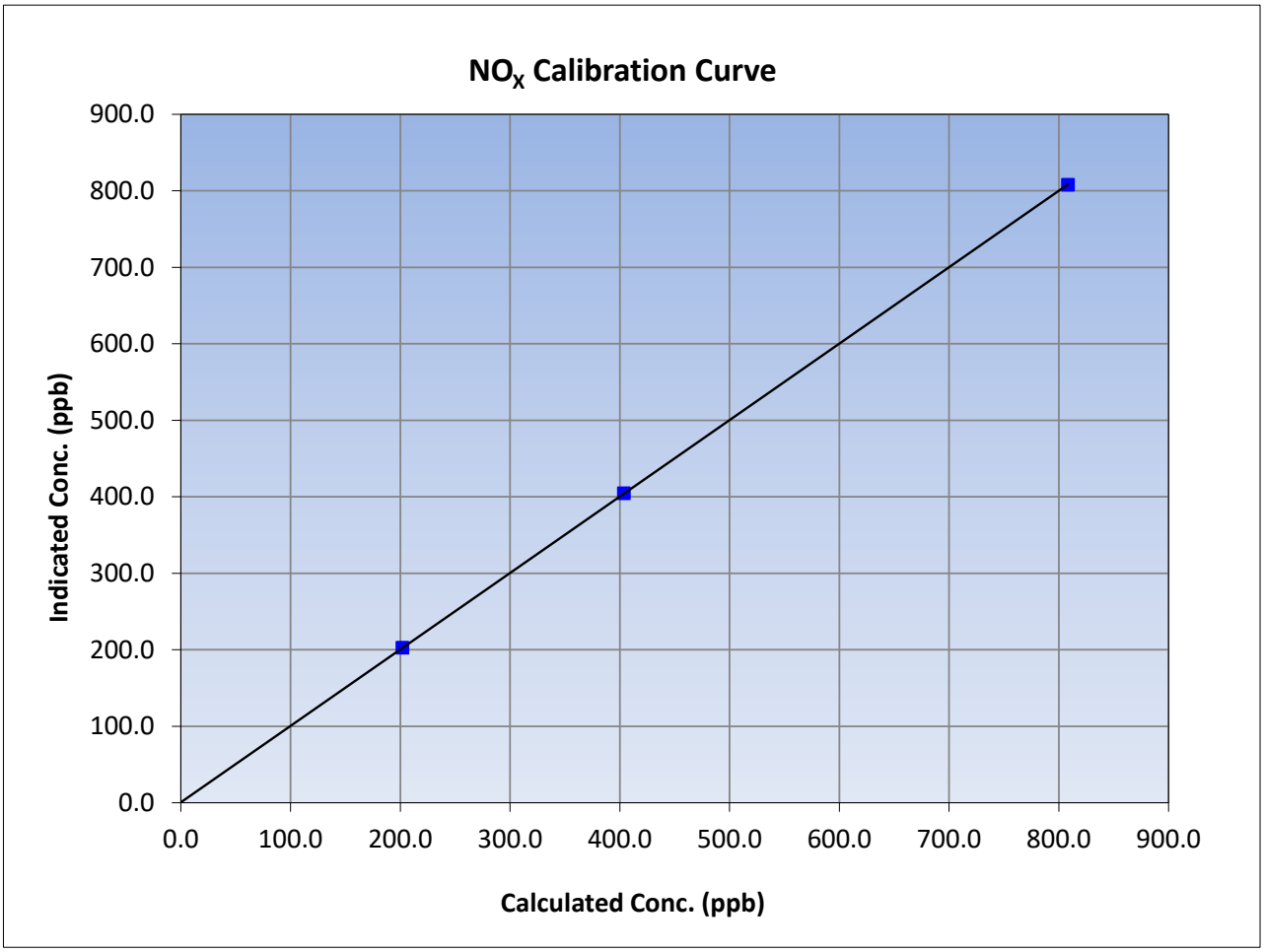
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:07 | End Time (MST): | 14:26 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262593 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999997 | ≥0.995 |
| 808.3 | 808.0 | 1.0003 | | | |
| 403.7 | 404.4 | 0.9983 | Slope | 0.999459 | 0.90 - 1.10 |
| 201.8 | 202.8 | 0.9952 | | | |
| | | | Intercept | 0.518402 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

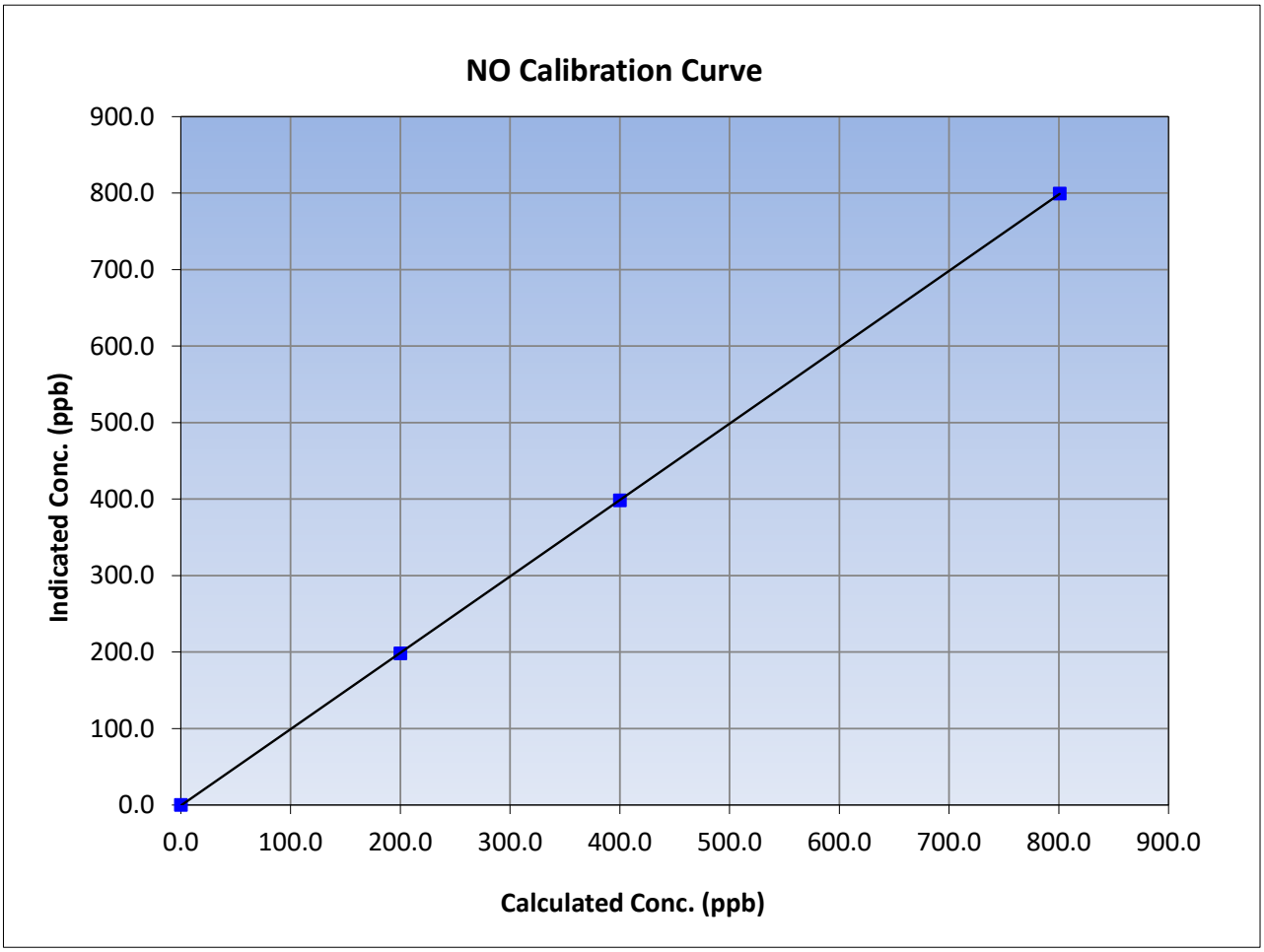
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:07 | End Time (MST): | 14:26 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262593 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 800.7 | 799.3 | 1.0018 | | | |
| 400.0 | 398.3 | 1.0042 | Slope | 0.998611 | 0.90 - 1.10 |
| 200.0 | 198.3 | 1.0083 | | | |
| | | | Intercept | -0.704018 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

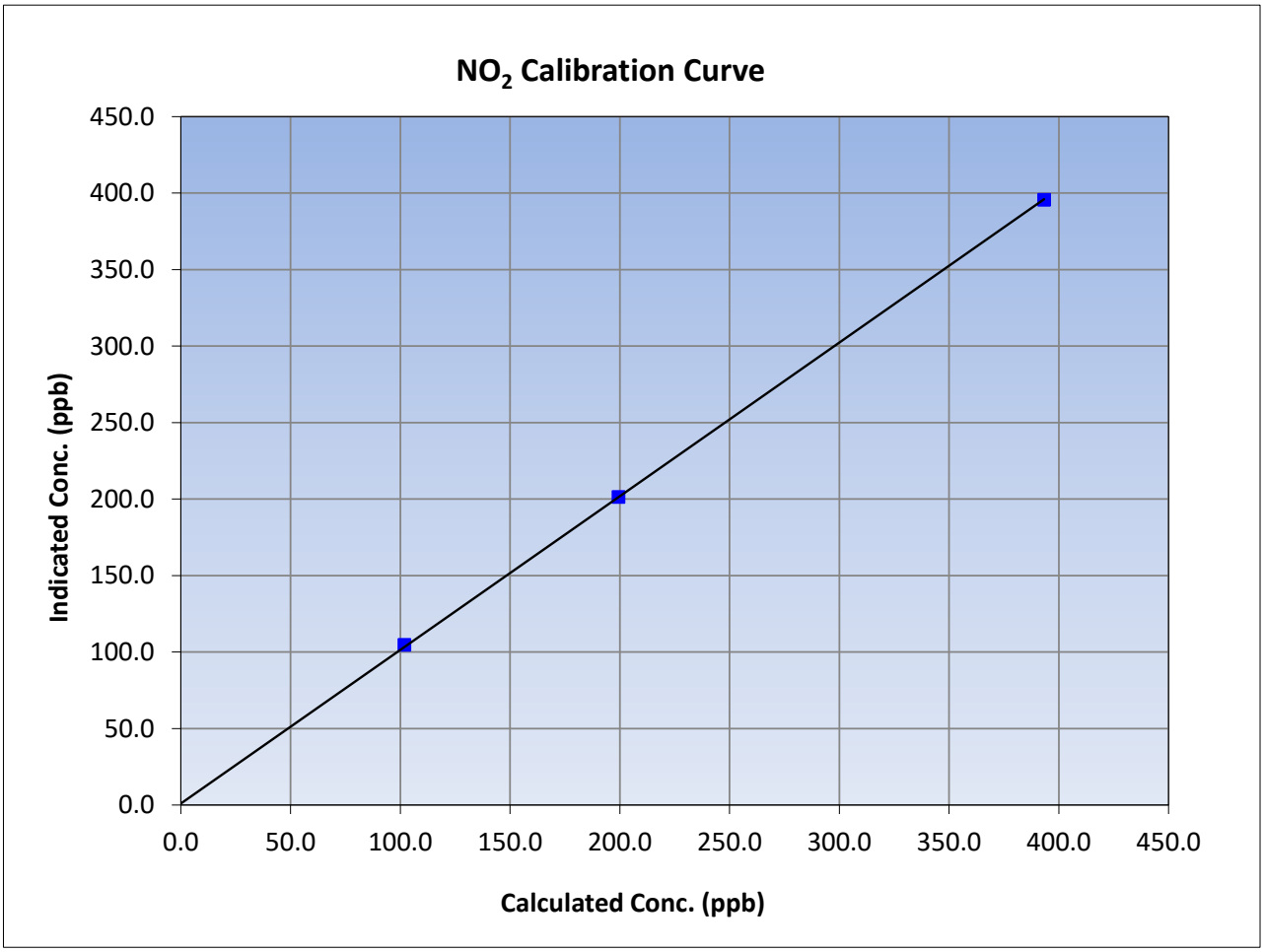
Version-04-2020

### Station Information

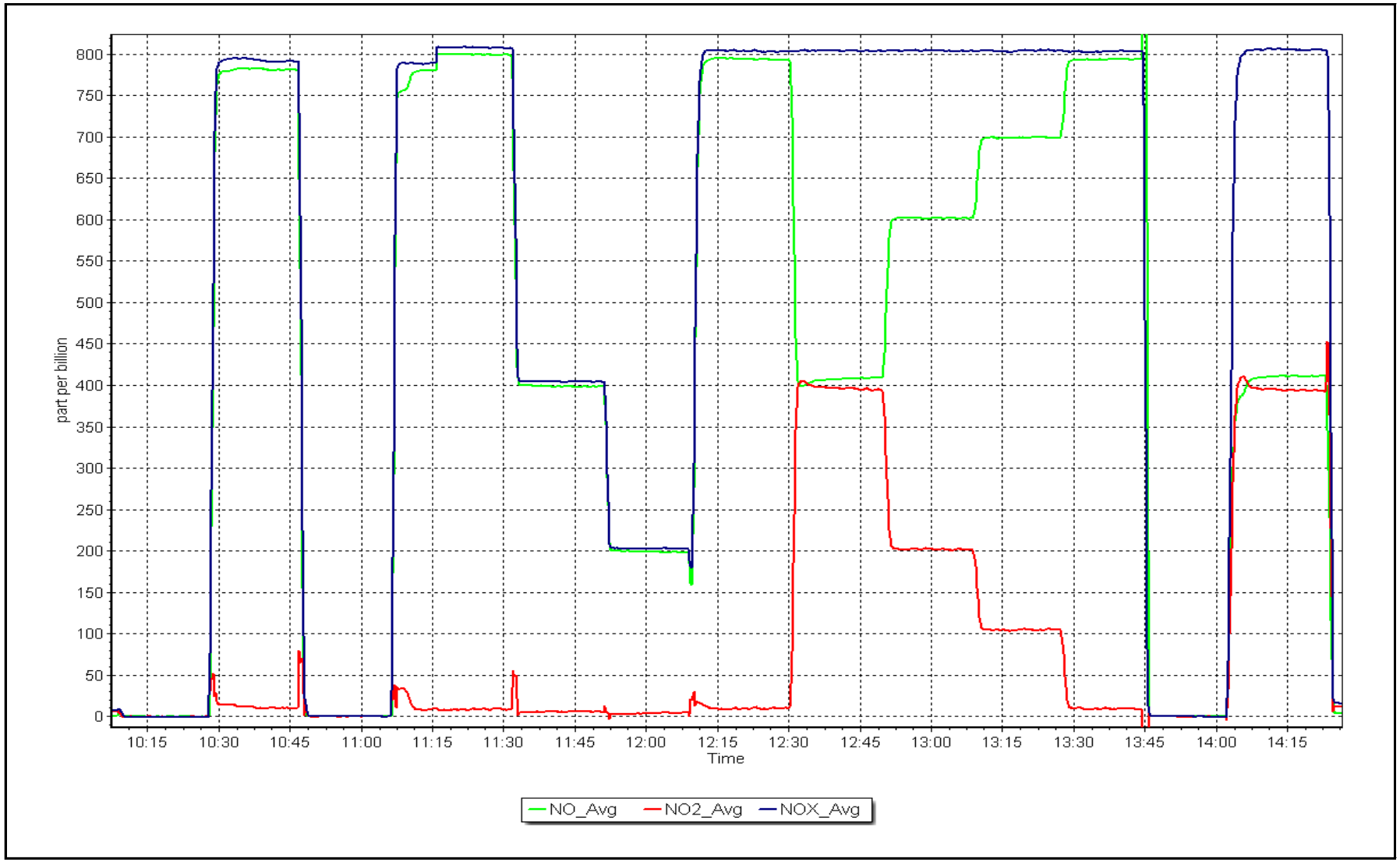
| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:07 | End Time (MST): | 14:26 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262593 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999962 | ≥0.995 |
| 393.3 | 395.6 | 0.9942 | | | |
| 199.4 | 201.4 | 0.9901 | Slope | 1.004419 | 0.90 - 1.10 |
| 101.9 | 104.7 | 0.9733 | | | |
| | | | Intercept | 0.978163 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 13, 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: | February 16, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 12:04 | End time (MST): | 12:39 |
| 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) | -0.10 | -0.11 | -0.10 | ☐ | +/- 2 °C |
| P (mmHg) | 731.10 | 738.88 | 731.10 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.02 | 4.92 | 5.02 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 37.00 | ----- | 37.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 5.60 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

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

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

Date Optical Chamber Cleaned: January 22, 2024

Date Disposable Filter Changed: January 22, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: August 23, 2023

Date RH/T Sensor Cleaned: August 23, 2023

Notes: Inlet head looks good. No adjusments. Leak check passed.

Calibration by: Sean Bala

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS11
## LOWER CAMP

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Lower Camp | Station number: | AMS11 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 7:35 | End time (MST): | 11:09 |
| 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 Make/Model: | Teledyne API T700 | | Serial Number: | 3807 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 196 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 100841398

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.001184 | 0.997880 | Backgd or Offset: | 14.6 | 14.5 |
| Calibration intercept: | -0.069544 | -0.244782 | Coeff or Slope: | 1.034 | 1.034 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as found span | 4932 | 81.4 | 799.6 | 799.9 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 1.0 | ---- |
| high point | 4932 | 81.4 | 799.6 | 798.3 | 1.002 |
| second point | 4959 | 40.7 | 400.9 | 399.3 | 1.004 |
| third point | 4981 | 20.4 | 200.9 | 198.9 | 1.010 |
| as left zero | 5000 | 0.0 | 0.0 | 0.9 | ---- |
| as left span | 4932 | 81.4 | 799.6 | 798.7 | 1.001 |
| | | | | Average Correction Factor | 1.005 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 799.10 | Previous response | 800.52 | *% 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

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

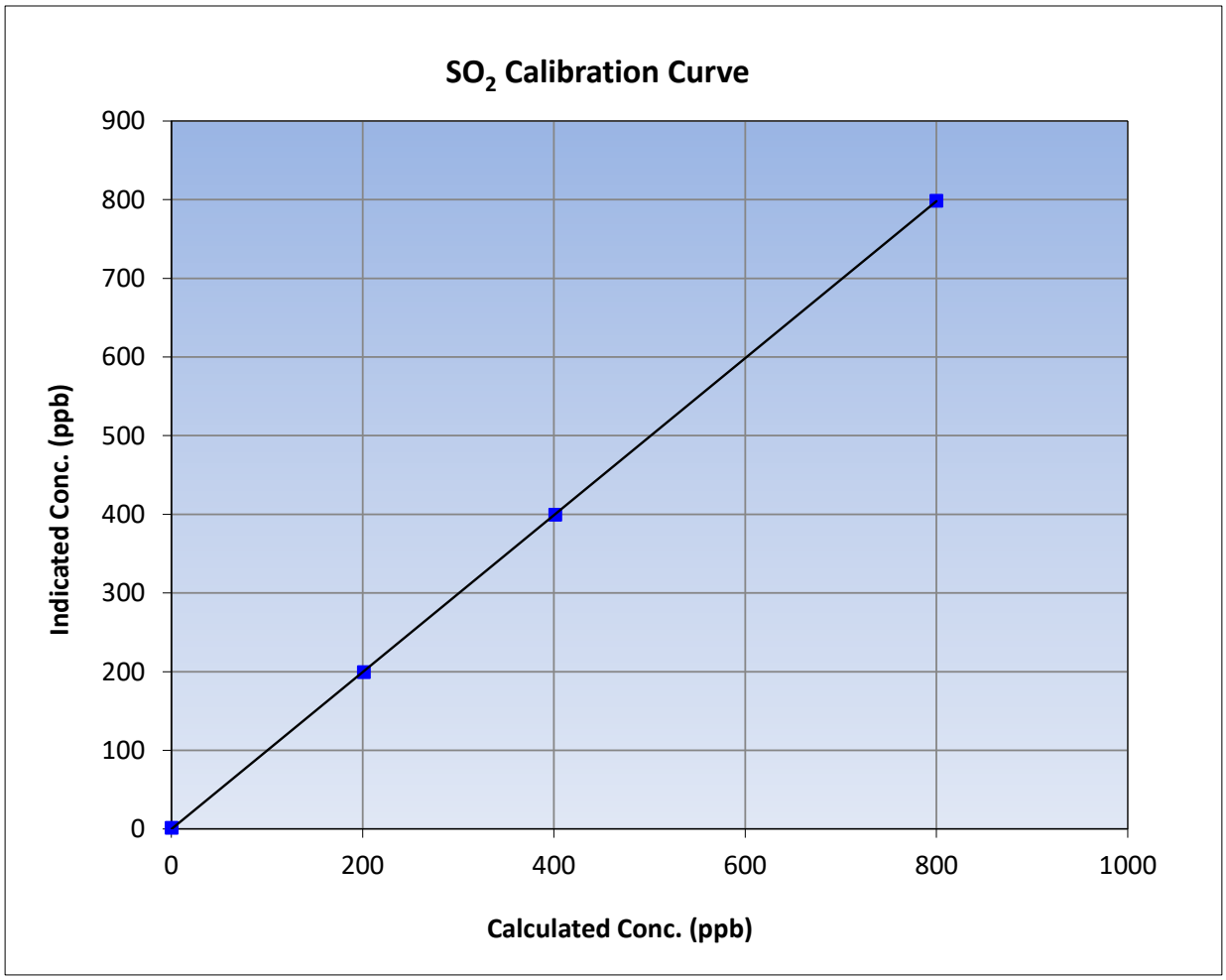
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 7:35 | End Time (MST): | 11:09 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 100841398 |

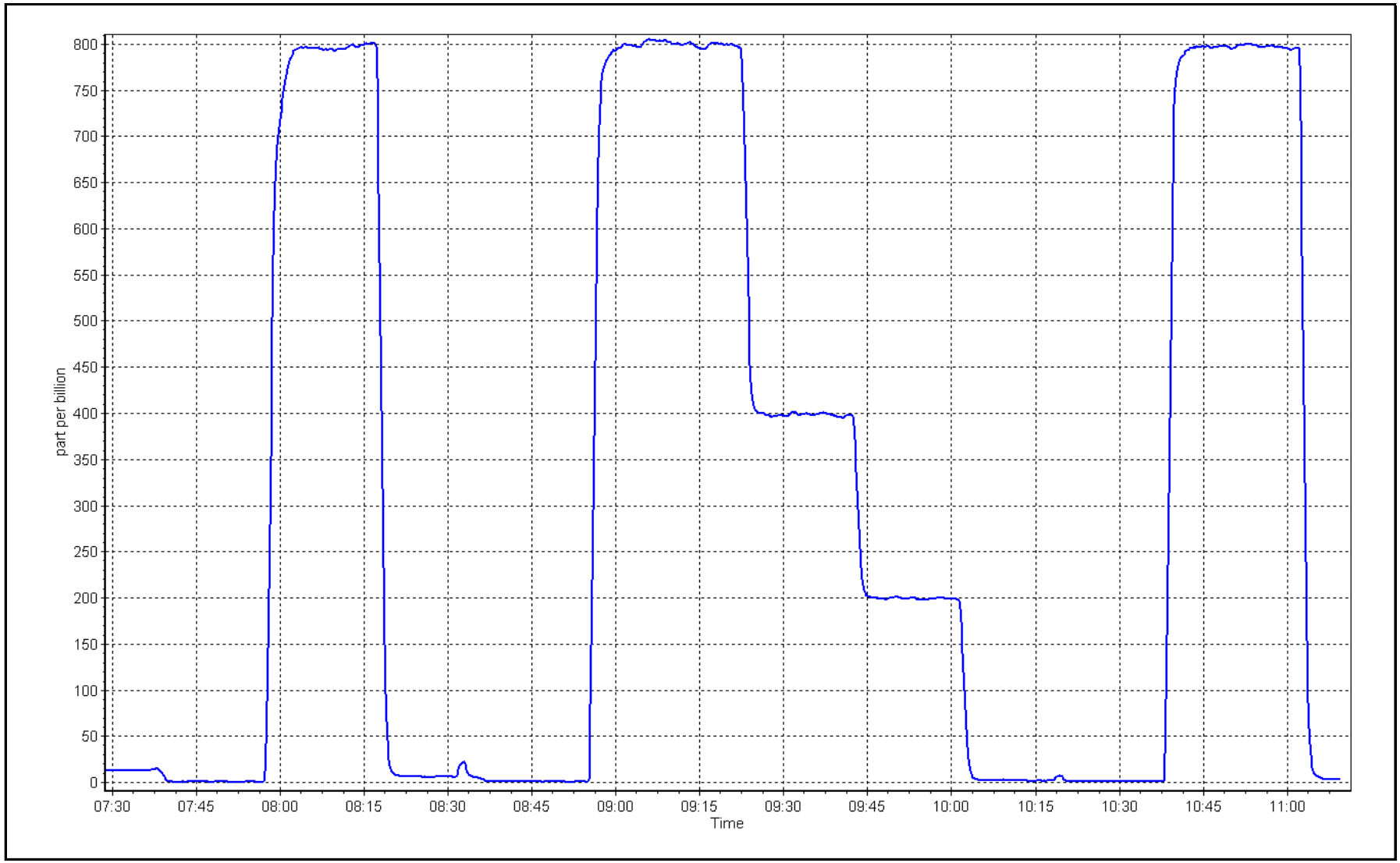
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 1.0 | ---- |
| 799.6 | 798.3 | 1.0017 |
| 400.9 | 399.3 | 1.0041 |
| 200.9 | 198.9 | 1.0100 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999989 | *≥0.995* |
| Slope | 0.997880 | *0.90 - 1.10* |
| Intercept | -0.244782 | *+/-30* |



**SO2 Calibration Plot** Date: February 15, 2024 Location: Lower Camp



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Lower Camp | Station number: | AMS11 |
| Calibration Date: | February 28, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 14:30 |
| Reason: | As Found | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.429 | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #: | CC501097 | | | |
| Removed Cal Gas Conc: | 5.429 | 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 450iQ | | Analyzer serial #: | CM20080003 | |
| Converter make: | NA | | Converter serial #: | NA | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.992455 | | Backgd or Offset: | 15.9 | NA |
| Calibration intercept: | -0.204215 | | Coeff or Slope: | 1.015 | NA |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.5 | ---- |
| as found span | 4926 | 73.6 | 79.9 | 79.5 | 0.999 |
| as found 2nd point | 4963 | 36.8 | 40.0 | 39.9 | 0.989 |
| as found 3rd point | 4982 | 18.6 | 20.2 | 19.7 | 1.000 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| SO2 Scrubber Check | | | | | |

| | | | |
|---|---|---|---|
| Date of last scrubber change: | | Ave Corr Factor | |
| Date of last converter efficiency test: | | | efficiency |

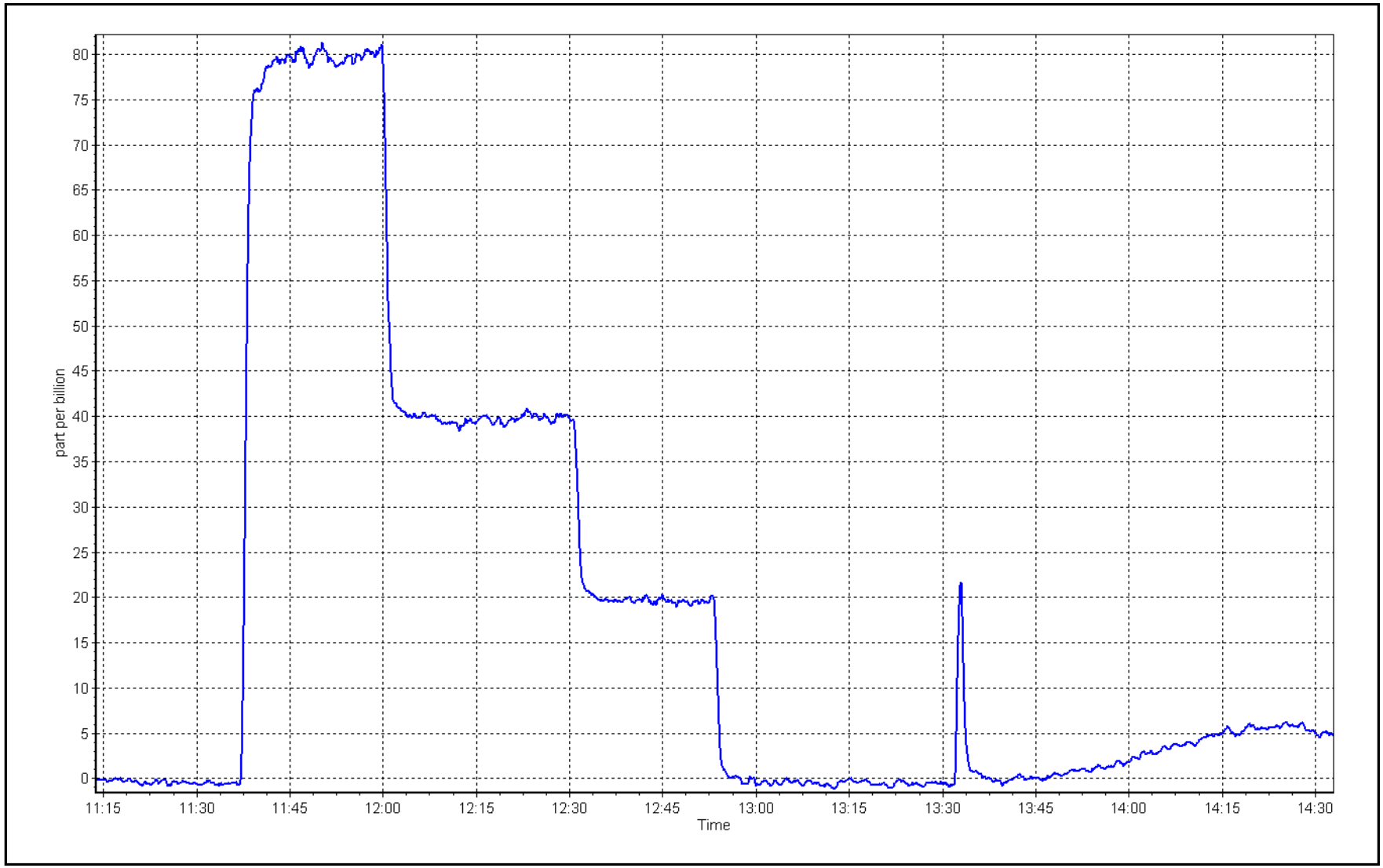
| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.0 | Prev response: | 79.11 | *% change: | 1.1% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.001611 | AF Intercept: | -0.424852 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999965 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. Performed a scrubber check after calibrator zero, and it failed. Halted the calibration and opted to replace the scrubber beads. We'll resume and complete the calibration tomorrow.

Calibration Performed By: Mohammed Kashif

**$H_2S$ Calibration Plot** Date: February 28, 2024 Location: Lower Camp



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Lower Camp | Station number: | AMS11 |
| Calibration Date: | February 29, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 10:15 | End time (MST): | 13:01 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.429 | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #: | CC501097 | | | |
| Removed Cal Gas Conc: | 5.429 | 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 450iQ | | Analyzer serial #: | CM20080003 | |
| Converter make: | NA | | Converter serial #: | NA | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.992455 | 1.011205 | Backgd or Offset: | 15.9 | 15.8 |
| Calibration intercept: | -0.204215 | -0.085817 | Coeff or Slope: | 1.015 | 1.015 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4926 | 73.6 | 79.9 | 80.8 | 0.989 |
| second point | 4963 | 36.8 | 40.0 | 40.2 | 0.994 |
| third point | 4982 | 18.6 | 20.2 | 20.3 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4926 | 73.6 | 79.9 | 80.3 | 0.995 |
| SO2 Scrubber Check | 4935 | 81.5 | 812.3 | -0.1 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.993 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | NA | Prev response: | NA | *% change: | NA |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | NA | AF Intercept: | NA |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | NA | | |

* = > +/-5% change initiates investigation

Notes: Yesterday, the scrubber beads and sample filter were replaced. Performed a scrubber check after calibrator zero, and it passed. Adjusted zero only.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

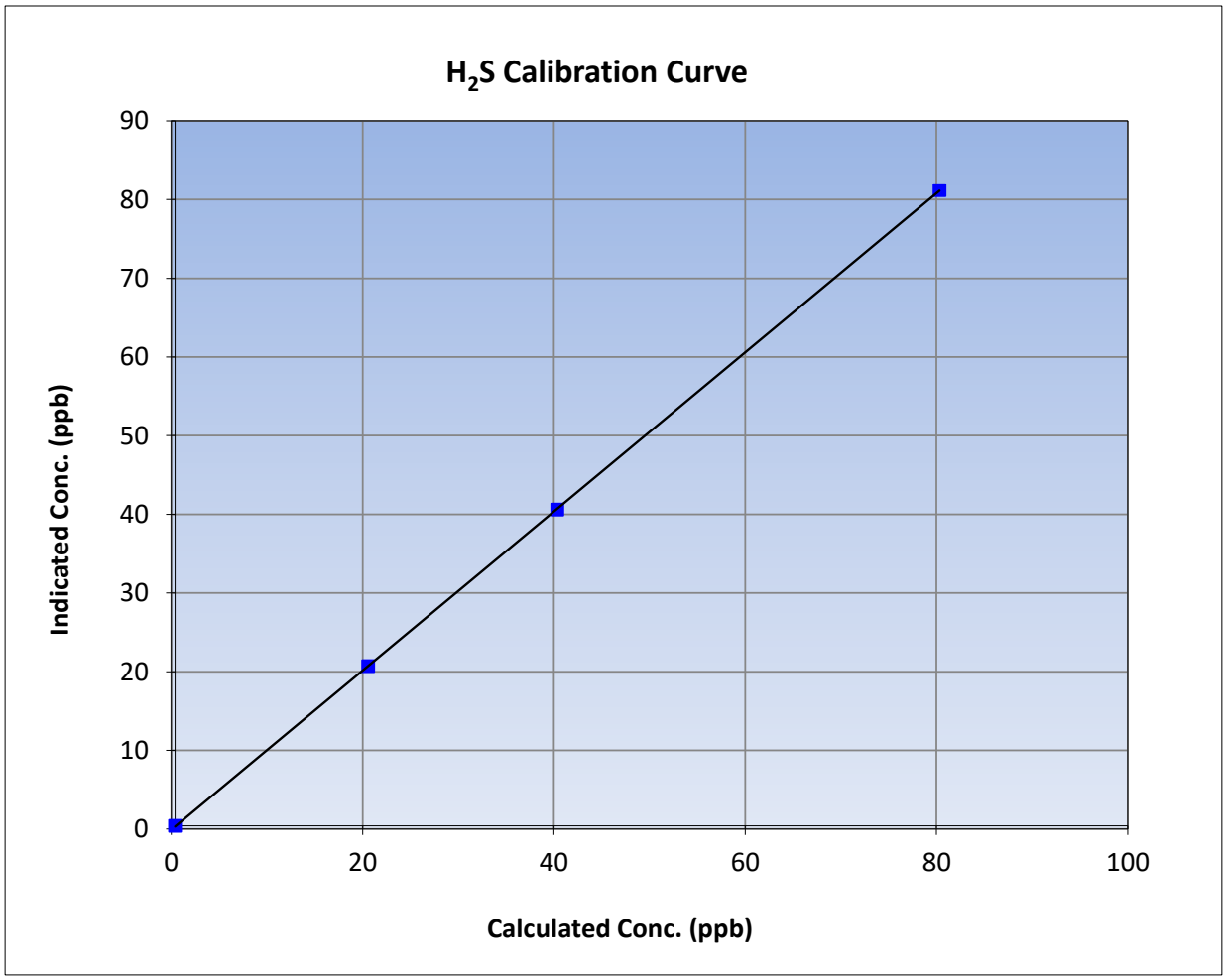
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 29, 2024 | Previous Calibration: | January 22, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 10:15 | End Time (MST): | 13:01 |
| Analyzer make: | Thermo 450iQ | Analyzer serial #: | CM20080003 |

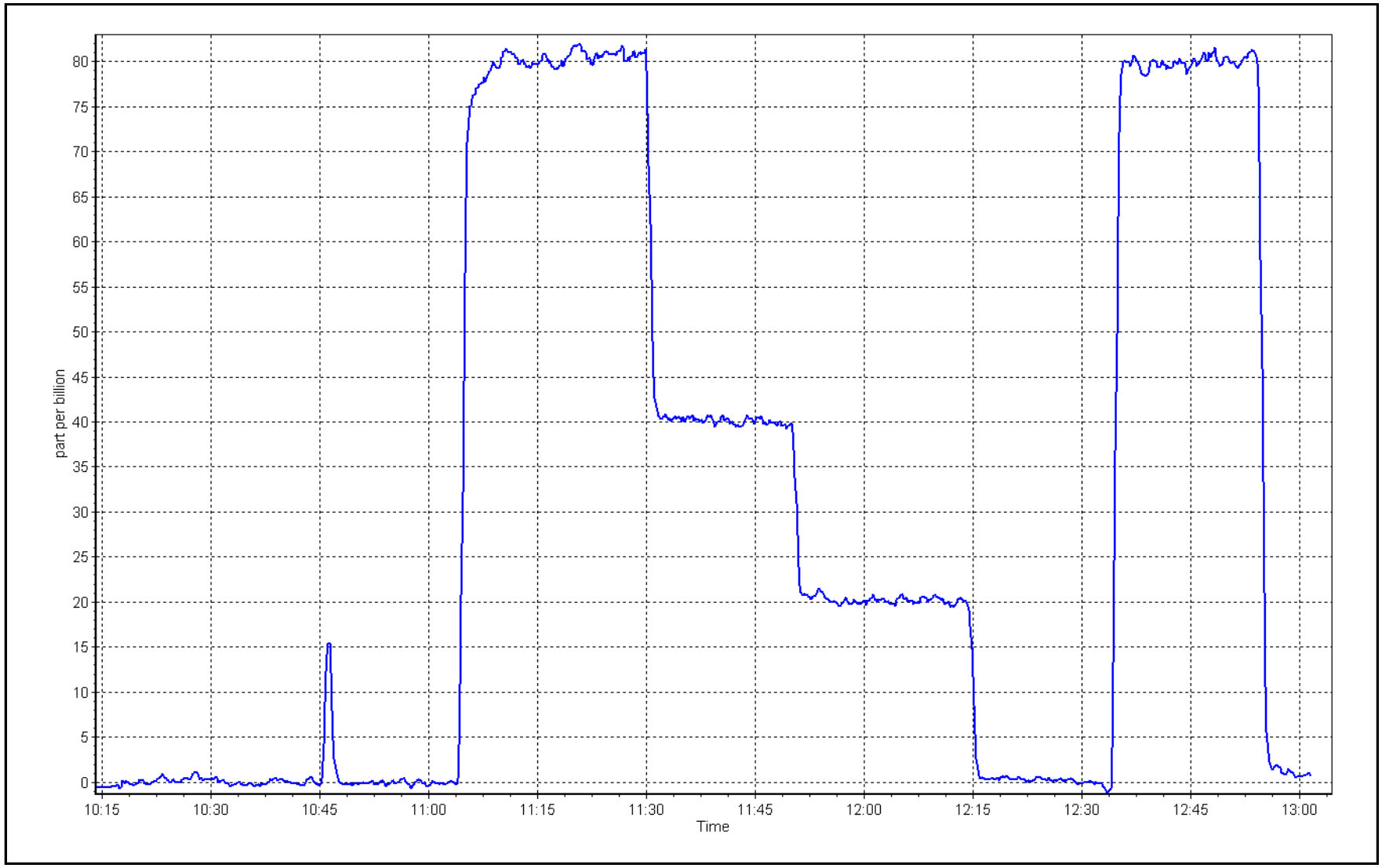
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 79.9 | 80.8 | 0.9891 |
| 40.0 | 40.2 | 0.9940 |
| 20.2 | 20.3 | 0.9948 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 1.011205 | *0.90 - 1.10* |
| Intercept | -0.085817 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 29, 2024 Location: Lower Camp



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Lower Camp | Station number: | AMS11 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 7:35 | End time (MST): | 11:09 |
| 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: | | | Removed Gas Expiry: | | |
| 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 196 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1505164381 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 3.00E-04 | 2.88E-04 | NMHC SP Ratio: | 5.77E-05 | 5.30E-05 |
| CH4 Retention time: | 14.2 | 14.6 | NMHC Peak Area: | 158880 | 173476 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4932 | 81.4 | 17.33 | 18.43 | 0.940 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4932 | 81.4 | 17.33 | 17.35 | 0.999 |
| second point | 4959 | 40.7 | 8.69 | 8.63 | 1.006 |
| third point | 4981 | 20.4 | 4.35 | 4.31 | 1.010 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4932 | 81.4 | 17.33 | 17.49 | 0.990 |
| | | | | Average Correction Factor | 1.005 |
| Baseline Corr AF: | 18.43 | Prev response | 17.29 | *% change | 6.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4932 | 81.4 | 9.18 | 9.97 | 0.921 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4932 | 81.4 | 9.18 | 9.19 | 0.998 |
| second point | 4959 | 40.7 | 4.60 | 4.57 | 1.006 |
| third point | 4981 | 20.4 | 2.31 | 2.28 | 1.011 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4932 | 81.4 | 9.18 | 9.23 | 0.995 |
| | | | | Average Correction Factor | 1.005 |
| Baseline Corr AF: | 9.97 | Prev response | 9.20 | *% change | 7.7% |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4932 | 81.4 | 8.15 | 8.47 | 0.963 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4932 | 81.4 | 8.15 | 8.16 | 0.999 |
| second point | 4959 | 40.7 | 4.09 | 4.06 | 1.006 |
| third point | 4981 | 20.4 | 2.05 | 2.03 | 1.009 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4932 | 81.4 | 8.15 | 8.27 | 0.986 |
| | | | | Average Correction Factor | 1.005 |
| Baseline Corr AF: | 8.47 | Prev response | 8.09 | *% change | 4.4% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.998445 | 1.001990 |
| THC Cal Offset: | -0.009595 | -0.033339 |
| CH4 Cal Slope: | 0.993827 | 1.001462 |
| CH4 Cal Offset: | -0.006092 | -0.014179 |
| NMHC Cal Slope: | 1.002671 | 1.002471 |
| NMHC Cal Offset: | -0.003503 | -0.018960 |

Notes: Changed sample inlet filter and Nitrogen cylinder after as founds. Adjusted span only.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

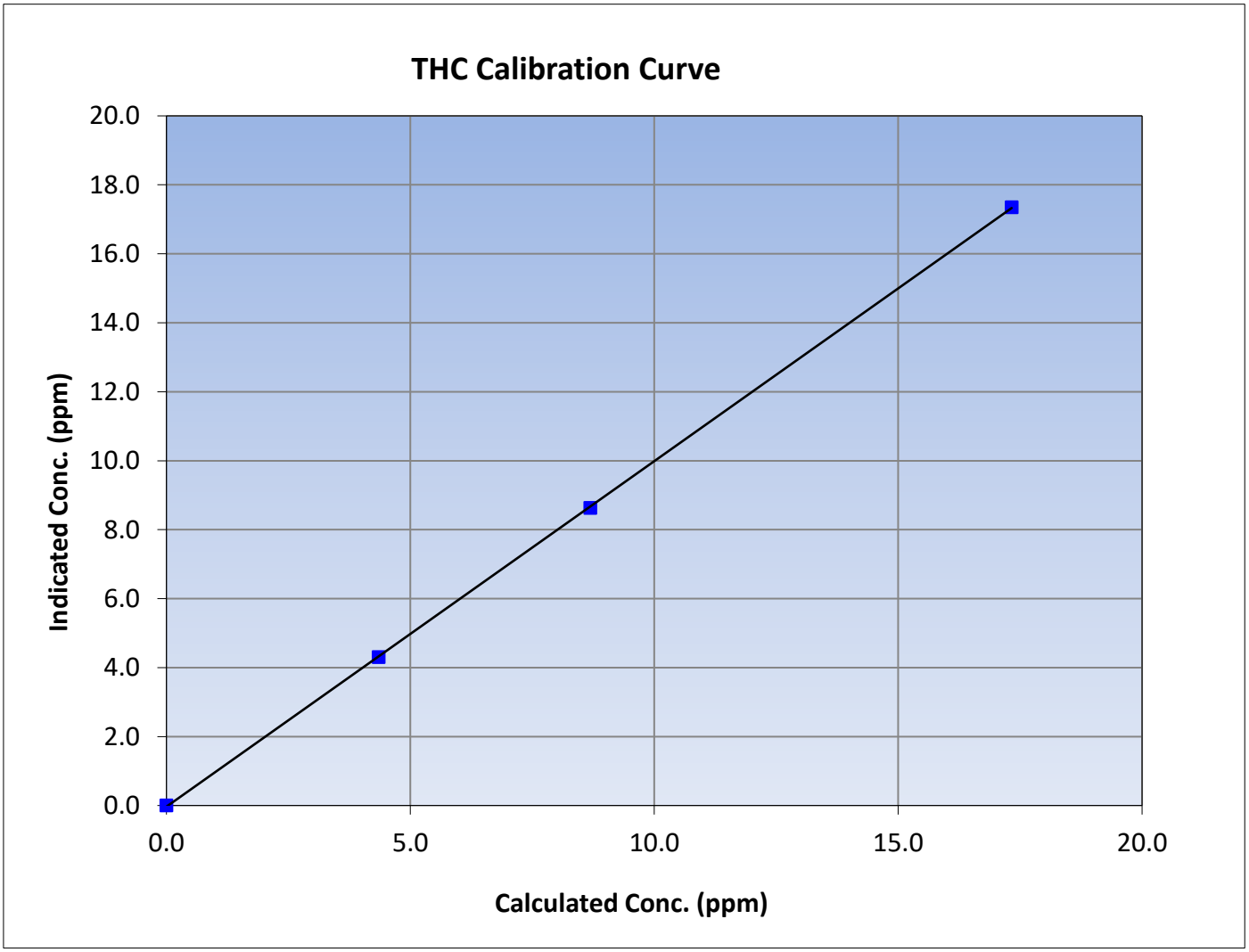
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 7:35 | End Time (MST): | 11:09 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1505164381 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999979 | *≥0.995* |
| 17.33 | 17.35 | 0.9986 | | | |
| 8.69 | 8.63 | 1.0061 | Slope | 1.001990 | *0.90 - 1.10* |
| 4.35 | 4.31 | 1.0104 | | | |
| | | | Intercept | -0.033339 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

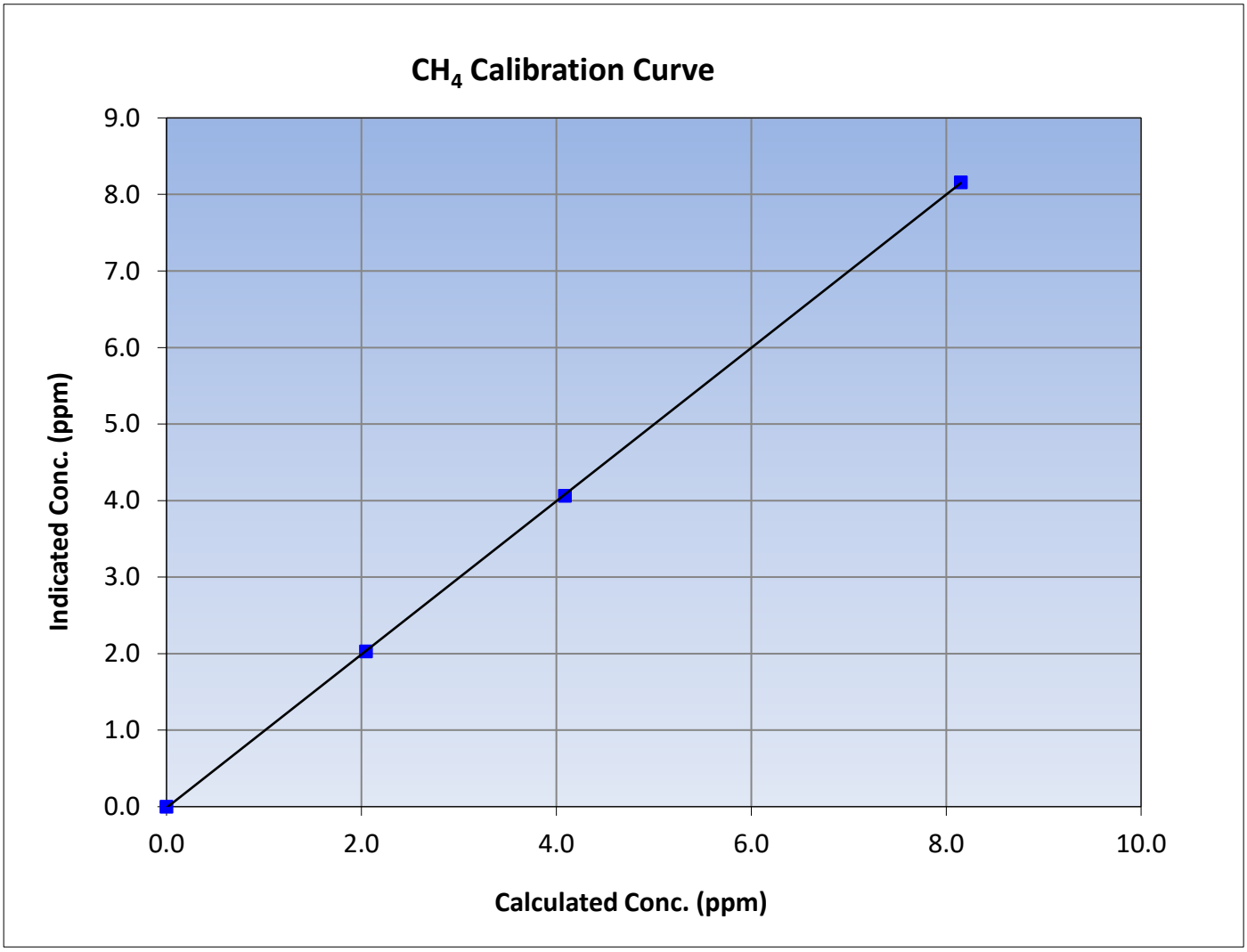
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 7:35 | End Time (MST): | 11:09 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1505164381 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999982 | *≥0.995* |
| 8.15 | 8.16 | 0.9990 | | | |
| 4.09 | 4.06 | 1.0063 | Slope | 1.001462 | *0.90 - 1.10* |
| 2.05 | 2.03 | 1.0092 | | | |
| | | | Intercept | -0.014179 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

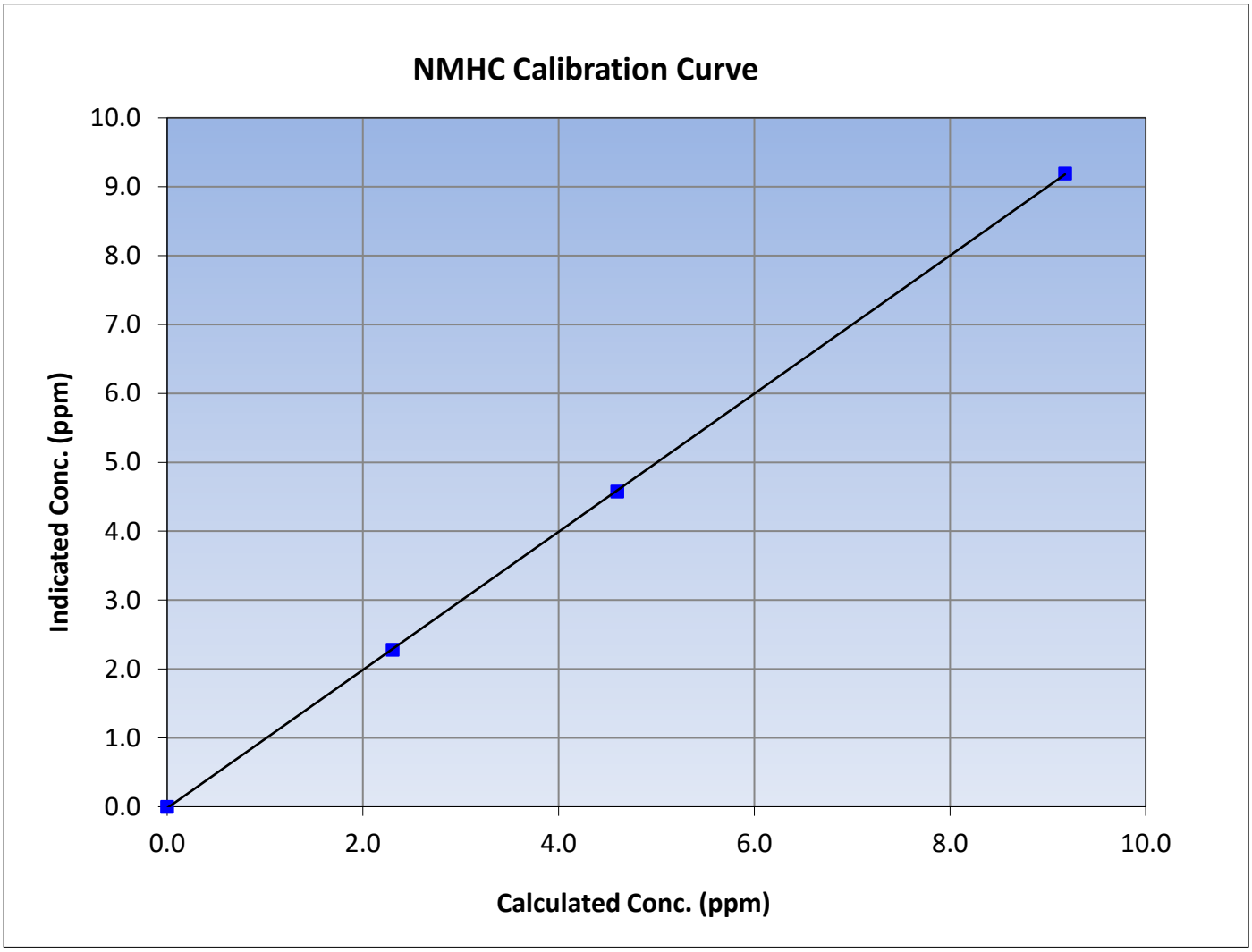
Version-06-2022

### Station Information

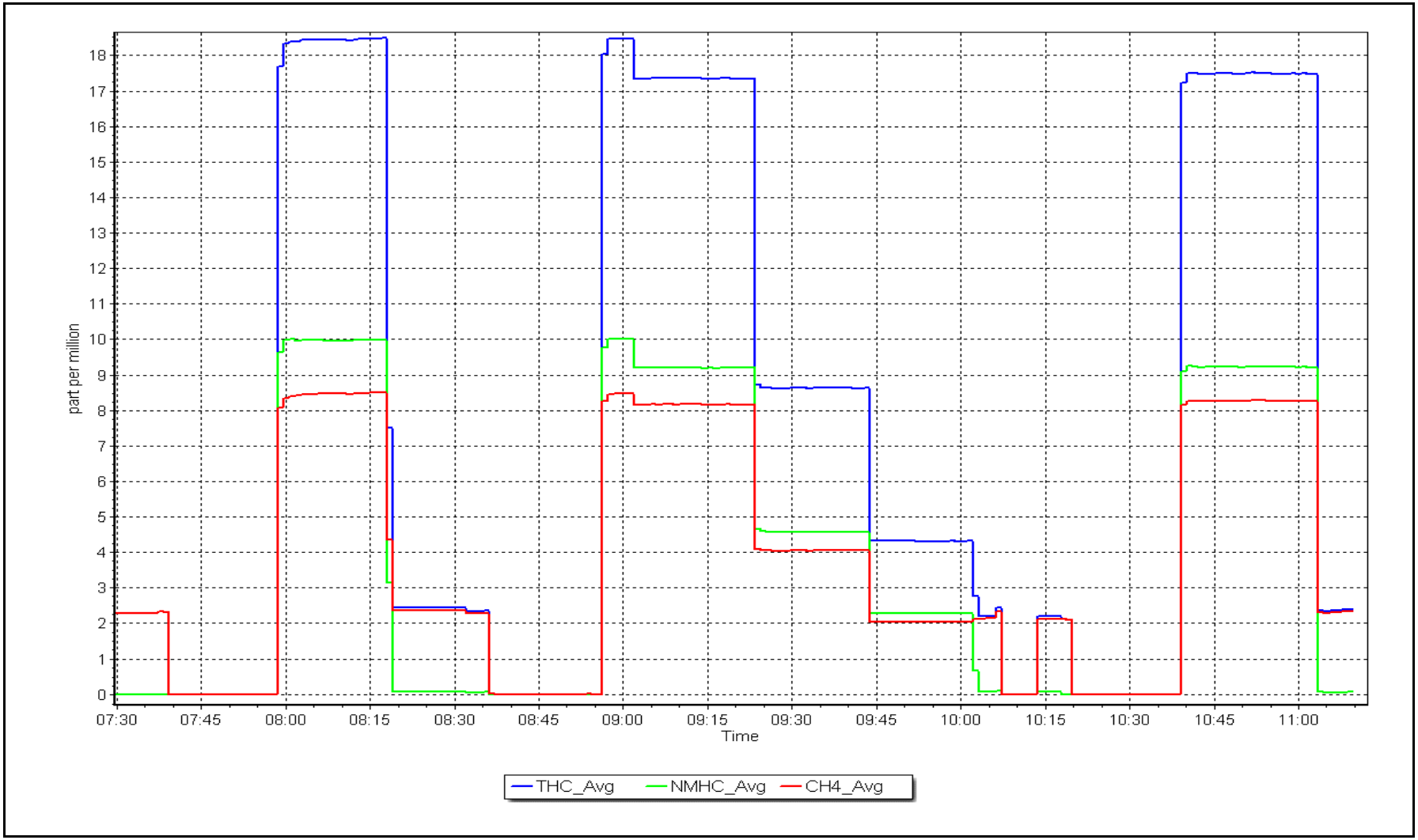
| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 7:35 | End Time (MST): | 11:09 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1505164381 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999978 | *≥0.995* |
| 9.18 | 9.19 | 0.9982 | | | |
| 4.60 | 4.57 | 1.0058 | Slope | 1.002471 | *0.90 - 1.10* |
| 2.31 | 2.28 | 1.0114 | | | |
| | | | Intercept | -0.018960 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 15, 2024 Location: Lower Camp



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS13
## FORT MCKAY SOUTH

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS13 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 10:25 | End time (MST): | 13:58 |
| 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: | N/A |
| Removed Gas Cyl #: | N/A | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 2448 |
| ZAG Make/Model: | API 701 | | Serial Number: | 1117 |

### Analyzer Information

Analyzer make: API T100 Analyzer serial #: 599

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.003443 | 1.003642 | Backgd or Offset: | 87.3 | 90.0 |
| Calibration intercept: | -2.798230 | -2.718121 | Coeff or Slope: | 0.713 | 0.711 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 1.1 | ---- |
| as found span | 4921 | 79.1 | 799.7 | 803.2 | 0.996 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| high point | 4921 | 79.1 | 799.7 | 801.0 | 0.998 |
| second point | 4961 | 39.5 | 399.3 | 397.2 | 1.005 |
| third point | 4980 | 19.8 | 200.2 | 195.4 | 1.024 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4921 | 79.1 | 799.7 | 800.2 | 0.999 |
| | | | | Average Correction Factor | 1.009 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.10 | Previous response | 799.64 | *% 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

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

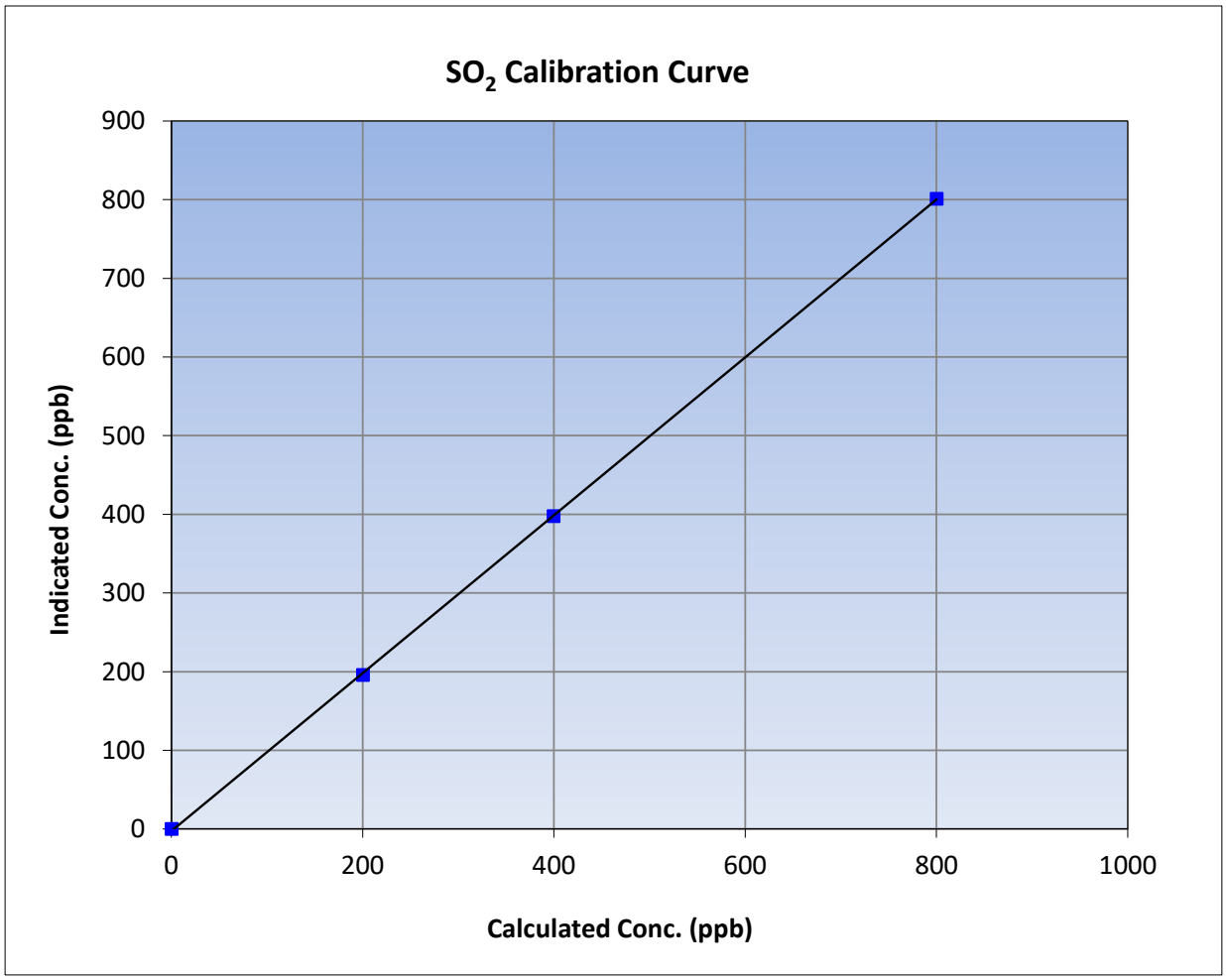
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:25 | End Time (MST): | 13:58 |
| Analyzer make: | API T100 | Analyzer serial #: | 599 |

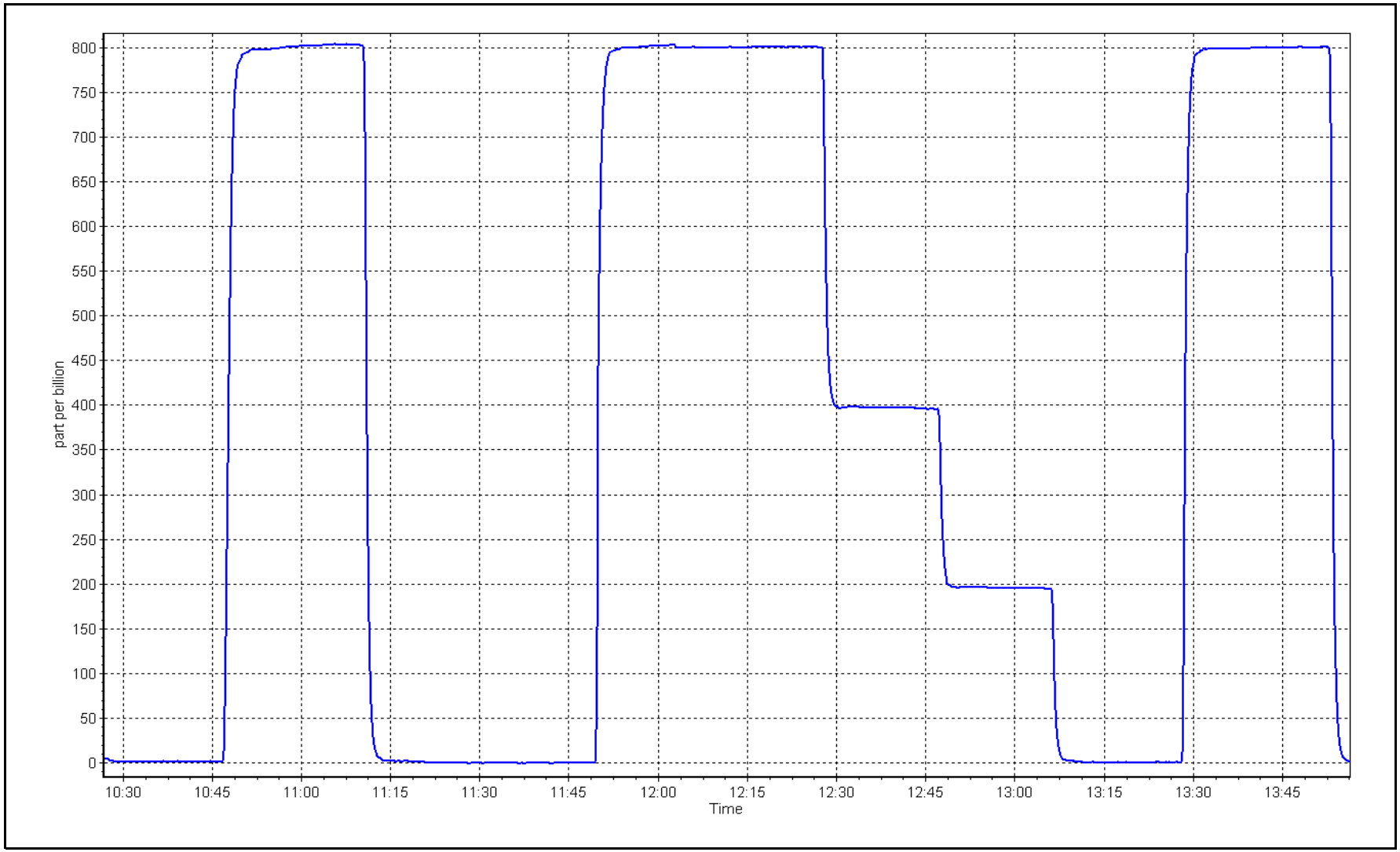
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.2 | ---- |
| 799.7 | 801.0 | 0.9984 |
| 399.3 | 397.2 | 1.0053 |
| 200.2 | 195.4 | 1.0245 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999954 | *≥0.995* |
| Slope | 1.003642 | *0.90 - 1.10* |
| Intercept | -2.718121 | *+/-30* |



**SO2 Calibration Plot** Date: February 12, 2024 Location: Fort McKay South



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS13 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 9:48 | End time (MST): | 14:19 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.34 | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #: | CC500241 | | | |
| Removed Cal Gas Conc: | 5.34 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 2448 |
| ZAG Make/Model: | Teledyne API 701 | | Serial Number: | 1117 |

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.997527 | 1.001638 | Backgd or Offset: | 4.15 | 4.15 |
| Calibration intercept: | -0.182182 | -0.302148 | Coeff or Slope: | 1.157 | 1.157 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.4 | ---- |
| as found span | 4925 | 75.5 | 80.6 | 80.5 | 0.997 |
| as found 2nd point | 4962 | 37.7 | 40.3 | 39.9 | 0.999 |
| as found 3rd point | 4981 | 18.9 | 20.2 | 19.4 | 1.019 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| high point | 4925 | 75.5 | 80.6 | 80.4 | 1.003 |
| second point | 4962 | 37.7 | 40.3 | 40.2 | 1.002 |
| third point | 4981 | 18.9 | 20.2 | 19.8 | 1.019 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4925 | 75.5 | 80.6 | 79.9 | 1.009 |
| SO2 Scrubber Check | 4921 | 79.1 | 791.0 | 0.1 | ---- |
| Date of last scrubber change: | | 20-Mar-20 | | Ave Corr Factor | 1.008 |
| Date of last converter efficiency test: | | NA | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.9 | Prev response: | 80.24 | *% change: | 0.8% |
| Baseline Corr 2nd AF pt: | 40.3 | AF Slope: | 1.005182 | AF Intercept: | -0.602173 |
| Baseline Corr 3rd AF pt: | 19.8 | AF Correlation: | 0.999964 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

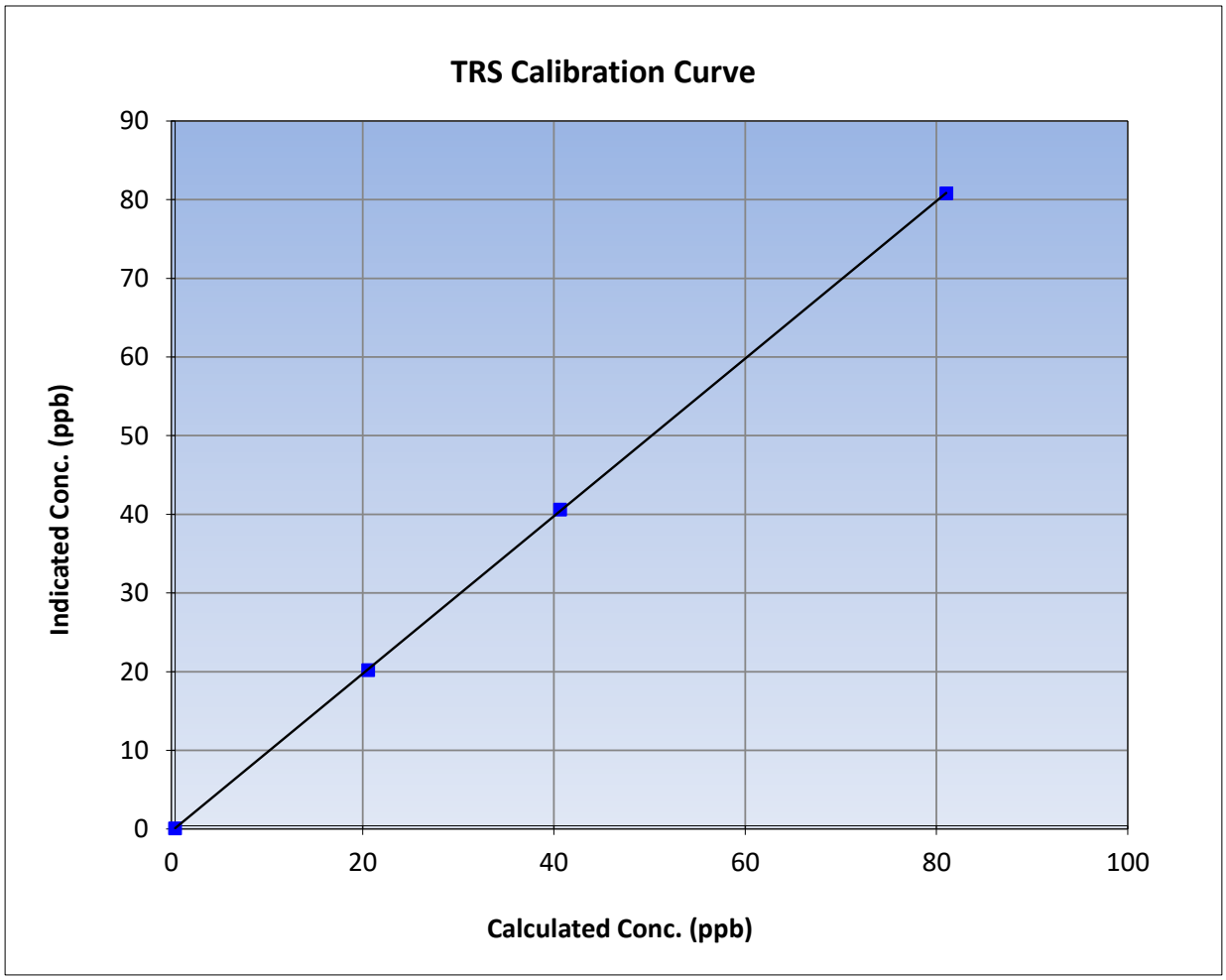
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 9:48 | End Time (MST): | 14:19 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1180540017 |

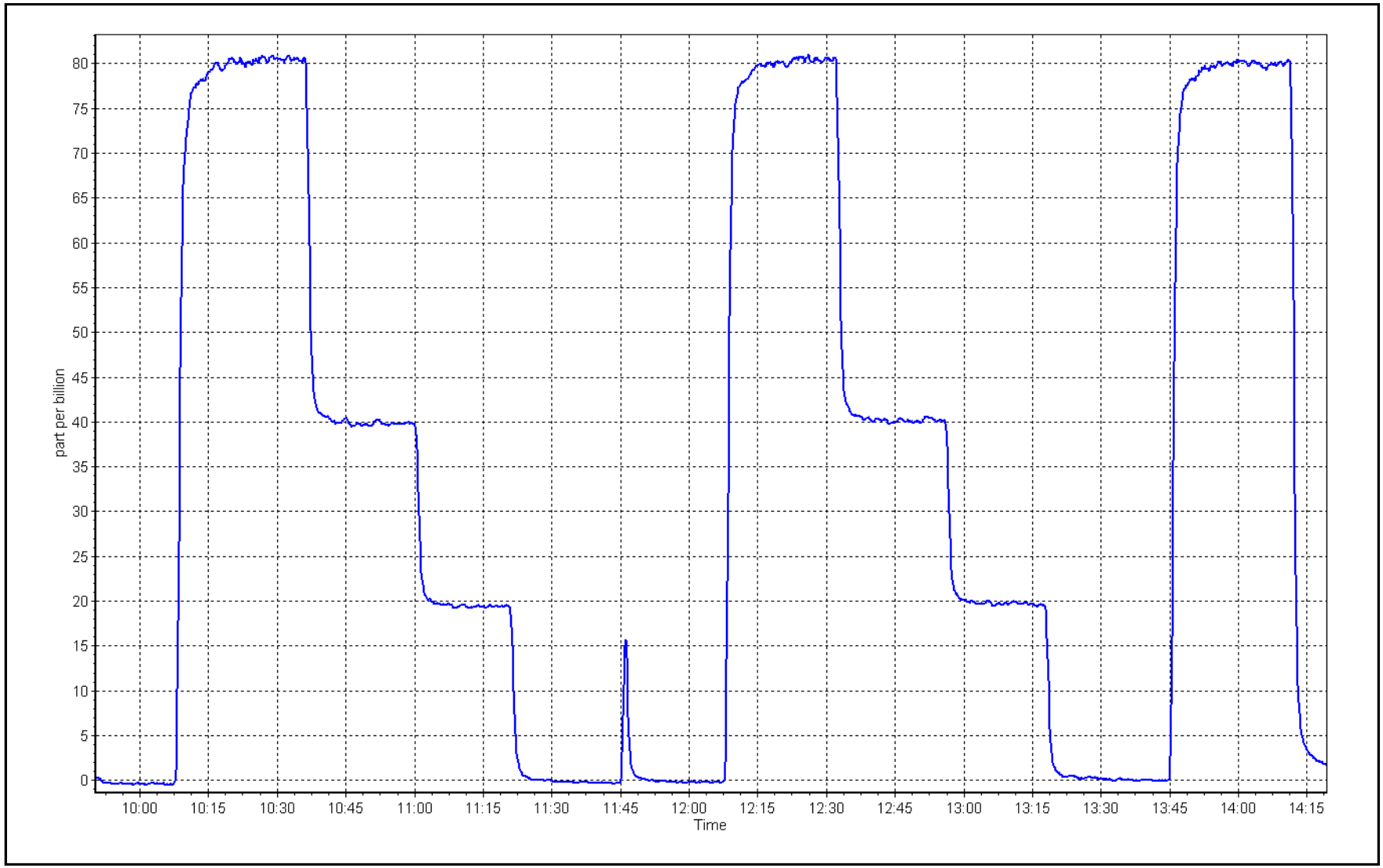
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.3 | ---- |
| 80.6 | 80.4 | 1.0028 |
| 40.3 | 40.2 | 1.0016 |
| 20.2 | 19.8 | 1.0195 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999987 | *≥0.995* |
| Slope | 1.001638 | *0.90 - 1.10* |
| Intercept | -0.302148 | *+/-3* |



**TRS Calibration Plot** Date: February 6, 2024 Location: Fort McKay South



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS13 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 10:25 | End time (MST): | 13:58 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC260812 | Cal Gas Expiry Date: | December 29, 2028 | |
| 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 | |
| ZAG make/model: | API701 | | Serial Number: | 1117 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1172750023 |
| THC Range (ppm): | 0 - 20 ppm | | |
| NMHC Range (ppm): | 0 - 10 ppm | CH4 Range (ppm): | 0 - 10 ppm |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| CH4 SP Ratio: | 2.94E-04 | 2.94E-04 | NMHC SP Ratio: | 4.74E-05 | 4.83E-05 |
| CH4 Retention time: | 15.00 | 15.20 | NMHC Peak Area: | 191512 | 1879773 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | ON |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.1 | 17.05 | 16.90 | 1.009 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.1 | 17.05 | 17.03 | 1.001 |
| second point | 4961 | 39.5 | 8.51 | 8.40 | 1.013 |
| third point | 4980 | 19.8 | 4.27 | 4.15 | 1.028 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.1 | 17.05 | 16.86 | 1.011 |
| | | | | Average Correction Factor | 1.014 |
| Baseline Corr AF: | 16.90 | Prev response | 17.02 | *% change | -0.7% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.1 | 9.08 | 8.91 | 1.019 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.1 | 9.08 | 9.08 | 1.000 |
| second point | 4961 | 39.5 | 4.53 | 4.51 | 1.006 |
| third point | 4980 | 19.8 | 2.27 | 2.23 | 1.021 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.1 | 9.08 | 8.95 | 1.015 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 8.91 | Prev response | 9.06 | *% change | -1.7% |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.1 | 7.97 | 8.00 | 0.996 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.1 | 7.97 | 7.95 | 1.002 |
| second point | 4961 | 39.5 | 3.98 | 3.90 | 1.020 |
| third point | 4980 | 19.8 | 1.99 | 1.93 | 1.036 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.1 | 7.97 | 7.91 | 1.007 |
| | | | | Average Correction Factor | 1.019 |
| Baseline Corr AF: | 8.00 | Prev response | 7.97 | *% change | 0.4% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.002747 | 1.000652 |
| THC Cal Offset: | -0.071954 | -0.065578 |
| CH4 Cal Slope: | 1.003122 | 1.000073 |
| CH4 Cal Offset: | -0.024172 | -0.040797 |
| NMHC Cal Slope: | 1.002658 | 1.001197 |
| NMHC Cal Offset: | -0.047981 | -0.024180 |

Notes: Changed inlet filter after as founds. Do zero chromatogram and use flatbaseline. Adjusted span.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## THC Calibration Summary

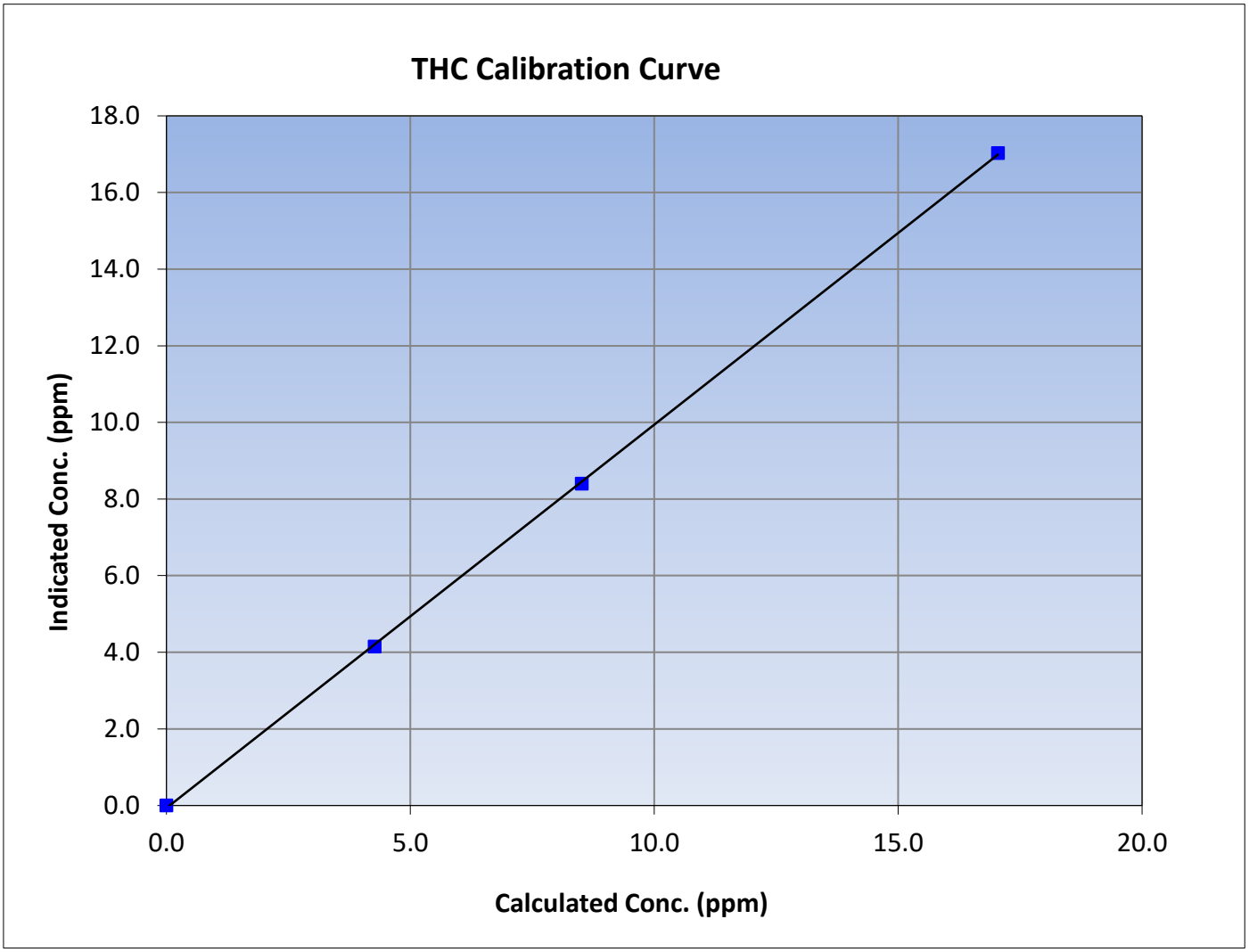
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:25 | End Time (MST): | 13:58 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1172750023 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999930 | ≥0.995 |
| 17.05 | 17.03 | 1.0009 | | | |
| 8.51 | 8.40 | 1.0130 | Slope | 1.000652 | 0.90 - 1.10 |
| 4.27 | 4.15 | 1.0282 | | | |
| | | | Intercept | -0.065578 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

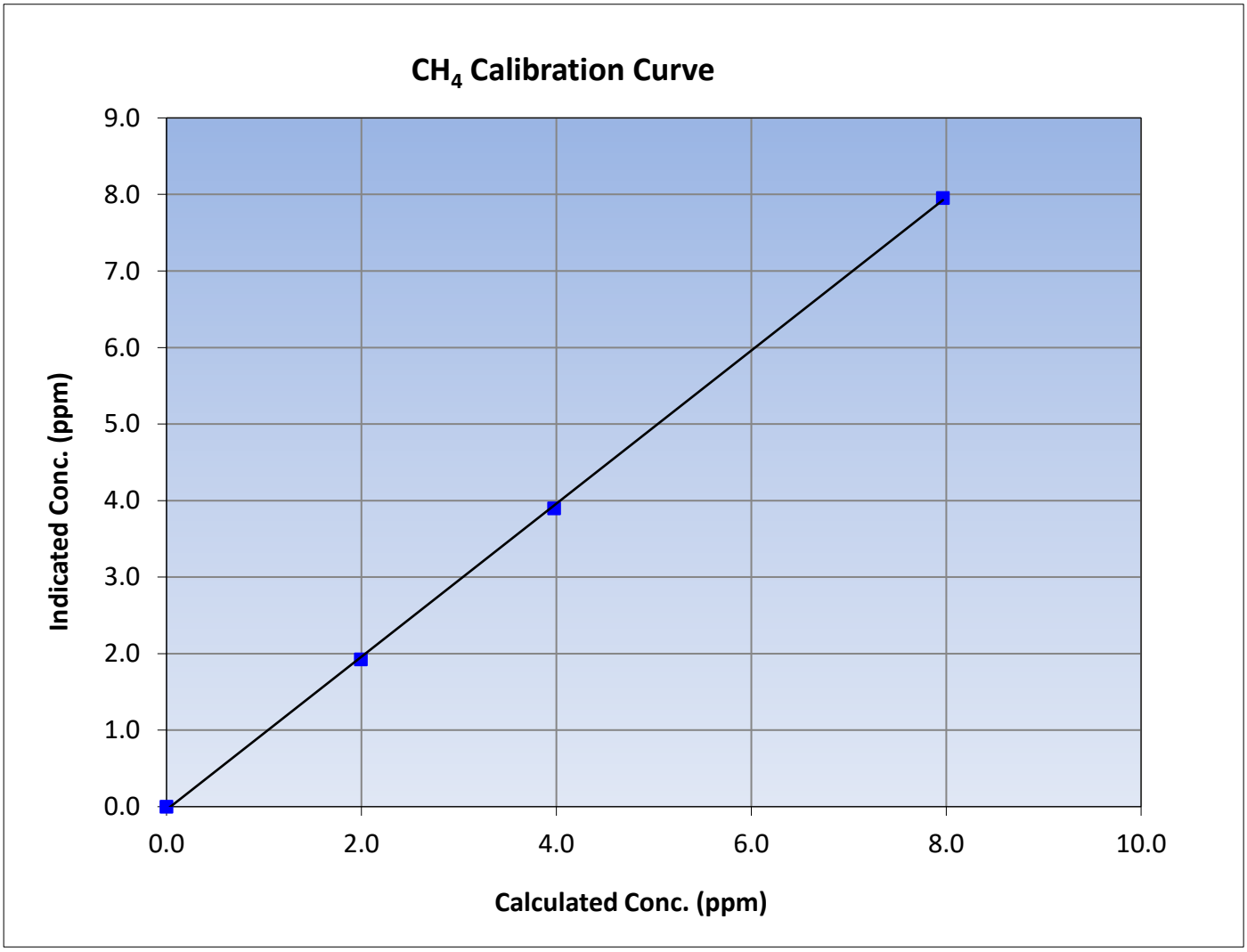
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:25 | End Time (MST): | 13:58 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1172750023 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999865 | *≥0.995* |
| 7.97 | 7.95 | 1.0017 | | | |
| 3.98 | 3.90 | 1.0203 | Slope | 1.000073 | *0.90 - 1.10* |
| 1.99 | 1.93 | 1.0360 | | | |
| | | | Intercept | -0.040797 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

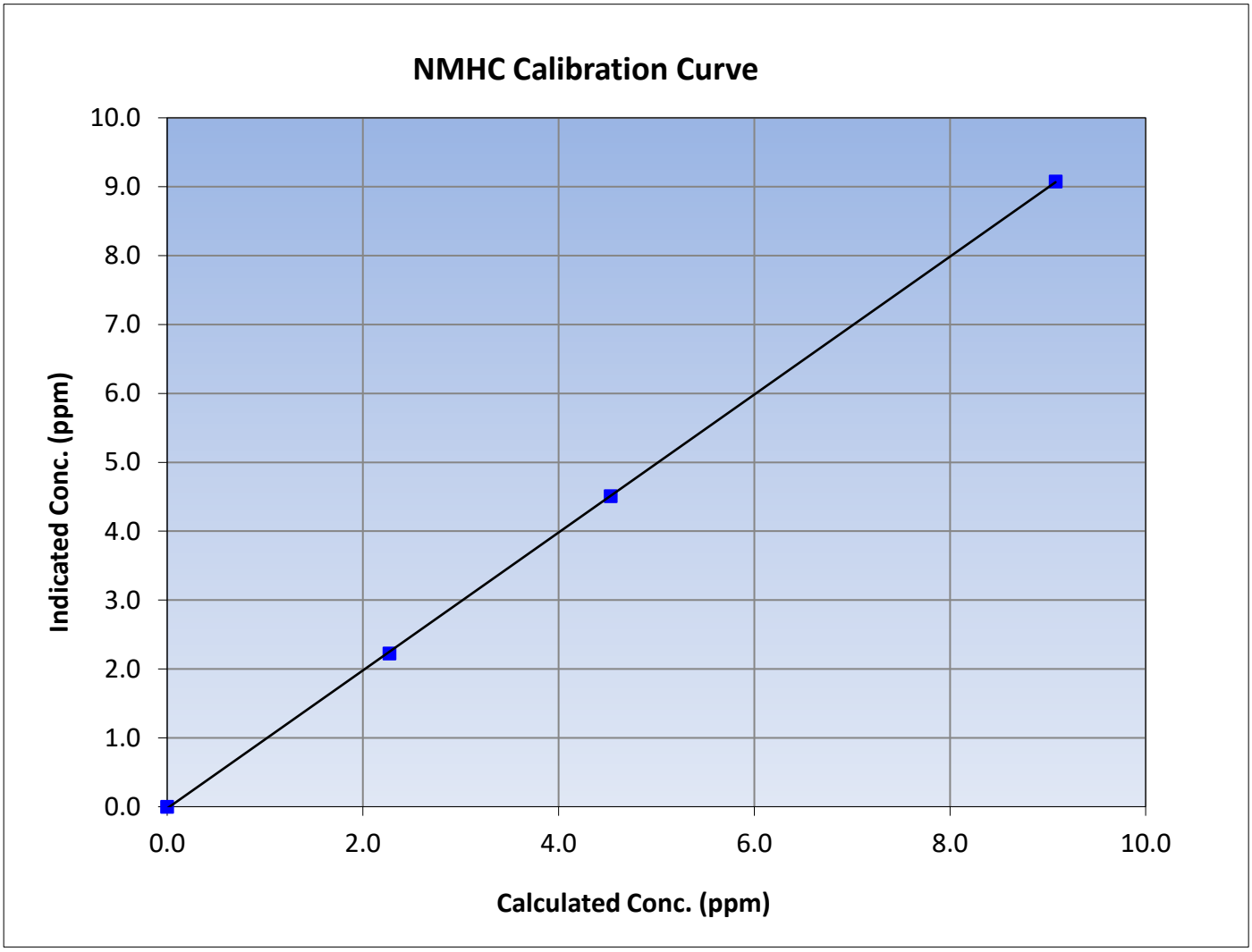
Version-06-2022

### Station Information

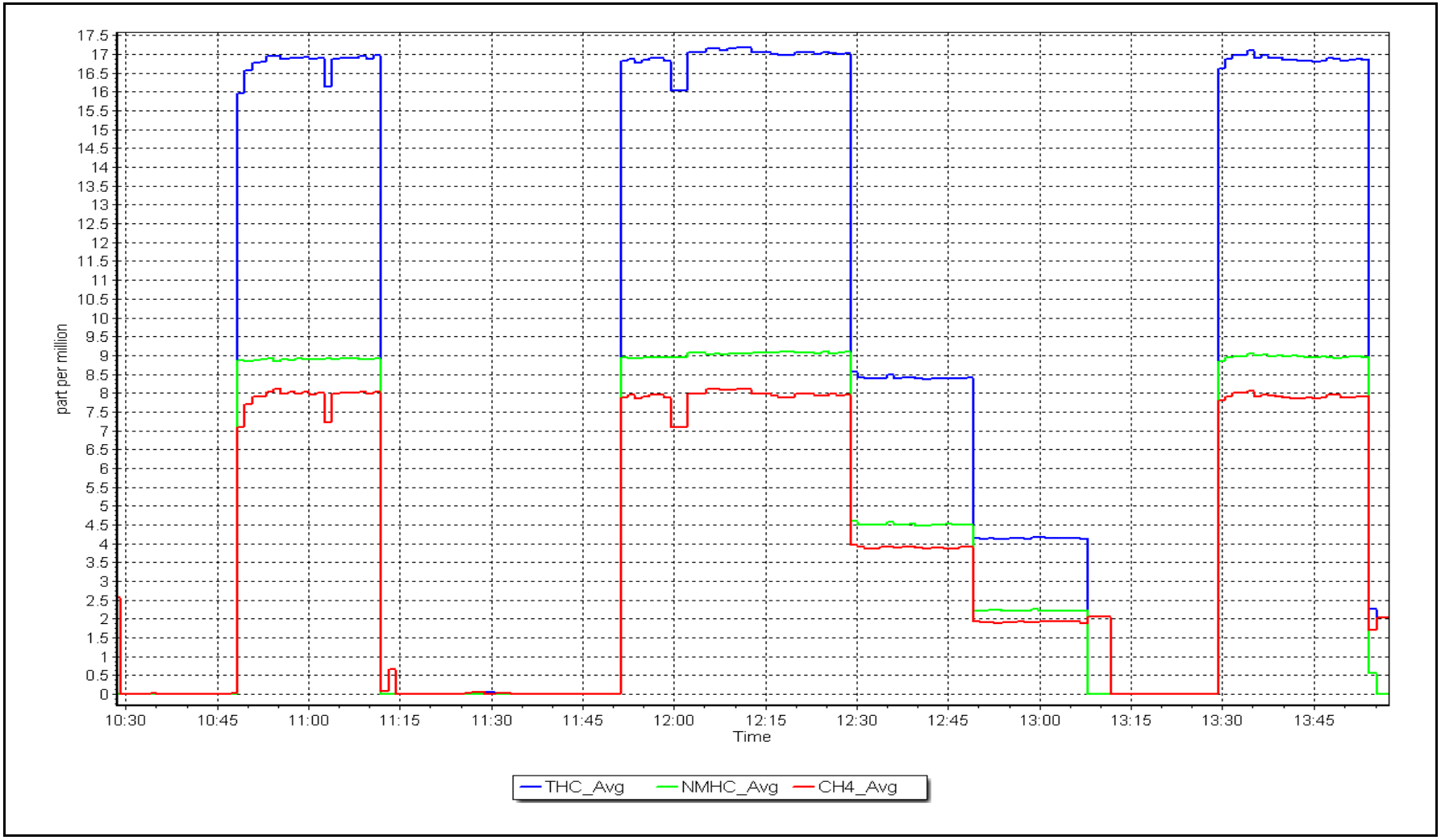
| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:25 | End Time (MST): | 13:58 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1172750023 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999967 | ≥0.995 |
| 9.08 | 9.08 | 1.0003 | | | |
| 4.53 | 4.51 | 1.0061 | Slope | 1.001197 | 0.90 - 1.10 |
| 2.27 | 2.23 | 1.0215 | | | |
| | | | Intercept | -0.024180 | +/-0.5 |



**NMHC Calibration Plot** Date: February 12, 2024 Location: Fort McKay South



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS 13 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 10:01 | End time (MST): | 14:39 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | T2UP1RP | | Cal Gas Expiry Date: | November 17, 2026 | |
| NOX Cal Gas Conc: | 48.25 | ppm | NO Cal Gas Conc: | 47.88 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 48.25 | ppm | Removed Gas NO Conc: | 47.88 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 2448 | |
| ZAG make/model: | API T701 | | Serial Number: | 1117 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661329 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.133 | 1.128 | NO bkgnd or offset: | 10.9 | 10.1 |
| NOX coeff or slope: | 1.001 | 0.999 | NOX bkgnd or offset: | 11.0 | 10.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 160.2 | 156.4 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.001306 | 0.999462 |
| $NO_X$ Cal Offset: | -2.253060 | -1.952788 |
| NO Cal Slope: | 1.003396 | 1.002954 |
| NO Cal Offset: | -3.151422 | -2.771571 |
| $NO_2$ Cal Slope: | 0.998110 | 1.000409 |
| $NO_2$ Cal Offset: | -0.700632 | -0.685310 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 0.0 | ---- | ---- |
| as found span | 4917 | 83.5 | 805.7 | 799.5 | 6.2 | 810.9 | 803.3 | 7.6 | 0.9936 | 0.9953 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator 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 | 804.3 | 800.4 | 3.8 | 1.0017 | 0.9989 |
| second point | 4958 | 41.8 | 403.4 | 400.3 | 3.1 | 400.3 | 397.7 | 2.6 | 1.0077 | 1.0065 |
| third point | 4979 | 20.9 | 201.7 | 200.1 | 1.5 | 197.5 | 194.8 | 2.7 | 1.0212 | 1.0274 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | ---- | ---- |
| as left span | 4917 | 83.5 | 805.7 | 381.9 | 423.8 | 806.7 | 379.0 | 427.6 | 0.9988 | 1.0077 |
| | | | | | | | | Average Correction Factor | 1.0102 | 1.0109 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 810.3 ppb | NO = 802.7 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.7% |
| Previous Response | $NO_X$ = 804.5 ppb | NO = 799.1 ppb | | *Percent Change | NO = | 0.5% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 794.5 | 376.9 | 423.8 | 423.6 | 1.0004 | 100.0% |
| 2nd GPT point (200 ppb O3) | 794.5 | 586.1 | 214.6 | 213.7 | 1.0041 | 99.6% |
| 3rd GPT point (100 ppb O3) | 794.5 | 690.8 | 109.9 | 108.5 | 1.0127 | 98.7% |
| | | | | Average Correction Factor | 1.0057 | 99.4% |

Notes: Changed inlet filter after as founds. Adjusted zero and span. Used 2nd NO reference point due to drift.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

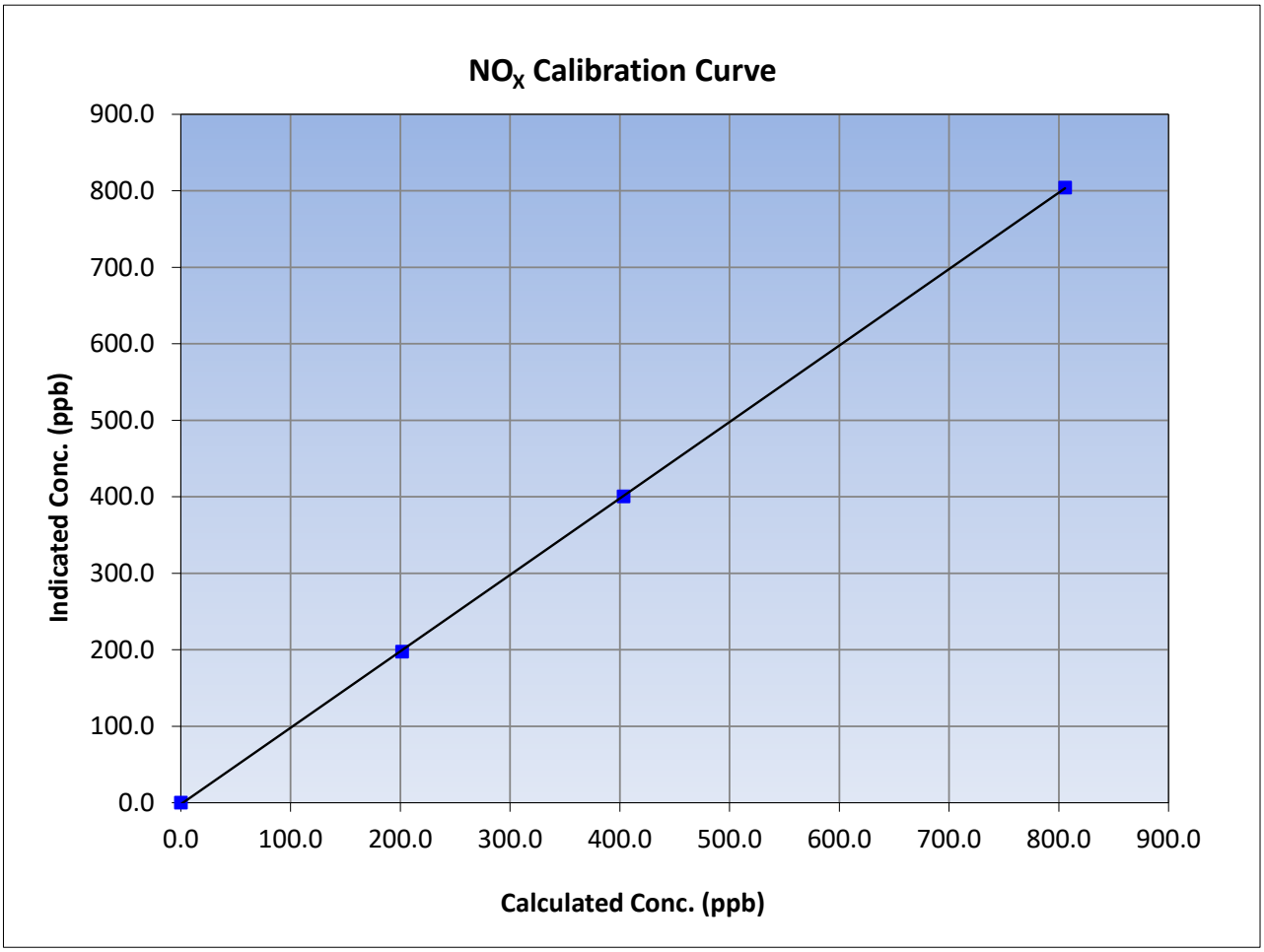
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS 13 |
| Start Time (MST): | 10:01 | End Time (MST): | 14:39 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661329 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999970 | ≥0.995 |
| 805.7 | 804.3 | 1.0017 | | | |
| 403.4 | 400.3 | 1.0077 | Slope | 0.999462 | 0.90 - 1.10 |
| 201.7 | 197.5 | 1.0212 | | | |
| | | | Intercept | -1.952788 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

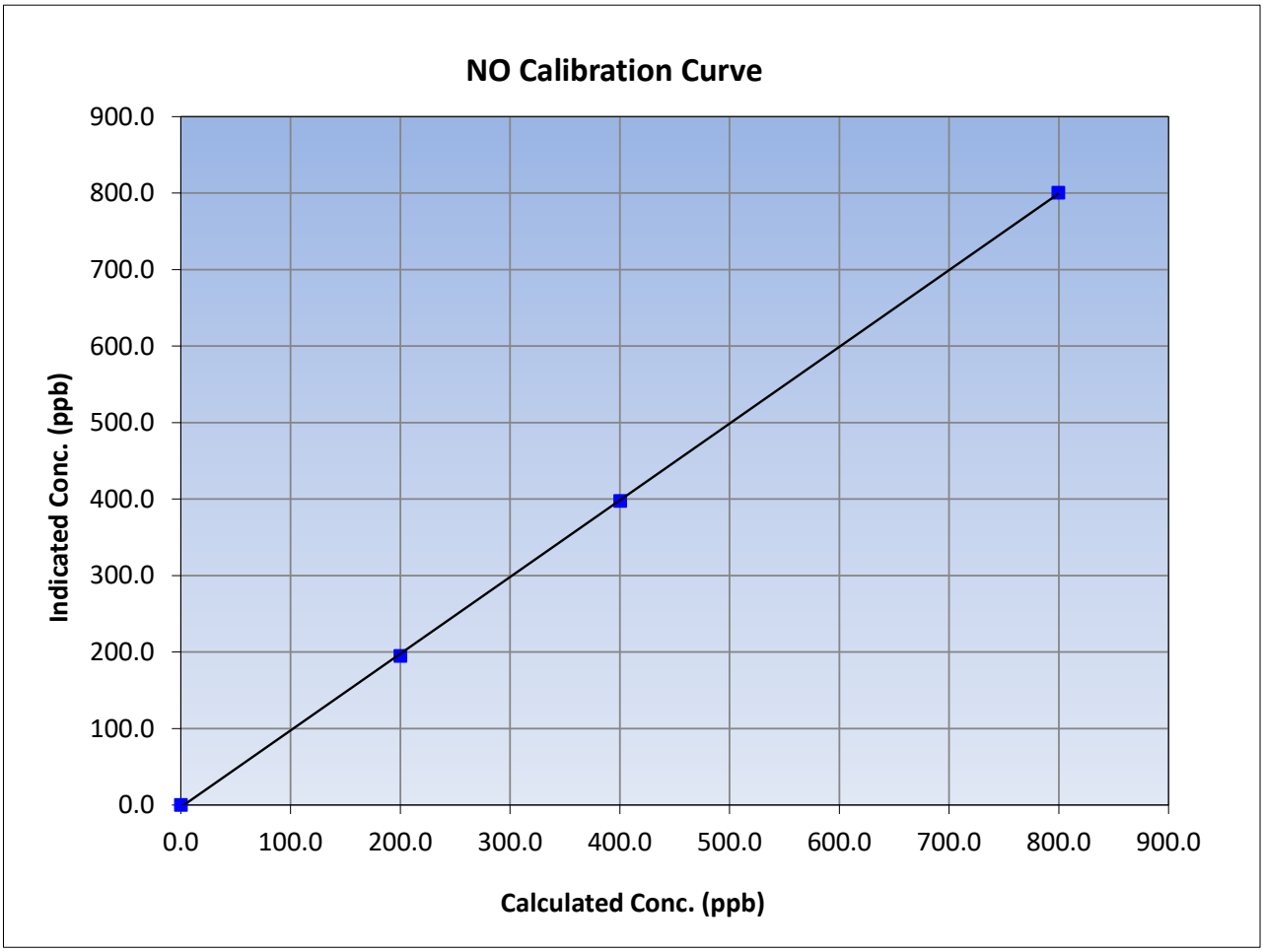
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS 13 |
| Start Time (MST): | 10:01 | End Time (MST): | 14:39 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661329 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999940 | ≥0.995 |
| 799.5 | 800.4 | 0.9989 | | | |
| 400.3 | 397.7 | 1.0065 | Slope | 1.002954 | 0.90 - 1.10 |
| 200.1 | 194.8 | 1.0274 | | | |
| | | | Intercept | -2.771571 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

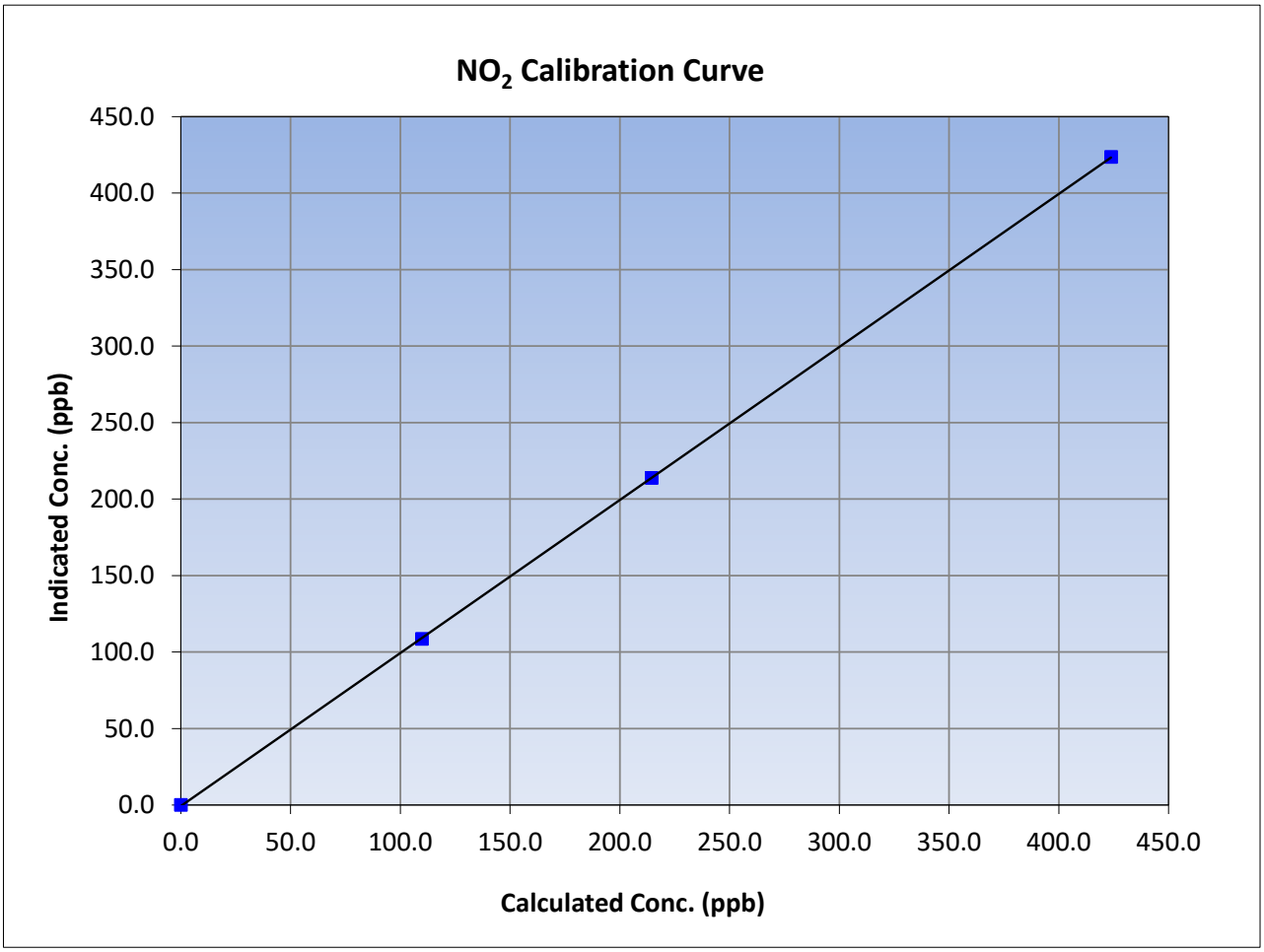
Version-04-2020

### Station Information

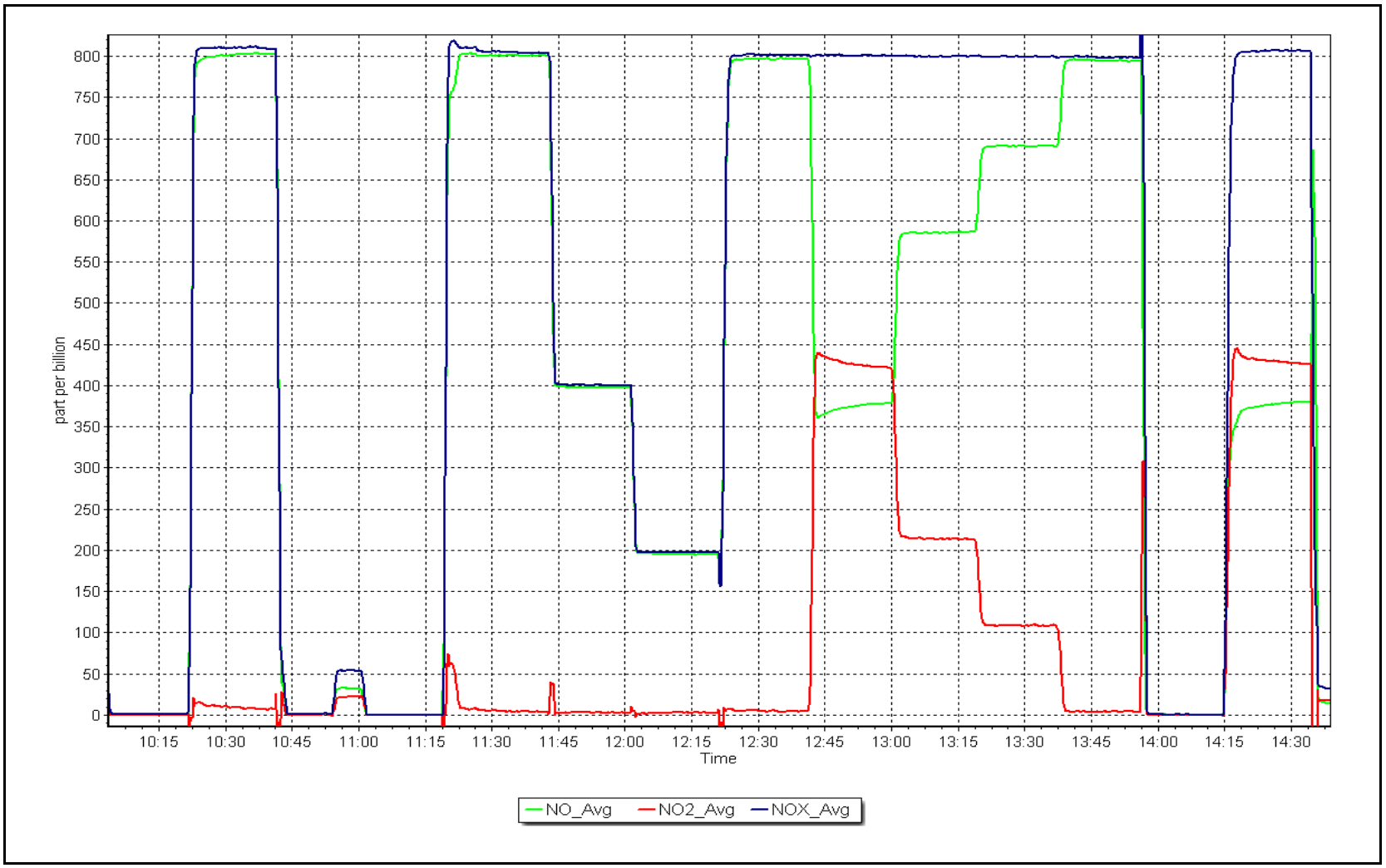
| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS 13 |
| Start Time (MST): | 10:01 | End Time (MST): | 14:39 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661329 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999988 | *≥0.995* |
| 423.8 | 423.6 | 1.0004 | | | |
| 214.6 | 213.7 | 1.0041 | Slope | 1.000409 | *0.90 - 1.10* |
| 109.9 | 108.5 | 1.0127 | | | |
| | | | Intercept | -0.685310 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 20, 2024 Location: Fort McKay South



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS13 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 10:12 | End time (MST): | 13:30 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.000914 | 1.000914 | Backgd or Offset: | 3.9 | 3.7 |
| Calibration intercept: | 0.240000 | 0.740000 | Coeff or Slope: | 0.971 | 0.970 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.8 | ---- |
| as found span | 5000 | 989.8 | 400.0 | 400.7 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 5000 | 989.8 | 400.0 | 400.7 | 0.998 |
| second point | 5000 | 849.9 | 200.0 | 201.4 | 0.993 |
| third point | 5000 | 745.1 | 100.0 | 101.5 | 0.985 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 5000 | 989.8 | 400.0 | 402.6 | 0.994 |
| | | | | Average Correction Factor | 0.992 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 401.5 | Previous response | 400.6 | *% 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

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

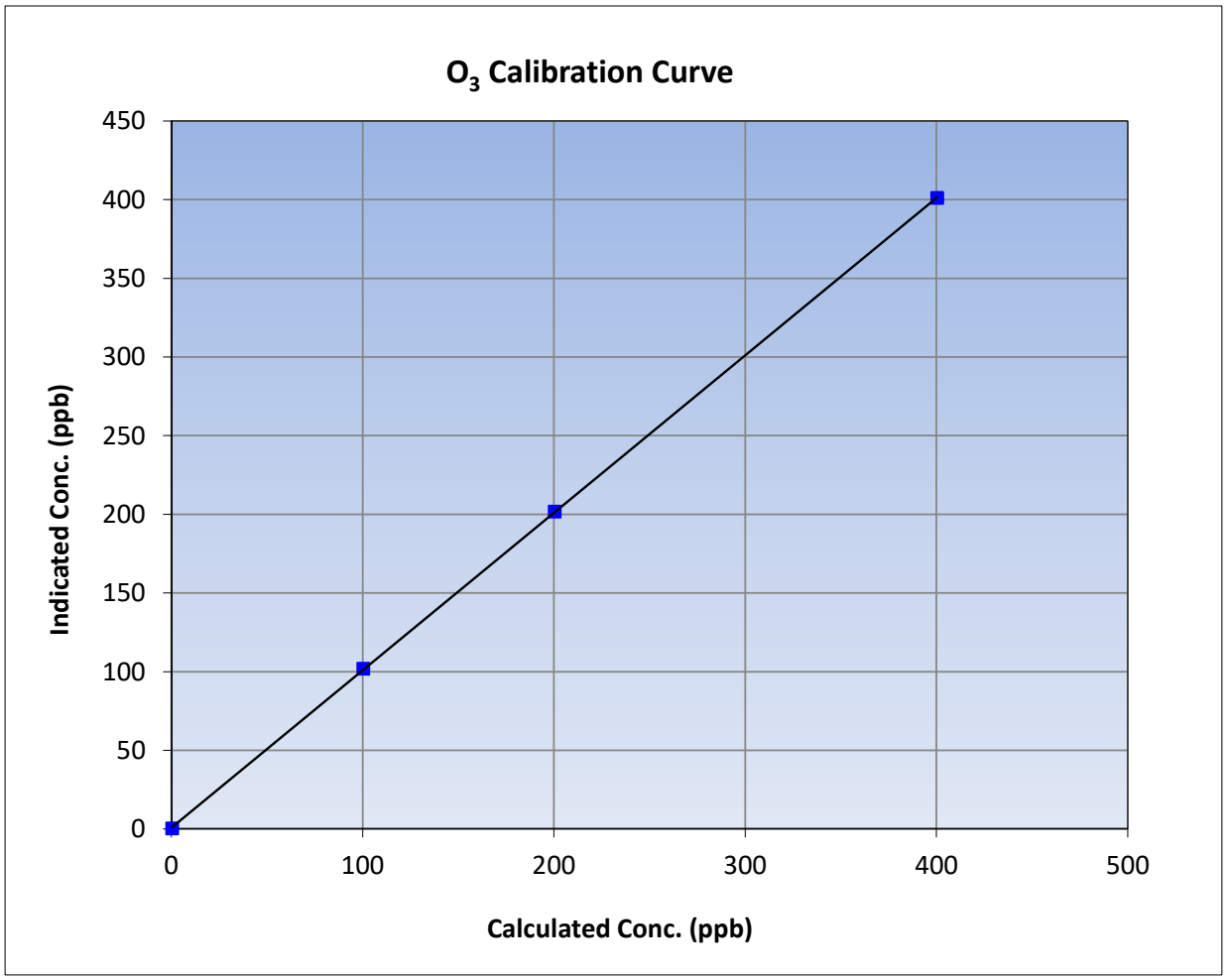
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:12 | End Time (MST): | 13:30 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 3871 |

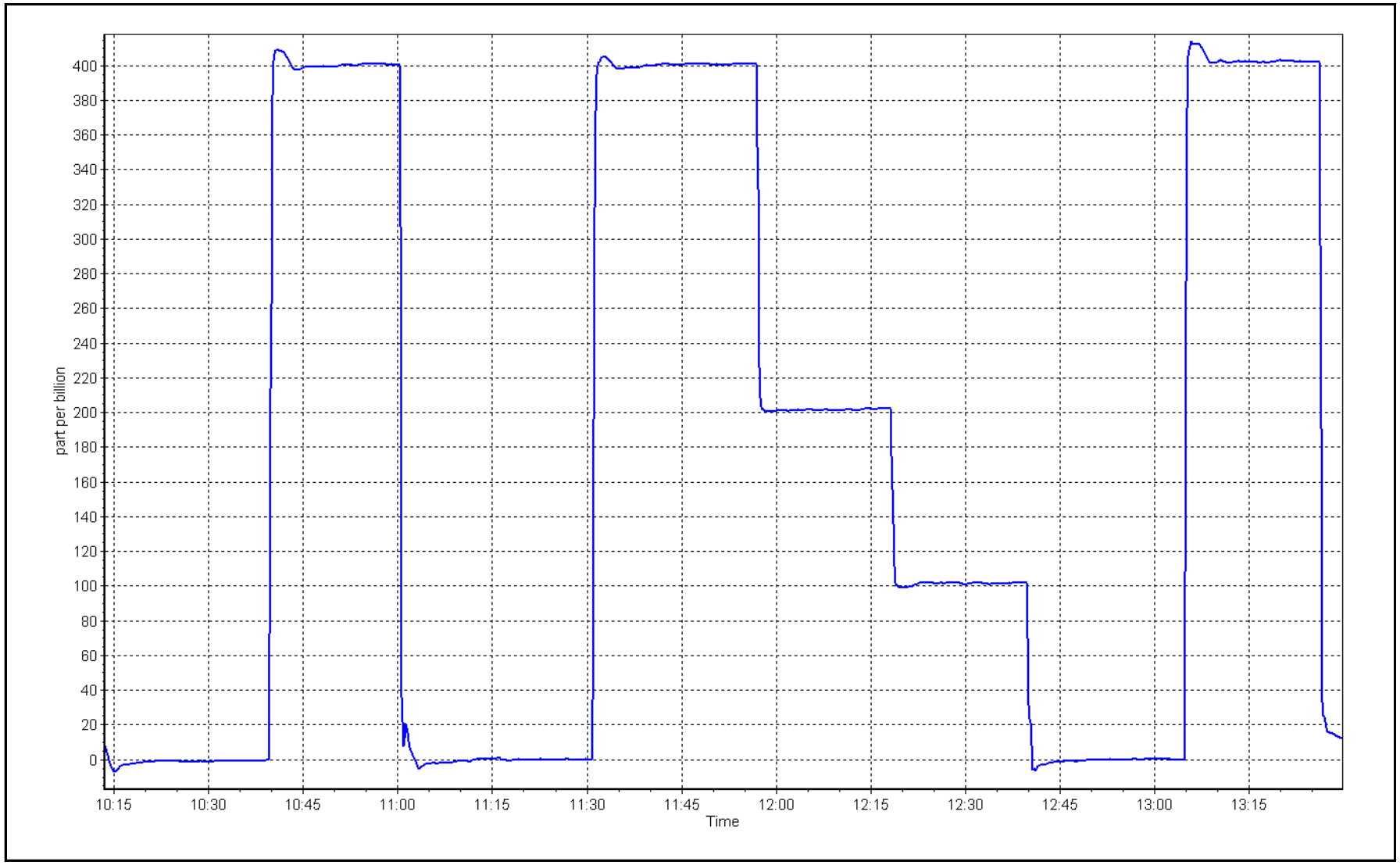
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 400.0 | 400.7 | 0.9983 |
| 200.0 | 201.4 | 0.9930 |
| 100.0 | 101.5 | 0.9852 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999984 | *≥0.995* |
| Slope | 1.000914 | *0.90 - 1.10* |
| Intercept | 0.740000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 2, 2024 Location: Fort McKay South



# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS 13 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 11:48 | End time (MST): | 12:05 |
| 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) | -7.80 | -8.16 | -7.80 | ☐ | +/- 2 °C |
| P (mmHg) | 731.20 | 733.35 | 731.20 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.03 | 4.91 | 5.03 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 46.00 | ----- | 46.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 16.60 | 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 | | | | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: January 22, 2024

Date Disposable Filter Changed: January 22, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: June 29, 2023

Date RH/T Sensor Cleaned: June 29, 2023

Notes: Inlet head cleaned. No adjusment made. Leak check passed.

Calibration by: Sean Bala

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS14
## ANZAC

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS 14 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 10:47 | End time (MST): | 13:49 |
| 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 Make/Model: | API T700 | | Serial Number: | 3060 |
| ZAG Make/Model: | API T701H | | Serial Number: | 357 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 0710321322

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.001175 | 0.994566 | Backgd or Offset: | 25.6 | 25.6 |
| Calibration intercept: | -1.861173 | -0.897563 | Coeff or Slope: | 0.812 | 0.812 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 1.2 | ---- |
| as found span | 4938 | 80.3 | 799.3 | 794.9 | 1.005 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 1.7 | ---- |
| high point | 4938 | 80.3 | 799.3 | 795.4 | 1.005 |
| second point | 4979 | 40.2 | 400.1 | 395.5 | 1.012 |
| third point | 4998 | 20.2 | 201.1 | 196.6 | 1.023 |
| as left zero | 5000 | 0.0 | 0.0 | 1.6 | ---- |
| as left span | 4938 | 80.3 | 799.3 | 797.2 | 1.003 |
| | | | | Average Correction Factor | 1.013 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 793.70 | Previous response | 798.35 | *% 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

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

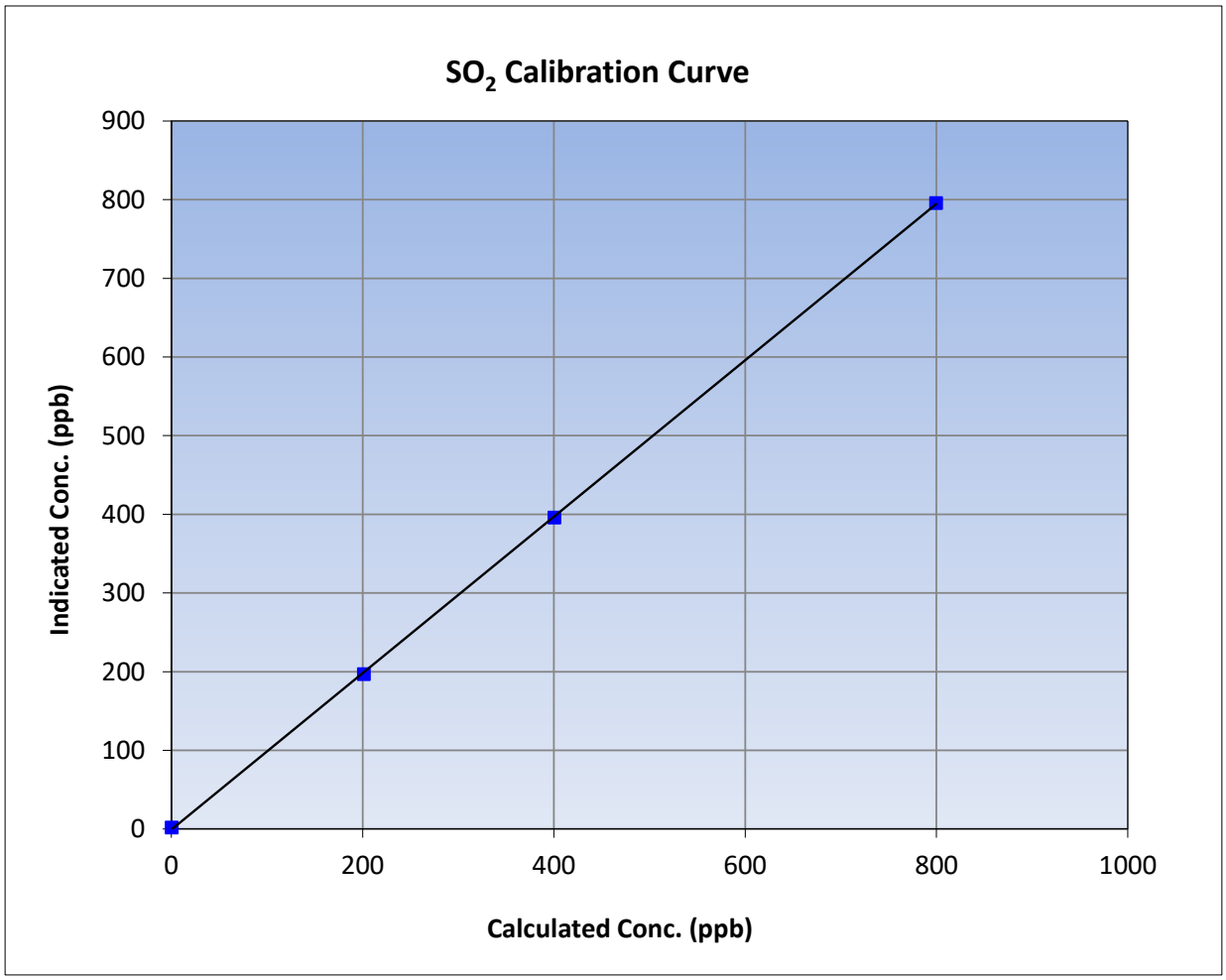
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Anzac | Station Number: | AMS 14 |
| Start Time (MST): | 10:47 | End Time (MST): | 13:49 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 0710321322 |

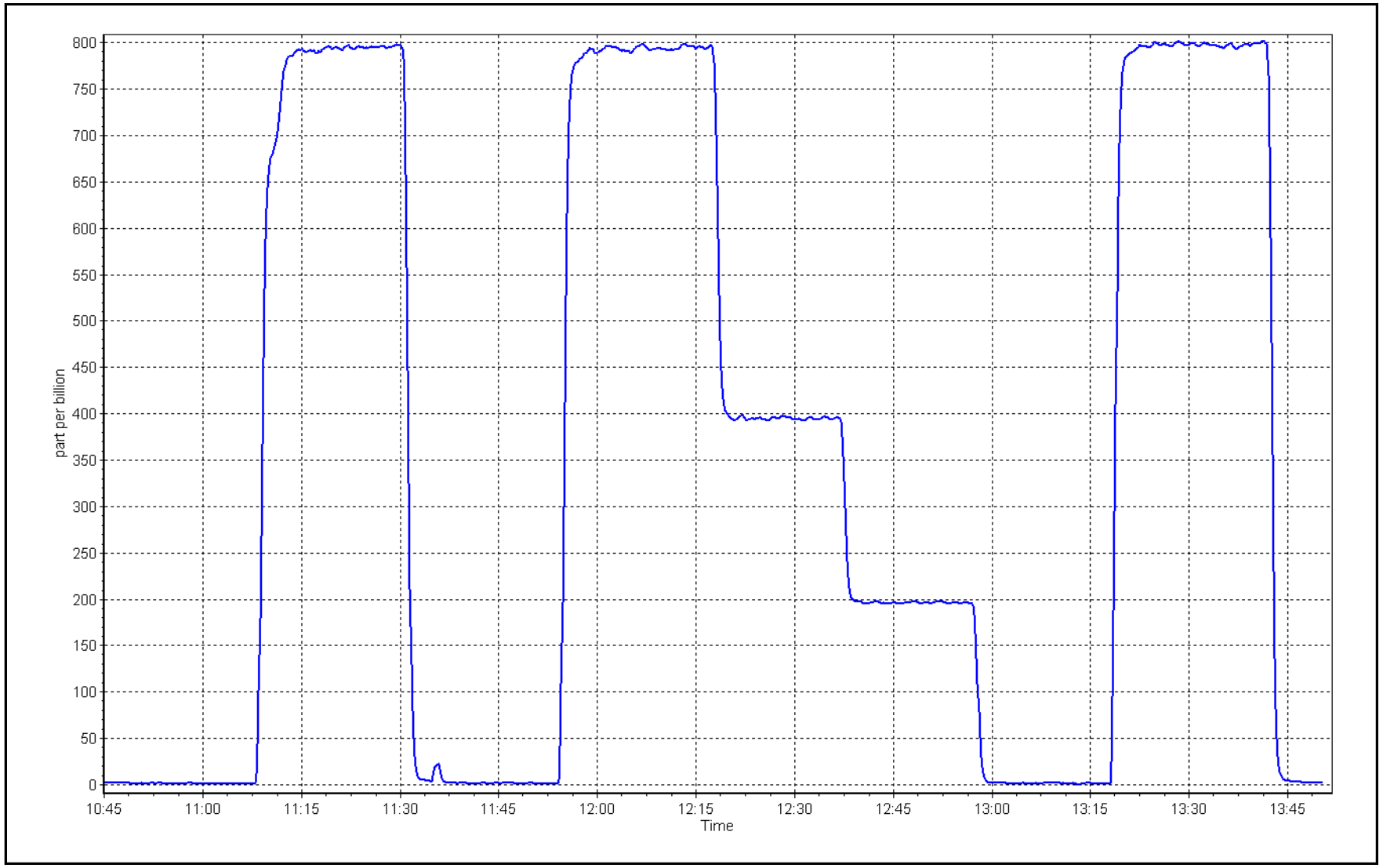
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 1.7 | ---- |
| 799.3 | 795.4 | 1.0049 |
| 400.1 | 395.5 | 1.0115 |
| 201.1 | 196.6 | 1.0227 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999951 | *≥0.995* |
| Slope | 0.994566 | *0.90 - 1.10* |
| Intercept | -0.897563 | *+/-30* |



**SO2 Calibration Plot** Date: February 7, 2024 Location: Anzac



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 10:33 | End time (MST): | 14:59 |
| 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.012453 | 1.003735 | Backgd or Offset: | 2.40 | 2.30 |
| Calibration intercept: | -0.065392 | -0.085416 | Coeff or Slope: | 1.043 | 0.984 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| as found span | 4938 | 77.9 | 80.0 | 84.7 | 0.942 |
| as found 2nd point | 4973 | 38.9 | 40.0 | 42.7 | 0.932 |
| as found 3rd point | 4997 | 19.5 | 20.0 | 21.0 | 0.944 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4938 | 77.9 | 80.0 | 80.2 | 0.997 |
| second point | 4973 | 38.9 | 40.0 | 40.0 | 0.999 |
| third point | 4997 | 19.5 | 20.0 | 19.9 | 1.006 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4938 | 77.9 | 80.0 | 78.6 | 1.017 |
| SO2 Scrubber Check | 4936 | 80.3 | 800.4 | -0.1 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.000 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 84.9 | Prev response: | 80.91 | *% change: | 4.7% |
| Baseline Corr 2nd AF pt: | 42.9 | AF Slope: | 1.062363 | AF Intercept: | -0.125652 |
| Baseline Corr 3rd AF pt: | 21.2 | AF Correlation: | 0.999955 | | |

* = > +/-5% change initiates investigation

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

Version-11-2021

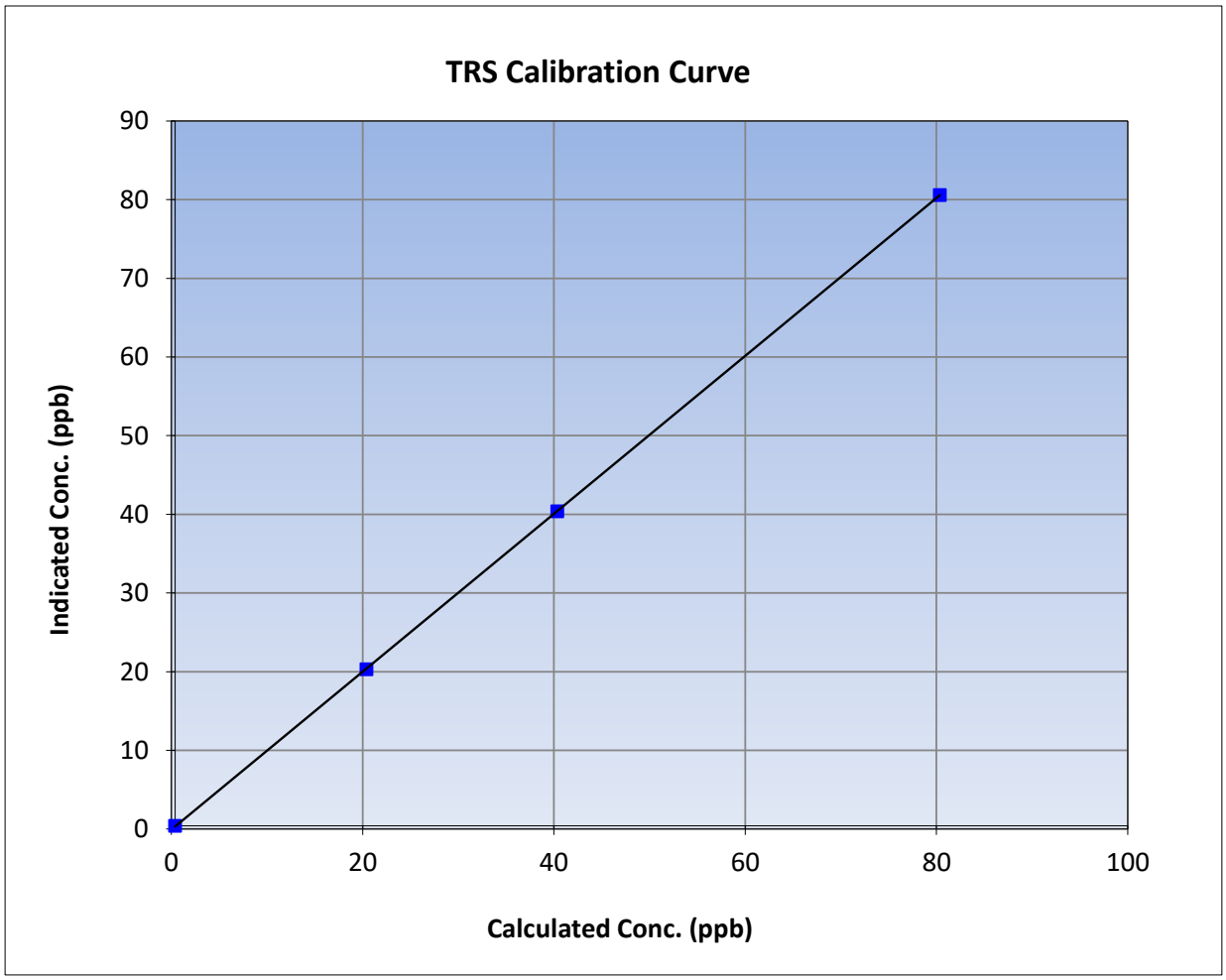
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 10:33 | End Time (MST): | 14:59 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1218153582 |

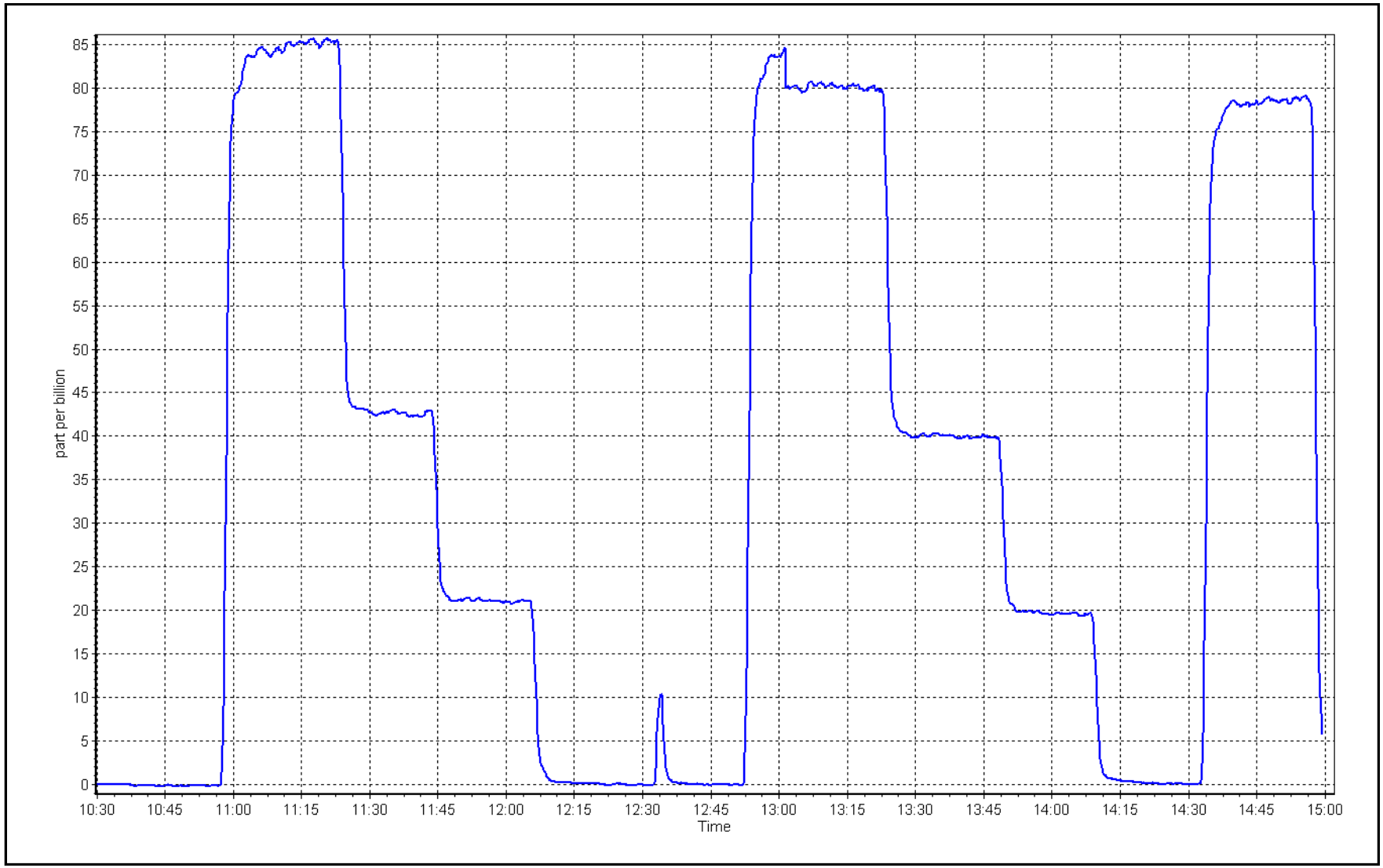
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.2 | 0.9969 |
| 40.0 | 40.0 | 0.9989 |
| 20.0 | 19.9 | 1.0056 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999995 | *≥0.995* |
| Slope | 1.003735 | *0.90 - 1.10* |
| Intercept | -0.085416 | *+/-3* |



**TRS Calibration Plot** Date: February 12, 2024 Location: Anzac



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | February 3, 2024 | Last Cal Date: | January 24, 2024 |
| Start time (MST): | 11:35 | End time (MST): | 16:32 |
| 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 | |
| ZAG make/model: | API 701H | | Serial Number: | 357 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1118148494 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 4.72E-04 | 2.25E-04 | NMHC SP Ratio: | 4.80E-05 | 4.11E-05 |
| CH4 Retention time: | 13.40 | 13.30 | NMHC Peak Area: | 188364 | 221451 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 17.10 | 17.12 | 0.999 |
| second point | 4979 | 40.2 | 8.56 | 8.48 | 1.009 |
| third point | 4998 | 20.2 | 4.30 | 4.23 | 1.018 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4938 | 80.3 | 17.10 | 17.18 | 0.996 |
| | | | | Average Correction Factor | 1.009 |

| | | | | | |
|---|---|---|---|---|---|
| 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 | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 9.11 | 9.13 | 0.998 |
| second point | 4979 | 40.2 | 4.56 | 4.54 | 1.005 |
| third point | 4998 | 20.2 | 2.29 | 2.28 | 1.004 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4938 | 80.3 | 9.11 | 9.16 | 0.995 |
| | | | | Average Correction Factor | 1.002 |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 7.99 | 7.99 | 1.000 |
| second point | 4979 | 40.2 | 4.00 | 3.94 | 1.014 |
| third point | 4998 | 20.2 | 2.01 | 1.94 | 1.035 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4938 | 80.3 | 7.99 | 8.01 | 0.997 |
| | | | | Average Correction Factor | 1.016 |
| 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 | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.002215 | 1.002044 |
| THC Cal Offset: | -0.033495 | -0.050467 |
| CH4 Cal Slope: | 0.999209 | 1.002402 |
| CH4 Cal Offset: | -0.009829 | -0.039003 |
| NMHC Cal Slope: | 1.004825 | 1.001944 |
| NMHC Cal Offset: | -0.024066 | -0.011066 |

Notes: Calibrated due to signifcant chromatogram changes. Updated window timings. Adjusted span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

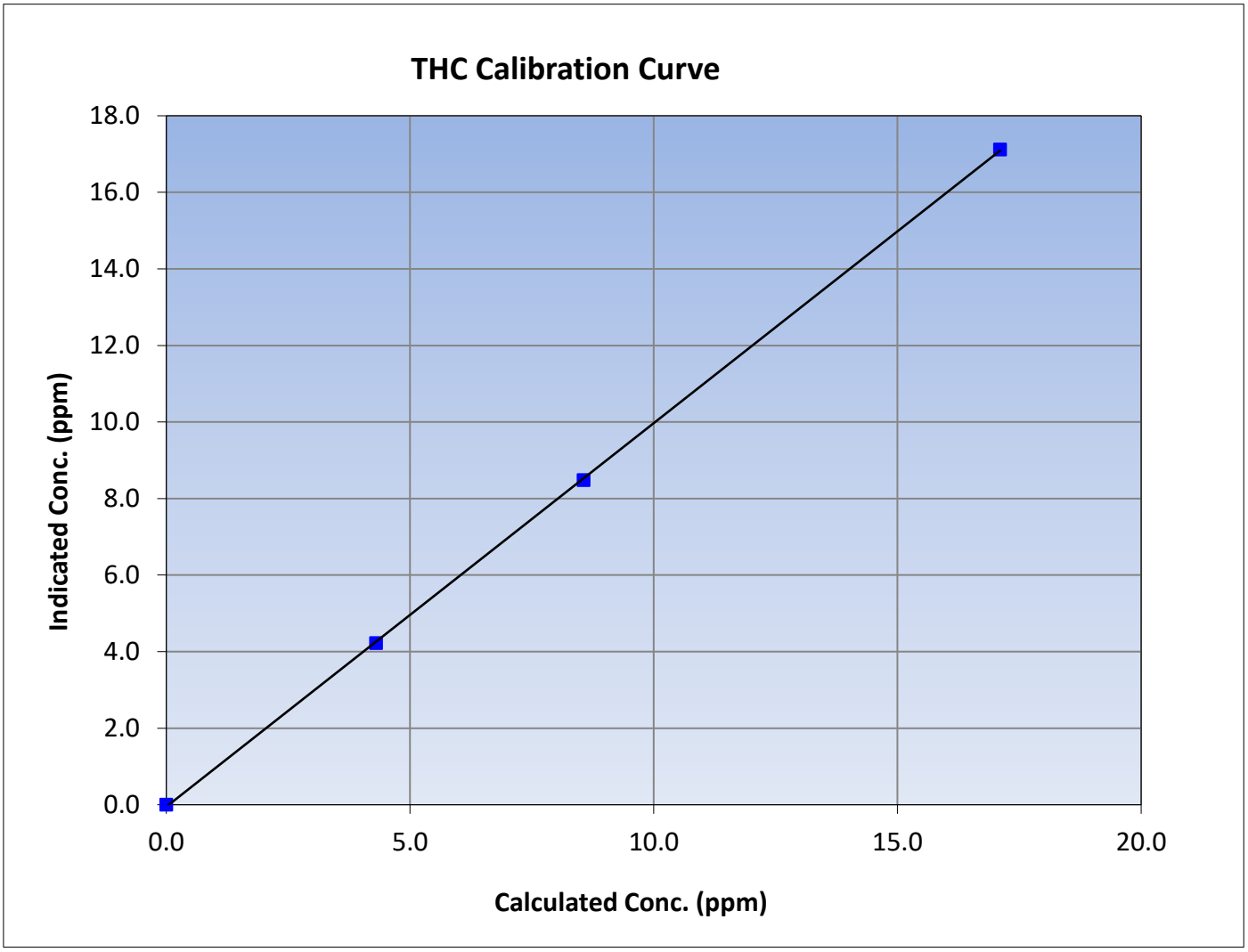
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 3, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:35 | End Time (MST): | 16:32 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148494 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999955 | ≥0.995 |
| 17.10 | 17.12 | 0.9990 | | | |
| 8.56 | 8.48 | 1.0095 | Slope | 1.002044 | 0.90 - 1.10 |
| 4.30 | 4.23 | 1.0183 | | | |
| | | | Intercept | -0.050467 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

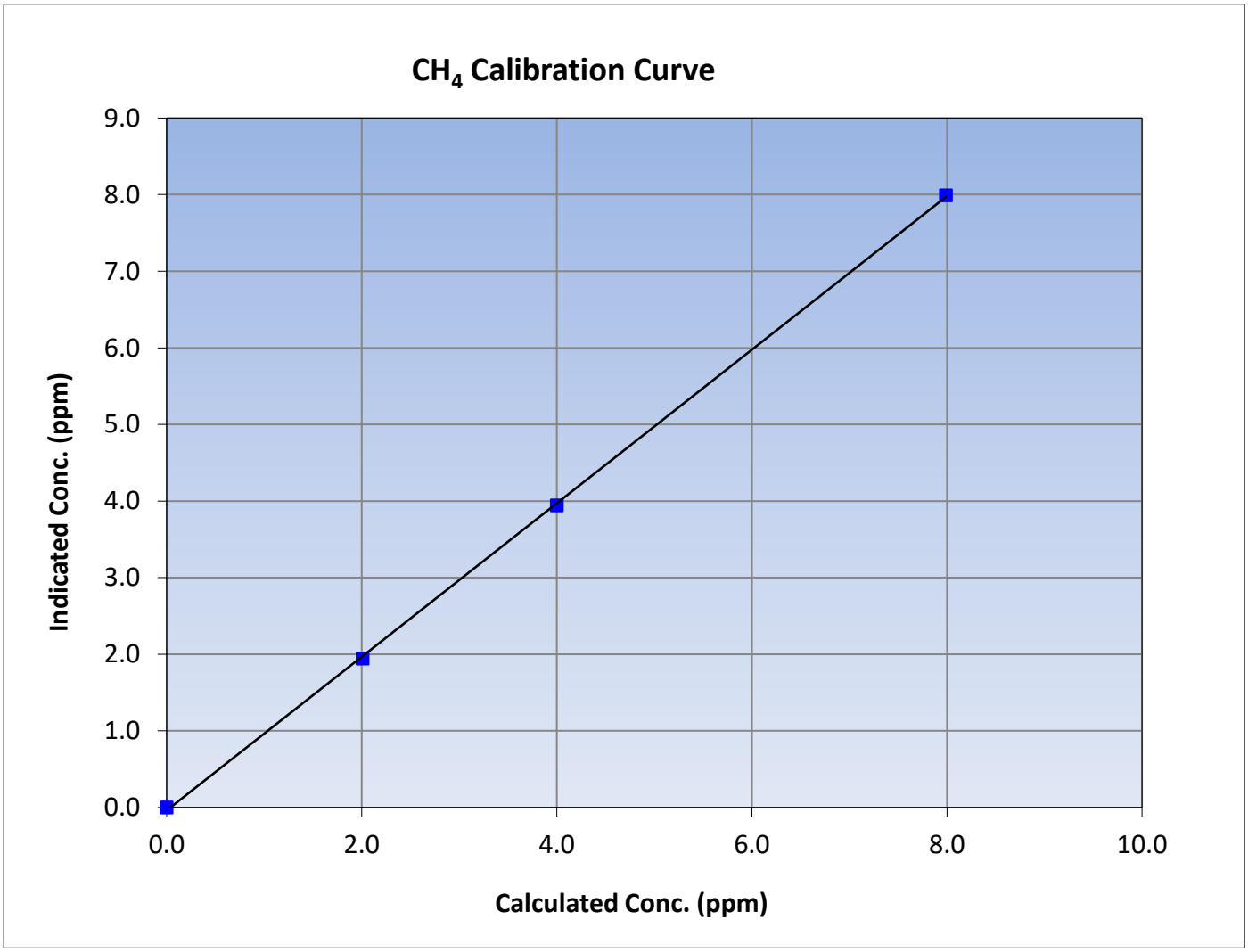
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 3, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:35 | End Time (MST): | 16:32 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148494 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999888 | *≥0.995* |
| 7.99 | 7.99 | 0.9997 | | | |
| 4.00 | 3.94 | 1.0145 | Slope | 1.002402 | *0.90 - 1.10* |
| 2.01 | 1.94 | 1.0349 | | | |
| | | | Intercept | -0.039003 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

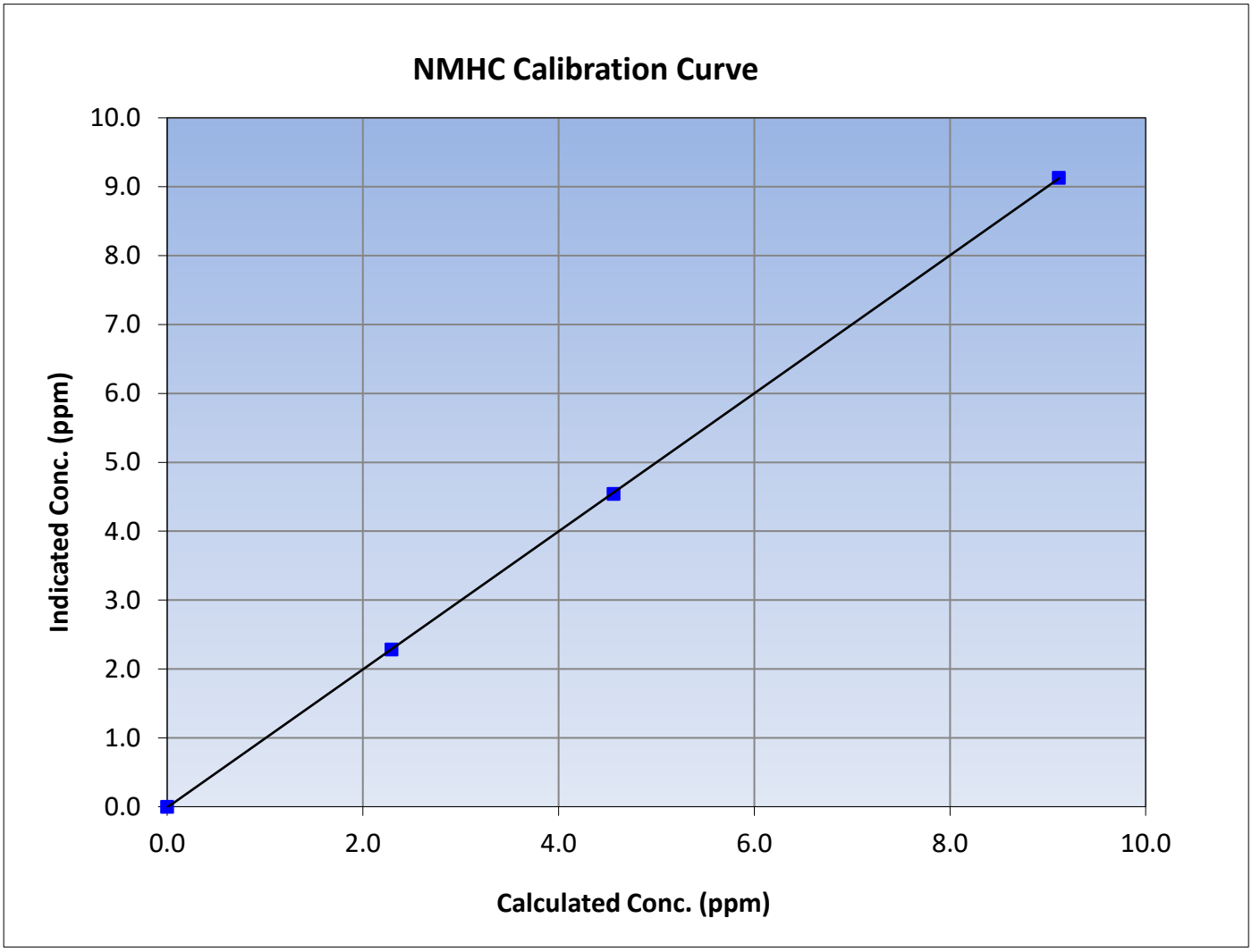
Version-06-2022

### Station Information

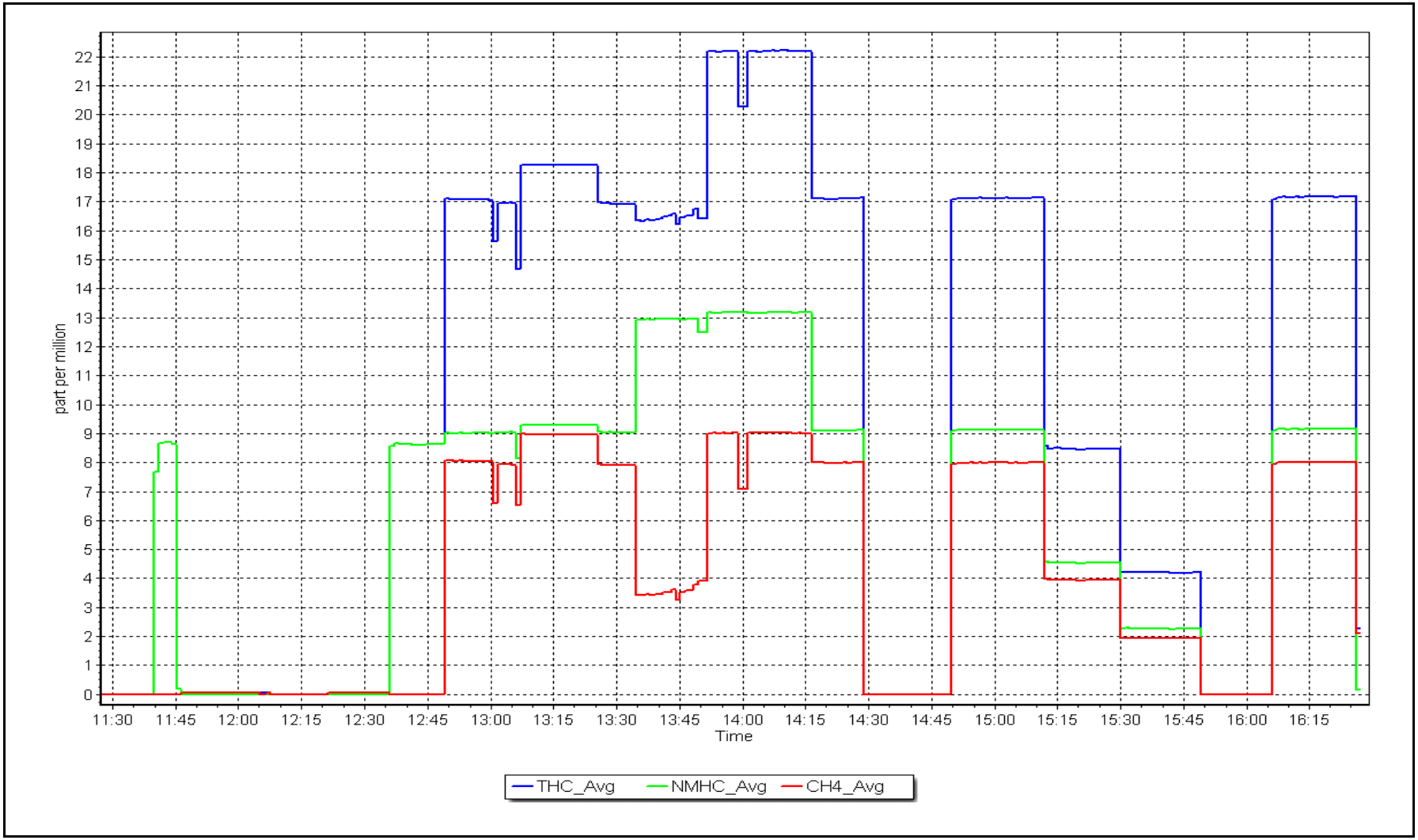
| | | | |
|---|---|---|---|
| Calibration Date: | February 3, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:35 | End Time (MST): | 16:32 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148494 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999987 | ≥0.995 |
| 9.11 | 9.13 | 0.9982 | | | |
| 4.56 | 4.54 | 1.0047 | Slope | 1.001944 | 0.90 - 1.10 |
| 2.29 | 2.28 | 1.0037 | | | |
| | | | Intercept | -0.011066 | +/-0.5 |



**NMHC Calibration Plot** Date: February 3, 2024 Location: Anzac



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | February 3, 2024 |
| Start time (MST): | 10:31 | End time (MST): | 12:50 |
| 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 | |
| ZAG make/model: | API 701H | | Serial Number: | 357 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1118148494 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.25E-04 | 2.25E-04 | NMHC SP Ratio: | 4.11E-05 | 4.11E-05 |
| CH4 Retention time: | 13.30 | 13.30 | NMHC Peak Area: | 221451 | 221451 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4938 | 80.3 | 17.10 | 17.21 | 0.994 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 17.10 | 17.21 | 0.994 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.994 |
| Baseline Corr AF: | 17.21 | Prev response | 17.09 | *% change | 0.7% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4938 | 80.3 | 9.11 | 9.20 | 0.991 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 9.11 | 9.19 | 0.991 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.991 |
| Baseline Corr AF: | 9.20 | Prev response | 9.12 | *% change | 0.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4938 | 80.3 | 7.99 | 8.02 | 0.997 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 7.99 | 8.02 | 0.997 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.997 |
| Baseline Corr AF: | 8.02 | Prev response | 7.97 | *% change | 0.6% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.002044 | 1.006155 |
| THC Cal Offset: | -0.050467 | 0.000000 |
| CH4 Cal Slope: | 1.002402 | 1.003190 |
| CH4 Cal Offset: | -0.039003 | 0.000000 |
| NMHC Cal Slope: | 1.001944 | 1.008755 |
| NMHC Cal Offset: | -0.011066 | 0.000000 |

Notes: Swapped out the N2 and H2 cylinders.

Calibration Performed By: Max Farrell

**NMHC Calibration Plot** Date: February 14, 2024 Location: Anzac

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 9:50 | End time (MST): | 14:39 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | DT0037092 | | Cal Gas Expiry Date: | May 16, 2031 | |
| NOX Cal Gas Conc: | 60.7 | ppm | NO Cal Gas Conc: | 60.4 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 60.7 | ppm | Removed Gas NO Conc: | 60.4 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3060 | |
| ZAG make/model: | Teledyne API 701H | | Serial Number: | 357 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1426262592 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.411 | 1.411 | NO bkgnd or offset: | 3.8 | 3.8 |
| 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: | 159.1 | 160.0 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.995638 | 1.001051 |
| $NO_X$ Cal Offset: | -0.669728 | -0.650468 |
| NO Cal Slope: | 1.002181 | 1.006866 |
| NO Cal Offset: | -2.129361 | -1.970746 |
| $NO_2$ Cal Slope: | 0.992183 | 0.997816 |
| $NO_2$ Cal Offset: | -0.766639 | -1.058817 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.2 | 0.1 | ---- | ---- |
| as found span | 4934 | 66.3 | 804.8 | 800.9 | 4.0 | 806.7 | 803.4 | 3.4 | 0.9977 | 0.9968 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator 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 | 805.2 | 805.3 | -0.1 | 0.9995 | 0.9945 |
| second point | 4985 | 33.2 | 401.6 | 399.6 | 2.0 | 401.6 | 399.6 | 2.0 | 1.0000 | 1.0000 |
| third point | 5004 | 16.7 | 201.9 | 200.9 | 1.0 | 200.3 | 198.2 | 2.1 | 1.0080 | 1.0136 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| as left span | 4934 | 66.3 | 804.8 | 415.7 | 389.2 | 804.8 | 421.4 | 383.4 | 1.0000 | 0.9864 |
| | | | | | | | | Average Correction Factor | 1.0025 | 1.0027 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = | 806.8 ppb | NO = | 803.6 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.8% |
| Previous Response | $NO_X$ = | 800.7 ppb | NO = | 800.5 ppb | | *Percent Change | NO = | 0.4% |
| Baseline Corr 2nd pt | $NO_X$ = NA | ppb | NO = NA | ppb | As found $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA | ppb | NO = NA | ppb | As found NO $r^2$: | NO Sl: | NO Int: | |
| | | | | | As found $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 801.3 | 416.1 | 389.2 | 387.9 | 1.0033 | 99.7% |
| 2nd GPT point (200 ppb O3) | 801.3 | 608.6 | 196.7 | 194.5 | 1.0112 | 98.9% |
| 3rd GPT point (100 ppb O3) | 801.3 | 705.3 | 100.0 | 97.6 | 1.0244 | 97.6% |
| | | | | Average Correction Factor | 1.0130 | 98.7% |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

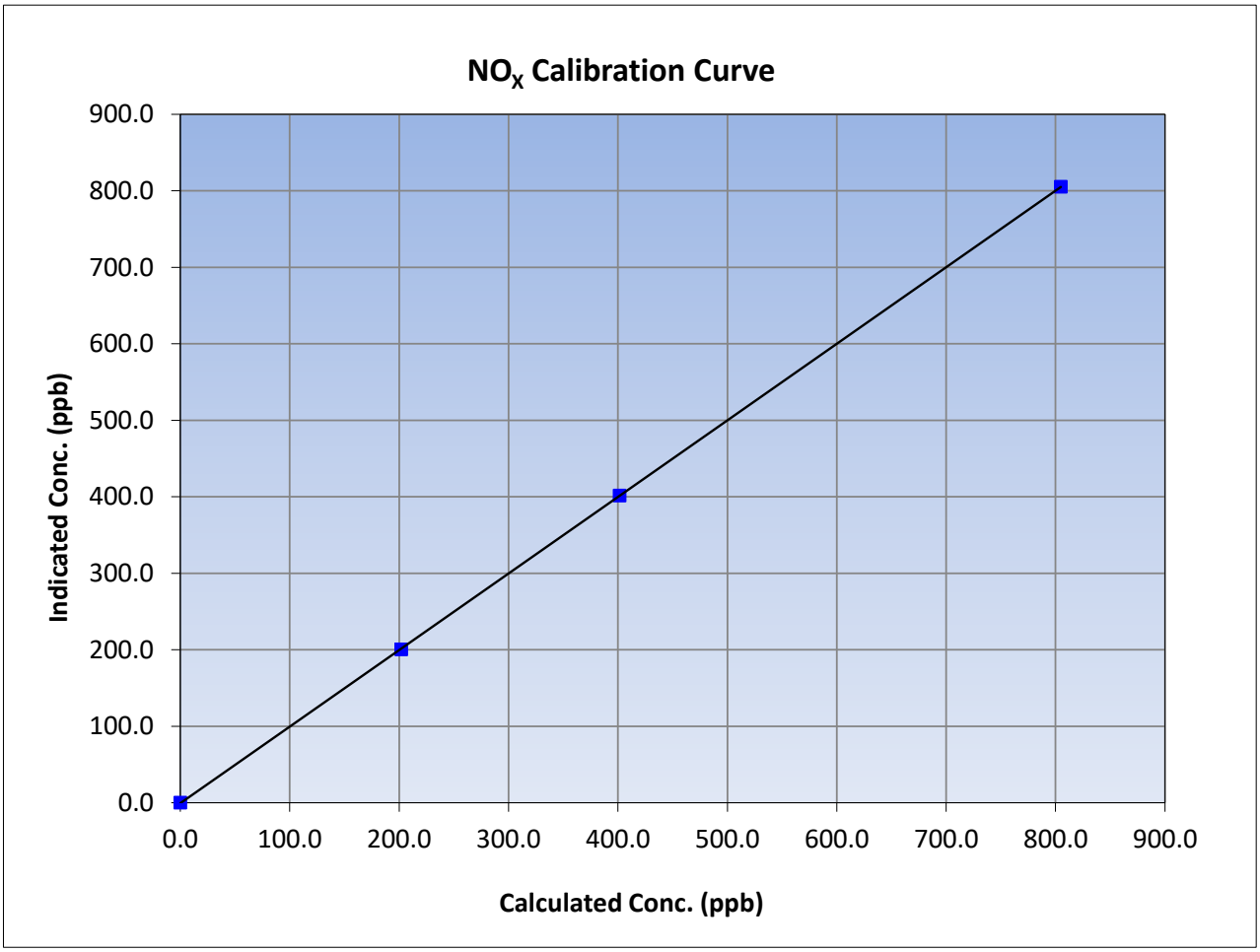
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 9:50 | End Time (MST): | 14:39 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262592 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999994 | *≥0.995* |
| 804.8 | 805.2 | 0.9995 | | | |
| 401.6 | 401.6 | 1.0000 | Slope | 1.001051 | *0.90 - 1.10* |
| 201.9 | 200.3 | 1.0080 | | | |
| | | | Intercept | -0.650468 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

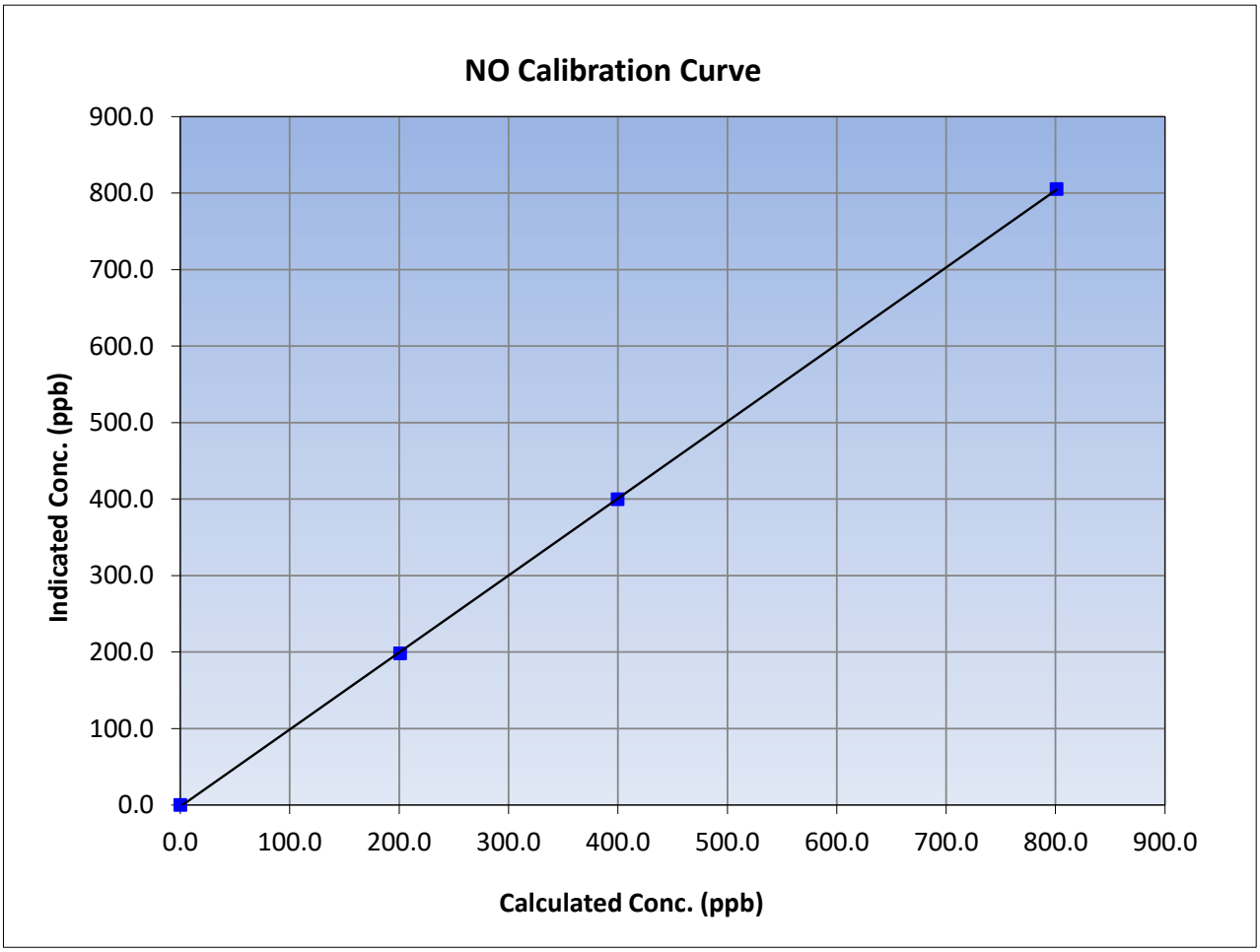
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 9:50 | End Time (MST): | 14:39 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262592 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999972 | ≥0.995 |
| 800.9 | 805.3 | 0.9945 | | | |
| 399.6 | 399.6 | 1.0000 | Slope | 1.006866 | 0.90 - 1.10 |
| 200.9 | 198.2 | 1.0136 | | | |
| | | | Intercept | -1.970746 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

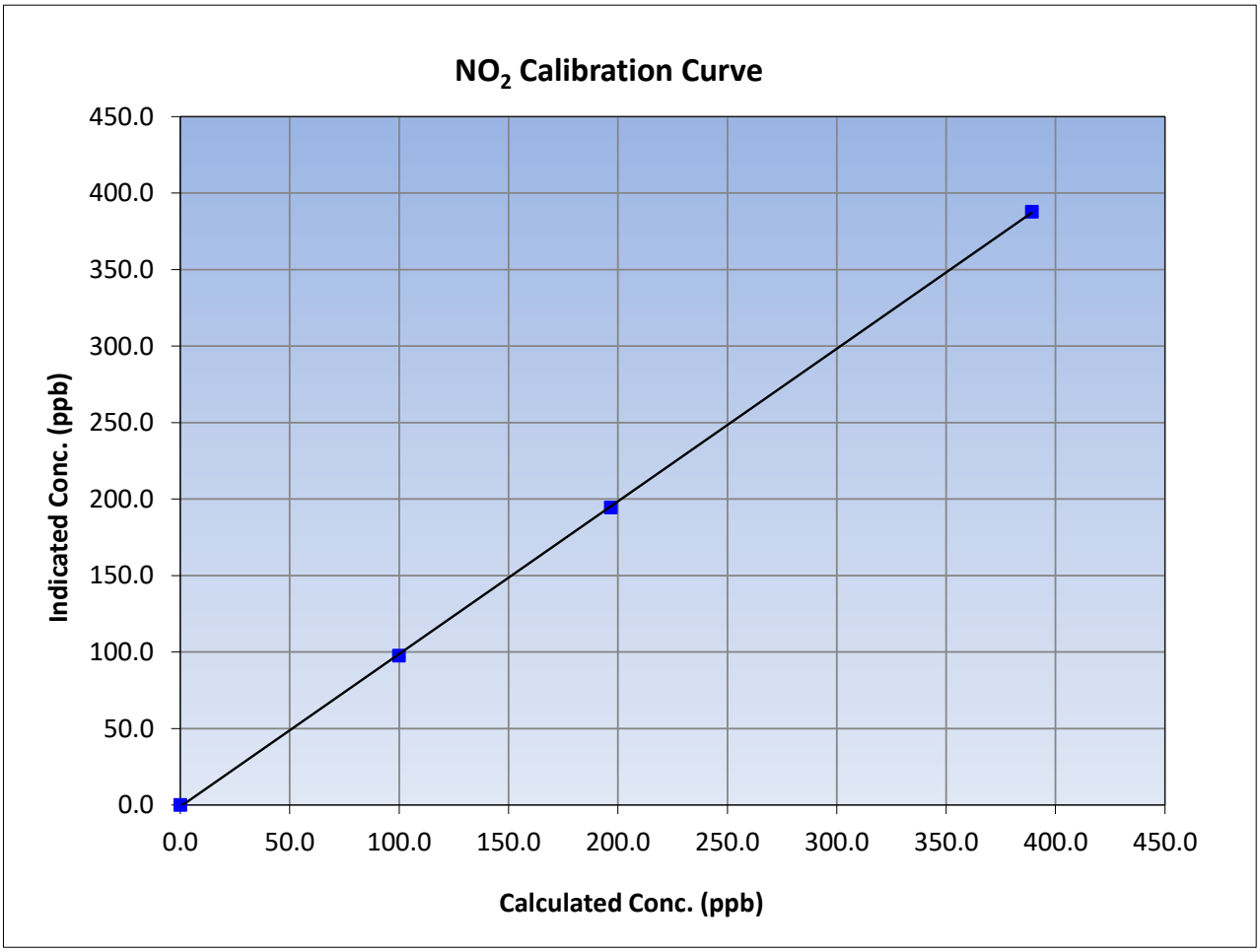
Version-04-2020

### Station Information

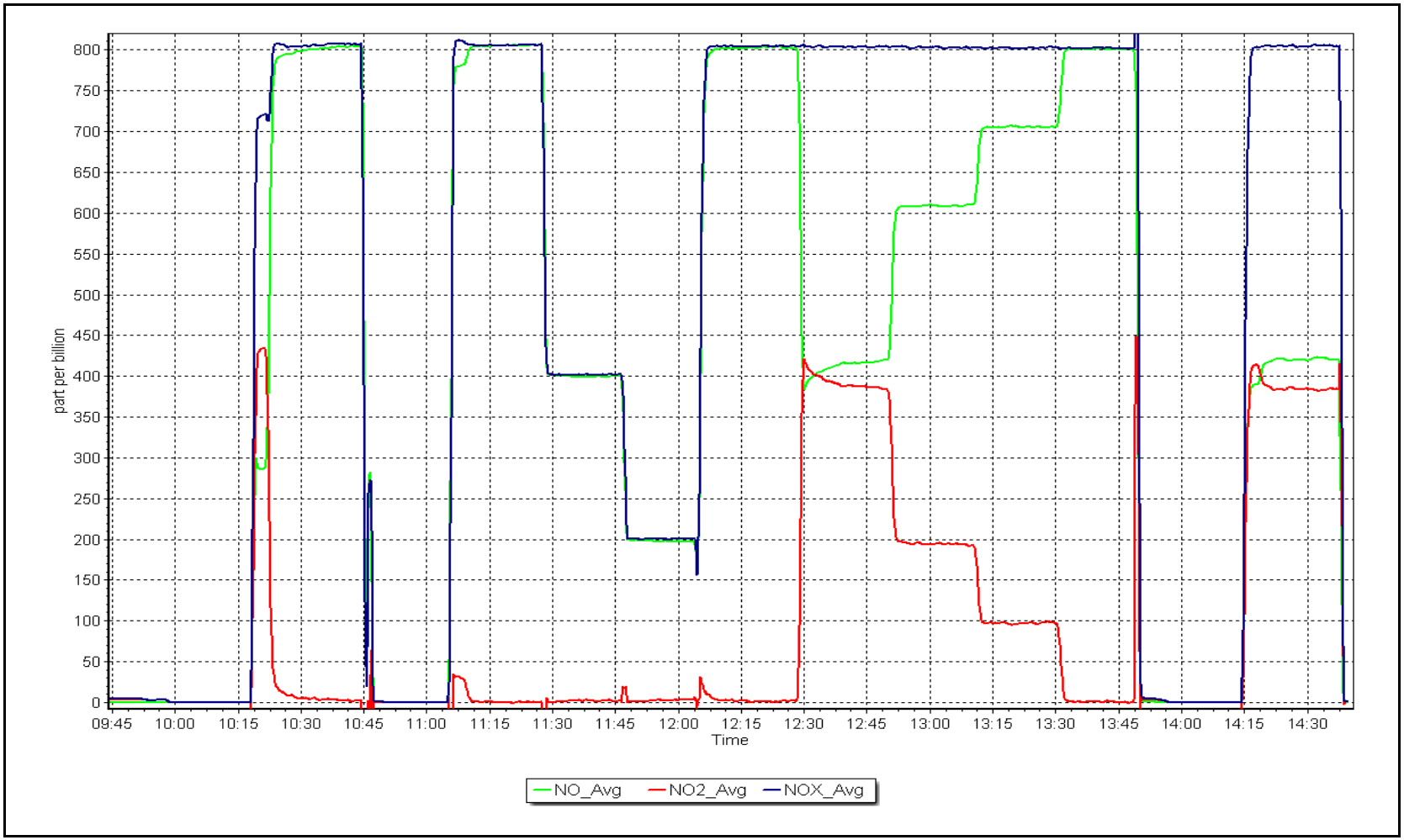
| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 9:50 | End Time (MST): | 14:39 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262592 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999958 | *≥0.995* |
| 389.2 | 387.9 | 1.0033 | | | |
| 196.7 | 194.5 | 1.0112 | Slope | 0.997816 | *0.90 - 1.10* |
| 100.0 | 97.6 | 1.0244 | | | |
| | | | Intercept | -1.058817 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 6, 2024 Location: Anzac



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 11:31 | End time (MST): | 14:16 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.001343 | 0.999057 | Backgd or Offset: | 1.4 | 1.4 |
| Calibration intercept: | -0.260000 | -0.260000 | Coeff or Slope: | 1.620 | 1.620 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as found span | 5000 | 918.8 | 400.0 | 399.8 | 1.001 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| high point | 5000 | 918.8 | 400.0 | 399.6 | 1.001 |
| second point | 5000 | 803.8 | 200.0 | 199.4 | 1.003 |
| third point | 5000 | 709.8 | 100.0 | 99.0 | 1.010 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 5000 | 918.8 | 400.0 | 403.5 | 0.991 |
| | | | | Average Correction Factor | 1.005 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 399.4 | 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

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

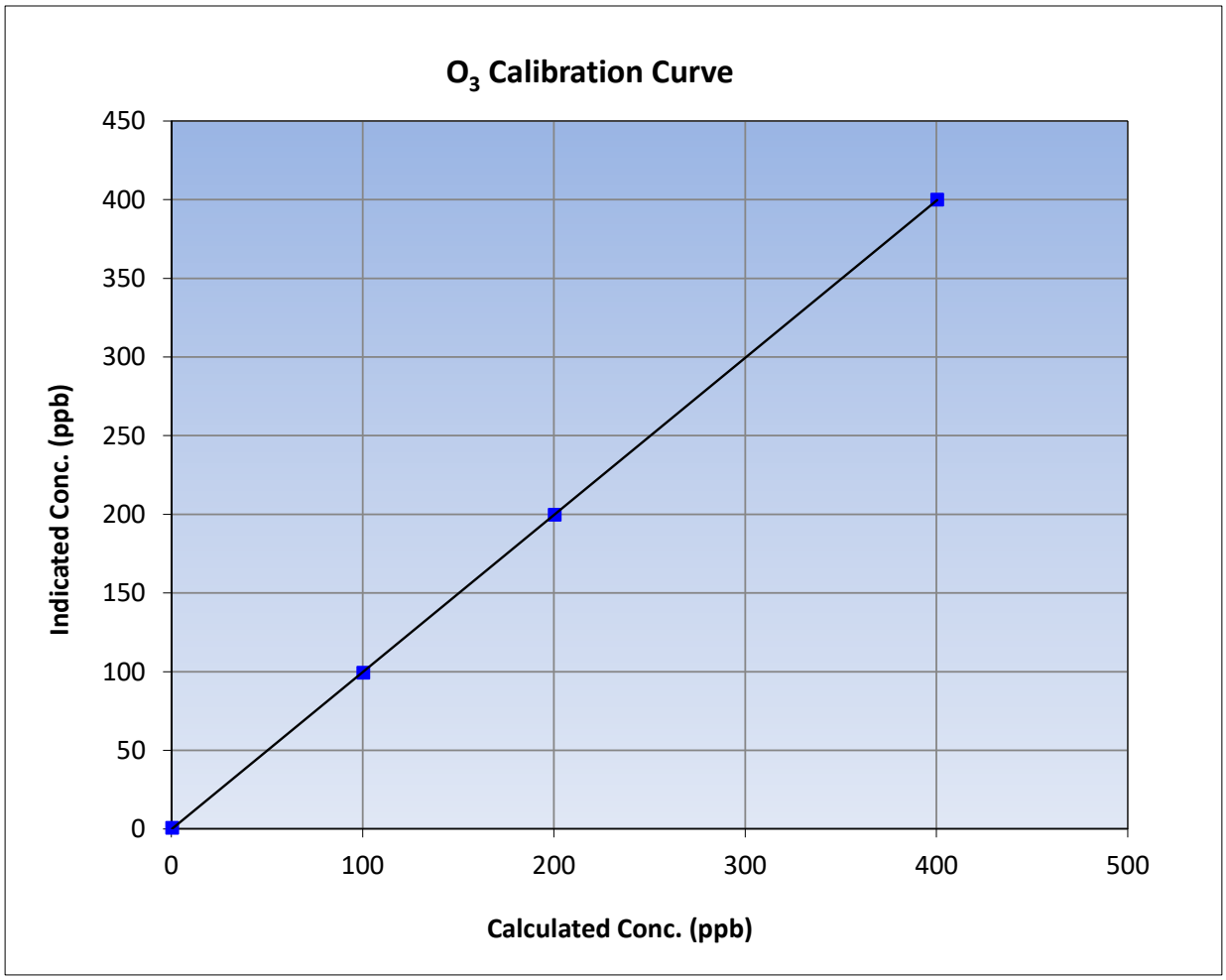
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:31 | End Time (MST): | 14:16 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1426262595 |

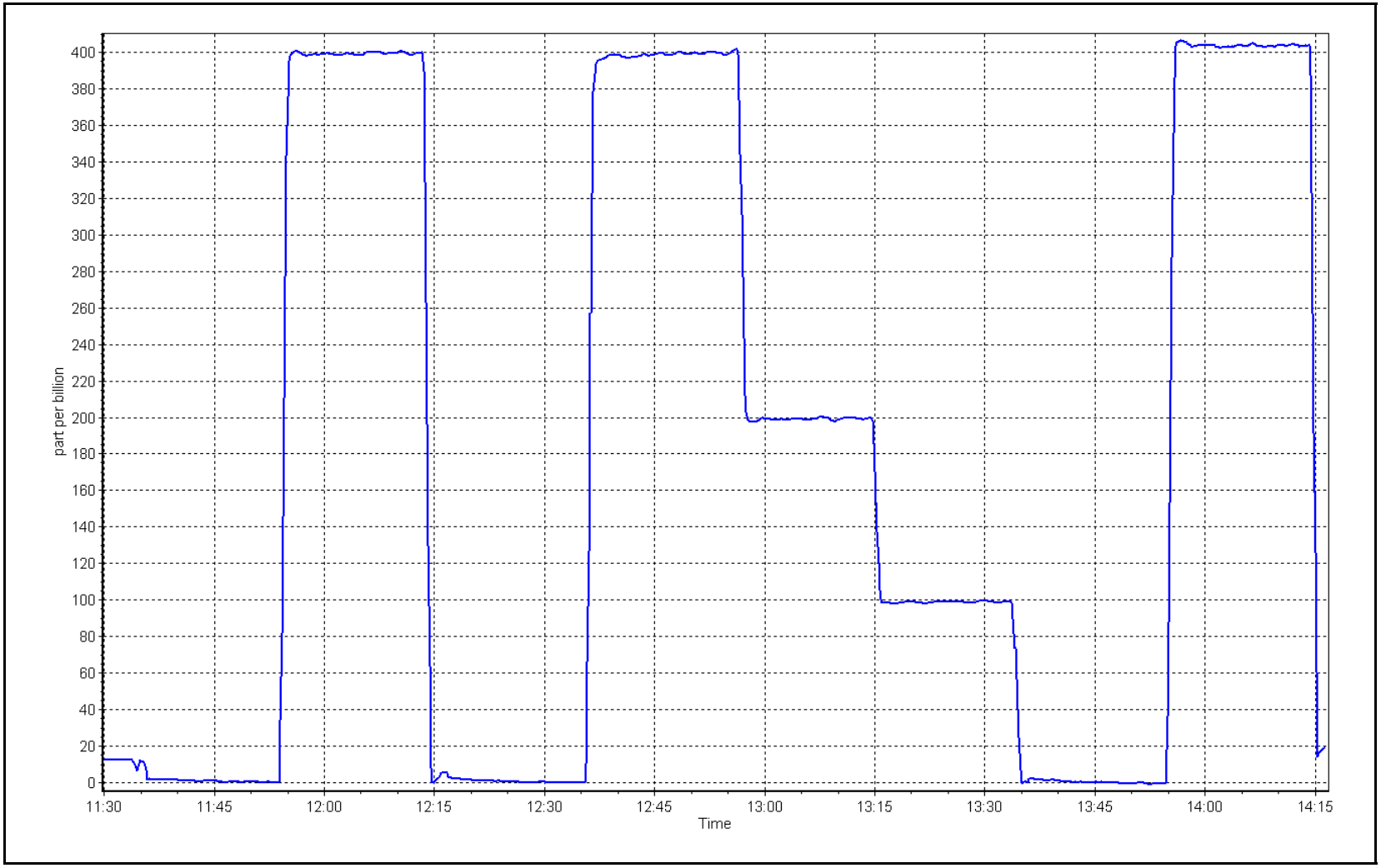
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 400.0 | 399.6 | 1.0010 |
| 200.0 | 199.4 | 1.0030 |
| 100.0 | 99.0 | 1.0101 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999991 | *≥0.995* |
| Slope | 0.999057 | *0.90 - 1.10* |
| Intercept | -0.260000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 5, 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: | February 26, 2024 | Last Cal Date: | January 24, 2024 |
| Start time (MST): | 11:36 | End time (MST): | 13:40 |
| 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) | -21.4 | -20.58 | -21.4 | ☐ | +/- 2 °C |
| P (mmHg) | 717.8 | 719.24 | 717.8 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 5.036 | 5.01 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 43 | ----- | 43 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 34.9 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: — Lot No.: — Expiry Date:

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

Date Optical Chamber Cleaned: December 6, 2023

Date Disposable Filter Changed: December 6, 2023

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

### Annual Maintenance

Date Sample Tube Cleaned: July 6, 2023

Date RH/T Sensor Cleaned: July 6, 2023

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

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 11:04 | End time (MST): | 14:02 |
| 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 Make/Model: | API T700 | Serial Number: | 2449 |
| ZAG Make/Model: | API 701H | Serial Number: | 359 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1218153459

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.004353 | 1.001438 | Backgd or Offset: | 13.4 | 13.4 |
| Calibration intercept: | -2.079066 | -1.359391 | Coeff or Slope: | 1.111 | 1.111 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4921 | 79.4 | 800.0 | 801.8 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| high point | 4921 | 79.4 | 800.0 | 801.1 | 0.999 |
| second point | 4960 | 39.7 | 400.0 | 397.1 | 1.007 |
| third point | 4980 | 19.8 | 199.5 | 197.4 | 1.011 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4920 | 79.4 | 800.1 | 805.7 | 0.993 |
| | | | | Average Correction Factor | 1.006 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 801.80 | Previous response | 801.37 | *% 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

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

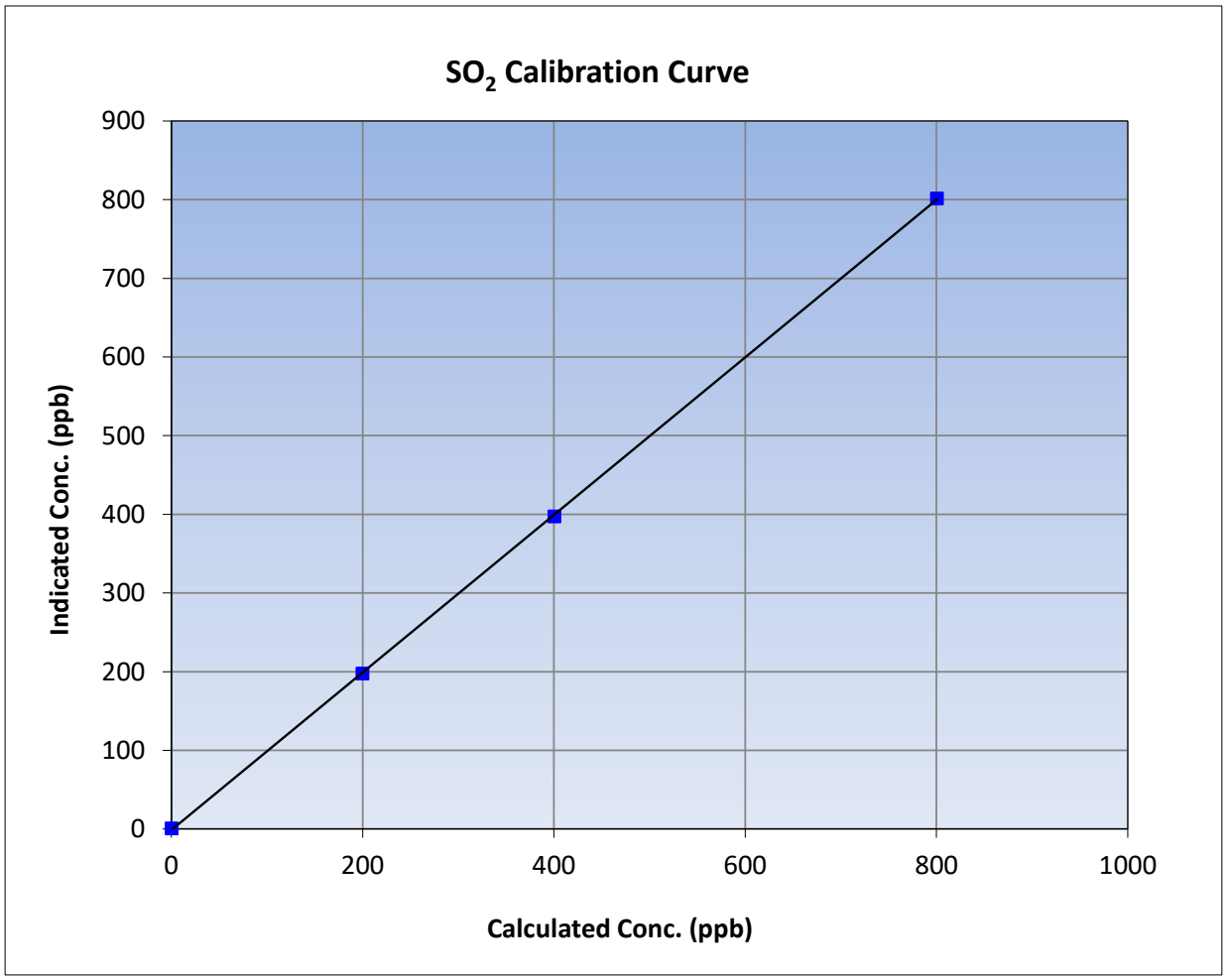
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 11:04 | End Time (MST): | 14:02 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1218153459 |

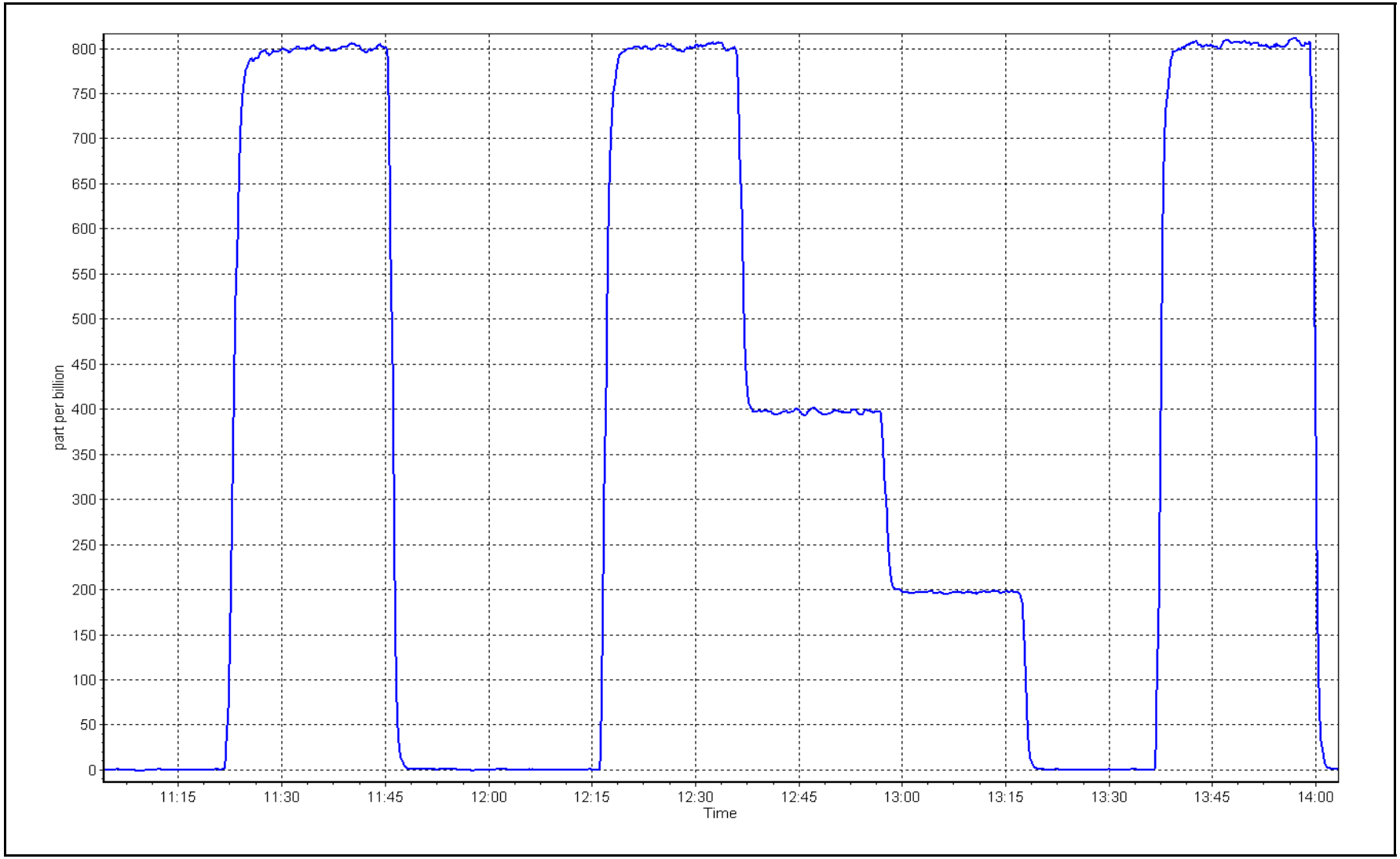
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.5 | ---- |
| 800.0 | 801.1 | 0.9986 |
| 400.0 | 397.1 | 1.0074 |
| 199.5 | 197.4 | 1.0107 |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999969 | *≥0.995* |
| Slope | 1.001438 | *0.90 - 1.10* |
| Intercept | -1.359391 | *+/-30* |



**SO2 Calibration Plot** Date: February 6, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 29, 2024 |
| Start time (MST): | 11:00 | End time (MST): | 15:25 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.076 | ppm | Cal Gas Exp Date: | September 16, 2024 |
| Cal Gas Cylinder #: | CC511852 | | | |
| Removed Cal Gas Conc: | 5.076 | 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: | n/a | | Converter serial #: | n/a | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.009996 | 1.010139 | Backgd or Offset: | 12.2 | 12.2 |
| Calibration intercept: | -0.299186 | 0.220812 | Coeff or Slope: | 1.114 | 1.114 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4921 | 78.8 | 80.0 | 81.7 | 0.978 |
| as found 2nd point | 4961 | 39.4 | 40.0 | 40.3 | 0.990 |
| as found 3rd point | 4980 | 19.7 | 20.0 | 20.4 | 0.976 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4921 | 78.8 | 80.0 | 81.0 | 0.988 |
| second point | 4961 | 39.4 | 40.0 | 40.7 | 0.983 |
| third point | 4980 | 19.7 | 20.0 | 20.4 | 0.980 |
| as left zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as left span | 4921 | 78.8 | 80.0 | 79.8 | 1.003 |
| SO2 Scrubber Check | 4921 | 79.4 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | n/a | | Ave Corr Factor | 0.984 |
| Date of last converter efficiency test: | | n/a | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.8 | Prev response: | 80.50 | *% change: | 1.6% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.021568 | AF Intercept: | -0.179202 |
| Baseline Corr 3rd AF pt: | 20.5 | AF Correlation: | 0.999947 | | |

* = > +/-5% change initiates investigation

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

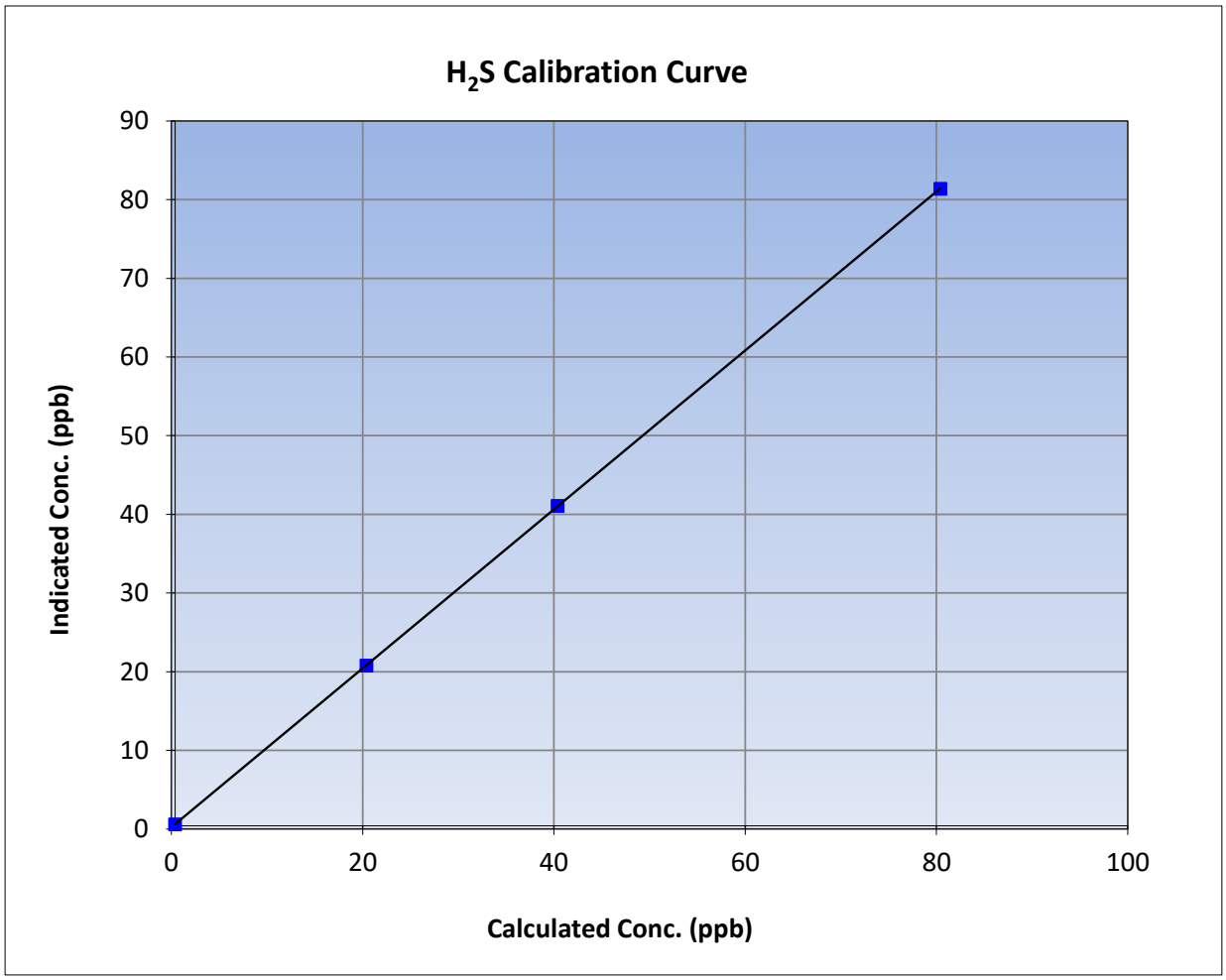
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 29, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 11:00 | End Time (MST): | 15:25 |
| Analyzer make: | Thermo 450i | Analyzer serial #: | 1218153583 |

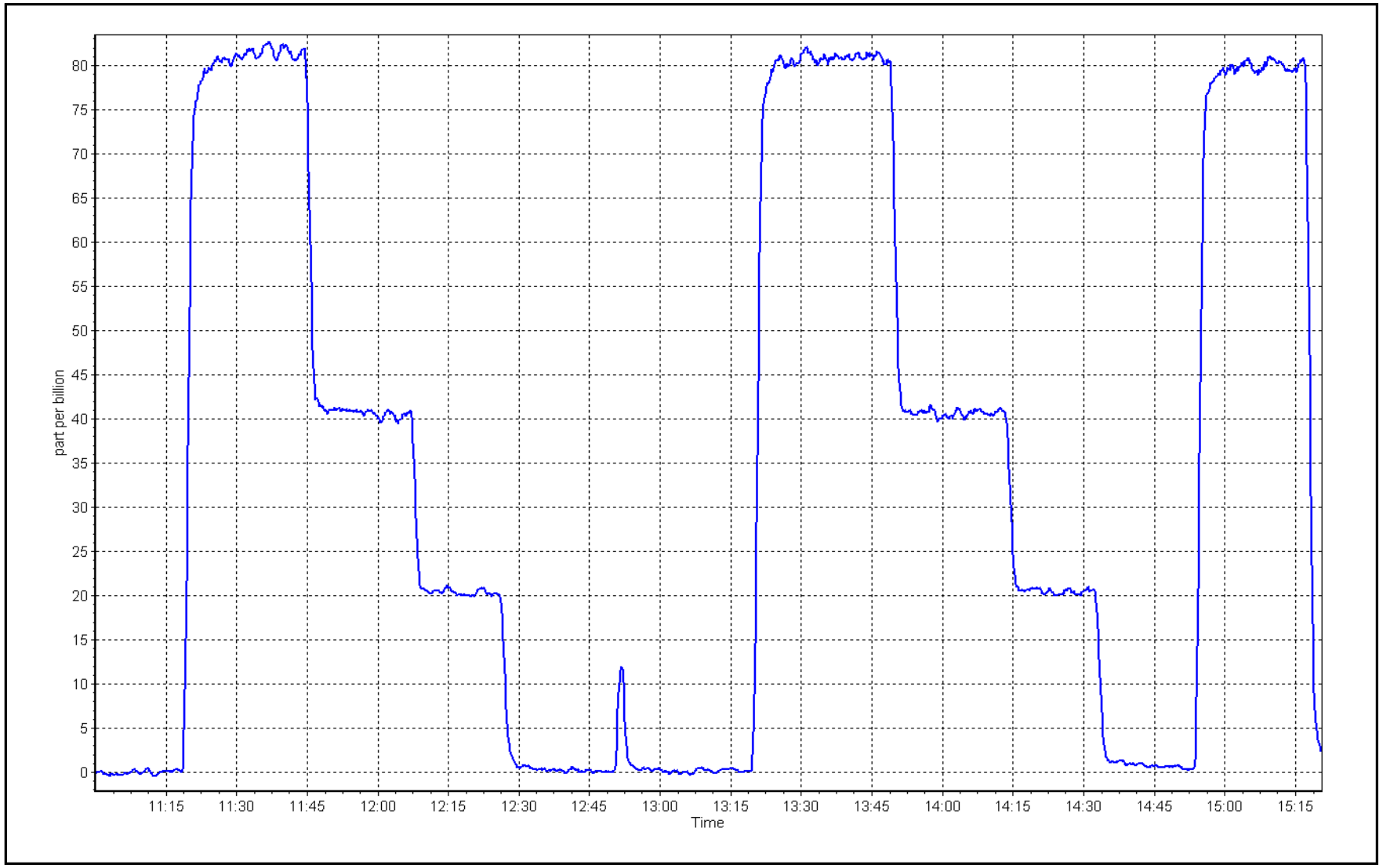
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 81.0 | 0.9877 |
| 40.0 | 40.7 | 0.9827 |
| 20.0 | 20.4 | 0.9804 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.010139 | *0.90 - 1.10* |
| Intercept | 0.220812 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 12, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 11:04 | End time (MST): | 14:02 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | ALM066507 | Cal Gas Expiry Date: | January 12, 2029 | |
| 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: | n/a | |
| Removed CH4 Conc. | 503.5 | ppm | CH4 Equiv Conc. | 1076.3 | ppm |
| Removed C3H8 Conc. | 208.3 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 2449 | |
| ZAG Make/Model: | API 701H | | Serial Number: | 359 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1218153352 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.993554 | 0.992396 | Background: | 3.020 | 3.020 |
| Calibration intercept: | 0.002025 | 0.034435 | Coefficient: | 4.390 | 4.390 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.03 | ---- |
| as found span | 4921 | 79.4 | 17.09 | 17.09 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.09 | ---- |
| high point | 4921 | 79.4 | 17.09 | 17.05 | 1.003 |
| second point | 4960 | 39.7 | 8.55 | 8.42 | 1.015 |
| third point | 4980 | 19.8 | 4.26 | 4.26 | 1.001 |
| as left zero | 5000 | 0.0 | 0.00 | -0.02 | ---- |
| as left span | 4921 | 79.4 | 17.09 | 17.03 | 1.004 |
| | | | | Average Correction Factor | 1.006 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.06 | Previous response | 16.98 | *% 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

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

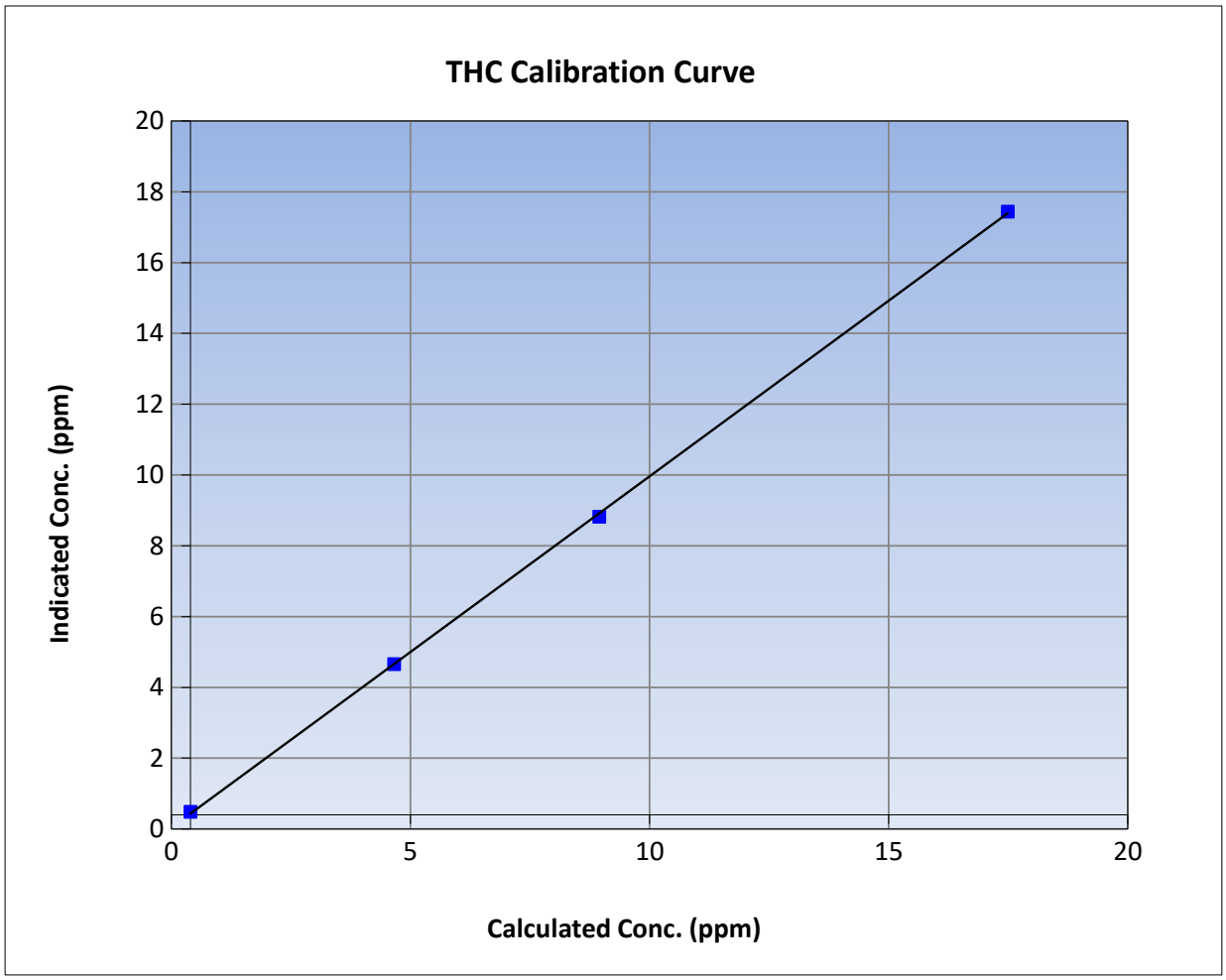
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 11:04 | End Time (MST): | 14:02 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1218153352 |

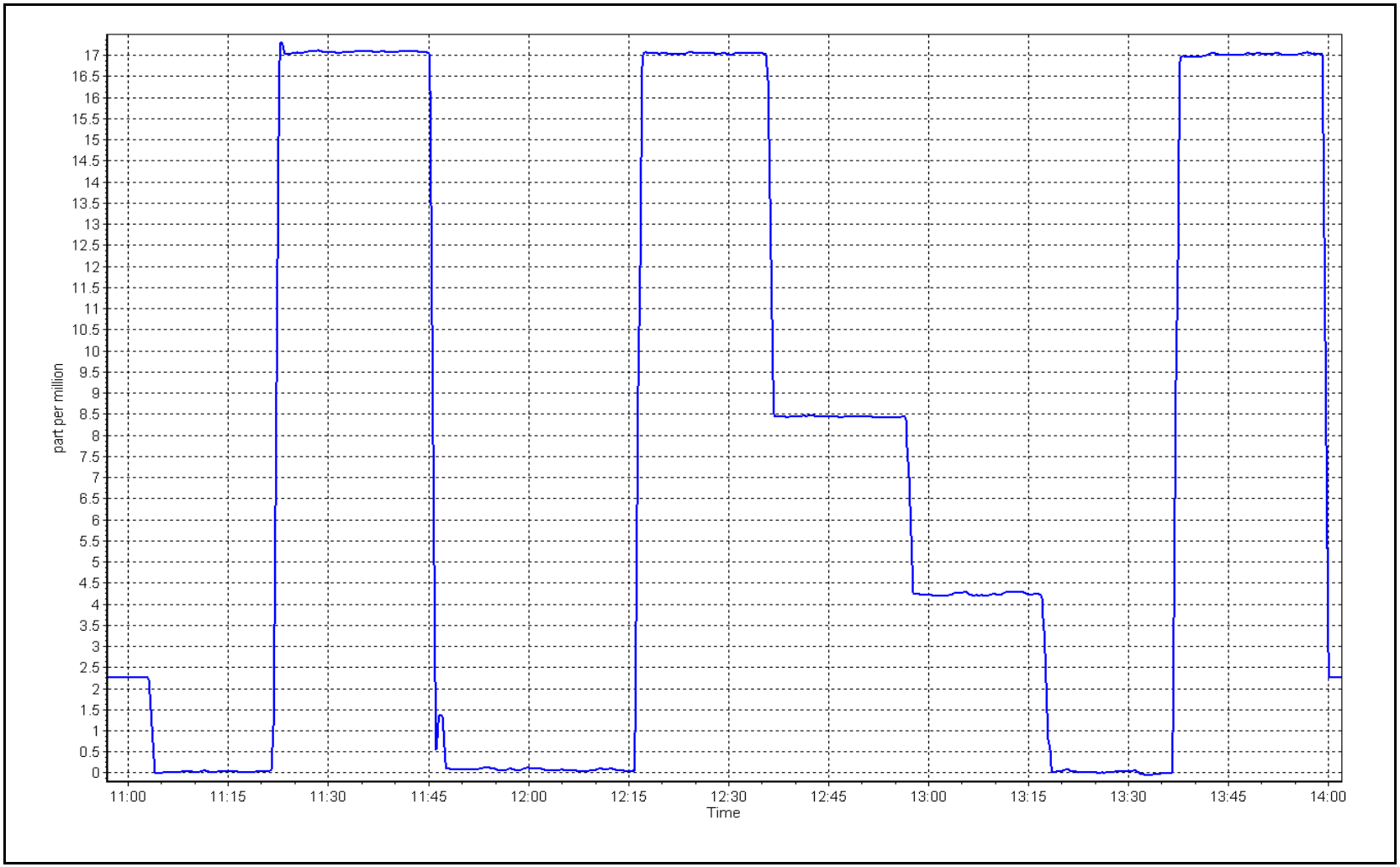
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | 0.09 | ---- |
| 17.09 | 17.05 | 1.0027 |
| 8.55 | 8.42 | 1.0151 |
| 4.26 | 4.26 | 1.0008 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999907 | *≥0.995* |
| Slope | 0.992396 | *0.90 - 1.10* |
| Intercept | 0.034435 | *+/-1.5* |



**THC Calibration Plot** Date: February 6, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 10:59 | End time (MST): | 16:05 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo Scientific 42iQ | Analyzer serial #: | 12300522720 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.250 | 1.264 | NO bkgnd or offset: | 8.1 | 8.1 |
| NOX coeff or slope: | 0.986 | 0.986 | NOX bkgnd or offset: | 8.1 | 8.1 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 326.0 | 335.3 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.003354 | 0.998991 |
| $NO_X$ Cal Offset: | -4.920000 | -5.260000 |
| NO Cal Slope: | 1.006788 | 1.001959 |
| NO Cal Offset: | -5.500000 | -5.660000 |
| $NO_2$ Cal Slope: | 0.997030 | 0.995634 |
| $NO_2$ Cal Offset: | -0.662092 | -1.245592 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.3 | 0.0 | ---- | ---- |
| as found span | 4917 | 83.2 | 817.2 | 799.9 | 17.3 | 807.8 | 792.4 | 15.5 | 1.0116 | 1.0094 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.3 | 0.1 | ---- | ---- |
| high point | 4917 | 83.2 | 817.2 | 799.9 | 17.3 | 814.3 | 799.3 | 14.9 | 1.0035 | 1.0007 |
| second point | 4958 | 41.6 | 408.6 | 399.9 | 8.7 | 398.3 | 389.9 | 8.4 | 1.0258 | 1.0258 |
| third point | 4979 | 20.8 | 204.3 | 200.0 | 4.3 | 195.3 | 191.0 | 4.3 | 1.0461 | 1.0470 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.2 | 0.1 | ---- | ---- |
| as left span | 4917 | 83.2 | 817.2 | 393.2 | 424.0 | 813.3 | 391.6 | 421.7 | 1.0047 | 1.0040 |
| | | | | | | | | Average Correction Factor | 1.0252 | 1.0245 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 808.2 ppb | NO = 792.7 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -0.8% |
| Previous Response | $NO_X$ = 815.0 ppb | NO = 799.8 ppb | | | *Percent Change | NO = | -0.9% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 801.4 | 394.7 | 424.0 | 421.7 | 1.0055 | 99.5% |
| 2nd GPT point (200 ppb O3) | 801.4 | 598.2 | 220.5 | 217.5 | 1.0138 | 98.6% |
| 3rd GPT point (100 ppb O3) | 801.4 | 699.5 | 119.2 | 116.1 | 1.0267 | 97.4% |
| | | | | Average Correction Factor | 1.0153 | 98.5% |

Notes: Change filters after as founds. Adjusted span only.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

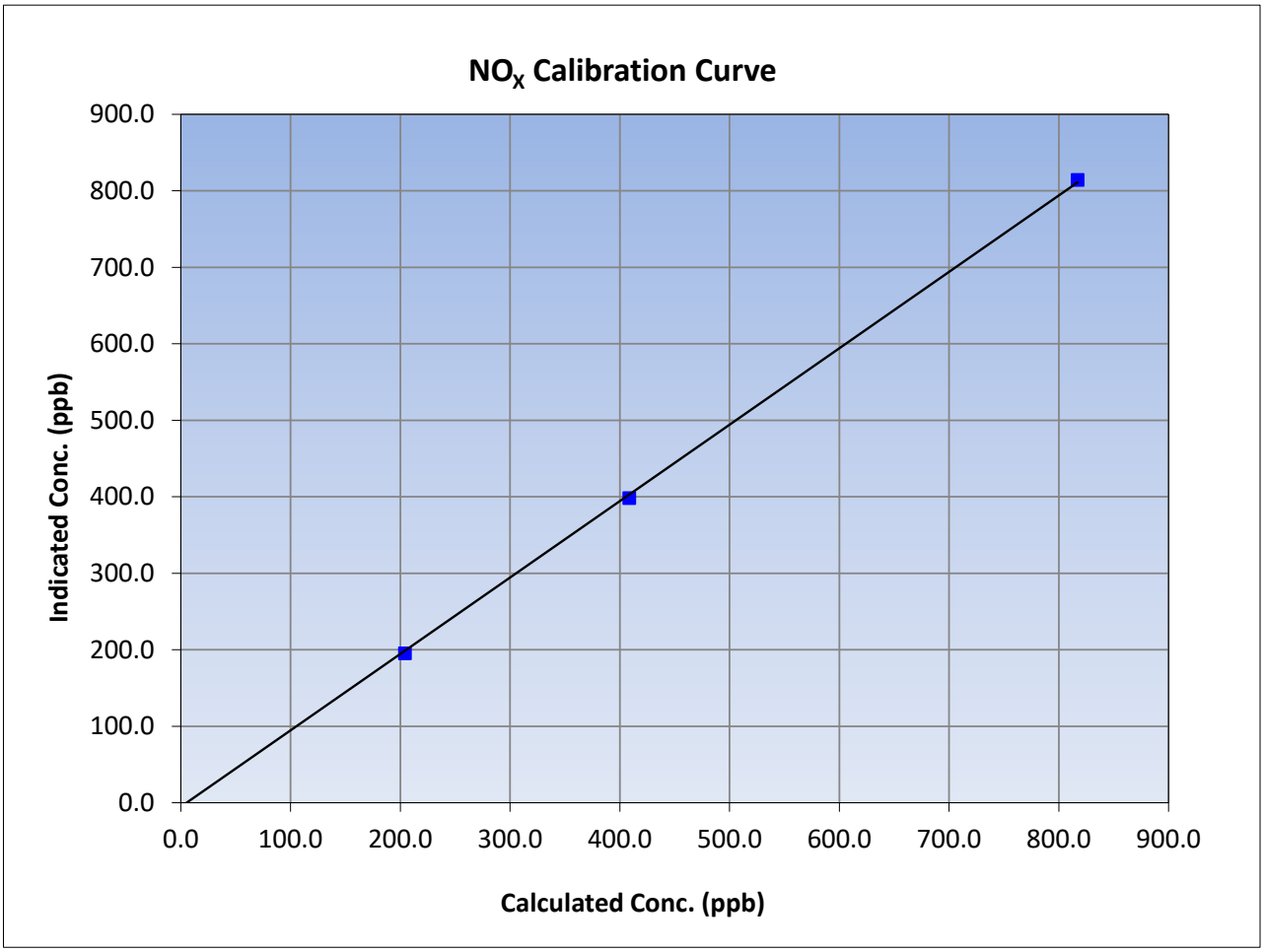
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 10:59 | End Time (MST): | 16:05 |
| Analyzer make: | Thermo Scientific 42iQ | Analyzer serial #: | 12300522720 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.3 | ---- | Correlation Coefficient | 0.999812 | *≥0.995* |
| 817.2 | 814.3 | 1.0035 | | | |
| 408.6 | 398.3 | 1.0258 | Slope | 0.998991 | *0.90 - 1.10* |
| 204.3 | 195.3 | 1.0461 | | | |
| | | | Intercept | -5.260000 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

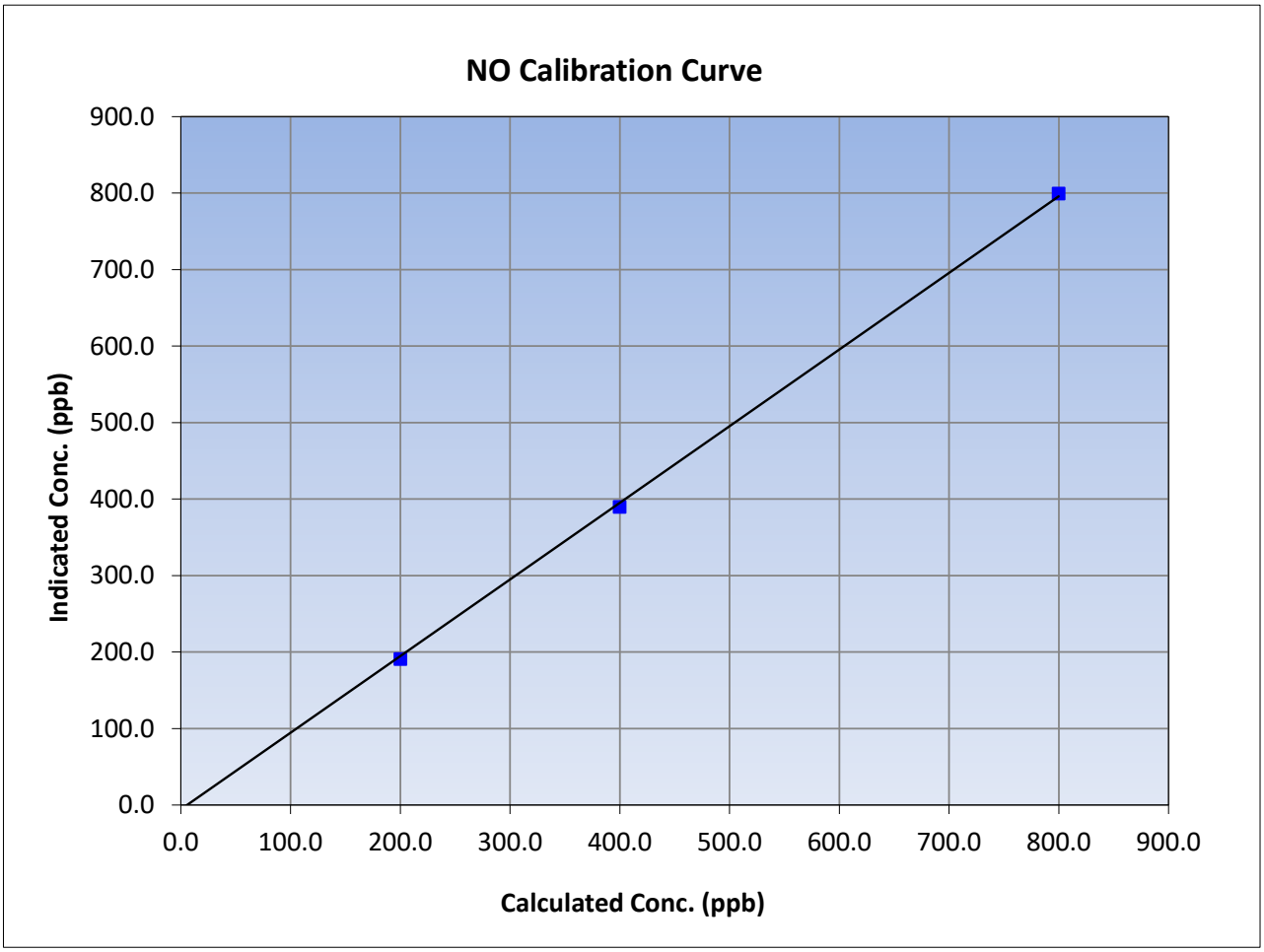
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 10:59 | End Time (MST): | 16:05 |
| Analyzer make: | Thermo Scientific 42iQ | Analyzer serial #: | 12300522720 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.3 | ---- | Correlation Coefficient | 0.999768 | ≥0.995 |
| 799.9 | 799.3 | 1.0007 | | | |
| 399.9 | 389.9 | 1.0258 | Slope | 1.001959 | 0.90 - 1.10 |
| 200.0 | 191.0 | 1.0470 | | | |
| | | | Intercept | -5.660000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

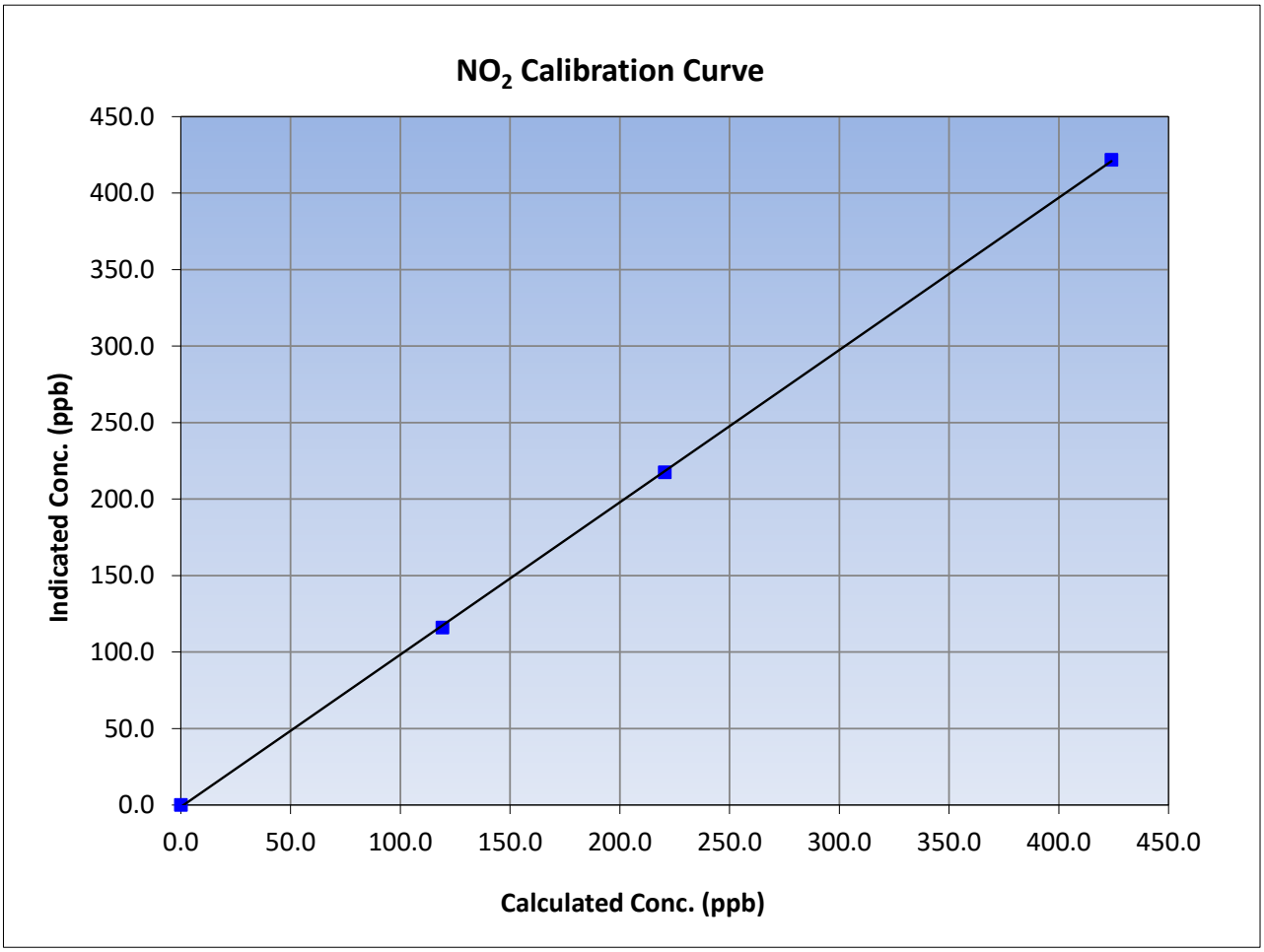
Version-04-2020

### Station Information

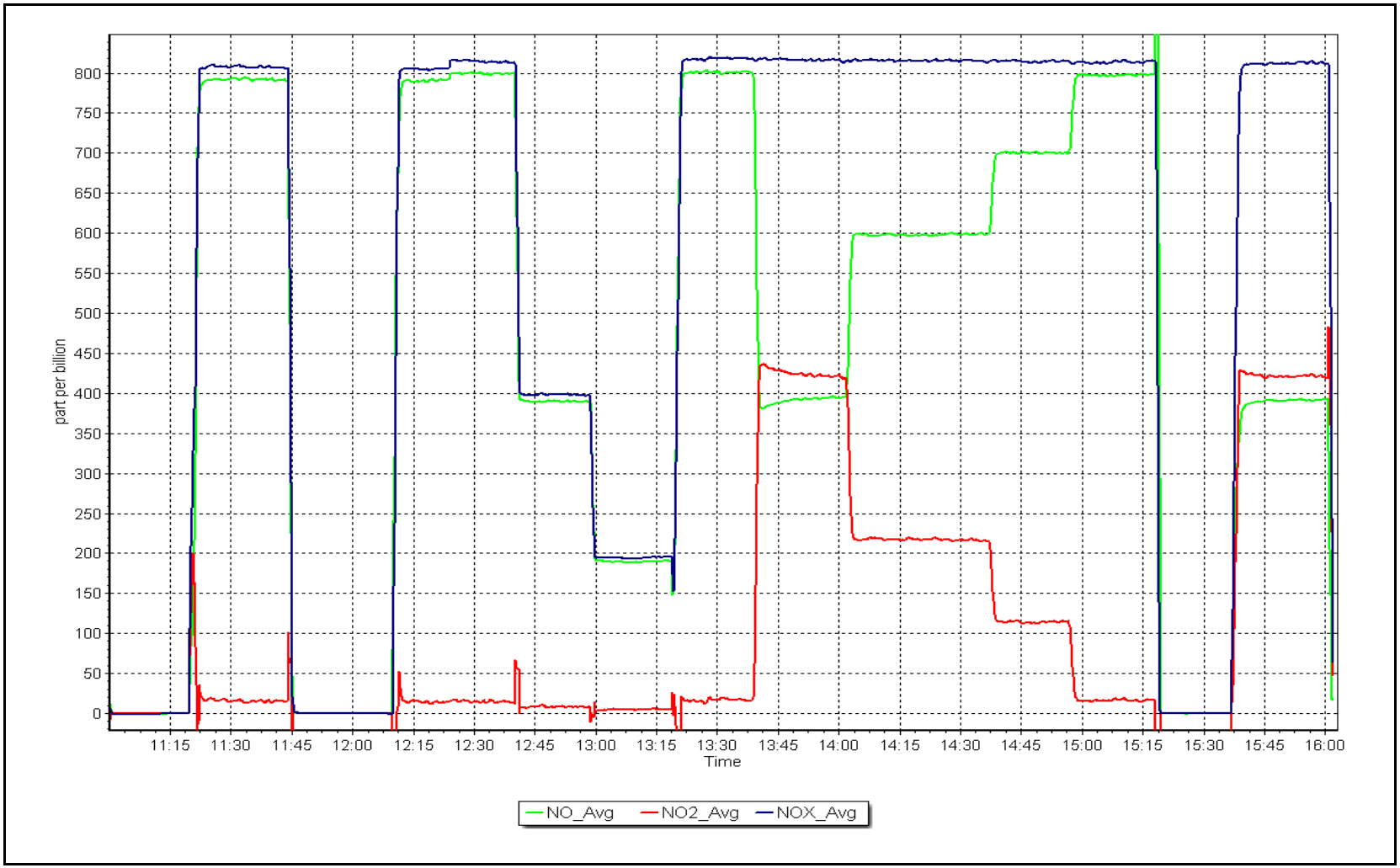
| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 10:59 | End Time (MST): | 16:05 |
| Analyzer make: | Thermo Scientific 42iQ | Analyzer serial #: | 12300522720 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999949 | ≥0.995 |
| 424.0 | 421.7 | 1.0055 | | | |
| 220.5 | 217.5 | 1.0138 | Slope | 0.995634 | 0.90 - 1.10 |
| 119.2 | 116.1 | 1.0267 | | | |
| | | | Intercept | -1.245592 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 13, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | February 9, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 10:45 | End time (MST): | 14:00 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | API T400 | Analyzer serial #: | 3870 |
| Analyzer Range | 0 - 500 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.001714 | 1.006914 | Backgd or Offset: | -1.8 | -1.8 |
| Calibration intercept: | -0.500000 | -0.560000 | Coeff or Slope: | 1.014 | 1.027 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as found span | 5000 | 1077.3 | 400.0 | 394.0 | 1.015 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 5000 | 1077.3 | 400.0 | 402.5 | 0.994 |
| second point | 5000 | 900.3 | 200.0 | 200.6 | 0.997 |
| third point | 5000 | 789.5 | 100.0 | 99.4 | 1.006 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 5000 | 1077.3 | 400.0 | 409.8 | 0.976 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 393.7 | Previous response | 400.2 | *% change | -1.6% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

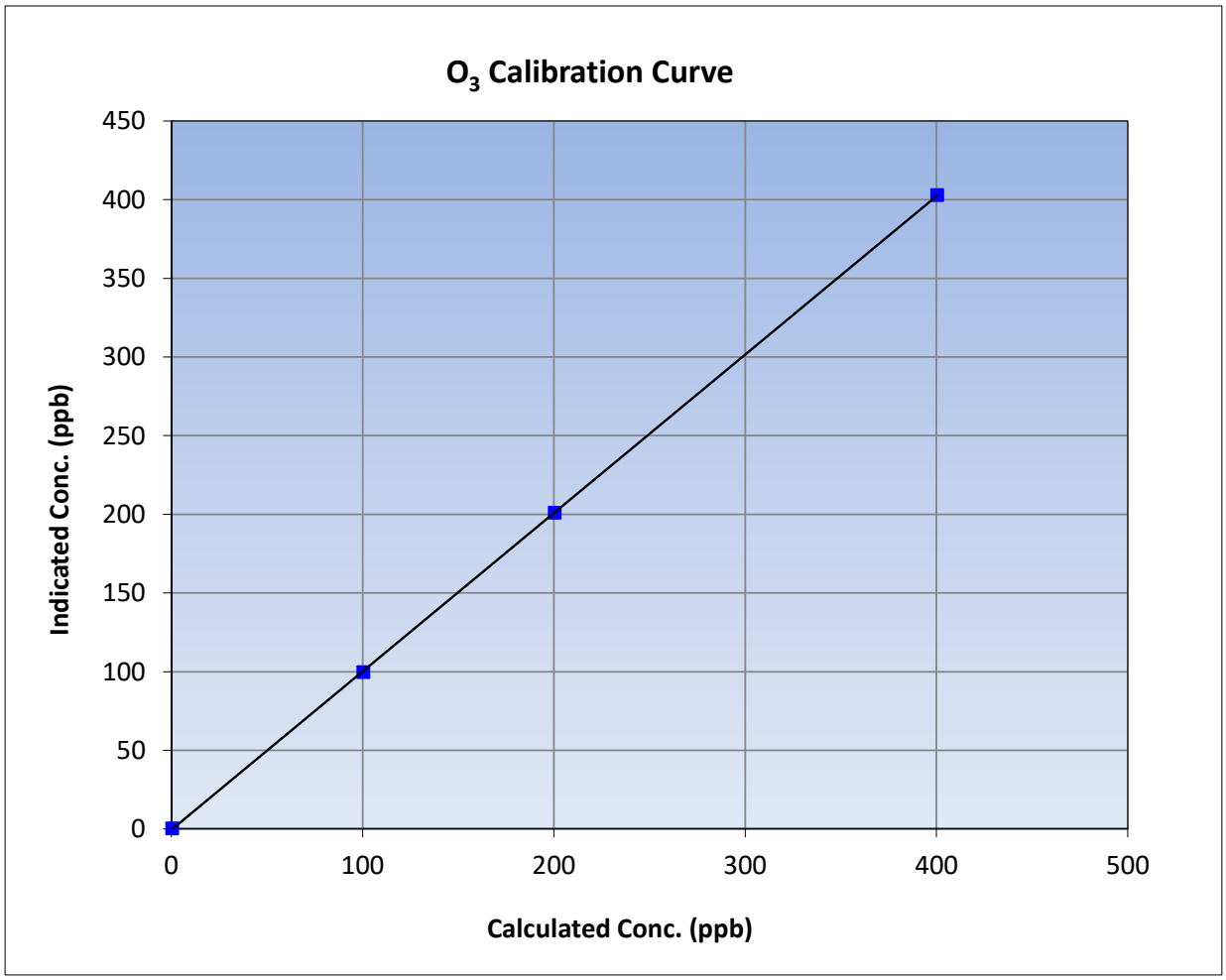
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 9, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 10:45 | End Time (MST): | 14:00 |
| Analyzer make: | API T400 | Analyzer serial #: | 3870 |

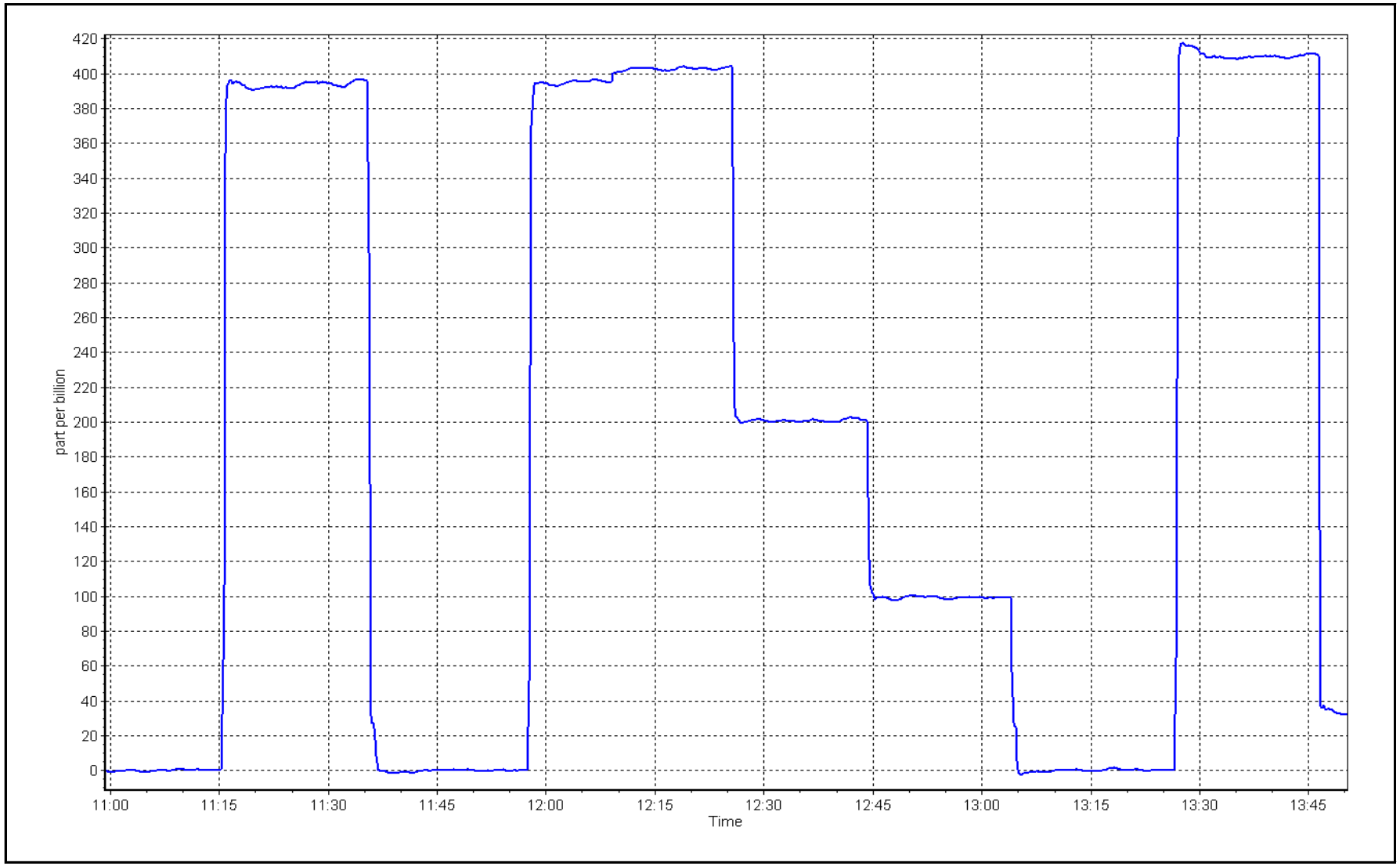
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 400.0 | 402.5 | 0.9938 |
| 200.0 | 200.6 | 0.9970 |
| 100.0 | 99.4 | 1.0060 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999988 | *≥0.995* |
| Slope | 1.006914 | *0.90 - 1.10* |
| Intercept | -0.560000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 9, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS 17 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 29, 2024 |
| Start time (MST): | 13:50 | End time (MST): | 15:39 |
| Analyzer Make: | API T640 | S/N: | 1183 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 388748 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 388748 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | (Limits) |
|---|---|---|---|---|---|
| T (°C) | -5.5 | -5.9 | -5.4 | ☐ | +/- 2 °C |
| P (mmHg) | 715.4 | 718.46 | 715.5 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.99 | 5.26 | 4.91 | ☑ | +/- 0.25 LPM |
| PW% (pump) | N/A | ----- | N/A | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 8.0 | 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: N/A — Lot No.: N/A

| Parameter | As found | Post maintenance | As left | Adjusted | (Limits) |
|---|---|---|---|---|---|
| PMT Peak Test | 10.7 | 10.7 | 11.2 | ☑ | +/- 0.5 |

Date Optical Chamber Cleaned: February 13, 2024

Date Disposable Filter Changed: February 13, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: _____

Date RH/T Sensor Cleaned: _____

Notes: Temp, pressure and flow checked. Flow adjusted. Quarterly maintenance carried out. PMT adjusted. Leak check passed pre and post quarterly maintenance.

Calibration by: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS 17 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 15:30 | End time (MST): | 16:30 |
| Analyzer Make: | Teledyne API T640 | S/N: | 1183 |
| 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) | -8.3 | -8.5 | -8.3 | ☐ | +/- 2 °C |
| P (mmHg) | 721.1 | 723.9 | 721.1 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 4.66 | 5.00 | ☑ | +/- 0.25 LPM |
| PW% (pump) | | ----- | | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 5.1 | 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: — Lot No.: — Expiry Date:

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

Date Optical Chamber Cleaned: February 13, 2024

Date Disposable Filter Changed: February 13, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: _____

Date RH/T Sensor Cleaned: _____

Notes: Flow was observed low during audit, calibrated flow to volumetric standard.

Calibration by: Kelly Baragar

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS18
## STONY MOUNTAIN

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | February 1, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 11:13 | End time (MST): | 15:25 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 49.40 | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #: | CC463851 | | | |
| Removed Cal Gas Conc: | 49.40 | 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 701H | | Serial Number: | 360 |

### Analyzer Information

Analyzer make: Thermo 43i  Analyzer serial #: JC1501301453

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.005444 | 1.002503 | Backgd or Offset: | 22.5 | 22.9 |
| Calibration intercept: | -0.422589 | -0.043083 | Coeff or Slope: | 0.813 | 0.800 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5009 | 0.0 | 0.0 | 0.7 | ---- |
| as found span | 4919 | 81.0 | 800.3 | 813.5 | 0.984 |
| as found 2nd point | 4959 | 40.5 | 400.2 | 407.2 | 0.983 |
| as found 3rd point | 4979 | 20.2 | 199.6 | 201.0 | 0.993 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| high point | 4919 | 81.0 | 800.3 | 802.5 | 0.997 |
| second point | 4959 | 40.5 | 400.2 | 401.0 | 0.998 |
| third point | 4979 | 20.2 | 199.6 | 199.3 | 1.002 |
| as left zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| as left span | 4919 | 81.0 | 800.3 | 804.2 | 0.995 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 812.80 | Previous response | 804.21 | *% change | 1.1% |
| Baseline Corr 2nd AF pt: | 406.50 | AF Slope: | 1.016696 | AF Intercept: | -0.261026 |
| Baseline Corr 3rd AF pt: | 200.30 | AF Correlation: | 0.999989 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

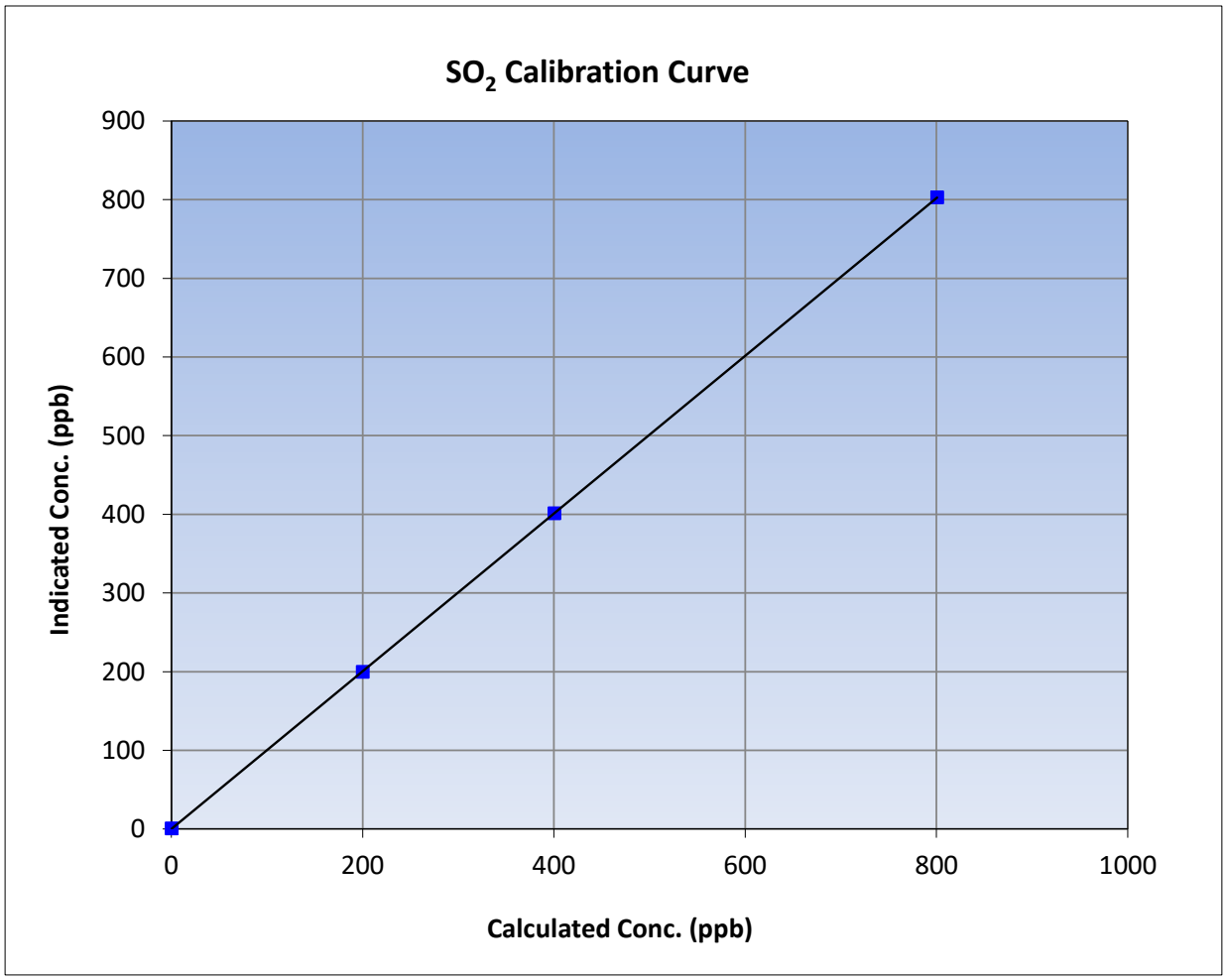
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:13 | End Time (MST): | 15:25 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1501301453 |

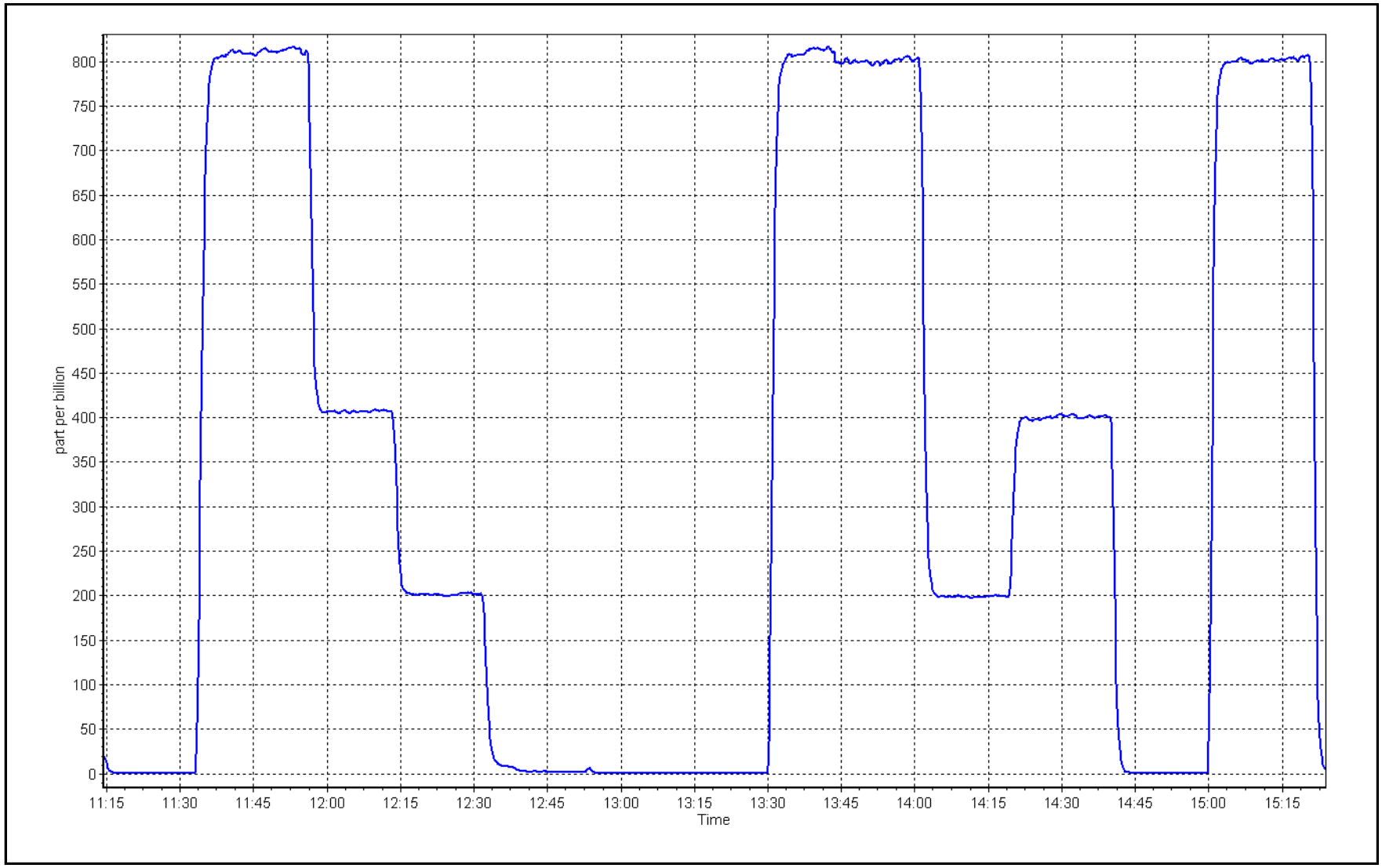
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 800.3 | 802.5 | 0.9972 |
| 400.2 | 401.0 | 0.9980 |
| 199.6 | 199.3 | 1.0015 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999997 | *≥0.995* |
| Slope | 1.002503 | *0.90 - 1.10* |
| Intercept | -0.043083 | *+/-30* |



**SO2 Calibration Plot** Date: February 1, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS18 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 30, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 15:45 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.479 | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #: | CC500395 | | | |
| Removed Cal Gas Conc: | 5.479 | 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.000728 | 0.995441 | Backgd or Offset: | 2.66 | 2.66 |
| Calibration intercept: | 0.341016 | 0.301088 | Coeff or Slope: | 1.157 | 1.157 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4927 | 73.0 | 80.0 | 81.0 | 0.989 |
| as found 2nd point | 4964 | 36.5 | 40.0 | 40.9 | 0.980 |
| as found 3rd point | 4983 | 18.3 | 20.0 | 20.4 | 0.988 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| high point | 4927 | 73.0 | 80.0 | 79.9 | 1.001 |
| second point | 4964 | 36.5 | 40.0 | 40.2 | 0.995 |
| third point | 4983 | 18.3 | 20.0 | 20.2 | 0.992 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4927 | 73.0 | 80.0 | 79.5 | 1.006 |
| SO2 Scrubber Check | 4923 | 77.1 | 771.0 | -0.1 | ---- |
| Date of last scrubber change: | | 17-Dec-21 | | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.9 | Prev response: | 80.39 | *% change: | 0.6% |
| Baseline Corr 2nd AF pt: | 40.8 | AF Slope: | 1.011732 | AF Intercept: | 0.180788 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999975 | | |

* = > +/-5% change initiates investigation

Notes: Scrubber check completed after calibrator zero. No adjustments made.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

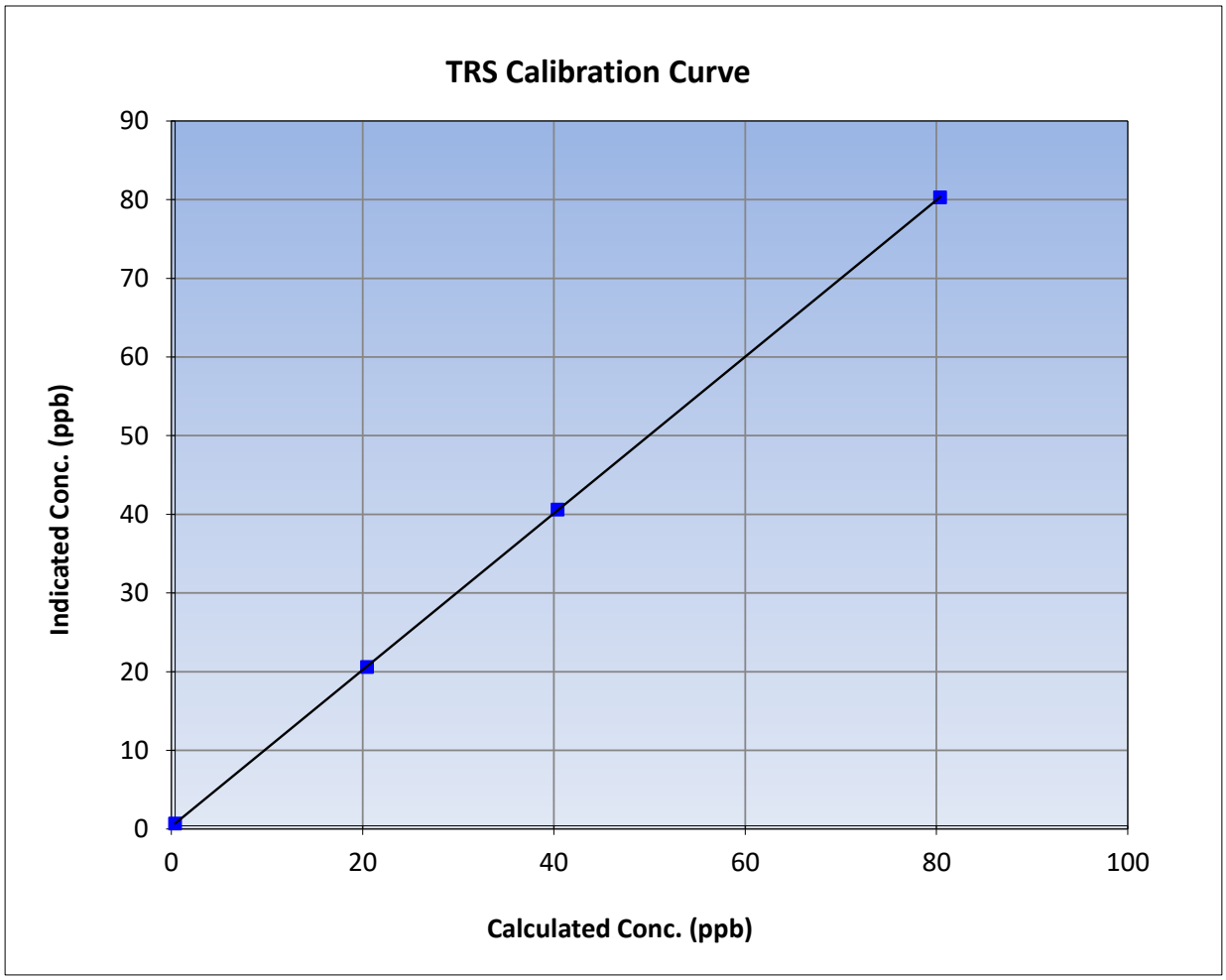
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 30, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS18 |
| Start Time (MST): | 11:15 | End Time (MST): | 15:45 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1218153359 |

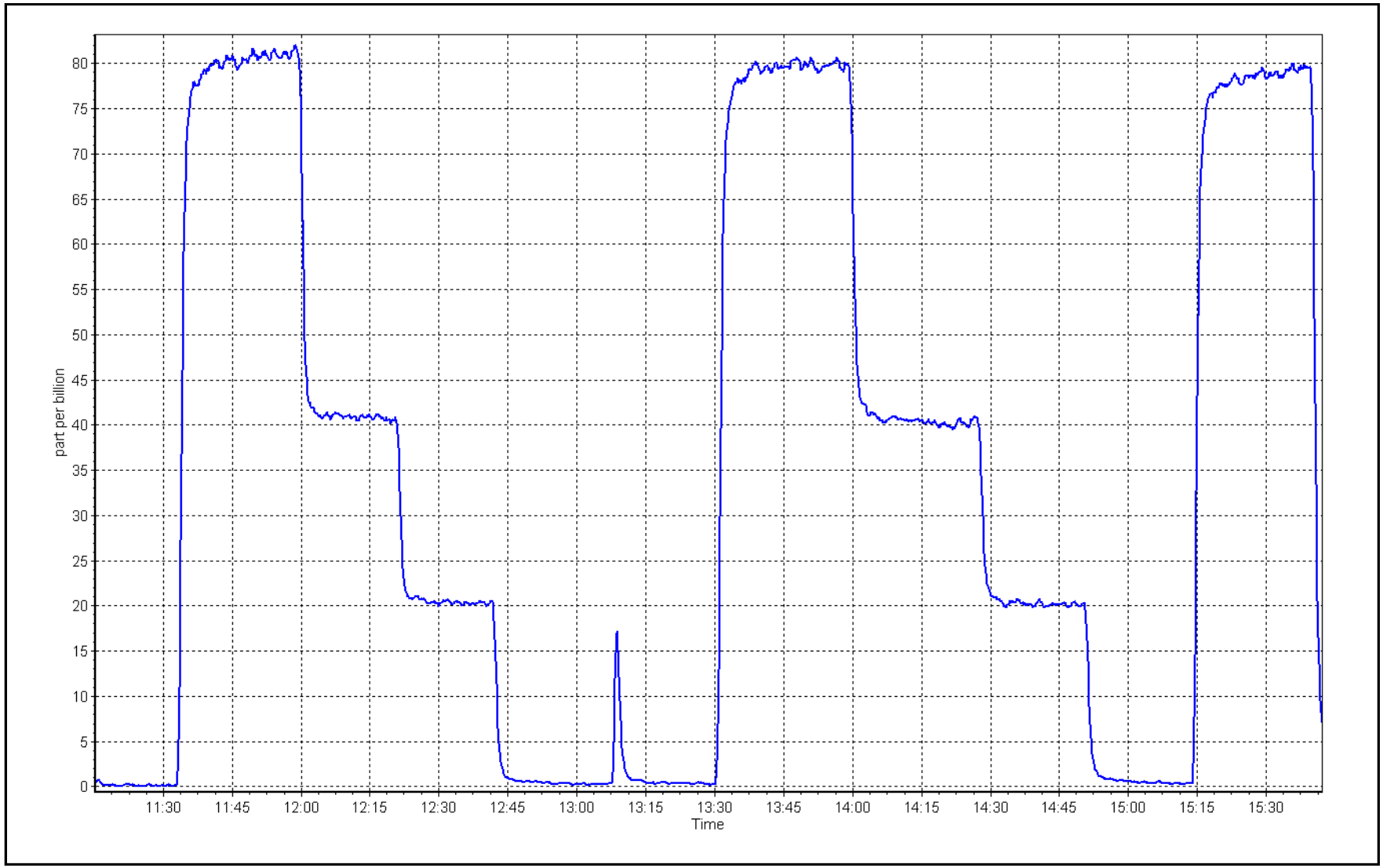
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 80.0 | 79.9 | 1.0012 |
| 40.0 | 40.2 | 0.9948 |
| 20.0 | 20.2 | 0.9925 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999997 | *≥0.995* |
| Slope | 0.995441 | *0.90 - 1.10* |
| Intercept | 0.301088 | *+/-3* |



**TRS Calibration Plot** Date: February 15, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | February 1, 2024 | Last Cal Date: | January 23, 2024 |
| Start time (MST): | 11:13 | End time (MST): | 15:25 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC463851 | Cal Gas Expiry Date: | February 23, 2025 | |
| CH4 Cal Gas Conc. | 500.8 | ppm | CH4 Equiv Conc. | 1066.8 | ppm |
| C3H8 Cal Gas Conc. | 205.8 | ppm | | | |
| Removed Gas Cert: | | NA | Removed Gas Expiry: | | NA |
| 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 T700 | | Serial Number: | 2658 | |
| ZAG make/model: | Teledyne API T701H | | Serial Number: | 360 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1193585647 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 3.13E-04 | 2.88E-04 | NMHC SP Ratio: | 6.14E-05 | 5.97E-05 |
| CH4 Retention time: | 16.2 | 15.8 | NMHC Peak Area: | 149456 | 153566 |
| Zero Chromatogram: | OFF | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.42 | ---- |
| as found span | 4919 | 81.0 | 17.28 | 14.36 | 1.204 |
| as found 2nd point | 4959 | 40.5 | 8.64 | 7.45 | 1.159 |
| as found 3rd point | 4979 | 20.2 | 4.31 | 3.95 | 1.091 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 17.28 | 17.16 | 1.007 |
| second point | 4959 | 40.5 | 8.64 | 8.62 | 1.002 |
| third point | 4979 | 20.2 | 4.31 | 4.30 | 1.002 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 81.0 | 17.28 | 17.38 | 0.995 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 13.94 | Prev response | 17.41 | *% change | -24.9% |
| Baseline Corr 2nd AF: | 7.0 | AF Slope: | 0.805889 | AF Intercept: | 0.454086 |
| Baseline Corr 3rd AF: | 3.5 | AF Correlation: | 0.999968 | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919 | 81.0 | 9.17 | 7.48 | 1.226 |
| as found 2nd point | 4959 | 40.5 | 4.58 | 3.80 | 1.207 |
| as found 3rd point | 4979 | 20.2 | 2.29 | 1.91 | 1.199 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 9.17 | 9.07 | 1.010 |
| second point | 4959 | 40.5 | 4.58 | 4.60 | 0.998 |
| third point | 4979 | 20.2 | 2.29 | 2.28 | 1.002 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 81.0 | 9.17 | 9.26 | 0.990 |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 7.48 | Prev response | 9.27 | *% change | -24.0% |
| Baseline Corr 2nd AF: | 3.8 | AF Slope: | 0.815019 | AF Intercept: | 0.028057 |
| Baseline Corr 3rd AF: | 1.9 | AF Correlation: | 0.999917 | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.42 | ---- |
| as found span | 4919 | 81.0 | 8.11 | 6.88 | 1.179 |
| as found 2nd point | 4959 | 40.5 | 4.06 | 3.66 | 1.110 |
| as found 3rd point | 4979 | 20.2 | 2.02 | 2.04 | 0.991 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 8.11 | 8.09 | 1.003 |
| second point | 4959 | 40.5 | 4.06 | 4.03 | 1.007 |
| third point | 4979 | 20.2 | 2.02 | 2.02 | 1.003 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 81.0 | 8.11 | 8.12 | 1.000 |
| | | | | Average Correction Factor | 1.004 |
| Baseline Corr AF: | 6.46 | Prev response | 8.14 | *% change | -26.0% |
| Baseline Corr 2nd AF: | 3.24 | AF Slope: | 0.795742 | AF Intercept: | 0.425429 |
| Baseline Corr 3rd AF: | 1.62 | AF Correlation: | 0.999997 | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.006554 | 0.993093 |
| THC Cal Offset: | 0.018647 | 0.015393 |
| CH4 Cal Slope: | 1.002919 | 0.997044 |
| CH4 Cal Offset: | 0.002793 | -0.003610 |
| NMHC Cal Slope: | 1.009996 | 0.989722 |
| NMHC Cal Offset: | 0.014455 | 0.019003 |

Notes: Zero chromatogram turned on, carrier pressure increased from 27 psi to 28 psi. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## THC Calibration Summary

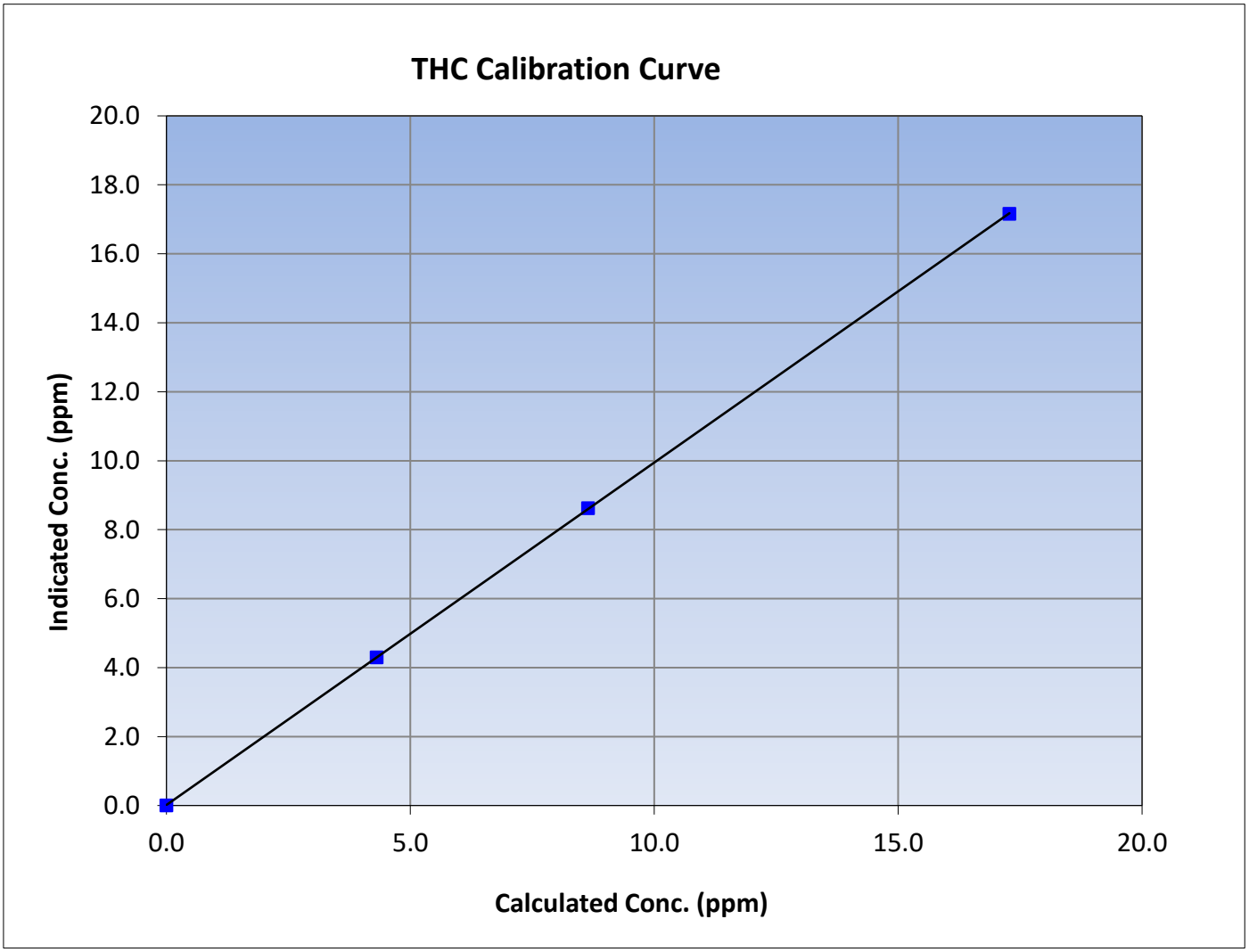
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:13 | End Time (MST): | 15:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585647 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999994 | *≥0.995* |
| 17.28 | 17.16 | 1.0068 | | | |
| 8.64 | 8.62 | 1.0023 | Slope | 0.993093 | *0.90 - 1.10* |
| 4.31 | 4.30 | 1.0024 | | | |
| | | | Intercept | 0.015393 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

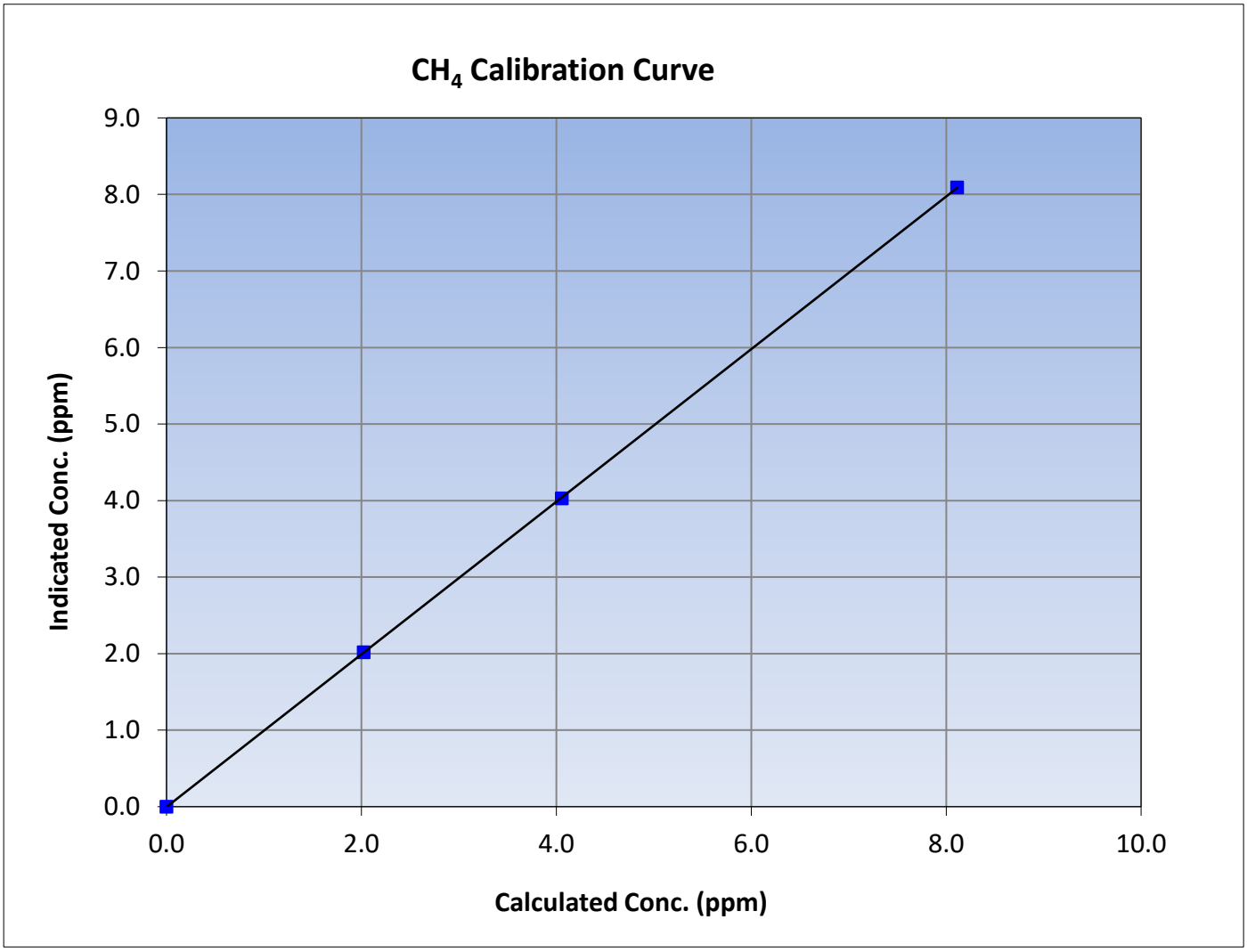
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:13 | End Time (MST): | 15:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585647 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999993 | *≥0.995* |
| 8.11 | 8.09 | 1.0027 | | | |
| 4.06 | 4.03 | 1.0072 | Slope | 0.997044 | *0.90 - 1.10* |
| 2.02 | 2.02 | 1.0028 | | | |
| | | | Intercept | -0.003610 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

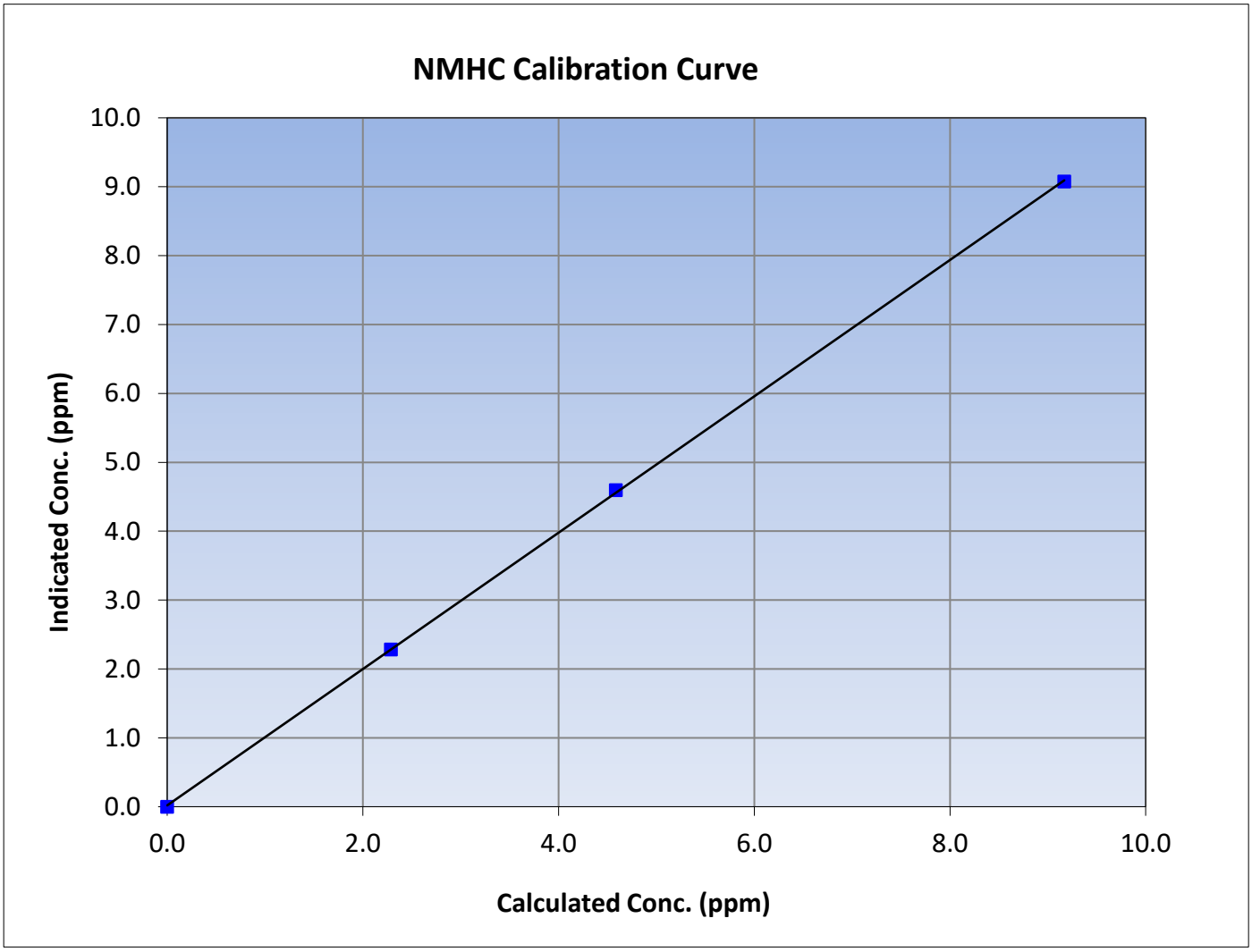
Version-06-2022

### Station Information

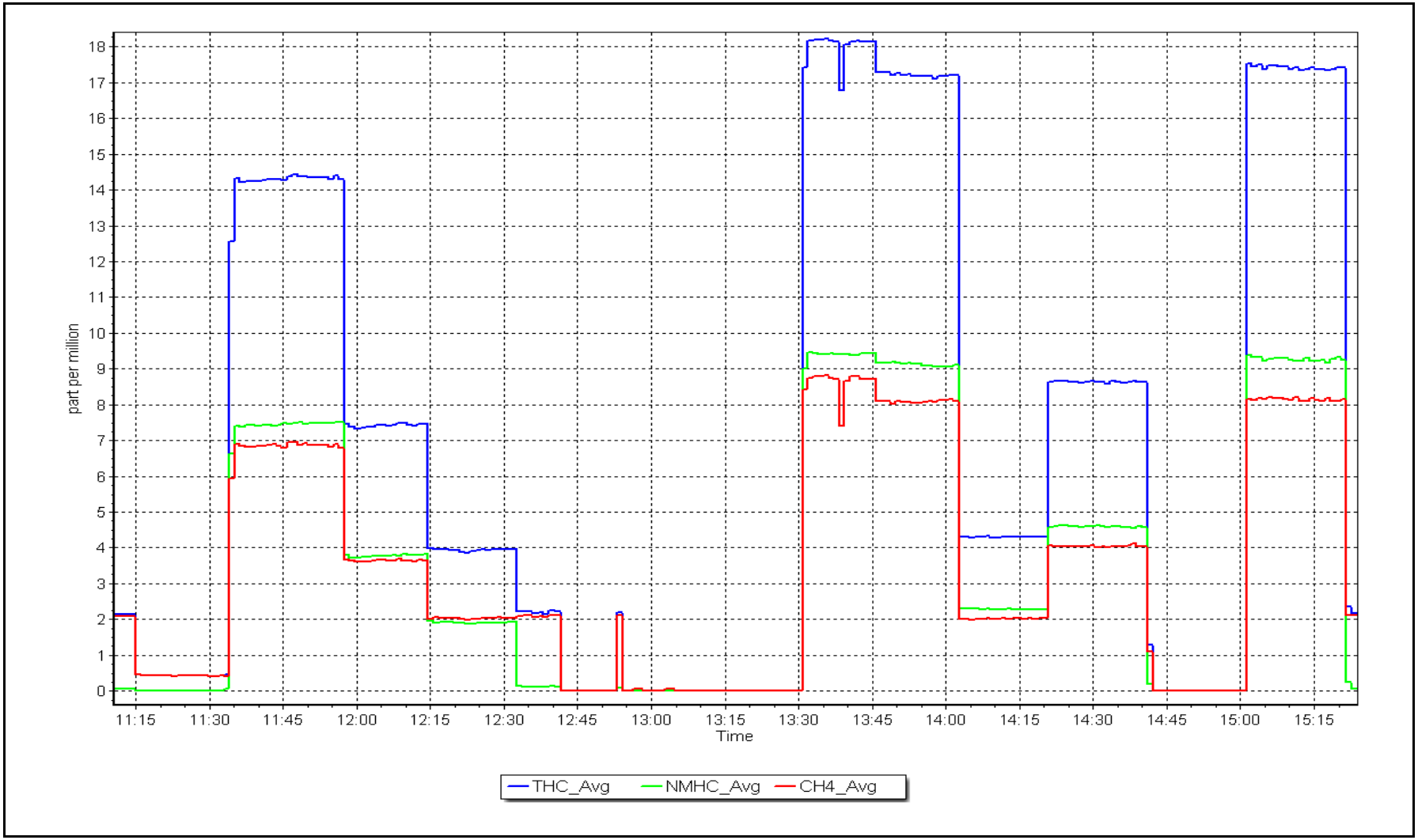
| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:13 | End Time (MST): | 15:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585647 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999951 | ≥0.995 |
| 9.17 | 9.07 | 1.0104 | | | |
| 4.58 | 4.60 | 0.9977 | Slope | 0.989722 | 0.90 - 1.10 |
| 2.29 | 2.28 | 1.0021 | | | |
| | | | Intercept | 0.019003 | +/-0.5 |



**NMHC Calibration Plot** Date: February 1, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 11:12 | End time (MST): | 16:16 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | T26DHGA | | Cal Gas Expiry Date: | November 17, 2026 | |
| NOX Cal Gas Conc: | 48.28 | ppm | NO Cal Gas Conc: | 47.58 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 48.28 | ppm | Removed Gas NO Conc: | 47.58 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 2658 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 13779 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1336160088 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.102 | 1.104 | NO bkgnd or offset: | 3.1 | 3.1 |
| NOX coeff or slope: | 0.988 | 0.995 | NOX bkgnd or offset: | 3.1 | 3.1 |
| NO2 coeff or slope: | 0.999 | 0.999 | Reaction cell Press: | 252.3 | 253.2 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000344 | 1.001950 |
| $NO_X$ Cal Offset: | -0.080000 | -1.100000 |
| NO Cal Slope: | 1.001207 | 1.001421 |
| NO Cal Offset: | -0.760000 | -1.260000 |
| $NO_2$ Cal Slope: | 0.998708 | 1.009656 |
| $NO_2$ Cal Offset: | 0.435337 | 1.192503 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.2 | 0.1 | ---- | ---- |
| as found span | 4916 | 84.0 | 811.1 | 799.3 | 11.8 | 807.4 | 799.9 | 7.5 | 1.0046 | 0.9993 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | ---- | ---- |
| high point | 4916 | 84.0 | 811.1 | 799.3 | 11.8 | 812.1 | 799.7 | 12.5 | 0.9988 | 0.9996 |
| second point | 4958 | 42.0 | 405.6 | 399.7 | 5.9 | 404.8 | 398.7 | 6.1 | 1.0019 | 1.0024 |
| third point | 4979 | 21.0 | 202.8 | 199.8 | 2.9 | 200.9 | 197.5 | 3.4 | 1.0093 | 1.0118 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | 0.0 | ---- | ---- |
| as left span | 4916 | 84.0 | 811.1 | 360.3 | 450.8 | 817.0 | 359.0 | 457.8 | 0.9928 | 1.0037 |
| | | | | | | | | Average Correction Factor | 1.0033 | 1.0046 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 807.5 ppb | NO = 800.1 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -0.5% |
| Previous Response | $NO_X$ = 811.3 ppb | NO = 799.5 ppb | | | *Percent Change | NO = | 0.1% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 796.0 | 357.0 | 450.8 | 455.4 | 0.9898 | 101.0% |
| 2nd GPT point (200 ppb O3) | 796.0 | 591.2 | 216.6 | 221.6 | 0.9773 | 102.3% |
| 3rd GPT point (100 ppb O3) | 796.0 | 693.2 | 114.6 | 117.1 | 0.9783 | 102.2% |
| | | | | Average Correction Factor | 0.9818 | 101.9% |

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

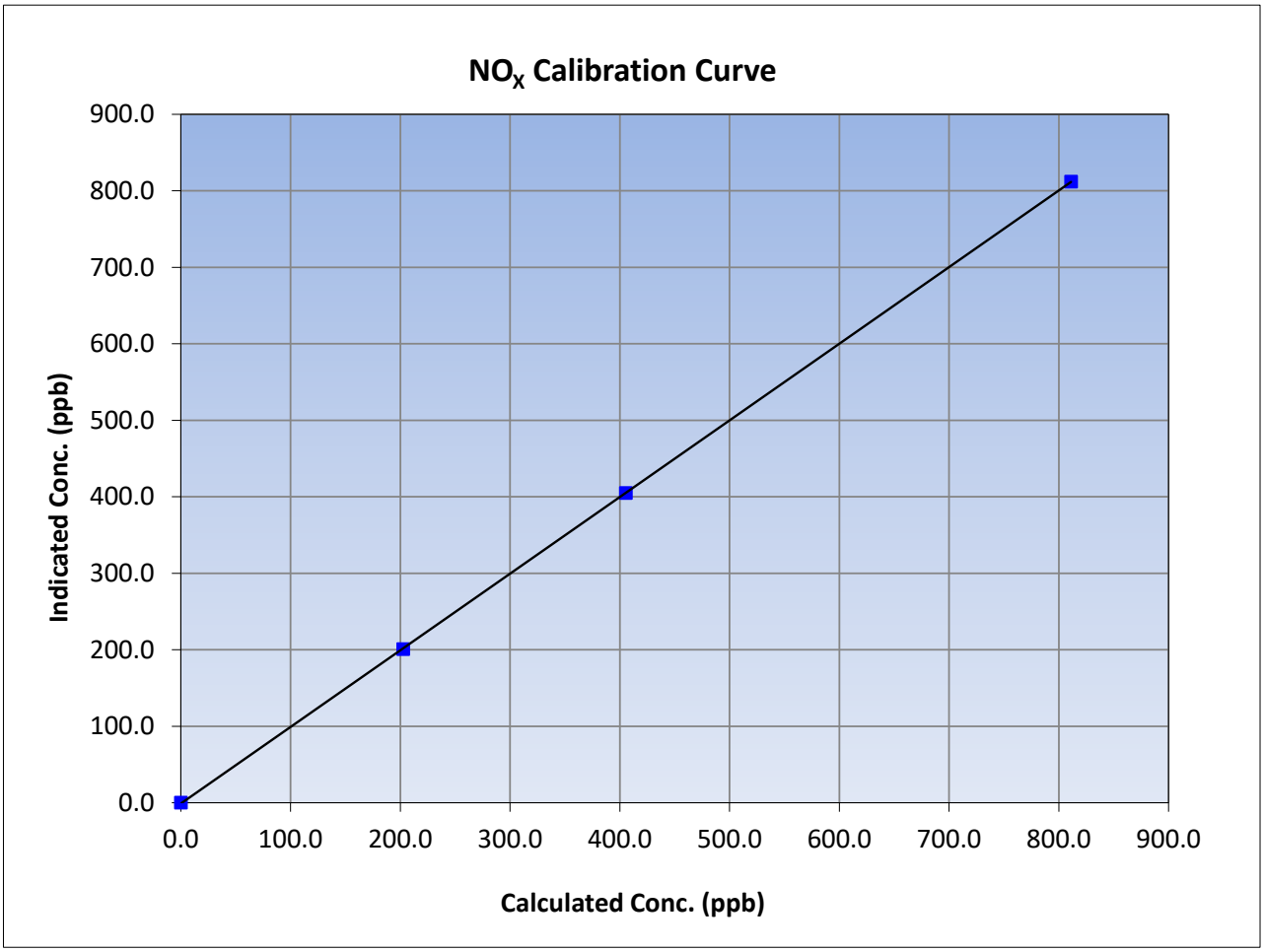
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:12 | End Time (MST): | 16:16 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1336160088 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999992 | ≥0.995 |
| 811.1 | 812.1 | 0.9988 | | | |
| 405.6 | 404.8 | 1.0019 | Slope | 1.001950 | 0.90 - 1.10 |
| 202.8 | 200.9 | 1.0093 | | | |
| | | | Intercept | -1.100000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

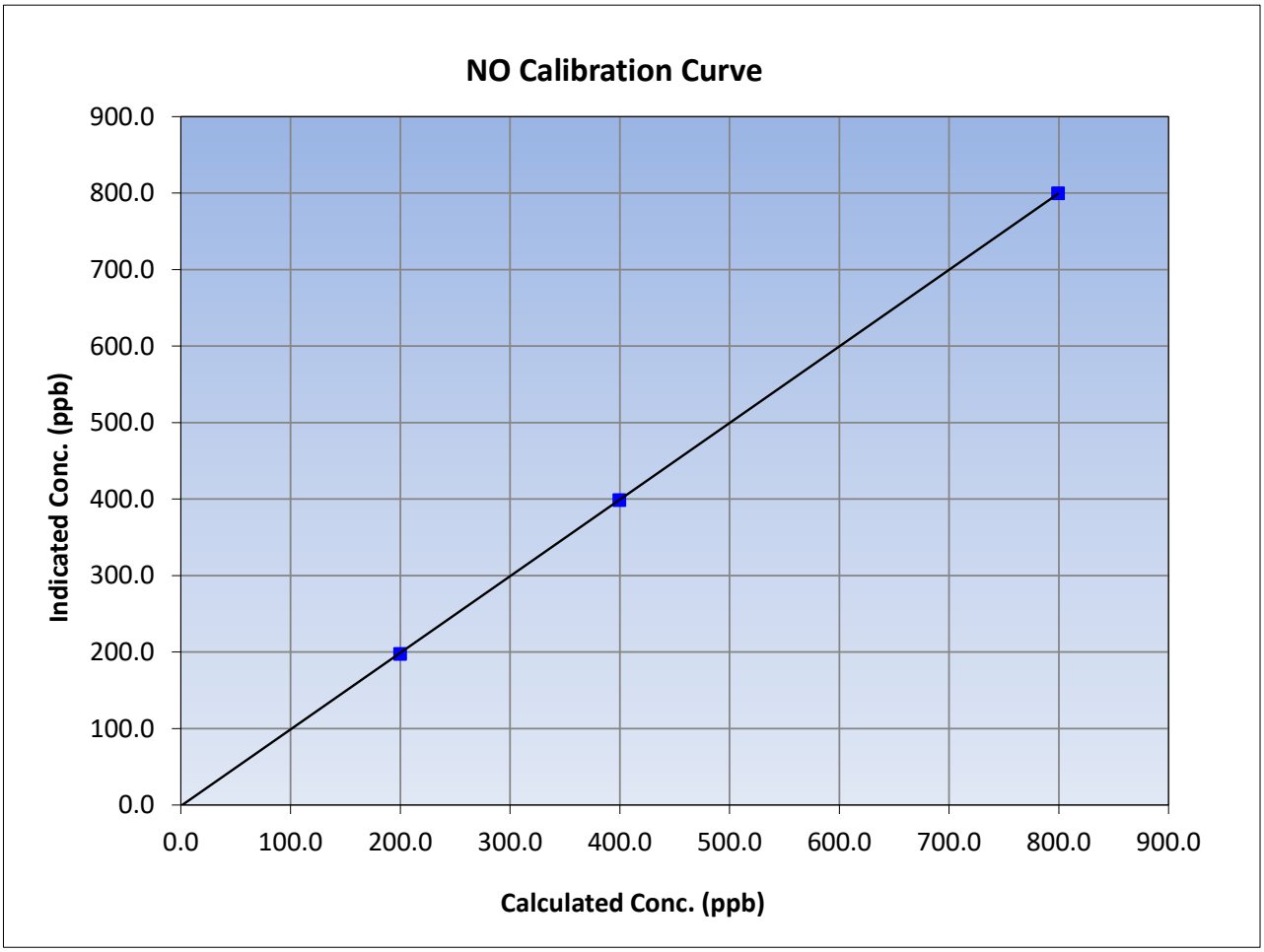
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:12 | End Time (MST): | 16:16 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1336160088 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999990 | ≥0.995 |
| 799.3 | 799.7 | 0.9996 | | | |
| 399.7 | 398.7 | 1.0024 | Slope | 1.001421 | 0.90 - 1.10 |
| 199.8 | 197.5 | 1.0118 | | | |
| | | | Intercept | -1.260000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

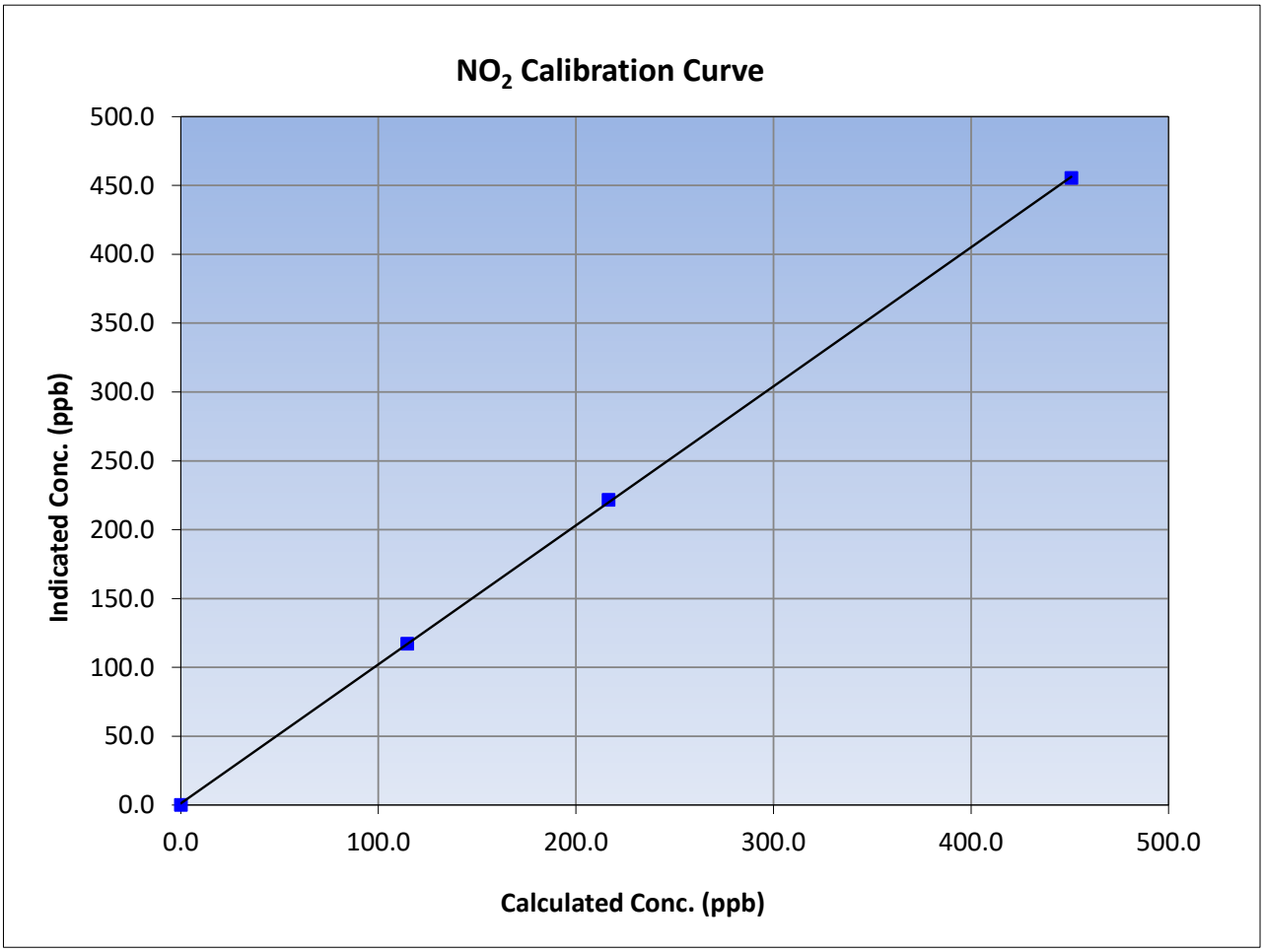
Version-04-2020

### Station Information

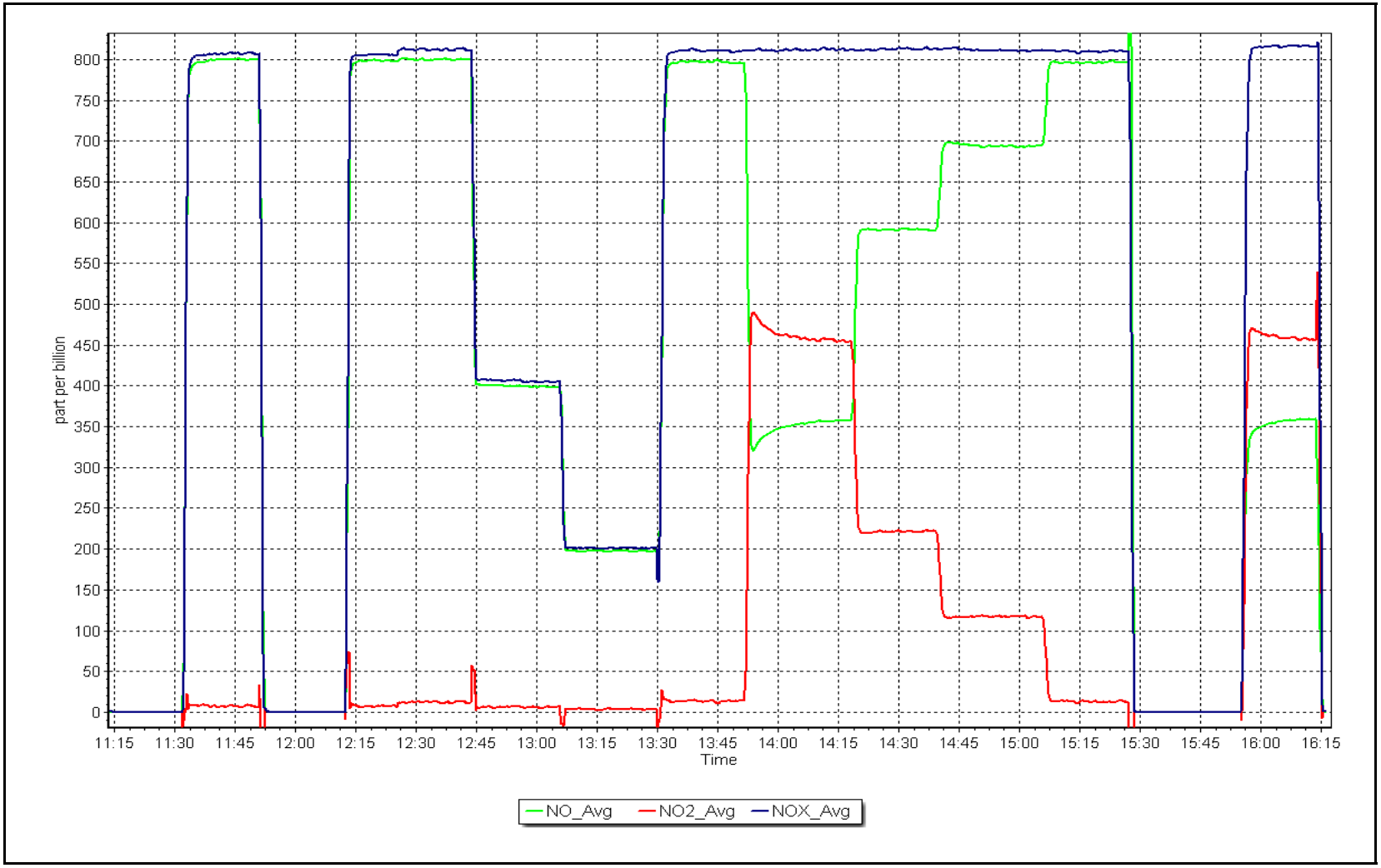
| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 11:12 | End Time (MST): | 16:16 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1336160088 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999954 | ≥0.995 |
| 450.8 | 455.4 | 0.9898 | | | |
| 216.6 | 221.6 | 0.9773 | Slope | 1.009656 | 0.90 - 1.10 |
| 114.6 | 117.1 | 0.9783 | | | |
| | | | Intercept | 1.192503 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 21, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS18 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | January 24, 2024 |
| Start time (MST): | 11:50 | End time (MST): | 15:07 |
| Reason: | Routine | | |

### Calibration Standards

| | | | |
|---|---|---|---|
| O3 generation mode: | Photometer | | |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number: | 2658 |
| ZAG Make/Model: | Teledyne API 701H | Serial Number: | 360 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | API T400 | Analyzer serial #: | 825 |
| Analyzer Range | 0 - 500 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.002743 | 1.002057 | Backgd or Offset: | -0.7 | 0.3 |
| Calibration intercept: | 0.020000 | 0.340000 | Coeff or Slope: | 0.971 | 0.982 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | NA | 0.0 | 1.4 | ---- |
| as found span | 4804 | 1141.9 | 400.0 | 397.8 | 1.006 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | NA | 0.0 | 0.6 | ---- |
| high point | 4888 | 1138.1 | 400.0 | 401.3 | 0.997 |
| second point | 4888 | 884.5 | 200.0 | 200.6 | 0.997 |
| third point | 4888 | 741.4 | 100.0 | 100.3 | 0.997 |
| as left zero | 5000 | NA | 0.0 | 0.0 | ---- |
| as left span | 4812 | 1097.9 | 400.0 | 404.4 | 0.989 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 396.4 | Previous response | 401.1 | *% change | -1.2% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: Zero and span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

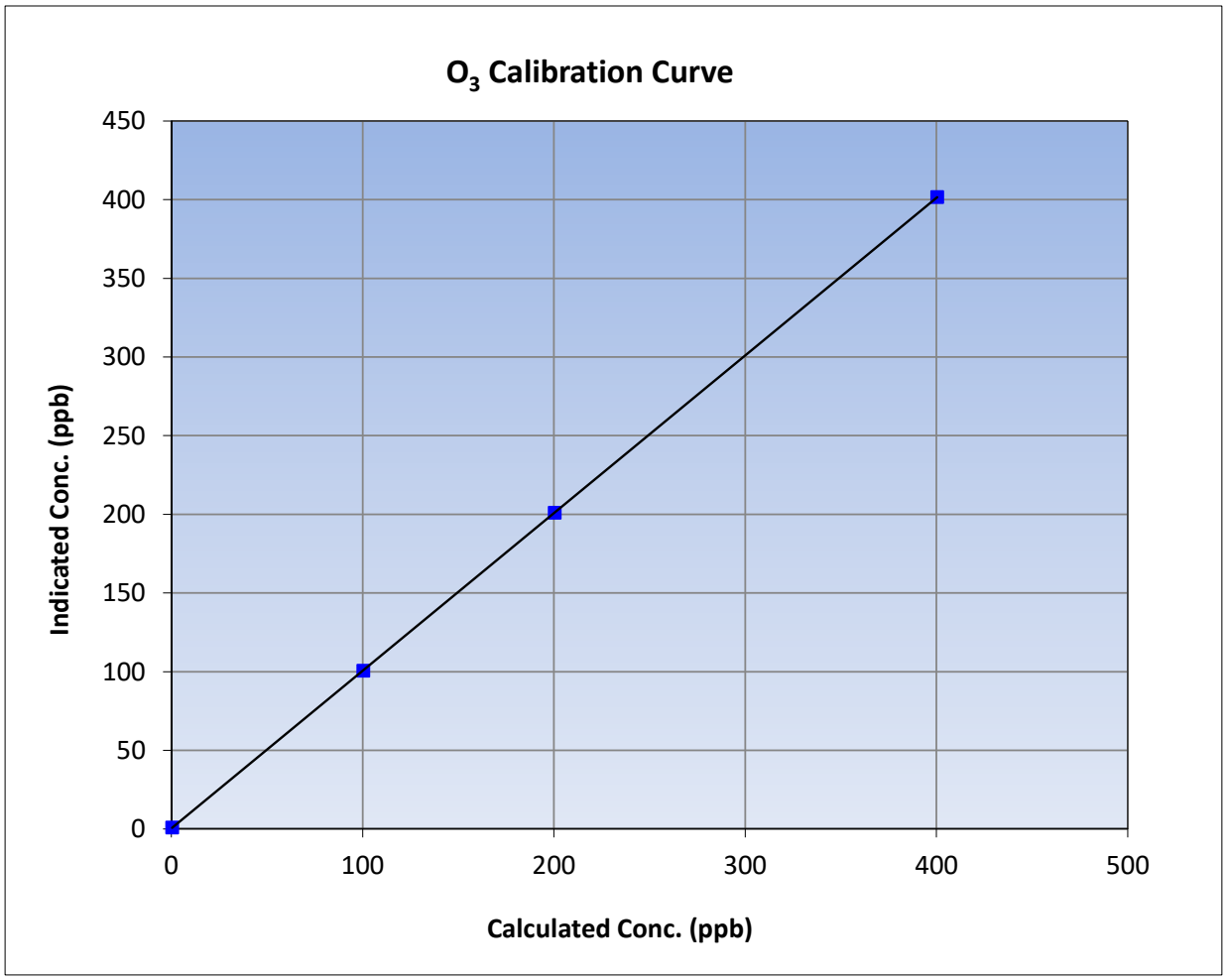
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS18 |
| Start Time (MST): | 11:50 | End Time (MST): | 15:07 |
| Analyzer make: | API T400 | Analyzer serial #: | 825 |

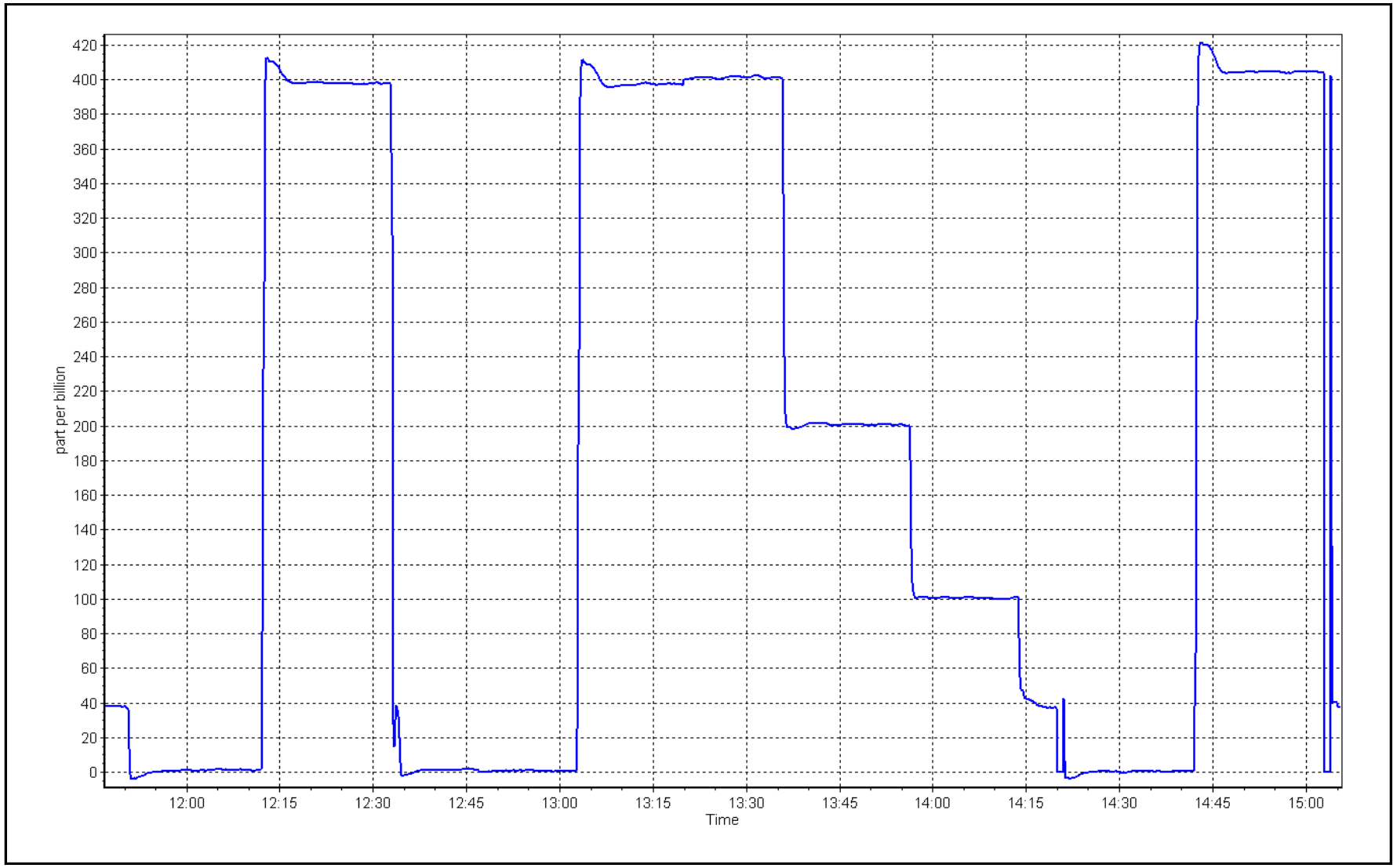
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 400.0 | 401.3 | 0.9968 |
| 200.0 | 200.6 | 0.9970 |
| 100.0 | 100.3 | 0.9970 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.002057 | *0.90 - 1.10* |
| Intercept | 0.340000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: February 14, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2023

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | January 30, 2024 |
| Start time (MST): | 14:43 | End time (MST): | 15:58 |
| Analyzer Make: | API T640 | S/N: | 1162 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 388748 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 388748 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| T (°C) | 7.3 | 6.8 | 7.3 | ☐ | +/- 2 °C |
| P (mmHg) | 695.7 | 694.6 | 695.7 | ☐ | +/- 10 mmHg |
| flow (LPM) | 4.99 | 6.06 | 4.99 | ☑ | +/- 0.25 LPM |

Leak Test: Date of check: February 21, 2024 Last Cal Date: January 30, 2024

PM w/o HEPA: 0.7 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

Inlet cleaning : Inlet Head ☑

### Quarterly Calibration Test

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

Post-maintenance leak check: PM w/o HEPA: _____ w/ HEPA: _____

Date Optical Chamber Cleaned: February 21, 2024 <0.2 ug/m3

Disposable Filter Changed: February 21, 2024

### Annual Maintenance

Date Sample Tube Cleaned: August 30, 2022

Date RH/T Sensor Cleaned: August 30, 2022

Notes: Flow adjusted. Quarterly checks done. Filter changed out.

Calibration by: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 12:24 | End time (MST): | 15:36 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 3,050 | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #: | ALM063503 | | | |
| Removed Cal Gas Conc: | 3,050 | 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: | API T300 | Analyzer serial #: | 3504 |
| Analyzer Range: | 0 - 50 ppm | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999887 | 0.999634 | Backgd or Offset: | -0.010 | -0.010 |
| Calibration intercept: | 0.043782 | 0.085783 | Coeff or Slope: | 0.908 | 0.901 |

### CO Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4933 | 66.7 | 40.7 | 41.1 | 0.989 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4933 | 66.7 | 40.7 | 40.7 | 1.001 |
| second point | 4966 | 33.3 | 20.3 | 20.6 | 0.987 |
| third point | 4983 | 16.7 | 10.2 | 10.3 | 0.991 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4933 | 66.7 | 40.7 | 40.7 | 0.999 |
| | | | | Average Correction Factor | 0.993 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 41.15 | Prev response: | 40.73 | *% 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

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

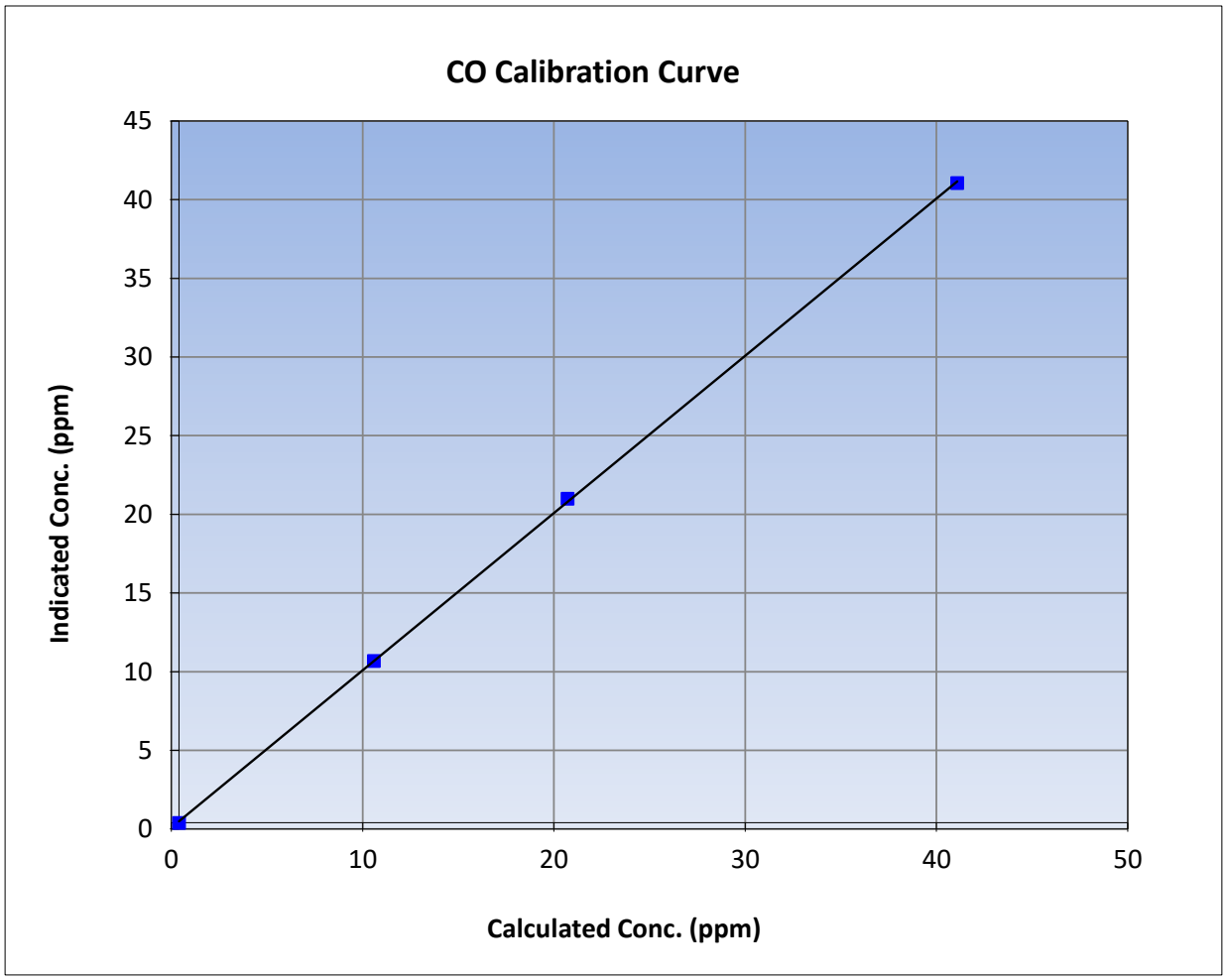
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 12:24 | End Time (MST): | 15:36 |
| Analyzer make: | API T300 | Analyzer serial #: | 3504 |

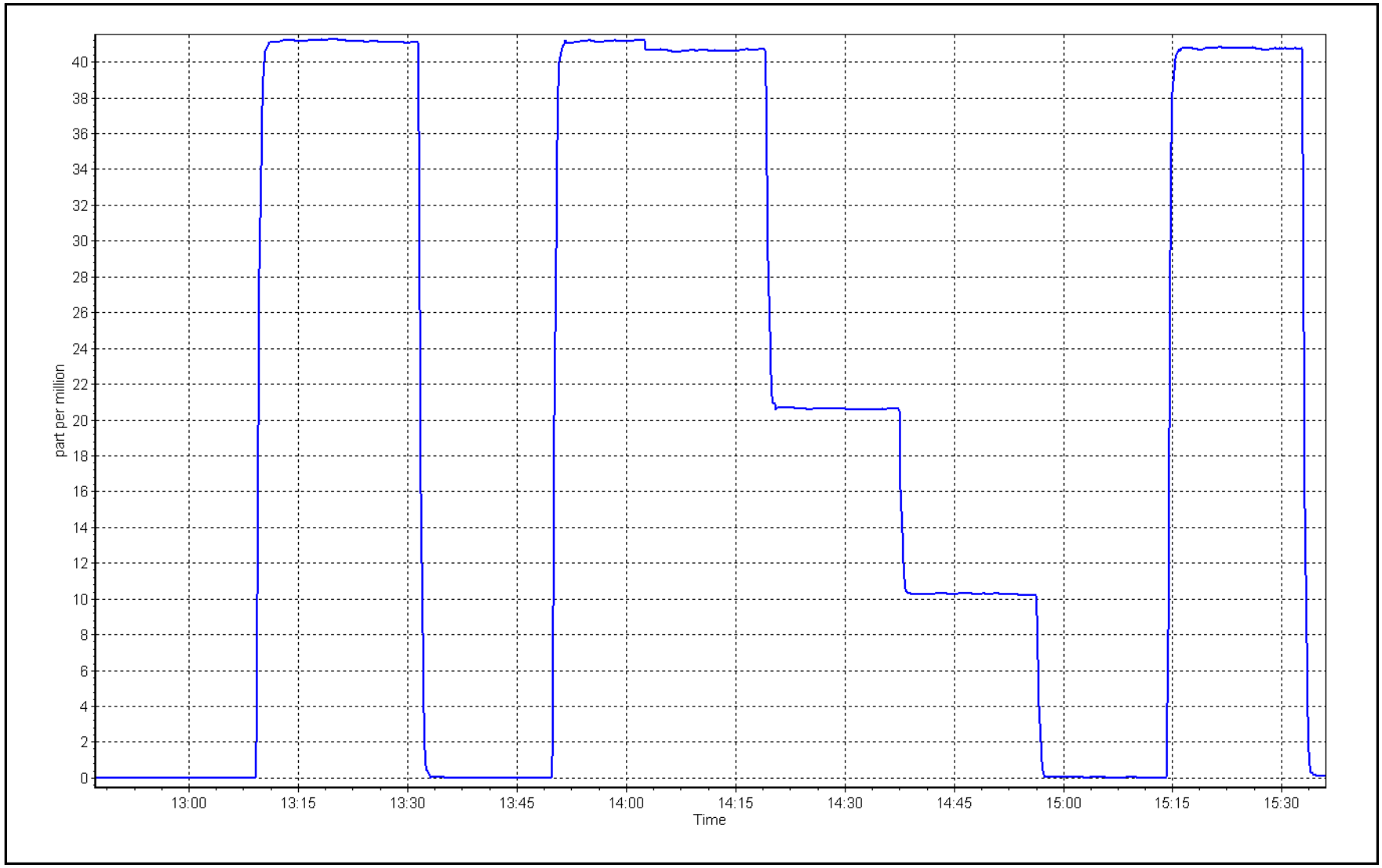
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 40.7 | 40.7 | 1.0007 |
| 20.3 | 20.6 | 0.9867 |
| 10.2 | 10.3 | 0.9910 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999934 | *≥0.995* |
| Slope | 0.999634 | *0.90 - 1.10* |
| Intercept | 0.085783 | *+/-1.5* |



**CO Calibration Plot** Date: February 5, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## $CO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 10:41 | End time (MST): | 14:04 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 59100 | ppm | Cal Gas Exp Date: | November 4, 2028 |
| Cal Gas Cylinder #: | EB0065608 | | | |
| Removed Cal Gas Conc: | 59,100 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 2658 |
| N2 Gen Make/Model: | Peak Scientific | | Serial Number: | 771048317 |

### Analyzer Information

Analyzer make: API T360 — Analyzer serial #: 489

Analyzer Range 0 - 2,000 ppm

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.996375 | 1.030319 | Backgd or Offset: | -0.037 | -0.037 |
| Calibration intercept: | -3.620000 | -5.680000 | Coeff or Slope: | 0.938 | 0.945 |

### $CO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 3000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 2920 | 80.0 | 1576.0 | 1569.4 | 1.004 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 3000 | 0.0 | 0.0 | 0.4 | ---- |
| high point | 2920 | 80.0 | 1576.0 | 1623.3 | 0.971 |
| second point | 2960 | 40.0 | 788.0 | 796.7 | 0.989 |
| third point | 2980 | 20.0 | 394.0 | 398.5 | 0.989 |
| as left zero | 3000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 2930 | 80.0 | 1570.8 | 1620.3 | 0.969 |
| | | | | Average Correction Factor | 0.983 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 1569.50 | Prev response: | 1566.67 | *% 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

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $CO_2$ Calibration Summary

Version-01-2020

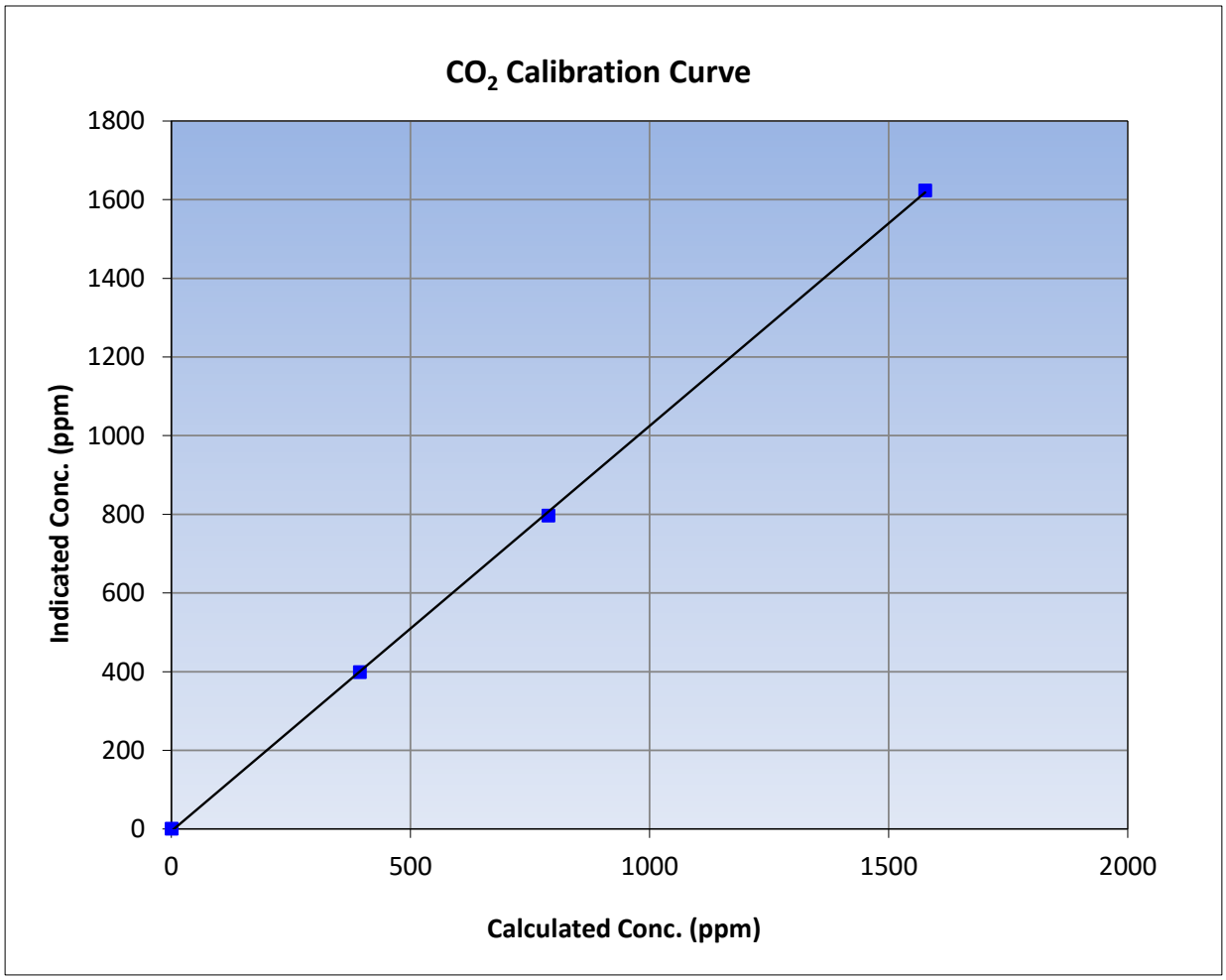
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date | February 7, 2024 | Previous Calibration | January 15, 2024 |
| Station Name | Stony Mountain | Station Number | AMS 18 |
| Start Time (MST) | 10:41 | End Time (MST) | 14:04 |
| Analyzer make | API T360 | Analyzer serial # | 489 |

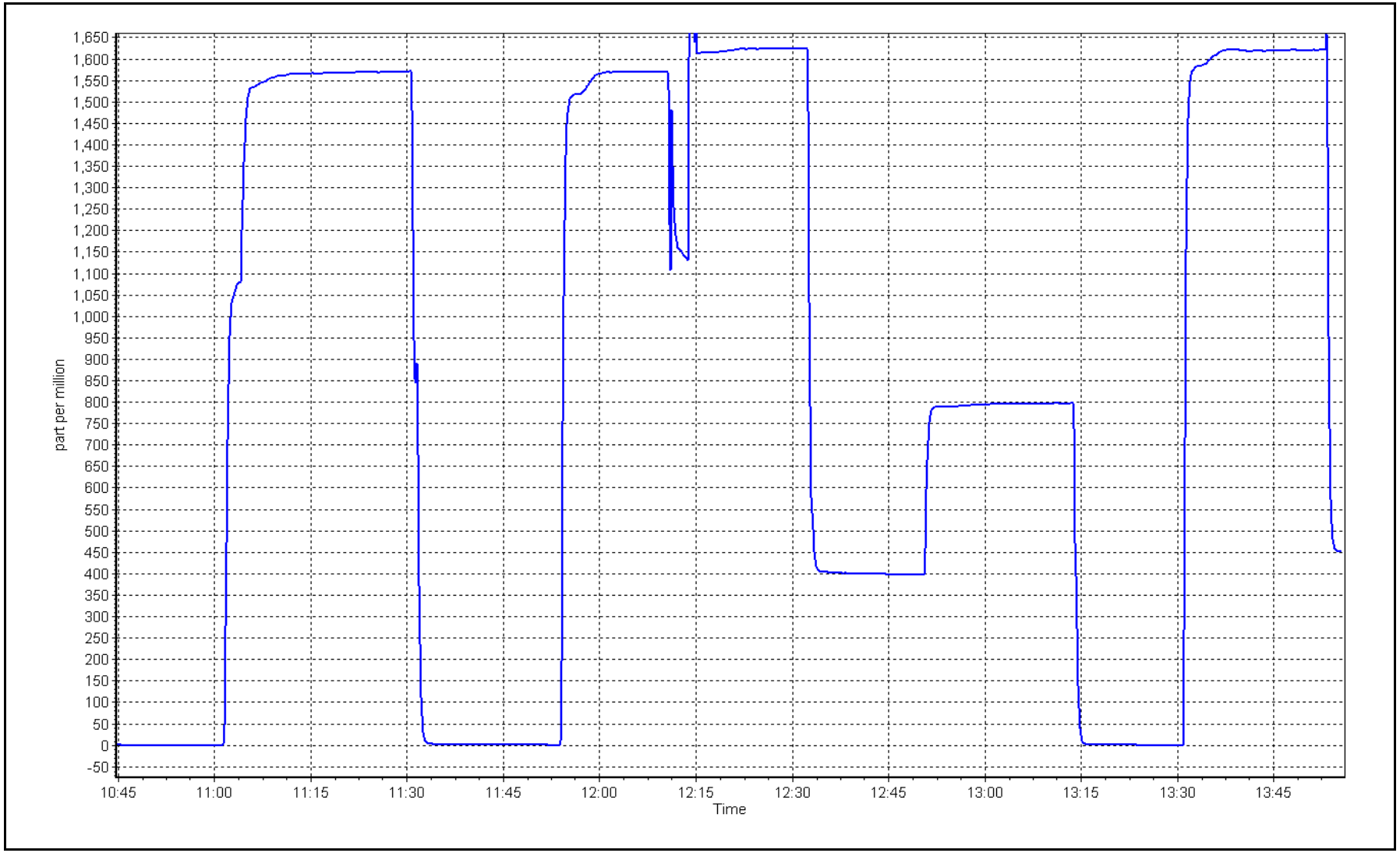
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 1576.0 | 1623.3 | 0.9709 |
| 788.0 | 796.7 | 0.9891 |
| 394.0 | 398.5 | 0.9887 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999891 | *≥0.995* |
| Slope | 1.030319 | *0.90 - 1.10* |
| Intercept | -5.680000 | *+/-10* |



**$CO_2$ Calibration Plot** Date: February 7, 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: | February 21, 2024 | Prev Cal Date: | NA |
| Start Time (MST): | 12:51 | End Time (MST): | 14:55 |
| Tower Height (m): | 10.0 | Reason: | Install |

### Wind Speed Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 010C | Serial Number: | D16124 |
| WS Calibrator: | RM Young 053-120 | Serial Number: | P15103 |

| Shaft RPM | Calculated Speed (K/hr) (Cv) | Indicated Speed (K/hr) (Iv) | % Error *Limit = +/- 1.5%* |
|---|---|---|---|
| 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% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| 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: | D14060 |
| As Found Declination (deg east of True North): | 14 | As Left Declination (deg east of True North): | 14 |
| Solar noon time (MST): | 12:37 | Calc Declination*: | 14 Degrees |
| Deadband calc: | 1.2 degrees (*Limit 4 deg*) | | * - calculated declination as per NOAA website |

| Physical Direction (Degrees) (Cv) | Indicated Direction (Degrees) (Iv) | % Error (based on 357° FS) *Limit = +/- 1.0%* |
|---|---|---|
| 0 | 0.4 | --- |
| 90 | 89.2 | -0.2% |
| 180 | 180.4 | 0.1% |
| 270 | 269.8 | -0.1% |
| 357 | 356.2 | -0.2% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999993 | *≥0.9995* |
| Calculated slope | | 1.001927 | *0.90 - 1.10* |
| Calculated intercept | | -0.139279 | *+/- 4* |

Notes: Installing new WD sensors on the 10m tower. Crossarm aligned with true north. No issues to note.

Calibration Performed By: Aswin Sasi Kumar

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS19
## FIREBAG

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS 19 |
| Calibration Date: | February 27, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 11:45 | End time (MST): | 14:51 |
| 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: | |
| Removed Gas Cyl #: | | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 1607 |
| ZAG Make/Model: | API T701 | | Serial Number: | 1118 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1410661308

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.996990 | 1.003793 | Backgd or Offset: | 10.5 | 10.5 |
| Calibration intercept: | 0.518257 | 0.237576 | Coeff or Slope: | 0.984 | 0.984 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 4999 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4919 | 81.1 | 799.5 | 801.0 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 4999 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4919 | 81.1 | 799.5 | 803.0 | 0.996 |
| second point | 4959 | 40.6 | 400.3 | 401.1 | 0.998 |
| third point | 4980 | 20.3 | 200.1 | 201.9 | 0.991 |
| as left zero | 4999 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4919 | 81.1 | 799.5 | 801.0 | 0.998 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 801.10 | Previous response | 797.58 | *% 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

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

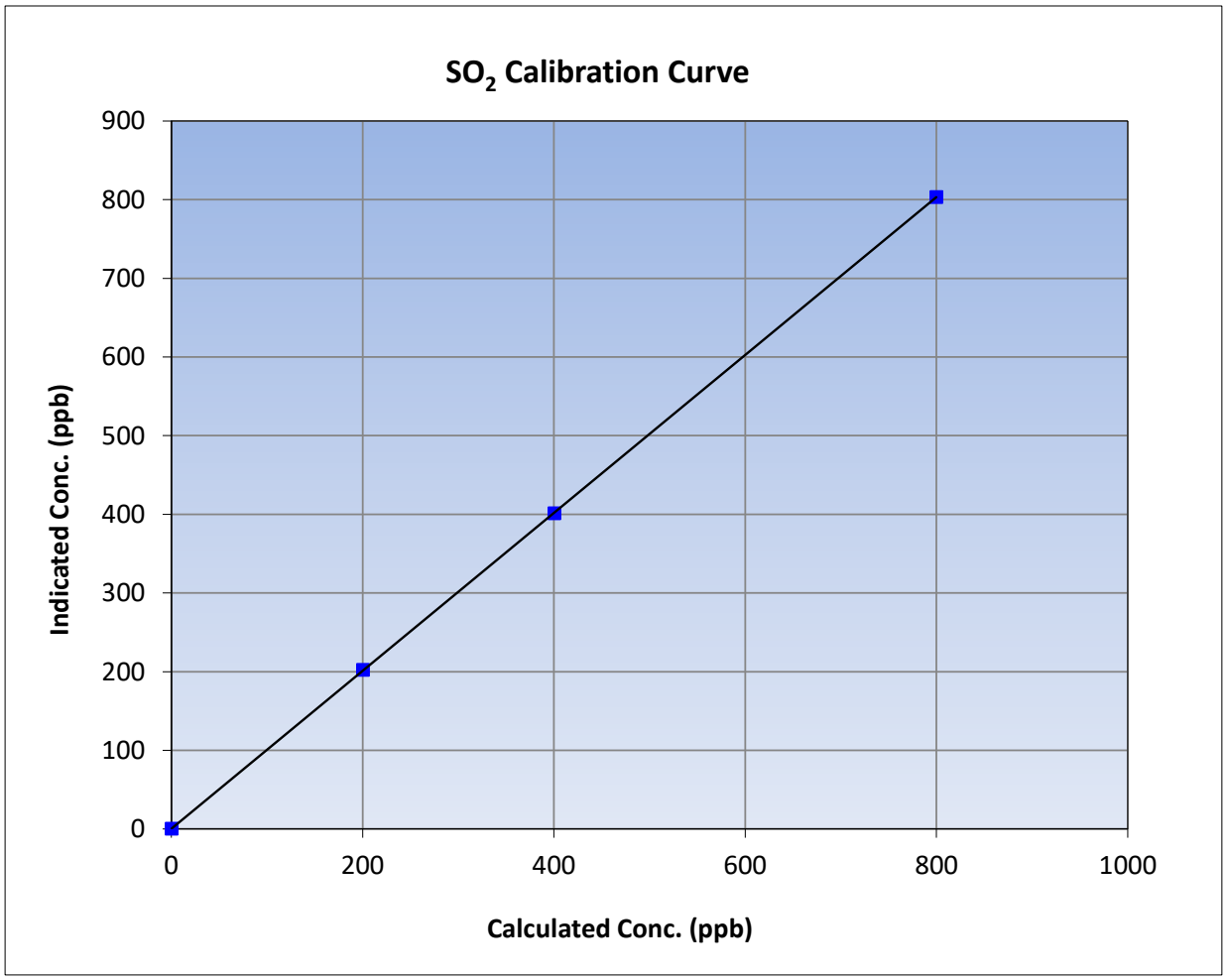
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 11:45 | End Time (MST): | 14:51 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1410661308 |

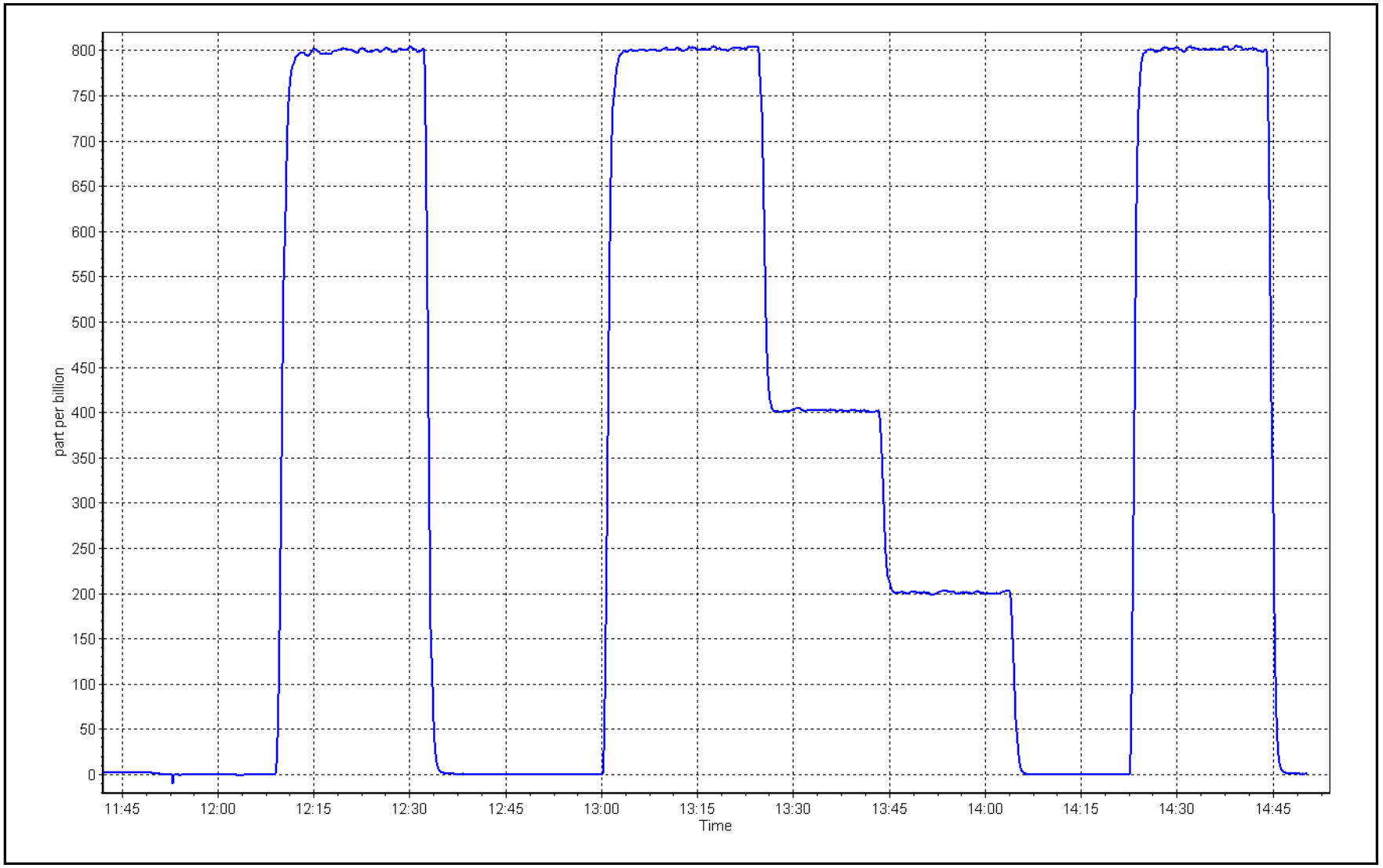
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 799.5 | 803.0 | 0.9956 |
| 400.3 | 401.1 | 0.9979 |
| 200.1 | 201.9 | 0.9911 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 1.003793 | *0.90 - 1.10* |
| Intercept | 0.237576 | *+/-30* |



**SO2 Calibration Plot** Date: February 27, 2024 Location: Firebag



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS19 |
| Calibration Date: | February 1, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 11:28 | End time (MST): | 16:23 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.114 | ppm | Cal Gas Exp Date: | February 5, 2024 |
| Cal Gas Cylinder #: | CC517427 | | | |
| Removed Cal Gas Conc: | 5.114 | ppm | Rem Gas Exp Date: | n/a |
| Removed Gas Cyl #: | n/a | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 1607 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 1118 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | | Analyzer serial #: | 1151680032 | |
| Converter make: | Global | | Converter serial #: | 2022-222 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.004771 | 1.000909 | Backgd or Offset: | 3.38 | 2.77 |
| Calibration intercept: | -0.021722 | -0.061541 | Coeff or Slope: | 1.225 | 1.166 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.6 | ---- |
| as found span | 4922 | 78.2 | 80.0 | 84.3 | 0.942 |
| as found 2nd point | 4961 | 39.1 | 40.0 | 41.9 | 0.941 |
| as found 3rd point | 4980 | 19.6 | 20.0 | 20.7 | 0.941 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4922 | 78.2 | 80.0 | 80.0 | 1.000 |
| second point | 4961 | 39.1 | 40.0 | 40.0 | 1.000 |
| third point | 4980 | 19.6 | 20.0 | 19.9 | 1.007 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4922 | 78.2 | 80.0 | 79.4 | 1.007 |
| SO2 Scrubber Check | 4922 | 78.3 | 800.2 | 0.0 | ---- |
| Date of last scrubber change: | | January 18, 2023 | | Ave Corr Factor | 1.002 |
| Date of last converter efficiency test: | | n/a | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 84.9 | Prev response: | 80.34 | *% change: | 5.4% |
| Baseline Corr 2nd AF pt: | 42.5 | AF Slope: | 1.061511 | AF Intercept: | -0.582906 |
| Baseline Corr 3rd AF pt: | 21.3 | AF Correlation: | 1.000000 | | |

* = > +/-5% change initiates investigation

Notes: Ran SOx scrubber check after cal zero. Adjusted zero and span. Large adjustment was due to changes in temperature.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

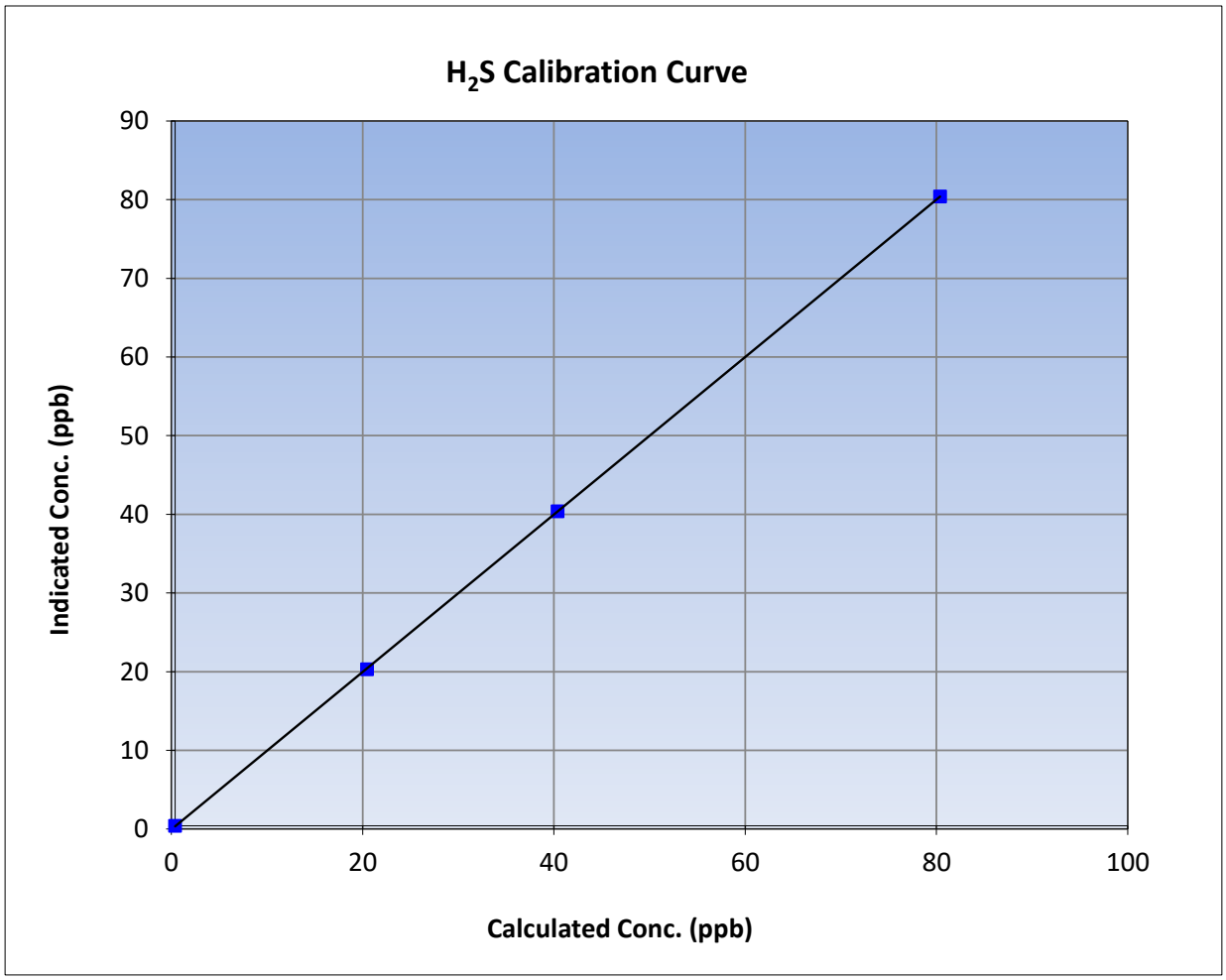
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 22, 2024 |
| Station Name: | Firebag | Station Number: | AMS19 |
| Start Time (MST): | 11:28 | End Time (MST): | 16:23 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1151680032 |

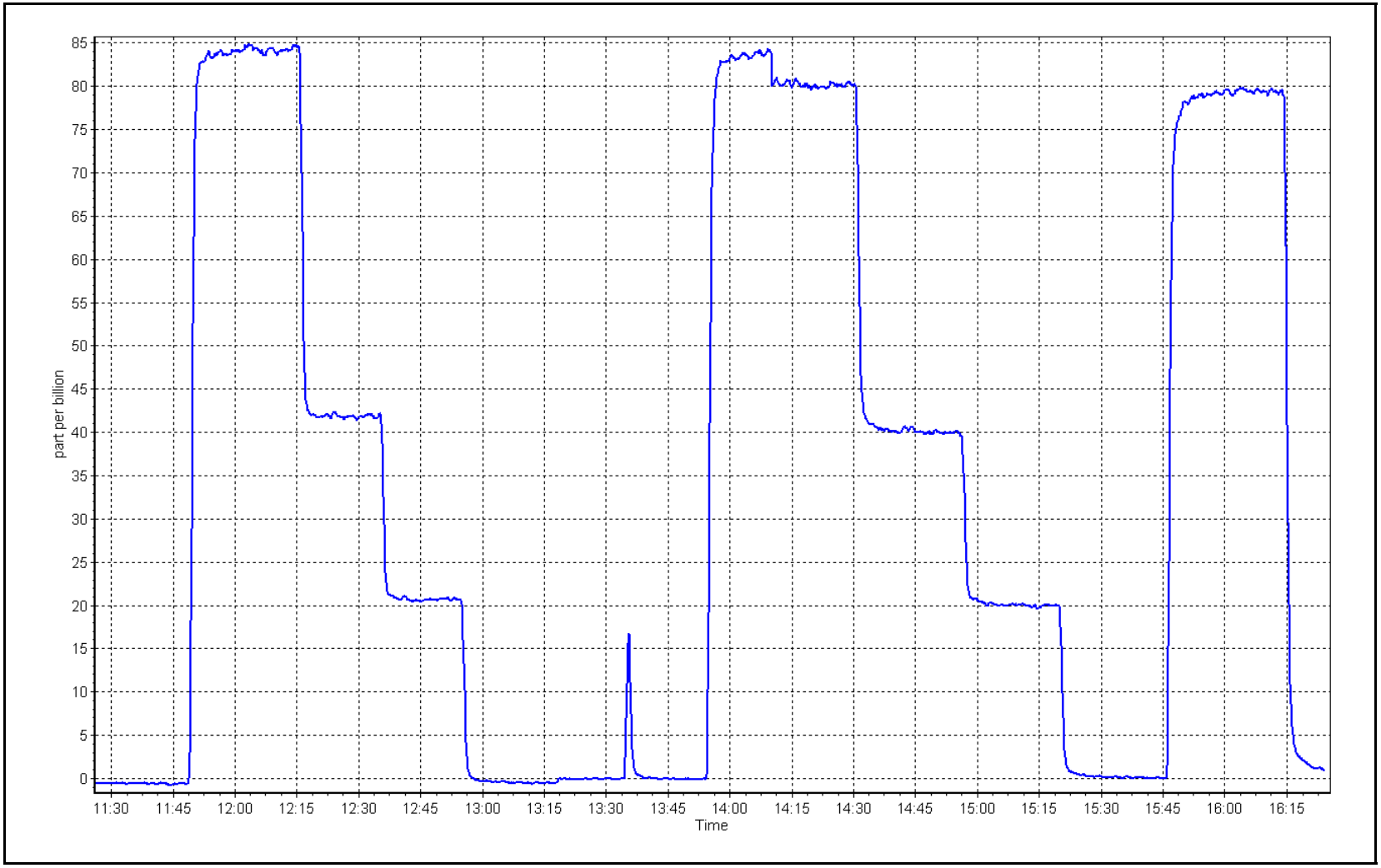
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.0 | 0.9997 |
| 40.0 | 40.0 | 0.9998 |
| 20.0 | 19.9 | 1.0075 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999995 | *≥0.995* |
| Slope | 1.000909 | *0.90 - 1.10* |
| Intercept | -0.061541 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 1, 2024 Location: Firebag



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS 19 |
| Calibration Date: | February 27, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 11:45 | End time (MST): | 14:51 |
| 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: | API T700 | | Serial Number: | 1607 | |
| ZAG Make/Model: | API T701 | | Serial Number: | 1118 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1336160089 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.995342 | 1.002921 | Background: | 2.03 | 2.03 |
| Calibration intercept: | 0.045092 | -0.061568 | Coefficient: | 3.764 | 3.764 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 4999 | 0.0 | 0.00 | -0.03 | ---- |
| as found span | 4919 | 81.1 | 17.31 | 17.34 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 4999 | 0.0 | 0.00 | -0.03 | ---- |
| high point | 4919 | 81.1 | 17.31 | 17.31 | 1.000 |
| second point | 4959 | 40.6 | 8.66 | 8.61 | 1.006 |
| third point | 4980 | 20.3 | 4.33 | 4.26 | 1.018 |
| as left zero | 5000 | 0.0 | 0.00 | -0.03 | ---- |
| as left span | 4919 | 81.1 | 17.31 | 17.43 | 0.993 |
| | | | | Average Correction Factor | 1.008 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.37 | Previous response | 17.27 | *% 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

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

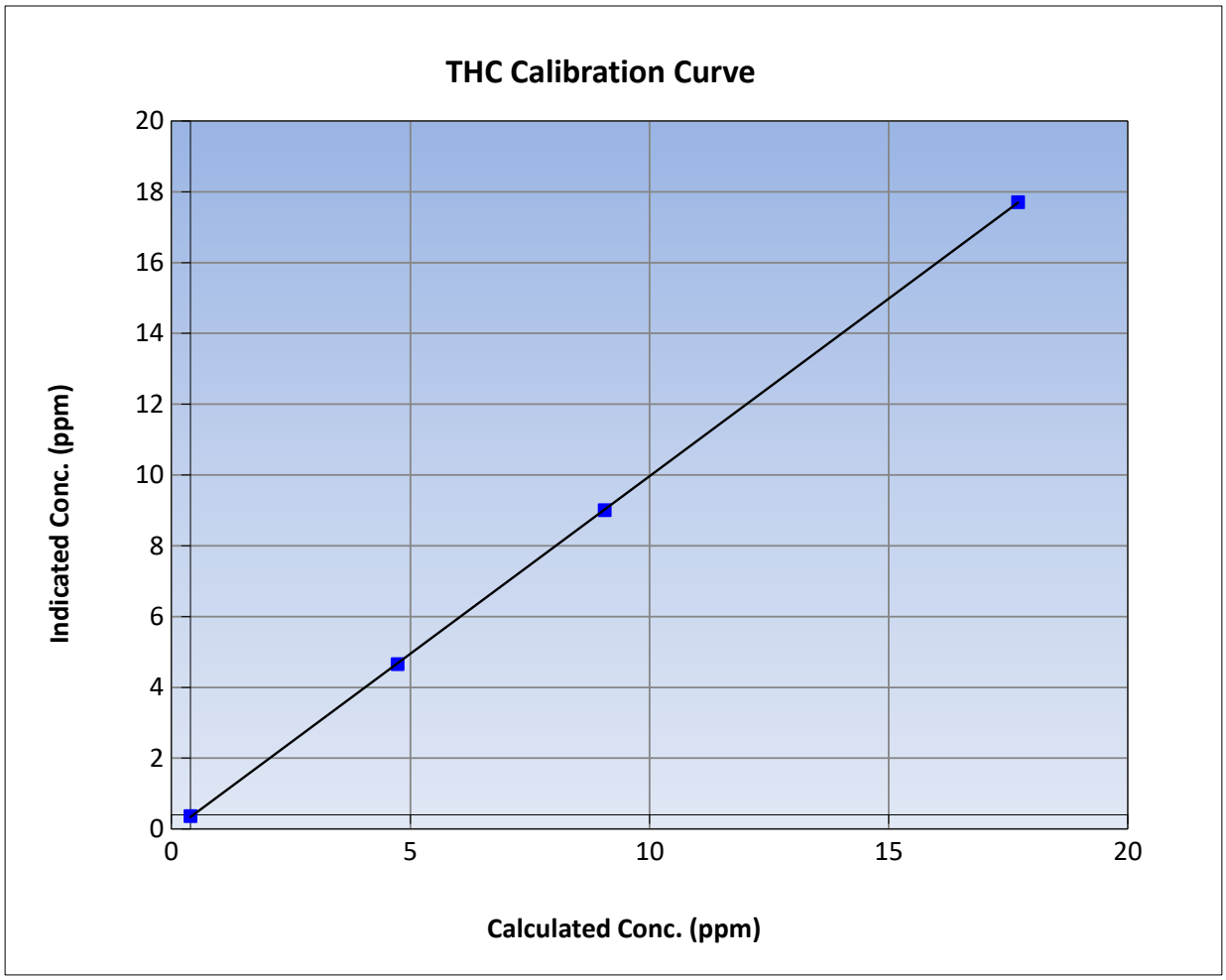
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 27, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 11:45 | End Time (MST): | 14:51 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1336160089 |

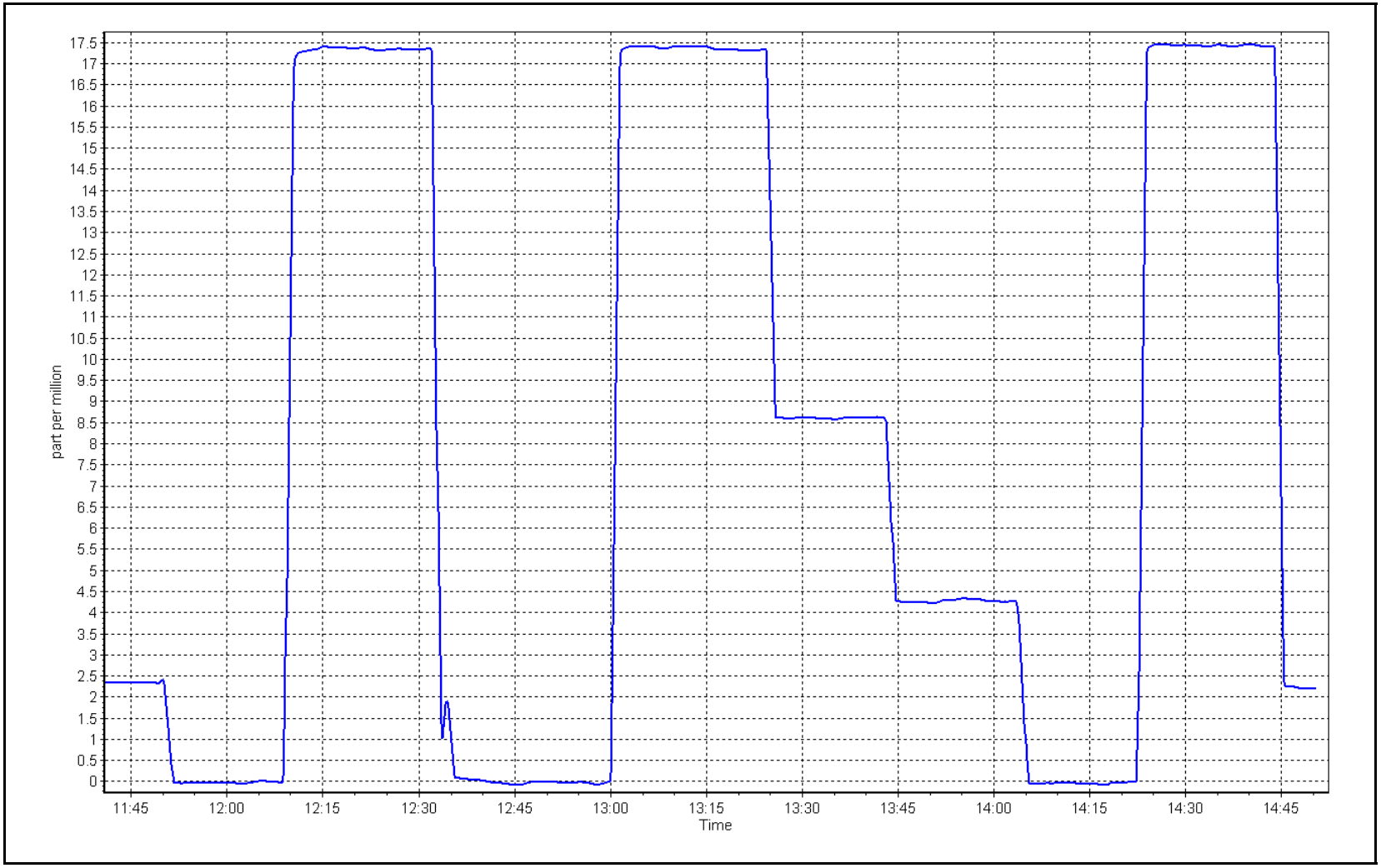
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.03 | ---- |
| 17.31 | 17.31 | 0.9997 |
| 8.66 | 8.61 | 1.0063 |
| 4.33 | 4.26 | 1.0180 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999987 | *≥0.995* |
| Slope | 1.002921 | *0.90 - 1.10* |
| Intercept | -0.061568 | *+/-1.5* |



**THC Calibration Plot** Date: February 27, 2024 Location: Firebag



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS 19 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 23, 2024 |
| Start time (MST): | 11:30 | End time (MST): | 16:55 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | DT0044018 | | Cal Gas Expiry Date: | November 3, 2031 | |
| NOX Cal Gas Conc: | 48.9 | ppm | NO Cal Gas Conc: | 48.7 | ppm |
| Removed Cylinder #: | n/a | | Removed Gas Exp Date: | n/a | |
| Removed Gas NOX Conc: | 48.9 | ppm | Removed Gas NO Conc: | 48.7 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 1607 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 1118 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1410661309 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.089 | 1.081 | NO bkgnd or offset: | 7.6 | 7.6 |
| NOX coeff or slope: | 0.993 | 0.996 | NOX bkgnd or offset: | 7.7 | 7.7 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 217.1 | 216.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.011351 | 1.006289 |
| $NO_X$ Cal Offset: | 0.260390 | 0.400360 |
| NO Cal Slope: | 1.014424 | 1.006923 |
| NO Cal Offset: | -0.039625 | 0.340247 |
| $NO_2$ Cal Slope: | 1.000829 | 0.998051 |
| $NO_2$ Cal Offset: | -0.524220 | -0.640112 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 4999 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.2 | -0.1 | ---- | ---- |
| as found span | 4919 | 81.0 | 792.2 | 788.9 | 3.2 | 813.0 | 811.0 | 1.3 | 0.9744 | 0.9728 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 4999 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | -0.1 | -0.1 | ---- | ---- |
| high point | 4919 | 81.5 | 797.1 | 793.8 | 3.3 | 802.0 | 799.3 | 3.1 | 0.9939 | 0.9931 |
| second point | 4959 | 40.7 | 398.0 | 396.4 | 1.6 | 401.8 | 400.1 | 1.7 | 0.9907 | 0.9908 |
| third point | 4980 | 20.4 | 199.5 | 198.7 | 0.8 | 201.4 | 200.6 | 0.8 | 0.9906 | 0.9905 |
| as left zero | 4999 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | 0.0 | ---- | ---- |
| as left span | 4919 | 81.0 | 792.2 | 377.4 | 414.8 | 807.0 | 387.6 | 418.9 | 0.9816 | 0.9737 |
| | | | | | | | | Average Correction Factor | 0.9917 | 0.9915 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 813.3 ppb | NO = 811.2 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | 1.5% |
| Previous Response | $NO_X$ = 801.4 ppb | NO = 800.3 ppb | | | *Percent Change | NO = | 1.3% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 796.8 | 385.3 | 414.8 | 413.5 | 1.0030 | 99.7% |
| 2nd GPT point (200 ppb O3) | 796.8 | 592.0 | 208.1 | 207.0 | 1.0051 | 99.5% |
| 3rd GPT point (100 ppb O3) | 796.8 | 694.7 | 105.4 | 103.8 | 1.0150 | 98.5% |
| | | | | Average Correction Factor | 1.0077 | 99.2% |

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

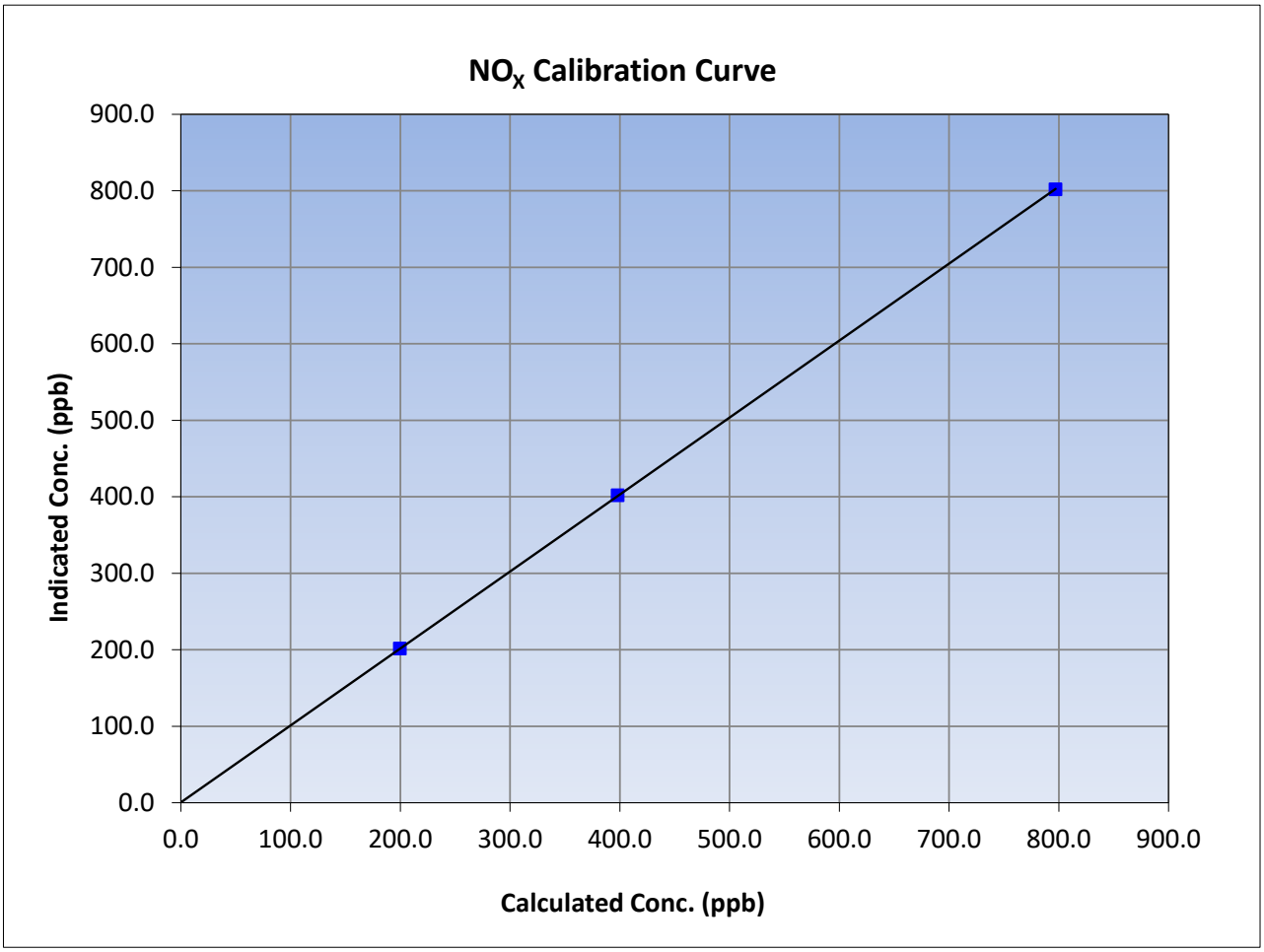
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 11:30 | End Time (MST): | 16:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661309 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 797.1 | 802.0 | 0.9939 | | | |
| 398.0 | 401.8 | 0.9907 | Slope | 1.006289 | 0.90 - 1.10 |
| 199.5 | 201.4 | 0.9906 | | | |
| | | | Intercept | 0.400360 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

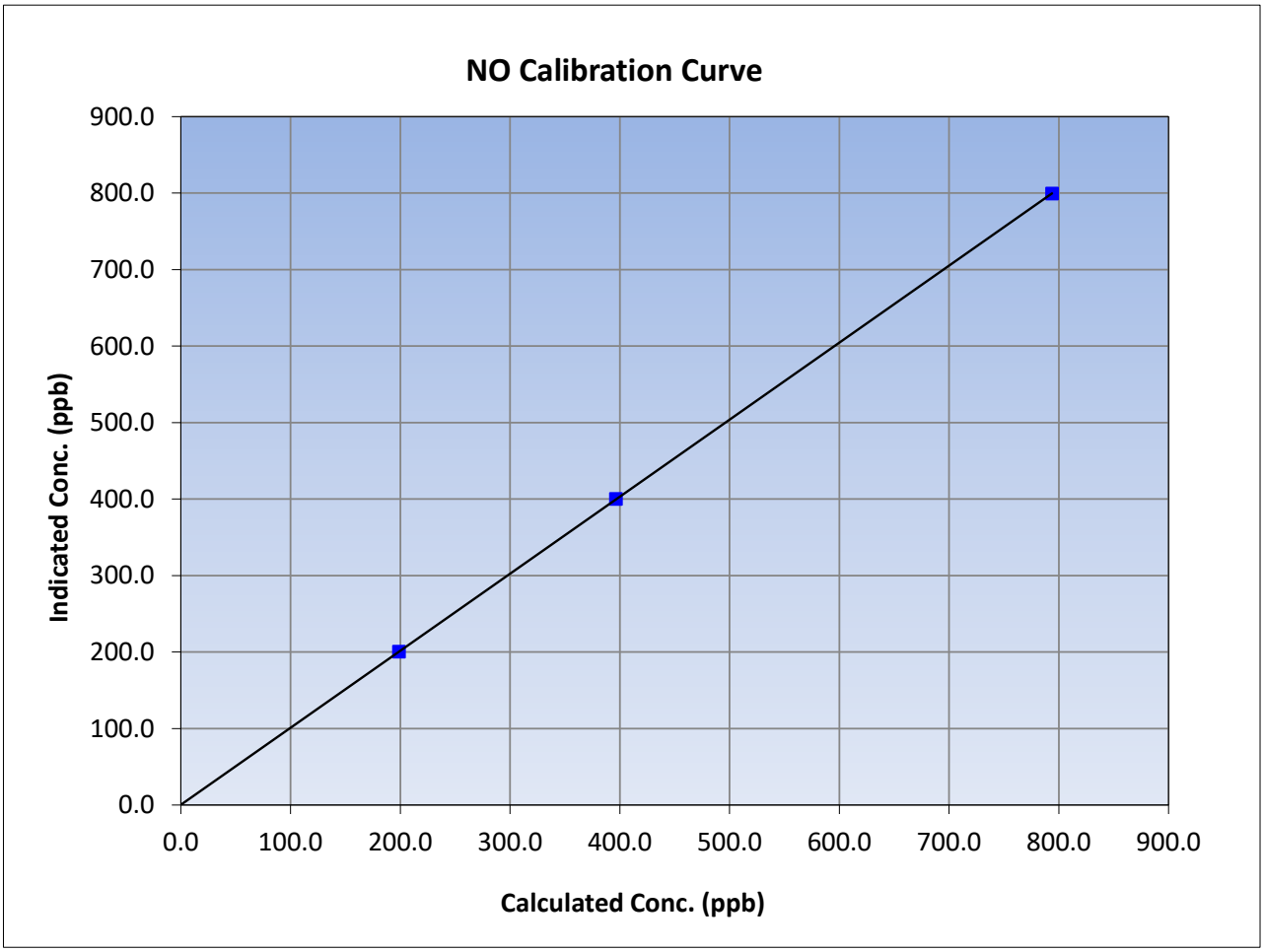
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 11:30 | End Time (MST): | 16:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661309 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999998 | ≥0.995 |
| 793.8 | 799.3 | 0.9931 | | | |
| 396.4 | 400.1 | 0.9908 | Slope | 1.006923 | 0.90 - 1.10 |
| 198.7 | 200.6 | 0.9905 | | | |
| | | | Intercept | 0.340247 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

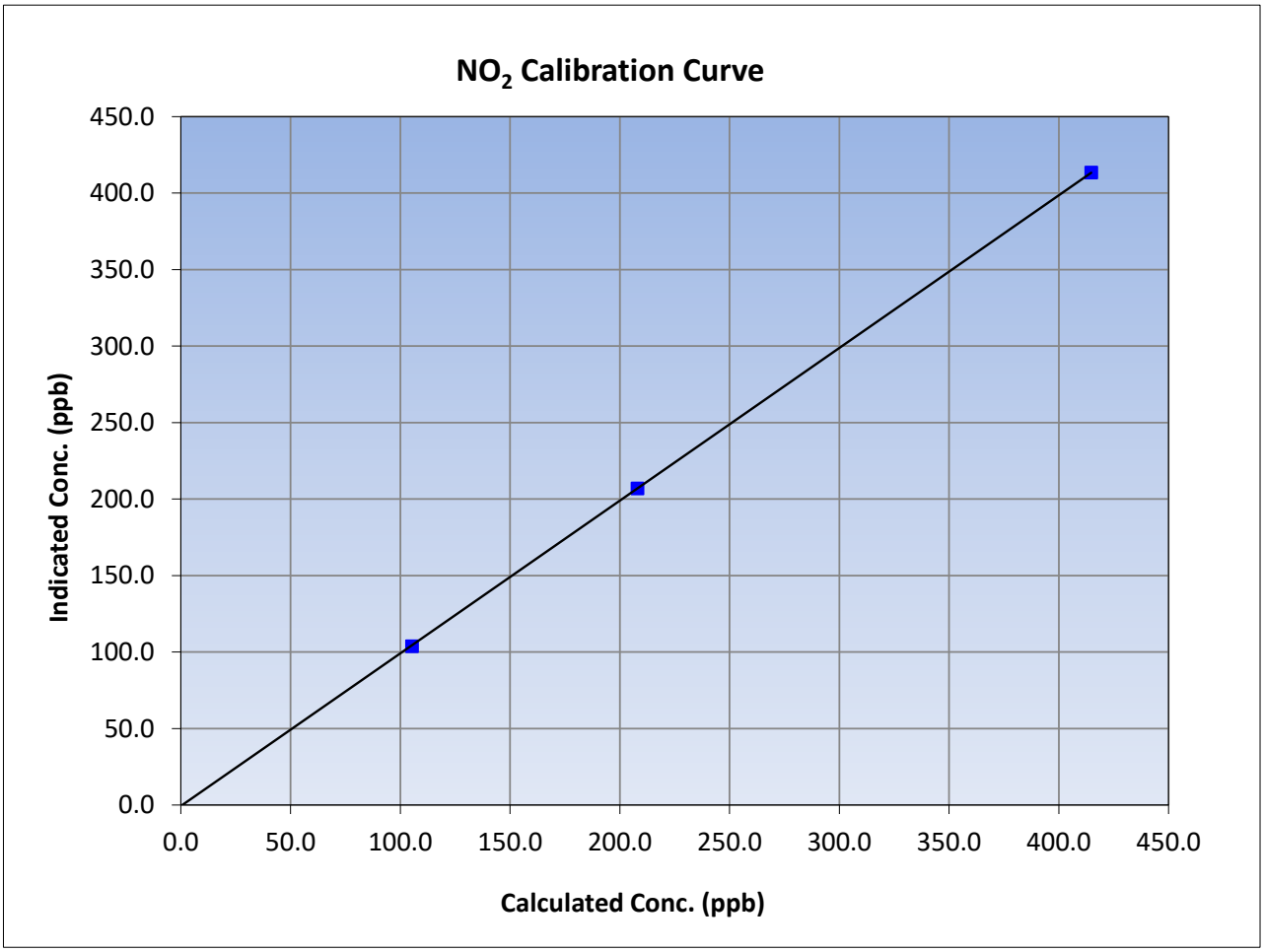
Version-04-2020

### Station Information

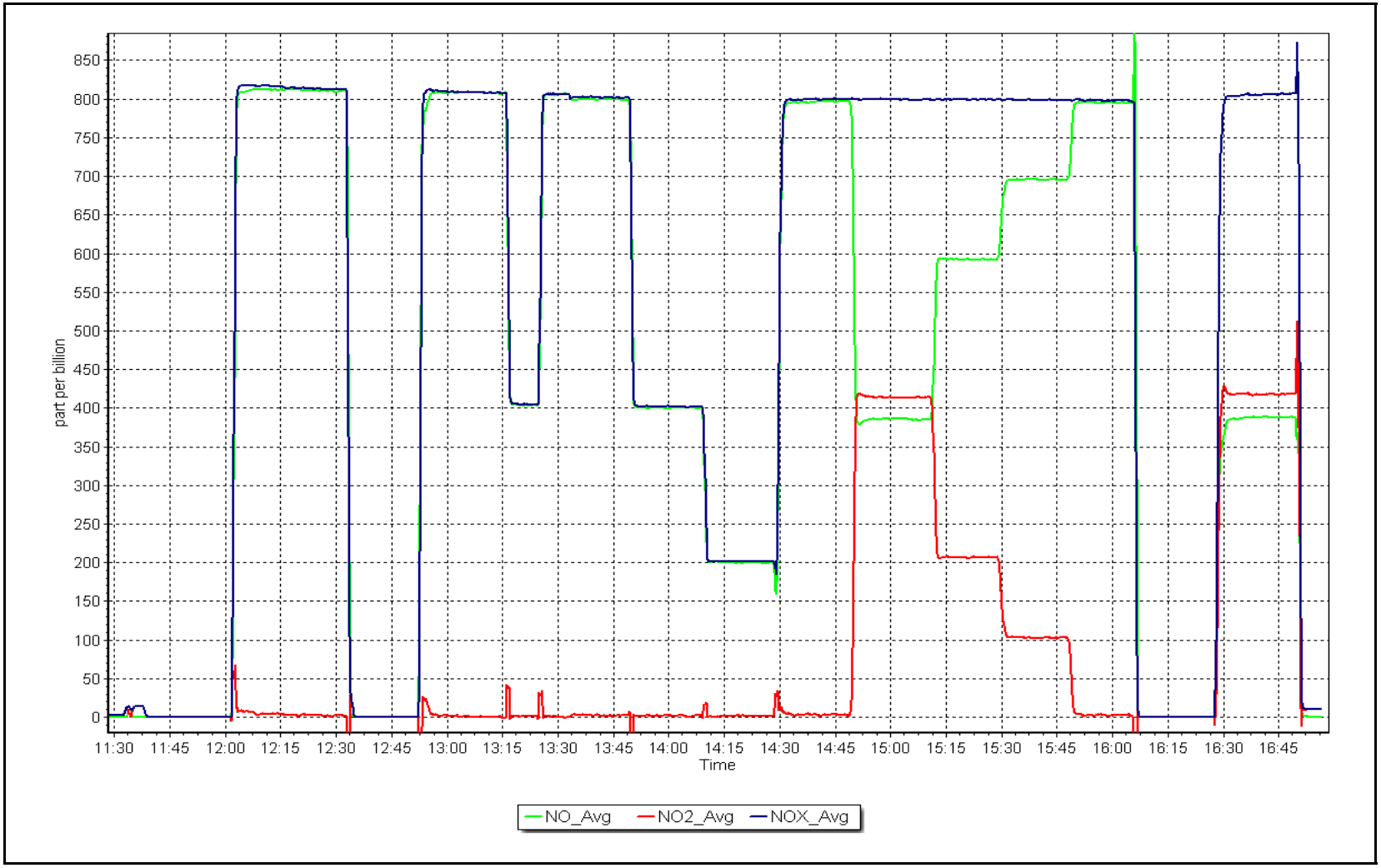
| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 11:30 | End Time (MST): | 16:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661309 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999991 | ≥0.995 |
| 414.8 | 413.5 | 1.0030 | | | |
| 208.1 | 207.0 | 1.0051 | Slope | 0.998051 | 0.90 - 1.10 |
| 105.4 | 103.8 | 1.0150 | | | |
| | | | Intercept | -0.640112 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 13, 2024 Location: Firebag



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS20
## MACKAY RIVER

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | MacKay River | Station number: | AMS20 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 9:00 | End time (MST): | 11:51 |
| Reason: | Routine | | |

### Calibration Standards

| | | | |
|---|---|---|---|
| Cal Gas Concentration: | 49.22 ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #: | CC306868 | | |
| Removed Cal Gas Conc: | 49.22 ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number: | 1220 |
| ZAG Make/Model: | Teledyne API 701 | Serial Number: | 4522 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1501301450

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.995124 | 1.004391 | Backgd or Offset: | 19.1 | 19.7 |
| Calibration intercept: | 2.791182 | 2.870973 | Coeff or Slope: | 0.965 | 0.965 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as found span | 4919 | 81.3 | 800.3 | 805.8 | 0.993 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4919 | 81.3 | 800.3 | 805.6 | 0.993 |
| second point | 4959 | 40.7 | 400.7 | 405.7 | 0.988 |
| third point | 4980 | 20.3 | 199.8 | 207.0 | 0.965 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4919 | 81.3 | 800.3 | 808.3 | 0.990 |
| | | | | Average Correction Factor | 0.982 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 805.40 | Previous response | 799.16 | *% 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

Notes: Zero adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

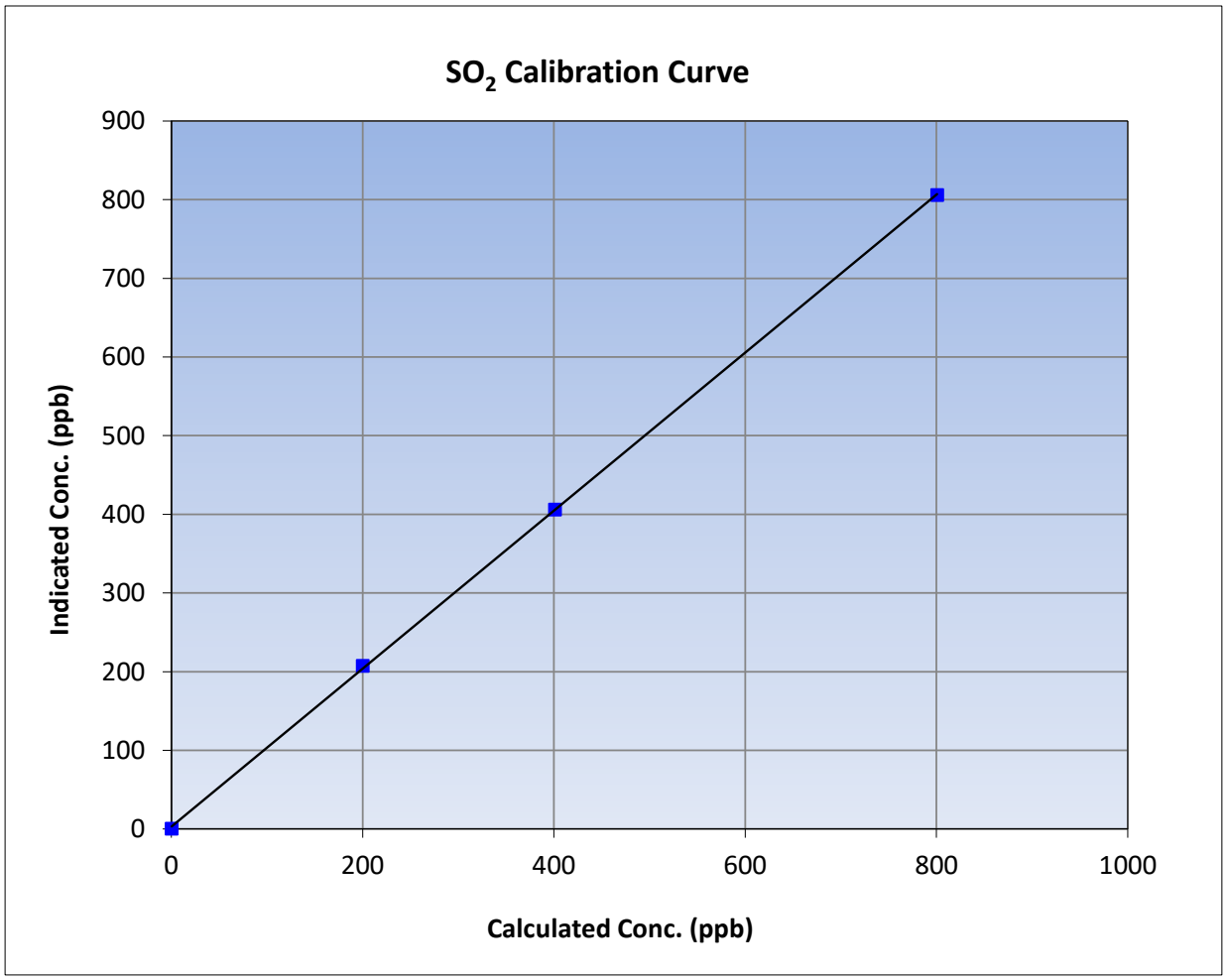
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 9:00 | End Time (MST): | 11:51 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1501301450 |

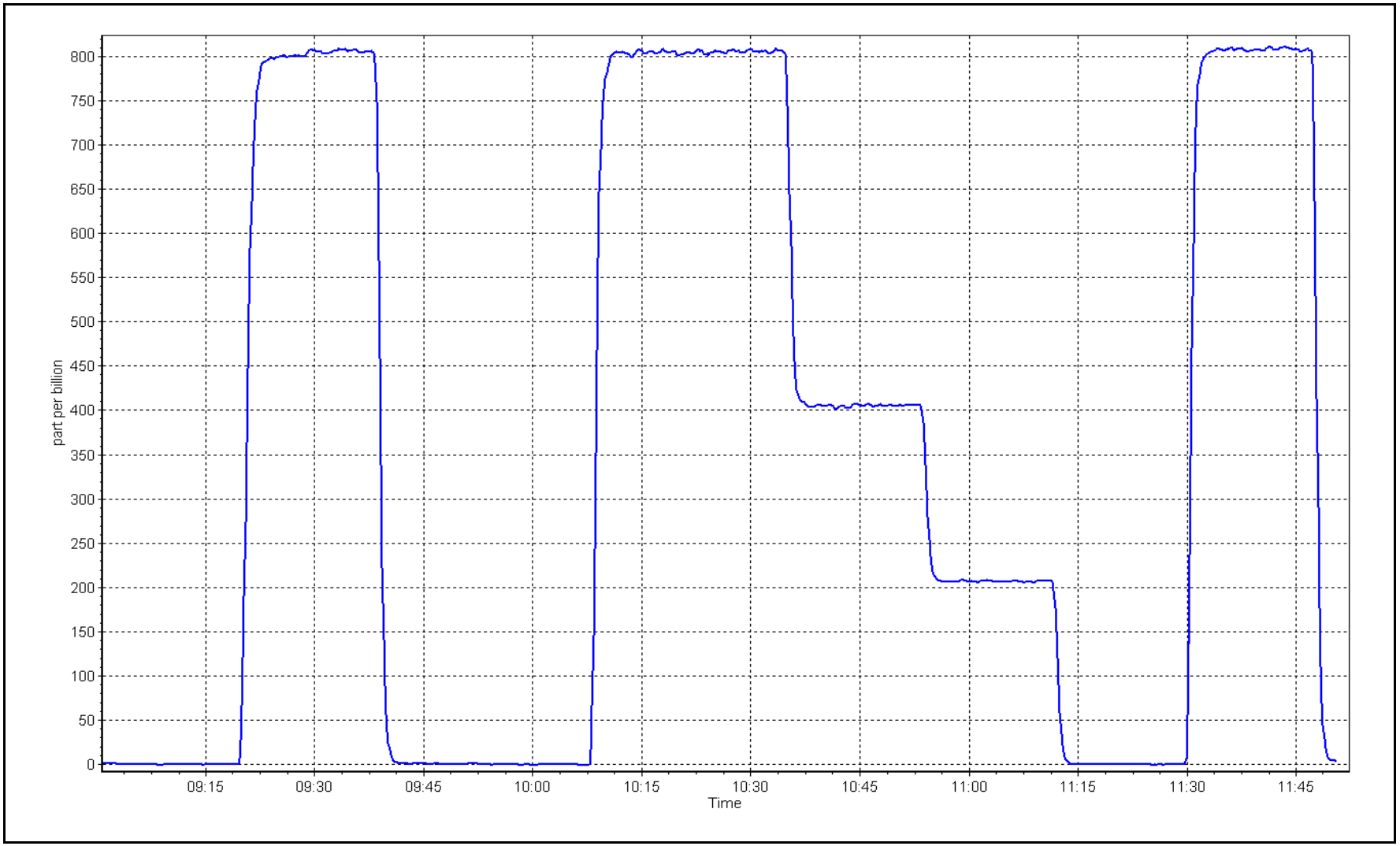
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.3 | 805.6 | 0.9934 |
| 400.7 | 405.7 | 0.9876 |
| 199.8 | 207.0 | 0.9653 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999941 | *≥0.995* |
| Slope | 1.004391 | *0.90 - 1.10* |
| Intercept | 2.870973 | *+/-30* |



**SO2 Calibration Plot** Date: February 20, 2024 Location: MacKay River



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | MacKay River | Station number: | AMS20 |
| Calibration Date: | February 1, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 7:48 | End time (MST): | 12:00 |
| 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: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 1220 |
| ZAG Make/Model: | Teledyne 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.991531 | 0.987249 | Backgd or Offset: | 3.19 | 3.19 |
| Calibration intercept: | 0.499365 | 0.499237 | Coeff or Slope: | 1.113 | 1.113 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as found span | 4922 | 78.1 | 80.0 | 80.4 | 0.997 |
| as found 2nd point | 4961 | 39.0 | 39.9 | 40.5 | 0.991 |
| as found 3rd point | 4980 | 19.5 | 20.0 | 20.7 | 0.974 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4922 | 78.1 | 80.0 | 79.4 | 1.008 |
| second point | 4961 | 39.0 | 40.0 | 40.0 | 0.999 |
| third point | 4980 | 19.5 | 20.0 | 20.6 | 0.970 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4922 | 78.1 | 80.0 | 79.1 | 1.012 |
| SO2 Scrubber Check | 4982 | 81.3 | 802.8 | 0.0 | ---- |
| Date of last scrubber change: | | May 25, 2023 | | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.2 | Prev response: | 79.79 | *% change: | 0.5% |
| Baseline Corr 2nd AF pt: | 40.3 | AF Slope: | 1.001167 | AF Intercept: | 0.439485 |
| Baseline Corr 3rd AF pt: | 20.5 | AF Correlation: | 0.999958 | | |

* = > +/-5% change initiates investigation

Notes: No maintenance and adjustments done. Sox scrubber checked after the calibrator zero.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

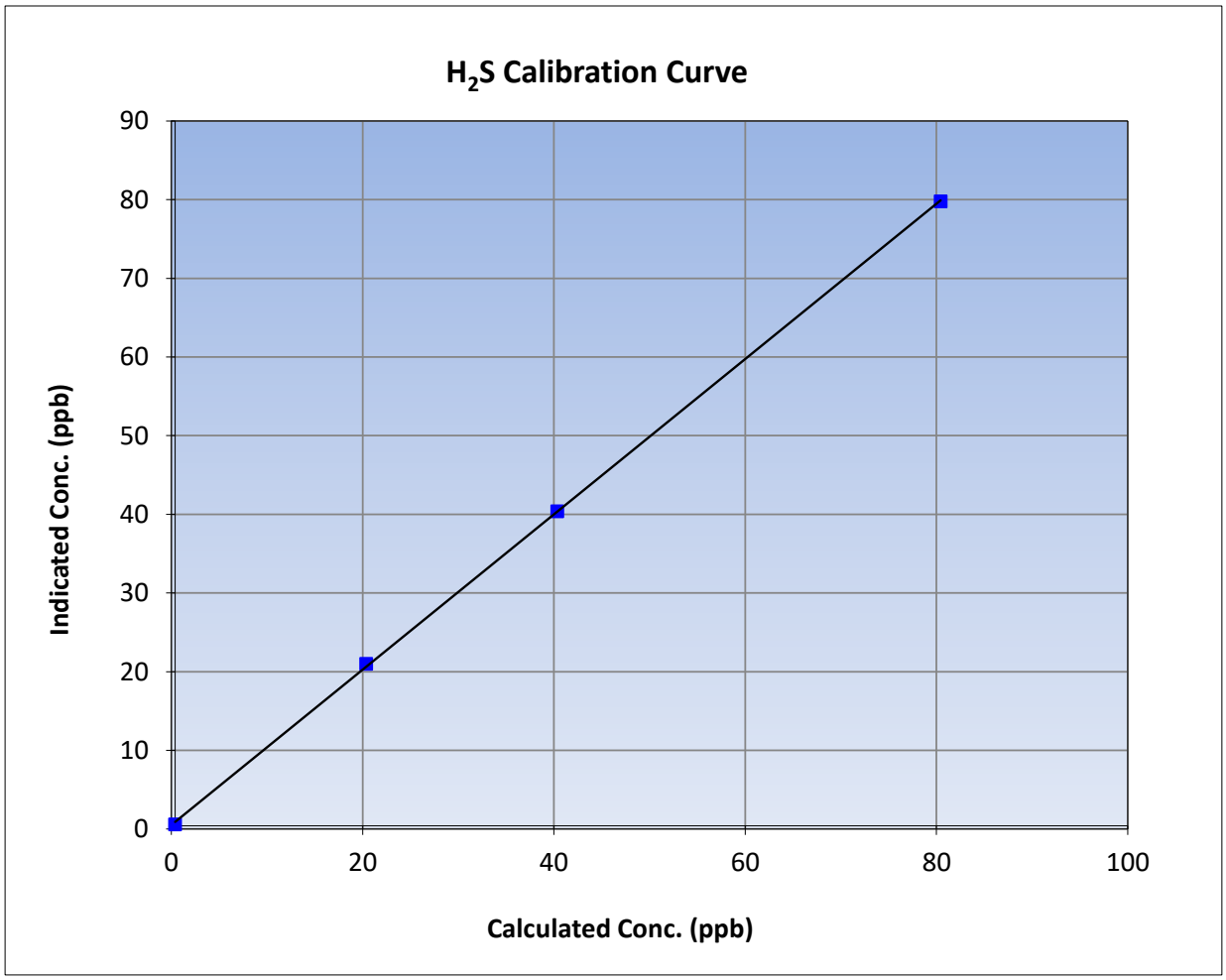
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 7:48 | End Time (MST): | 12:00 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1236656117 |

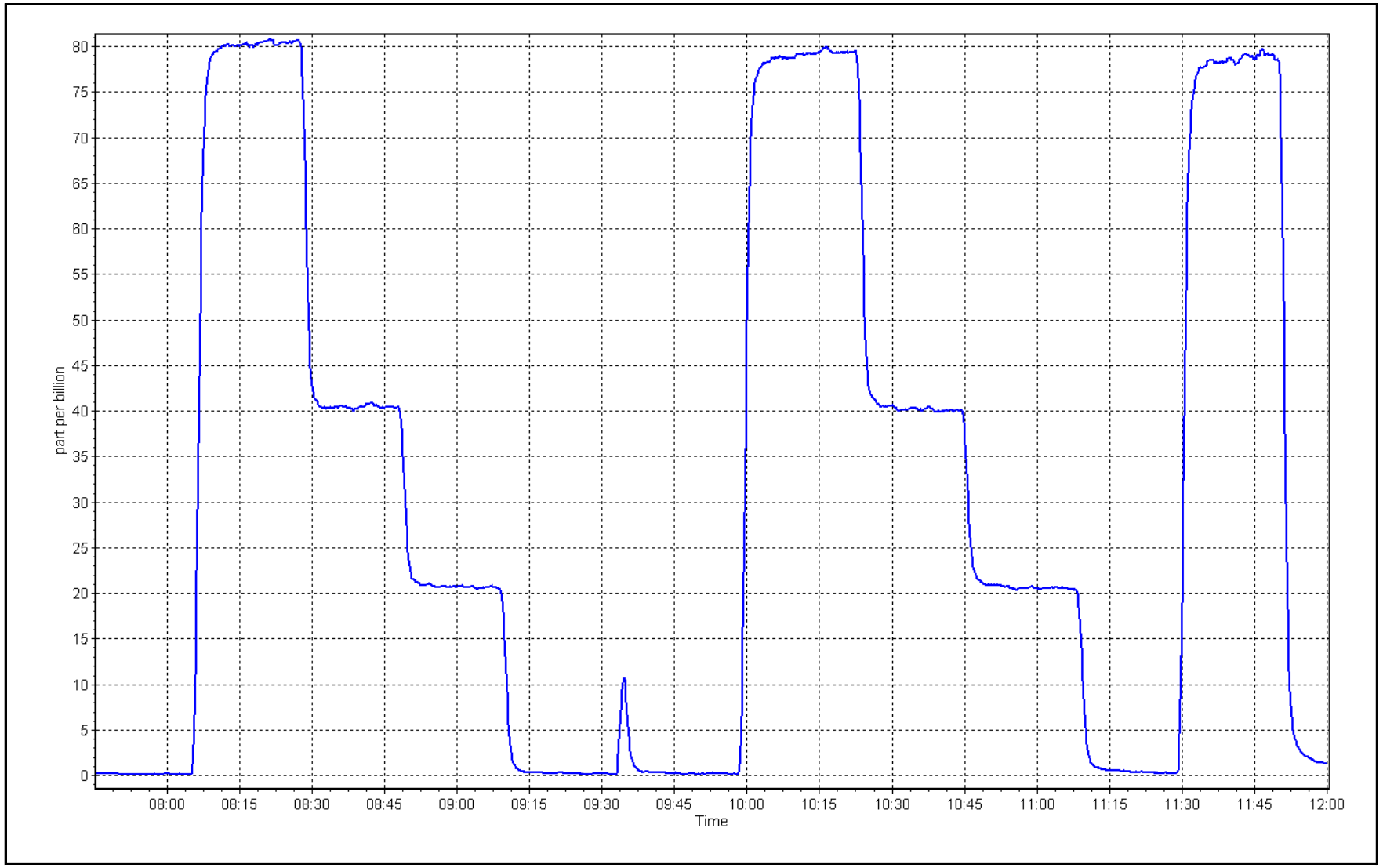
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 79.4 | 1.0080 |
| 40.0 | 40.0 | 0.9992 |
| 20.0 | 20.6 | 0.9702 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999929 | *≥0.995* |
| Slope | 0.987249 | *0.90 - 1.10* |
| Intercept | 0.499237 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 1, 2024 Location: MacKay River



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | MacKay River | Station number: | AMS20 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 9:00 | End time (MST): | 11:50 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | CC306868 | | Cal Gas Expiry Date: | February 23, 2025 | |
| CH4 Cal Gas Conc. | 499.40 | ppm | CH4 Equiv Conc. | 1066.45 | ppm |
| C3H8 Cal Gas Conc. | 206.20 | ppm | | | |
| Removed Gas Cert: | NA | | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 499.40 | ppm | CH4 Equiv Conc. | 1066.45 | ppm |
| Removed C3H8 Conc. | 206.20 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 1220 | |
| ZAG Make/Model: | Teledyne API 701 | | Serial Number: | 4522 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1501663727 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.987892 | 0.999403 | Background: | 3.110 | 3.480 |
| Calibration intercept: | 0.076023 | 0.034183 | Coefficient: | 5.590 | 5.950 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.29 | ---- |
| as found span | 4919 | 81.3 | 17.34 | 16.66 | 1.041 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | -0.01 | ---- |
| high point | 4919 | 81.3 | 17.34 | 17.34 | 1.000 |
| second point | 4959 | 40.7 | 8.68 | 8.74 | 0.993 |
| third point | 4980 | 20.3 | 4.33 | 4.39 | 0.986 |
| as left zero | 5000 | 0.0 | 0.00 | -0.07 | ---- |
| as left span | 4919 | 81.3 | 17.34 | 17.38 | 0.998 |
| | | | | Average Correction Factor | 0.993 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 16.37 | Previous response | 17.21 | *% change | -5.1% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: No maintenance done. Zero and span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

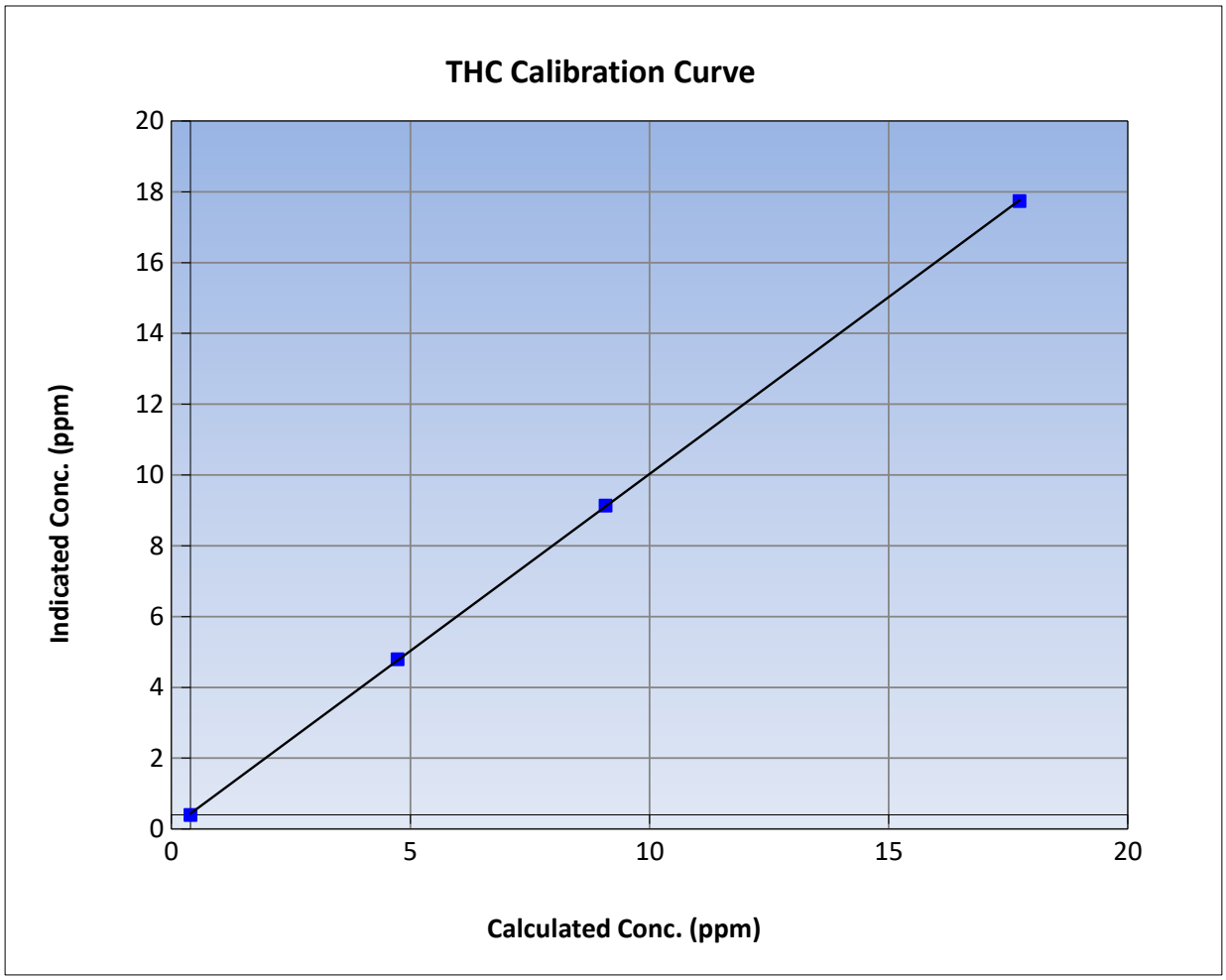
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 9:00 | End Time (MST): | 11:50 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1501663727 |

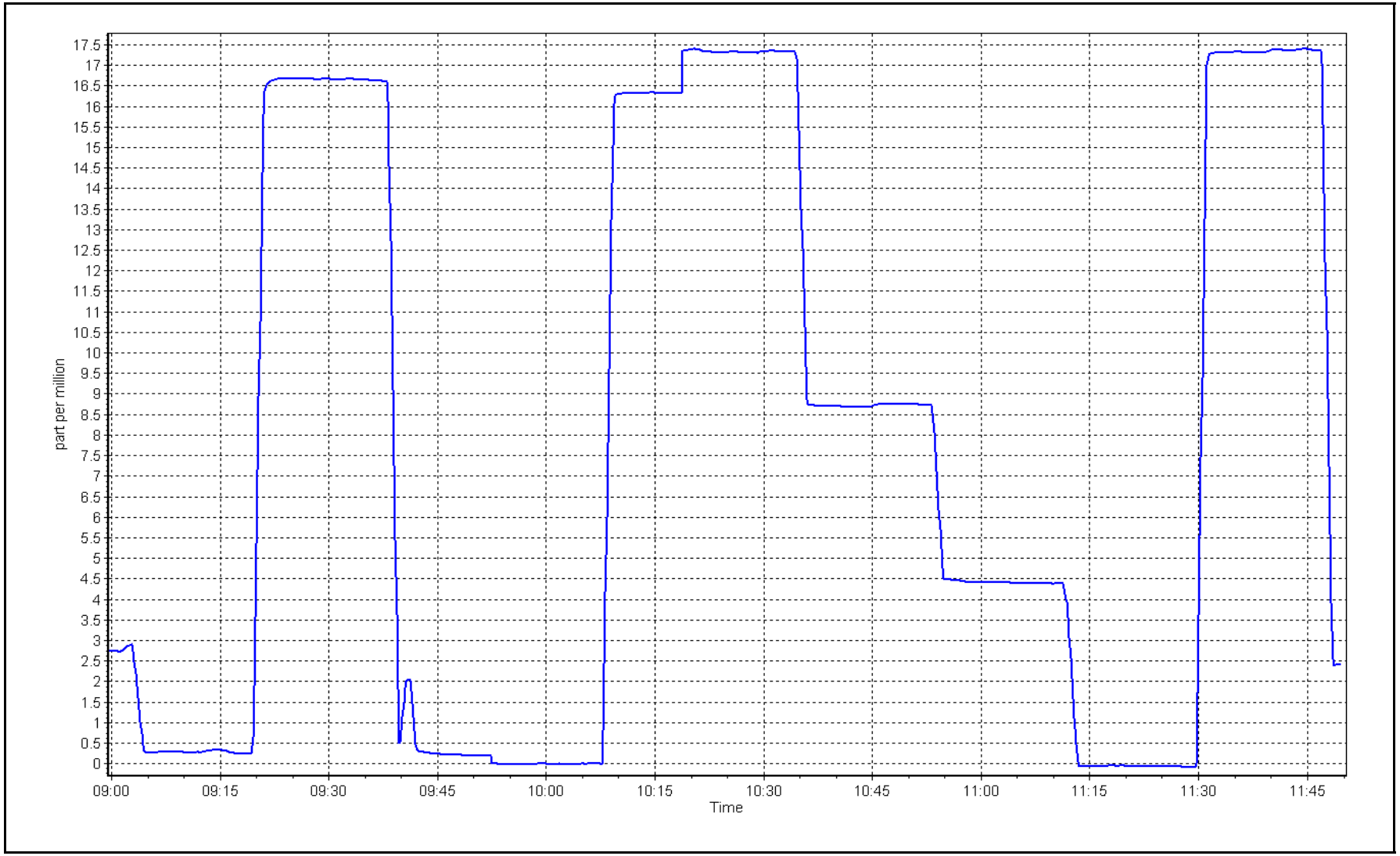
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.01 | ---- |
| 17.34 | 17.34 | 1.0000 |
| 8.68 | 8.74 | 0.9932 |
| 4.33 | 4.39 | 0.9856 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999975 | ≥0.995 |
| Slope | 0.999403 | 0.90 - 1.10 |
| Intercept | 0.034183 | +/-1.5 |



**THC Calibration Plot** Date: February 20, 2024 Location: MacKay River



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | MacKay River | Station number: | AMS20 |
| Calibration Date: | February 8, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 8:00 | End time (MST): | 12:17 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | T376265 | | Cal Gas Expiry Date: | April 13, 2025 | |
| NOX Cal Gas Conc: | 49.19 | ppm | NO Cal Gas Conc: | 48.04 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 49.19 | ppm | Removed Gas NO Conc: | 48.04 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 1220 | |
| ZAG make/model: | Teledyne API 701 | | Serial Number: | 4522 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1505164379 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 0.990 | 0.990 | NO bkgnd or offset: | 2.8 | 2.8 |
| NOX coeff or slope: | 0.994 | 0.994 | NOX bkgnd or offset: | 3.0 | 3.0 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 164.8 | 164.8 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.997760 | 0.994581 |
| $NO_X$ Cal Offset: | 3.562350 | 3.602279 |
| NO Cal Slope: | 0.996944 | 0.995045 |
| NO Cal Offset: | 2.762658 | 2.502804 |
| $NO_2$ Cal Slope: | 1.002101 | 1.000946 |
| $NO_2$ Cal Offset: | -0.557879 | -1.281410 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | -0.1 | ---- | ---- |
| as found span | 4917 | 83.3 | 819.5 | 800.3 | 19.2 | 819.0 | 797.9 | 21.1 | 1.0006 | 1.0030 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ---- | ---- |
| high point | 4917 | 83.3 | 819.5 | 800.3 | 19.2 | 817.0 | 797.8 | 19.2 | 1.0030 | 1.0031 |
| second point | 4958 | 41.7 | 410.3 | 400.7 | 9.6 | 412.9 | 401.8 | 11.1 | 0.9936 | 0.9972 |
| third point | 4979 | 20.8 | 204.6 | 199.9 | 4.8 | 211.1 | 204.3 | 6.8 | 0.9694 | 0.9782 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | ---- | ---- |
| as left span | 4917 | 83.3 | 819.5 | 449.1 | 370.4 | 811.8 | 439.2 | 372.5 | 1.0094 | 1.0225 |
| | | | | | | | | Average Correction Factor | 0.9887 | 0.9929 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 819.1 ppb | NO = 797.9 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -0.3% |
| Previous Response | $NO_X$ = 821.2 ppb | NO = 800.6 ppb | | | *Percent Change | NO = | -0.3% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 792.9 | 441.7 | 370.4 | 370.1 | 1.0007 | 99.9% |
| 2nd GPT point (200 ppb O3) | 792.9 | 608.7 | 203.4 | 202.0 | 1.0067 | 99.3% |
| 3rd GPT point (100 ppb O3) | 792.9 | 696.6 | 115.5 | 112.6 | 1.0254 | 97.5% |
| | | | | Average Correction Factor | 1.0109 | 98.9% |

Notes: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

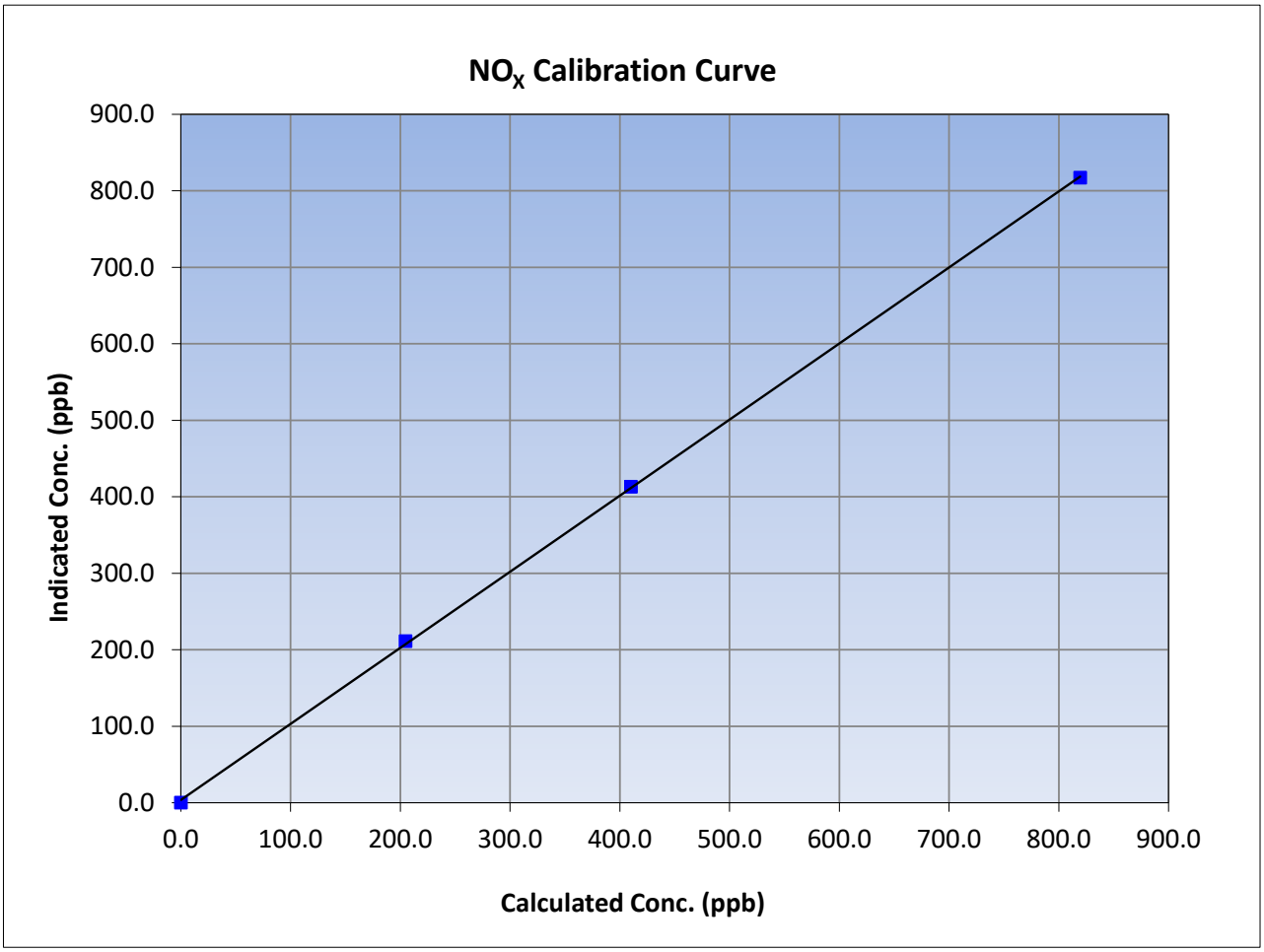
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 8:00 | End Time (MST): | 12:17 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1505164379 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999909 | ≥0.995 |
| 819.5 | 817.0 | 1.0030 | | | |
| 410.3 | 412.9 | 0.9936 | Slope | 0.994581 | 0.90 - 1.10 |
| 204.6 | 211.1 | 0.9694 | | | |
| | | | Intercept | 3.602279 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

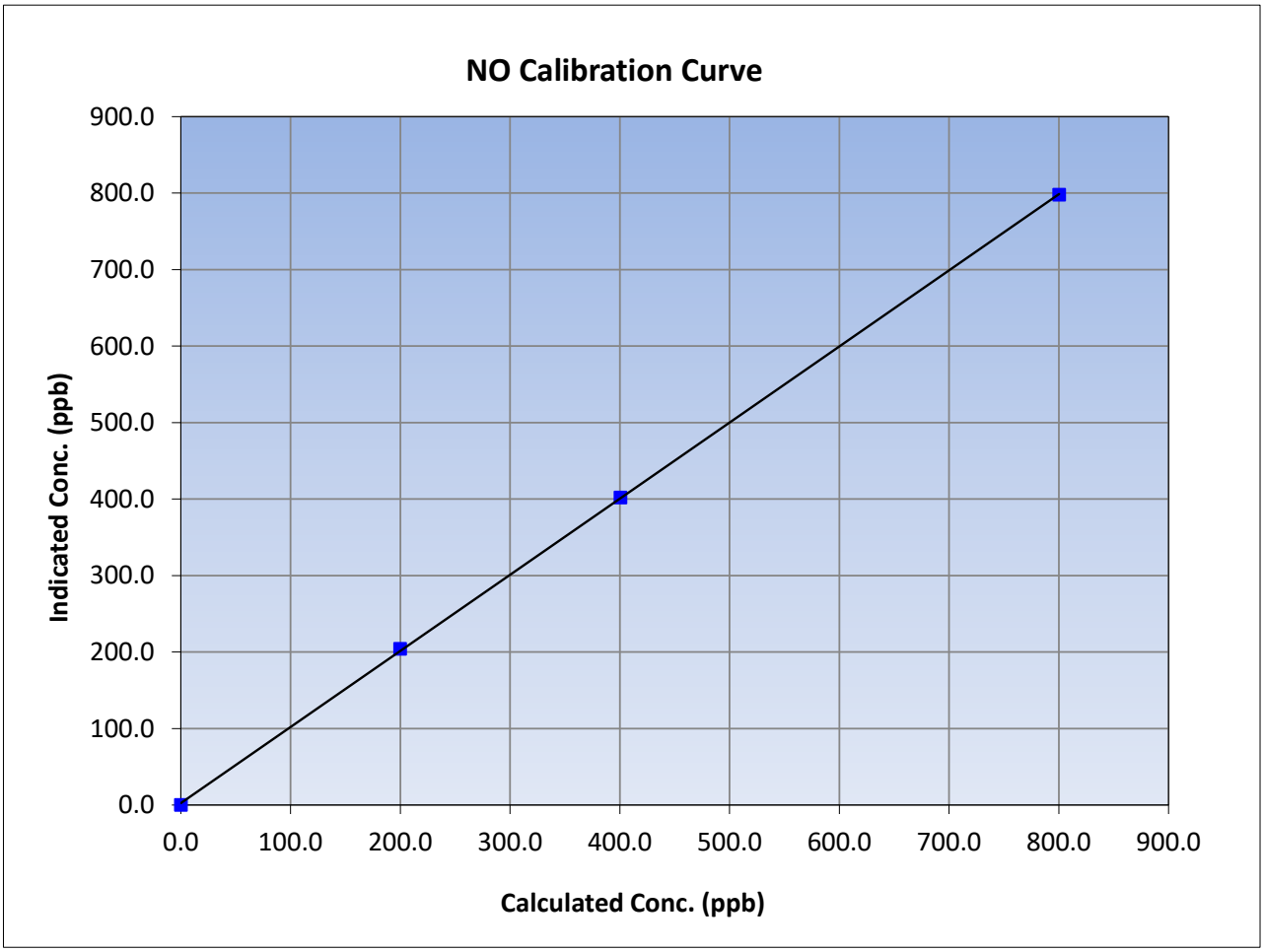
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 8:00 | End Time (MST): | 12:17 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1505164379 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999953 | *≥0.995* |
| 800.3 | 797.8 | 1.0031 | | | |
| 400.7 | 401.8 | 0.9972 | Slope | 0.995045 | *0.90 - 1.10* |
| 199.9 | 204.3 | 0.9782 | | | |
| | | | Intercept | 2.502804 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

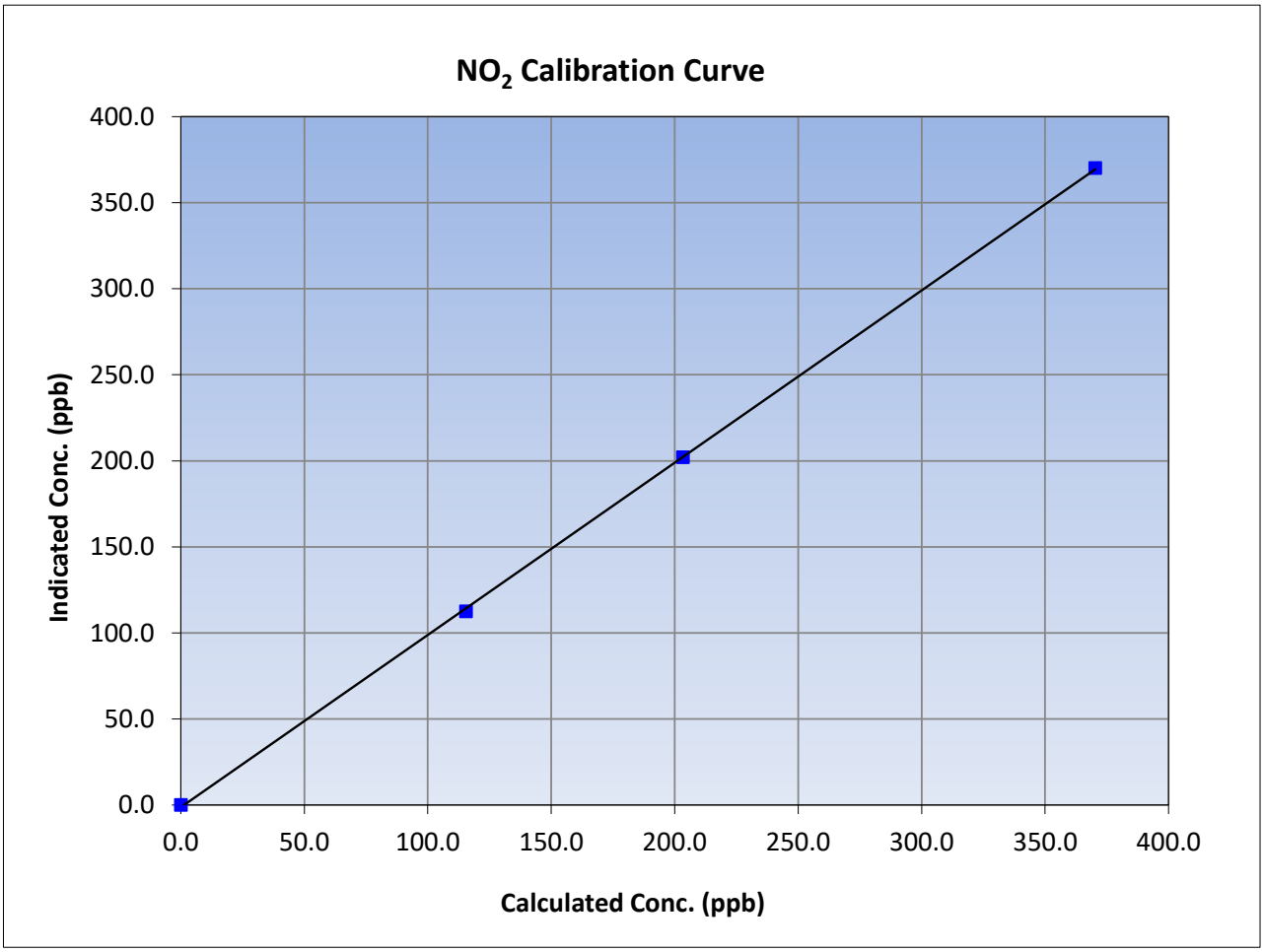
Version-04-2020

### Station Information

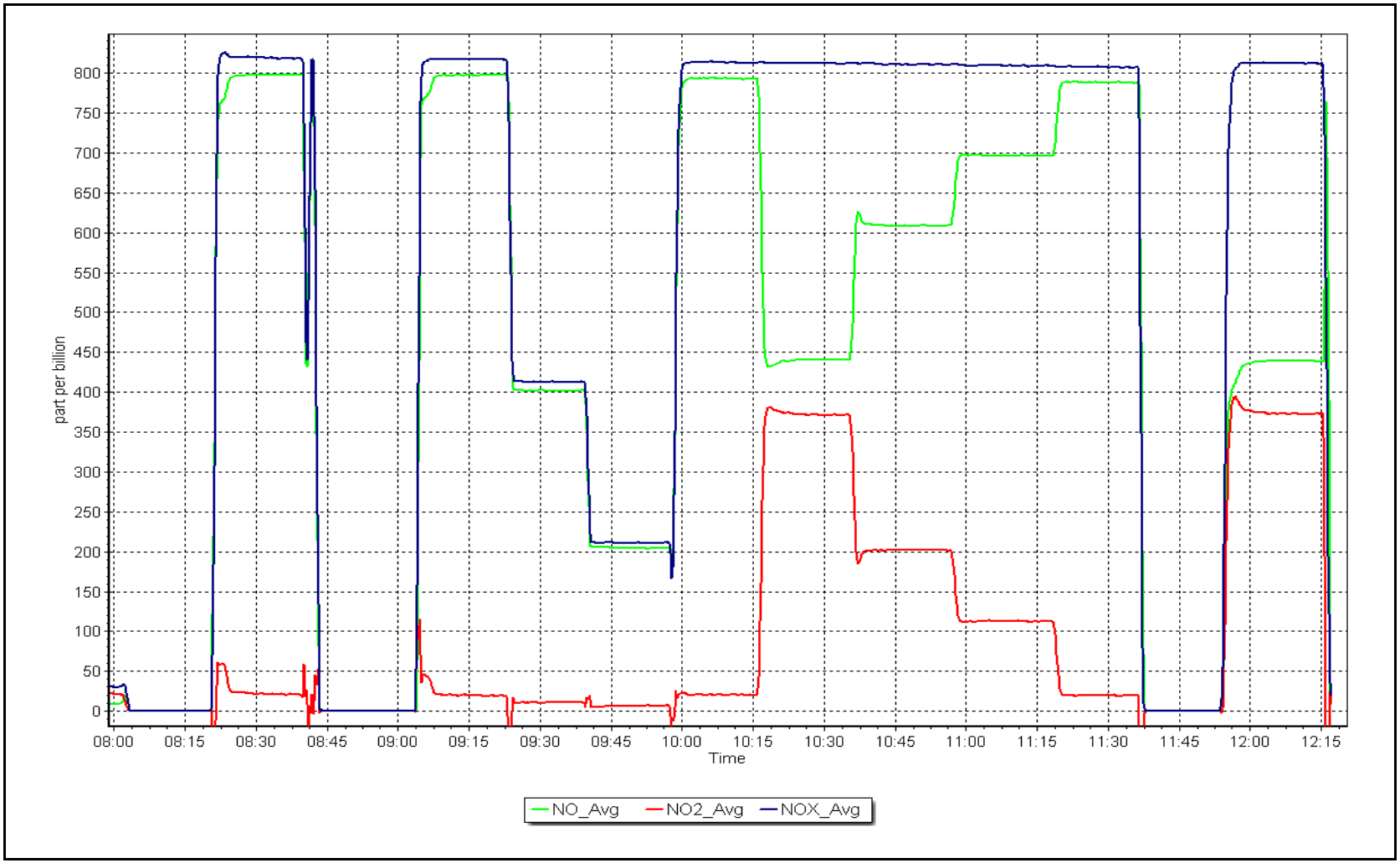
| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 8:00 | End Time (MST): | 12:17 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1505164379 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999932 | *≥0.995* |
| 370.4 | 370.1 | 1.0007 | | | |
| 203.4 | 202.0 | 1.0067 | Slope | 1.000946 | *0.90 - 1.10* |
| 115.5 | 112.6 | 1.0254 | | | |
| | | | Intercept | -1.281410 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 8, 2024 Location: MacKay River



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS21
## CONKLIN

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | February 8, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 10:07 | End time (MST): | 13:04 |
| 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 Make/Model: | Teledyne API T700 | | Serial Number: | 3810 |
| ZAG Make/Model: | Teledyne API 701 | | Serial Number: | 691 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1428701363

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.997790 | 0.997719 | Backgd or Offset: | 28.3 | 28.7 |
| Calibration intercept: | 1.075857 | 1.675879 | Coeff or Slope: | 0.911 | 0.914 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5005 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4920 | 80.2 | 800.8 | 797.2 | 1.005 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5005 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4920 | 80.2 | 800.8 | 800.1 | 1.001 |
| second point | 4960 | 40.1 | 400.4 | 401.4 | 0.998 |
| third point | 4980 | 20.0 | 200.1 | 203.3 | 0.984 |
| as left zero | 5005 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4920 | 80.2 | 800.8 | 800.2 | 1.001 |
| | | | | Average Correction Factor | 0.994 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 797.30 | Previous response | 800.15 | *% 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

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

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

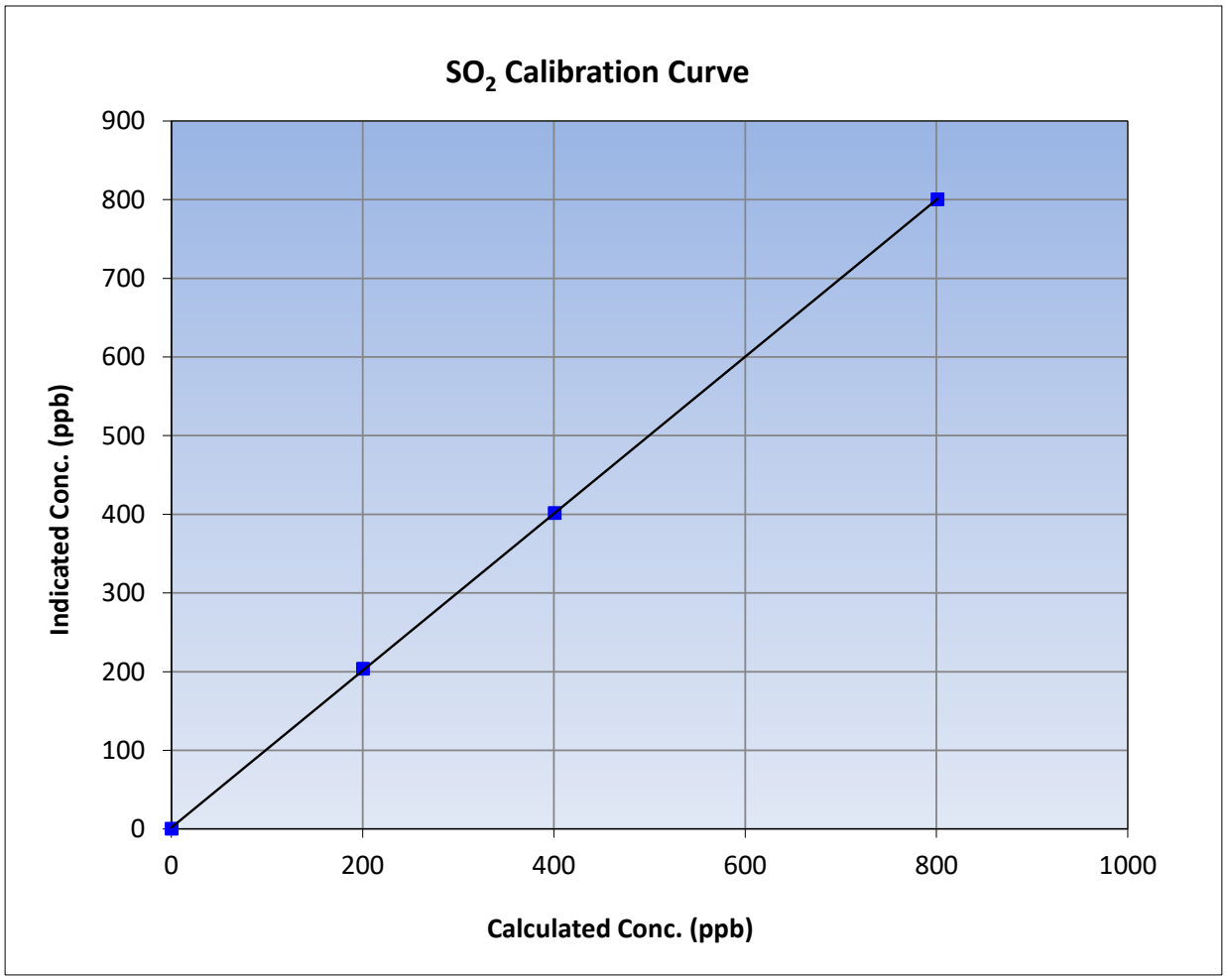
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 10:07 | End Time (MST): | 13:04 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1428701363 |

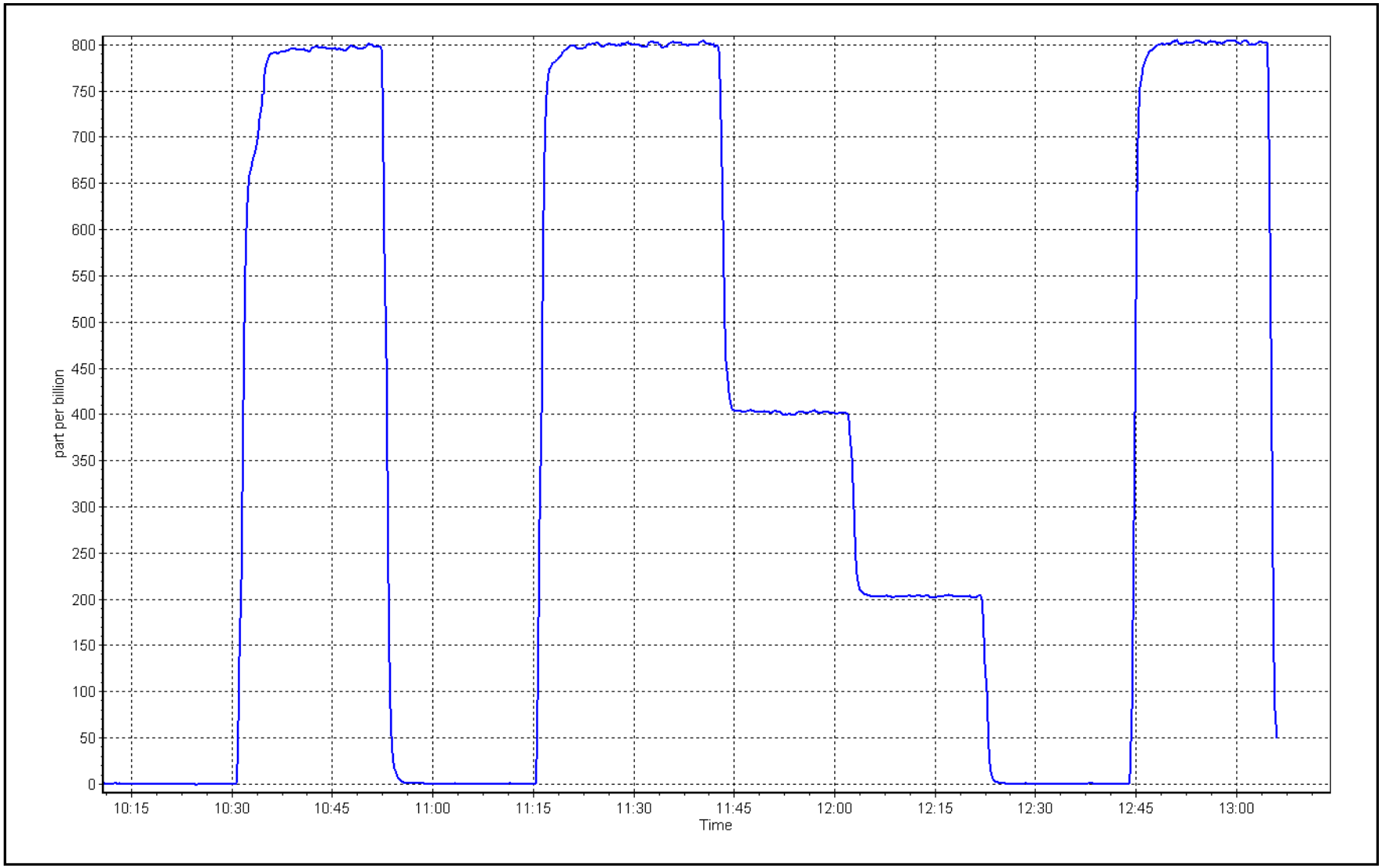
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.8 | 800.1 | 1.0009 |
| 400.4 | 401.4 | 0.9976 |
| 200.1 | 203.3 | 0.9843 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999981 | *≥0.995* |
| Slope | 0.997719 | *0.90 - 1.10* |
| Intercept | 1.675879 | *+/-30* |



**SO2 Calibration Plot** Date: February 8, 2024 Location: Conklin



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 24, 2024 |
| Start time (MST): | 11:32 | End time (MST): | 16:13 |
| 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 API T700 | | Serial Number: | 3810 |
| ZAG Make/Model: | Teledyne API 701H | | Serial Number: | 691 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | | Analyzer serial #: | 1236656116 | |
| Converter make: | CD-Nova 101 | | Converter serial #: | NA | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.011429 | 1.001571 | Backgd or Offset: | 2.4 | 2.42 |
| Calibration intercept: | 0.300000 | 0.420000 | Coeff or Slope: | 0.992 | 0.980 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4920 | 80.0 | 80.0 | 81.7 | 0.980 |
| as found 2nd point | 4960 | 40.0 | 40.0 | 41.1 | 0.976 |
| as found 3rd point | 4980 | 20.0 | 20.0 | 20.7 | 0.971 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4920 | 80.0 | 80.0 | 80.4 | 0.995 |
| second point | 4960 | 40.0 | 40.0 | 40.7 | 0.983 |
| third point | 4980 | 20.0 | 20.0 | 20.6 | 0.971 |
| as left zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as left span | 4920 | 80.0 | 80.0 | 81.0 | 0.988 |
| SO2 Scrubber Check | 4920 | 80.2 | 802.0 | 0.1 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.983 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.6 | Prev response: | 81.21 | *% change: | 0.5% |
| Baseline Corr 2nd AF pt: | 41.0 | AF Slope: | 1.019429 | AF Intercept: | 0.220000 |
| Baseline Corr 3rd AF pt: | 20.6 | AF Correlation: | 0.999989 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

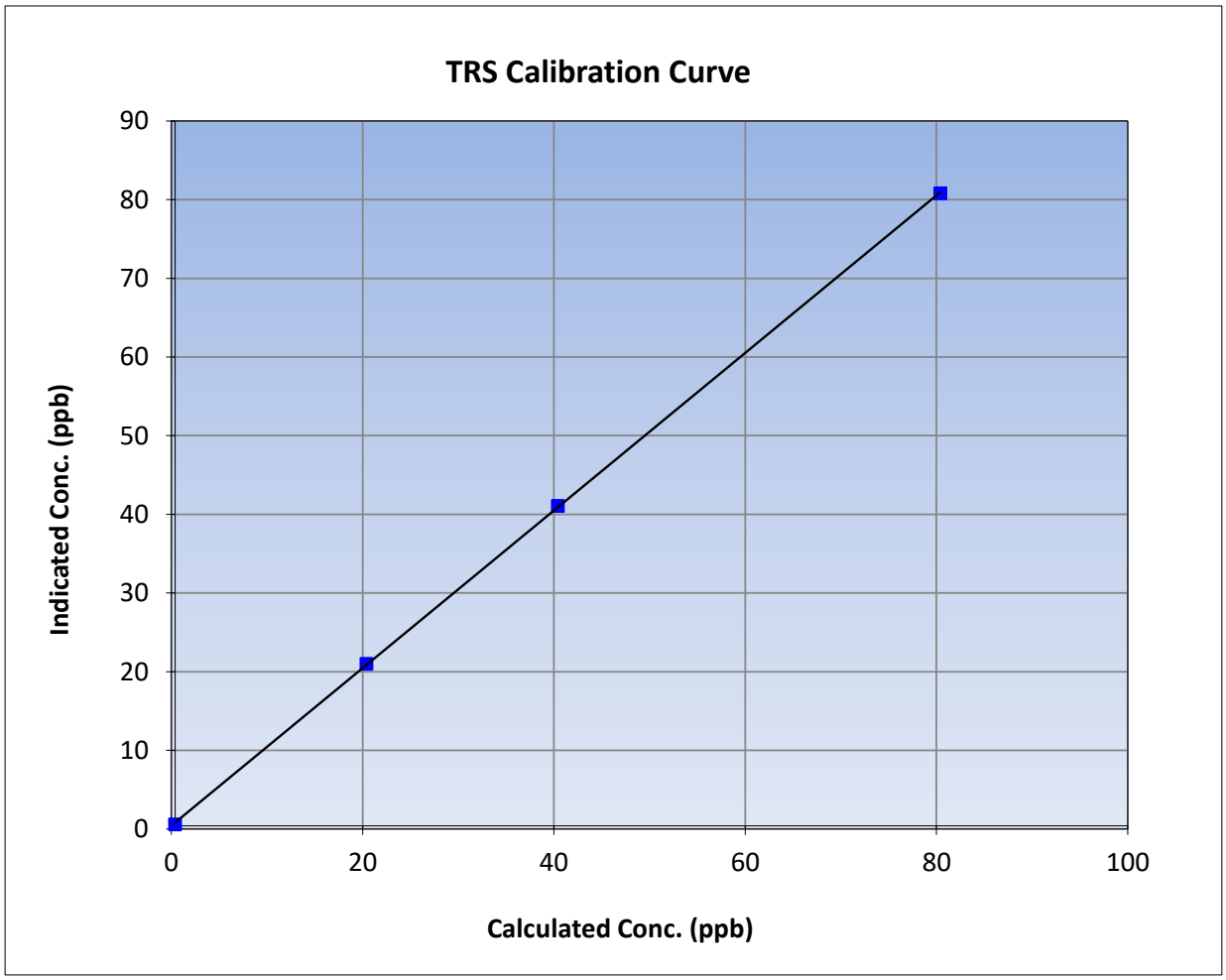
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 11:32 | End Time (MST): | 16:13 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1236656116 |

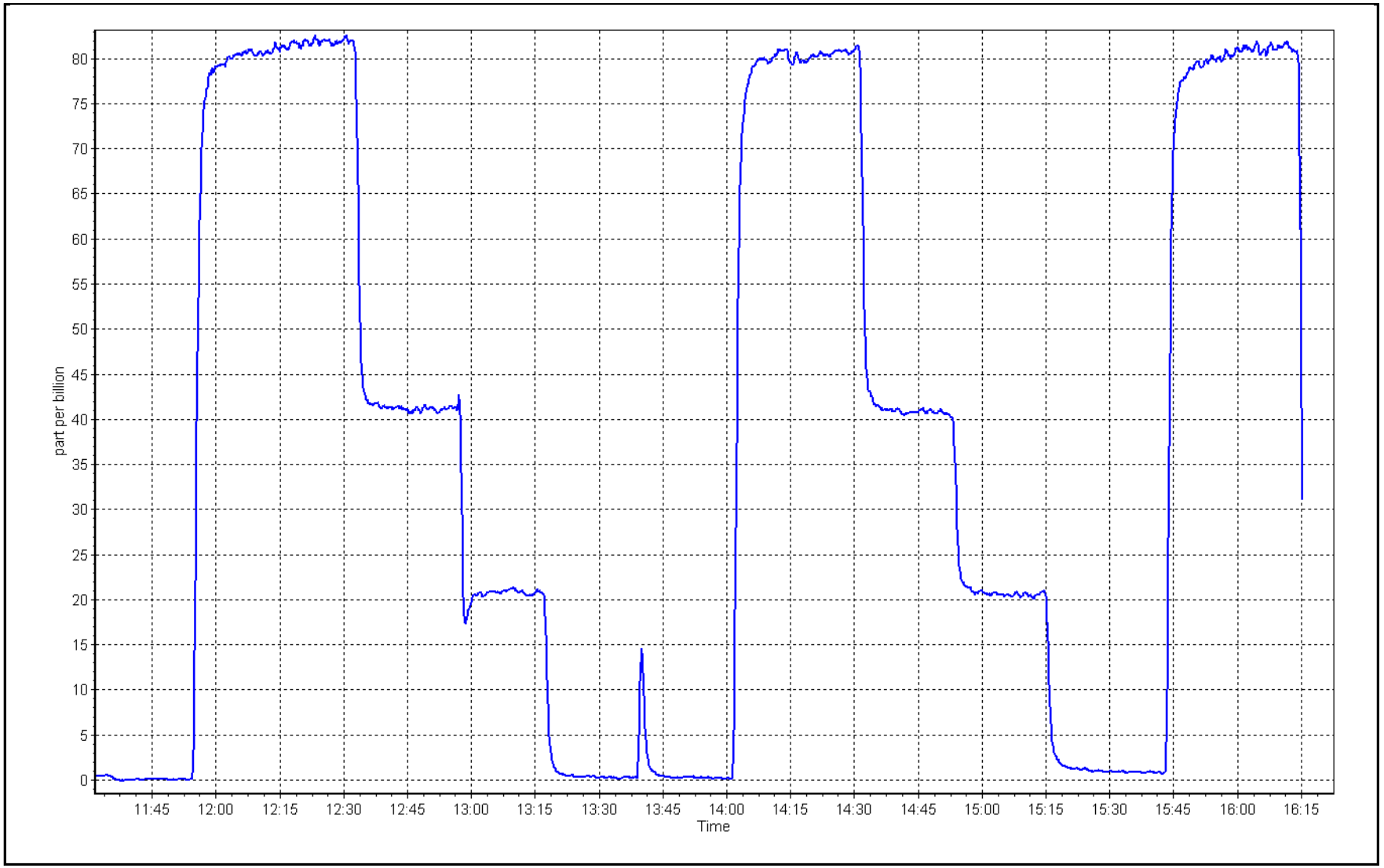
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 80.4 | 0.9950 |
| 40.0 | 40.7 | 0.9828 |
| 20.0 | 20.6 | 0.9709 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999960 | *≥0.995* |
| Slope | 1.001571 | *0.90 - 1.10* |
| Intercept | 0.420000 | *+/-3* |



**TRS Calibration Plot** Date: February 12, 2024 Location: Conklin



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | February 8, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 10:07 | End time (MST): | 13:04 |
| 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: | 3810 | |
| ZAG make/model: | Teledyne API 701H | | Serial Number: | 691 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1193585649 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 3.86E-04 | 3.71E-04 | NMHC SP Ratio: | 7.53E-05 | 7.57E-05 |
| CH4 Retention time: | 17.4 | 17.4 | NMHC Peak Area: | 122333 | 120807 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 17.13 | 17.45 | 0.982 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 17.13 | 17.15 | 0.999 |
| second point | 4960 | 40.1 | 8.56 | 8.61 | 0.995 |
| third point | 4980 | 20.0 | 4.28 | 4.35 | 0.983 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 17.13 | 17.05 | 1.004 |
| | | | | Average Correction Factor | 0.992 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.45 | Prev response | 17.04 | *% change | 2.3% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 9.14 | 9.13 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 9.14 | 9.17 | 0.997 |
| second point | 4960 | 40.1 | 4.57 | 4.61 | 0.991 |
| third point | 4980 | 20.0 | 2.28 | 2.32 | 0.983 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 9.14 | 9.14 | 1.000 |
| | | | | Average Correction Factor | 0.990 |
| Baseline Corr AF: | 9.13 | Prev response | 9.12 | *% 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 7.99 | 8.32 | 0.960 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 7.99 | 7.98 | 1.001 |
| second point | 4960 | 40.1 | 3.99 | 4.00 | 0.999 |
| third point | 4980 | 20.0 | 2.00 | 2.03 | 0.984 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 7.99 | 7.91 | 1.010 |
| | | | | Average Correction Factor | 0.995 |
| Baseline Corr AF: | 8.32 | Prev response | 7.91 | *% change | 4.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.992346 | 1.000154 |
| THC Cal Offset: | 0.043763 | 0.033769 |
| CH4 Cal Slope: | 0.988303 | 0.997762 |
| CH4 Cal Offset: | 0.021954 | 0.015158 |
| NMHC Cal Slope: | 0.995866 | 1.002131 |
| NMHC Cal Offset: | 0.021609 | 0.018811 |

Notes: Changed sample inlet filters after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## THC Calibration Summary

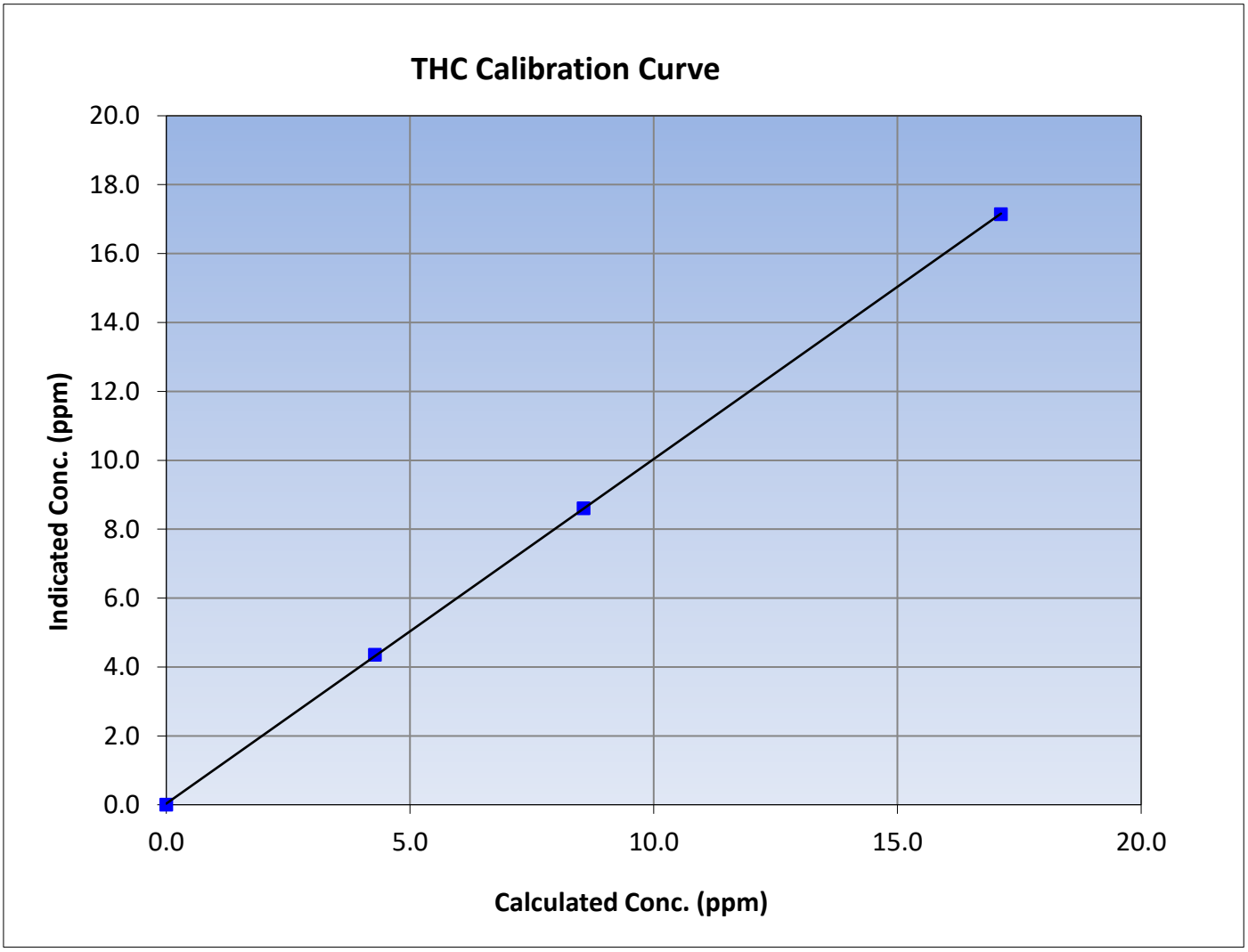
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 10:07 | End Time (MST): | 13:04 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585649 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999982 | ≥0.995 |
| 17.13 | 17.15 | 0.9987 | | | |
| 8.56 | 8.61 | 0.9947 | Slope | 1.000154 | 0.90 - 1.10 |
| 4.28 | 4.35 | 0.9833 | | | |
| | | | Intercept | 0.033769 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

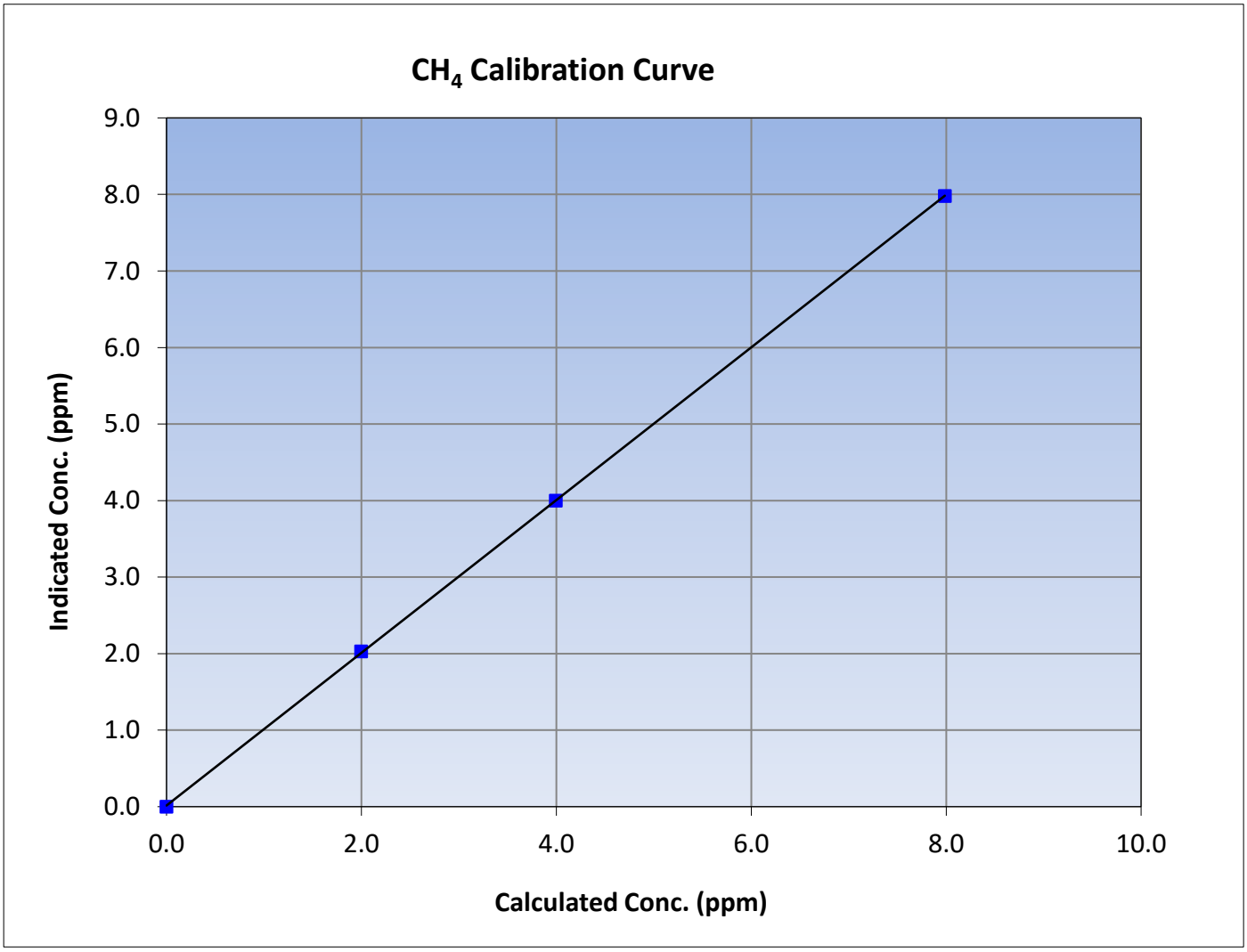
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 10:07 | End Time (MST): | 13:04 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585649 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999979 | *≥0.995* |
| 7.99 | 7.98 | 1.0009 | | | |
| 3.99 | 4.00 | 0.9990 | Slope | 0.997762 | *0.90 - 1.10* |
| 2.00 | 2.03 | 0.9840 | | | |
| | | | Intercept | 0.015158 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

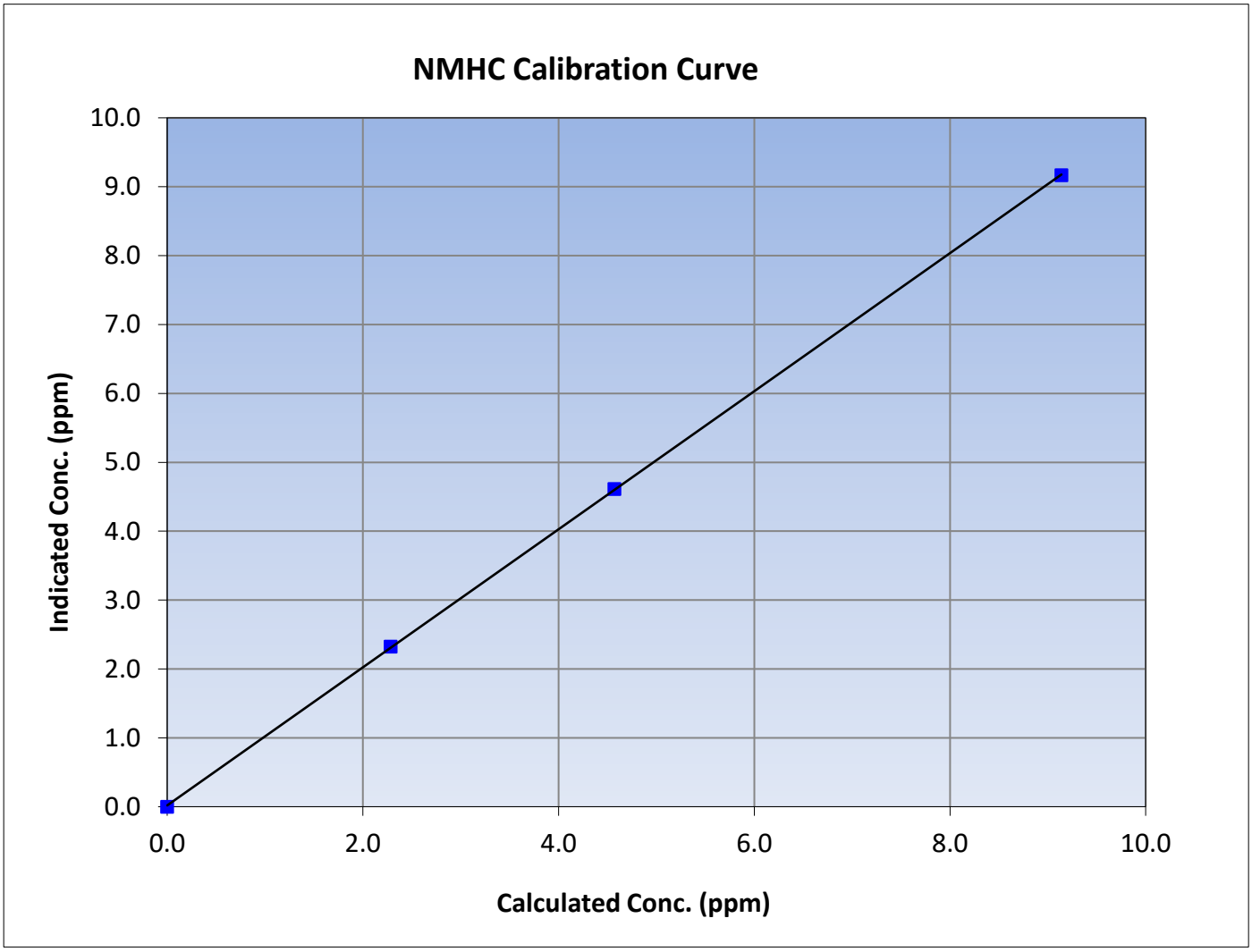
Version-06-2022

### Station Information

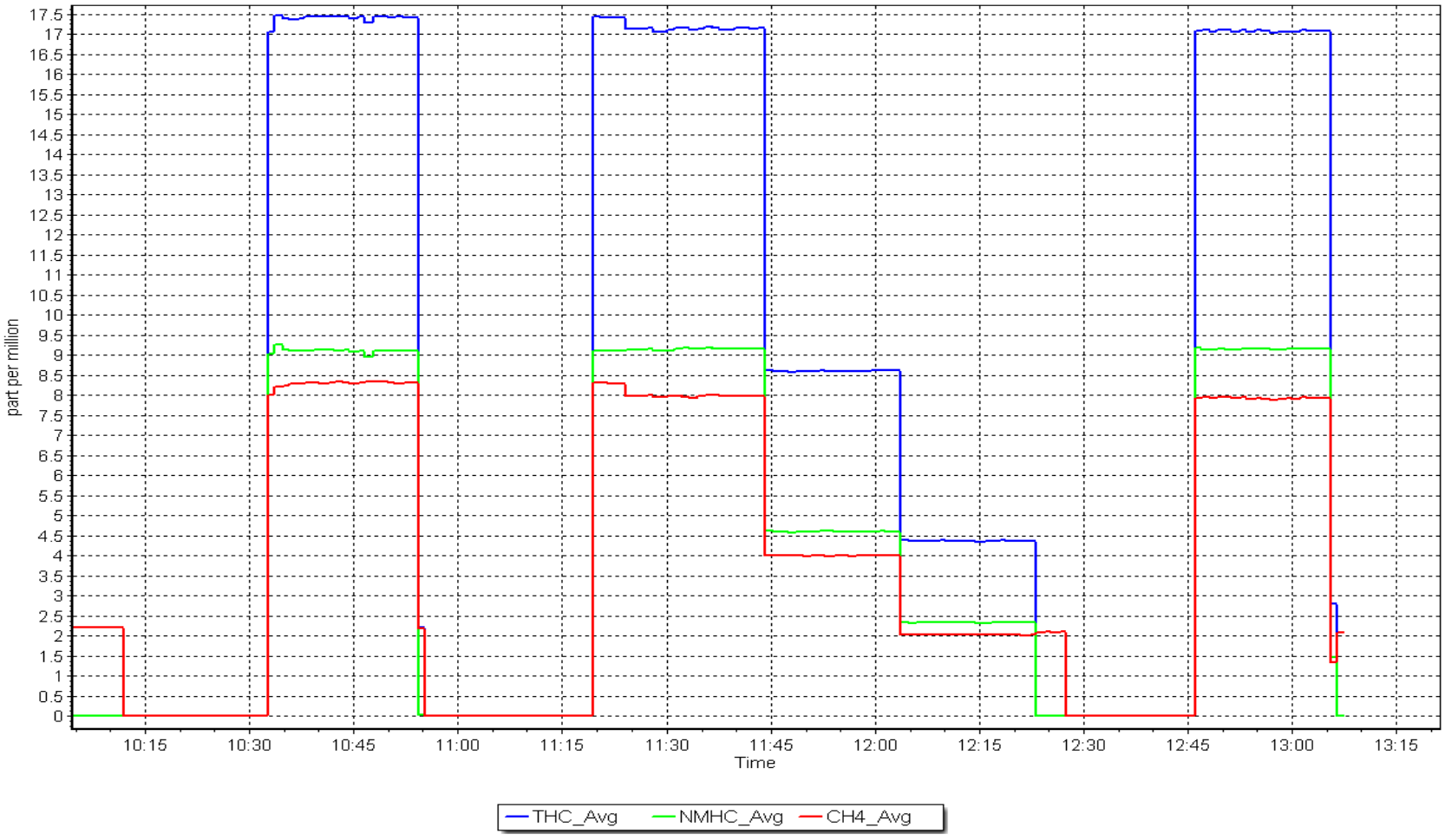
| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 10:07 | End Time (MST): | 13:04 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585649 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999980 | ≥0.995 |
| 9.14 | 9.17 | 0.9970 | | | |
| 4.57 | 4.61 | 0.9910 | Slope | 1.002131 | 0.90 - 1.10 |
| 2.28 | 2.32 | 0.9827 | | | |
| | | | Intercept | 0.018811 | +/-0.5 |



**NMHC Calibration Plot** Date: February 8, 2024 Location: Conklin



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | January 19, 2024 |
| Start time (MST): | 9:21 | End time (MST): | 13:54 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | SA18828 | | Cal Gas Expiry Date: | November 3, 2031 | |
| NOX Cal Gas Conc: | 48.90 | ppm | NO Cal Gas Conc: | 48.80 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 48.90 | ppm | Removed Gas NO Conc: | 48.80 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3810 | |
| ZAG make/model: | Teledyne API T701H | | Serial Number: | 364 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1501663731 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.062 | 1.050 | NO bkgnd or offset: | 10.6 | 10.5 |
| NOX coeff or slope: | 0.983 | 0.993 | NOX bkgnd or offset: | 10.6 | 10.6 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 152.1 | 150.6 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.997935 | 0.991077 |
| $NO_X$ Cal Offset: | 2.088043 | 2.428003 |
| NO Cal Slope: | 0.999591 | 0.994636 |
| NO Cal Offset: | 1.508039 | 1.768002 |
| $NO_2$ Cal Slope: | 0.998906 | 1.001397 |
| $NO_2$ Cal Offset: | 0.745906 | -0.933646 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.2 | -0.1 | ---- | ---- |
| as found span | 4918 | 82.0 | 802.0 | 800.1 | 1.9 | 810.8 | 808.8 | 2.0 | 0.9891 | 0.9892 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator 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 | 796.3 | 797.2 | -1.0 | 1.0071 | 1.0039 |
| second point | 4959 | 41.0 | 401.0 | 400.2 | 0.8 | 400.3 | 399.9 | 0.4 | 1.0017 | 1.0007 |
| third point | 4980 | 20.5 | 200.5 | 200.1 | 0.4 | 203.9 | 202.9 | 1.0 | 0.9832 | 0.9860 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 | ---- | ---- |
| as left span | 4918 | 82.0 | 802.0 | 387.7 | 414.2 | 791.2 | 381.7 | 409.5 | 1.0136 | 1.0158 |
| | | | | | | | | Average Correction Factor | 0.9973 | 0.9969 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 811.1 ppb | NO = 809.0 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.1% |
| Previous Response | $NO_X$ = 802.4 ppb | NO = 801.3 ppb | | *Percent Change | NO = | 1.0% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: ; | $NO_2$ Int: |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 793.0 | 380.4 | 414.2 | 414.7 | 0.9989 | 100.1% |
| 2nd GPT point (200 ppb O3) | 793.0 | 586.6 | 208.0 | 205.9 | 1.0104 | 99.0% |
| 3rd GPT point (100 ppb O3) | 793.0 | 690.4 | 104.2 | 103.2 | 1.0101 | 99.0% |
| | | | | Average Correction Factor | 1.0065 | 99.4% |

Notes: Changed sample inlet filter after as founds. Adjusted Span only. Used 2nd NO reference point because of drift.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

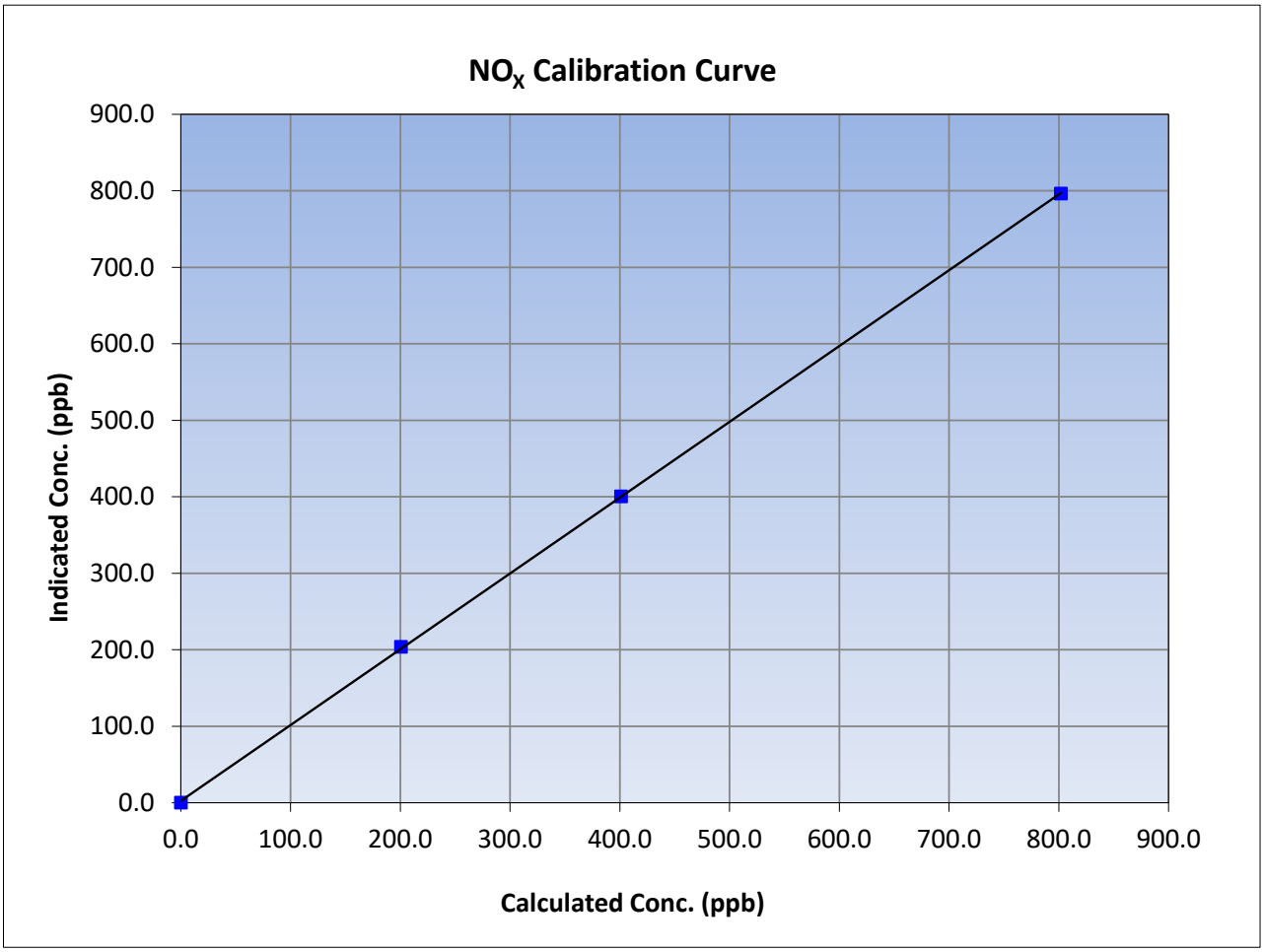
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 9:21 | End Time (MST): | 13:54 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1501663731 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999959 | *≥0.995* |
| 802.0 | 796.3 | 1.0071 | | | |
| 401.0 | 400.3 | 1.0017 | Slope | 0.991077 | *0.90 - 1.10* |
| 200.5 | 203.9 | 0.9832 | | | |
| | | | Intercept | 2.428003 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

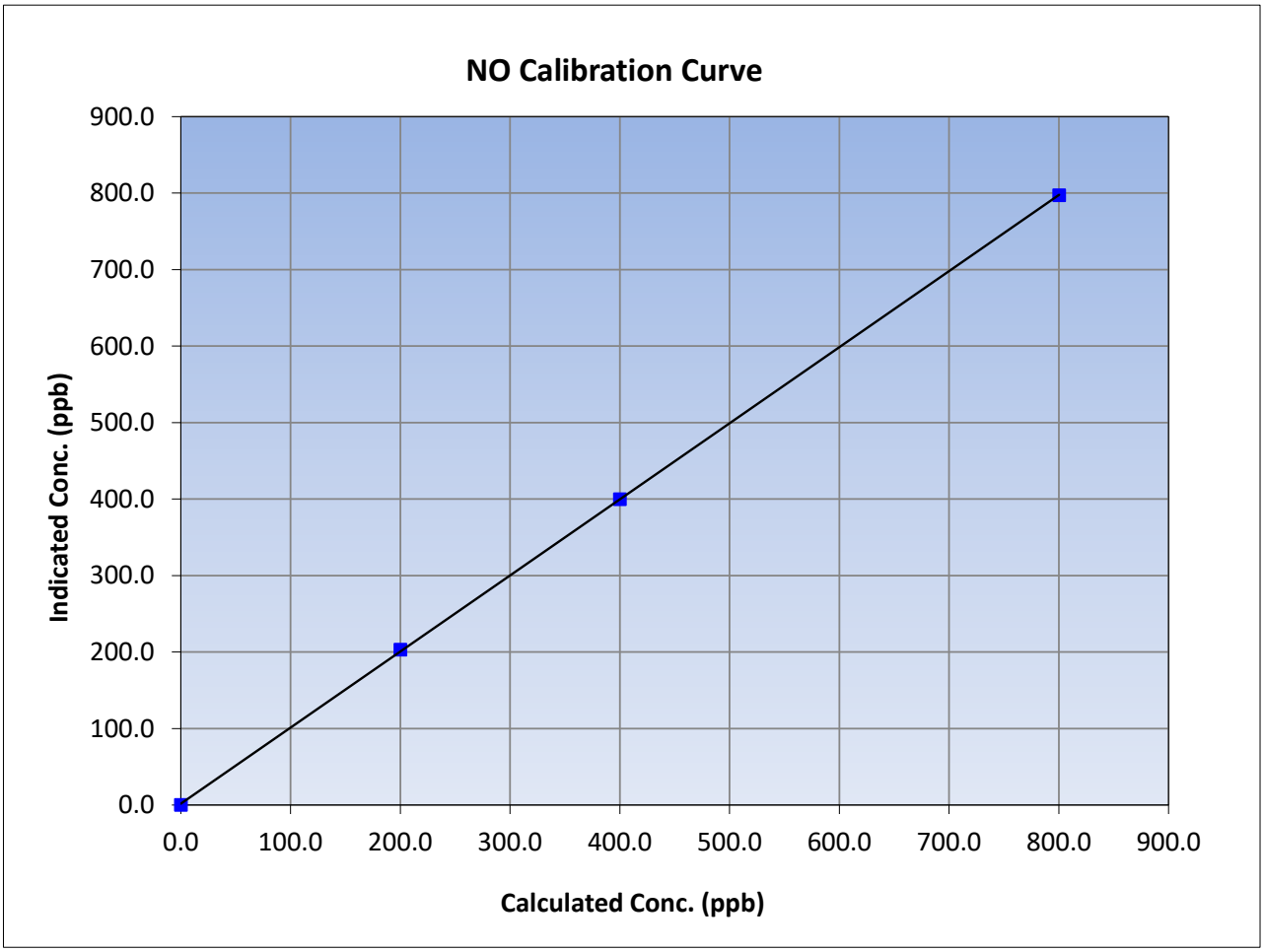
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 9:21 | End Time (MST): | 13:54 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1501663731 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999978 | ≥0.995 |
| 800.3 | 797.2 | 1.0039 | | | |
| 400.2 | 399.9 | 1.0007 | Slope | 0.994636 | 0.90 - 1.10 |
| 200.1 | 202.9 | 0.9860 | | | |
| | | | Intercept | 1.768002 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

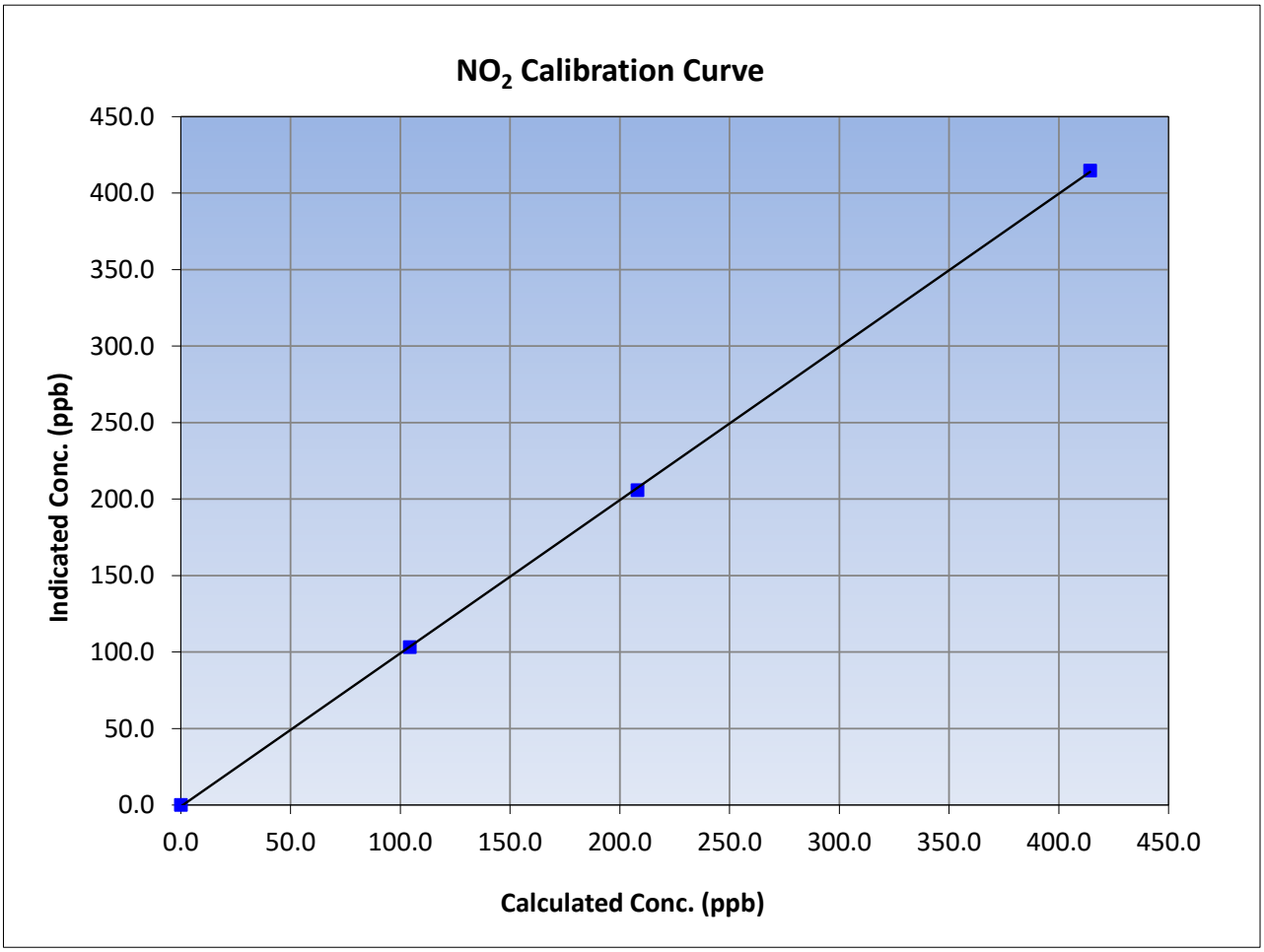
Version-04-2020

### Station Information

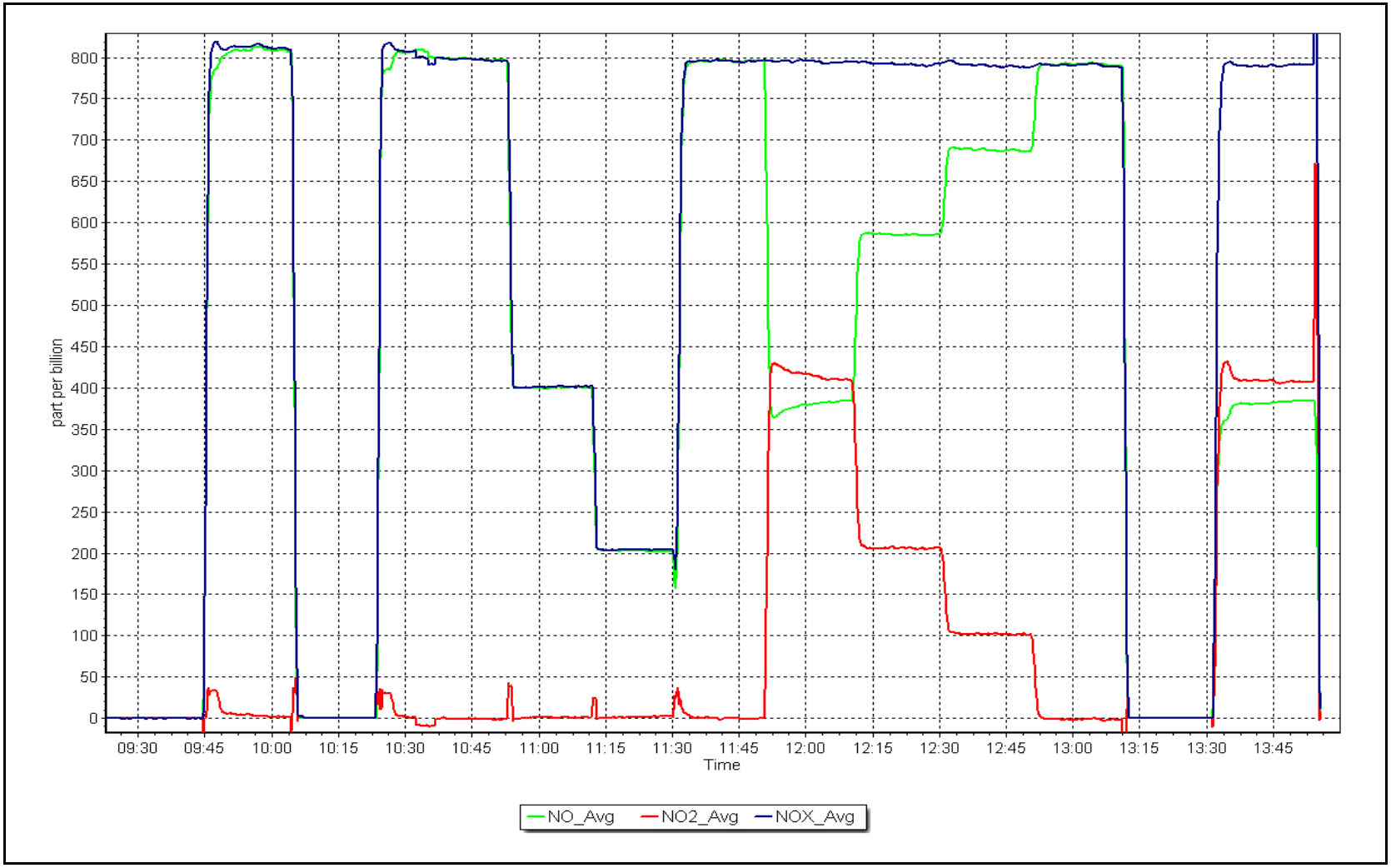
| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 19, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 9:21 | End Time (MST): | 13:54 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1501663731 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999959 | ≥0.995 |
| 414.2 | 414.7 | 0.9989 | | | |
| 208.0 | 205.9 | 1.0104 | Slope | 1.001397 | 0.90 - 1.10 |
| 104.2 | 103.2 | 1.0101 | | | |
| | | | Intercept | -0.933646 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 14, 2024 Location: Conklin



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | February 1, 2024 | Last Cal Date: | January 12, 2024 |
| Start time (MST): | 10:10 | End time (MST): | 13:46 |
| Reason: | Routine | | |

### Calibration Standards

| | | | |
|---|---|---|---|
| O3 generation mode: | Photometer | | |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number: | 3810 |
| ZAG Make/Model: | Teledyne API 701H | Serial Number: | 691 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1501663734 |
| Analyzer Range | 0 - 500 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.000771 | 1.001543 | Backgd or Offset: | -1.1 | -1.2 |
| Calibration intercept: | 0.740000 | 0.180000 | Coeff or Slope: | 1.005 | 0.998 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 5000 | 952.6 | 400.0 | 402.6 | 0.994 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 5000 | 952.6 | 400.0 | 400.8 | 0.998 |
| second point | 5000 | 801.3 | 200.0 | 200.4 | 0.998 |
| third point | 5000 | 807.8 | 100.0 | 100.5 | 0.995 |
| as left zero | 5000 | 800.0 | 0.0 | 0.0 | ---- |
| as left span | 5000 | 952.8 | 400.0 | 401.1 | 0.997 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 402.7 | Previous response | 401.0 | *% 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

Notes: Sample inlet filters changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

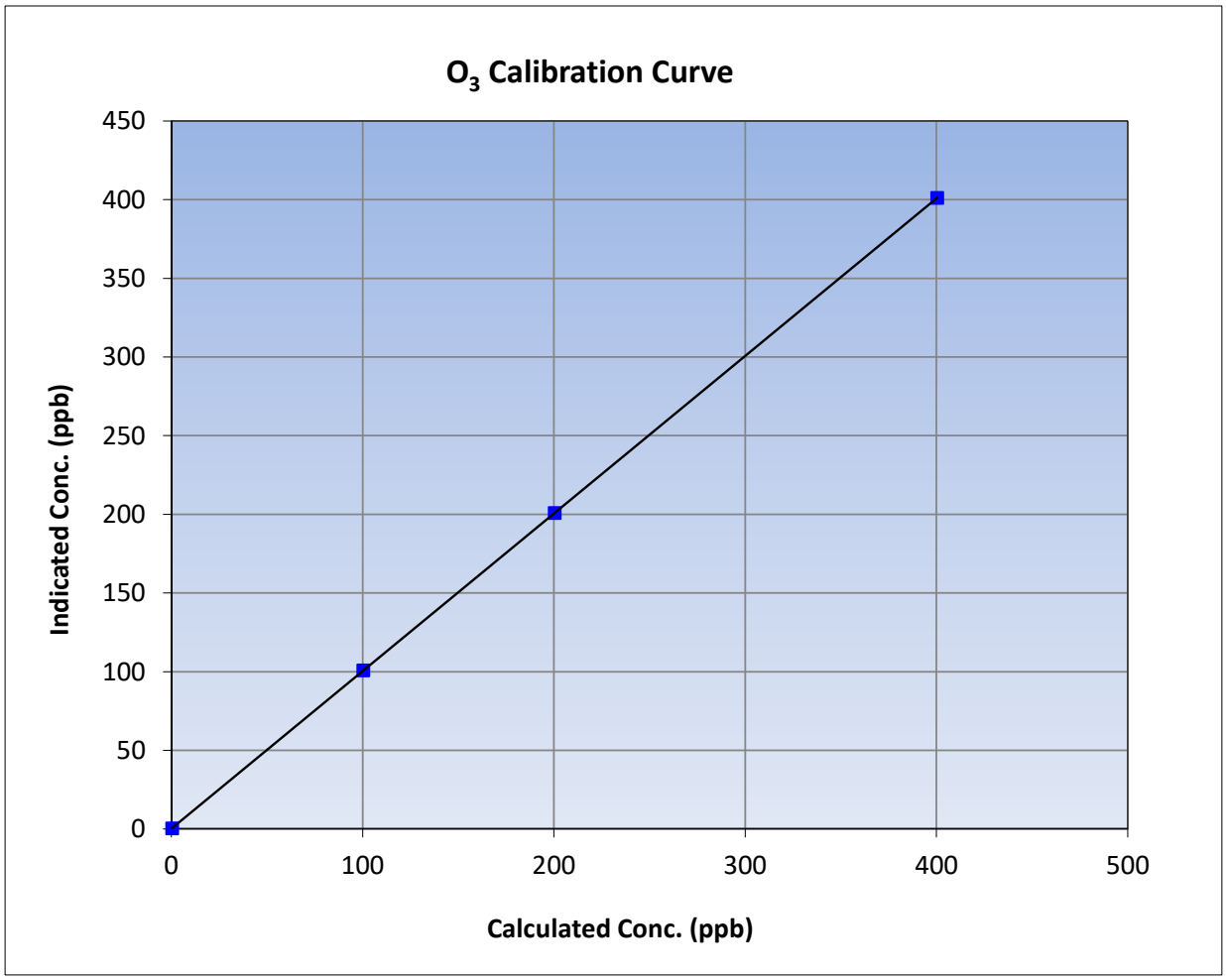
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 1, 2024 | Previous Calibration: | January 12, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 10:10 | End Time (MST): | 13:46 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1501663734 |

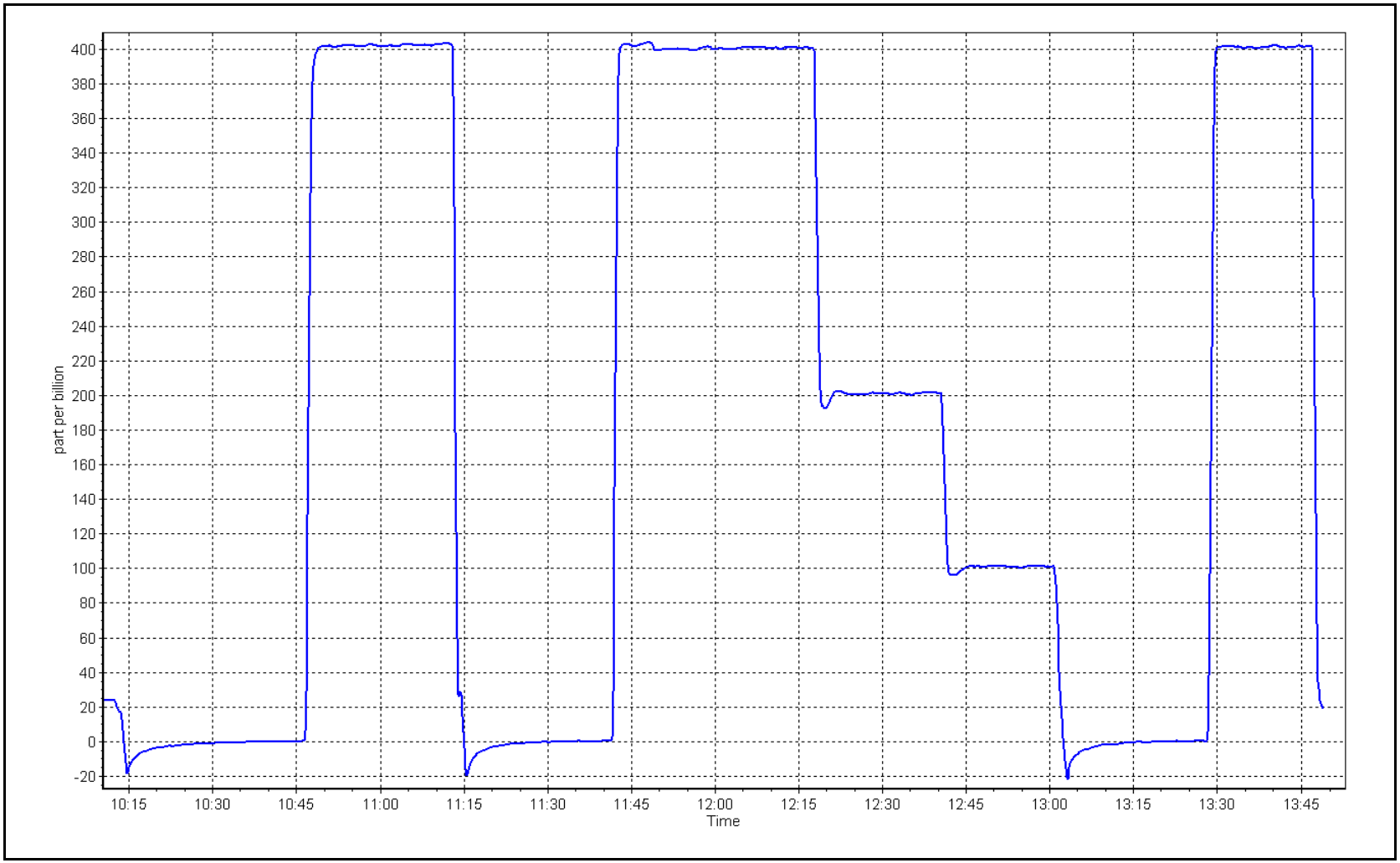
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 400.0 | 400.8 | 0.9980 |
| 200.0 | 200.4 | 0.9980 |
| 100.0 | 100.5 | 0.9950 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 1.000000 | ≥0.995 |
| Slope | 1.001543 | 0.90 - 1.10 |
| Intercept | 0.180000 | +/- 5 |



**$O_3$ Calibration Plot** Date: February 1, 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: | February 12, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 12:45 | End time (MST): | 13:06 |
| Analyzer Make: | API T640 | S/N: | 326 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 388751 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 388751 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| T (°C) | 1.50 | 1.03 | 1.50 | ☐ | +/- 2 °C |
| P (mmHg) | 704.00 | 705.70 | 704.00 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.98 | 5.05 | 4.98 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 40.00 | ----- | 40.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 2.30 | 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.:

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

Date Optical Chamber Cleaned: December 7, 2023

Date Disposable Filter Changed: December 7, 2023

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

### Annual Maintenance

Date Sample Tube Cleaned: December 7, 2023

Date RH/T Sensor Cleaned: December 7, 2023

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

Calibration by: Jan Castro

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS22
## JANVIER

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | February 23, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 11:10 | End time (MST): | 14:02 |
| 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 Make/Model: | Teledyne API T700 | | Serial Number: | 3806 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4890 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1152430006

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.002679 | 1.000307 | Backgd or Offset: | 23.7 | 24.0 |
| Calibration intercept: | 0.383769 | 1.464248 | Coeff or Slope: | 1.035 | 1.035 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4920 | 79.8 | 799.8 | 799.6 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| high point | 4920 | 79.8 | 799.8 | 800.5 | 0.999 |
| second point | 4960 | 39.9 | 399.9 | 403.4 | 0.991 |
| third point | 4980 | 20.0 | 200.4 | 202.1 | 0.992 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 79.8 | 799.8 | 803.4 | 0.996 |
| | | | | Average Correction Factor | 0.994 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 799.50 | Previous response | 802.31 | *% 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

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

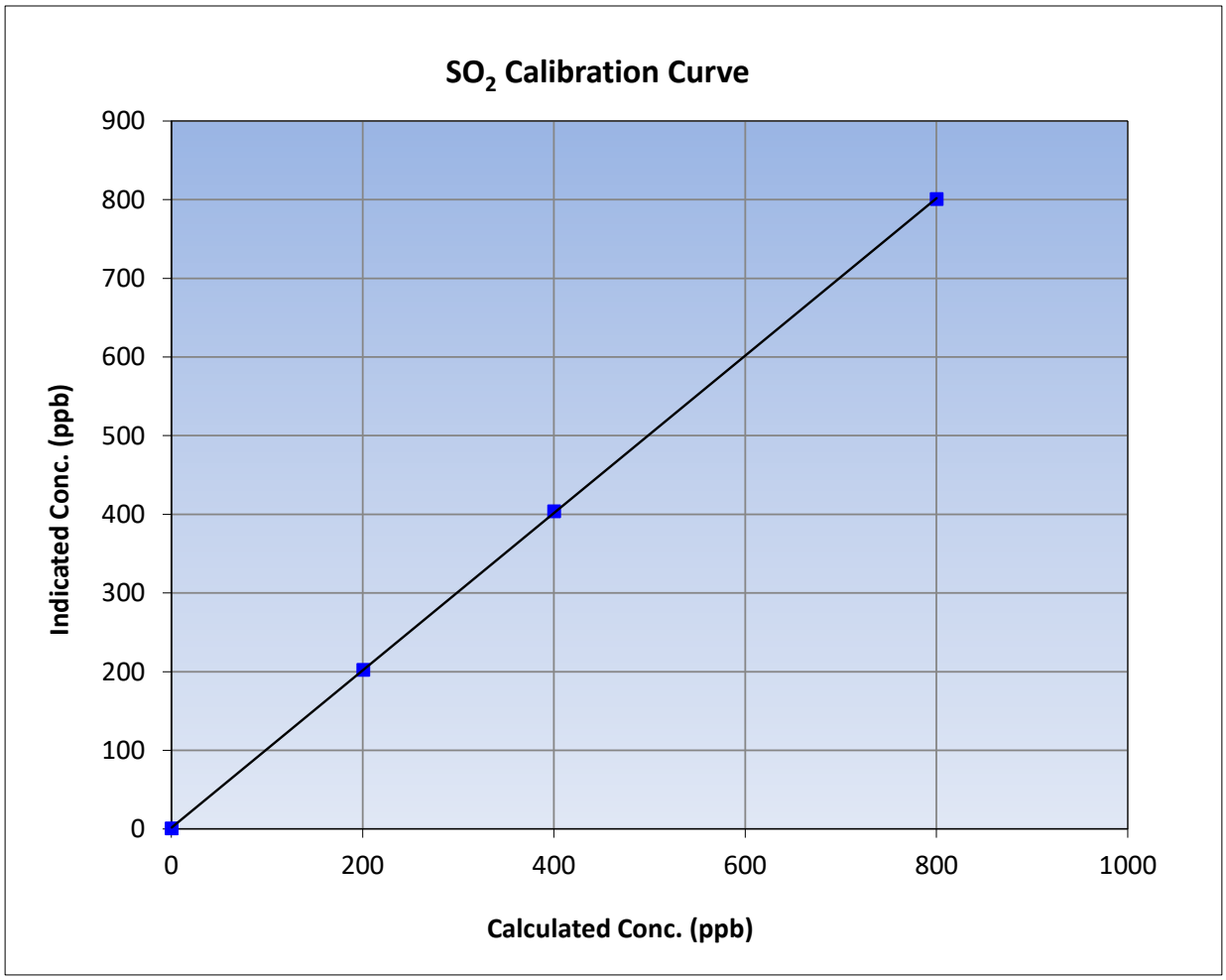
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:10 | End Time (MST): | 14:02 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1152430006 |

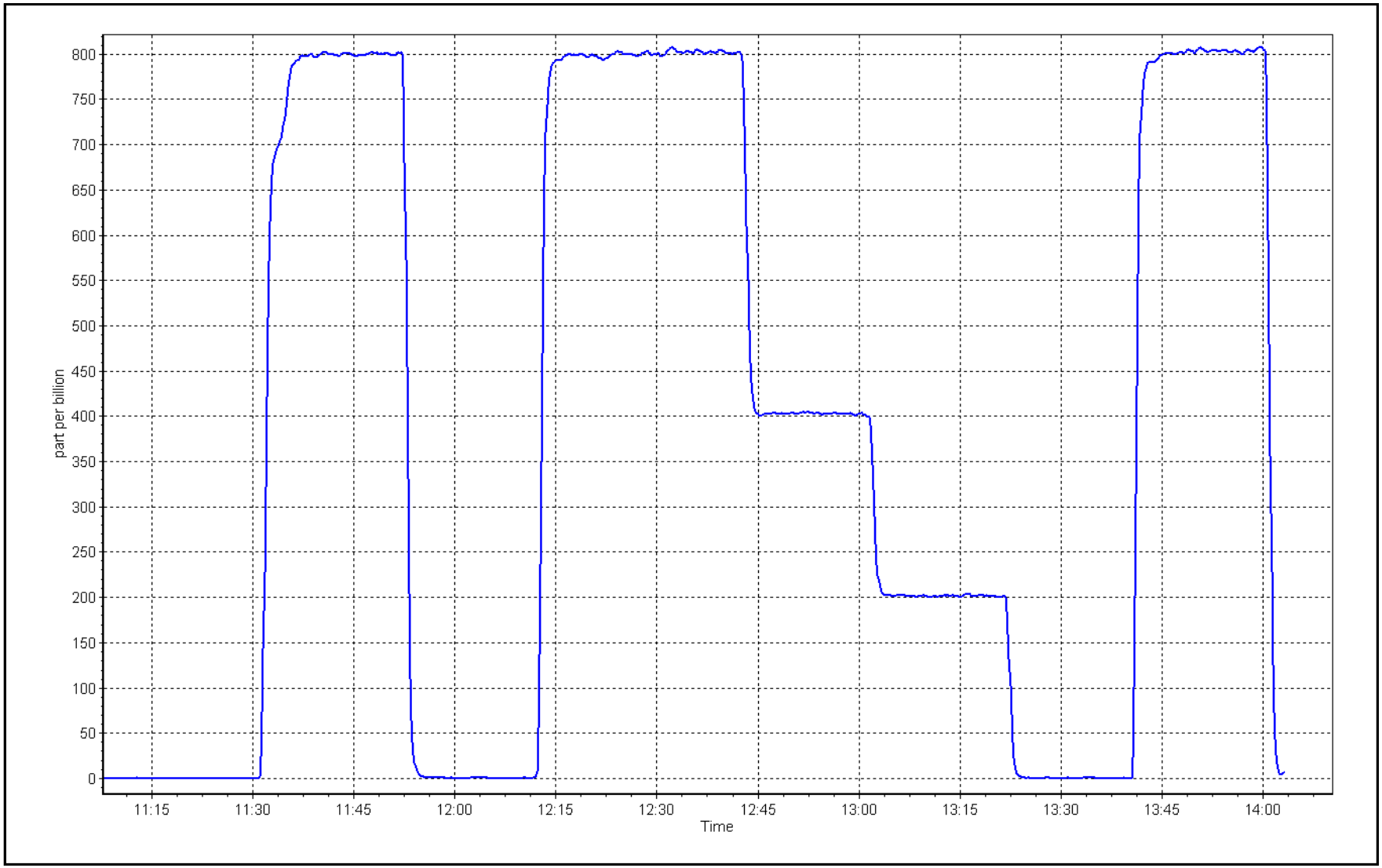
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 799.8 | 800.5 | 0.9991 |
| 399.9 | 403.4 | 0.9913 |
| 200.4 | 202.1 | 0.9918 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999983 | *≥0.995* |
| Slope | 1.000307 | *0.90 - 1.10* |
| Intercept | 1.464248 | *+/-30* |



**SO2 Calibration Plot** Date: February 23, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS22 |
| Calibration Date: | February 22, 2024 | Last Cal Date: | January 24, 2024 |
| Start time (MST): | 11:28 | End time (MST): | 15:20 |
| 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: | 4890 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | | Analyzer serial #: | 1151680031 | |
| Converter make: | CDN-101 | | Converter serial #: | 587 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.999522 | 0.996235 | Backgd or Offset: | 3.71 | 3.64 |
| Calibration intercept: | 0.500639 | 0.440650 | Coeff or Slope: | 1.205 | 1.188 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4920 | 79.7 | 80.0 | 80.7 | 0.993 |
| as found 2nd point | 4960 | 39.8 | 40.0 | 40.9 | 0.979 |
| as found 3rd point | 4980 | 19.9 | 20.0 | 20.6 | 0.975 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4920 | 79.7 | 80.0 | 80.0 | 1.000 |
| second point | 4960 | 39.8 | 40.0 | 40.5 | 0.987 |
| third point | 4980 | 19.9 | 20.0 | 20.5 | 0.975 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 79.7 | 80.0 | 80.6 | 0.993 |
| SO2 Scrubber Check | 4920 | 79.8 | 798.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.987 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.6 | Prev response: | 80.49 | *% change: | 0.1% |
| Baseline Corr 2nd AF pt: | 40.8 | AF Slope: | 1.006373 | AF Intercept: | 0.360891 |
| Baseline Corr 3rd AF pt: | 20.5 | AF Correlation: | 0.999936 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

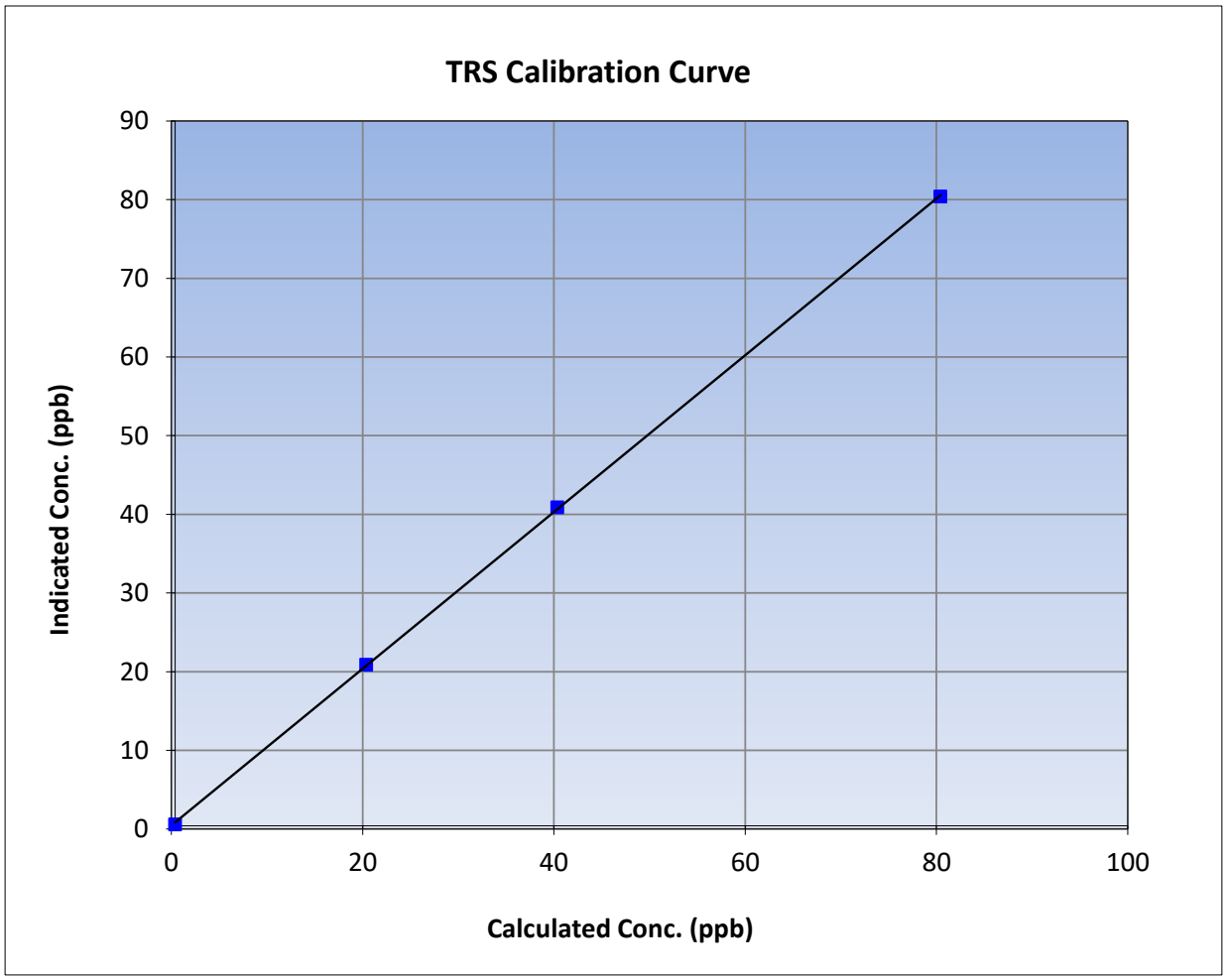
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Janvier | Station Number: | AMS22 |
| Start Time (MST): | 11:28 | End Time (MST): | 15:20 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1151680031 |

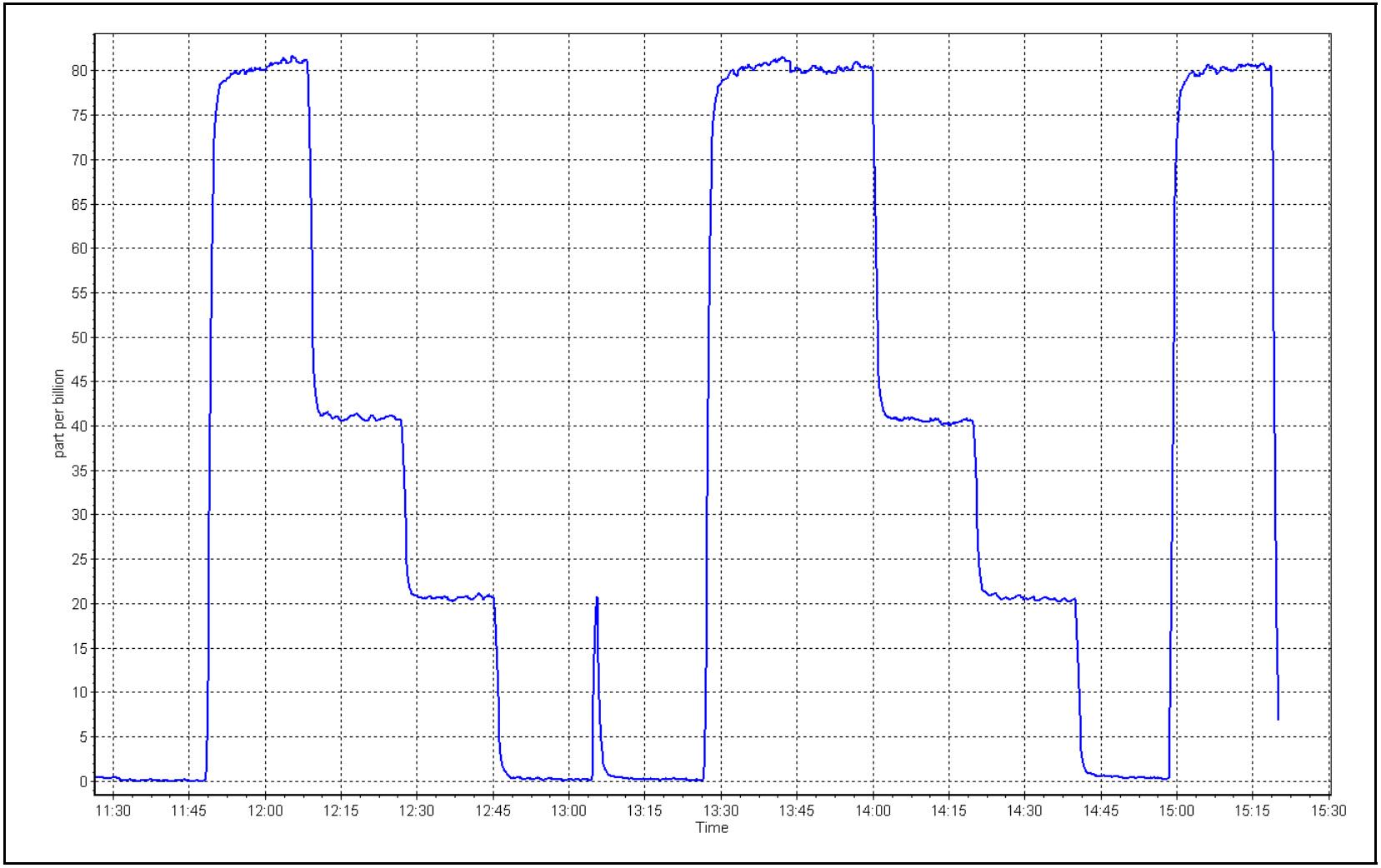
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 80.0 | 1.0003 |
| 40.0 | 40.5 | 0.9867 |
| 20.0 | 20.5 | 0.9746 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999951 | *≥0.995* |
| Slope | 0.996235 | *0.90 - 1.10* |
| Intercept | 0.440650 | *+/-3* |



**TRS Calibration Plot** Date: February 22, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | February 23, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 11:10 | End time (MST): | 14:03 |
| 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 | |
| ZAG make/model: | Teledyne API 701 | | Serial Number: | 4890 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1317958219 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.940E-04 | 3.010E-04 | NMHC SP Ratio: | 6.33E-05 | 6.46E-05 |
| CH4 Retention time: | 13.2 | 13.4 | NMHC Peak Area: | 144559 | 141681 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 17.17 | 16.97 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 17.17 | 17.19 | 0.999 |
| second point | 4960 | 39.9 | 8.59 | 8.59 | 1.000 |
| third point | 4980 | 20.0 | 4.30 | 4.30 | 1.001 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 17.17 | 17.21 | 0.998 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 16.97 | Prev response | 17.11 | *% change | -0.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 9.15 | 9.04 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 9.15 | 9.17 | 0.998 |
| second point | 4960 | 39.9 | 4.57 | 4.58 | 0.999 |
| third point | 4980 | 20.0 | 2.29 | 2.29 | 1.001 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.15 | 9.17 | 0.998 |
| | | | | Average Correction Factor | 0.999 |
| Baseline Corr AF: | 9.04 | Prev response | 9.09 | *% 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 8.03 | 7.93 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 8.03 | 8.02 | 1.000 |
| second point | 4960 | 39.9 | 4.01 | 4.01 | 1.001 |
| third point | 4980 | 20.0 | 2.01 | 2.01 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 8.03 | 8.04 | 0.998 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 7.93 | Prev response | 8.01 | *% change | -1.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.996236 | 1.001221 |
| THC Cal Offset: | 0.001413 | -0.004804 |
| CH4 Cal Slope: | 0.999459 | 0.999574 |
| CH4 Cal Offset: | -0.005759 | -0.000163 |
| NMHC Cal Slope: | 0.993433 | 1.002654 |
| NMHC Cal Offset: | 0.007572 | -0.004841 |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## THC Calibration Summary

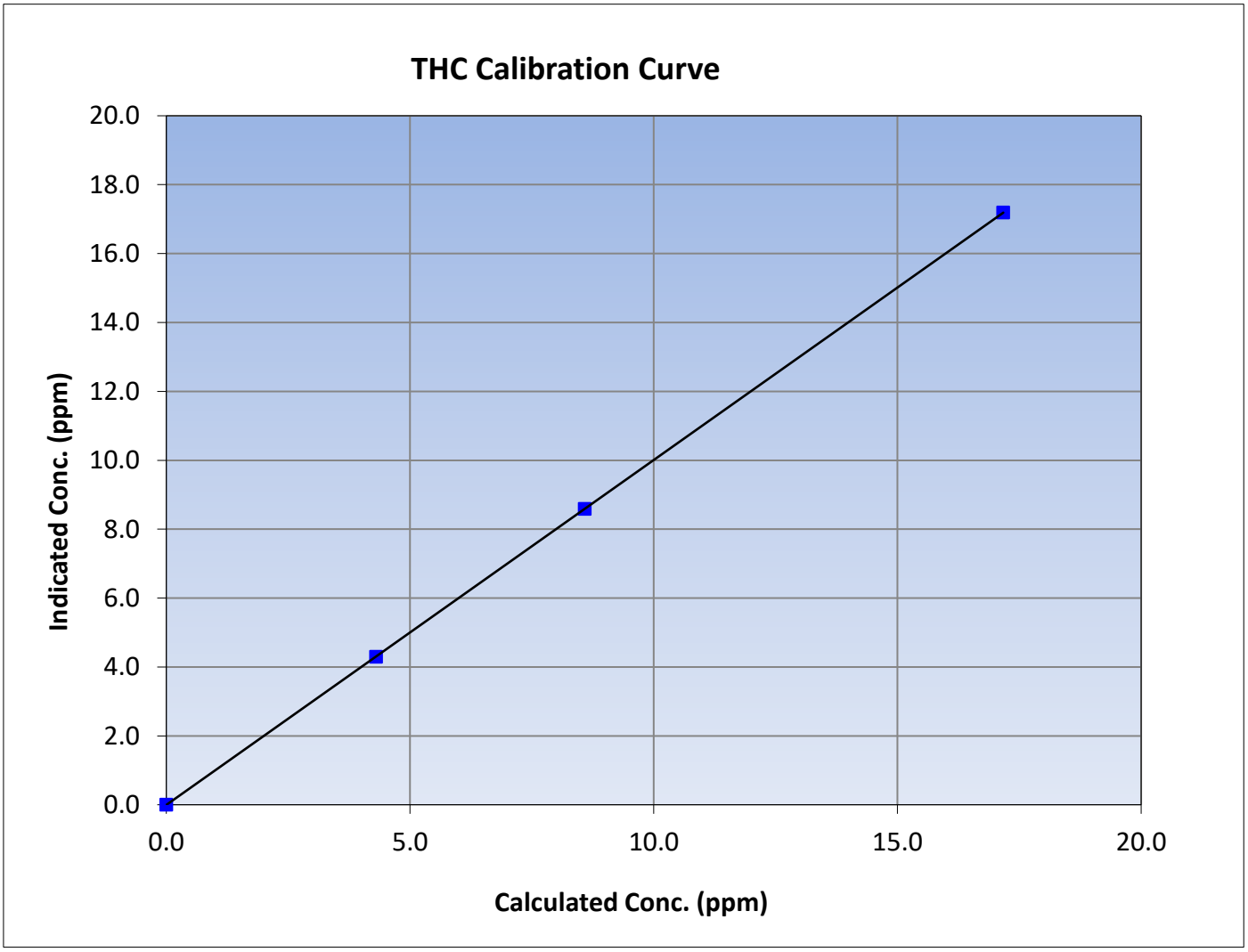
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:10 | End Time (MST): | 14:03 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 1.000000 | ≥0.995 |
| 17.17 | 17.19 | 0.9989 | | | |
| 8.59 | 8.59 | 0.9998 | Slope | 1.001221 | 0.90 - 1.10 |
| 4.30 | 4.30 | 1.0008 | | | |
| | | | Intercept | -0.004804 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

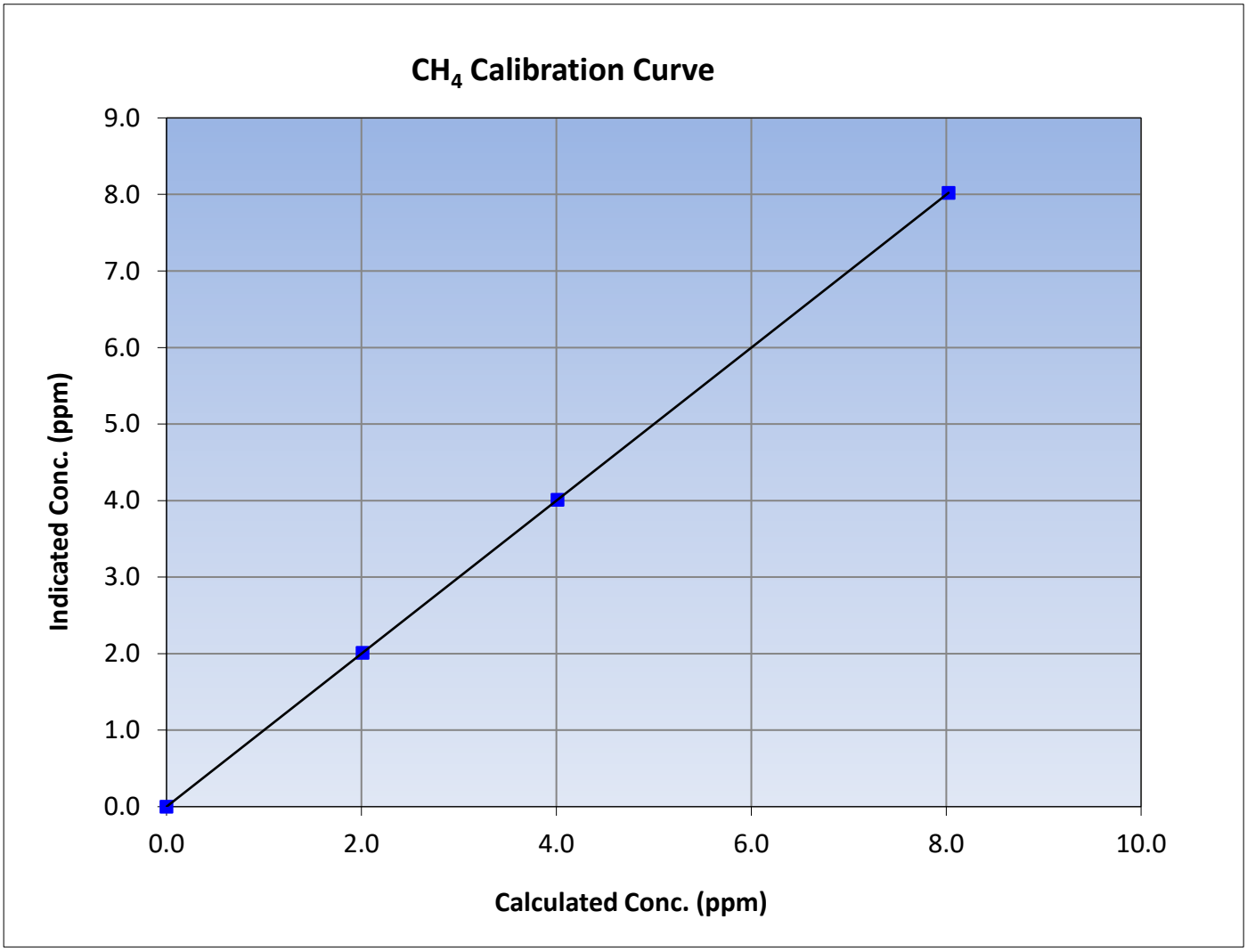
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:10 | End Time (MST): | 14:03 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 1.000000 | *≥0.995* |
| 8.03 | 8.02 | 1.0004 | | | |
| 4.01 | 4.01 | 1.0009 | Slope | 0.999574 | *0.90 - 1.10* |
| 2.01 | 2.01 | 1.0001 | | | |
| | | | Intercept | -0.000163 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

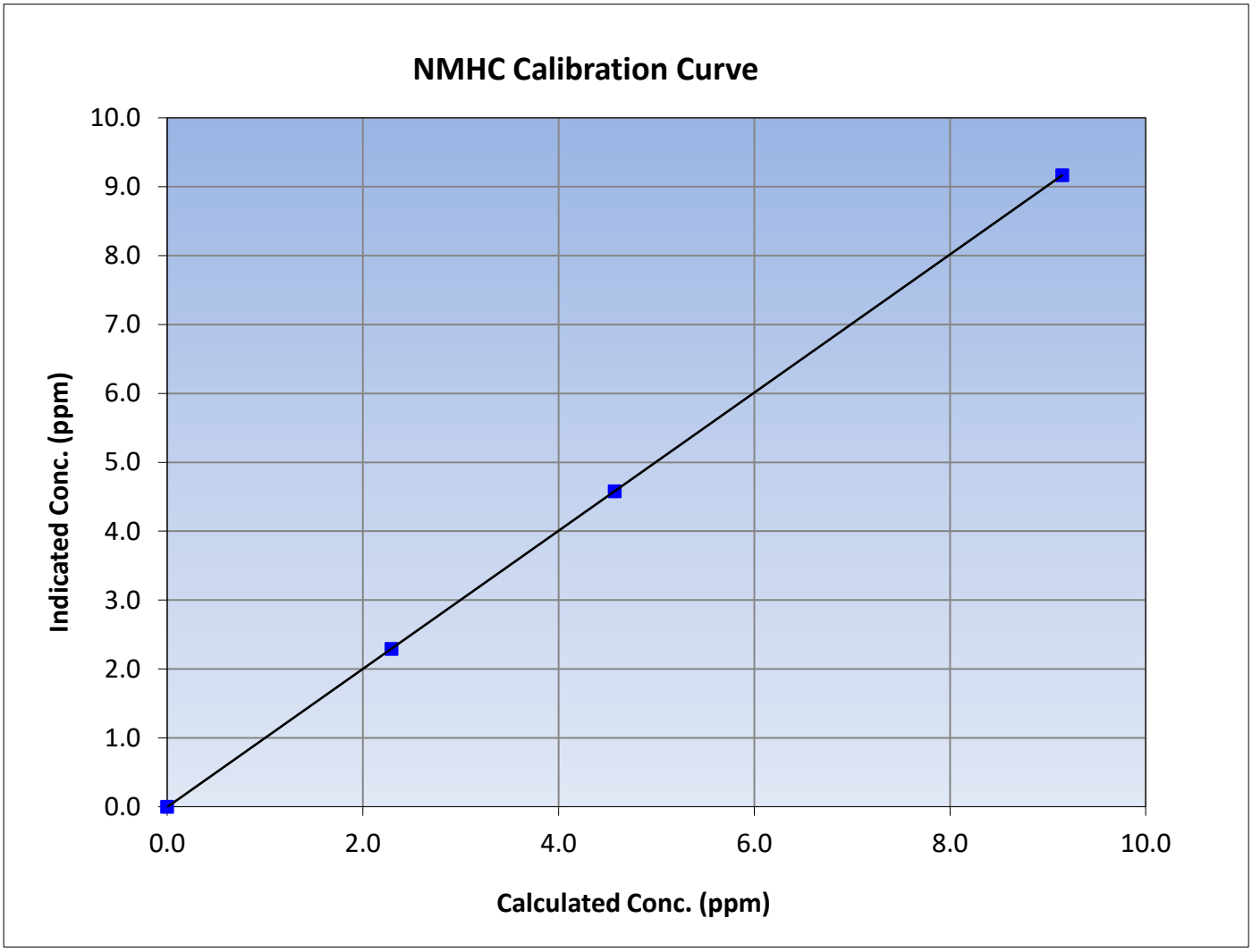
Version-06-2022

### Station Information

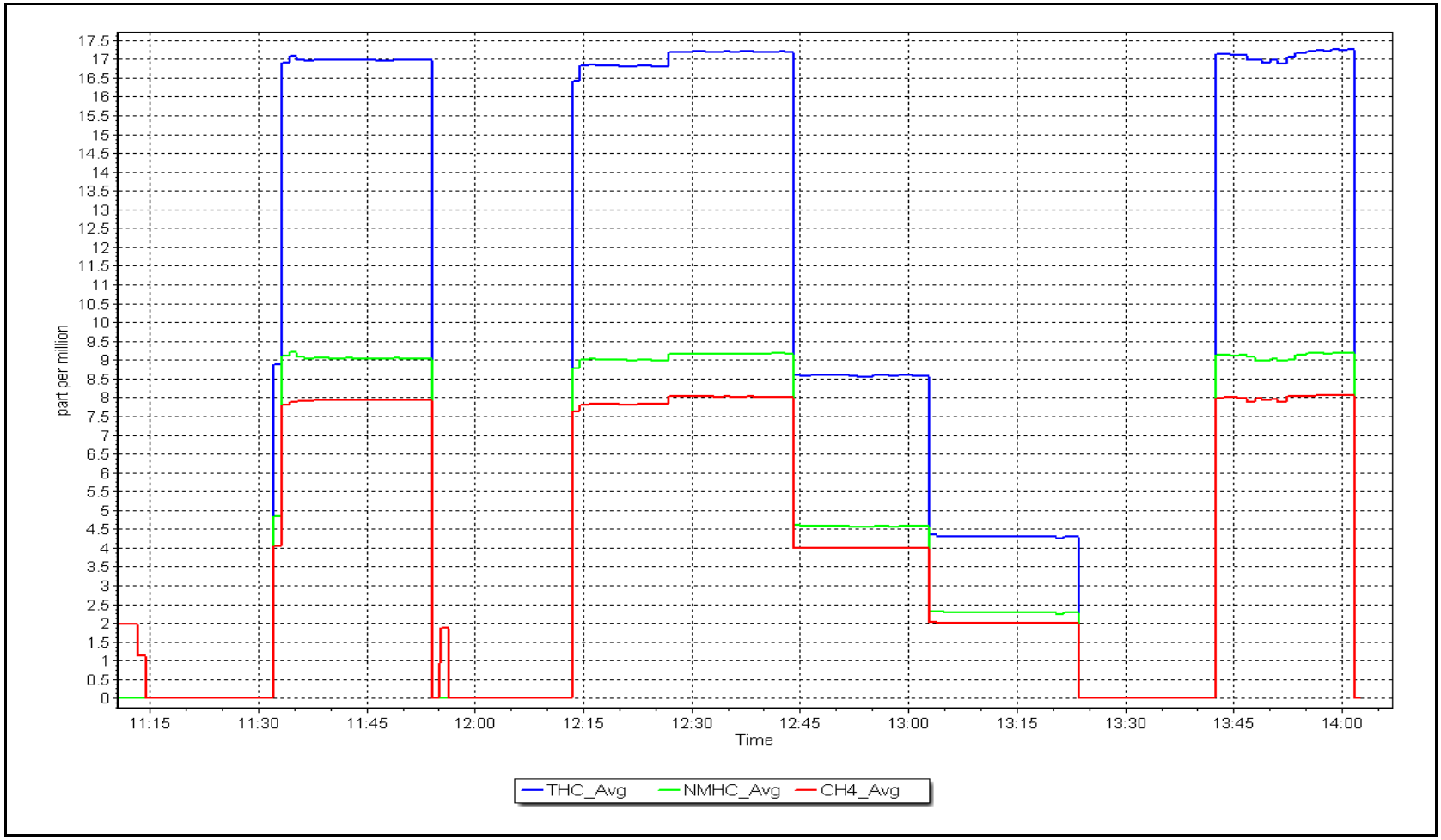
| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:10 | End Time (MST): | 14:03 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 9.15 | 9.17 | 0.9976 | | | |
| 4.57 | 4.58 | 0.9990 | Slope | 1.002654 | *0.90 - 1.10* |
| 2.29 | 2.29 | 1.0015 | | | |
| | | | Intercept | -0.004841 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 23, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | February 29, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 11:50 | End time (MST): | 15:51 |
| Reason: | Maintenance | | |

### 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 | |
| ZAG make/model: | Teledyne API 701 | | Serial Number: | 4890 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1317958219 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 3.010E-04 | 2.890E-04 | NMHC SP Ratio: | 6.46E-05 | 5.52E-05 |
| CH4 Retention time: | 13.4 | 13.1 | NMHC Peak Area: | 141681 | 165825 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 17.17 | 17.47 | 0.983 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 17.17 | 17.17 | 1.000 |
| second point | 4960 | 39.9 | 8.59 | 8.59 | 1.000 |
| third point | 4980 | 20.0 | 4.30 | 4.32 | 0.996 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 17.17 | 17.18 | 0.999 |
| | | | | Average Correction Factor | 0.999 |
| Baseline Corr AF: | 17.47 | Prev response | 17.19 | *% change | 1.6% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 9.15 | 9.34 | 0.979 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 9.15 | 9.14 | 1.000 |
| second point | 4960 | 39.9 | 4.57 | 4.58 | 1.000 |
| third point | 4980 | 20.0 | 2.29 | 2.31 | 0.995 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.15 | 9.17 | 0.998 |
| | | | | Average Correction Factor | 0.998 |
| Baseline Corr AF: | 9.34 | Prev response | 9.17 | *% change | 1.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 79.8 | 8.03 | 8.13 | 0.987 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 8.03 | 8.02 | 1.000 |
| second point | 4960 | 39.9 | 4.01 | 4.01 | 1.001 |
| third point | 4980 | 20.0 | 2.01 | 2.02 | 0.998 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 8.03 | 8.01 | 1.001 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 8.13 | Prev response | 8.02 | *% change | 1.4% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.001221 | 0.999432 |
| THC Cal Offset: | -0.004804 | 0.007396 |
| CH4 Cal Slope: | 0.999574 | 0.999247 |
| CH4 Cal Offset: | -0.000163 | 0.002236 |
| NMHC Cal Slope: | 1.002654 | 0.999206 |
| NMHC Cal Offset: | -0.004841 | 0.005960 |

Notes: Adjusted the window timings. Adjusted the span.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## THC Calibration Summary

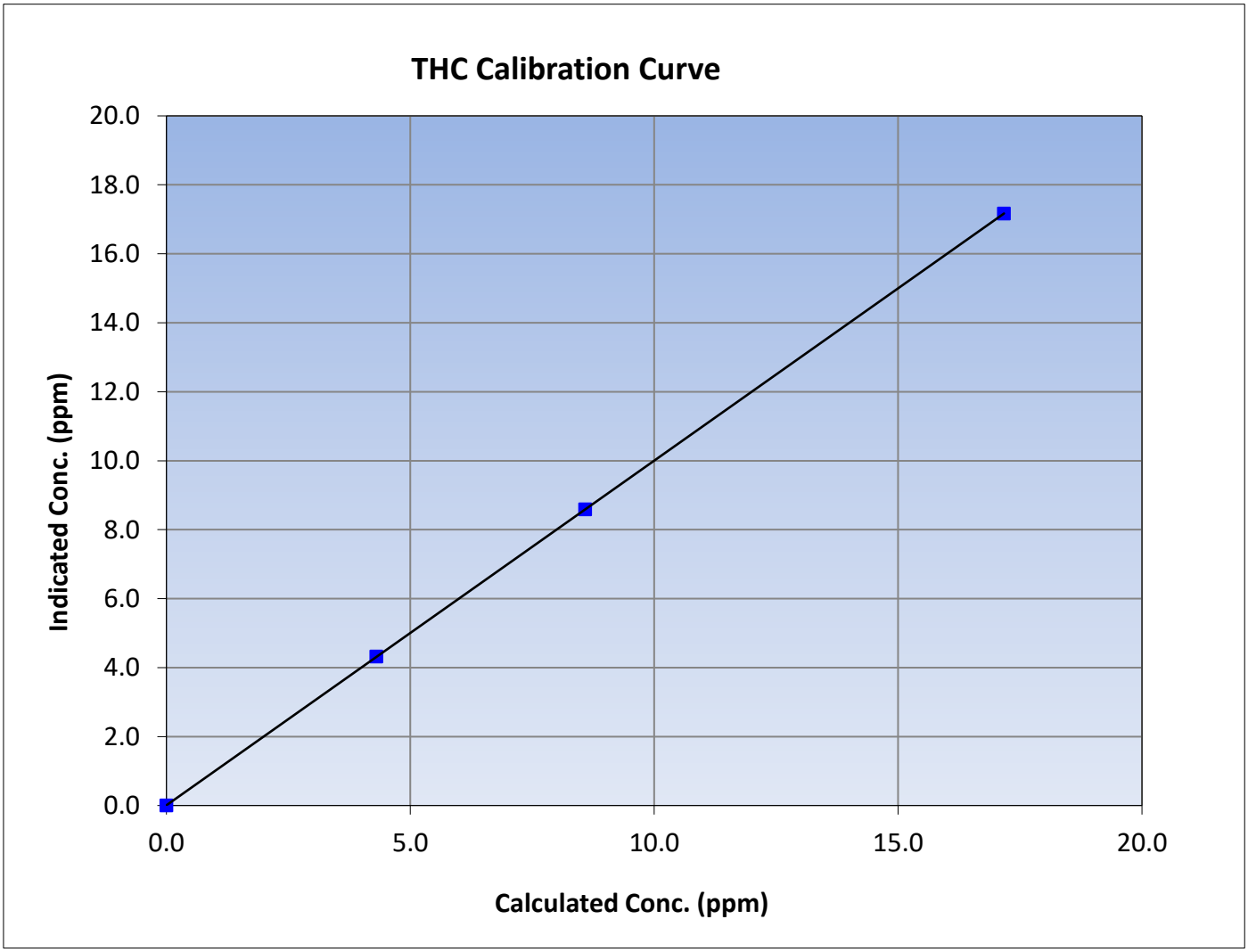
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 29, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:50 | End Time (MST): | 15:51 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 17.17 | 17.17 | 1.0002 | | | |
| 8.59 | 8.59 | 1.0000 | Slope | 0.999432 | *0.90 - 1.10* |
| 4.30 | 4.32 | 0.9962 | | | |
| | | | Intercept | 0.007396 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

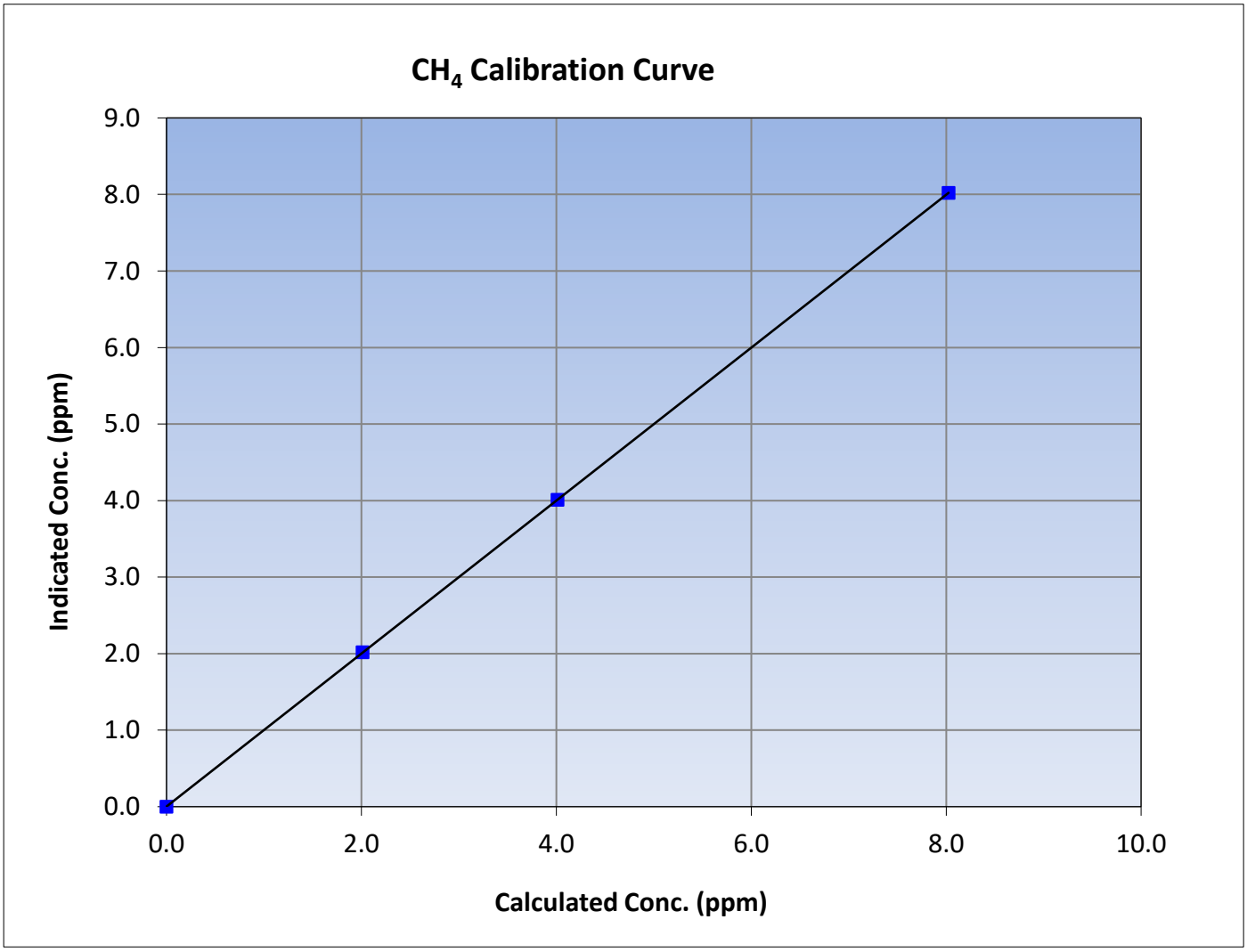
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 29, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:50 | End Time (MST): | 15:51 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 8.03 | 8.02 | 1.0005 | | | |
| 4.01 | 4.01 | 1.0006 | Slope | 0.999247 | *0.90 - 1.10* |
| 2.01 | 2.02 | 0.9976 | | | |
| | | | Intercept | 0.002236 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

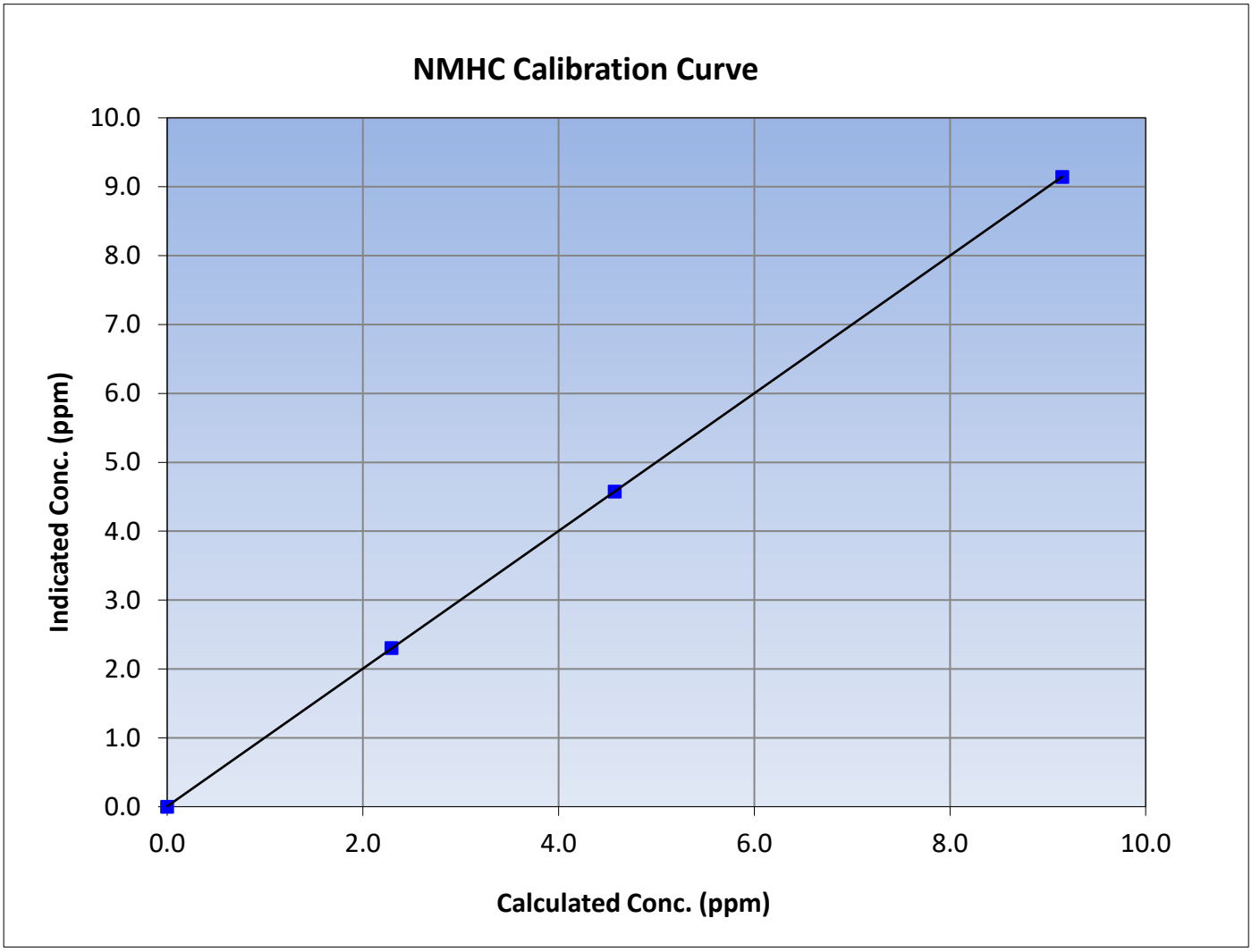
Version-06-2022

### Station Information

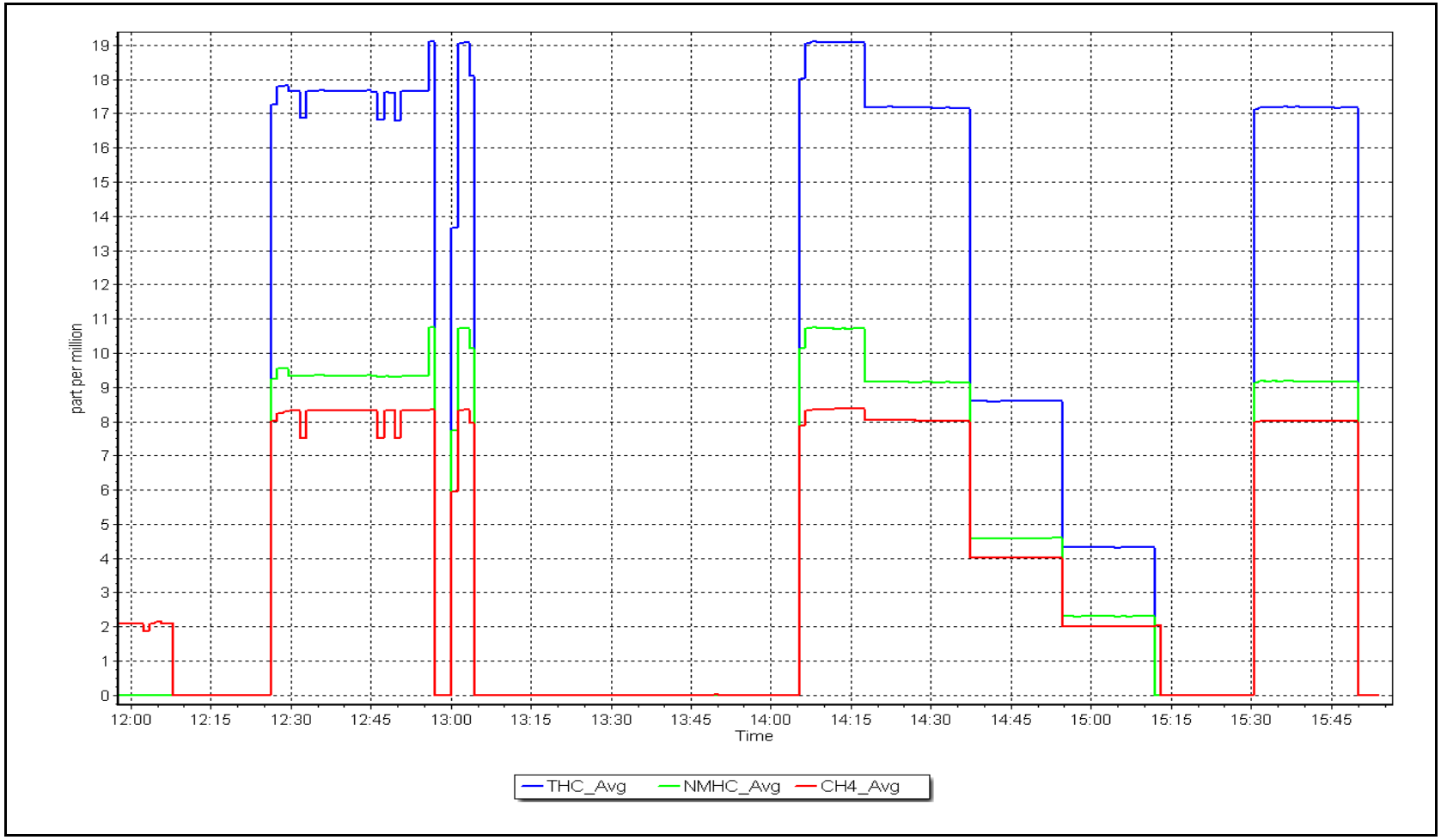
| | | | |
|---|---|---|---|
| Calibration Date: | February 29, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:50 | End Time (MST): | 15:51 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 9.15 | 9.14 | 1.0003 | | | |
| 4.57 | 4.58 | 0.9997 | Slope | 0.999206 | *0.90 - 1.10* |
| 2.29 | 2.31 | 0.9945 | | | |
| | | | Intercept | 0.005960 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 29, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | February 28, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 10:38 | End time (MST): | 15:00 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | DT0047765 | | Cal Gas Expiry Date: | March 11, 2031 | |
| NOX Cal Gas Conc: | 48.90 | ppm | NO Cal Gas Conc: | 48.80 | ppm |
| Removed Cylinder #: | | | Removed Gas Exp Date: | | |
| Removed Gas NOX Conc: | 48.90 | ppm | Removed Gas NO Conc: | 48.80 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 3806 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 691 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 833 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 0.854 | 0.840 | NO bkgnd or offset: | 0.0 | 0.0 |
| NOX coeff or slope: | 0.849 | 0.835 | NOX bkgnd or offset: | -0.2 | -0.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 6.1 | 6.2 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000095 | 1.000594 |
| $NO_X$ Cal Offset: | 1.384206 | 0.484102 |
| NO Cal Slope: | 1.000674 | 0.999460 |
| NO Cal Offset: | 0.024014 | -0.576026 |
| $NO_2$ Cal Slope: | 1.008342 | 1.004914 |
| $NO_2$ Cal Offset: | 1.498437 | 0.223696 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | 0.3 | ---- | ---- |
| as found span | 4918 | 82.0 | 802.0 | 800.3 | 1.6 | 813.9 | 804.1 | 9.9 | 0.9853 | 0.9953 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | -0.1 | 0.3 | ---- | ---- |
| high point | 4918 | 82.0 | 802.0 | 800.3 | 1.6 | 802.7 | 799.5 | 3.1 | 0.9991 | 1.0010 |
| second point | 4960 | 41.0 | 400.9 | 400.1 | 0.8 | 402.0 | 399.2 | 2.8 | 0.9973 | 1.0022 |
| third point | 4980 | 20.5 | 200.5 | 200.1 | 0.4 | 201.2 | 198.8 | 2.4 | 0.9964 | 1.0063 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.2 | 0.4 | ---- | ---- |
| as left span | 4918 | 82.0 | 802.0 | 408.6 | 393.3 | 797.4 | 405.5 | 391.9 | 1.0057 | 1.0077 |
| | | | | | | | | Average Correction Factor | 0.9976 | 1.0032 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 813.9 ppb | NO = 804.5 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.3% |
| Previous Response | $NO_X$ = 803.4 ppb | NO = 800.9 ppb | | *Percent Change | NO = | 0.4% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 795.5 | 403.8 | 393.3 | 395.4 | 0.9948 | 100.5% |
| 2nd GPT point (200 ppb O3) | 795.5 | 601.3 | 195.8 | 197.4 | 0.9921 | 100.8% |
| 3rd GPT point (100 ppb O3) | 795.5 | 697.4 | 99.7 | 100.1 | 0.9964 | 100.4% |
| | | | | Average Correction Factor | 0.9944 | 100.6% |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

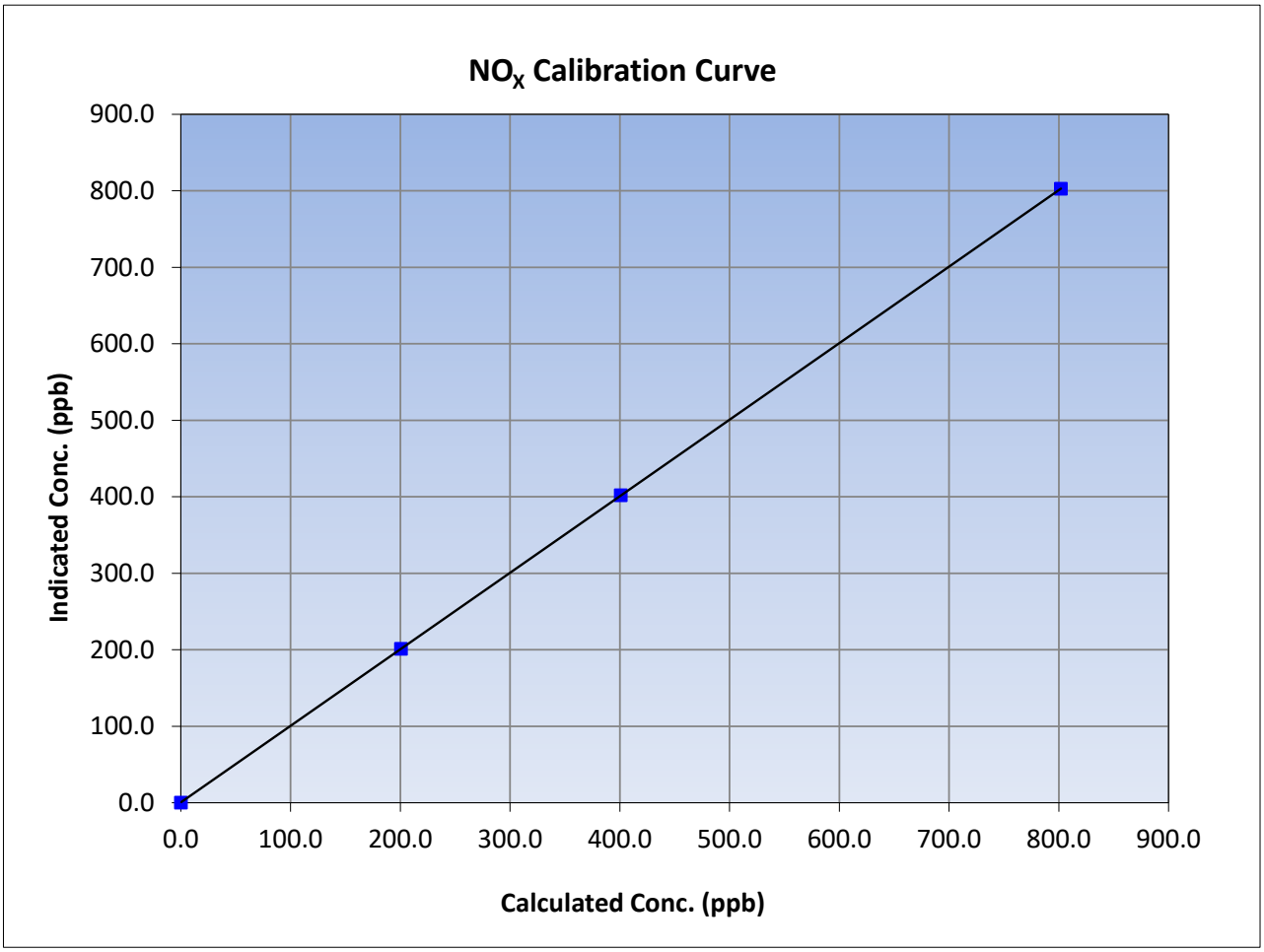
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 28, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:38 | End Time (MST): | 15:00 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 833 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.2 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 802.0 | 802.7 | 0.9991 | | | |
| 400.9 | 402.0 | 0.9973 | Slope | 1.000594 | *0.90 - 1.10* |
| 200.5 | 201.2 | 0.9964 | | | |
| | | | Intercept | 0.484102 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

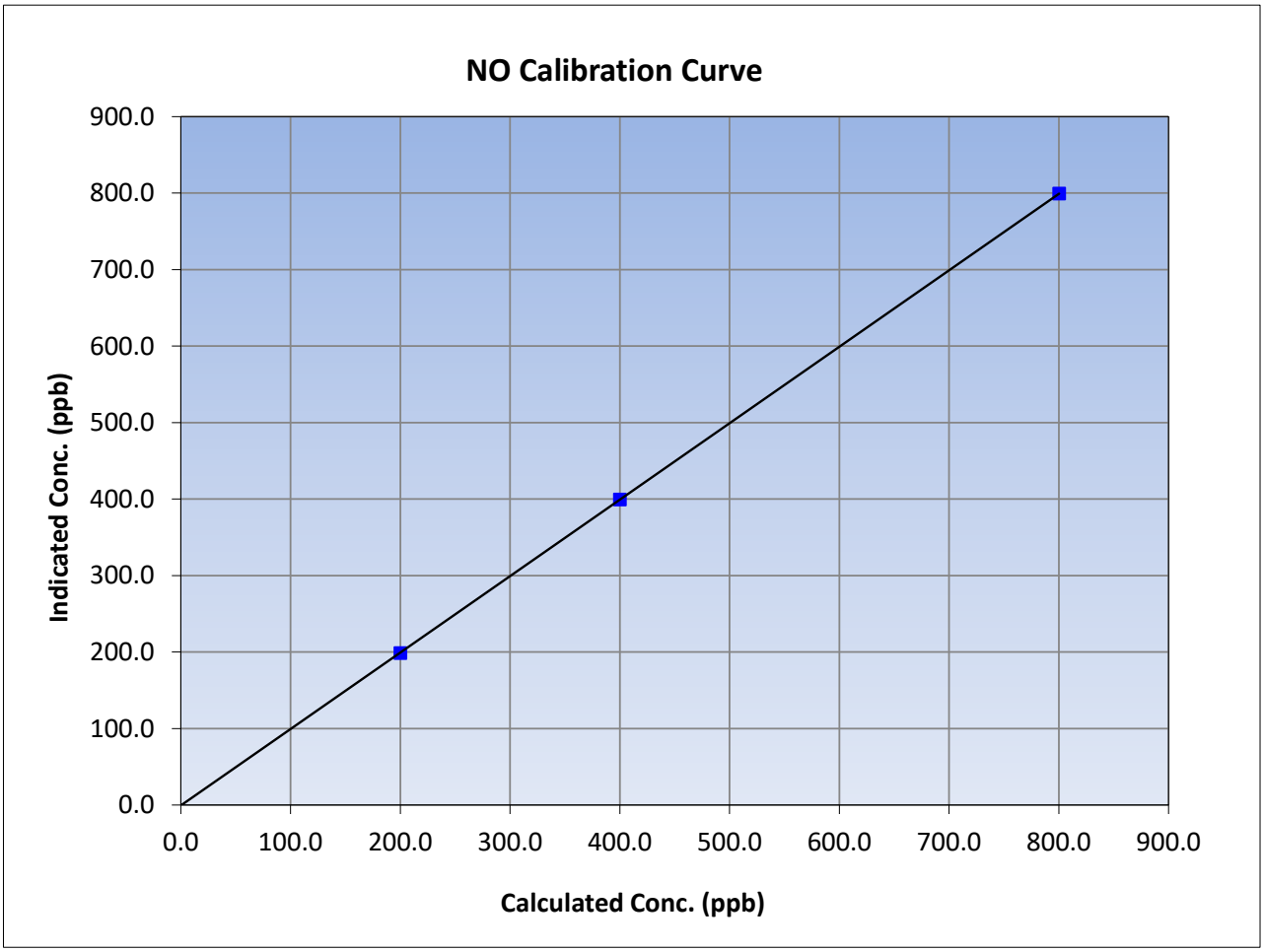
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 28, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:38 | End Time (MST): | 15:00 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 833 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 800.3 | 799.5 | 1.0010 | | | |
| 400.1 | 399.2 | 1.0022 | Slope | 0.999460 | *0.90 - 1.10* |
| 200.1 | 198.8 | 1.0063 | | | |
| | | | Intercept | -0.576026 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

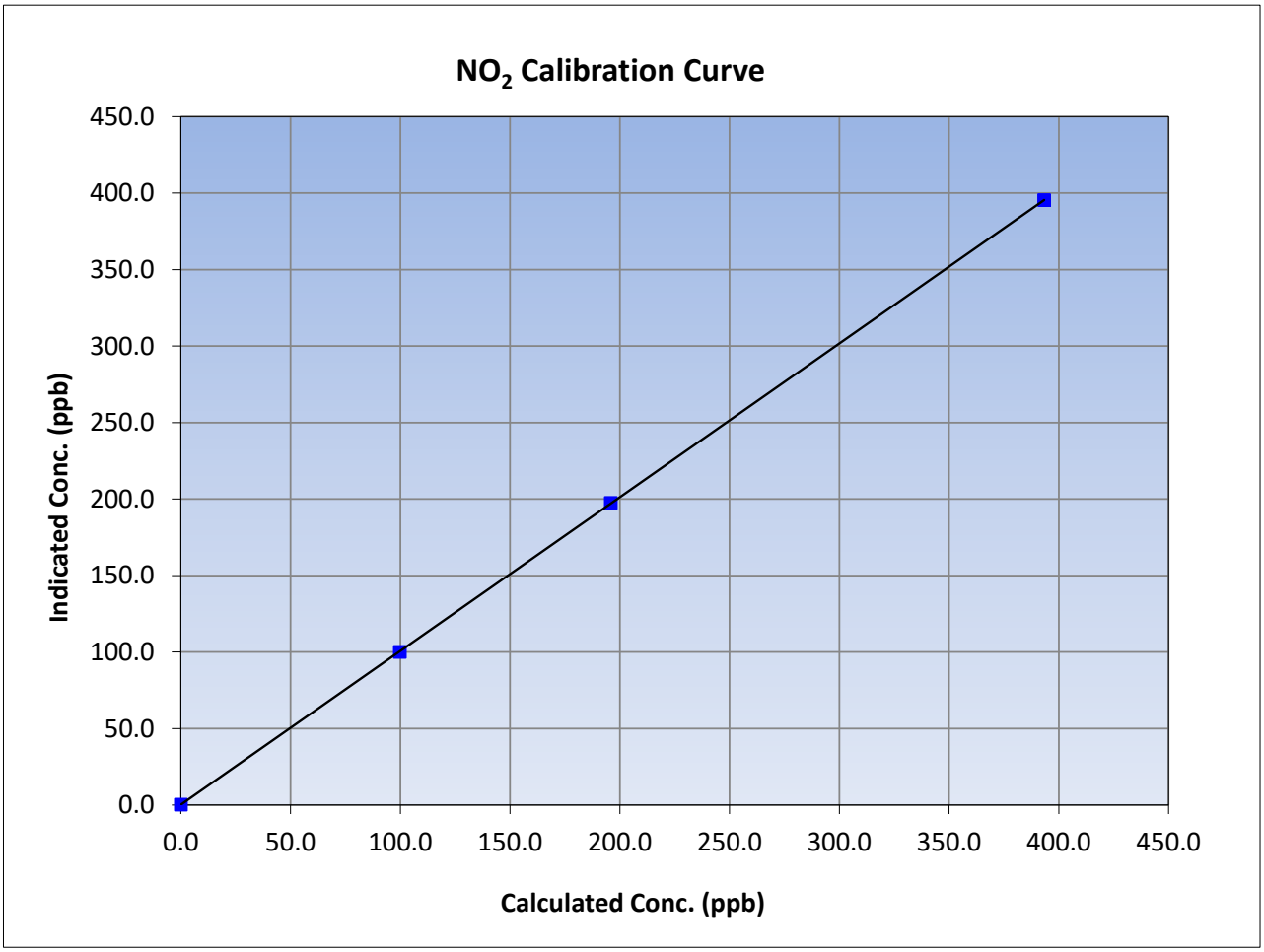
Version-04-2020

### Station Information

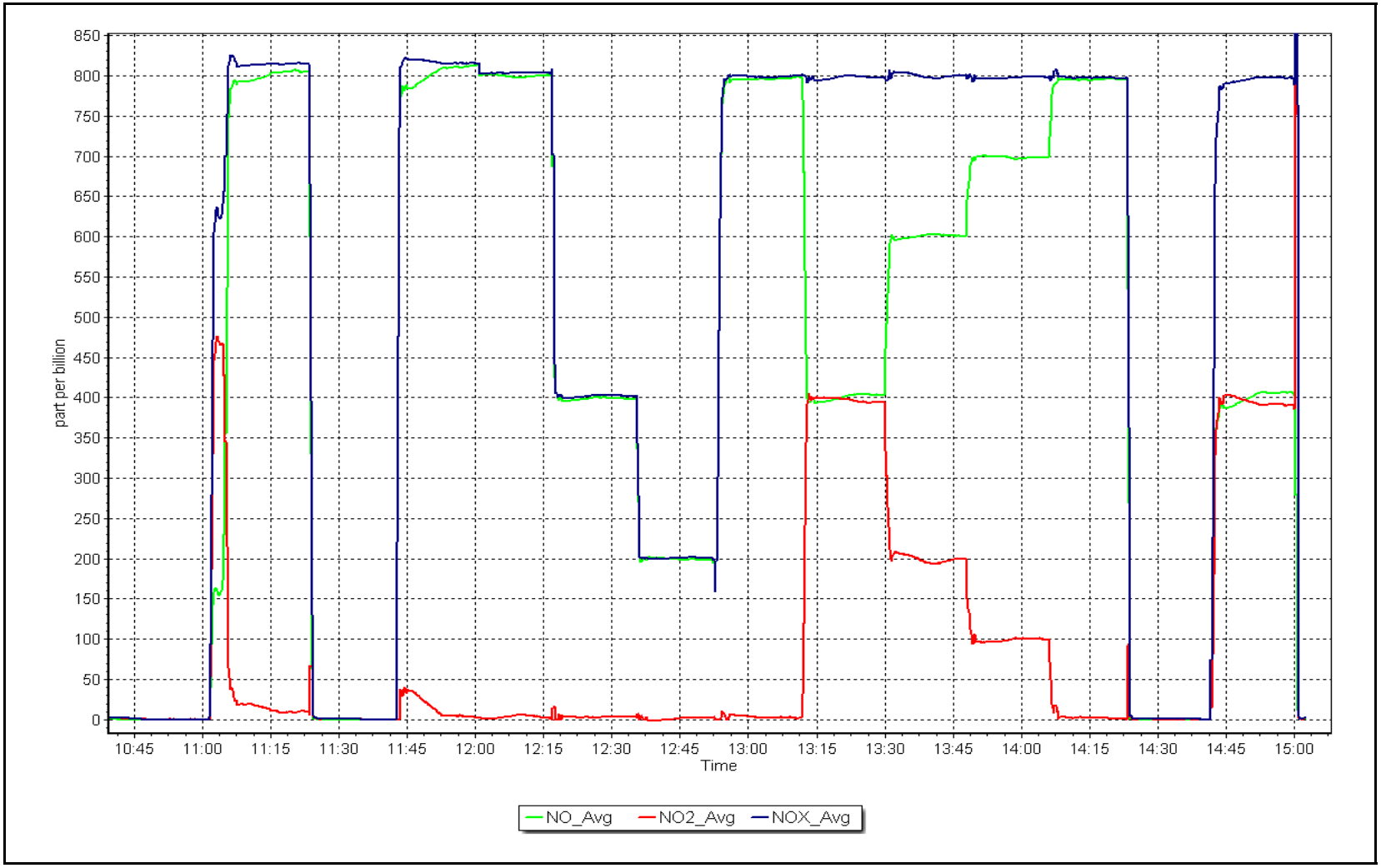
| | | | |
|---|---|---|---|
| Calibration Date: | February 28, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:38 | End Time (MST): | 15:00 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 833 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.3 | ---- | Correlation Coefficient | 0.999997 | *≥0.995* |
| 393.3 | 395.4 | 0.9948 | | | |
| 195.8 | 197.4 | 0.9921 | Slope | 1.004914 | *0.90 - 1.10* |
| 99.7 | 100.1 | 0.9964 | | | |
| | | | Intercept | 0.223696 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 28, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | February 20, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 11:23 | End time (MST): | 14:46 |
| Reason: | Routine | | |

### Calibration Standards

| | | | |
|---|---|---|---|
| O3 generation mode: | Photometer | | |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number: | 3806 |
| ZAG Make/Model: | Teledyne API T701H | Serial Number: | 691 |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 7046 |
| Analyzer Range | 0 - 500 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.005200 | 1.003229 | Backgd or Offset: | -0.2 | 2.2 |
| Calibration intercept: | 0.740000 | 0.560000 | Coeff or Slope: | 1.021 | 1.027 |

### $O_3$ Calibration Data

| Set Point | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 800.0 | 0.0 | 0.4 | ---- |
| as found span | 4895 | 905.3 | 400.0 | 401.0 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 800.0 | 0.0 | 0.2 | ---- |
| high point | 4895 | 905.3 | 400.0 | 401.7 | 0.996 |
| second point | 4895 | 756.7 | 200.0 | 201.3 | 0.994 |
| third point | 4895 | 656.1 | 100.0 | 101.3 | 0.987 |
| as left zero | 5000 | 800.0 | 0.0 | 0.4 | ---- |
| as left span | 4895 | 904.3 | 400.0 | 404.7 | 0.988 |
| | | | | Average Correction Factor | 0.992 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 400.6 | Previous response | 402.8 | *% 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

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

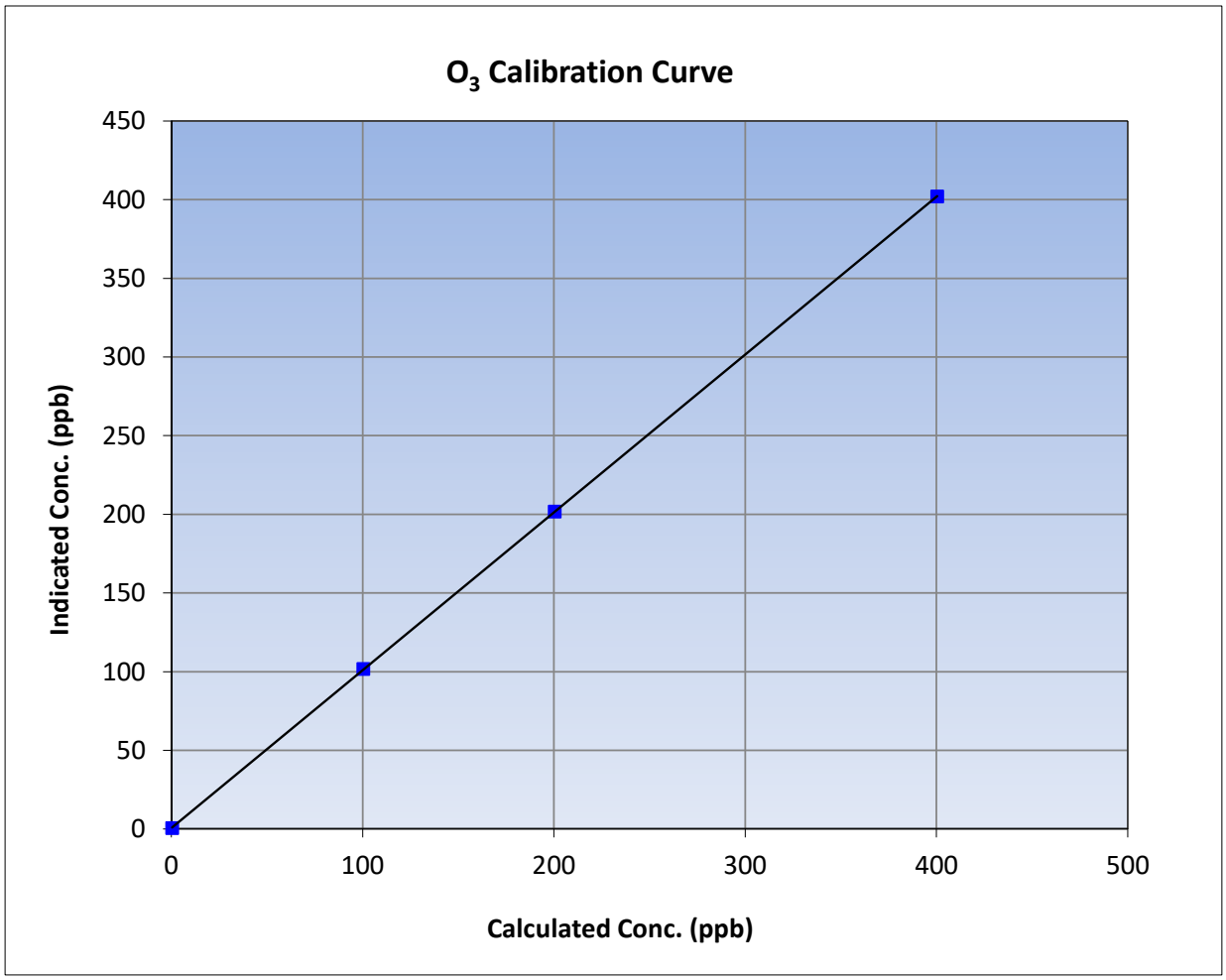
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 20, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 11:23 | End Time (MST): | 14:46 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 7046 |

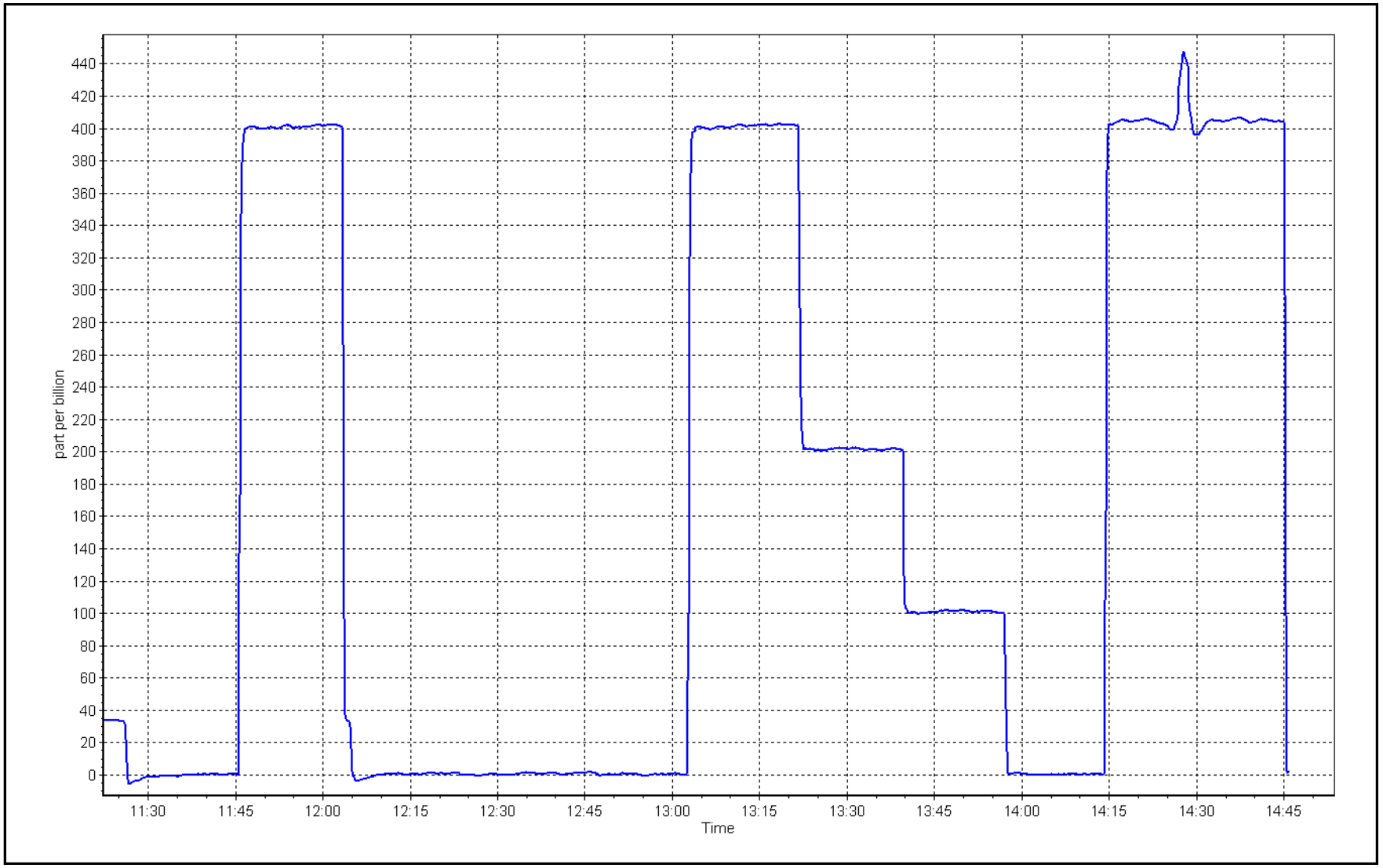
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 400.0 | 401.7 | 0.9958 |
| 200.0 | 201.3 | 0.9935 |
| 100.0 | 101.3 | 0.9872 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999996 | ≥0.995 |
| Slope | 1.003229 | 0.90 - 1.10 |
| Intercept | 0.560000 | +/- 5 |



**$O_3$ Calibration Plot** Date: February 20, 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: | February 28, 2024 | Last Cal Date: | January 31, 2024 |
| Start time (MST): | 11:01 | End time (MST): | 12:29 |
| 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) | -14.9 | -15.5 | -14.9 | ☐ | +/- 2 °C |
| P (mmHg) | 713.3 | 714.4 | 713.3 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.99 | 5.106 | 4.99 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 42 | ----- | 42 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 3.4 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

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

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

Date Optical Chamber Cleaned: January 24, 2024

Date Disposable Filter Changed: January 24, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: July 26, 2023

Date RH/T Sensor Cleaned: July 26, 2023

Notes: Verified flow, temperature, and pressure. Leak check passed.

Calibration by: Rene Chamberland

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS23
## FORT HILLS

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Hills | Station number: | AMS23 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 9:17 | End time (MST): | 12:05 |
| 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: | N/A |
| Removed Gas Cyl #: | N/A | | 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 — Analyzer serial #: 1160290012

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999893 | 1.000522 | Backgd or Offset: | 18.5 | 18.5 |
| Calibration intercept: | -0.983326 | -0.903438 | Coeff or Slope: | 1.063 | 1.063 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| as found span | 4920 | 80.3 | 799.1 | 797.7 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| high point | 4920 | 80.3 | 799.1 | 799.1 | 1.000 |
| second point | 4960 | 40.2 | 400.1 | 398.7 | 1.003 |
| third point | 4980 | 20.1 | 200.0 | 198.6 | 1.007 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4920 | 80.3 | 799.1 | 800.7 | 0.998 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 798.00 | Previous response | 798.03 | *% 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

Notes: No Adjustments and Maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

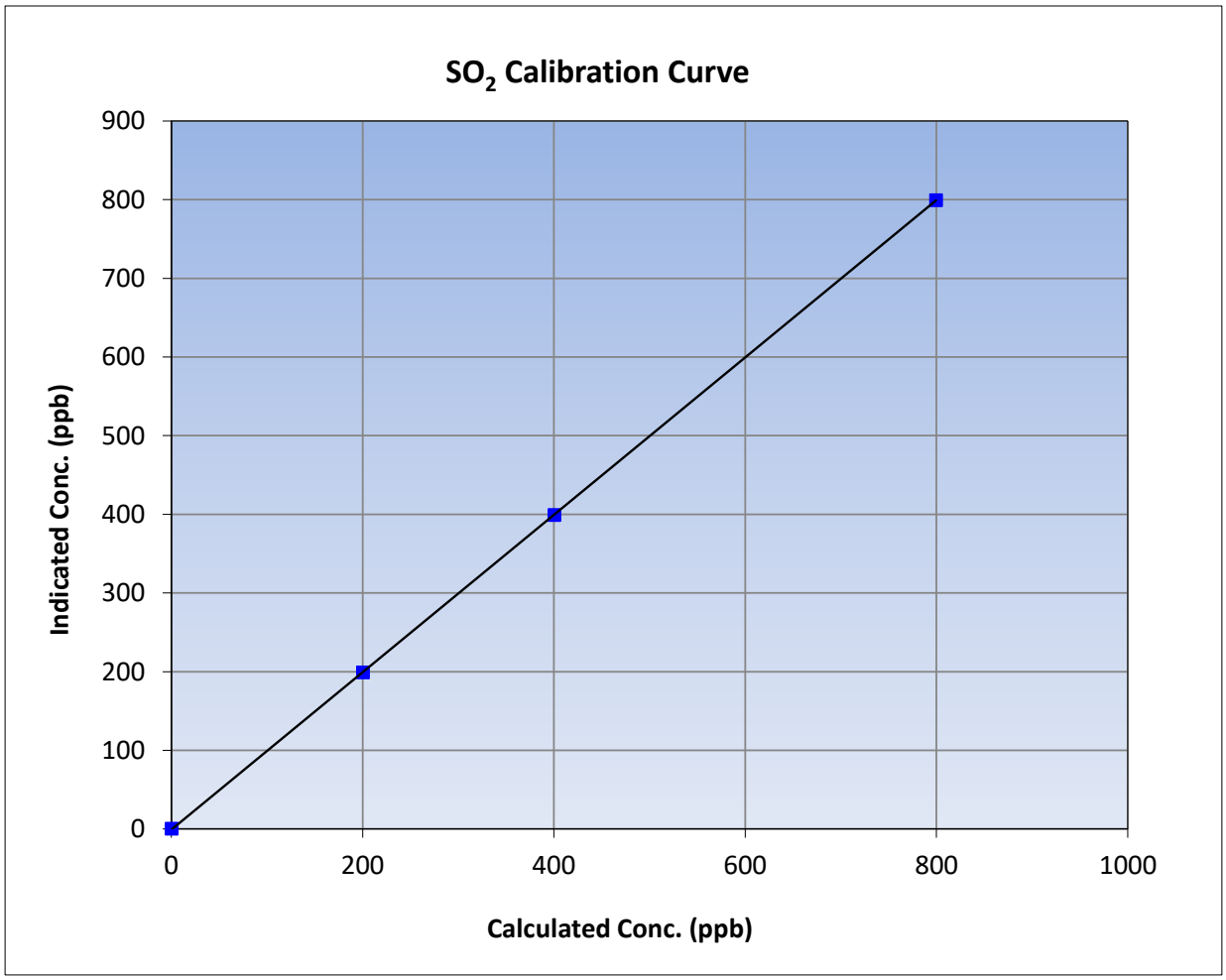
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 9:17 | End Time (MST): | 12:05 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1160290012 |

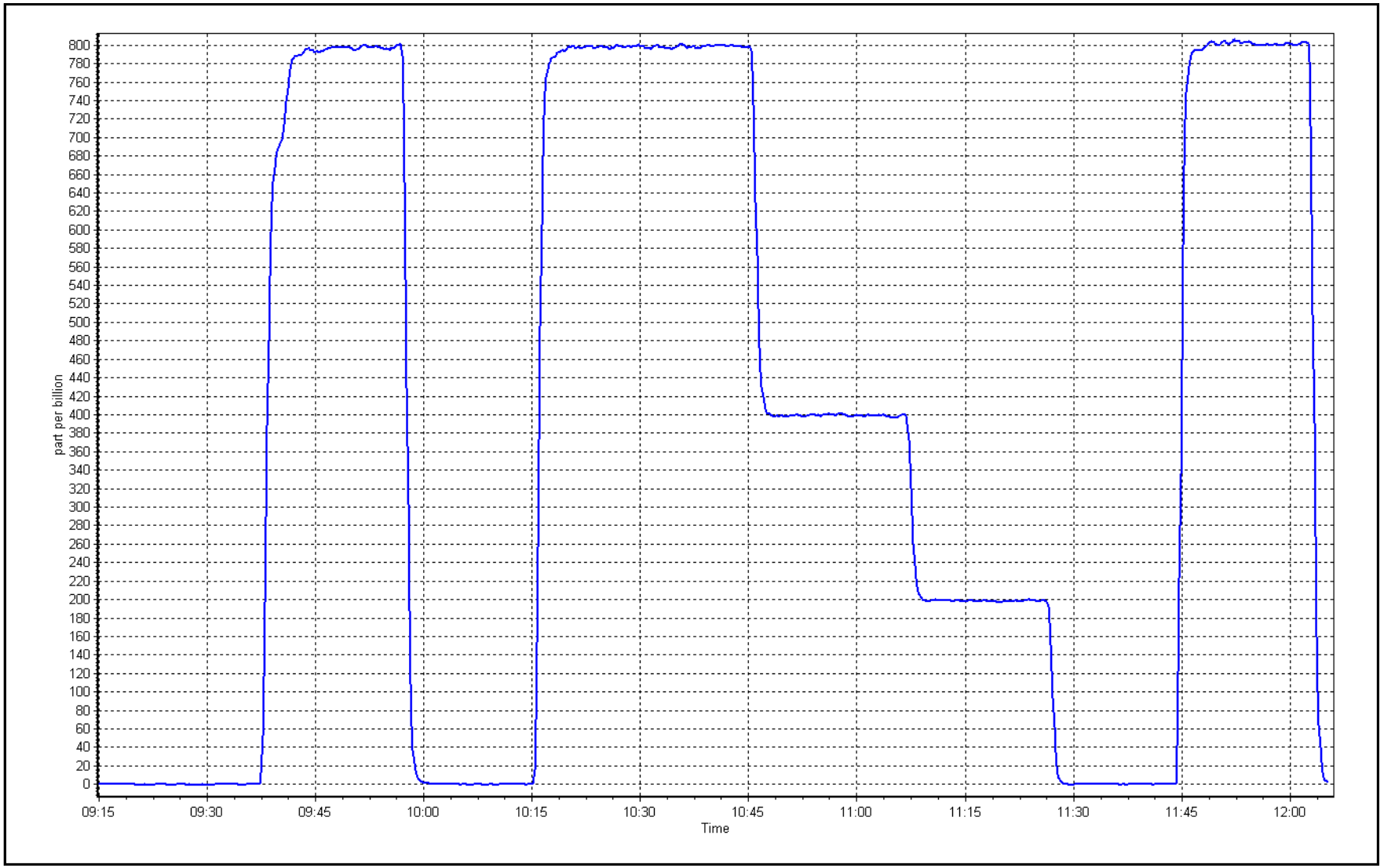
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.1 | ---- |
| 799.1 | 799.1 | 1.0000 |
| 400.1 | 398.7 | 1.0034 |
| 200.0 | 198.6 | 1.0072 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999995 | *≥0.995* |
| Slope | 1.000522 | *0.90 - 1.10* |
| Intercept | -0.903438 | *+/-30* |



**SO2 Calibration Plot** Date: February 7, 2024 Location: Fort Hills



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Hills | Station number: | AMS23 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 9, 2024 |
| Start time (MST): | 7:50 | End time (MST): | 11:40 |
| 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: | N/A |
| Removed Gas Cyl #: | N/A | | 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.995462 | 1.010172 | Backgd or Offset: | 1.19 | 1.96 |
| Calibration intercept: | -0.178345 | -0.218012 | Coeff or Slope: | 1.124 | 1.160 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4923 | 77.0 | 80.0 | 76.3 | 1.049 |
| as found 2nd point | 4962 | 38.5 | 40.0 | 38.2 | 1.047 |
| as found 3rd point | 4981 | 19.2 | 19.9 | 19.1 | 1.044 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4923 | 77.0 | 80.0 | 80.8 | 0.990 |
| second point | 4962 | 38.5 | 40.0 | 39.9 | 1.002 |
| third point | 4981 | 19.2 | 19.9 | 19.7 | 1.013 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4923 | 77.0 | 80.0 | 81.3 | 0.984 |
| SO2 Scrubber Check | 4920 | 80.3 | 803.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.002 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 76.3 | Prev response: | 79.46 | *% change: | -4.1% |
| Baseline Corr 2nd AF pt: | 38.2 | AF Slope: | 0.953468 | AF Intercept: | 0.040902 |
| Baseline Corr 3rd AF pt: | 19.1 | AF Correlation: | 0.999999 | | |

* = > +/-5% change initiates investigation

Notes: SOx scrubber checked after the third point. Span adjusted. Dianogsitcs similar to last months calibration.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

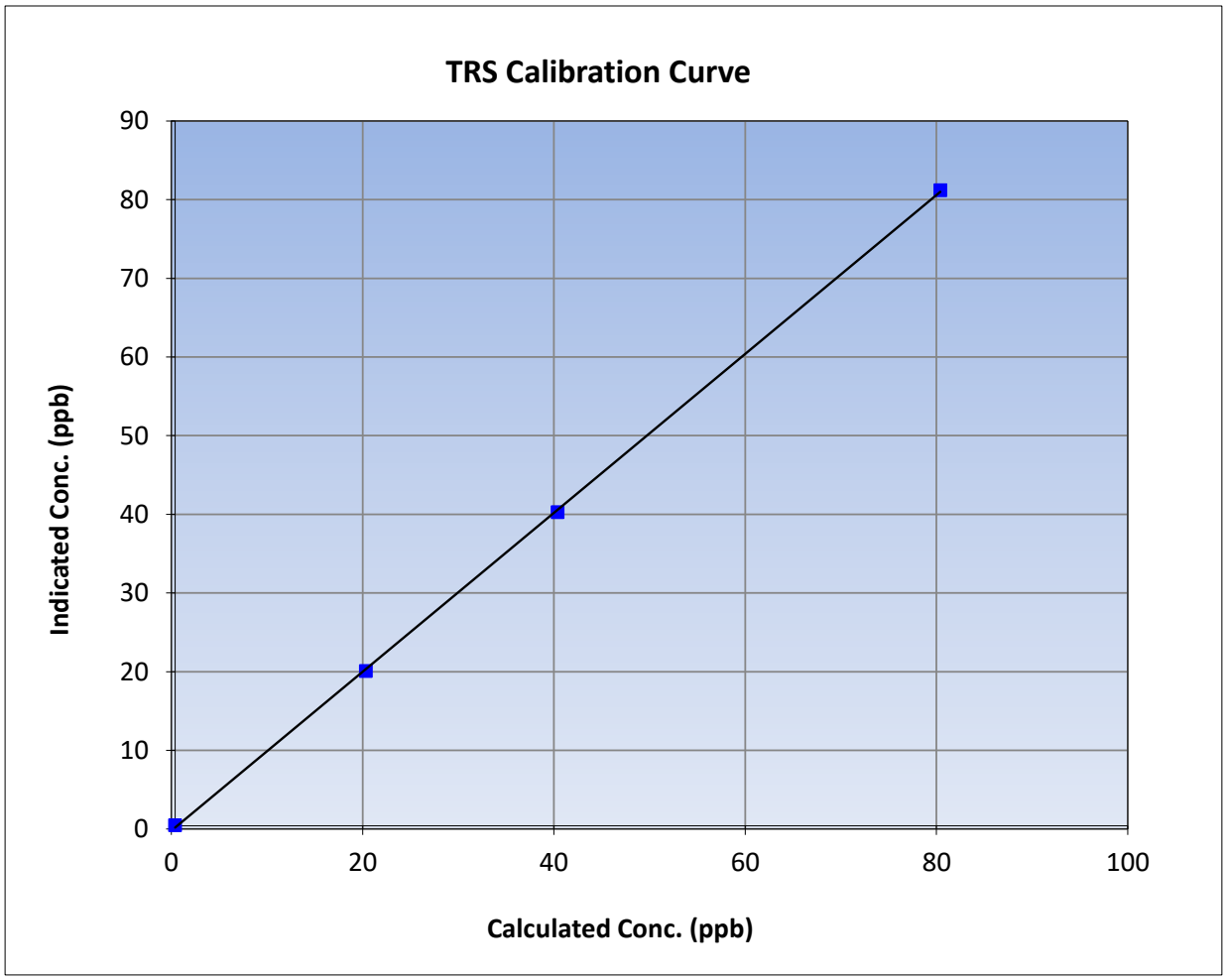
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 7:50 | End Time (MST): | 11:40 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1300156232 |

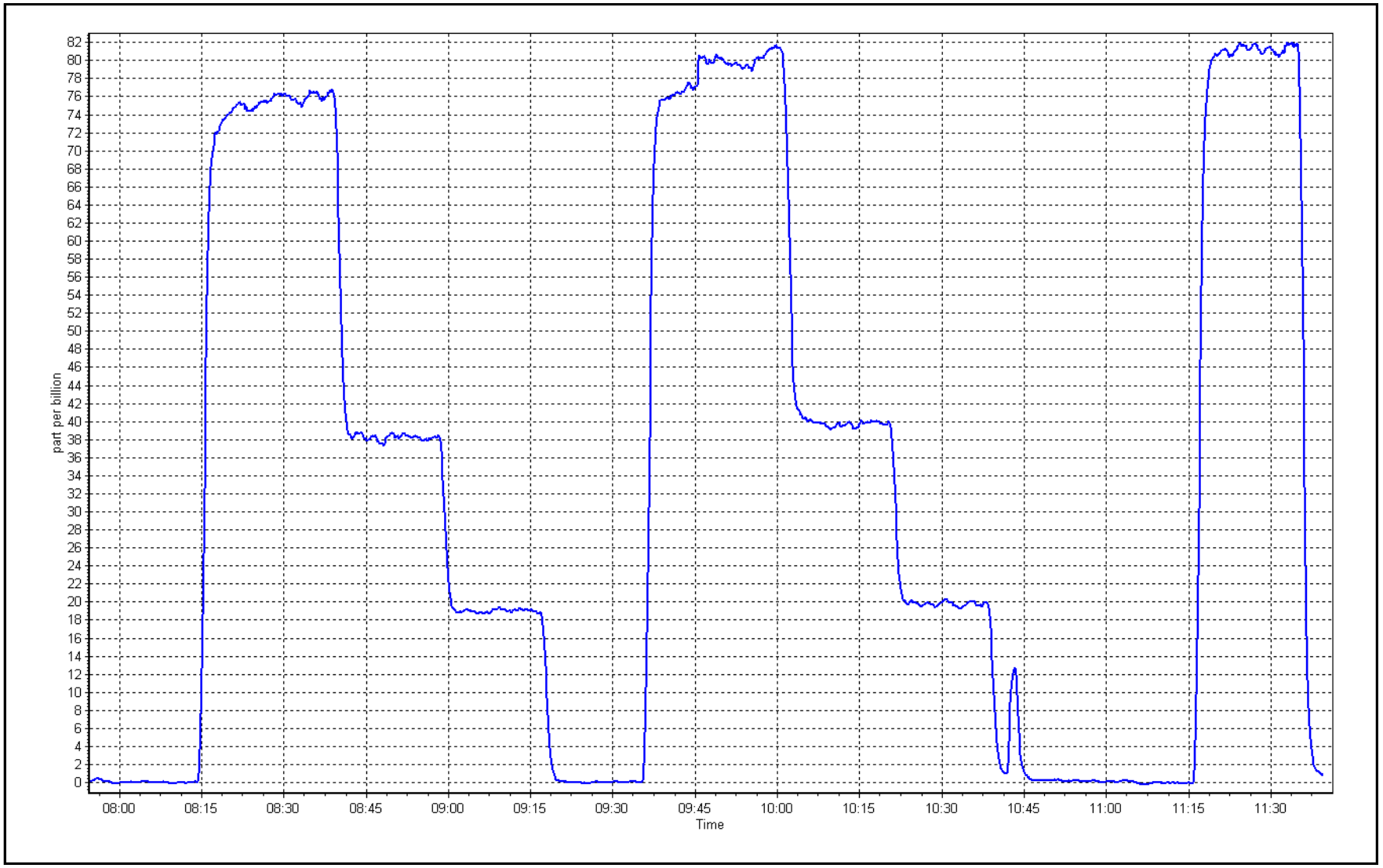
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 80.8 | 0.9901 |
| 40.0 | 39.9 | 1.0024 |
| 19.9 | 19.7 | 1.0126 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999922 | *≥0.995* |
| Slope | 1.010172 | *0.90 - 1.10* |
| Intercept | -0.218012 | *+/-3* |



**TRS Calibration Plot** Date: February 13, 2024 Location: Fort Hills



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Hills | Station number: | AMS23 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 9:17 | End time (MST): | 12:04 |
| 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: | | N/A | Removed Gas Expiry: | N/A | |
| 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 | |
| ZAG make/model: | API T701 | | Serial Number: | 5611 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585648 |
| THC Range (ppm): | 0 - 20 ppm | | |
| NMHC Range (ppm): | 0 - 10 ppm | CH4 Range (ppm): | 0 - 10 ppm |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| CH4 SP Ratio: | 2.31E-04 | 2.31E-04 | NMHC SP Ratio: | 4.93E-05 | 4.93E-05 |
| CH4 Retention time: | 13.0 | 13.0 | NMHC Peak Area: | 186451 | 186451 |
| Zero Chromatogram: | ON | ON | Flat Baseline: | OFF | OFF |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.3 | 17.19 | 16.96 | 1.014 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.3 | 17.19 | 17.20 | 1.000 |
| second point | 4960 | 40.2 | 8.61 | 8.63 | 0.997 |
| third point | 4980 | 20.1 | 4.30 | 4.36 | 0.987 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 17.19 | 17.27 | 0.995 |
| | | | | Average Correction Factor | 0.995 |
| Baseline Corr AF: | 16.96 | Prev response | 17.32 | *% change | -2.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.3 | 9.16 | 9.02 | 1.015 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.3 | 9.16 | 9.19 | 0.997 |
| second point | 4960 | 40.2 | 4.59 | 4.65 | 0.986 |
| third point | 4980 | 20.1 | 2.29 | 2.38 | 0.963 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 9.16 | 9.21 | 0.994 |
| | | | | Average Correction Factor | 0.982 |
| Baseline Corr AF: | 9.02 | Prev response | 9.22 | *% change | -2.3% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.3 | 8.03 | 7.94 | 1.011 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.3 | 8.03 | 8.01 | 1.003 |
| second point | 4960 | 40.2 | 4.02 | 3.99 | 1.008 |
| third point | 4980 | 20.1 | 2.01 | 1.98 | 1.016 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 8.03 | 8.05 | 0.998 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 7.94 | Prev response | 8.10 | *% change | -2.0% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.007788 | 0.999507 |
| THC Cal Offset: | -0.007208 | 0.025608 |
| CH4 Cal Slope: | 1.012164 | 0.997953 |
| CH4 Cal Offset: | -0.027257 | -0.014037 |
| NMHC Cal Slope: | 1.005072 | 1.000996 |
| NMHC Cal Offset: | 0.018048 | 0.041641 |

Notes: Span adjusted. Nitrogen cylinder changed.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

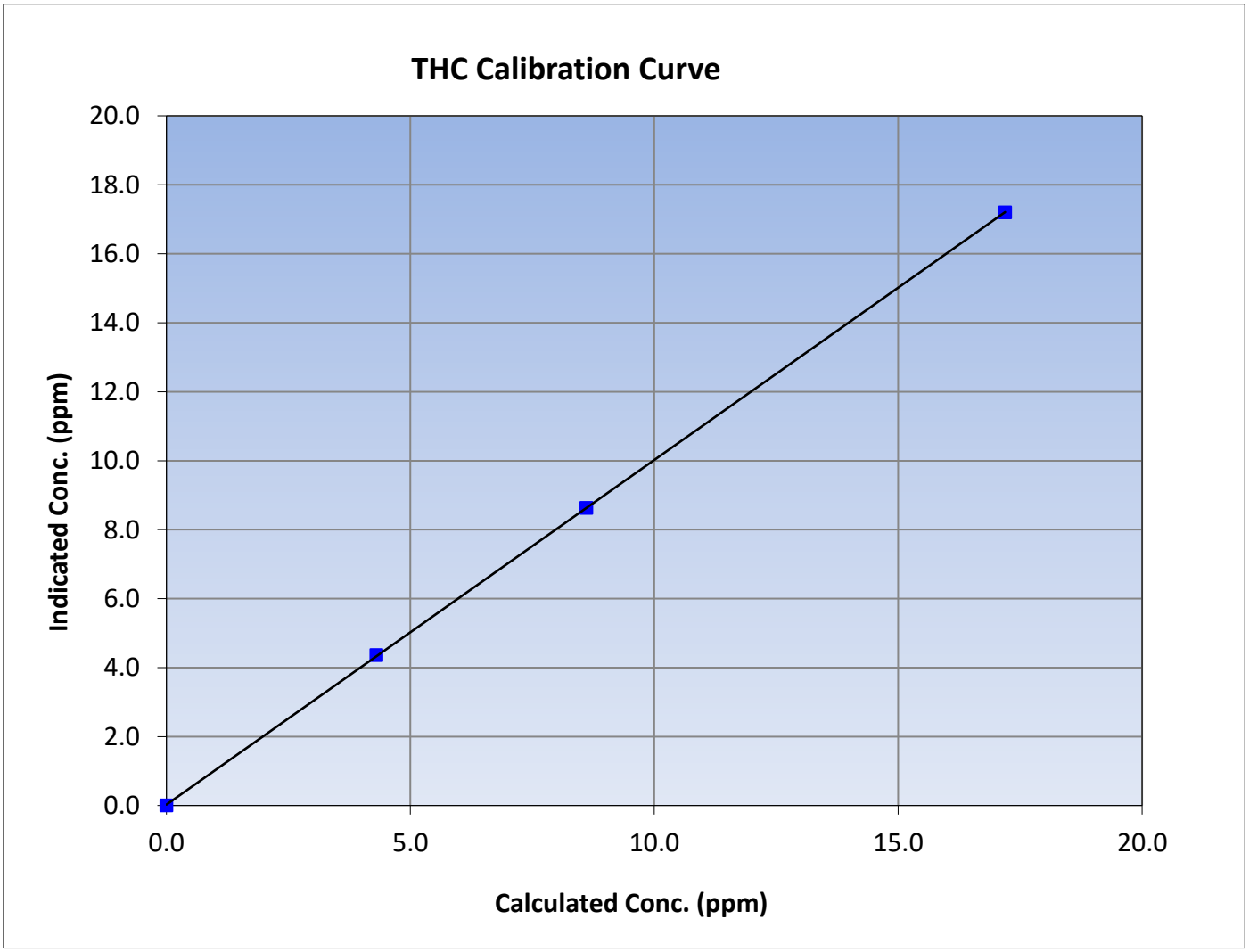
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 9:17 | End Time (MST): | 12:04 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585648 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999989 | *≥0.995* |
| 17.19 | 17.20 | 0.9995 | | | |
| 8.61 | 8.63 | 0.9973 | Slope | 0.999507 | *0.90 - 1.10* |
| 4.30 | 4.36 | 0.9870 | | | |
| | | | Intercept | 0.025608 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

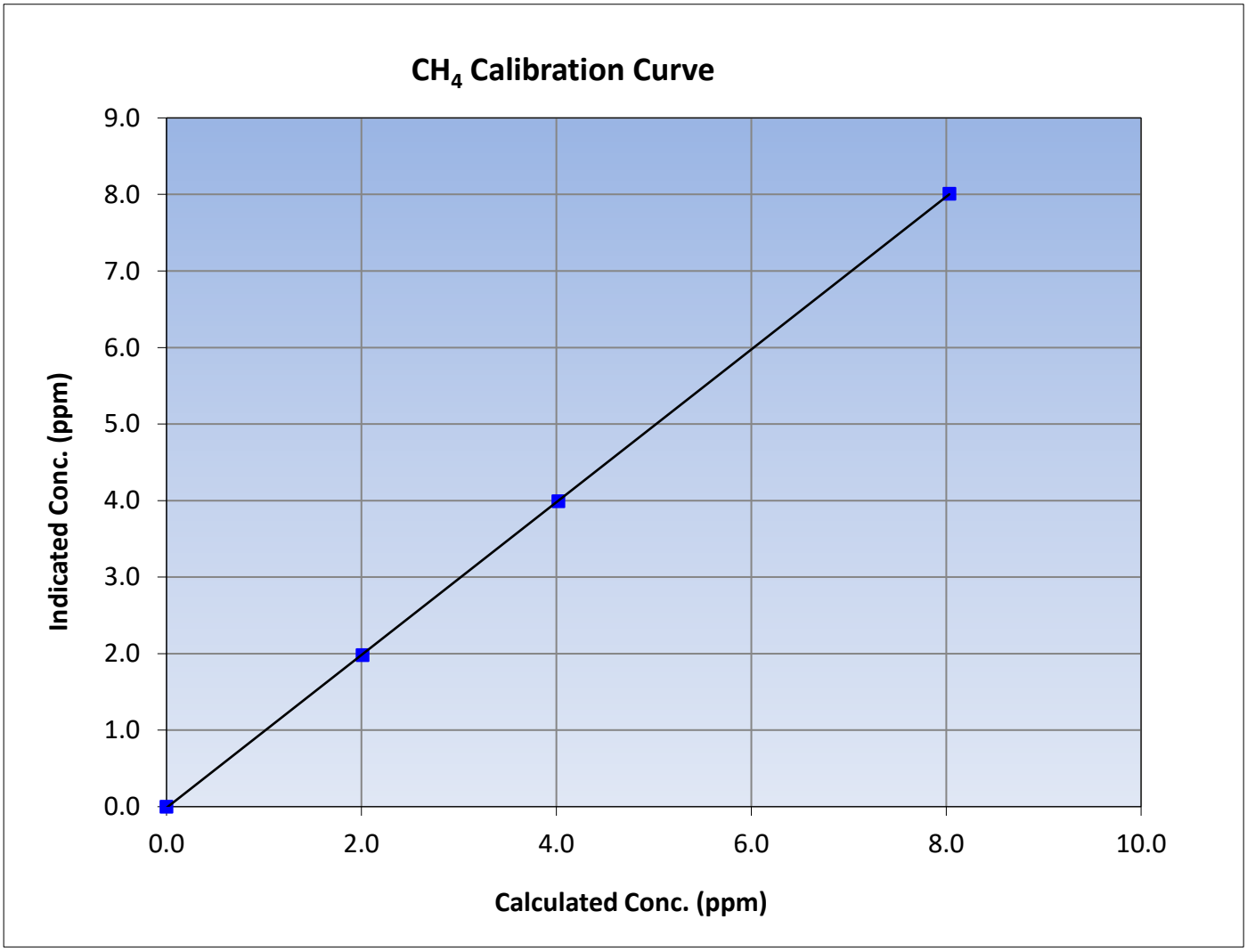
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 9:17 | End Time (MST): | 12:04 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585648 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999986 | *≥0.995* |
| 8.03 | 8.01 | 1.0028 | | | |
| 4.02 | 3.99 | 1.0079 | Slope | 0.997953 | *0.90 - 1.10* |
| 2.01 | 1.98 | 1.0155 | | | |
| | | | Intercept | -0.014037 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

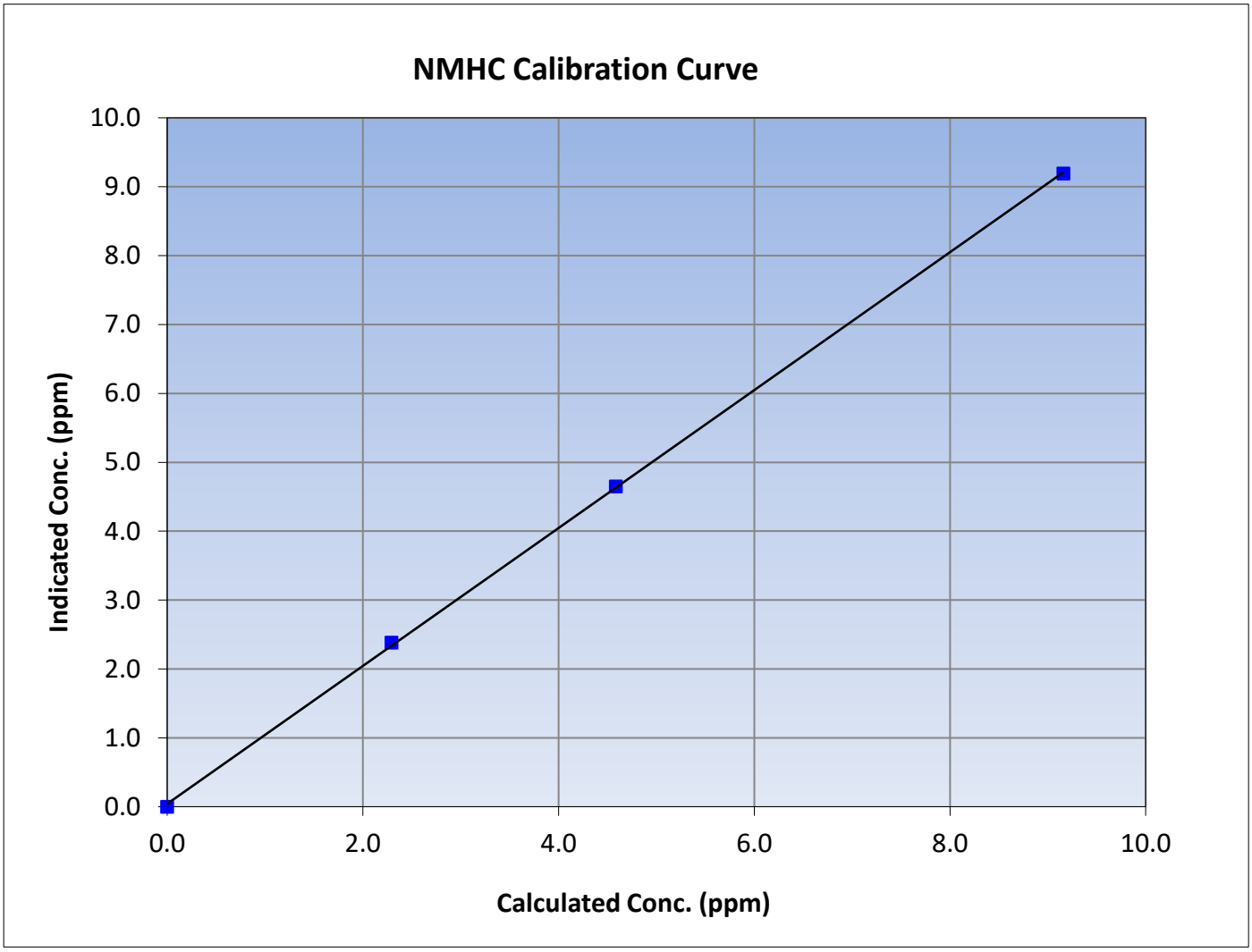
Version-06-2022

### Station Information

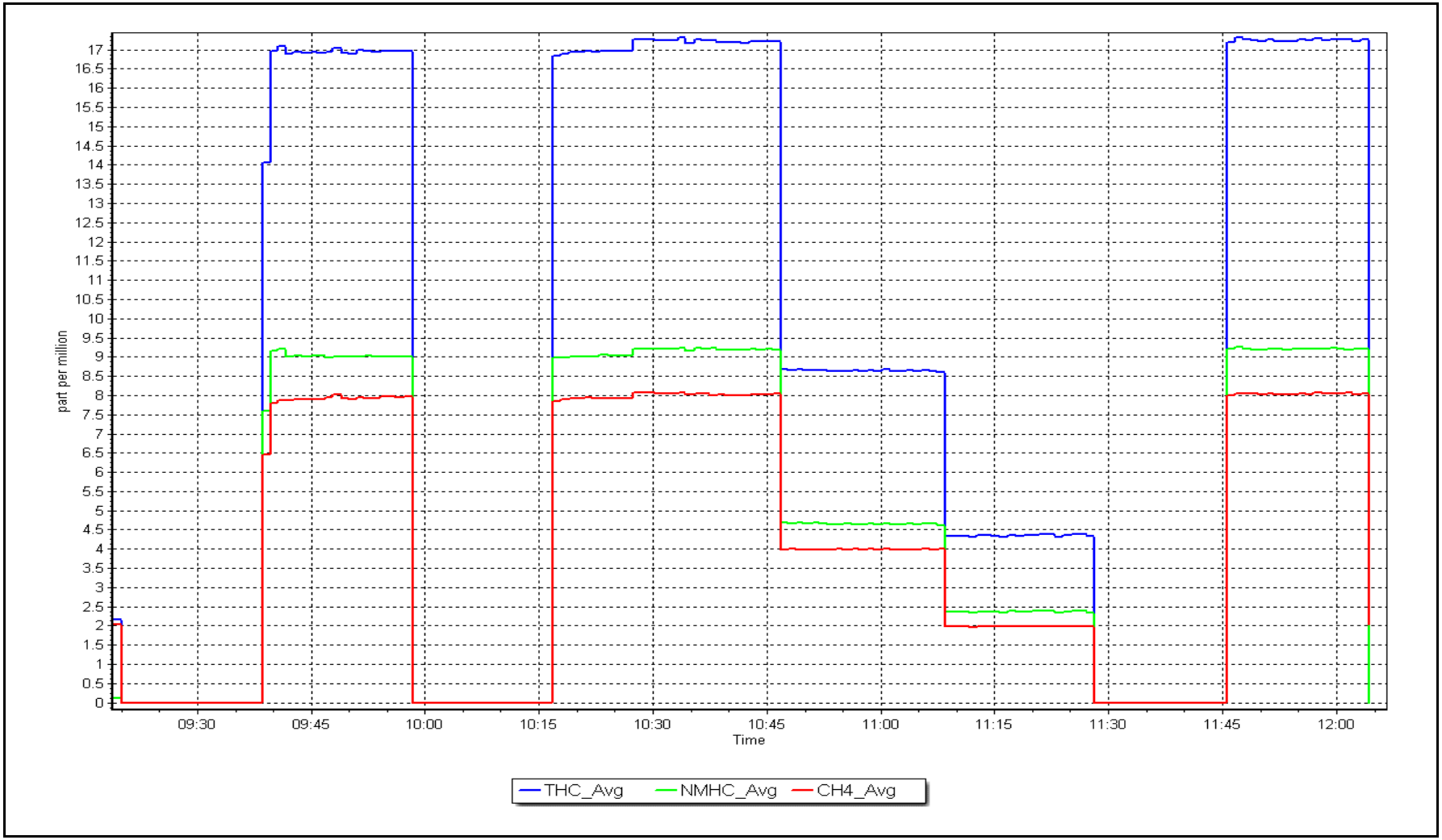
| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 15, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 9:17 | End Time (MST): | 12:04 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585648 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999905 | *≥0.995* |
| 9.16 | 9.19 | 0.9967 | | | |
| 4.59 | 4.65 | 0.9861 | Slope | 1.000996 | *0.90 - 1.10* |
| 2.29 | 2.38 | 0.9633 | | | |
| | | | Intercept | 0.041641 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 7, 2024 Location: Fort Hills



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Hills | Station number: | AMS23 |
| Calibration Date: | February 2, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 7:43 | End time (MST): | 12:02 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | CC332703 | | Cal Gas Expiry Date: | January 28, 2024 | |
| NOX Cal Gas Conc: | 49.7 | ppm | NO Cal Gas Conc: | 49.7 | ppm |
| Removed Cylinder #: | N/A | | Removed Gas Exp Date: | N/A | |
| Removed Gas NOX Conc: | 49.7 | ppm | Removed Gas NO Conc: | 49.7 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 451 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 5611 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1152430007 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.081 | 1.102 | NO bkgnd or offset: | 3 | 3 |
| NOX coeff or slope: | 0.989 | 0.990 | NOX bkgnd or offset: | 3.2 | 3.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 162.9 | 162.9 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998780 | 1.002680 |
| $NO_X$ Cal Offset: | 0.244003 | 0.104366 |
| NO Cal Slope: | 1.000209 | 1.001767 |
| NO Cal Offset: | -0.556171 | -0.976340 |
| $NO_2$ Cal Slope: | 0.999293 | 1.002767 |
| $NO_2$ Cal Offset: | -0.815351 | 0.602578 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | 0.0 | ---- | ---- |
| as found span | 4920 | 80.5 | 800.2 | 800.2 | 0.0 | 784.3 | 781.7 | 2.6 | 1.020 | 1.024 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | ---- | ---- |
| high point | 4920 | 80.5 | 800.2 | 800.2 | 0.0 | 802.2 | 800.9 | 1.4 | 0.997 | 0.999 |
| second point | 4960 | 40.2 | 399.6 | 399.6 | 0.0 | 401.3 | 399.4 | 1.9 | 0.996 | 1.000 |
| third point | 4980 | 20.1 | 199.8 | 199.8 | 0.0 | 200.2 | 197.8 | 2.3 | 0.998 | 1.010 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | 0.0 | ---- | ---- |
| as left span | 4920 | 80.5 | 800.2 | 470.9 | 329.3 | 802.0 | 470.7 | 331.4 | 0.998 | 1.000 |
| | | | | | | | | Average Correction Factor | 0.997 | 1.003 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 784.4 ppb | NO = 781.8 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -1.9% |
| Previous Response | $NO_X$ = 799.4 ppb | NO = 799.8 ppb | | | *Percent Change | NO = | -2.3% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 798.0 | 468.7 | 329.3 | 330.5 | 0.996 | 100.4% |
| 2nd GPT point (200 ppb O3) | 798.0 | 635.5 | 162.5 | 164.0 | 0.991 | 100.9% |
| 3rd GPT point (100 ppb O3) | 798.0 | 715.2 | 82.8 | 84.0 | 0.986 | 101.4% |
| | | | | Average Correction Factor | 0.991 | 100.9% |

Notes: No maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

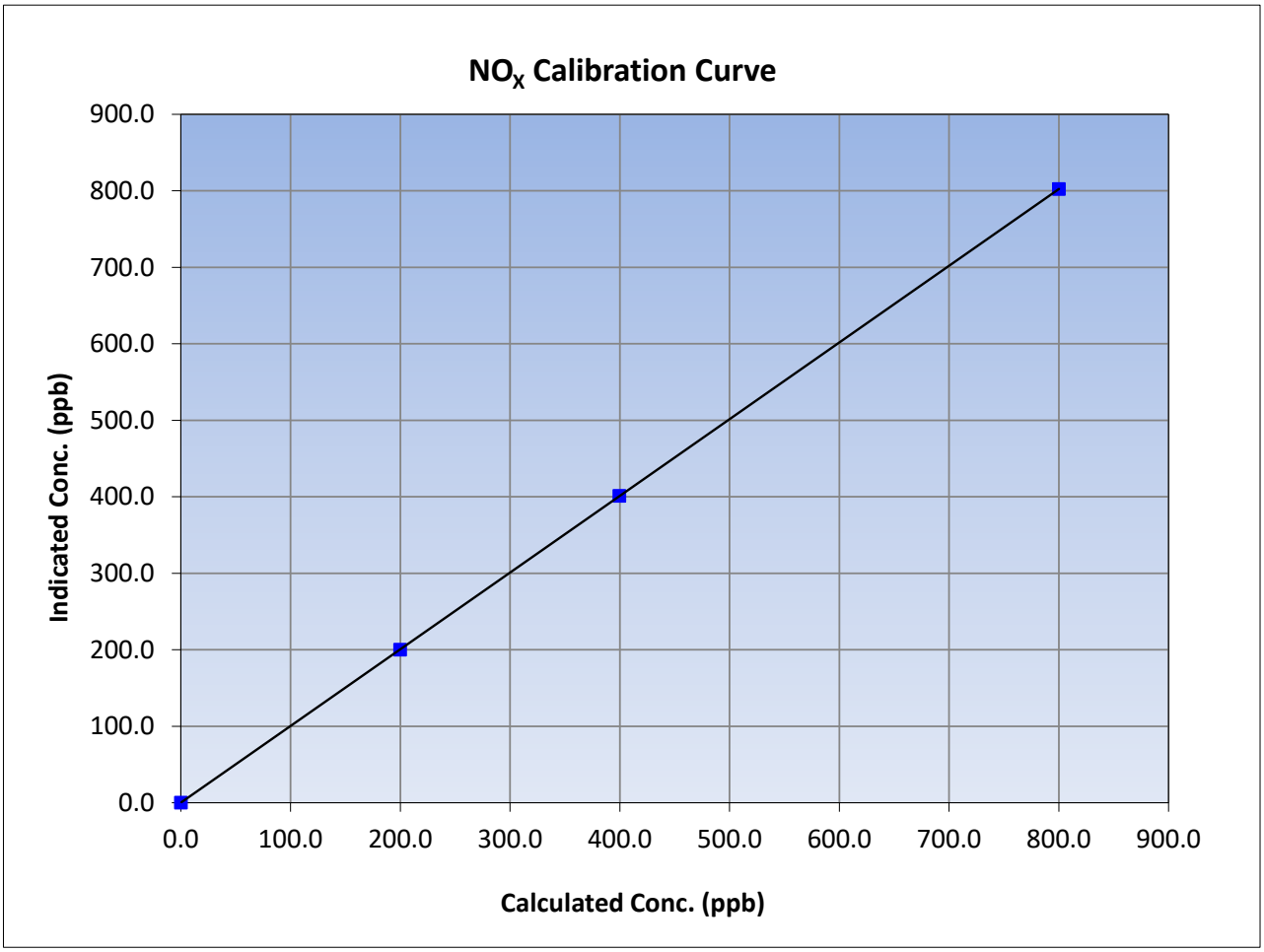
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 7:43 | End Time (MST): | 12:02 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1152430007 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 800.2 | 802.2 | 0.9975 | | | |
| 399.6 | 401.3 | 0.9957 | Slope | 1.002680 | *0.90 - 1.10* |
| 199.8 | 200.2 | 0.9980 | | | |
| | | | Intercept | 0.104366 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

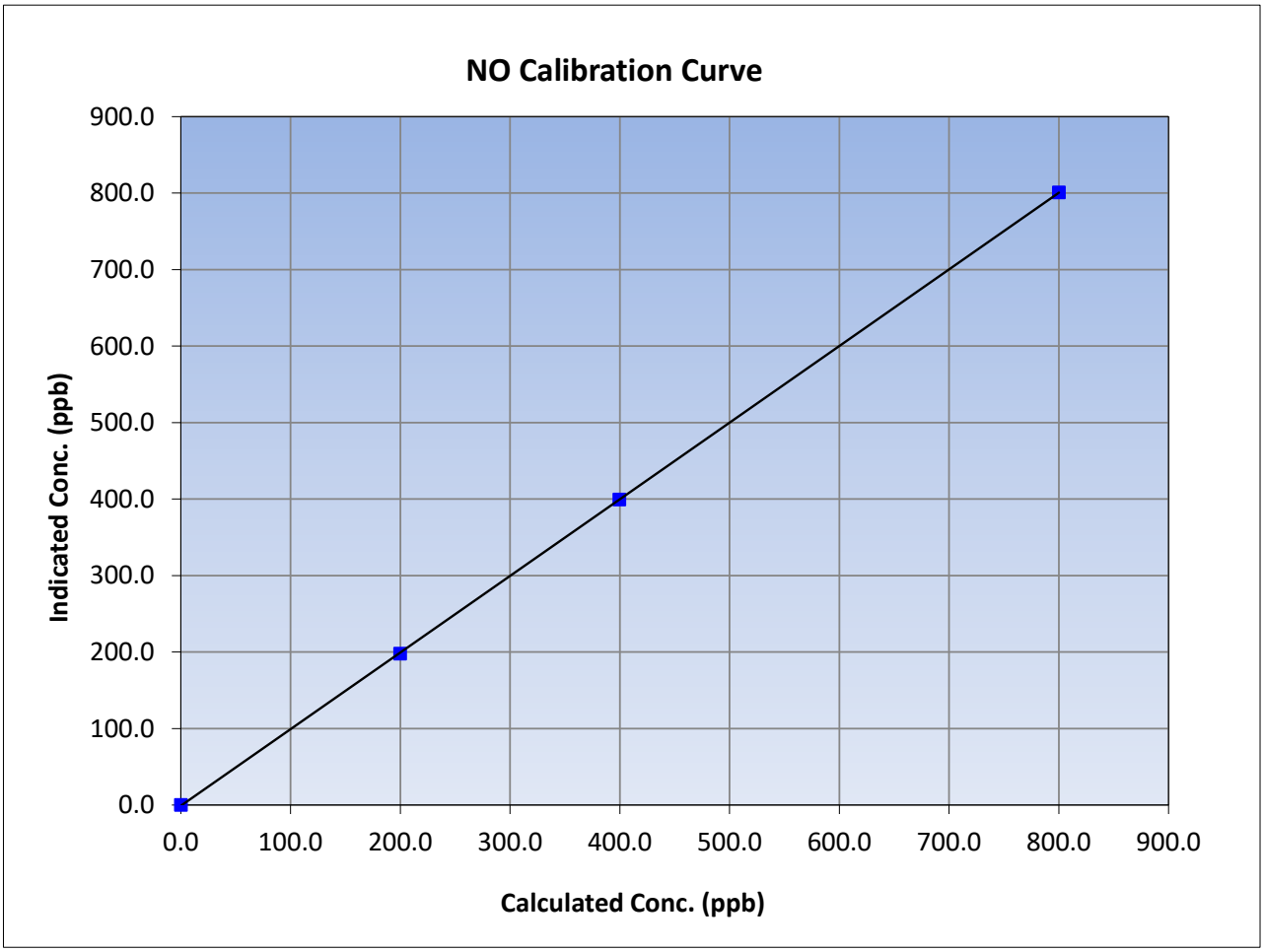
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 7:43 | End Time (MST): | 12:02 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1152430007 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999992 | ≥0.995 |
| 800.2 | 800.9 | 0.9991 | | | |
| 399.6 | 399.4 | 1.0004 | Slope | 1.001767 | 0.90 - 1.10 |
| 199.8 | 197.8 | 1.0101 | | | |
| | | | Intercept | -0.976340 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

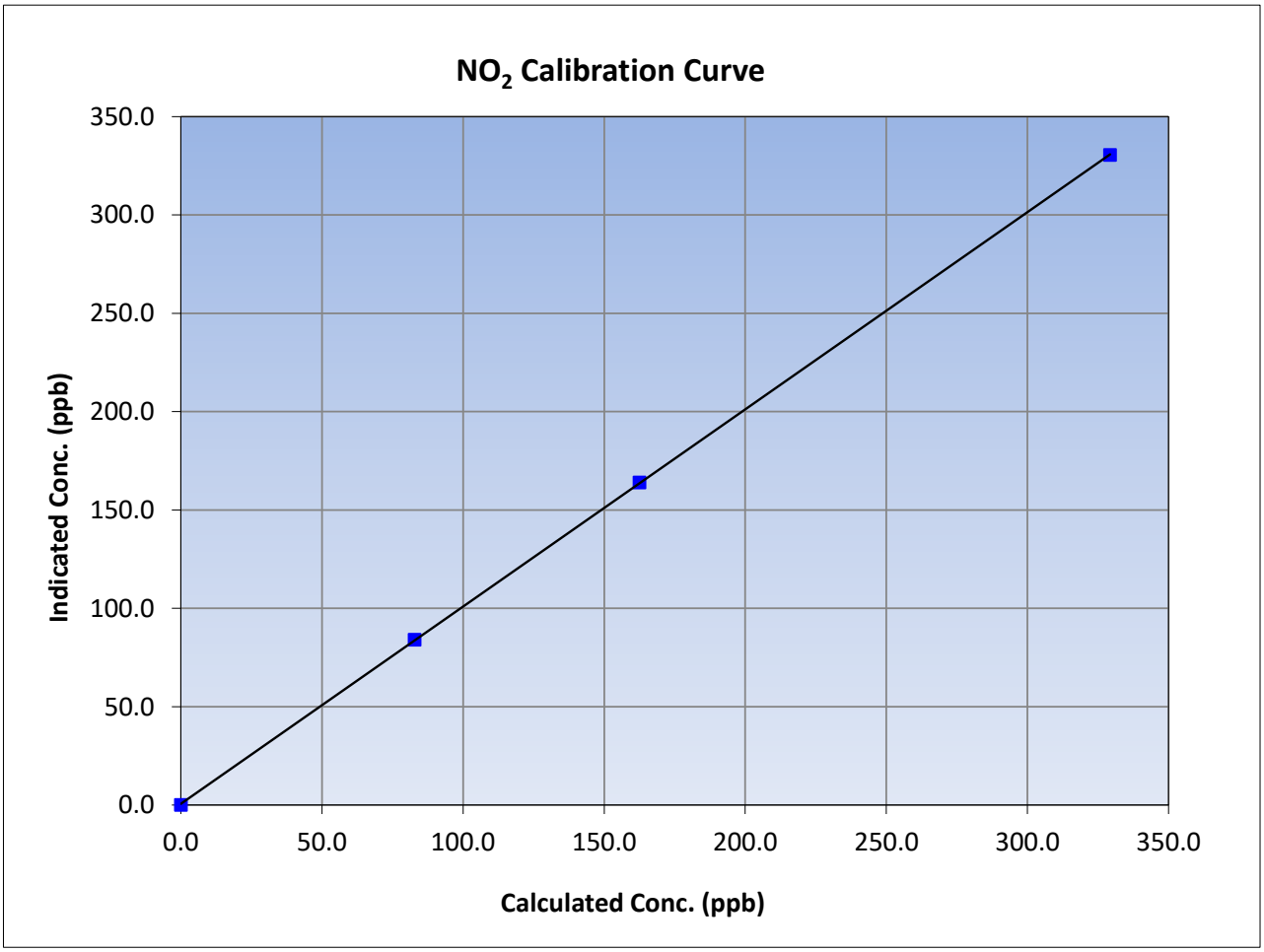
Version-04-2020

### Station Information

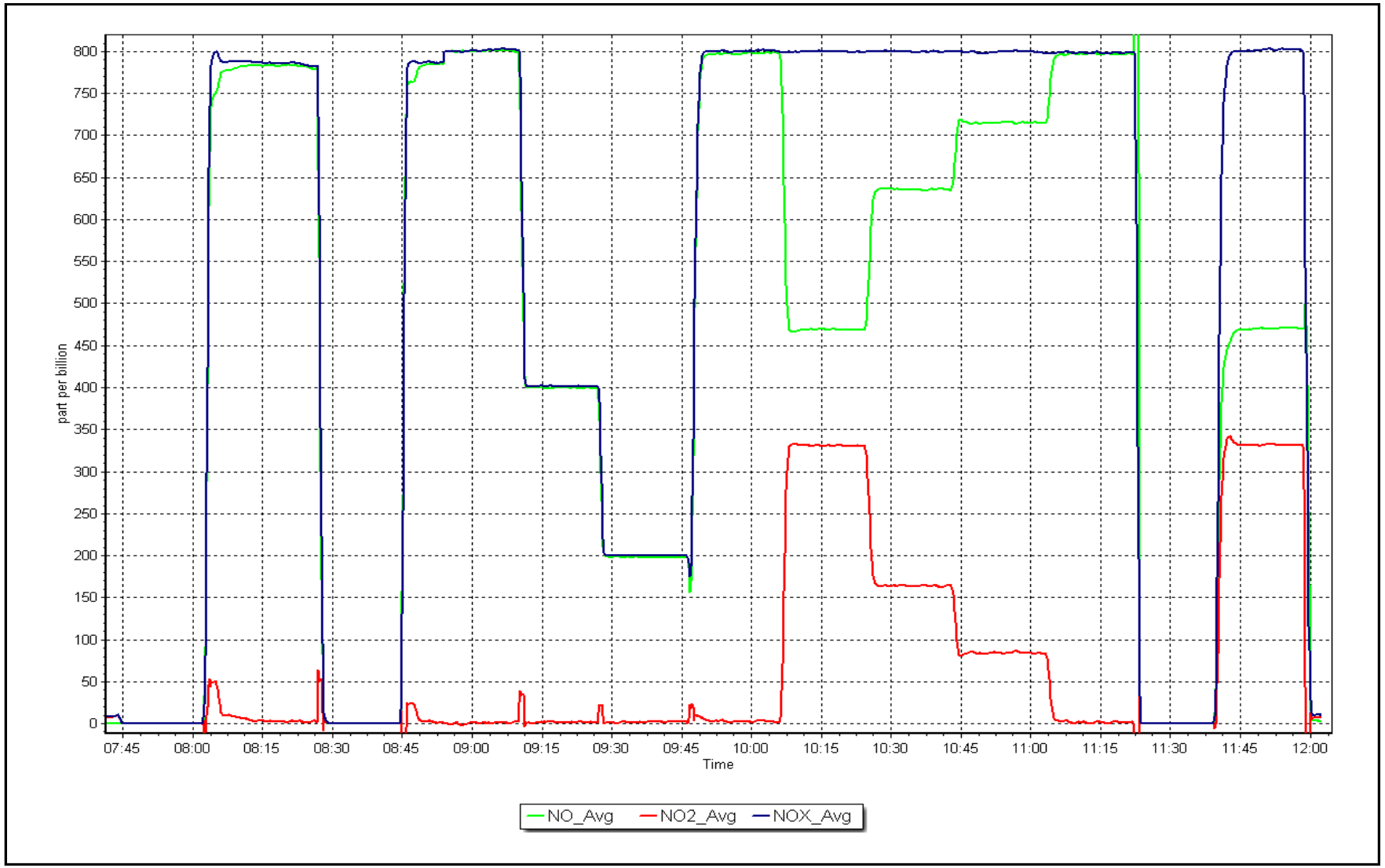
| | | | |
|---|---|---|---|
| Calibration Date: | February 2, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 7:43 | End Time (MST): | 12:02 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1152430007 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999988 | ≥0.995 |
| 329.3 | 330.5 | 0.9964 | | | |
| 162.5 | 164.0 | 0.9909 | Slope | 1.002767 | 0.90 - 1.10 |
| 82.8 | 84.0 | 0.9857 | | | |
| | | | Intercept | 0.602578 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 2, 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: | February 7, 2024 | Last Cal Date: | January 15, 2024 |
| Start time (MST): | 8:04 | End time (MST): | 9:23 |
| Analyzer Make: | API T640 | S/N: | 1546 |
| 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) | -10.4 | -10.7 | -10.4 | ☐ | +/- 2 °C |
| P (mmHg) | 734.1 | 733.4 | 734.1 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5 | 5.09 | 5 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 40 | ----- | 40 | ☐ | >80% |

Zero Verification — PM w/o HEPA: 11.5 — 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: 10-Jun-24 — Lot No.: 100128-050-042

| Parameter | As found | Post maintenance | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| PMT Peak Test | 9.2 | 10.9 | 10.9 | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: February 7, 2024

Date Disposable Filter Changed: February 7, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0 <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 before and after cleaning.

Calibration by: Melissa Lemay

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS25
## WASKŌW OHCI PIMÂTISIWIN

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Waskow ohci Pimatisiwin | Station number: | AMS25 |
| Calibration Date: | February 16, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 7:45 | End time (MST): | 10:56 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 50.54 | ppm | Cal Gas Exp Date: | December 29, 2028 |
| Cal Gas Cylinder #: | CC437219 | | | |
| Removed Cal Gas Conc: | 50.54 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 747 |
| ZAG Make/Model: | API T701 | | Serial Number: | 4765 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1118148497

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999234 | 1.004302 | Backgd or Offset: | 11.4 | 10.8 |
| Calibration intercept: | 0.023996 | 0.123899 | Coeff or Slope: | 1.050 | 1.030 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| as found span | 4921 | 79.2 | 800.5 | 818.2 | 0.978 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4921 | 79.2 | 800.5 | 803.9 | 0.996 |
| second point | 4960 | 39.6 | 400.3 | 402.7 | 0.994 |
| third point | 4980 | 19.8 | 200.1 | 200.8 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4921 | 79.2 | 800.5 | 804.5 | 0.995 |
| | | | | Average Correction Factor | 0.996 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 818.40 | Previous response | 799.93 | *% change | 2.3% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: No maintenance done. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

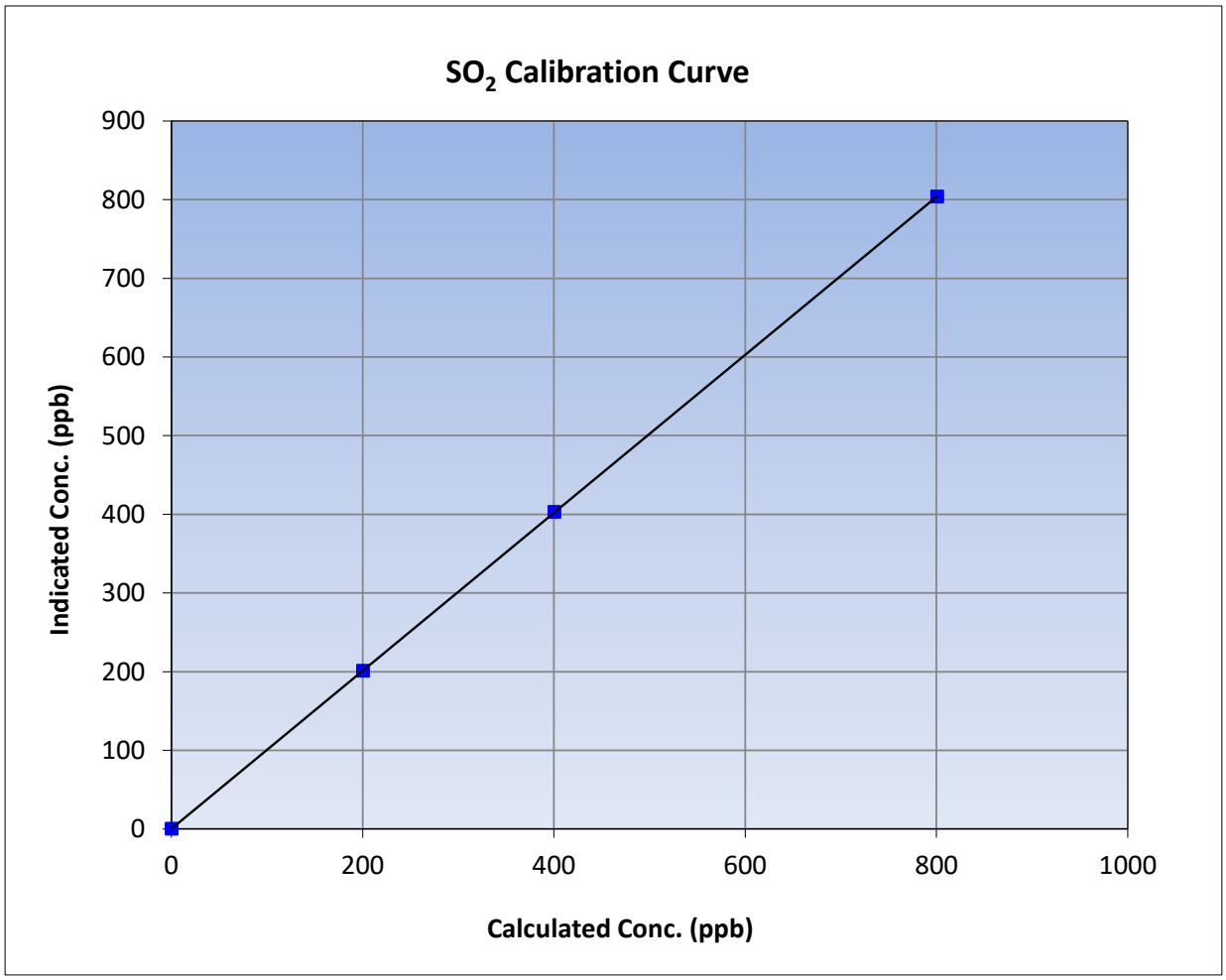
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | January 22, 2024 |
| Station Name: | Waskow ohci Pimatisiwin | Station Number: | AMS25 |
| Start Time (MST): | 7:45 | End Time (MST): | 10:56 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1118148497 |

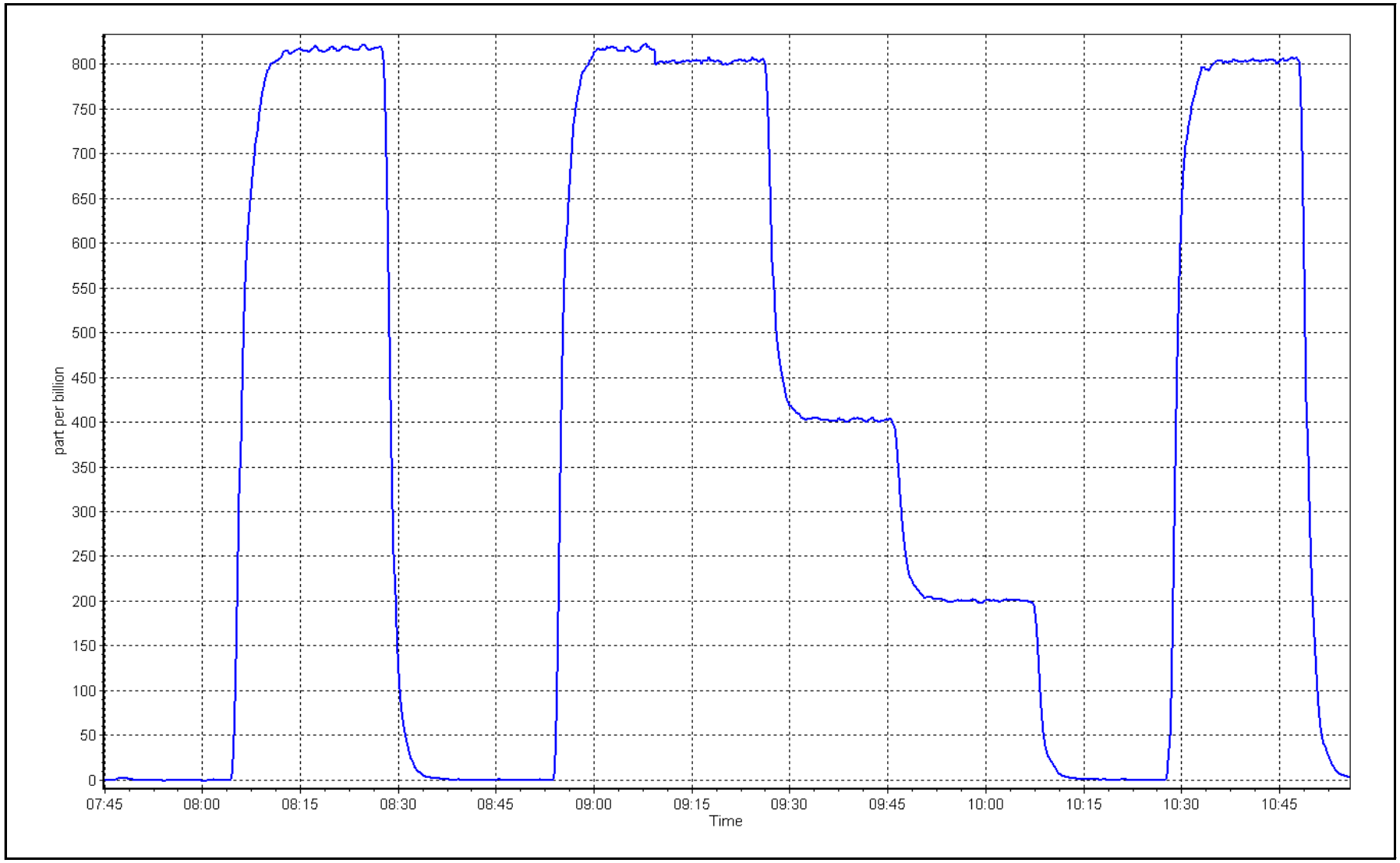
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.5 | 803.9 | 0.9958 |
| 400.3 | 402.7 | 0.9941 |
| 200.1 | 200.8 | 0.9967 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 1.004302 | *0.90 - 1.10* |
| Intercept | 0.123899 | *+/-30* |



**SO2 Calibration Plot** Date: February 16, 2024 Location: Waskow ohci Pimatisiwin



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Waskow ohci Pimatisiwin | Station number: | AMS25 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 7:30 | End time (MST): | 12:00 |
| 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: | NA |
| Removed Gas Cyl #: | NA | | 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 | | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.002531 | 1.005840 | Backgd or Offset: | 3.30 | 3.30 |
| Calibration intercept: | 0.300000 | 0.060000 | Coeff or Slope: | 1.125 | 1.113 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4920 | 80.0 | 79.5 | 80.9 | 0.982 |
| as found 2nd point | 4960 | 40.0 | 39.7 | 40.6 | 0.979 |
| as found 3rd point | 4980 | 20.0 | 19.9 | 20.3 | 0.979 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4920 | 80.0 | 79.5 | 80.0 | 0.993 |
| second point | 4960 | 40.0 | 39.7 | 40.0 | 0.993 |
| third point | 4980 | 20.0 | 19.9 | 20.0 | 0.993 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4920 | 80.0 | 800.0 | 805.2 | 0.994 |
| SO2 Scrubber Check | 4921 | 79.2 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | 20-Jun-23 | | Ave Corr Factor | 0.993 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.9 | Prev response: | 79.96 | *% change: | 1.2% |
| Baseline Corr 2nd AF pt: | 40.6 | AF Slope: | 1.018066 | AF Intercept: | 0.060000 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999996 | | |

* = > +/-5% change initiates investigation

Notes: SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

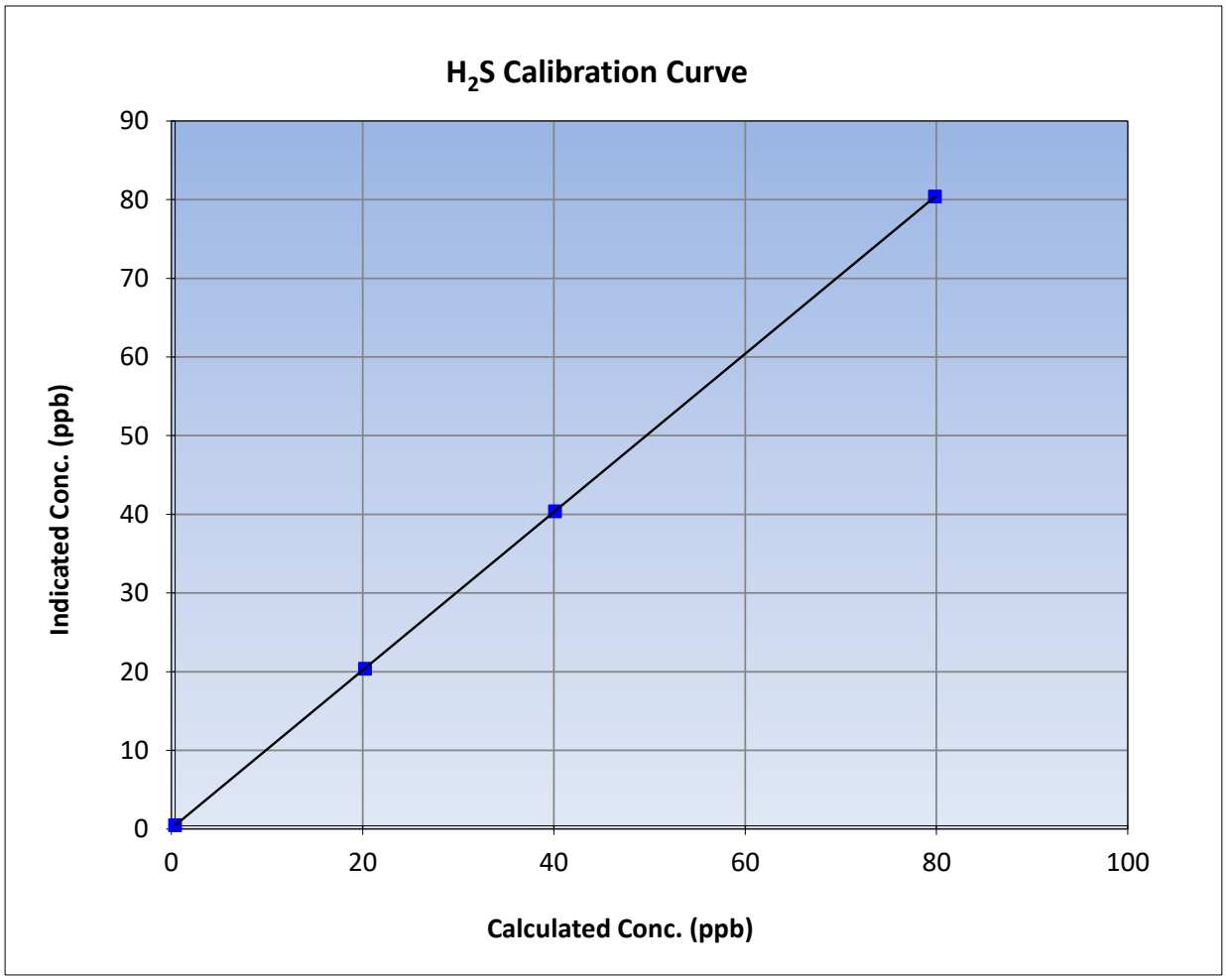
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Waskow ohci Pimatisiwin | Station Number: | AMS25 |
| Start Time (MST): | 7:30 | End Time (MST): | 12:00 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1170050146 |

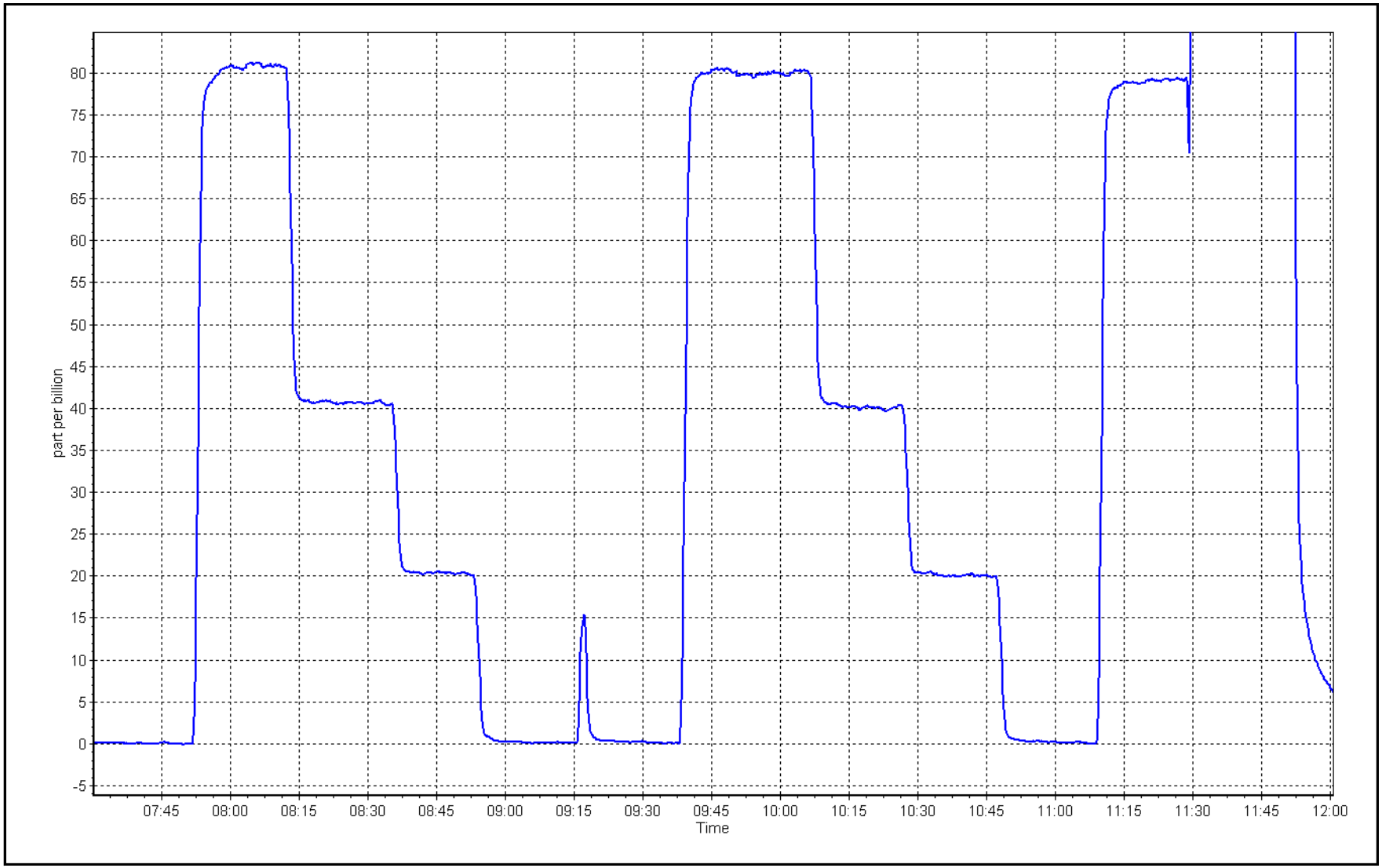
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 79.5 | 80.0 | 0.9932 |
| 39.7 | 40.0 | 0.9932 |
| 19.9 | 20.0 | 0.9932 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 1.005840 | *0.90 - 1.10* |
| Intercept | 0.060000 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 14, 2024 Location: Waskow ohci Pimatisiwin



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS26
## CHRISTINA LAKE

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Christina Lake | Station number: | AMS 26 |
| Calibration Date: | February 3, 2024 | Last Cal Date: | NA |
| Start time (MST): | 13:02 | End time (MST): | 15:08 |
| Reason: | Install | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 49.56 | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #: | CC362134 | | | |
| Removed Cal Gas Conc: | 49.56 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 281 |
| ZAG Make/Model: | API T701H | | Serial Number: | 832 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1152430005

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | NA | 0.998578 | Backgd or Offset: | NA | 25.8 |
| Calibration intercept: | NA | 0.236006 | Coeff or Slope: | NA | 0.944 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4919 | 80.8 | 800.9 | 799.9 | 1.001 |
| second point | 4960 | 40.4 | 400.4 | 400.3 | 1.000 |
| third point | 4980 | 20.2 | 200.2 | 200.2 | 1.000 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 80.8 | 800.9 | 799.8 | 1.001 |
| | | | | Average Correction Factor | 1.001 |

| | | | | | |
|---|---|---|---|---|---|
| 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

Notes: Install calibrations. Sample inlet filters changed before calibrated zero. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

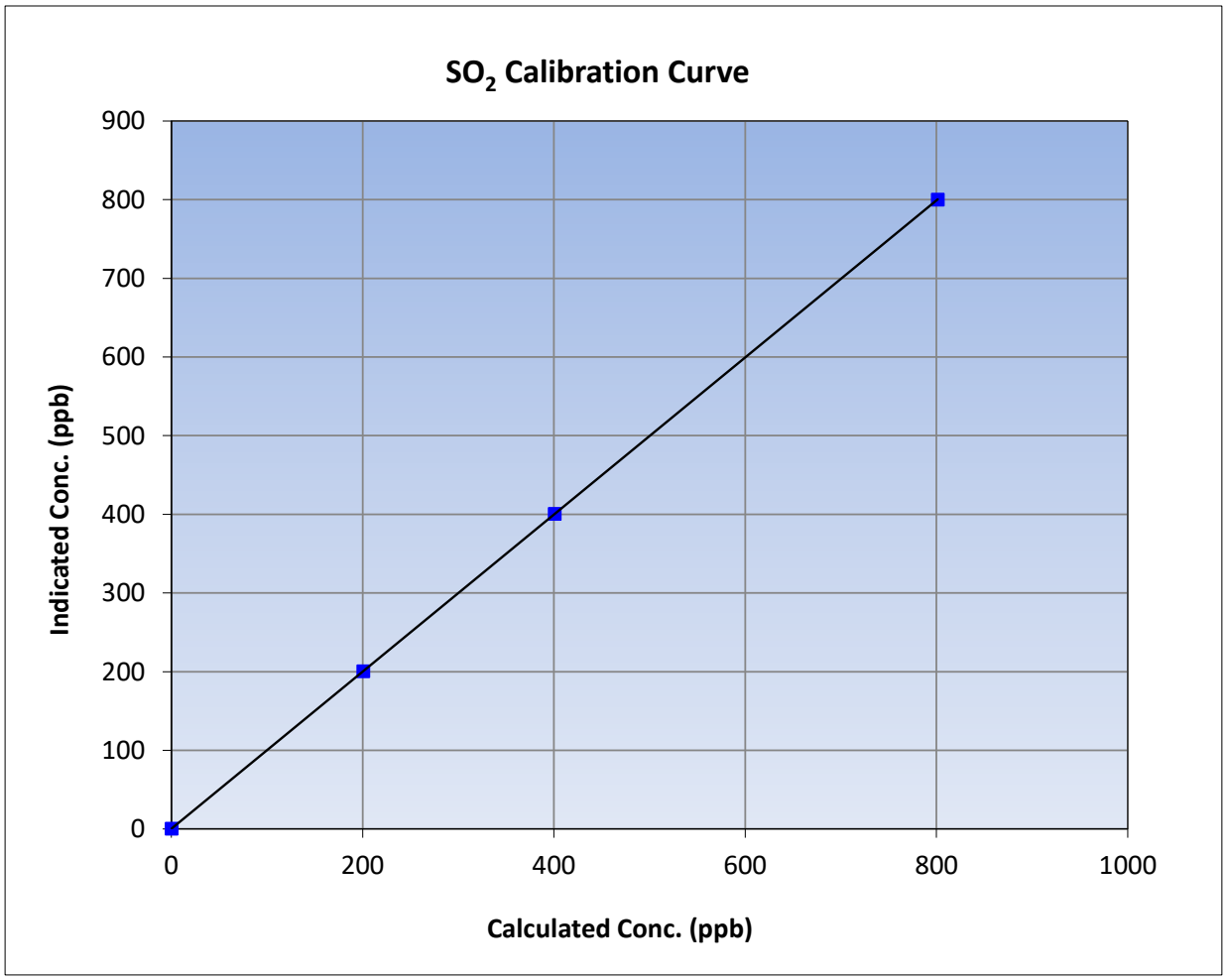
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 3, 2024 | Previous Calibration: | NA |
| Station Name: | Christina Lake | Station Number: | AMS 26 |
| Start Time (MST): | 13:02 | End Time (MST): | 15:08 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1152430005 |

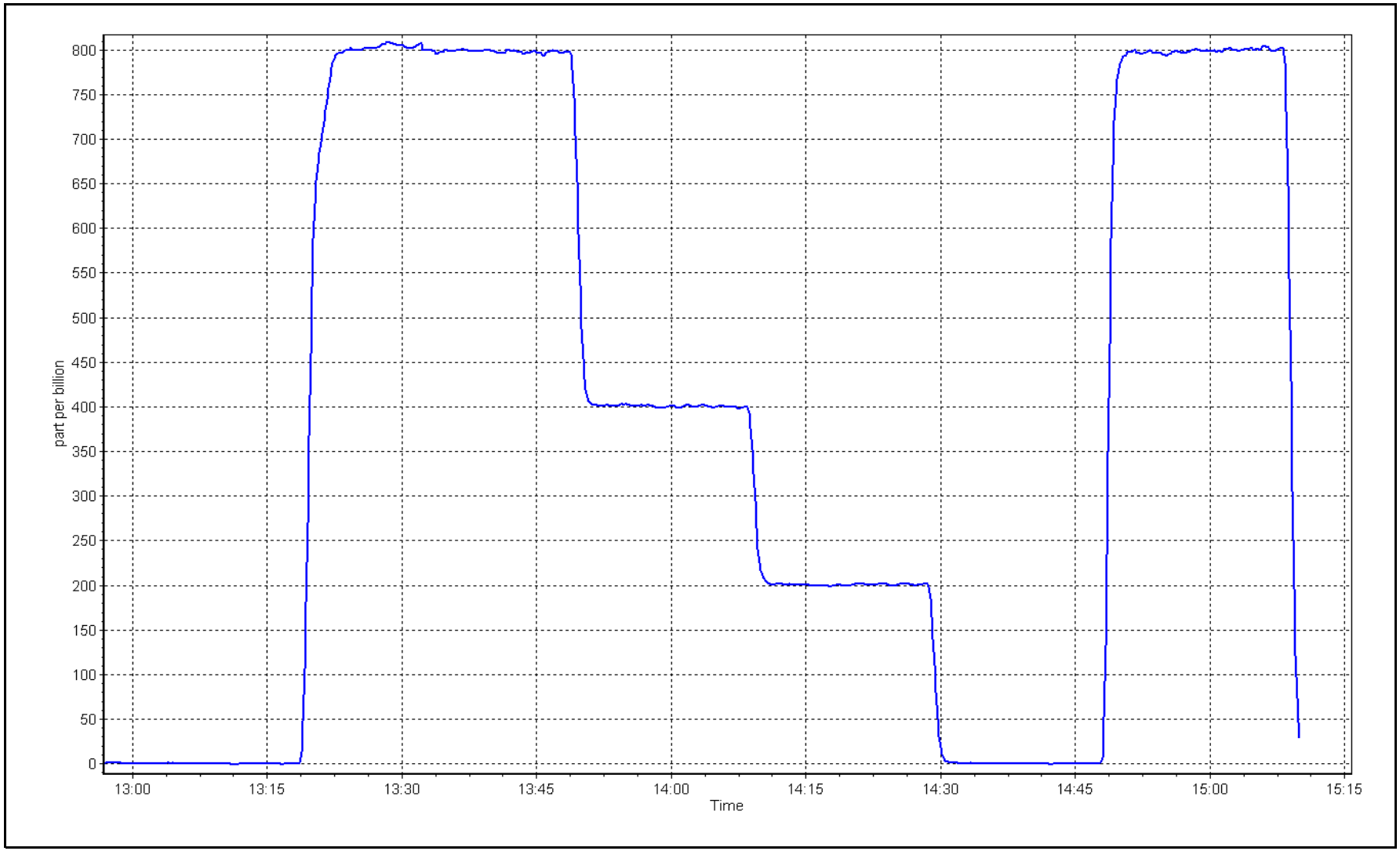
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.9 | 799.9 | 1.0013 |
| 400.4 | 400.3 | 1.0003 |
| 200.2 | 200.2 | 1.0001 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 1.000000 | *≥0.995* |
| Slope | 0.998578 | *0.90 - 1.10* |
| Intercept | 0.236006 | *+/-30* |



**SO2 Calibration Plot** Date: February 3, 2024 Location: Christina Lake



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Christina Lake | Station number: | AMS26 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 10:14 | End time (MST): | 14:21 |
| 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: | |
| Removed Gas Cyl #: | | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3253 |
| ZAG Make/Model: | API T701H | | Serial Number: | 832 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 450i | | Analyzer serial #: | 1180030032 | |
| Converter make: | NA | | Converter serial #: | NA | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.001140 | 1.008427 | Backgd or Offset: | 36.0 | 35.0 |
| Calibration intercept: | 0.238387 | 0.258384 | Coeff or Slope: | 1.115 | 1.086 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as found span | 4921 | 79.2 | 80.0 | 82.4 | 0.974 |
| as found 2nd point | 4960 | 39.6 | 40.0 | 41.3 | 0.976 |
| as found 3rd point | 4980 | 19.8 | 20.0 | 21.0 | 0.966 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| high point | 4921 | 79.2 | 80.0 | 80.9 | 0.989 |
| second point | 4960 | 39.6 | 40.0 | 40.7 | 0.983 |
| third point | 4980 | 19.8 | 20.0 | 20.3 | 0.985 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4921 | 79.2 | 80.0 | 80.0 | 1.000 |
| SO2 Scrubber Check | 4931 | 80.9 | 807.1 | 0.0 | ---- |
| Date of last scrubber change: | | 27-Feb-19 | | Ave Corr Factor | 0.986 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 82.1 | Prev response: | 80.32 | *% change: | 2.2% |
| Baseline Corr 2nd AF pt: | 41.0 | AF Slope: | 1.025572 | AF Intercept: | 0.358361 |
| Baseline Corr 3rd AF pt: | 20.7 | AF Correlation: | 0.999993 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

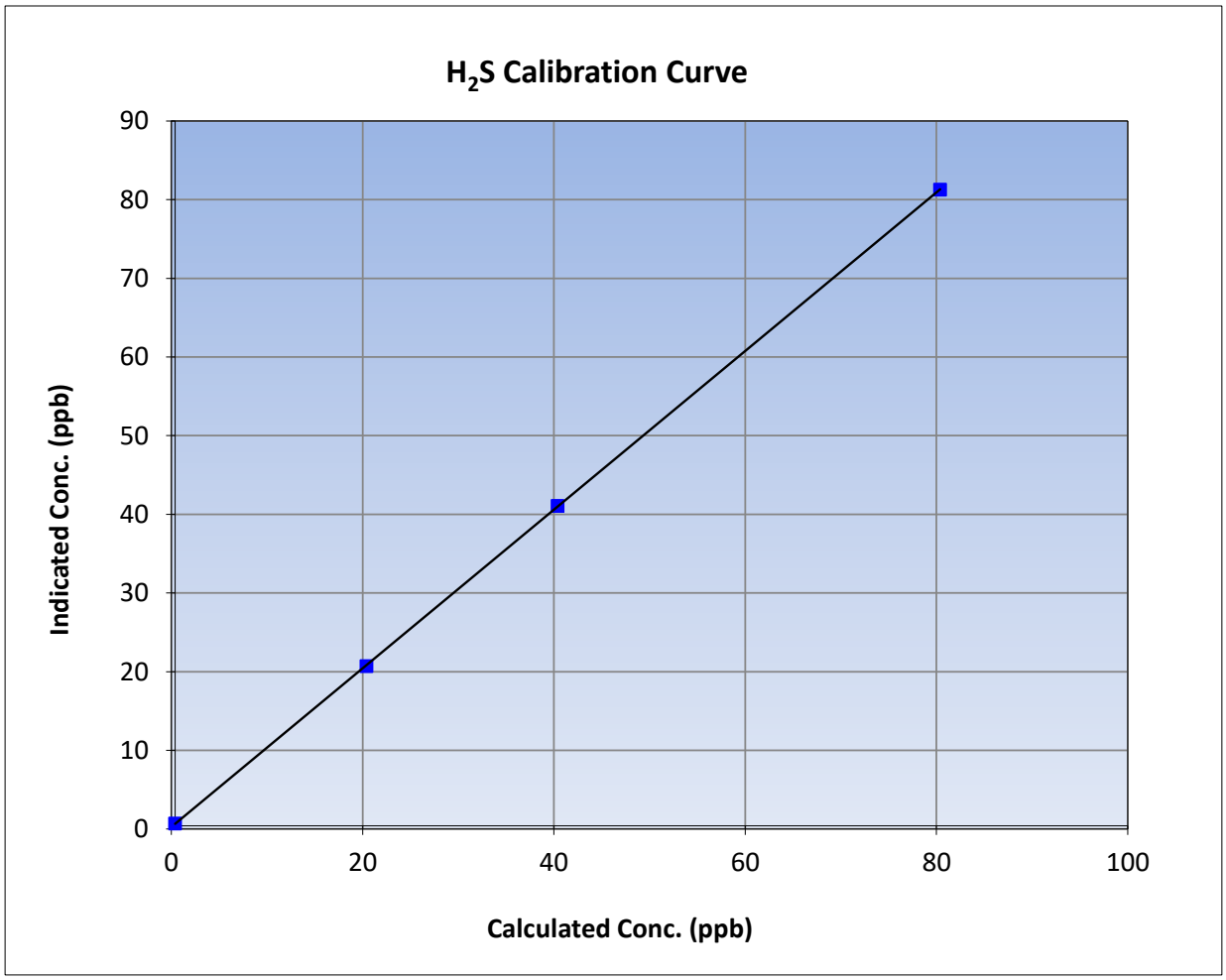
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 10:14 | End Time (MST): | 14:21 |
| Analyzer make: | Thermo 450i | Analyzer serial #: | 1180030032 |

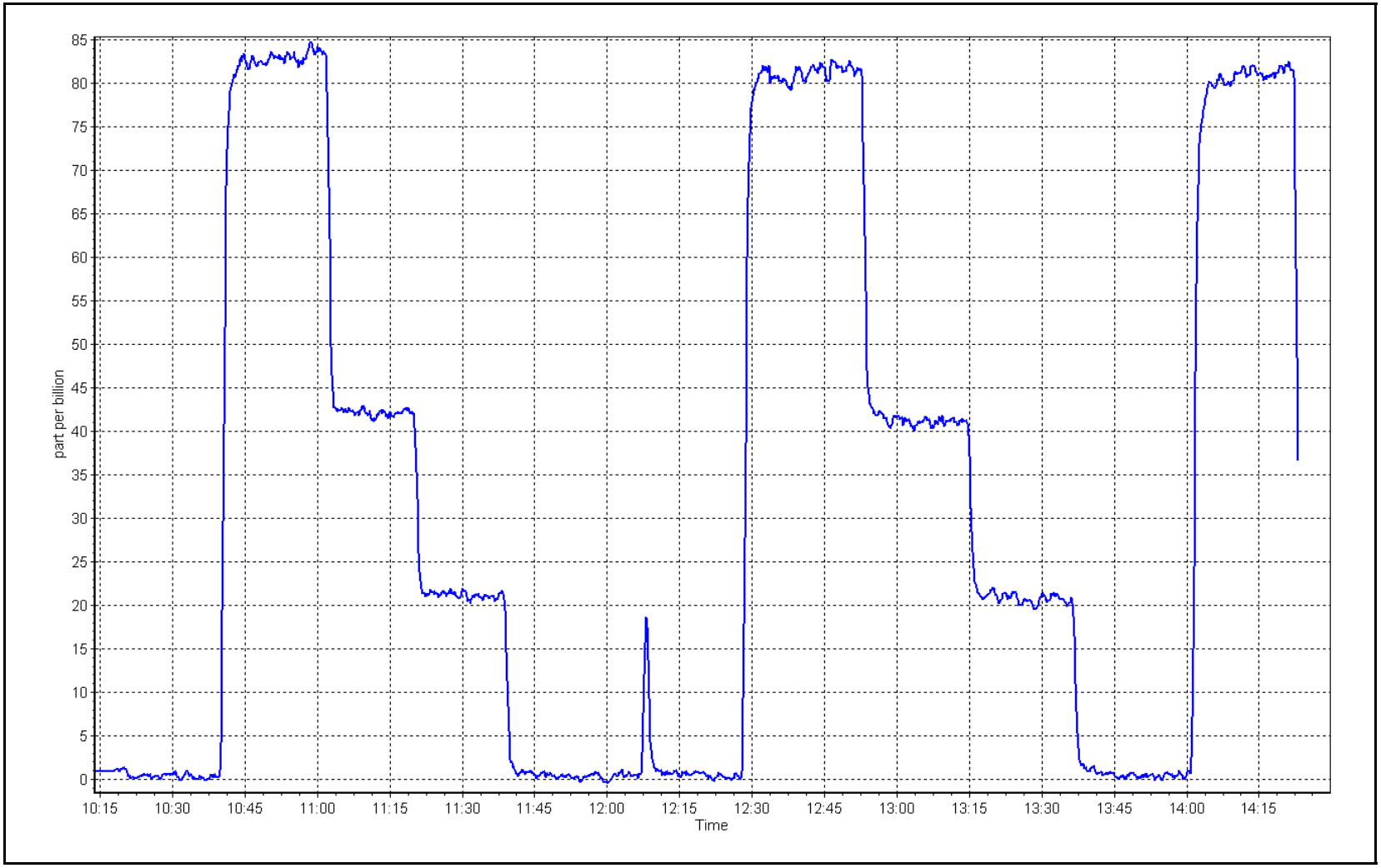
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 80.0 | 80.9 | 0.9887 |
| 40.0 | 40.7 | 0.9828 |
| 20.0 | 20.3 | 0.9852 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 1.008427 | *0.90 - 1.10* |
| Intercept | 0.258384 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 7, 2024 Location: Christina Lake



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Christina Lake | Station number: | AMS26 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 10:23 | End time (MST): | 14:58 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | CC755290 | | Cal Gas Expiry Date: | January 3, 2031 | |
| NOX Cal Gas Conc: | 48.90 | ppm | NO Cal Gas Conc: | 48.70 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 48.90 | ppm | Removed Gas NO Conc: | 48.70 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 3253 | |
| ZAG make/model: | API T701H | | Serial Number: | 832 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1173480006 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.314 | 1.325 | NO bkgnd or offset: | 2.5 | 2.5 |
| NOX coeff or slope: | 0.990 | 0.994 | NOX bkgnd or offset: | 3.2 | 3.3 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 161.9 | 162.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000236 | 0.999923 |
| $NO_X$ Cal Offset: | 0.306500 | 0.266541 |
| NO Cal Slope: | 1.001429 | 0.998413 |
| NO Cal Offset: | 0.426316 | 0.406737 |
| $NO_2$ Cal Slope: | 0.997306 | 1.003805 |
| $NO_2$ Cal Offset: | -0.717929 | 0.175464 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.9 | -0.2 | -0.7 | ---- | ---- |
| as found span | 4918 | 82.1 | 802.9 | 799.6 | 3.3 | 802.8 | 799.6 | 3.3 | 1.0002 | 1.0000 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.7 | -0.1 | -0.6 | ---- | ---- |
| high point | 4918 | 82.1 | 802.9 | 799.6 | 3.3 | 802.7 | 798.7 | 4.1 | 1.0003 | 1.0012 |
| second point | 4959 | 41.1 | 401.9 | 400.3 | 1.6 | 402.5 | 399.8 | 2.7 | 0.9986 | 1.0013 |
| third point | 4980 | 20.5 | 200.5 | 199.7 | 0.8 | 201.8 | 200.6 | 1.1 | 0.9934 | 0.9953 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.6 | 0.1 | -0.7 | ---- | ---- |
| as left span | 4918 | 82.1 | 802.9 | 437.9 | 365.0 | 801.0 | 435.0 | 365.8 | 1.0024 | 1.0068 |
| | | | | | | | | Average Correction Factor | 0.9974 | 0.9992 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 803.7 ppb | NO = 799.8 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.0% |
| Previous Response | $NO_X$ = 803.4 ppb | NO = 801.2 ppb | | *Percent Change | NO = | -0.2% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 795.7 | 434.0 | 365.0 | 366.0 | 0.9972 | 100.3% |
| 2nd GPT point (200 ppb O3) | 795.7 | 613.5 | 185.5 | 187.2 | 0.9908 | 100.9% |
| 3rd GPT point (100 ppb O3) | 795.7 | 706.5 | 92.5 | 93.5 | 0.9891 | 101.1% |
| | | | | Average Correction Factor | 0.9924 | 100.8% |

Notes: Changed sample inlet filter after as founds. Adjusted span only. Used NO 2nd reference point because of drift.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

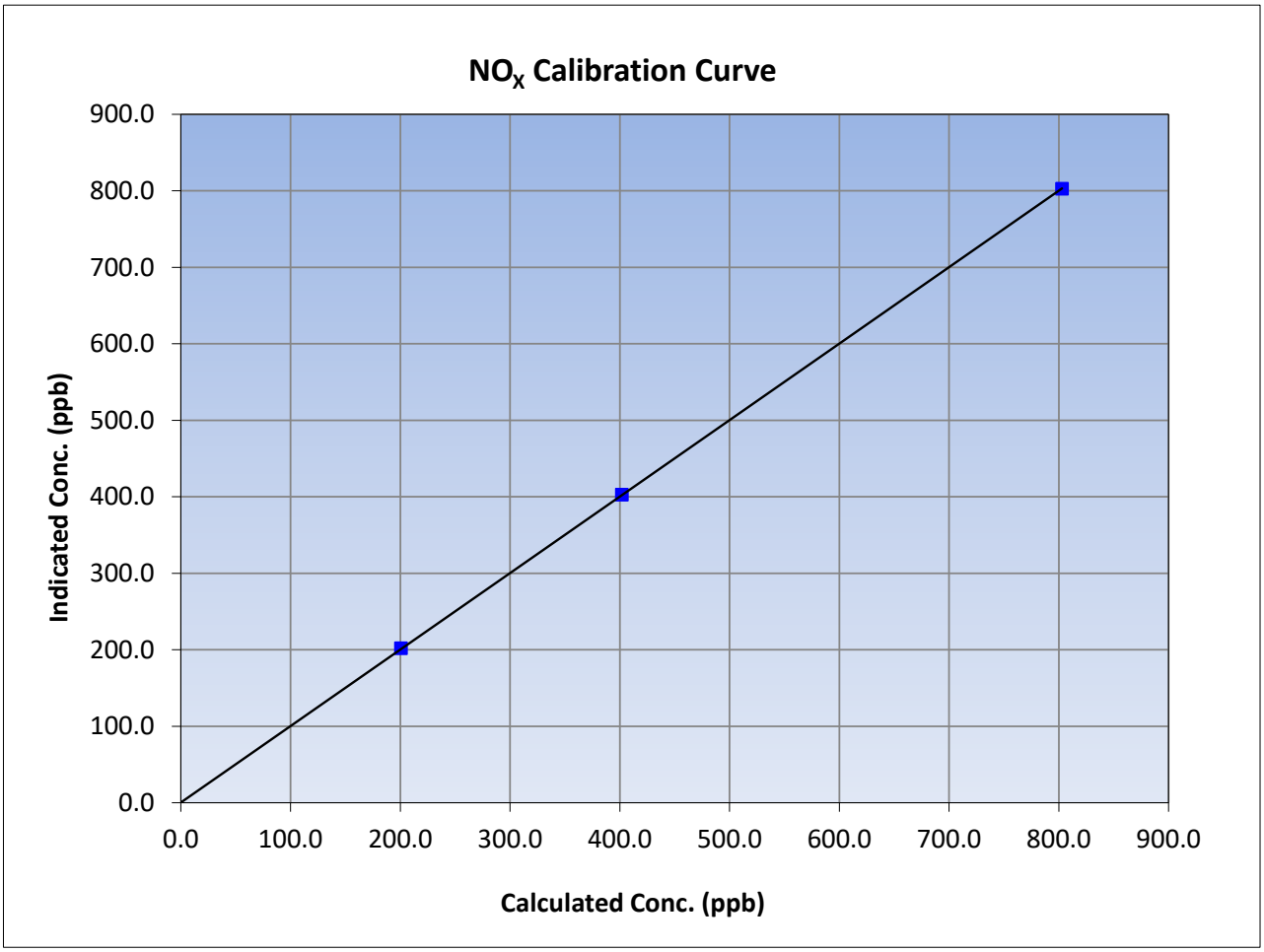
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 10:23 | End Time (MST): | 14:58 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1173480006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.7 | ---- | Correlation Coefficient | 0.999993 | *≥0.995* |
| 802.9 | 802.7 | 1.0003 | | | |
| 401.9 | 402.5 | 0.9986 | Slope | 0.999923 | *0.90 - 1.10* |
| 200.5 | 201.8 | 0.9934 | | | |
| | | | Intercept | 0.266541 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

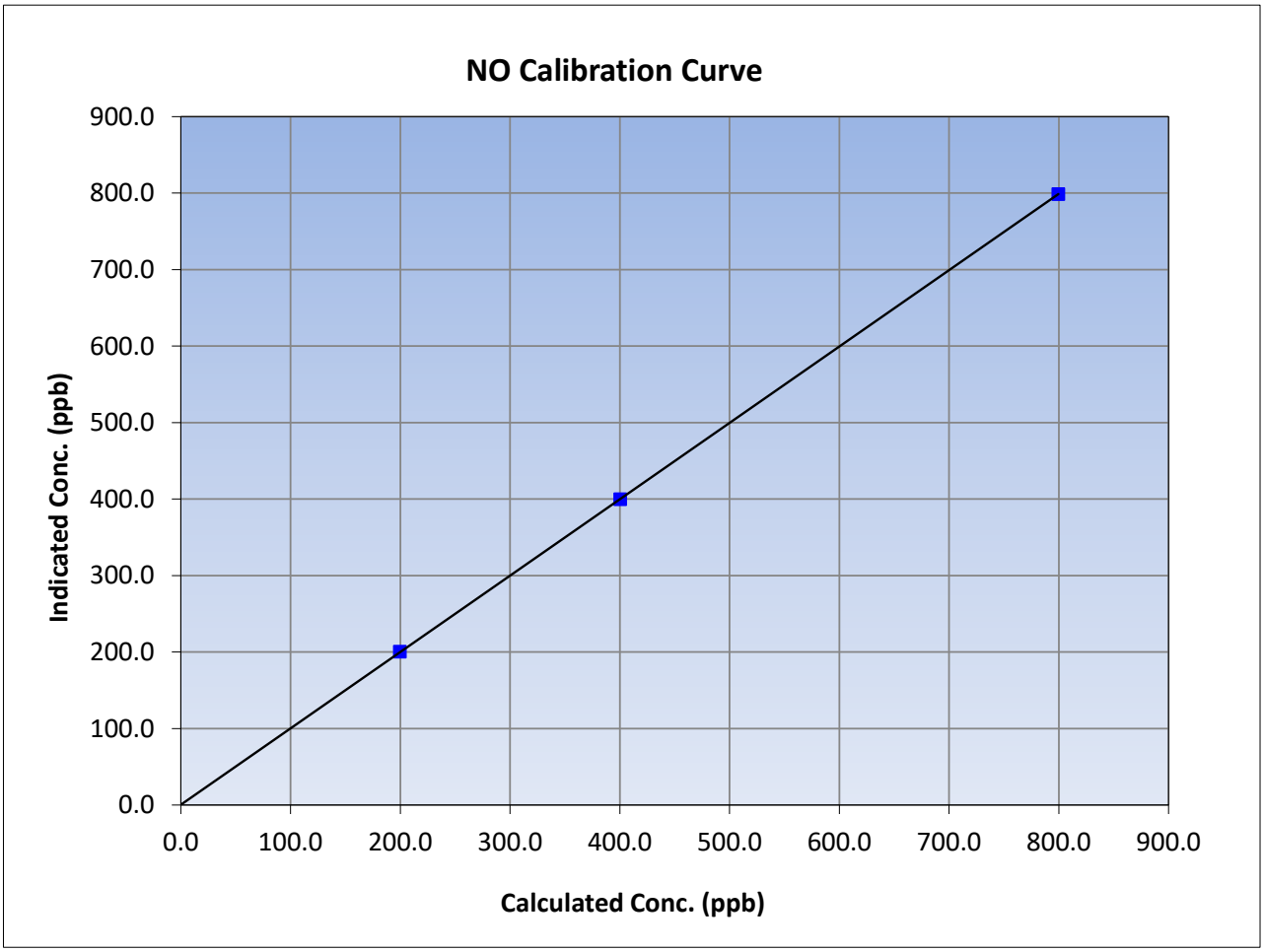
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 10:23 | End Time (MST): | 14:58 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1173480006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999997 | *≥0.995* |
| 799.6 | 798.7 | 1.0012 | | | |
| 400.3 | 399.8 | 1.0013 | Slope | 0.998413 | *0.90 - 1.10* |
| 199.7 | 200.6 | 0.9953 | | | |
| | | | Intercept | 0.406737 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

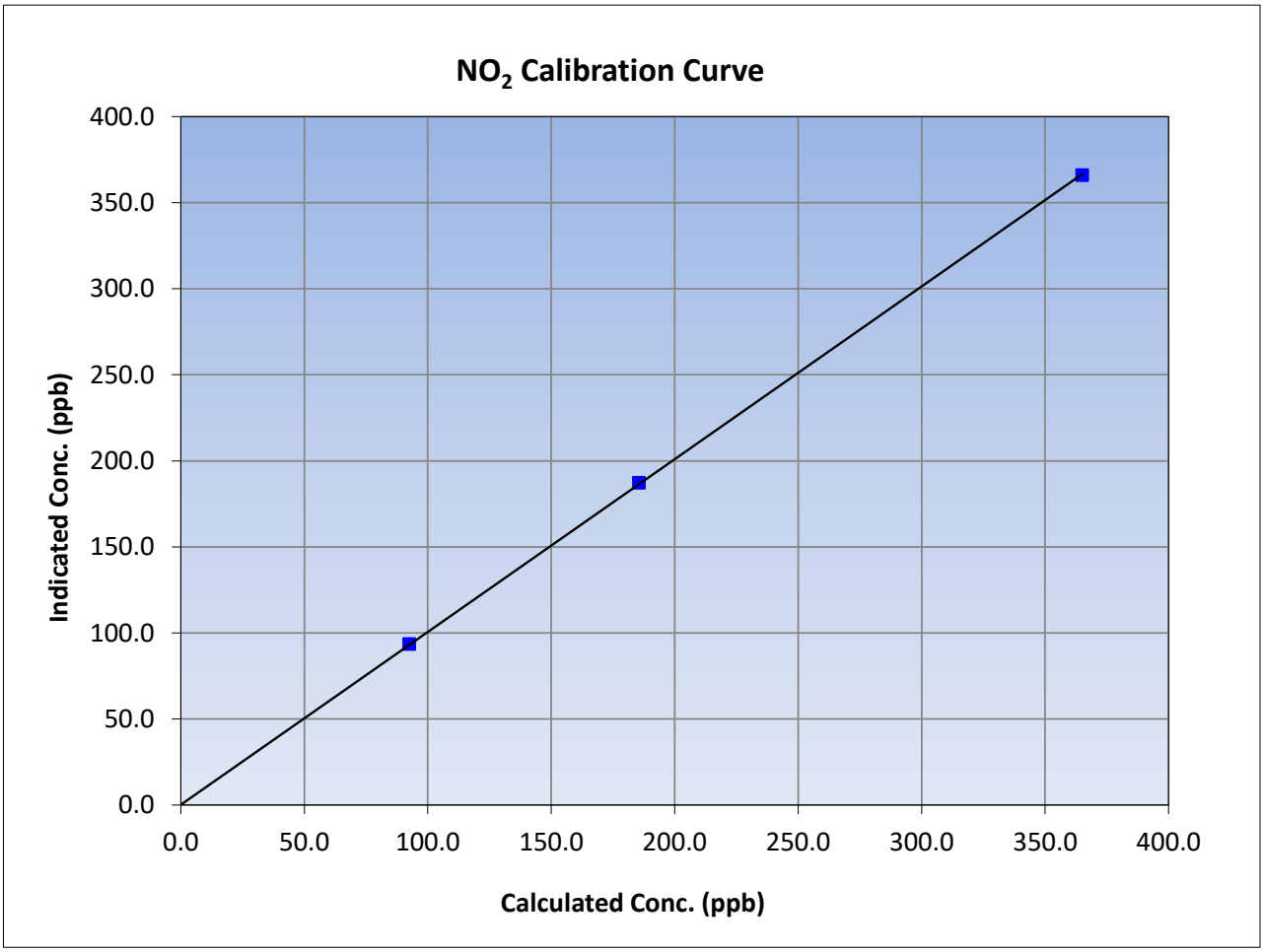
Version-04-2020

### Station Information

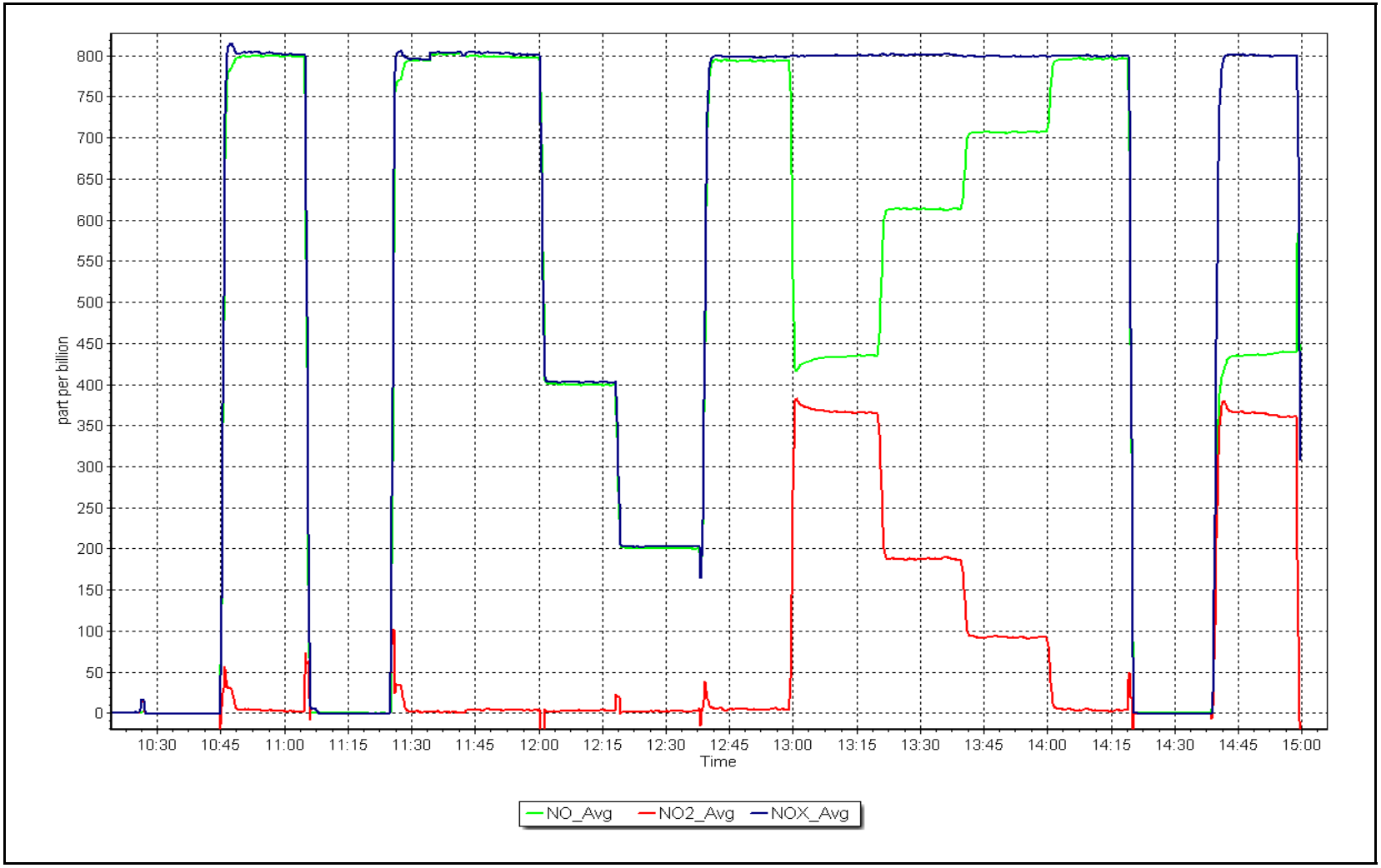
| | | | |
|---|---|---|---|
| Calibration Date: | February 13, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 10:23 | End Time (MST): | 14:58 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1173480006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.6 | ---- | Correlation Coefficient | 0.999975 | ≥0.995 |
| 365.0 | 366.0 | 0.9972 | | | |
| 185.5 | 187.2 | 0.9908 | Slope | 1.003805 | 0.90 - 1.10 |
| 92.5 | 93.5 | 0.9891 | | | |
| | | | Intercept | 0.175464 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 13, 2024 Location: Christina Lake



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS27
## JACKFISH 2/3

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Jackfish 2/3 | Station number: | AMS 27 |
| Calibration Date: | February 13, 2024 | Last Cal Date: | January 27, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 14:32 |
| Reason: | Removal | | |

### 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 Make/Model: | API T700 | | Serial Number: | 3811 |
| ZAG Make/Model: | API 701 | | Serial Number: | 268 |

### Analyzer Information

Analyzer make: Thermo 43iQ-TL  Analyzer serial #: 1203169745

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.001831 | | Backgd or Offset: | 2.4 | NA |
| Calibration intercept: | -0.817522 | | Coeff or Slope: | 0.774 | NA |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4921 | 79.1 | 800.2 | 797.5 | 1.003 |
| as found 2nd point | 4961 | 39.5 | 399.5 | 397.1 | 1.006 |
| as found 3rd point | 4980 | 19.8 | 200.3 | 194.6 | 1.029 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |

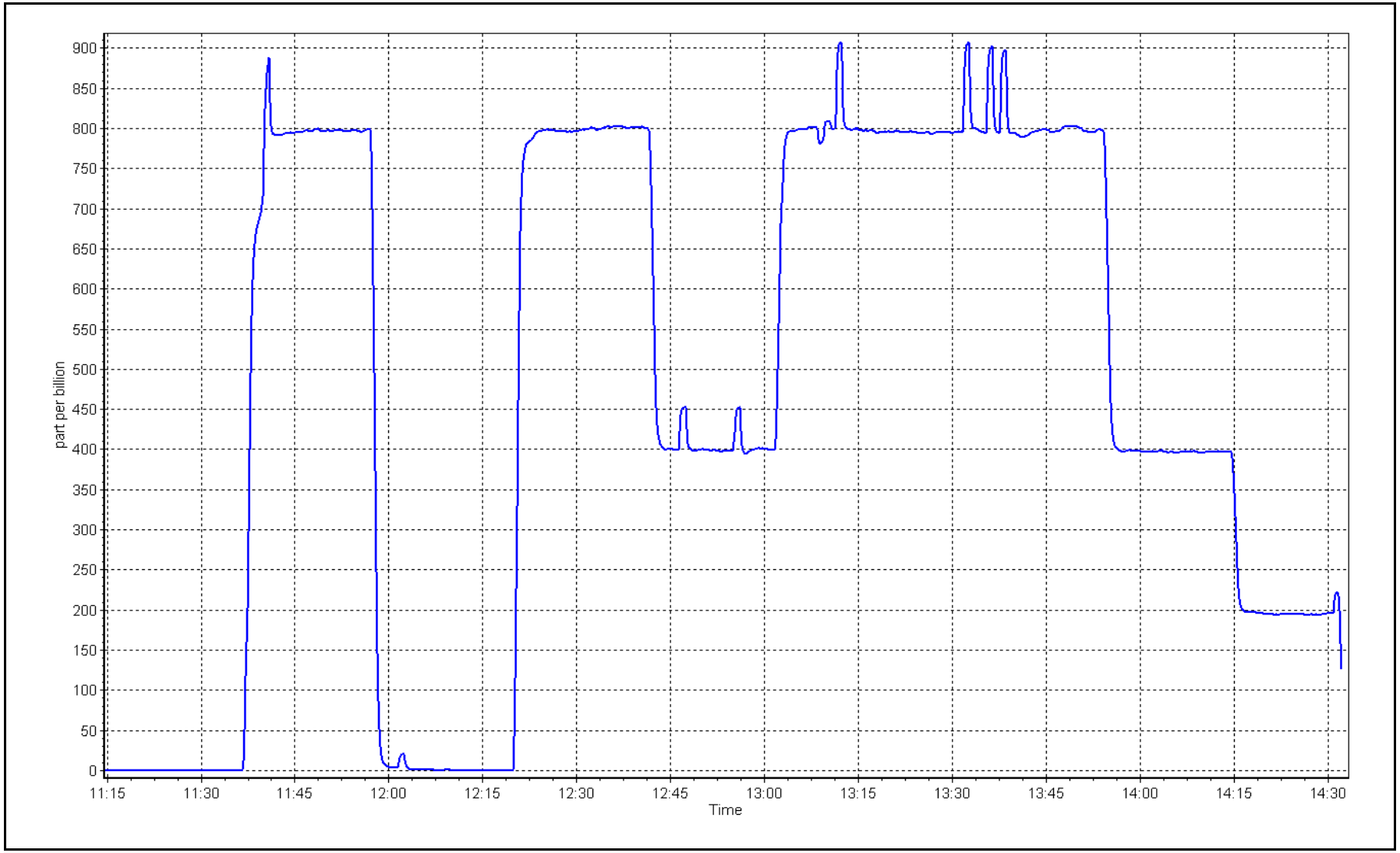
| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 797.50 | Previous response | 800.81 | *% change | -0.4% |
| Baseline Corr 2nd AF pt: | 397.10 | AF Slope: | 0.998674 | AF Intercept: | -2.237394 |
| Baseline Corr 3rd AF pt: | 194.60 | AF Correlation: | 0.999955 | | |

* = > +/-5% change initiates investigation

Notes: Removal calibration only.

Calibration Performed By: Mohammed Kashif

**SO2 Calibration Plot** Date: February 13, 2024 Location: Jackfish 2/3



# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Jackfish 2/3 | Station number: | AMS 27 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | NA |
| Start time (MST): | 11:45 | End time (MST): | 14:25 |
| Reason: | Install | | |

### 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 Make/Model: | API T700 | | Serial Number: | 3811 |
| ZAG Make/Model: | API 701 | | Serial Number: | 268 |

### Analyzer Information

Analyzer make: Thermo 43iQ-TL  Analyzer serial #: 12124313138

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | NA | 1.006935 | Backgd or Offset: | NA | 8.4 |
| Calibration intercept: | NA | -2.579017 | Coeff or Slope: | NA | 0.960 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4921 | 79.1 | 800.2 | 804.7 | 0.994 |
| second point | 4961 | 39.5 | 399.5 | 397.6 | 1.005 |
| third point | 4980 | 19.8 | 200.3 | 197.1 | 1.016 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4921 | 79.1 | 800.2 | 803.1 | 0.996 |
| | | | | Average Correction Factor | 1.005 |

| | | | | | |
|---|---|---|---|---|---|
| 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

Notes: Installation calibration. Adjusted zero and span.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

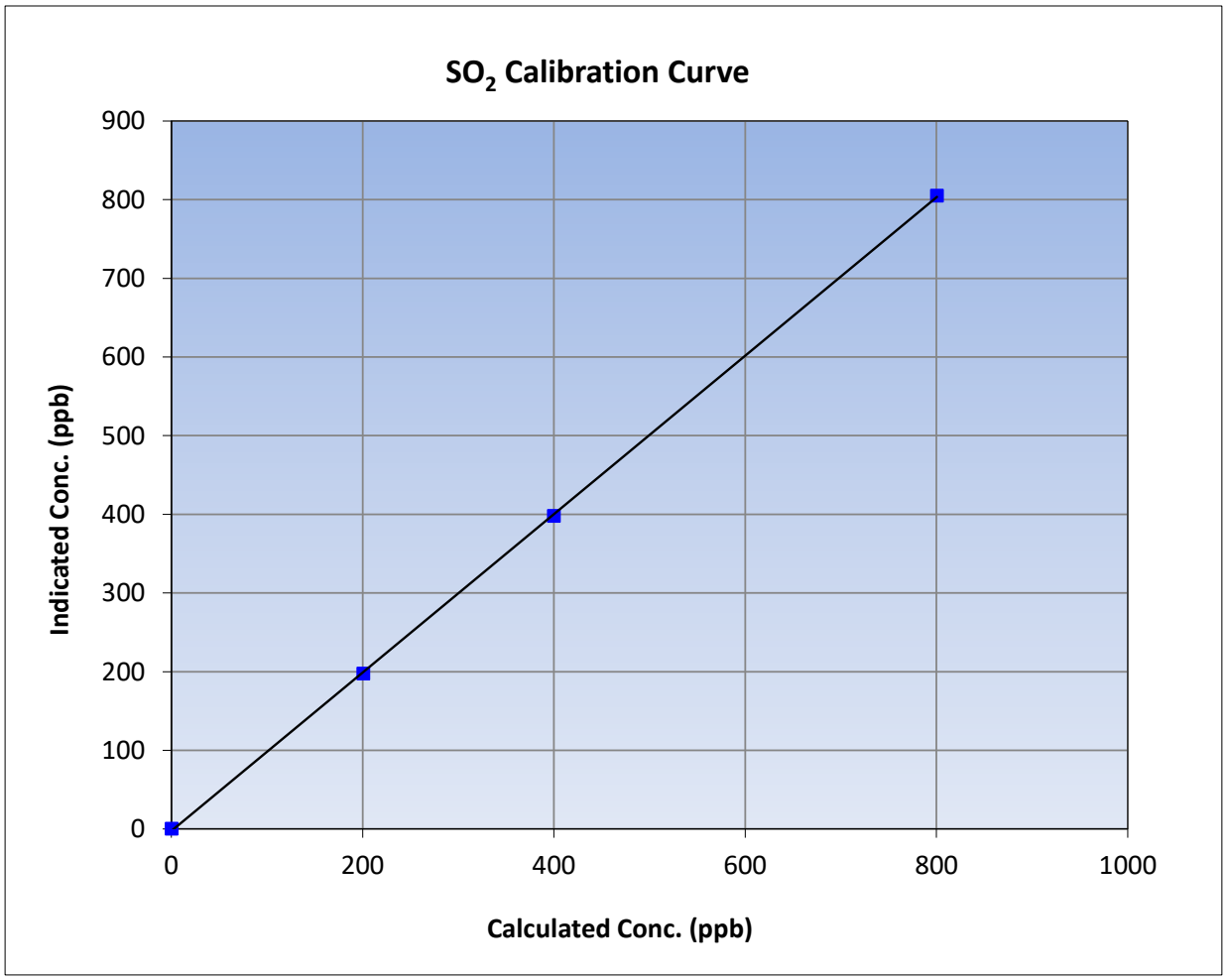
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | NA |
| Station Name: | Jackfish 2/3 | Station Number: | AMS 27 |
| Start Time (MST): | 11:45 | End Time (MST): | 14:25 |
| Analyzer make: | Thermo 43iQ-TL | Analyzer serial #: | 12124313138 |

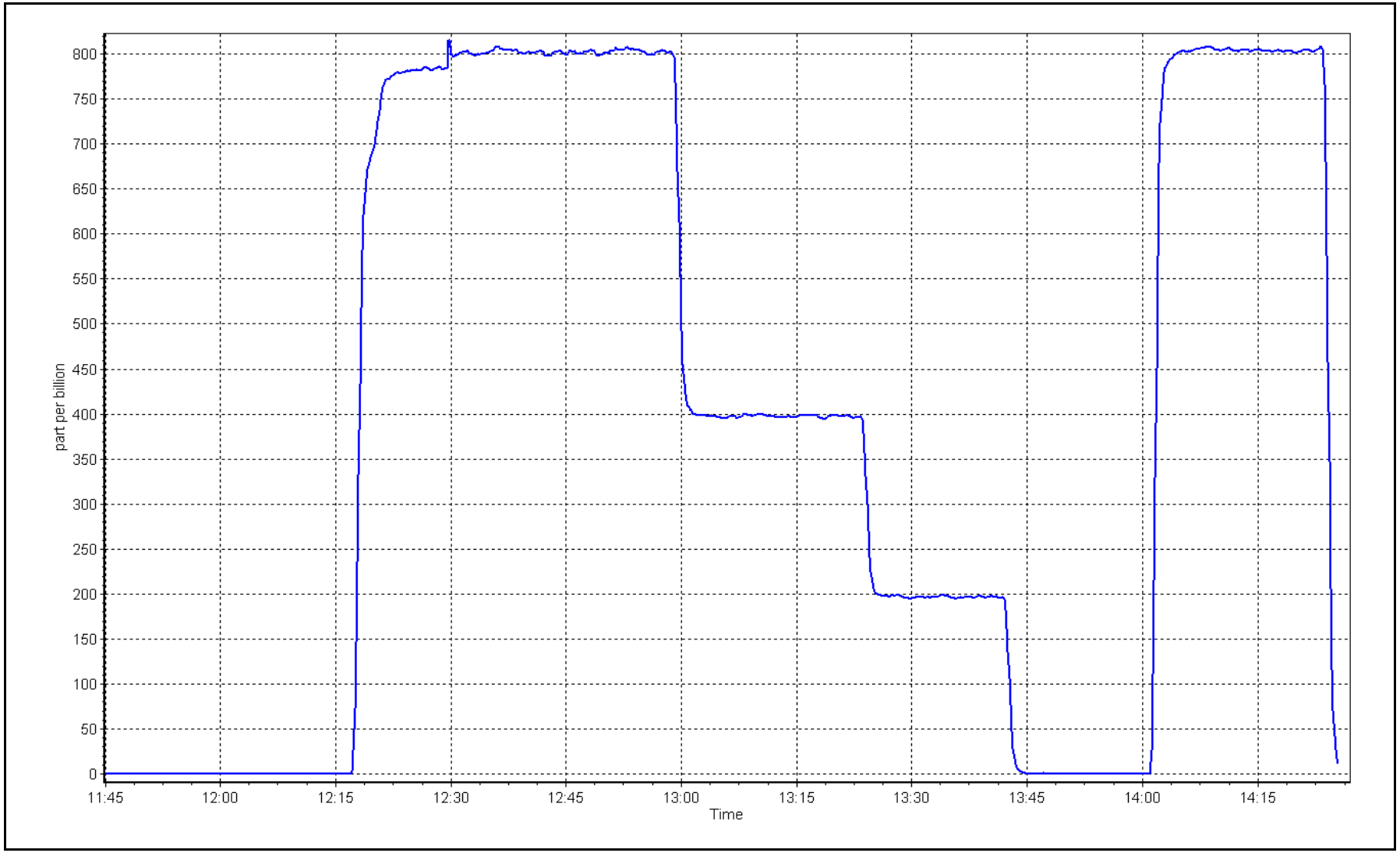
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 800.2 | 804.7 | 0.9944 |
| 399.5 | 397.6 | 1.0049 |
| 200.3 | 197.1 | 1.0163 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999950 | *≥0.995* |
| Slope | 1.006935 | *0.90 - 1.10* |
| Intercept | -2.579017 | *+/-30* |



**SO2 Calibration Plot** Date: February 14, 2024 Location: Jackfish 2/3



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Jackfish 2/3 | Station number: | AMS27 |
| Calibration Date: | February 22, 2024 | Last Cal Date: | January 12, 2024 |
| Start time (MST): | 9:47 | End time (MST): | 14:32 |
| 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: | | | Converter serial #: | |
| Analyzer Range | 0 - 100 ppb | | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.010462 | 1.013890 | Backgd or Offset: | 29.9 | 29.9 |
| Calibration intercept: | 0.002360 | -0.217825 | Coeff or Slope: | 1.013 | 0.965 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as found span | 4926 | 74.1 | 80.2 | 86.5 | 0.928 |
| as found 2nd point | 4963 | 37.0 | 40.0 | 43.1 | 0.931 |
| as found 3rd point | 4982 | 18.5 | 20.0 | 20.8 | 0.967 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4926 | 74.1 | 80.2 | 81.3 | 0.986 |
| second point | 4963 | 37.0 | 40.0 | 40.1 | 0.998 |
| third point | 4982 | 18.5 | 20.0 | 19.7 | 1.016 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4926 | 74.1 | 80.2 | 81.3 | 0.986 |
| SO2 Scrubber Check | 4921 | 79.1 | 791.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.000 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 86.4 | Prev response: | 81.02 | *% change: | 6.2% |
| Baseline Corr 2nd AF pt: | 43.0 | AF Slope: | 1.081165 | AF Intercept: | -0.276196 |
| Baseline Corr 3rd AF pt: | 20.7 | AF Correlation: | 0.999884 | | |

* = > +/-5% change initiates investigation

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

## $H_2S$ Calibration Summary

Version-11-2021

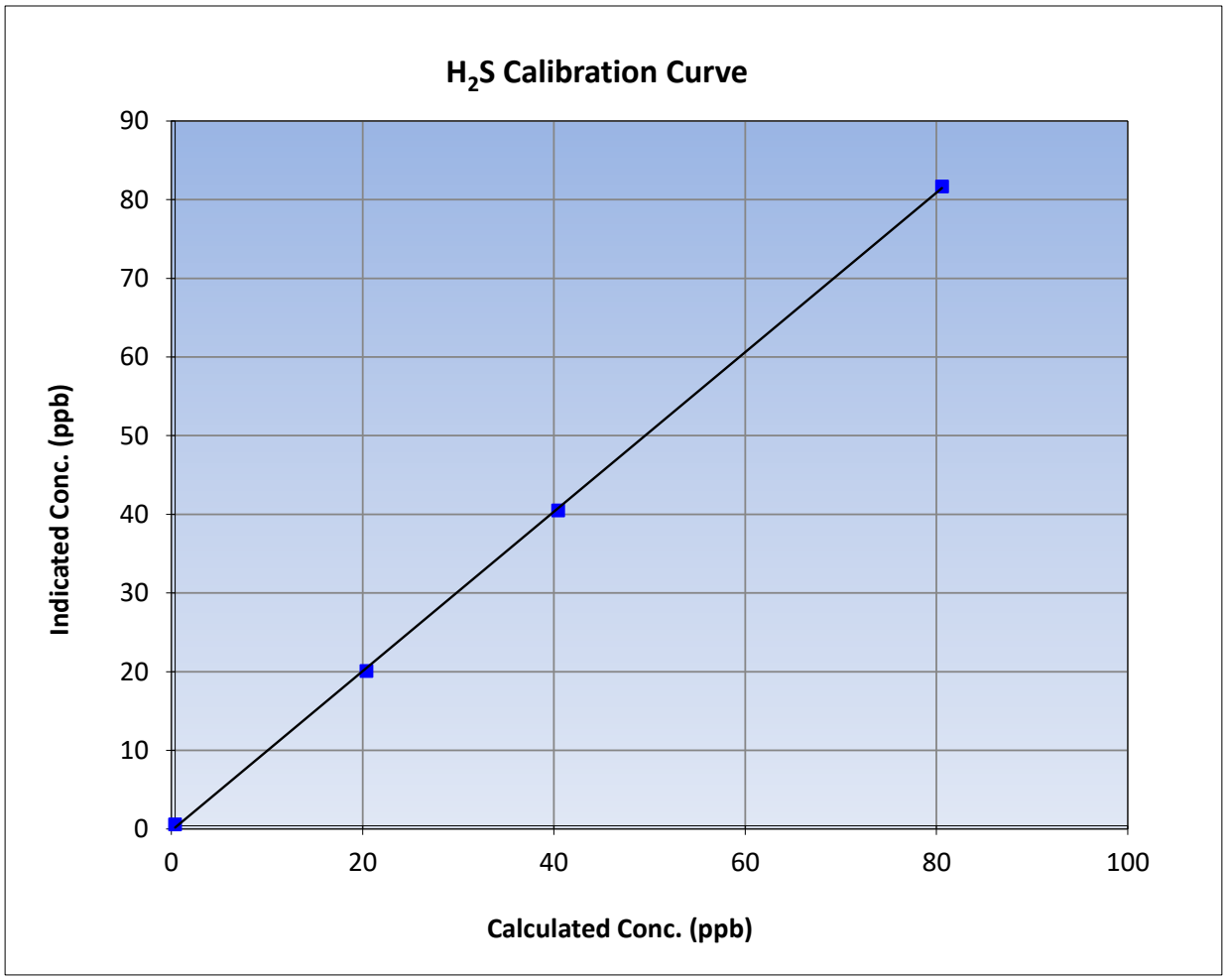
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 12, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 9:47 | End Time (MST): | 14:32 |
| Analyzer make: | API T101 | Analyzer serial #: | 621 |

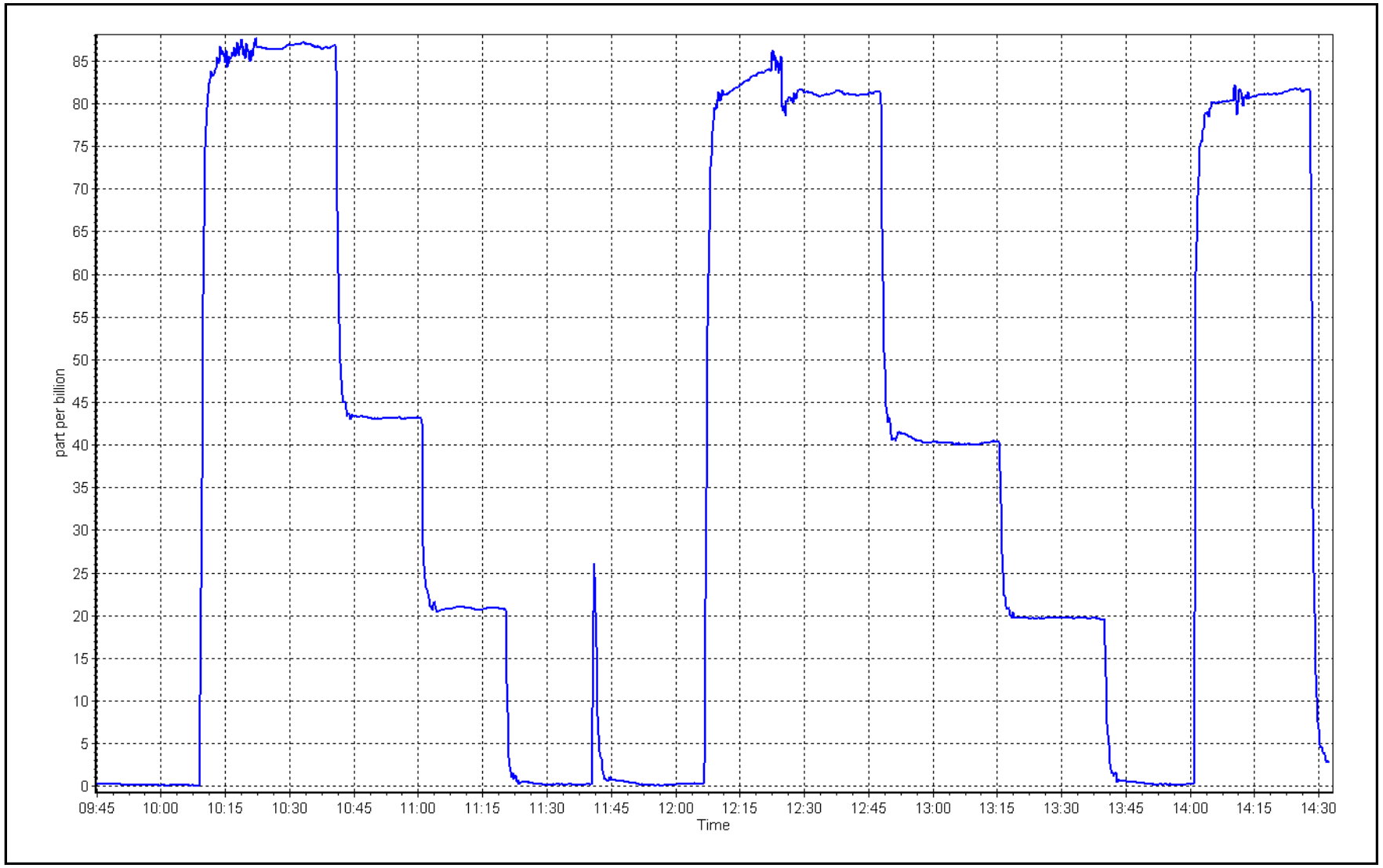
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.2 | 81.3 | 0.9862 |
| 40.0 | 40.1 | 0.9984 |
| 20.0 | 19.7 | 1.0160 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999878 | *≥0.995* |
| Slope | 1.013890 | *0.90 - 1.10* |
| Intercept | -0.217825 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 22, 2024 Location: Jackfish 2/3



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Jackfish 2/3 | Station number: | AMS27 |
| Calibration Date: | February 22, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 14:32 | End time (MST): | 19:34 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | T2Y1P35 | | Cal Gas Expiry Date: | December 11, 2023 | |
| NOX Cal Gas Conc: | 51.44 | ppm | NO Cal Gas Conc: | 50.40 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 51.44 | ppm | Removed Gas NO Conc: | 50.40 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 3811 | |
| ZAG make/model: | API T701 | | Serial Number: | 268 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | API T200 | | Analyzer serial #: | 722 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.193 | 1.227 | NO bkgnd or offset: | 0.3 | 0.3 |
| NOX coeff or slope: | 1.169 | 1.207 | NOX bkgnd or offset: | 1.2 | 1.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 3.2 | 3.1 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.992430 | 1.006157 |
| $NO_X$ Cal Offset: | -3.538303 | -3.917080 |
| NO Cal Slope: | 0.998816 | 1.005101 |
| NO Cal Offset: | -3.680579 | -3.480285 |
| $NO_2$ Cal Slope: | 0.979539 | 0.998557 |
| $NO_2$ Cal Offset: | -1.570350 | 0.165718 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| as found span | 4921 | 79.4 | 816.8 | 800.3 | 16.5 | 794.2 | 777.7 | 16.5 | 1.0285 | 1.0290 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | -0.4 | ---- | ---- |
| high point | 4921 | 79.4 | 816.8 | 800.3 | 16.5 | 819.0 | 802.6 | 16.4 | 0.9973 | 0.9971 |
| second point | 4960 | 39.7 | 408.5 | 400.2 | 8.3 | 407.7 | 397.5 | 10.2 | 1.0019 | 1.0068 |
| third point | 4980 | 19.8 | 203.7 | 199.6 | 4.1 | 195.4 | 192.8 | 2.6 | 1.0425 | 1.0352 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.7 | 1.9 | ---- | ---- |
| as left span | 4921 | 79.4 | 816.8 | 414.8 | 404.9 | 818.3 | 416.3 | 402.0 | 0.9982 | 0.9964 |
| | | | | | | | | Average Correction Factor | 1.0139 | 1.0130 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 794.1 ppb | NO = 777.7 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = -1.6% | | |
| Previous Response | $NO_X$ = 807.1 ppb | NO = 795.7 ppb | | *Percent Change | NO = -2.3% | | |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 800.9 | 412.5 | 404.9 | 404.1 | 1.0020 | 99.8% |
| 2nd GPT point (200 ppb O3) | 800.9 | 625.4 | 192.0 | 192.6 | 0.9970 | 100.3% |
| 3rd GPT point (100 ppb O3) | 800.9 | 718.1 | 99.3 | 99.6 | 0.9971 | 100.3% |
| | | | | Average Correction Factor | 0.9987 | 100.1% |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

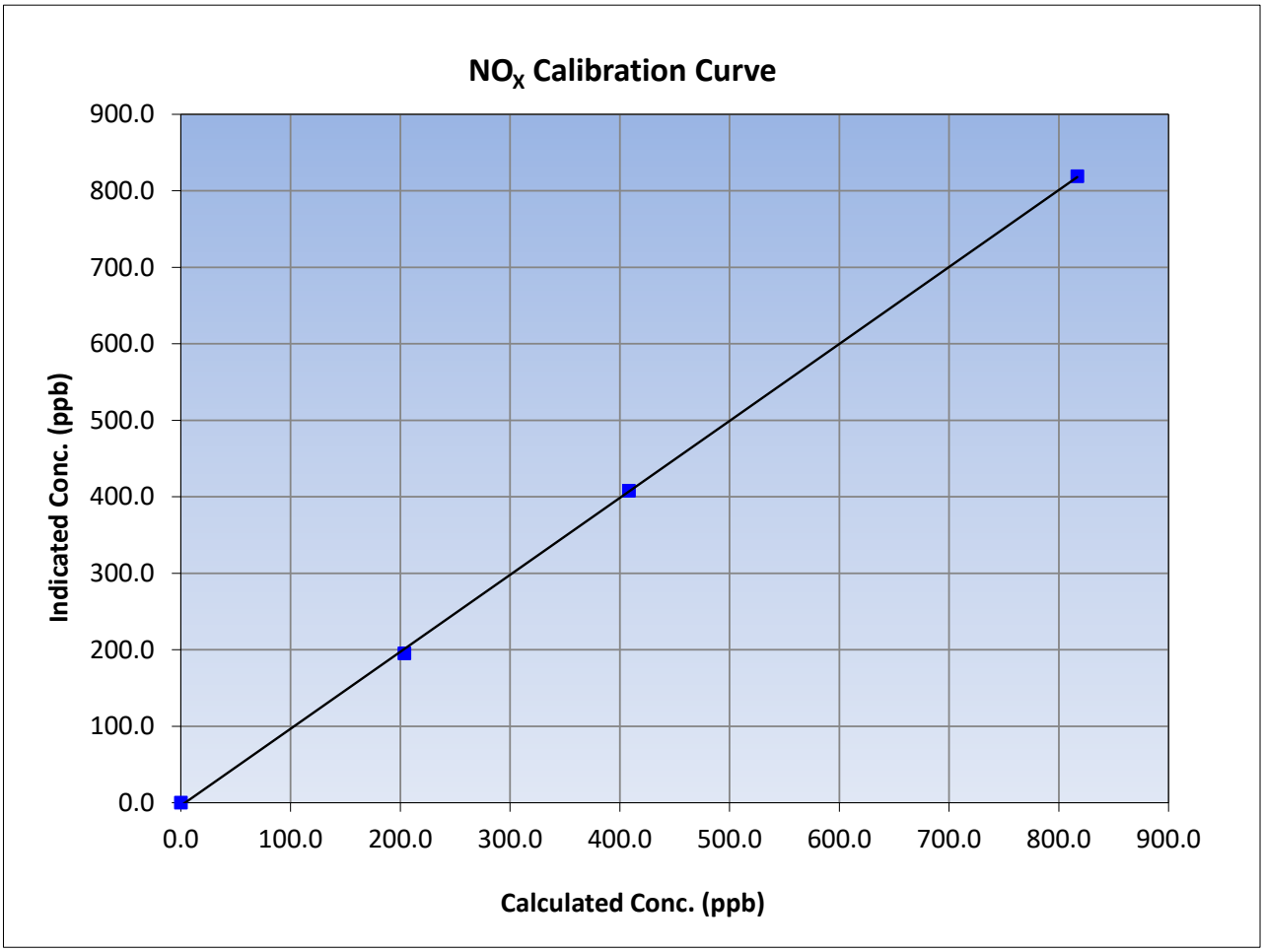
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 14:32 | End Time (MST): | 19:34 |
| Analyzer make: | API T200 | Analyzer serial #: | 722 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999868 | ≥0.995 |
| 816.8 | 819.0 | 0.9973 | | | |
| 408.5 | 407.7 | 1.0019 | Slope | 1.006157 | 0.90 - 1.10 |
| 203.7 | 195.4 | 1.0425 | | | |
| | | | Intercept | -3.917080 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

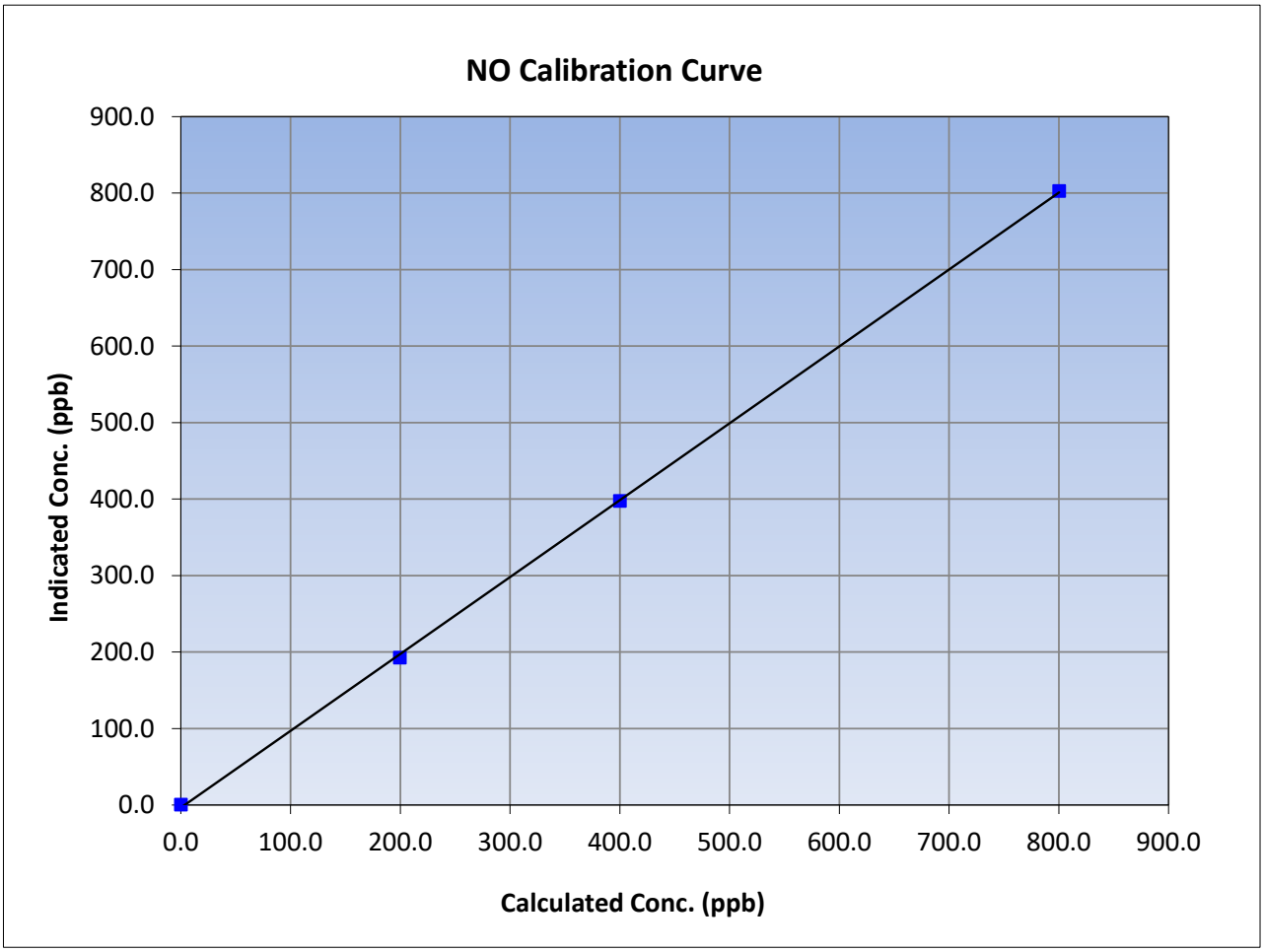
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 14:32 | End Time (MST): | 19:34 |
| Analyzer make: | API T200 | Analyzer serial #: | 722 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.4 | ---- | Correlation Coefficient | 0.999892 | ≥0.995 |
| 800.3 | 802.6 | 0.9971 | | | |
| 400.2 | 397.5 | 1.0068 | Slope | 1.005101 | 0.90 - 1.10 |
| 199.6 | 192.8 | 1.0352 | | | |
| | | | Intercept | -3.480285 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

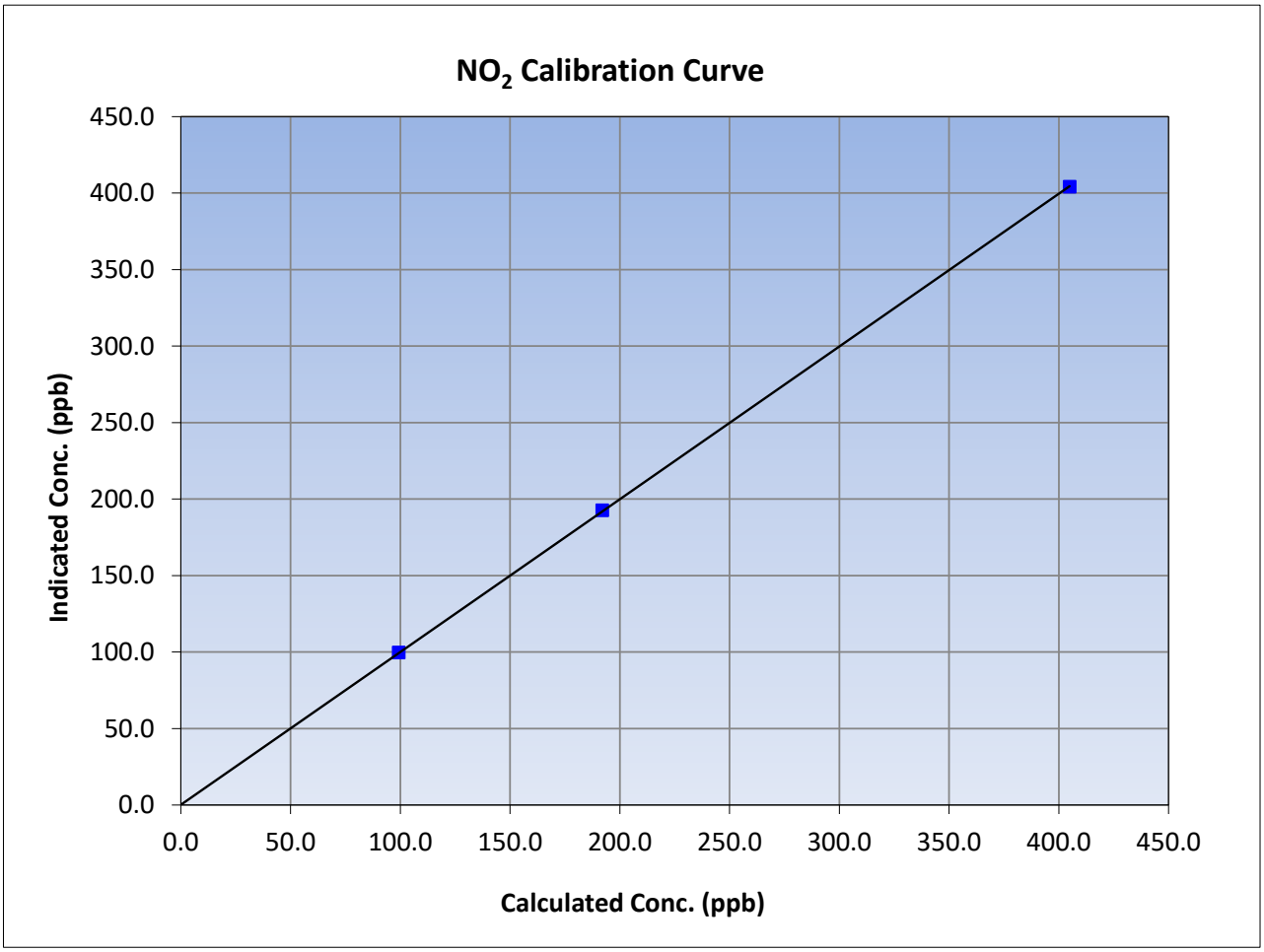
Version-04-2020

### Station Information

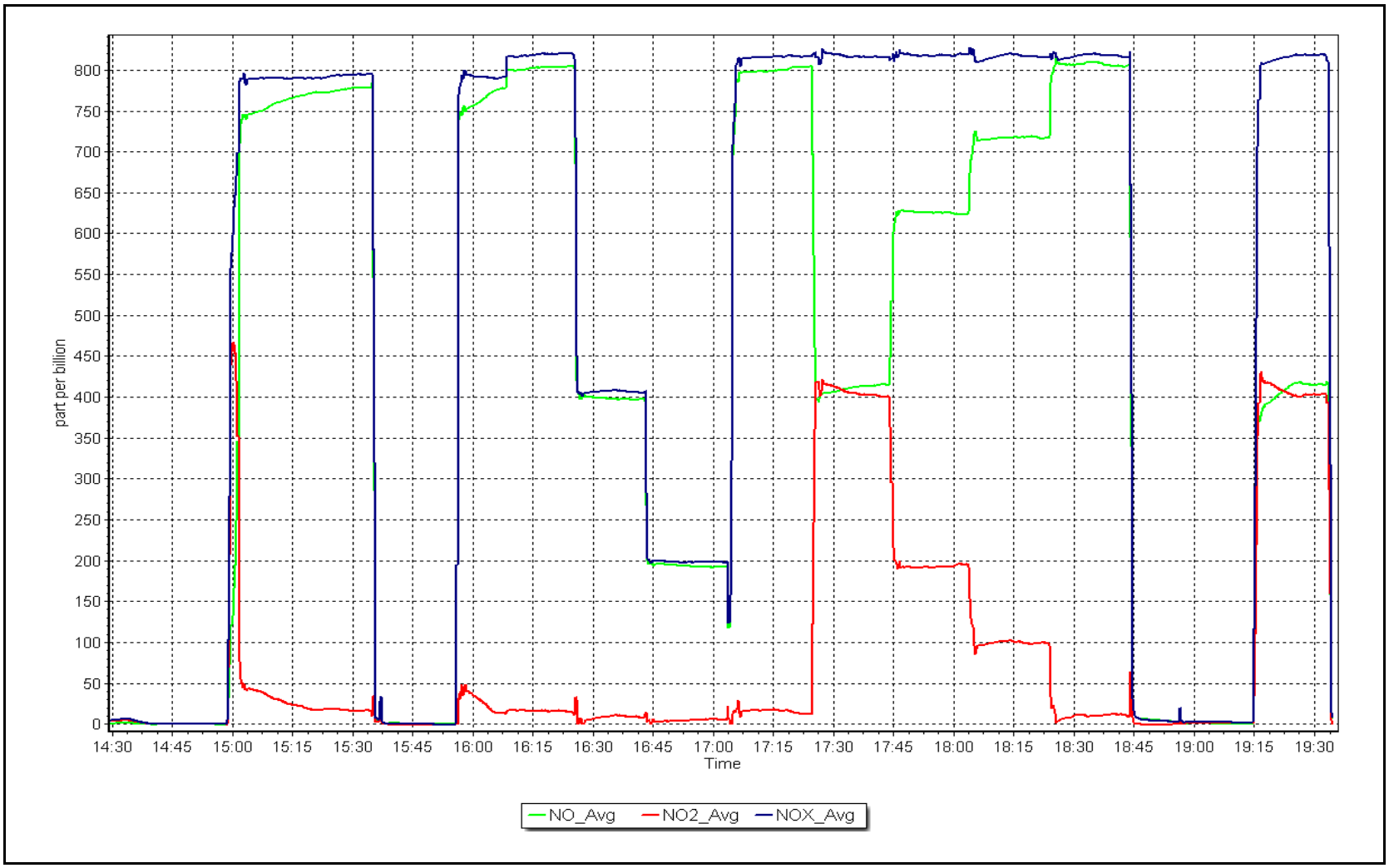
| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 14:32 | End Time (MST): | 19:34 |
| Analyzer make: | API T200 | Analyzer serial #: | 722 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.4 | ---- | Correlation Coefficient | 0.999988 | ≥0.995 |
| 404.9 | 404.1 | 1.0020 | | | |
| 192.0 | 192.6 | 0.9970 | Slope | 0.998557 | 0.90 - 1.10 |
| 99.3 | 99.6 | 0.9971 | | | |
| | | | Intercept | 0.165718 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 22, 2024 Location: Jackfish 2/3



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS29
## SURMONT 2

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station number: | AMS29 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 11:39 | End time (MST): | 15:12 |
| 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 Make/Model: | Teledyne API T700 | | Serial Number: | 5472 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4297 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1170050150

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.001159 | 0.998273 | Backgd or Offset: | 13.5 | 12.9 |
| Calibration intercept: | -1.385825 | -1.525570 | Coeff or Slope: | 0.976 | 0.939 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4919 | 81.3 | 800.1 | 831.0 | 0.963 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4919 | 81.3 | 800.1 | 798.0 | 1.003 |
| second point | 4959 | 40.7 | 400.6 | 397.7 | 1.007 |
| third point | 4979 | 20.3 | 199.8 | 196.1 | 1.019 |
| as left zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| as left span | 4919 | 81.3 | 800.1 | 803.0 | 0.996 |
| | | | | Average Correction Factor | 1.010 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 831.10 | Previous response | 799.65 | *% change | 3.8% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

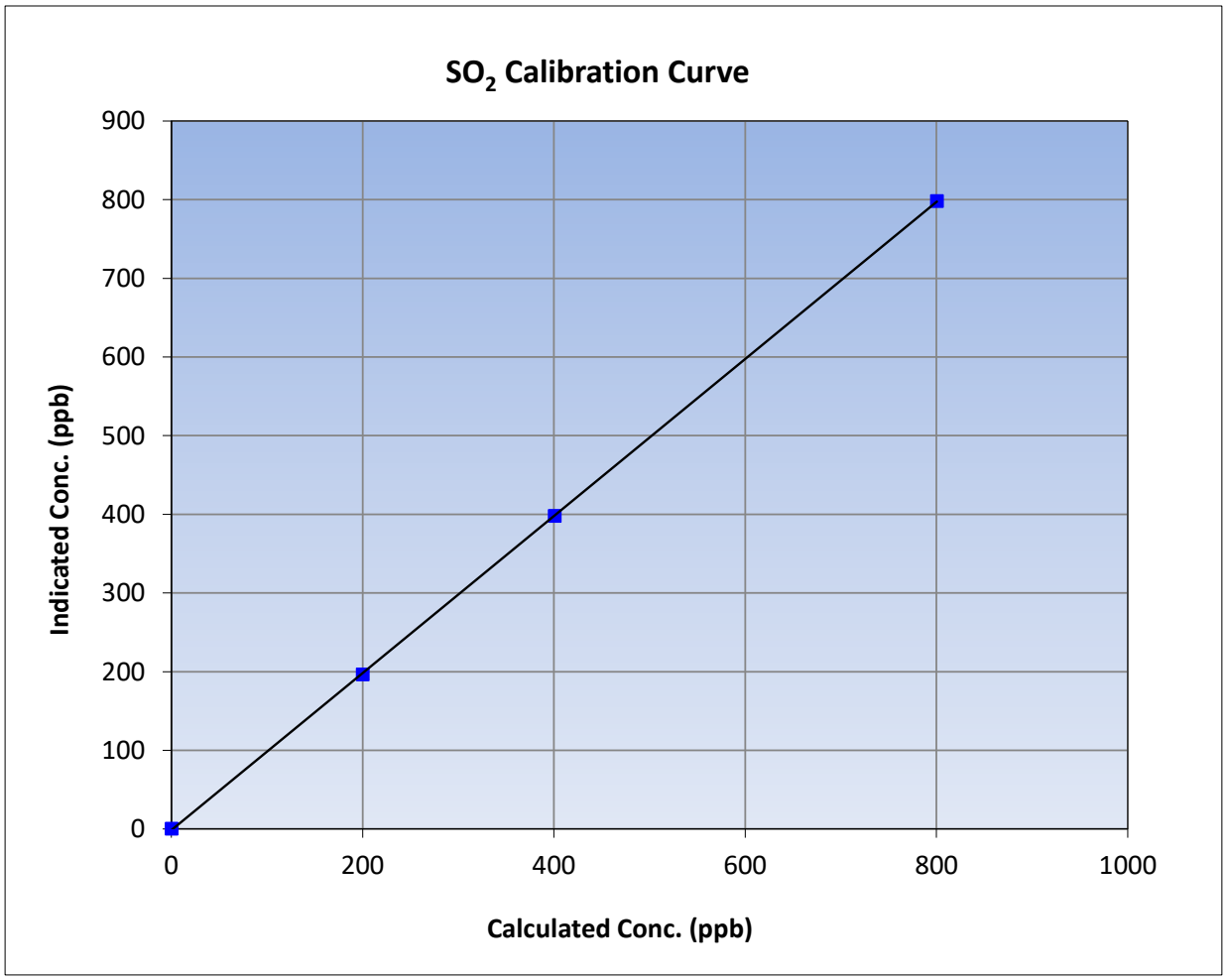
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:39 | End Time (MST): | 15:12 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1170050150 |

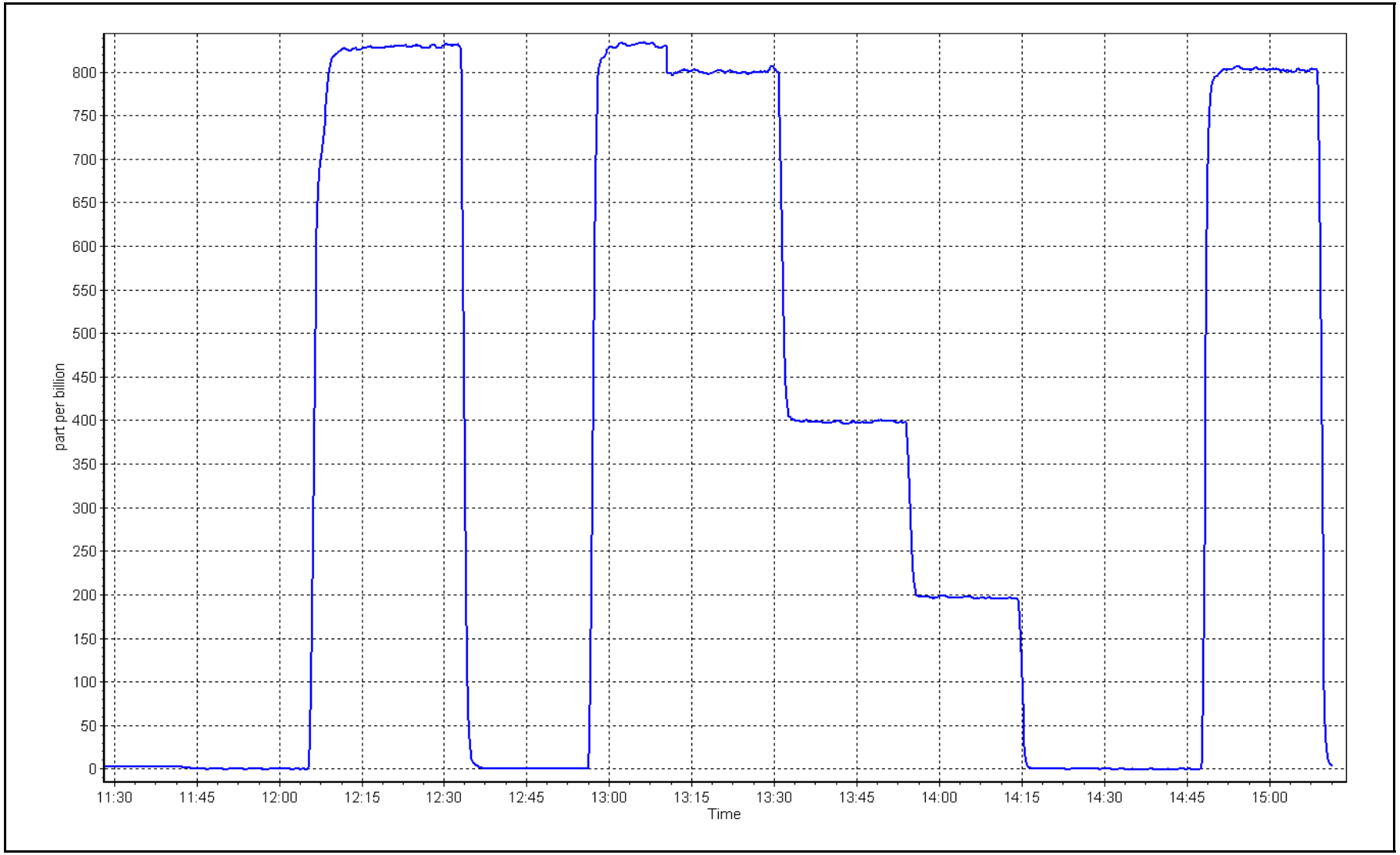
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 800.1 | 798.0 | 1.0026 |
| 400.6 | 397.7 | 1.0073 |
| 199.8 | 196.1 | 1.0190 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999979 | *≥0.995* |
| Slope | 0.998273 | *0.90 - 1.10* |
| Intercept | -1.525570 | *+/-30* |



**SO2 Calibration Plot** Date: February 5, 2024 Location: Surmont 2



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station number: | AMS29 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 10:53 | End time (MST): | 15:22 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.391 | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #: | CC508338 | | | |
| Removed Cal Gas Conc: | 5.391 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | CC508338 | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5472 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4297 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43iQ-TLE | | Analyzer serial #: | 1200326170 | |
| Converter make: | Global | | Converter serial #: | 2022-220 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.004616 | 1.004326 | Backgd or Offset: | 0.92 | 0.92 |
| Calibration intercept: | -0.102938 | -0.142791 | Coeff or Slope: | 1.074 | 1.074 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4926 | 74.2 | 80.0 | 80.8 | 0.989 |
| as found 2nd point | 4963 | 37.2 | 40.1 | 40.1 | 0.998 |
| as found 3rd point | 4982 | 18.6 | 20.1 | 19.9 | 1.003 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4926 | 74.2 | 80.0 | 80.3 | 0.996 |
| second point | 4963 | 37.2 | 40.1 | 40.0 | 1.003 |
| third point | 4982 | 18.6 | 20.1 | 19.9 | 1.008 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4926 | 74.2 | 80.0 | 80.2 | 0.998 |
| SO2 Scrubber Check | 4919 | 81.3 | 813.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.002 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.9 | Prev response: | 80.27 | *% change: | 0.8% |
| Baseline Corr 2nd AF pt: | 40.2 | AF Slope: | 1.011896 | AF Intercept: | -0.283041 |
| Baseline Corr 3rd AF pt: | 20.0 | AF Correlation: | 0.999971 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. No adjustments made. Scrubber check done after cal zero, passed.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

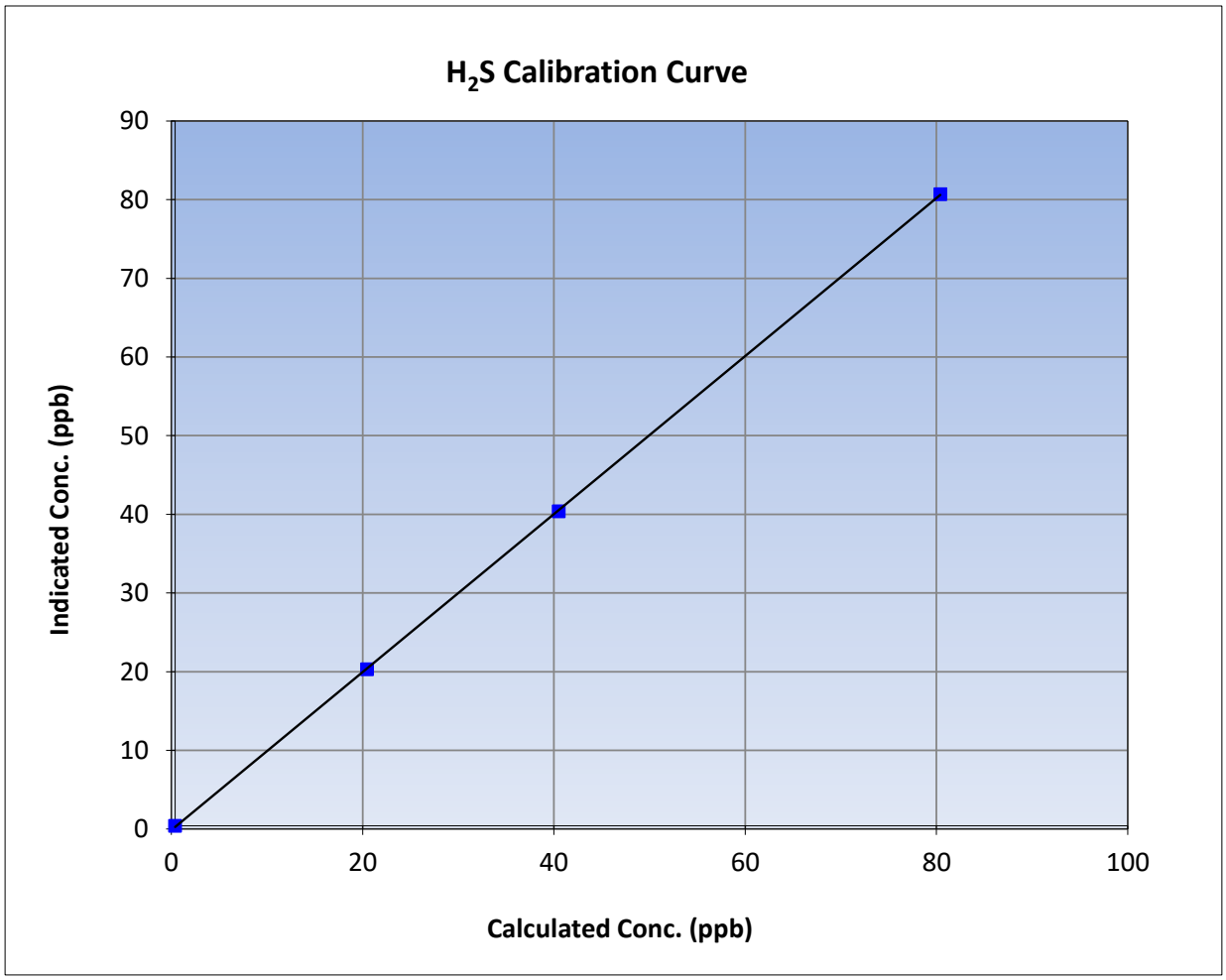
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 12, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 10:53 | End Time (MST): | 15:22 |
| Analyzer make: | Thermo 43iQ-TLE | Analyzer serial #: | 1200326170 |

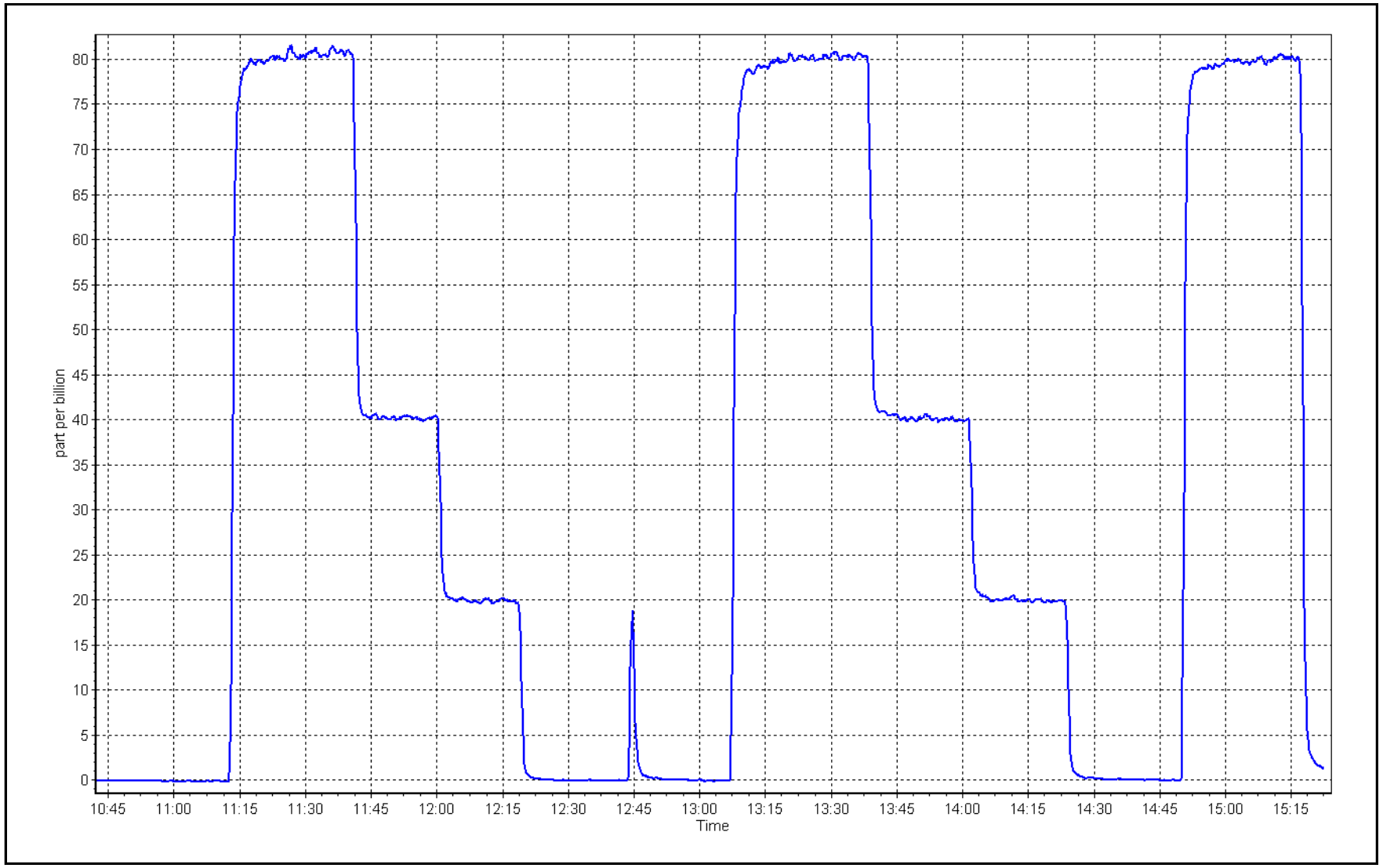
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.3 | 0.9963 |
| 40.1 | 40.0 | 1.0027 |
| 20.1 | 19.9 | 1.0077 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999984 | *≥0.995* |
| Slope | 1.004326 | *0.90 - 1.10* |
| Intercept | -0.142791 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 12, 2024 Location: Surmont 2



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station number: | AMS29 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 5, 2024 |
| Start time (MST): | 11:39 | End time (MST): | 15:12 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | CC356008 | | Cal Gas Expiry Date: | February 23, 2025 | |
| CH4 Cal Gas Conc. | 499.0 | ppm | CH4 Equiv Conc. | 1064.7 | ppm |
| C3H8 Cal Gas Conc. | 205.7 | ppm | | | |
| Removed Gas Cert: | NA | | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 499.0 | ppm | CH4 Equiv Conc. | 1064.7 | ppm |
| Removed C3H8 Conc. | 205.7 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5472 | |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4297 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1170050149 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.001735 | 1.003467 | Background: | 3.62 | 3.62 |
| Calibration intercept: | -0.005651 | -0.070017 | Coefficient: | 4.021 | 4.021 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | -0.03 | ---- |
| as found span | 4918 | 81.3 | 17.31 | 17.32 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | -0.07 | ---- |
| high point | 4918 | 81.3 | 17.31 | 17.30 | 1.001 |
| second point | 4959 | 40.6 | 8.65 | 8.62 | 1.003 |
| third point | 4979 | 20.3 | 4.32 | 4.26 | 1.016 |
| as left zero | 5000 | 0.0 | 0.00 | -0.08 | ---- |
| as left span | 4918 | 81.3 | 17.31 | 17.37 | 0.997 |
| | | | | Average Correction Factor | 1.007 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.35 | Previous response | 17.34 | *% 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

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

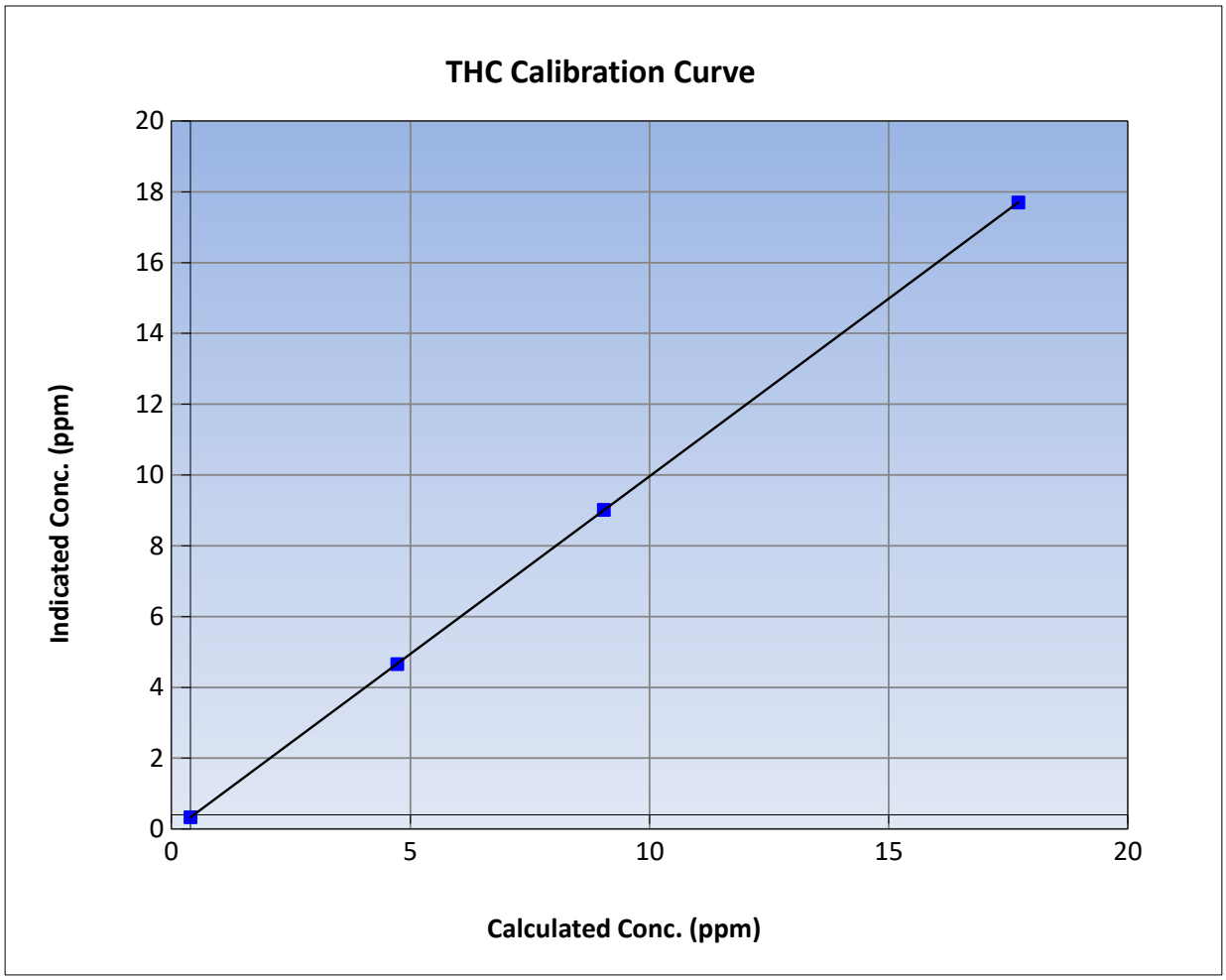
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 5, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:39 | End Time (MST): | 15:12 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1170050149 |

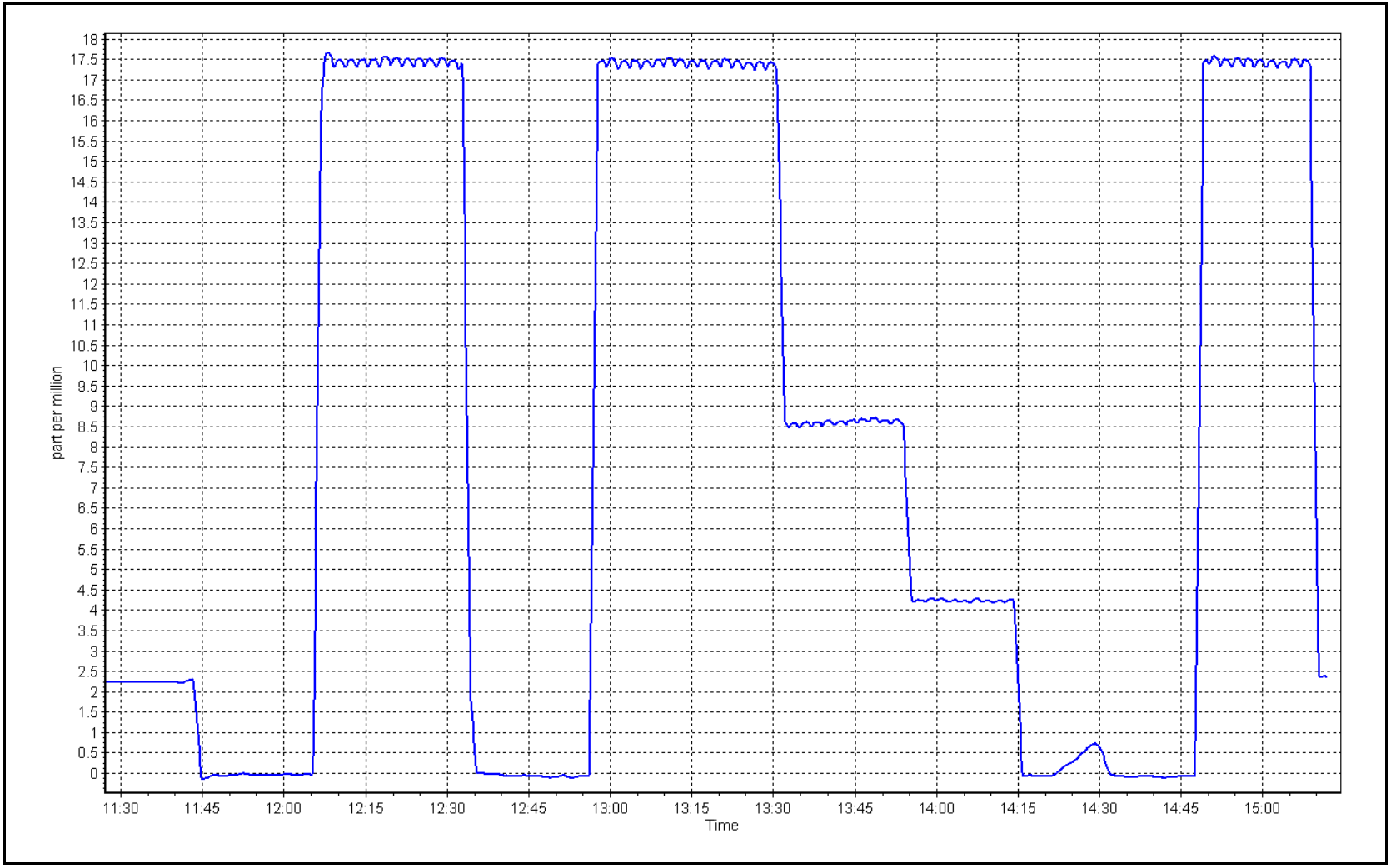
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.07 | ---- |
| 17.31 | 17.30 | 1.0008 |
| 8.65 | 8.62 | 1.0030 |
| 4.32 | 4.26 | 1.0158 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.003467 | *0.90 - 1.10* |
| Intercept | -0.070017 | *+/-1.5* |



**THC Calibration Plot** Date: February 5, 2024 Location: Surmont 2



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station number: | AMS29 |
| Calibration Date: | February 26, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 11:48 | End time (MST): | 15:14 |
| Reason: | Maintenance | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | CC356008 | | Cal Gas Expiry Date: | February 23, 2025 | |
| CH4 Cal Gas Conc. | 499.0 | ppm | CH4 Equiv Conc. | 1064.7 | ppm |
| C3H8 Cal Gas Conc. | 205.7 | ppm | | | |
| Removed Gas Cert: | NA | | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 499.0 | ppm | CH4 Equiv Conc. | 1064.7 | ppm |
| Removed C3H8 Conc. | 205.7 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5472 | |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4698 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1170050149 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.003467 | 0.995247 | Background: | 3.62 | 3.62 |
| Calibration intercept: | -0.070017 | -0.136283 | Coefficient: | 4.021 | 4.021 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | -0.11 | ---- |
| high point | 4918 | 81.3 | 17.31 | 17.12 | 1.011 |
| second point | 4959 | 40.6 | 8.65 | 8.42 | 1.027 |
| third point | 4979 | 20.3 | 4.32 | 4.17 | 1.038 |
| as left zero | 5000 | 0.0 | 0.00 | -0.12 | ---- |
| as left span | 4918 | 81.3 | 17.31 | 17.24 | 1.004 |
| | | | | Average Correction Factor | 1.025 |

| | | | | | |
|---|---|---|---|---|---|
| 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

Notes: ZAG not able to hold enough pressure to operate properly. Installed new ZAG, generated multiple points to prove linearity.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

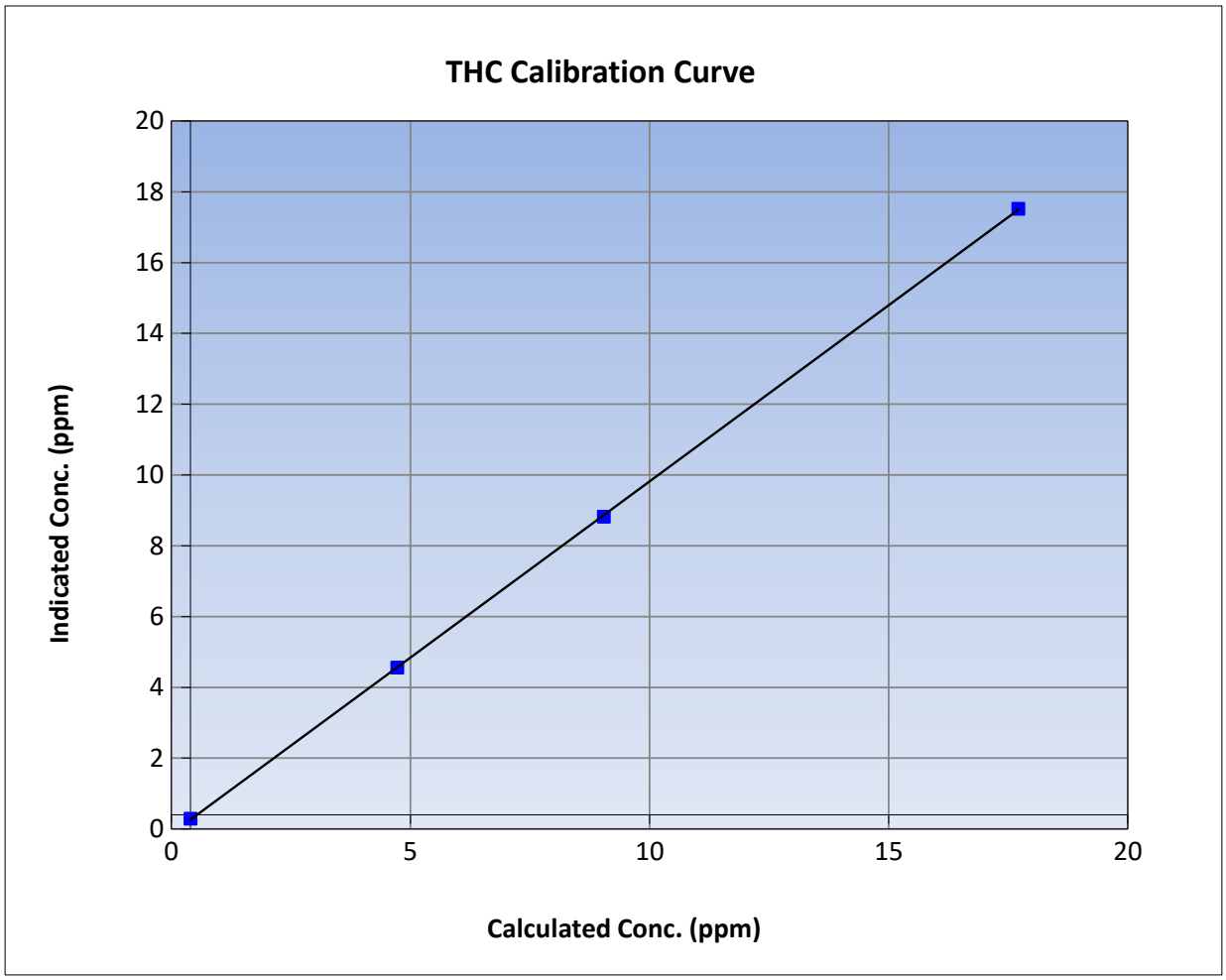
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 26, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:48 | End Time (MST): | 15:14 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1170050149 |

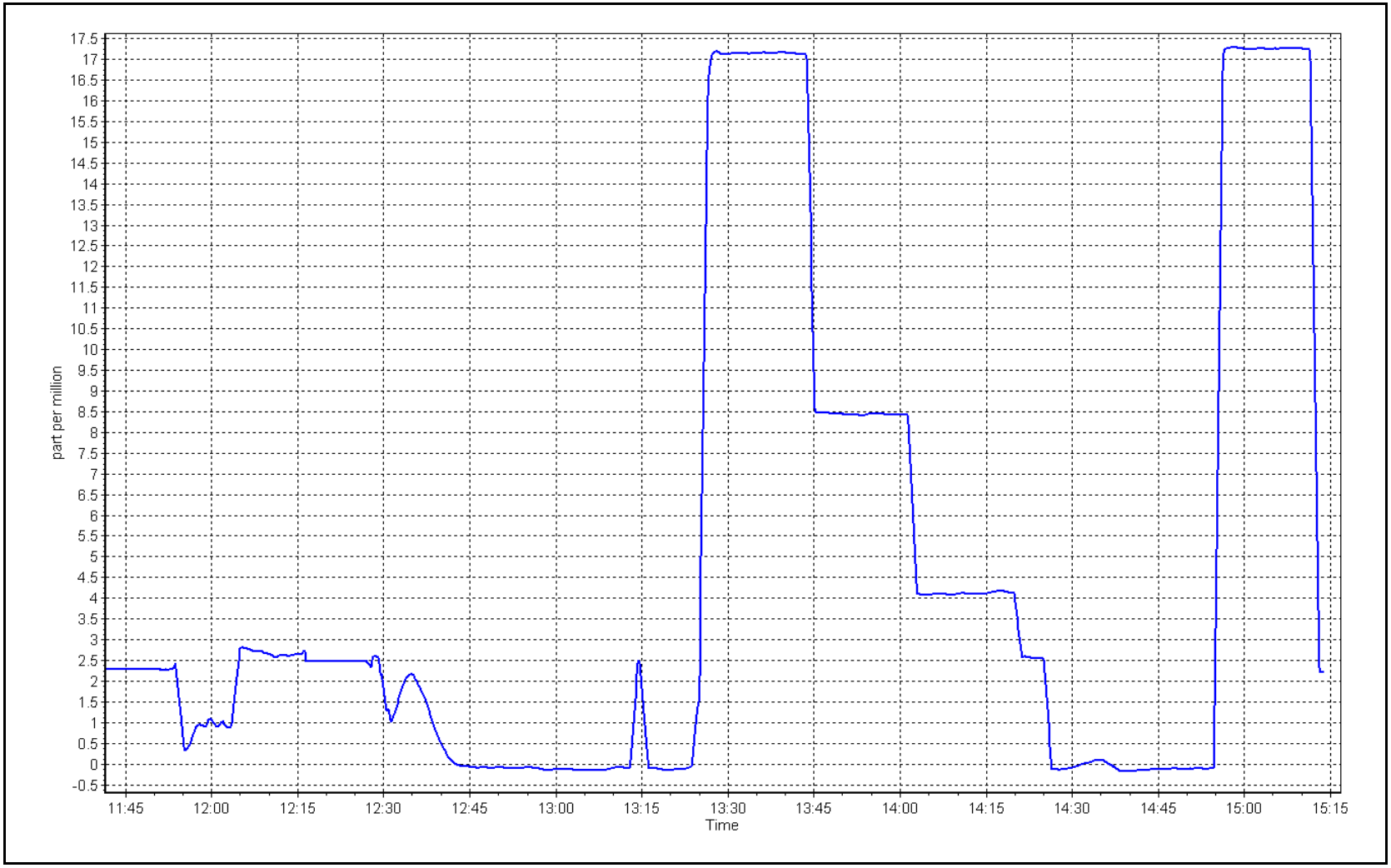
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.11 | ---- |
| 17.31 | 17.12 | 1.0113 |
| 8.65 | 8.42 | 1.0268 |
| 4.32 | 4.17 | 1.0380 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999978 | *≥0.995* |
| Slope | 0.995247 | *0.90 - 1.10* |
| Intercept | -0.136283 | *+/-1.5* |



**THC Calibration Plot** Date: February 26, 2024 Location: Surmont 2



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station number: | AMS29 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 10:39 | End time (MST): | 15:21 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | | T12YYFE | Cal Gas Expiry Date: | October 30, 2024 | |
| NOX Cal Gas Conc: | 47.46 | ppm | NO Cal Gas Conc: | 47.46 | ppm |
| Removed Cylinder #: | | NA | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 47.46 | ppm | Removed Gas NO Conc: | 47.46 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 5472 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4297 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1170050148 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.390 | 1.390 | NO bkgnd or offset: | 1.4 | 1.4 |
| NOX coeff or slope: | 0.996 | 0.996 | NOX bkgnd or offset: | 1.4 | 1.4 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 176.8 | 175.3 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998364 | 0.999594 |
| $NO_X$ Cal Offset: | -0.271978 | -1.052309 |
| NO Cal Slope: | 0.997476 | 0.998306 |
| NO Cal Offset: | -0.811525 | -1.451708 |
| $NO_2$ Cal Slope: | 1.004575 | 0.998502 |
| $NO_2$ Cal Offset: | 0.126759 | -0.096658 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | 0.0 | ---- | ---- |
| as found span | 4916 | 84.2 | 799.2 | 799.2 | 0.0 | 797.9 | 796.8 | 1.0 | 1.0016 | 1.0030 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| high point | 4916 | 84.2 | 799.2 | 799.2 | 0.0 | 798.3 | 796.8 | 1.5 | 1.0011 | 1.0030 |
| second point | 4958 | 42.1 | 399.6 | 399.6 | 0.0 | 398.1 | 397.7 | 0.4 | 1.0038 | 1.0048 |
| third point | 4979 | 21.1 | 200.3 | 200.3 | 0.0 | 197.8 | 196.4 | 1.4 | 1.0125 | 1.0197 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | ---- | ---- |
| as left span | 4916 | 84.2 | 799.2 | 412.6 | 386.6 | 793.5 | 406.8 | 386.7 | 1.0072 | 1.0142 |
| | | | | | | | | Average Correction Factor | 1.0058 | 1.0092 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 798.0 ppb | NO = 796.9 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.0% |
| Previous Response | $NO_X$ = 797.6 ppb | NO = 796.4 ppb | | *Percent Change | NO = | 0.1% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 793.7 | 407.1 | 386.6 | 385.9 | 1.0018 | 99.8% |
| 2nd GPT point (200 ppb O3) | 793.7 | 602.1 | 191.6 | 191.5 | 1.0005 | 99.9% |
| 3rd GPT point (100 ppb O3) | 793.7 | 695.2 | 98.5 | 97.8 | 1.0072 | 99.3% |
| | | | | Average Correction Factor | 1.0032 | 99.7% |

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

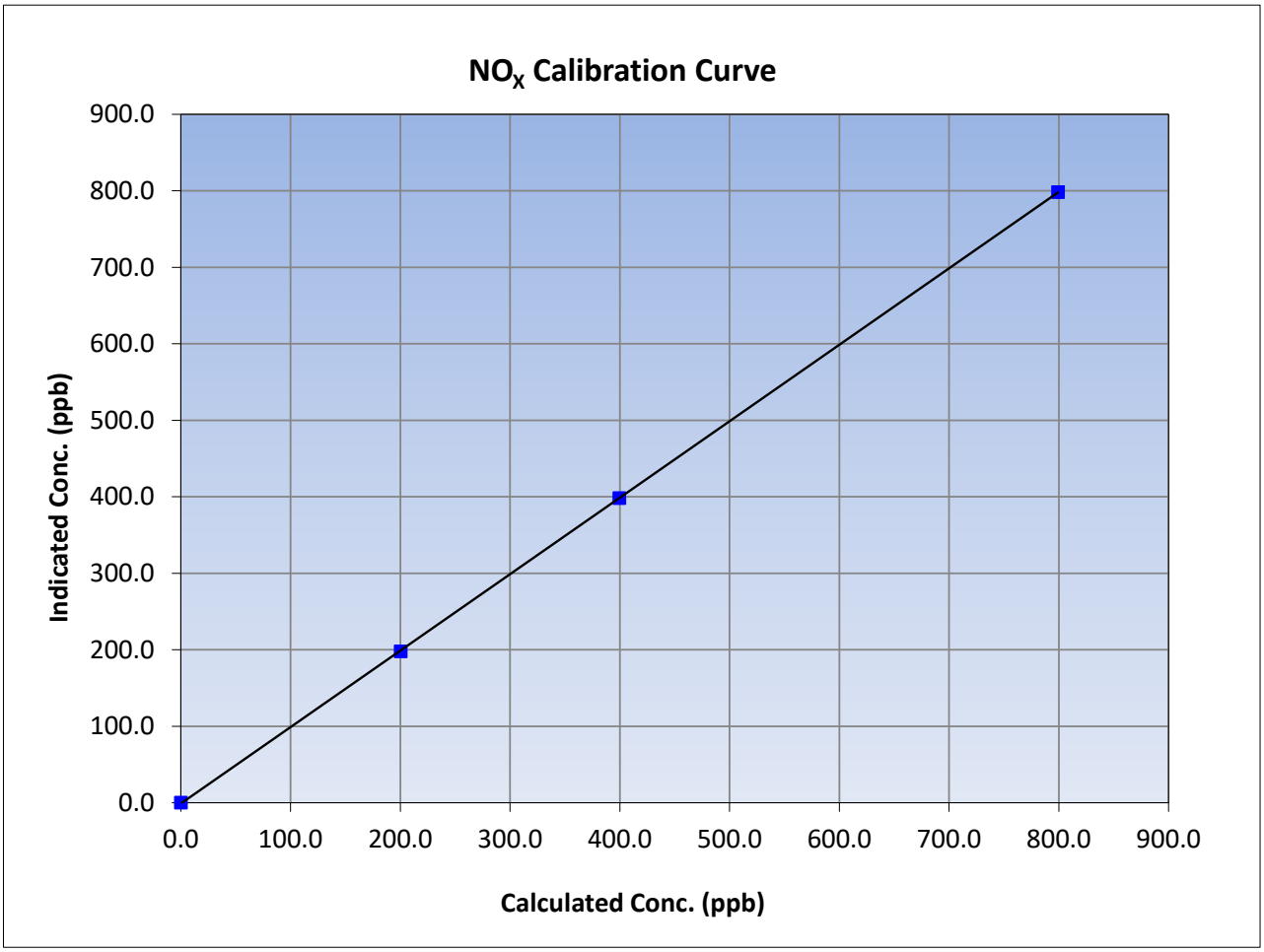
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 10:39 | End Time (MST): | 15:21 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1170050148 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999990 | ≥0.995 |
| 799.2 | 798.3 | 1.0011 | | | |
| 399.6 | 398.1 | 1.0038 | Slope | 0.999594 | 0.90 - 1.10 |
| 200.3 | 197.8 | 1.0125 | | | |
| | | | Intercept | -1.052309 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

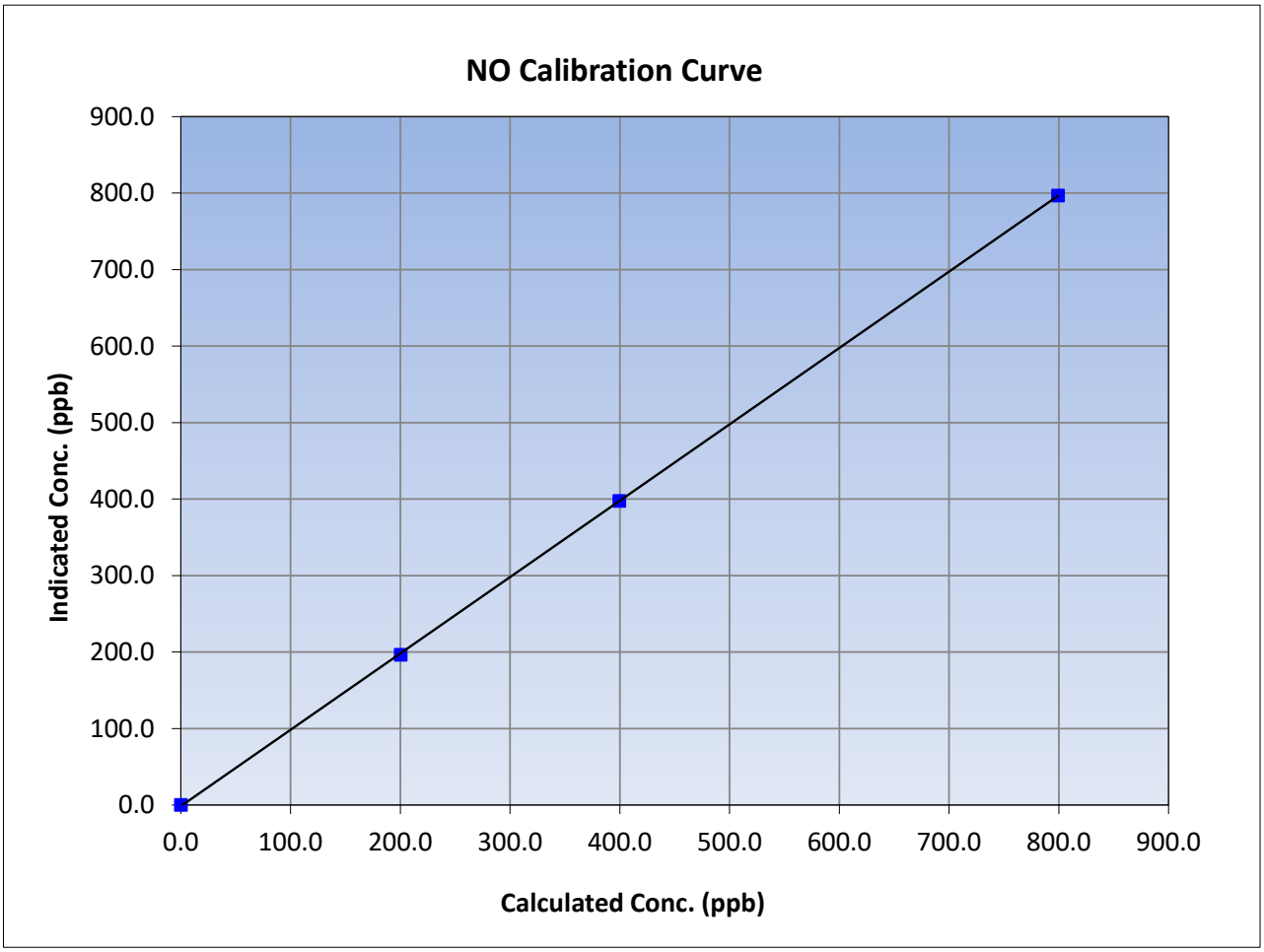
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 10:39 | End Time (MST): | 15:21 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1170050148 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999981 | ≥0.995 |
| 799.2 | 796.8 | 1.0030 | | | |
| 399.6 | 397.7 | 1.0048 | Slope | 0.998306 | 0.90 - 1.10 |
| 200.3 | 196.4 | 1.0197 | | | |
| | | | Intercept | -1.451708 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

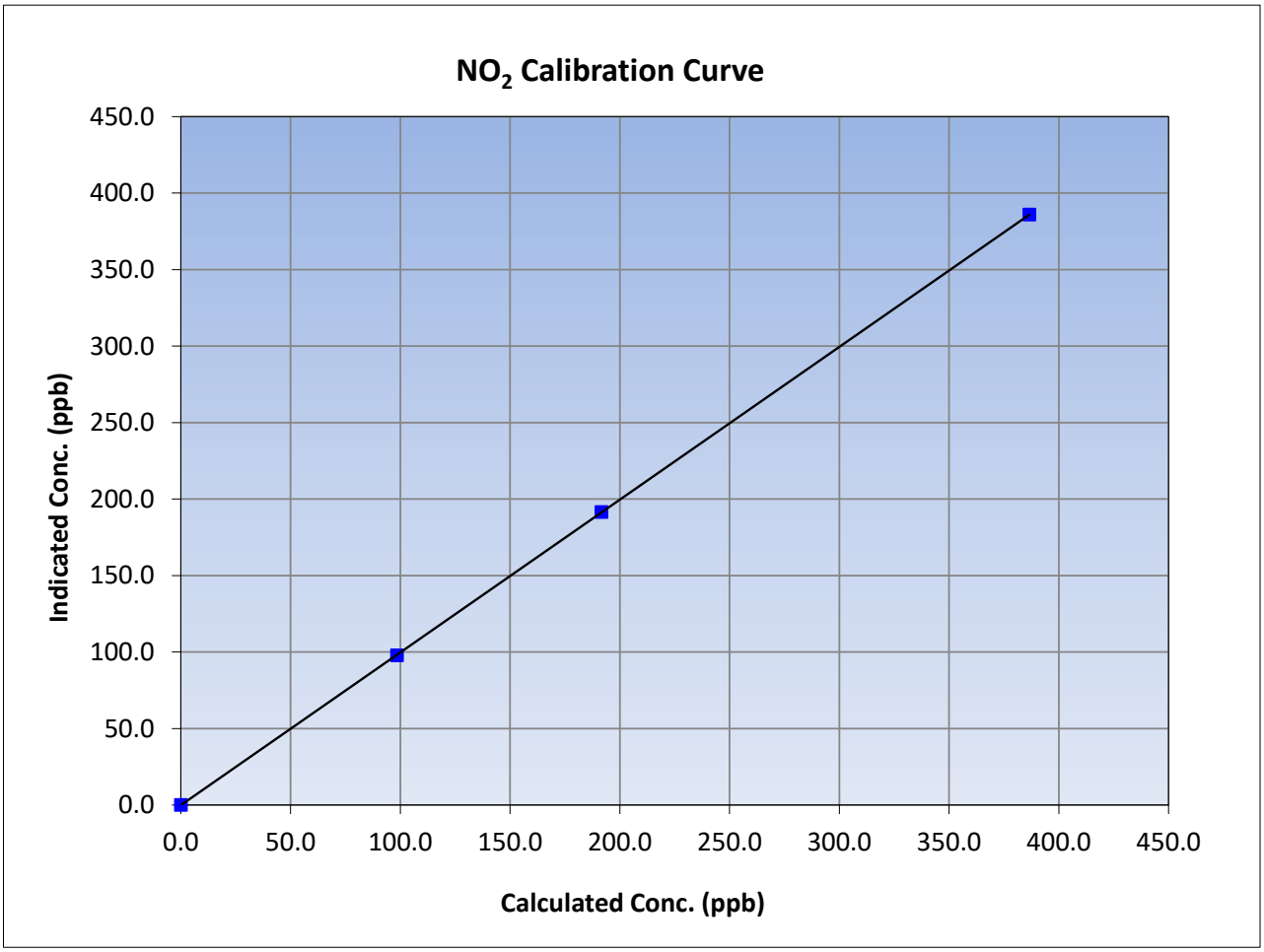
Version-04-2020

### Station Information

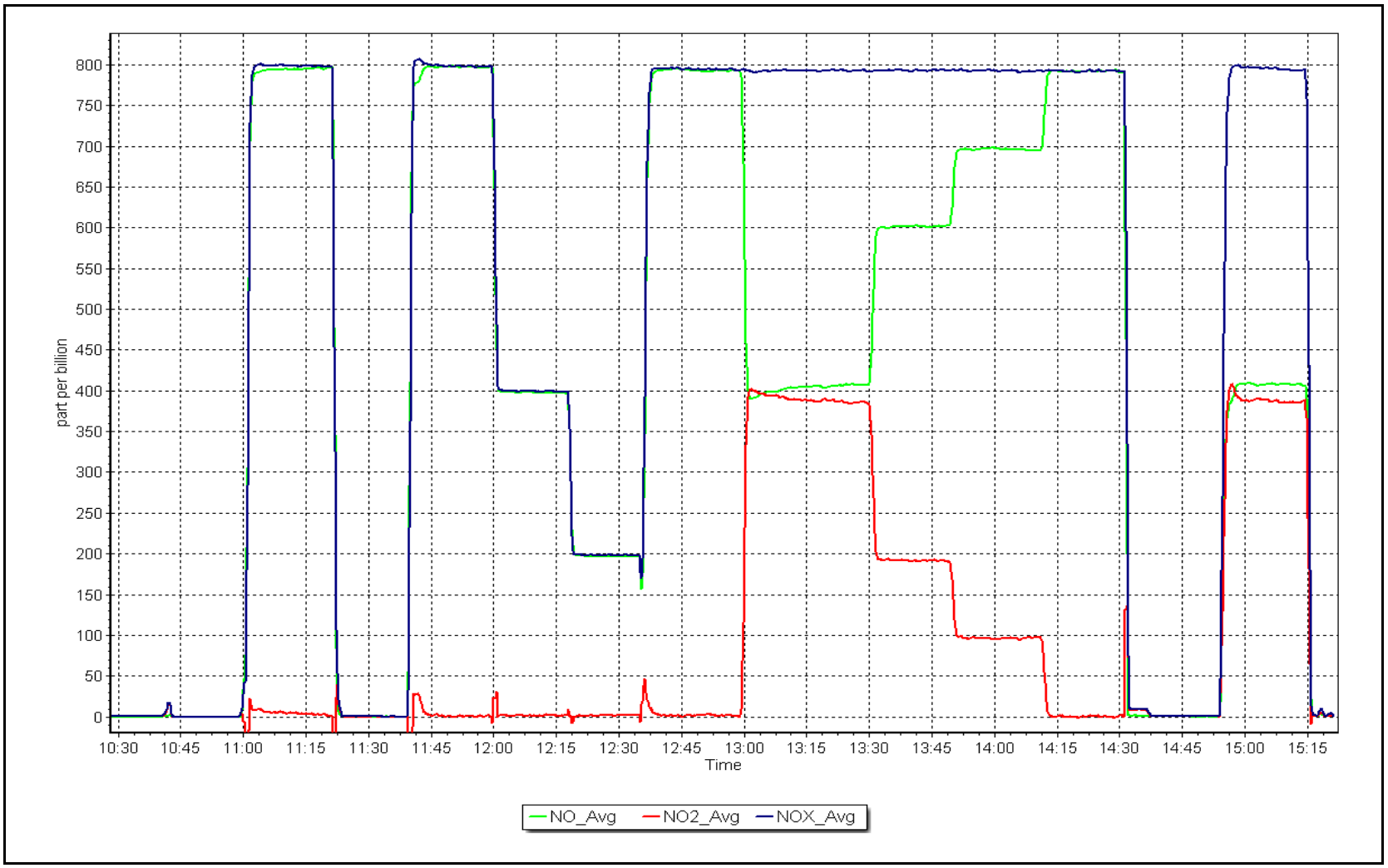
| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 4, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 10:39 | End Time (MST): | 15:21 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1170050148 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 386.6 | 385.9 | 1.0018 | | | |
| 191.6 | 191.5 | 1.0005 | Slope | 0.998502 | 0.90 - 1.10 |
| 98.5 | 97.8 | 1.0072 | | | |
| | | | Intercept | -0.096658 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 6, 2024 Location: Surmont 2



# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont | Station number: | AMS 29 |
| Calibration Date: | February 12, 2024 | Last Cal Date: | January 4, 2024 |
| Start time (MST): | 11:53 | End time (MST): | 13:43 |
| 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) | 0.7 | 0.41 | 0.7 | ☐ | +/- 2 °C |
| P (mmHg) | 705.0 | 705.69 | 705.0 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.02 | 5.092 | 5.02 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 36 | ----- | 36 | ☐ | >80% |

Zero Verification — PM w/o HEPA: 1.7 — PM w/ HEPA: 0.0 — <0.2 ug/m3

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

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

### Quarterly Calibration Test

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

| Parameter | As found | Post maintenance | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| PMT Peak Test | 11.0 | 11.0 | 11.0 | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: February 12, 2024

Date Disposable Filter Changed: February 12, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: October 25, 2023

Date RH/T Sensor Cleaned: October 25, 2023

Notes: No adjustments made. Quarterly maintenance completed. Leak checks passed.

Calibration by: Braiden Boutilier

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS30
## ELLS RIVER

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 11:19 | End time (MST): | 14:21 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 50.53 | ppm | Cal Gas Exp Date: | December 29, 2028 |
| Cal Gas Cylinder #: | CC494126 | | | |
| Removed Cal Gas Conc: | 50.53 | ppm | Rem Gas Exp Date: | |
| Removed Gas Cyl #: | | | 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 | Analyzer serial #: | 1008841397 |
| Analyzer Range | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.001174 | 1.000960 | Backgd or Offset: | 9.5 | 9.5 |
| Calibration intercept: | -1.736008 | -2.235937 | Coeff or Slope: | 0.982 | 0.982 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| as found span | 4921 | 79.2 | 800.4 | 798.2 | 1.003 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4921 | 79.2 | 800.4 | 800.0 | 1.000 |
| second point | 4960 | 39.6 | 400.2 | 397.4 | 1.007 |
| third point | 4980 | 19.8 | 200.1 | 195.6 | 1.023 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4921 | 79.2 | 800.4 | 801.5 | 0.999 |
| | | | | Average Correction Factor | 1.010 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 798.40 | Previous response | 799.57 | *% 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

Notes: Inlet filter changed after As Founds, no adjustments made.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

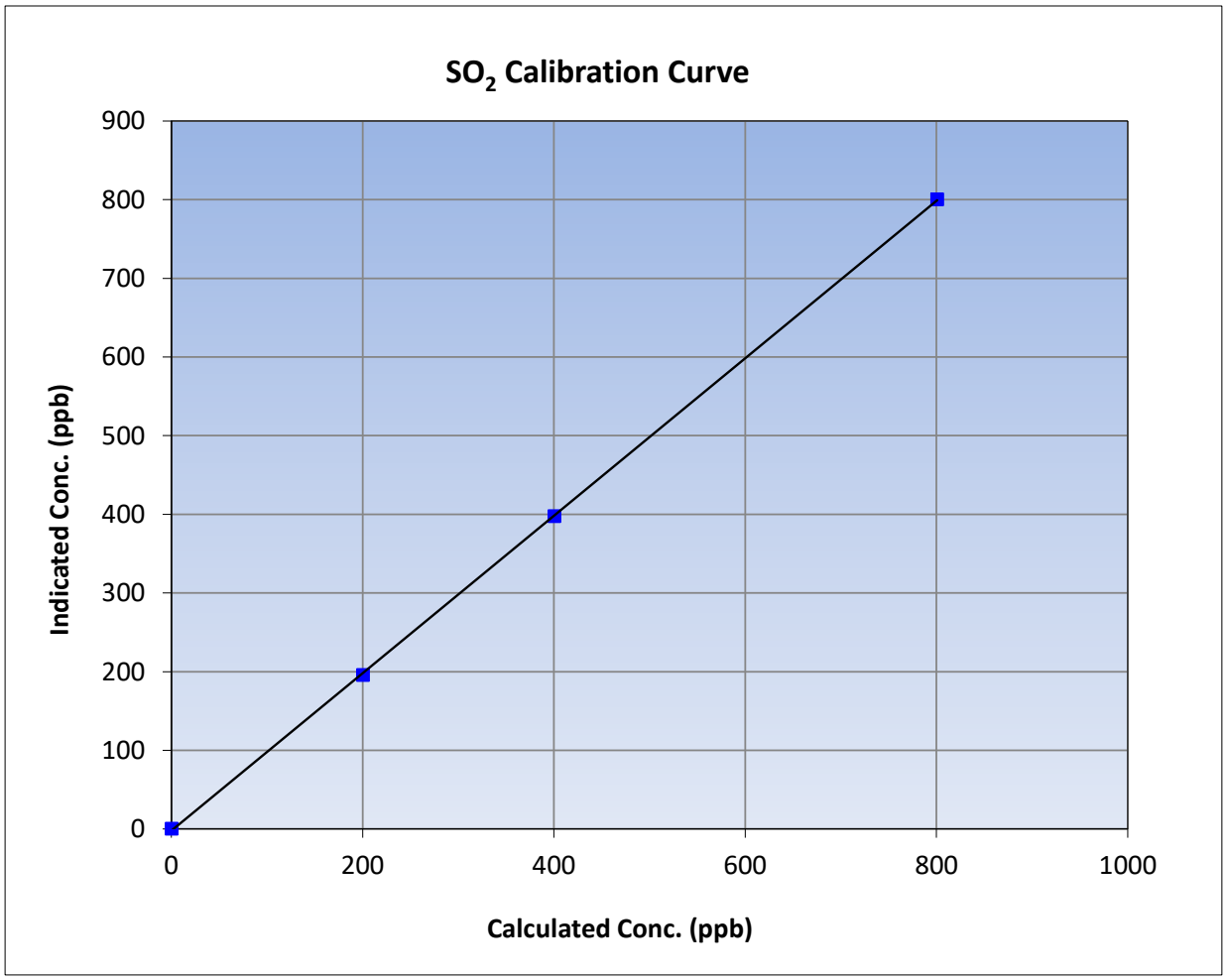
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 11:19 | End Time (MST): | 14:21 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1008841397 |

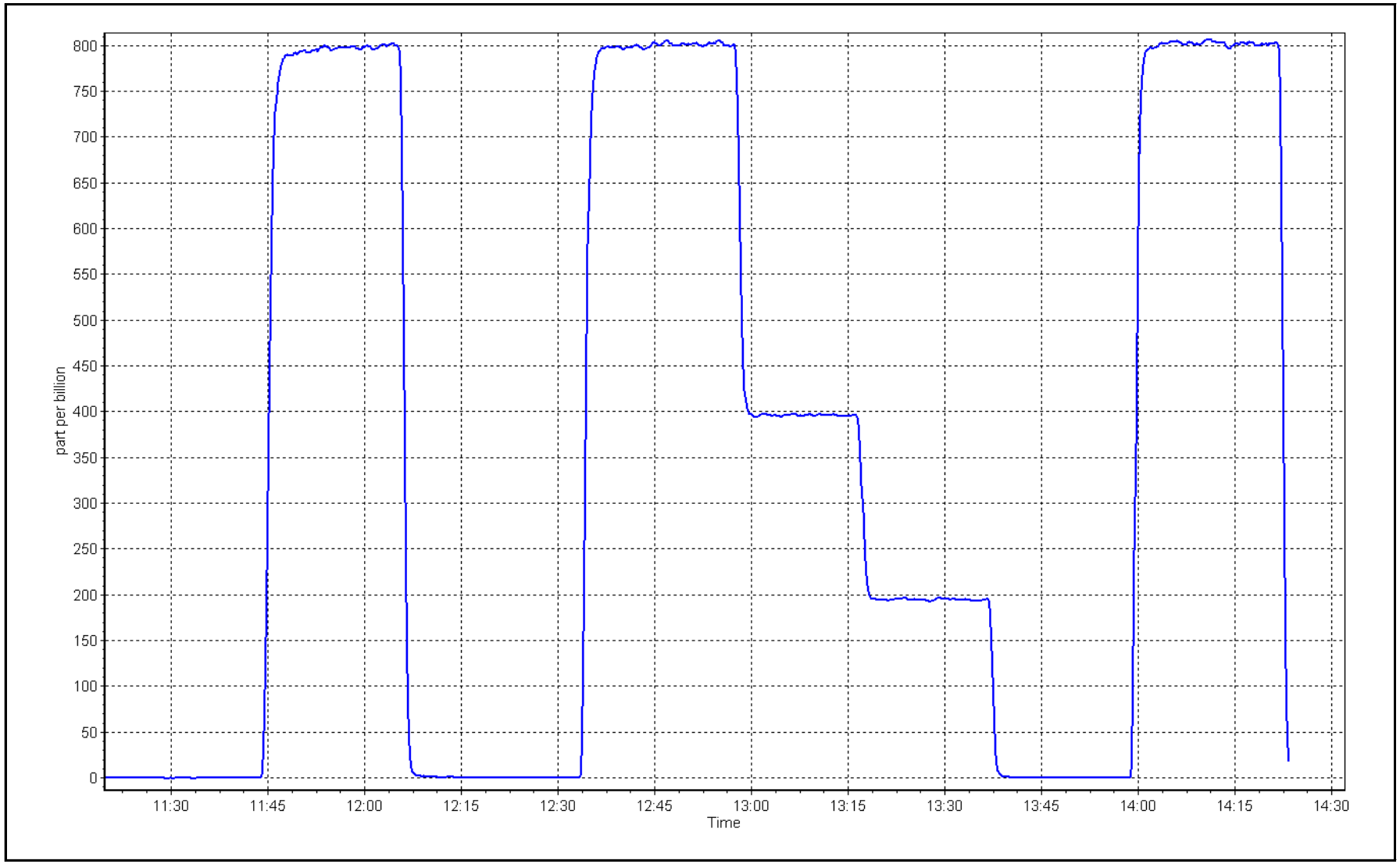
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.4 | 800.0 | 1.0005 |
| 400.2 | 397.4 | 1.0071 |
| 200.1 | 195.6 | 1.0230 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999961 | *≥0.995* |
| Slope | 1.000960 | *0.90 - 1.10* |
| Intercept | -2.235937 | *+/-30* |



**SO2 Calibration Plot** Date: February 5, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS30 |
| Calibration Date: | February 6, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 10:02 | End time (MST): | 14:52 |
| 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 | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.005472 | 1.002473 | Backgd or Offset: | 2.05 | 1.64 |
| Calibration intercept: | -0.120388 | 0.159591 | Coeff or Slope: | 1.072 | 1.060 |

### TRS As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.5 | ---- |
| as found span | 4920 | 80.2 | 80.0 | 80.1 | 0.993 |
| as found 2nd point | 4960 | 40.1 | 40.0 | 39.9 | 0.991 |
| as found 3rd point | 4980 | 20.0 | 20.0 | 19.1 | 1.018 |
| new cylinder response | | | | | |

### TRS Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4920 | 80.2 | 80.0 | 80.3 | 0.997 |
| second point | 4960 | 40.1 | 40.0 | 40.4 | 0.991 |
| third point | 4980 | 20.0 | 20.0 | 20.3 | 0.983 |
| as left zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as left span | 4920 | 80.2 | 80.0 | 80.0 | 1.000 |
| SO2 Scrubber Check | 4921 | 79.2 | 800.4 | 0.1 | ---- |
| Date of last scrubber change: | | N/A | | Ave Corr Factor | 0.990 |
| Date of last converter efficiency test: | | N/A | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.6 | Prev response: | 80.35 | *% change: | 0.3% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.009332 | AF Intercept: | -0.680519 |
| Baseline Corr 3rd AF pt: | 19.6 | AF Correlation: | 0.999944 | | |

* = > +/-5% change initiates investigation

Notes: Change inlet filters after multipoint as founds. SO2 scrubber check done after calibrator zero, passed. Adjusted zero and span.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

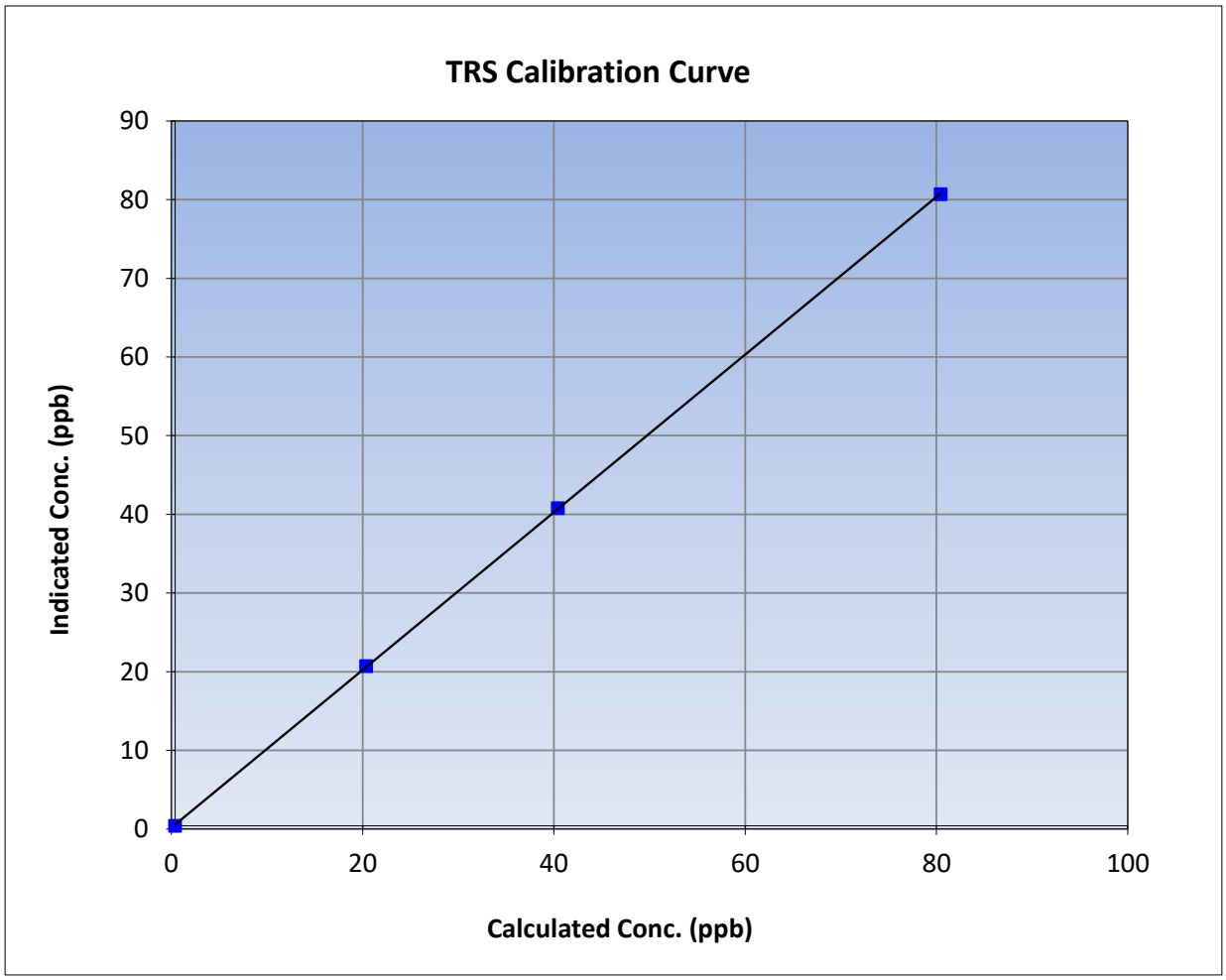
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 6, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Ells River | Station Number: | AMS30 |
| Start Time (MST): | 10:02 | End Time (MST): | 14:52 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1410661331 |

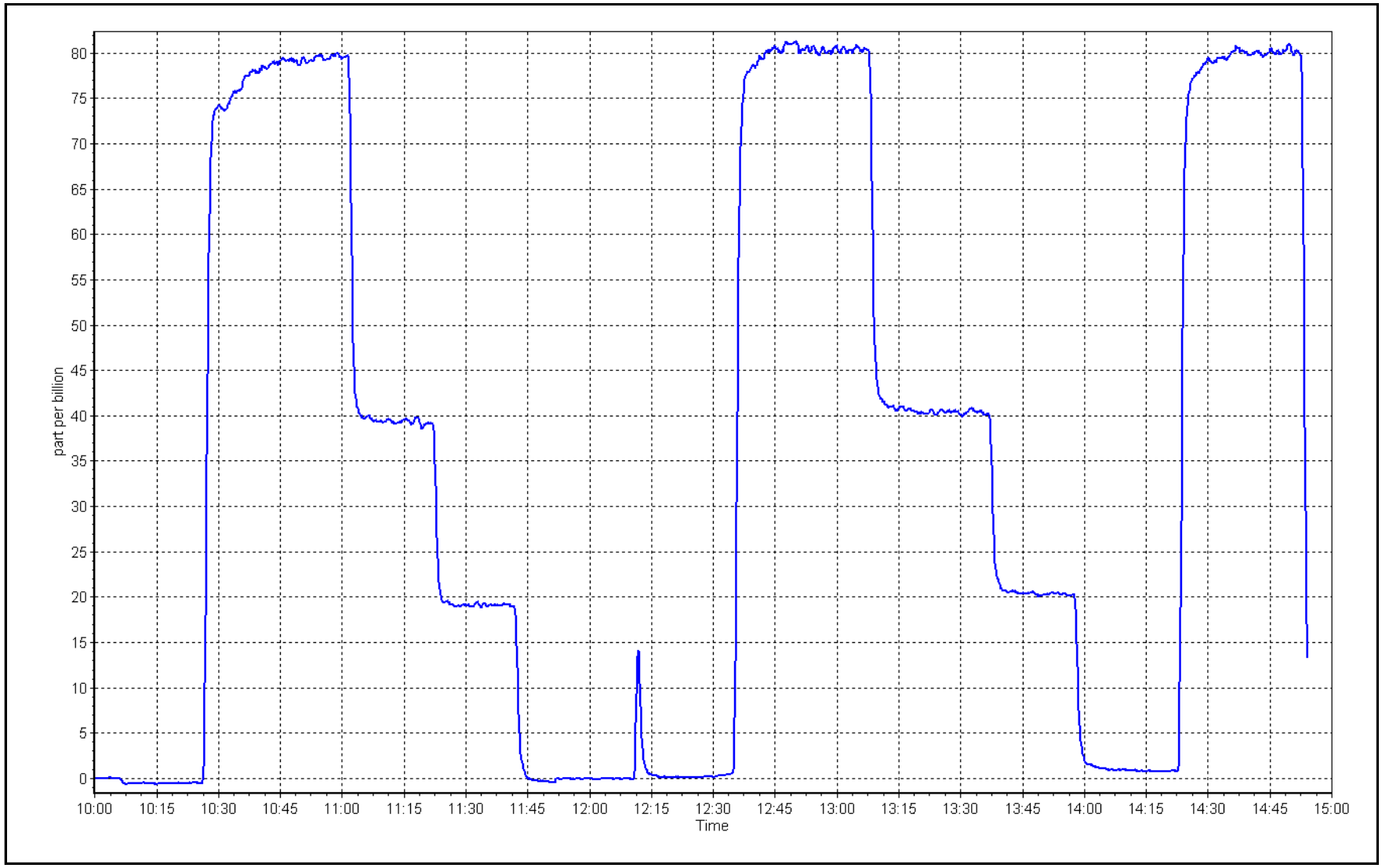
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.3 | 0.9967 |
| 40.0 | 40.4 | 0.9906 |
| 20.0 | 20.3 | 0.9833 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999981 | *≥0.995* |
| Slope | 1.002473 | *0.90 - 1.10* |
| Intercept | 0.159591 | *+/-3* |



**TRS Calibration Plot** Date: February 6, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | February 5, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 11:19 | End time (MST): | 14:21 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC494126 | Cal Gas Expiry Date: | December 29, 2028 | |
| CH4 Cal Gas Conc. | 499.7 | ppm | CH4 Equiv Conc. | 1075.0 | ppm |
| C3H8 Cal Gas Conc. | 209.2 | ppm | | | |
| Removed Gas Cert: | | | Removed Gas Expiry: | | |
| Removed CH4 Conc. | 499.7 | ppm | CH4 Equiv Conc. | 1075.0 | ppm |
| Removed C3H8 Conc. | 209.2 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | API T700 | | Serial Number: | 3061 | |
| ZAG make/model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1181490018 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.51E-04 | 2.53E-04 | NMHC SP Ratio: | 6.00E-05 | 6.42E-05 |
| CH4 Retention time: | 14.2 | 14.2 | NMHC Peak Area: | 151854 | 141799 |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.2 | 17.03 | 16.56 | 1.028 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.2 | 17.03 | 17.03 | 1.000 |
| second point | 4960 | 39.6 | 8.51 | 8.47 | 1.005 |
| third point | 4980 | 19.8 | 4.26 | 4.15 | 1.026 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 17.03 | 17.24 | 0.988 |
| | | | | Average Correction Factor | 1.010 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.56 | Prev response | 17.05 | *% change | -3.0% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.2 | 9.11 | 8.68 | 1.050 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.2 | 9.11 | 9.15 | 0.996 |
| second point | 4960 | 39.6 | 4.56 | 4.55 | 1.002 |
| third point | 4980 | 19.8 | 2.28 | 2.22 | 1.027 |
| as left zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 9.11 | 9.25 | 0.985 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 8.68 | Prev response | 9.17 | *% change | -5.6% |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.2 | 7.91 | 7.88 | 1.005 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.2 | 7.91 | 7.88 | 1.004 |
| second point | 4960 | 39.6 | 3.96 | 3.92 | 1.009 |
| third point | 4980 | 19.8 | 1.98 | 1.93 | 1.024 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 7.91 | 7.99 | 0.991 |
| | | | | Average Correction Factor | 1.012 |
| Baseline Corr AF: | 7.88 | 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 | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.003892 | 1.002141 |
| THC Cal Offset: | -0.039540 | -0.052740 |
| CH4 Cal Slope: | 0.999470 | 0.997247 |
| CH4 Cal Offset: | -0.026357 | -0.019157 |
| NMHC Cal Slope: | 1.007395 | 1.006266 |
| NMHC Cal Offset: | -0.012583 | -0.033582 |

Notes: Inlet filter changed after As Founds, adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## THC Calibration Summary

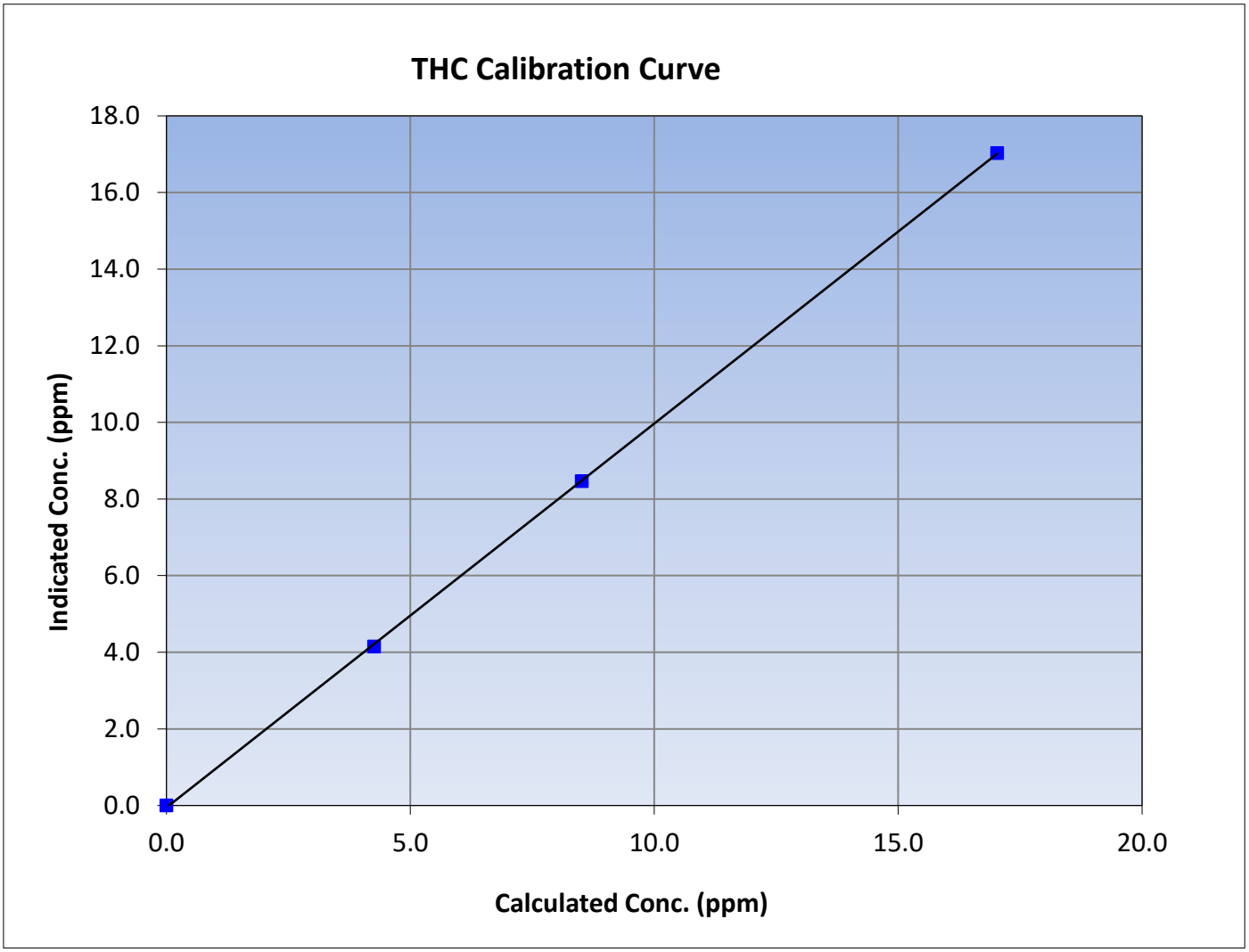
Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 11:19 | End Time (MST): | 14:21 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999954 | *≥0.995* |
| 17.03 | 17.03 | 0.9997 | | | |
| 8.51 | 8.47 | 1.0053 | Slope | 1.002141 | *0.90 - 1.10* |
| 4.26 | 4.15 | 1.0258 | | | |
| | | | Intercept | -0.052740 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

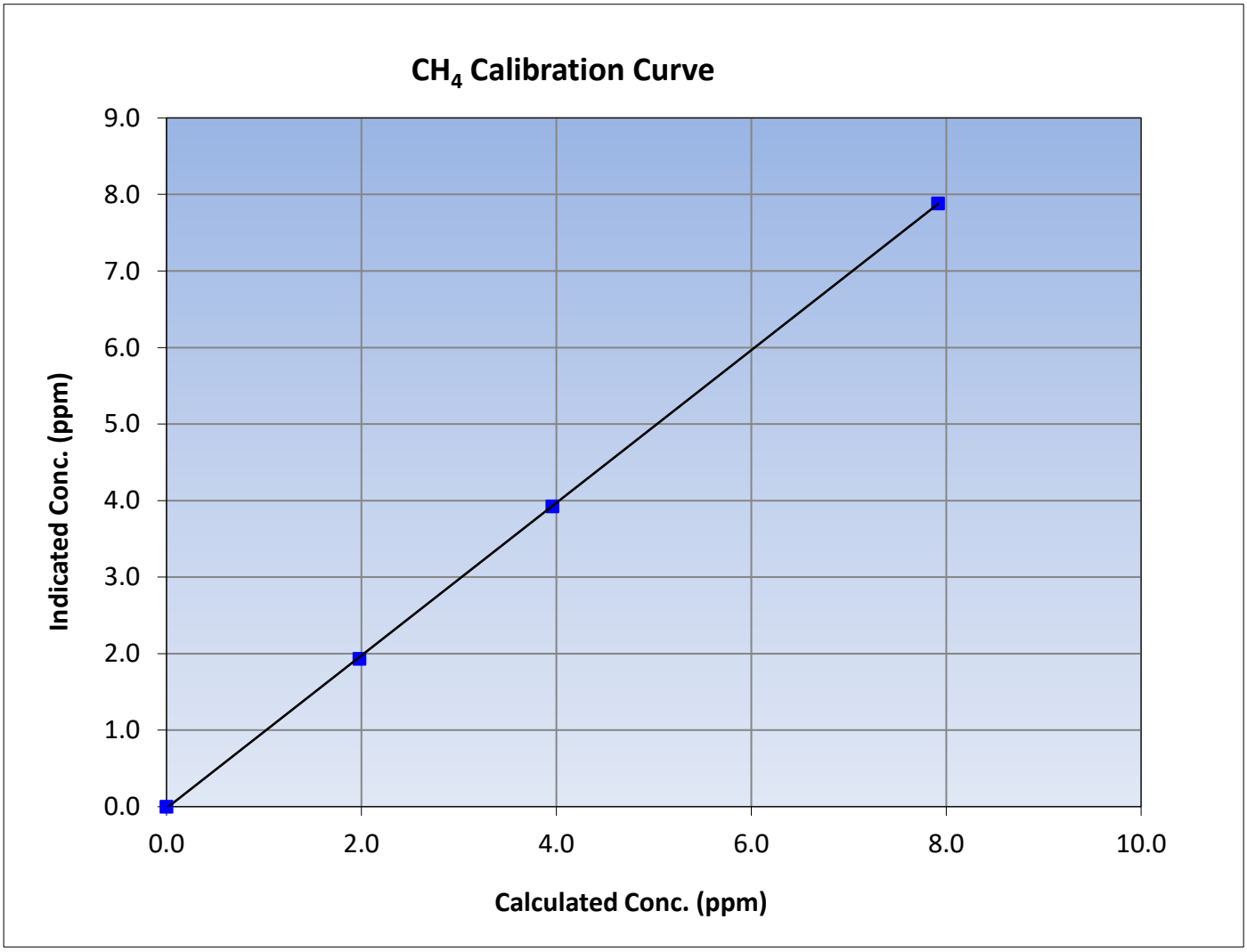
Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 11:19 | End Time (MST): | 14:21 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999972 | *≥0.995* |
| 7.91 | 7.88 | 1.0042 | | | |
| 3.96 | 3.92 | 1.0089 | Slope | 0.997247 | *0.90 - 1.10* |
| 1.98 | 1.93 | 1.0243 | | | |
| | | | Intercept | -0.019157 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

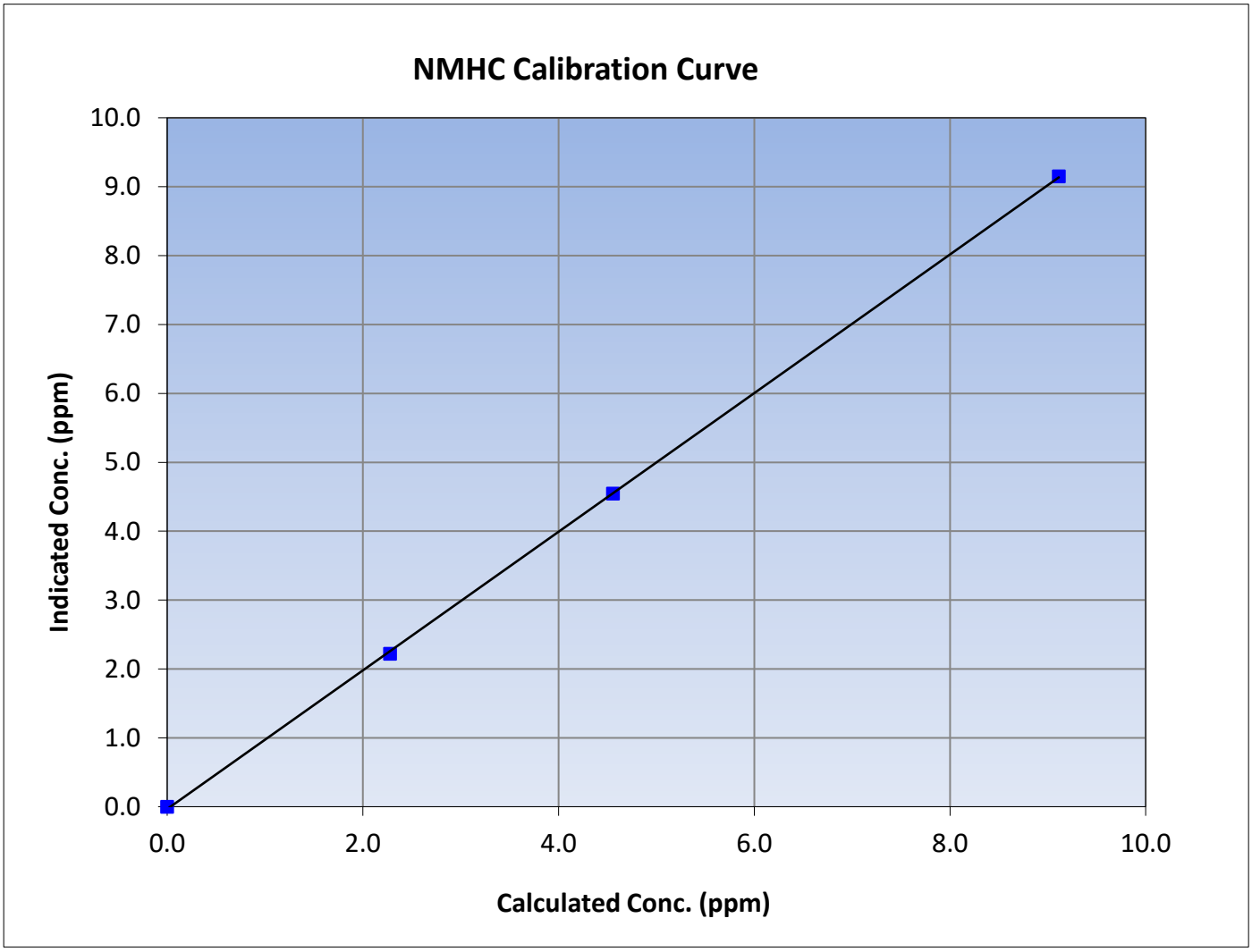
Version-01-2020

### Station Information

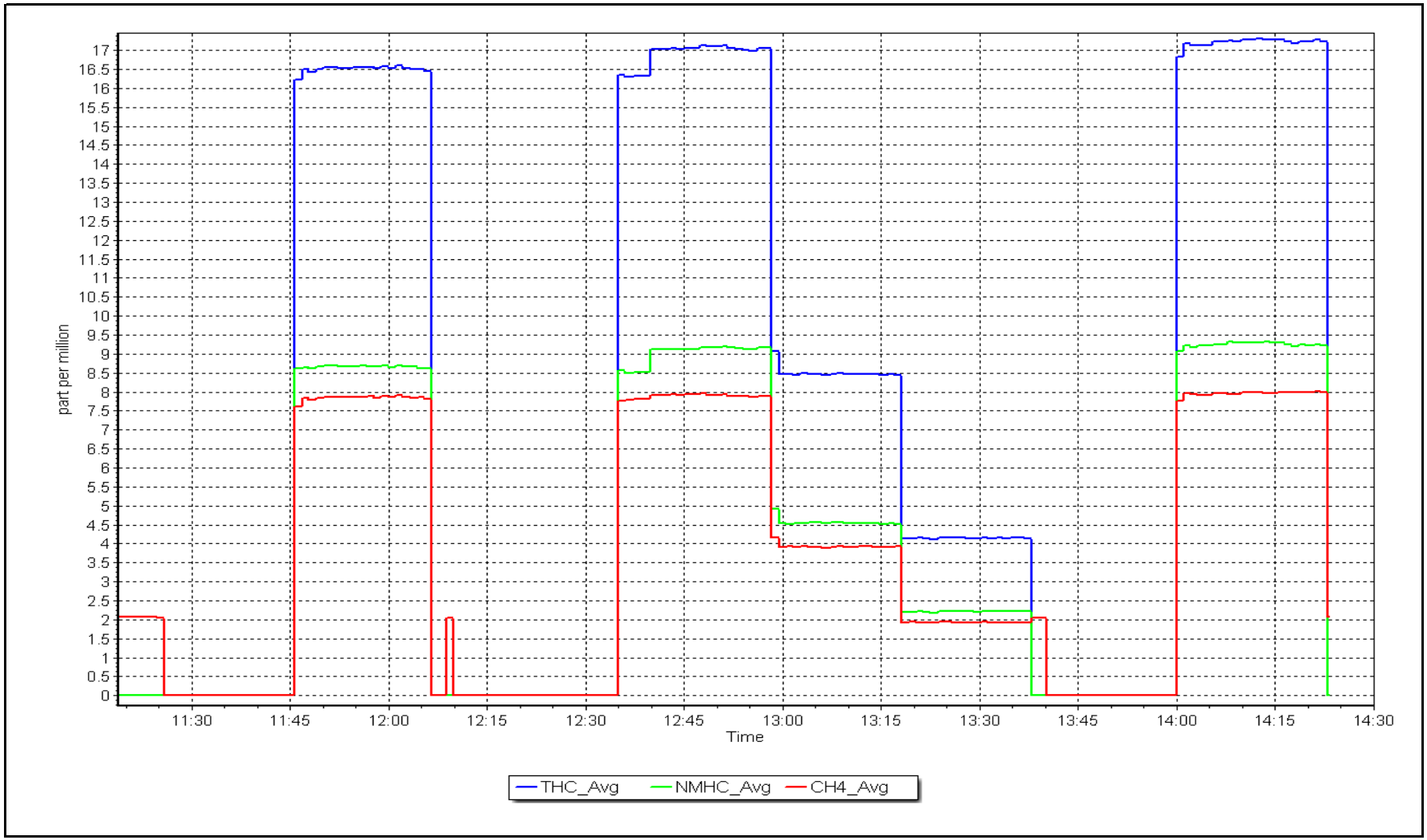
| | | | |
|---|---|---|---|
| Calibration Date: | February 5, 2024 | Previous Calibration: | January 3, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 11:19 | End Time (MST): | 14:21 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999935 | *≥0.995* |
| 9.11 | 9.15 | 0.9960 | | | |
| 4.56 | 4.55 | 1.0024 | Slope | 1.006266 | *0.90 - 1.10* |
| 2.28 | 2.22 | 1.0272 | | | |
| | | | Intercept | -0.033582 | *+/-0.5* |



**NMHC Calibration Plot** Date: February 5, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | February 27, 2024 | Last Cal Date: | January 3, 2024 |
| Start time (MST): | 9:36 | End time (MST): | 11:07 |
| Reason: | Cylinder Change | N2 cylinder change | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | CC494126 | | Cal Gas Expiry Date: | December 29, 2028 | |
| CH4 Cal Gas Conc. | 499.7 | ppm | CH4 Equiv Conc. | 1075.0 | ppm |
| C3H8 Cal Gas Conc. | 209.2 | ppm | | | |
| Removed Gas Cert: | | | Removed Gas Expiry: | | |
| Removed CH4 Conc. | 499.7 | ppm | CH4 Equiv Conc. | 1075.0 | ppm |
| Removed C3H8 Conc. | 209.2 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | API T700 | | Serial Number: | 3061 | |
| ZAG make/model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1181490018 | |
| THC Range (ppm): | 0 - 20 ppm | | | | |
| NMHC Range (ppm): | 0 - 10 ppm | | CH4 Range (ppm): | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.51E-04 | 2.53E-04 | NMHC SP Ratio: | 6.00E-05 | 6.42E-05 |
| CH4 Retention time: | 14.2 | 14.2 | NMHC Peak Area: | 151854 | 141799 |

### THC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.2 | 17.03 | 17.55 | 0.970 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.2 | 17.03 | 17.41 | 0.978 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.978 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.55 | Prev response | 17.05 | *% change | 2.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.2 | 9.11 | 9.52 | 0.957 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.2 | 9.11 | 9.47 | 0.962 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.962 |
| Baseline Corr AF: | 9.52 | Prev response | 9.17 | *% change | 3.7% |
| 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 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF *Limit= 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.2 | 7.91 | 8.03 | 0.986 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4921 | 79.2 | 7.91 | 7.94 | 0.997 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.997 |
| Baseline Corr AF: | 8.03 | Prev response | 7.88 | *% change | 1.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

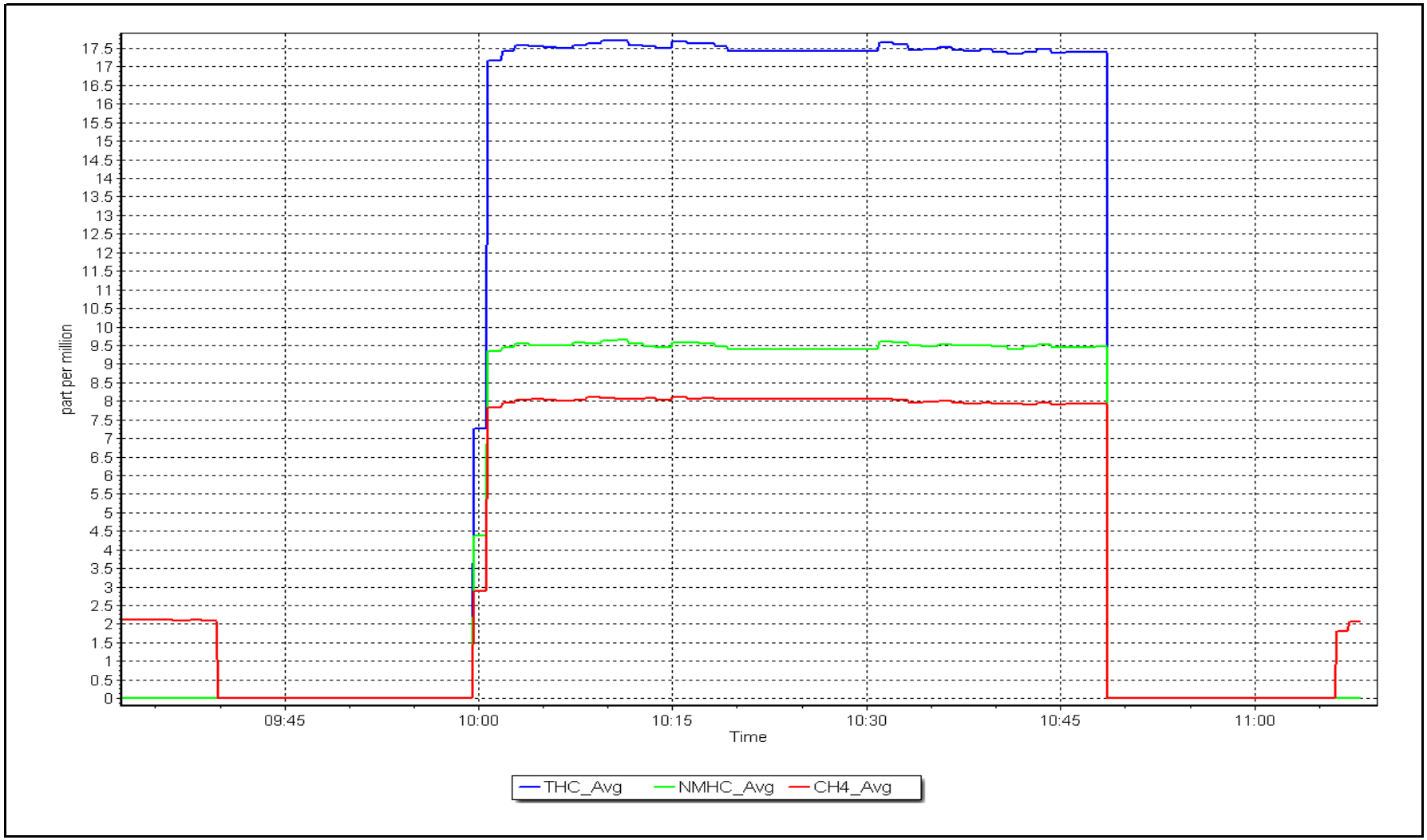
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.003892 | 1.022298 |
| THC Cal Offset: | -0.039540 | 0.000000 |
| CH4 Cal Slope: | 0.999470 | 1.002915 |
| CH4 Cal Offset: | -0.026357 | 0.000000 |
| NMHC Cal Slope: | 1.007395 | 1.039135 |
| NMHC Cal Offset: | -0.012583 | 0.000000 |

Notes: N2 cylinder changed after as founds. No adjustment made.

Calibration Performed By: Jan Castro

**NMHC Calibration Plot** Date: February 27, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | February 4, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 11:20 | End time (MST): | 12:58 |
| Reason: | Cylinder Change | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | | A0931384 | Cal Gas Expiry Date: | November 30, 2023 | |
| NOX Cal Gas Conc: | 51.12 | ppm | NO Cal Gas Conc: | 49.40 | ppm |
| Removed Cylinder #: | | DT0045703 | Removed Gas Exp Date: | May 16, 2031 | |
| Removed Gas NOX Conc: | 60.4 | ppm | Removed Gas NO Conc: | 60.1 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 3061 | |
| ZAG make/model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 710321429 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.165 | 1.165 | NO bkgnd or offset: | 13.6 | 13.7 |
| NOX coeff or slope: | 0.992 | 0.992 | NOX bkgnd or offset: | 13.5 | 13.6 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 194.2 | 192.4 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.007658 | |
| $NO_X$ Cal Offset: | -1.638433 | |
| NO Cal Slope: | 1.007289 | |
| NO Cal Offset: | -2.359365 | |
| $NO_2$ Cal Slope: | 0.990195 | |
| $NO_2$ Cal Offset: | 1.994477 | |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | | | | | | | | | | |
| as found span | | | | | | | | | | |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4919 | 81.0 | 828.1 | 800.3 | 27.9 | 841.0 | 813.0 | 28.5 | 0.9847 | 0.9844 |
| calibrator zero | | | | | | | | | | |
| high point | | | | | | | | | | |
| second point | | | | | | | | | | |
| third point | | | | | | | | | | |
| as left zero | | | | | | | | | | |
| as left span | | | | | | | | | | |
| | | | | | | | | Average Correction Factor | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = NA | ppb | NO = NA | ppb | * = > +/-5% change initiates investigation | | | *Percent Change | $NO_X$ = | NA |
| Previous Response | $NO_X$ = NA | ppb | NO = NA | ppb | | | | *Percent Change | NO = | NA |
| Baseline Corr 2nd pt | $NO_X$ = NA | ppb | NO = NA | ppb | As found | $NO_X$ $r^2$: | | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA | ppb | NO = NA | ppb | As found | NO $r^2$: | | NO Sl: | NO Int: | |
| | | | | | As found | $NO_2$ $r^2$: | | NO2 Sl: | $NO_2$ Int: | |

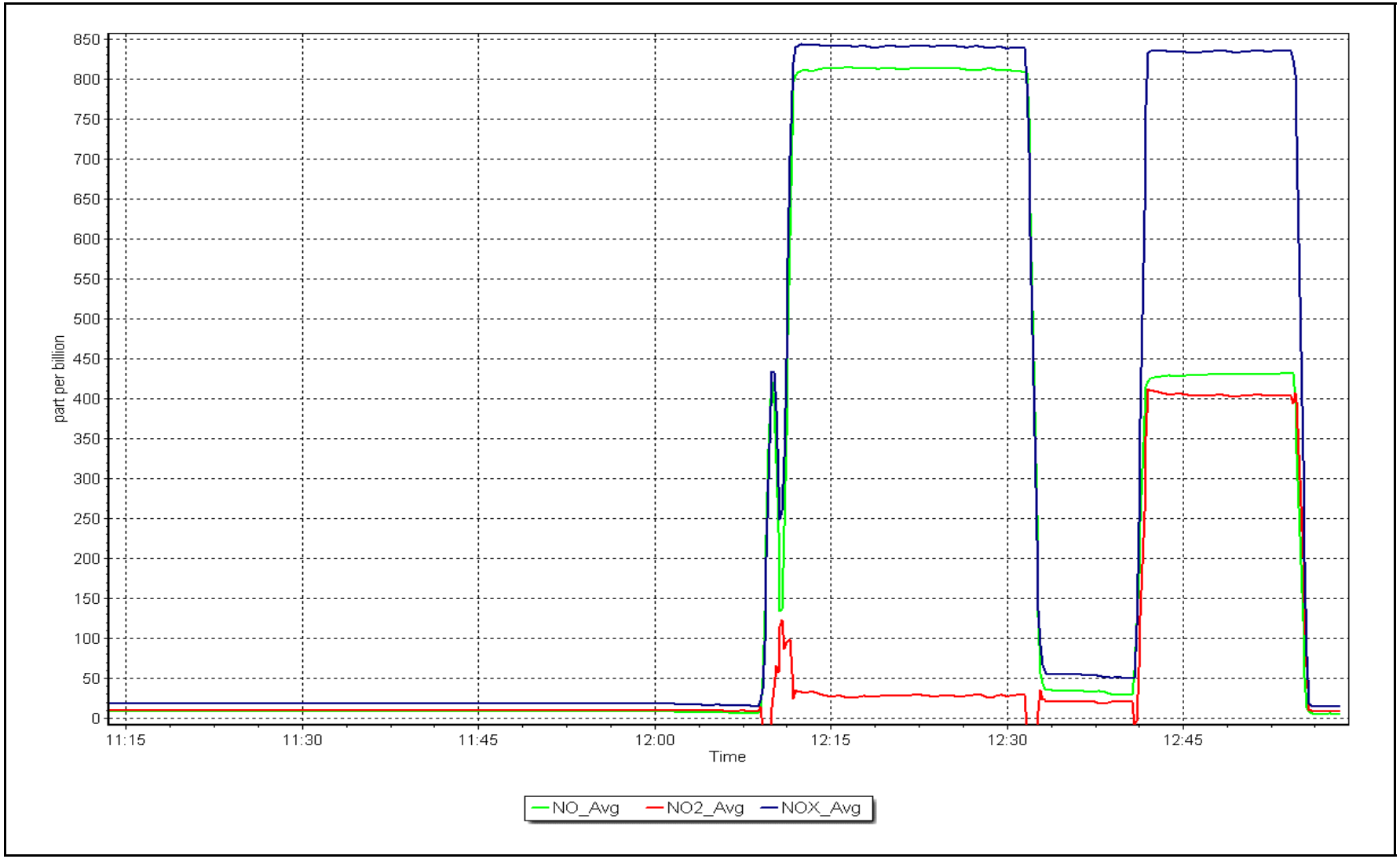
## GPT Calibration Data

| 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | | | | | | |
| 2nd GPT point (200 ppb O3) | | | | | | |
| 3rd GPT point (100 ppb O3) | | | | | | |
| | | | | Average Correction Factor | | |

Notes: Cylinder#: DT0045703 empty due to leak. Replaced with cylinder#: A0931384. New cylinder response captured.

Calibration Performed By: Braiden Boutilier

**$NO_X$ Calibration Plot** Date: February 4, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | February 23, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 10:00 | End time (MST): | 15:28 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | DT0027487 | | Cal Gas Expiry Date: | January 9, 2032 | |
| NOX Cal Gas Conc: | 59.3 | ppm | NO Cal Gas Conc: | 59.1 | ppm |
| Removed Cylinder #: | A0931384 | | Removed Gas Exp Date: | November 30, 2023 | |
| Removed Gas NOX Conc: | 51.12 | ppm | Removed Gas NO Conc: | 49.40 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 3061 | |
| ZAG make/model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 710321429 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.165 | 1.182 | NO bkgnd or offset: | 13.6 | 14.0 |
| NOX coeff or slope: | 0.992 | 0.994 | NOX bkgnd or offset: | 13.5 | 13.9 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 194.2 | 188.7 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.007658 | 0.998634 |
| $NO_X$ Cal Offset: | -1.638433 | -0.718485 |
| NO Cal Slope: | 1.007289 | 0.999588 |
| NO Cal Offset: | -2.359365 | -1.719843 |
| $NO_2$ Cal Slope: | 0.990195 | 1.005754 |
| $NO_2$ Cal Offset: | 1.994477 | 0.149457 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.2 | 0.1 | ---- | ---- |
| as found span | 4932 | 67.7 | 803.0 | 800.3 | 2.7 | 826.2 | 788.6 | 37.6 | 0.9719 | 1.0148 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4932 | 67.7 | 803.0 | 800.3 | 2.7 | 792.0 | 790.1 | 1.9 | 1.0139 | 1.0129 |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | ---- | ---- |
| high point | 4932 | 67.7 | 803.0 | 800.3 | 2.7 | 801.3 | 799.0 | 2.4 | 1.0021 | 1.0016 |
| second point | 4966 | 33.8 | 400.9 | 399.5 | 1.4 | 400.0 | 397.1 | 2.9 | 1.0022 | 1.0061 |
| third point | 4983 | 16.9 | 200.4 | 199.8 | 0.7 | 198.1 | 195.9 | 2.2 | 1.0118 | 1.0197 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | ---- | ---- |
| as left span | 4932 | 67.7 | 803.0 | 425.4 | 377.6 | 804.0 | 426.5 | 377.5 | 0.9987 | 0.9973 |
| | | | | | | | | Average Correction Factor | 1.0054 | 1.0091 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 826.3 ppb | NO = 788.8 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 2.3% |
| Previous Response | $NO_X$ = 807.5 ppb | NO = 803.7 ppb | | *Percent Change | NO = | -1.9% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 795.8 | 420.9 | 377.6 | 379.7 | 0.9945 | 100.6% |
| 2nd GPT point (200 ppb O3) | 795.8 | 615.3 | 183.2 | 185.1 | 0.9898 | 101.0% |
| 3rd GPT point (100 ppb O3) | 795.8 | 702.8 | 95.7 | 96.0 | 0.9970 | 100.3% |
| | | | | Average Correction Factor | 0.9937 | 100.6% |

Notes: Changed sample inlet filters and NOx cylinder after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

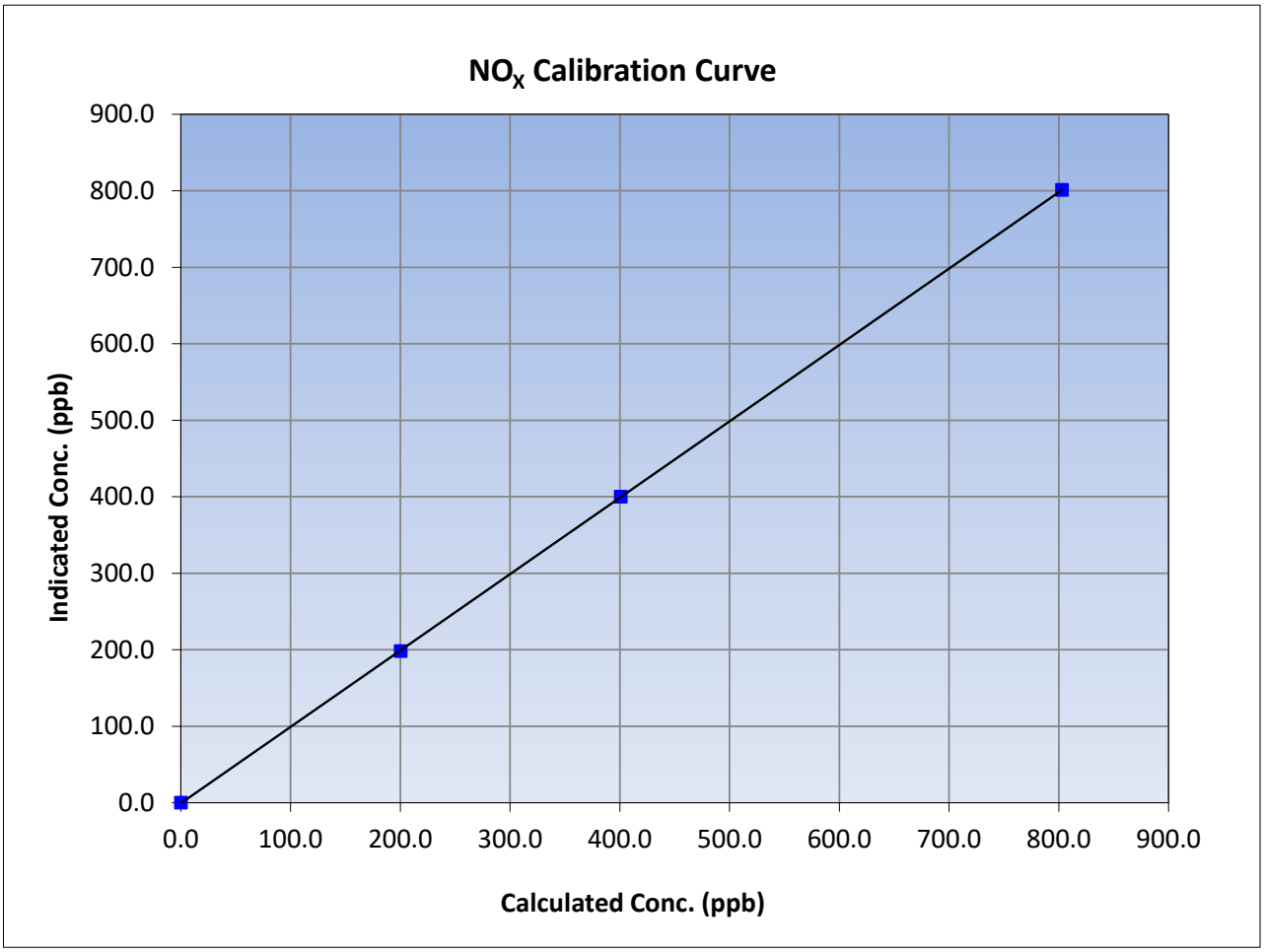
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:00 | End Time (MST): | 15:28 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 710321429 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999992 | ≥0.995 |
| 803.0 | 801.3 | 1.0021 | | | |
| 400.9 | 400.0 | 1.0022 | Slope | 0.998634 | 0.90 - 1.10 |
| 200.4 | 198.1 | 1.0118 | | | |
| | | | Intercept | -0.718485 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

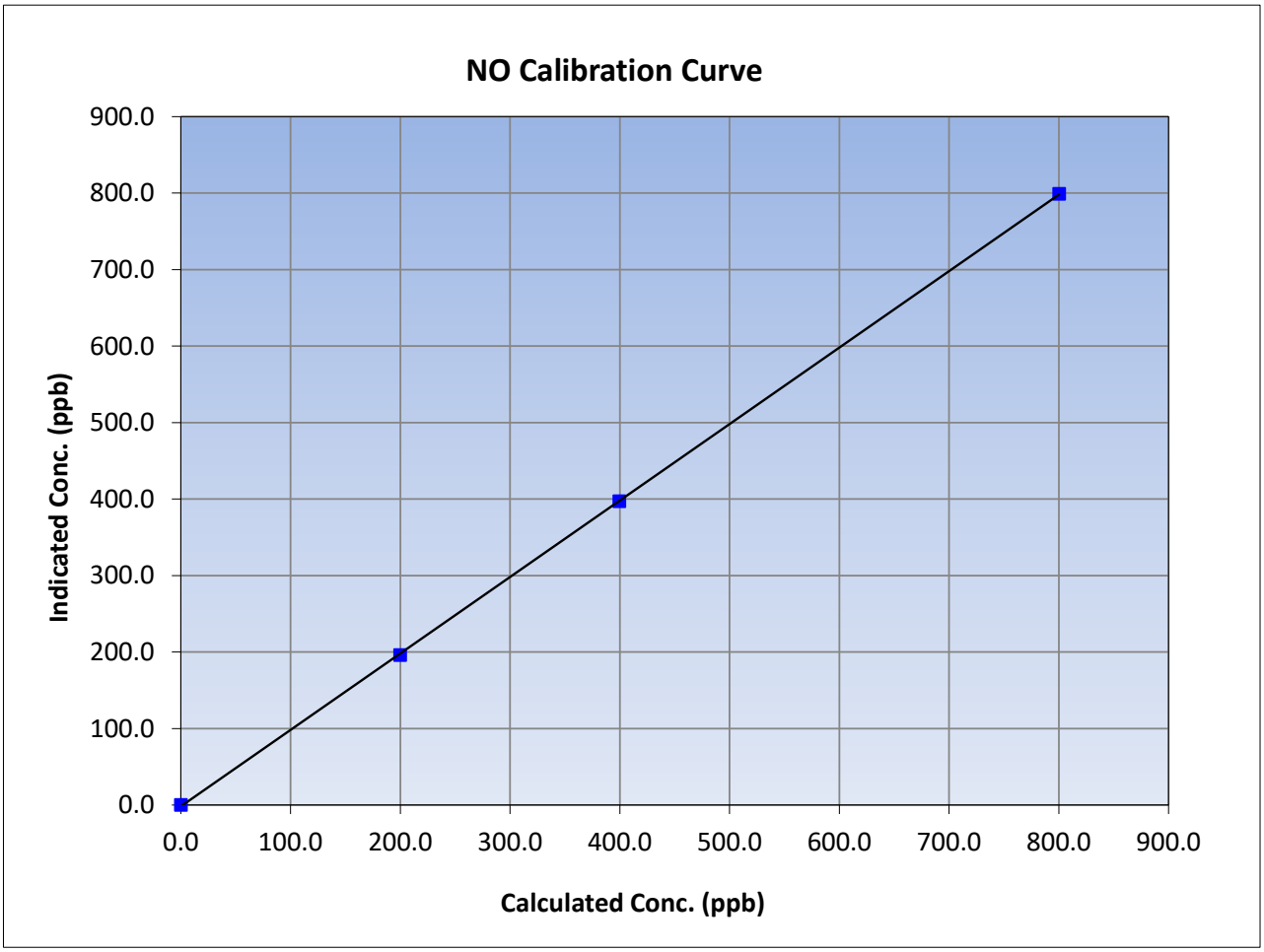
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:00 | End Time (MST): | 15:28 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 710321429 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999976 | ≥0.995 |
| 800.3 | 799.0 | 1.0016 | | | |
| 399.5 | 397.1 | 1.0061 | Slope | 0.999588 | 0.90 - 1.10 |
| 199.8 | 195.9 | 1.0197 | | | |
| | | | Intercept | -1.719843 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

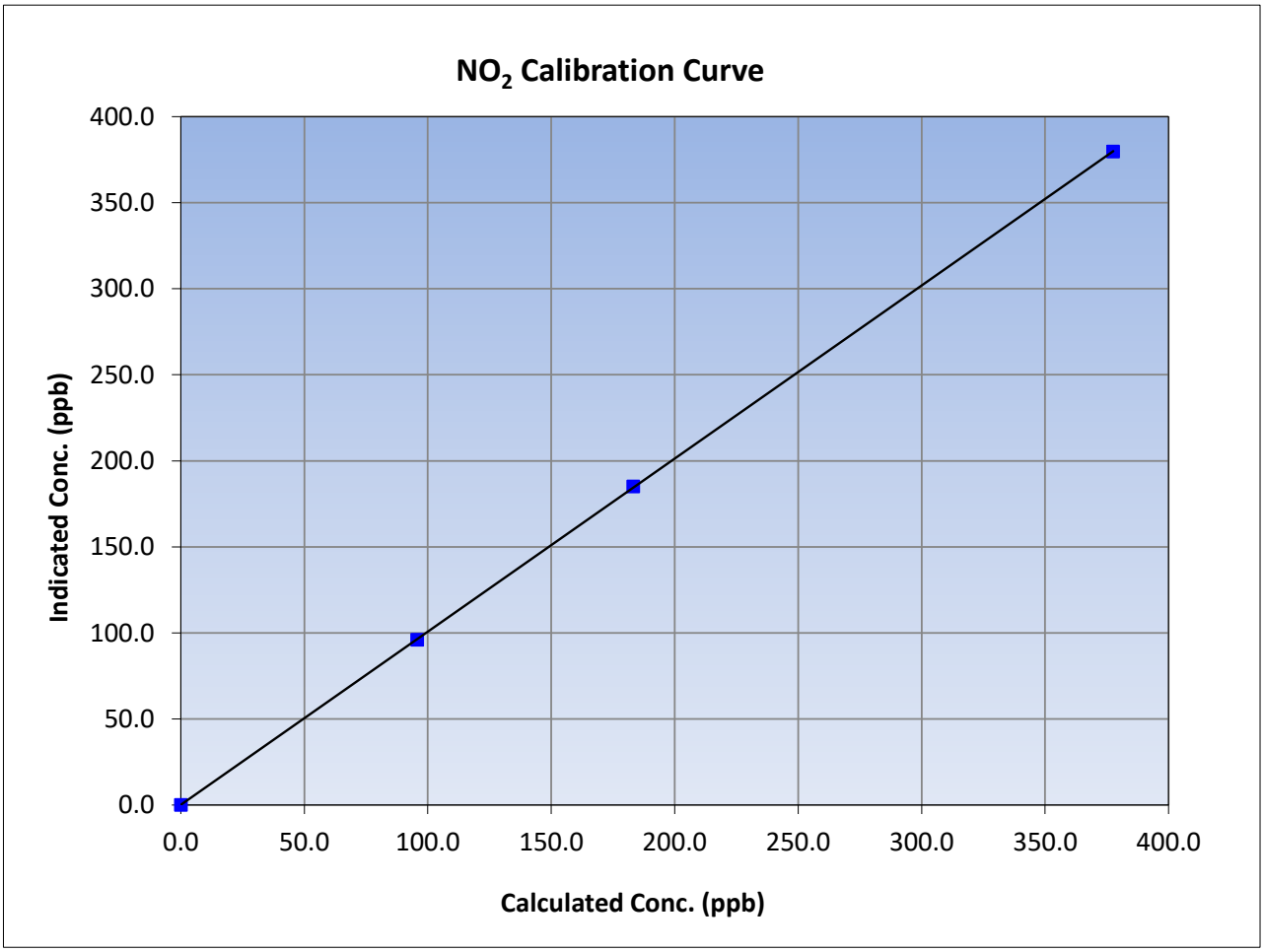
Version-04-2020

### Station Information

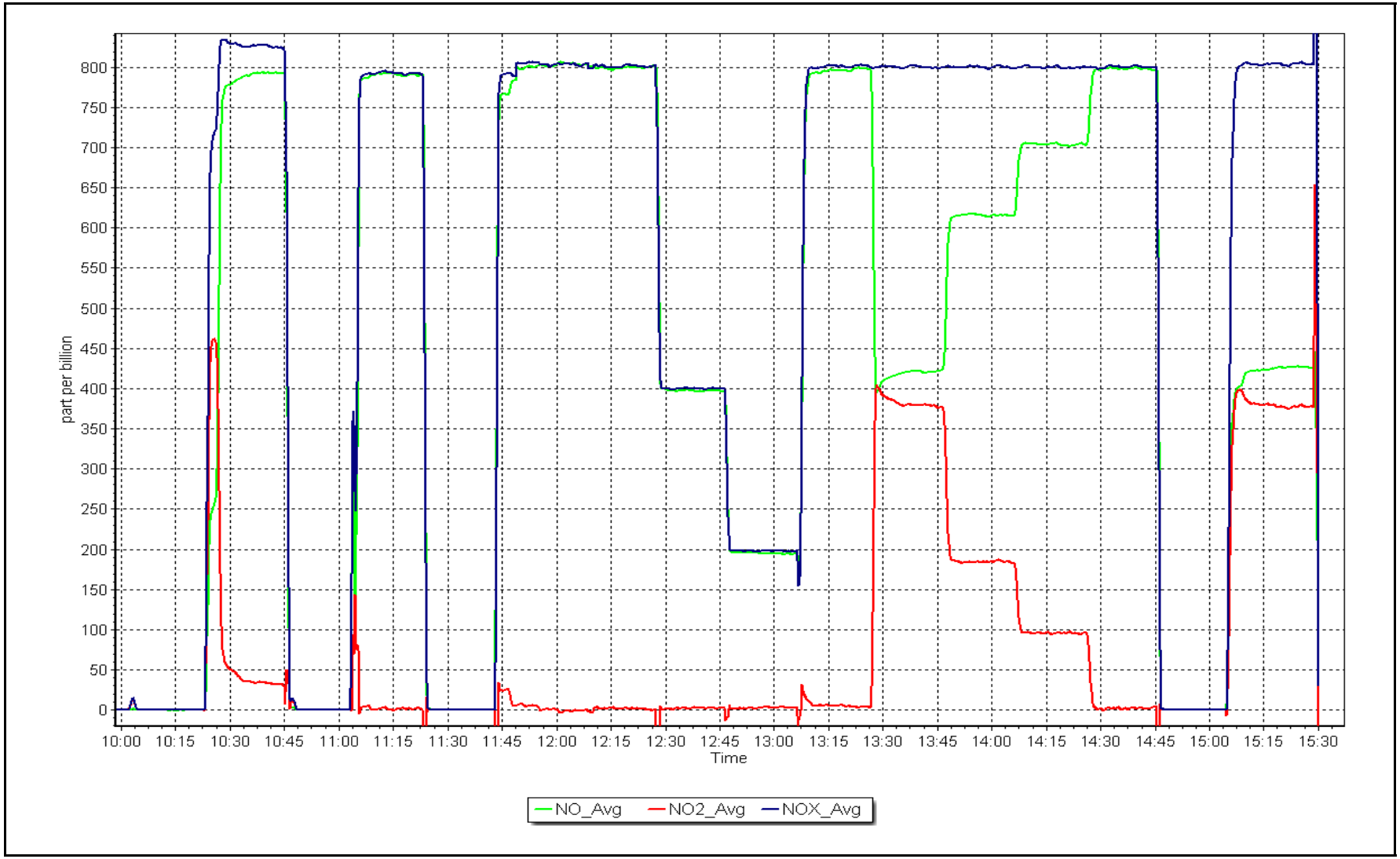
| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:00 | End Time (MST): | 15:28 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 710321429 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999991 | ≥0.995 |
| 377.6 | 379.7 | 0.9945 | | | |
| 183.2 | 185.1 | 0.9898 | Slope | 1.005754 | 0.90 - 1.10 |
| 95.7 | 96.0 | 0.9970 | | | |
| | | | Intercept | 0.149457 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 23, 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: | February 23, 2024 | Last Cal Date: | January 22, 2024 |
| Start time (MST): | 12:27 | End time (MST): | 12:41 |
| 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) | 6.90 | 6.49 | 6.90 | ☐ | +/- 2 °C |
| P (mmHg) | 718.00 | 719.67 | 718.00 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.98 | 5.05 | 4.98 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 45.00 | ----- | 45.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 2.50 | PM w/ HEPA: | 0.00 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: September 29, 2024 — Lot No.: 100128-050-040

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

Date Optical Chamber Cleaned: January 22, 2024

Date Disposable Filter Changed: January 22, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <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 and pressure. Leak check passed. No adjustment made.

Calibration by: Jan Castro

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS501
## LEISMER

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station number: | AMS501 |
| Calibration Date: | February 8, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 9:52 | End time (MST): | 12:54 |
| 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 Make/Model: | API T700 | | | Serial Number: | 2659 |
| ZAG Make/Model: | API 701 | | | Serial Number: | 4427 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1160290011

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.000572 | 1.003086 | Backgd or Offset: | 20.3 | 19.8 |
| Calibration intercept: | -1.756005 | -1.136075 | Coeff or Slope: | 0.981 | 0.981 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.8 | ---- |
| as found span | 4921 | 79.2 | 800.2 | 801.5 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| high point | 4921 | 79.2 | 800.2 | 801.5 | 0.998 |
| second point | 4960 | 39.6 | 400.2 | 401.4 | 0.997 |
| third point | 4980 | 19.8 | 200.1 | 197.4 | 1.014 |
| as left zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| as left span | 4921 | 79.2 | 800.2 | 806.8 | 0.992 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.30 | Previous response | 798.91 | *% 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

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

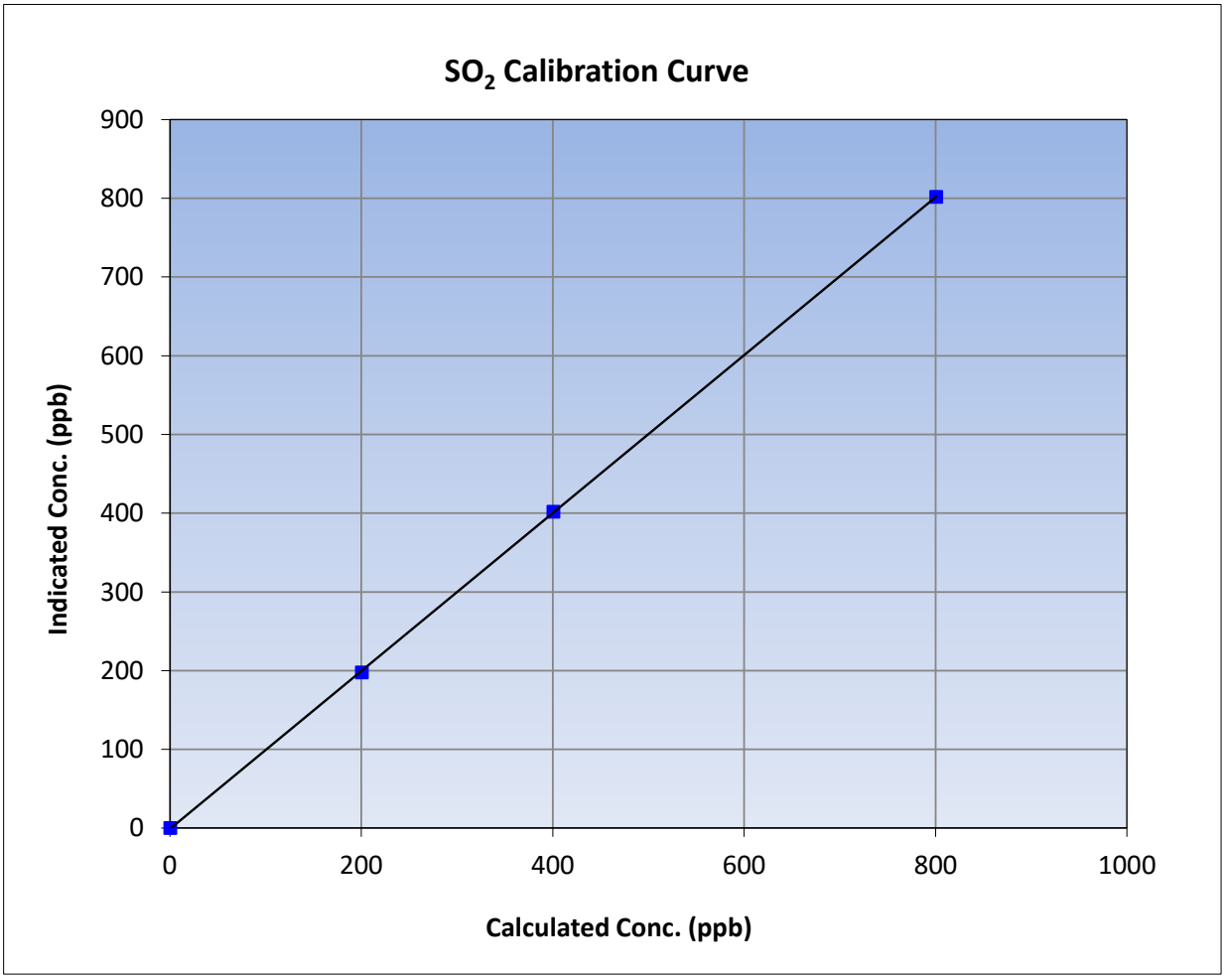
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 10:02 | End Time (MST): | 12:54 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1160290011 |

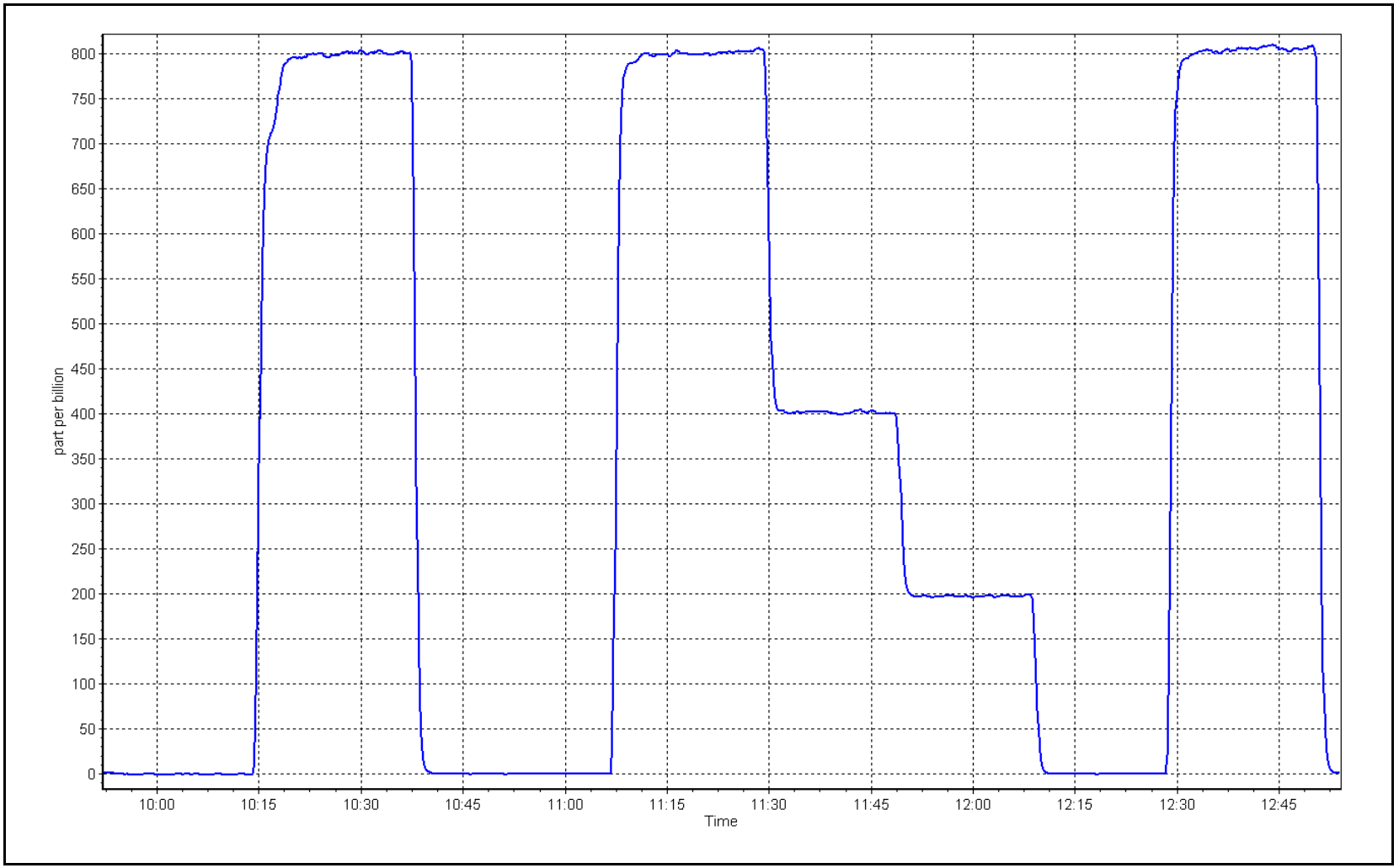
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.1 | ---- |
| 800.2 | 801.5 | 0.9984 |
| 400.2 | 401.4 | 0.9969 |
| 200.1 | 197.4 | 1.0135 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999980 | *≥0.995* |
| Slope | 1.003086 | *0.90 - 1.10* |
| Intercept | -1.136075 | *+/-30* |



**SO2 Calibration Plot** Date: February 8, 2024 Location: Leismer



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station number: | AMS501 |
| Calibration Date: | February 7, 2024 | Last Cal Date: | January 23, 2024 |
| Start time (MST): | 9:43 | End time (MST): | 13:51 |
| 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: | API T700 | | Serial Number: | 2659 |
| ZAG Make/Model: | API 701 | | Serial Number: | 4427 |

### Analyzer Information

| | | | | |
|---|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | | Analyzer serial #: | 1180540020 |
| Converter make: | Global G150 | | Converter serial #: | 2022-218 |
| Analyzer Range | 0 - 100 ppb | | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.999147 | 1.011575 | Backgd or Offset: | 3.57 | 3.57 |
| Calibration intercept: | 0.001539 | -0.158186 | Coeff or Slope: | 1.128 | 1.128 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4922 | 77.8 | 80.0 | 80.4 | 0.994 |
| as found 2nd point | 4961 | 38.9 | 40.0 | 40.0 | 0.997 |
| as found 3rd point | 4981 | 19.4 | 19.9 | 19.8 | 1.002 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4922 | 77.8 | 80.0 | 80.8 | 0.990 |
| second point | 4961 | 38.9 | 40.0 | 40.3 | 0.992 |
| third point | 4981 | 19.4 | 19.9 | 19.8 | 1.007 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4922 | 77.8 | 80.0 | 81.2 | 0.985 |
| SO2 Scrubber Check | 4921 | 79.2 | 792.0 | 0.0 | ---- |
| Date of last scrubber change: | | 24-Feb-23 | | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: | | December 1, 2022 | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.5 | Prev response: | 79.91 | *% change: | 0.7% |
| Baseline Corr 2nd AF pt: | 40.1 | AF Slope: | 1.007002 | AF Intercept: | -0.198215 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999993 | | |

* = > +/-5% change initiates investigation

Notes: Changed inlet filter after as founds. Scrubber test done after calibrator zero. No adjustment made.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

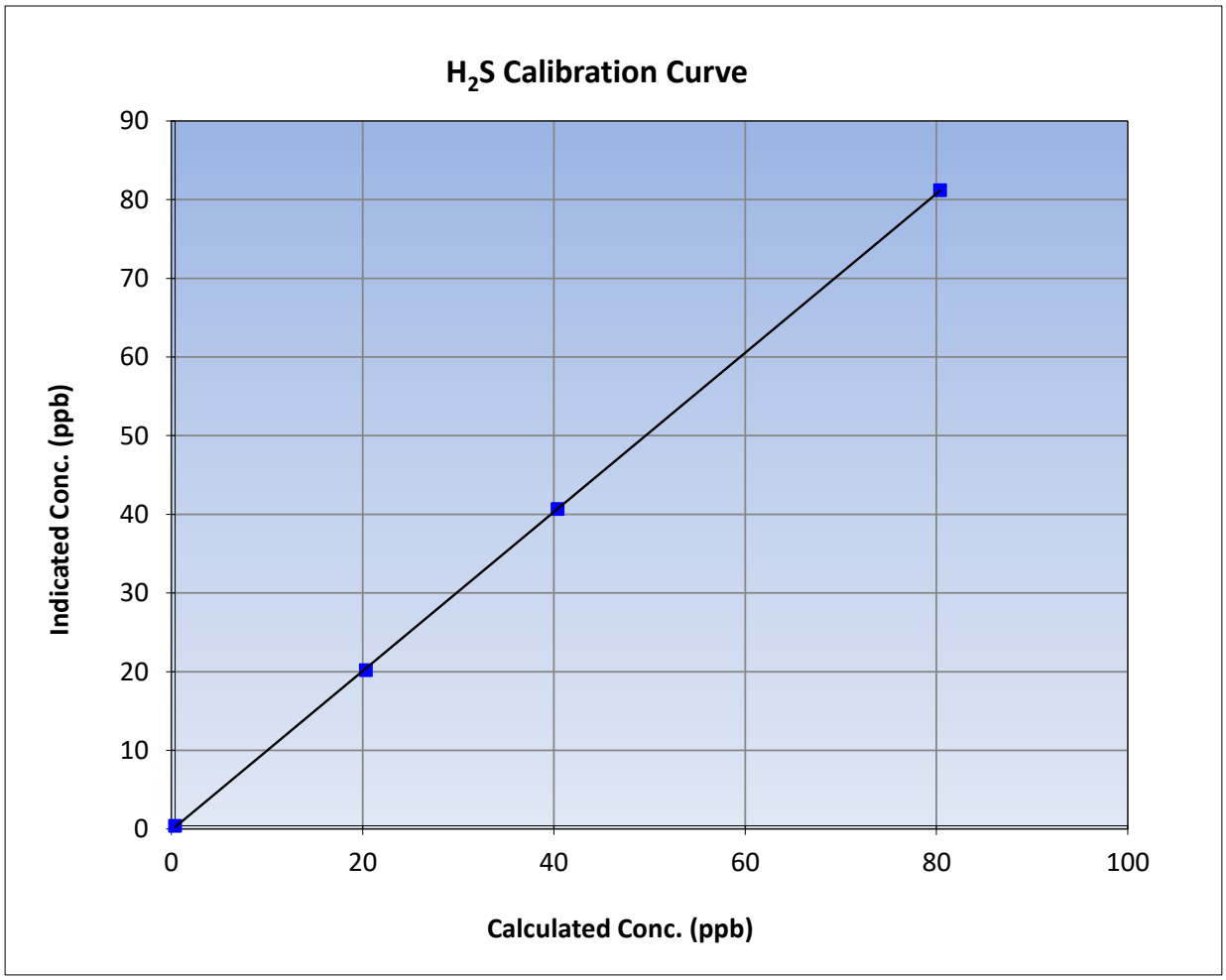
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 7, 2024 | Previous Calibration: | January 23, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 9:43 | End Time (MST): | 13:51 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1180540020 |

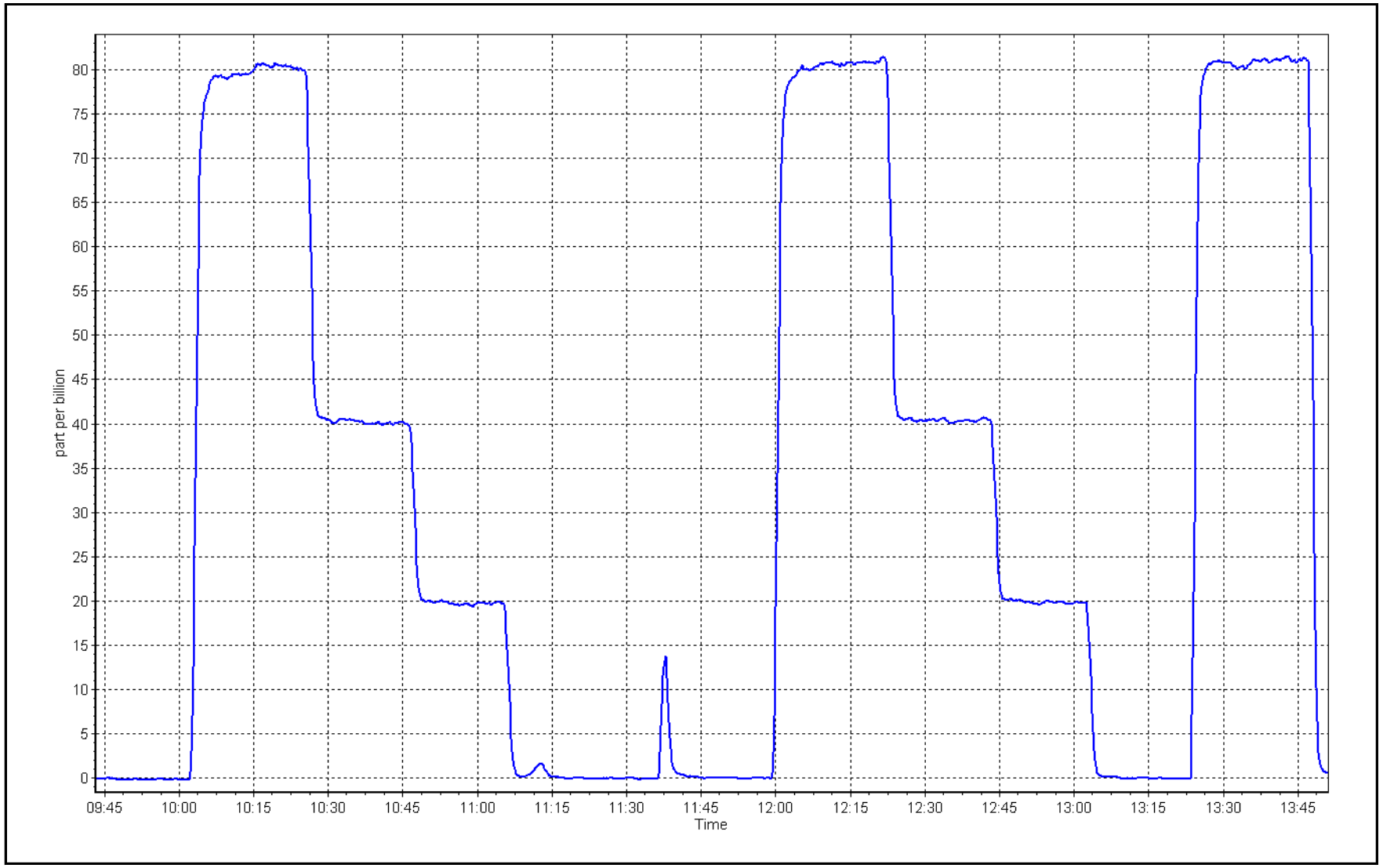
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.8 | 0.9899 |
| 40.0 | 40.3 | 0.9923 |
| 19.9 | 19.8 | 1.0072 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999979 | *≥0.995* |
| Slope | 1.011575 | *0.90 - 1.10* |
| Intercept | -0.158186 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 7, 2024 Location: Leismer



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station number: | AMS501 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | January 24, 2024 |
| Start time (MST): | 9:44 | End time (MST): | 13:55 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | | T26811M | Cal Gas Expiry Date: | October 30, 2024 | |
| NOX Cal Gas Conc: | 47.46 | ppm | NO Cal Gas Conc: | 47.39 | ppm |
| Removed Cylinder #: | | NA | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 47.46 | ppm | Removed Gas NO Conc: | 47.39 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 2659 | |
| ZAG make/model: | API 701 | | Serial Number: | 4427 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1218153356 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.186 | 1.186 | NO bkgnd or offset: | 3.5 | 3.5 |
| NOX coeff or slope: | 0.991 | 0.991 | NOX bkgnd or offset: | 3.5 | 3.5 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 166.2 | 166.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.001018 | 1.006425 |
| $NO_X$ Cal Offset: | -1.427986 | -3.447999 |
| NO Cal Slope: | 1.002011 | 1.006912 |
| NO Cal Offset: | -2.907962 | -4.347977 |
| $NO_2$ Cal Slope: | 1.000174 | 0.999948 |
| $NO_2$ Cal Offset: | 0.184957 | 0.272718 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | 0.1 | ---- | ---- |
| as found span | 4916 | 84.4 | 801.1 | 799.9 | 1.2 | 805.1 | 802.0 | 3.2 | 0.9950 | 0.9974 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| high point | 4916 | 84.4 | 801.1 | 799.9 | 1.2 | 804.2 | 802.8 | 1.3 | 0.9961 | 0.9964 |
| second point | 4958 | 42.2 | 400.5 | 400.0 | 0.6 | 398.9 | 397.5 | 1.5 | 1.0041 | 1.0062 |
| third point | 4979 | 21.1 | 200.3 | 200.0 | 0.3 | 193.9 | 191.8 | 2.1 | 1.0329 | 1.0427 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| as left span | 4916 | 84.4 | 801.1 | 404.9 | 396.2 | 796.7 | 401.9 | 394.8 | 1.0055 | 1.0074 |
| | | | | | | | | Average Correction Factor | 1.0110 | 1.0151 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 805.1 ppb | NO = 802.2 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.6% |
| Previous Response | $NO_X$ = 800.4 ppb | NO = 798.6 ppb | | *Percent Change | NO = | 0.5% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 796.3 | 401.3 | 396.2 | 396.3 | 0.9997 | 100.0% |
| 2nd GPT point (200 ppb O3) | 796.3 | 609.0 | 188.5 | 189.0 | 0.9973 | 100.3% |
| 3rd GPT point (100 ppb O3) | 796.3 | 704.1 | 93.4 | 93.7 | 0.9966 | 100.3% |
| | | | | Average Correction Factor | 0.9979 | 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

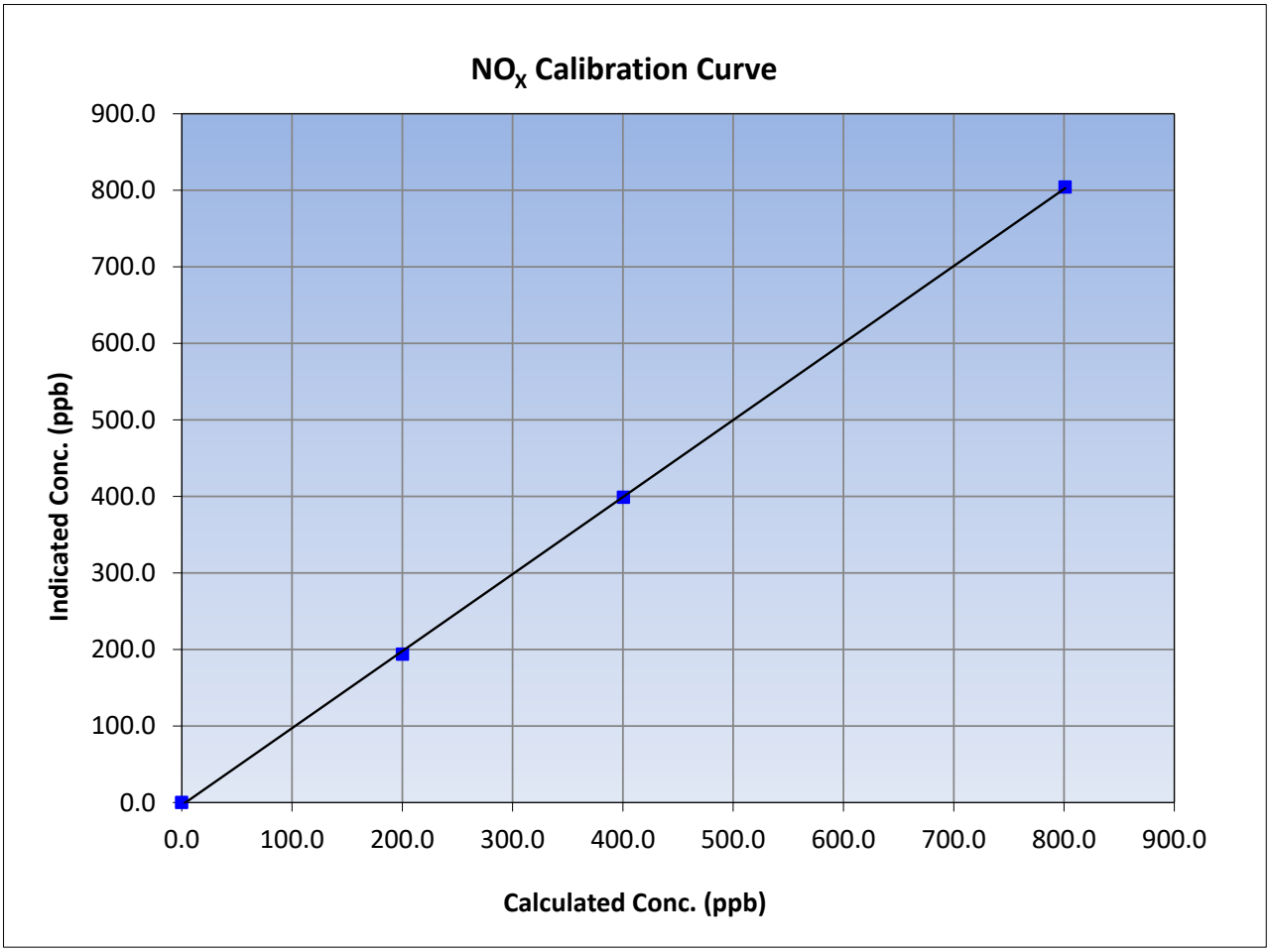
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 9:44 | End Time (MST): | 13:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153356 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999907 | *≥0.995* |
| 801.1 | 804.2 | 0.9961 | | | |
| 400.5 | 398.9 | 1.0041 | Slope | 1.006425 | *0.90 - 1.10* |
| 200.3 | 193.9 | 1.0329 | | | |
| | | | Intercept | -3.447999 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

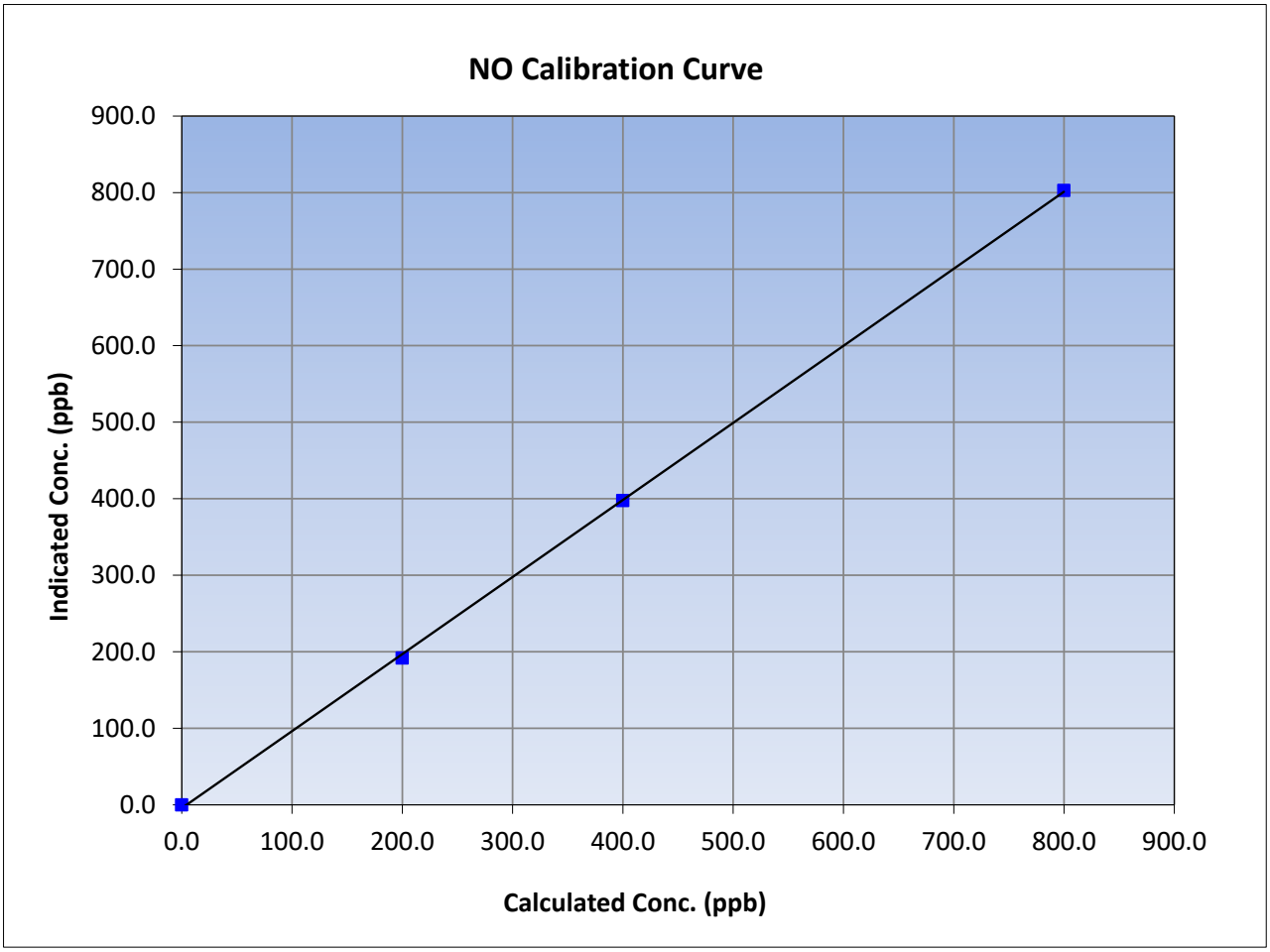
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 9:44 | End Time (MST): | 13:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153356 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999859 | *≥0.995* |
| 799.9 | 802.8 | 0.9964 | | | |
| 400.0 | 397.5 | 1.0062 | Slope | 1.006912 | *0.90 - 1.10* |
| 200.0 | 191.8 | 1.0427 | | | |
| | | | Intercept | -4.347977 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

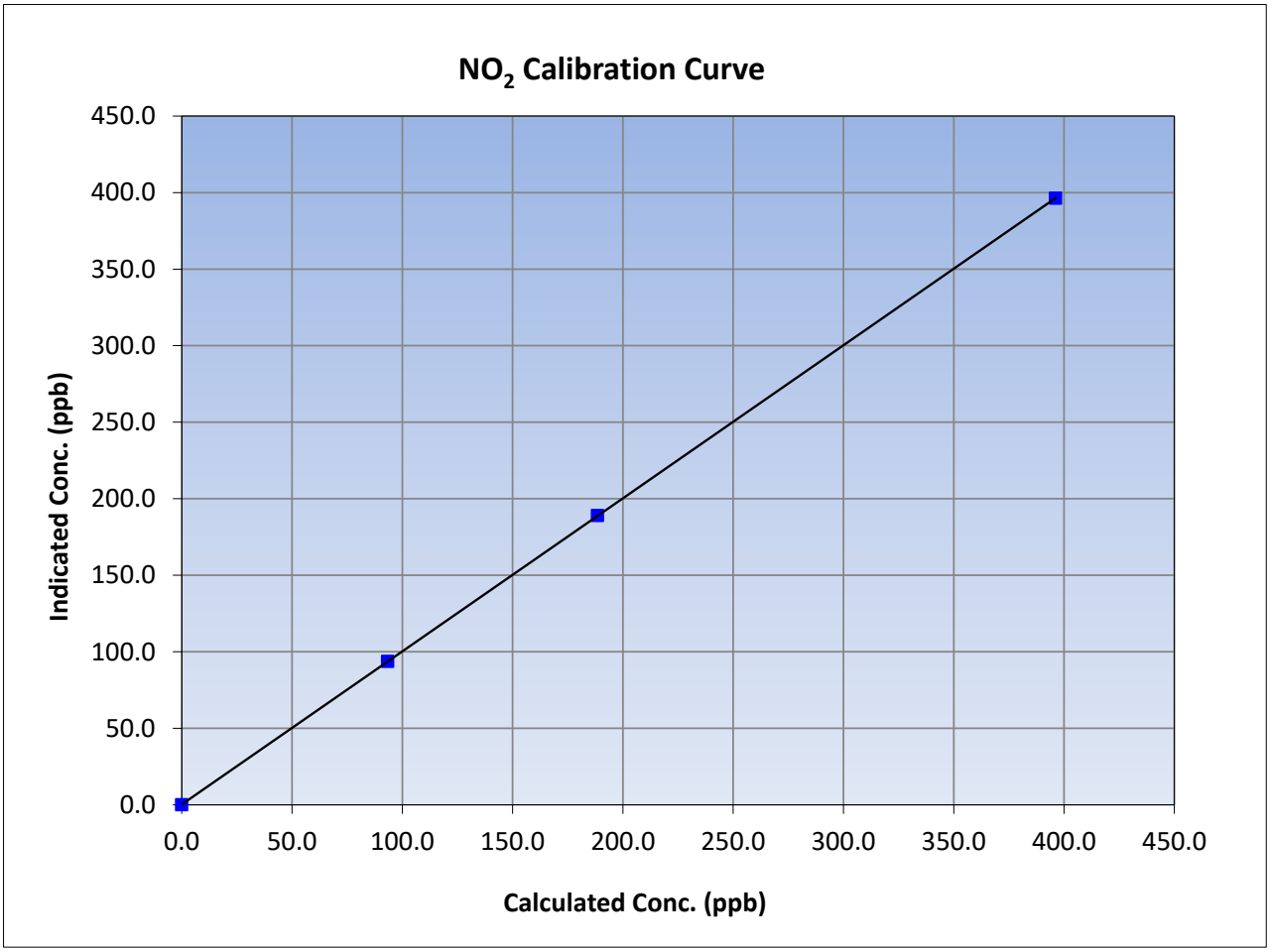
Version-04-2020

### Station Information

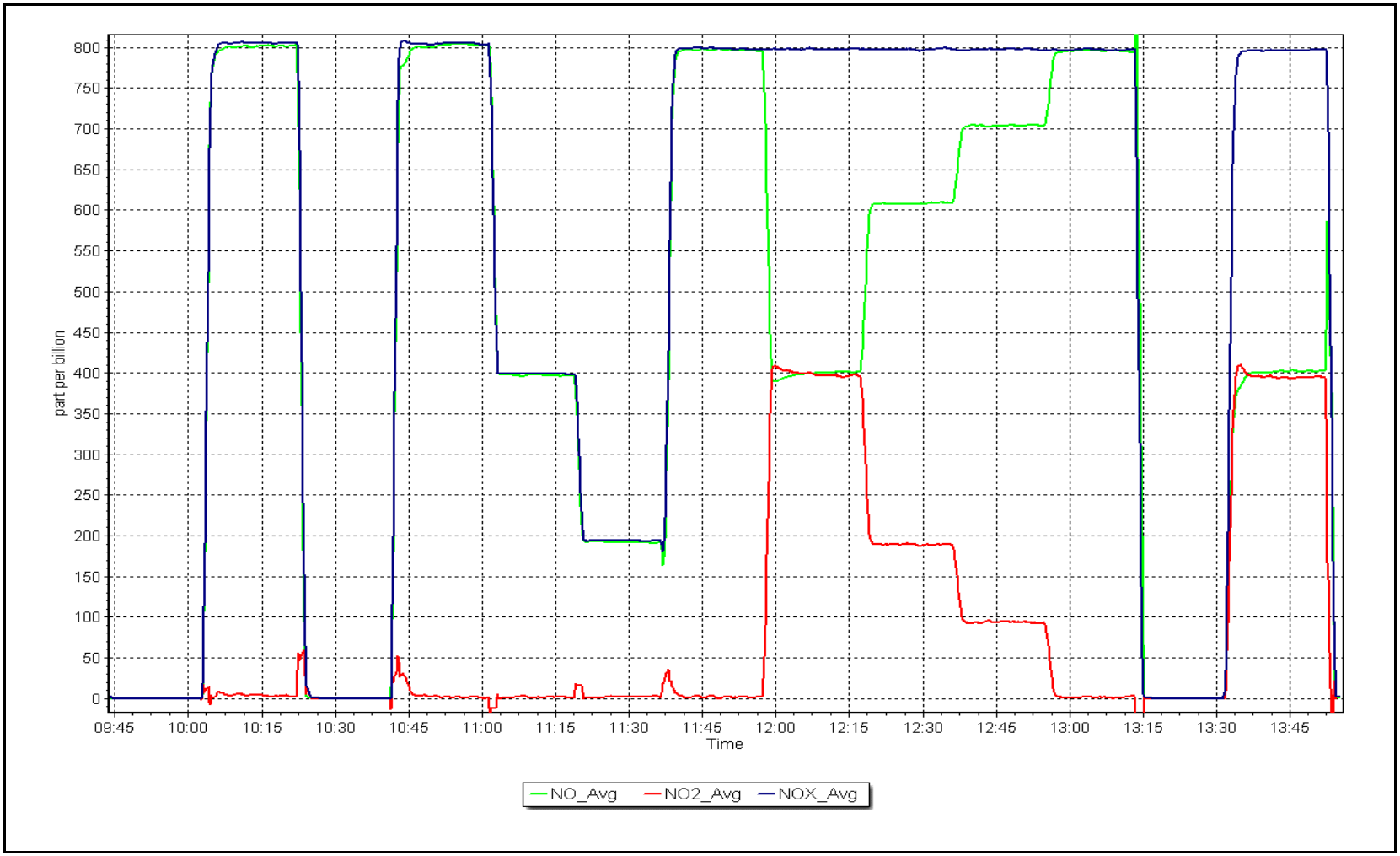
| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 24, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 9:44 | End Time (MST): | 13:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153356 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 396.2 | 396.3 | 0.9997 | | | |
| 188.5 | 189.0 | 0.9973 | Slope | 0.999948 | *0.90 - 1.10* |
| 93.4 | 93.7 | 0.9966 | | | |
| | | | Intercept | 0.272718 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 21, 2024 Location: Leismer



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS505
## SAWBONES BAY

## FEBRUARY 2024

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

March 28, 2024

CALS_546

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Sawbones Bay | Station number: | AMS505 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 11, 2024 |
| Start time (MST): | 9:24 | End time (MST): | 12:20 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 51.4 | ppm | Cal Gas Exp Date: | February 15, 2029 |
| Cal Gas Cylinder #: | EY0000672 | | | |
| Removed Cal Gas Conc: | 51.40 | ppm | Rem Gas Exp Date: | February 15, 2029 |
| Removed Gas Cyl #: | EY0000672 | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5112 |
| ZAG Make/Model: | Teledyne API T701H | | Serial Number: | 690 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 0710321323

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.001437 | 1.004096 | Backgd or Offset: | 20.5 | 20.1 |
| Calibration intercept: | -0.892107 | -1.272603 | Coeff or Slope: | 0.994 | 0.989 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.5 | ---- |
| as found span | 4922 | 77.8 | 799.8 | 805.1 | 0.993 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4922 | 77.8 | 799.8 | 802.1 | 0.997 |
| second point | 4961 | 38.9 | 399.9 | 400.7 | 0.998 |
| third point | 4981 | 19.5 | 200.4 | 198.0 | 1.012 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4922 | 77.8 | 799.8 | 801.2 | 0.998 |
| | | | | Average Correction Factor | 1.002 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 805.60 | Previous response | 800.07 | *% 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

Notes: Changed inlet filter. Adjusted span only.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

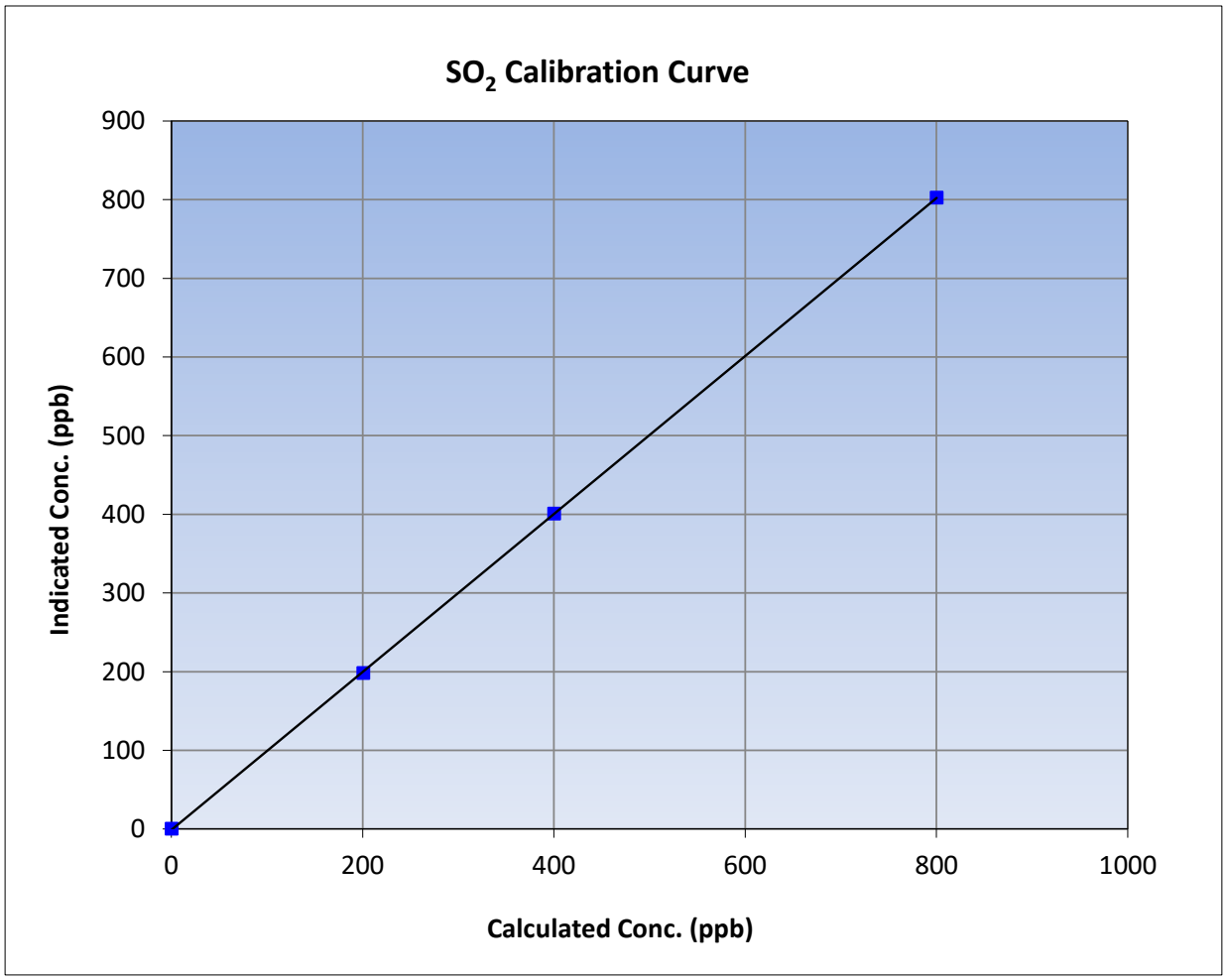
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 11, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 9:24 | End Time (MST): | 12:20 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 0710321323 |

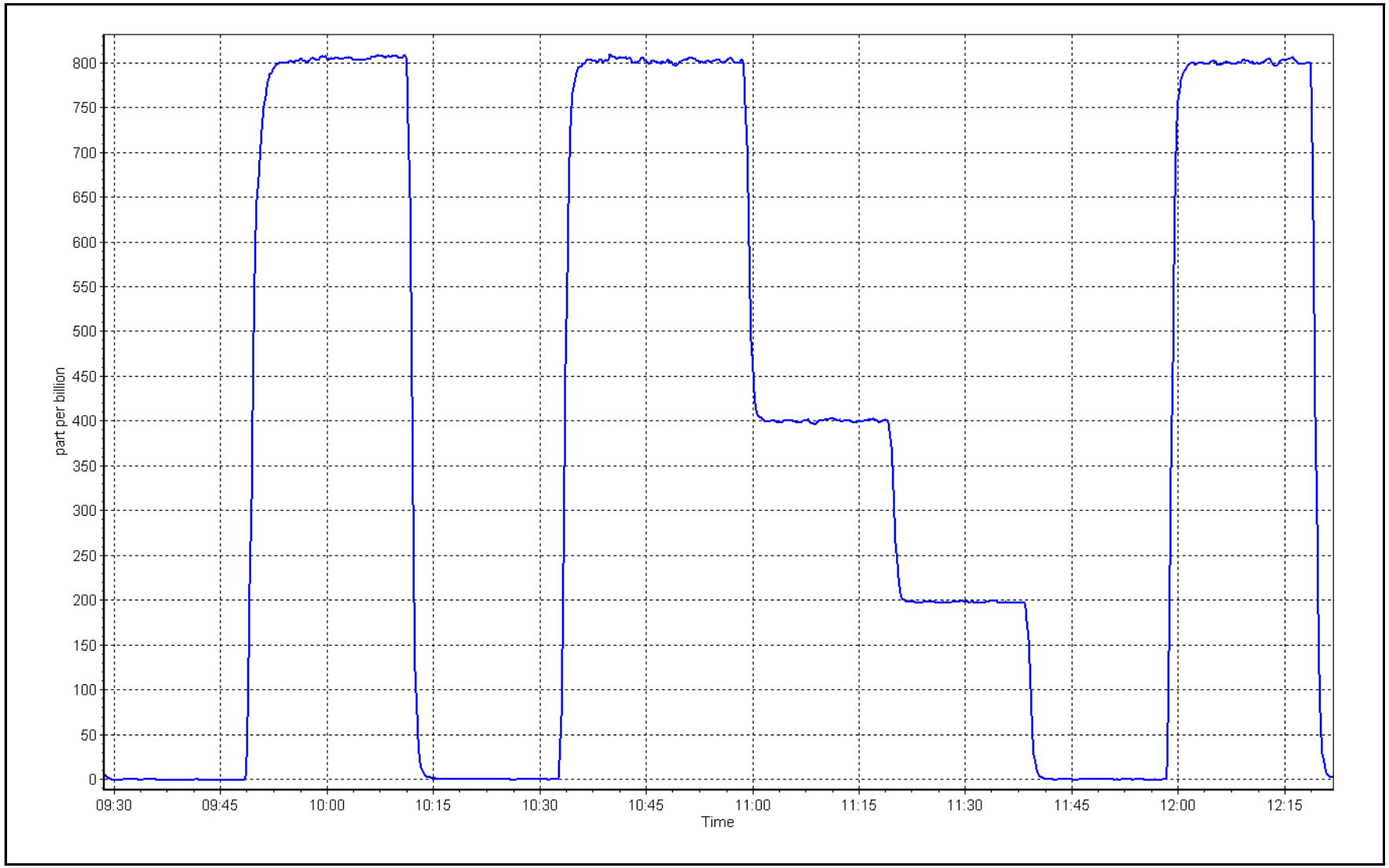
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 799.8 | 802.1 | 0.9972 |
| 399.9 | 400.7 | 0.9980 |
| 200.4 | 198.0 | 1.0123 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999983 | *≥0.995* |
| Slope | 1.004096 | *0.90 - 1.10* |
| Intercept | -1.272603 | *+/-30* |



**SO2 Calibration Plot** Date: February 15, 2024 Location: Sawbones Bay



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Sawbones Bay | Station number: | AMS505 |
| Calibration Date: | February 22, 2024 | Last Cal Date: | January 8, 2024 |
| Start time (MST): | 9:34 | End time (MST): | 13:23 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.15 | ppm | Cal Gas Exp Date: | February 5, 2024 |
| Cal Gas Cylinder #: | CC517397 | | | |
| Removed Cal Gas Conc: | 5.15 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | Teledybe API T700 | | Serial Number: | 5112 |
| ZAG Make/Model: | Teledybe API T701 | | Serial Number: | 690 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43iQ | | Analyzer serial #: | 12113311965 | |
| Converter make: | Global 150 | | Converter serial #: | 2022-224 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.006361 | 1.014500 | Backgd or Offset: | 1.01 | 1.01 |
| Calibration intercept: | -0.218059 | -0.077888 | Coeff or Slope: | 1.119 | 1.119 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as found span | 4922 | 77.7 | 80.0 | 81.5 | 0.981 |
| as found 2nd point | 4961 | 38.8 | 40.0 | 40.5 | 0.984 |
| as found 3rd point | 4981 | 19.4 | 20.0 | 20.0 | 0.994 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4922 | 77.7 | 80.0 | 81.2 | 0.986 |
| second point | 4961 | 38.8 | 40.0 | 40.3 | 0.992 |
| third point | 4981 | 19.4 | 20.0 | 20.2 | 0.989 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4922 | 77.7 | 80.0 | 80.8 | 0.991 |
| SO2 Scrubber Check | 4922 | 77.8 | 778.0 | -0.1 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.989 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.6 | Prev response: | 80.33 | *% change: | 1.6% |
| Baseline Corr 2nd AF pt: | 40.6 | AF Slope: | 1.020497 | AF Intercept: | -0.237739 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999987 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

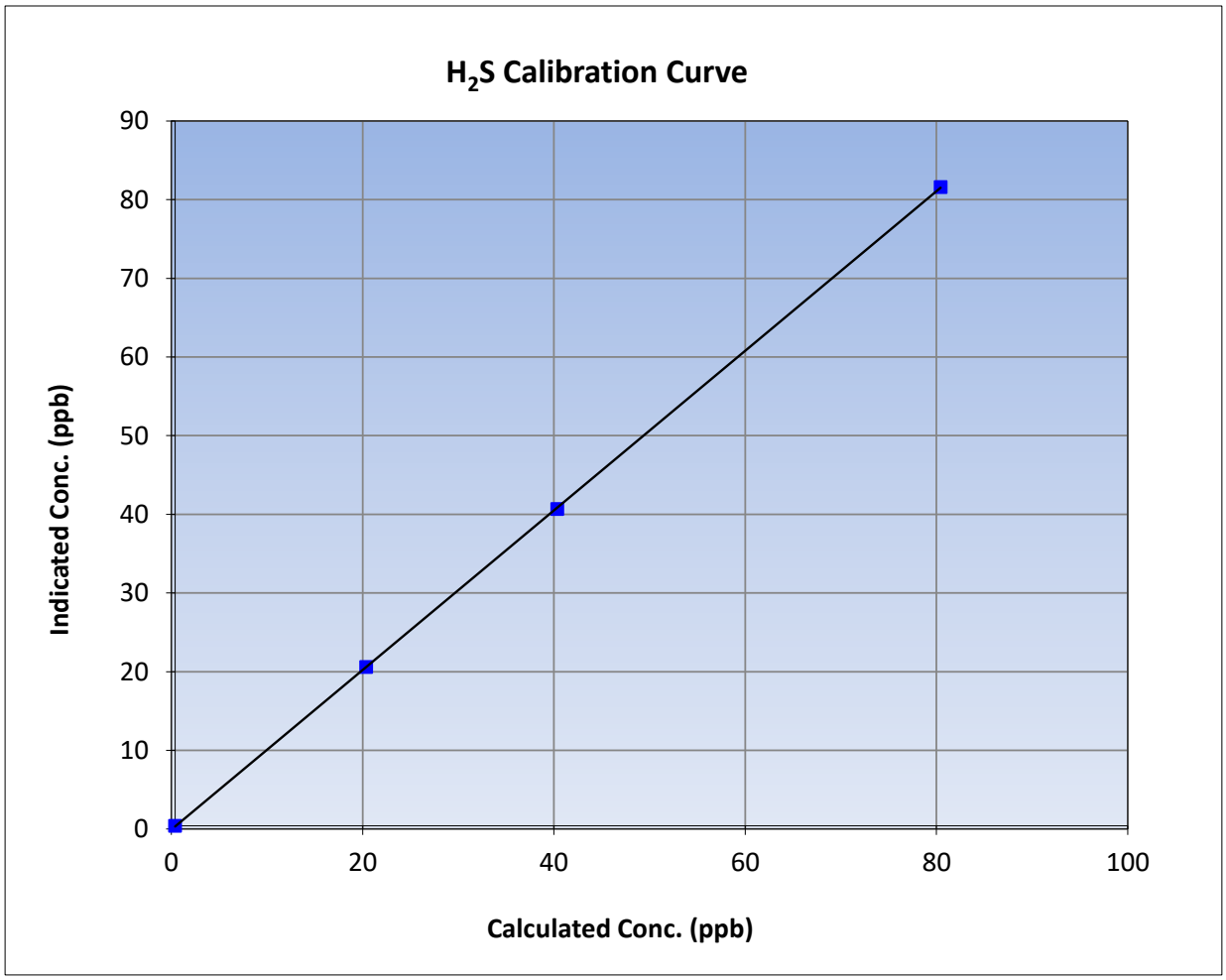
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | January 8, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 9:34 | End Time (MST): | 13:23 |
| Analyzer make: | Thermo 43iQ | Analyzer serial #: | 12113311965 |

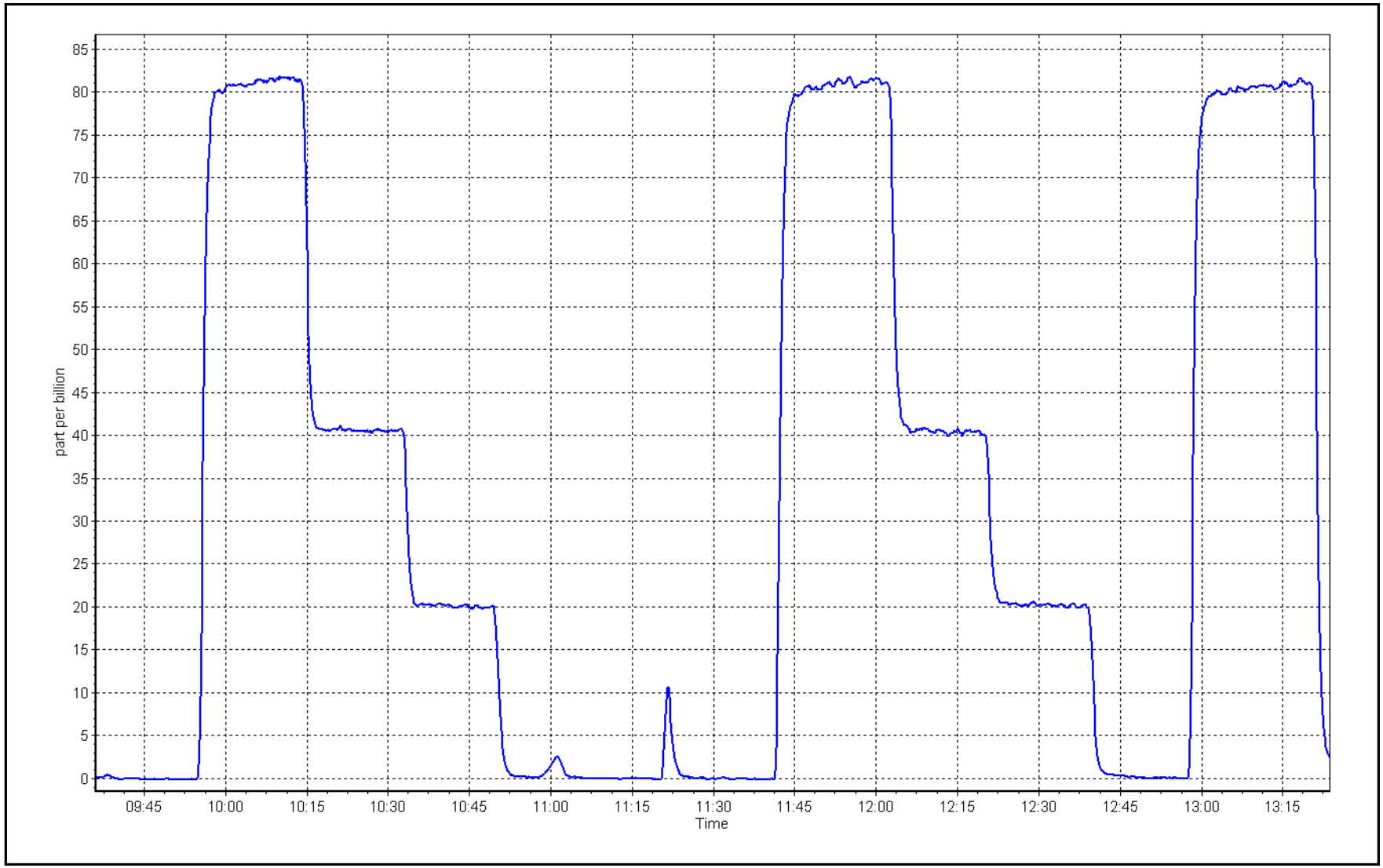
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 81.2 | 0.9857 |
| 40.0 | 40.3 | 0.9917 |
| 20.0 | 20.2 | 0.9891 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999989 | *≥0.995* |
| Slope | 1.014500 | *0.90 - 1.10* |
| Intercept | -0.077888 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 22, 2024 Location: Sawbones Bay



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Sawbones Bay | Station number: | AMS505 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | January 10, 2024 |
| Start time (MST): | 9:30 | End time (MST): | 13:42 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | T1FY3PK | | Cal Gas Expiry Date: | March 14, 2025 | |
| NOX Cal Gas Conc: | 47.94 | ppm | NO Cal Gas Conc: | 47.94 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 47.94 | ppm | Removed Gas NO Conc: | 47.94 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 5112 | |
| ZAG make/model: | API T701H | | Serial Number: | 690 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | API T200 | Analyzer serial #: | 4260 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.062 | 1.054 | NO bkgnd or offset: | 0.4 | 0.4 |
| NOX coeff or slope: | 1.060 | 1.052 | NOX bkgnd or offset: | 1.3 | 1.3 |
| NO2 coeff or slope: | NA | NA | Reaction cell Press: | 7.6 | 8.0 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.001378 | 1.001650 |
| $NO_X$ Cal Offset: | -1.910345 | -1.730586 |
| NO Cal Slope: | 1.000734 | 1.001864 |
| NO Cal Offset: | -2.109999 | -1.930254 |
| $NO_2$ Cal Slope: | 0.999561 | 1.000683 |
| $NO_2$ Cal Offset: | 0.319413 | -0.373004 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.2 | -0.2 | ---- | ---- |
| as found span | 4917 | 83.4 | 799.6 | 799.6 | 0.0 | 805.6 | 801.6 | 3.8 | 0.9925 | 0.9975 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.5 | -0.1 | -0.4 | ---- | ---- |
| high point | 4917 | 83.4 | 799.6 | 799.6 | 0.0 | 799.7 | 799.9 | -0.3 | 0.9998 | 0.9996 |
| second point | 4958 | 41.7 | 399.8 | 399.8 | 0.0 | 398.4 | 398.2 | 0.3 | 1.0036 | 1.0041 |
| third point | 4979 | 20.9 | 200.4 | 200.4 | 0.0 | 197.6 | 196.7 | 0.9 | 1.0141 | 1.0188 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.1 | -0.3 | ---- | ---- |
| as left span | 4916 | 83.4 | 799.7 | 333.8 | 465.9 | 795.1 | 332.3 | 462.8 | 1.0058 | 1.0046 |
| | | | | | | | | Average Correction Factor | 1.0059 | 1.0075 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 806.0 ppb | NO = 801.8 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.9% |
| Previous Response | $NO_X$ = 798.8 ppb | NO = 798.1 ppb | | *Percent Change | NO = | 0.5% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 796.1 | 330.2 | 465.9 | 465.8 | 1.0002 | 100.0% |
| 2nd GPT point (200 ppb O3) | 796.1 | 545.1 | 251.0 | 250.9 | 1.0004 | 100.0% |
| 3rd GPT point (100 ppb O3) | 796.1 | 646.5 | 149.6 | 149.3 | 1.0020 | 99.8% |
| | | | | Average Correction Factor | 1.0009 | 99.9% |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

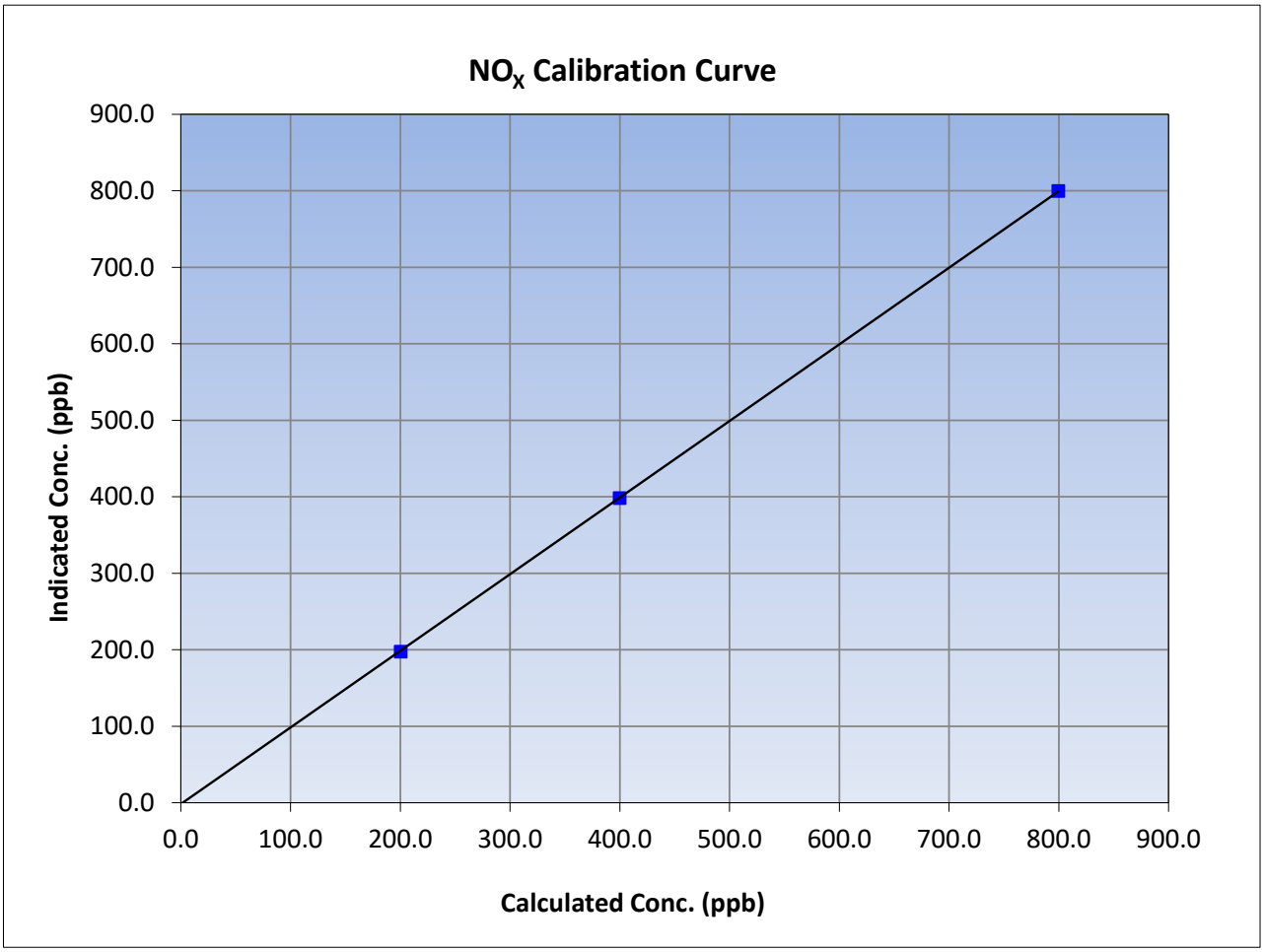
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 9:30 | End Time (MST): | 13:42 |
| Analyzer make: | API T200 | Analyzer serial #: | 4260 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.5 | ---- | Correlation Coefficient | 0.999989 | ≥0.995 |
| 799.6 | 799.7 | 0.9998 | | | |
| 399.8 | 398.4 | 1.0036 | Slope | 1.001650 | 0.90 - 1.10 |
| 200.4 | 197.6 | 1.0141 | | | |
| | | | Intercept | -1.730586 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

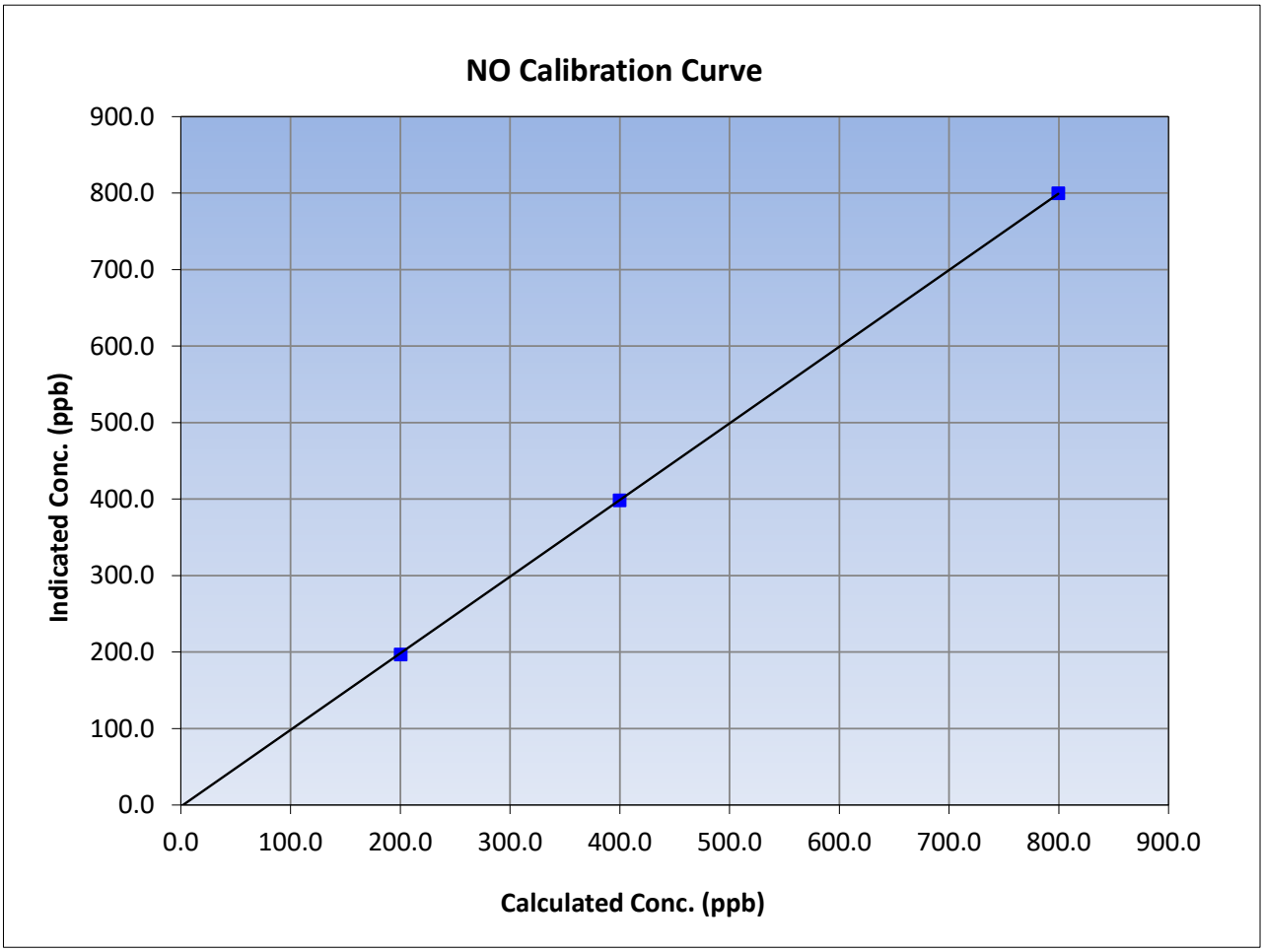
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 9:30 | End Time (MST): | 13:42 |
| Analyzer make: | API T200 | Analyzer serial #: | 4260 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999975 | ≥0.995 |
| 799.6 | 799.9 | 0.9996 | | | |
| 399.8 | 398.2 | 1.0041 | Slope | 1.001864 | 0.90 - 1.10 |
| 200.4 | 196.7 | 1.0188 | | | |
| | | | Intercept | -1.930254 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

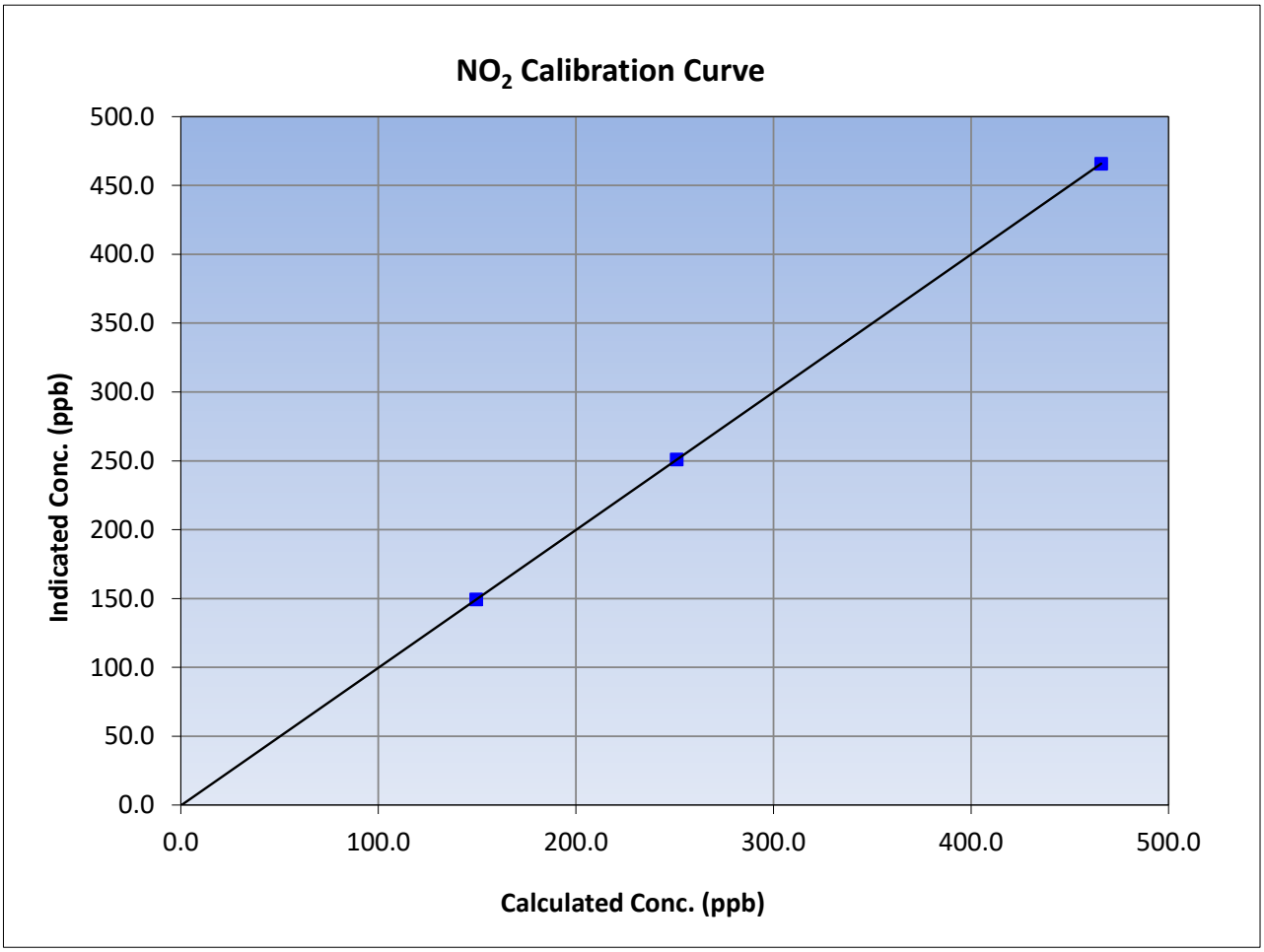
Version-04-2020

### Station Information

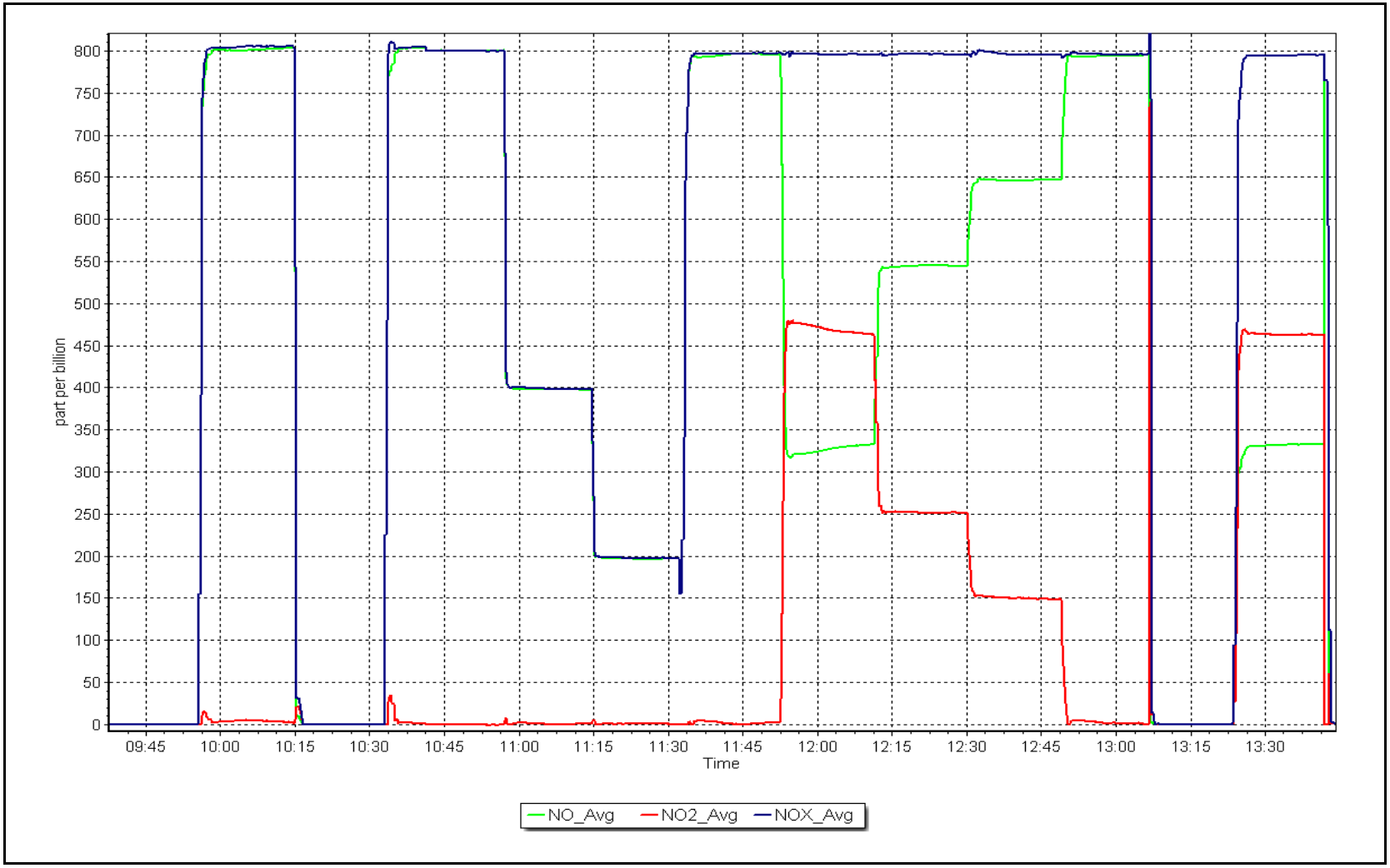
| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 10, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 9:30 | End Time (MST): | 13:42 |
| Analyzer make: | API T200 | Analyzer serial #: | 4260 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.4 | ---- | Correlation Coefficient | 1.000000 | ≥0.995 |
| 465.9 | 465.8 | 1.0002 | | | |
| 251.0 | 250.9 | 1.0004 | Slope | 1.000683 | 0.90 - 1.10 |
| 149.6 | 149.3 | 1.0020 | | | |
| | | | Intercept | -0.373004 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 14, 2024 Location: Sawbones Bay



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS507
## KIRBY SOUTH

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS 507 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 12:43 | End time (MST): | 15:54 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 49.18 | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #: | CC303554 | | | |
| Removed Cal Gas Conc: | 49.18 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3804 |
| ZAG Make/Model: | API T701H | | Serial Number: | 880 |

### Analyzer Information

Analyzer make: Thermo 43iQ — Analyzer serial #: 1182340007

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.005405 | 0.997947 | Backgd or Offset: | 24.6 | 23.9 |
| Calibration intercept: | -1.048100 | -0.888482 | Coeff or Slope: | 1.100 | 1.072 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| as found span | 4919 | 81.3 | 799.6 | 816.0 | 0.980 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| high point | 4919 | 81.3 | 799.6 | 798.0 | 1.002 |
| second point | 4959 | 40.7 | 400.3 | 396.7 | 1.009 |
| third point | 4980 | 20.3 | 199.7 | 198.6 | 1.005 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 81.3 | 799.6 | 798.7 | 1.001 |
| | | | | Average Correction Factor | 1.006 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 816.30 | Previous response | 802.89 | *% 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

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

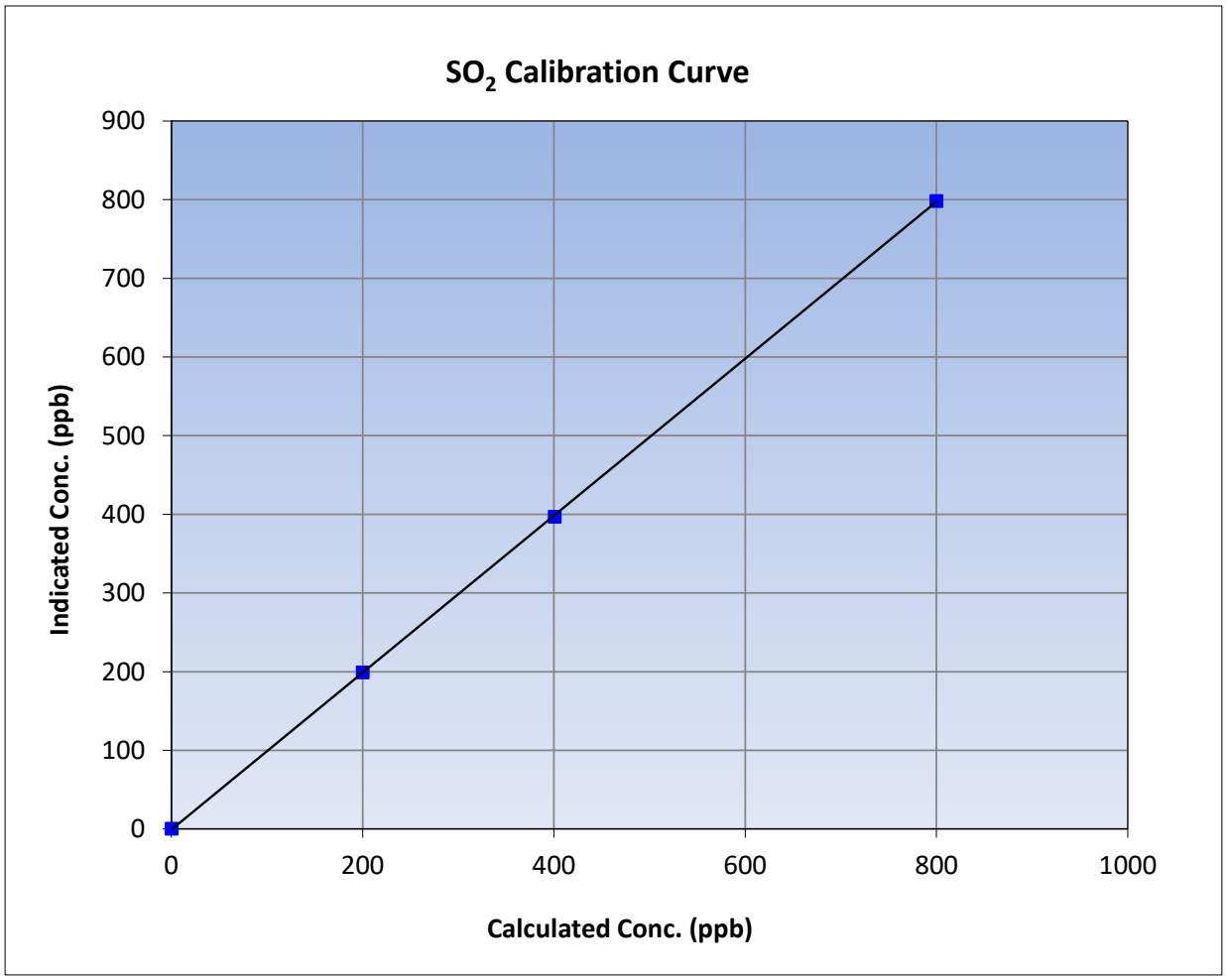
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Kirby South | Station Number: | AMS 507 |
| Start Time (MST): | 12:43 | End Time (MST): | 15:54 |
| Analyzer make: | Thermo 43iQ | Analyzer serial #: | 1182340007 |

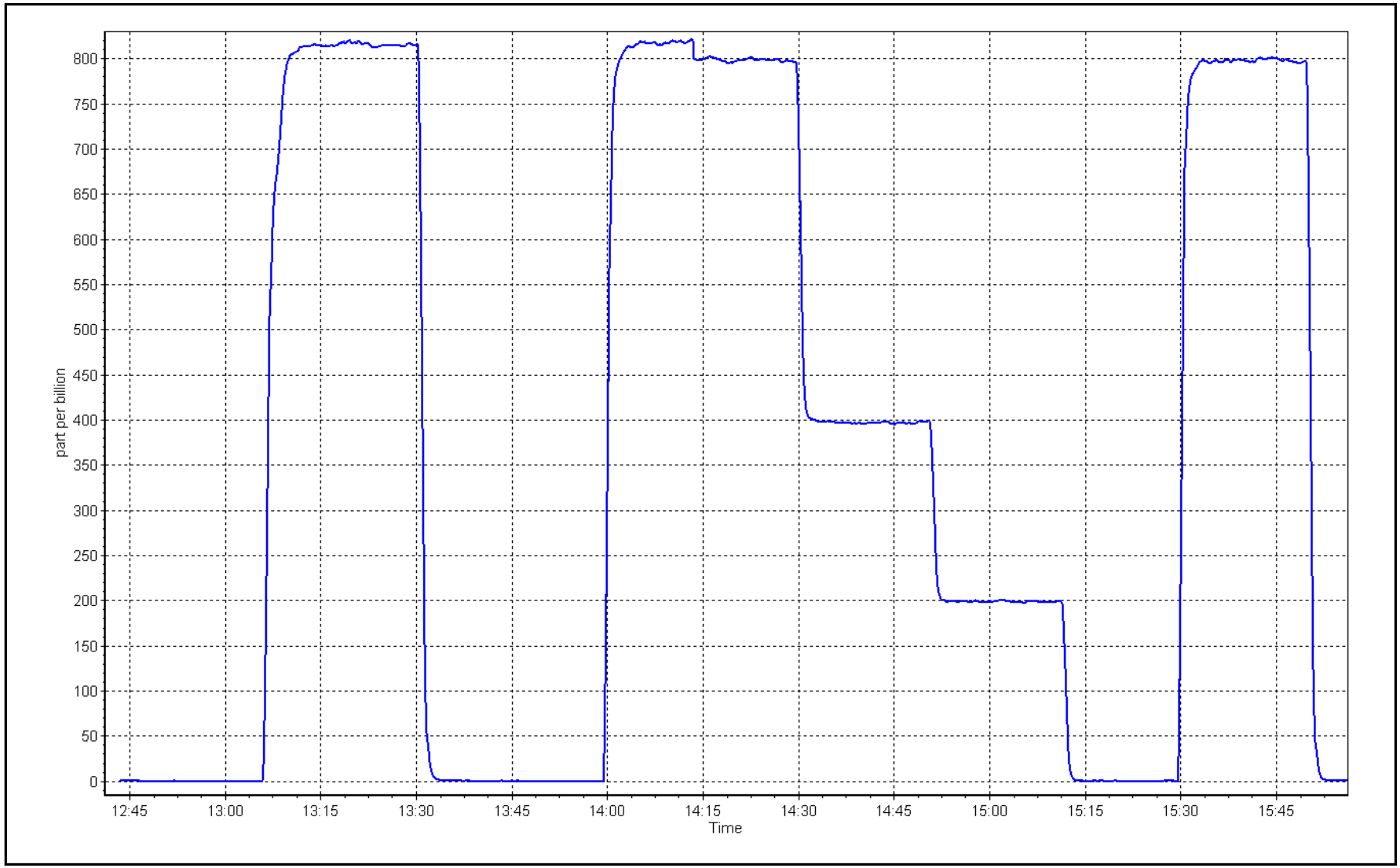
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.1 | ---- |
| 799.6 | 798.0 | 1.0020 |
| 400.3 | 396.7 | 1.0092 |
| 199.7 | 198.6 | 1.0053 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999985 | *≥0.995* |
| Slope | 0.997947 | *0.90 - 1.10* |
| Intercept | -0.888482 | *+/-30* |



**SO2 Calibration Plot** Date: February 14, 2024 Location: Kirby South



# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS 507 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 13:00 | End time (MST): | 16:05 |
| Reason: | Install | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 49.18 | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #: | CC303554 | | | |
| Removed Cal Gas Conc: | 49.18 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3804 |
| ZAG Make/Model: | API T701H | | Serial Number: | 880 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1173410001

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.005405 | 0.999677 | Backgd or Offset: | NA | 18.8 |
| Calibration intercept: | -1.048100 | -1.668567 | Coeff or Slope: | NA | 0.889 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4919 | 81.3 | 799.6 | 799.0 | 1.001 |
| second point | 4959 | 40.7 | 400.3 | 396.3 | 1.010 |
| third point | 4980 | 20.3 | 199.7 | 197.2 | 1.012 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4919 | 81.3 | 799.6 | 799.2 | 1.001 |
| | | | | Average Correction Factor | 1.008 |

| | | | | | |
|---|---|---|---|---|---|
| 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

Notes: Install due to communication issues after a firmware update. Removed 43iQ SN: 1182340007, installed 43i SN: 1173410001.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

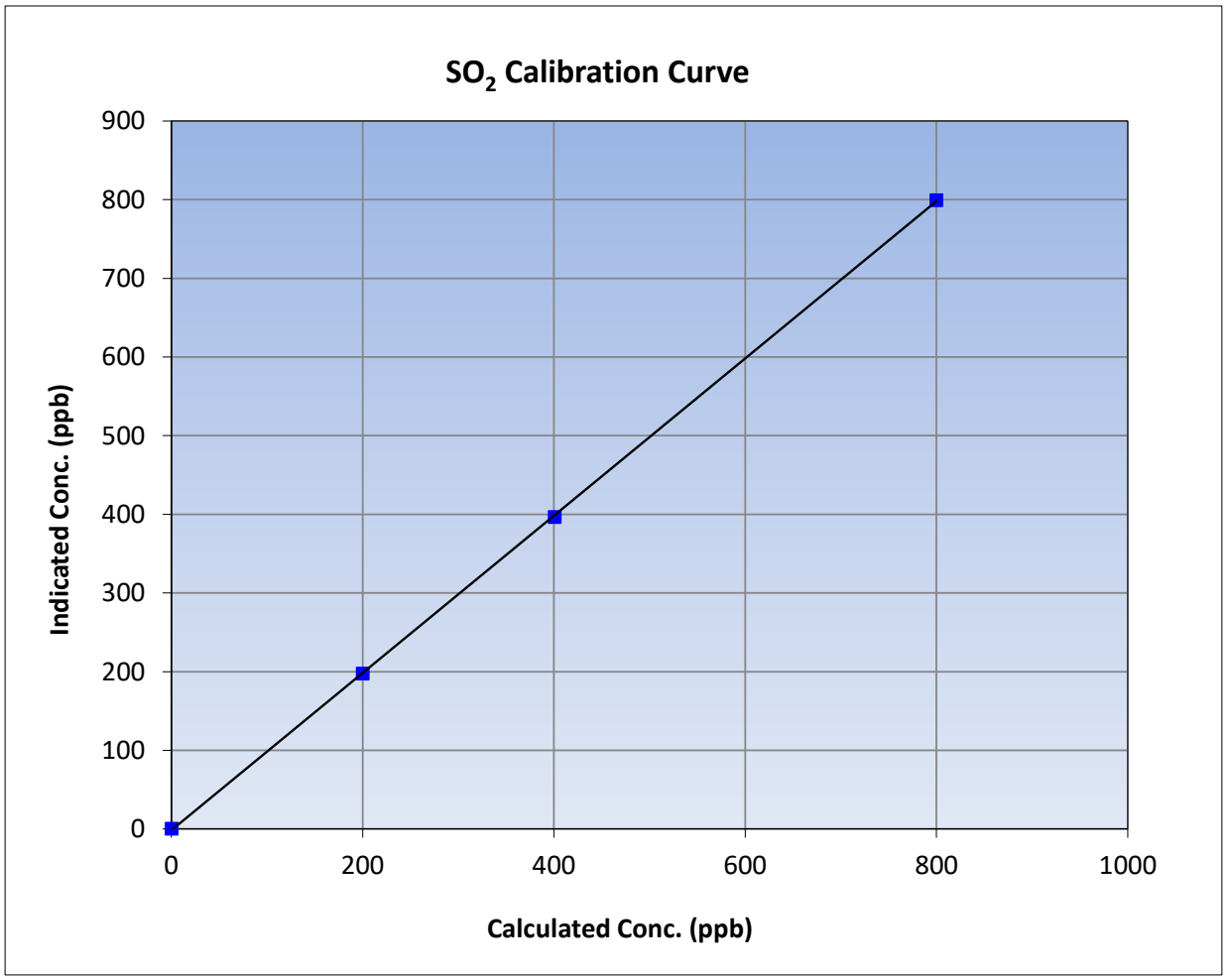
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Kirby South | Station Number: | AMS 507 |
| Start Time (MST): | 13:00 | End Time (MST): | 16:05 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1173410001 |

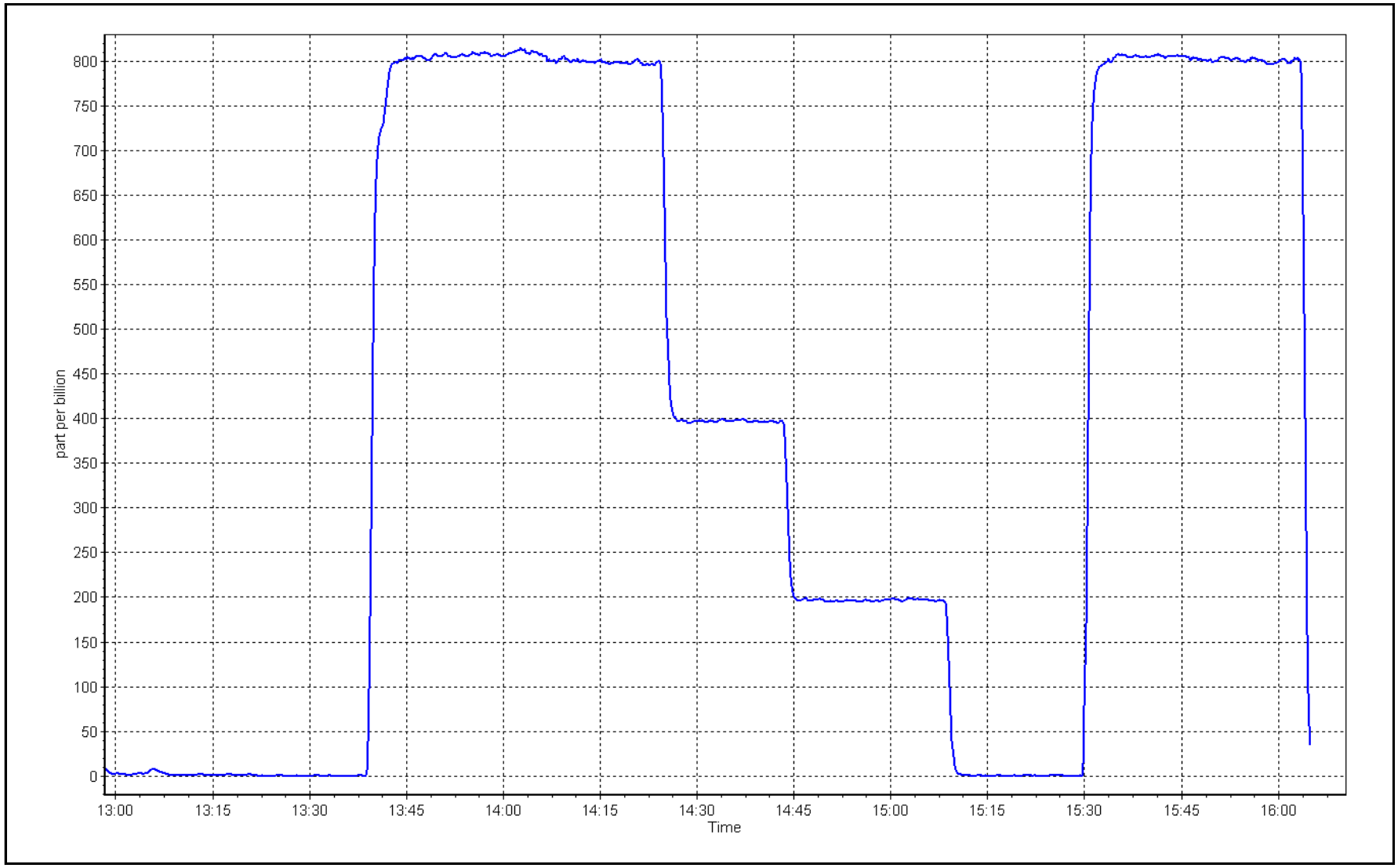
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 799.6 | 799.0 | 1.0008 |
| 400.3 | 396.3 | 1.0102 |
| 199.7 | 197.2 | 1.0125 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999971 | *≥0.995* |
| Slope | 0.999677 | *0.90 - 1.10* |
| Intercept | -1.668567 | *+/-30* |



**SO2 Calibration Plot** Date: February 15, 2024 Location: Kirby South



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS507 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 7:35 | End time (MST): | 13:26 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.05 | ppm | Cal Gas Exp Date: | November 15, 2026 |
| Cal Gas Cylinder #: | DT0019762 | | | |
| Removed Cal Gas Conc: | 5.05 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | DT0019762 | | Diff between cyl: | |
| Calibrator Make/Model: | API T750 | | Serial Number: | 281 |
| ZAG Make/Model: | API T751H | | Serial Number: | 321 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i TLE | | Analyzer serial #: | 1150840012 | |
| Converter make: | Global | | Converter serial #: | 2022-197 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.997813 | 0.998813 | Backgd or Offset: | 1.74 | 1.74 |
| Calibration intercept: | 0.179050 | 0.219035 | Coeff or Slope: | 1.052 | 1.052 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4923 | 77.4 | 78.2 | 79.6 | 0.982 |
| as found 2nd point | 4961 | 38.8 | 39.2 | 39.9 | 0.982 |
| as found 3rd point | 4981 | 19.3 | 19.5 | 20.0 | 0.975 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4921 | 79.2 | 80.0 | 80.0 | 1.000 |
| second point | 4960 | 39.6 | 40.0 | 40.3 | 0.993 |
| third point | 4980 | 19.8 | 20.0 | 20.4 | 0.980 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4921 | 79.2 | 80.0 | 80.2 | 0.997 |
| SO2 Scrubber Check | 4919 | 80.0 | 800.2 | 0.1 | ---- |
| Date of last scrubber change: | | 25-Jul-23 | | Ave Corr Factor | 0.991 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 79.6 | Prev response: | 78.18 | *% change: | 1.8% |
| Baseline Corr 2nd AF pt: | 39.9 | AF Slope: | 1.017647 | AF Intercept: | 0.058982 |
| Baseline Corr 3rd AF pt: | 20.0 | AF Correlation: | 0.999995 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. Ran SOx scrubber check after cal zero. No adjustments made.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

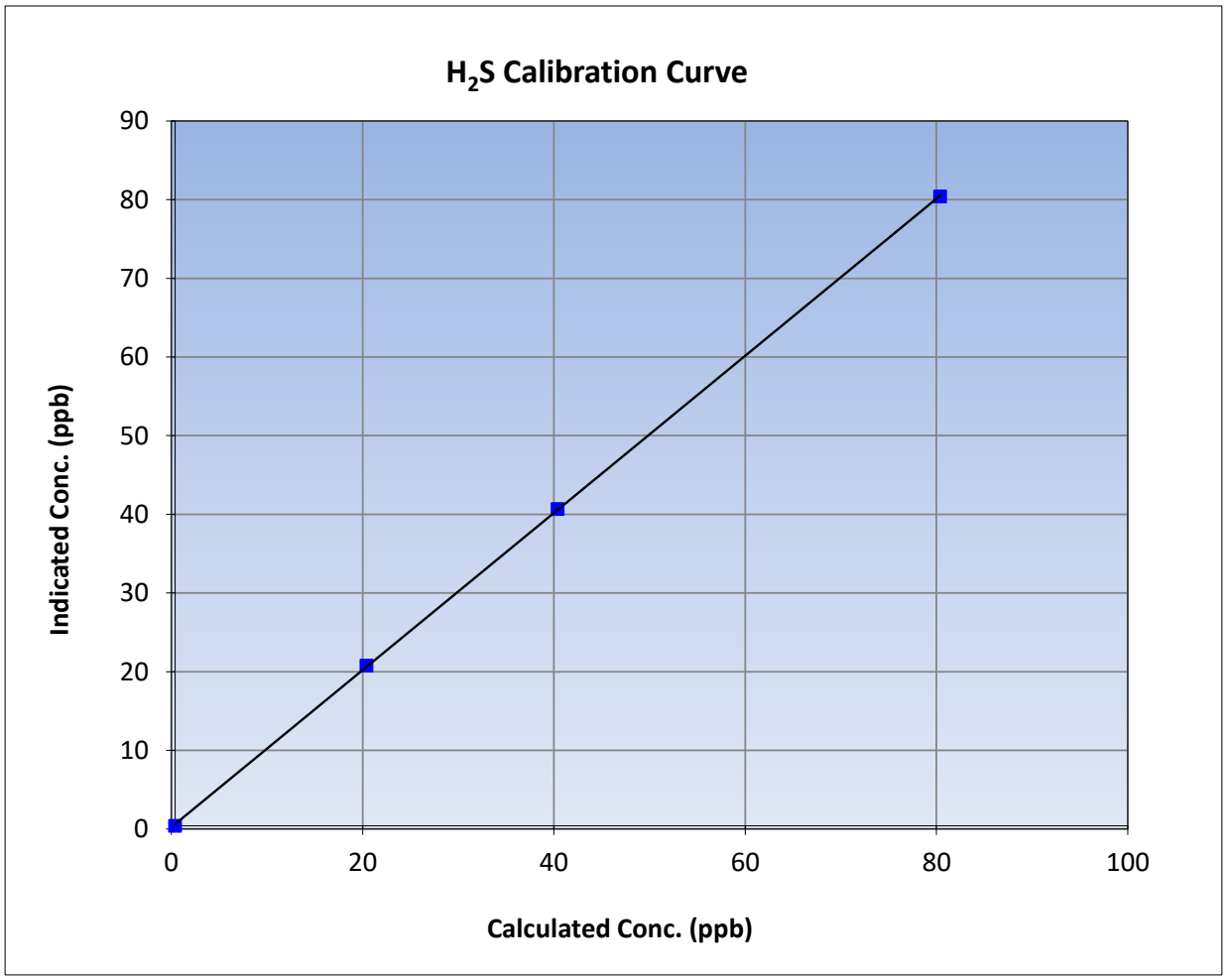
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 7:35 | End Time (MST): | 13:26 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1150840012 |

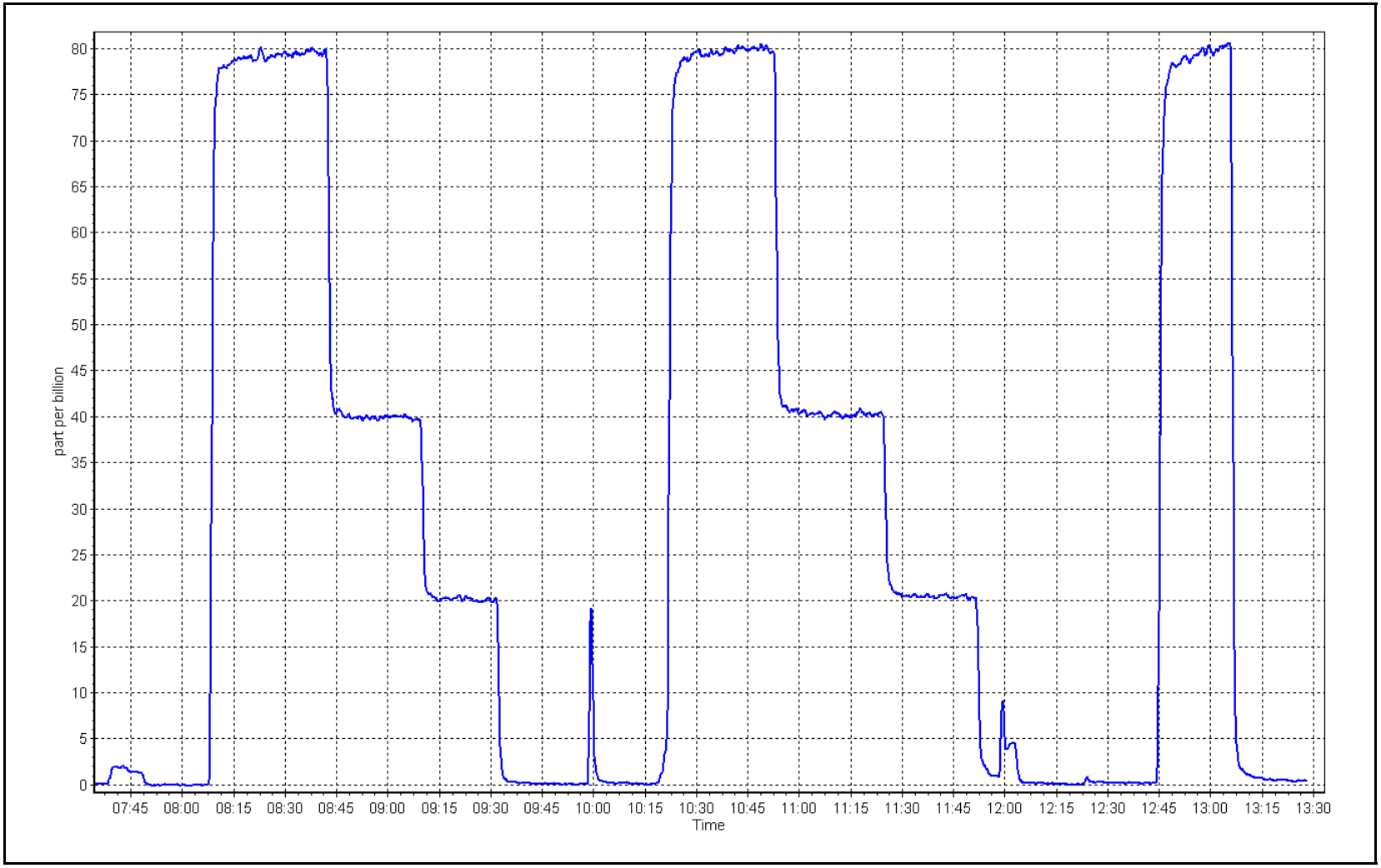
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.0 | 0.9999 |
| 40.0 | 40.3 | 0.9925 |
| 20.0 | 20.4 | 0.9803 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999965 | ≥0.995 |
| Slope | 0.998813 | 0.90 - 1.10 |
| Intercept | 0.219035 | +/-3 |



**$H_2S$ Calibration Plot** Date: February 15, 2024 Location: Kirby South



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS507 |
| Calibration Date: | February 14, 2024 | Last Cal Date: | January 16, 2024 |
| Start time (MST): | 12:43 | End time (MST): | 15:54 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC303554 | Cal Gas Expiry Date: | March 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: | API T700 | | Serial Number: | 3804 | |
| ZAG Make/Model: | API T701H | | Serial Number: | 880 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i | | Analyzer serial #: | 1182340005 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.993376 | 1.003790 | Background: | 2.86 | 3.01 |
| Calibration intercept: | 0.069808 | -0.088611 | Coefficient: | 3.753 | 3.711 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | -0.13 | ---- |
| as found span | 4919 | 81.3 | 17.26 | 17.21 | 1.003 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | -0.04 | ---- |
| high point | 4919 | 81.3 | 17.26 | 17.26 | 1.000 |
| second point | 4959 | 40.7 | 8.64 | 8.57 | 1.009 |
| third point | 4980 | 20.3 | 4.31 | 4.19 | 1.029 |
| as left zero | 5000 | 0.0 | 0.00 | -0.07 | ---- |
| as left span | 4919 | 81.3 | 17.26 | 17.38 | 0.993 |
| | | | | Average Correction Factor | 1.012 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.34 | Previous response | 17.22 | *% 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

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

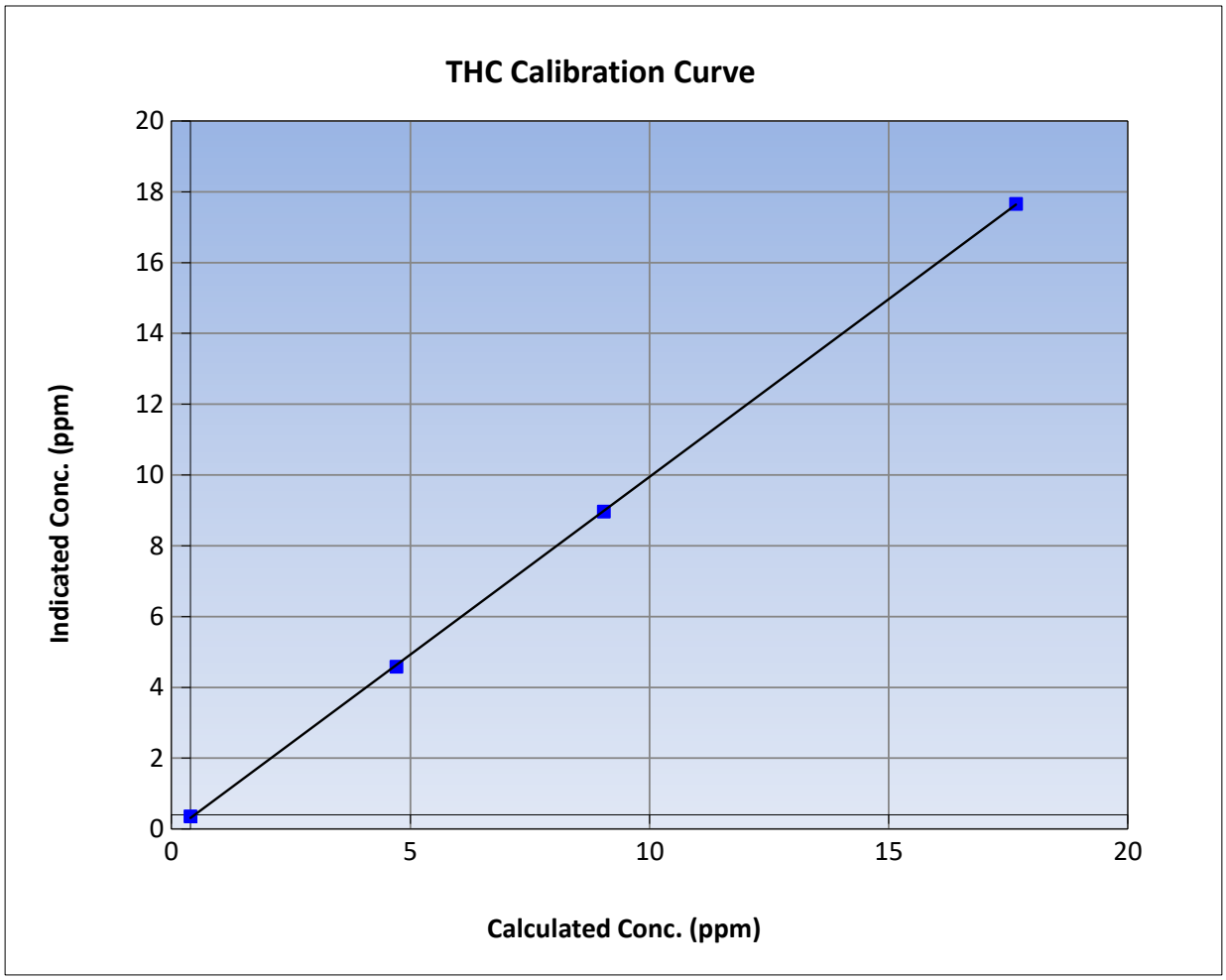
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 14, 2024 | Previous Calibration: | January 16, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 12:43 | End Time (MST): | 15:54 |
| Analyzer make: | Thermo 51i | Analyzer serial #: | 1182340005 |

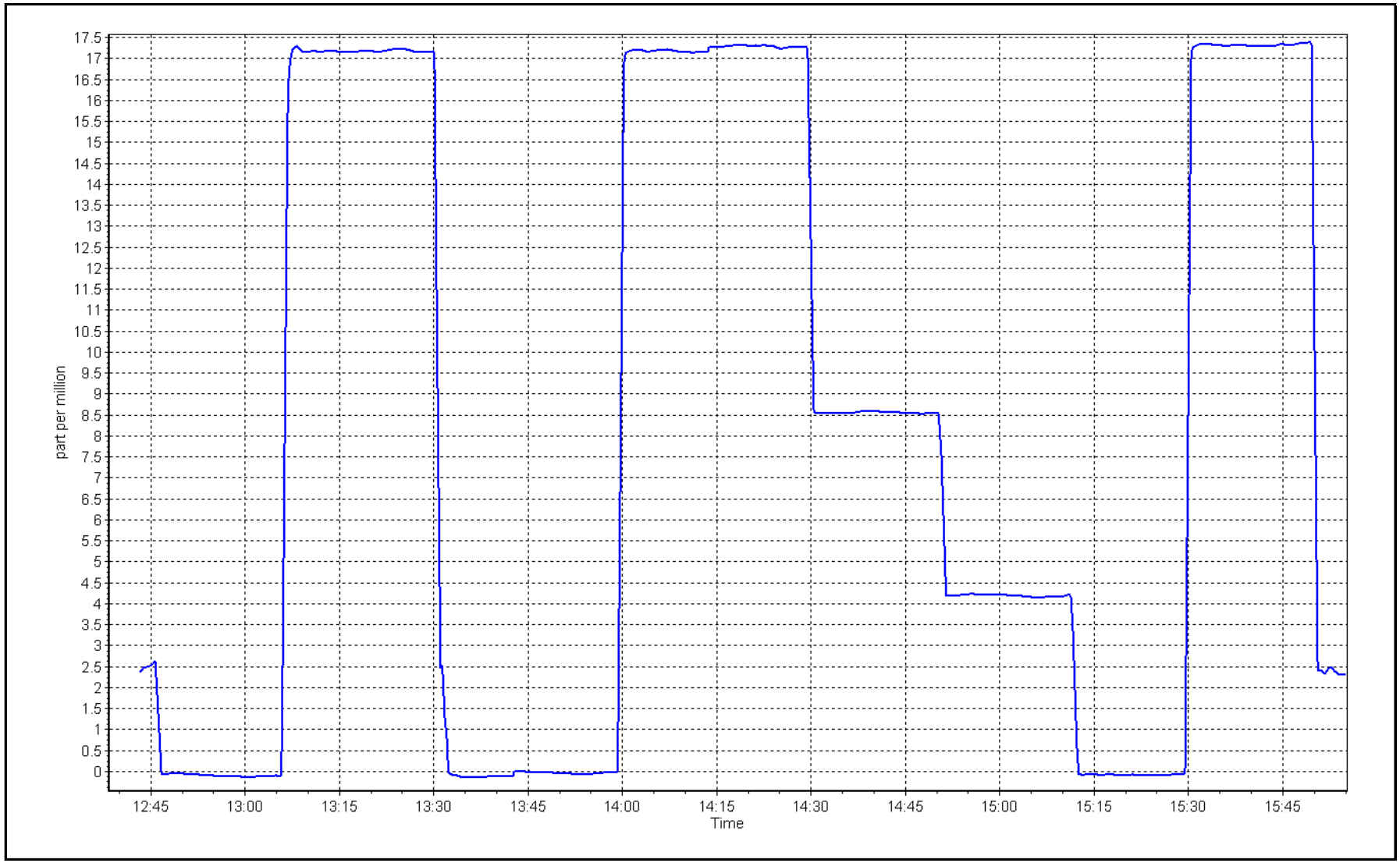
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.04 | ---- |
| 17.26 | 17.26 | 1.0002 |
| 8.64 | 8.57 | 1.0085 |
| 4.31 | 4.19 | 1.0287 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999969 | *≥0.995* |
| Slope | 1.003790 | *0.90 - 1.10* |
| Intercept | -0.088611 | *+/-1.5* |



**THC Calibration Plot** Date: February 14, 2024 Location: Kirby South



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS507 |
| Calibration Date: | February 16, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 12:48 | End time (MST): | 16:17 |
| Reason: | Maintenance | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC303554 | Cal Gas Expiry Date: | March 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: | API T700 | | Serial Number: | 3804 | |
| ZAG Make/Model: | API T701H | | Serial Number: | 880 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i | | Analyzer serial #: | 1182340005 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.003790 | 1.002093 | Background: | 3.01 | 4.07 |
| Calibration intercept: | -0.088611 | -0.117790 | Coefficient: | 3.711 | 3.745 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | | | | | |
| as found span | | | | | |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | -0.01 | ---- |
| high point | 4919 | 81.3 | 17.26 | 17.24 | 1.001 |
| second point | 4959 | 40.7 | 8.64 | 8.47 | 1.020 |
| third point | 4980 | 20.3 | 4.31 | 4.11 | 1.048 |
| as left zero | 5000 | 0.0 | 0.00 | -0.35 | ---- |
| as left span | 4919 | 81.3 | 17.26 | 16.91 | 1.021 |
| | | | | Average Correction Factor | 1.023 |

| | | | | | |
|---|---|---|---|---|---|
| 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

Notes: As founds could not be completed as the flame was unable to be lit. Swapped THC internal pump and hydrogen cylinder. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

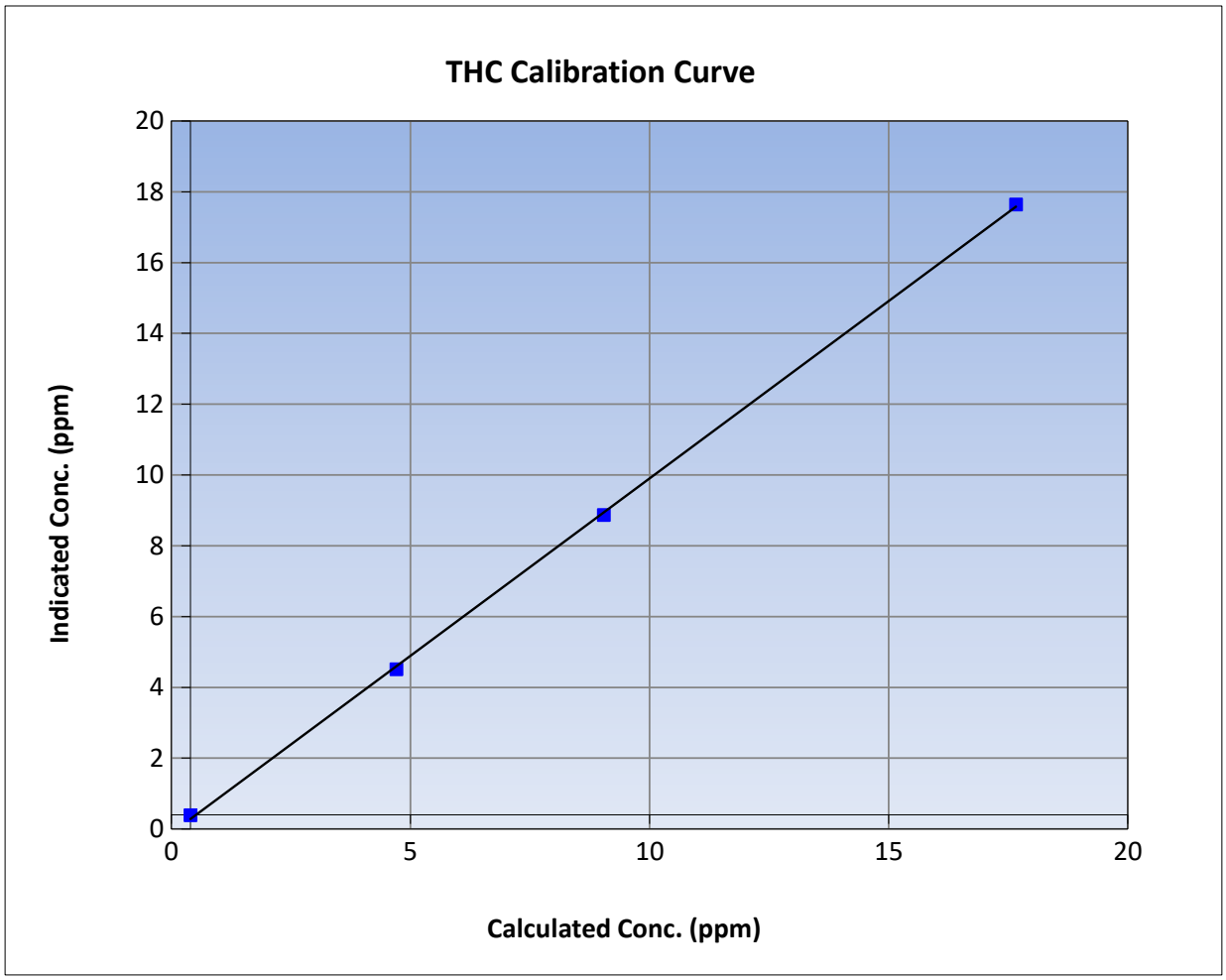
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 16, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 12:48 | End Time (MST): | 16:17 |
| Analyzer make: | Thermo 51i | Analyzer serial #: | 1182340005 |

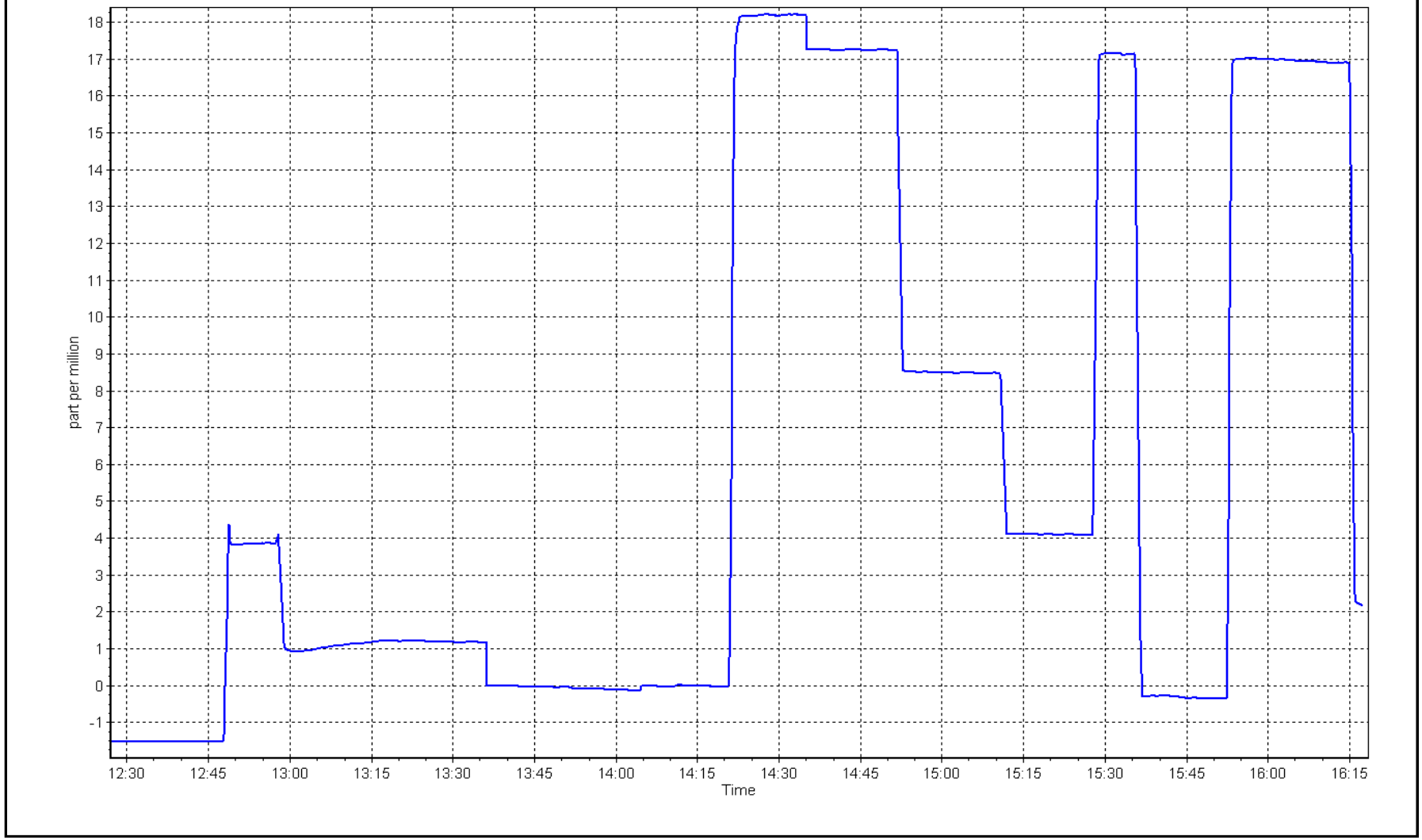
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.01 | ---- |
| 17.26 | 17.24 | 1.0013 |
| 8.64 | 8.47 | 1.0204 |
| 4.31 | 4.11 | 1.0482 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999831 | *≥0.995* |
| Slope | 1.002093 | *0.90 - 1.10* |
| Intercept | -0.117790 | *+/-1.5* |



**THC Calibration Plot** Date: February 16, 2024 Location: Kirby South



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS507 |
| Calibration Date: | February 22, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 12:24 | End time (MST): | 15:33 |
| Reason: | Maintenance | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC303554 | Cal Gas Expiry Date: | March 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: | API T700 | | Serial Number: | 3804 | |
| ZAG Make/Model: | API T701H | | Serial Number: | 880 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i | | Analyzer serial #: | 1182340005 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.002093 | 0.998323 | Background: | 4.07 | 2.30 |
| Calibration intercept: | -0.117790 | 0.032189 | Coefficient: | 3.745 | 3.728 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | -1.90 | ---- |
| as found span | 4919 | 81.3 | 17.26 | 15.47 | 1.116 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.02 | ---- |
| high point | 4919 | 81.3 | 17.26 | 17.26 | 1.000 |
| second point | 4959 | 40.7 | 8.64 | 8.67 | 0.997 |
| third point | 4980 | 20.3 | 4.31 | 4.34 | 0.993 |
| as left zero | 5000 | 0.0 | 0.00 | 0.12 | ---- |
| as left span | 4919 | 81.3 | 17.26 | 17.40 | 0.992 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.37 | Previous response | 17.18 | *% 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

Notes: Calibrated due to drift after a pump change. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

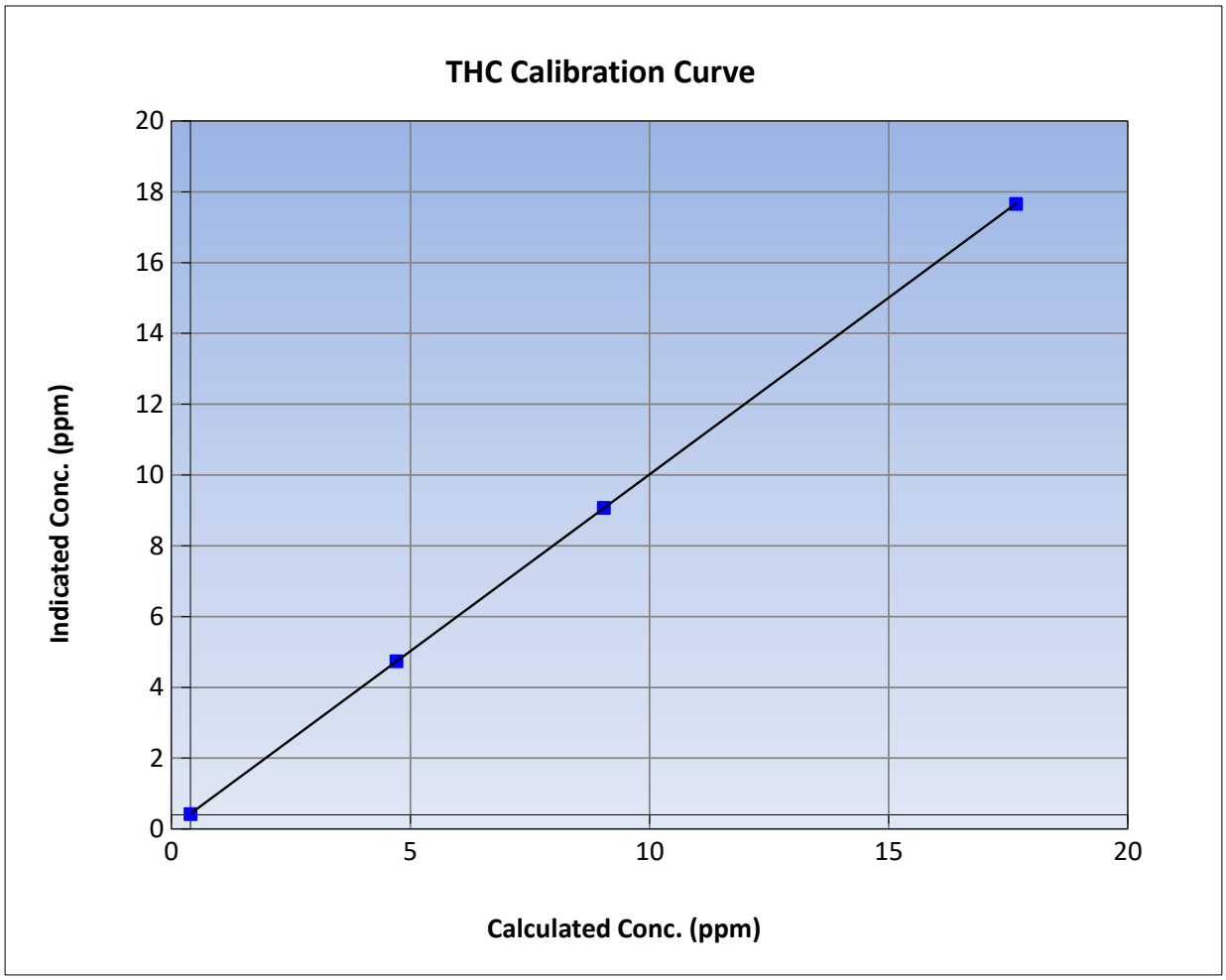
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 22, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 12:24 | End Time (MST): | 15:33 |
| Analyzer make: | Thermo 51i | Analyzer serial #: | 1182340005 |

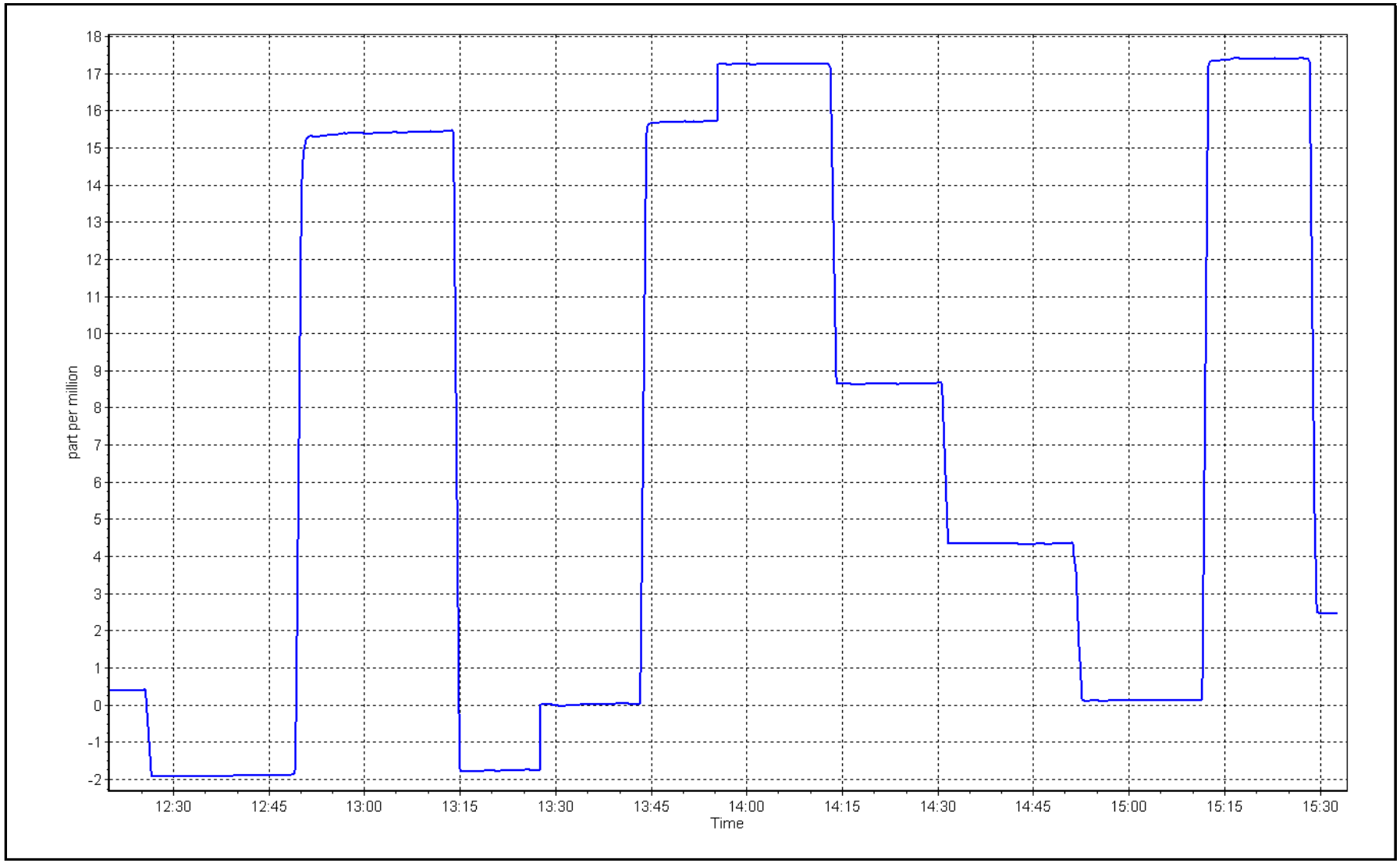
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | 0.02 | ---- |
| 17.26 | 17.26 | 1.0002 |
| 8.64 | 8.67 | 0.9969 |
| 4.31 | 4.34 | 0.9932 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 0.998323 | *0.90 - 1.10* |
| Intercept | 0.032189 | *+/-1.5* |



**THC Calibration Plot** Date: February 22, 2024 Location: Kirby South



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS507 |
| Calibration Date: | February 15, 2024 | Last Cal Date: | January 18, 2024 |
| Start time (MST): | 7:45 | End time (MST): | 12:50 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | | T34ULGL | Cal Gas Expiry Date: | March 8, 2025 | |
| NOX Cal Gas Conc: | 49.39 | ppm | NO Cal Gas Conc: | 49.02 | ppm |
| Removed Cylinder #: | | NA | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 49.39 | ppm | Removed Gas NO Conc: | 49.02 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | API T700 | | Serial Number: | 3804 | |
| ZAG make/model: | API 701H | | Serial Number: | 880 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42iQ | | Analyzer serial #: | 1182340006 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.397 | 1.383 | NO bkgnd or offset: | 1.7 | 1.7 |
| NOX coeff or slope: | 0.995 | 0.998 | NOX bkgnd or offset: | 1.8 | 1.8 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 209.21 | 210.24 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.003862 | 1.009303 |
| $NO_X$ Cal Offset: | -4.492458 | -4.671552 |
| NO Cal Slope: | 1.005411 | 1.014663 |
| NO Cal Offset: | -5.173949 | -5.612277 |
| $NO_2$ Cal Slope: | 0.997888 | 1.003572 |
| $NO_2$ Cal Offset: | 0.693913 | 1.309741 |

# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.6 | 0.2 | ---- | ---- |
| as found span | 4919 | 81.0 | 800.1 | 794.1 | 6.0 | 806.0 | 802.0 | 4.1 | 0.9927 | 0.9902 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.4 | 0.0 | ---- | ---- |
| high point | 4919 | 81.0 | 800.1 | 794.1 | 6.0 | 805.0 | 803.0 | 2.1 | 0.9939 | 0.9889 |
| second point | 4960 | 40.5 | 400.0 | 397.0 | 3.0 | 397.0 | 393.9 | 3.1 | 1.0076 | 1.0079 |
| third point | 4980 | 20.2 | 199.5 | 198.0 | 1.5 | 192.4 | 190.6 | 1.8 | 1.0370 | 1.0390 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.3 | 0.0 | ---- | ---- |
| as left span | 4919 | 81.0 | 800.1 | 399.9 | 400.2 | 808.0 | 402.3 | 406.0 | 0.9902 | 0.9941 |
| | | | | | | | | Average Correction Factor | 1.0129 | 1.0120 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 806.4 ppb | NO = 802.6 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.0% |
| Previous Response | $NO_X$ = 798.7 ppb | NO = 793.2 ppb | | *Percent Change | NO = | 1.2% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

### 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 799.0 | 404.8 | 400.2 | 402.2 | 0.9950 | 100.5% |
| 2nd GPT point (200 ppb O3) | 799.0 | 625.2 | 179.8 | 183.0 | 0.9825 | 101.8% |
| 3rd GPT point (100 ppb O3) | 799.0 | 718.9 | 86.1 | 88.5 | 0.9728 | 102.8% |
| | | | | Average Correction Factor | 0.9834 | 101.7% |

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

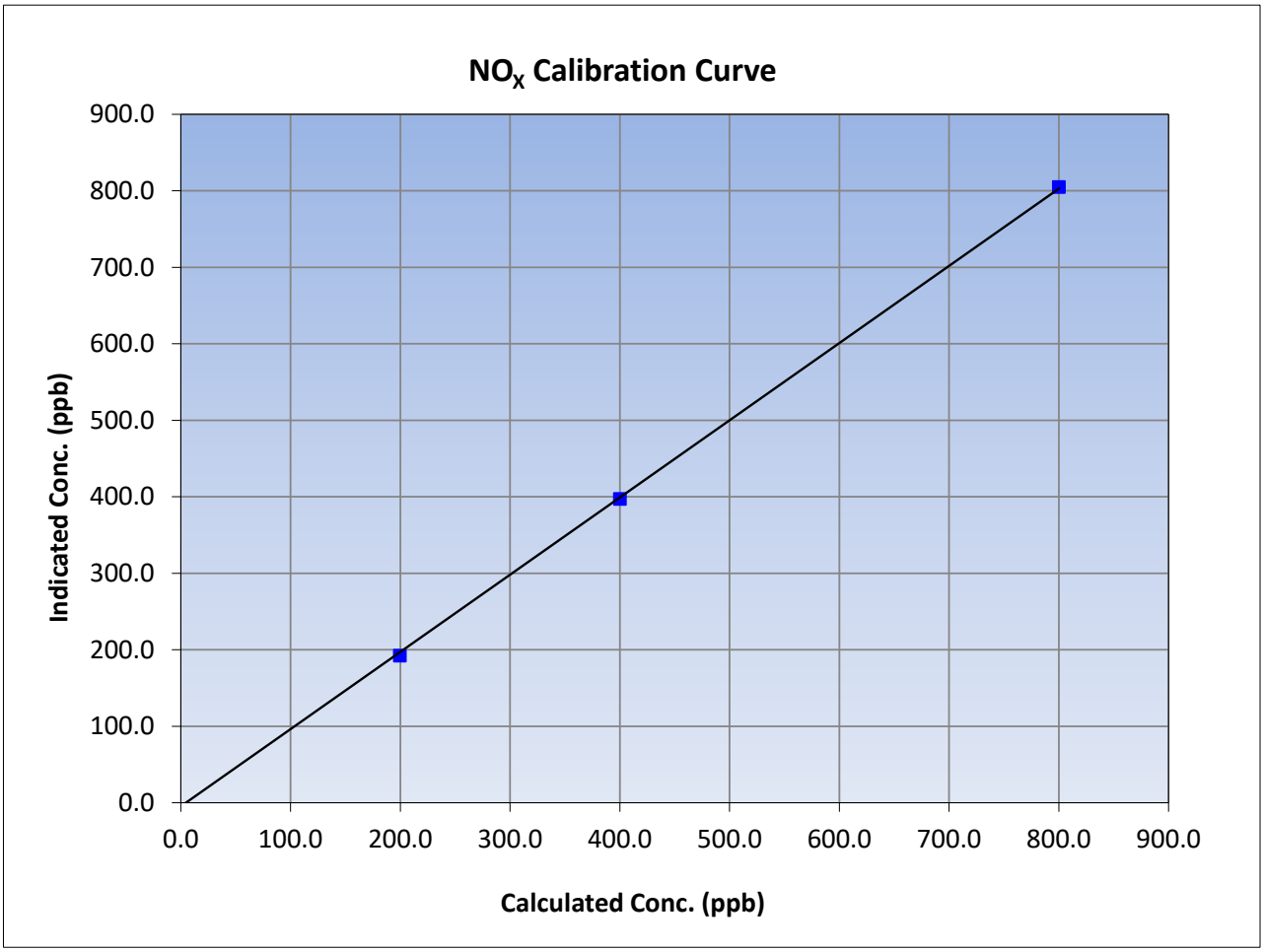
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:50 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 1182340006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.4 | ---- | Correlation Coefficient | 0.999872 | ≥0.995 |
| 800.1 | 805.0 | 0.9939 | | | |
| 400.0 | 397.0 | 1.0076 | Slope | 1.009303 | 0.90 - 1.10 |
| 199.5 | 192.4 | 1.0370 | | | |
| | | | Intercept | -4.671552 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

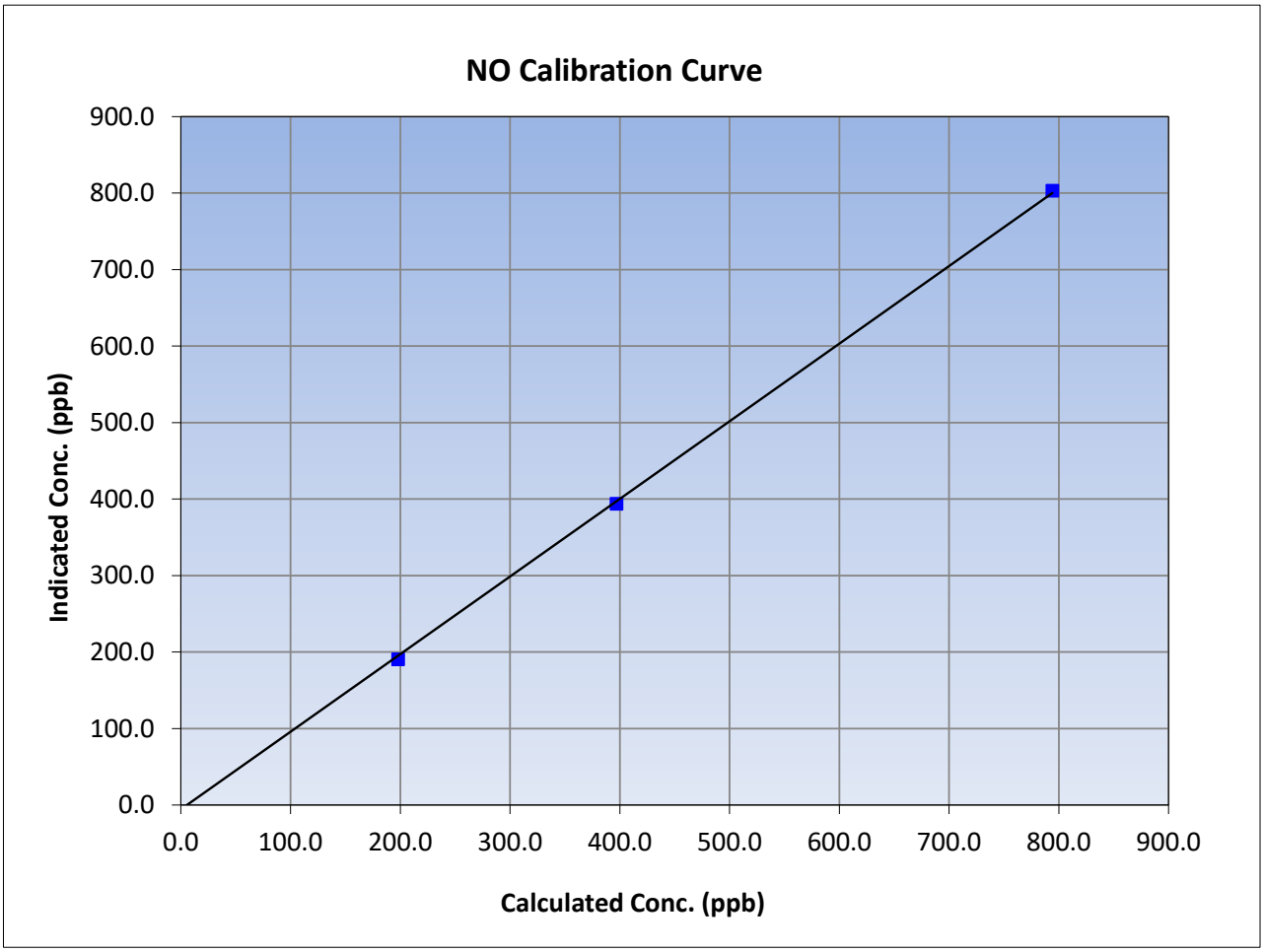
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:50 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 1182340006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.4 | ---- | Correlation Coefficient | 0.999807 | ≥0.995 |
| 794.1 | 803.0 | 0.9889 | | | |
| 397.0 | 393.9 | 1.0079 | Slope | 1.014663 | 0.90 - 1.10 |
| 198.0 | 190.6 | 1.0390 | | | |
| | | | Intercept | -5.612277 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

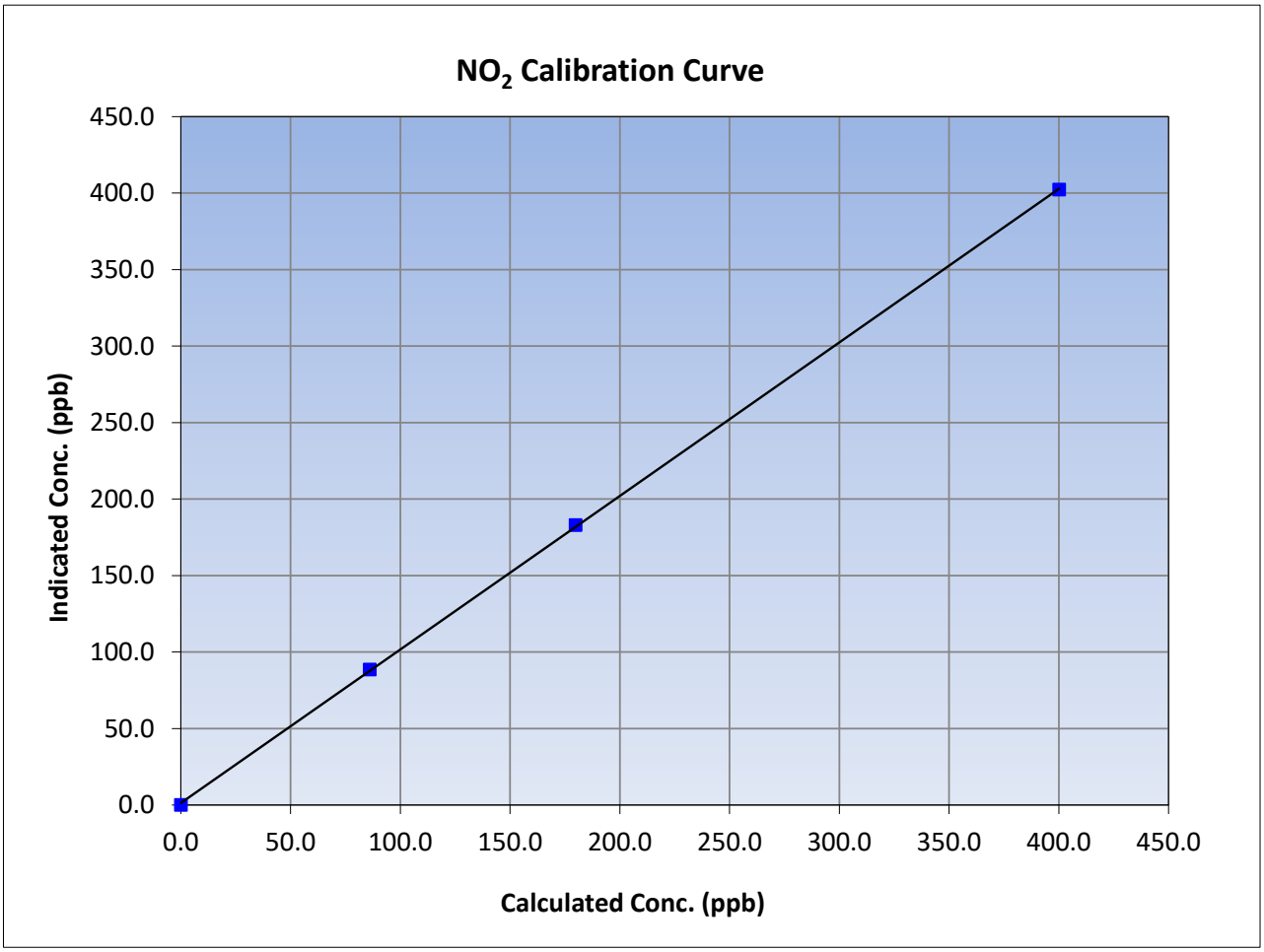
Version-04-2020

### Station Information

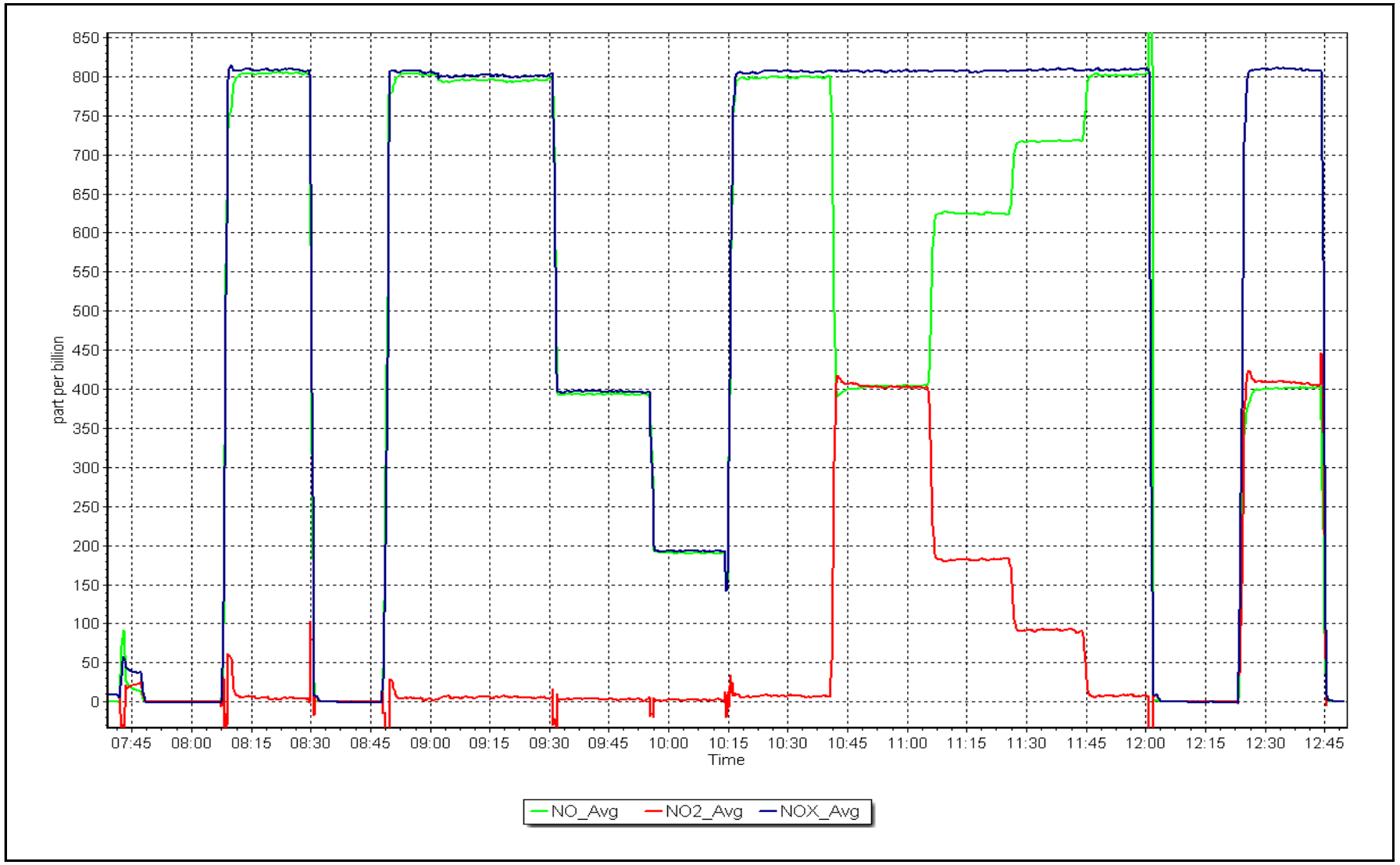
| | | | |
|---|---|---|---|
| Calibration Date: | February 15, 2024 | Previous Calibration: | January 18, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 7:45 | End Time (MST): | 12:50 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 1182340006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999950 | *≥0.995* |
| 400.2 | 402.2 | 0.9950 | | | |
| 179.8 | 183.0 | 0.9825 | Slope | 1.003572 | *0.90 - 1.10* |
| 86.1 | 88.5 | 0.9728 | | | |
| | | | Intercept | 1.309741 | *+/-20* |



**$NO_X$ Calibration Plot** Date: February 15, 2024 Location: Kirby South



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS511
## BLACKGOLD

## FEBRUARY 2024

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

March 28, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 10:50 | End time (MST): | 14:30 |
| 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 Make/Model: | Teledyne API T700 | Serial Number: | 5258 |
| ZAG Make/Model: | Teledyne API 701 | Serial Number: | 138 |

### Analyzer Information

Analyzer make: Thermo scientific  Analyzer serial #: 1160290014

Analyzer Range 0 - 1000 ppb

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 1.000172 | 1.003517 | Backgd or Offset: | 36.5 | 36.0 |
| Calibration intercept: | 2.710765 | 0.290852 | Coeff or Slope: | 1.228 | 1.202 |

### $SO_2$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| as found span | 4926 | 79.9 | 799.0 | 816.4 | 0.979 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| high point | 4926 | 79.9 | 799.0 | 802.5 | 0.996 |
| second point | 4968 | 40.0 | 399.8 | 400.8 | 0.998 |
| third point | 4987 | 20.0 | 200.0 | 200.9 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | -0.6 | ---- |
| as left span | 4926 | 80.0 | 800.0 | 800.8 | 0.999 |
| | | | | Average Correction Factor | 0.996 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 815.70 | Previous response | 801.86 | *% 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

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

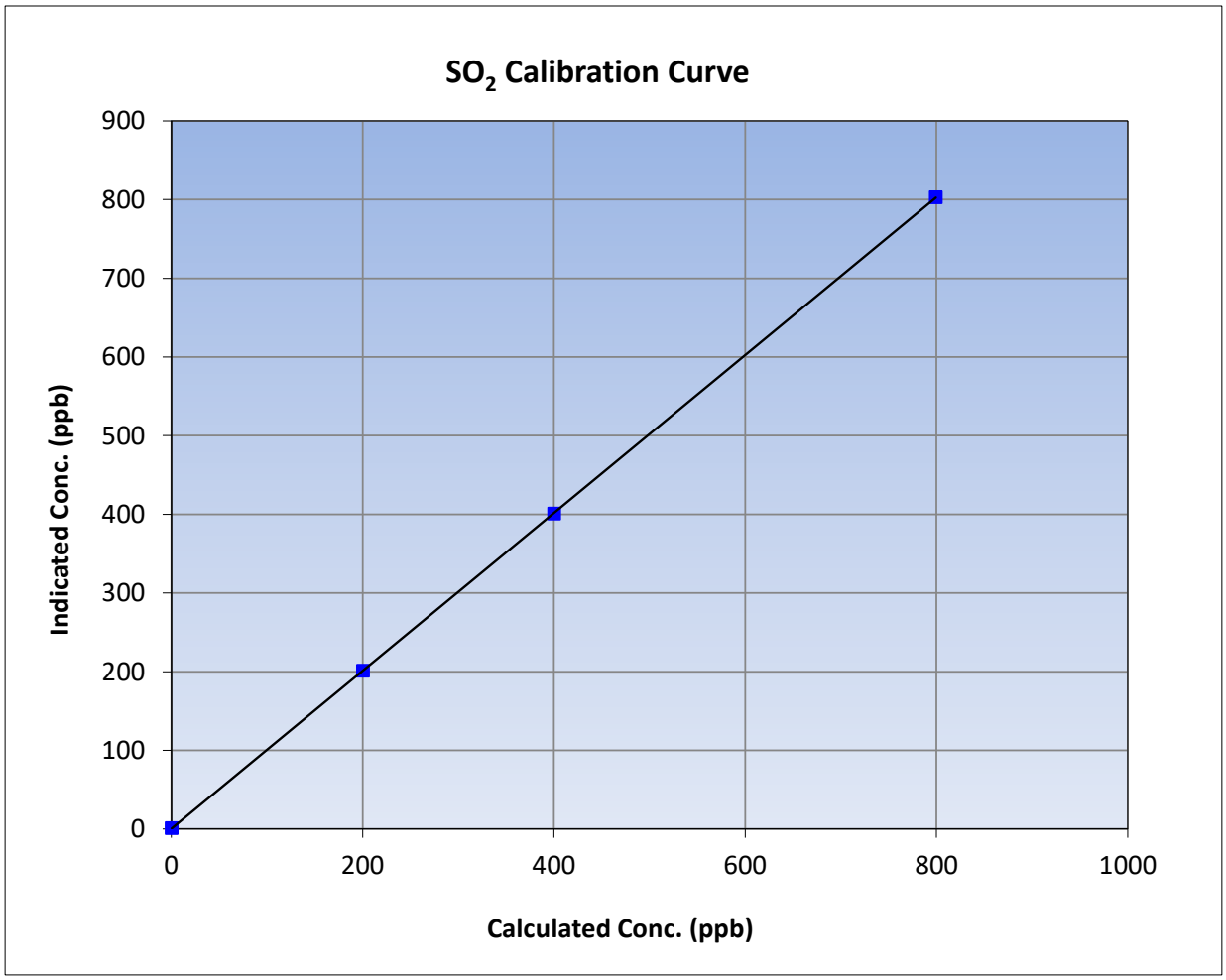
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 10:50 | End Time (MST): | 14:30 |
| Analyzer make: | Thermo scientific | Analyzer serial #: | 1160290014 |

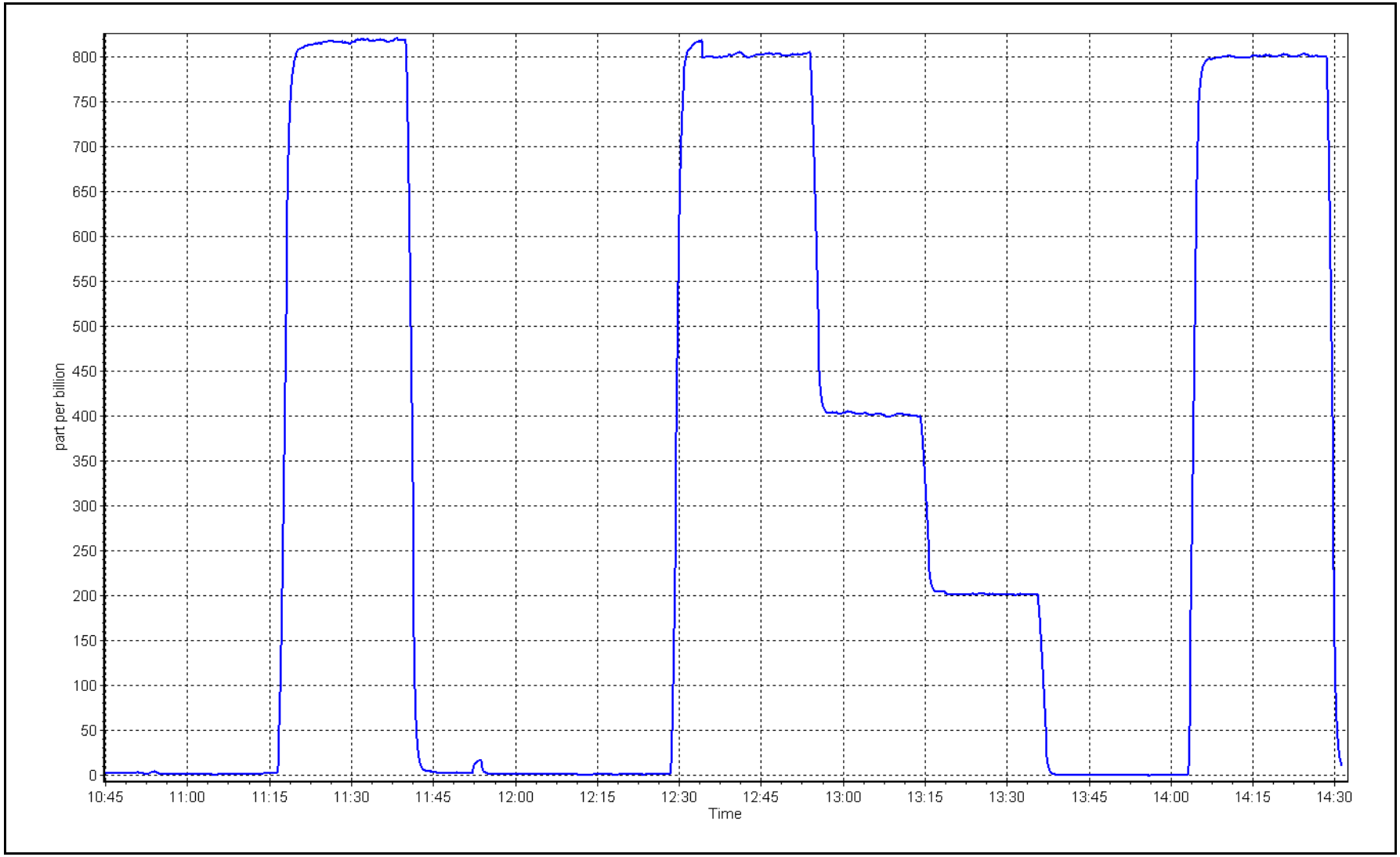
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.7 | ---- |
| 799.0 | 802.5 | 0.9957 |
| 399.8 | 400.8 | 0.9976 |
| 200.0 | 200.9 | 0.9953 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.003517 | *0.90 - 1.10* |
| Intercept | 0.290852 | *+/-30* |



**SO2 Calibration Plot** Date: February 21, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | February 8, 2024 | Last Cal Date: | January 25, 2024 |
| Start time (MST): | 11:53 | End time (MST): | 16:12 |
| 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-TLE | | Analyzer serial #: | 1336160090 | |
| Converter make: | Global G150 | | Converter serial #: | 2022-227 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.977047 | 0.998919 | Backgd or Offset: | 3.39 | 3.49 |
| Calibration intercept: | 0.181198 | 0.140727 | Coeff or Slope: | 1.159 | 1.189 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as found span | 4922 | 77.8 | 80.0 | 78.7 | 1.016 |
| as found 2nd point | 4961 | 38.9 | 40.0 | 39.3 | 1.017 |
| as found 3rd point | 4981 | 19.5 | 20.0 | 19.7 | 1.017 |
| new cylinder response | | | | | |

### $H_2S$ Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4922 | 77.8 | 80.0 | 80.0 | 1.000 |
| second point | 4961 | 38.9 | 40.0 | 40.1 | 0.997 |
| third point | 4981 | 19.5 | 20.0 | 20.2 | 0.992 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4922 | 77.9 | 80.0 | 79.8 | 1.003 |
| SO2 Scrubber Check | 4920 | 80.0 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 78.7 | Prev response: | 78.31 | *% change: | 0.5% |
| Baseline Corr 2nd AF pt: | 39.3 | AF Slope: | 0.984195 | AF Intercept: | -0.018968 |
| Baseline Corr 3rd AF pt: | 19.7 | AF Correlation: | 1.000000 | | |

* = > +/-5% change initiates investigation

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

## $H_2S$ Calibration Summary

Version-11-2021

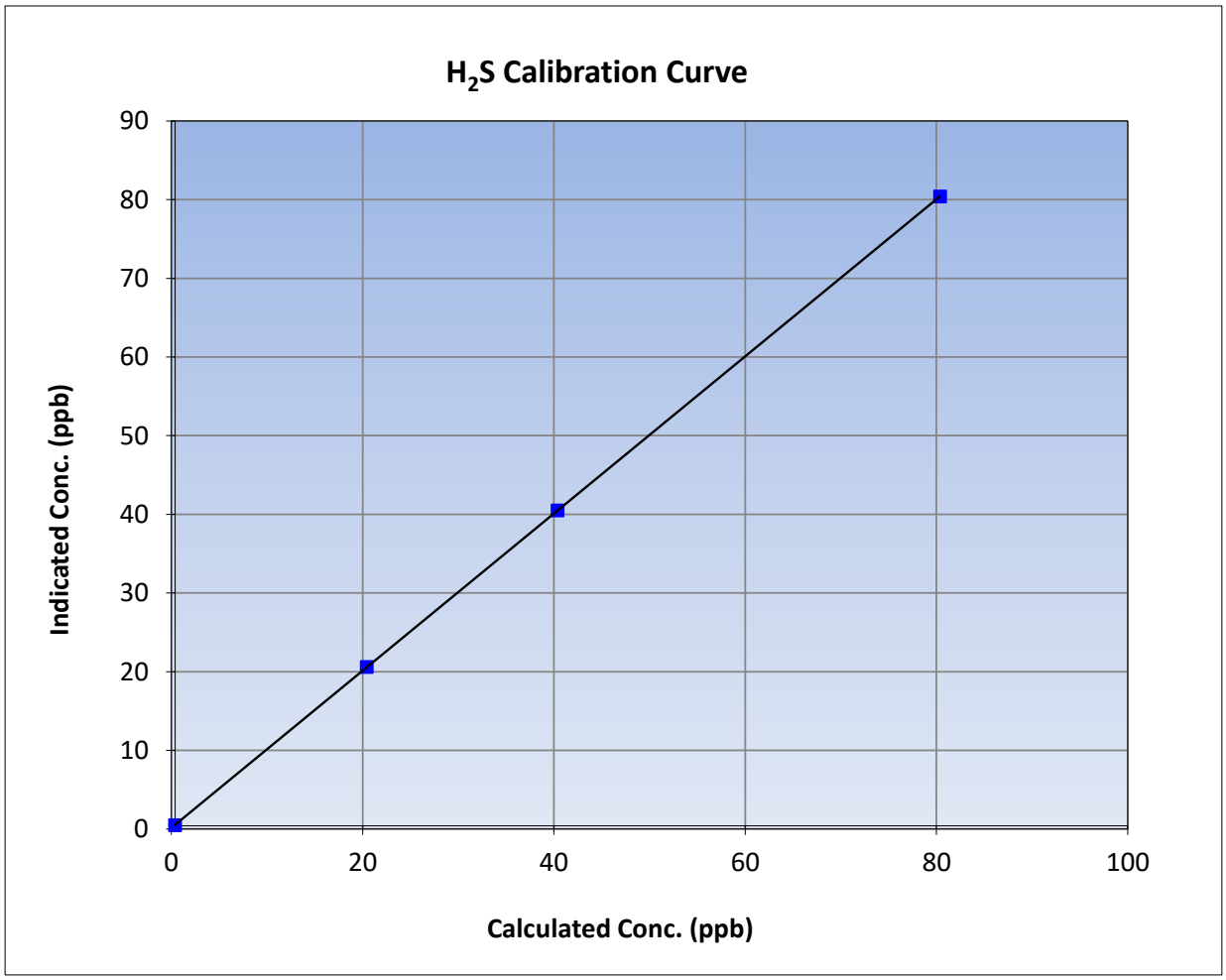
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 8, 2024 | Previous Calibration: | January 25, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 11:53 | End Time (MST): | 16:12 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1336160090 |

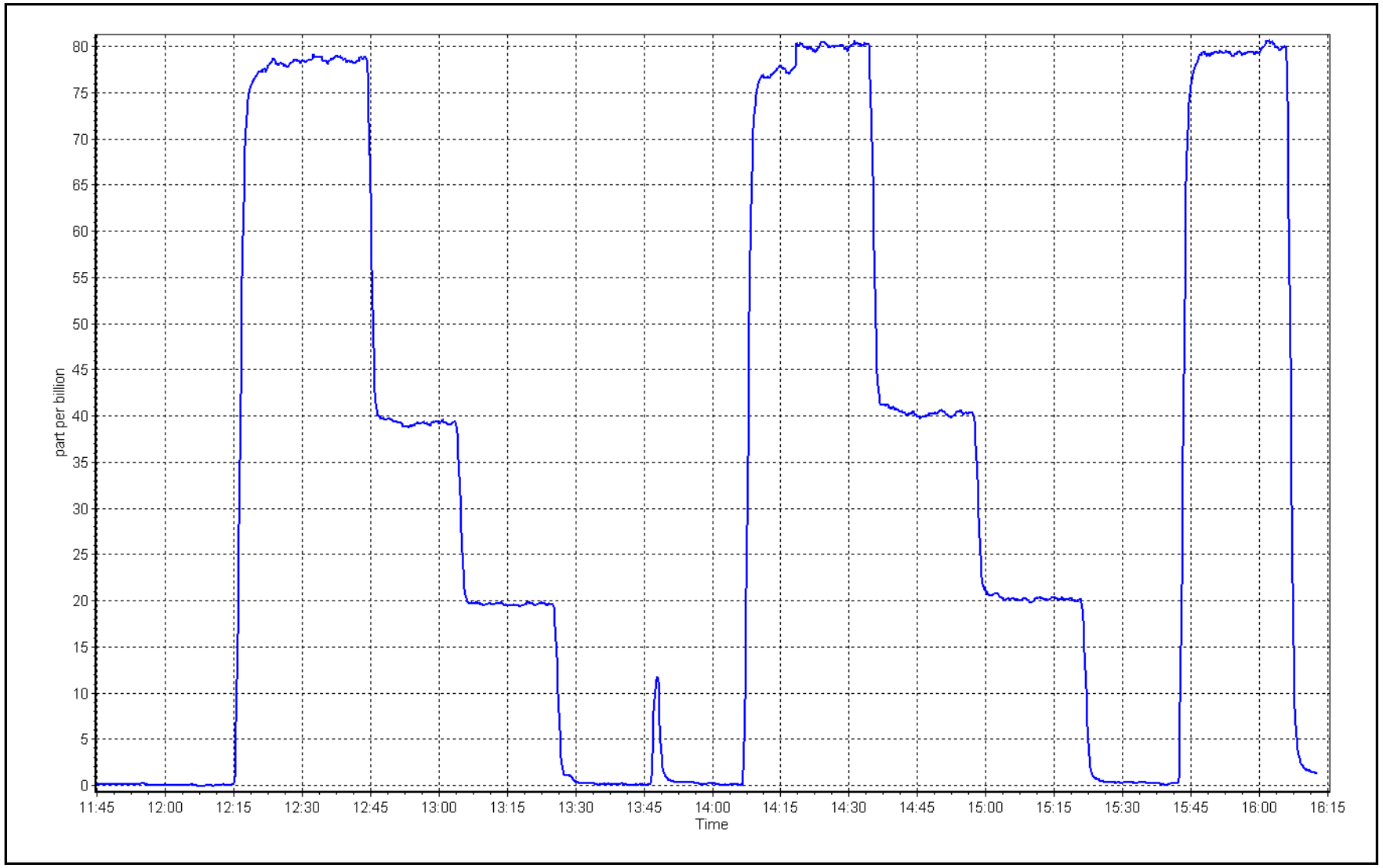
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 80.0 | 0.9996 |
| 40.0 | 40.1 | 0.9971 |
| 20.0 | 20.2 | 0.9921 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 0.998919 | *0.90 - 1.10* |
| Intercept | 0.140727 | *+/-3* |



**$H_2S$ Calibration Plot** Date: February 8, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | February 21, 2024 | Last Cal Date: | January 17, 2024 |
| Start time (MST): | 10:50 | End time (MST): | 14:30 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | CC147416 | | Cal Gas Expiry Date: | January 5, 2029 | |
| CH4 Cal Gas Conc. | 498.90 | ppm | CH4 Equiv Conc. | 1070.90 | ppm |
| C3H8 Cal Gas Conc. | 208.00 | ppm | | | |
| Removed Gas Cert: | NA | | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 498.90 | ppm | CH4 Equiv Conc. | 1070.90 | ppm |
| Removed C3H8 Conc. | 208.00 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5258 | |
| ZAG Make/Model: | Teledyne API 701 | | Serial Number: | 138 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1317958295 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.996004 | 0.982206 | Background: | 0.89 | 0.89 |
| Calibration intercept: | -0.004347 | -0.016488 | Coefficient: | 0.567 | 0.567 |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.00 | 0.04 | ---- |
| as found span | 4920 | 79.9 | 17.11 | 16.83 | 1.017 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.06 | ---- |
| high point | 4920 | 79.9 | 17.11 | 16.85 | 1.016 |
| second point | 4960 | 40.0 | 8.57 | 8.32 | 1.030 |
| third point | 4980 | 20.0 | 4.28 | 4.14 | 1.034 |
| as left zero | 5000 | 0.0 | 0.00 | 0.07 | ---- |
| as left span | 4926 | 80.0 | 17.11 | 16.95 | 1.010 |
| | | | | Average Correction Factor | 1.027 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 16.79 | Previous response | 17.04 | *% change | -1.5% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: Changed the sample inlet filter and Hydrogen cylinder after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

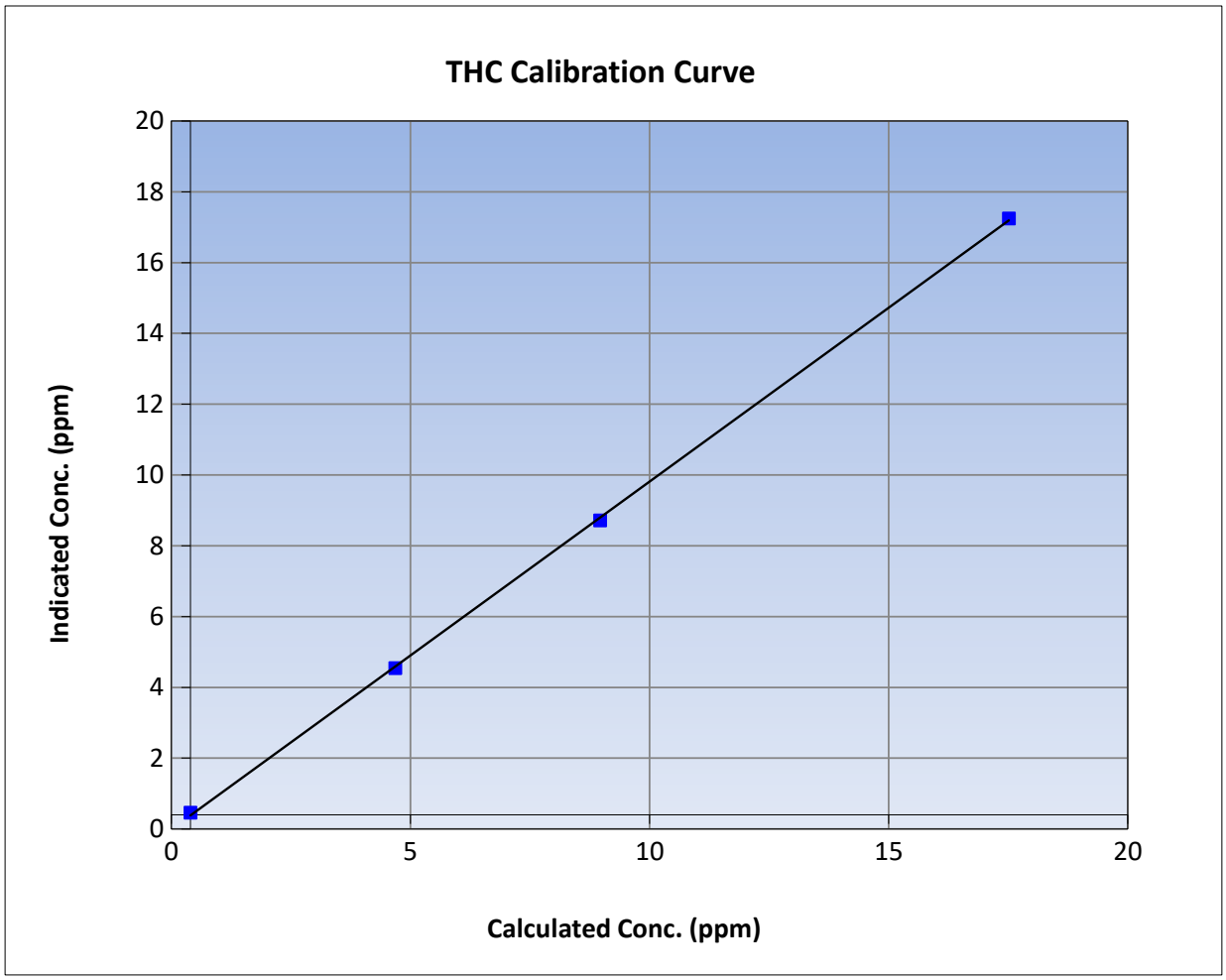
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 21, 2024 | Previous Calibration: | January 17, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 10:50 | End Time (MST): | 14:30 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1317958295 |

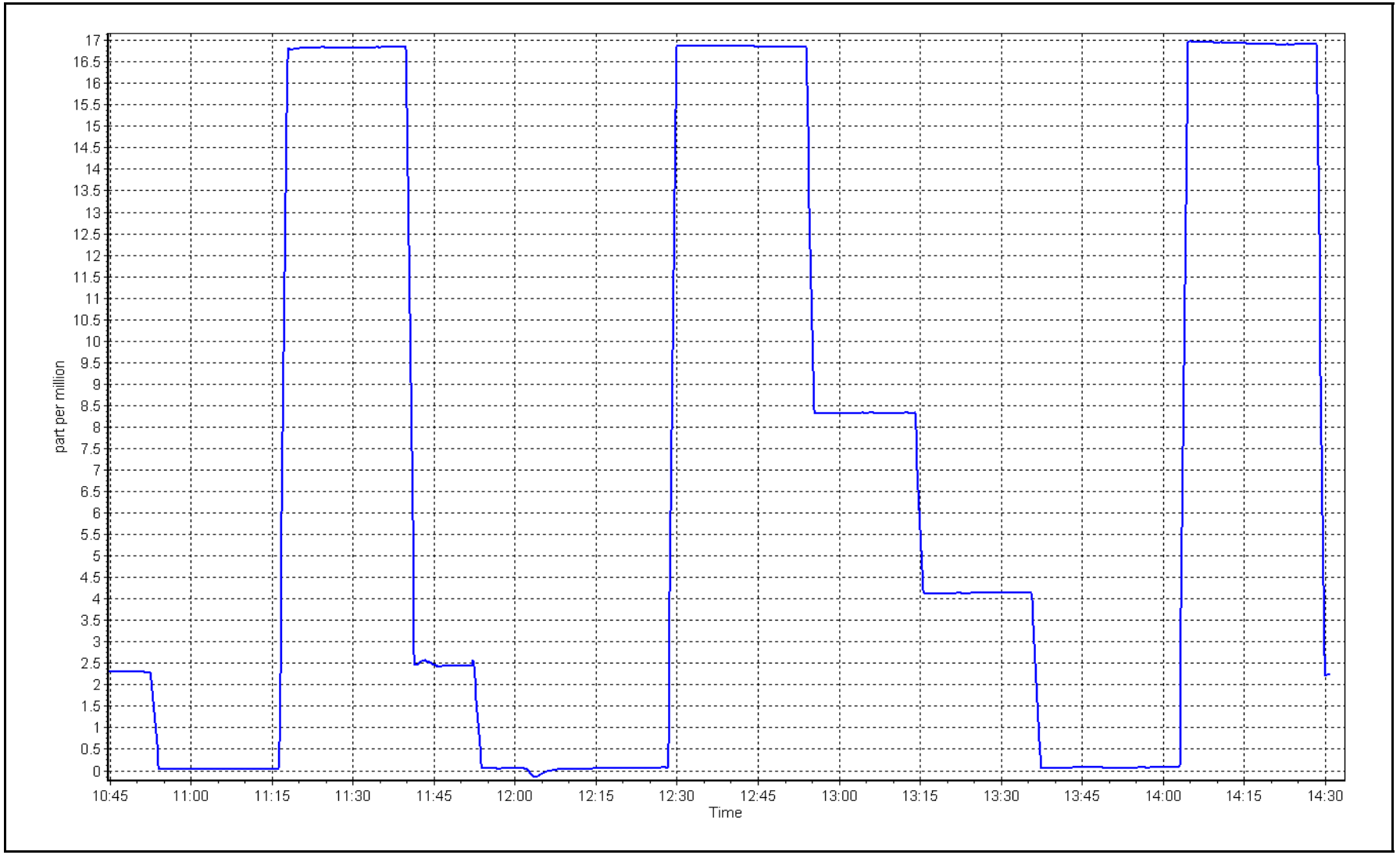
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | 0.06 | ---- |
| 17.11 | 16.85 | 1.0159 |
| 8.57 | 8.32 | 1.0301 |
| 4.28 | 4.14 | 1.0339 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999887 | *≥0.995* |
| Slope | 0.982206 | *0.90 - 1.10* |
| Intercept | -0.016488 | *+/-1.5* |



**THC Calibration Plot** Date: February 21, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | February 23, 2024 | Last Cal Date: | January 9, 2024 |
| Start time (MST): | 8:58 | End time (MST): | 13:36 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | T0F8P52 | | Cal Gas Expiry Date: | August 16, 2026 | |
| NOX Cal Gas Conc: | 47.43 | ppm | NO Cal Gas Conc: | 47.43 | ppm |
| Removed Cylinder #: | NA | | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 47.43 | ppm | Removed Gas NO Conc: | 47.43 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 2445 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 138 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 7029 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.041 | 1.041 | NO bkgnd or offset: | 0.2 | 0.2 |
| NOX coeff or slope: | 1.038 | 1.038 | NOX bkgnd or offset: | 0.4 | 0.4 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 4.1 | 4.2 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.002964 | 1.016612 |
| $NO_X$ Cal Offset: | -1.992779 | 0.426960 |
| NO Cal Slope: | 1.002150 | 1.015955 |
| NO Cal Offset: | -2.932730 | -0.193015 |
| $NO_2$ Cal Slope: | 1.004437 | 1.002724 |
| $NO_2$ Cal Offset: | 1.342612 | 0.288096 |

# Wood Buffalo Environmental Association

# $NO_X$ \ NO \ $NO_2$ Calibration Report

Version-04-2020

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | -0.1 | 0.2 | ---- | ---- |
| as found span | 4916 | 84.4 | 800.6 | 800.6 | 0.0 | 809.8 | 806.6 | 3.1 | 0.9886 | 0.9925 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator 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 | 814.0 | 813.1 | 0.7 | 0.9835 | 0.9846 |
| second point | 4958 | 42.2 | 400.3 | 400.3 | 0.0 | 407.7 | 406.7 | 1.1 | 0.9819 | 0.9843 |
| third point | 4979 | 21.1 | 200.2 | 200.2 | 0.0 | 204.4 | 202.9 | 1.5 | 0.9792 | 0.9865 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ---- | ---- |
| as left span | 4916 | 84.4 | 800.6 | 403.9 | 396.7 | 810.8 | 418.8 | 392.0 | 0.9874 | 0.9643 |
| | | | | | | | | Average Correction Factor | 0.9815 | 0.9851 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 809.7 ppb | NO = 806.7 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.1% |
| Previous Response | $NO_X$ = 800.9 ppb | NO = 799.3 ppb | | *Percent Change | NO = | 0.9% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

## 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) *Calibration Limit = 0.95-1.05* *As Found Limit = 0.90-1.10* | Converter Efficiency *Calibration Limit = 96-104%* |
|---|---|---|---|---|---|---|
| as found GPT zero | | | | | | |
| as found GPT point (400 ppb NO2) | | | | | | |
| as found GPT point (200 ppb NO2) | | | | | | |
| as found GPT point (100 ppb NO2) | | | | | | |
| 1st GPT point (400 ppb O3) | 813.2 | 416.5 | 396.7 | 398.2 | 0.9962 | 100.4% |
| 2nd GPT point (200 ppb O3) | 813.2 | 647.2 | 166.0 | 166.0 | 1.0000 | 100.0% |
| 3rd GPT point (100 ppb O3) | 813.2 | 734.3 | 78.9 | 80.3 | 0.9826 | 101.8% |
| | | | | Average Correction Factor | 0.9929 | 100.7% |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

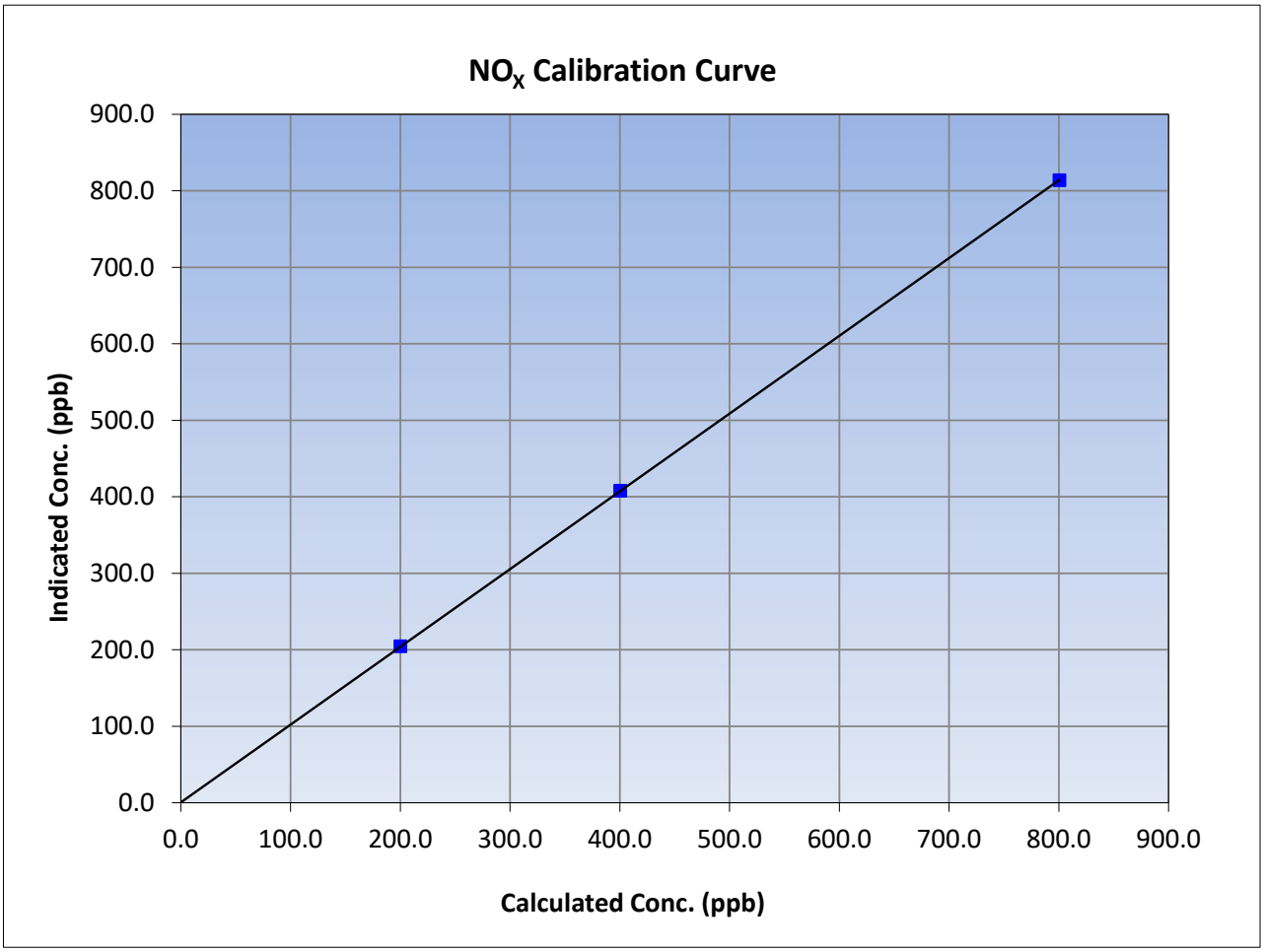
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:58 | End Time (MST): | 13:36 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 7029 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999998 | *≥0.995* |
| 800.6 | 814.0 | 0.9835 | | | |
| 400.3 | 407.7 | 0.9819 | Slope | 1.016612 | *0.90 - 1.10* |
| 200.2 | 204.4 | 0.9792 | | | |
| | | | Intercept | 0.426960 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

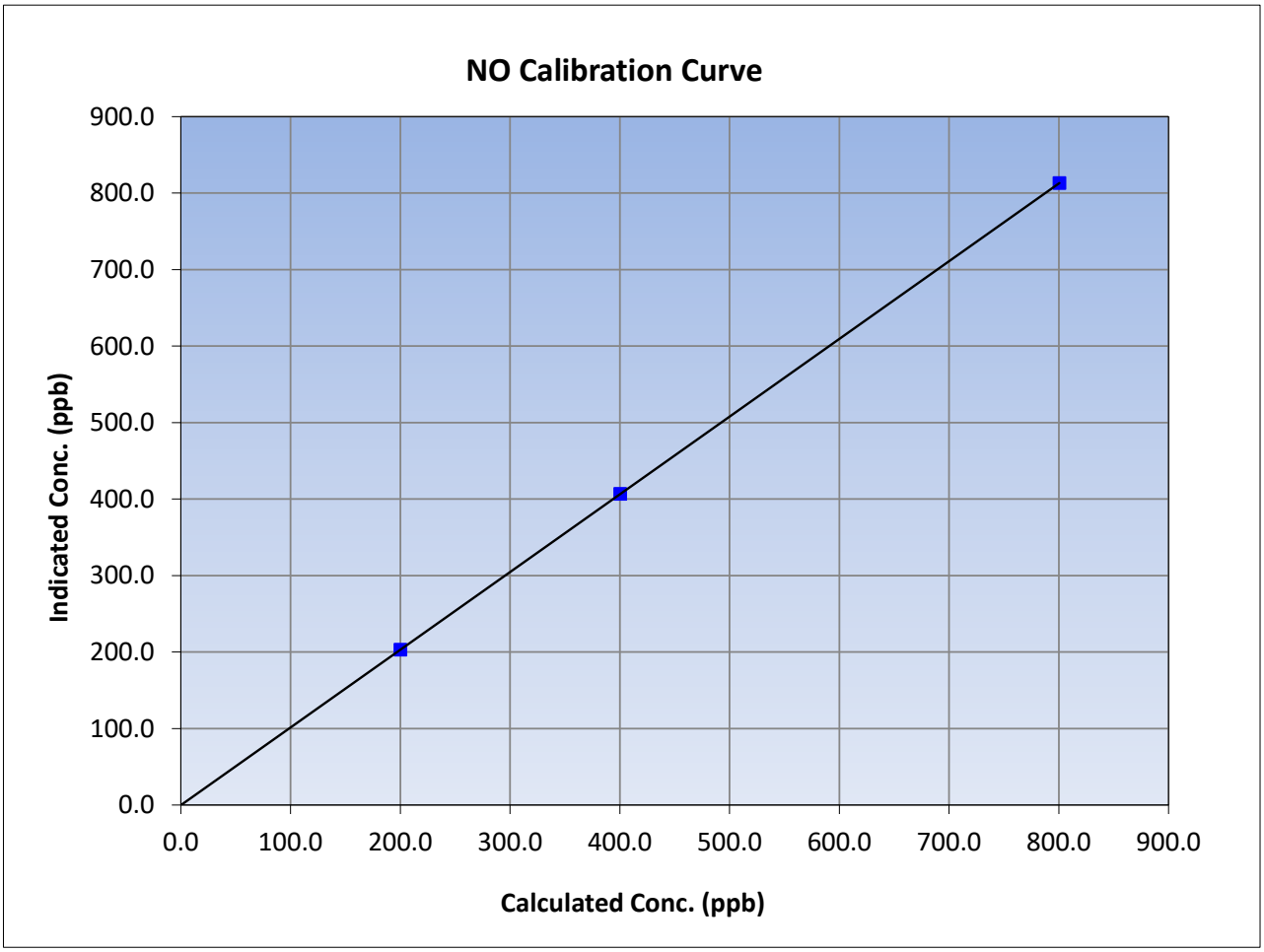
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:58 | End Time (MST): | 13:36 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 7029 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 1.000000 | ≥0.995 |
| 800.6 | 813.1 | 0.9846 | | | |
| 400.3 | 406.7 | 0.9843 | Slope | 1.015955 | 0.90 - 1.10 |
| 200.2 | 202.9 | 0.9865 | | | |
| | | | Intercept | -0.193015 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

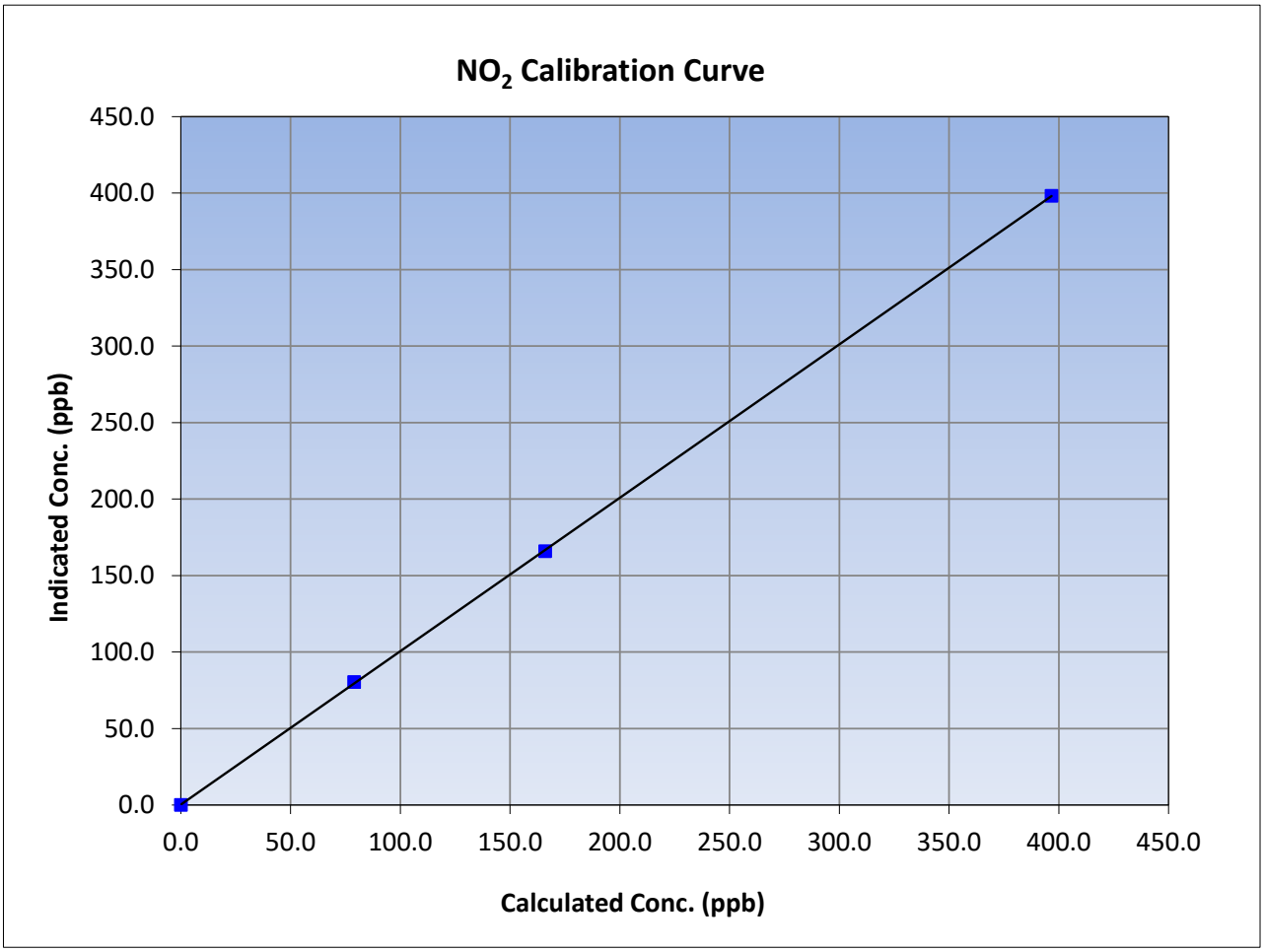
Version-04-2020

### Station Information

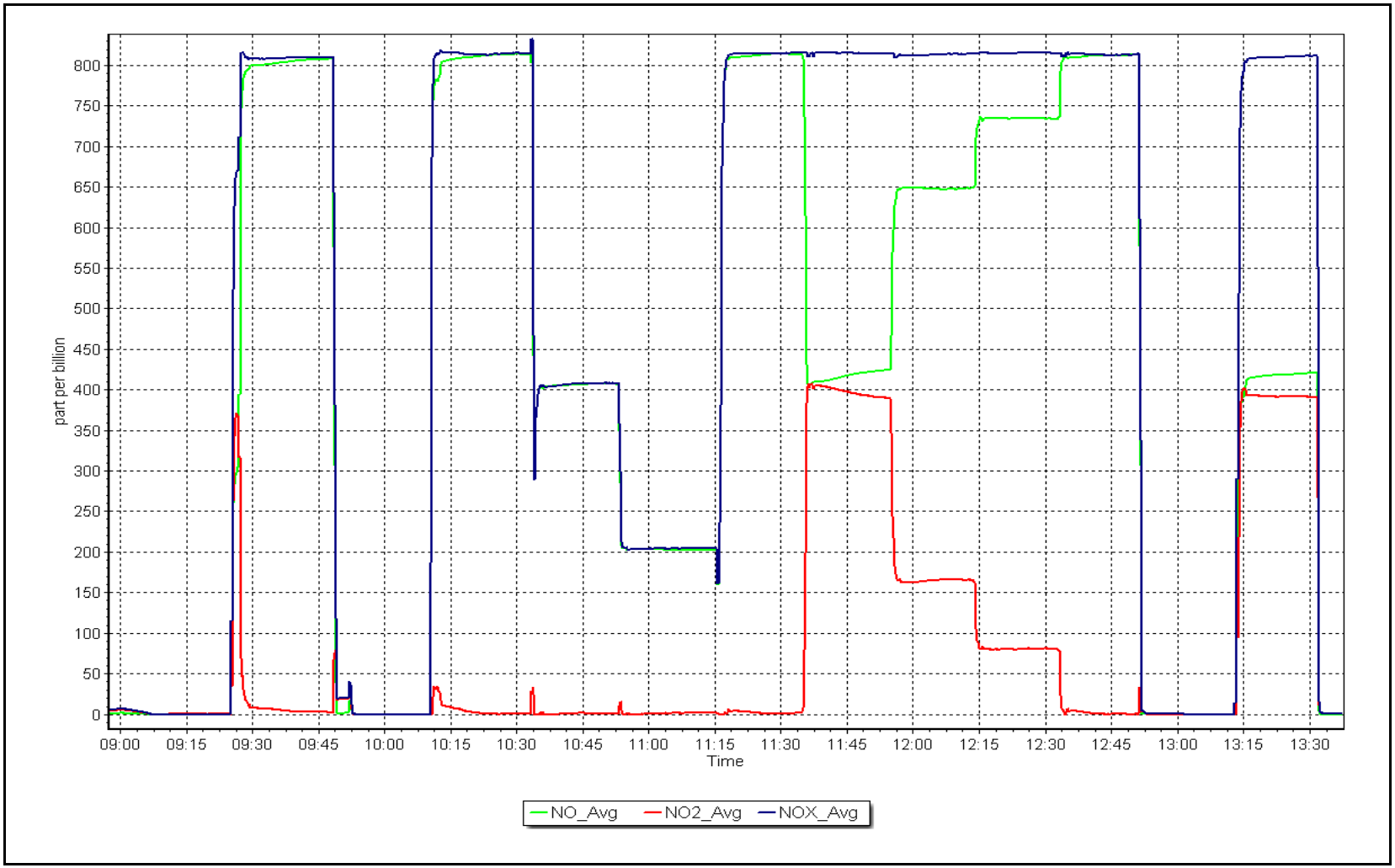
| | | | |
|---|---|---|---|
| Calibration Date: | February 23, 2024 | Previous Calibration: | January 9, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:58 | End Time (MST): | 13:36 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 7029 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999984 | ≥0.995 |
| 396.7 | 398.2 | 0.9962 | | | |
| 166.0 | 166.0 | 1.0000 | Slope | 1.002724 | 0.90 - 1.10 |
| 78.9 | 80.3 | 0.9826 | | | |
| | | | Intercept | 0.288096 | +/-20 |



**$NO_X$ Calibration Plot** Date: February 23, 2024 Location: Blackgold



End of Report