WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION

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Wood Buffalo Environmental Association

# MARCH 2024

# MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

April 30, 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
## MARCH 2024

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

April 30, 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: | March 5, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 11:11 | End time (MST): | 14:41 |
| 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: | 1.001365 | 0.997052 | Backgd or Offset: | 19.7 | 19.5 |
| Calibration intercept: | -0.173166 | -0.112969 | Coeff or Slope: | 0.891 | 0.885 |

### $SO_2$ 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 | 4918 | 81.3 | 800.3 | 802.9 | 0.997 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| high point | 4918 | 81.3 | 800.3 | 798.5 | 1.002 |
| second point | 4959 | 40.7 | 400.6 | 397.9 | 1.007 |
| third point | 4979 | 20.3 | 199.8 | 199.1 | 1.004 |
| as left zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| as left span | 4918 | 81.3 | 800.3 | 796.5 | 1.005 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.50 | Previous response | 801.19 | *% 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 the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

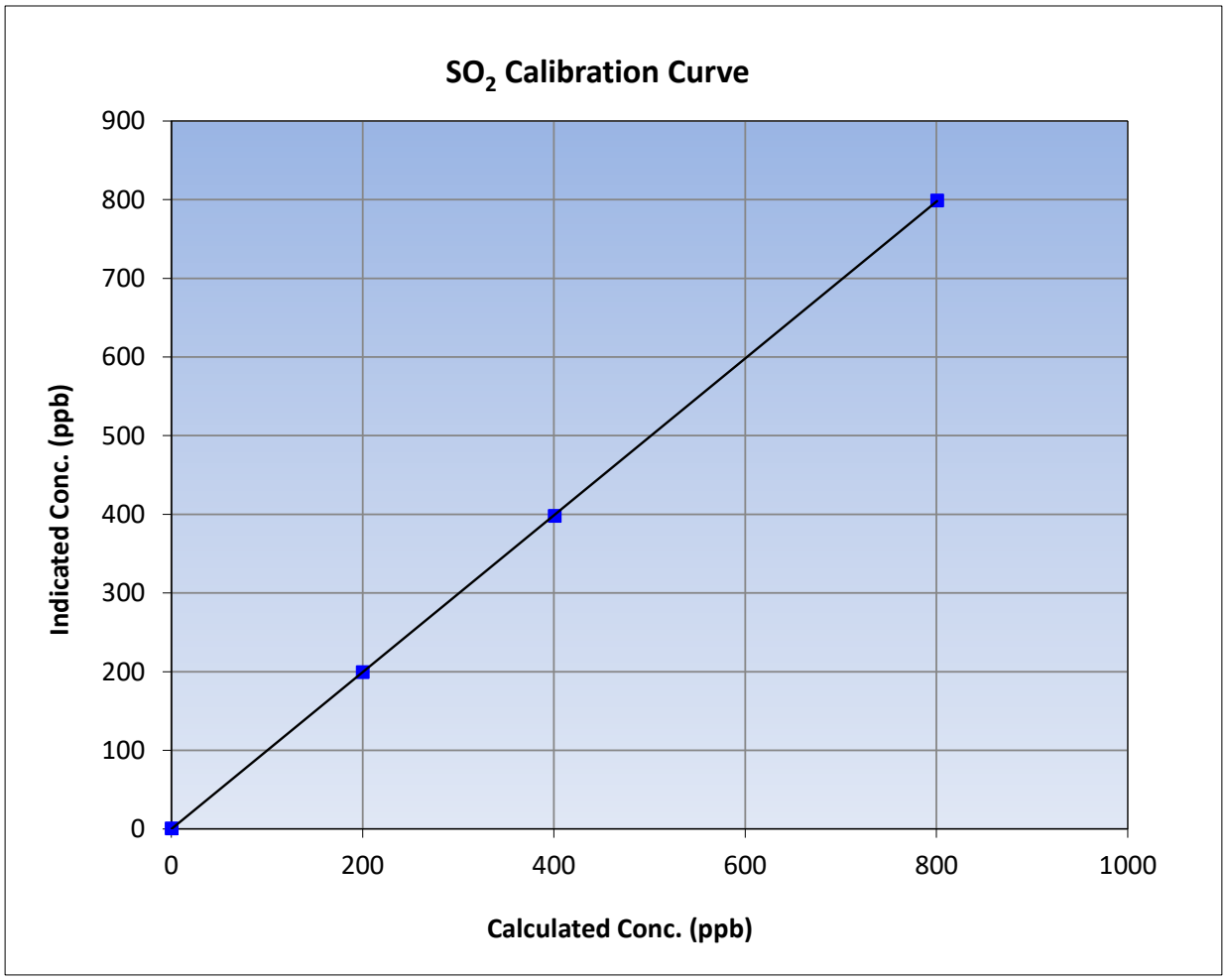
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:11 | End Time (MST): | 14:41 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1501301448 |

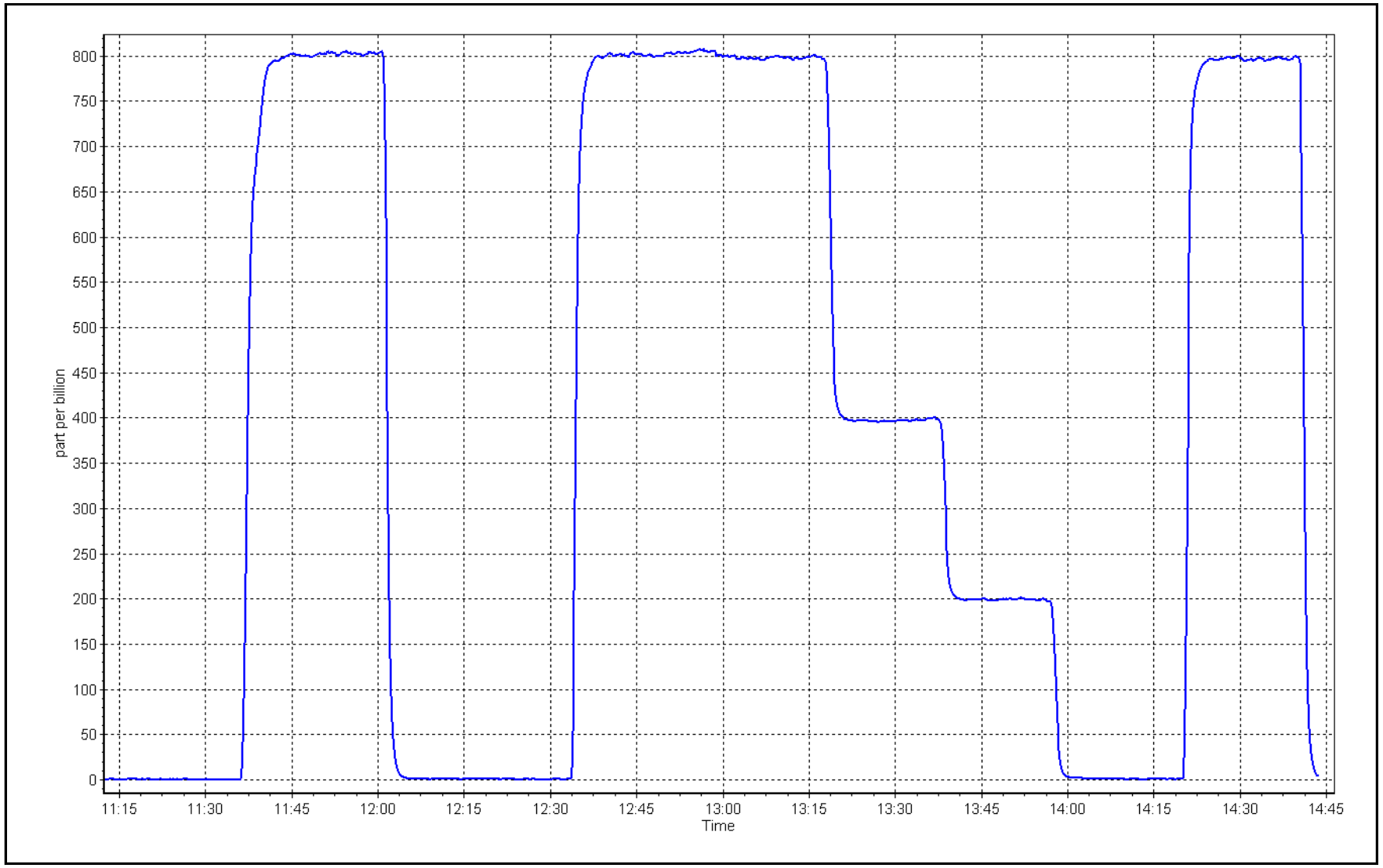
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 800.3 | 798.5 | 1.0022 |
| 400.6 | 397.9 | 1.0068 |
| 199.8 | 199.1 | 1.0036 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999991 | ≥0.995 |
| Slope | 0.997052 | 0.90 - 1.10 |
| Intercept | -0.112969 | +/-30 |



**SO2 Calibration Plot** Date: February 5, 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: | March 18, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 9:09 | End time (MST): | 13:18 |
| 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: | 0.997793 | 1.002936 | Backgd or Offset: | 2.45 | 2.43 |
| Calibration intercept: | 0.179996 | 0.199998 | Coeff or Slope: | 0.937 | 0.931 |

### 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 | 4921 | 78.4 | 80.0 | 80.5 | 0.994 |
| as found 2nd point | 4960 | 39.2 | 40.0 | 40.5 | 0.988 |
| as found 3rd point | 4980 | 19.6 | 20.0 | 20.2 | 0.990 |
| 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 | 4921 | 78.4 | 80.0 | 80.4 | 0.995 |
| 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 | 0.3 | ---- |
| as left span | 4921 | 78.4 | 80.0 | 80.5 | 0.994 |
| SO2 Scrubber Check | 4919 | 81.3 | 813.0 | 0.0 | ---- |
| Date of last scrubber change: | | December 17, 2021 | | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.5 | Prev response: | 80.00 | *% change: | 0.6% |
| Baseline Corr 2nd AF pt: | 40.5 | AF Slope: | 1.006365 | AF Intercept: | 0.079997 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999988 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

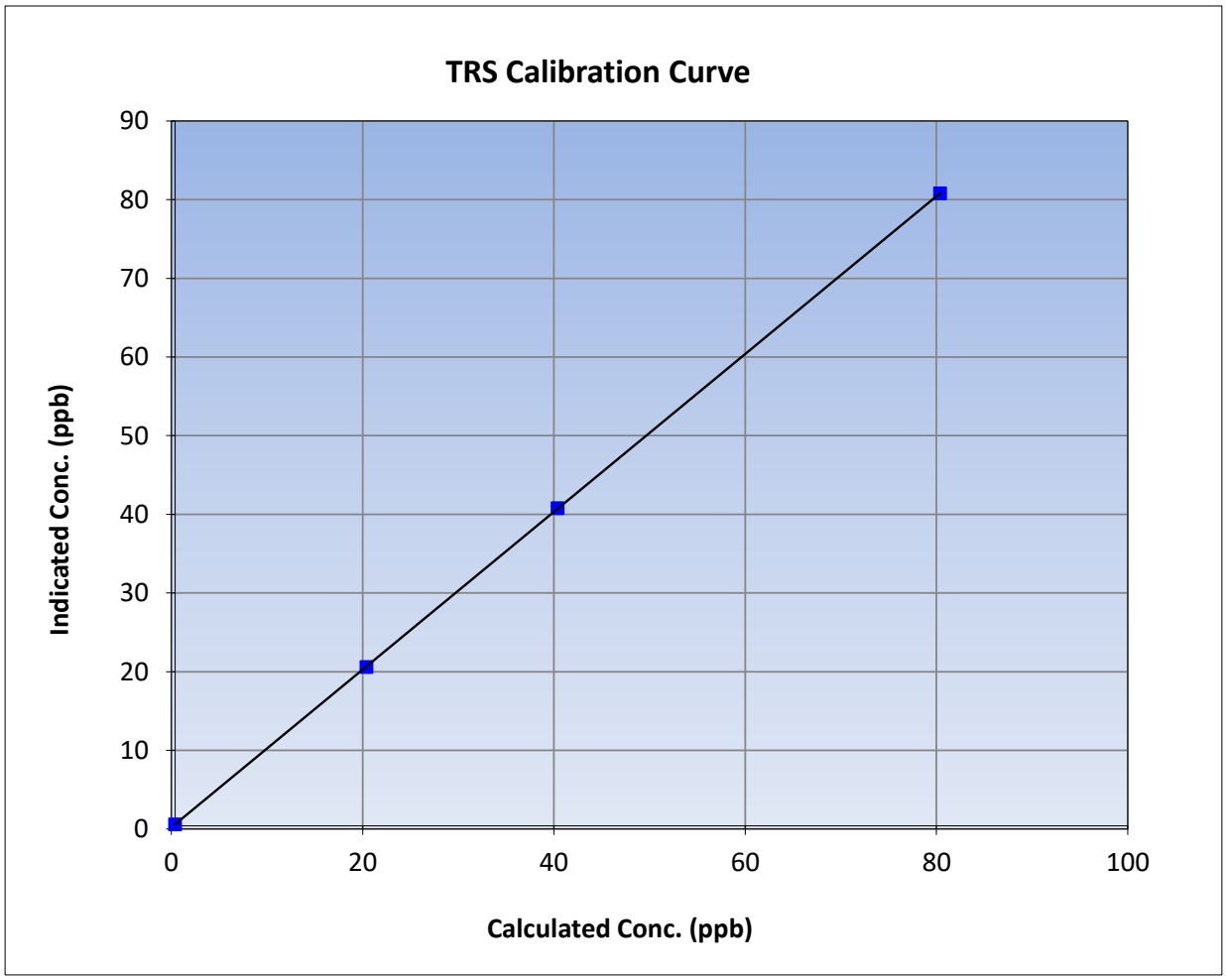
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 9:09 | End Time (MST): | 13:18 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1218153461 |

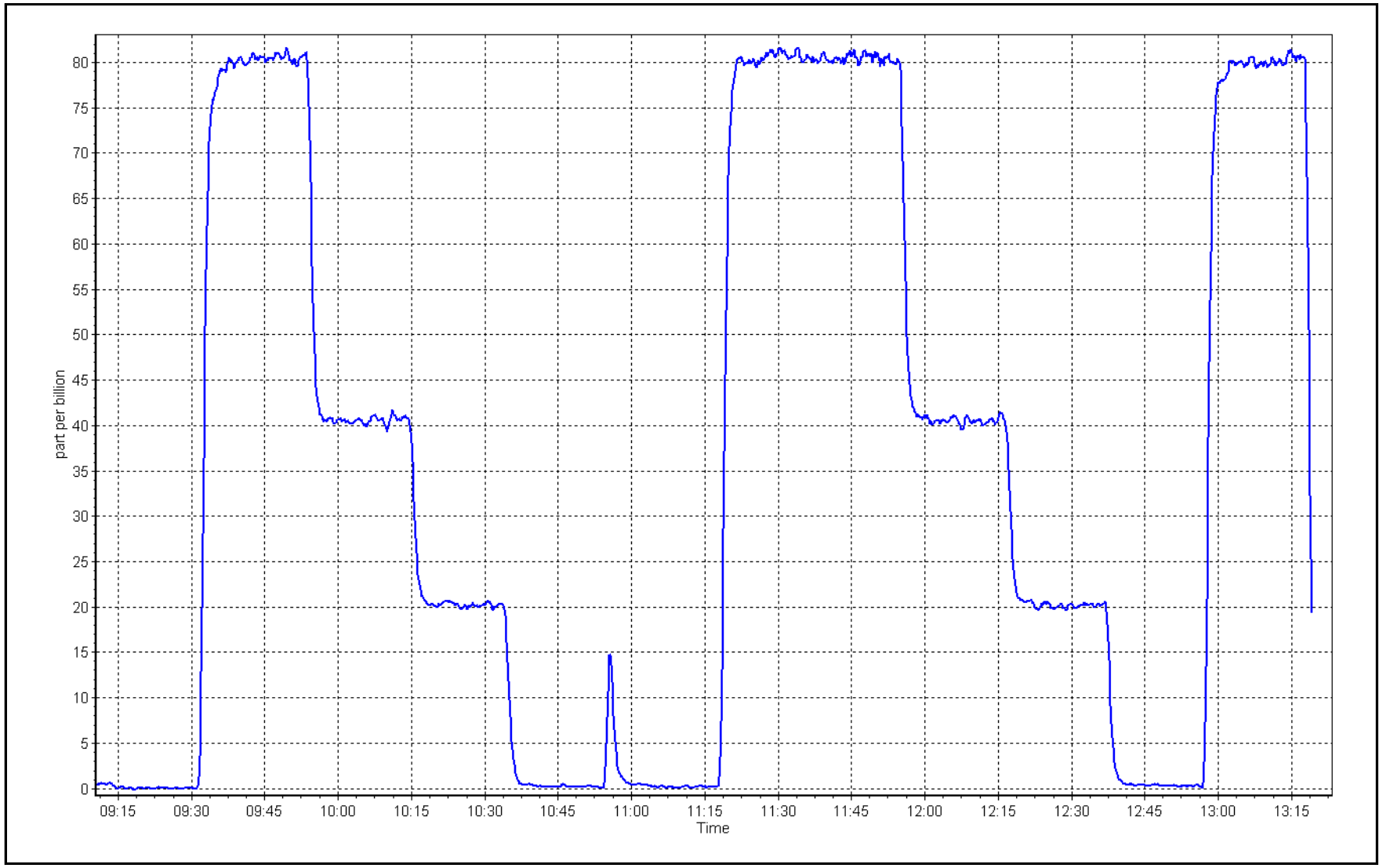
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 80.4 | 0.9949 |
| 40.0 | 40.4 | 0.9901 |
| 20.0 | 20.2 | 0.9900 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999997 | ≥0.995 |
| Slope | 1.002936 | 0.90 - 1.10 |
| Intercept | 0.199998 | +/-3 |



**TRS Calibration Plot** Date: March 18, 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: | March 18, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 9:09 | End time (MST): | 13:18 |
| 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: | 1.002571 | 1.005285 | Backgd or Offset: | 2.04 | 2.02 |
| Calibration intercept: | 0.116774 | -0.003216 | Coeff or Slope: | 0.992 | 0.985 |

### $H_2S$ 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 | 78.4 | 80.0 | 80.9 | 0.988 |
| as found 2nd point | 4960 | 39.2 | 40.0 | 40.6 | 0.985 |
| as found 3rd point | 4980 | 19.6 | 20.0 | 20.2 | 0.990 |
| 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 | 80.4 | 0.995 |
| second point | 4960 | 39.2 | 40.0 | 40.2 | 0.995 |
| third point | 4980 | 19.6 | 20.0 | 20.1 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4922 | 78.4 | 80.0 | 80.6 | 0.992 |
| SO2 Scrubber Check | 4919 | 81.3 | 813.0 | 0.1 | ---- |
| Date of last scrubber change: | | January 25, 2024 | | Ave Corr Factor | 0.995 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.9 | Prev response: | 80.28 | *% change: | 0.8% |
| Baseline Corr 2nd AF pt: | 40.6 | AF Slope: | 1.012057 | AF Intercept: | 0.016754 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999995 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

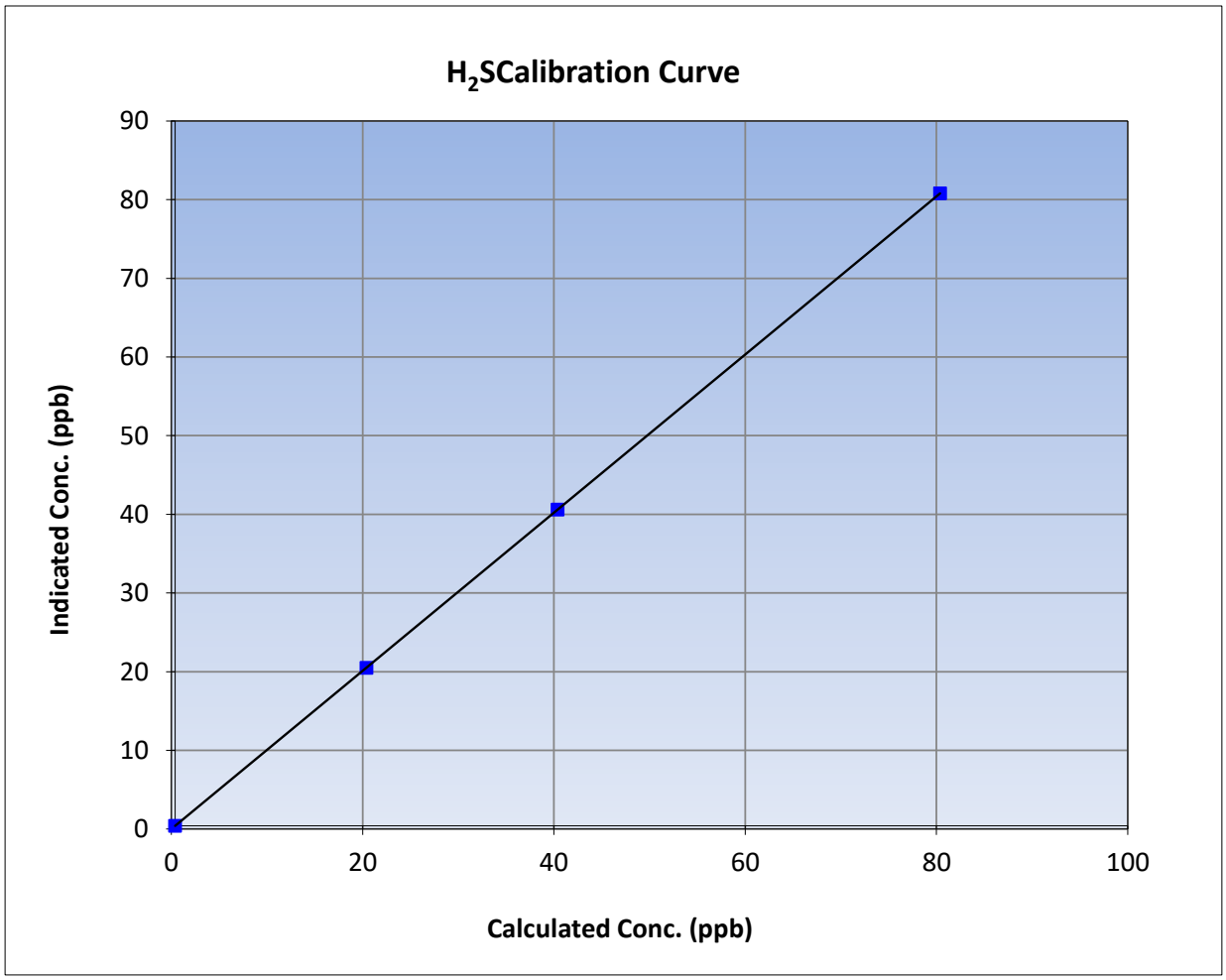
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 9:09 | End Time (MST): | 13:18 |
| Analyzer make: | Thermo 43iQTL | Analyzer serial #: | 1200326167 |

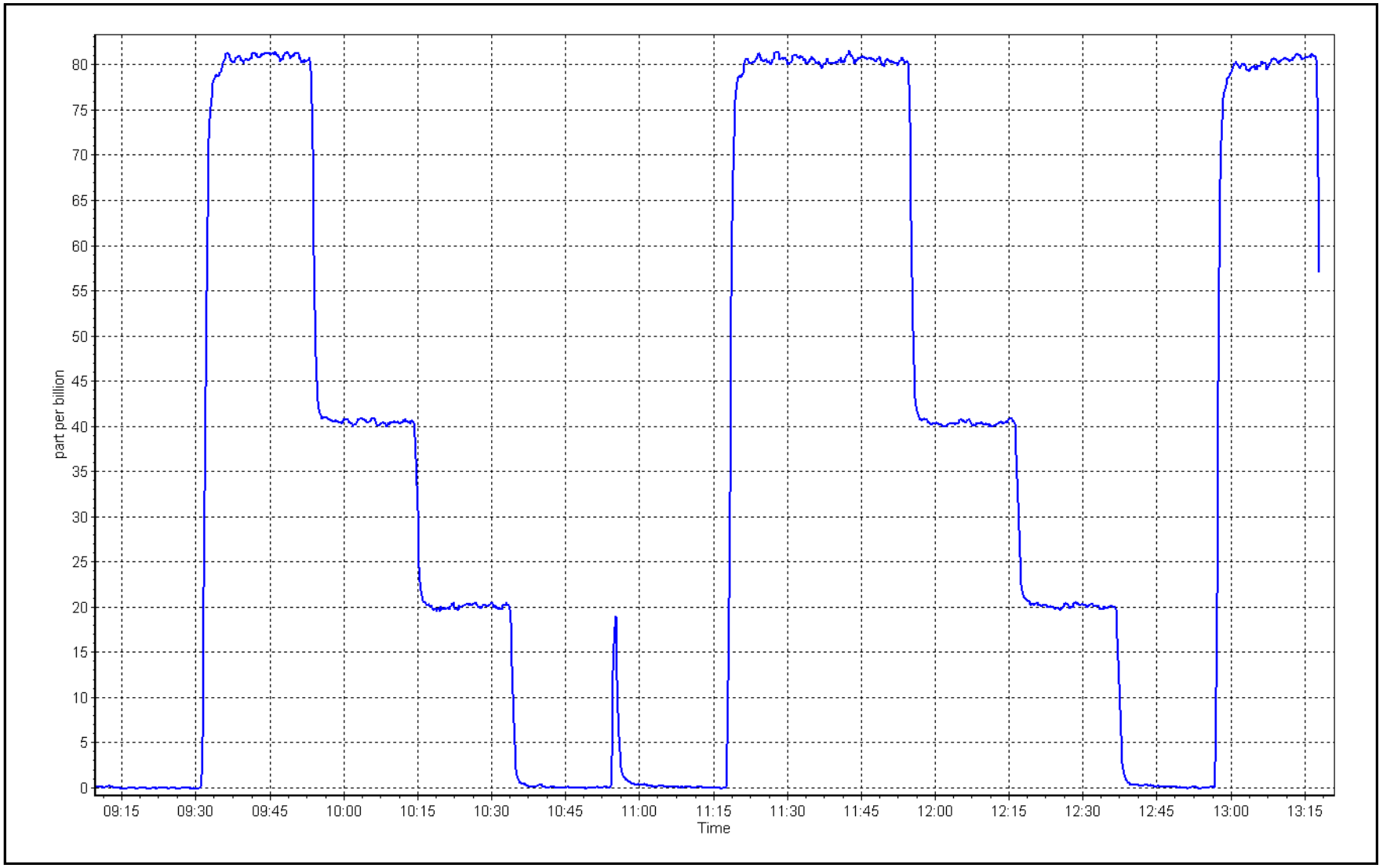
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.4 | 0.9947 |
| 40.0 | 40.2 | 0.9950 |
| 20.0 | 20.1 | 0.9949 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 1.000000 | *≥0.995* |
| Slope | 1.005285 | *0.90 - 1.10* |
| Intercept | -0.003216 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 18, 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: | March 5, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 11:11 | End time (MST): | 14:41 |
| 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: | 4.30E-04 | 4.30E-04 | NMHC SP Ratio: | 7.18E-05 | 7.20E-05 |
| CH4 Retention time: | 16.7 | 16.7 | NMHC Peak Area: | 127929 | 127593 |
| 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 | 17.22 | 1.003 |
| 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 | 17.29 | 0.999 |
| second point | 4959 | 40.7 | 8.64 | 8.53 | 1.014 |
| third point | 4980 | 20.3 | 4.31 | 4.25 | 1.016 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4918 | 81.3 | 17.27 | 17.30 | 0.998 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 17.22 | Prev response | 17.23 | *% change | -0.1% |
| 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 | 9.10 | 1.009 |
| 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 | 9.14 | 1.005 |
| second point | 4959 | 40.7 | 4.60 | 4.55 | 1.011 |
| third point | 4980 | 20.3 | 2.29 | 2.26 | 1.014 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4918 | 81.3 | 9.18 | 9.19 | 1.000 |
| | | | | Average Correction Factor | 1.010 |
| Baseline Corr AF: | 9.10 | Prev response | 9.16 | *% change | -0.7% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 8.13 | 0.995 |
| 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 | 8.15 | 0.993 |
| second point | 4959 | 40.7 | 4.05 | 3.98 | 1.017 |
| third point | 4980 | 20.3 | 2.02 | 1.98 | 1.017 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4918 | 81.3 | 8.09 | 8.12 | 0.996 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 8.13 | Prev response | 8.07 | *% change | 0.7% |
| 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: | 1.000371 | 1.001618 |
| THC Cal Offset: | -0.041569 | -0.052990 |
| CH4 Cal Slope: | 1.002874 | 1.008062 |
| CH4 Cal Offset: | -0.035591 | -0.039196 |
| NMHC Cal Slope: | 0.998167 | 0.995931 |
| NMHC Cal Offset: | -0.005978 | -0.013994 |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## THC Calibration Summary

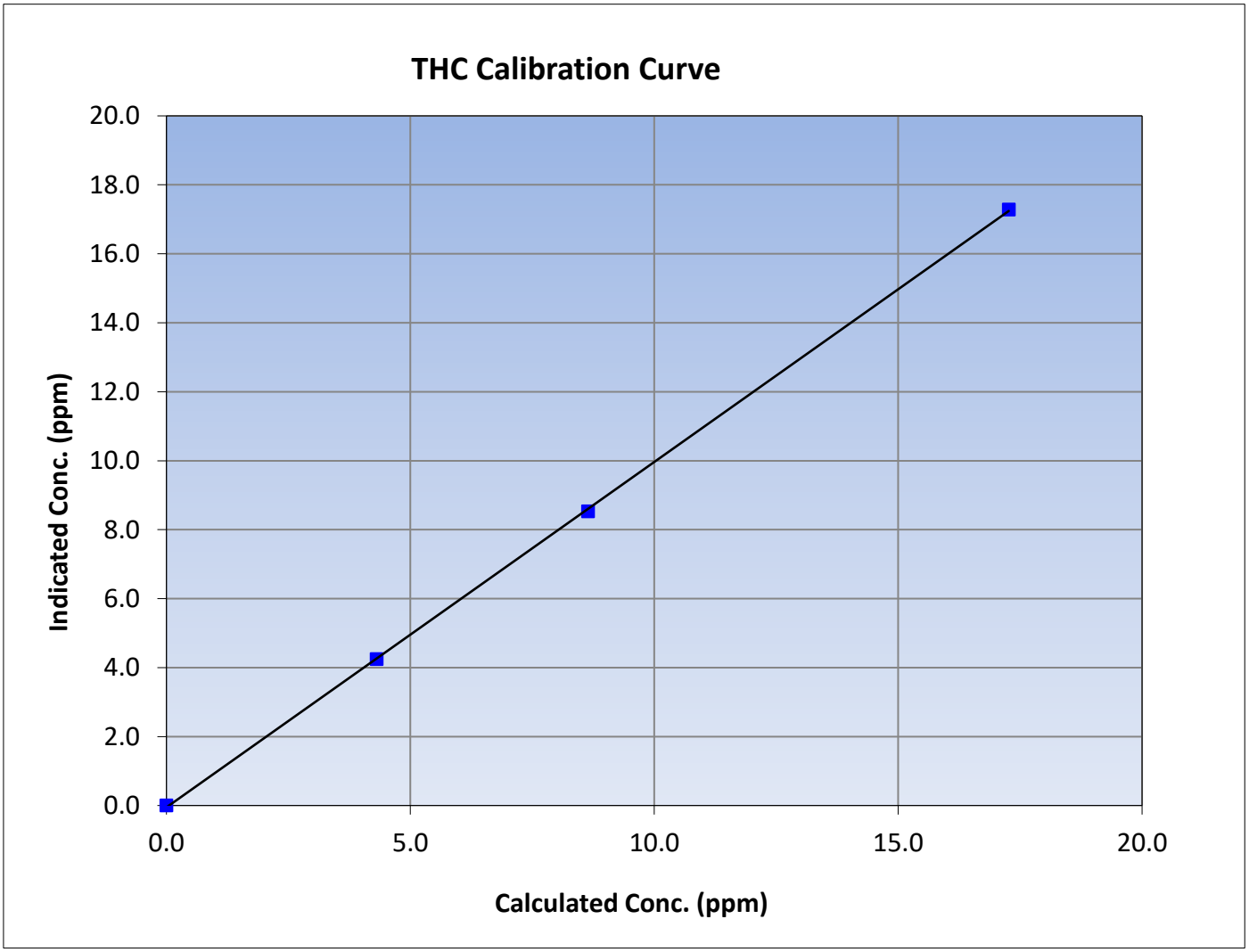
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:11 | End Time (MST): | 14:41 |
| 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 | 0.999933 | ≥0.995 |
| 17.27 | 17.29 | 0.9990 | | | |
| 8.64 | 8.53 | 1.0135 | Slope | 1.001618 | 0.90 - 1.10 |
| 4.31 | 4.25 | 1.0155 | | | |
| | | | Intercept | -0.052990 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

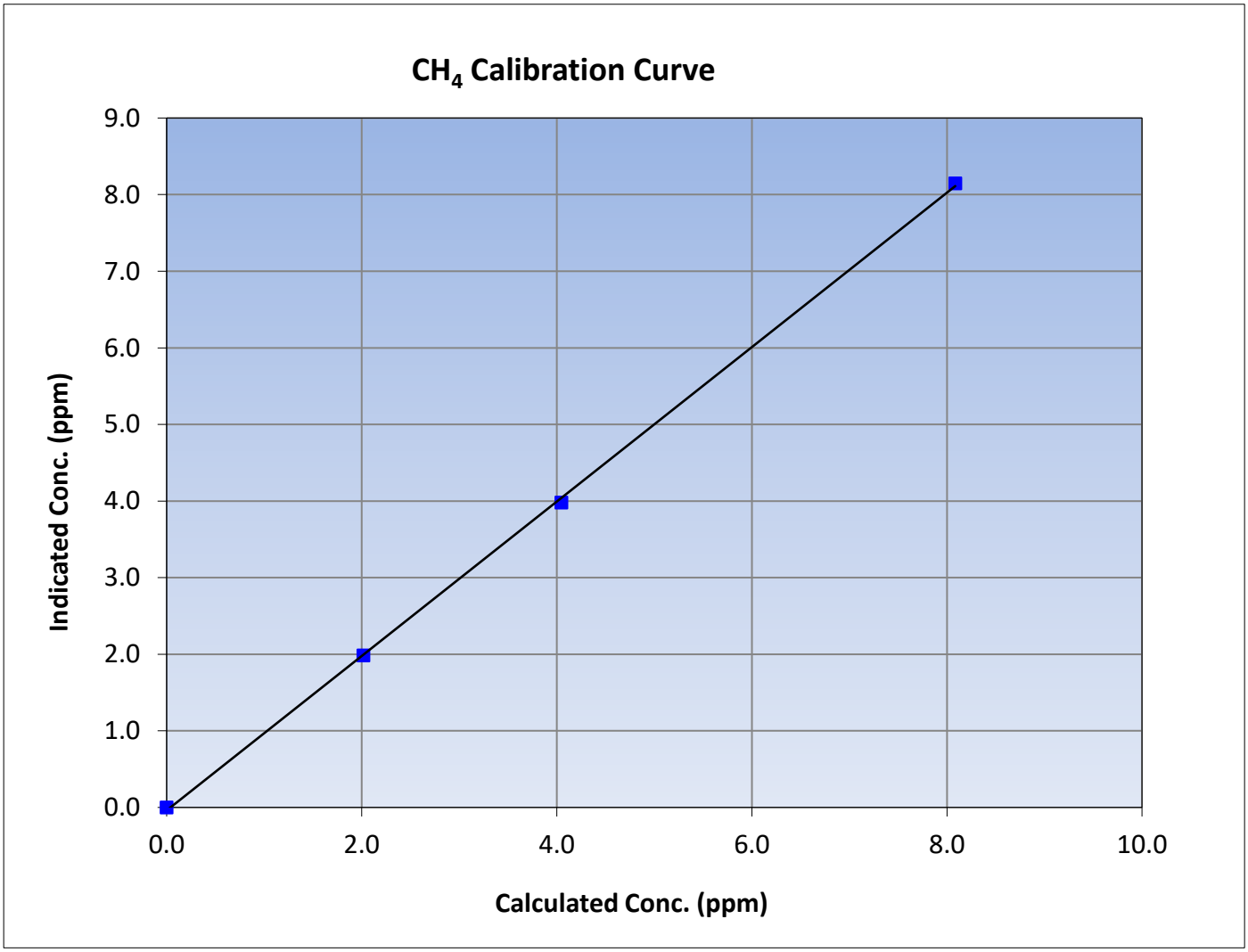
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:11 | End Time (MST): | 14:41 |
| 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 | 0.999821 | *≥0.995* |
| 8.09 | 8.15 | 0.9927 | | | |
| 4.05 | 3.98 | 1.0169 | Slope | 1.008062 | *0.90 - 1.10* |
| 2.02 | 1.98 | 1.0175 | | | |
| | | | Intercept | -0.039196 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

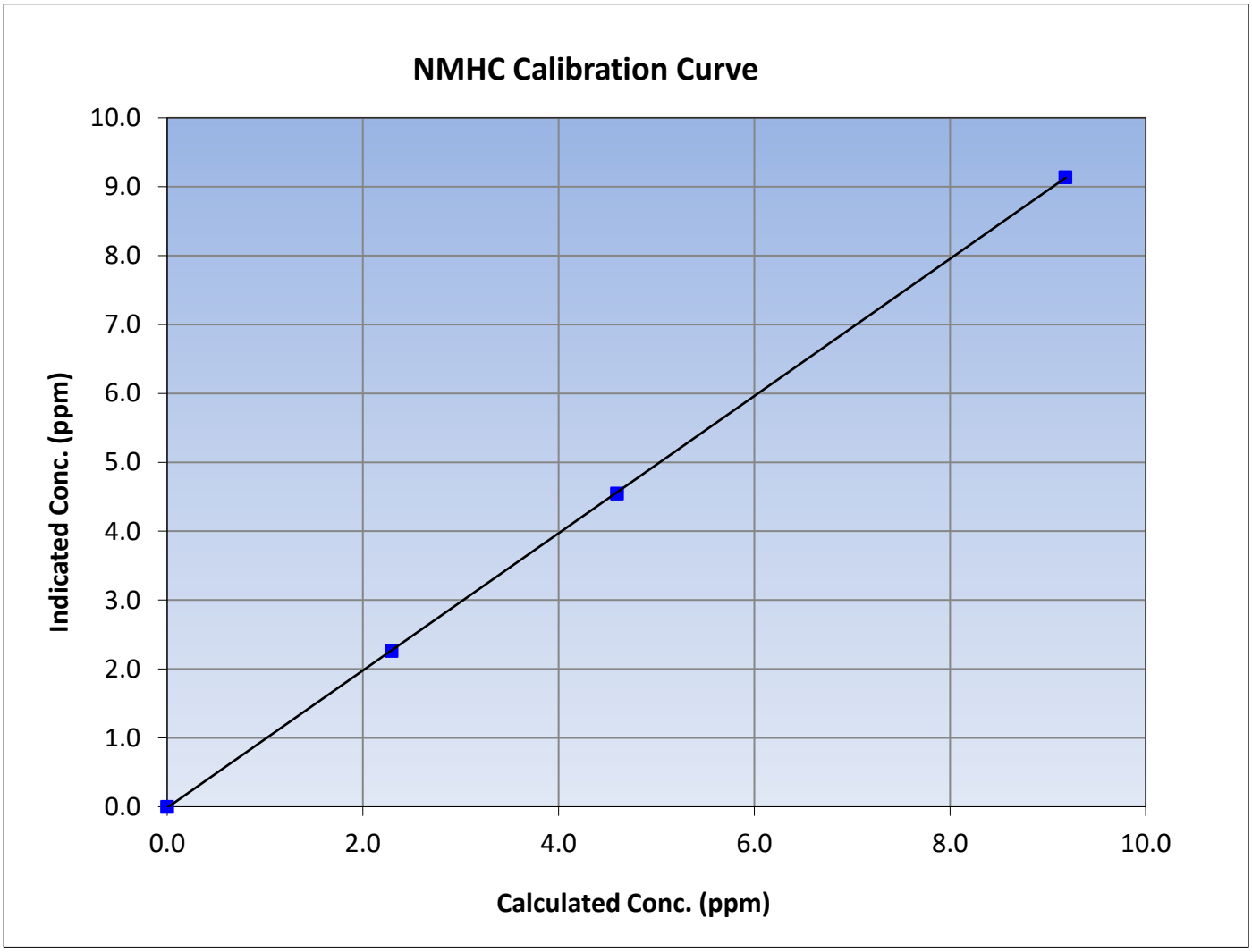
Version-06-2022

### Station Information

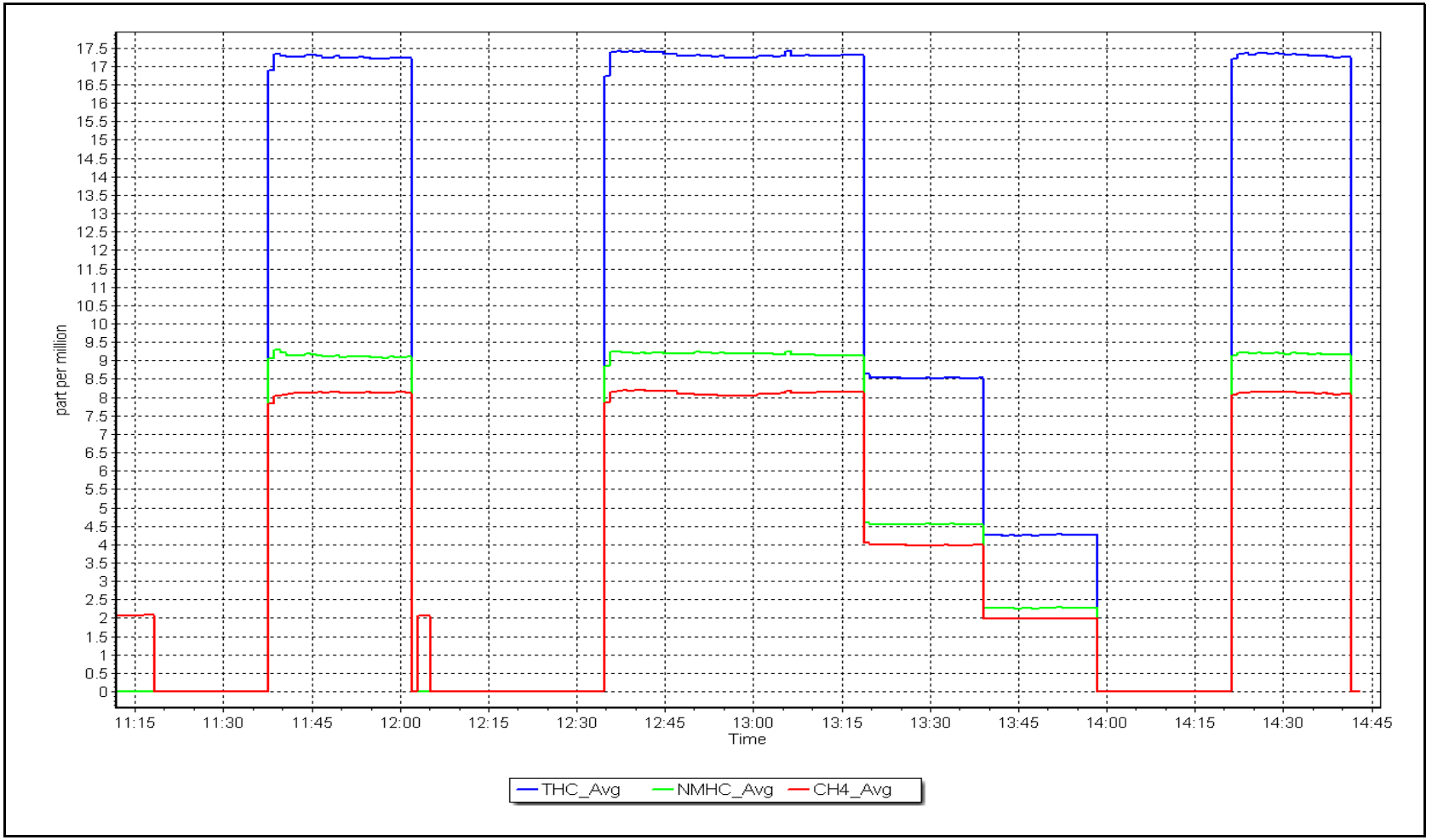
| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 11:11 | End Time (MST): | 14:41 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320040 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999986 | ≥0.995 |
| 9.18 | 9.14 | 1.0045 | | | |
| 4.60 | 4.55 | 1.0108 | Slope | 0.995931 | 0.90 - 1.10 |
| 2.29 | 2.26 | 1.0138 | | | |
| | | | Intercept | -0.013994 | +/-0.5 |



**NMHC Calibration Plot** Date: March 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: | March 14, 2024 | Last Cal Date: | February 26, 2024 |
| Start time (MST): | 10:32 | End time (MST): | 15:51 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.556 | 1.496 | NO bkgnd or offset: | 7.6 | 7.4 |
| NOX coeff or slope: | 0.999 | 0.999 | NOX bkgnd or offset: | 7.6 | 7.5 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 196.0 | 200.1 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000310 | 0.999371 |
| $NO_X$ Cal Offset: | -0.160000 | 0.020000 |
| NO Cal Slope: | 1.001719 | 1.000862 |
| NO Cal Offset: | -0.920000 | -1.220000 |
| $NO_2$ Cal Slope: | 0.995800 | 0.995953 |
| $NO_2$ Cal Offset: | -0.397873 | 0.117298 |

# 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 | 0.7 | 0.3 | 0.4 | ---- | ---- |
| as found span | 4932 | 67.6 | 803.1 | 800.4 | 2.7 | 868.0 | 860.8 | 7.3 | 0.9252 | 0.9298 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.3 | 0.3 | ---- | ---- |
| high point | 4932 | 67.6 | 803.1 | 800.4 | 2.7 | 802.8 | 800.6 | 2.1 | 1.0004 | 0.9997 |
| second point | 4966 | 33.8 | 401.5 | 400.2 | 1.4 | 401.3 | 398.6 | 2.7 | 1.0006 | 1.0040 |
| third point | 4983 | 16.9 | 200.8 | 200.1 | 0.7 | 199.9 | 197.5 | 2.4 | 1.0044 | 1.0131 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 | ---- | ---- |
| as left span | 4932 | 67.6 | 803.1 | 398.7 | 404.4 | 797.1 | 392.0 | 405.1 | 1.0075 | 1.0171 |
| | | | | | | | | Average Correction Factor | 1.0018 | 1.0056 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 867.3 ppb | NO = 860.5 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 7.4% |
| Previous Response | $NO_X$ = 803.2 ppb | NO = 800.8 ppb | | *Percent Change | NO = | 6.9% |
| 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) | 797.3 | 395.6 | 404.4 | 403.5 | 1.0022 | 99.8% |
| 2nd GPT point (200 ppb O3) | 797.3 | 593.0 | 207.0 | 204.7 | 1.0113 | 98.9% |
| 3rd GPT point (100 ppb O3) | 797.3 | 699.4 | 100.6 | 101.1 | 0.9951 | 100.5% |
| | | | | Average Correction Factor | 1.0029 | 99.7% |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

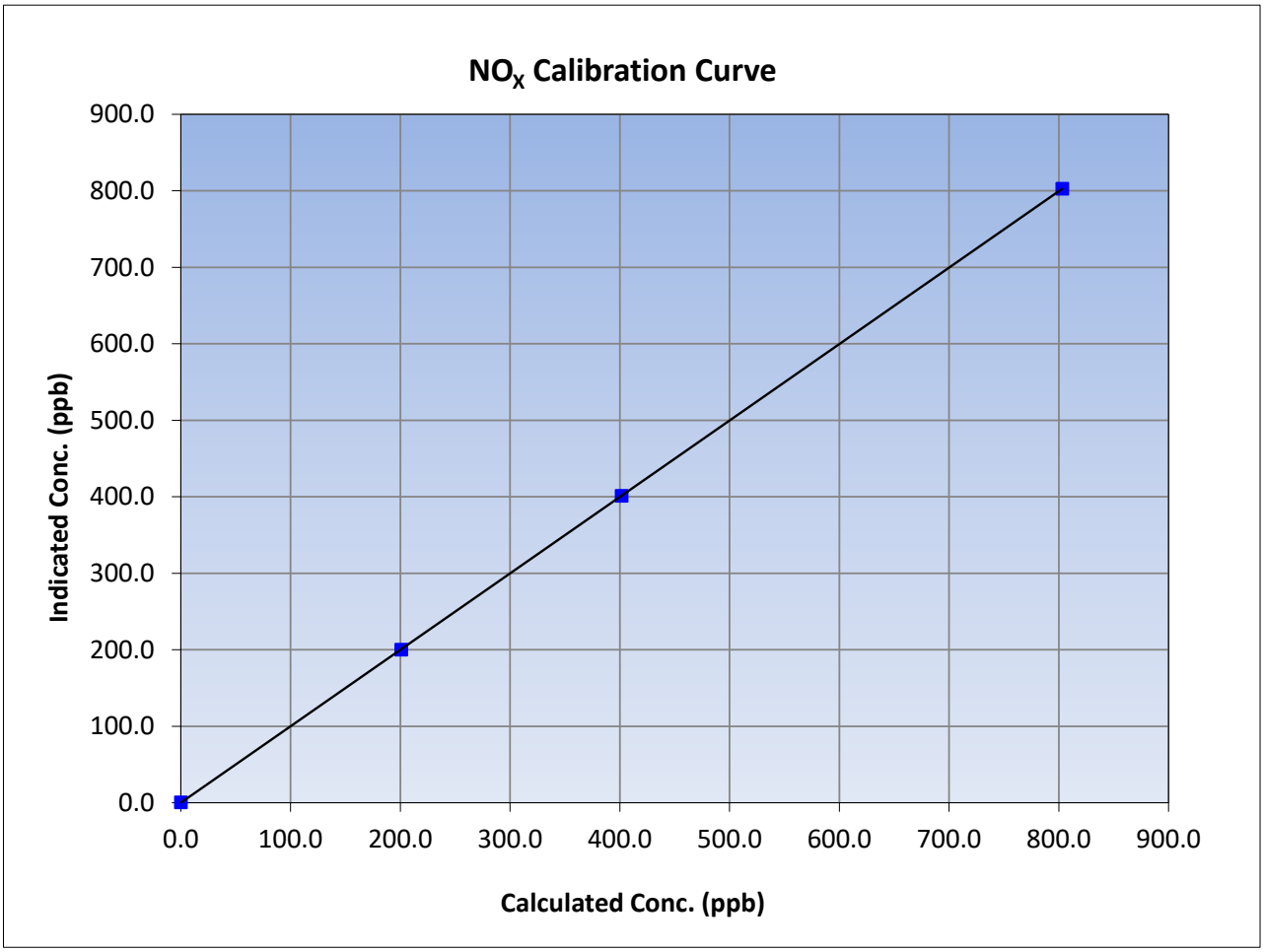
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 26, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:32 | End Time (MST): | 15:51 |
| 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 | 0.6 | ---- | Correlation Coefficient | 0.999997 | ≥0.995 |
| 803.1 | 802.8 | 1.0004 | | | |
| 401.5 | 401.3 | 1.0006 | Slope | 0.999371 | 0.90 - 1.10 |
| 200.8 | 199.9 | 1.0044 | | | |
| | | | Intercept | 0.020000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

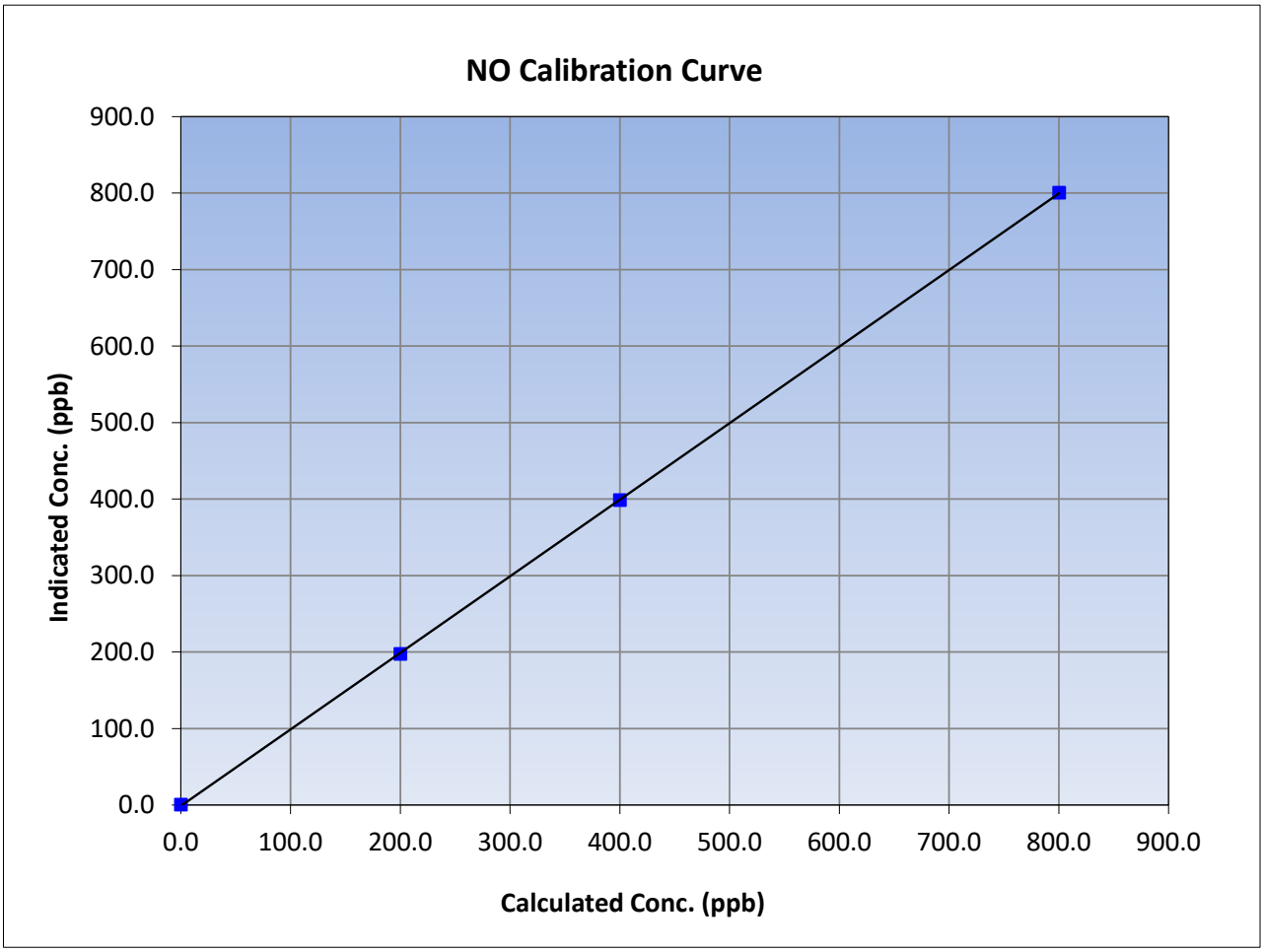
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 26, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:32 | End Time (MST): | 15:51 |
| 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 | 0.3 | ---- | Correlation Coefficient | 0.999984 | ≥0.995 |
| 800.4 | 800.6 | 0.9997 | | | |
| 400.2 | 398.6 | 1.0040 | Slope | 1.000862 | 0.90 - 1.10 |
| 200.1 | 197.5 | 1.0131 | | | |
| | | | Intercept | -1.220000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

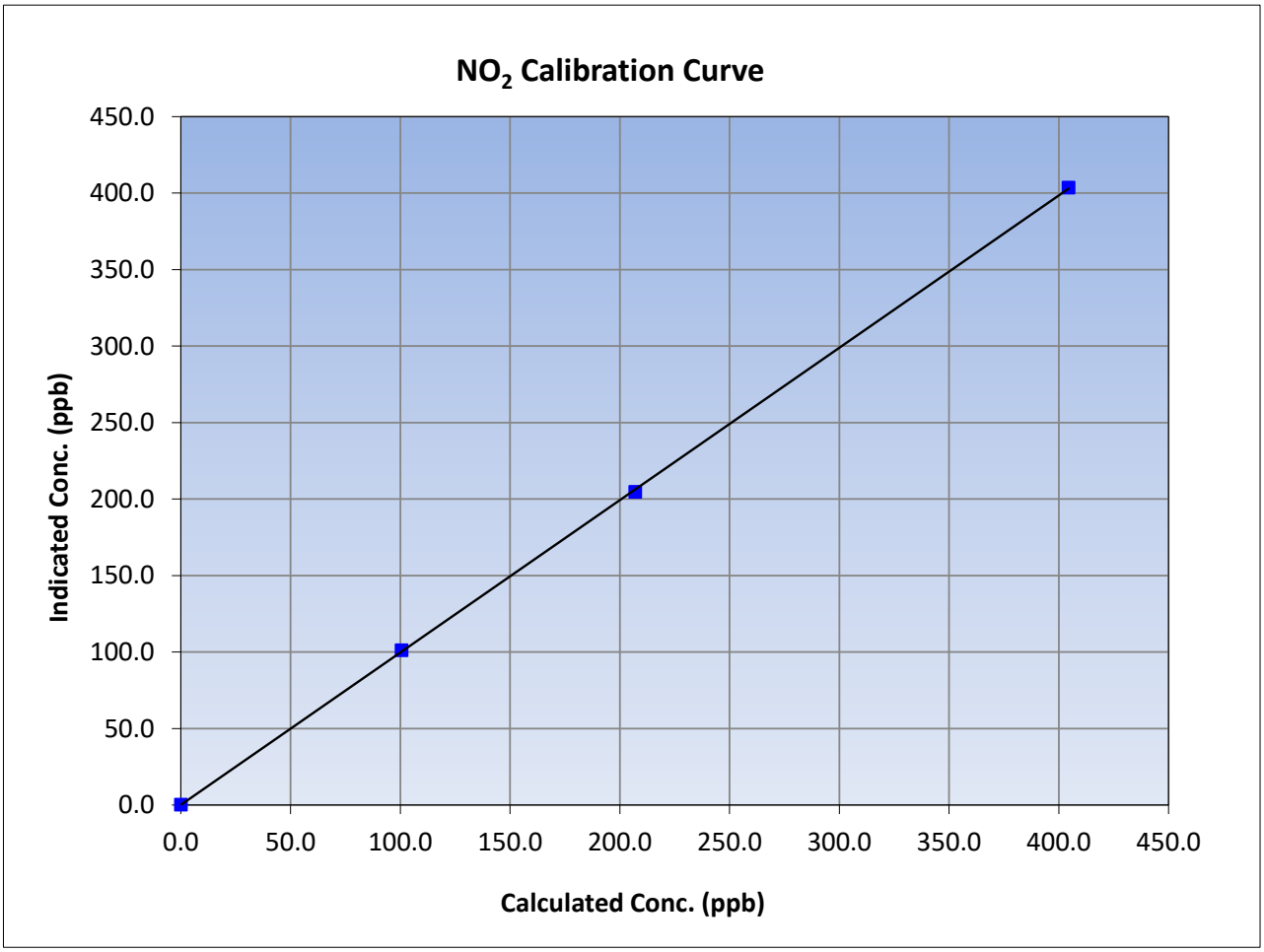
Version-04-2020

### Station Information

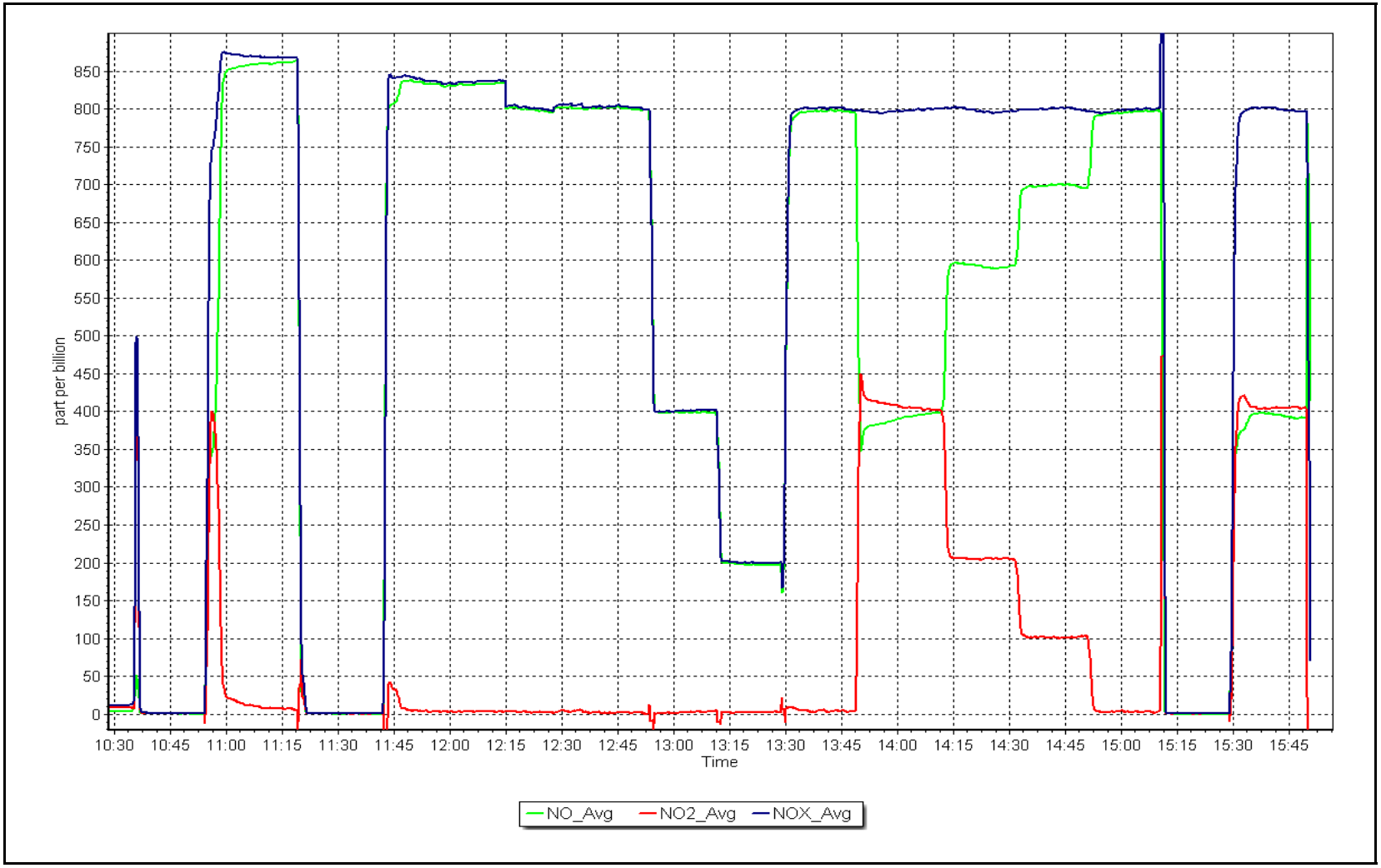
| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 26, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:32 | End Time (MST): | 15:51 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153357 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.3 | ---- | Correlation Coefficient | 0.999960 | ≥0.995 |
| 404.4 | 403.5 | 1.0022 | | | |
| 207.0 | 204.7 | 1.0113 | Slope | 0.995953 | 0.90 - 1.10 |
| 100.6 | 101.1 | 0.9951 | | | |
| | | | Intercept | 0.117298 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 14, 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: | March 6, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 10:42 | End time (MST): | 13:30 |
| 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: | 0.999143 | 1.001057 | Backgd or Offset: | 5.3 | 5.5 |
| Calibration intercept: | 1.000000 | 0.640000 | Coeff or Slope: | 1.015 | 1.044 |

### $O_3$ 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 | 863.1 | 400.0 | 390.8 | 1.024 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| high point | 5000 | 863.1 | 400.0 | 400.6 | 0.999 |
| second point | 5000 | 742.5 | 200.0 | 201.4 | 0.993 |
| third point | 5000 | 651.7 | 100.0 | 101.5 | 0.985 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 5000 | 863.1 | 400.0 | 400.7 | 0.998 |
| | | | | Average Correction Factor | 0.992 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 390.9 | Previous response | 400.7 | *% change | -2.5% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

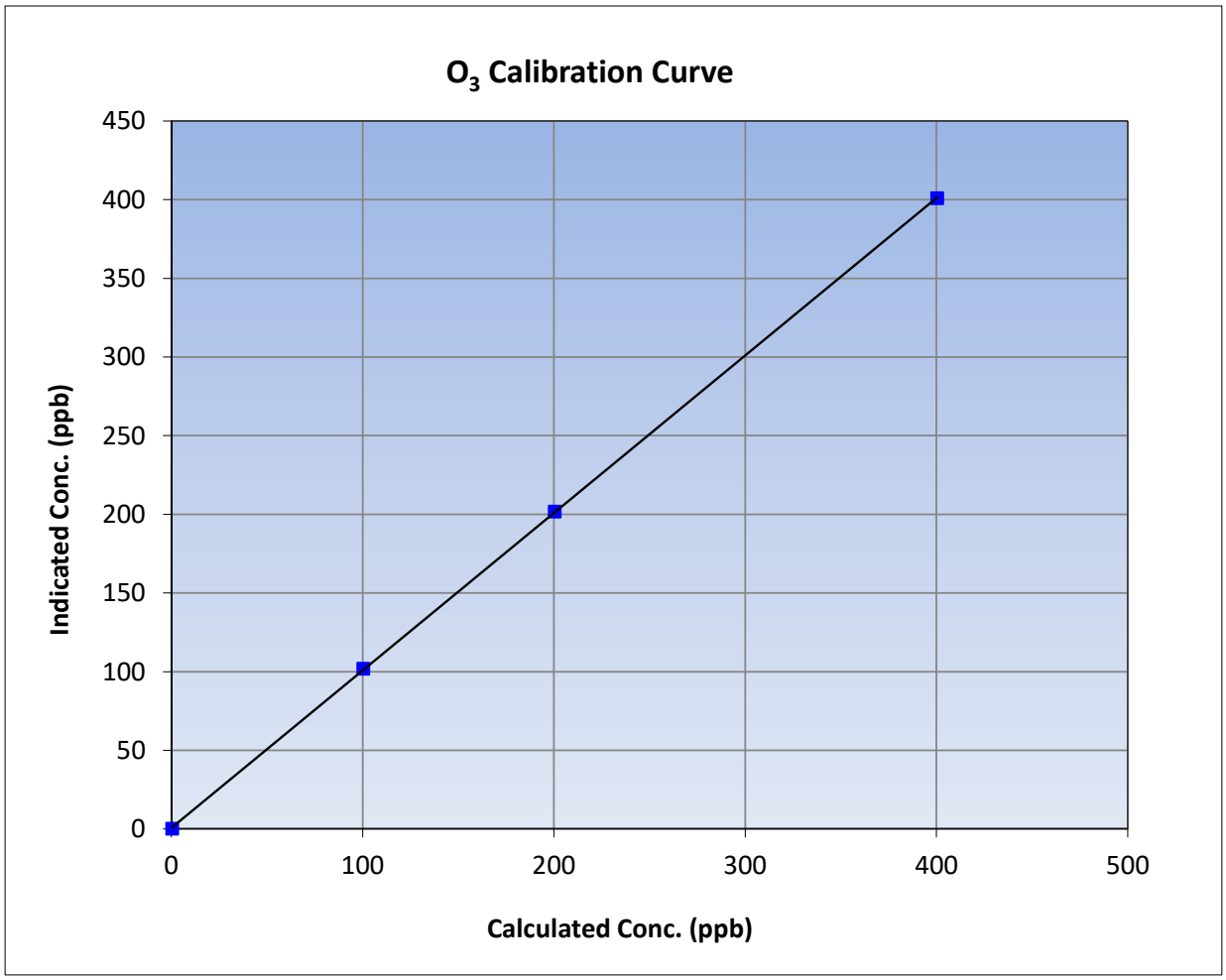
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:42 | End Time (MST): | 13:30 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 1107 |

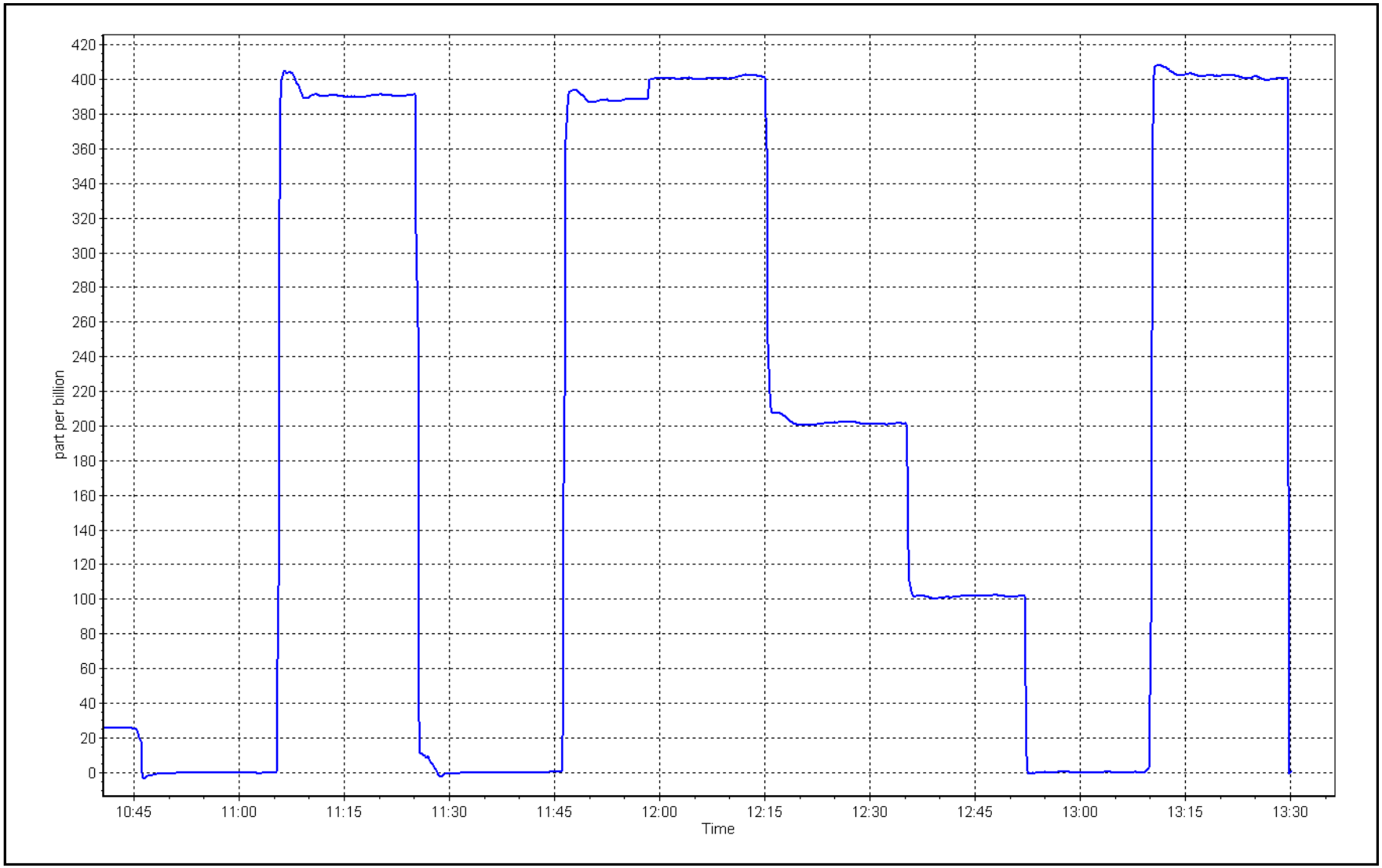
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.2 | ---- |
| 400.0 | 400.6 | 0.9985 |
| 200.0 | 201.4 | 0.9930 |
| 100.0 | 101.5 | 0.9852 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999980 | *≥0.995* |
| Slope | 1.001057 | *0.90 - 1.10* |
| Intercept | 0.640000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 6, 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: | March 18, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 12:10 | End time (MST): | 13:04 |
| 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) | -1.7 | -2.41 | -1.7 | ☐ | +/- 2 °C |
| P (mmHg) | 740.4 | 739.69 | 740.4 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.03 | 5.16 | 5.03 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 40 | ----- | 40 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 7.3 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 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: | March 15, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 10:02 | End time (MST): | 13:04 |
| 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: | 1.001370 | 1.000382 | Backgd or Offset: | -0.013 | -0.013 |
| Calibration intercept: | 0.145823 | 0.195846 | Coeff or Slope: | 0.989 | 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 | 0.1 | ---- |
| as found span | 4933 | 66.7 | 40.6 | 40.7 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4933 | 66.7 | 40.6 | 40.6 | 0.998 |
| second point | 4966 | 33.3 | 20.2 | 20.7 | 0.976 |
| third point | 4983 | 16.7 | 10.2 | 10.3 | 0.983 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 2960 | 40.0 | 40.5 | 40.1 | 1.010 |
| | | | | Average Correction Factor | 0.986 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 40.57 | Prev response: | 40.76 | *% 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: Rene Chamberland

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

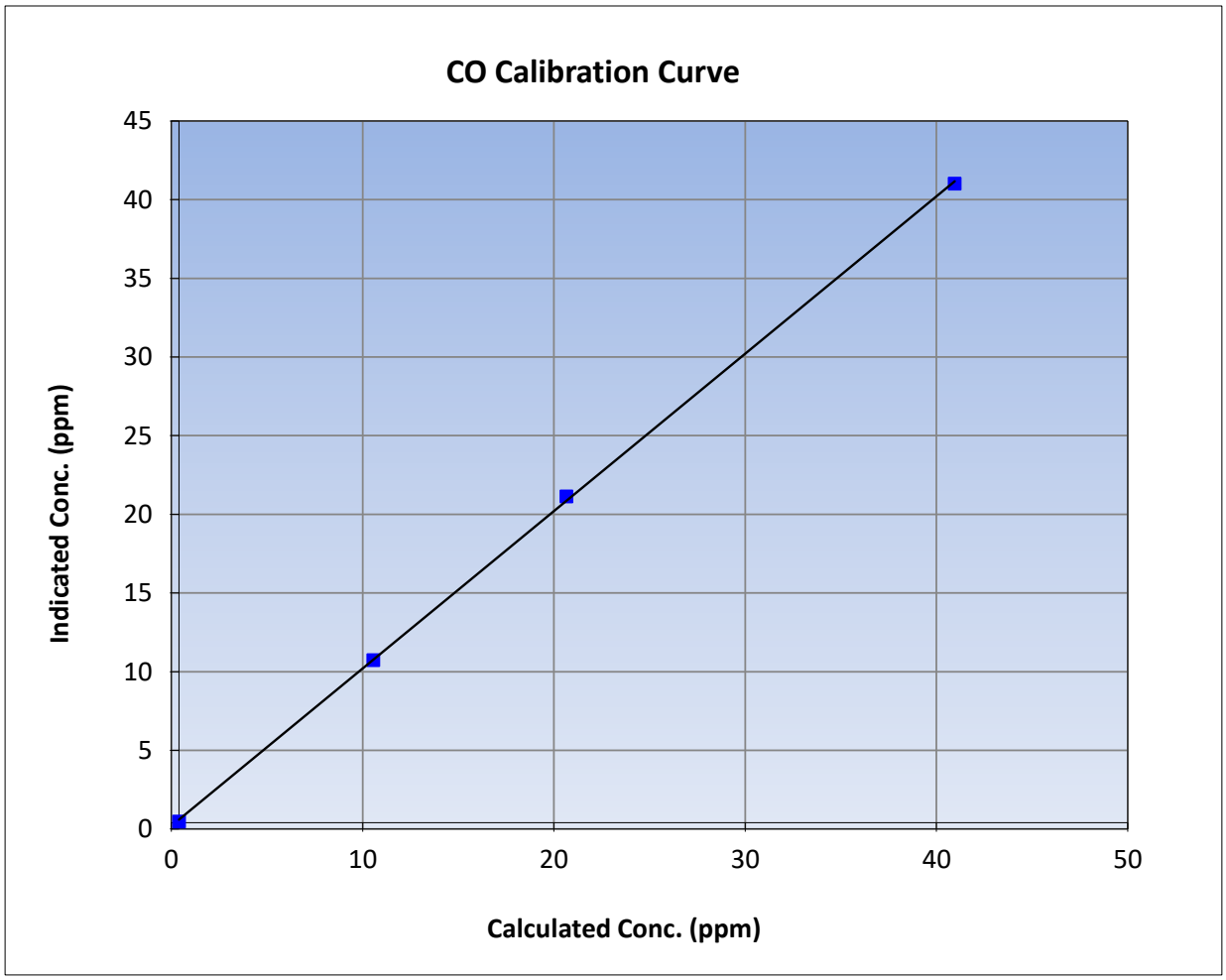
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:02 | End Time (MST): | 13:04 |
| Analyzer make: | Teledyne API T300 | Analyzer serial #: | 3520 |

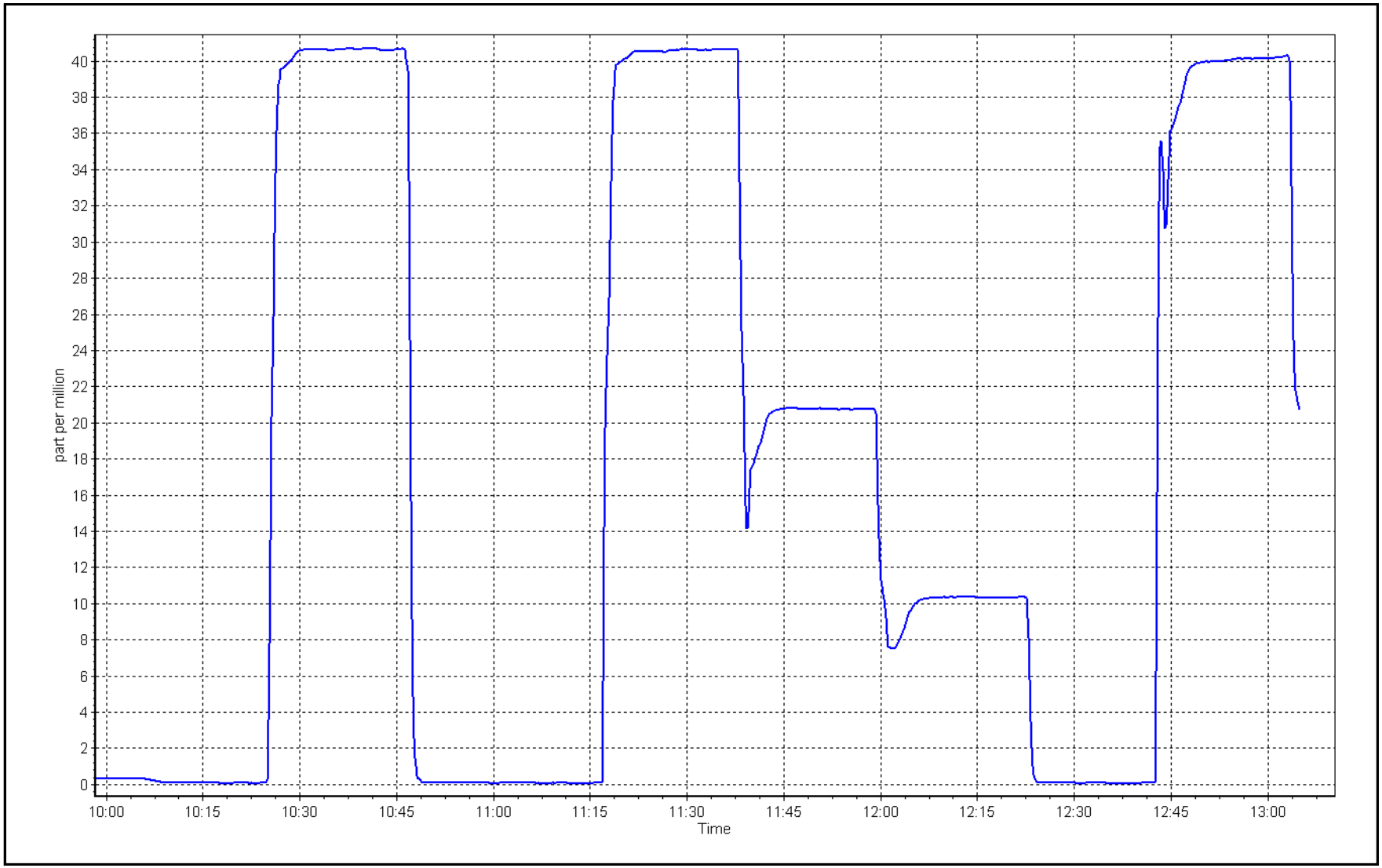
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 40.6 | 40.6 | 0.9982 |
| 20.2 | 20.7 | 0.9763 |
| 10.2 | 10.3 | 0.9830 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999869 | *≥0.995* |
| Slope | 1.000382 | *0.90 - 1.10* |
| Intercept | 0.195846 | *+/-1.5* |



**CO Calibration Plot** Date: March 15, 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: | March 12, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 10:13 | End time (MST): | 13:46 |
| 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: | 0.998372 | 1.000907 | Backgd or Offset: | 0.045 | 0.045 |
| Calibration intercept: | -5.840000 | -6.720000 | 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 | 0.0 | ---- |
| as found span | 2920 | 80.0 | 1605.3 | 1600.8 | 1.003 |
| as found 2nd point | 2960 | 40.0 | 802.7 | 793.9 | 1.011 |
| as found 3rd point | 2980 | 20.0 | 401.3 | 390.1 | 1.029 |
| new cylinder response | | | | | |
| calibrator zero | 3000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 2920 | 80.0 | 1605.3 | 1604.6 | 1.000 |
| second point | 2960 | 40.0 | 802.7 | 789.8 | 1.016 |
| third point | 2980 | 20.0 | 401.3 | 390.6 | 1.027 |
| as left zero | 3000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 2960 | 40.0 | 802.7 | 778.7 | 1.031 |
| | | | | Average Correction Factor | 1.015 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 1600.80 | Prev response: | 1596.88 | *% change: | 0.2% |
| Baseline Corr 2nd AF pt: | 793.9 | AF Slope: | 0.998870 | AF Intercept: | -5.340000 |
| Baseline Corr 3rd AF pt: | 390.1 | AF Correlation: | 0.999949 | | |

* = > +/-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

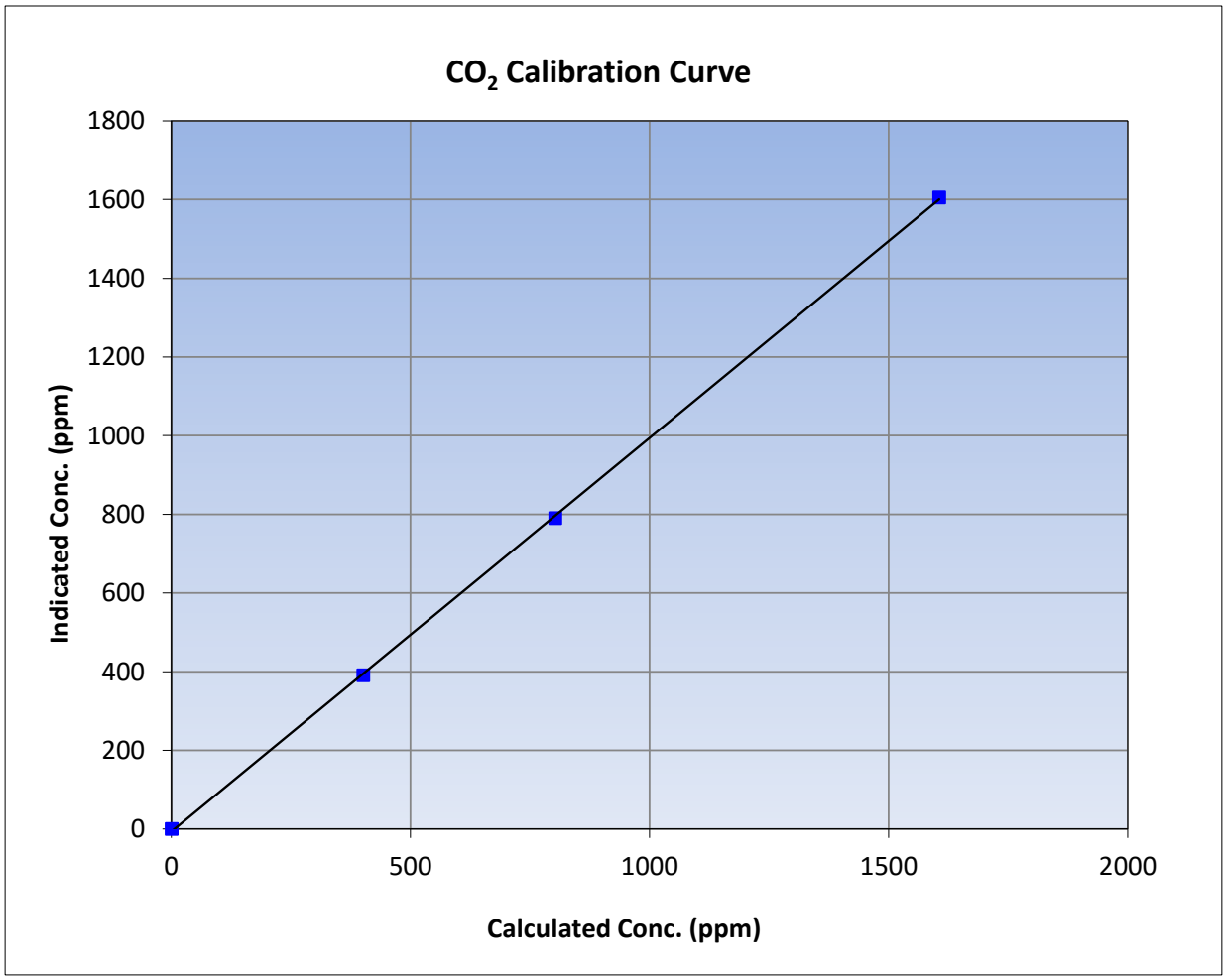
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date | March 12, 2024 | Previous Calibration | February 6, 2024 |
| Station Name | Bertha Ganter-Fort McKay | Station Number | AMS01 |
| Start Time (MST) | 10:13 | End Time (MST) | 13:46 |
| Analyzer make | Teledyne API 360 | Analyzer serial # | 442 |

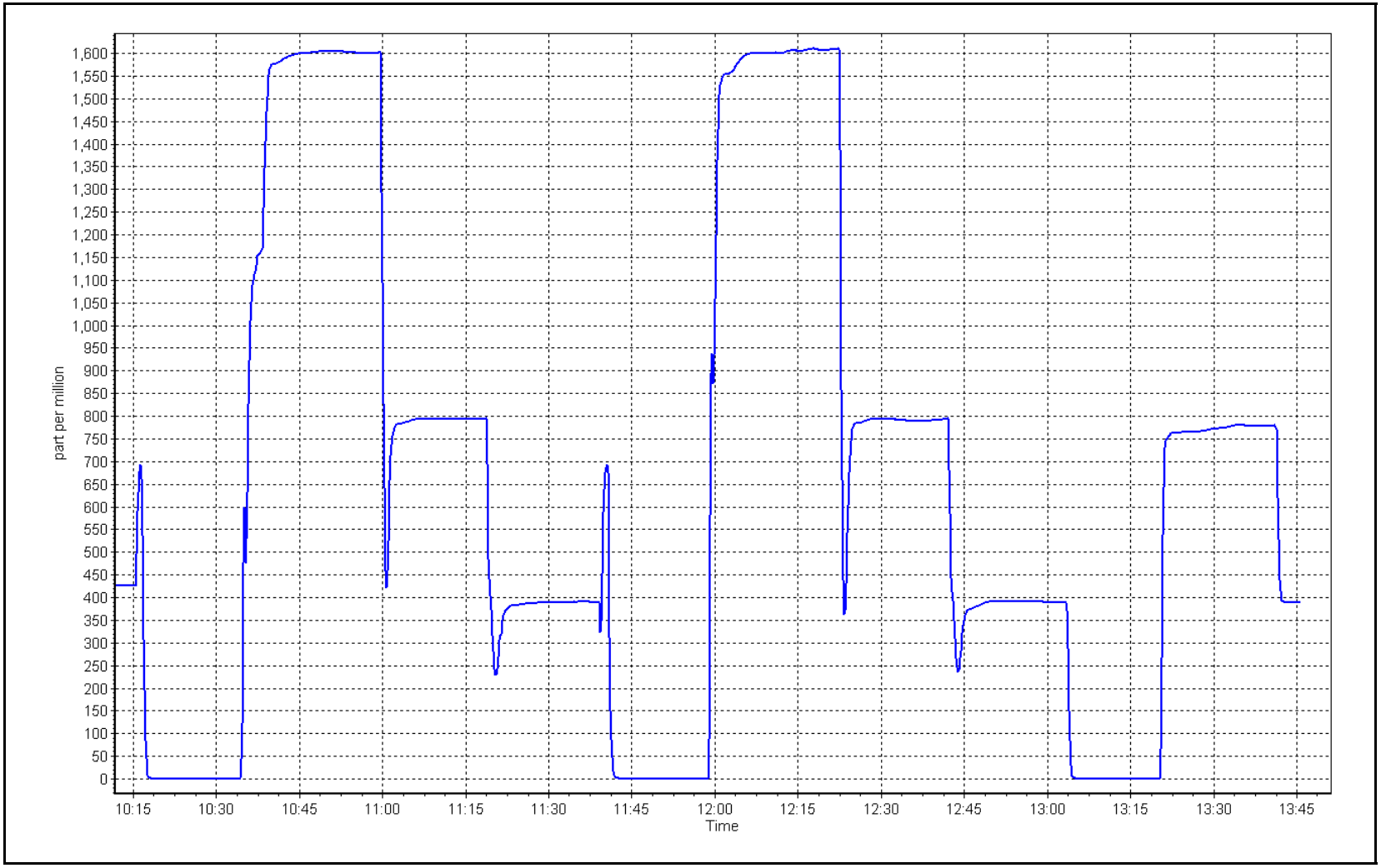
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 1605.3 | 1604.6 | 1.0005 |
| 802.7 | 789.8 | 1.0163 |
| 401.3 | 390.6 | 1.0275 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999906 | *≥0.995* |
| Slope | 1.000907 | *0.90 - 1.10* |
| Intercept | -6.720000 | *+/-10* |



**$CO_2$ Calibration Plot** Date: March 12, 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: | March 19, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 9:46 | End time (MST): | 14:14 |
| NH3 Cal Date: | March 20, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 10:00 | End time (MST): | 13:35 |
| 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: | 6.00 |
| NOX Range (ppb): | 0 - 1000 ppb | Sample Flow: | 552 |

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| NO coefficient: | 0.956 | 0.960 | TN coefficient: | 0.968 | 0.969 |
| NOX coefficient: | 0.962 | 0.966 | NO bkgrnd: | -0.9 | -0.9 |
| NO2 coefficient: | 1.000 | 1.000 | NOX bkgrnd: | -0.3 | -0.3 |
| NH3 coefficient: | 0.946 | 0.946 | TN bkgrnd: | 1.2 | 1.2 |

### Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| $NO_X$ Cal Slope: | 0.999528 | 1.001292 |
| $NO_X$ Cal Offset: | -1.960000 | -2.380000 |
| NO Cal Slope: | 0.999963 | 1.000877 |
| NO Cal Offset: | -2.580000 | -2.600000 |
| $NO_2$ Cal Slope: | 0.992493 | 0.999426 |
| $NO_2$ Cal Offset: | -0.912249 | -0.898937 |
| NH3 Cal Slope: | 1.004564 | 1.002078 |
| NH3 Cal Offset: | -0.612859 | -0.363408 |
| TN Cal Slope: | 1.007097 | 1.004775 |
| TN Cal Offset: | -0.451064 | -0.436983 |

# 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 | -0.2 | 0.1 | -0.2 | ---- | ---- |
| as found NO | 4932 | 67.6 | 803.1 | 803.1 | ---- | 804.7 | 806.3 | -1.6 | 0.998 | ---- |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | -0.3 | 0.1 | ---- | ---- |
| high NO point | 4932 | 67.6 | 803.1 | 803.1 | ---- | 801.5 | 803.0 | -1.3 | 1.002 | ---- |
| NO/O3 point | 4932 | 67.6 | 803.1 | 803.1 | ---- | 798.7 | 796.7 | 2.0 | 1.005 | ---- |
| as found NH3 | 3418 | 82.2 | 1798.5 | ---- | 1798.5 | 1806.1 | ---- | 1801.4 | 0.996 | 0.998 |
| new NH3 cyl rp | | | | | | | ---- | | | |
| first NH3 | 3418 | 82.2 | 1798.5 | ---- | 1798.5 | 1806.1 | ---- | 1801.4 | 0.996 | 0.998 |
| second NH3 | 3454 | 45.7 | 1000.0 | ---- | 1000.0 | 1006.1 | ---- | 1003.5 | 0.994 | 0.997 |
| third NH3 | 3477 | 22.8 | 498.9 | ---- | 498.9 | 499.4 | ---- | 497.8 | 0.999 | 1.002 |
| | | | | | | | | Average Correction Factor | 1.0037 | 0.9990 |

Corrected As found TN = 804.9 ppb $NO_X$ = 806.2 ppb NH3 = 1801.6 ppb *Percent Change TN = -0.4%

Previous Response TN = 808.3 ppb $NO_X$ = 800.7 ppb NH3 = 1806.1 ppb *Percent Change $NO_X$ = 0.7%

*Percent Change NH3 = -0.3%

* = > +/-5% change initiates investigation

NH3 Previous Converter Efficiency = 94.6%

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 | -0.2 | -0.2 | -0.7 | ---- | ---- |
| as found span | 4932 | 67.6 | 803.1 | 800.4 | 803.1 | 806.7 | 797.2 | 803.7 | 0.9955 | 1.0040 |
| new NO cyl rp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.1 | -0.2 | ---- | ---- |
| high point | 4932 | 67.6 | 803.1 | 800.4 | 803.1 | 803.0 | 799.8 | 801.5 | 1.0001 | 1.0007 |
| second point | 4966 | 33.8 | 401.5 | 400.2 | 401.5 | 398.0 | 396.5 | 398.1 | 1.0089 | 1.0093 |
| third point | 4983 | 16.9 | 200.8 | 200.1 | 200.8 | 197.0 | 195.3 | 198.2 | 1.0191 | 1.0246 |
| | | | | | | | | Average Correction Factor | 1.0094 | 1.0115 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Baseline Corr As fnd | TN = | 804.4 ppb | $NO_X$ = | 806.9 ppb | NO = | 797.4 ppb | *Percent Change TN = -0.5% |
| Previous Response | TN = | 808.3 ppb | $NO_X$ = | 800.7 ppb | NO = | 797.8 ppb | *Percent Change $NO_X$ = 0.8% |
| | | | | | | | *Percent Change NO = 0.0% |

* = > +/-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) | 795.8 | 385.0 | 413.5 | 412.9 | 1.0015 | 99.9% |
| 2nd GPT point (200 ppb O3) | 795.8 | 590.8 | 207.7 | 205.8 | 1.0093 | 99.1% |
| 3rd GPT point (100 ppb O3) | 795.8 | 694.1 | 104.4 | 103.1 | 1.0126 | 98.8% |
| | | | | Average Correction Factor | 1.0078 | 99.2% |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## TN Calibration Summary

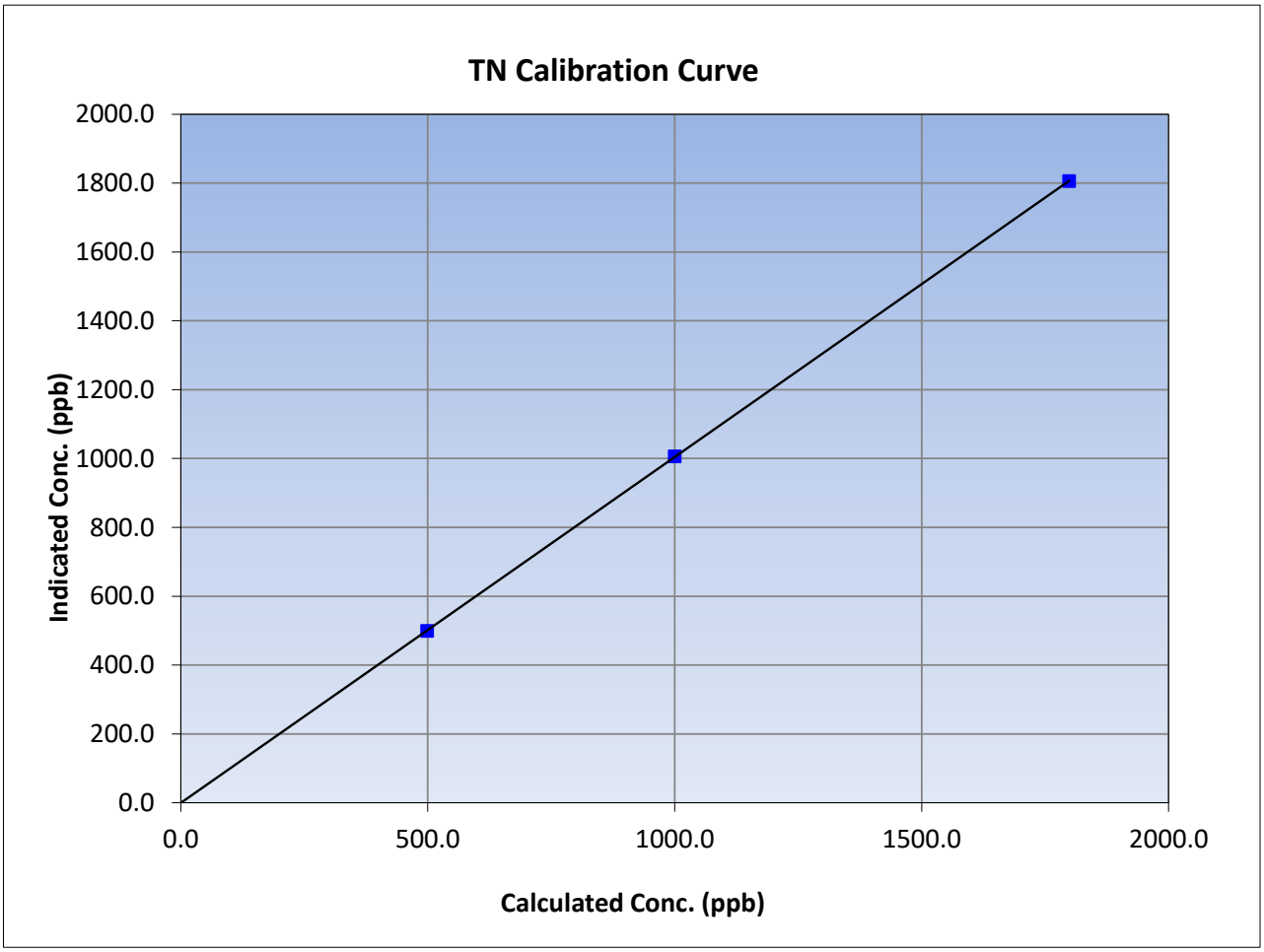
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:00 | End Time (MST): | 13:35 |
| 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 | 0.999997 | *≥0.995* |
| 1798.5 | 1806.1 | 0.9958 | | | |
| 1000.0 | 1006.1 | 0.9939 | Slope | 1.004775 | *0.90 - 1.10* |
| 498.9 | 499.4 | 0.9989 | | | |
| | | | Intercept | -0.436983 | *+/-20* |



# Wood Buffalo Environmental Association

## $NH_3$ Calibration Summary

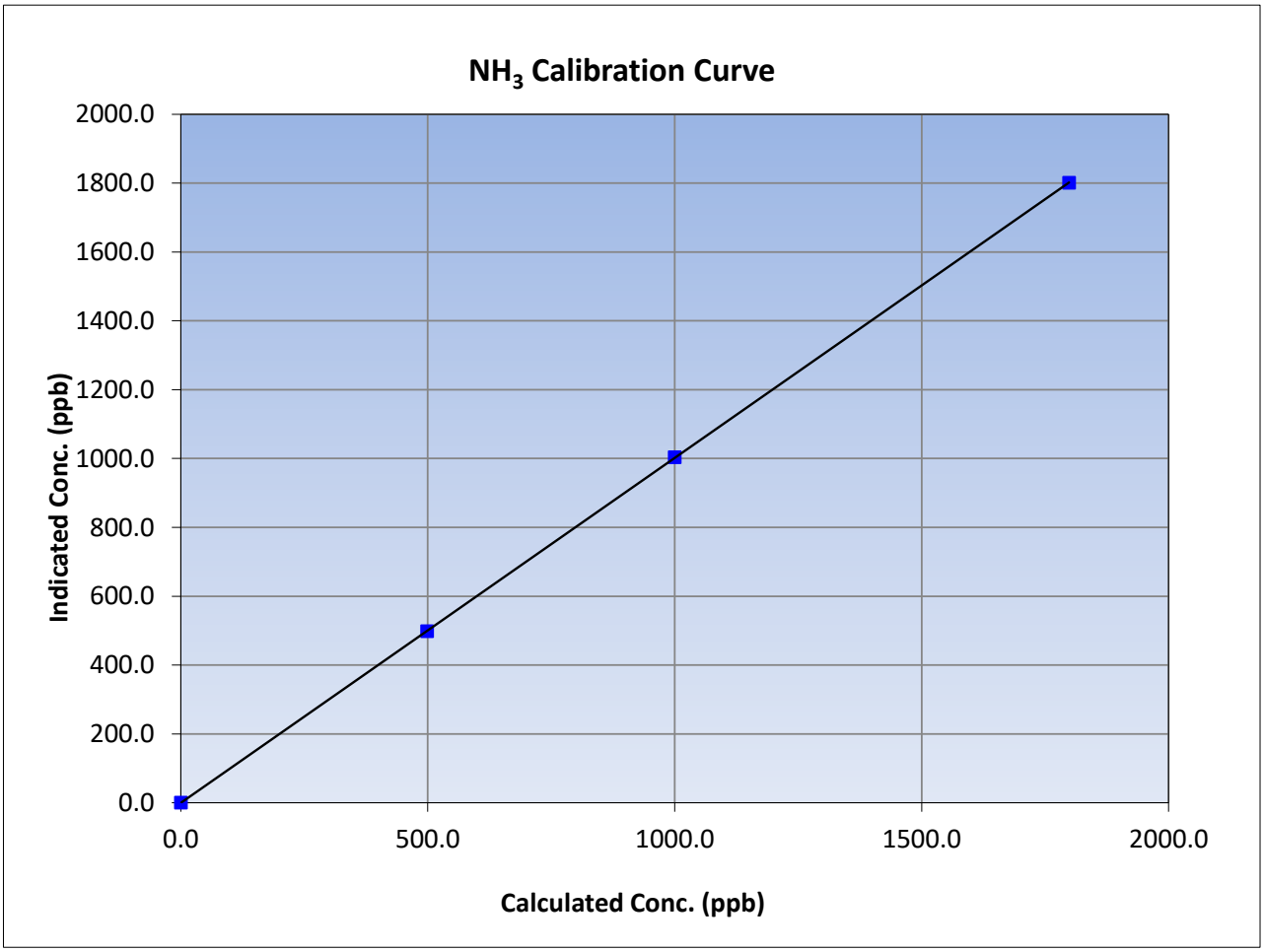
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 10:00 | End Time (MST): | 13:35 |
| 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 | 0.999996 | ≥0.995 |
| 1798.5 | 1801.4 | 0.9984 | | | |
| 1000.0 | 1003.5 | 0.9965 | Slope | 1.002078 | 0.90 - 1.10 |
| 498.9 | 497.8 | 1.0021 | | | |
| | | | Intercept | -0.363408 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

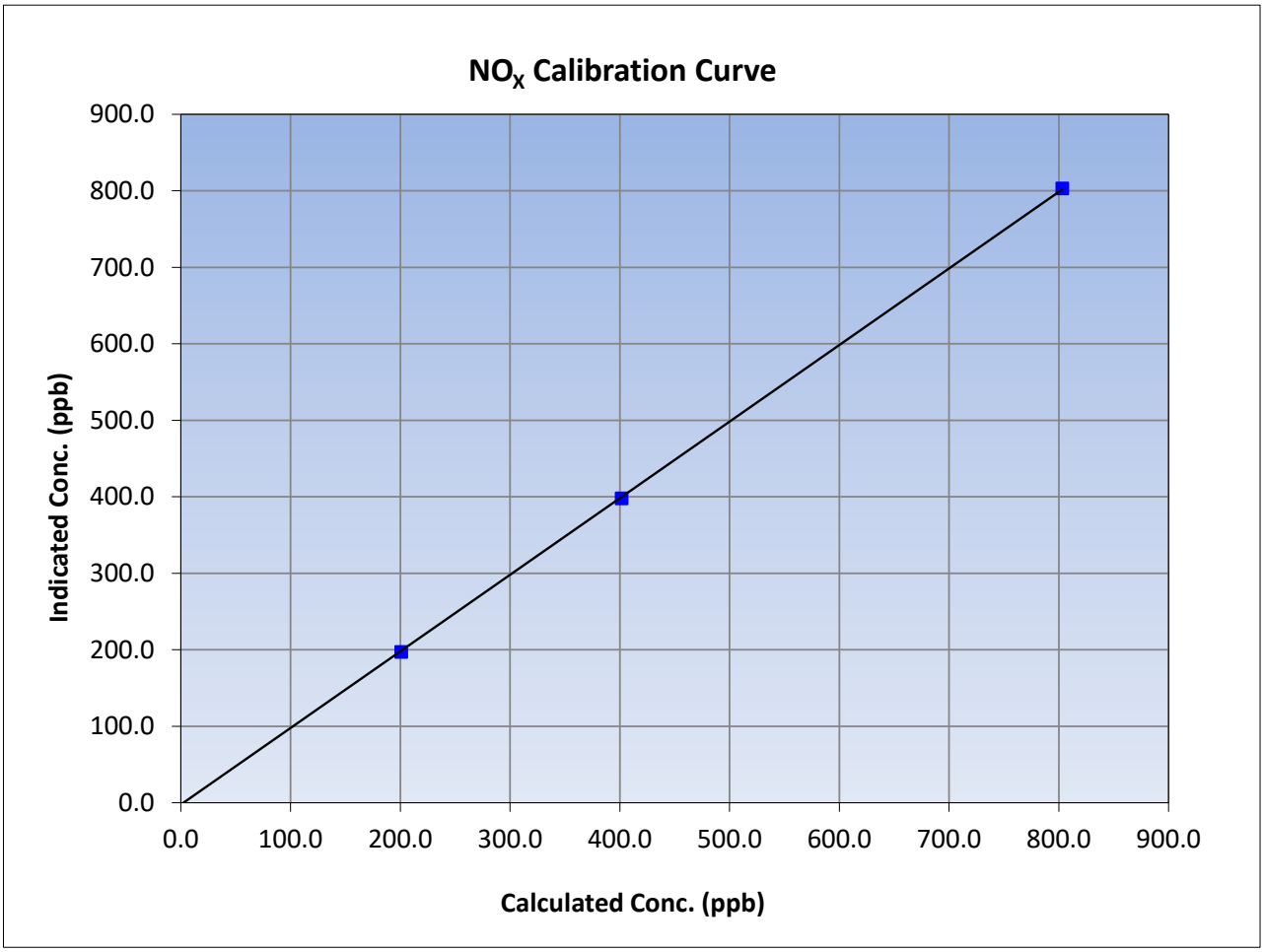
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 9:46 | End Time (MST): | 14:14 |
| 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 | -0.3 | ---- | Correlation Coefficient | 0.999968 | ≥0.995 |
| 803.1 | 803.0 | 1.0001 | | | |
| 401.5 | 398.0 | 1.0089 | Slope | 1.001292 | 0.90 - 1.10 |
| 200.8 | 197.0 | 1.0191 | | | |
| | | | Intercept | -2.380000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

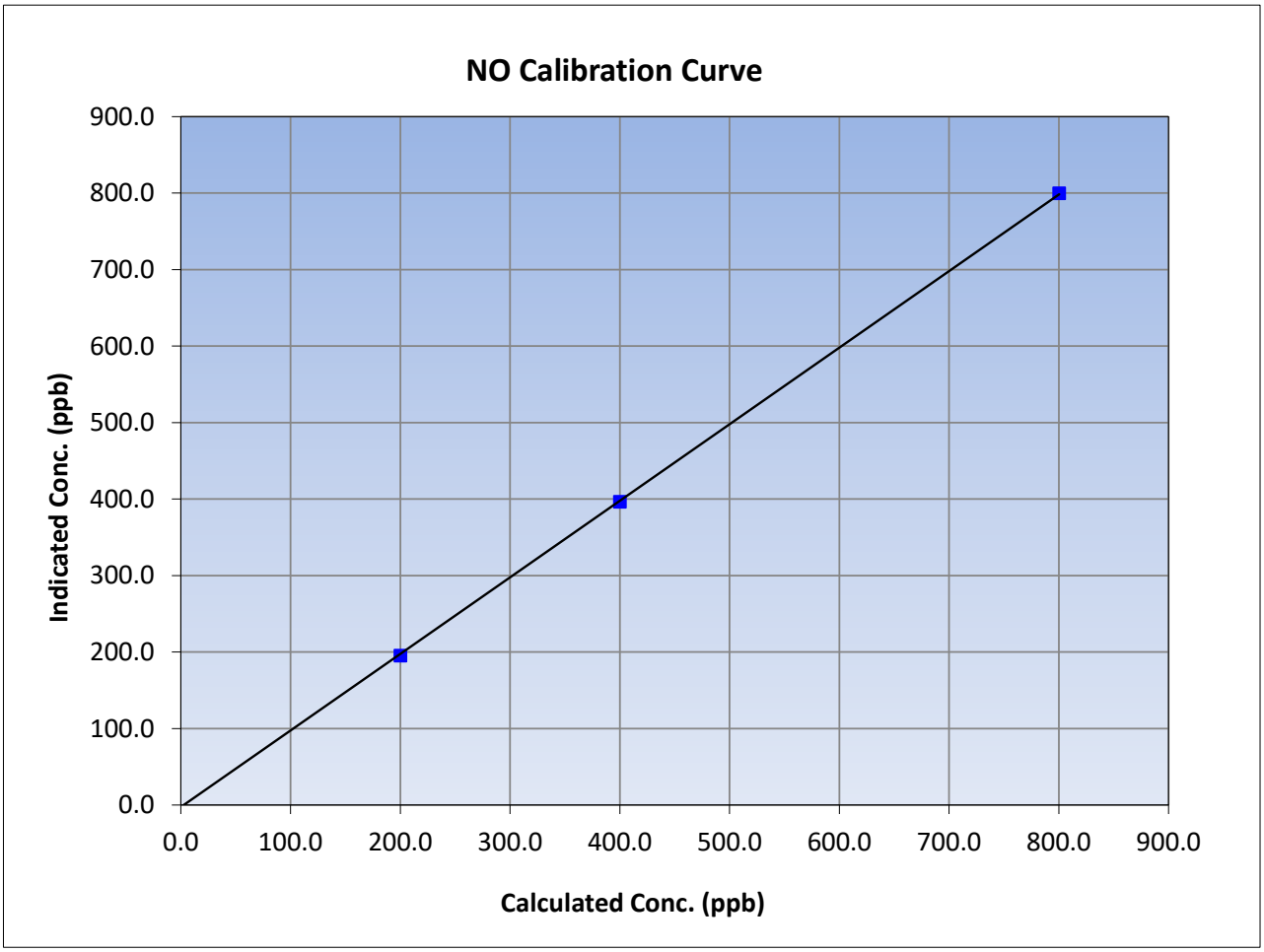
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 9:46 | End Time (MST): | 14:14 |
| 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 | 0.999955 | ≥0.995 |
| 800.4 | 799.8 | 1.0007 | | | |
| 400.2 | 396.5 | 1.0093 | Slope | 1.000877 | 0.90 - 1.10 |
| 200.1 | 195.3 | 1.0246 | | | |
| | | | Intercept | -2.600000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

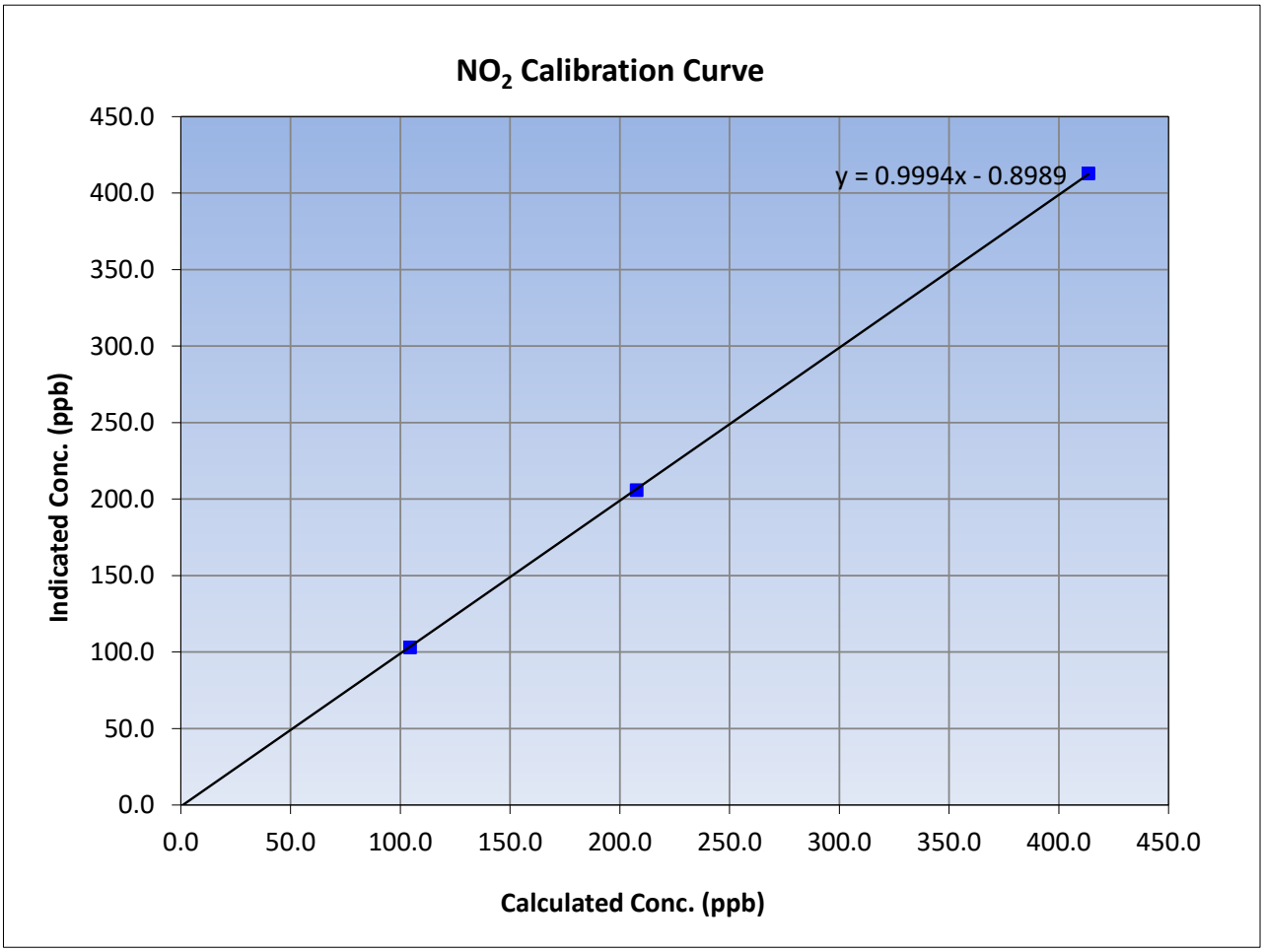
Version-05-2023

### Station Information

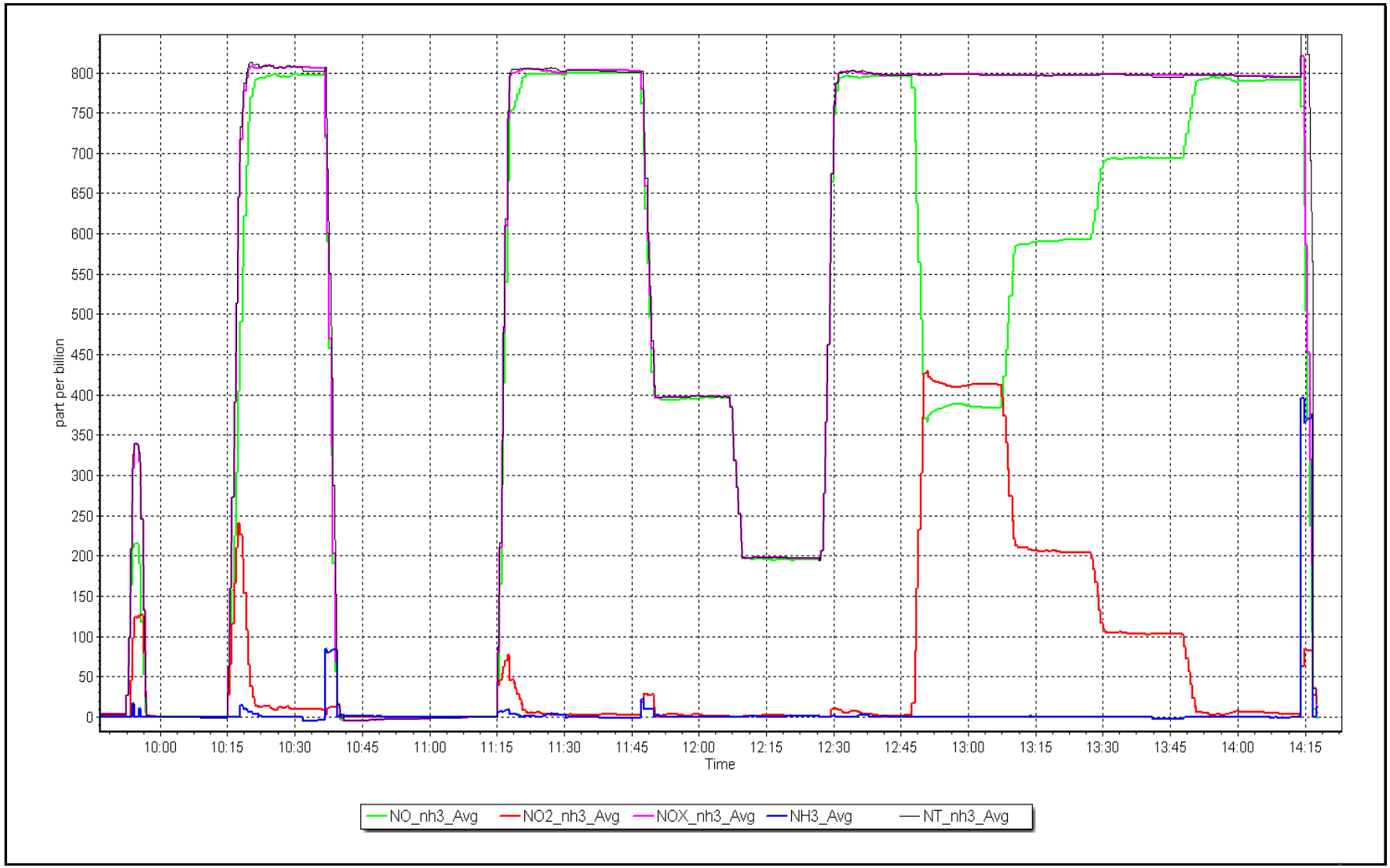
| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Bertha Ganter-Fort McKay | Station Number: | AMS01 |
| Start Time (MST): | 9:46 | End Time (MST): | 14:14 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 475 |

### Calibration Data

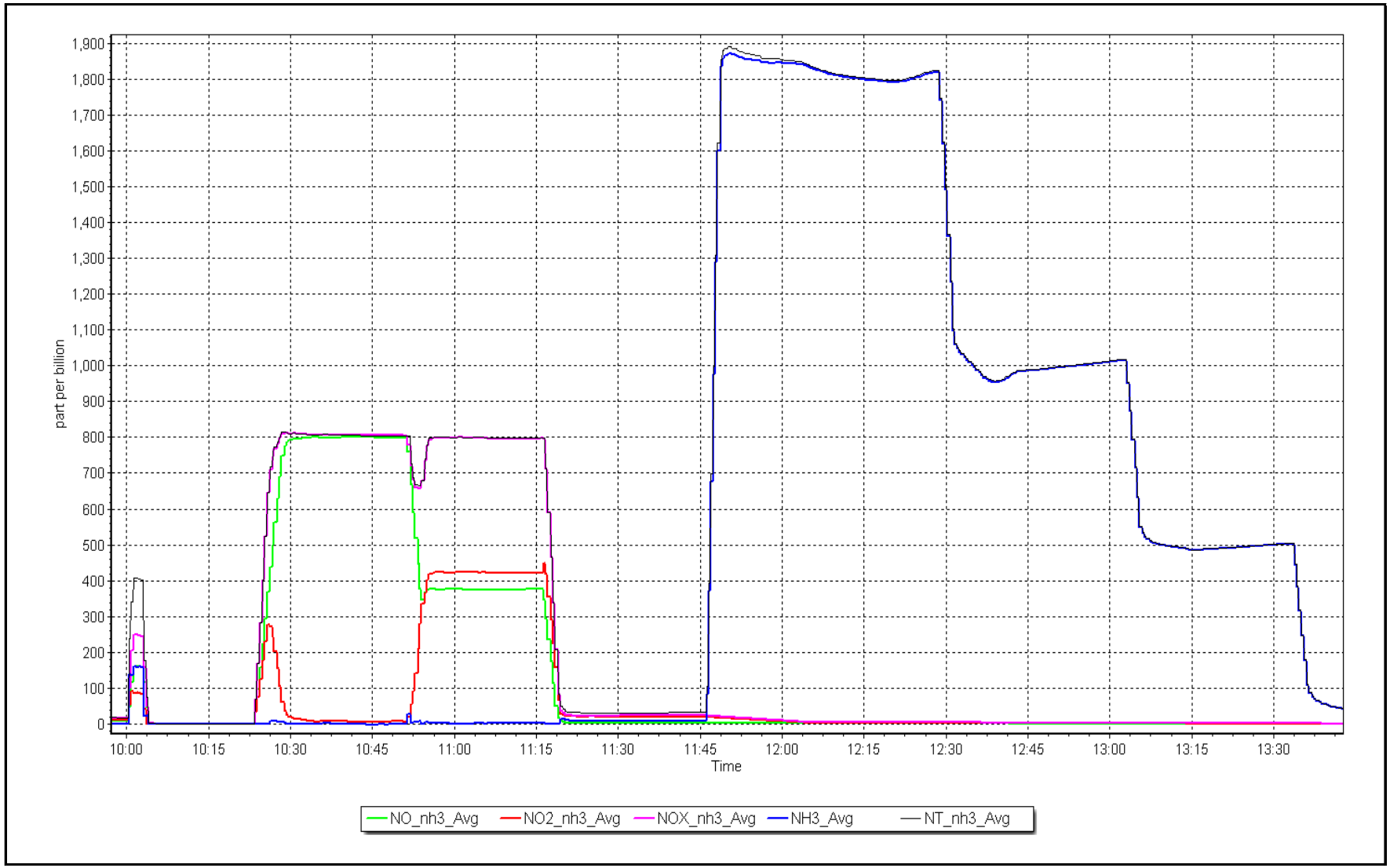
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999982 | ≥0.995 |
| 413.5 | 412.9 | 1.0015 | | | |
| 207.7 | 205.8 | 1.0093 | Slope | 0.999426 | 0.90 - 1.10 |
| 104.4 | 103.1 | 1.0126 | | | |
| | | | Intercept | -0.898937 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 19, 2024 Location: Bertha Ganter-Fort McKay



**$NH_3$ Calibration Plot** Date: March 20, 2024 Location: Bertha Ganter-Fort McKay



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS02
## MILDRED LAKE
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mildred Lake | Station number: | AMS02 |
| Calibration Date: | March 19, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 10:09 | End time (MST): | 13:26 |
| 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: | 0.998019 | 1.000614 | Backgd or Offset: | 18.4 | 18.5 |
| Calibration intercept: | -0.505025 | -0.364904 | Coeff or Slope: | 0.795 | 0.787 |

### $SO_2$ 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 | 80.2 | 801.6 | 809.0 | 0.991 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4920 | 80.2 | 801.6 | 802.0 | 1.000 |
| second point | 4960 | 40.1 | 400.8 | 400.4 | 1.001 |
| third point | 4980 | 20.0 | 199.9 | 199.4 | 1.003 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4920 | 80.2 | 801.6 | 801.0 | 1.001 |
| | | | | Average Correction Factor | 1.001 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 808.70 | Previous response | 799.55 | *% 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: Changed sample inlet filter after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

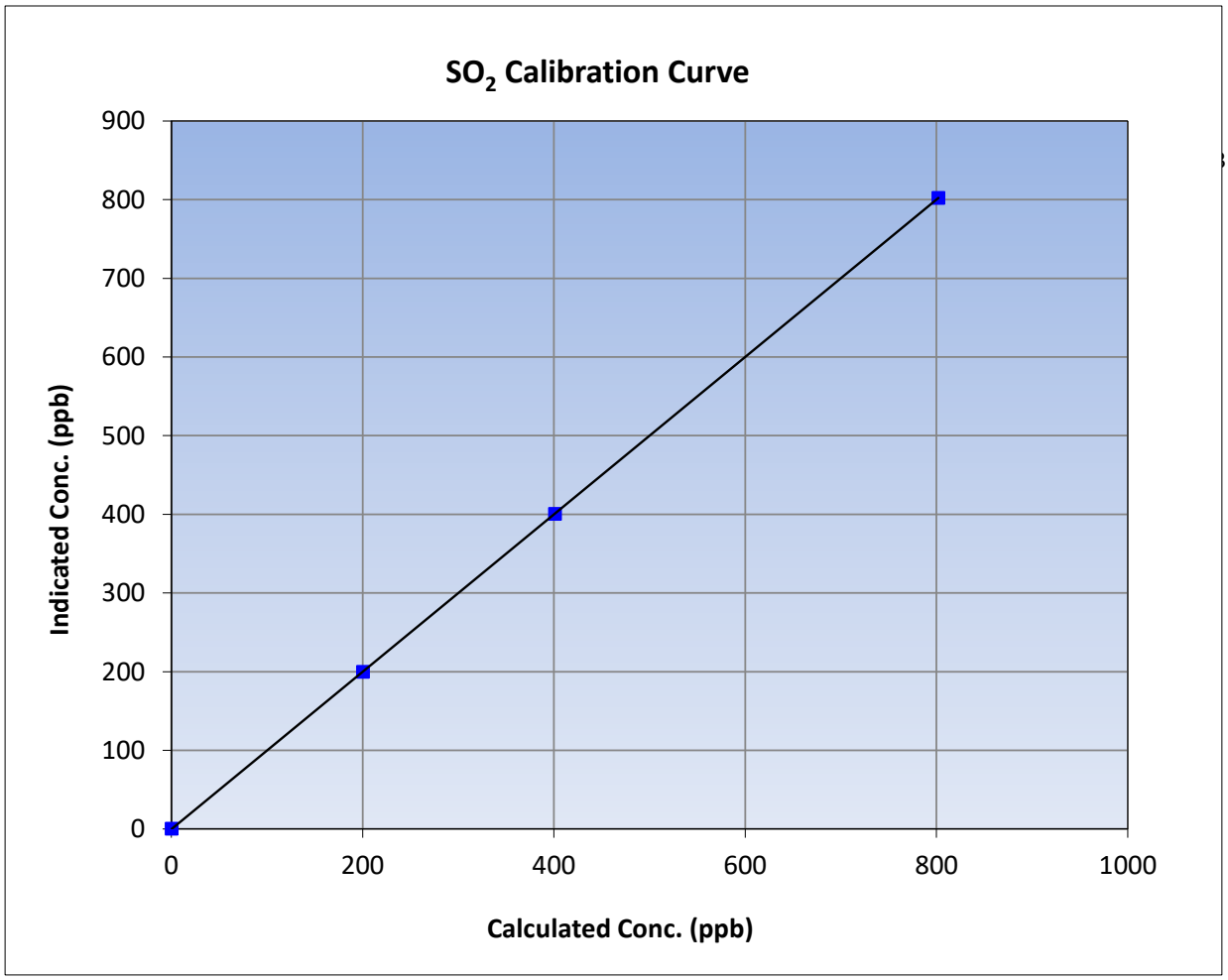
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:09 | End Time (MST): | 13:26 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1404901075 |

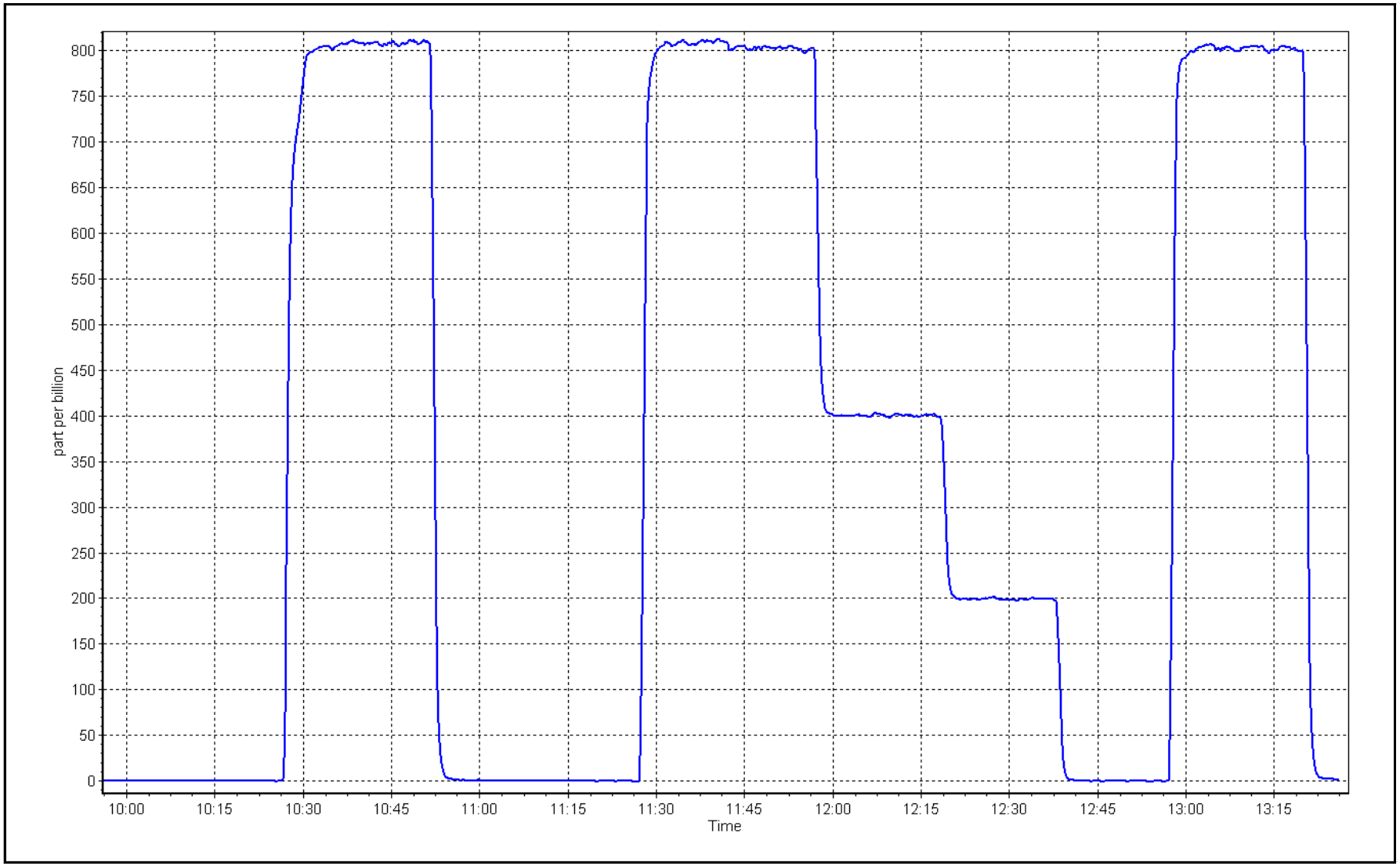
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 801.6 | 802.0 | 0.9996 |
| 400.8 | 400.4 | 1.0011 |
| 199.9 | 199.4 | 1.0026 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 1.000614 | *0.90 - 1.10* |
| Intercept | -0.364904 | *+/-30* |



**SO2 Calibration Plot** Date: March 19, 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: | March 26, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 10:09 | End time (MST): | 14:42 |
| 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: | 4891 |

### 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: | 0.998393 | 1.000964 | Backgd or Offset: | 1.68 | 1.67 |
| Calibration intercept: | -0.039204 | 0.020800 | Coeff or Slope: | 0.731 | 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 | 0.1 | ---- |
| as found span | 4924 | 75.6 | 80.0 | 80.6 | 0.994 |
| as found 2nd point | 4962 | 37.8 | 40.0 | 40.3 | 0.995 |
| as found 3rd point | 4981 | 18.9 | 20.0 | 19.9 | 1.010 |
| 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 | 80.1 | 0.999 |
| second point | 4962 | 37.8 | 40.0 | 40.1 | 0.997 |
| third point | 4981 | 18.9 | 20.0 | 19.9 | 1.005 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4924 | 75.6 | 80.0 | 80.2 | 0.997 |
| SO2 Scrubber Check | 4920 | 80.2 | 802.0 | 0.0 | ---- |
| Date of last scrubber change: | | 20-Sep-23 | | Ave Corr Factor | 1.000 |
| Date of last converter efficiency test: | | March 26, 2024 | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.5 | Prev response: | 79.82 | *% change: | 0.8% |
| Baseline Corr 2nd AF pt: | 40.2 | AF Slope: | 1.007679 | AF Intercept: | -0.039196 |
| Baseline Corr 3rd AF pt: | 19.8 | AF Correlation: | 0.999981 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

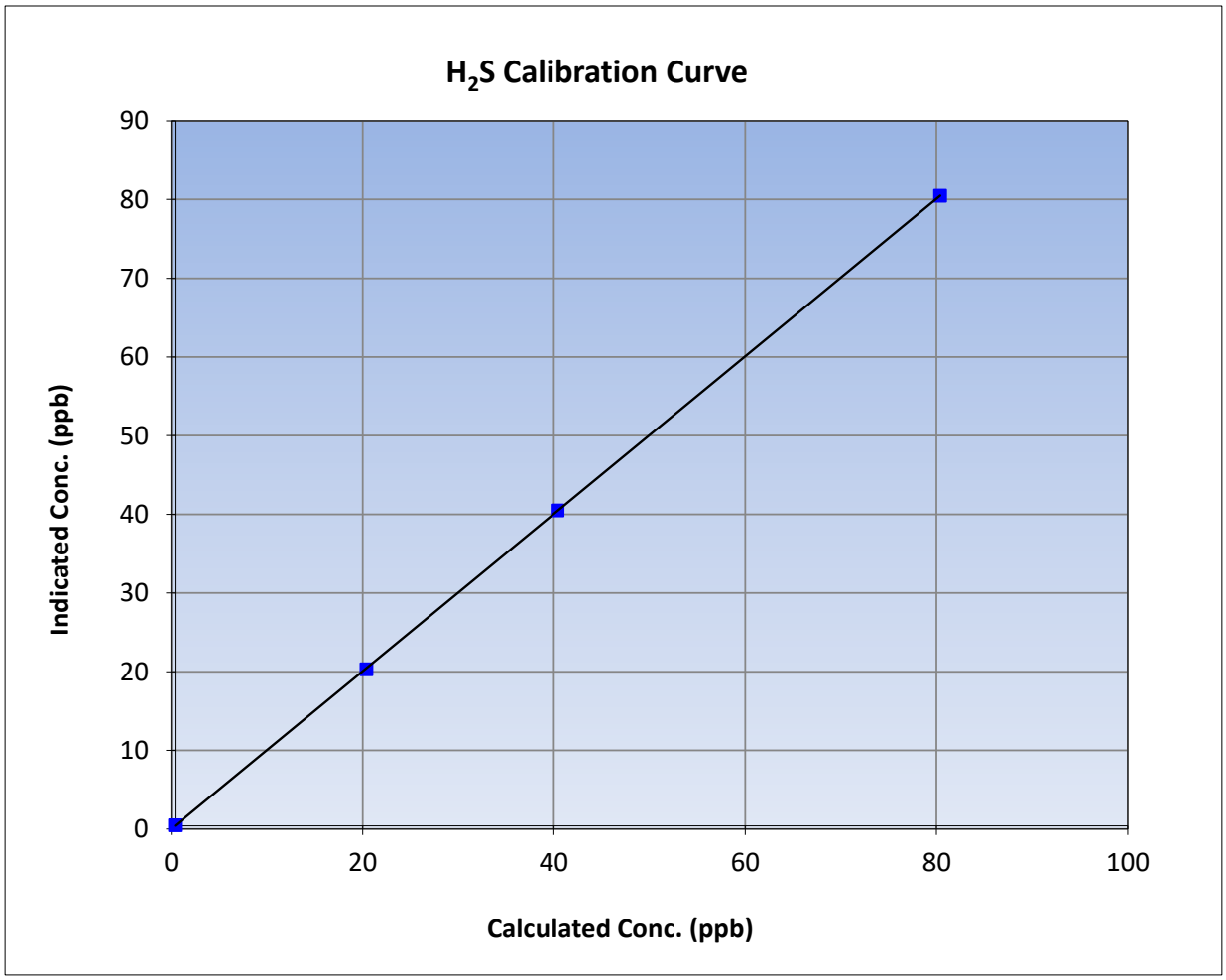
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:09 | End Time (MST): | 14:42 |
| Analyzer make: | Thermo 43iQTL | Analyzer serial #: | 12113311966 |

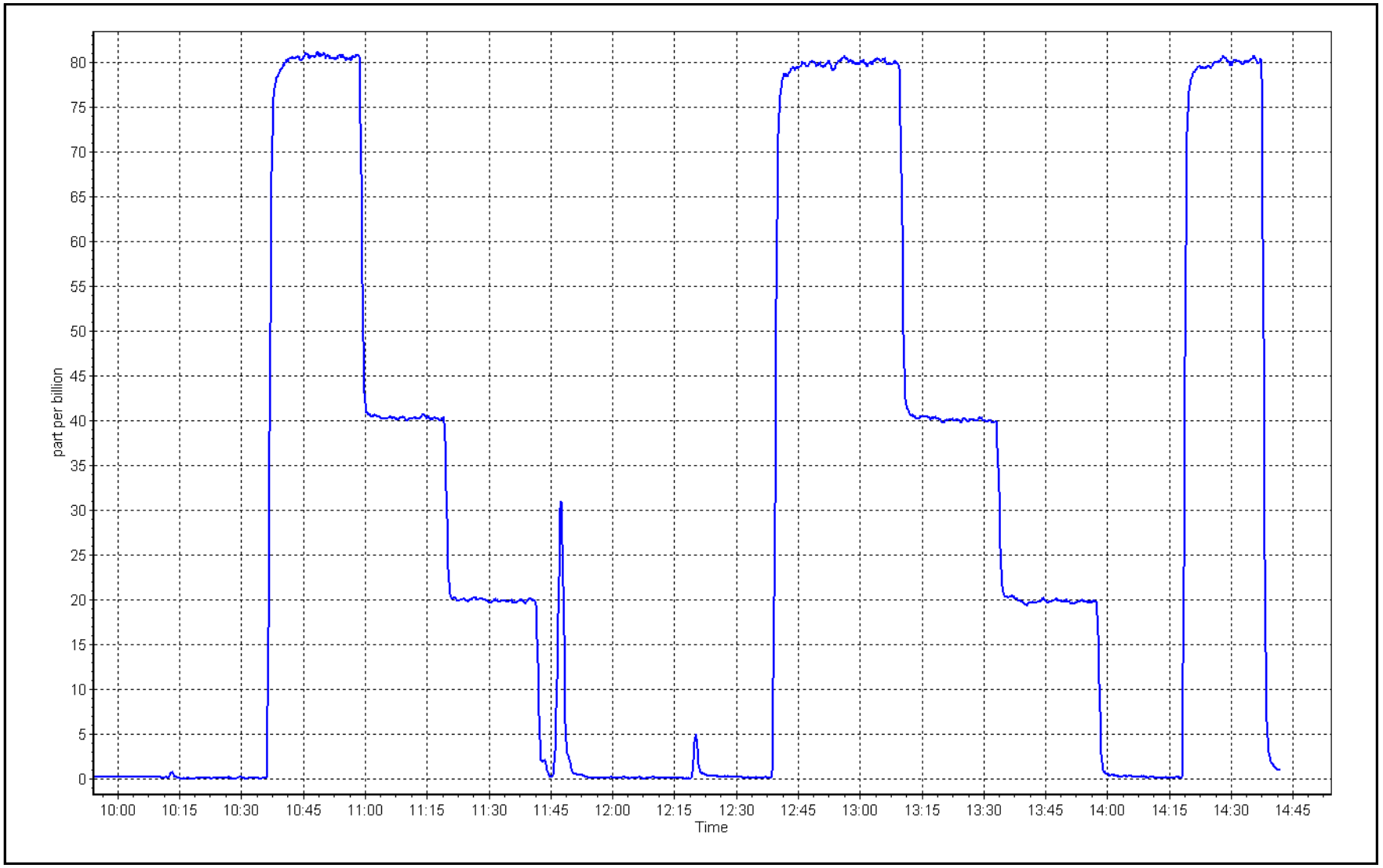
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 80.1 | 0.9986 |
| 40.0 | 40.1 | 0.9974 |
| 20.0 | 19.9 | 1.0049 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 1.000964 | *0.90 - 1.10* |
| Intercept | 0.020800 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 26, 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: | March 7, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 10:24 | End time (MST): | 13:21 |
| 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: | 2.73E-04 | 2.92E-04 | NMHC SP Ratio: | 6.17E-05 | 6.02E-05 |
| CH4 Retention time: | 15.9 | 16.3 | NMHC Peak Area: | 142620 | 146130 |
| 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 | 16.56 | 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 | 80.2 | 16.82 | 16.84 | 0.999 |
| second point | 4960 | 40.1 | 8.41 | 8.38 | 1.004 |
| third point | 4980 | 20.0 | 4.19 | 4.18 | 1.005 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 16.82 | 16.76 | 1.004 |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 16.56 | Prev response | 16.78 | *% change | -1.3% |
| 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 | 8.80 | 9.02 | 0.975 |
| 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 | 8.81 | 0.998 |
| second point | 4960 | 40.1 | 4.40 | 4.38 | 1.005 |
| third point | 4980 | 20.0 | 2.19 | 2.19 | 1.002 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 8.80 | 8.74 | 1.007 |
| | | | | Average Correction Factor | 1.002 |
| Baseline Corr AF: | 9.02 | Prev response | 8.76 | *% change | 2.9% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 7.54 | 1.064 |
| 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 | 4.00 | 1.003 |
| third point | 4980 | 20.0 | 2.00 | 1.99 | 1.007 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 8.02 | 8.02 | 1.000 |
| | | | | Average Correction Factor | 1.004 |
| Baseline Corr AF: | 7.54 | Prev response | 8.01 | *% change | -6.3% |
| 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: | 0.998749 | 1.001195 |
| THC Cal Offset: | -0.021919 | -0.017905 |
| CH4 Cal Slope: | 1.000498 | 1.000469 |
| CH4 Cal Offset: | -0.013049 | -0.008450 |
| NMHC Cal Slope: | 0.996921 | 1.001609 |
| NMHC Cal Offset: | -0.008470 | -0.009255 |

Notes: Sample inlet filters changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## THC Calibration Summary

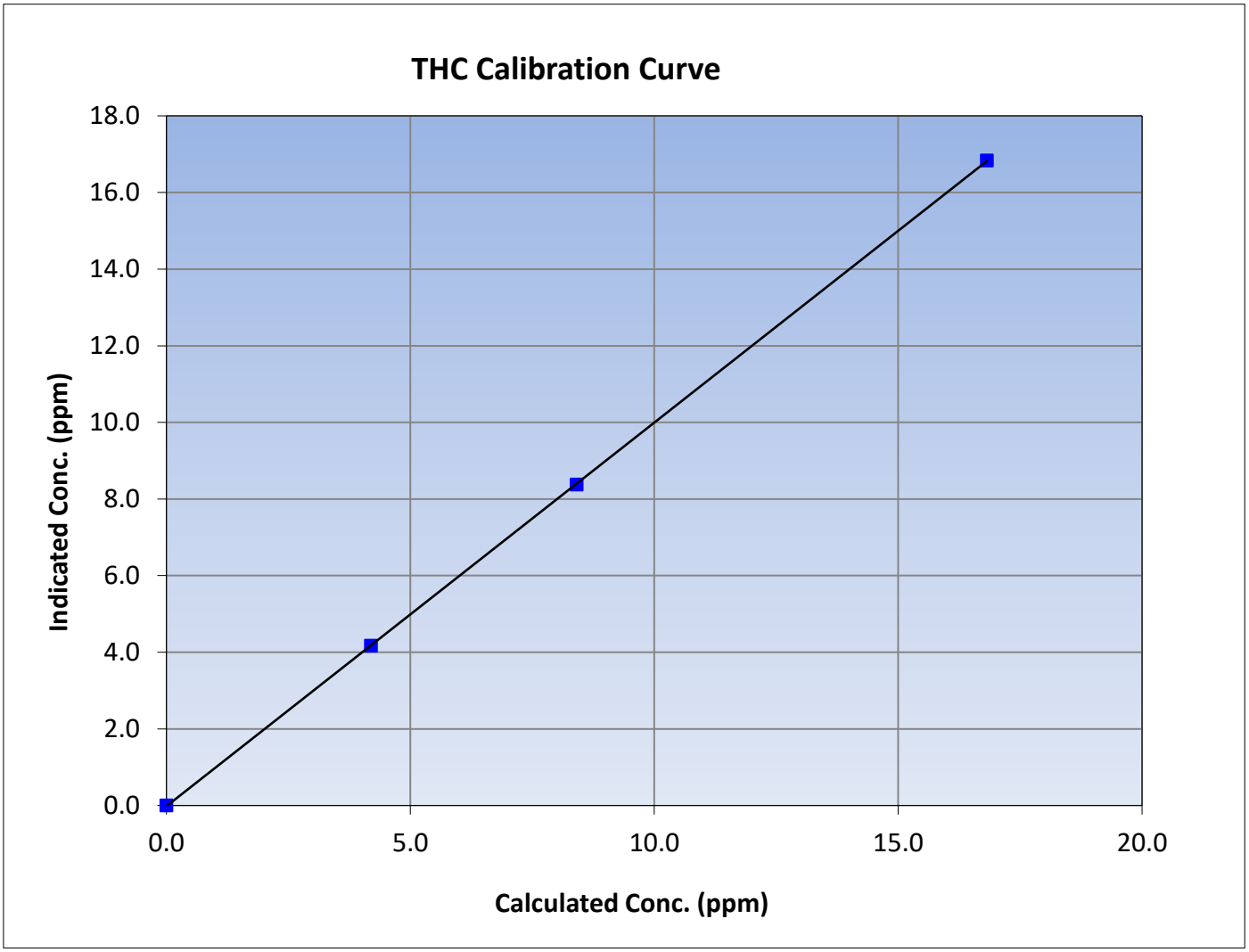
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:24 | End Time (MST): | 13:21 |
| 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 | 0.999992 | *≥0.995* |
| 16.82 | 16.84 | 0.9990 | | | |
| 8.41 | 8.38 | 1.0041 | Slope | 1.001195 | *0.90 - 1.10* |
| 4.19 | 4.18 | 1.0046 | | | |
| | | | Intercept | -0.017905 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

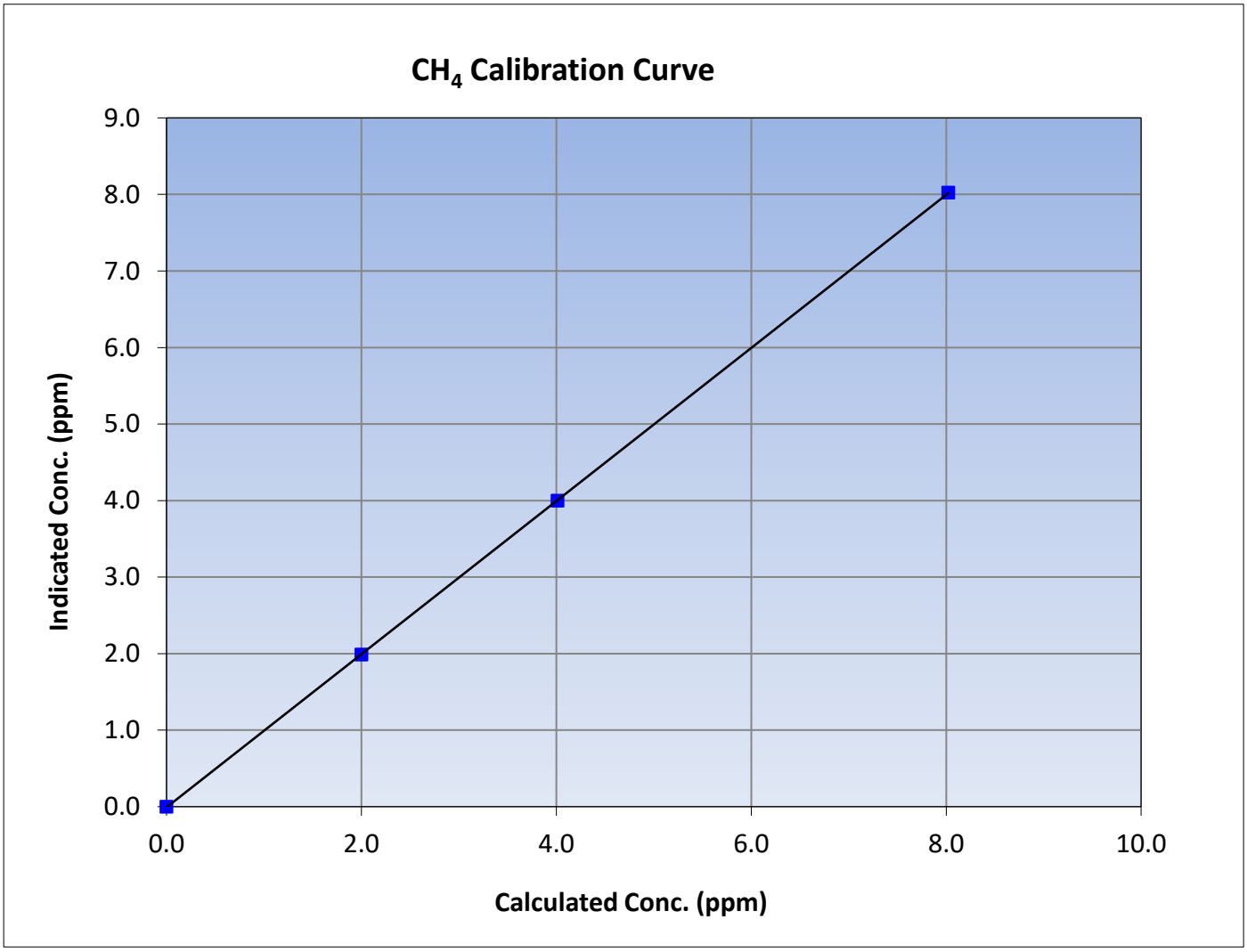
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:24 | End Time (MST): | 13:21 |
| 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 | 0.999995 | *≥0.995* |
| 8.02 | 8.02 | 1.0000 | | | |
| 4.01 | 4.00 | 1.0031 | Slope | 1.000469 | *0.90 - 1.10* |
| 2.00 | 1.99 | 1.0075 | | | |
| | | | Intercept | -0.008450 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

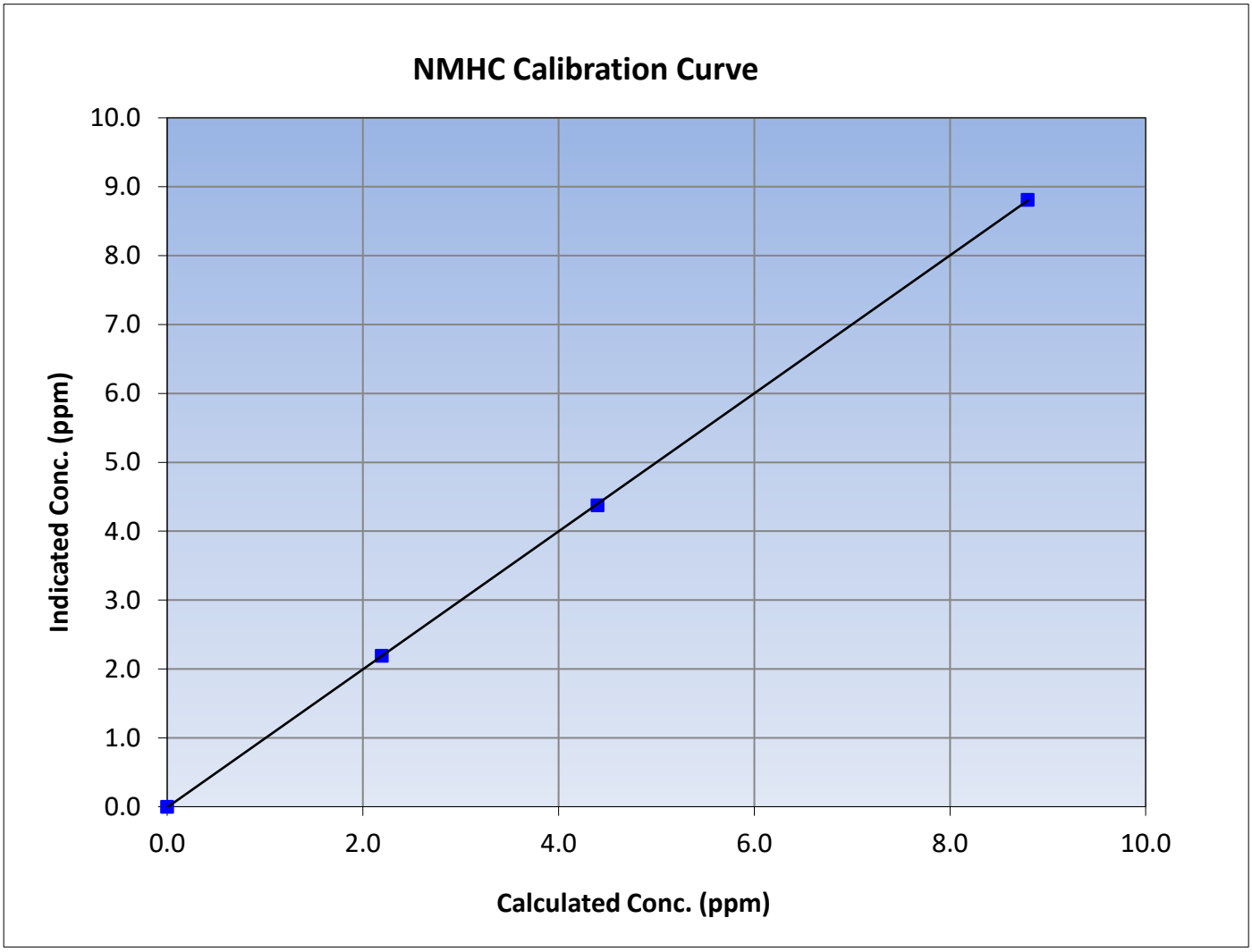
Version-06-2022

### Station Information

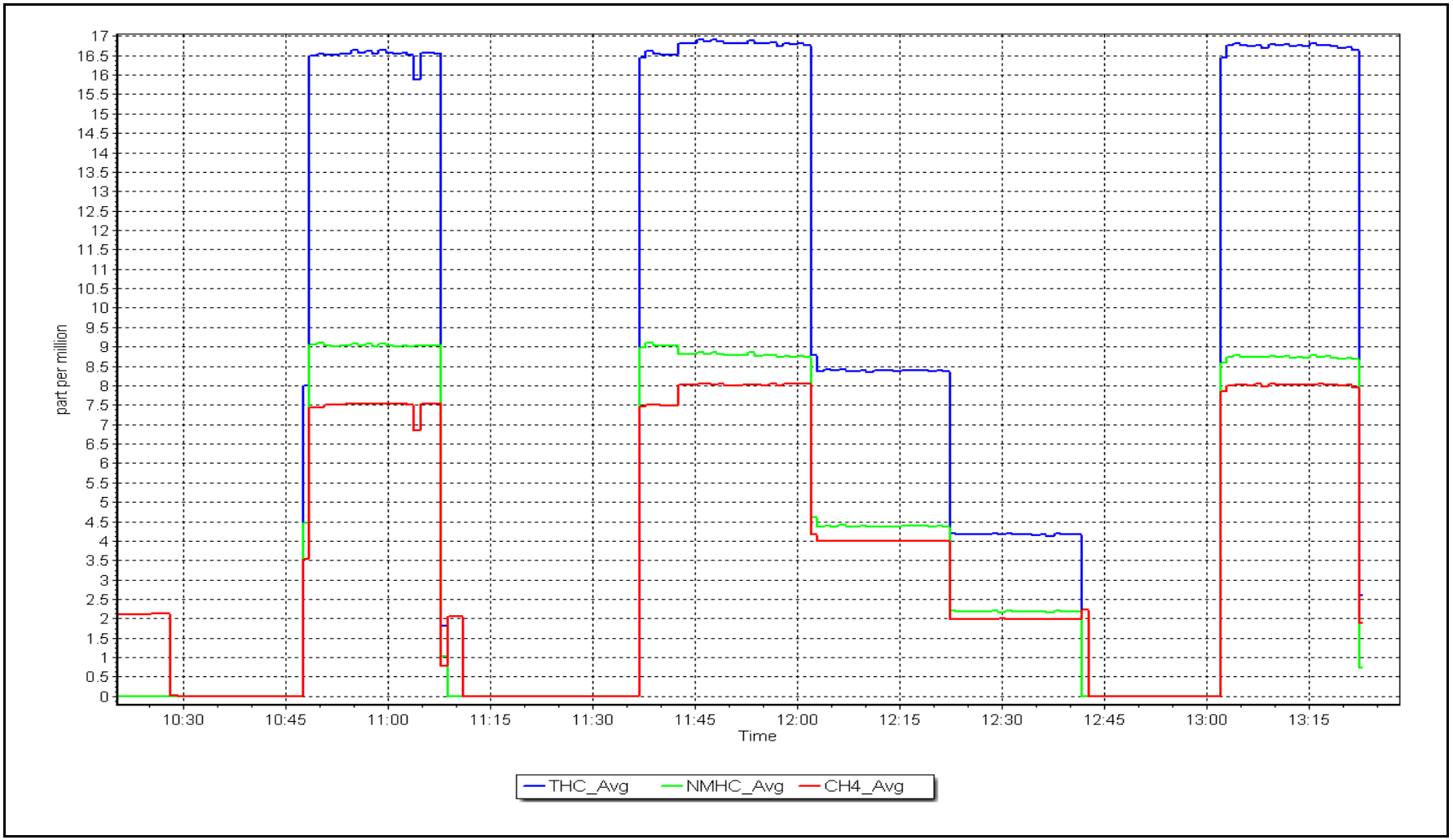
| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Mildred Lake | Station Number: | AMS02 |
| Start Time (MST): | 10:24 | End Time (MST): | 13:21 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1180320039 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999986 | ≥0.995 |
| 8.80 | 8.81 | 0.9983 | | | |
| 4.40 | 4.38 | 1.0052 | Slope | 1.001609 | 0.90 - 1.10 |
| 2.19 | 2.19 | 1.0020 | | | |
| | | | Intercept | -0.009255 | +/-0.5 |



**NMHC Calibration Plot** Date: March 7, 2024 Location: Mildred Lake



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS04
## BUFFALO VIEWPOINT
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Buffalo Viewpoint | Station number: | AMS04 |
| Calibration Date: | March 21, 2024 | Last Cal Date: | February 9, 2024 |
| Start time (MST): | 6:18 | End time (MST): | 11:15 |
| 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: | 0.999358 | 1.000873 | Backgd or Offset: | 24.1 | 24.7 |
| Calibration intercept: | 0.554368 | -0.325433 | Coeff or Slope: | 0.875 | 0.867 |

### $SO_2$ 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 | 78.6 | 799.7 | 657.1 | 1.217 |
| as found 2nd point | 4961 | 39.3 | 399.8 | 327.9 | 1.219 |
| as found 3rd point | 4980 | 19.6 | 199.4 | 164.1 | 1.215 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| high point | 4921 | 78.6 | 799.7 | 800.0 | 1.000 |
| second point | 4961 | 39.3 | 399.8 | 400.4 | 0.999 |
| third point | 4980 | 19.6 | 199.4 | 198.6 | 1.004 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4921 | 78.6 | 799.7 | 798.8 | 1.001 |
| | | | | Average Correction Factor | 1.001 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 656.30 | Previous response | 799.78 | *% change | -21.9% |
| Baseline Corr 2nd AF pt: | 327.10 | AF Slope: | 0.820651 | AF Intercept: | 0.456142 |
| Baseline Corr 3rd AF pt: | 163.30 | AF Correlation: | 0.999997 | | |

* = > +/-5% change initiates investigation

Notes: External Valve and Filter Folder replaced. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

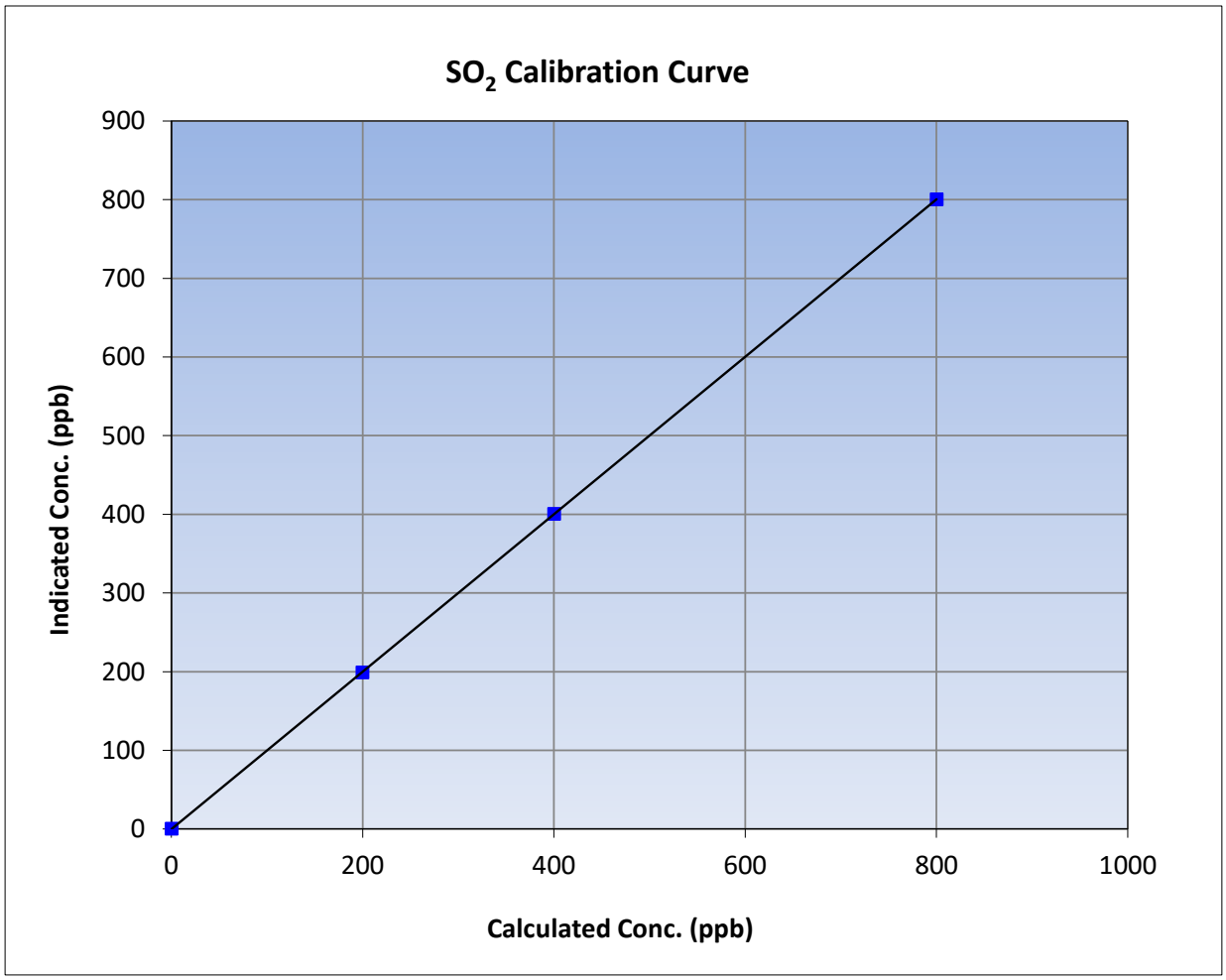
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 9, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:18 | End Time (MST): | 11:15 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1327300932 |

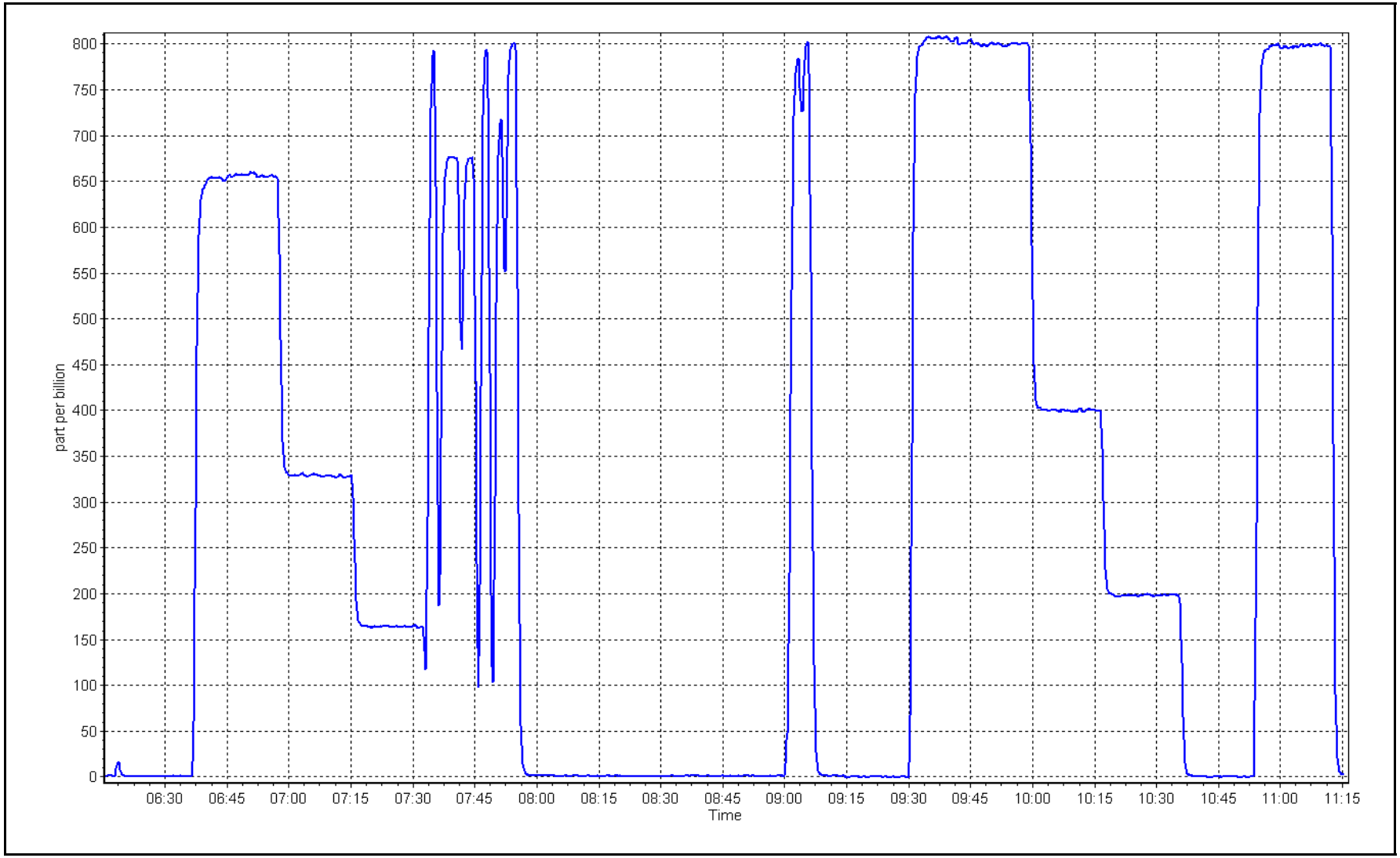
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.1 | ---- |
| 799.7 | 800.0 | 0.9997 |
| 399.8 | 400.4 | 0.9985 |
| 199.4 | 198.6 | 1.0042 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.000873 | *0.90 - 1.10* |
| Intercept | -0.325433 | *+/-30* |



**SO2 Calibration Plot** Date: March 21, 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: | March 20, 2024 | Last Cal Date: | February 29, 2024 |
| Start time (MST): | 6:00 | End time (MST): | 10:20 |
| 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: | 0.997925 | 0.995649 | Backgd or Offset: | 1.09 | 1.09 |
| Calibration intercept: | 0.202175 | 0.182120 | Coeff or Slope: | 1.130 | 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 | 80.6 | 0.998 |
| as found 2nd point | 4963 | 37.0 | 40.1 | 40.3 | 0.998 |
| as found 3rd point | 4982 | 18.5 | 20.1 | 20.1 | 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 | 0.2 | ---- |
| high point | 4926 | 74.1 | 80.3 | 80.1 | 1.003 |
| second point | 4963 | 37.0 | 40.1 | 40.3 | 0.995 |
| third point | 4982 | 18.5 | 20.1 | 20.0 | 1.003 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4926 | 74.1 | 80.3 | 80.0 | 1.004 |
| SO2 Scrubber Check | 4920 | 80.0 | 800.0 | 0.2 | ---- |
| Date of last scrubber change: | | 16-May-23 | | Ave Corr Factor | 1.000 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.5 | Prev response: | 80.36 | *% change: | 0.2% |
| Baseline Corr 2nd AF pt: | 40.2 | AF Slope: | 1.002622 | AF Intercept: | 0.062213 |
| Baseline Corr 3rd AF pt: | 20.0 | AF Correlation: | 0.999998 | | |

* = > +/-5% change initiates investigation

Notes: Sox scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

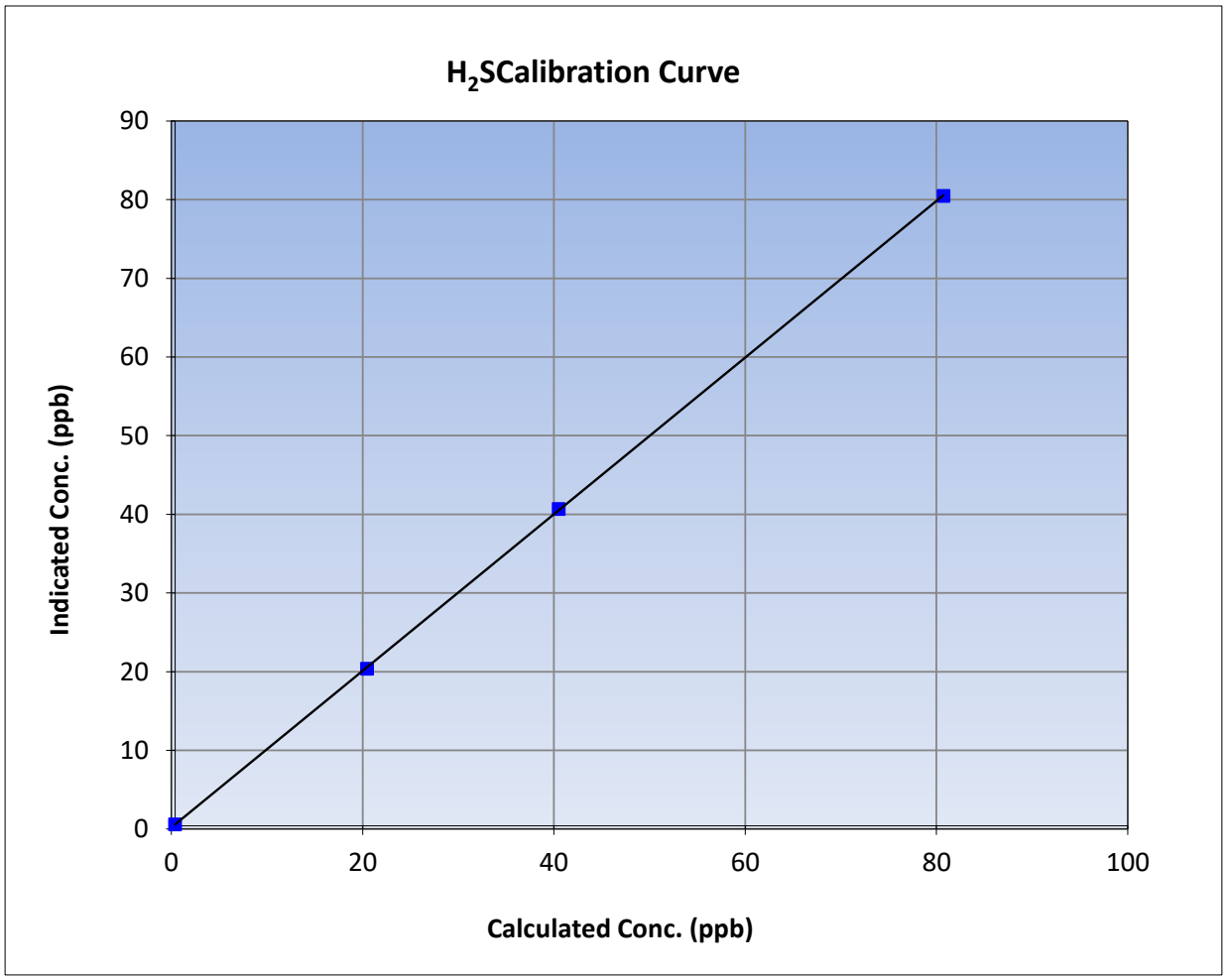
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 29, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:00 | End Time (MST): | 10:20 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1008841400 |

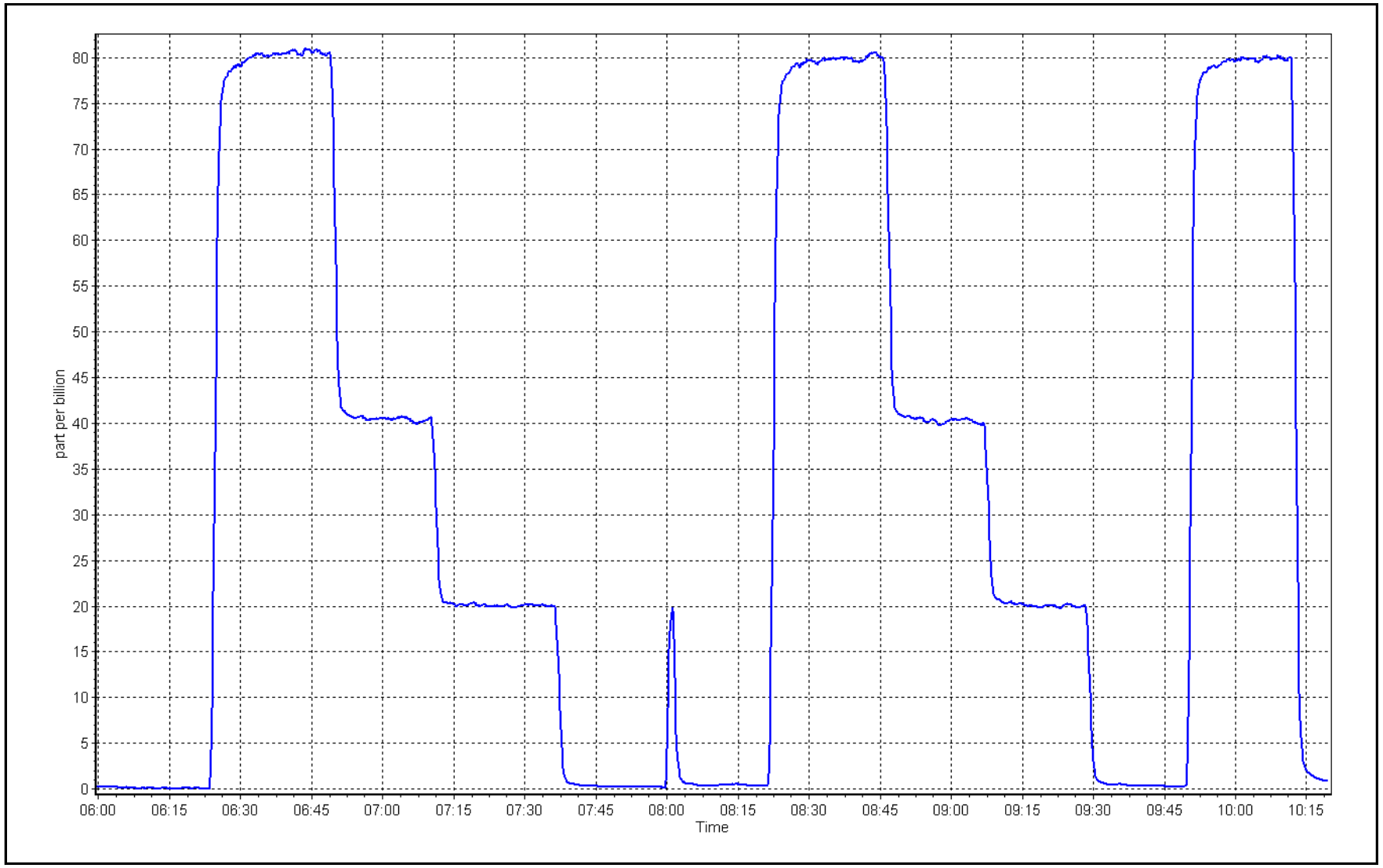
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.3 | 80.1 | 1.0028 |
| 40.1 | 40.3 | 0.9952 |
| 20.1 | 20.0 | 1.0026 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999983 | *≥0.995* |
| Slope | 0.995649 | *0.90 - 1.10* |
| Intercept | 0.182120 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 20, 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: | March 21, 2024 | Last Cal Date: | February 9, 2024 |
| Start time (MST): | 6:18 | End time (MST): | 11:14 |
| Reason: | Routine | | |

### 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: | 4.21E-04 | 4.25E-04 | NMHC SP Ratio: | 1.08E-04 | 1.10E-04 |
| CH4 Retention time: | 13.7 | 13.7 | NMHC Peak Area: | 81432 | 80500 |
| 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 | 16.58 | 1.003 |
| 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 | 16.65 | 0.999 |
| second point | 4961 | 39.3 | 8.32 | 8.34 | 0.997 |
| third point | 4980 | 19.6 | 4.15 | 4.16 | 0.997 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 16.64 | 16.69 | 0.997 |
| | | | | Average Correction Factor | 0.998 |
| Baseline Corr AF: | 16.58 | Prev response | 16.61 | *% 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 | 4921 | 78.6 | 8.82 | 8.78 | 1.004 |
| 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 | 8.82 | 1.000 |
| second point | 4961 | 39.3 | 4.41 | 4.43 | 0.995 |
| third point | 4980 | 19.6 | 2.20 | 2.22 | 0.990 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 8.82 | 8.86 | 0.995 |
| | | | | Average Correction Factor | 0.995 |
| Baseline Corr AF: | 8.78 | Prev response | 8.81 | *% change | -0.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 7.80 | 1.003 |
| 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 | 7.82 | 0.999 |
| second point | 4961 | 39.3 | 3.91 | 3.91 | 1.000 |
| third point | 4980 | 19.6 | 1.95 | 1.94 | 1.004 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 78.6 | 7.82 | 7.83 | 0.998 |
| | | | | Average Correction Factor | 1.001 |
| Baseline Corr AF: | 7.80 | Prev response | 7.81 | *% 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: | 0.997921 | 1.000586 |
| THC Cal Offset: | 0.010460 | 0.008071 |
| CH4 Cal Slope: | 0.999537 | 1.001043 |
| CH4 Cal Offset: | -0.004306 | -0.004702 |
| NMHC Cal Slope: | 0.996864 | 0.999701 |
| NMHC Cal Offset: | 0.013566 | 0.013373 |

Notes: Hydrogen Cylinder Replaced. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

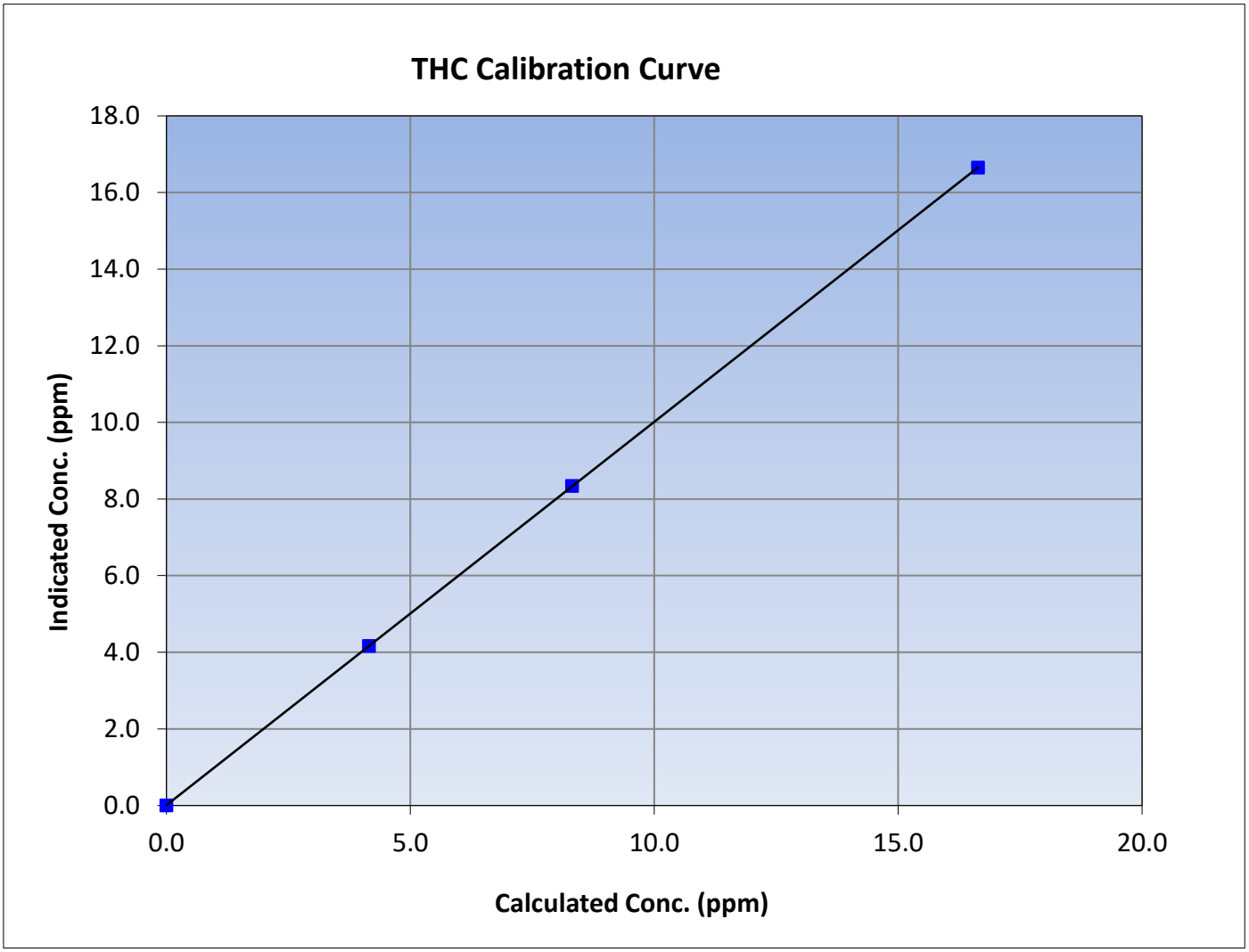
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 9, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:18 | End Time (MST): | 11:14 |
| 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 | 0.999999 | ≥0.995 |
| 16.64 | 16.65 | 0.9993 | | | |
| 8.32 | 8.34 | 0.9972 | Slope | 1.000586 | 0.90 - 1.10 |
| 4.15 | 4.16 | 0.9965 | | | |
| | | | Intercept | 0.008071 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

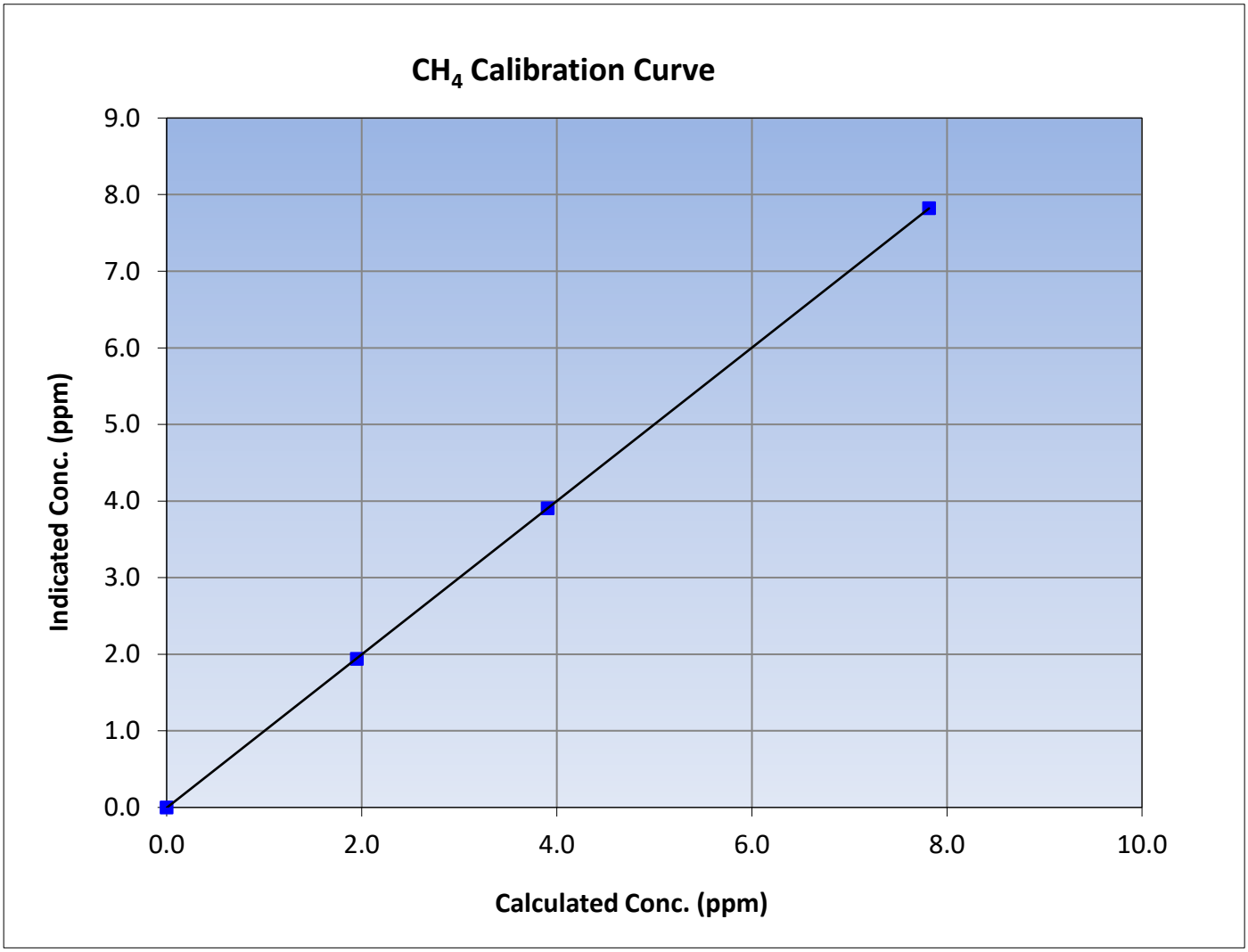
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 9, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:18 | End Time (MST): | 11:14 |
| 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 | 7.82 | 0.9993 | | | |
| 3.91 | 3.91 | 1.0004 | Slope | 1.001043 | *0.90 - 1.10* |
| 1.95 | 1.94 | 1.0042 | | | |
| | | | Intercept | -0.004702 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

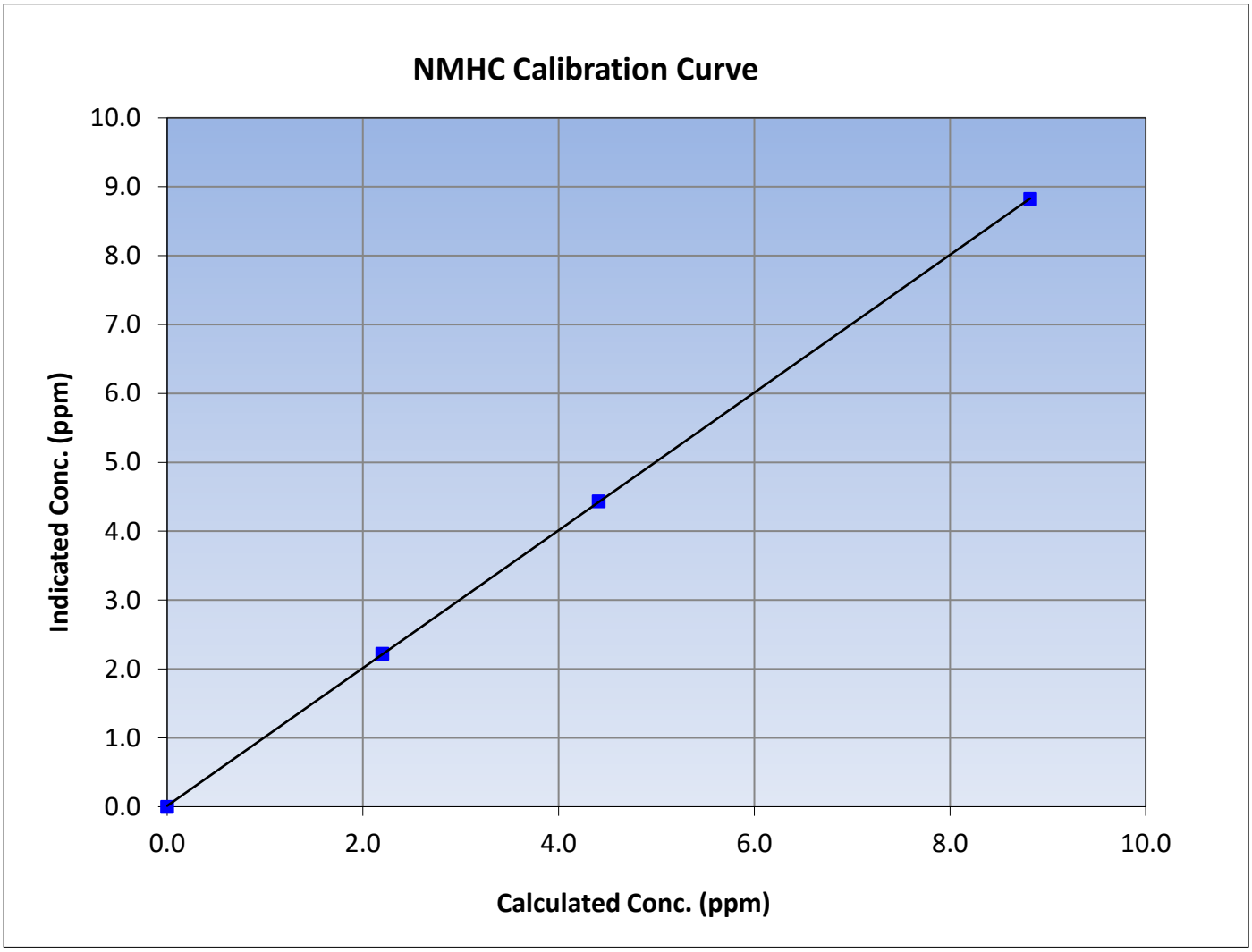
Version-06-2022

### Station Information

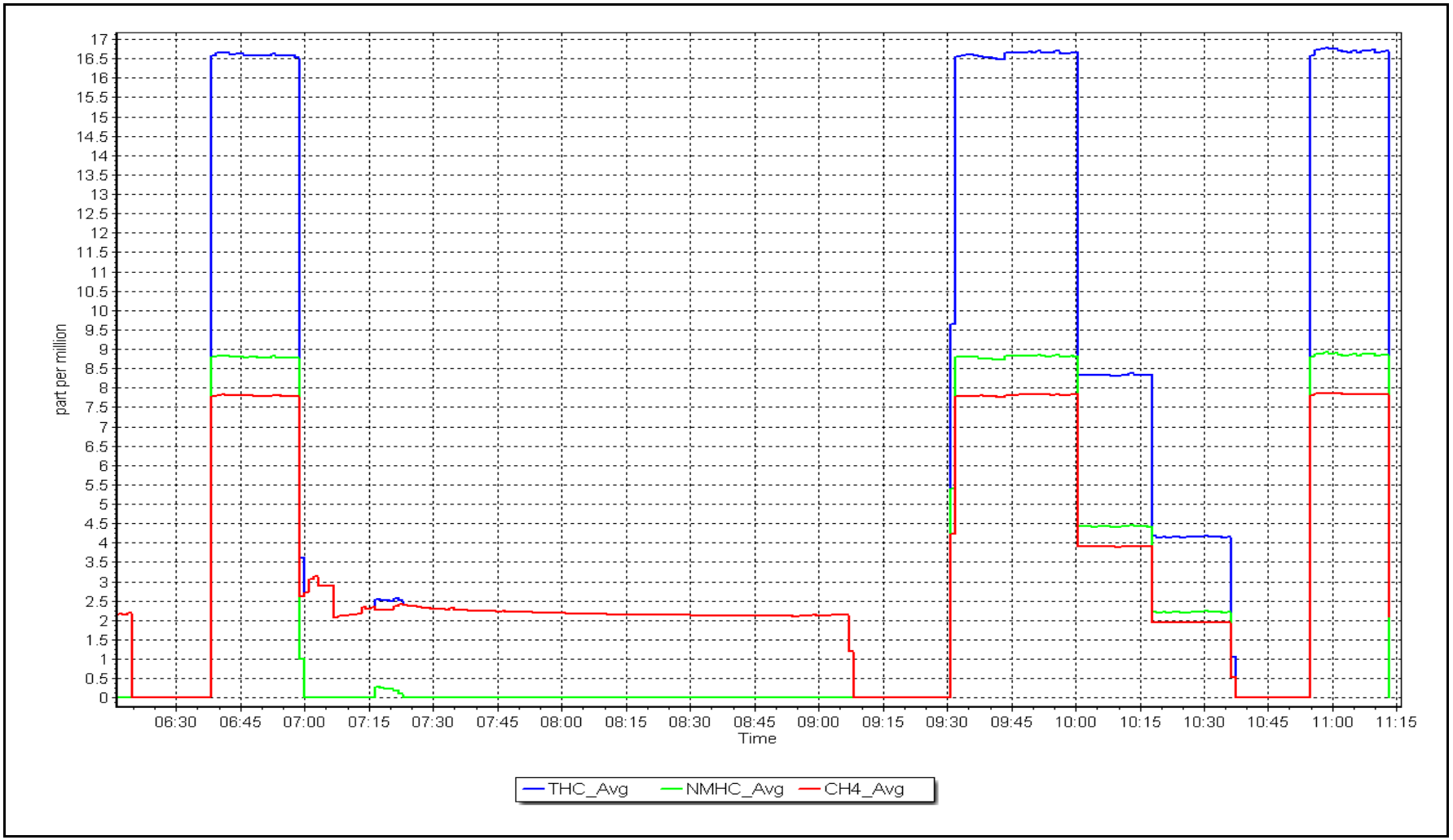
| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 9, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:18 | End Time (MST): | 11:14 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1426262594 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999989 | ≥0.995 |
| 8.82 | 8.82 | 0.9997 | | | |
| 4.41 | 4.43 | 0.9946 | Slope | 0.999701 | 0.90 - 1.10 |
| 2.20 | 2.22 | 0.9898 | | | |
| | | | Intercept | 0.013373 | +/-0.5 |



**NMHC Calibration Plot** Date: March 21, 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: | March 1, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 6:50 | End time (MST): | 11:56 |
| 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: | 1.162 | 1.162 | NO bkgnd or offset: | -0.6 | -0.6 |
| NOX coeff or slope: | 1.154 | 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: | 1.001294 | 0.995753 |
| $NO_X$ Cal Offset: | -0.213331 | -0.374543 |
| NO Cal Slope: | 0.999626 | 0.993186 |
| NO Cal Offset: | -0.914344 | -1.315833 |
| $NO_2$ Cal Slope: | 0.997058 | 0.998315 |
| $NO_2$ Cal Offset: | -0.192985 | 1.614021 |

# 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 | 4918 | 81.8 | 800.0 | 798.4 | 1.6 | 792.8 | 789.1 | 3.6 | 1.0091 | 1.0118 |
| 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 | 0.3 | 0.5 | -0.2 | ---- | ---- |
| high point | 4918 | 81.8 | 800.0 | 798.4 | 1.6 | 796.5 | 792.7 | 3.7 | 1.0044 | 1.0072 |
| second point | 4959 | 40.9 | 400.0 | 399.2 | 0.8 | 397.9 | 393.8 | 4.1 | 1.0053 | 1.0137 |
| third point | 4980 | 20.4 | 199.5 | 199.1 | 0.4 | 197.4 | 194.9 | 2.5 | 1.0106 | 1.0215 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 1.0 | -0.6 | ---- | ---- |
| as left span | 4918 | 81.8 | 800.0 | 402.7 | 397.3 | 787.1 | 393.9 | 393.2 | 1.0164 | 1.0223 |
| | | | | | | | | Average Correction Factor | 1.0068 | 1.0141 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 792.7 ppb | NO = 788.9 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -1.0% |
| Previous Response | $NO_X$ = 800.9 ppb | NO = 797.2 ppb | | *Percent Change | NO = | -1.1% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: |

### 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) | 789.8 | 394.1 | 397.3 | 397.6 | 0.9993 | 100.1% |
| 2nd GPT point (200 ppb O3) | 789.8 | 595.0 | 196.4 | 198.0 | 0.9921 | 100.8% |
| 3rd GPT point (100 ppb O3) | 789.8 | 694.2 | 97.2 | 100.9 | 0.9637 | 103.8% |
| | | | | Average Correction Factor | 0.9850 | 101.5% |

Notes: No maintenance or adjustsments done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

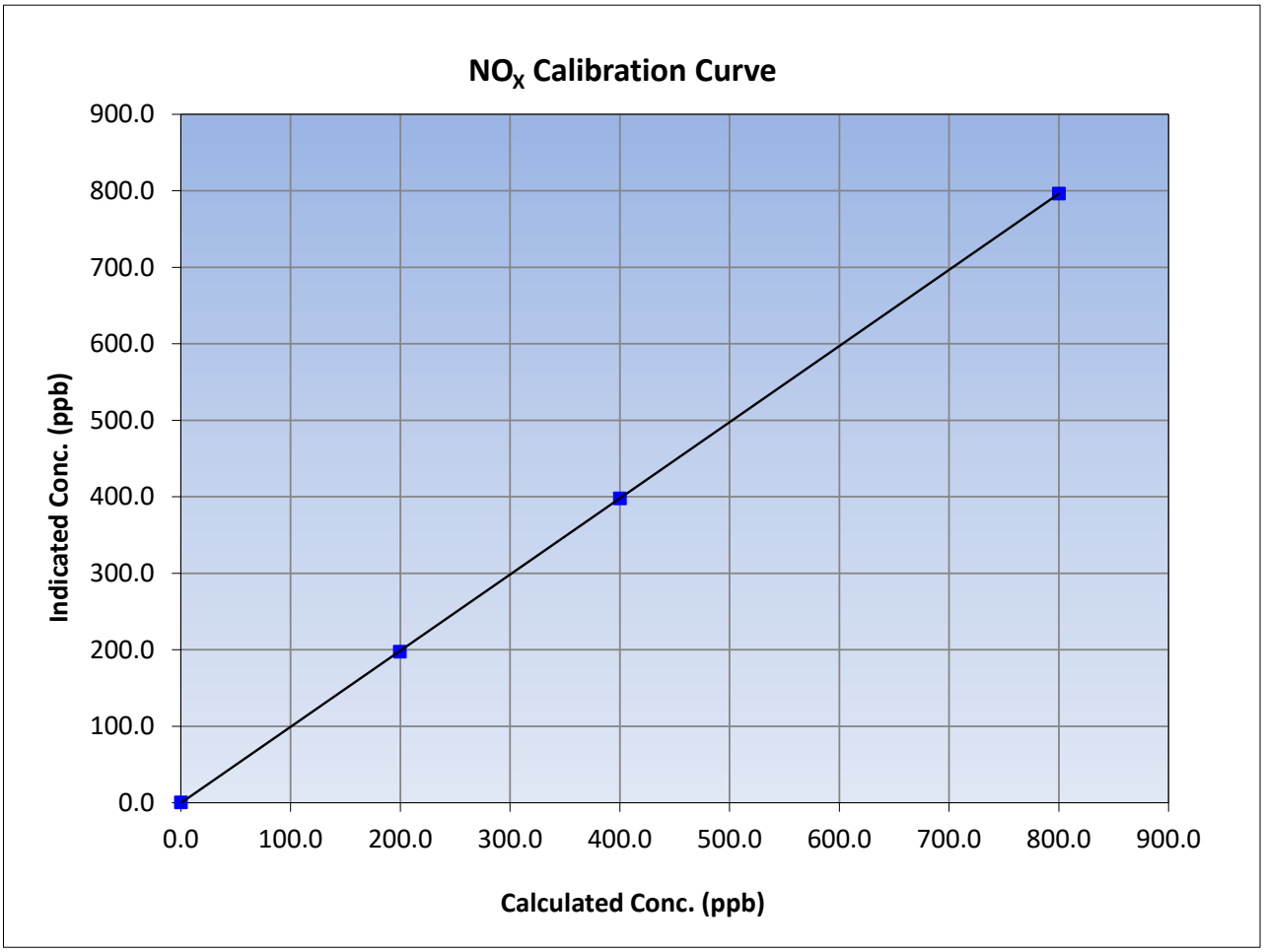
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:50 | End Time (MST): | 11:56 |
| 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 | 0.999996 | ≥0.995 |
| 800.0 | 796.5 | 1.0044 | | | |
| 400.0 | 397.9 | 1.0053 | Slope | 0.995753 | 0.90 - 1.10 |
| 199.5 | 197.4 | 1.0106 | | | |
| | | | Intercept | -0.374543 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

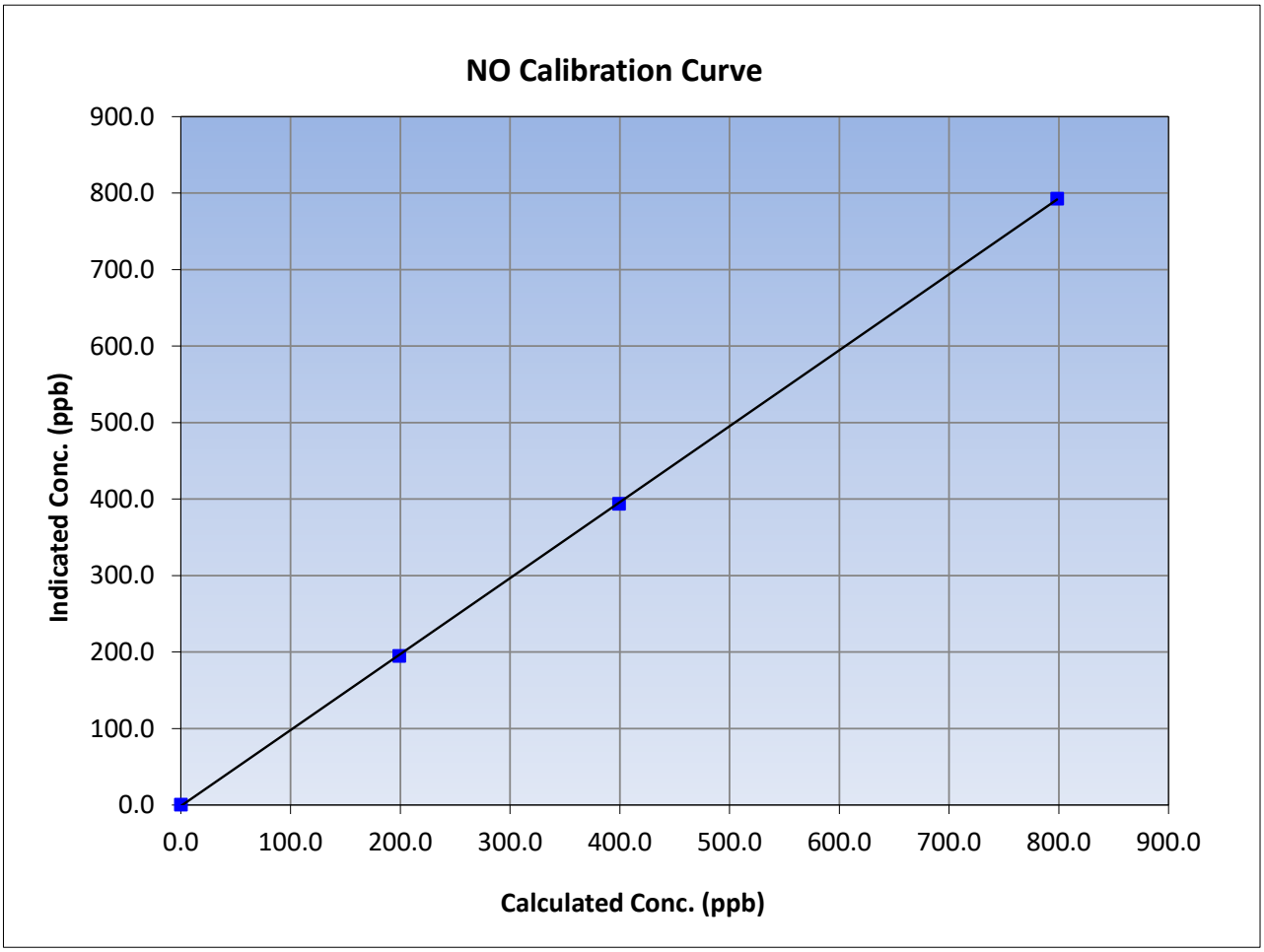
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:50 | End Time (MST): | 11:56 |
| 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 | 0.999975 | ≥0.995 |
| 798.4 | 792.7 | 1.0072 | | | |
| 399.2 | 393.8 | 1.0137 | Slope | 0.993186 | 0.90 - 1.10 |
| 199.1 | 194.9 | 1.0215 | | | |
| | | | Intercept | -1.315833 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

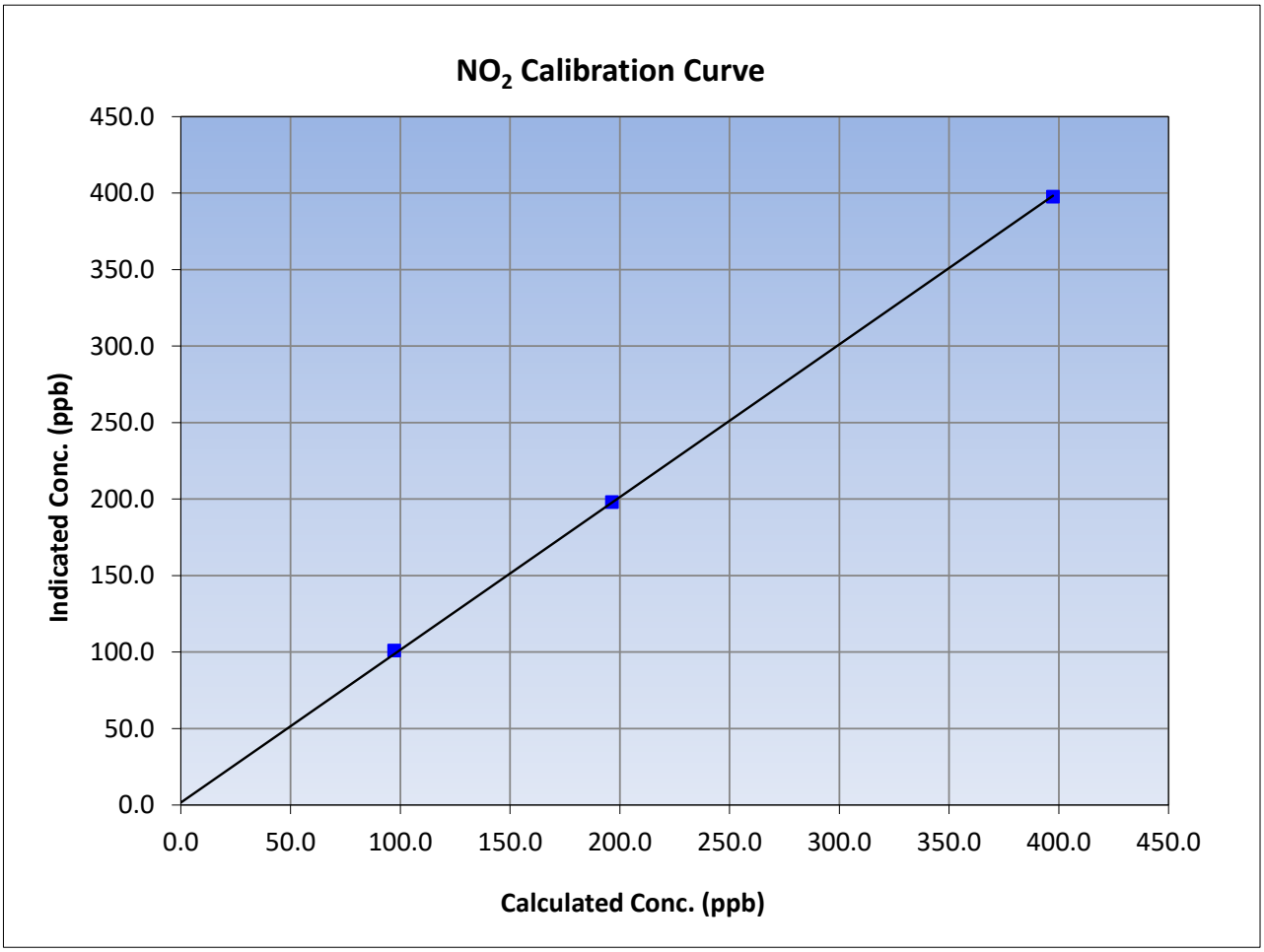
Version-04-2020

### Station Information

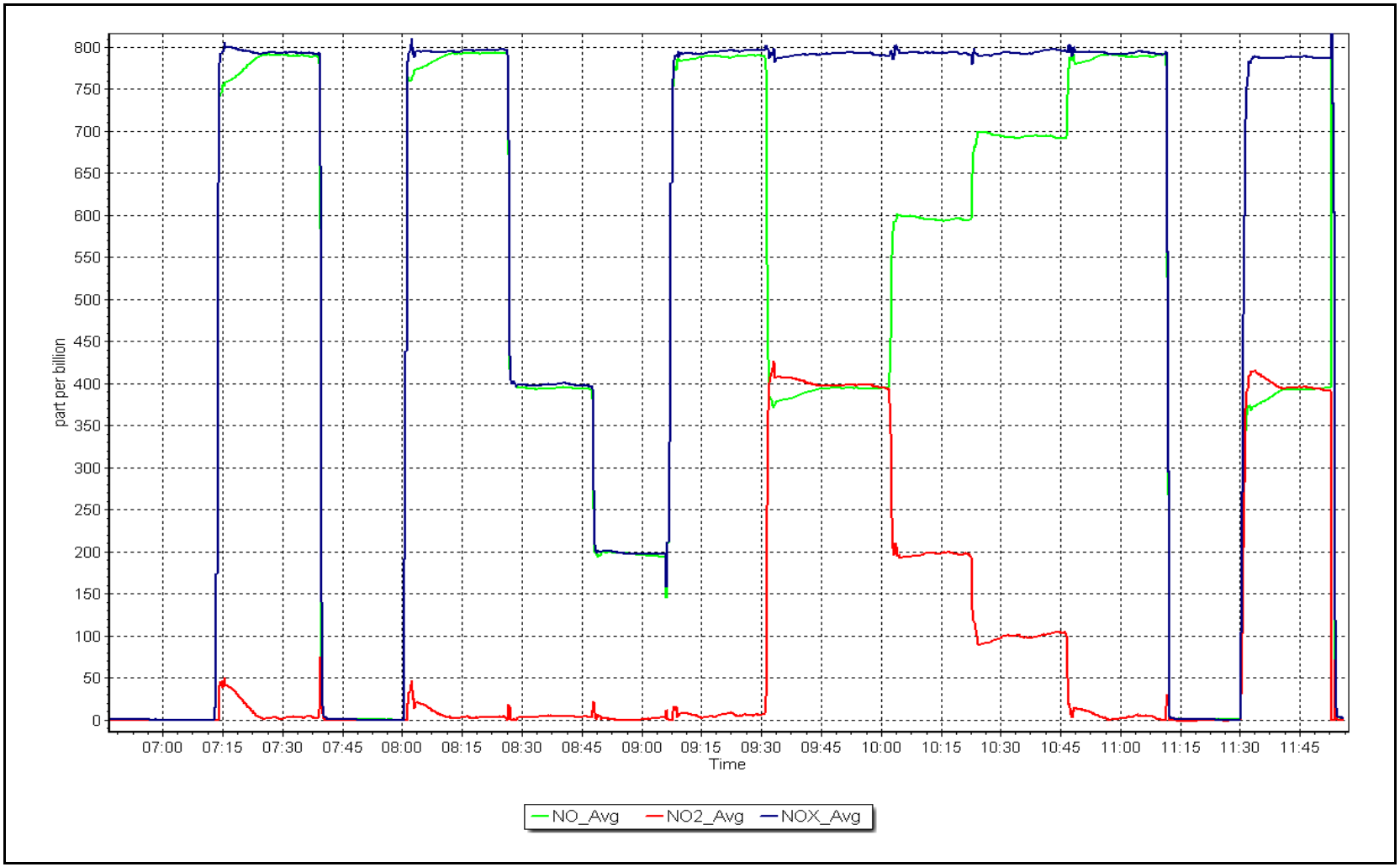
| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 6:50 | End Time (MST): | 11:56 |
| Analyzer make: | API T200 | Analyzer serial #: | 721 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999899 | ≥0.995 |
| 397.3 | 397.6 | 0.9993 | | | |
| 196.4 | 198.0 | 0.9921 | Slope | 0.998315 | 0.90 - 1.10 |
| 97.2 | 100.9 | 0.9637 | | | |
| | | | Intercept | 1.614021 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 1, 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: | March 15, 2024 | Last Cal Date: | February 9, 2024 |
| Start time (MST): | 8:57 | End time (MST): | 11:15 |
| 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: | 0.999029 | 1.004971 | Backgd or Offset: | -2.2 | -2.2 |
| Calibration intercept: | 0.420000 | -0.120000 | 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 | -0.6 | ---- |
| as found span | 5000 | 990.7 | 400.0 | 401.9 | 0.995 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| high point | 5000 | 991.2 | 400.0 | 401.8 | 0.996 |
| second point | 5000 | 819.1 | 200.0 | 200.9 | 0.996 |
| third point | 5000 | 710.9 | 100.0 | 100.6 | 0.994 |
| as left zero | 5000 | 0.0 | 0.0 | -0.5 | ---- |
| as left span | 5000 | 992.5 | 400.0 | 402.1 | 0.995 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 402.5 | Previous response | 400.0 | *% 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 or maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

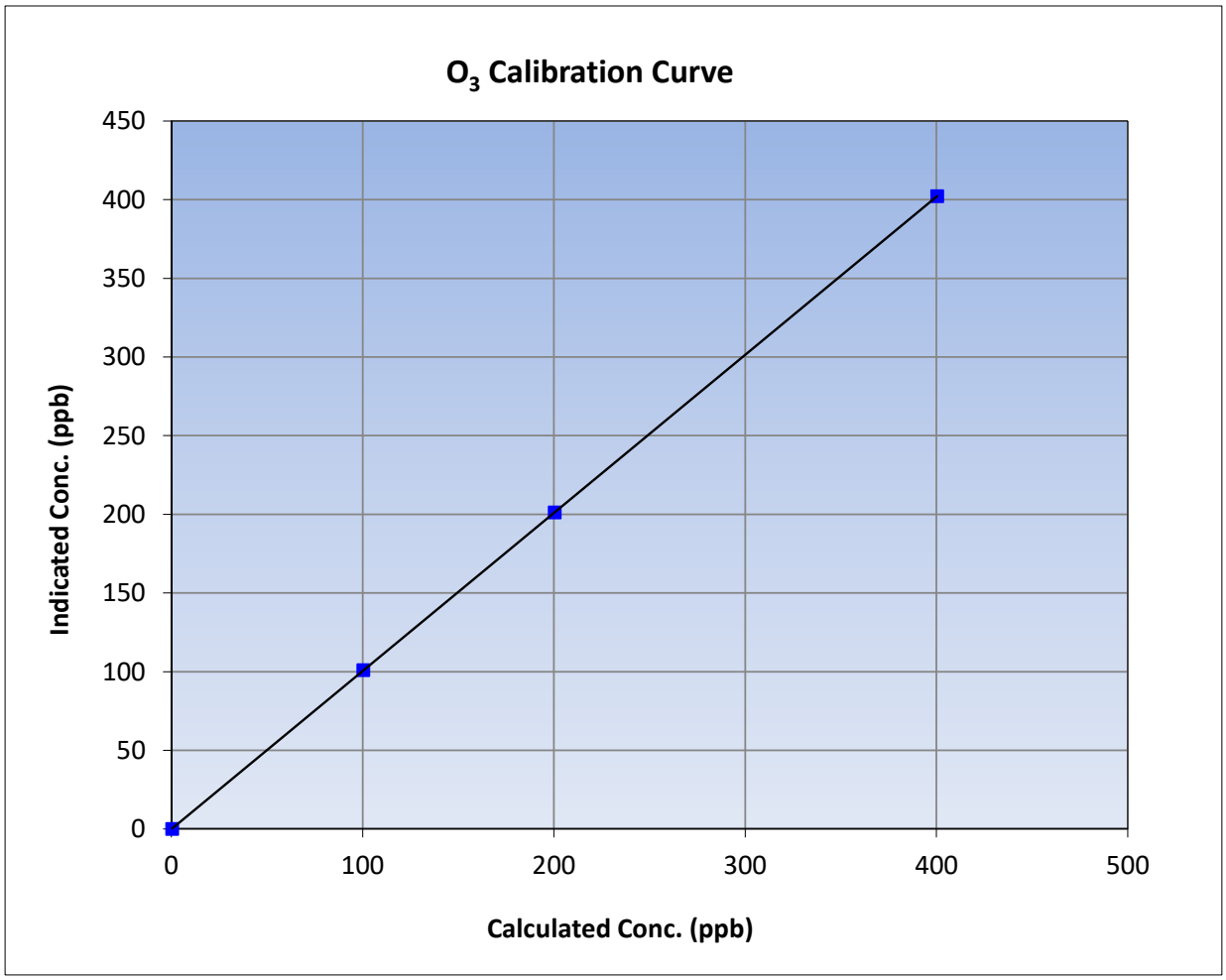
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | February 9, 2024 |
| Station Name: | Buffalo Viewpoint | Station Number: | AMS04 |
| Start Time (MST): | 8:57 | End Time (MST): | 11:15 |
| Analyzer make: | API T400 | Analyzer serial #: | 2961 |

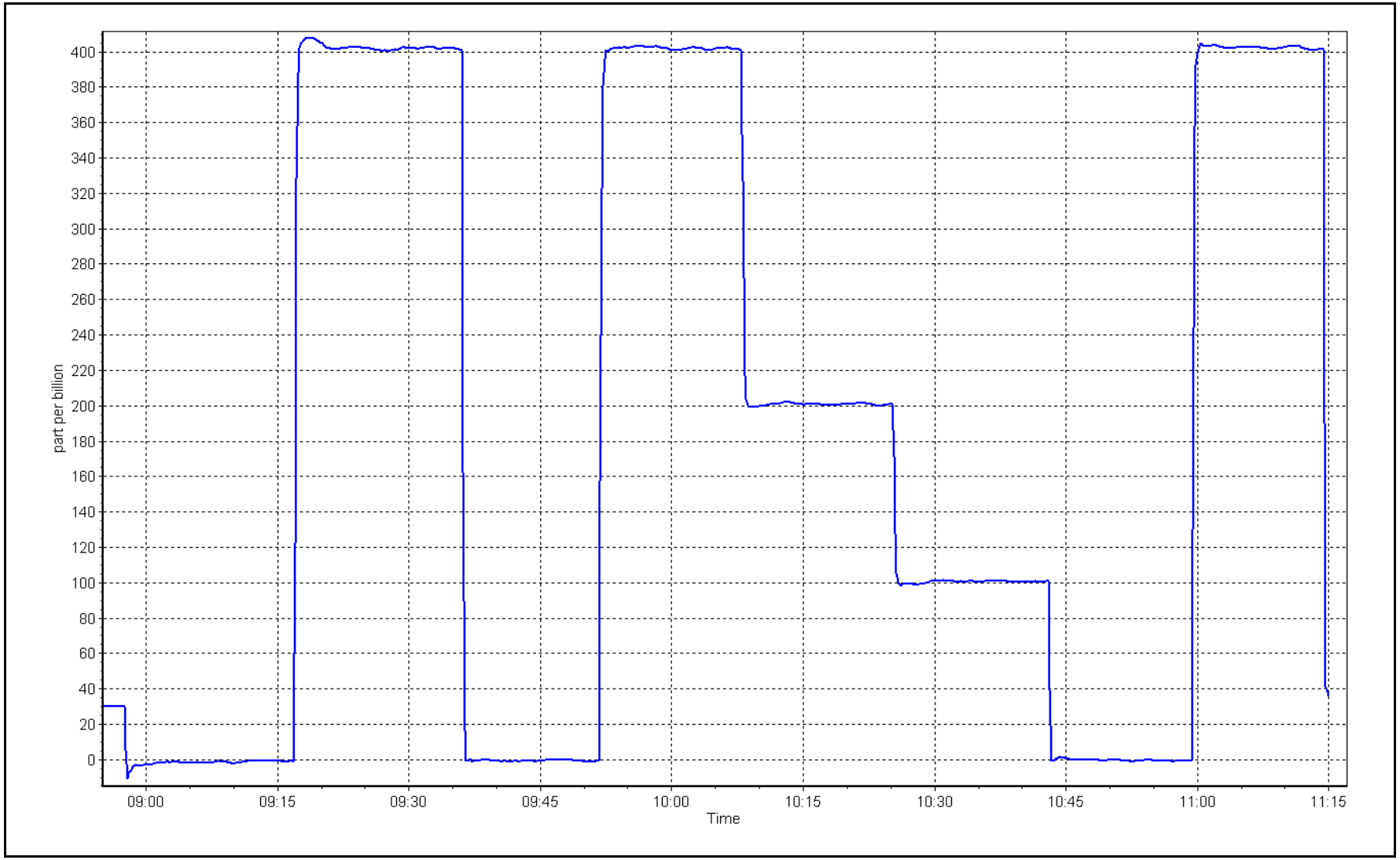
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.3 | ---- |
| 400.0 | 401.8 | 0.9955 |
| 200.0 | 200.9 | 0.9955 |
| 100.0 | 100.6 | 0.9940 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 1.004971 | *0.90 - 1.10* |
| Intercept | -0.120000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 15, 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: | March 20, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 10:22 | End time (MST): | 11:01 |
| 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) | -13.6 | -13.4 | -13.6 | ☐ | +/- 2 °C |
| P (mmHg) | 741.9 | 743.6 | 741.9 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.00 | 5.14 | 5.00 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 41 | ----- | 41 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 5.5 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

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

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

Date Optical Chamber Cleaned: February 27, 2024

Date Disposable Filter Changed: February 27, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: February 27, 2024

Date RH/T Sensor Cleaned: February 27, 2024

Notes: No adjustments done. Leak check passed.

Calibration by: Melissa Lemay

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS05
## MANNIX
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS05 |
| Calibration Date: | March 20, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 10:21 | End time (MST): | 13:30 |
| 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: | 1.004227 | 1.005098 | Backgd or Offset: | 9.1 | 9.6 |
| Calibration intercept: | -0.020000 | -0.700000 | 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 | 0.6 | ---- |
| as found span | 4920 | 80.0 | 800.3 | 802.0 | 0.998 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4920 | 80.0 | 800.3 | 804.2 | 0.995 |
| second point | 4960 | 40.0 | 400.2 | 400.8 | 0.998 |
| third point | 4980 | 20.0 | 200.1 | 199.8 | 1.001 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4920 | 80.0 | 800.3 | 805.5 | 0.994 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 801.40 | Previous response | 803.68 | *% 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 the zero.

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

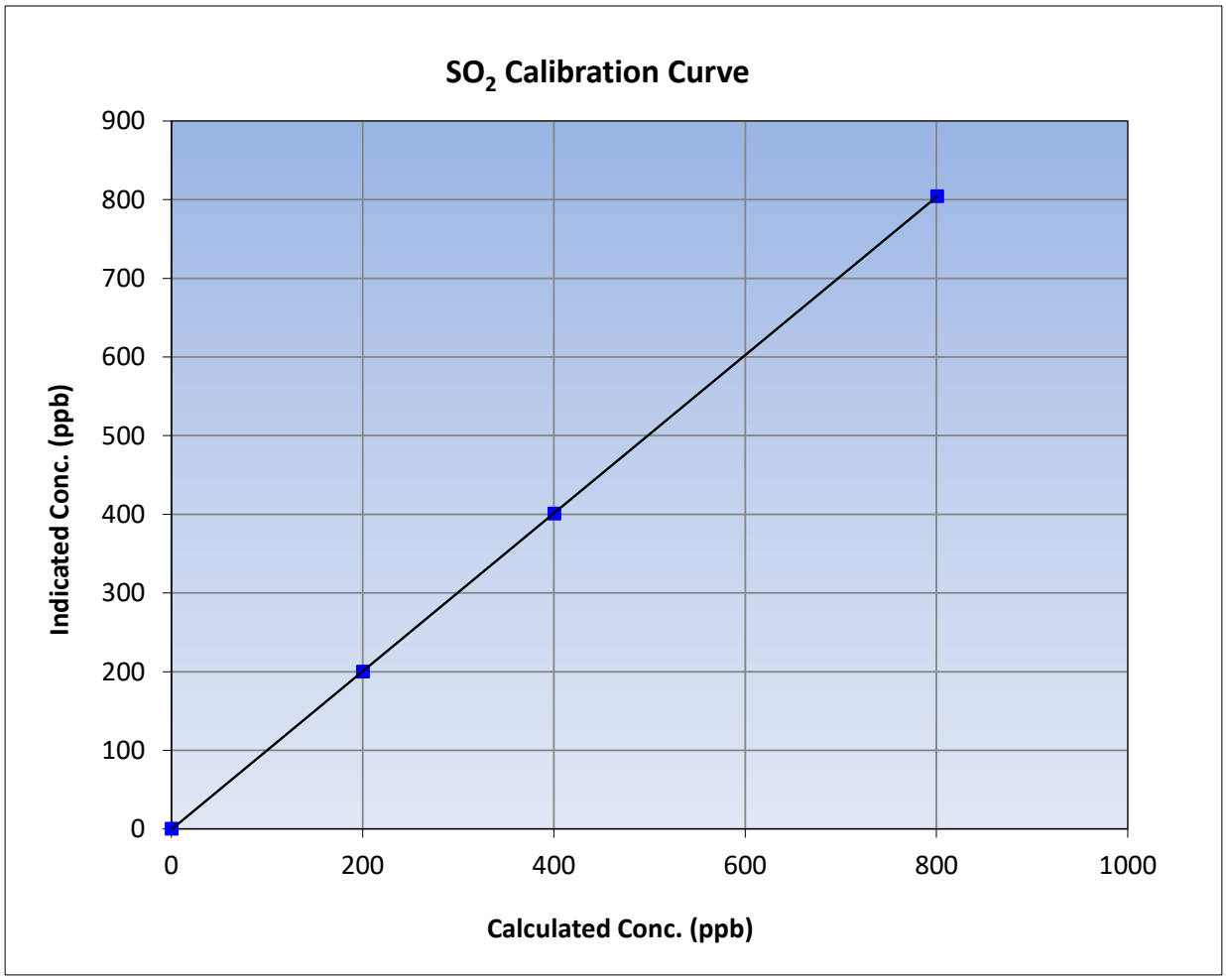
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Mannix | Station Number: | AMS05 |
| Start Time (MST): | 10:21 | End Time (MST): | 13:30 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1008841399 |

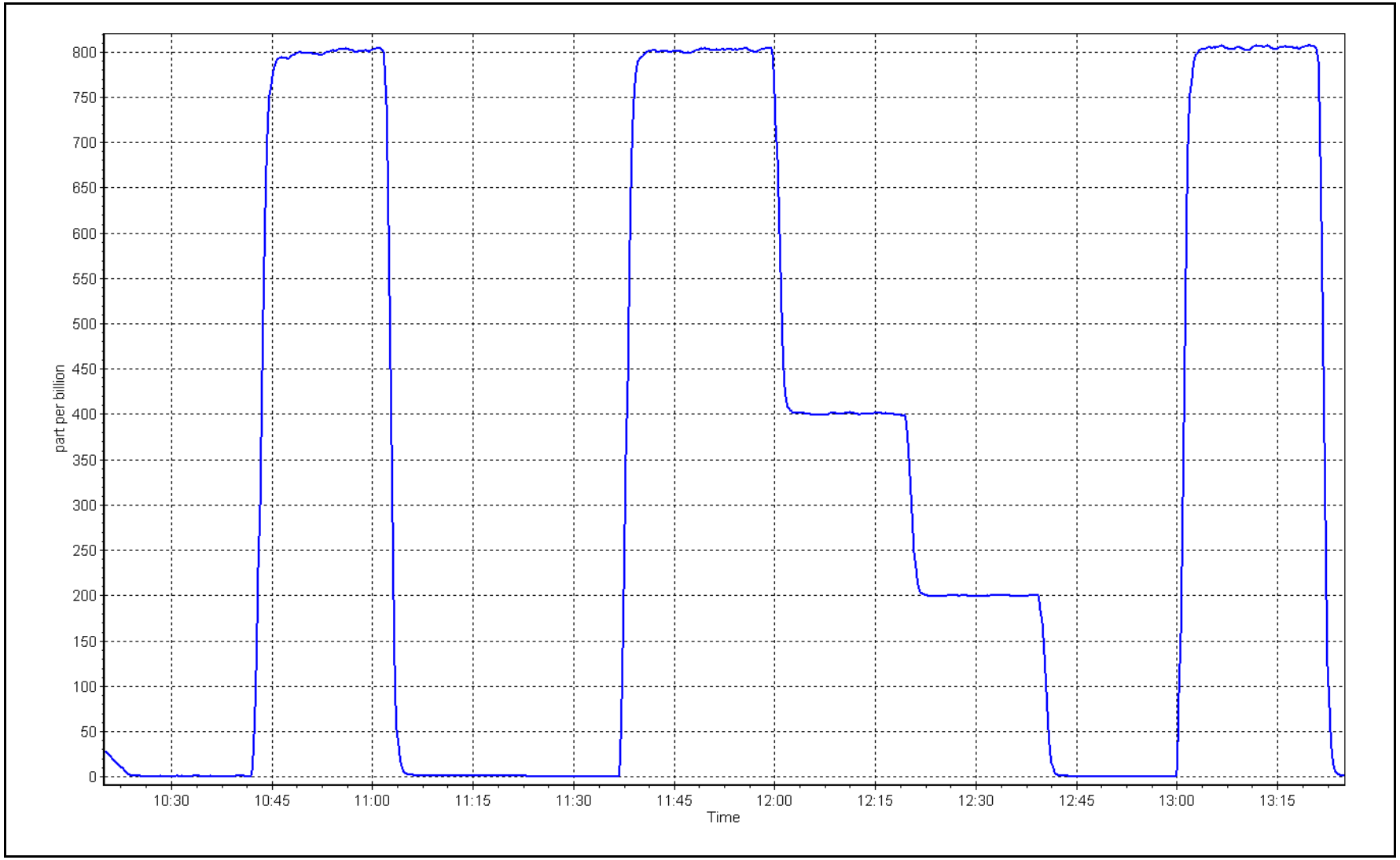
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.3 | 804.2 | 0.9952 |
| 400.2 | 400.8 | 0.9984 |
| 200.1 | 199.8 | 1.0014 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999995 | *≥0.995* |
| Slope | 1.005098 | *0.90 - 1.10* |
| Intercept | -0.700000 | *+/-30* |



**SO2 Calibration Plot** Date: March 20, 2024 Location: Mannix



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Mannix | Station number: | AMS05 |
| Calibration Date: | March 12, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 9:28 | End time (MST): | 14:17 |
| 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: | 1.008837 | 0.997116 | Backgd or Offset: | 1.24 | 1.23 |
| Calibration intercept: | 0.022150 | -0.017688 | Coeff or Slope: | 0.998 | 0.978 |

### $H_2S$ 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 | 81.4 | 0.982 |
| as found 2nd point | 4960 | 40.3 | 40.0 | 40.7 | 0.982 |
| as found 3rd point | 4980 | 20.2 | 20.0 | 20.1 | 0.997 |
| 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 | 79.8 | 1.002 |
| second point | 4960 | 40.3 | 40.0 | 39.7 | 1.007 |
| third point | 4980 | 20.2 | 20.0 | 19.9 | 1.007 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 80.6 | 80.0 | 81.0 | 0.987 |
| SO2 Scrubber Check | 4920 | 80.0 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.005 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.4 | Prev response: | 80.69 | *% change: | 0.9% |
| Baseline Corr 2nd AF pt: | 40.7 | AF Slope: | 1.019272 | AF Intercept: | -0.118001 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999983 | | |

* = > +/-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

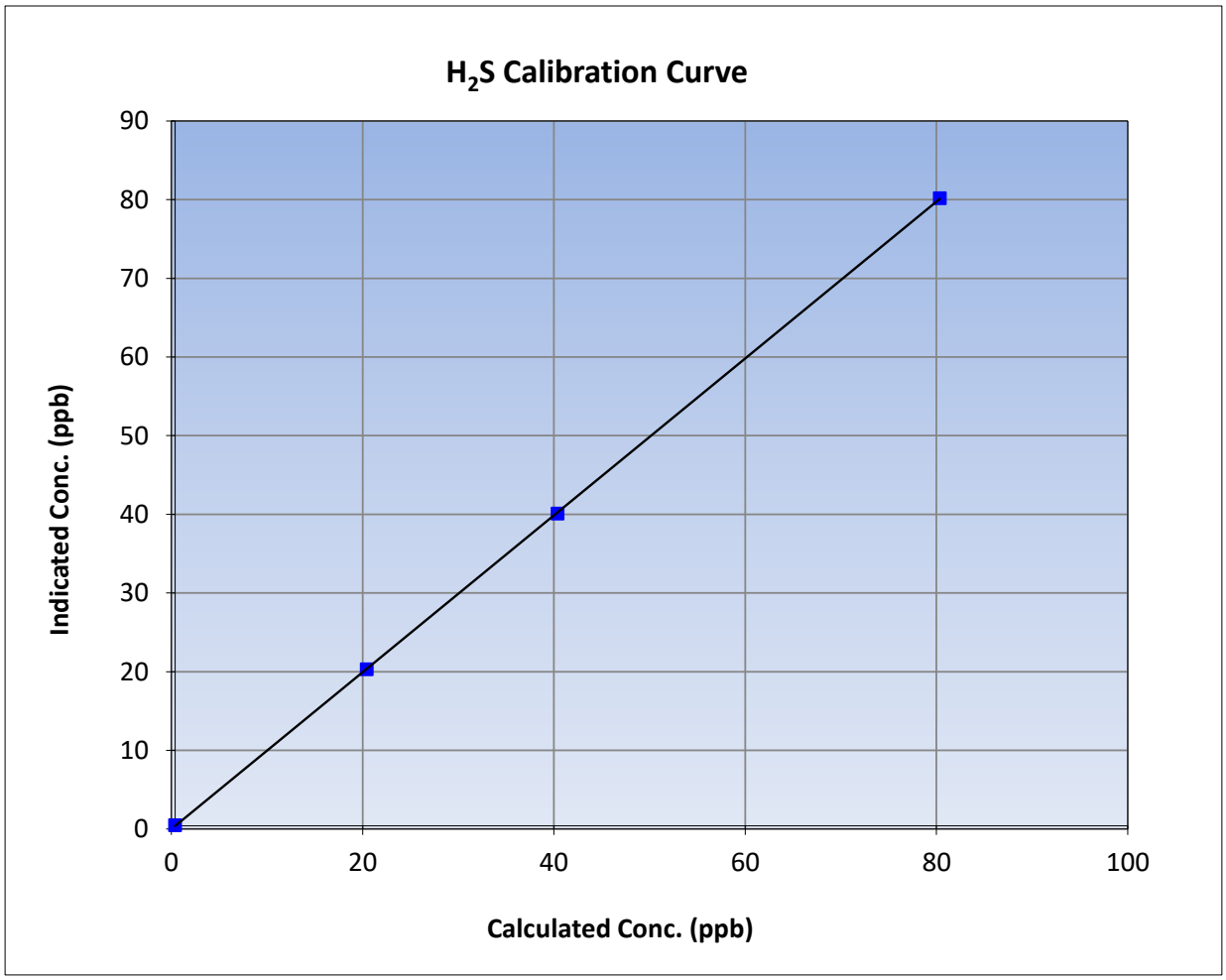
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Mannix | Station Number: | AMS05 |
| Start Time (MST): | 9:28 | End Time (MST): | 14:17 |
| Analyzer make: | Thermo 43iQTL | Analyzer serial #: | 1200326169 |

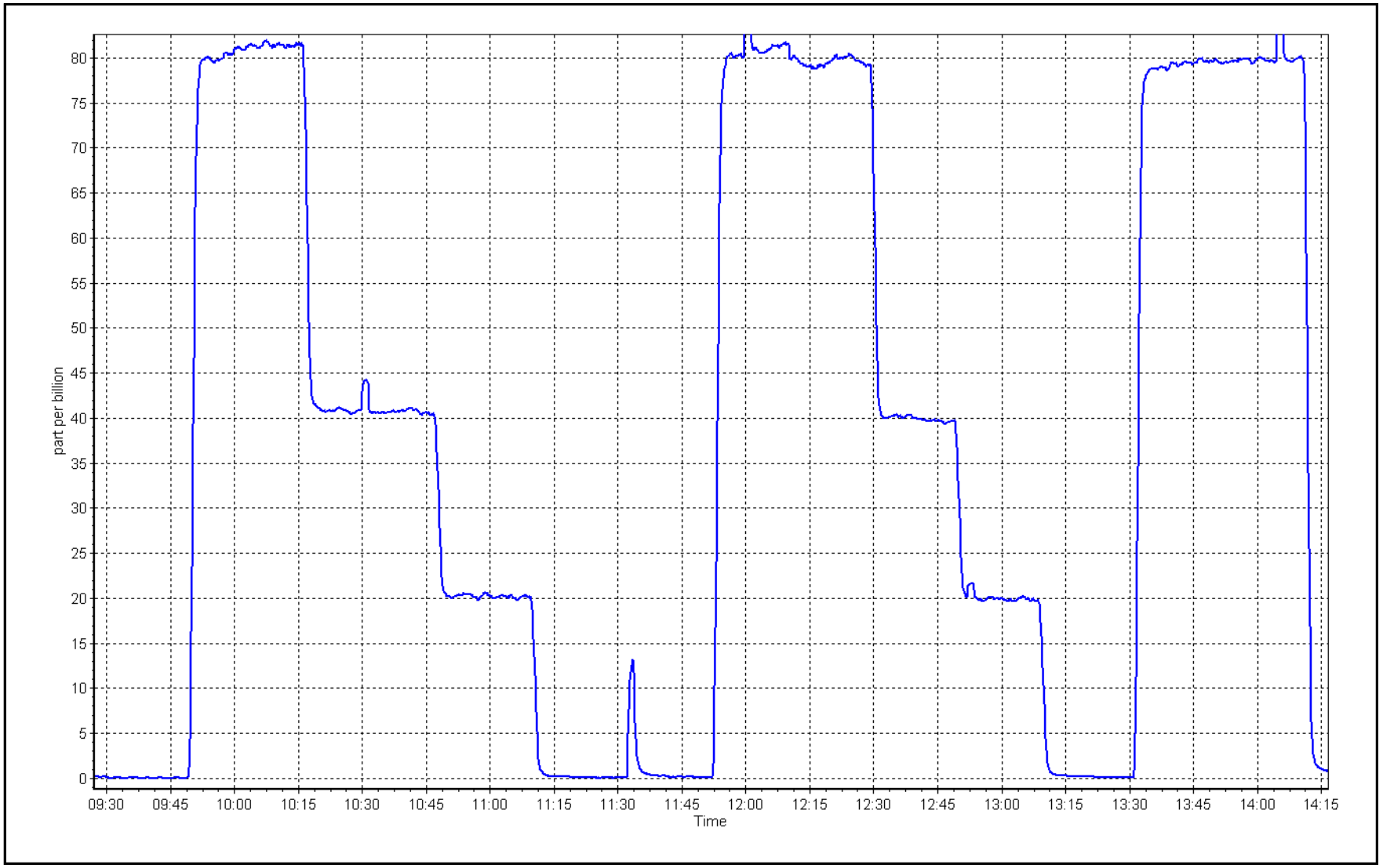
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 79.8 | 1.0020 |
| 40.0 | 39.7 | 1.0069 |
| 20.0 | 19.9 | 1.0069 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999987 | ≥0.995 |
| Slope | 0.997116 | 0.90 - 1.10 |
| Intercept | -0.017688 | +/-3 |



**$H_2S$ Calibration Plot** Date: March 12, 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: | March 10, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 9:30 | End time (MST): | 12:08 |
| Reason: | Maintenance | Baseline drop | |

### 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: | 2.98E-04 | 2.74E-04 | NMHC SP Ratio: | 4.94E-05 | 4.75E-05 |
| CH4 Retention time: | 16.4 | 16.0 | NMHC Peak Area: | 185404 | 192745 |
| 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 | 16.62 | 1.036 |
| 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 | 17.20 | 1.002 |
| second point | 4960 | 40.0 | 8.61 | 8.61 | 1.001 |
| third point | 4980 | 20.0 | 4.31 | 4.30 | 1.002 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 17.23 | 17.16 | 1.004 |
| | | | | Average Correction Factor | 1.002 |
| Baseline Corr AF: | 16.62 | Prev response | 17.24 | *% change | -3.7% |
| 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 | 4920 | 80.0 | 9.15 | 9.26 | 0.988 |
| 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 | 4.58 | 0.999 |
| third point | 4980 | 20.0 | 2.29 | 2.29 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 9.15 | 9.07 | 1.009 |
| | | | | Average Correction Factor | 1.001 |
| Baseline Corr AF: | 9.26 | Prev response | 9.15 | *% change | 1.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### 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 | 7.37 | 1.097 |
| 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 | 8.07 | 1.001 |
| second point | 4960 | 40.0 | 4.04 | 4.03 | 1.002 |
| third point | 4980 | 20.0 | 2.02 | 2.01 | 1.005 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 8.08 | 8.09 | 0.999 |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 7.37 | Prev response | 8.09 | *% change | -9.9% |
| 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: | 1.000620 | 0.998544 |
| THC Cal Offset: | 0.007200 | -0.000400 |
| CH4 Cal Slope: | 0.999873 | 0.999590 |
| CH4 Cal Offset: | 0.014400 | -0.004600 |
| NMHC Cal Slope: | 1.001368 | 0.998095 |
| NMHC Cal Offset: | -0.006800 | 0.003800 |

Notes: CH4 chromatogram displayed the peak edge on the back hitting the CH4 window timing; adjusted carrier pressure from 28.0 to 30.0 psi and calibrated channels, no further response dips noted.

Calibration Performed By: Kelly Baragar

# Wood Buffalo Environmental Association

## THC Calibration Summary

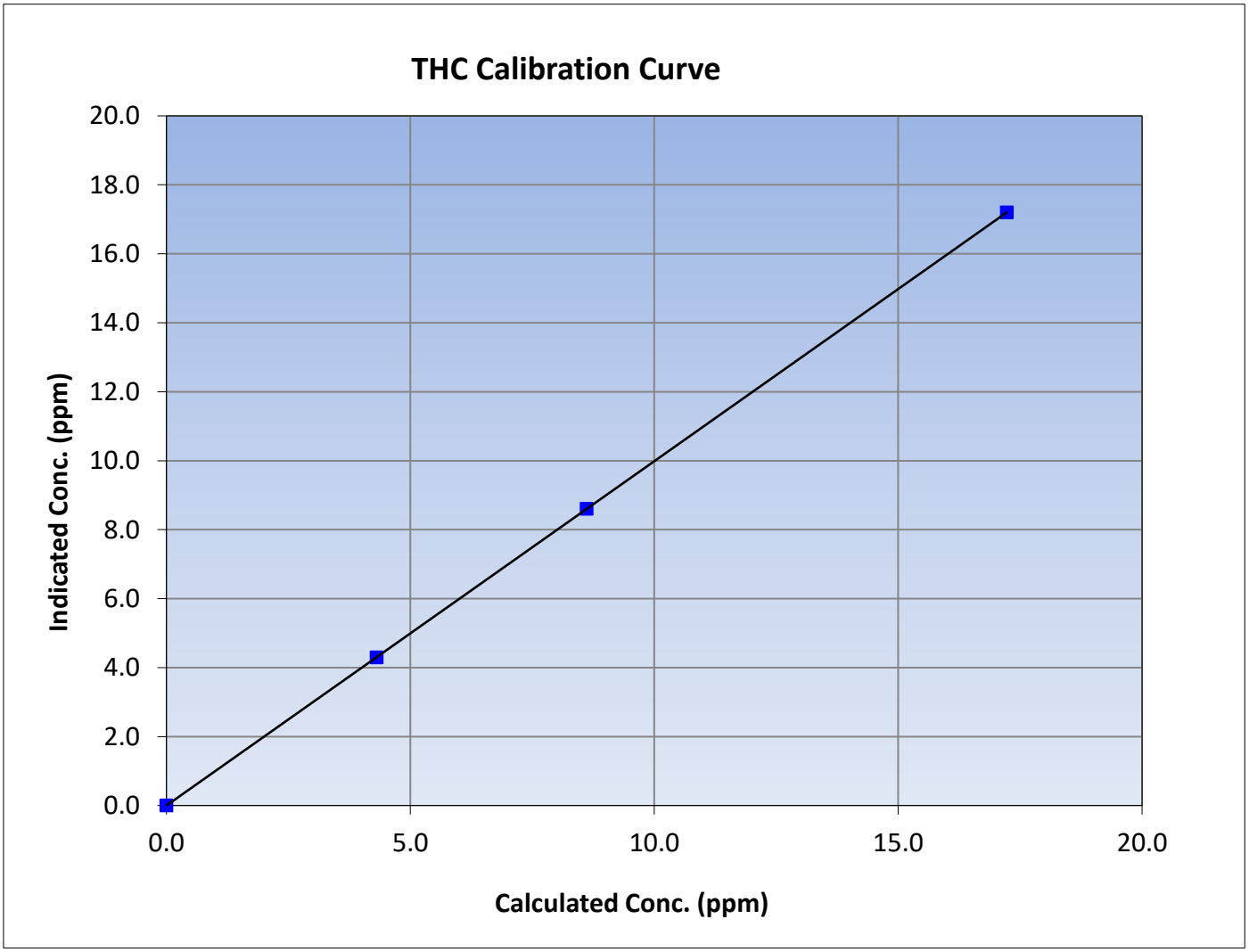
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 10, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 9:30 | End Time (MST): | 12:08 |
| 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 | 1.000000 | *≥0.995* |
| 17.23 | 17.20 | 1.0016 | | | |
| 8.61 | 8.61 | 1.0009 | Slope | 0.998544 | *0.90 - 1.10* |
| 4.31 | 4.30 | 1.0024 | | | |
| | | | Intercept | -0.000400 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

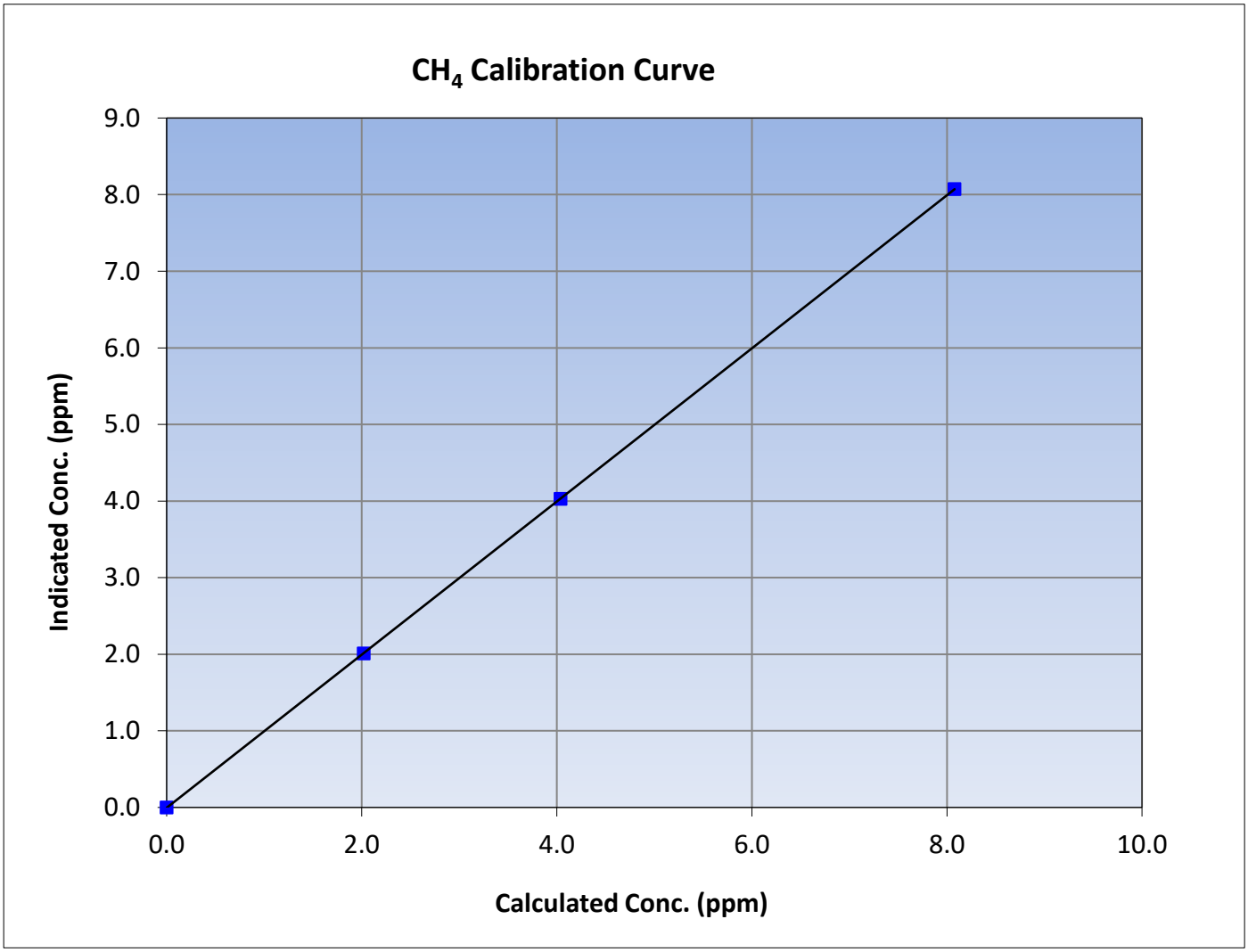
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 10, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 9:30 | End Time (MST): | 12:08 |
| 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* |
| 8.08 | 8.07 | 1.0007 | | | |
| 4.04 | 4.03 | 1.0023 | Slope | 0.999590 | *0.90 - 1.10* |
| 2.02 | 2.01 | 1.0048 | | | |
| | | | Intercept | -0.004600 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

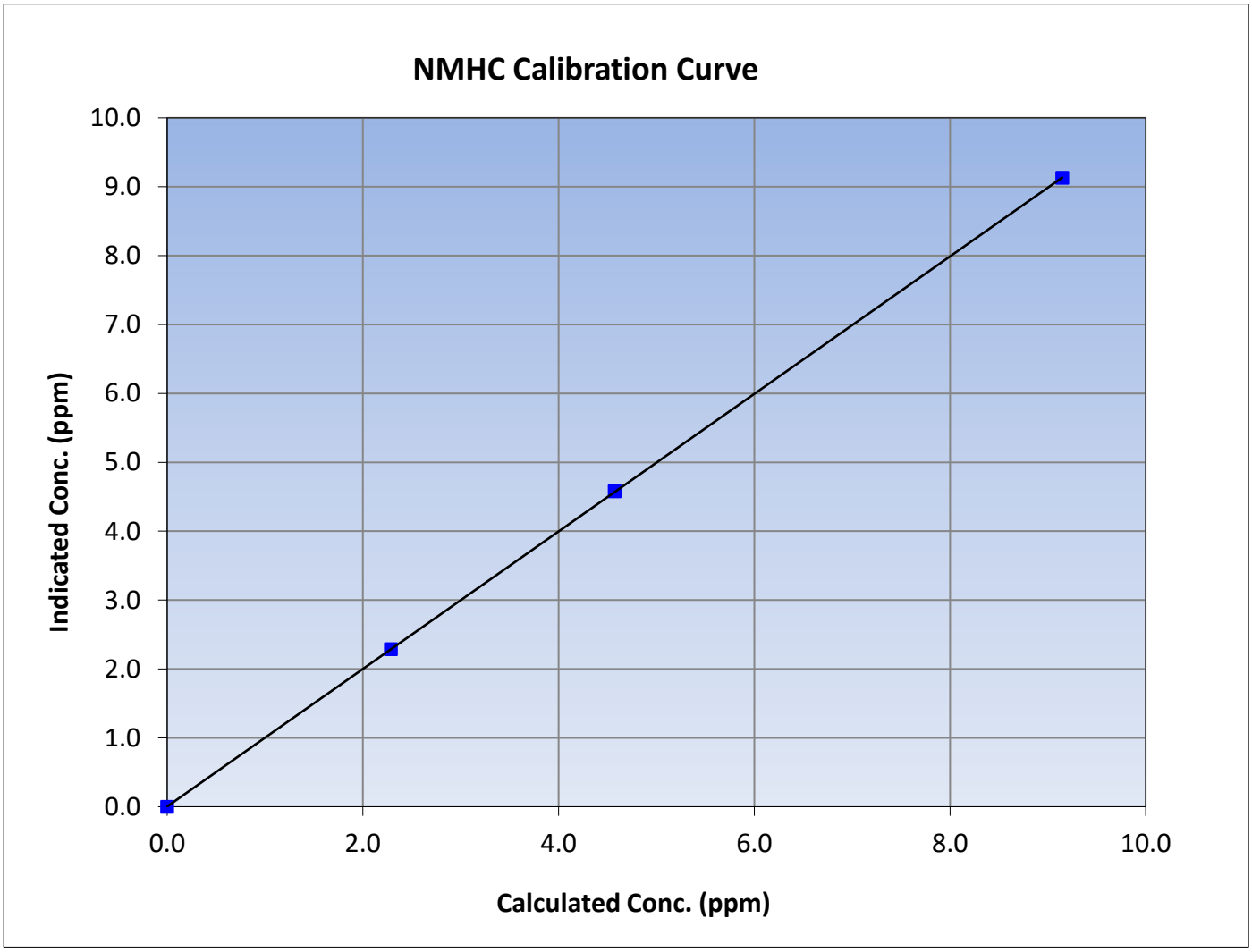
Version-06-2022

### Station Information

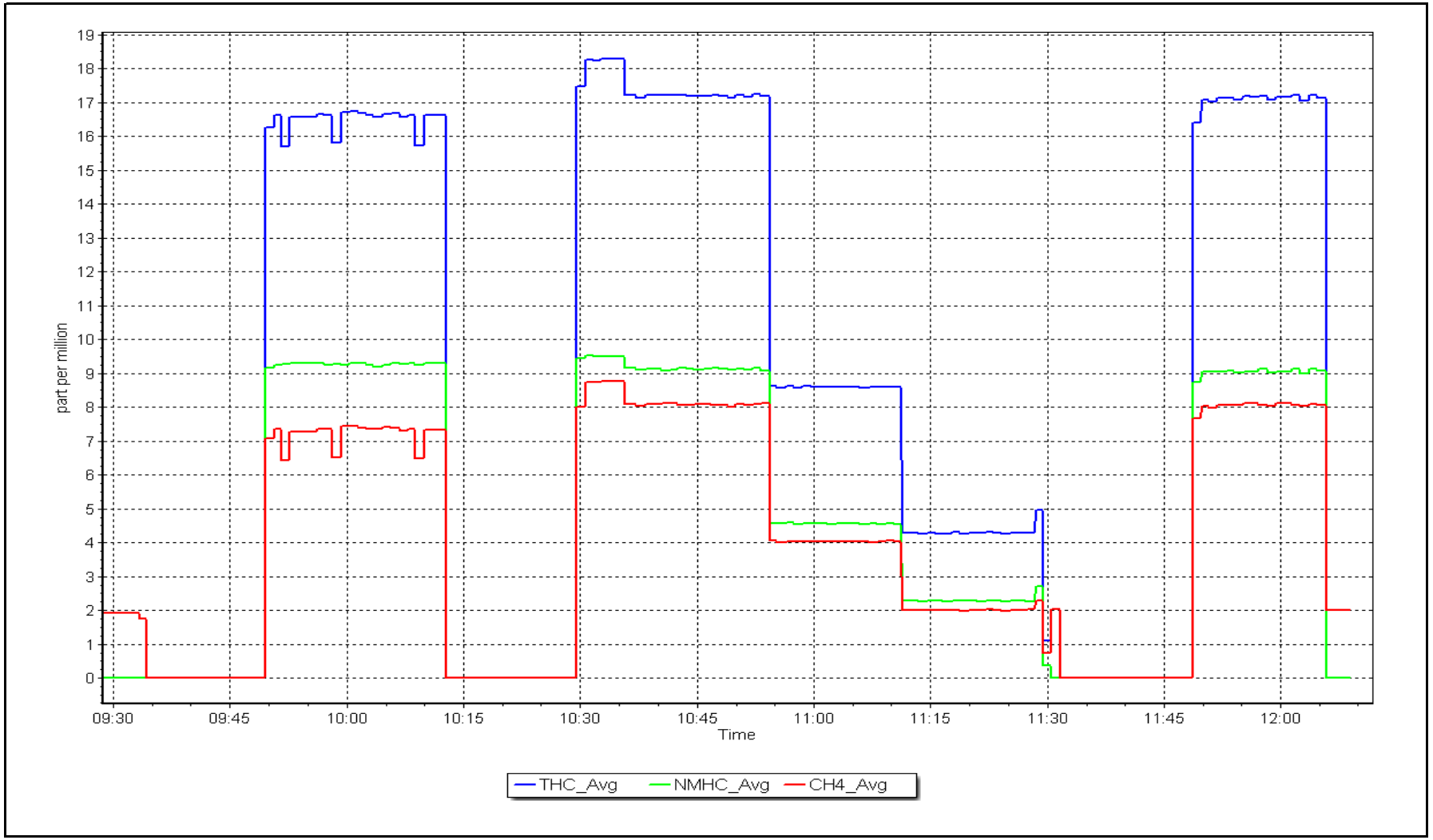
| | | | |
|---|---|---|---|
| Calibration Date: | March 10, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 9:30 | End Time (MST): | 12:08 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### 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 | 9.13 | 1.0019 | | | |
| 4.57 | 4.58 | 0.9993 | Slope | 0.998095 | *0.90 - 1.10* |
| 2.29 | 2.29 | 1.0004 | | | |
| | | | Intercept | 0.003800 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 10, 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: | March 13, 2024 | Last Cal Date: | March 10, 2024 |
| Start time (MST): | 8:52 | End time (MST): | 10:12 |
| Reason: | Removal | | |

### 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: | 2.74E-04 | NA | NMHC SP Ratio: | 4.75E-05 | NA |
| CH4 Retention time: | 16.0 | NA | NMHC Peak Area: | 192745 | NA |
| Zero Chromatogram: | ON | 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 | 80.0 | 17.23 | 17.12 | 1.006 |
| as found 2nd point | 4960 | 40.0 | 8.61 | 8.59 | 1.003 |
| as found 3rd point | 4980 | 20.0 | 4.31 | 4.28 | 1.007 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | 17.16 | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 17.12 | Prev response | 17.20 | *% change | -0.5% |
| Baseline Corr 2nd AF: | 8.6 | AF Slope: | 0.994185 | AF Intercept: | 0.003200 |
| Baseline Corr 3rd AF: | 4.3 | 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 | 80.0 | 9.15 | 9.52 | 0.961 |
| as found 2nd point | 4960 | 40.0 | 4.57 | 4.75 | 0.964 |
| as found 3rd point | 4980 | 20.0 | 2.29 | 2.37 | 0.966 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | 9.07 | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 9.52 | Prev response | 9.13 | *% change | 4.0% |
| Baseline Corr 2nd AF: | 4.7 | AF Slope: | 1.040898 | AF Intercept: | -0.008000 |
| Baseline Corr 3rd AF: | 2.4 | AF Correlation: | 0.999996 | * = > +/-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 | 7.60 | 1.063 |
| as found 2nd point | 4960 | 40.0 | 4.04 | 3.84 | 1.051 |
| as found 3rd point | 4980 | 20.0 | 2.02 | 1.91 | 1.058 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | 8.09 | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 7.60 | Prev response | 8.07 | *% change | -6.2% |
| Baseline Corr 2nd AF: | 3.84 | AF Slope: | 0.941063 | AF Intercept: | 0.012000 |
| Baseline Corr 3rd AF: | 1.91 | AF Correlation: | 0.999958 | * = > +/-5% change initiates investigation | |

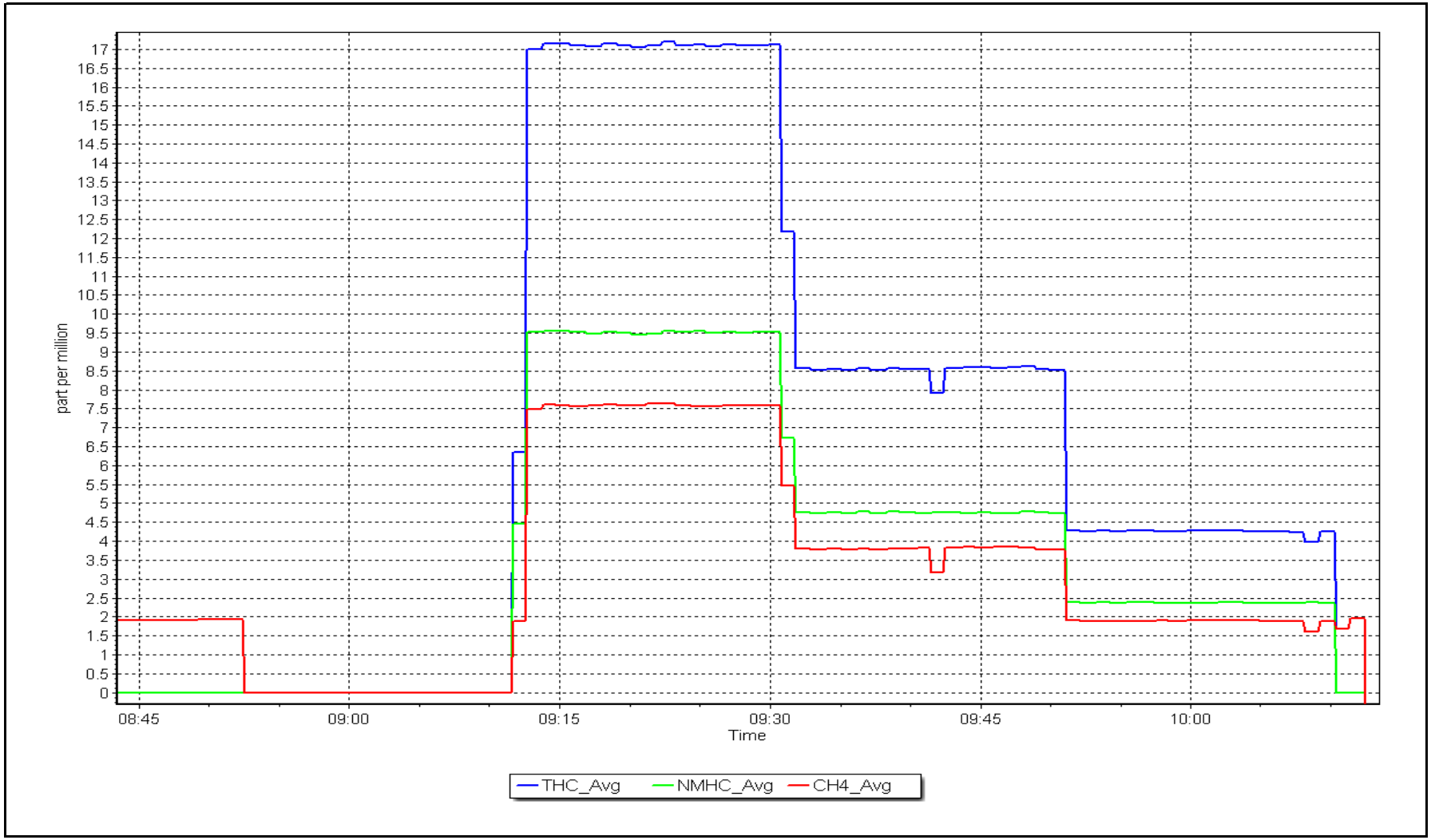
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.998544 | |
| THC Cal Offset: | -0.000400 | |
| CH4 Cal Slope: | 0.999590 | |
| CH4 Cal Offset: | -0.004600 | |
| NMHC Cal Slope: | 0.998095 | |
| NMHC Cal Offset: | 0.003800 | |

Notes: Removal Calibration.

Calibration Performed By: Mohammed Kashif

**NMHC Calibration Plot** Date: March 13, 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: | March 13, 2024 | Last Cal Date: | NA |
| Start time (MST): | 11:08 | End time (MST): | 13:25 |
| Reason: | Install | | |

### 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 #: | 1170050130 |
| 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: | NA | 2.76E-04 | NMHC SP Ratio: | NA | 5.97E-05 |
| CH4 Retention time: | NA | 14.4 | NMHC Peak Area: | NA | 153276 |
| 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 | 80.0 | 17.23 | 17.22 | 1.000 |
| second point | 4960 | 40.0 | 8.61 | 8.59 | 1.002 |
| third point | 4980 | 20.0 | 4.31 | 4.30 | 1.003 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 17.23 | 17.30 | 0.996 |
| | | | | 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 | |

# 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 | 9.15 | 1.000 |
| second point | 4960 | 40.0 | 4.57 | 4.60 | 0.994 |
| third point | 4980 | 20.0 | 2.29 | 2.32 | 0.987 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 9.15 | 9.23 | 0.991 |
| | | | | Average Correction Factor | 0.994 |
| 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 | 8.07 | 1.001 |
| second point | 4960 | 40.0 | 4.04 | 3.99 | 1.012 |
| third point | 4980 | 20.0 | 2.02 | 1.98 | 1.021 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.0 | 8.08 | 8.06 | 1.002 |
| | | | | Average Correction Factor | 1.011 |
| 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: | | 0.999917 |
| THC Cal Offset: | | -0.008000 |
| CH4 Cal Slope: | | 1.000113 |
| CH4 Cal Offset: | | -0.024200 |
| NMHC Cal Slope: | | 0.999769 |
| NMHC Cal Offset: | | 0.016600 |

Notes: Install calibration. Sample inlet filter changed. Adjusted span only.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

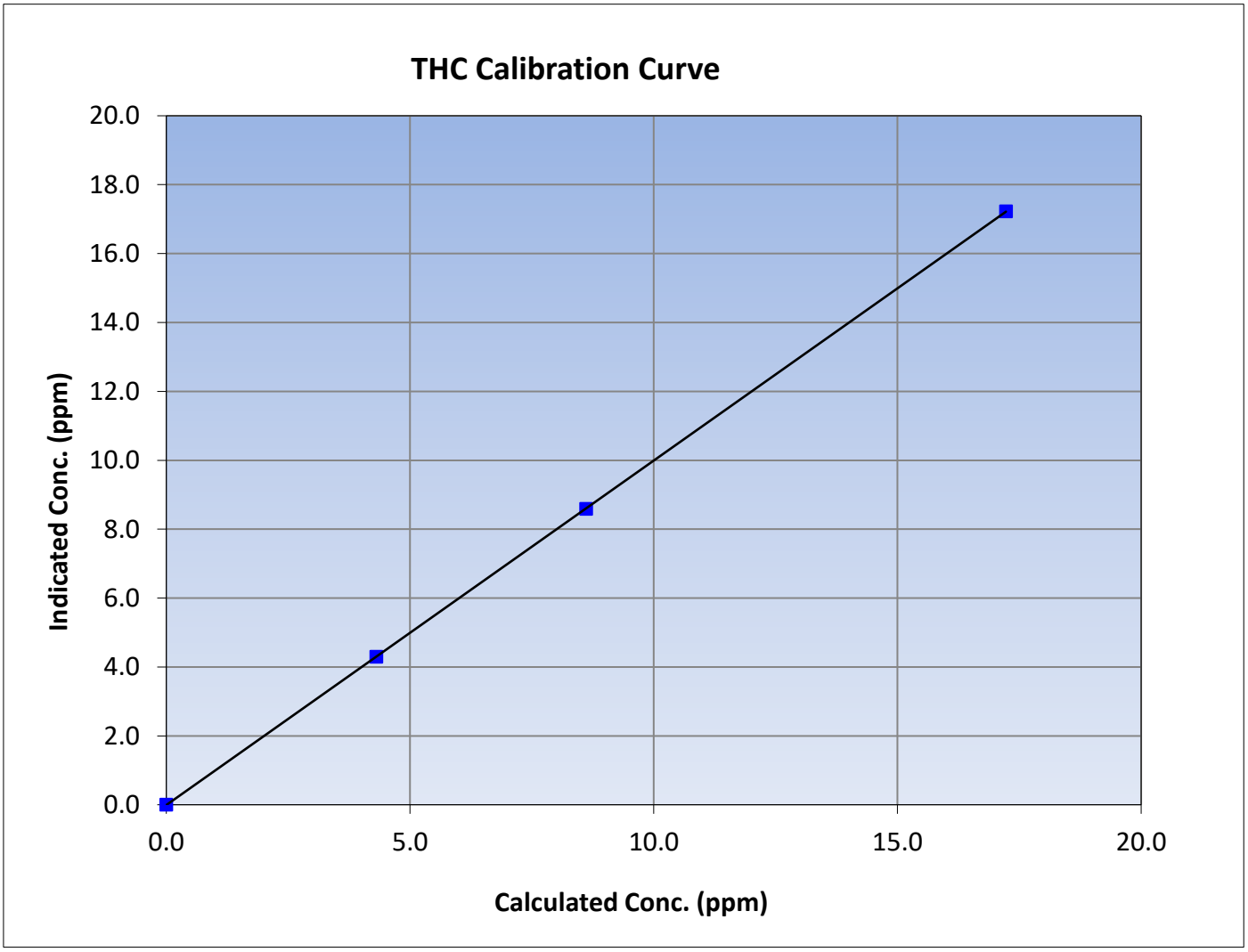
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | NA |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 11:08 | End Time (MST): | 13:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1170050130 |

### 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 | 17.22 | 1.0002 | | | |
| 8.61 | 8.59 | 1.0023 | Slope | 0.999917 | 0.90 - 1.10 |
| 4.31 | 4.30 | 1.0027 | | | |
| | | | Intercept | -0.008000 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

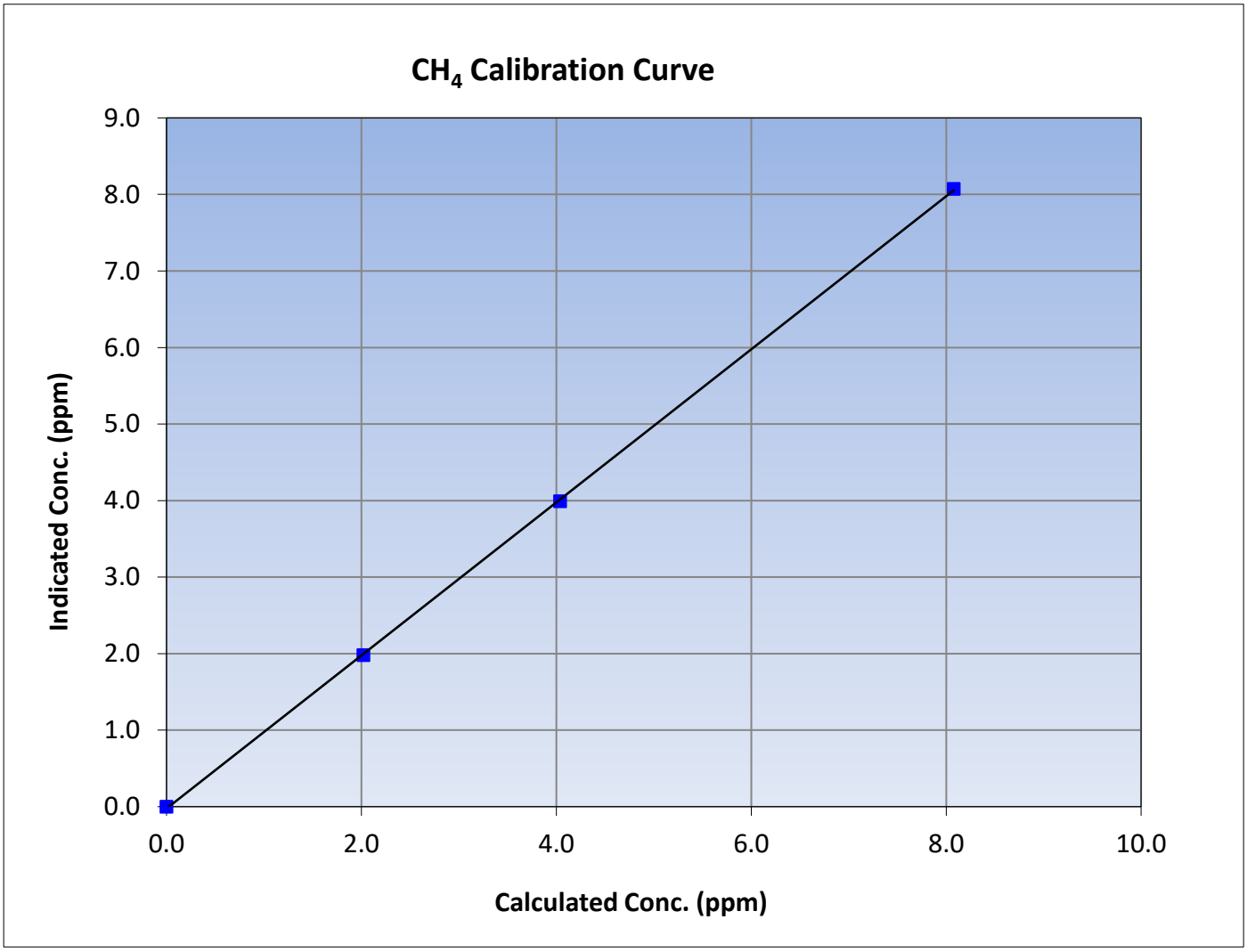
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | NA |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 11:08 | End Time (MST): | 13:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1170050130 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999953 | ≥0.995 |
| 8.08 | 8.07 | 1.0009 | | | |
| 4.04 | 3.99 | 1.0118 | Slope | 1.000113 | 0.90 - 1.10 |
| 2.02 | 1.98 | 1.0205 | | | |
| | | | Intercept | -0.024200 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

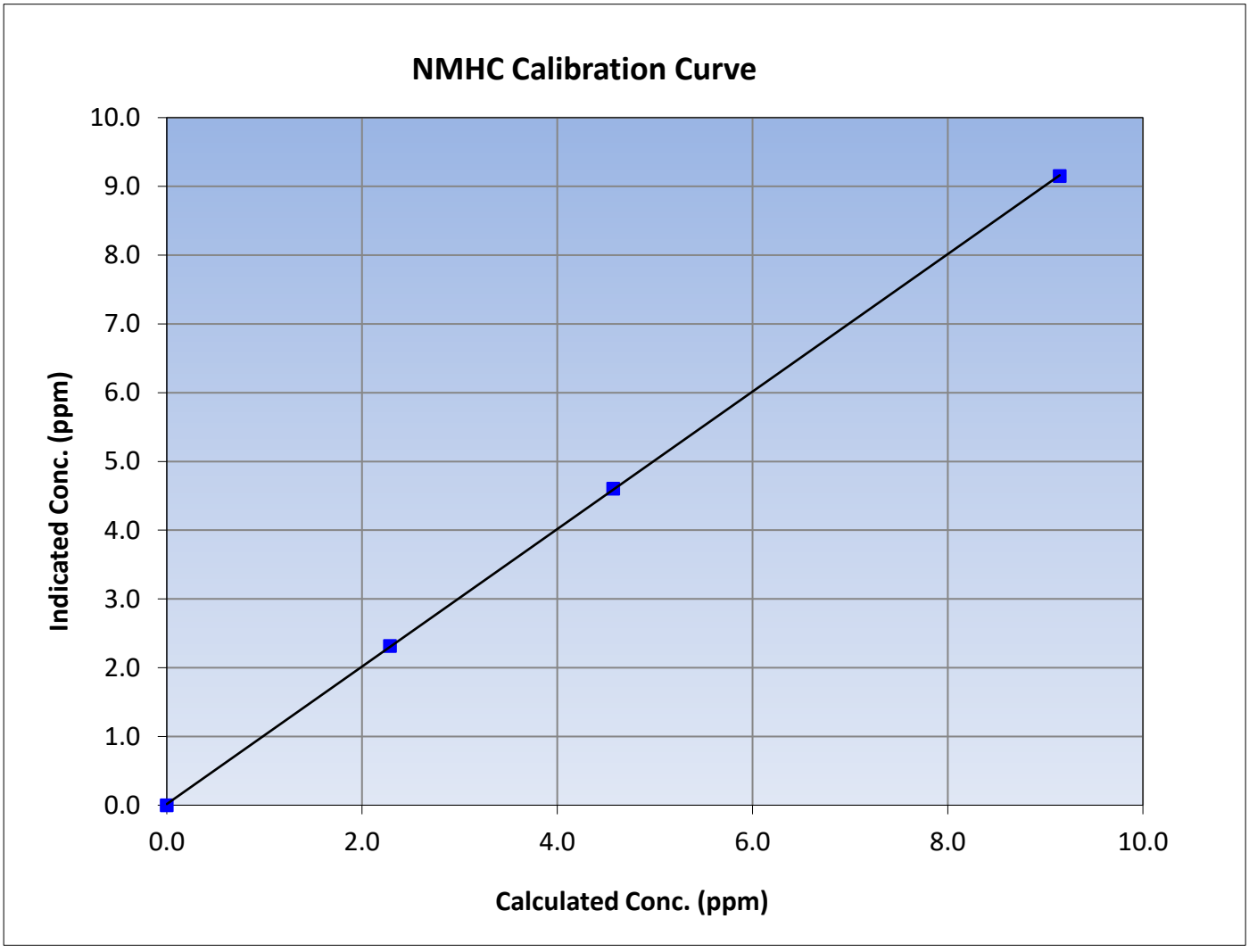
Version-06-2022

### Station Information

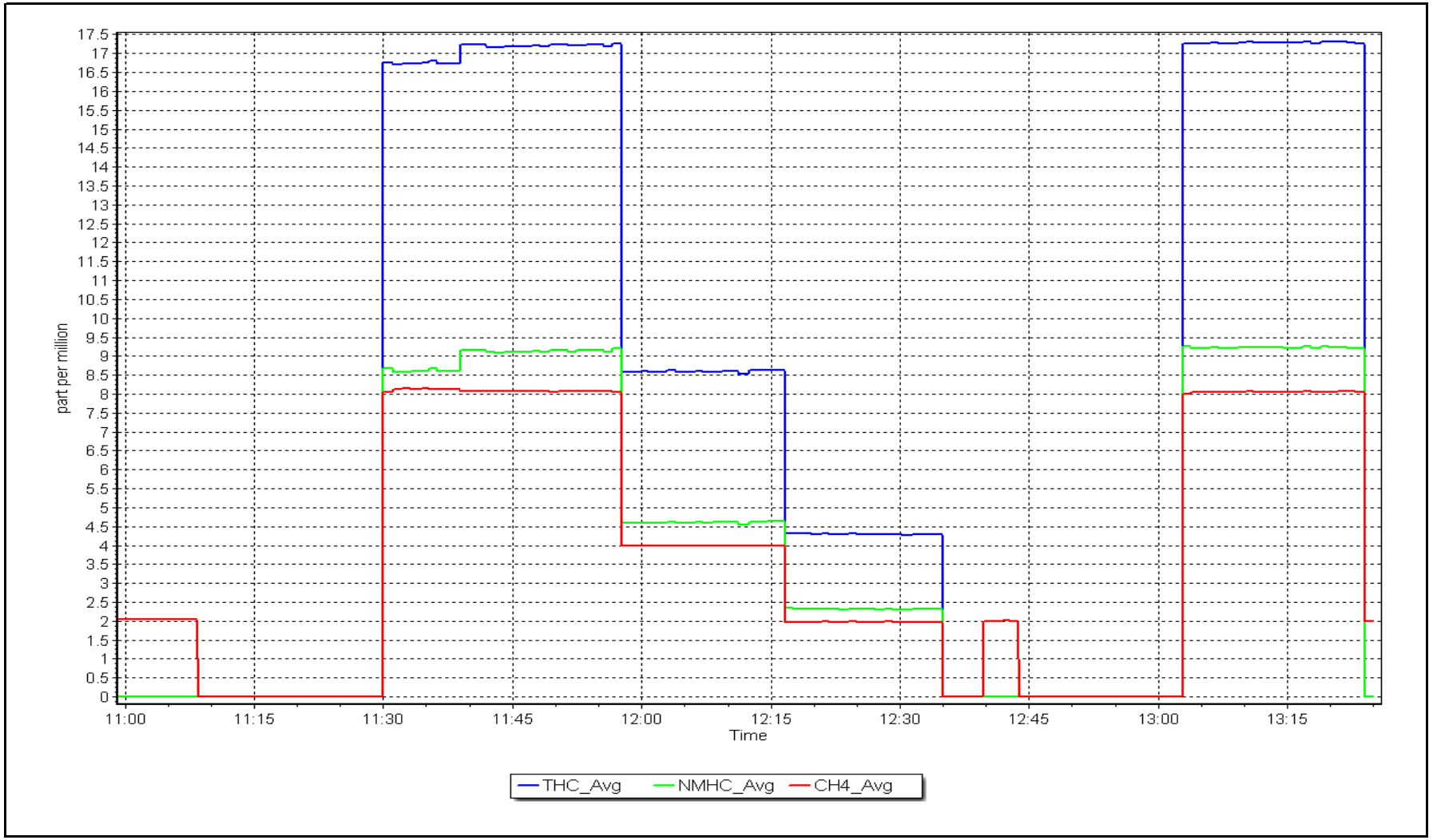
| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | NA |
| Station Name: | Mannix | Station Number: | AMS 05 |
| Start Time (MST): | 11:08 | End Time (MST): | 13:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1170050130 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999984 | ≥0.995 |
| 9.15 | 9.15 | 0.9995 | | | |
| 4.57 | 4.60 | 0.9937 | Slope | 0.999769 | 0.90 - 1.10 |
| 2.29 | 2.32 | 0.9874 | | | |
| | | | Intercept | 0.016600 | +/-0.5 |



**NMHC Calibration Plot** Date: March 13, 2024 Location: Mannix



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS06
## PATRICIA MCINNES
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Patricia McInnes | Station number: | AMS06 |
| Calibration Date: | March 7, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 10:20 | End time (MST): | 14:15 |
| 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: | 0.996386 | 0.997030 | Backgd or Offset: | 17.7 | 17.7 |
| Calibration intercept: | 1.161262 | 1.560821 | 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 | 0.2 | ---- |
| as found span | 4920 | 80.3 | 799.5 | 794.9 | 1.006 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4920 | 80.3 | 799.5 | 798.0 | 1.002 |
| second point | 4960 | 40.2 | 400.2 | 401.2 | 0.998 |
| third point | 4980 | 20.1 | 200.1 | 202.5 | 0.988 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 80.3 | 799.5 | 797.9 | 1.002 |
| | | | | Average Correction Factor | 0.996 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 794.70 | Previous response | 797.74 | *% 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: Max Farrell

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

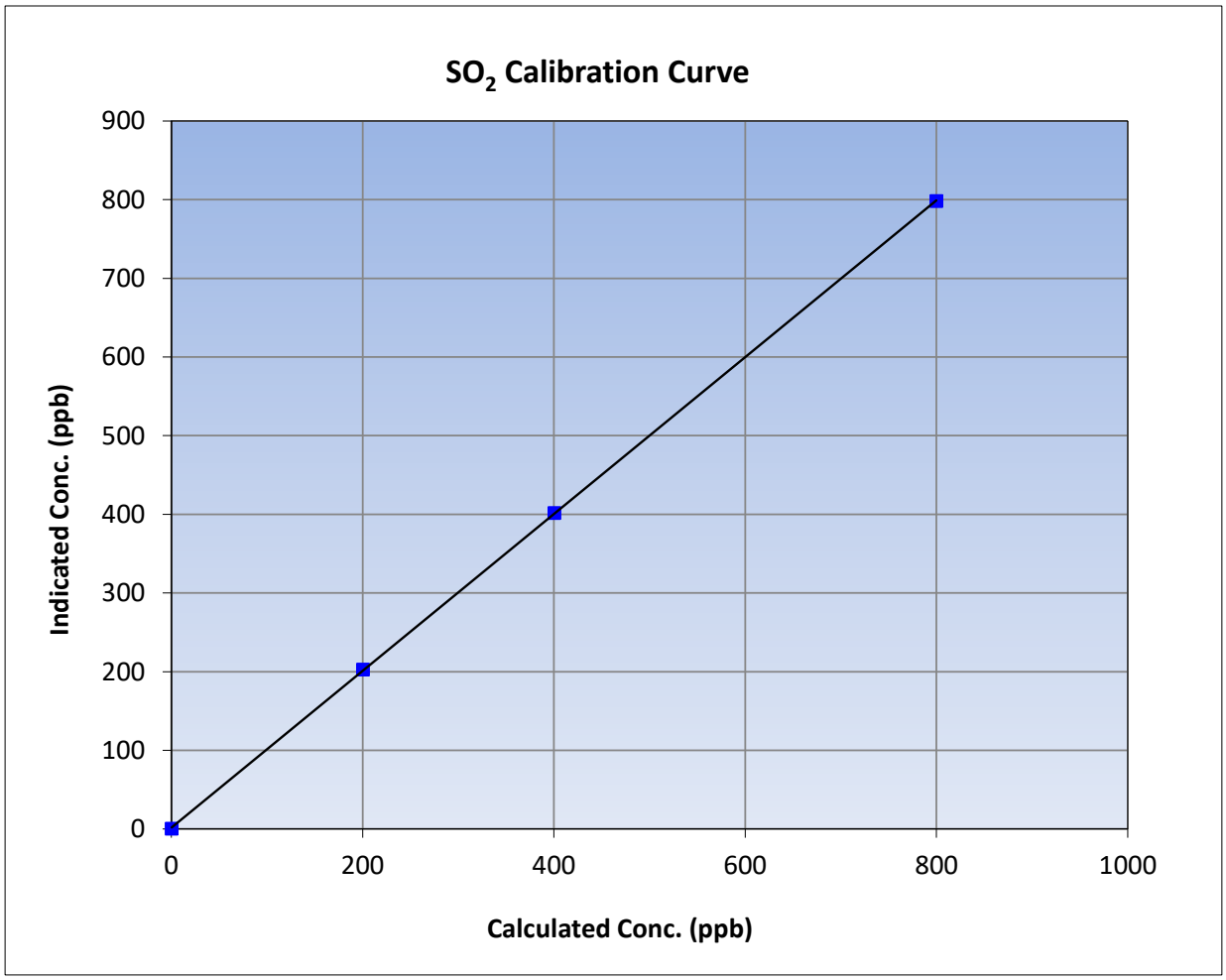
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:20 | End Time (MST): | 14:15 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1160290013 |

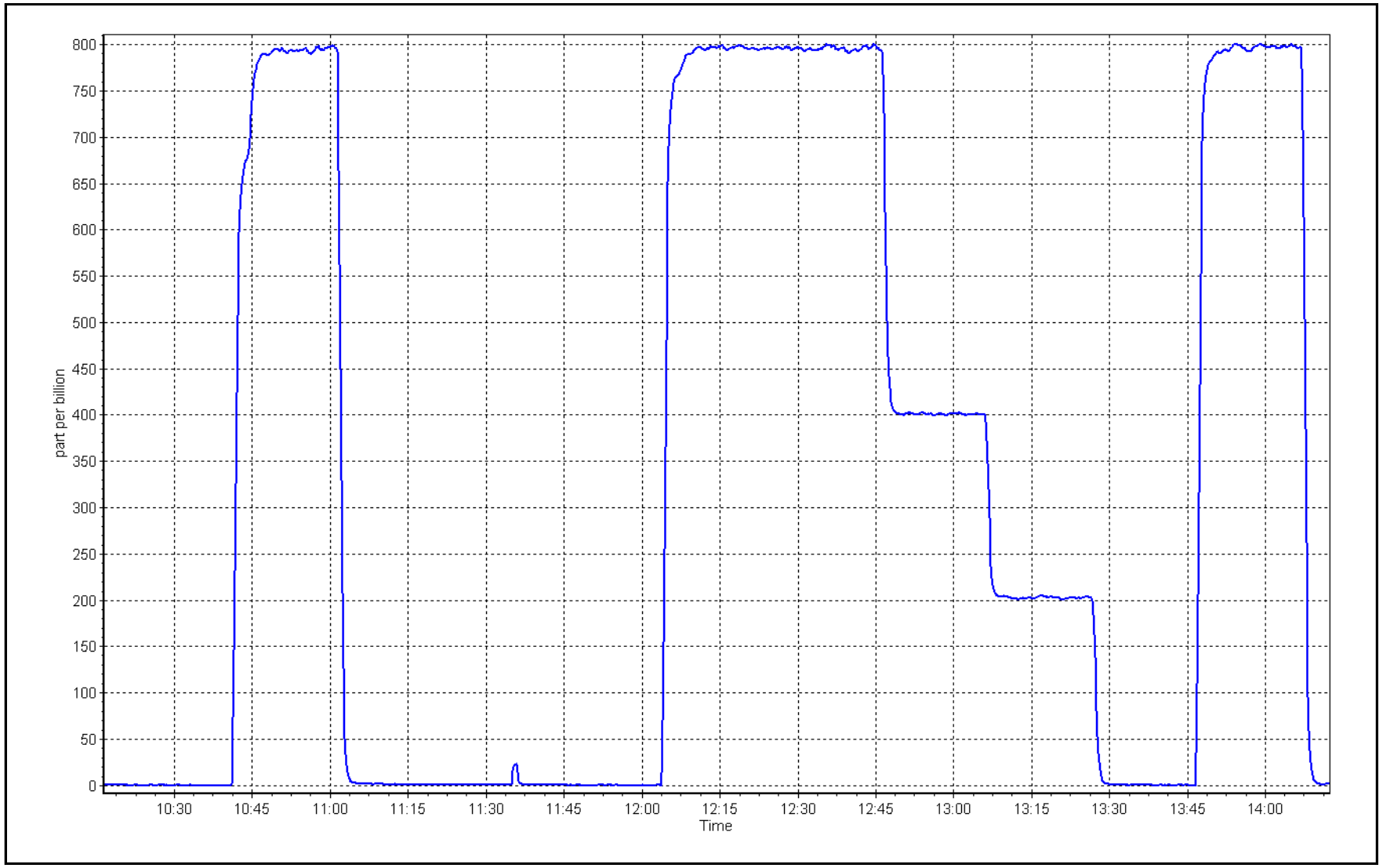
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 799.5 | 798.0 | 1.0018 |
| 400.2 | 401.2 | 0.9976 |
| 200.1 | 202.5 | 0.9882 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999987 | *≥0.995* |
| Slope | 0.997030 | *0.90 - 1.10* |
| Intercept | 1.560821 | *+/-30* |



**SO2 Calibration Plot** Date: March 7, 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: | March 8, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 9:29 | End time (MST): | 13:30 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i TLE | | Analyzer serial #: | 1218153358 | |
| Converter make: | CDN-101 | | Converter serial #: | 517 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.994029 | 0.993746 | Backgd or Offset: | 1.95 | 1.95 |
| Calibration intercept: | 0.280242 | 0.540147 | 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 | 80.1 | 1.000 |
| as found 2nd point | 4963 | 37.5 | 40.0 | 40.3 | 0.994 |
| as found 3rd point | 4981 | 18.8 | 20.0 | 20.6 | 0.977 |
| 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 | 75.1 | 80.0 | 79.9 | 1.002 |
| second point | 4963 | 37.5 | 40.0 | 40.4 | 0.989 |
| third point | 4981 | 18.8 | 20.0 | 20.8 | 0.963 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4925 | 75.1 | 80.0 | 80.9 | 0.989 |
| SO2 Scrubber Check | 4920 | 80.3 | 803.0 | 0.0 | ---- |
| Date of last scrubber change: | | December 20, 2021 | | Ave Corr Factor | 0.985 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.0 | Prev response: | 79.83 | *% change: | 0.2% |
| Baseline Corr 2nd AF pt: | 40.2 | AF Slope: | 0.998032 | AF Intercept: | 0.340131 |
| Baseline Corr 3rd AF pt: | 20.5 | AF Correlation: | 0.999958 | | |

* = > +/-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

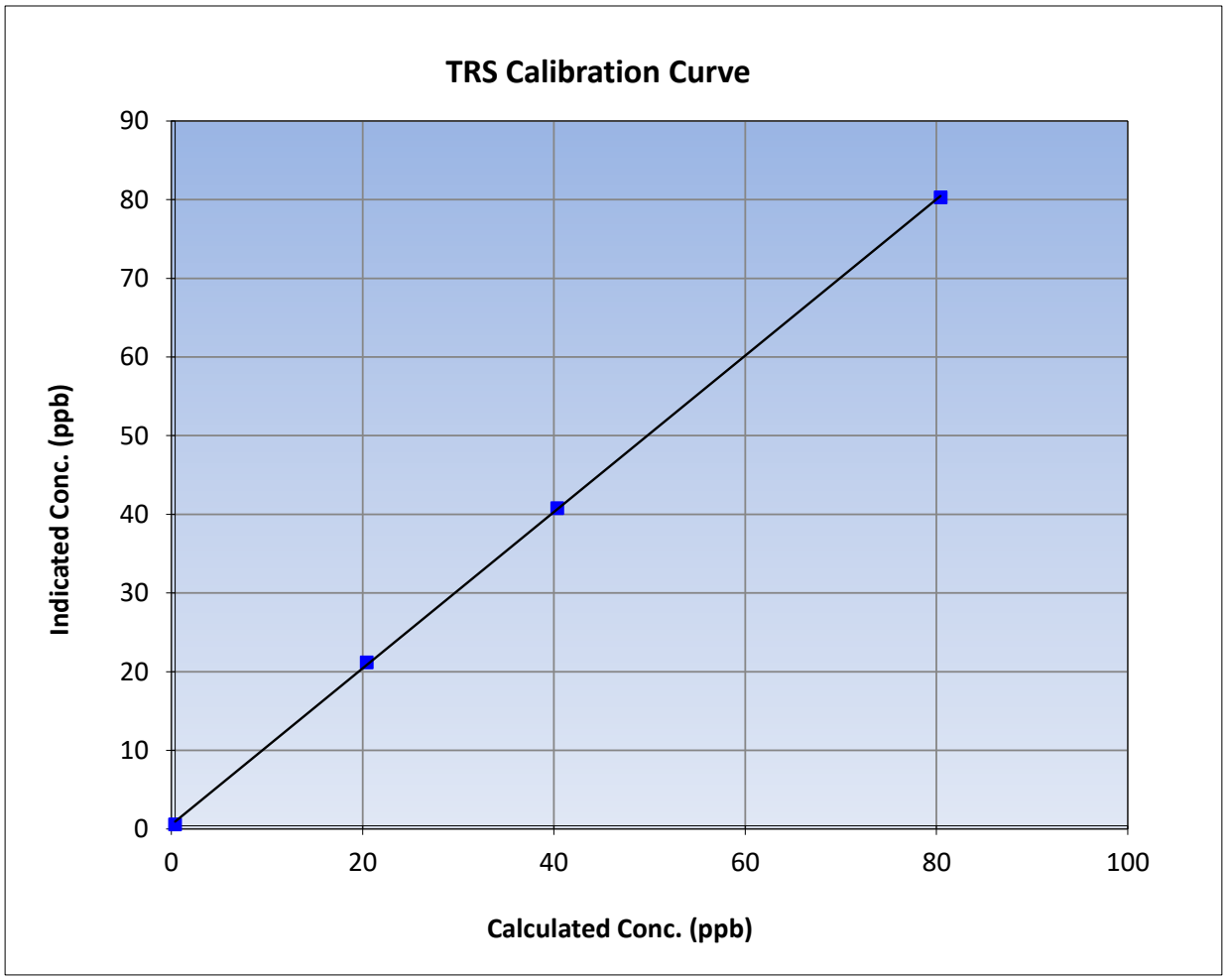
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:29 | End Time (MST): | 13:30 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1218153358 |

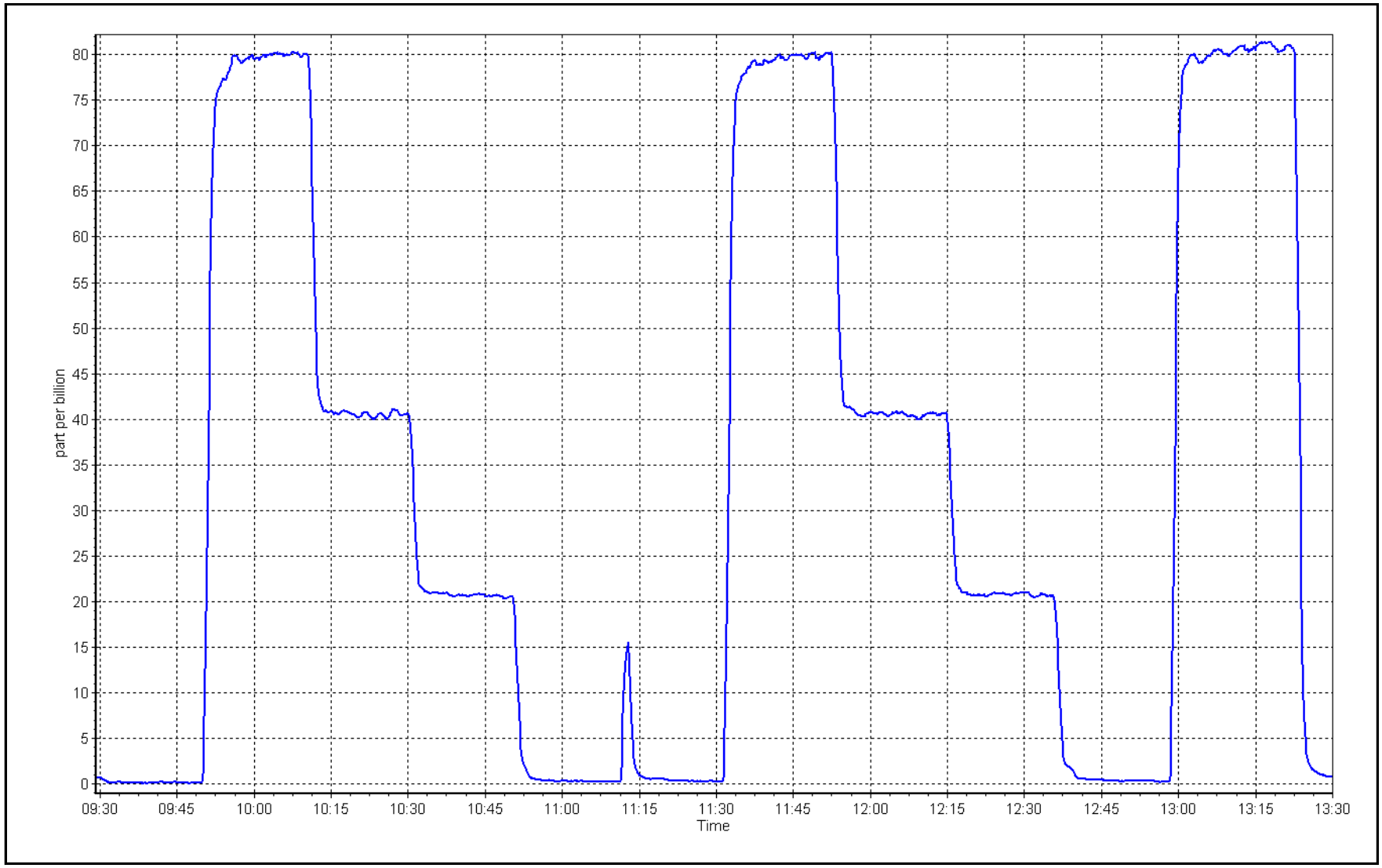
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 79.9 | 1.0016 |
| 40.0 | 40.4 | 0.9890 |
| 20.0 | 20.8 | 0.9632 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999916 | ≥0.995 |
| Slope | 0.993746 | 0.90 - 1.10 |
| Intercept | 0.540147 | +/-3 |



**TRS Calibration Plot** Date: March 8, 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: | March 7, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 10:20 | 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: | 2.15E-04 | 2.21E-04 | NMHC SP Ratio: | 4.71E-05 | 4.84E-05 |
| CH4 Retention time: | 14.2 | 14.2 | NMHC Peak Area: | 192619 | 187266 |
| 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 | 16.81 | 1.018 |
| 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 | 17.12 | 1.000 |
| second point | 4960 | 40.2 | 8.57 | 8.58 | 0.999 |
| third point | 4980 | 20.1 | 4.29 | 4.35 | 0.986 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 17.12 | 17.12 | 1.000 |
| | | | | Average Correction Factor | 0.995 |
| Baseline Corr AF: | 16.81 | Prev response | 17.05 | *% change | -1.4% |
| 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 | 8.94 | 1.015 |
| 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 | 9.07 | 1.000 |
| second point | 4960 | 40.2 | 4.54 | 4.56 | 0.995 |
| third point | 4980 | 20.1 | 2.27 | 2.32 | 0.979 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919.7 | 80.3 | 9.07 | 9.08 | 0.999 |
| | | | | Average Correction Factor | 0.991 |
| Baseline Corr AF: | 8.93 | Prev response | 9.04 | *% change | -1.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 7.88 | 1.023 |
| 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 | 8.05 | 1.001 |
| second point | 4960 | 40.2 | 4.03 | 4.02 | 1.004 |
| third point | 4980 | 20.1 | 2.02 | 2.03 | 0.995 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919.7 | 80.3 | 8.06 | 8.04 | 1.001 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 7.88 | Prev response | 8.00 | *% change | -1.6% |
| 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: | 0.994828 | 0.998467 |
| THC Cal Offset: | 0.012664 | 0.026638 |
| CH4 Cal Slope: | 0.993816 | 0.998356 |
| CH4 Cal Offset: | -0.003140 | 0.002848 |
| NMHC Cal Slope: | 0.995576 | 0.998464 |
| NMHC Cal Offset: | 0.016404 | 0.024190 |

Notes: Changed the inlet filter and reconnected the instrument to a H2 generator. Adjusted the span only.

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## THC Calibration Summary

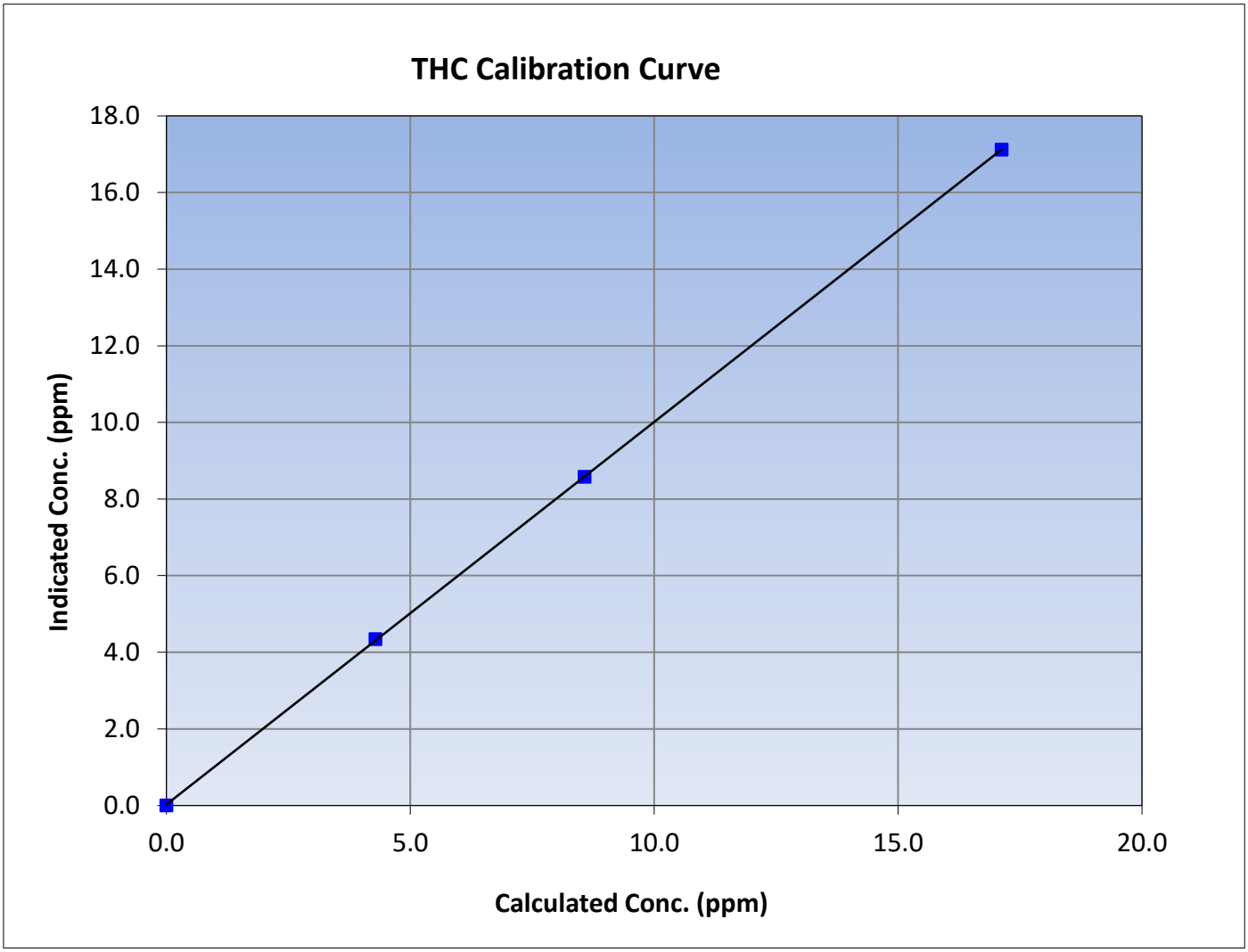
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:20 | 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 | 0.999986 | *≥0.995* |
| 17.12 | 17.12 | 1.0003 | | | |
| 8.57 | 8.58 | 0.9993 | Slope | 0.998467 | *0.90 - 1.10* |
| 4.29 | 4.35 | 0.9864 | | | |
| | | | Intercept | 0.026638 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

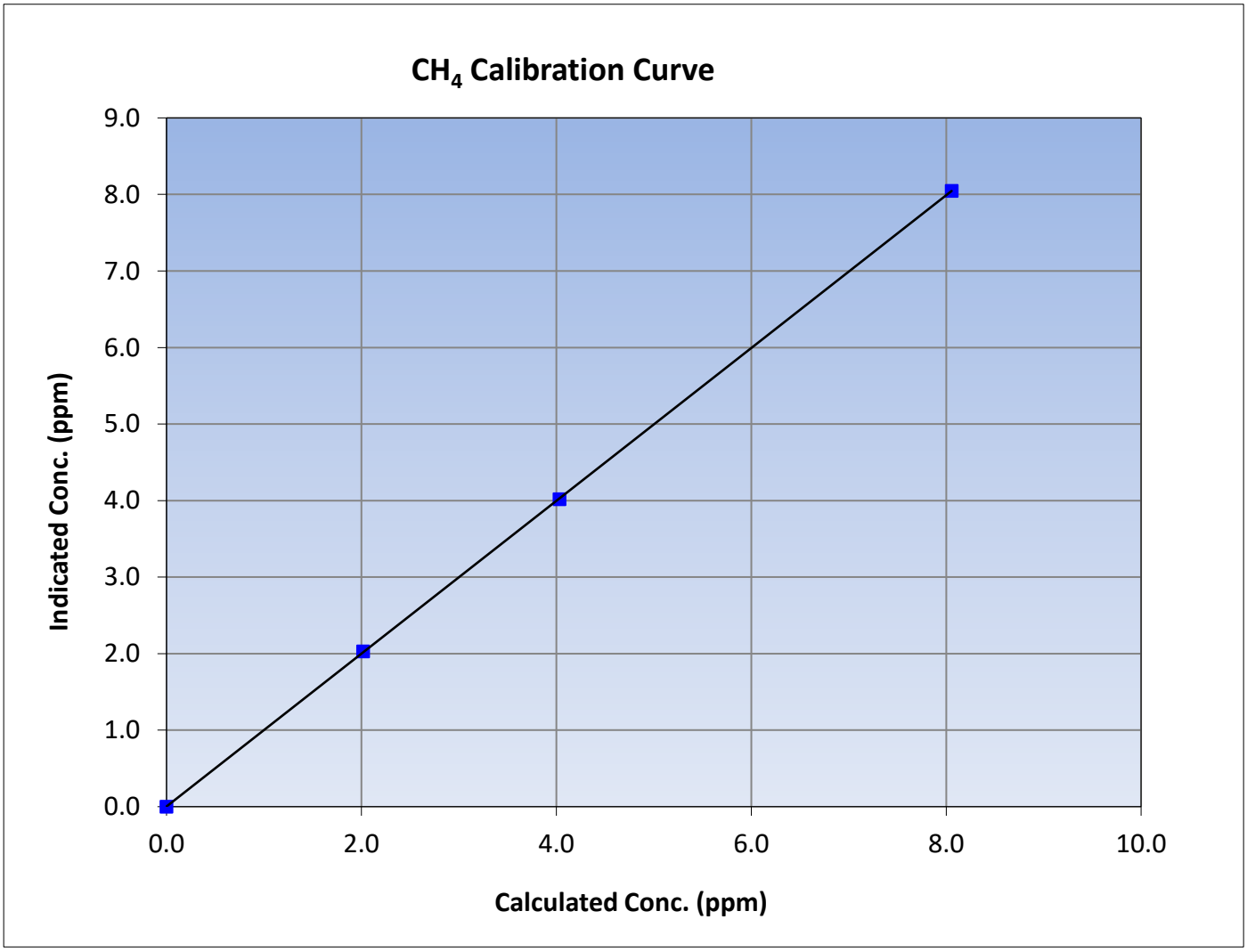
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:20 | 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 | 0.999993 | ≥0.995 |
| 8.06 | 8.05 | 1.0010 | | | |
| 4.03 | 4.02 | 1.0037 | Slope | 0.998356 | 0.90 - 1.10 |
| 2.02 | 2.03 | 0.9948 | | | |
| | | | Intercept | 0.002848 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

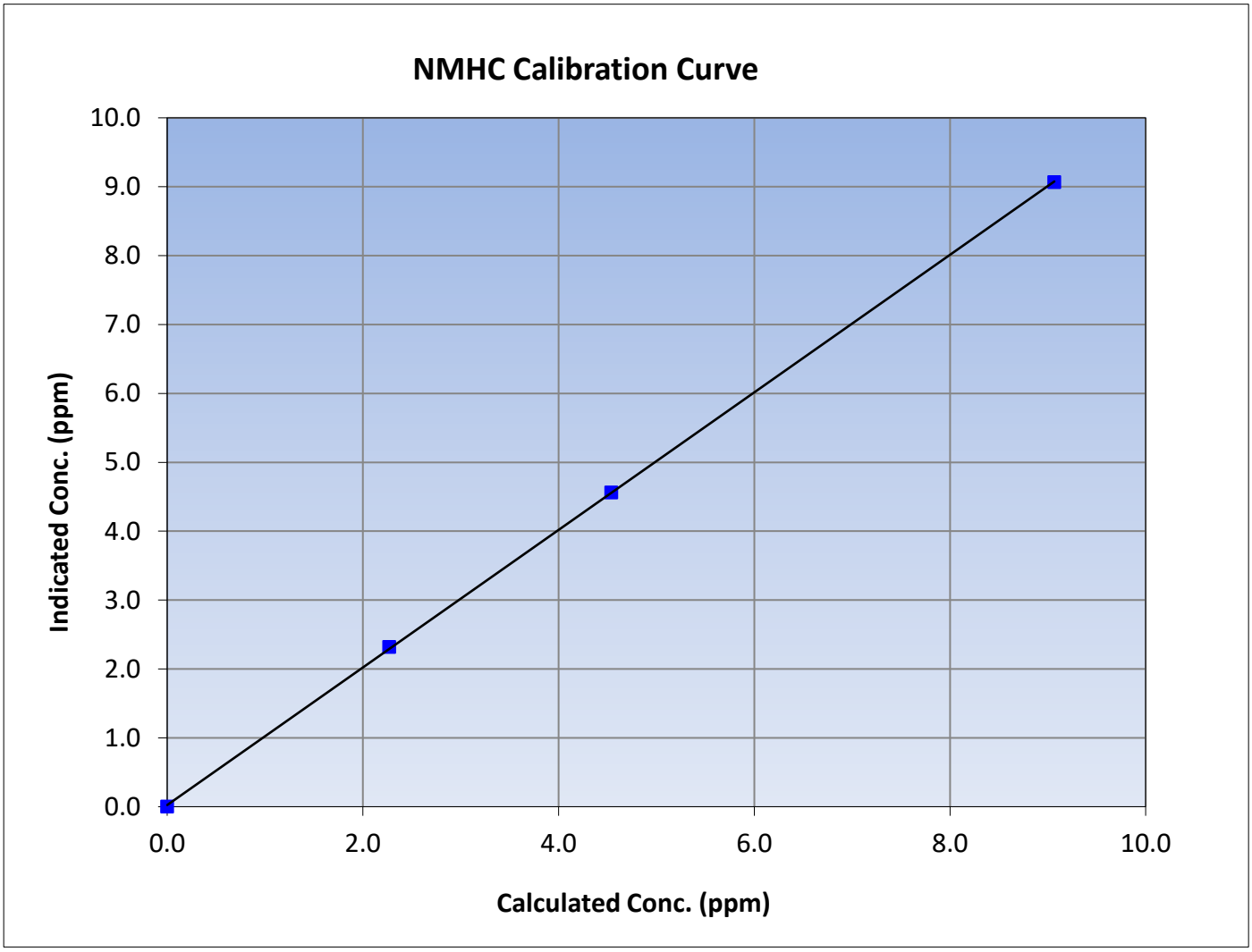
Version-06-2022

### Station Information

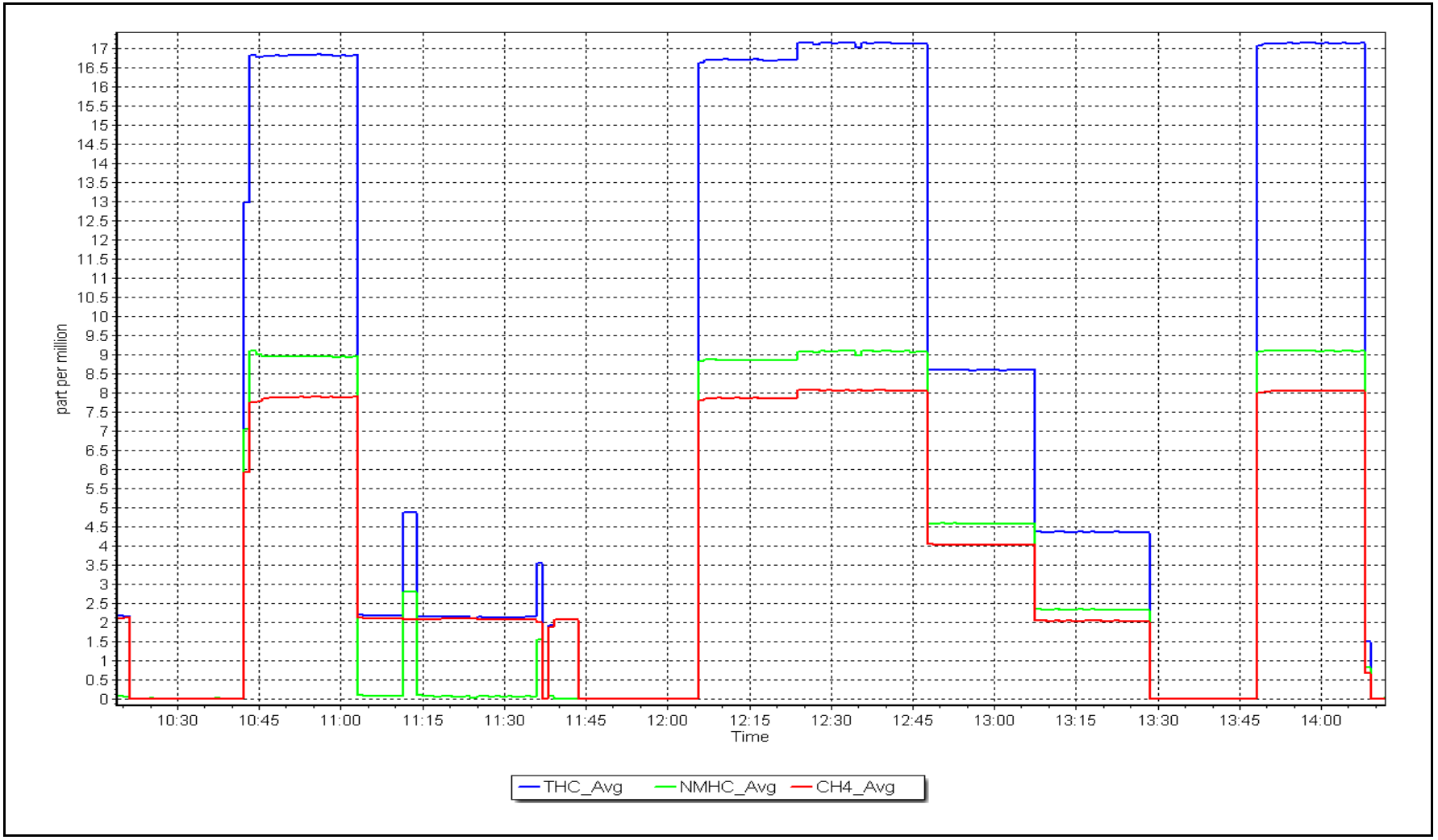
| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 10:20 | End Time (MST): | 14:15 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148495 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999968 | ≥0.995 |
| 9.07 | 9.07 | 0.9999 | | | |
| 4.54 | 4.56 | 0.9952 | Slope | 0.998464 | 0.90 - 1.10 |
| 2.27 | 2.32 | 0.9791 | | | |
| | | | Intercept | 0.024190 | +/-0.5 |



**NMHC Calibration Plot** Date: March 7, 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: | March 5, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 9:58 | End time (MST): | 14:41 |
| 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: | 1.000023 | 1.002416 |
| $NO_X$ Cal Offset: | 2.315635 | 1.975128 |
| NO Cal Slope: | 1.002417 | 1.003032 |
| NO Cal Offset: | 1.022423 | 1.382192 |
| $NO_2$ Cal Slope: | 0.999140 | 0.999602 |
| $NO_2$ Cal Offset: | -0.524585 | -0.538439 |

# 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 | 832.5 | 804.7 | 27.8 | 0.9927 | 0.9938 |
| 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 | 4914 | 86.2 | 826.5 | 799.7 | 26.7 | 829.5 | 803.0 | 26.6 | 0.9963 | 0.9959 |
| second point | 4957 | 43.1 | 413.2 | 399.9 | 13.4 | 417.0 | 403.1 | 13.9 | 0.9910 | 0.9920 |
| third point | 4978 | 21.6 | 207.1 | 200.4 | 6.7 | 211.7 | 203.3 | 8.4 | 0.9784 | 0.9858 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | -0.4 | ---- | ---- |
| as left span | 4914 | 86.2 | 826.5 | 399.1 | 427.3 | 827.0 | 402.2 | 424.8 | 0.9993 | 0.9924 |
| | | | | | | | | Average Correction Factor | 0.9885 | 0.9913 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 832.7 ppb | NO = 804.5 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | 0.5% |
| Previous Response | $NO_X$ = 828.8 ppb | NO = 802.7 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) | 801.3 | 400.7 | 427.3 | 426.7 | 1.0015 | 99.9% |
| 2nd GPT point (200 ppb O3) | 801.3 | 604.0 | 224.0 | 223.3 | 1.0032 | 99.7% |
| 3rd GPT point (100 ppb O3) | 801.3 | 703.3 | 124.7 | 124.0 | 1.0058 | 99.4% |
| | | | | Average Correction Factor | 1.0035 | 99.7% |

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

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

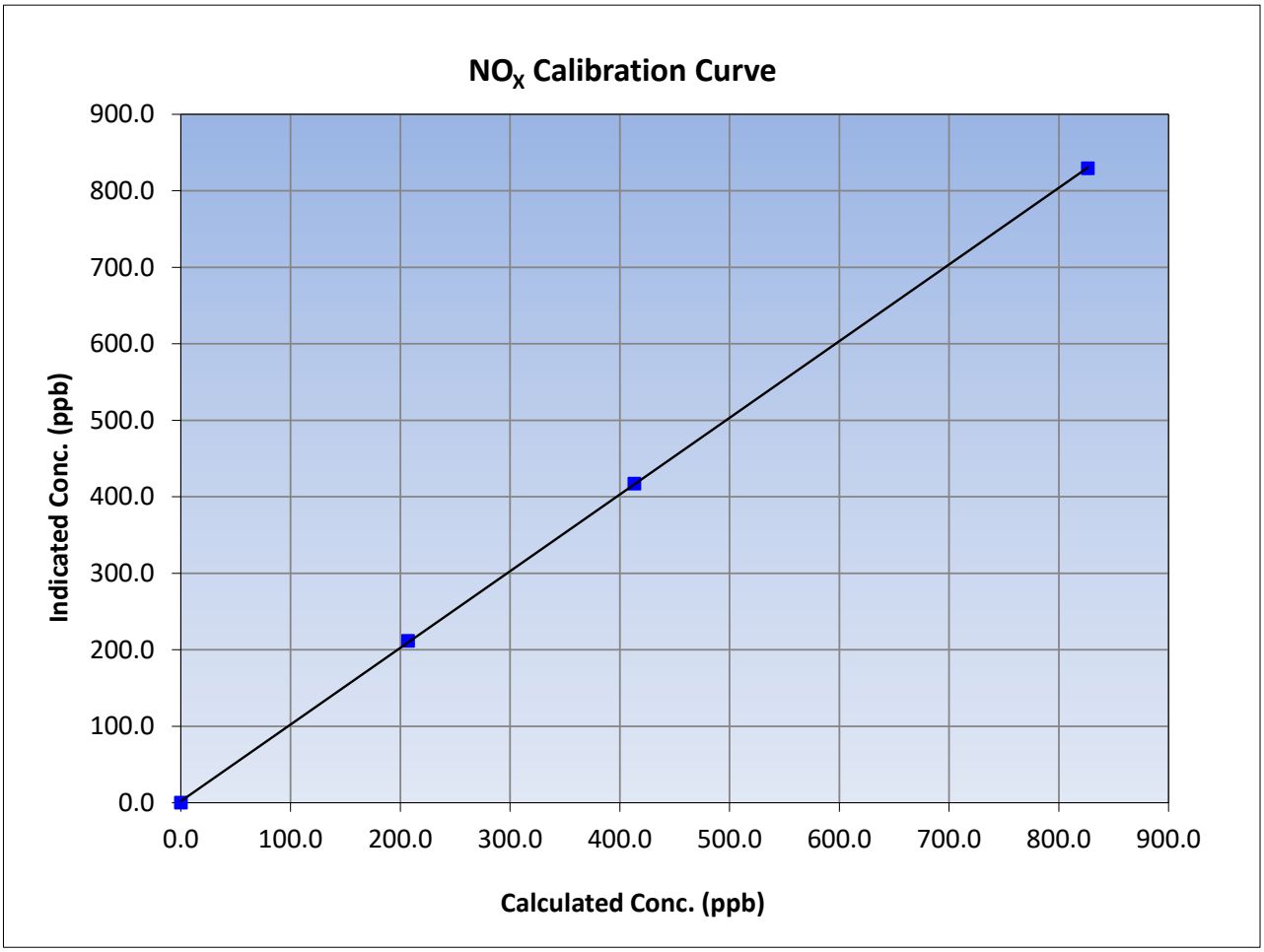
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 9:58 | End Time (MST): | 14:41 |
| 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 | 0.0 | ---- | Correlation Coefficient | 0.999974 | *≥0.995* |
| 826.5 | 829.5 | 0.9963 | | | |
| 413.2 | 417.0 | 0.9910 | Slope | 1.002416 | *0.90 - 1.10* |
| 207.1 | 211.7 | 0.9784 | | | |
| | | | Intercept | 1.975128 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

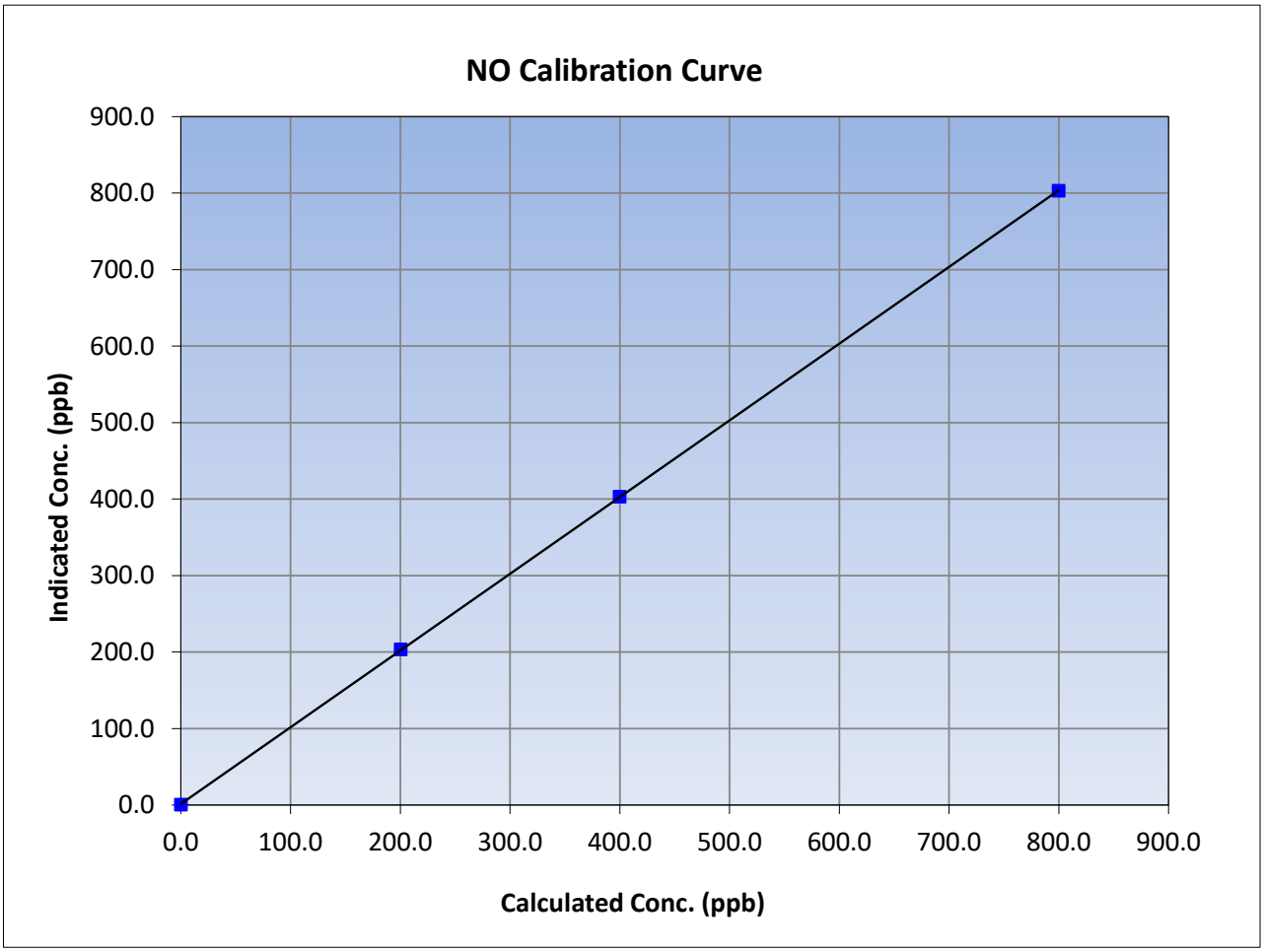
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 9:58 | End Time (MST): | 14:41 |
| 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 | 0.999993 | *≥0.995* |
| 799.7 | 803.0 | 0.9959 | | | |
| 399.9 | 403.1 | 0.9920 | Slope | 1.003032 | *0.90 - 1.10* |
| 200.4 | 203.3 | 0.9858 | | | |
| | | | Intercept | 1.382192 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

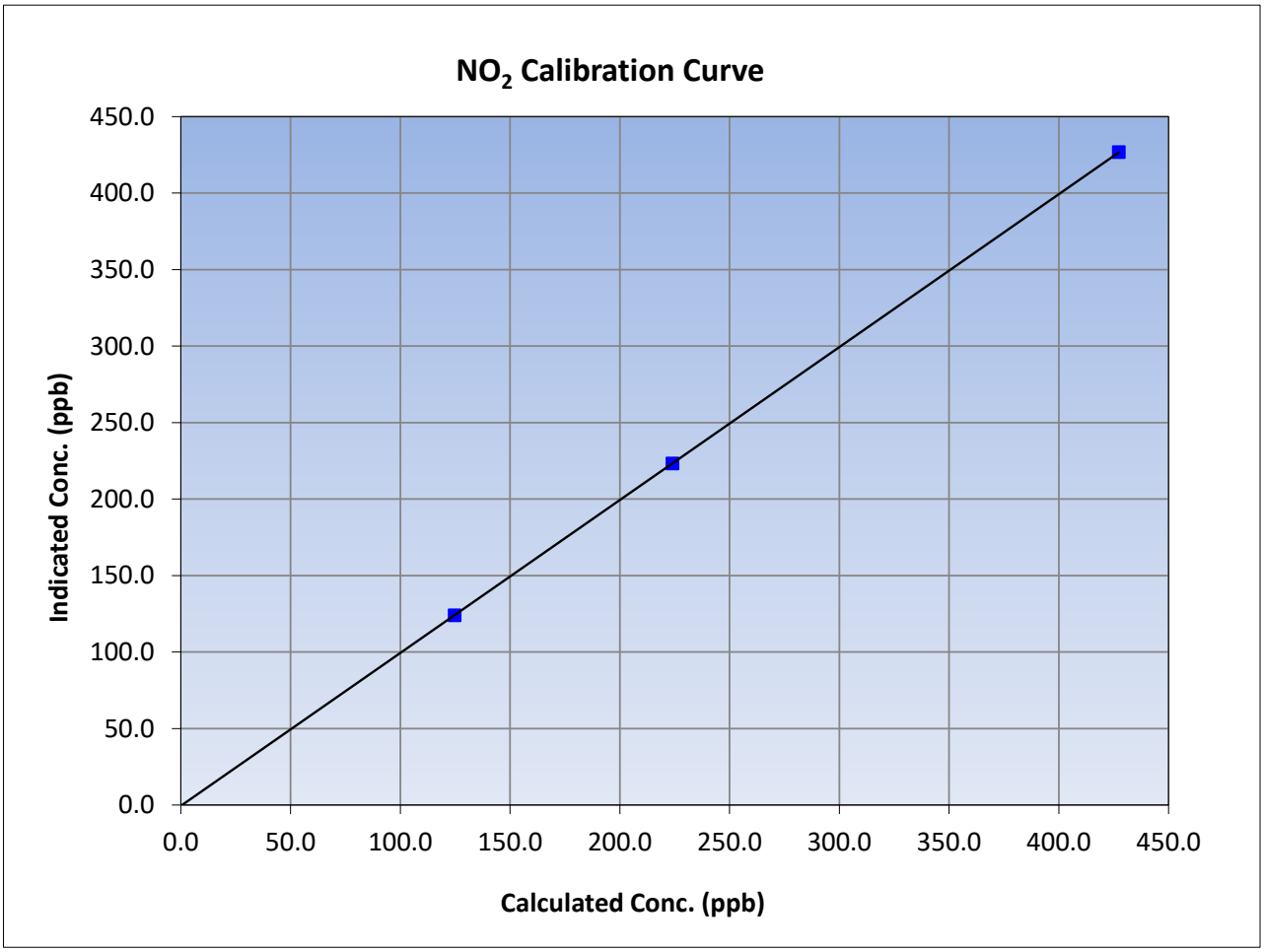
Version-04-2020

### Station Information

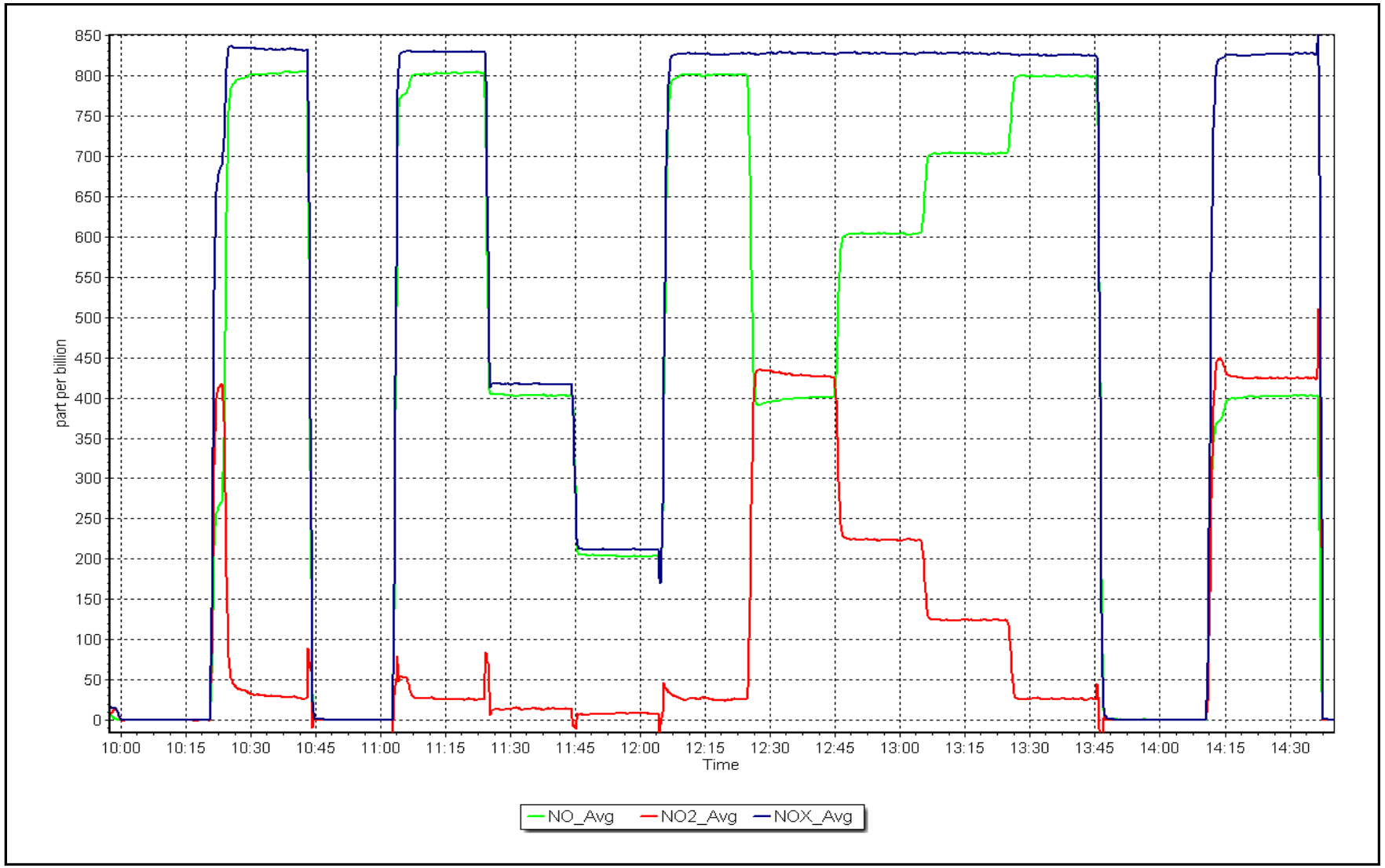
| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 9:58 | End Time (MST): | 14:41 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1172750022 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.4 | ---- | Correlation Coefficient | 0.999999 | *≥0.995* |
| 427.3 | 426.7 | 1.0015 | | | |
| 224.0 | 223.3 | 1.0032 | Slope | 0.999602 | *0.90 - 1.10* |
| 124.7 | 124.0 | 1.0058 | | | |
| | | | Intercept | -0.538439 | *+/-20* |



**$NO_X$ Calibration Plot** Date: March 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: | March 22, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 9:25 | End time (MST): | 12:32 |
| 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: | 1.003629 | 1.004200 | Backgd or Offset: | -0.2 | -0.2 |
| Calibration intercept: | -0.860000 | -0.660000 | 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 | 0.0 | ---- |
| as found span | 5000 | 1303.0 | 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 | 5000 | 1303.0 | 400.0 | 401.4 | 0.997 |
| second point | 5000 | 966.5 | 200.0 | 199.9 | 1.001 |
| 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 | 401.8 | 0.996 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 401.0 | Previous response | 400.6 | *% change | 0.1% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

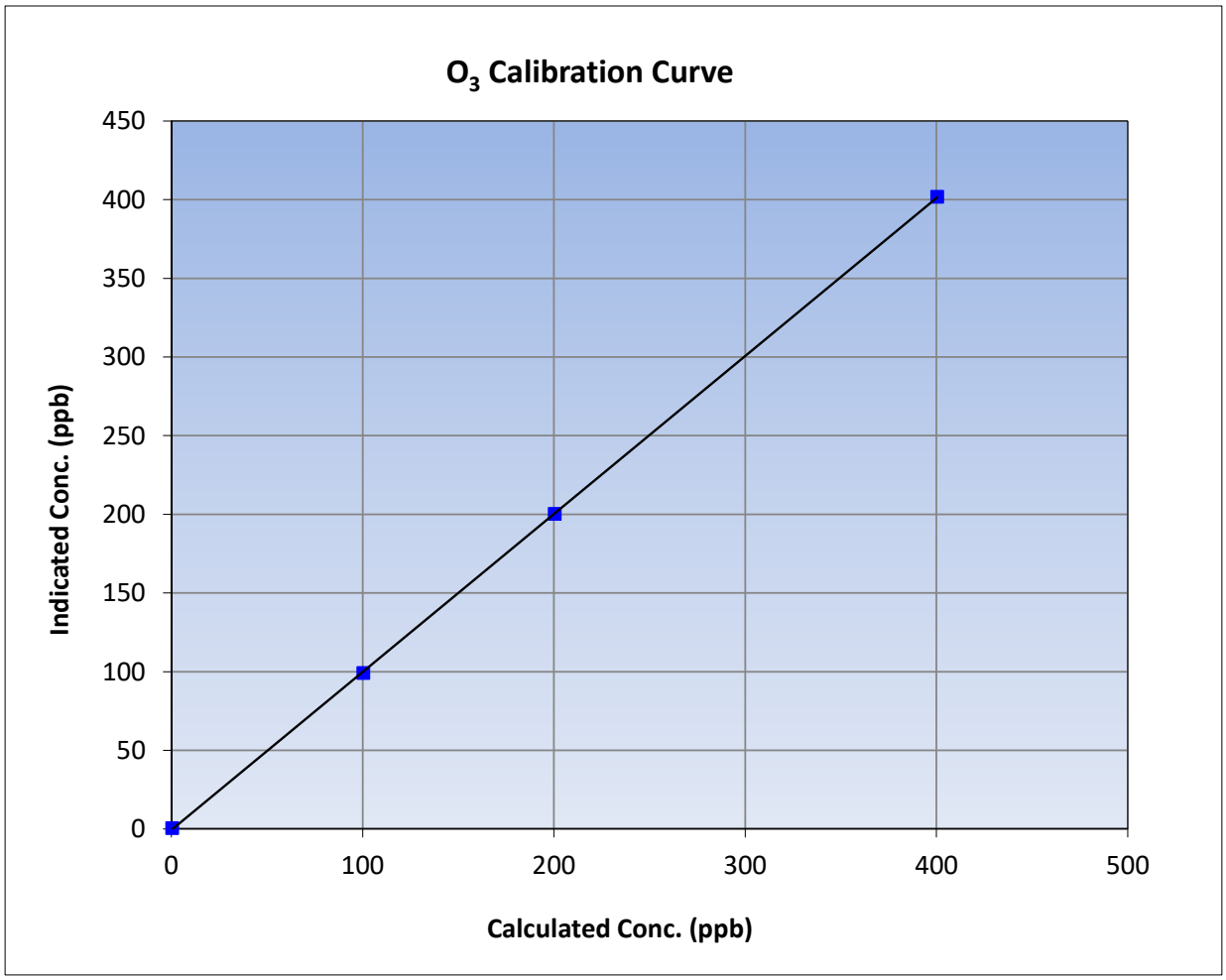
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS06 |
| Start Time (MST): | 9:25 | End Time (MST): | 12:32 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1300156234 |

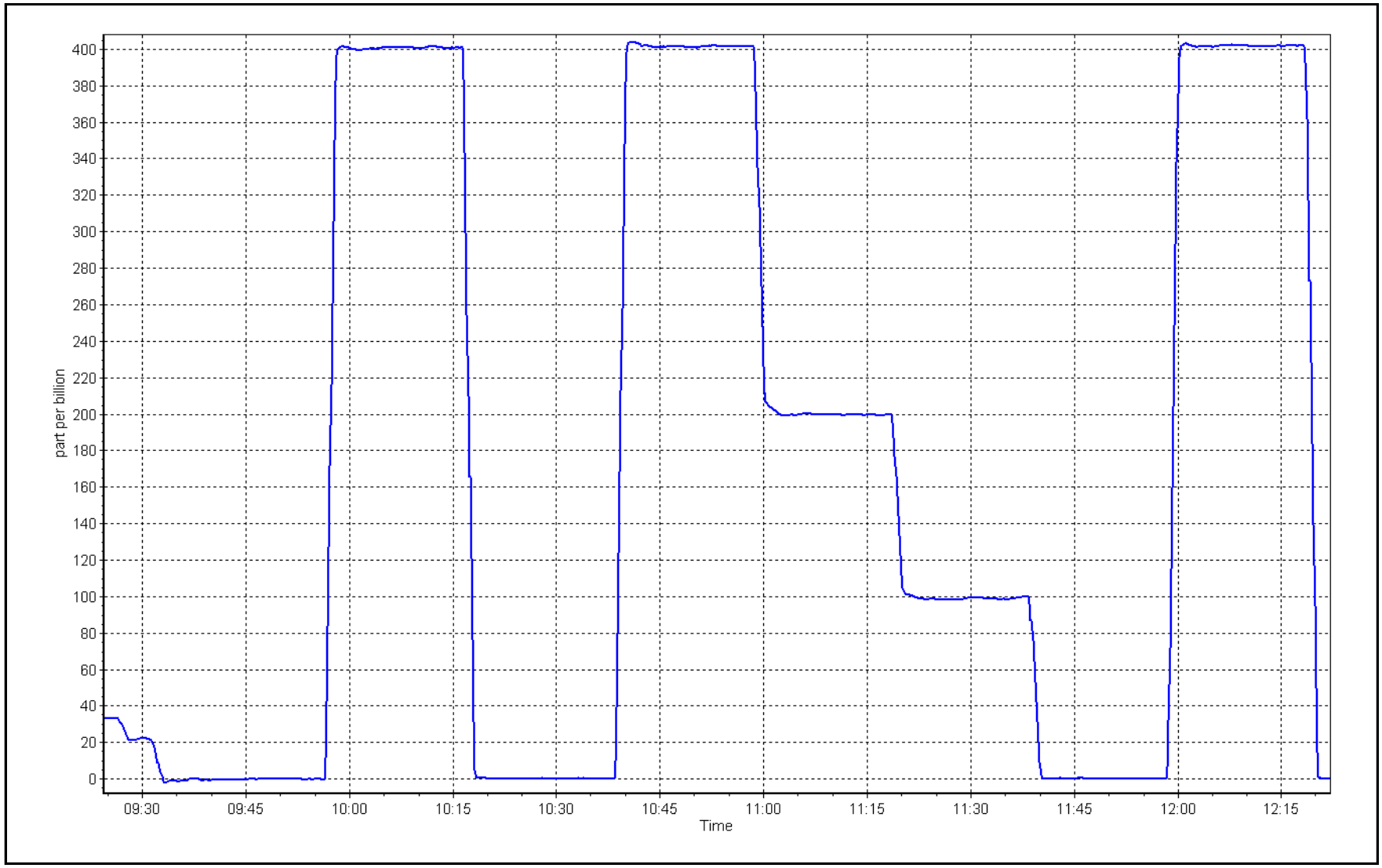
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 400.0 | 401.4 | 0.9965 |
| 200.0 | 199.9 | 1.0005 |
| 100.0 | 98.8 | 1.0121 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999979 | *≥0.995* |
| Slope | 1.004200 | *0.90 - 1.10* |
| Intercept | -0.660000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 22, 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: | March 22, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 12:49 | End time (MST): | 13:55 |
| 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) | -7.9 | -8.2 | -7.9 | ☐ | +/- 2 °C |
| P (mmHg) | 737.9 | 740.4 | 737.9 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 5.12 | 5.01 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 42 | ----- | 42 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 7.3 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 11-23-2023 — Lot No.: 100128-050-035

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

Date Optical Chamber Cleaned: March 22, 2024

Date Disposable Filter Changed: March 22, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: April 13, 2023

Date RH/T Sensor Cleaned: April 13, 2023

Notes: Quarterly calibrations complete. 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: | March 6, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 9:40 | End time (MST): | 14:00 |
| NH3 Cal Date: | March 6, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 13:30 | End time (MST): | 16:00 |
| 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 | 0.896 | TN bkgrnd: | 5.018 | 5.018 |

### Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| $NO_X$ Cal Slope: | 0.995140 | 0.992580 |
| $NO_X$ Cal Offset: | 2.256598 | 1.257688 |
| NO Cal Slope: | 0.997671 | 0.996357 |
| NO Cal Offset: | 1.183452 | -0.056315 |
| $NO_2$ Cal Slope: | 0.997218 | 1.001744 |
| $NO_2$ Cal Offset: | 0.194612 | -0.225723 |
| NH3 Cal Slope: | 1.010551 | 1.000069 |
| NH3 Cal Offset: | 1.110139 | 3.359353 |
| TN Cal Slope: | 1.017335 | 1.006770 |
| TN Cal Offset: | 2.438080 | 4.605099 |

# 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 | -2.1 | 0.0 | -2.0 | ---- | ---- |
| as found NO | 4914 | 86.2 | 826.5 | 826.5 | ---- | 824.9 | 822.4 | 2.5 | 1.002 | ---- |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -1.0 | 0.2 | -1.2 | ---- | ---- |
| high NO point | 4914 | 86.2 | 826.5 | 826.5 | ---- | 825.9 | 821.0 | 4.8 | 1.001 | ---- |
| NO/O3 point | 4914 | 86.2 | 826.5 | 826.5 | ---- | 824.0 | 820.3 | 3.5 | 1.003 | ---- |
| as found NH3 | 3417 | 82.6 | 1800.6 | ---- | 1800.6 | 1824.0 | ---- | 1811.0 | 0.987 | 0.994 |
| new NH3 cyl rp | 3417 | 82.6 | 1800.6 | ---- | 1800.6 | | ---- | | | |
| first NH3 | 3417 | 82.6 | 1800.6 | ---- | 1800.6 | 1814.1 | ---- | 1801.4 | 0.993 | 1.000 |
| second NH3 | 3454 | 45.9 | 1000.5 | ---- | 1000.5 | 1015.0 | ---- | 1006.5 | 0.986 | 0.994 |
| third NH3 | 3477 | 22.9 | 499.2 | ---- | 499.2 | 513.0 | ---- | 507.3 | 0.973 | 0.984 |
| | | | | | | | | Average Correction Factor | 1.0018 | 0.9925 |

Corrected As found TN = 827 ppb $NO_X$ = 822.4 ppb NH3 = 1813.0 ppb

Previous Response TN = 843.2 ppb $NO_X$ = 824.7 ppb NH3 = 1820.8 ppb

*Percent Change TN = -2.0%

*Percent Change $NO_X$ = -0.3%

*Percent Change NH3 = -0.4%

* = > +/-5% change initiates investigation

NH3 Previous Converter Efficiency = 89.1%

NH3 Current Converter Efficiency = 89.6%

# 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 | 0.0 | 0.1 | -2.1 | ---- | ---- |
| as found span | 4914 | 86.2 | 826.5 | 799.7 | 826.5 | 822.4 | 795.6 | 824.9 | 1.0049 | 1.0052 |
| new NO cyl rp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.5 | -1.0 | ---- | ---- |
| high point | 4914 | 86.2 | 826.5 | 799.7 | 826.5 | 821.0 | 797.6 | 825.9 | 1.0066 | 1.0027 |
| second point | 4957 | 43.1 | 413.2 | 399.9 | 413.2 | 412.1 | 396.4 | 413.5 | 1.0028 | 1.0088 |
| third point | 4978 | 21.6 | 207.1 | 200.4 | 207.1 | 207.8 | 200.2 | 208.7 | 0.9967 | 1.0011 |
| | | | | | | | | Average Correction Factor | 1.0020 | 1.0042 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Baseline Corr As fnd | TN = | 827 ppb | $NO_X$ = | 822.4 ppb | NO = | 795.5 ppb | *Percent Change | TN = -2.0% |
| Previous Response | TN = | 843.2 ppb | $NO_X$ = | 824.7 ppb | NO = | 799.1 ppb | *Percent Change | $NO_X$ = -0.3% |
| | | | | | | | *Percent Change | NO = -0.4% |

* = > +/-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 | -0.3 | ---- | ---- |
| 1st GPT point (400 ppb O3) | 793.2 | 394.3 | 425.6 | 426.1 | 0.9989 | 100.1% |
| 2nd GPT point (200 ppb O3) | 793.2 | 600.4 | 219.5 | 219.7 | 0.9992 | 100.1% |
| 3rd GPT point (100 ppb O3) | 793.2 | 696.5 | 123.4 | 123.5 | 0.9994 | 100.1% |
| | | | | Average Correction Factor | 0.9991 | 100.1% |

Notes: Changed the inlet filter after as founds. Adjusted the NH3 span only.

Calibration Performed By: Max Farrell

# Wood Buffalo Environmental Association

## TN Calibration Summary

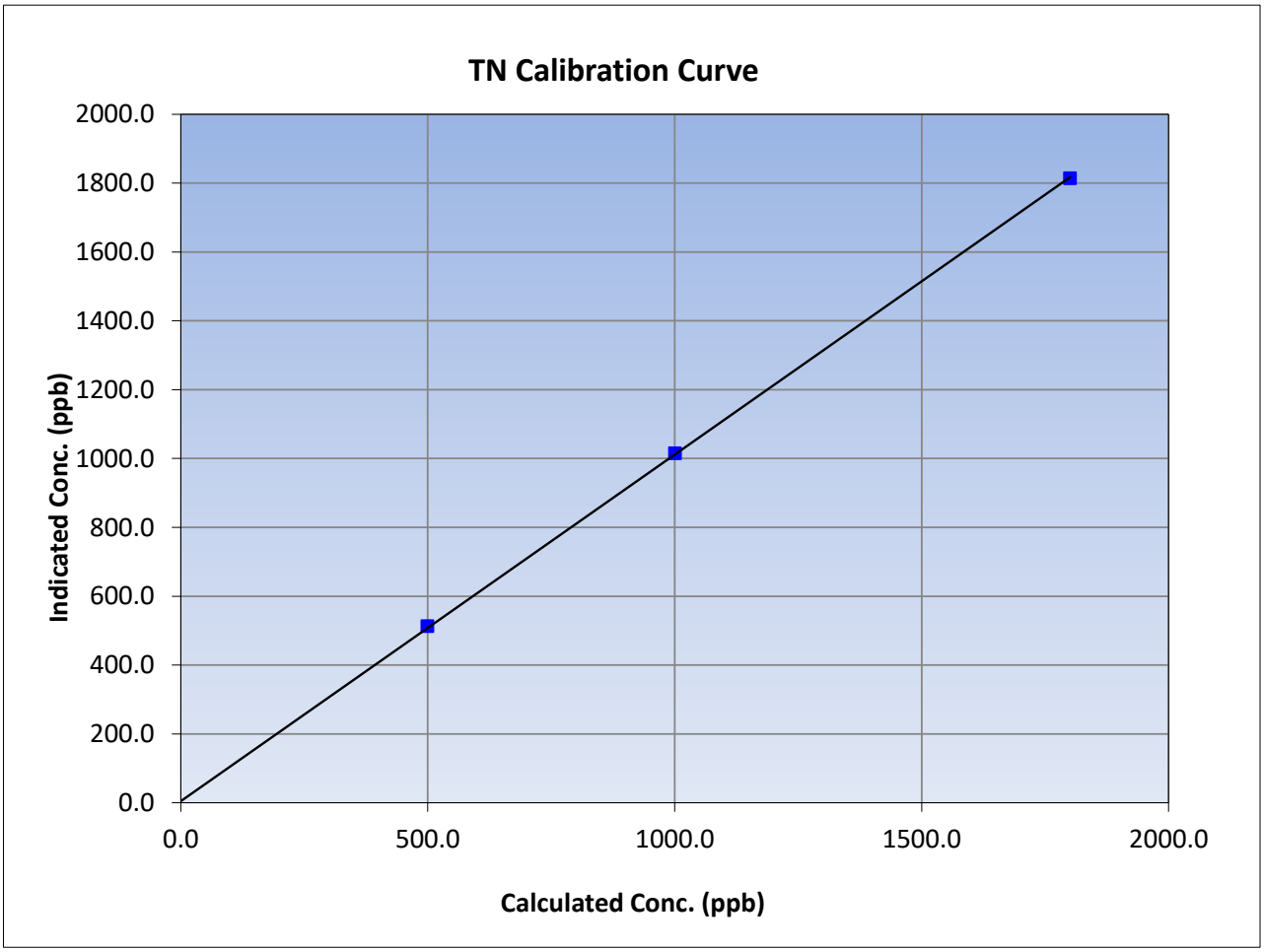
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:40 | End Time (MST): | 14:00 |
| 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 | -1.0 | ---- | Correlation Coefficient | 0.999952 | *≥0.995* |
| 1800.6 | 1814.1 | 0.9926 | | | |
| 1000.5 | 1015.0 | 0.9857 | Slope | 1.006770 | *0.90 - 1.10* |
| 499.2 | 513.0 | 0.9730 | | | |
| | | | Intercept | 4.605099 | *+/-20* |



# Wood Buffalo Environmental Association

## $NH_3$ Calibration Summary

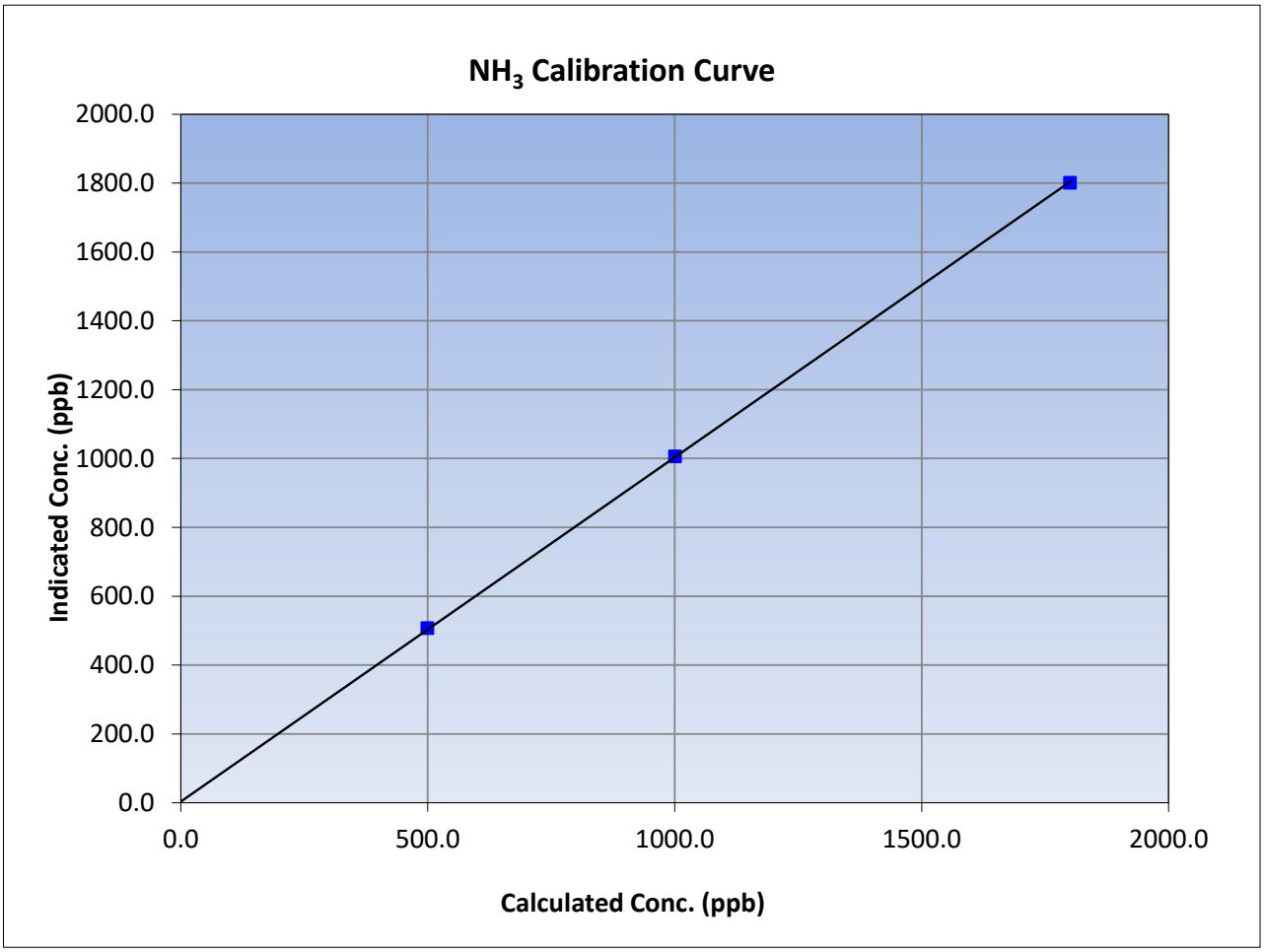
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:40 | End Time (MST): | 14:00 |
| 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 | -1.2 | ---- | Correlation Coefficient | 0.999968 | ≥0.995 |
| 1800.6 | 1801.4 | 0.9996 | | | |
| 1000.5 | 1006.5 | 0.9941 | Slope | 1.000069 | 0.90 - 1.10 |
| 499.2 | 507.3 | 0.9840 | | | |
| | | | Intercept | 3.359353 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

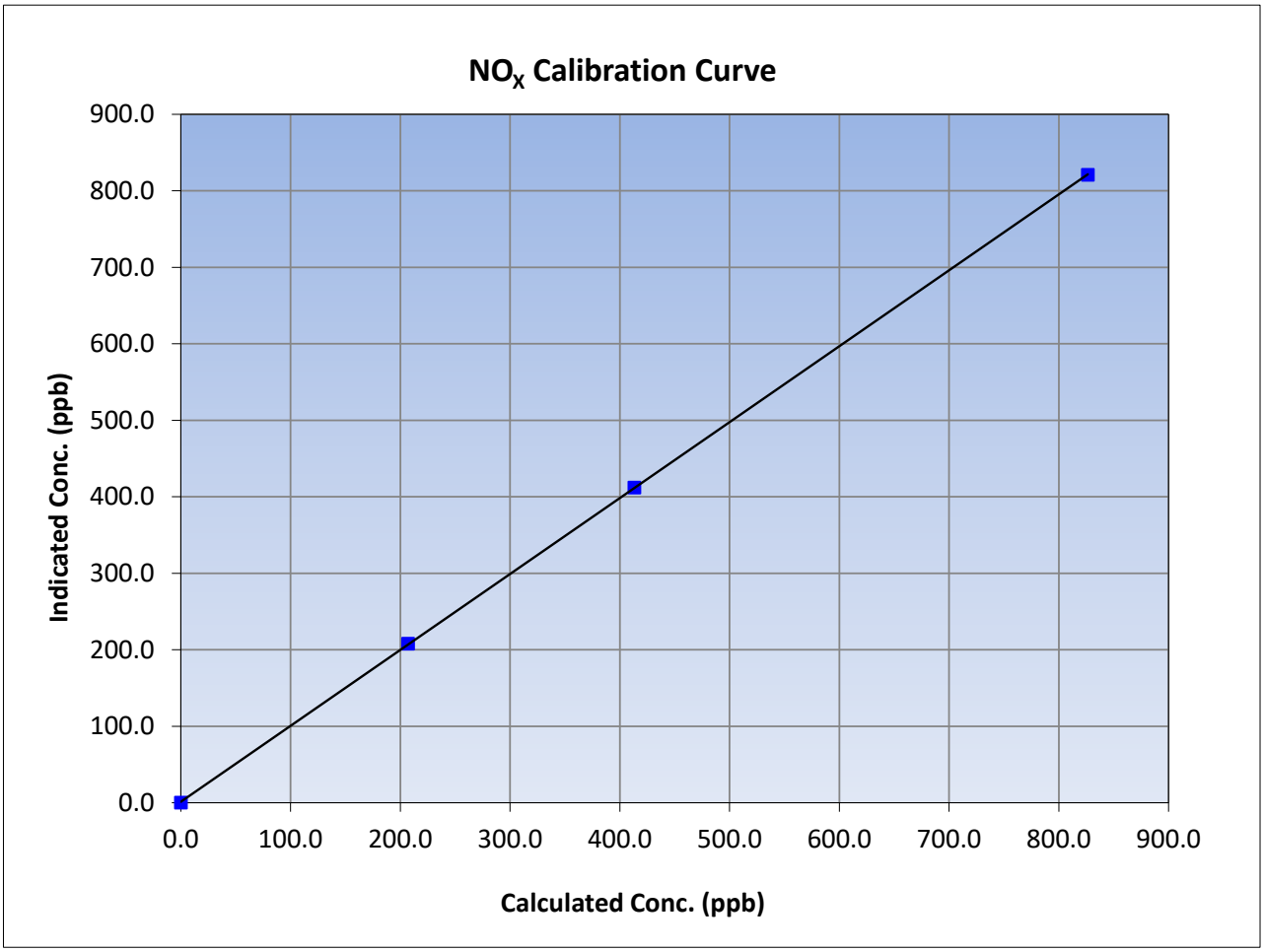
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:40 | End Time (MST): | 14:00 |
| 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 | 0.999992 | ≥0.995 |
| 826.5 | 821.0 | 1.0066 | | | |
| 413.2 | 412.1 | 1.0028 | Slope | 0.992580 | 0.90 - 1.10 |
| 207.1 | 207.8 | 0.9967 | | | |
| | | | Intercept | 1.257688 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

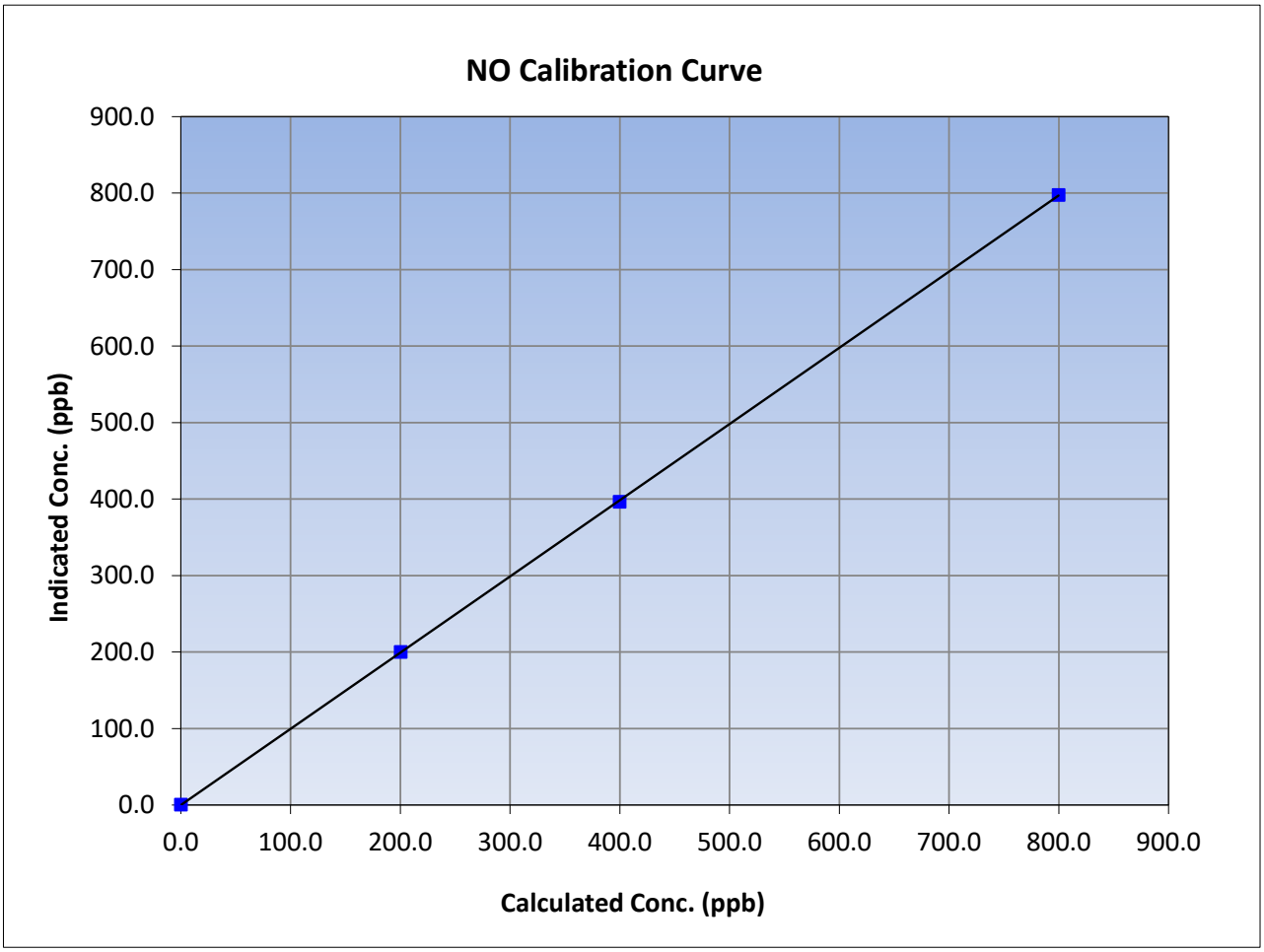
Version-05-2023

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:40 | End Time (MST): | 14:00 |
| 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 | 0.999985 | *≥0.995* |
| 799.7 | 797.6 | 1.0027 | | | |
| 399.9 | 396.4 | 1.0088 | Slope | 0.996357 | *0.90 - 1.10* |
| 200.4 | 200.2 | 1.0011 | | | |
| | | | Intercept | -0.056315 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

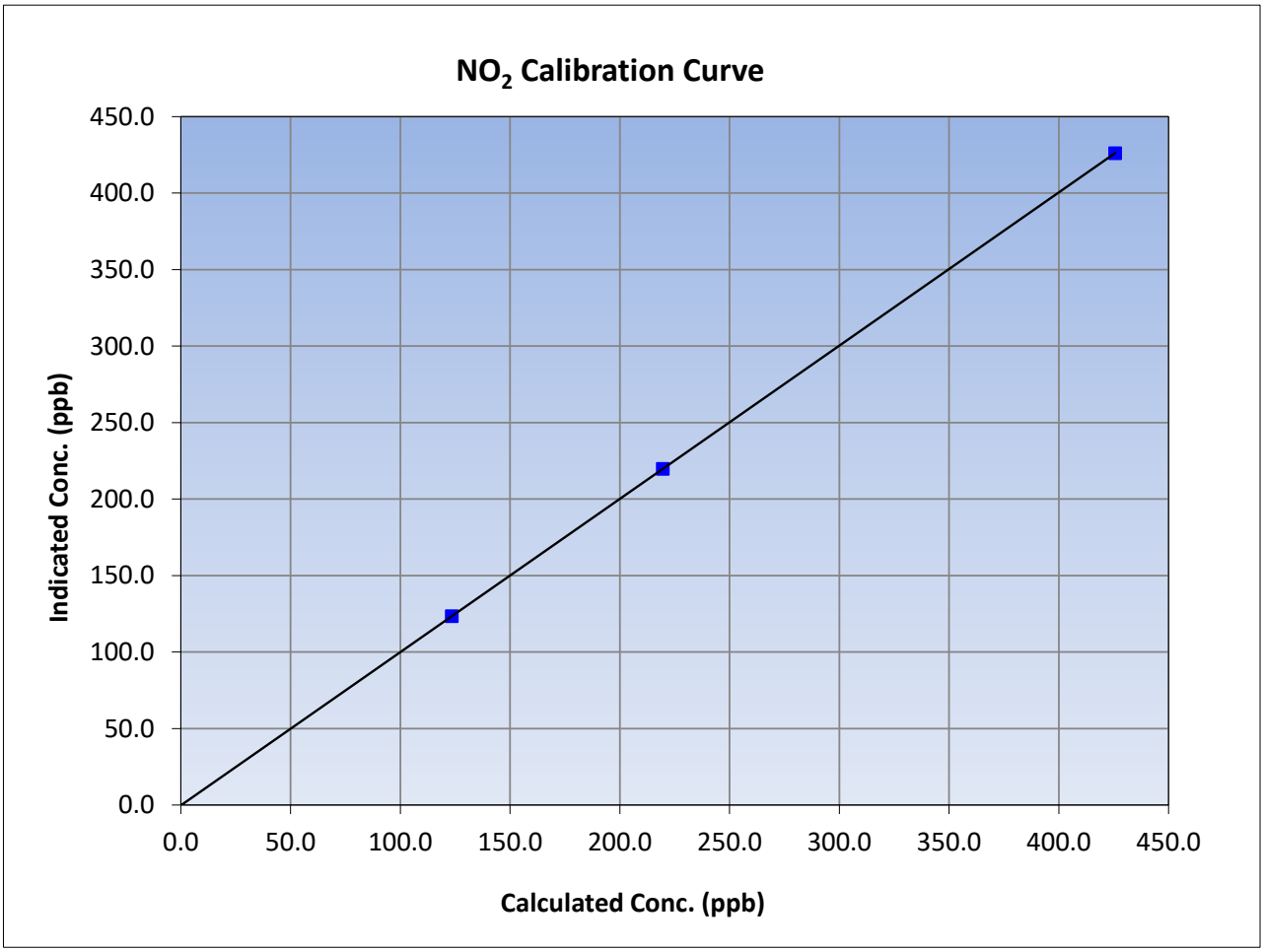
Version-05-2023

### Station Information

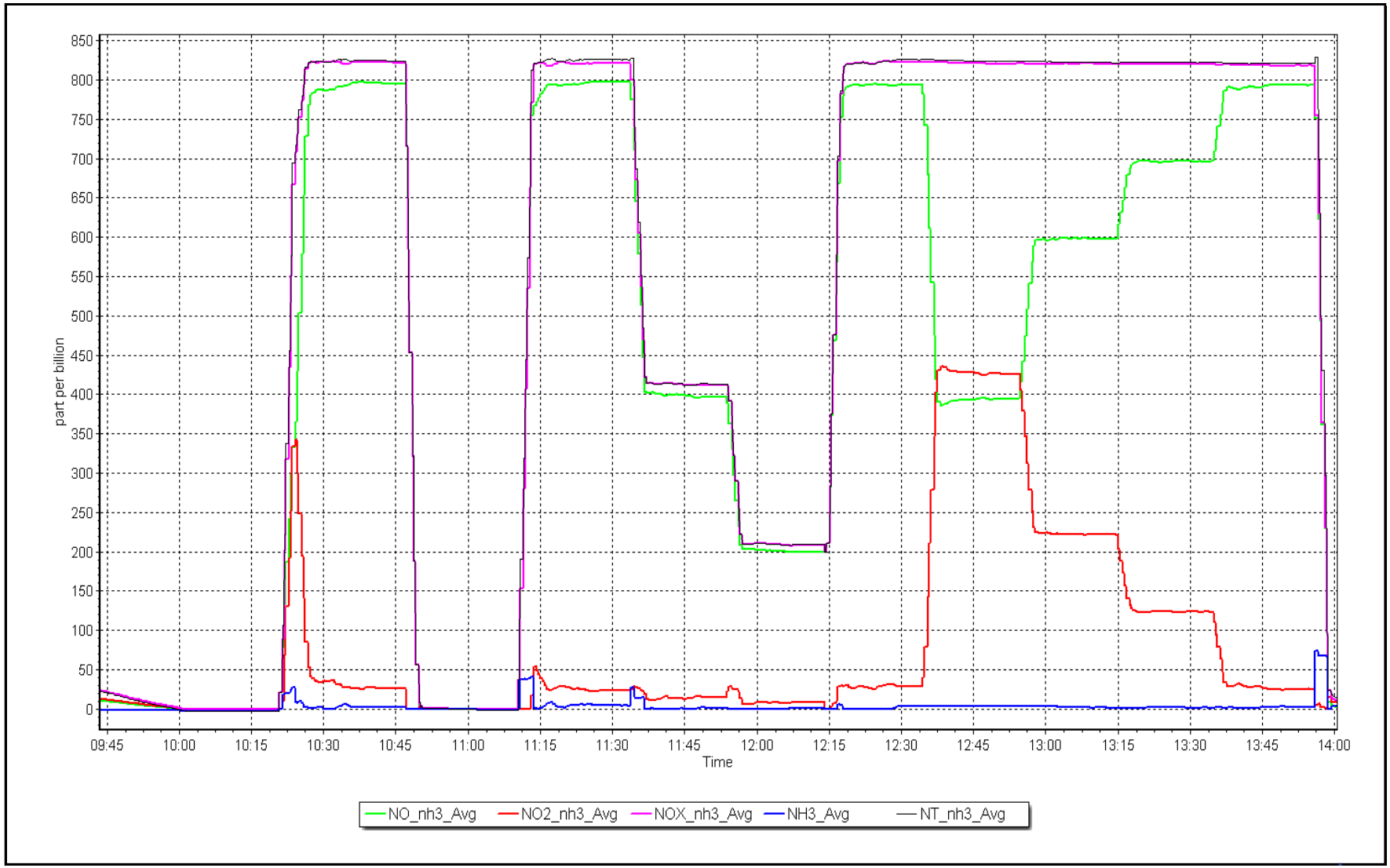
| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Patricia McInnes | Station Number: | AMS 06 |
| Start Time (MST): | 9:40 | End Time (MST): | 14:00 |
| Analyzer make: | Teledyne API T201 | Analyzer serial #: | 808 |

### Calibration Data

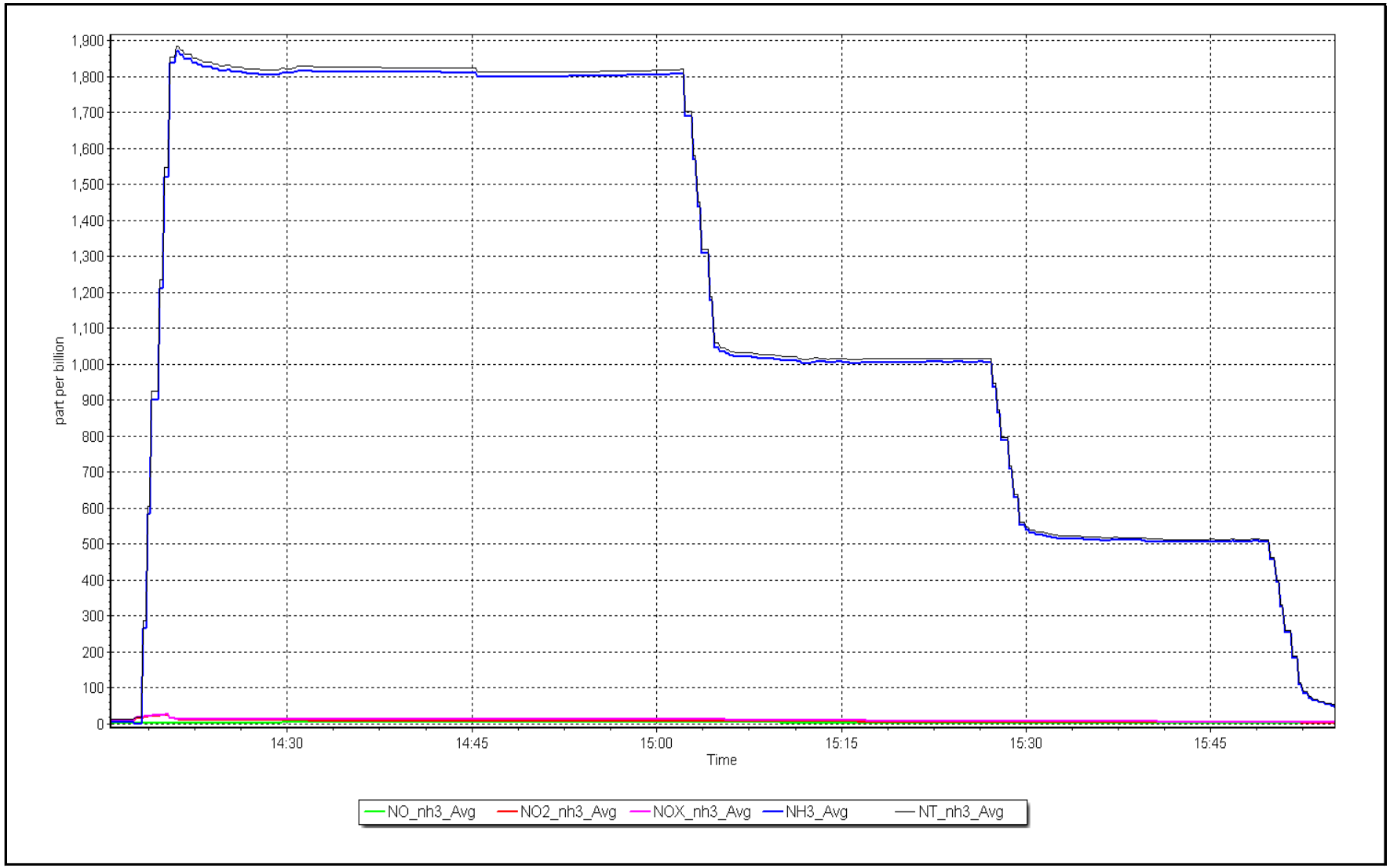
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.3 | ---- | Correlation Coefficient | 1.000000 | ≥0.995 |
| 425.6 | 426.1 | 0.9989 | | | |
| 219.5 | 219.7 | 0.9992 | Slope | 1.001744 | 0.90 - 1.10 |
| 123.4 | 123.5 | 0.9994 | | | |
| | | | Intercept | -0.225723 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 6, 2024 Location: Patricia McInnes



**$NH_3$ Calibration Plot** Date: March 6, 2024 Location: Patricia McInnes



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS07
## ATHABASCA VALLEY
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | March 22, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 9:41 | End time (MST): | 13:02 |
| 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: | 1.002036 | 1.000577 | Backgd or Offset: | 2.70 | 2.60 |
| Calibration intercept: | 1.783896 | 1.744314 | Coeff or Slope: | 0.852 | 0.845 |

### $SO_2$ 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 | 802.7 | 0.995 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4920 | 79.8 | 799.0 | 799.8 | 0.999 |
| second point | 4960 | 39.9 | 399.5 | 404.1 | 0.989 |
| third point | 4980 | 20.0 | 200.2 | 202.4 | 0.989 |
| 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 | 0.992 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.70 | Previous response | 802.40 | *% 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: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

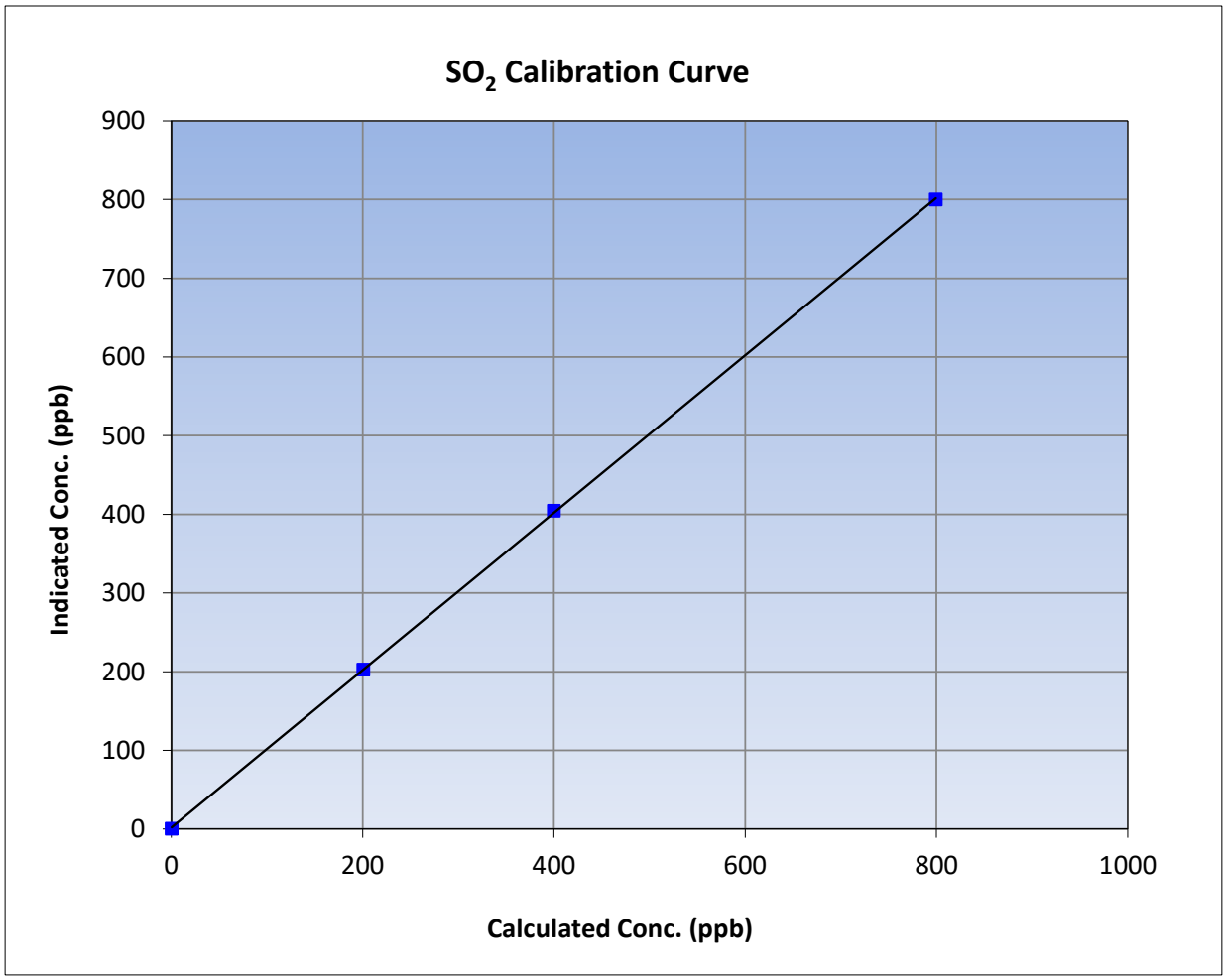
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 9:41 | End Time (MST): | 13:02 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1507864683 |

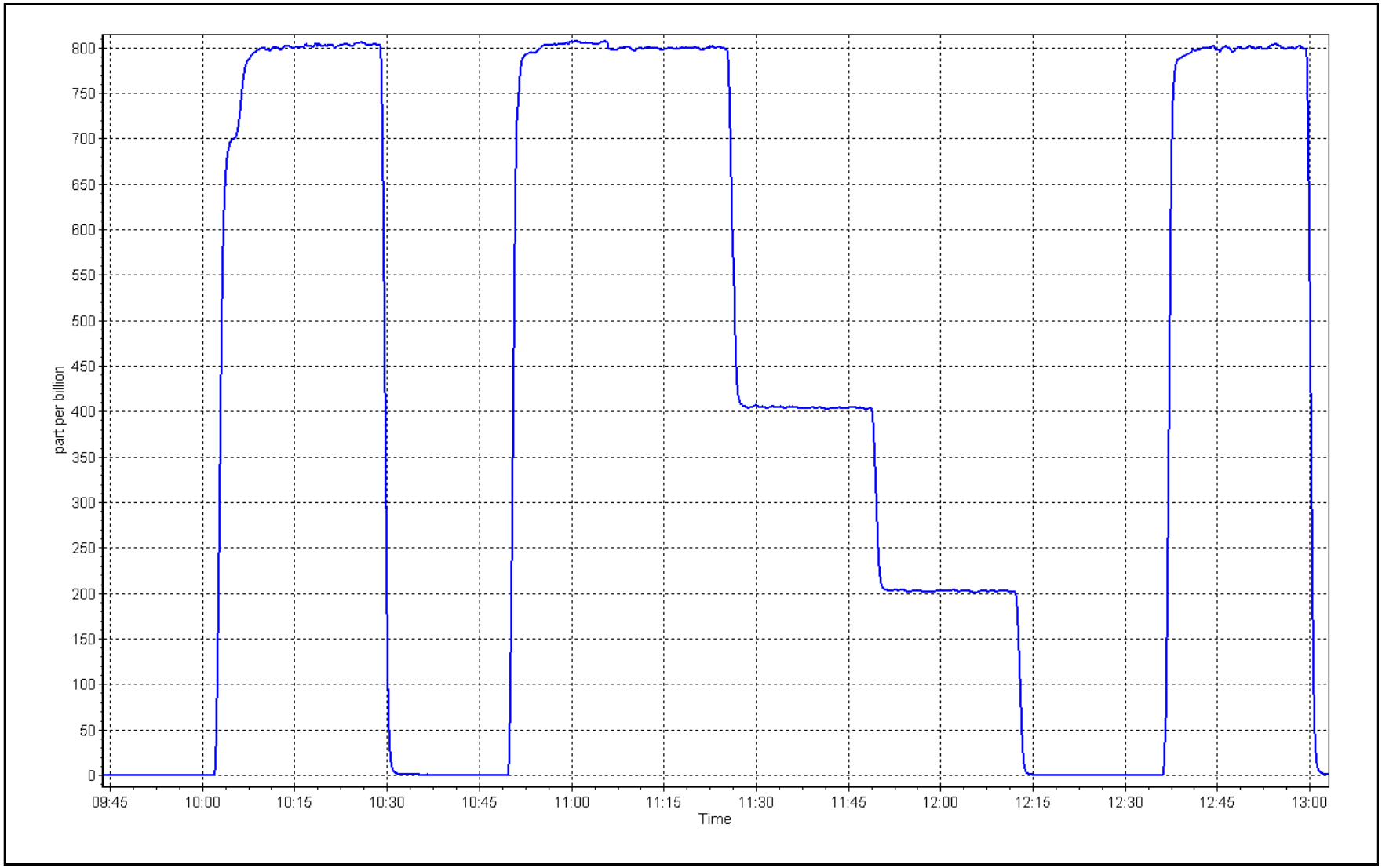
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 799.0 | 799.8 | 0.9990 |
| 399.5 | 404.1 | 0.9886 |
| 200.2 | 202.4 | 0.9893 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999967 | *≥0.995* |
| Slope | 1.000577 | *0.90 - 1.10* |
| Intercept | 1.744314 | *+/-30* |



**SO2 Calibration Plot** Date: March 22, 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: | March 7, 2024 | Last Cal Date: | February 22, 2024 |
| Start time (MST): | 10:12 | End time (MST): | 15:05 |
| 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: | 1.017941 | 0.998195 | Backgd or Offset: | 2.40 | 2.40 |
| Calibration intercept: | 0.157770 | 0.217844 | Coeff or Slope: | 0.901 | 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 | 79.3 | 1.001 |
| as found 2nd point | 4962 | 37.7 | 39.6 | 39.7 | 1.000 |
| 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 | 0.3 | ---- |
| high point | 4925 | 75.5 | 79.3 | 79.4 | 0.999 |
| second point | 4962 | 37.7 | 39.6 | 39.8 | 0.995 |
| third point | 4981 | 18.9 | 19.9 | 19.9 | 0.998 |
| as left zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as left span | 4925 | 75.5 | 79.3 | 79.1 | 1.003 |
| SO2 Scrubber Check | 4920 | 79.2 | 800.4 | 0.4 | ---- |
| Date of last scrubber change: | | 25-Feb-22 | | Ave Corr Factor | 0.997 |
| Date of last converter efficiency test: | | April 22, 2022 | | 92.6% | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 79.2 | Prev response: | 80.85 | *% change: | -2.1% |
| Baseline Corr 2nd AF pt: | 39.6 | AF Slope: | 0.997616 | AF Intercept: | 0.257692 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999974 | | |

* = > +/-5% change initiates investigation

Notes: No adjustments made.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

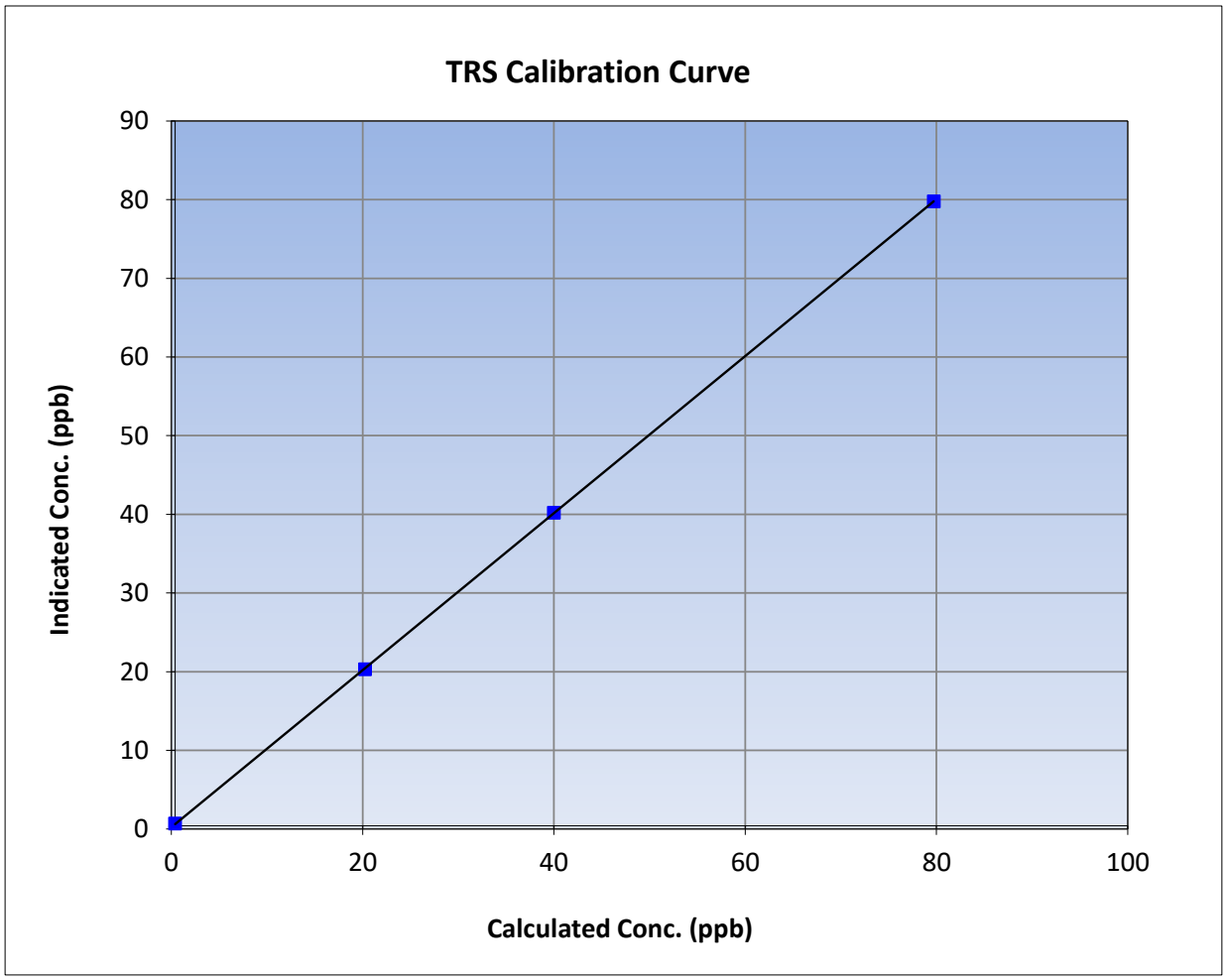
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:12 | End Time (MST): | 15:05 |
| Analyzer make: | CDN-101 | Analyzer serial #: | 551 |

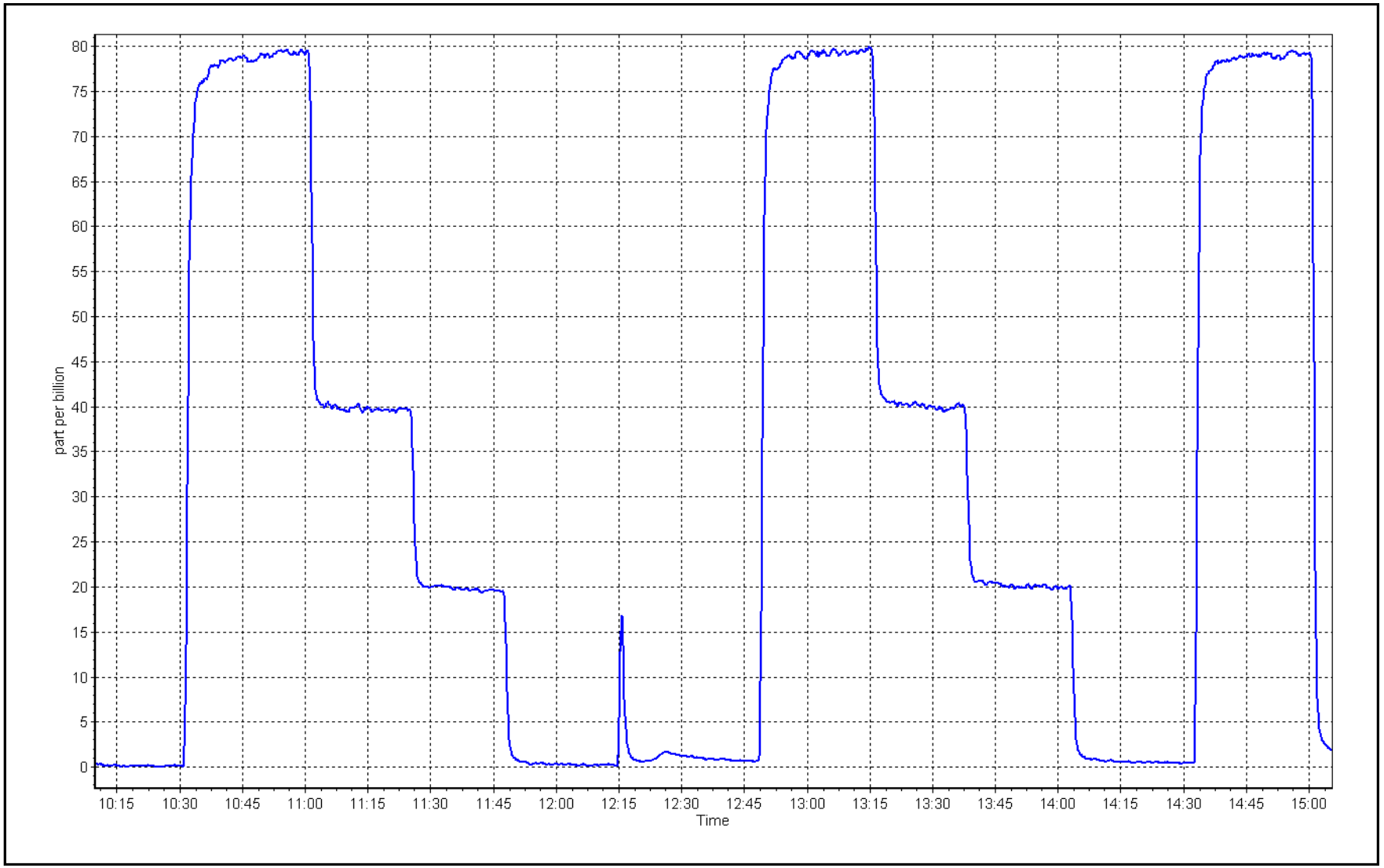
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 79.3 | 79.4 | 0.9989 |
| 39.6 | 39.8 | 0.9952 |
| 19.9 | 19.9 | 0.9978 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 0.998195 | *0.90 - 1.10* |
| Intercept | 0.217844 | *+/-3* |



**TRS Calibration Plot** Date: March 7, 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: | March 22, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 9:41 | End time (MST): | 13:02 |
| 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 #: | 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: | 2.45E-04 | 2.56E-04 | NMHC SP Ratio: | 4.93E-05 | 5.14E-05 |
| CH4 Retention time: | 13.4 | 13.4 | NMHC Peak Area: | 182375 | 175223 |
| 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 | 16.26 | 1.040 |
| 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 | 16.86 | 1.003 |
| second point | 4960 | 39.9 | 8.46 | 8.42 | 1.005 |
| third point | 4980 | 20.0 | 4.24 | 4.23 | 1.003 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 16.91 | 16.85 | 1.004 |
| | | | | Average Correction Factor | 1.004 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.26 | Prev response | 16.96 | *% change | -4.3% |
| 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 | 79.8 | 9.00 | 8.68 | 1.037 |
| 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 | 8.96 | 1.005 |
| second point | 4960 | 39.9 | 4.50 | 4.49 | 1.003 |
| third point | 4980 | 20.0 | 2.26 | 2.26 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.00 | 8.94 | 1.006 |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 8.68 | Prev response | 9.05 | *% change | -4.3% |
| 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 | 79.8 | 7.92 | 7.58 | 1.044 |
| 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 | 7.90 | 1.002 |
| second point | 4960 | 39.9 | 3.96 | 3.93 | 1.007 |
| third point | 4980 | 20.0 | 1.98 | 1.97 | 1.007 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 7.92 | 7.91 | 1.001 |
| | | | | Average Correction Factor | 1.005 |
| Baseline Corr AF: | 7.58 | Prev response | 7.91 | *% change | -4.3% |
| 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: | 1.001667 | 0.996773 |
| THC Cal Offset: | 0.015848 | -0.002926 |
| CH4 Cal Slope: | 0.999012 | 0.998463 |
| CH4 Cal Offset: | 0.001263 | -0.008332 |
| NMHC Cal Slope: | 1.004116 | 0.995057 |
| NMHC Cal Offset: | 0.014385 | 0.005807 |

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## THC Calibration Summary

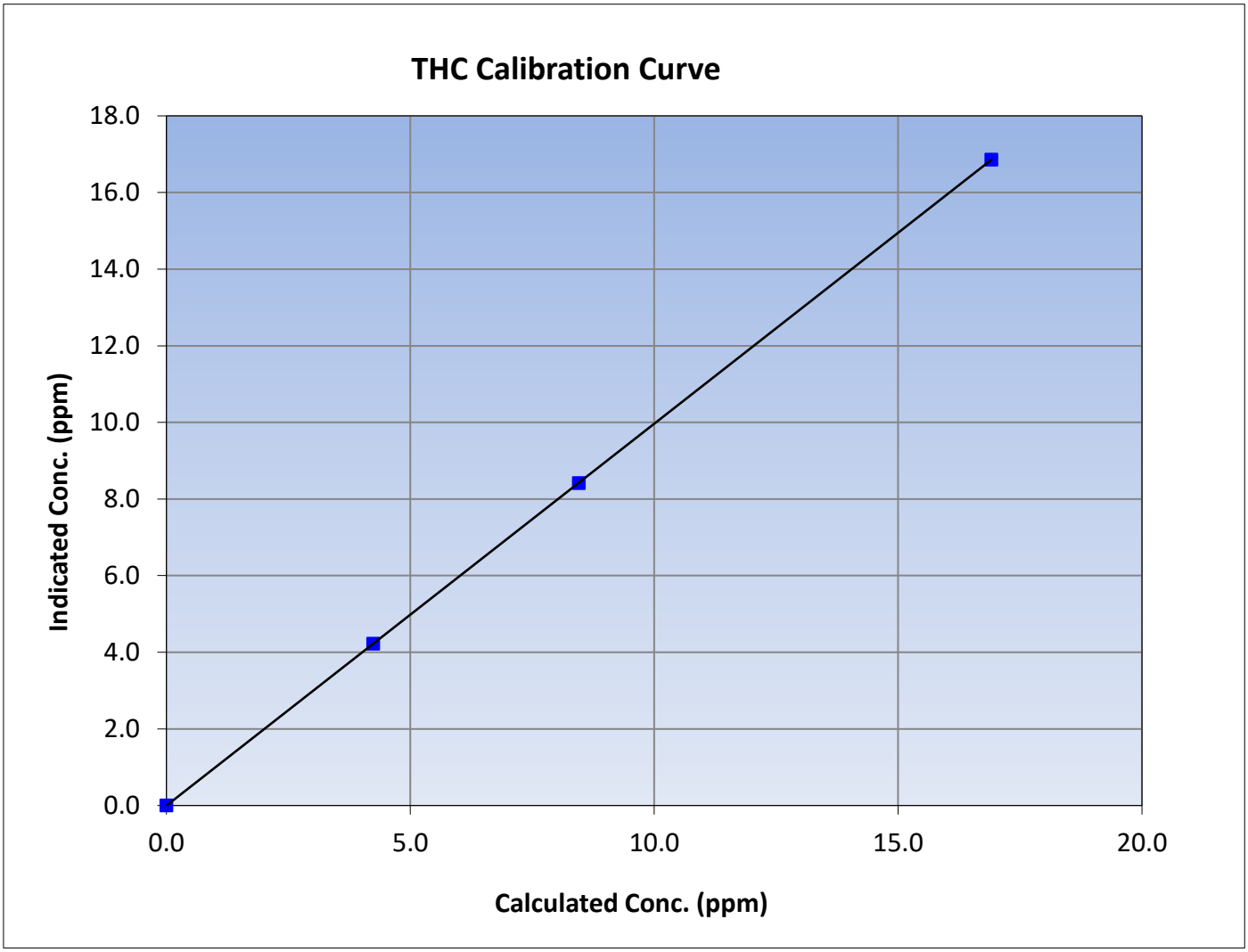
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 9:41 | End Time (MST): | 13:02 |
| 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 |
| 16.91 | 16.86 | 1.0032 | | | |
| 8.46 | 8.42 | 1.0047 | Slope | 0.996773 | 0.90 - 1.10 |
| 4.24 | 4.23 | 1.0033 | | | |
| | | | Intercept | -0.002926 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

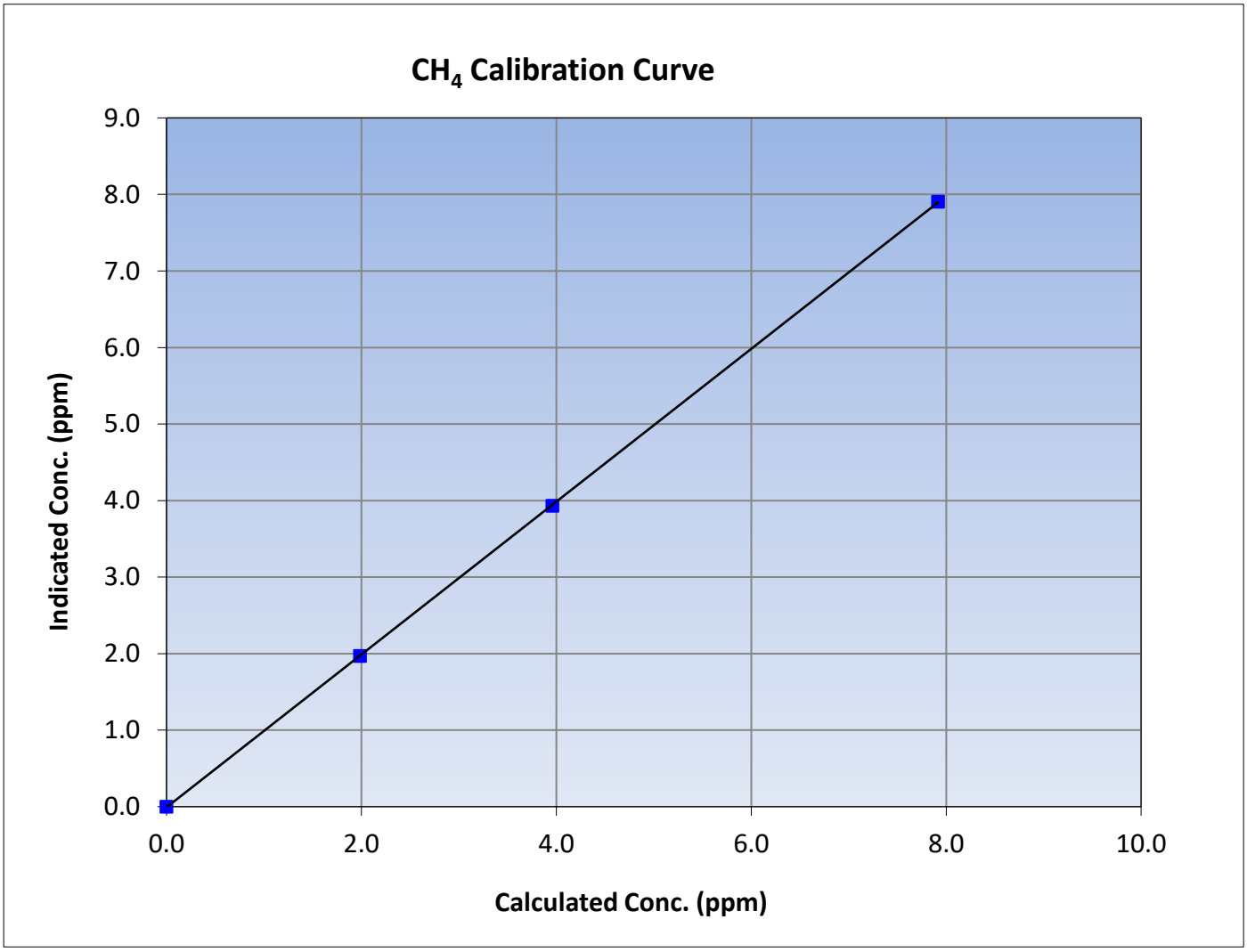
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 9:41 | End Time (MST): | 13:02 |
| 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 | 0.999992 | *≥0.995* |
| 7.92 | 7.90 | 1.0017 | | | |
| 3.96 | 3.93 | 1.0069 | Slope | 0.998463 | *0.90 - 1.10* |
| 1.98 | 1.97 | 1.0071 | | | |
| | | | Intercept | -0.008332 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

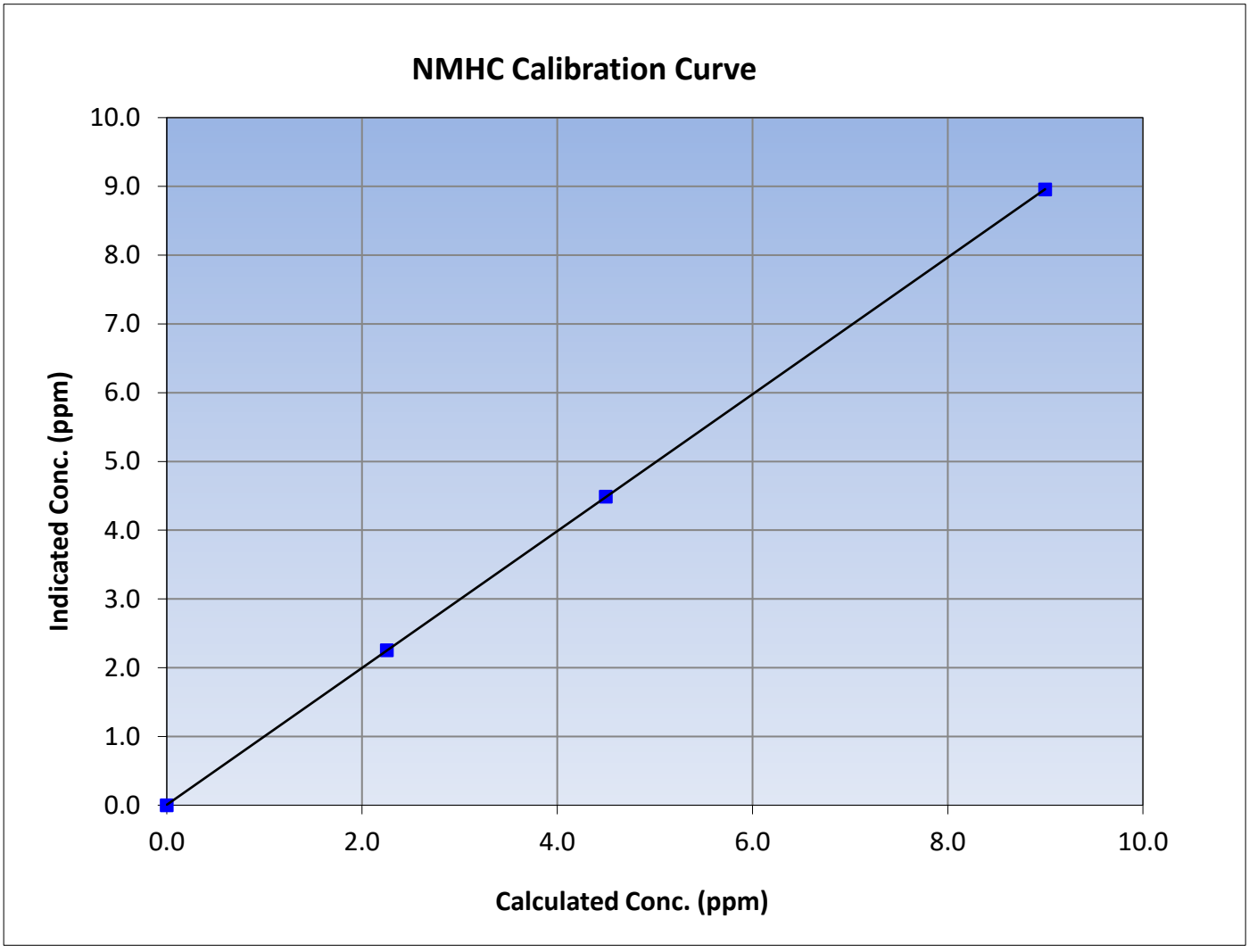
Version-06-2022

### Station Information

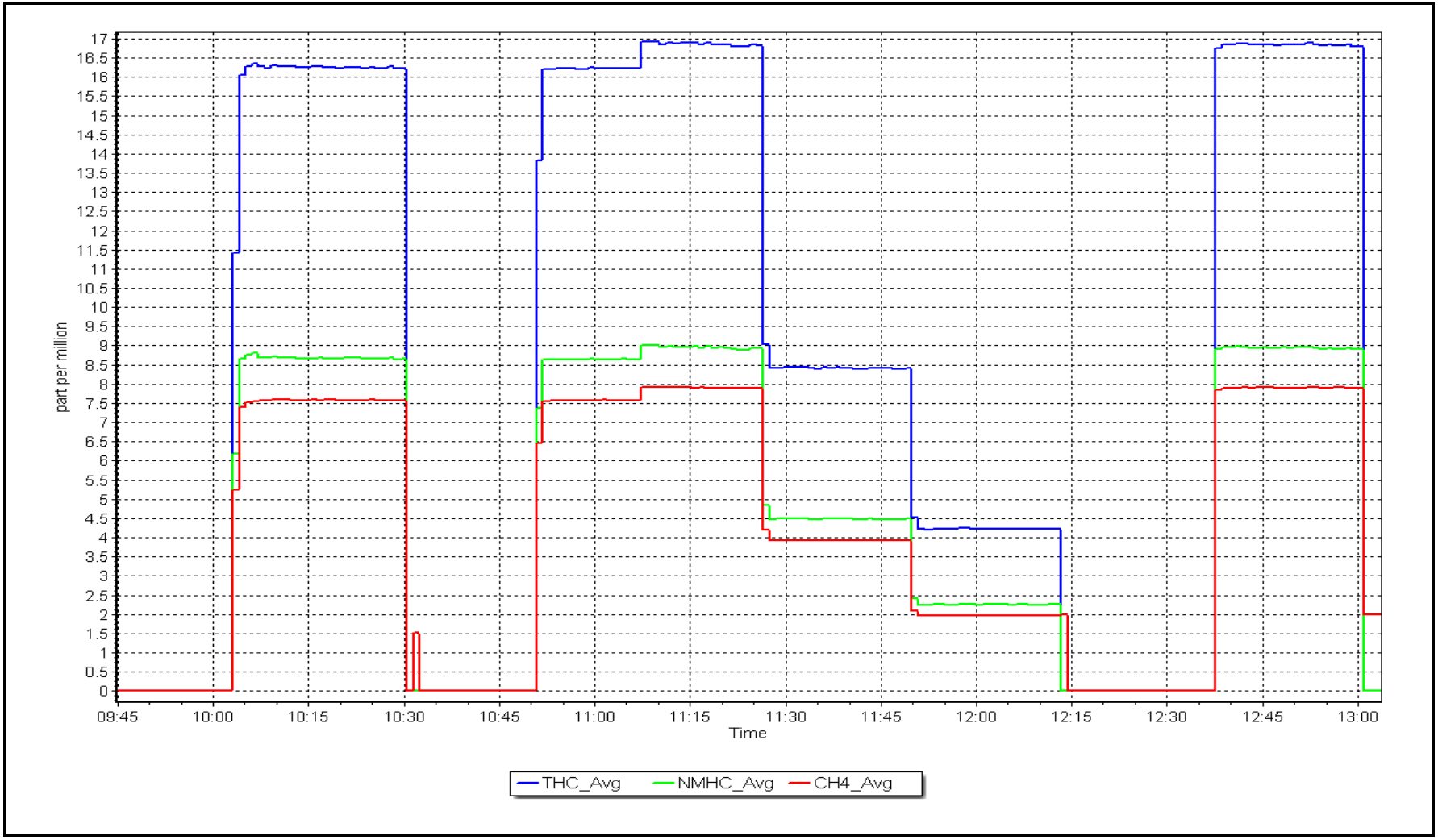
| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 9:41 | End Time (MST): | 13:02 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 12227620777 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999998 | ≥0.995 |
| 9.00 | 8.96 | 1.0047 | | | |
| 4.50 | 4.49 | 1.0029 | Slope | 0.995057 | 0.90 - 1.10 |
| 2.26 | 2.26 | 1.0000 | | | |
| | | | Intercept | 0.005807 | +/-0.5 |



**NMHC Calibration Plot** Date: March 22, 2024 Location: Athabasca Valley



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS 07 |
| Calibration Date: | March 26, 2024 | Last Cal Date: | March 22, 2024 |
| Start time (MST): | 9:00 | End time (MST): | 13:10 |
| Reason: | Maintenance | Investigation of intermittent baseline drop to zero | |

### Calibration Standards

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

### Analyzer Information

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

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| CH4 SP Ratio: | 2.56E-04 | 2.55E-04 | NMHC SP Ratio: | 5.14E-05 | 5.32E-05 |
| CH4 Retention time: | 13.4 | 13.4 | NMHC Peak Area: | 175223 | 169129 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As found High point | 4920 | 79.8 | 16.91 | 16.87 | 1.003 |
| As found Mid point | 4960 | 39.9 | 8.46 | 8.42 | 1.004 |
| As found Low point | 4980 | 20.0 | 4.24 | 4.25 | 0.998 |
| New cylinder response | | | | | |
| Baseline Corr AF: | 16.87 | Prev response | 16.86 | *% change | 0.1% |
| Baseline Corr 2nd AF: | 8.42 | AF Slope: | 0.996733 | AF Intercept: | 0.005868 |
| Baseline Corr 3rd AF: | 4.25 | AF Correlation: | 0.999997 | * = > +/-5% change initiates investigation | |

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4920 | 79.8 | 16.91 | 16.96 | 0.997 |
| Mid point | 4960 | 39.9 | 8.46 | 8.50 | 0.995 |
| Low point | 4980 | 20.0 | 4.24 | 4.28 | 0.990 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4920 | 79.8 | 16.91 | 17.07 | 0.991 |
| | | | | Average Correction Factor | 0.994 |

Notes: Instrument was dipping from baseline readings to zero; replaced actuator.

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### NMHC As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As found High point | 4920 | 79.8 | 9.00 | 8.96 | 1.005 |
| As found Mid point | 4960 | 39.9 | 4.50 | 4.49 | 1.003 |
| As found Low point | 4980 | 20.0 | 2.26 | 2.27 | 0.992 |
| New cylinder response | | | | | |
| Baseline Corr AF: | 8.96 | Prev response | 8.96 | *% change | 0.0% |
| Baseline Corr 2nd AF: | 4.49 | AF Slope: | 0.994360 | AF Intercept: | 0.012803 |
| Baseline Corr 3rd AF: | 2.27 | AF Correlation: | 0.999989 | * = > +/-5% change initiates investigation | |

### NMHC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4920 | 79.8 | 9.00 | 9.04 | 0.995 |
| Mid point | 4960 | 39.9 | 4.50 | 4.56 | 0.986 |
| Low 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 | 9.18 | 0.980 |
| | | | | Average Correction Factor | 0.985 |

### CH4 As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As found High point | 4920 | 79.8 | 7.92 | 7.91 | 1.001 |
| As found Mid point | 4960 | 39.9 | 3.96 | 3.94 | 1.005 |
| As found Low point | 4980 | 20.0 | 1.98 | 1.97 | 1.005 |
| New cylinder response | | | | | |
| Baseline Corr AF: | 7.91 | Prev response | 7.90 | *% change | 0.2% |
| Baseline Corr 2nd AF: | 3.94 | AF Slope: | 0.999430 | AF Intercept: | -0.006935 |
| Baseline Corr 3rd AF: | 1.97 | AF Correlation: | 0.999994 | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4920 | 79.8 | 7.92 | 7.92 | 1.000 |
| Mid point | 4960 | 39.9 | 3.96 | 3.93 | 1.006 |
| Low point | 4980 | 20.0 | 1.98 | 1.97 | 1.008 |
| 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 | 1.005 |

### Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| THC Cal Slope: | 0.996773 | 1.002451 |
| THC Cal Offset: | -0.002926 | 0.015044 |
| CH4 Cal Slope: | 0.998463 | 1.000657 |
| CH4 Cal Offset: | -0.008332 | -0.011935 |
| NMHC Cal Slope: | 0.995057 | 1.003673 |
| NMHC Cal Offset: | 0.005807 | 0.027380 |

Calibration Performed By: Kelly Baragar

# Wood Buffalo Environmental Association

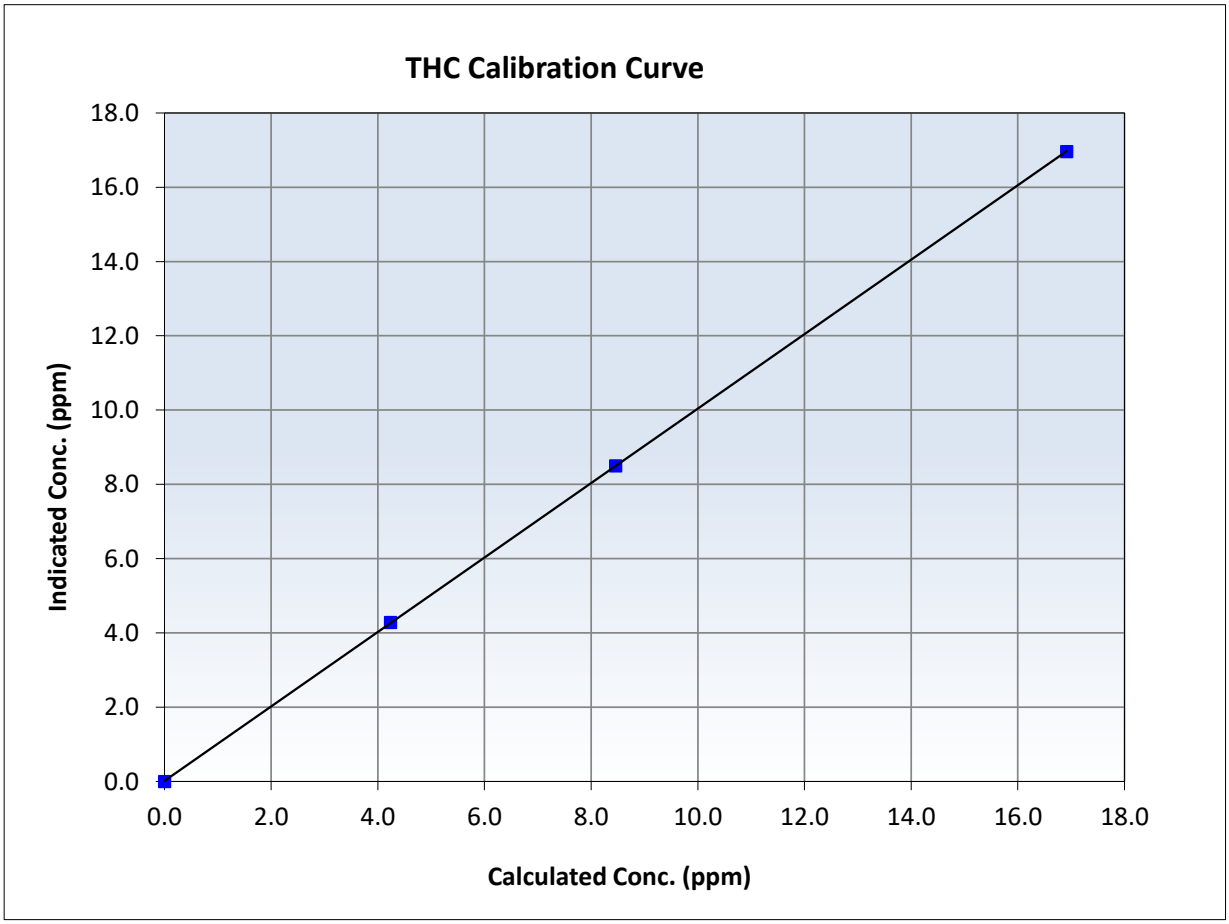
## THC Calibration Summary

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | March 22, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS 07 |
| Start Time (MST): | 9:00 | End Time (MST): | 13:10 |
| 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 | 16.96 | 0.9971 | Slope | 1.002451 | 0.90 - 1.10 |
| 8.46 | 8.50 | 0.9952 | | | |
| 4.24 | 4.28 | 0.9902 | Intercept | 0.015044 | +/-0.5 |



# Wood Buffalo Environmental Association

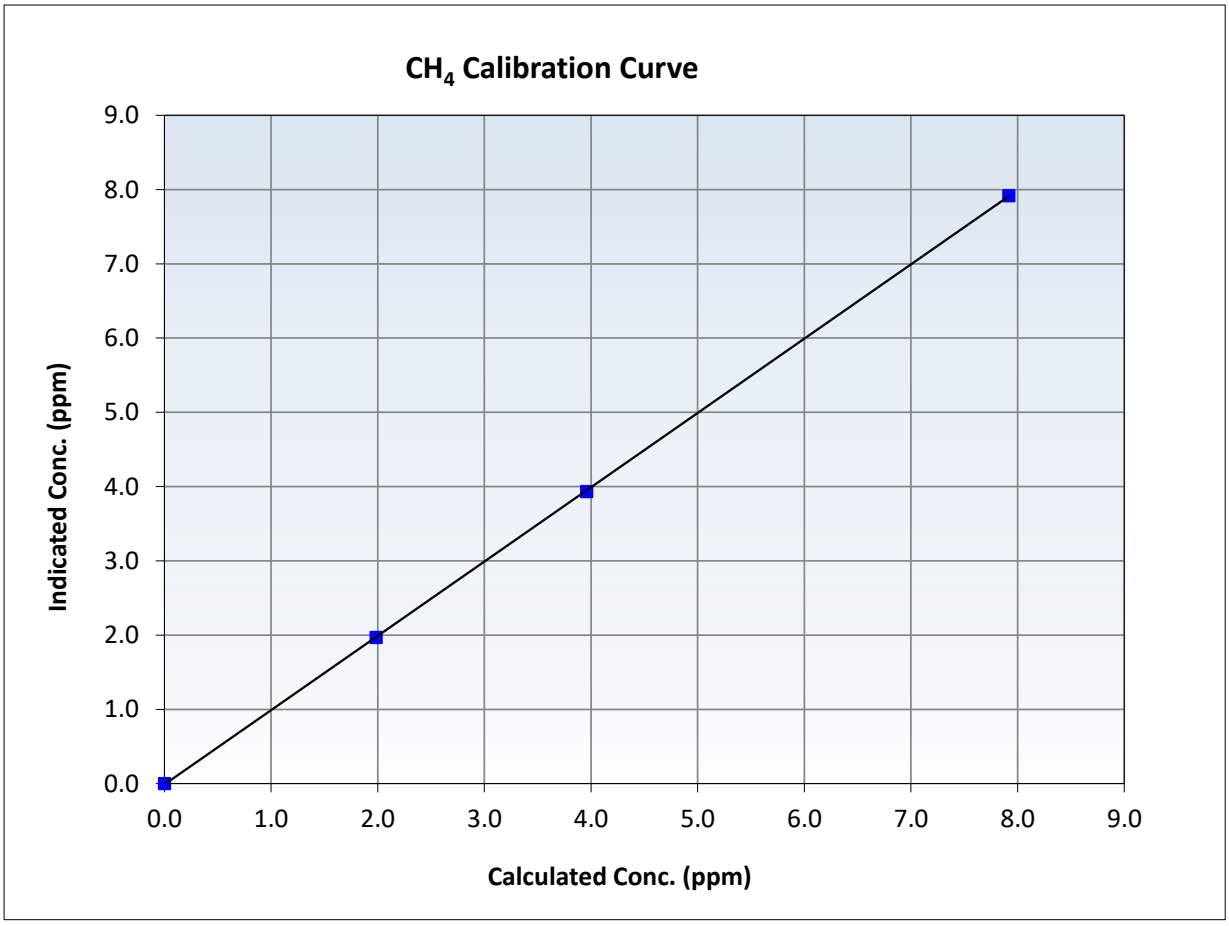
## $CH_4$ Calibration Summary

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | March 22, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS 07 |
| Start Time (MST): | 9:00 | End Time (MST): | 13:10 |
| 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 | 0.999985 | ≥0.995 |
| 7.92 | 7.92 | 0.9997 | Slope | 1.000657 | 0.90 - 1.10 |
| 3.96 | 3.93 | 1.0064 | | | |
| 1.98 | 1.97 | 1.0081 | Intercept | -0.011935 | +/-0.5 |



# Wood Buffalo Environmental Association

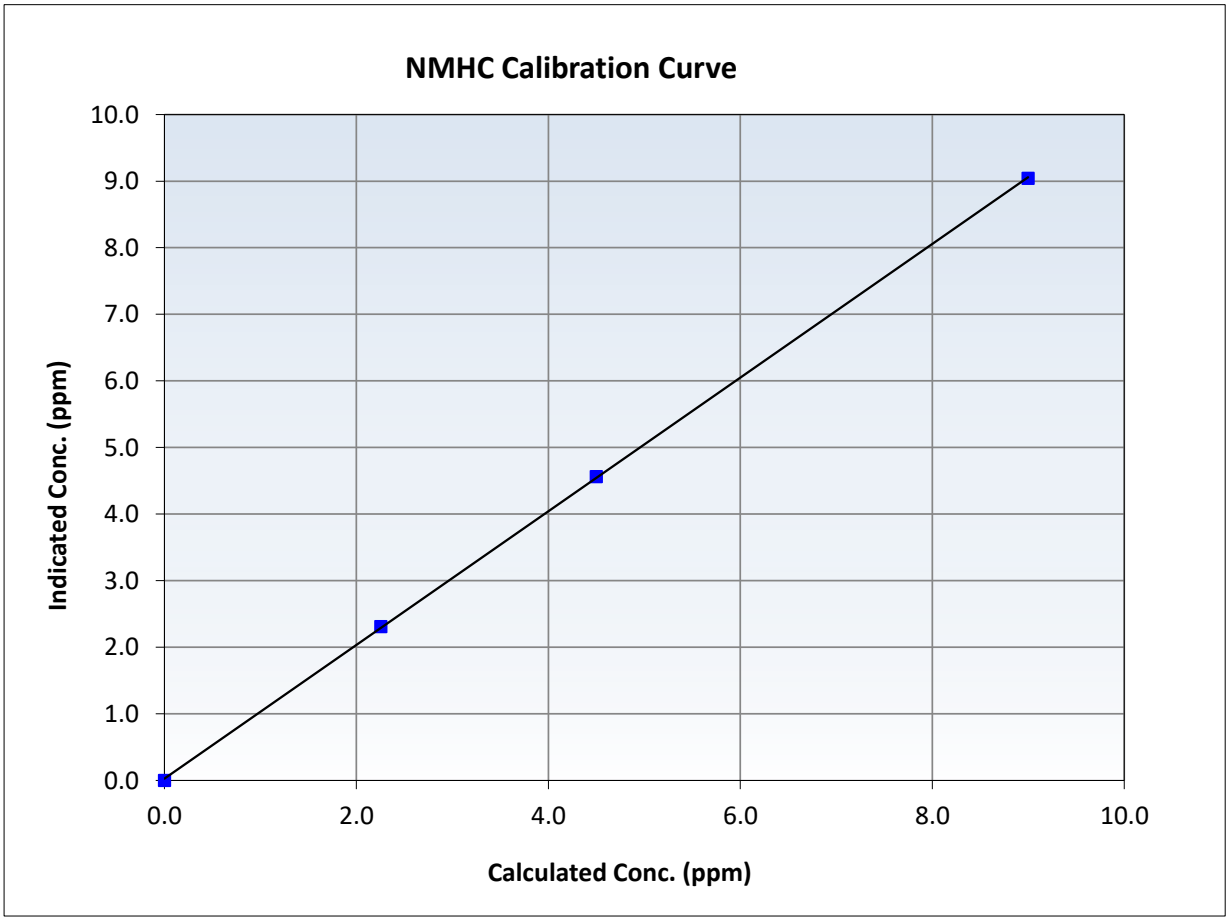
## NMHC Calibration Summary

### Station Information

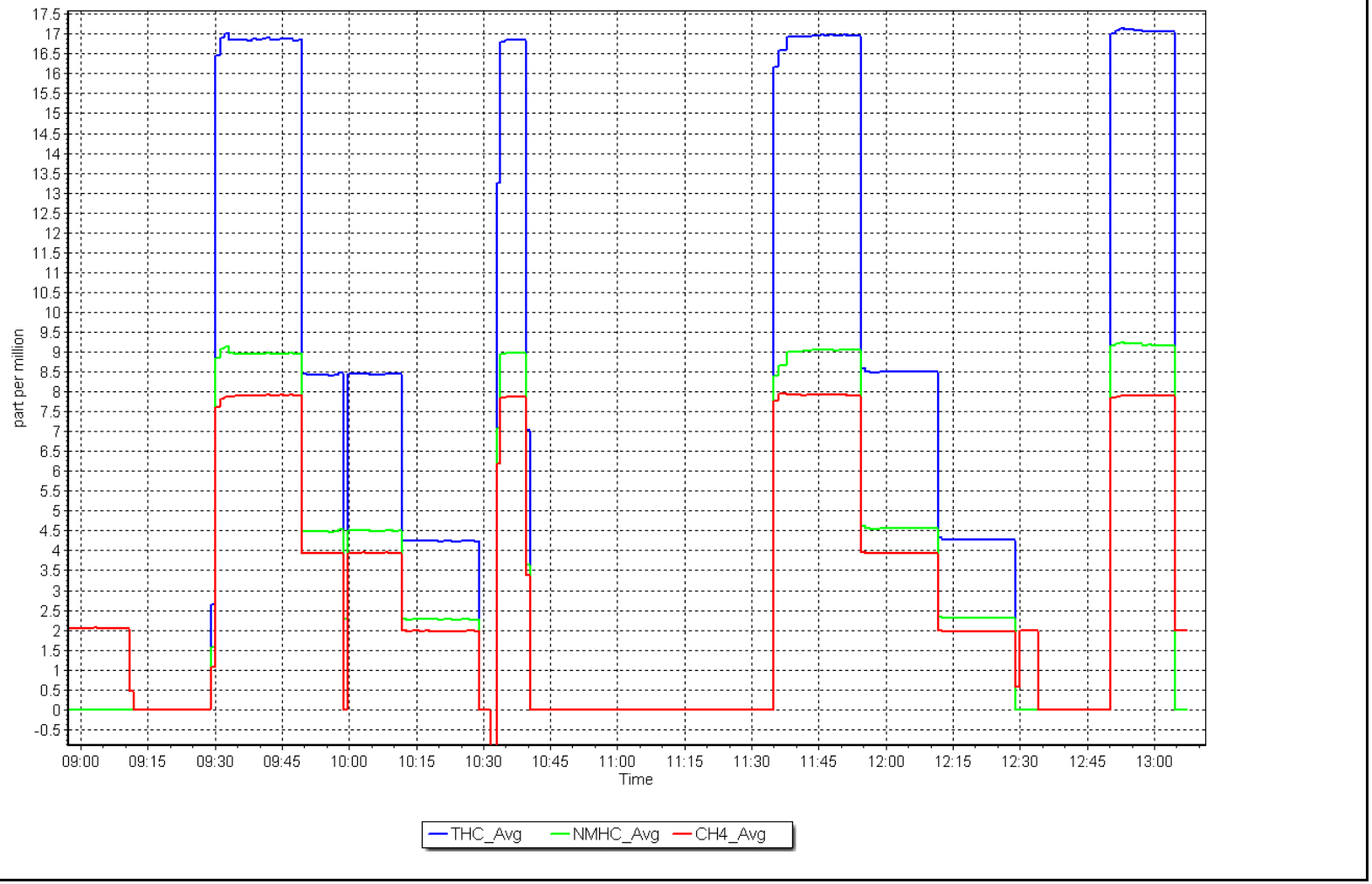
| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | March 22, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS 07 |
| Start Time (MST): | 9:00 | End Time (MST): | 13:10 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 12227620777 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999956 | ≥0.995 |
| 9.00 | 9.04 | 0.9951 | Slope | 1.003673 | 0.90 - 1.10 |
| 4.50 | 4.56 | 0.9857 | | | |
| 2.26 | 2.31 | 0.9749 | Intercept | 0.027380 | +/-0.5 |



**NMHC Calibration Plot** Date: March 26, 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: | March 5, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 10:14 | End time (MST): | 15:26 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1160120024 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.079 | 1.075 | NO bkgnd or offset: | 7.6 | 7.6 |
| NOX coeff or slope: | 0.990 | 1.005 | NOX bkgnd or offset: | 7.8 | 7.9 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 214.5 | 214.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.995415 | 0.999973 |
| $NO_X$ Cal Offset: | 2.191943 | 1.651897 |
| NO Cal Slope: | 0.999970 | 0.998014 |
| NO Cal Offset: | 2.371891 | 1.431946 |
| $NO_2$ Cal Slope: | 0.995591 | 1.008548 |
| $NO_2$ Cal Offset: | -1.458446 | 1.193739 |

# 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 | 4933 | 66.8 | 803.0 | 800.3 | 2.7 | 795.6 | 799.0 | -3.5 | 1.0093 | 1.0016 |
| 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 | 4933 | 66.8 | 803.0 | 800.3 | 2.7 | 803.3 | 799.0 | 4.3 | 0.9996 | 1.0016 |
| second point | 4966 | 33.4 | 401.5 | 400.2 | 1.3 | 405.3 | 402.8 | 2.5 | 0.9907 | 0.9935 |
| third point | 4983 | 16.7 | 200.7 | 200.1 | 0.7 | 203.3 | 201.7 | 1.6 | 0.9874 | 0.9920 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | -0.1 | ---- | ---- |
| as left span | 4933 | 66.8 | 803.0 | 400.9 | 402.1 | 808.8 | 399.0 | 409.7 | 0.9928 | 1.0048 |
| | | | | | | | | Average Correction Factor | 0.9926 | 0.9957 |

| | | | | | |
|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 795.8 ppb | NO = 799.1 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = -0.7% |
| Previous Response | $NO_X$ = 801.5 ppb | NO = 802.6 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) | 796.5 | 397.1 | 402.1 | 405.9 | 0.9906 | 101.0% |
| 2nd GPT point (200 ppb O3) | 796.5 | 599.0 | 200.2 | 204.2 | 0.9803 | 102.0% |
| 3rd GPT point (100 ppb O3) | 796.5 | 698.5 | 100.7 | 103.7 | 0.9708 | 103.0% |
| | | | | Average Correction Factor | 0.9805 | 102.0% |

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

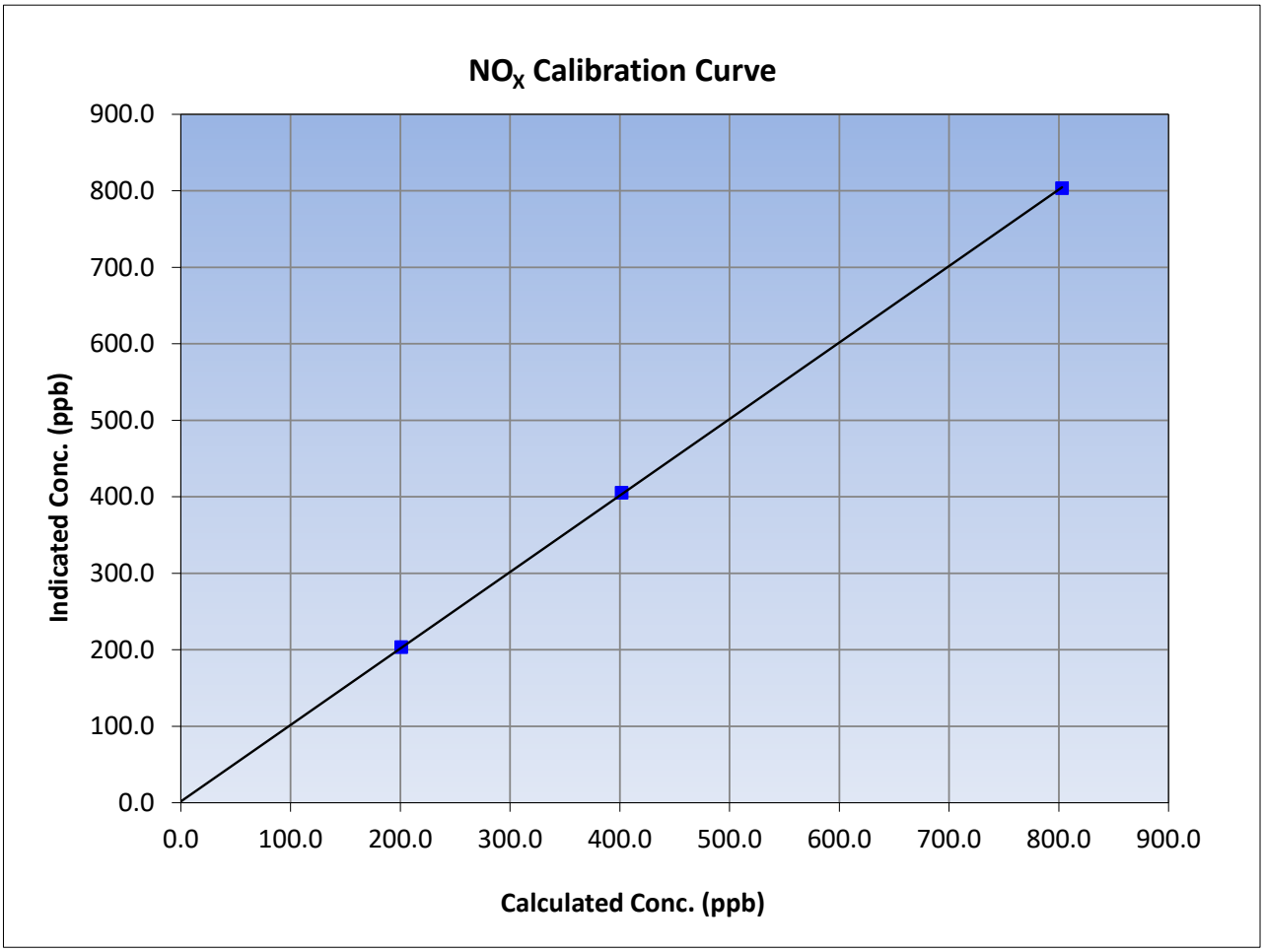
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:14 | End Time (MST): | 15:26 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1160120024 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999971 | *≥0.995* |
| 803.0 | 803.3 | 0.9996 | | | |
| 401.5 | 405.3 | 0.9907 | Slope | 0.999973 | *0.90 - 1.10* |
| 200.7 | 203.3 | 0.9874 | | | |
| | | | Intercept | 1.651897 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

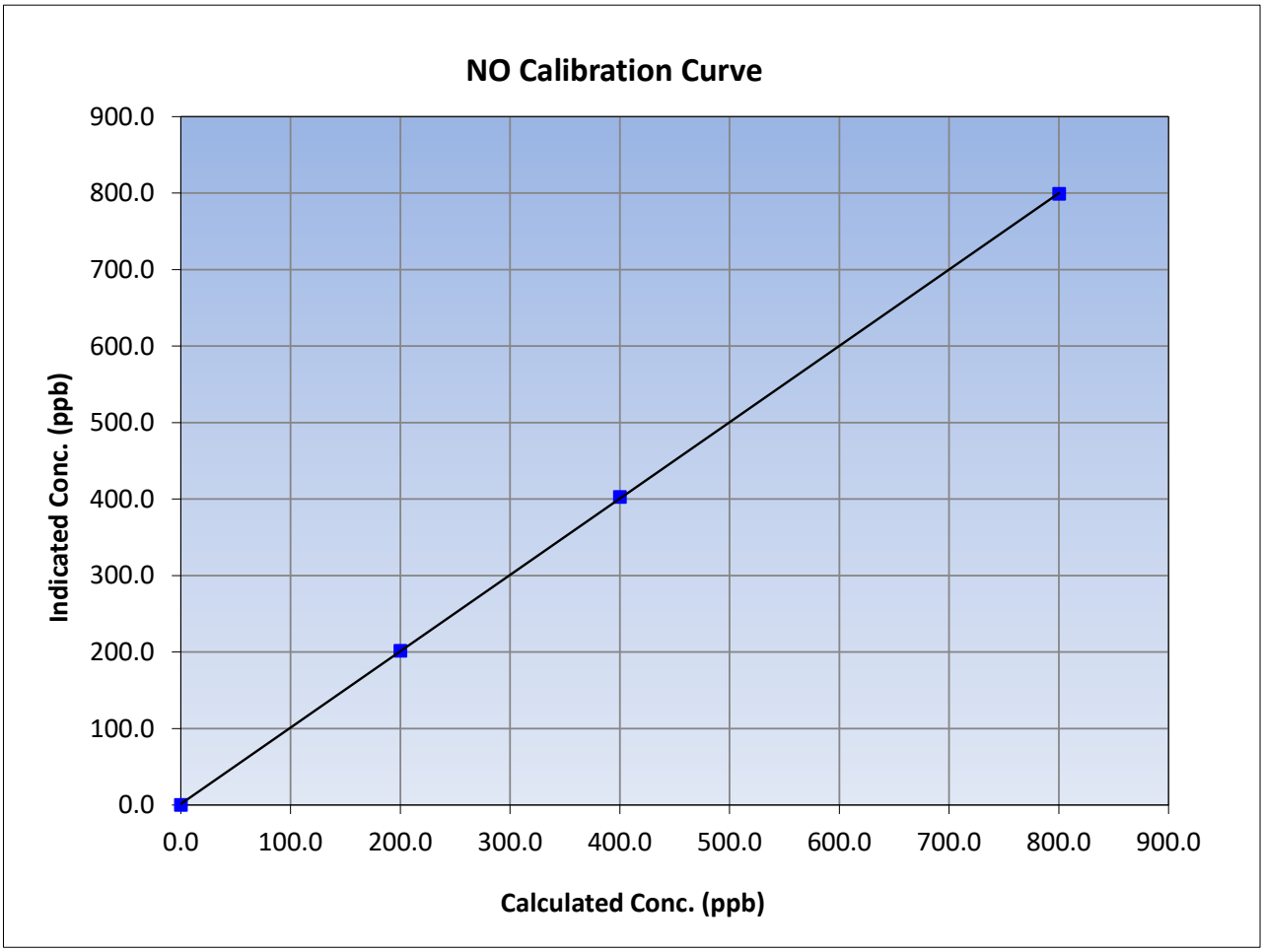
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:14 | End Time (MST): | 15:26 |
| 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 | 0.999978 | ≥0.995 |
| 800.3 | 799.0 | 1.0016 | | | |
| 400.2 | 402.8 | 0.9935 | Slope | 0.998014 | 0.90 - 1.10 |
| 200.1 | 201.7 | 0.9920 | | | |
| | | | Intercept | 1.431946 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

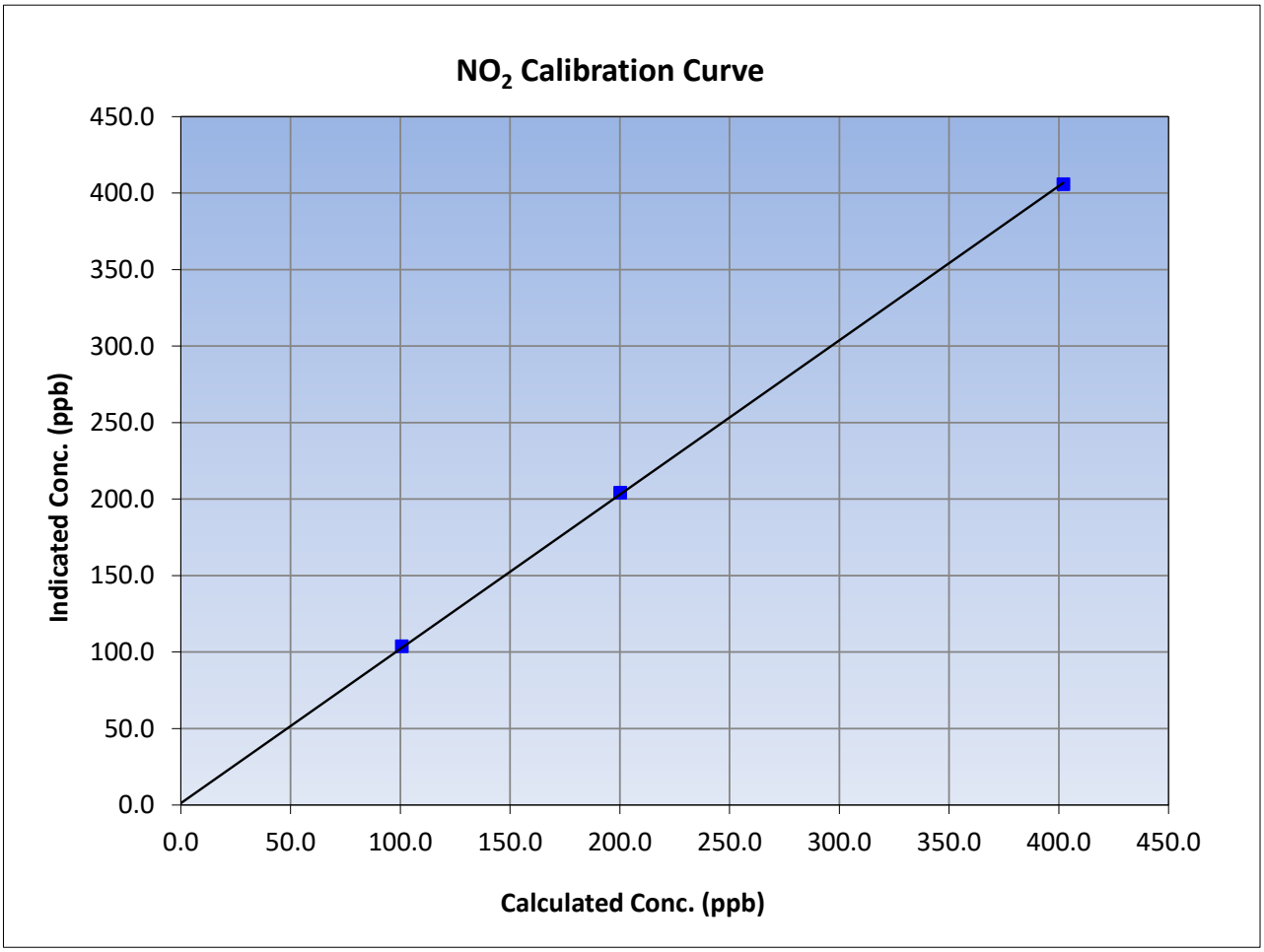
Version-04-2020

### Station Information

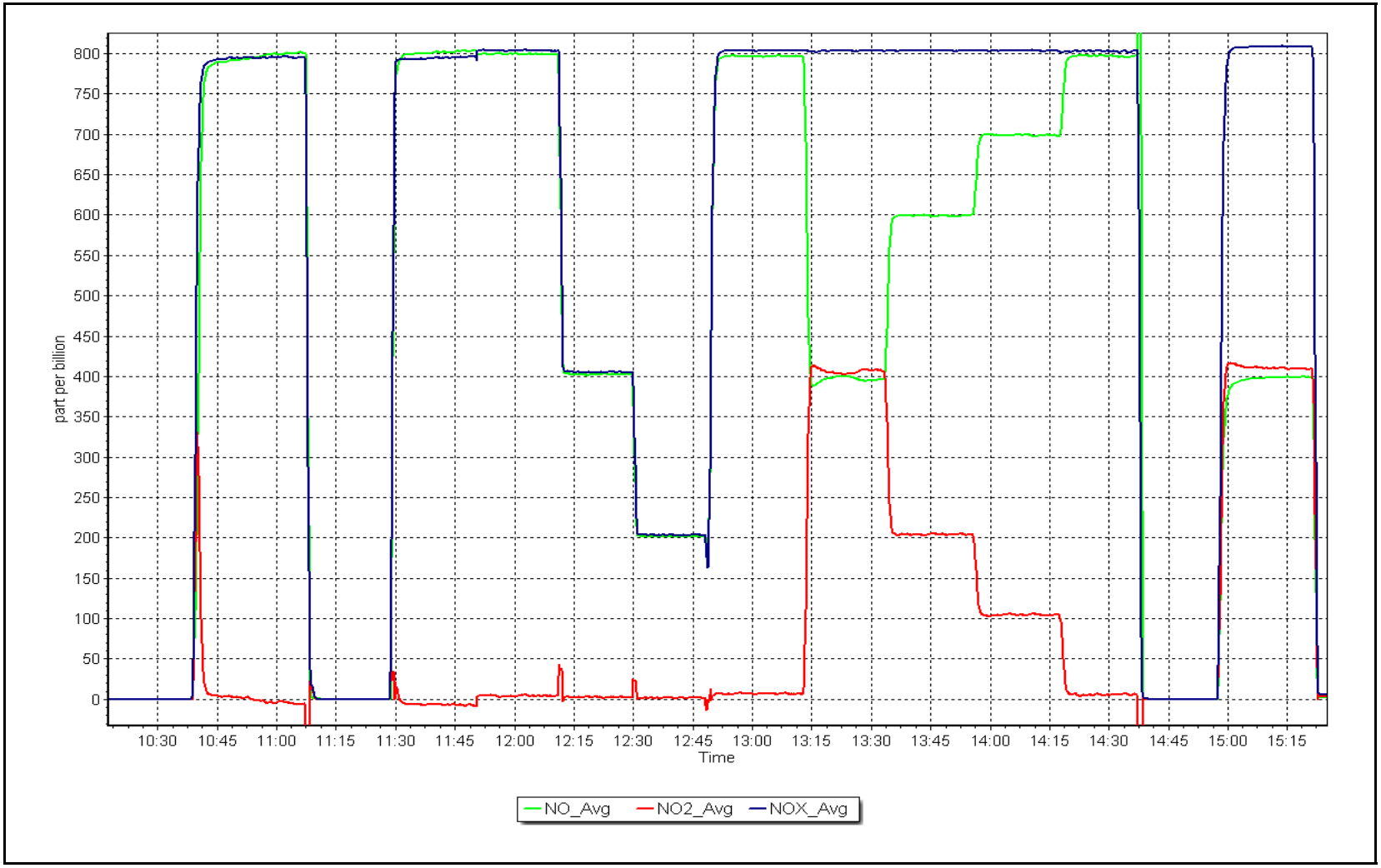
| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 10:14 | End Time (MST): | 15:26 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1160120024 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999950 | ≥0.995 |
| 402.1 | 405.9 | 0.9906 | | | |
| 200.2 | 204.2 | 0.9803 | Slope | 1.008548 | 0.90 - 1.10 |
| 100.7 | 103.7 | 0.9708 | | | |
| | | | Intercept | 1.193739 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 5, 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: | March 27, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 6:05 | End time (MST): | 9:23 |
| 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: | 0.993286 | 0.993629 | Backgd or Offset: | -1.6 | -1.6 |
| Calibration intercept: | 0.100000 | 1.040000 | 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 | -1.0 | ---- |
| as found span | 5000 | 1522.8 | 400.0 | 397.5 | 1.006 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| high point | 5000 | 1523.6 | 400.0 | 398.4 | 1.004 |
| second point | 5000 | 1088.1 | 200.0 | 199.7 | 1.002 |
| third point | 5000 | 880.5 | 100.0 | 100.9 | 0.991 |
| as left zero | 5000 | 0.0 | 0.0 | -1.2 | ---- |
| as left span | 5000 | 1522.4 | 400.0 | 398.7 | 1.003 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 398.5 | Previous response | 397.4 | *% 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: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

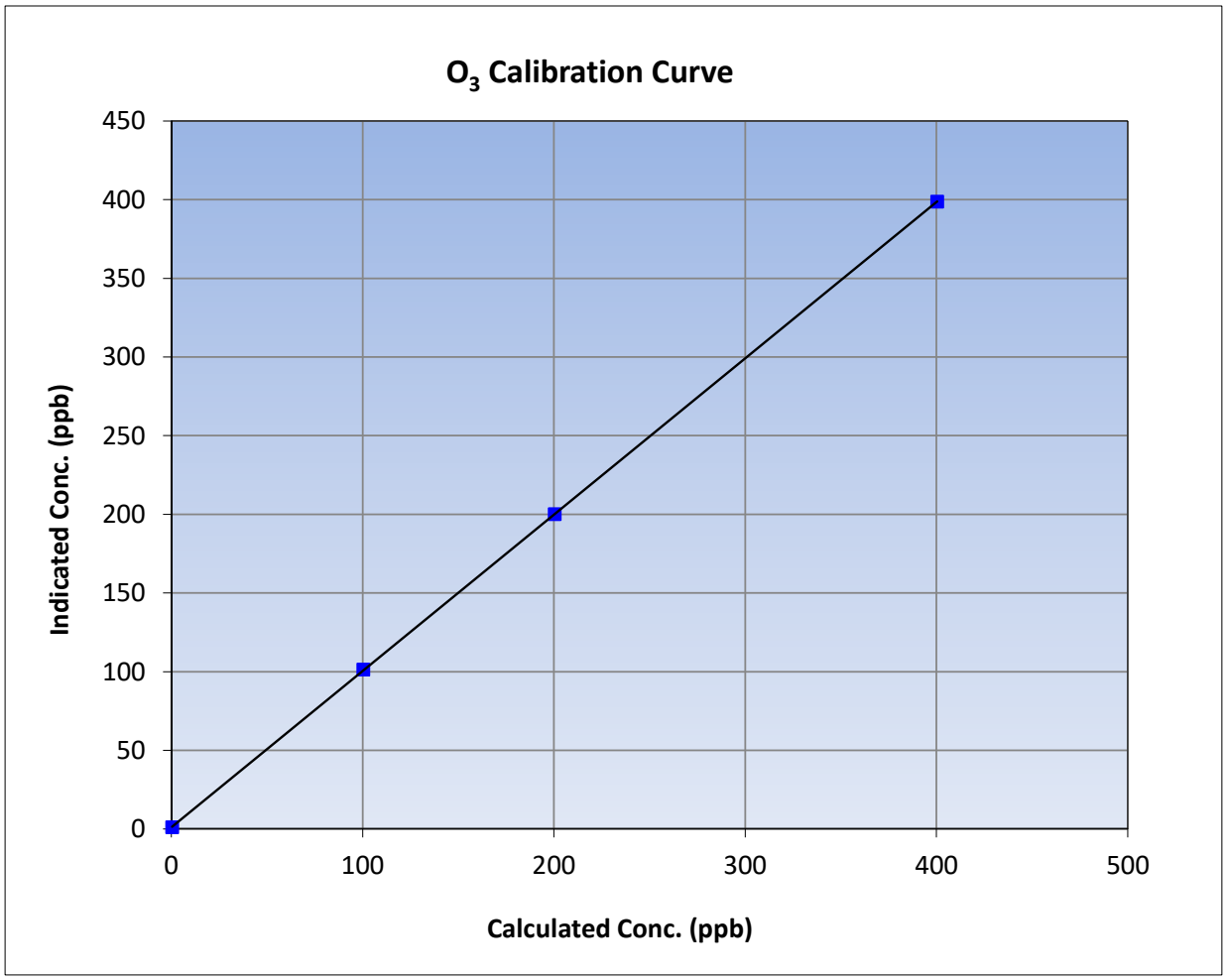
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 6:05 | End Time (MST): | 9:23 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1152220023 |

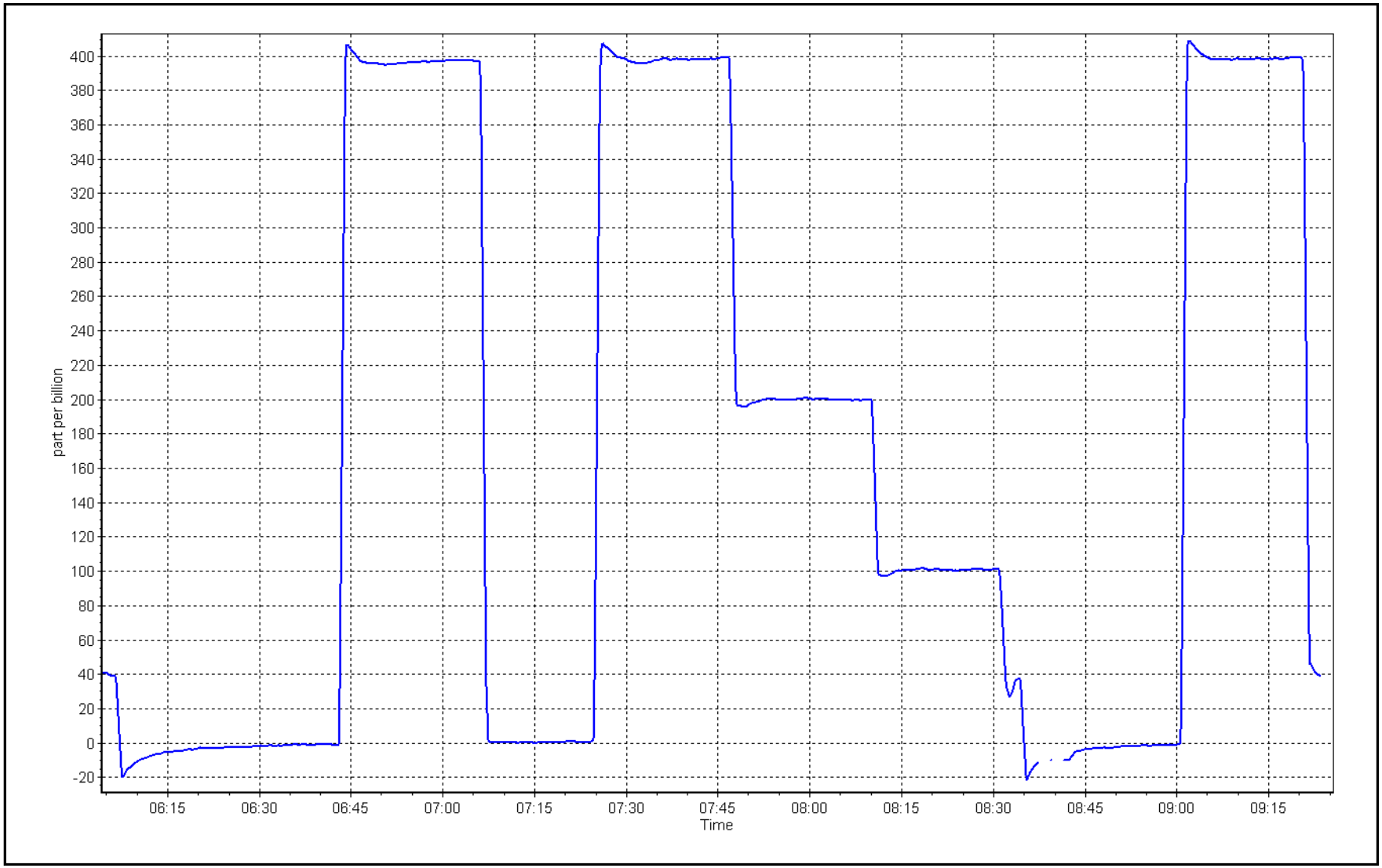
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.7 | ---- |
| 400.0 | 398.4 | 1.0040 |
| 200.0 | 199.7 | 1.0015 |
| 100.0 | 100.9 | 0.9911 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 0.993629 | *0.90 - 1.10* |
| Intercept | 1.040000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 27, 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: | March 27, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 5:27 | End time (MST): | 6:12 |
| Analyzer Make: | | S/N: | 645 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 388753 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 388753 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| T (°C) | -5.4 | -5.8 | -5.4 | ☐ | +/- 2 °C |
| P (mmHg) | 735.9 | 735 | 735.9 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 4.8 | 5.02 | ☑ | +/- 0.25 LPM |
| PW% (pump) | 37 | ----- | 37 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 4.0 | 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: October 6, 2024 — Lot No.: 100128-050-042

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

Date Optical Chamber Cleaned: February 27, 2024

Date Disposable Filter Changed: February 27, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: December 5, 2022

Date RH/T Sensor Cleaned: December 5, 2022

Notes: Flow Adjusted. Leak check passed.

Calibration by: Melissa Lemay

# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Athabasca Valley | Station number: | AMS07 |
| Calibration Date: | March 27, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 9:20 | End time (MST): | 12:19 |
| 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 serial #: 1408761381

Analyzer Range: 0 - 50 ppm

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 0.996688 | 0.995632 | Backgd or Offset: | 4.425 | 4.642 |
| Calibration intercept: | 0.062533 | 0.048509 | 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 | 39.9 | 1.004 |
| 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 | 1.004 |
| second point | 4967 | 33.3 | 20.0 | 20.0 | 0.999 |
| third point | 4983 | 16.7 | 10.0 | 10.1 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4933 | 66.7 | 40.0 | 39.7 | 1.008 |
| | | | | Average Correction Factor | 1.000 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 39.82 | Prev response: | 39.95 | *% 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: Zero adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

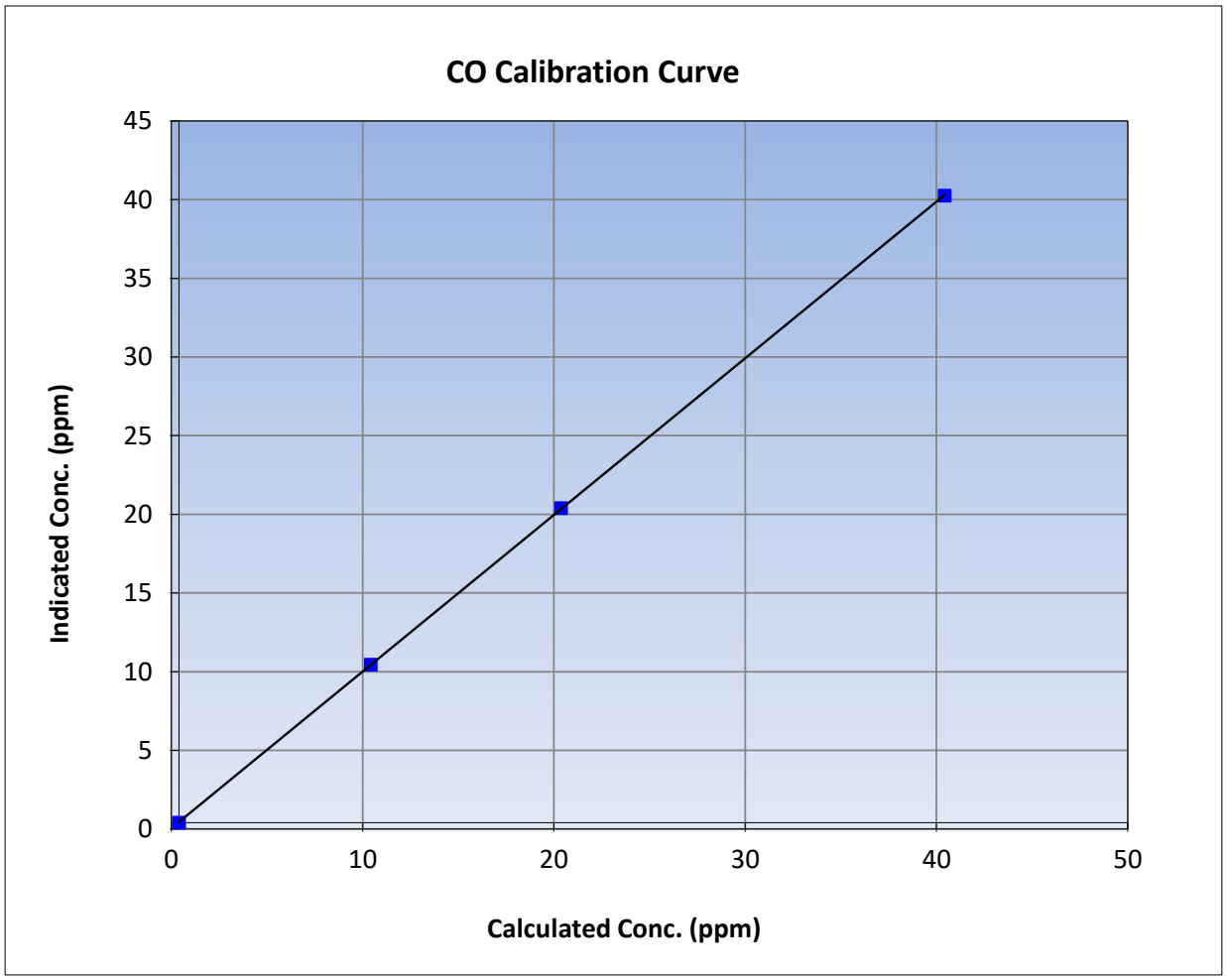
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Athabasca Valley | Station Number: | AMS07 |
| Start Time (MST): | 9:20 | End Time (MST): | 12:19 |
| Analyzer make: | Thermo 48i-LTE | Analyzer serial #: | 1408761381 |

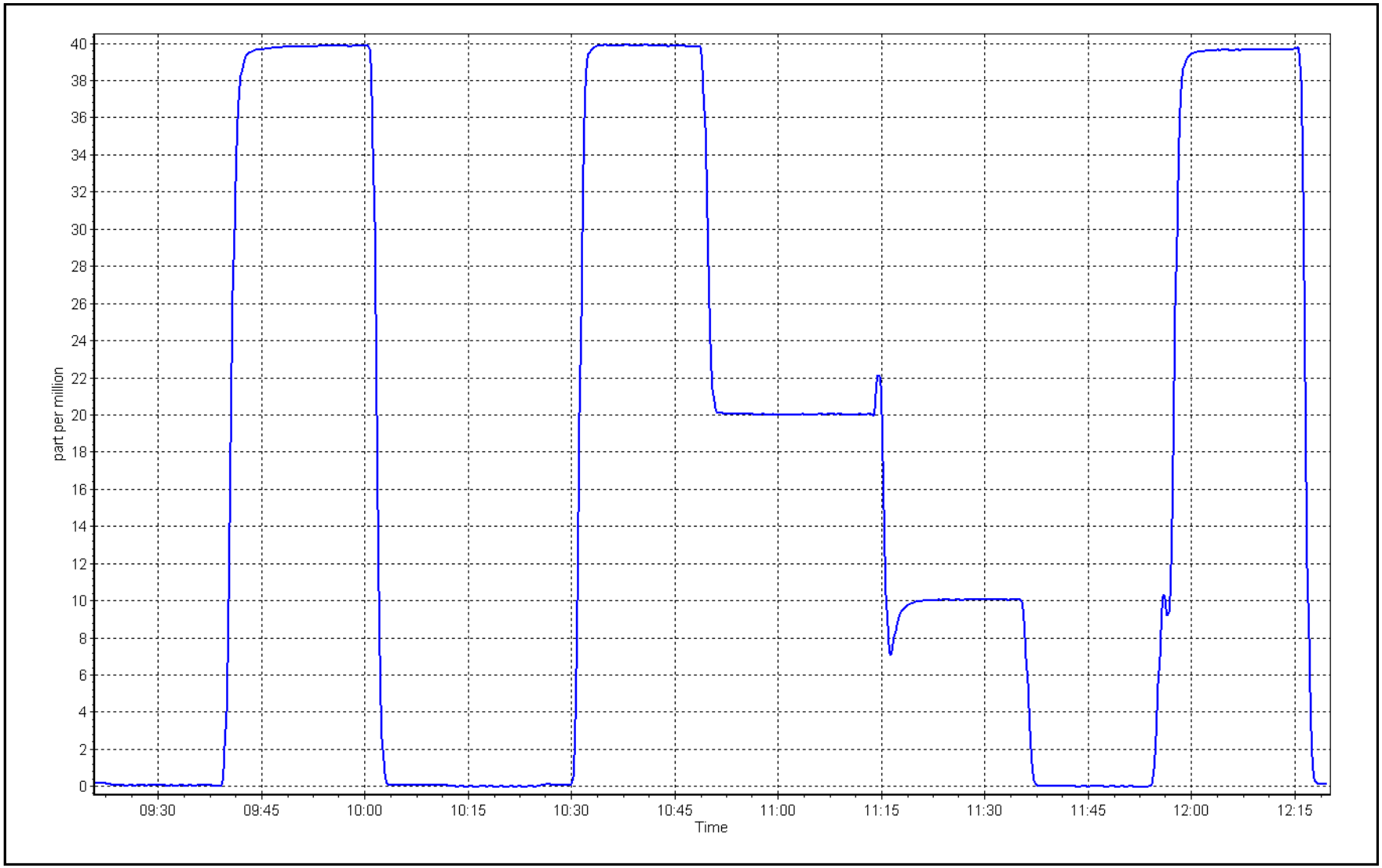
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 40.0 | 39.9 | 1.0041 |
| 20.0 | 20.0 | 0.9989 |
| 10.0 | 10.1 | 0.9971 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999991 | *≥0.995* |
| Slope | 0.995632 | *0.90 - 1.10* |
| Intercept | 0.048509 | *+/-1.5* |



**CO Calibration Plot** Date: March 27, 2024 Location: Athabasca Valley



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS08
## FORT CHIPEWYAN
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | March 20, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 12:08 | End time (MST): | 14:47 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 49.84 | ppm | Cal Gas Exp Date: | January 6, 2030 |
| Cal Gas Cylinder #: | CC196697 | | | |
| Removed Cal Gas Conc: | 49.84 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator 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: | 0.994207 | 1.003858 | Backgd or Offset: | 1.83 | 1.83 |
| Calibration intercept: | 1.596267 | 0.615265 | 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 | 798.5 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| high point | 4920 | 80.3 | 800.4 | 804.3 | 0.995 |
| second point | 4960 | 40.2 | 400.7 | 401.4 | 0.998 |
| third point | 4980 | 20.1 | 200.4 | 203.8 | 0.983 |
| as left zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| as left span | 4920 | 80.3 | 800.4 | 802.6 | 0.997 |
| | | | | Average Correction Factor | 0.992 |

Baseline Corr As found: 798.90  Previous response 797.34  *% change 0.2%

* = > +/-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

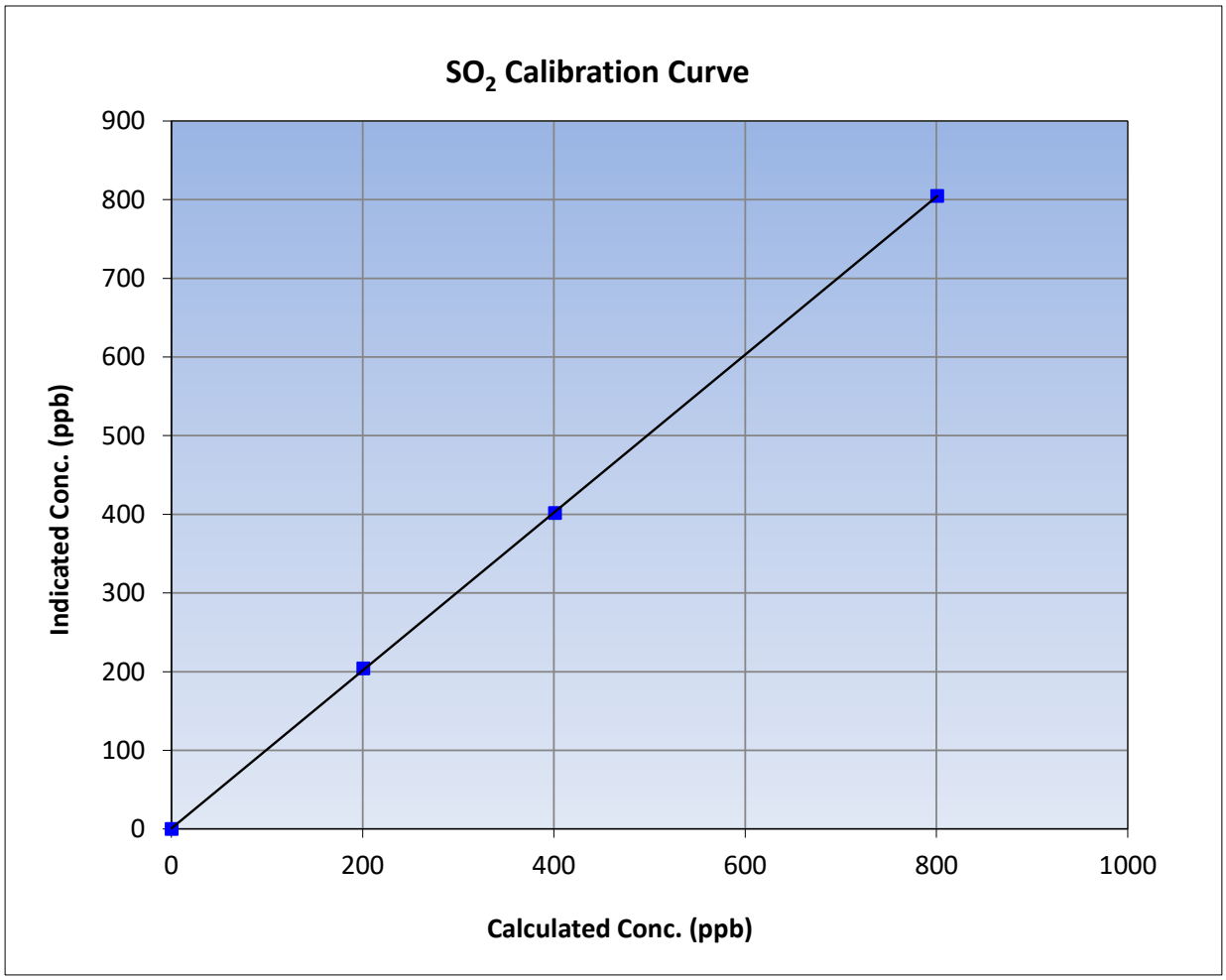
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | December 13, 2023 | Station Number: | Fort Chipewyan |
| Start Time (MST): | 12:08 | End Time (MST): | 14:47 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1136451241 |

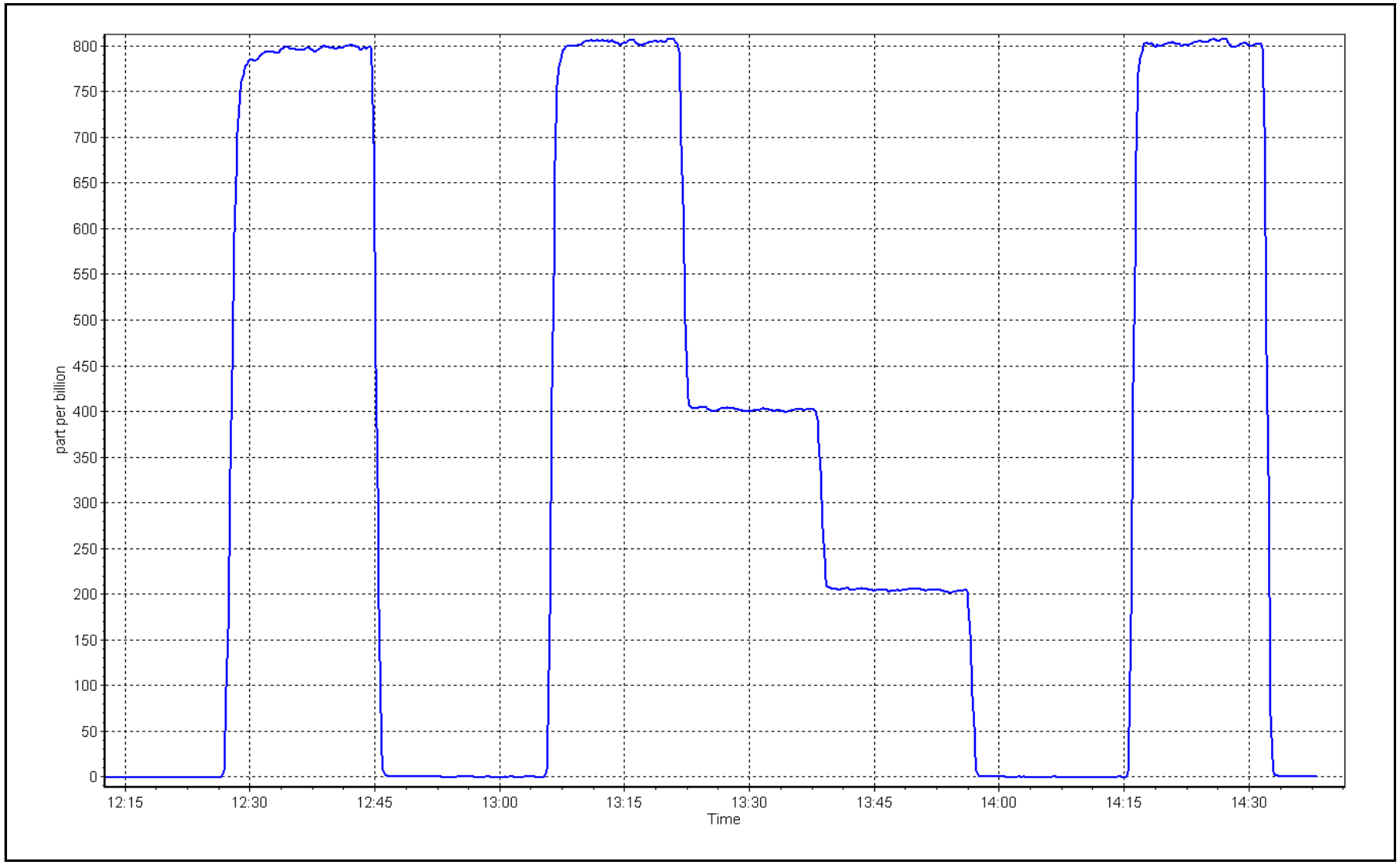
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.2 | ---- |
| 800.4 | 804.3 | 0.9951 |
| 400.7 | 401.4 | 0.9983 |
| 200.4 | 203.8 | 0.9831 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999980 | *≥0.995* |
| Slope | 1.003858 | *0.90 - 1.10* |
| Intercept | 0.615265 | *+/-30* |



**SO2 Calibration Plot** Date: March 20, 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: | March 20, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 14:46 | End time (MST): | 18:33 |
| 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: | 0.991000 | 1.003284 | Backgd or Offset: | 0.98 | 0.99 |
| Calibration intercept: | 0.578560 | 0.498794 | Coeff or Slope: | 0.741 | 0.754 |

### 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 | 78.5 | 1.026 |
| as found 2nd point | 4960 | 40.2 | 40.0 | 39.9 | 1.014 |
| as found 3rd point | 4980 | 20.1 | 20.0 | 19.9 | 1.030 |
| 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 | 80.8 | 0.990 |
| second point | 4960 | 40.2 | 40.0 | 40.6 | 0.984 |
| third point | 4980 | 20.1 | 20.0 | 20.4 | 0.979 |
| as left zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| as left span | 4920 | 80.5 | 80.0 | 81.4 | 0.983 |
| SO2 Scrubber Check | 4919.7 | 80.3 | 803.0 | 0.1 | ---- |
| Date of last scrubber change: | | March 7, 2022 | | Ave Corr Factor | 0.985 |
| Date of last converter efficiency test: | | March 15, 2022 | | 100.7% | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 78.0 | Prev response: | 79.87 | *% change: | -2.4% |
| Baseline Corr 2nd AF pt: | 39.4 | AF Slope: | 0.975855 | AF Intercept: | 0.558435 |
| Baseline Corr 3rd AF pt: | 19.4 | AF Correlation: | 0.999950 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

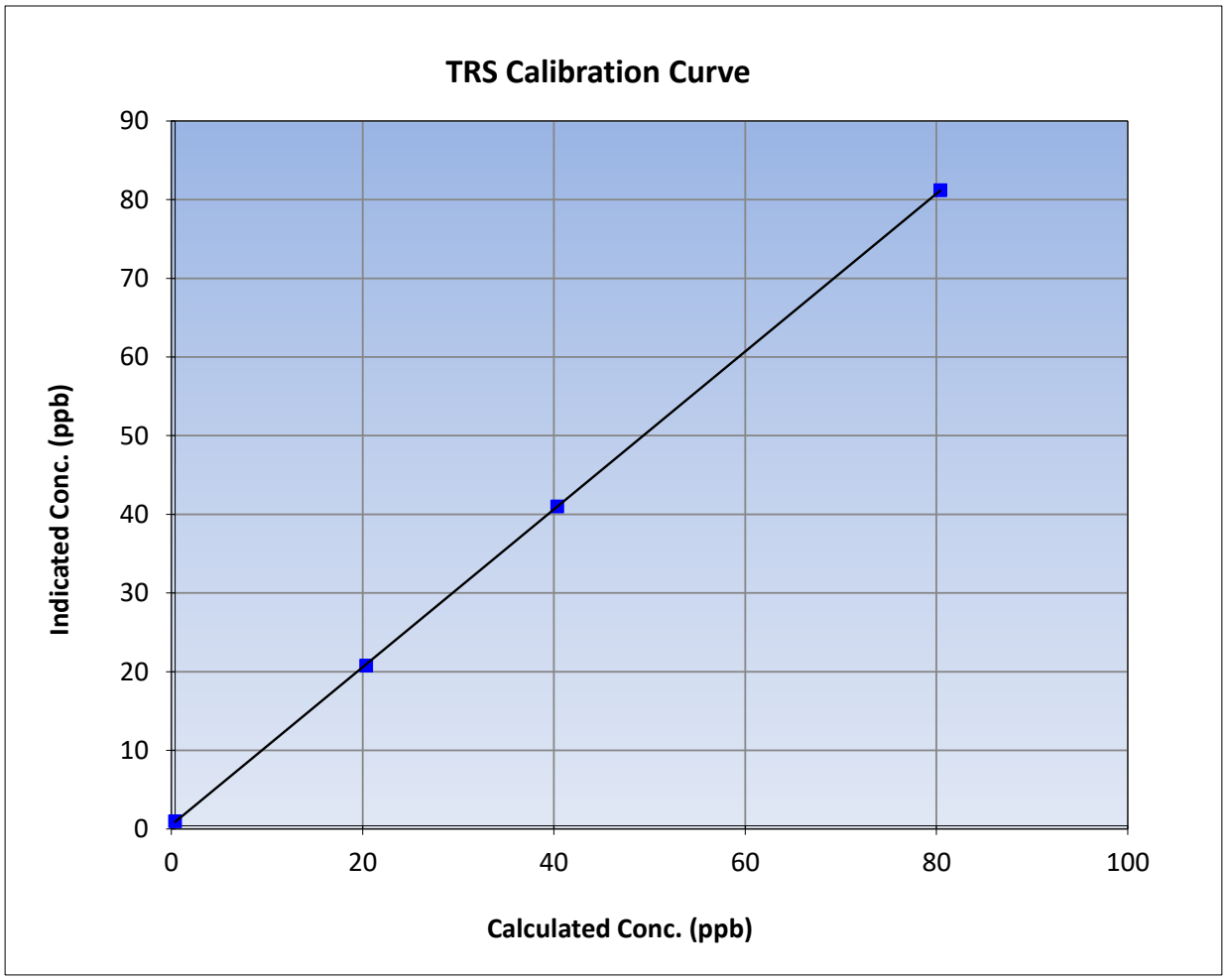
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 14:46 | End Time (MST): | 18:33 |
| Analyzer make: | Thermo 43iQ-TL | Analyzer serial #: | 1203169744 |

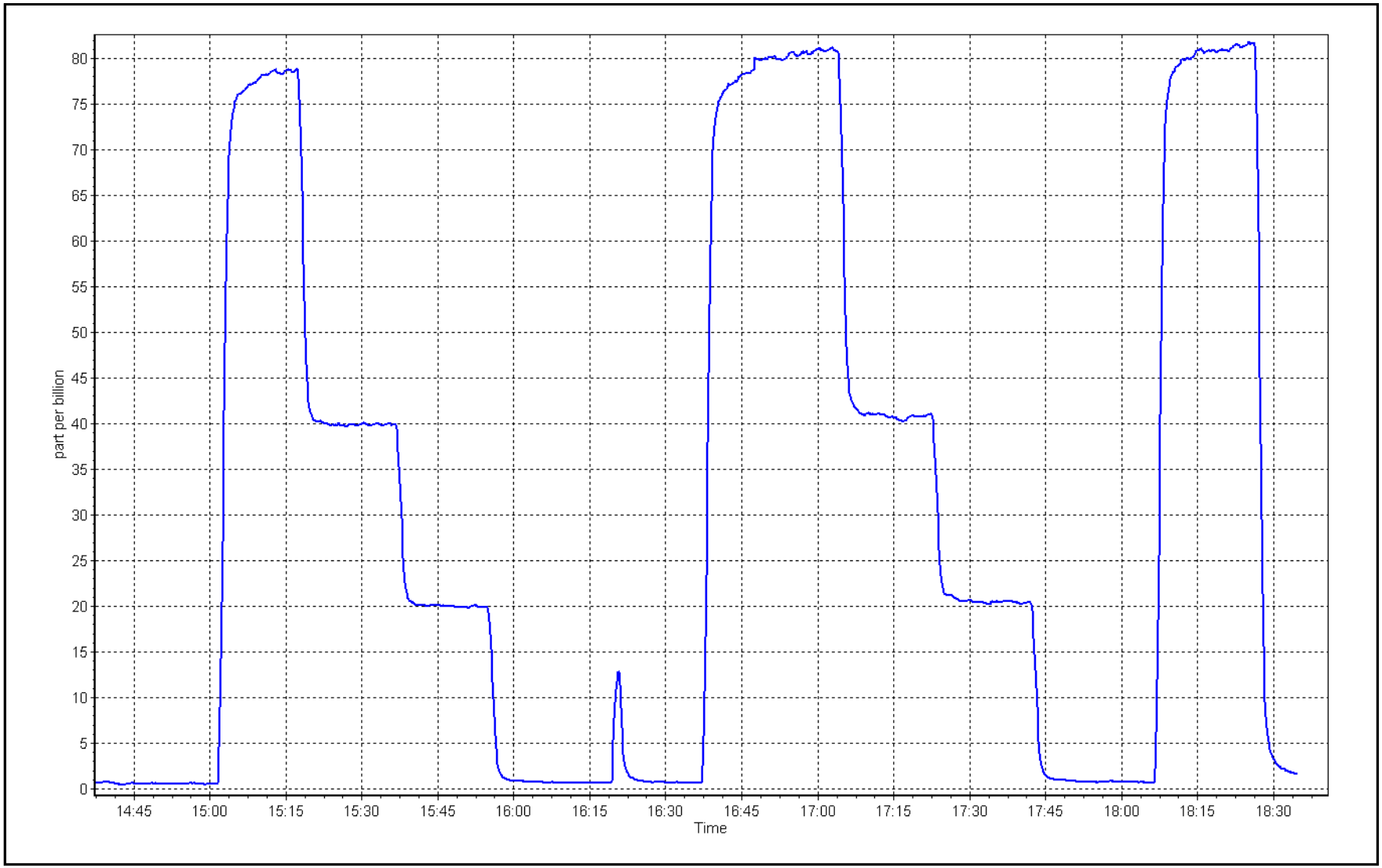
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 80.0 | 80.8 | 0.9902 |
| 40.0 | 40.6 | 0.9842 |
| 20.0 | 20.4 | 0.9794 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999991 | *≥0.995* |
| Slope | 1.003284 | *0.90 - 1.10* |
| Intercept | 0.498794 | *+/-3* |



**TRS Calibration Plot** Date: March 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: | March 20, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 7:54 | End time (MST): | 12:13 |
| Reason: | Routine | | |

### Calibration Standards

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

### Analyzer Information

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

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.154 | 1.200 | NO bkgnd or offset: | -2.5 | -2.5 |
| NOX coeff or slope: | 1.152 | 1.194 | NOX bkgnd or offset: | -2.2 | -2.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 2.9 | 2.9 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.997032 | 0.995037 |
| $NO_X$ Cal Offset: | 2.294675 | 3.395408 |
| NO Cal Slope: | 0.998455 | 0.998540 |
| NO Cal Offset: | 1.134987 | 1.155021 |
| $NO_2$ Cal Slope: | 1.001043 | 0.993301 |
| $NO_2$ Cal Offset: | 0.109543 | 0.722793 |

# 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 | 1.2 | 1.2 | 0.0 | ---- | ---- |
| as found span | 4933 | 66.7 | 803.1 | 800.4 | 2.7 | 774.0 | 767.4 | 6.3 | 1.0376 | 1.0431 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 1.4 | -0.1 | ---- | ---- |
| high point | 4933 | 66.7 | 803.1 | 800.4 | 2.7 | 801.1 | 800.3 | 0.8 | 1.0025 | 1.0002 |
| second point | 4967 | 33.3 | 400.9 | 399.6 | 1.3 | 404.5 | 400.8 | 4.0 | 0.9911 | 0.9969 |
| third point | 4983 | 16.7 | 201.1 | 200.4 | 0.7 | 204.8 | 200.5 | 4.3 | 0.9818 | 0.9995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 1.3 | 0.0 | ---- | ---- |
| as left span | 4933 | 66.7 | 803.1 | 391.1 | 412.0 | 785.6 | 377.7 | 407.9 | 1.0223 | 1.0356 |
| | | | | | | | | Average Correction Factor | 0.9918 | 0.9989 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 772.8 ppb | NO = 766.2 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = -3.9% | | |
| Previous Response | $NO_X$ = 803.0 ppb | NO = 800.3 ppb | | *Percent Change | NO = -4.5% | | |
| 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) | 790.9 | 381.6 | 412.0 | 409.2 | 1.0068 | 99.3% |
| 2nd GPT point (200 ppb O3) | 790.9 | 588.1 | 205.5 | 206.2 | 0.9965 | 100.4% |
| 3rd GPT point (100 ppb O3) | 790.9 | 695.1 | 98.5 | 98.7 | 0.9977 | 100.2% |
| | | | | Average Correction Factor | 1.0003 | 100.0% |

Notes: Sample inlet filters changed after as found. Adjusted span.

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

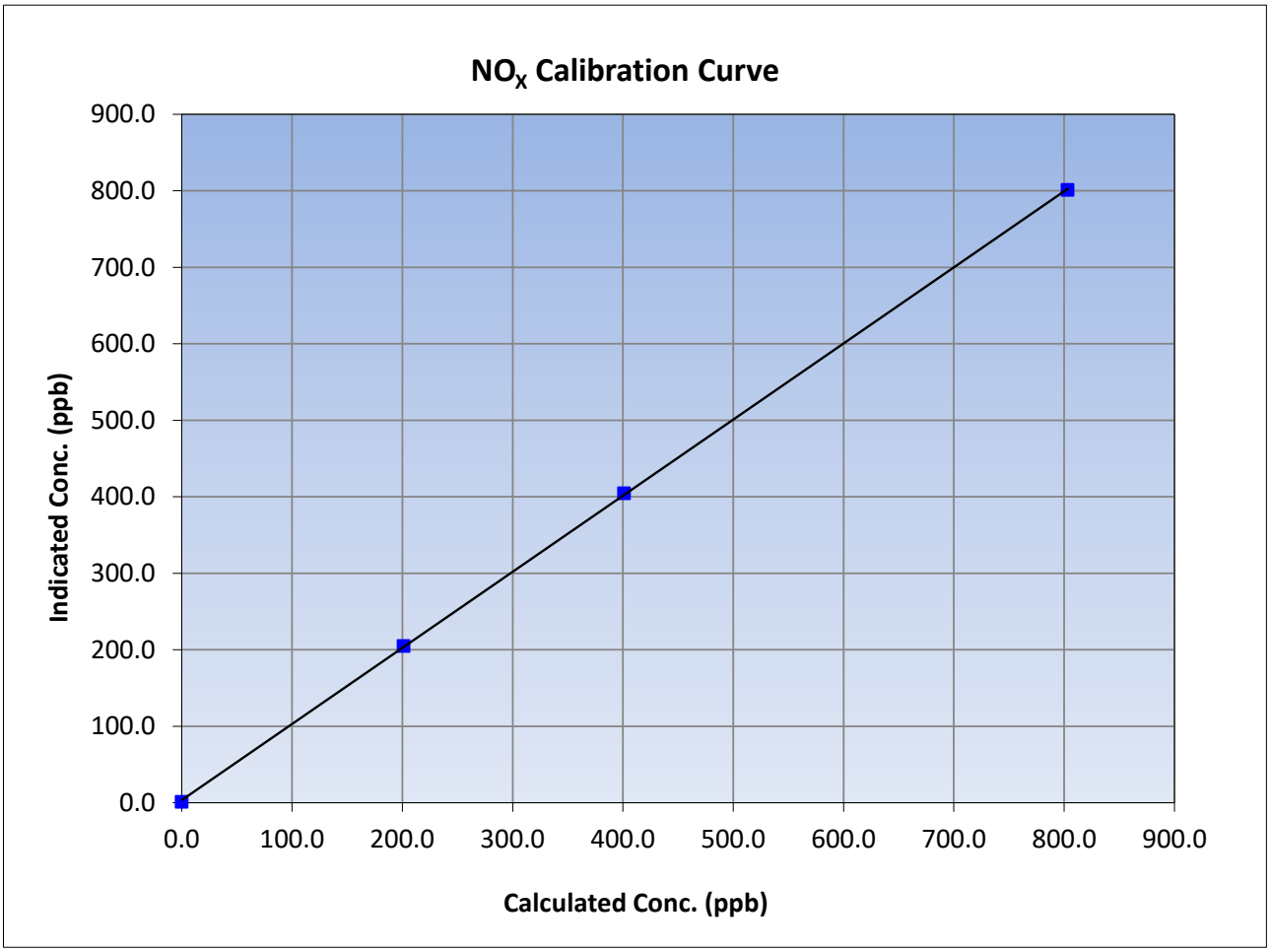
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:54 | End Time (MST): | 12:13 |
| Analyzer make: | API T200 | Analyzer serial #: | 12:13:00 PM |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 1.3 | ---- | Correlation Coefficient | 0.999963 | ≥0.995 |
| 803.1 | 801.1 | 1.0025 | | | |
| 400.9 | 404.5 | 0.9911 | Slope | 0.995037 | 0.90 - 1.10 |
| 201.1 | 204.8 | 0.9818 | | | |
| | | | Intercept | 3.395408 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

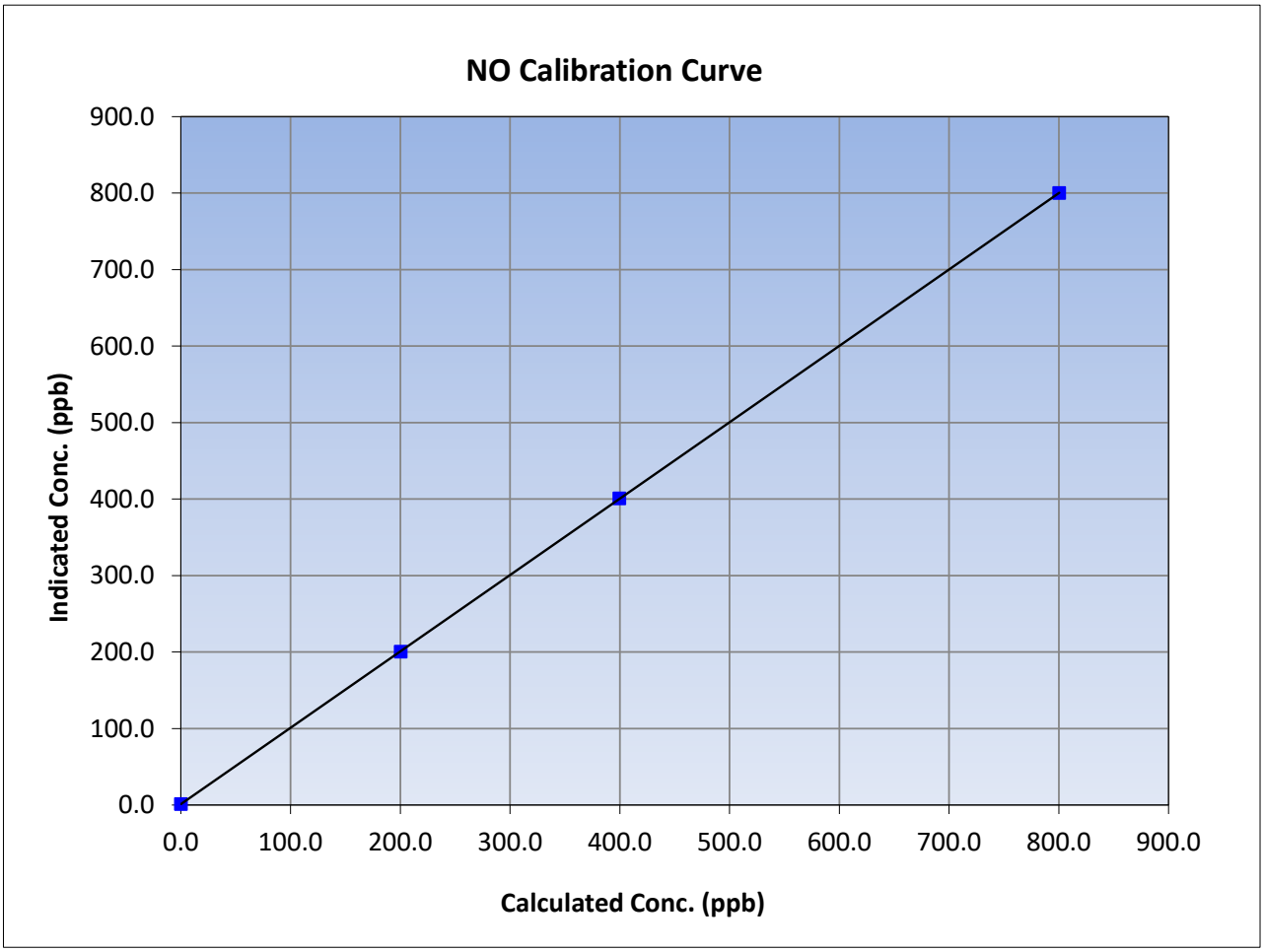
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:54 | End Time (MST): | 12:13 |
| Analyzer make: | API T200 | Analyzer serial #: | 12:13:00 PM |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 1.4 | ---- | Correlation Coefficient | 0.999997 | ≥0.995 |
| 800.4 | 800.3 | 1.0002 | | | |
| 399.6 | 400.8 | 0.9969 | Slope | 0.998540 | 0.90 - 1.10 |
| 200.4 | 200.5 | 0.9995 | | | |
| | | | Intercept | 1.155021 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

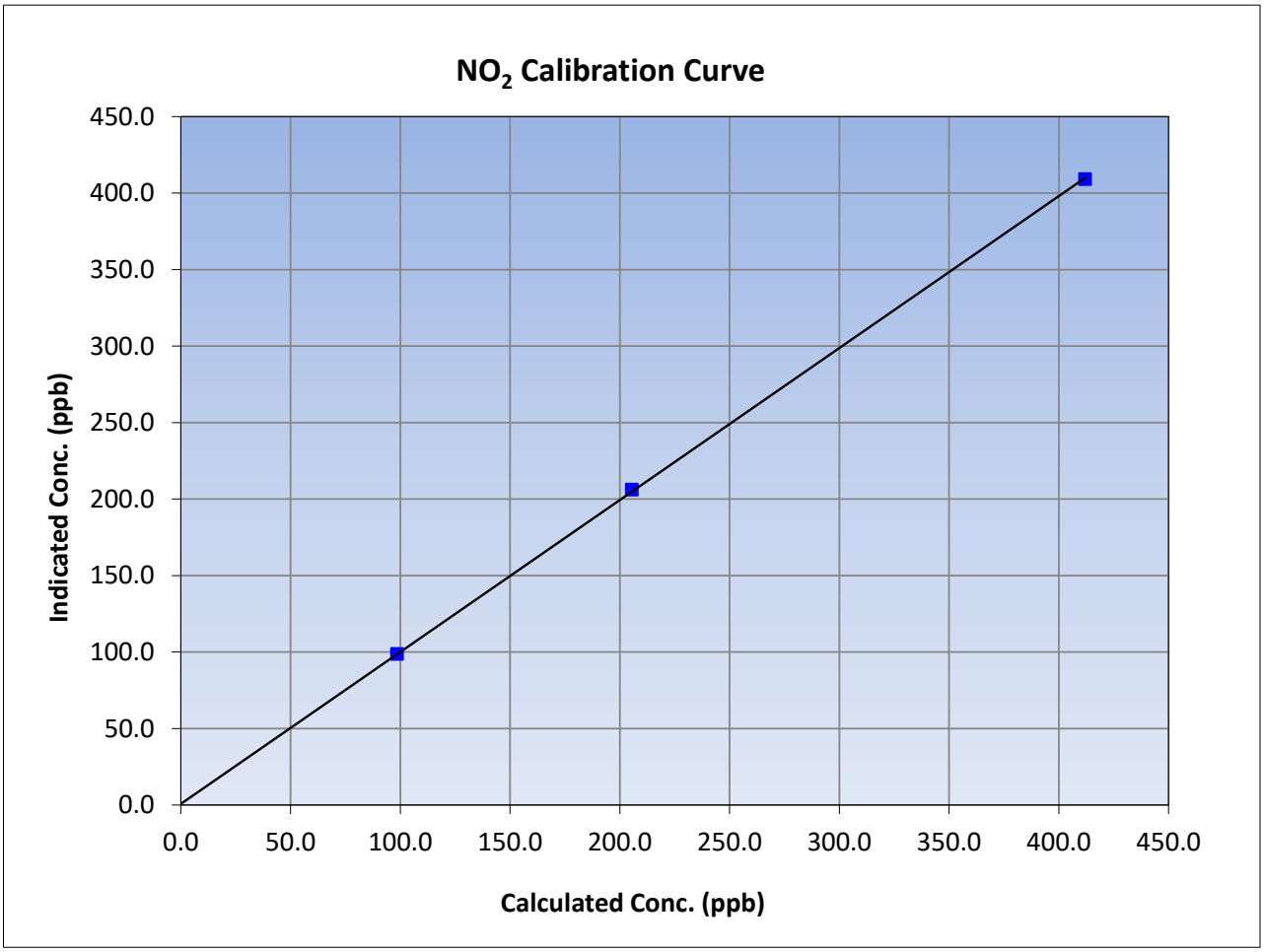
Version-04-2020

### Station Information

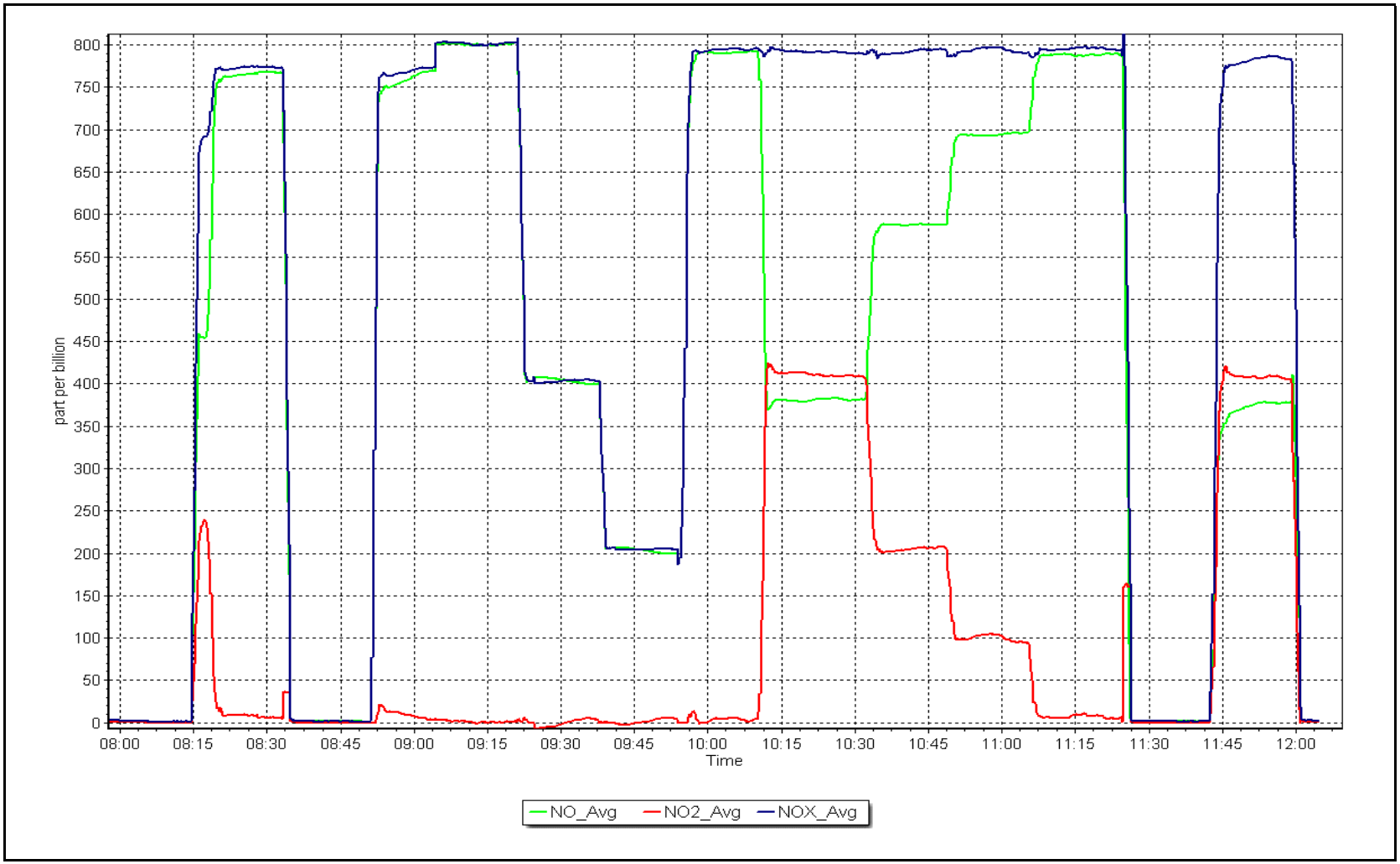
| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:54 | End Time (MST): | 12:13 |
| Analyzer make: | API T200 | Analyzer serial #: | 12:13:00 PM |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999966 | ≥0.995 |
| 412.0 | 409.2 | 1.0068 | | | |
| 205.5 | 206.2 | 0.9965 | Slope | 0.993301 | 0.90 - 1.10 |
| 98.5 | 98.7 | 0.9977 | | | |
| | | | Intercept | 0.722793 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 20, 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: | March 19, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 7:14 | End time (MST): | 10:05 |
| 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: | 1.027914 | 0.994571 | Backgd or Offset: | -2.0 | -2.0 |
| Calibration intercept: | 0.240000 | 0.100000 | 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 | 0.2 | ---- |
| as found span | 5000 | 913.0 | 400.0 | 399.0 | 1.003 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| high point | 5000 | 914.7 | 400.0 | 397.9 | 1.005 |
| second point | 5000 | 786.4 | 200.0 | 199.3 | 1.004 |
| third point | 5000 | 701.3 | 100.0 | 99.1 | 1.009 |
| as left zero | 5000 | 0.0 | 0.0 | 1.1 | ---- |
| as left span | 5000 | 963.3 | 400.0 | 398.0 | 1.005 |
| | | | | Average Correction Factor | 1.006 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 398.8 | Previous response | 411.4 | *% change | -3.2% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: Changed out inlet filter after as found. No adjustments made. During as founds entered PPB point instead of GPTPS point.

Calibration Performed By: Matthew C

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

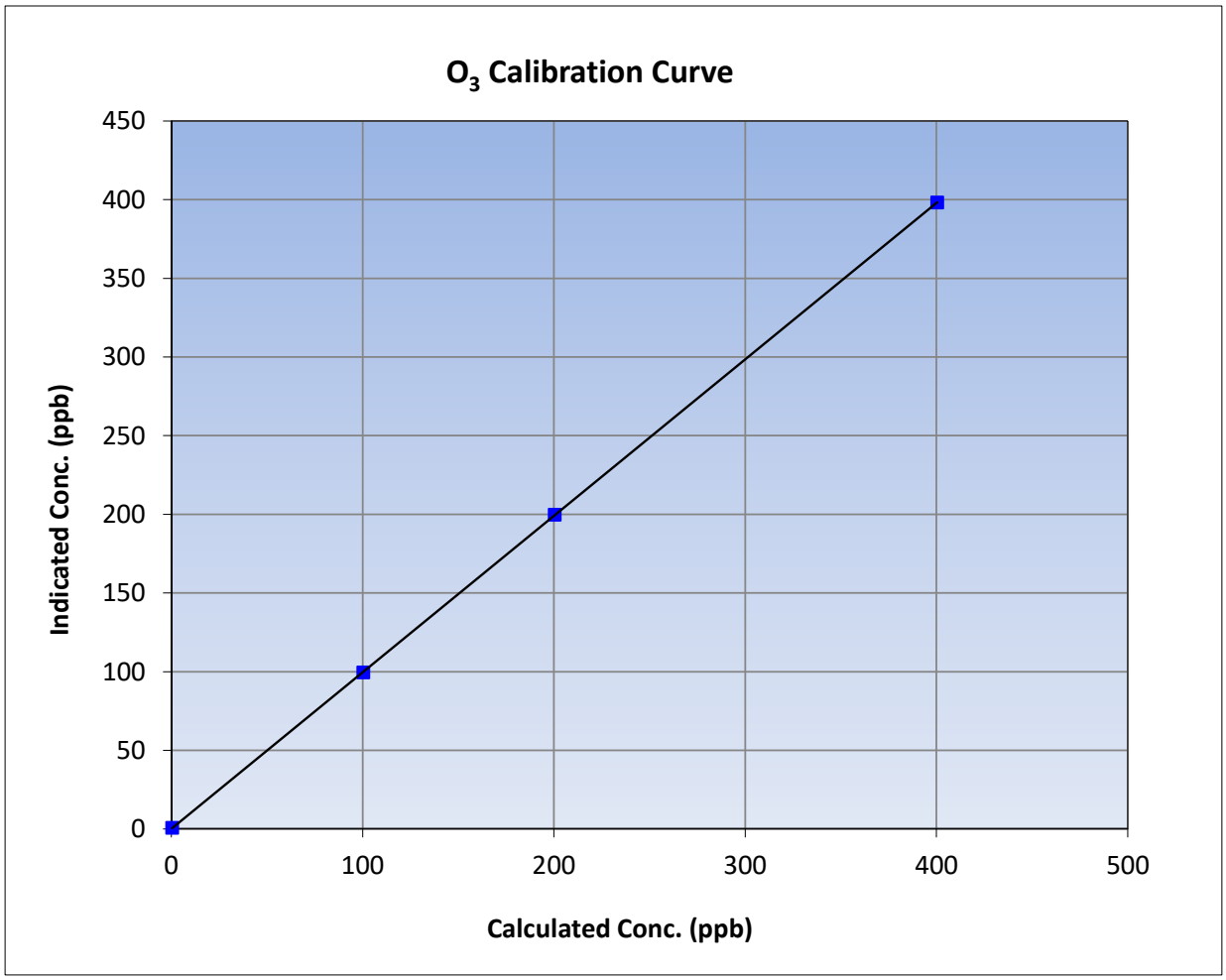
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 7:14 | End Time (MST): | 10:05 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 3872 |

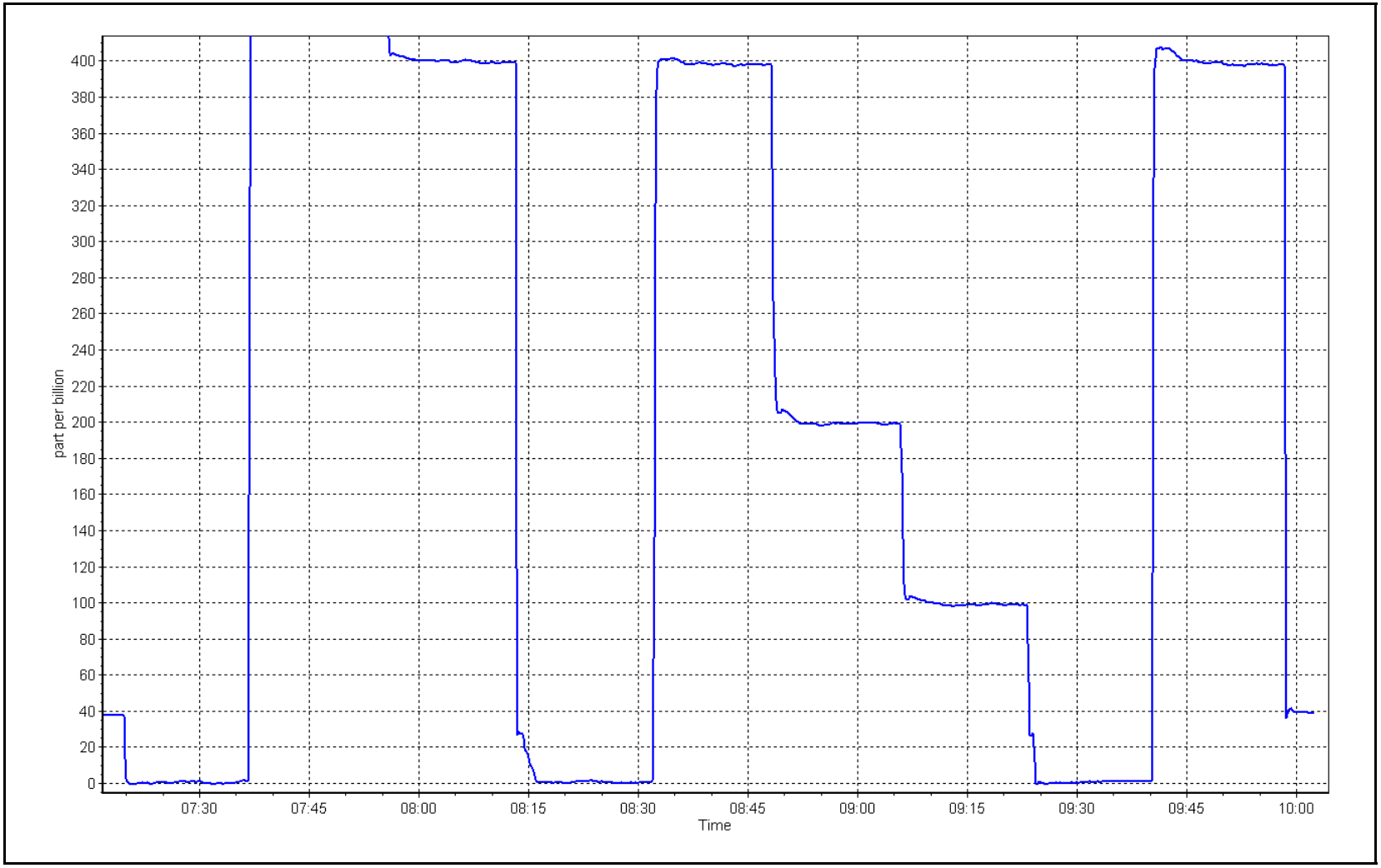
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 400.0 | 397.9 | 1.0053 |
| 200.0 | 199.3 | 1.0035 |
| 100.0 | 99.1 | 1.0091 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 0.994571 | *0.90 - 1.10* |
| Intercept | 0.100000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 19, 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: | March 20, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 13:10 | End time (MST): | 14:03 |
| 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) | -12.90 | -12.45 | -12.90 | ☐ | +/- 2 °C |
| P (mmHg) | 751.10 | 752.5 | 751.10 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.00 | 5.01 | 5.00 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 42% | ----- | 42% | ☐ | >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 | | | | ☐ | +/- 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: No adjustments needed.

Calibration by: Morgan Voyageur

# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Chipewyan | Station number: | AMS08 |
| Calibration Date: | March 19, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 14:47 | End time (MST): | 17:32 |
| 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: | 0.994000 | 0.997054 | Backgd or Offset: | -0.014 | -0.015 |
| Calibration intercept: | 0.374934 | 0.100939 | Coeff or Slope: | 0.998 | 1.007 |

### 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 | 0.36 | ---- |
| as found span | 4933 | 66.7 | 40.4 | 40.8 | 0.991 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4934 | 66.7 | 40.4 | 40.3 | 1.002 |
| second point | 4967 | 33.3 | 20.2 | 20.4 | 0.992 |
| third point | 4983 | 16.7 | 10.1 | 10.2 | 0.992 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 2960 | 40.0 | 40.4 | 40.0 | 1.010 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 40.44 | Prev response: | 40.56 | *% 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 inlet filter after as founds. Adjustments made to span and zero.

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

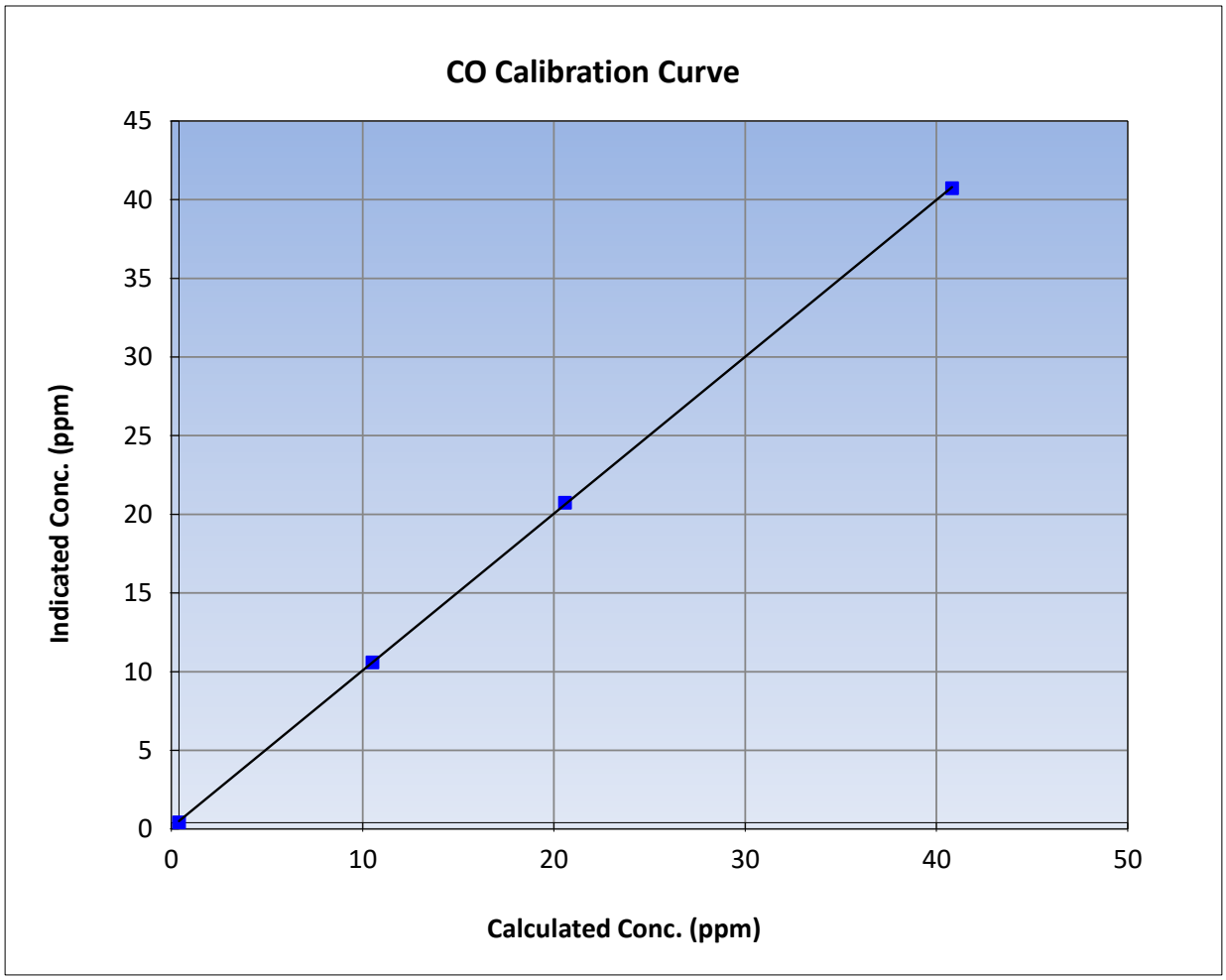
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Fort Chipewyan | Station Number: | AMS08 |
| Start Time (MST): | 14:47 | End Time (MST): | 17:32 |
| Analyzer make: | API T300 | Analyzer serial #: | 3505 |

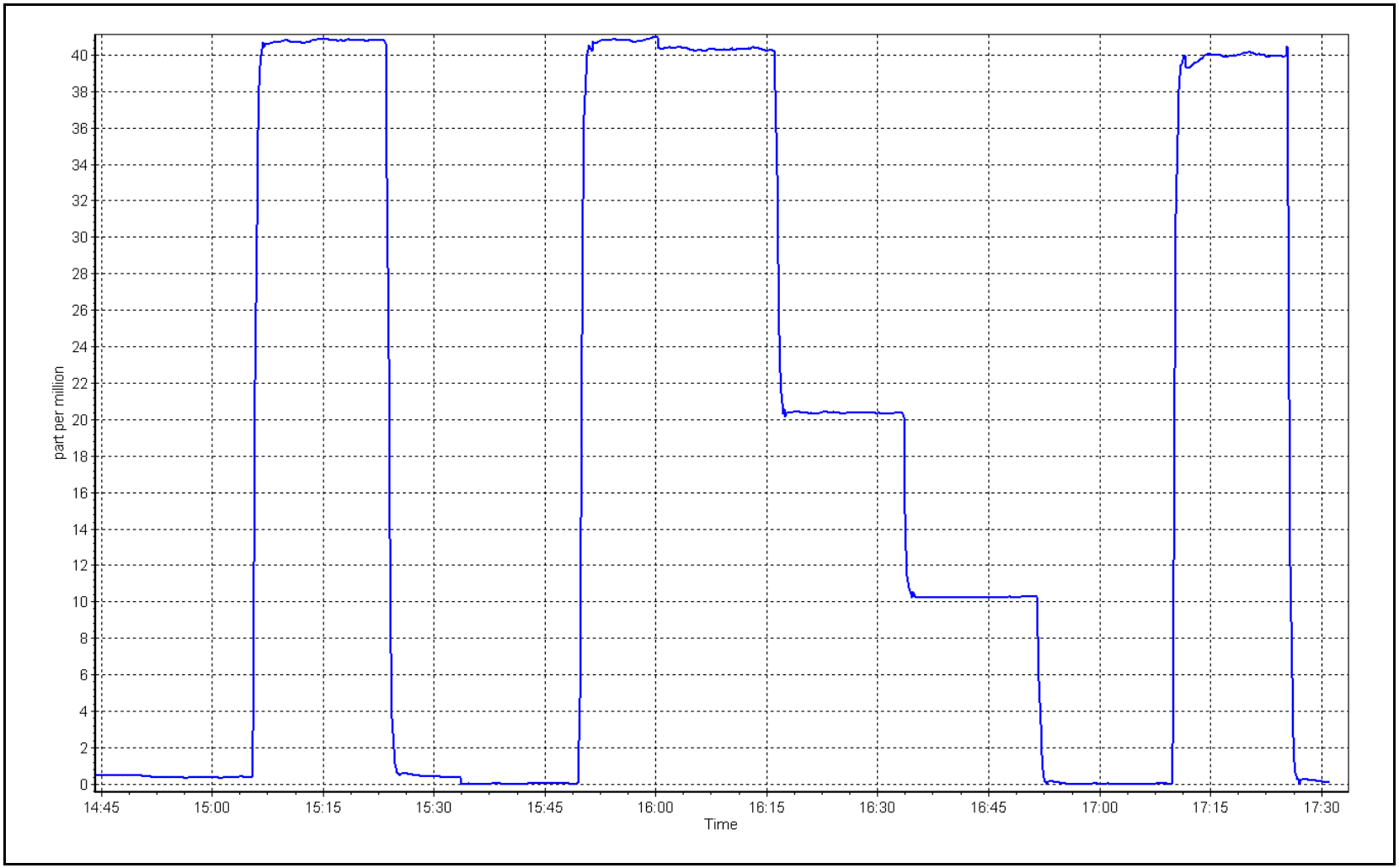
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 40.4 | 40.3 | 1.0021 |
| 20.2 | 20.4 | 0.9916 |
| 10.1 | 10.2 | 0.9922 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999971 | *≥0.995* |
| Slope | 0.997054 | *0.90 - 1.10* |
| Intercept | 0.100939 | *+/-1.5* |



**CO Calibration Plot** Date: March 19, 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: | March 19, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 12:16 | End time (MST): | 14:46 |
| 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: | 1.000467 | 1.011498 | Backgd or Offset: | -0.063 | -0.063 |
| Calibration intercept: | -10.320000 | -16.020000 | Coeff or Slope: | 1.094 | 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 | -4.9 | ---- |
| as found span | 2920 | 80.0 | 1605.9 | 1614.8 | 0.994 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 3000 | 0.0 | 0.0 | -4.9 | ---- |
| high point | 2920 | 80.0 | 1605.9 | 1621.2 | 0.991 |
| second point | 2960 | 40.0 | 802.9 | 768.6 | 1.045 |
| third point | 2980 | 20.0 | 401.5 | 393.6 | 1.020 |
| as left zero | 3000 | 0.0 | 0.0 | -4.8 | ---- |
| as left span | 2960 | 40.0 | 802.9 | 766.9 | 1.047 |
| | | | | Average Correction Factor | 1.018 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 1619.70 | Prev response: | 1596.30 | *% change: | 1.4% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Morgan Voyageur

# Wood Buffalo Environmental Association

## $CO_2$ Calibration Summary

Version-01-2020

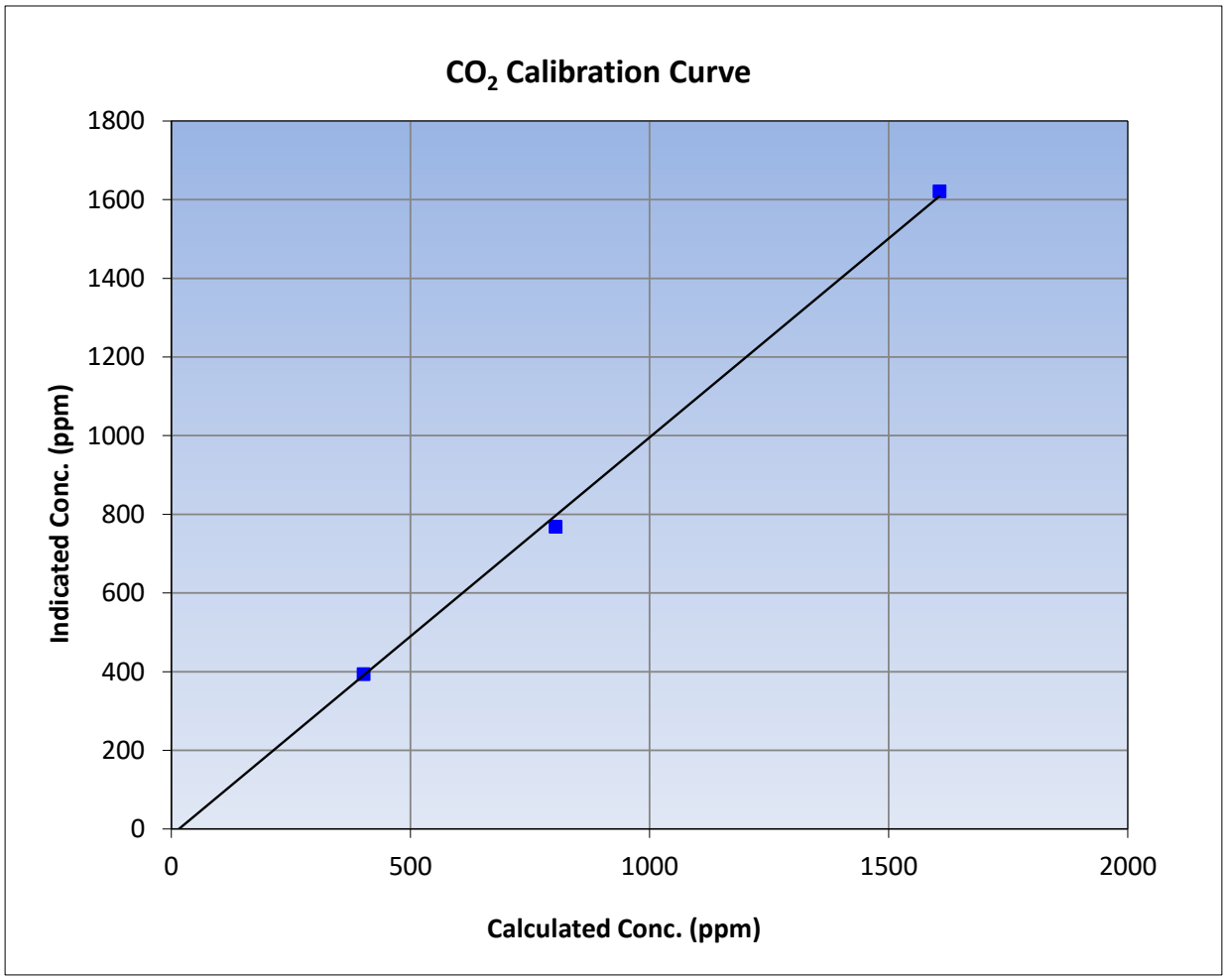
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date | March 19, 2024 | Previous Calibration | February 6, 2024 |
| Station Name | Fort Chipewyan | Station Number | AMS08 |
| Start Time (MST) | 12:16 | End Time (MST) | 14:46 |
| Analyzer make | Teledyne API T360 | Analyzer serial # | 289 |

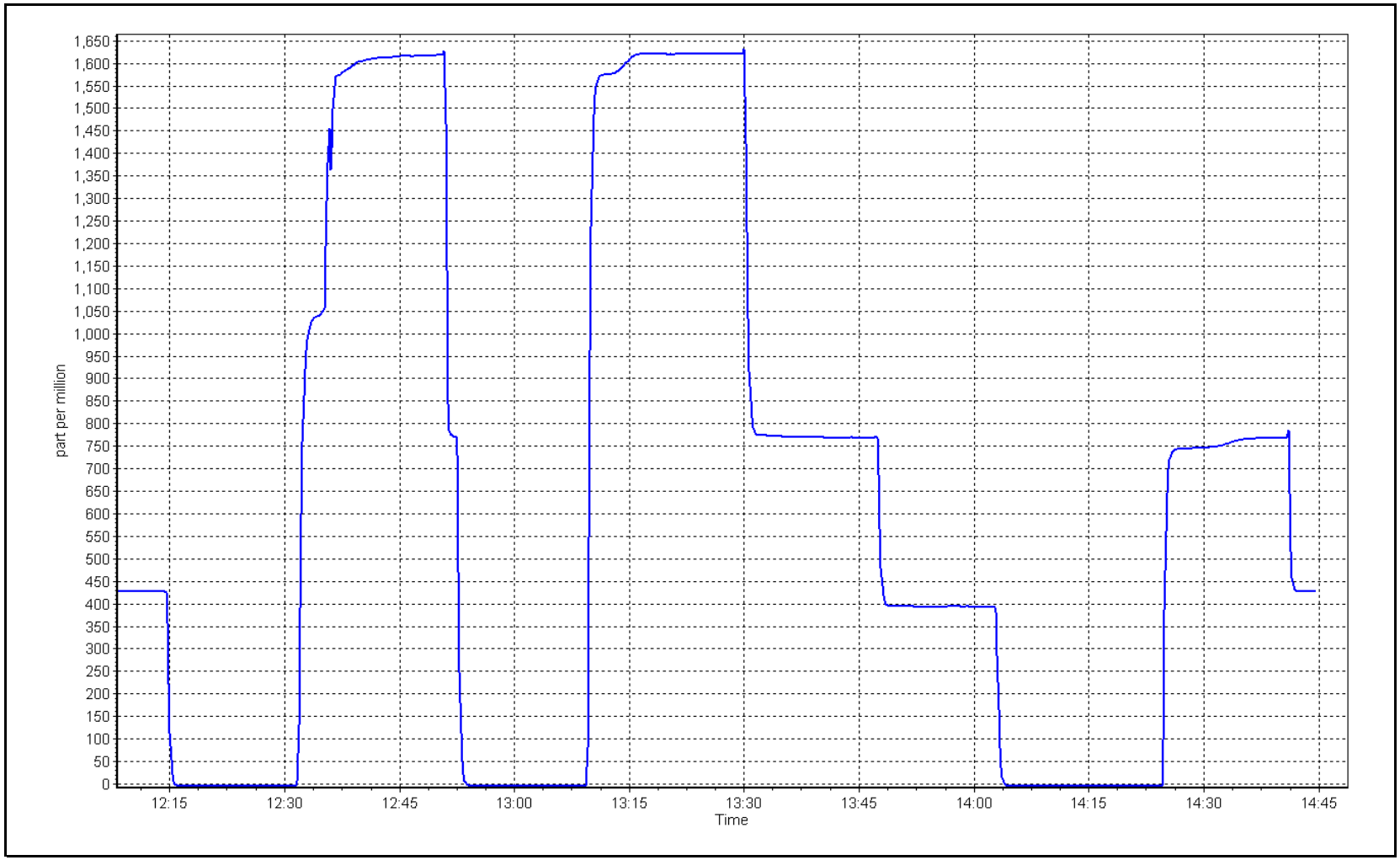
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -4.9 | ---- |
| 1605.9 | 1621.2 | 0.9905 |
| 802.9 | 768.6 | 1.0447 |
| 401.5 | 393.6 | 1.0200 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999265 | *≥0.995* |
| Slope | 1.011498 | *0.90 - 1.10* |
| Intercept | -16.020000 | *+/-20* |



**$CO_2$ Calibration Plot** Date: March 19, 2024 Location: Fort Chipewyan



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS09
## BARGE LANDING
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Barge Landing | Station number: | AMS09 |
| Calibration Date: | March 6, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 10:04 | End time (MST): | 13:14 |
| 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: | 0.999855 | 1.001110 | Backgd or Offset: | 10.2 | 10.2 |
| Calibration intercept: | 0.931270 | 0.391536 | Coeff or Slope: | 0.963 | 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 | -0.3 | ---- |
| as found span | 4919 | 80.2 | 801.5 | 802.3 | 0.999 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| high point | 4919 | 80.2 | 801.5 | 802.9 | 0.998 |
| second point | 4959 | 40.1 | 400.8 | 401.1 | 0.999 |
| third point | 4980 | 20.0 | 199.8 | 200.9 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 80.2 | 801.5 | 803.2 | 0.998 |
| | | | | Average Correction Factor | 0.997 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.60 | Previous response | 802.30 | *% 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 sample inlet filter after as founds. No adjustments made.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

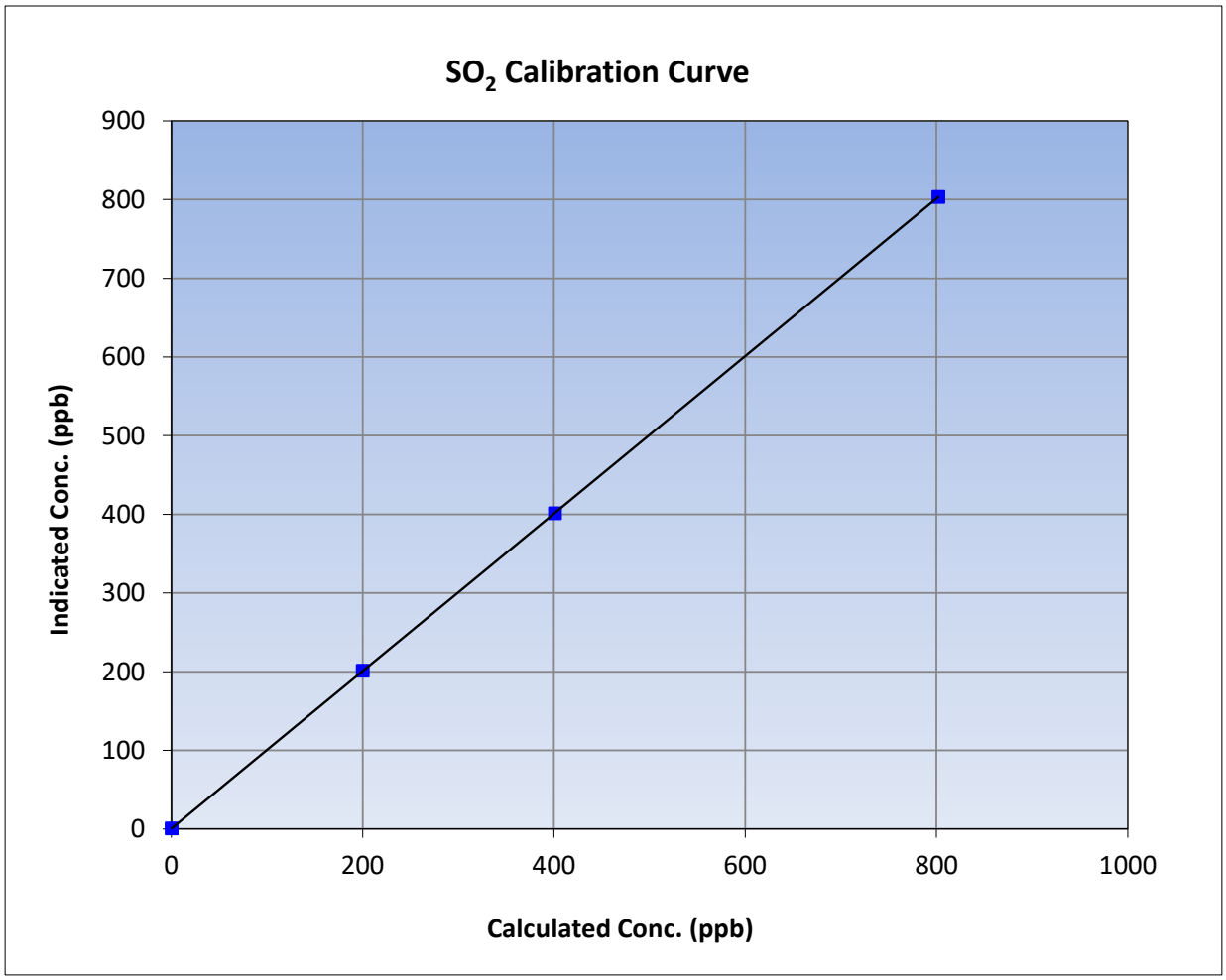
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:04 | End Time (MST): | 13:14 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1118148498 |

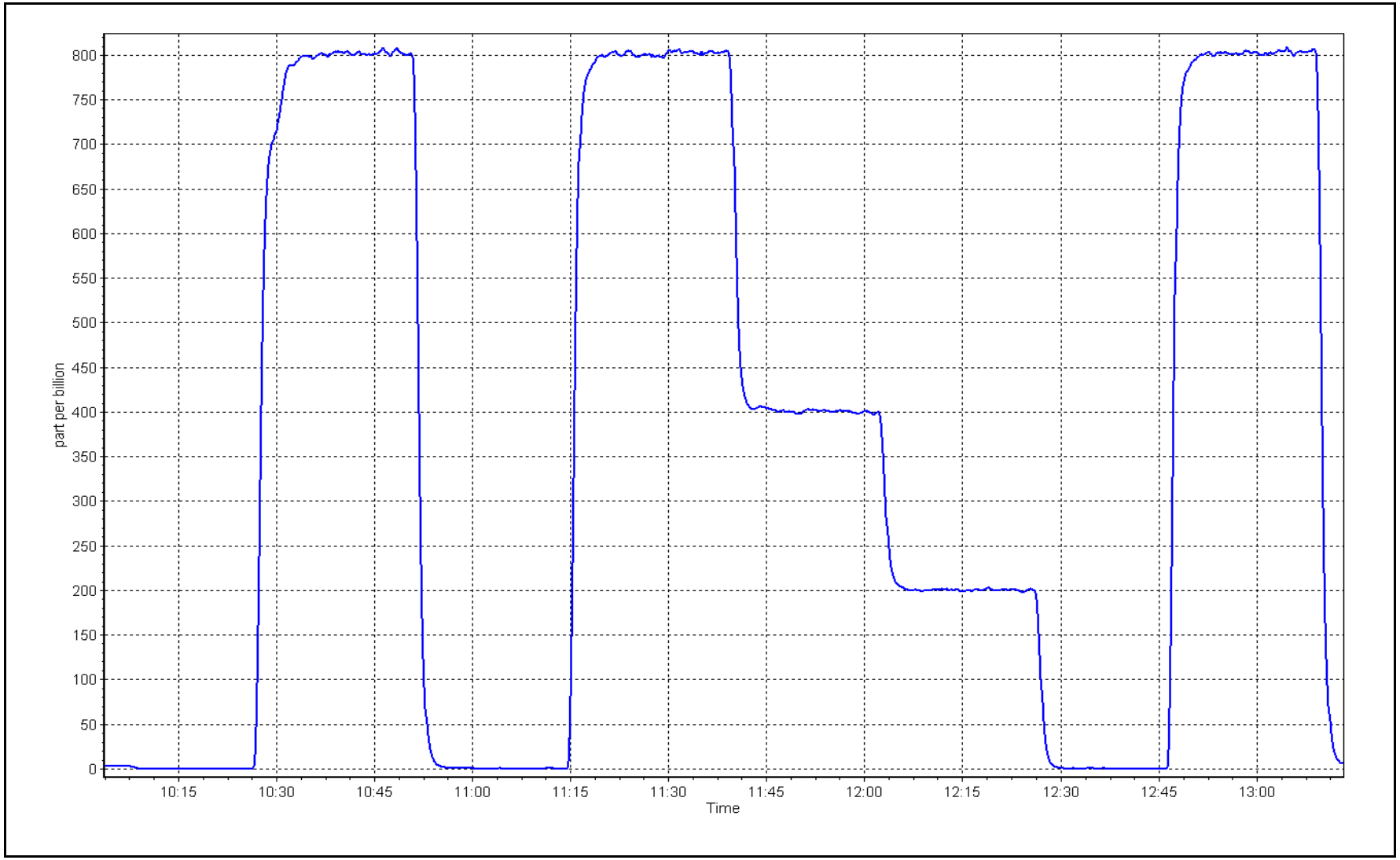
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 801.5 | 802.9 | 0.9982 |
| 400.8 | 401.1 | 0.9991 |
| 199.8 | 200.9 | 0.9947 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999999 | ≥0.995 |
| Slope | 1.001110 | 0.90 - 1.10 |
| Intercept | 0.391536 | +/-30 |



**SO2 Calibration Plot** Date: March 6, 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: | March 7, 2024 | Last Cal Date: | February 1, 2024 |
| Start time (MST): | 10:14 | End time (MST): | 14:30 |
| 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: | 0.999264 | 1.000835 | Backgd or Offset: | 2.93 | 2.84 |
| Calibration intercept: | 0.119396 | 0.139405 | Coeff or Slope: | 1.201 | 1.170 |

### 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 | 81.5 | 0.982 |
| as found 2nd point | 4961 | 38.7 | 40.0 | 41.0 | 0.976 |
| as found 3rd point | 4981 | 19.3 | 20.0 | 20.3 | 0.983 |
| 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 | 77.4 | 80.0 | 80.2 | 0.998 |
| 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 | 80.4 | 0.996 |
| SO2 Scrubber Check | 4920 | 80.2 | 802.0 | 0.0 | ---- |
| Date of last scrubber change: | | 28-Feb-23 | | Ave Corr Factor | 0.995 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.5 | Prev response: | 80.10 | *% change: | 1.7% |
| Baseline Corr 2nd AF pt: | 41.0 | AF Slope: | 1.018680 | AF Intercept: | 0.039717 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999987 | | |

* = > +/-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

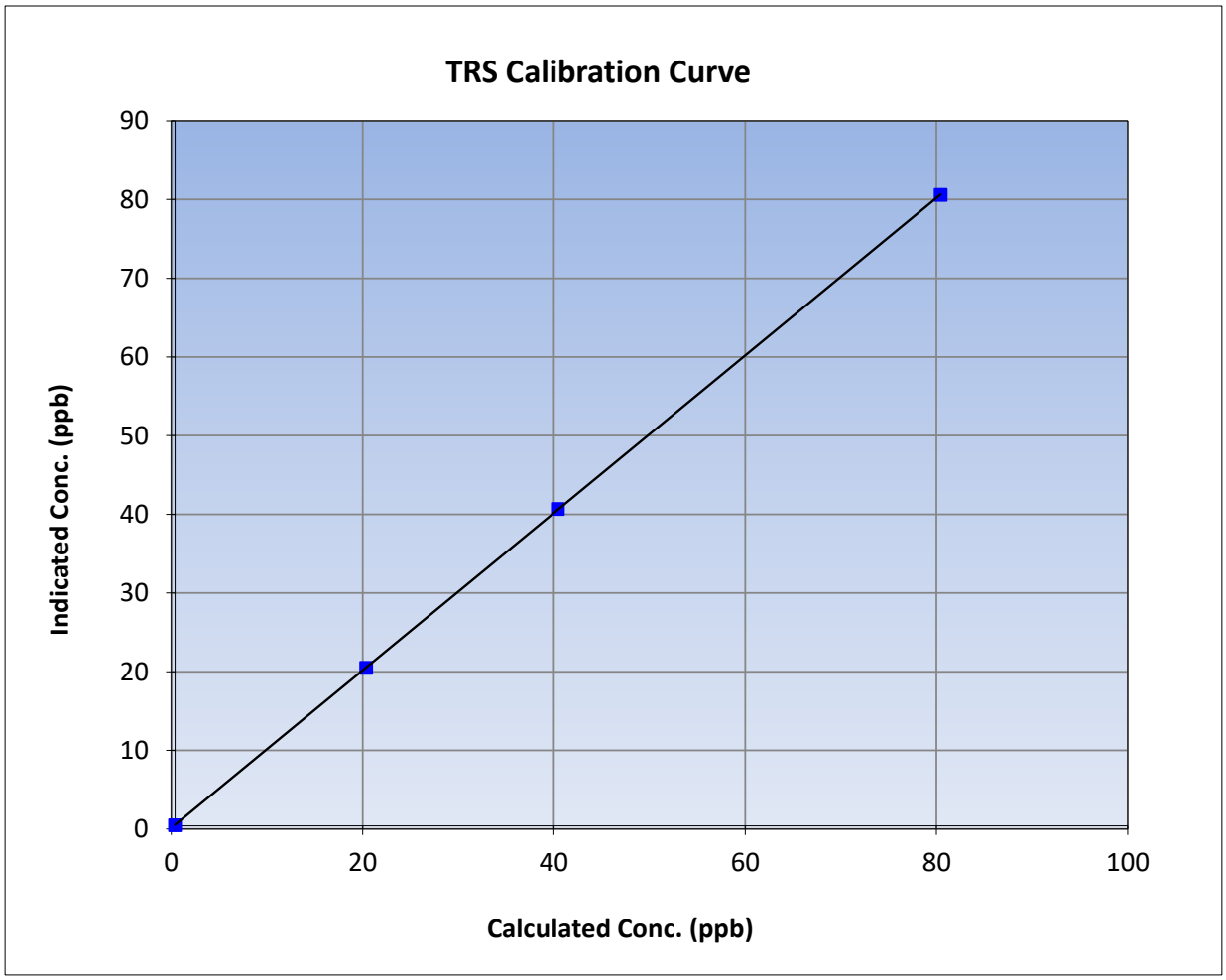
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:14 | End Time (MST): | 14:30 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1331259320 |

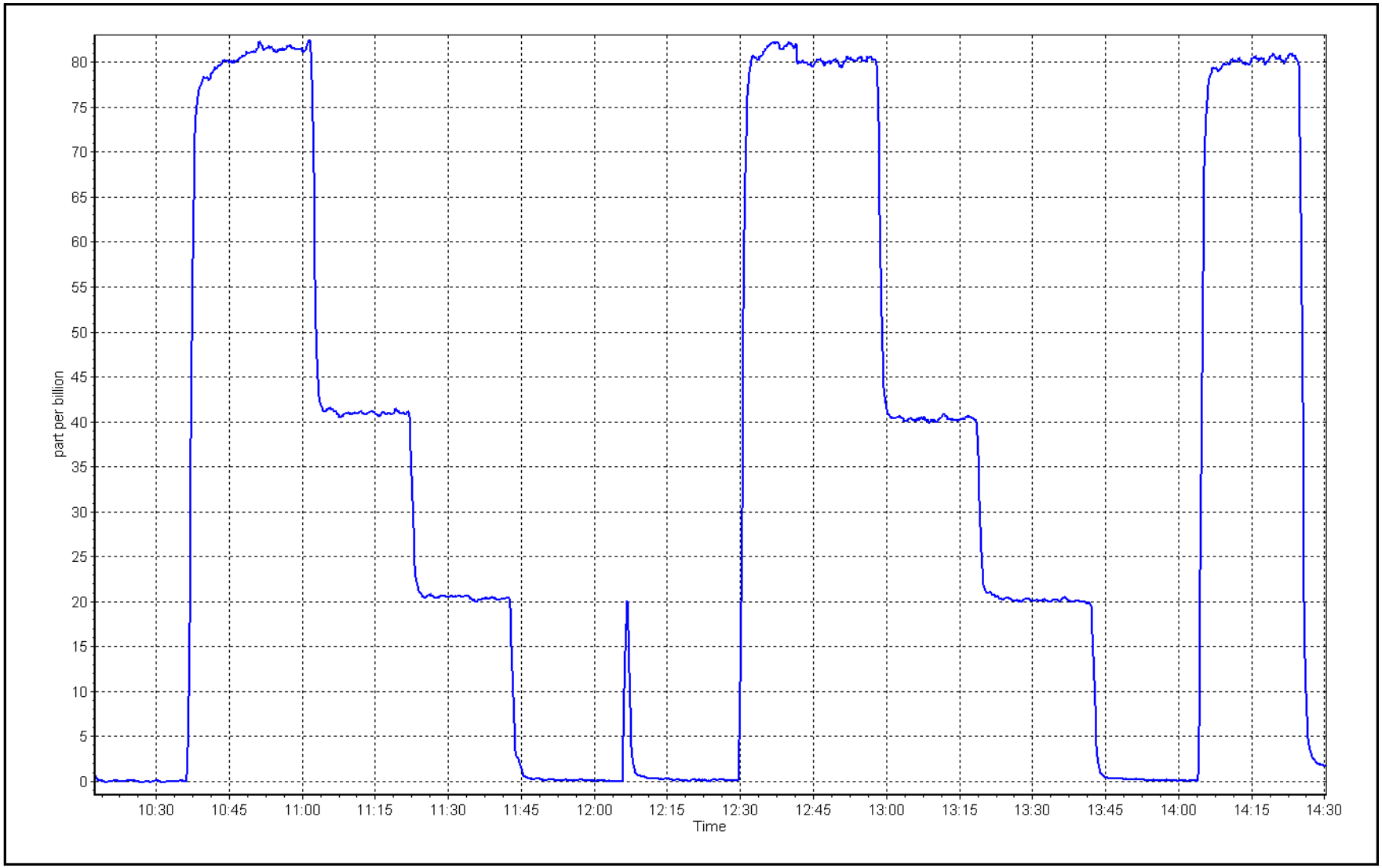
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 80.2 | 0.9980 |
| 40.0 | 40.3 | 0.9932 |
| 20.0 | 20.1 | 0.9930 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 1.000835 | *0.90 - 1.10* |
| Intercept | 0.139405 | *+/-3* |



**TRS Calibration Plot** Date: March 7, 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: | March 6, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 10:04 | End time (MST): | 13:14 |
| 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 | 17.09 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 80.2 | 17.12 | 17.04 | 1.004 |
| second point | 4960 | 40.1 | 8.56 | 8.50 | 1.007 |
| third point | 4980 | 20.0 | 4.27 | 4.26 | 1.002 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 80.2 | 17.12 | 17.05 | 1.004 |
| | | | | ;e Correction Factor | 1.004 |
| Baseline Corr AF: | 17.09 | Prev response | 17.12 | *% 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 | 9.12 | 1.002 |
| 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 | 9.08 | 1.006 |
| second point | 4960 | 40.1 | 4.57 | 4.53 | 1.009 |
| third point | 4980 | 20.0 | 2.28 | 2.27 | 1.003 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 80.2 | 9.14 | 9.09 | 1.005 |
| | | | | Average Correction Factor | 1.006 |
| Baseline Corr AF: | 9.12 | Prev response | 9.11 | *% 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 | 7.98 | 1.001 |
| 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 | 7.97 | 1.002 |
| second point | 4960 | 40.1 | 3.99 | 3.97 | 1.005 |
| third point | 4980 | 20.0 | 1.99 | 1.99 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 80.2 | 7.98 | 7.96 | 1.002 |
| | | | | Average Correction Factor | 1.002 |
| Baseline Corr AF: | 7.98 | Prev response | 8.00 | *% 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: | 0.999215 | 0.995217 |
| THC Cal Offset: | 0.010853 | 0.001033 |
| CH4 Cal Slope: | 1.001638 | 0.997716 |
| CH4 Cal Offset: | 0.008070 | -0.000741 |
| NMHC Cal Slope: | 0.997023 | 0.993146 |
| NMHC Cal Offset: | 0.003583 | 0.001575 |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## THC Calibration Summary

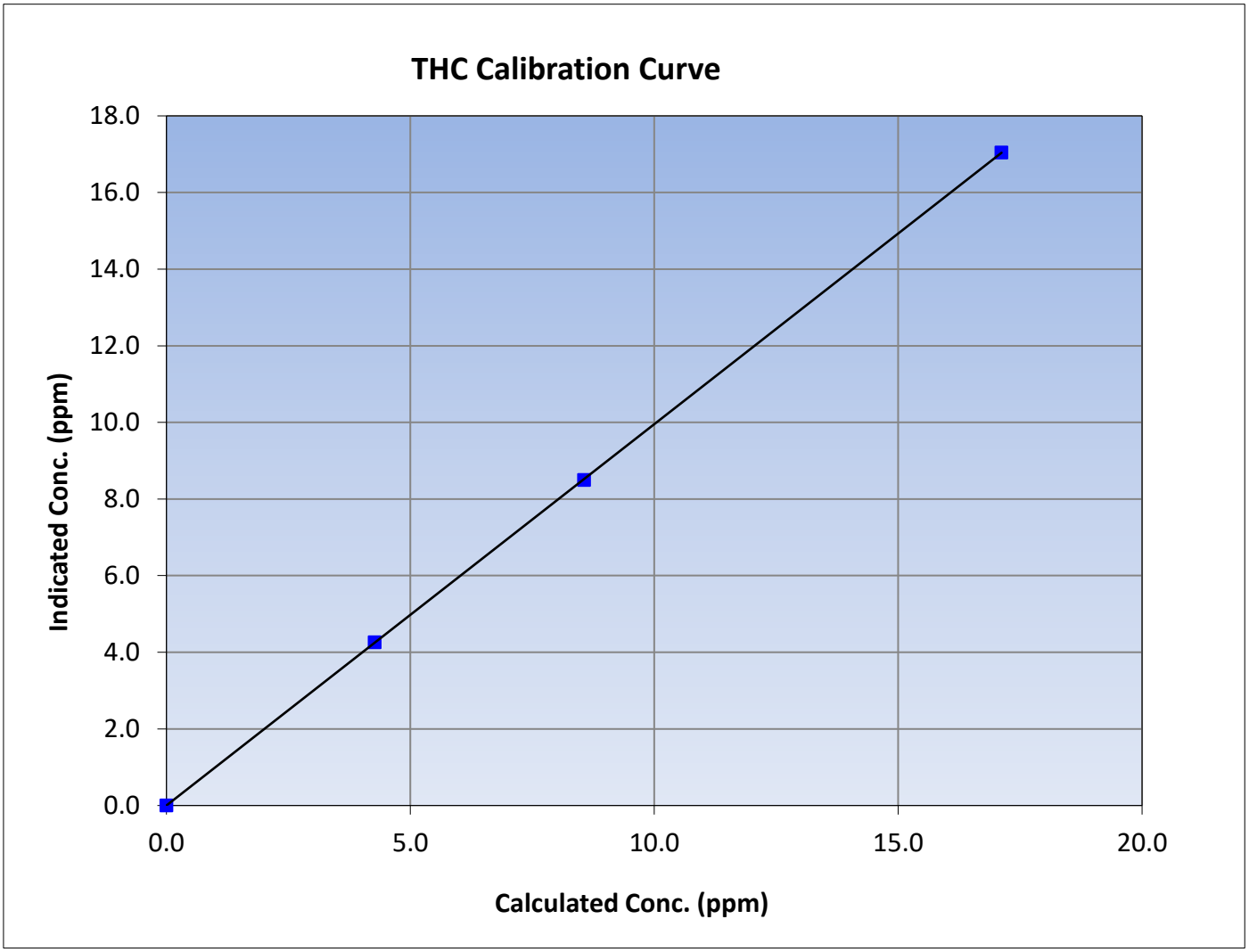
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:04 | End Time (MST): | 13:14 |
| 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 | 0.999997 | *≥0.995* |
| 17.12 | 17.04 | 1.0044 | | | |
| 8.56 | 8.50 | 1.0067 | Slope | 0.995217 | *0.90 - 1.10* |
| 4.27 | 4.26 | 1.0015 | | | |
| | | | Intercept | 0.001033 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

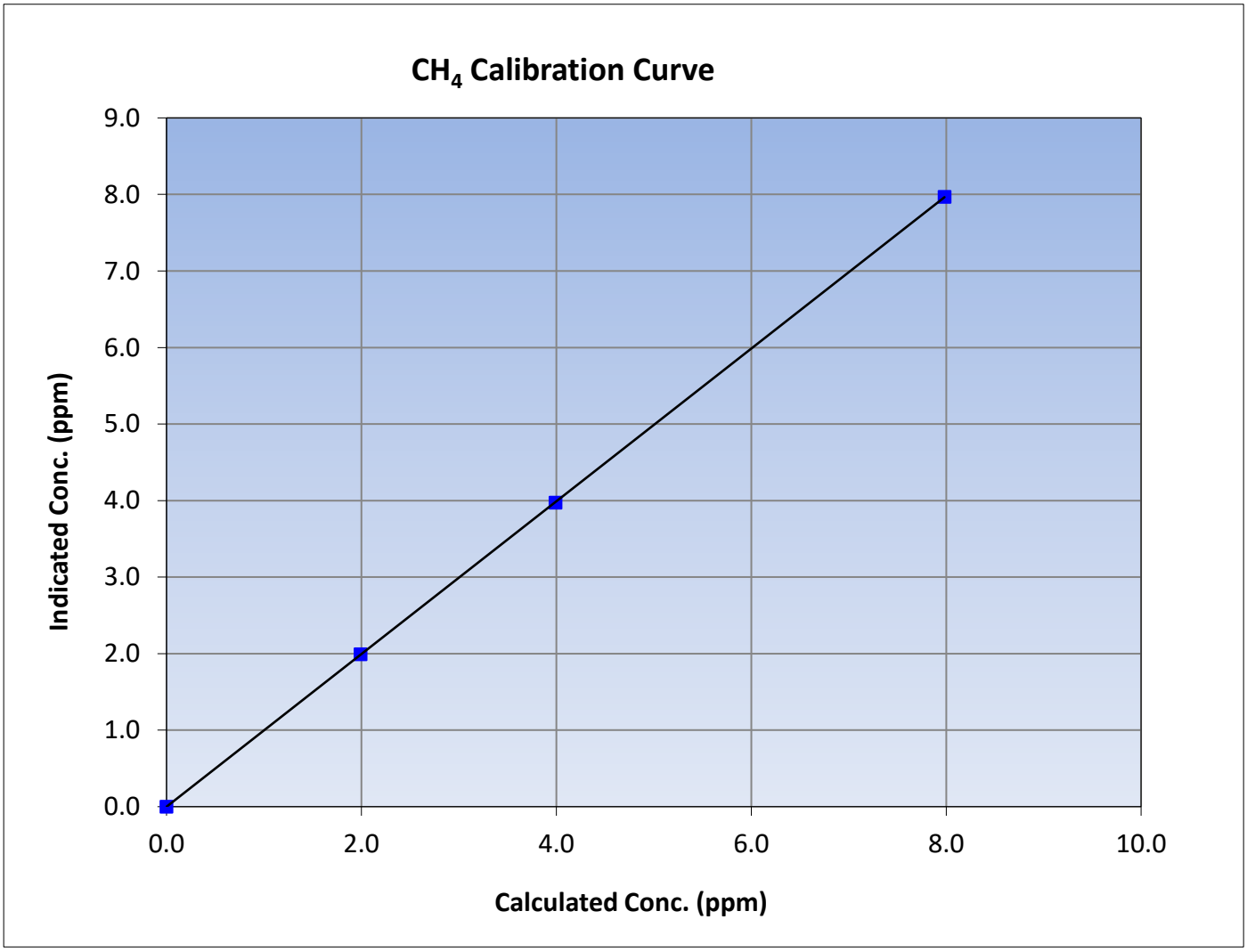
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:04 | End Time (MST): | 13:14 |
| 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 | 0.999997 | ≥0.995 |
| 7.98 | 7.97 | 1.0020 | | | |
| 3.99 | 3.97 | 1.0047 | Slope | 0.997716 | 0.90 - 1.10 |
| 1.99 | 1.99 | 1.0002 | | | |
| | | | Intercept | -0.000741 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

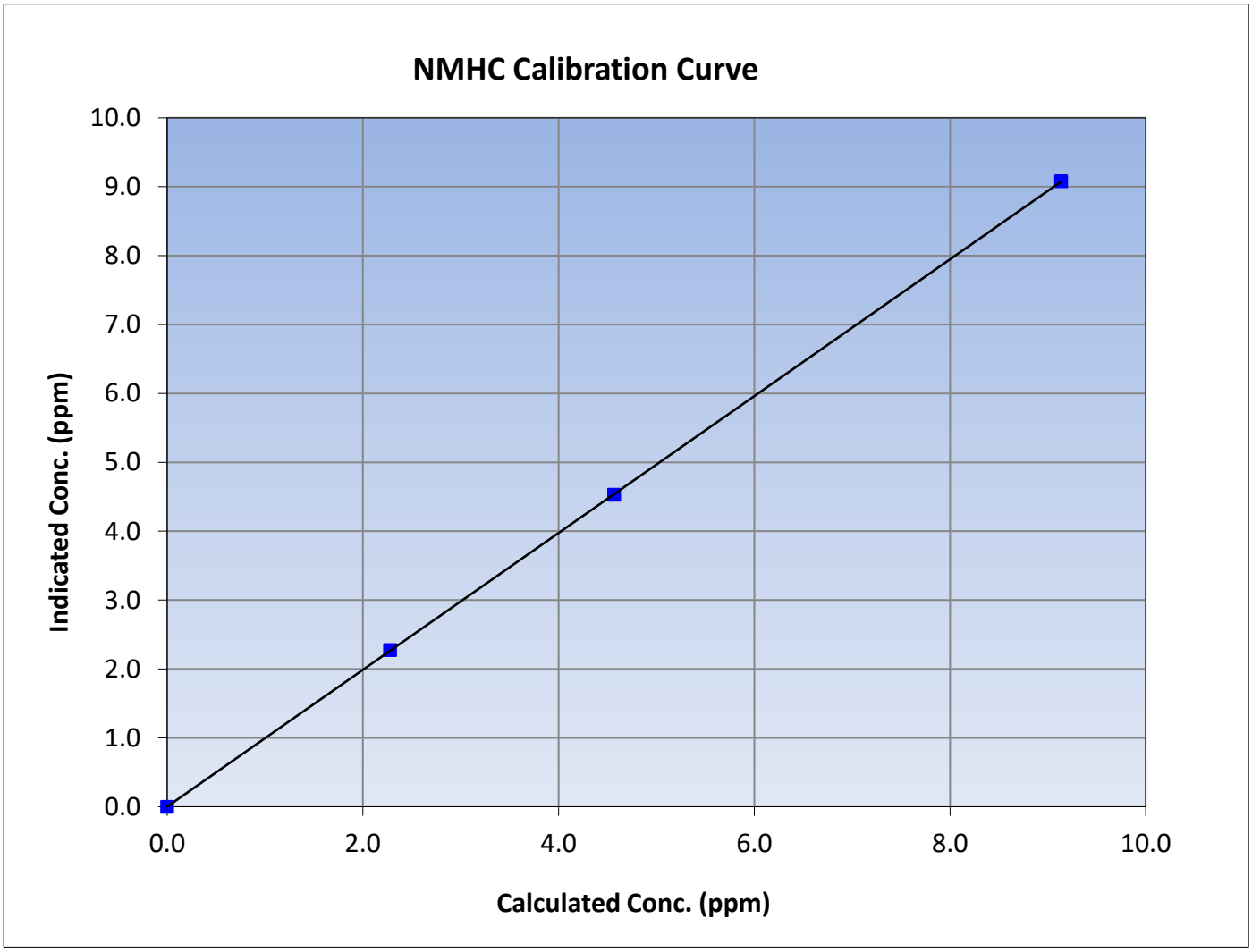
Version-06-2022

### Station Information

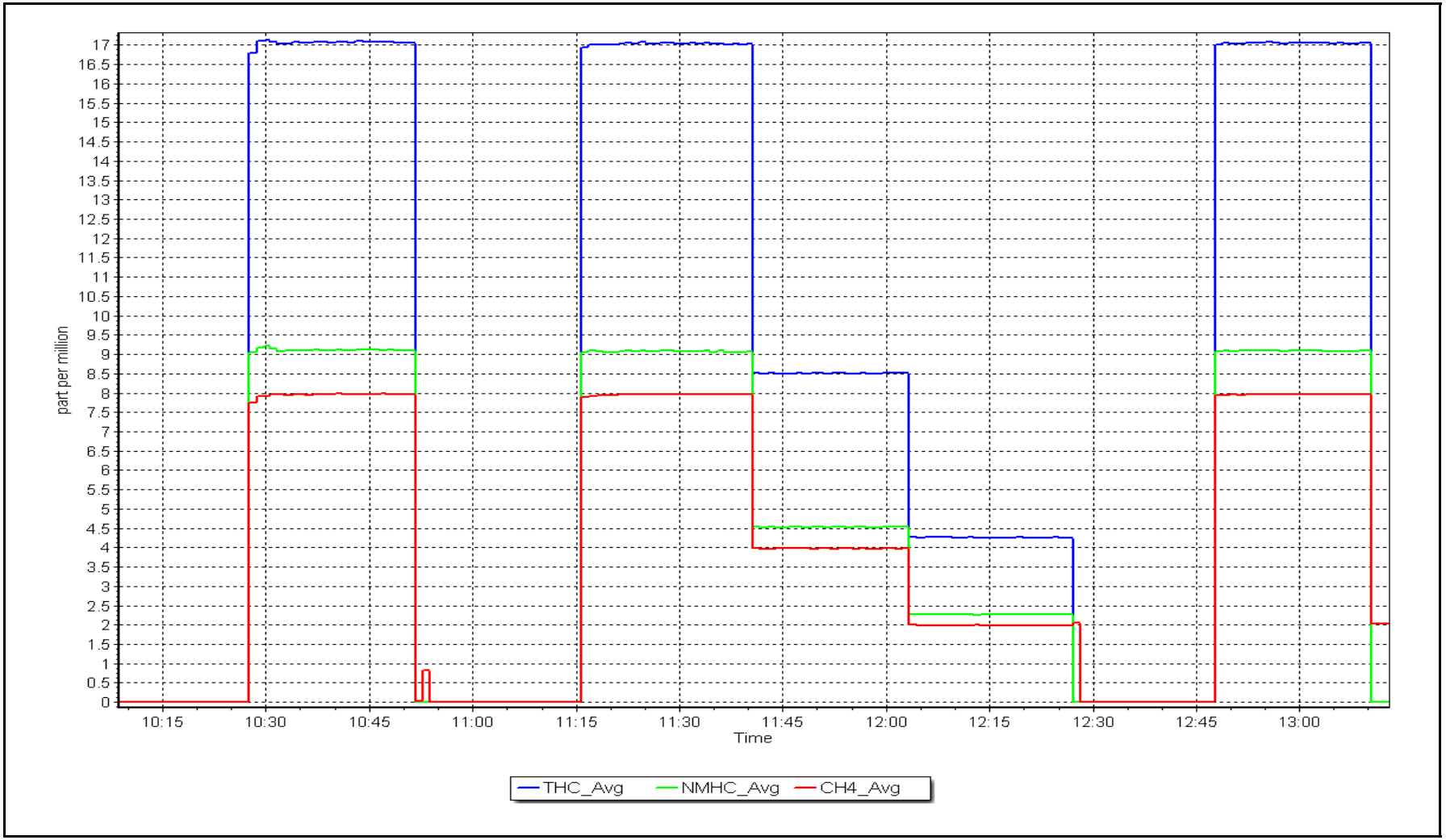
| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 10:04 | End Time (MST): | 13:14 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259521 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999997 | *≥0.995* |
| 9.14 | 9.08 | 1.0065 | | | |
| 4.57 | 4.53 | 1.0085 | Slope | 0.993146 | *0.90 - 1.10* |
| 2.28 | 2.27 | 1.0027 | | | |
| | | | Intercept | 0.001575 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 6, 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: | March 28, 2024 | Last Cal Date: | March 6, 2024 |
| Start time (MST): | 9:43 | End time (MST): | 12:24 |
| Reason: | Cylinder Change | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC151285 | Cal Gas Expiry Date: | January 5, 2025 | |
| CH4 Cal Gas Conc. | 497.6 | ppm | CH4 Equiv Conc. | 1067.1 | ppm |
| C3H8 Cal Gas Conc. | 207.1 | ppm | | | |
| Removed Gas Cert: | | NA | Removed Gas Expiry: | | |
| Removed CH4 Conc. | 497.6 | ppm | CH4 Equiv Conc. | 1067.1 | ppm |
| Removed C3H8 Conc. | 207.1 | ppm | Diff between cyl (THC): | | |
| Diff between cyl ($CH_4$): | | | Diff between cyl (NM): | | |
| Calibrator Model: | API T700 | | Serial Number: | 3812 | |
| 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 | 16.88 | 1.014 |
| 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 | 16.66 | 1.028 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | ;e Correction Factor | 1.028 |
| Baseline Corr AF: | 16.88 | Prev response | 17.04 | *% change | -0.9% |
| 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 | 8.95 | 1.021 |
| 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 | 8.83 | 1.035 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.035 |
| Baseline Corr AF: | 8.95 | Prev response | 9.08 | *% change | -1.4% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 7.93 | 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 | 80.2 | 7.98 | 7.84 | 1.018 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.018 |
| Baseline Corr AF: | 7.93 | Prev response | 7.96 | *% change | -0.5% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

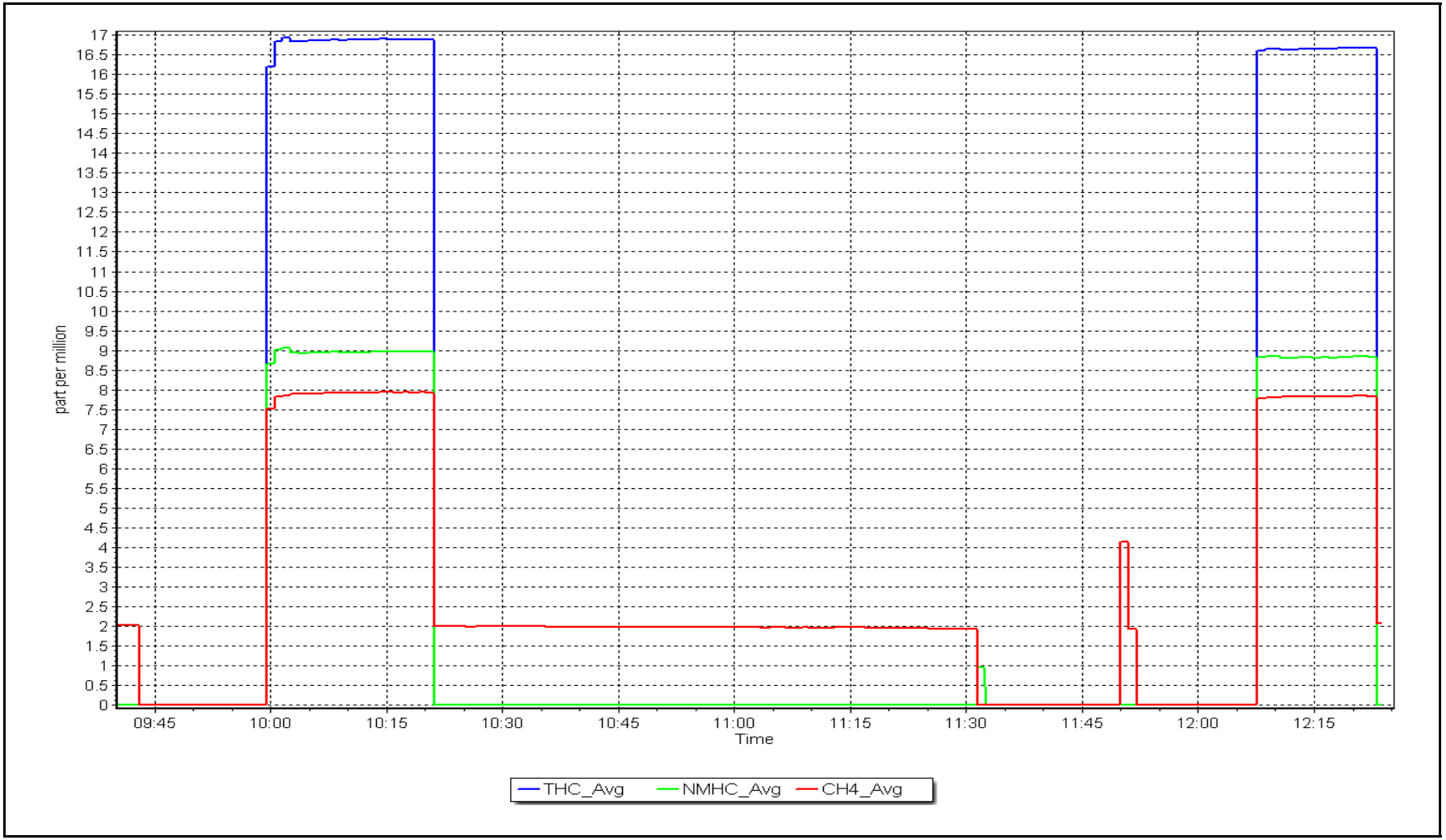
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.995217 | 0.973222 |
| THC Cal Offset: | 0.001033 | 0.000000 |
| CH4 Cal Slope: | 0.997716 | 0.981863 |
| CH4 Cal Offset: | -0.000741 | 0.000000 |
| NMHC Cal Slope: | 0.993146 | 0.966000 |
| NMHC Cal Offset: | 0.001575 | 0.000000 |

Notes: Nitrogen Cylinder Change.

Calibration Performed By: Melissa Lemay

**NMHC Calibration Plot** Date: March 28, 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: | March 22, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 8:51 | End time (MST): | 13:14 |
| 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: | 1.120 | 1.094 | NO bkgnd or offset: | 10.3 | 10.0 |
| NOX coeff or slope: | 0.998 | 0.998 | NOX bkgnd or offset: | 10.6 | 10.3 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 176.5 | 181.0 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.999459 | 1.000294 |
| $NO_X$ Cal Offset: | 0.518402 | 0.198498 |
| NO Cal Slope: | 0.998611 | 0.999838 |
| NO Cal Offset: | -0.704018 | -0.783809 |
| $NO_2$ Cal Slope: | 1.004419 | 0.999826 |
| $NO_2$ Cal Offset: | 0.978163 | -1.024158 |

# 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 | -0.1 | -0.3 | ---- | ---- |
| as found span | 4915 | 85.3 | 808.3 | 800.7 | 7.5 | 832.9 | 821.1 | 11.6 | 0.970 | 0.975 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | -0.2 | ---- | ---- |
| high point | 4915 | 85.3 | 808.3 | 800.7 | 7.5 | 808.4 | 800.2 | 8.2 | 1.000 | 1.001 |
| second point | 4957 | 42.6 | 403.7 | 400.0 | 3.7 | 404.6 | 398.9 | 5.7 | 0.998 | 1.003 |
| third point | 4979 | 21.3 | 201.8 | 200.0 | 1.9 | 202.1 | 198.1 | 3.9 | 0.999 | 1.009 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | -0.2 | ---- | ---- |
| as left span | 4915 | 85.3 | 808.3 | 418.0 | 390.2 | 799.3 | 408.8 | 390.4 | 1.011 | 1.023 |
| | | | | | | | | Average Correction Factor | 0.999 | 1.004 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 833.3 ppb | NO = 821.2 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | 3.0% |
| Previous Response | $NO_X$ = 808.3 ppb | NO = 798.9 ppb | | | *Percent Change | NO = | 2.7% |
| 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) | 790.4 | 407.7 | 390.2 | 389.5 | 1.002 | 99.8% |
| 2nd GPT point (200 ppb O3) | 790.4 | 597.3 | 200.6 | 199.3 | 1.007 | 99.3% |
| 3rd GPT point (100 ppb O3) | 790.4 | 692.9 | 105.0 | 103.0 | 1.019 | 98.1% |
| | | | | Average Correction Factor | 1.009 | 99.1% |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

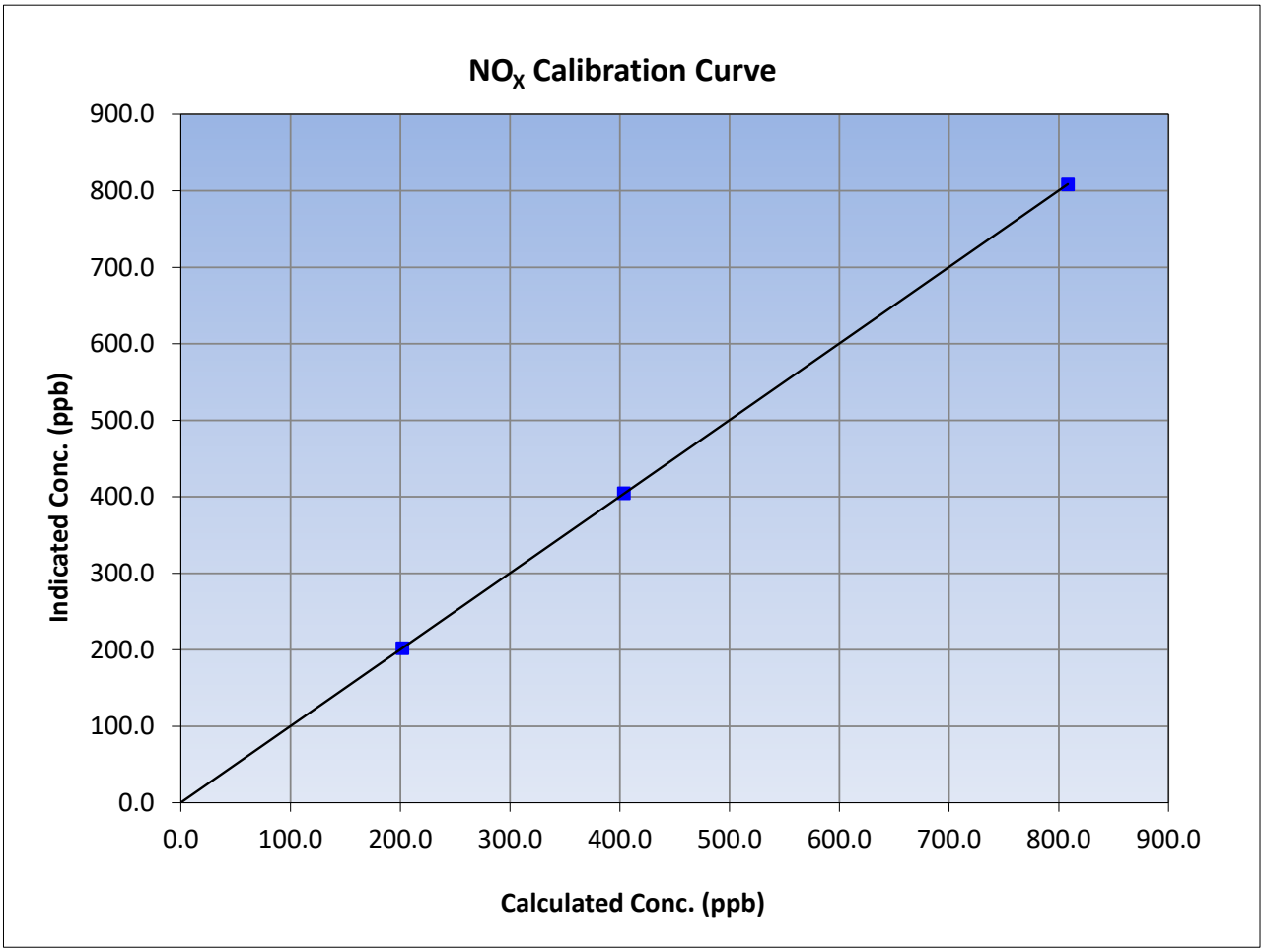
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 8:51 | End Time (MST): | 13:14 |
| 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 | 0.999999 | ≥0.995 |
| 808.3 | 808.4 | 0.9998 | | | |
| 403.7 | 404.6 | 0.9978 | Slope | 1.000294 | 0.90 - 1.10 |
| 201.8 | 202.1 | 0.9986 | | | |
| | | | Intercept | 0.198498 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

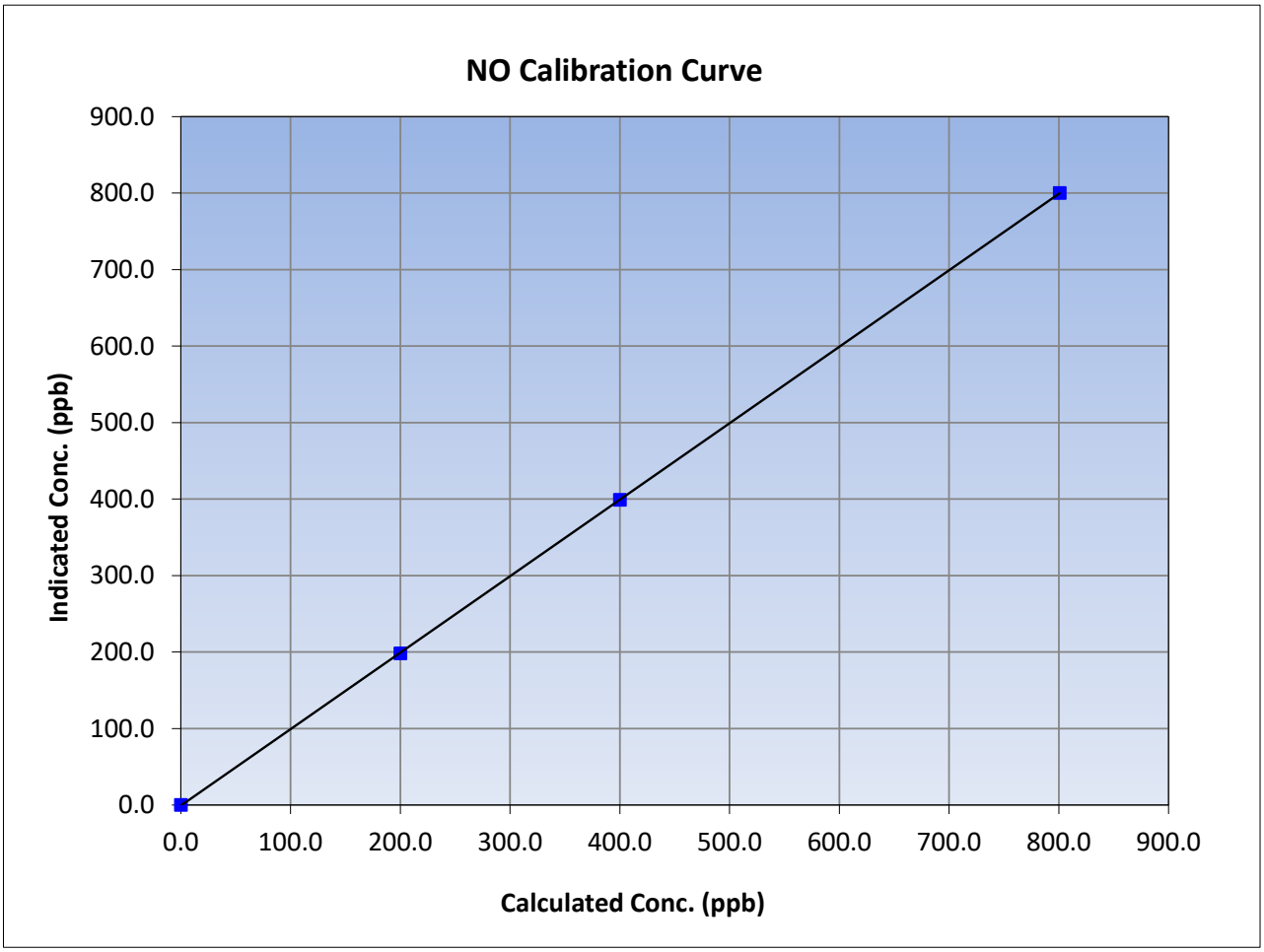
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 8:51 | End Time (MST): | 13:14 |
| 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 | 0.999994 | ≥0.995 |
| 800.7 | 800.2 | 1.0007 | | | |
| 400.0 | 398.9 | 1.0027 | Slope | 0.999838 | 0.90 - 1.10 |
| 200.0 | 198.1 | 1.0094 | | | |
| | | | Intercept | -0.783809 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

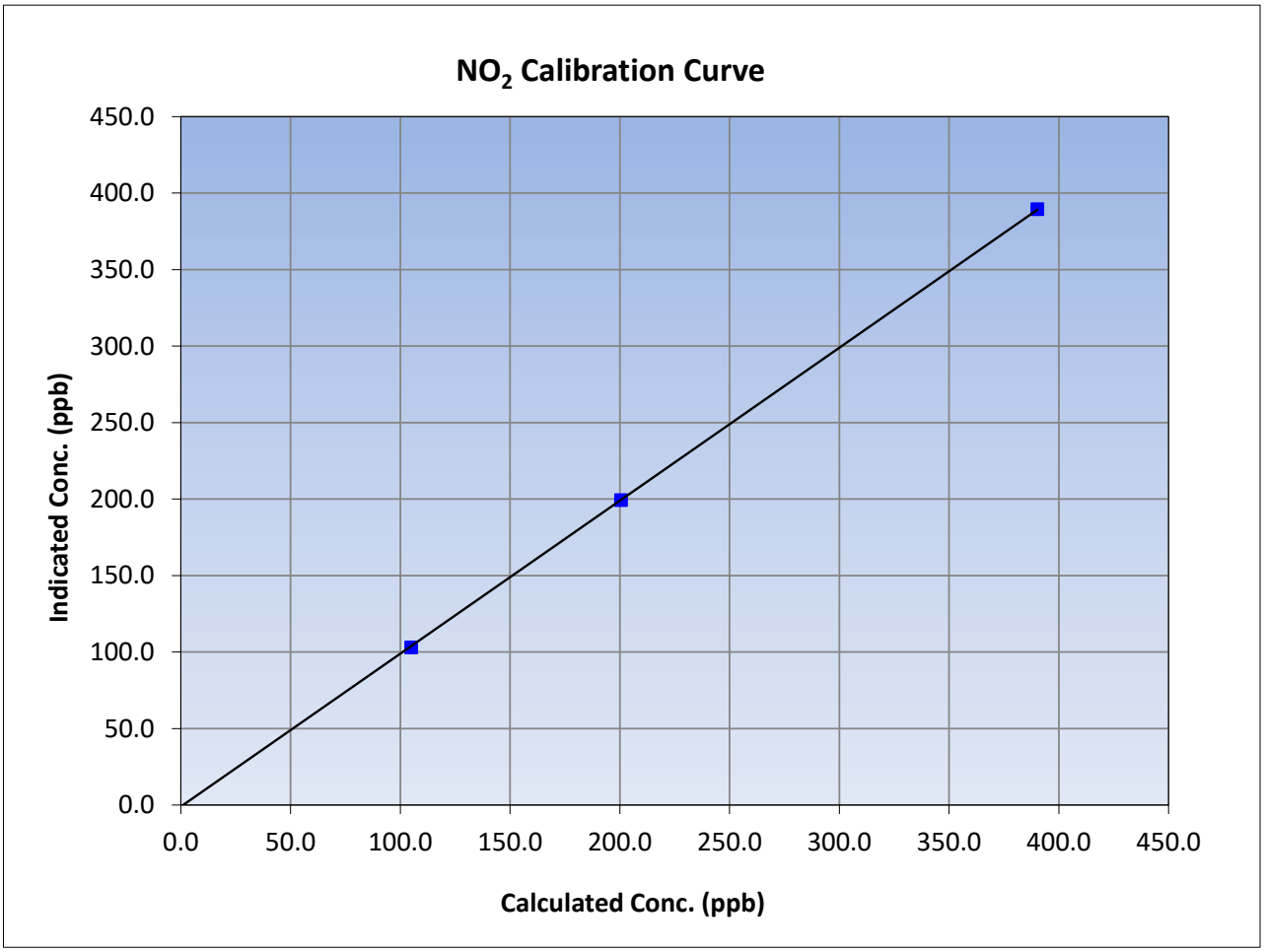
Version-04-2020

### Station Information

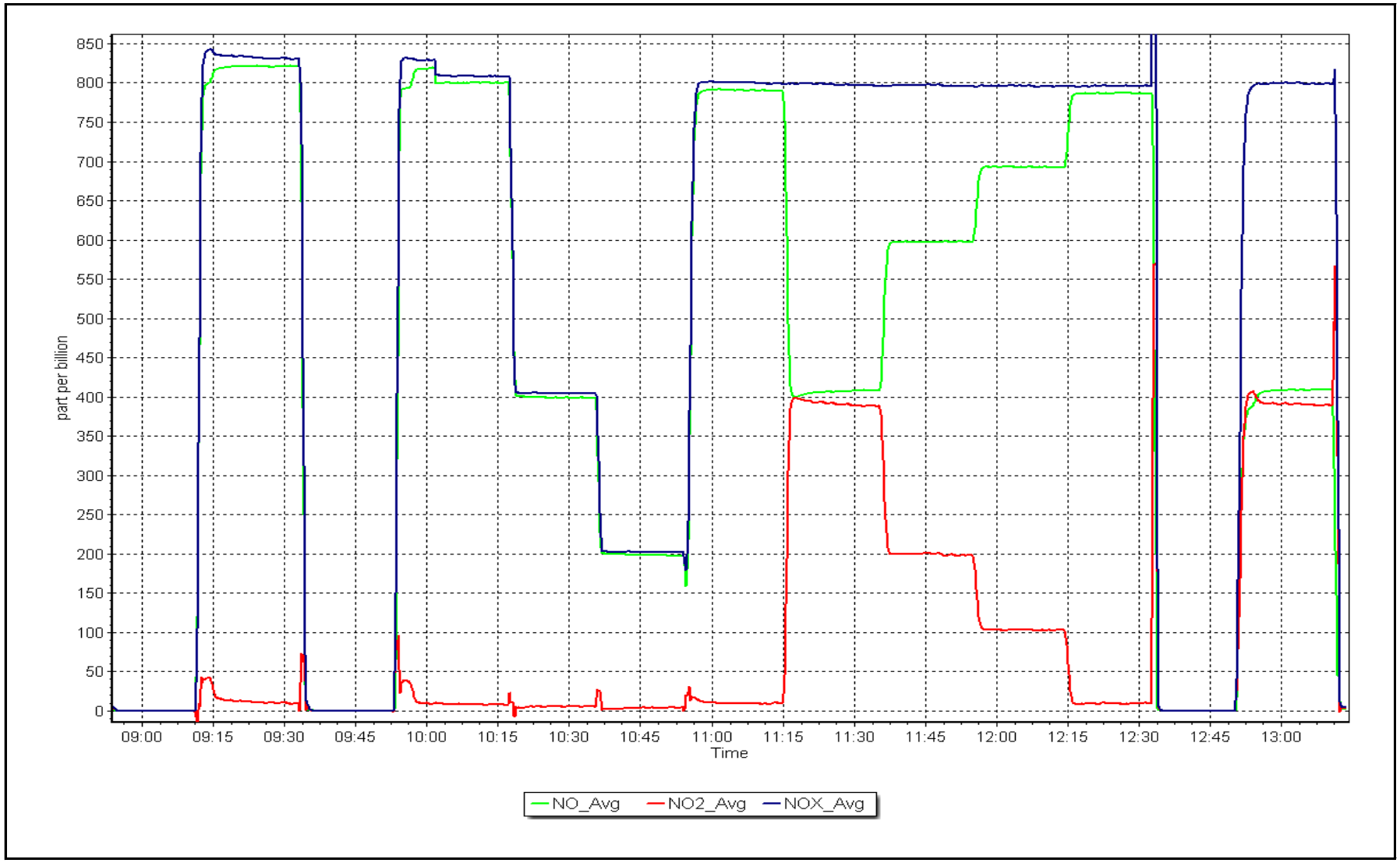
| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Barge Landing | Station Number: | AMS09 |
| Start Time (MST): | 8:51 | End Time (MST): | 13:14 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262593 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999978 | ≥0.995 |
| 390.2 | 389.5 | 1.0018 | | | |
| 200.6 | 199.3 | 1.0066 | Slope | 0.999826 | 0.90 - 1.10 |
| 105.0 | 103.0 | 1.0195 | | | |
| | | | Intercept | -1.024158 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 22, 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: | March 22, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 9:43 | End time (MST): | 9:54 |
| 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) | -12.60 | -12.62 | -12.60 | ☐ | +/- 2 °C |
| P (mmHg) | 741.80 | 749.69 | 741.80 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.99 | 4.97 | 4.99 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 39.00 | ----- | 39.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 17.80 | PM w/ HEPA: | 0.2 | <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 adjustments. Leak check passed.

Calibration by: Sean Bala

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS11
## LOWER CAMP
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Lower Camp | Station number: | AMS11 |
| Calibration Date: | March 26, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 10:47 | End time (MST): | 14:43 |
| 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: | 0.997880 | 0.994478 | Backgd or Offset: | 14.5 | 14.7 |
| Calibration intercept: | -0.244782 | 0.097406 | 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 | 0.9 | ---- |
| as found span | 4932 | 81.4 | 799.6 | 797.6 | 1.003 |
| as found 2nd point | 4959 | 40.7 | 400.9 | 397.9 | 1.008 |
| as found 3rd point | 4981 | 20.4 | 200.9 | 200.1 | 1.004 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 1.2 | ---- |
| high point | 4932 | 81.4 | 799.6 | 796.1 | 1.004 |
| second point | 4959 | 40.7 | 400.9 | 397.6 | 1.008 |
| third point | 4981 | 20.4 | 200.9 | 199.2 | 1.008 |
| as left zero | 5000 | 0.0 | 0.0 | 1.3 | ---- |
| as left span | 4932 | 81.4 | 799.6 | 799.2 | 1.001 |
| | | | | Average Correction Factor | 1.007 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 796.70 | Previous response | 797.71 | *% change | -0.1% |
| Baseline Corr 2nd AF pt: | 397.00 | AF Slope: | 0.996365 | AF Intercept: | 0.036126 |
| Baseline Corr 3rd AF pt: | 199.20 | AF Correlation: | 0.999989 | | |

* = > +/-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

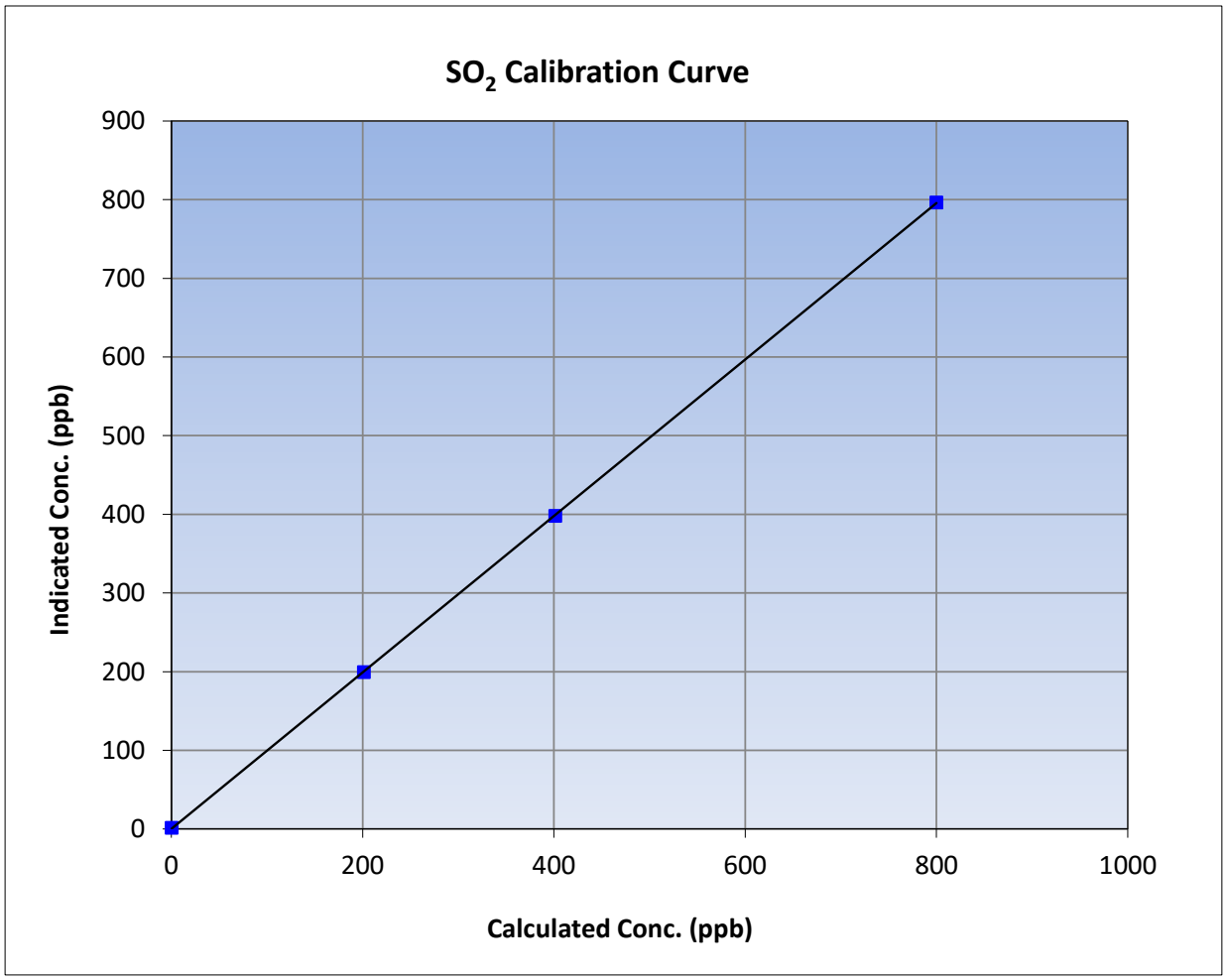
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 10:47 | End Time (MST): | 14:43 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 100841398 |

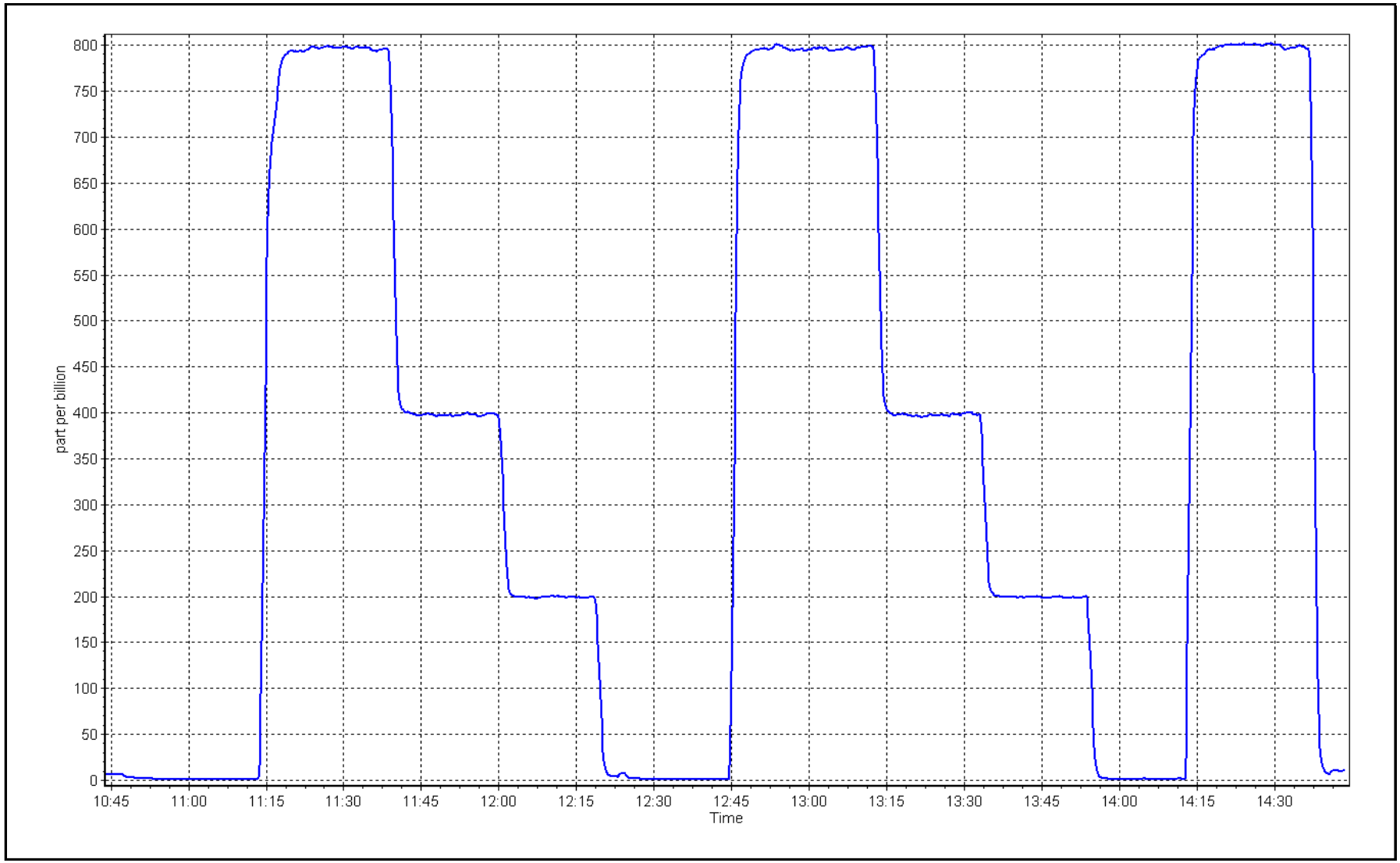
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 1.2 | ---- |
| 799.6 | 796.1 | 1.0045 |
| 400.9 | 397.6 | 1.0083 |
| 200.9 | 199.2 | 1.0085 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999989 | ≥0.995 |
| Slope | 0.994478 | 0.90 - 1.10 |
| Intercept | 0.097406 | +/-30 |



**SO2 Calibration Plot** Date: March 26, 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: | March 25, 2024 | Last Cal Date: | February 29, 2024 |
| Start time (MST): | 9:34 | End time (MST): | 11:22 |
| Reason: | Removal | | |

### 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: | 1.011205 | | Backgd or Offset: | 15.8 | NA |
| Calibration intercept: | -0.085817 | | 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 | -0.1 | ---- |
| as found span | 4926 | 73.6 | 79.9 | 80.2 | 0.995 |
| as found 2nd point | 4963 | 36.8 | 40.0 | 40.3 | 0.989 |
| as found 3rd point | 4982 | 18.6 | 20.2 | 20.2 | 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 | | | | -0.1 | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| SO2 Scrubber Check | 4935 | 81.5 | 812.3 | 0.3 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | |
| Date of last converter efficiency test: | | | | | efficiency |

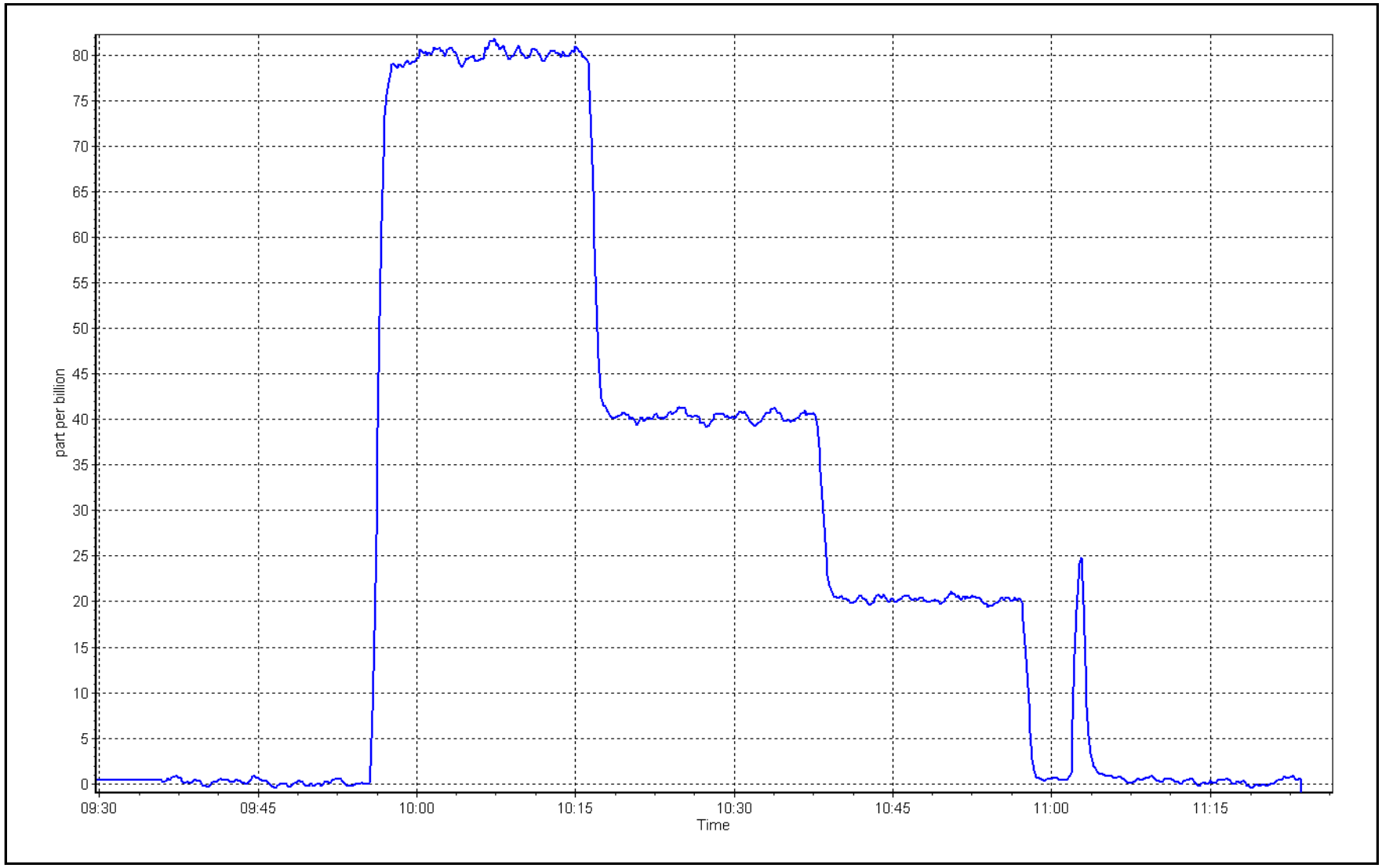
| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.3 | Prev response: | 80.73 | *% change: | -0.5% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.005049 | AF Intercept: | -0.045255 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999987 | | |

* = > +/-5% change initiates investigation

Notes: Removal calibration. Ran SO2 scrubber check after as found span and it passed.

Calibration Performed By: Mohammed Kashif

**$H_2S$ Calibration Plot** Date: March 25, 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: | March 25, 2024 | Last Cal Date: | NA |
| Start time (MST): | 13:00 | End time (MST): | 15:29 |
| Reason: | Install | | |

### 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 43iQ | | Analyzer serial #: | 1203169745 | |
| Converter make: | Global G150 | | Converter serial #: | 2022-223 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | NA | 1.012278 | Backgd or Offset: | NA | 3.01 |
| Calibration intercept: | NA | -0.364532 | Coeff or Slope: | NA | 0.817 |

### $H_2S$ 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 | -0.1 | ---- |
| high point | 4926 | 73.6 | 79.9 | 80.5 | 0.993 |
| second point | 4963 | 36.8 | 40.0 | 40.2 | 0.994 |
| third point | 4982 | 18.6 | 20.2 | 20.0 | 1.010 |
| as left zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| as left span | 4926 | 73.6 | 79.9 | 80.7 | 0.990 |
| SO2 Scrubber Check | 4935 | 81.5 | 812.3 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.999 |
| 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: Changed sample inlet filter. Adjusted both zero and span. Ran scrubber check after cal zero and it passed.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

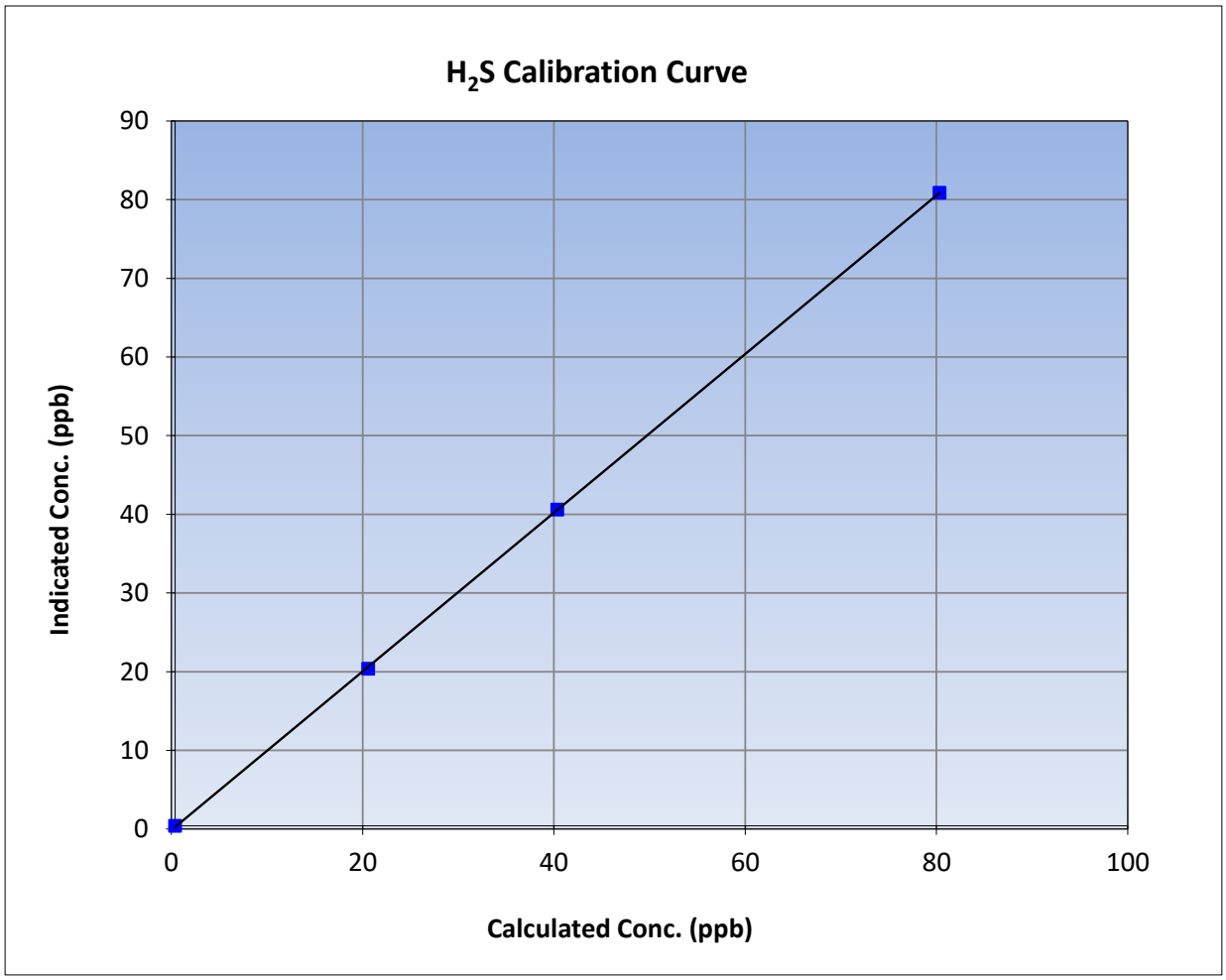
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | NA |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 13:00 | End Time (MST): | 15:29 |
| Analyzer make: | Thermo 43iQ | Analyzer serial #: | 1203169745 |

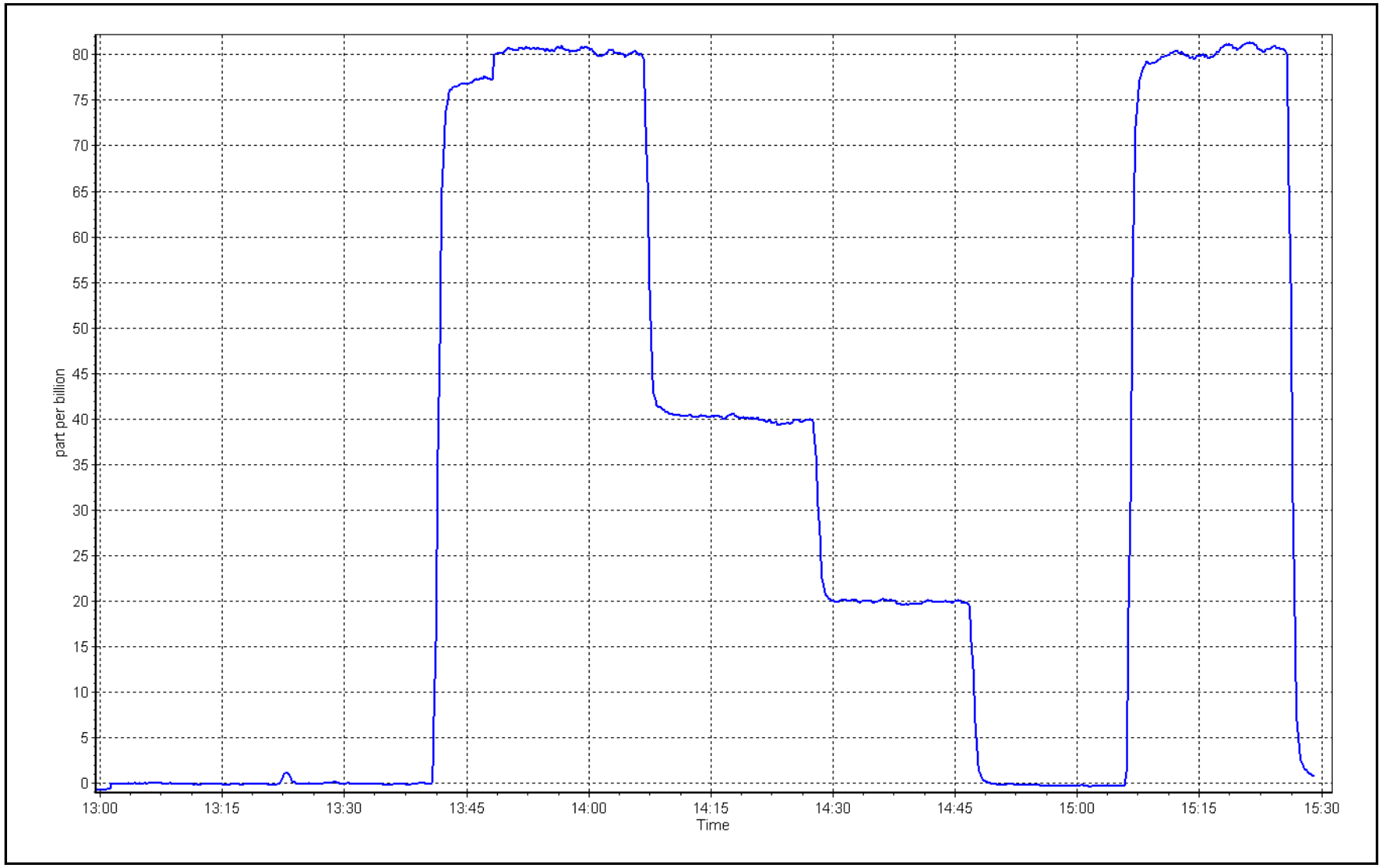
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | | ---- |
| 79.9 | 80.5 | 0.9928 |
| 40.0 | 40.2 | 0.9940 |
| 20.2 | 20.0 | 1.0097 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999989 | *≥0.995* |
| Slope | 1.012278 | *0.90 - 1.10* |
| Intercept | -0.364532 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 25, 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: | March 26, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 10:47 | End time (MST): | 14:43 |
| 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: | 2.88E-04 | 2.68E-04 | NMHC SP Ratio: | 5.30E-05 | 4.81E-05 |
| CH4 Retention time: | 14.6 | 14.6 | NMHC Peak Area: | 173476 | 190907 |
| 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 | 18.90 | 0.917 |
| as found 2nd point | 4959 | 40.7 | 8.69 | 9.37 | 0.927 |
| as found 3rd point | 4981 | 20.4 | 4.35 | 4.69 | 0.928 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4932 | 81.4 | 17.33 | 17.30 | 1.001 |
| second point | 4959 | 40.7 | 8.69 | 8.63 | 1.006 |
| third point | 4981 | 20.4 | 4.35 | 4.31 | 1.009 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4932 | 81.4 | 17.33 | 17.52 | 0.989 |
| | | | | Average Correction Factor | 1.005 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 18.90 | Prev response | 17.33 | *% change | 8.3% |
| Baseline Corr 2nd AF: | 9.4 | AF Slope: | 1.091445 | AF Intercept: | -0.044688 |
| Baseline Corr 3rd AF: | 4.7 | AF Correlation: | 0.999957 | * = > +/-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 | 10.10 | 0.909 |
| as found 2nd point | 4959 | 40.7 | 4.60 | 5.02 | 0.916 |
| as found 3rd point | 4981 | 20.4 | 2.31 | 2.51 | 0.917 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4932 | 81.4 | 9.18 | 9.16 | 1.001 |
| second point | 4959 | 40.7 | 4.60 | 4.58 | 1.004 |
| third point | 4981 | 20.4 | 2.31 | 2.29 | 1.008 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4932 | 81.4 | 9.18 | 9.29 | 0.988 |
| | | | | Average Correction Factor | 1.005 |
| Baseline Corr AF: | 10.10 | Prev response | 9.18 | *% change | 9.1% |
| Baseline Corr 2nd AF: | 5.0 | AF Slope: | 1.100657 | AF Intercept: | -0.016446 |
| Baseline Corr 3rd AF: | 2.5 | AF Correlation: | 0.999982 | * = > +/-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 | 8.81 | 0.926 |
| as found 2nd point | 4959 | 40.7 | 4.09 | 4.34 | 0.941 |
| as found 3rd point | 4981 | 20.4 | 2.05 | 2.18 | 0.940 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4932 | 81.4 | 8.15 | 8.14 | 1.002 |
| second point | 4959 | 40.7 | 4.09 | 4.06 | 1.008 |
| third point | 4981 | 20.4 | 2.05 | 2.03 | 1.010 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4932 | 81.4 | 8.15 | 8.23 | 0.991 |
| | | | | Average Correction Factor | 1.006 |
| Baseline Corr AF: | 8.81 | Prev response | 8.15 | *% change | 7.5% |
| Baseline Corr 2nd AF: | 4.34 | AF Slope: | 1.080823 | AF Intercept: | -0.027841 |
| Baseline Corr 3rd AF: | 2.18 | AF Correlation: | 0.999919 | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.001990 | 0.999083 |
| THC Cal Offset: | -0.033339 | -0.021522 |
| CH4 Cal Slope: | 1.001462 | 0.998771 |
| CH4 Cal Offset: | -0.014179 | -0.011567 |
| NMHC Cal Slope: | 1.002471 | 0.999149 |
| NMHC Cal Offset: | -0.018960 | -0.009354 |

Notes: Hydrogen generator was swapped with cylinder then performed as founds. Changed sample inlet filter after MAF's. Investigation was made and suspecting that the switch from the H2 generator to an H2 cylinder as the fuel source may have caused the off-limits readings, as the setup, diagnostics, and chromatograms appeared normal. Adjusted span only.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

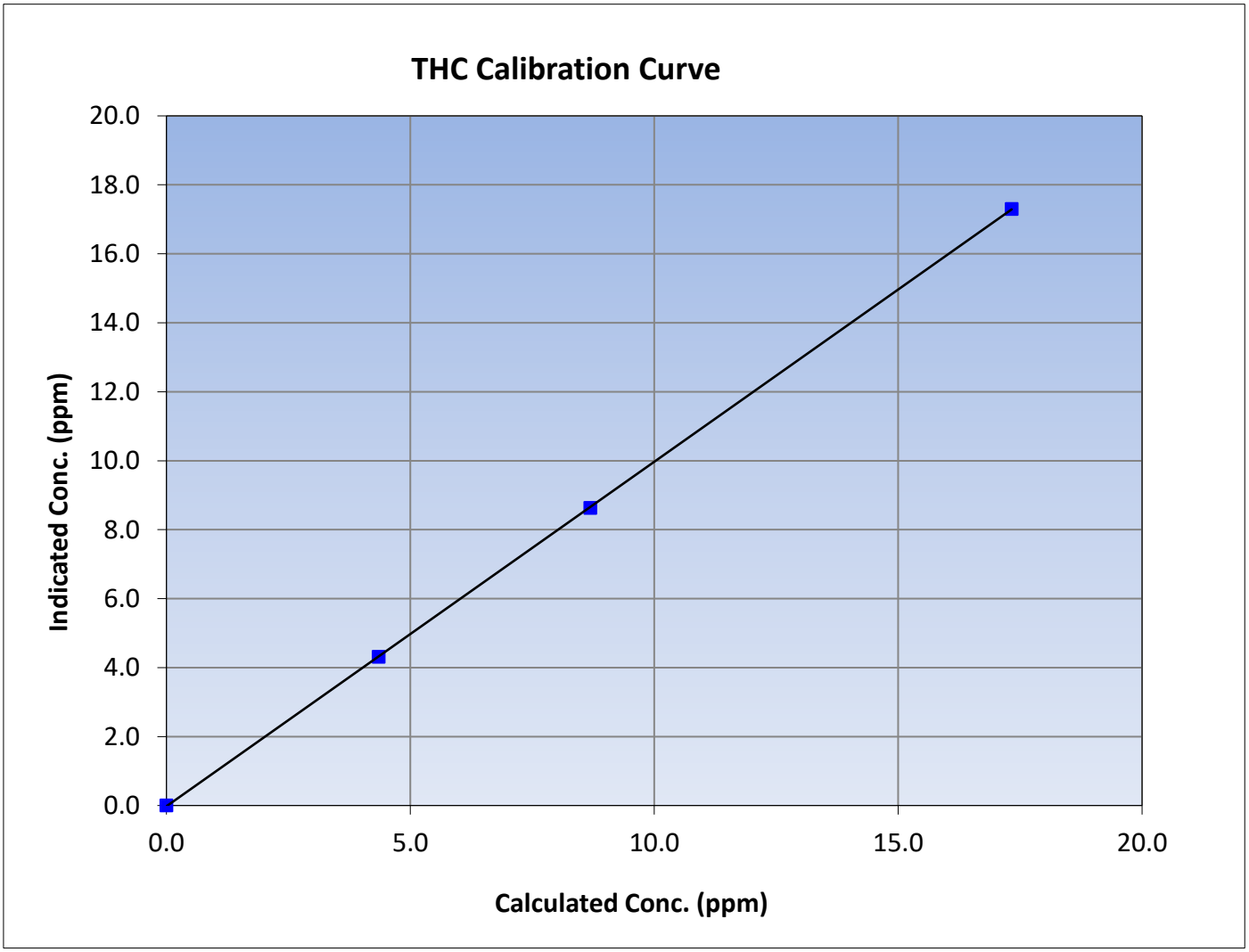
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 10:47 | End Time (MST): | 14:43 |
| 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 | 0.999991 | *≥0.995* |
| 17.33 | 17.30 | 1.0013 | | | |
| 8.69 | 8.63 | 1.0061 | Slope | 0.999083 | *0.90 - 1.10* |
| 4.35 | 4.31 | 1.0090 | | | |
| | | | Intercept | -0.021522 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

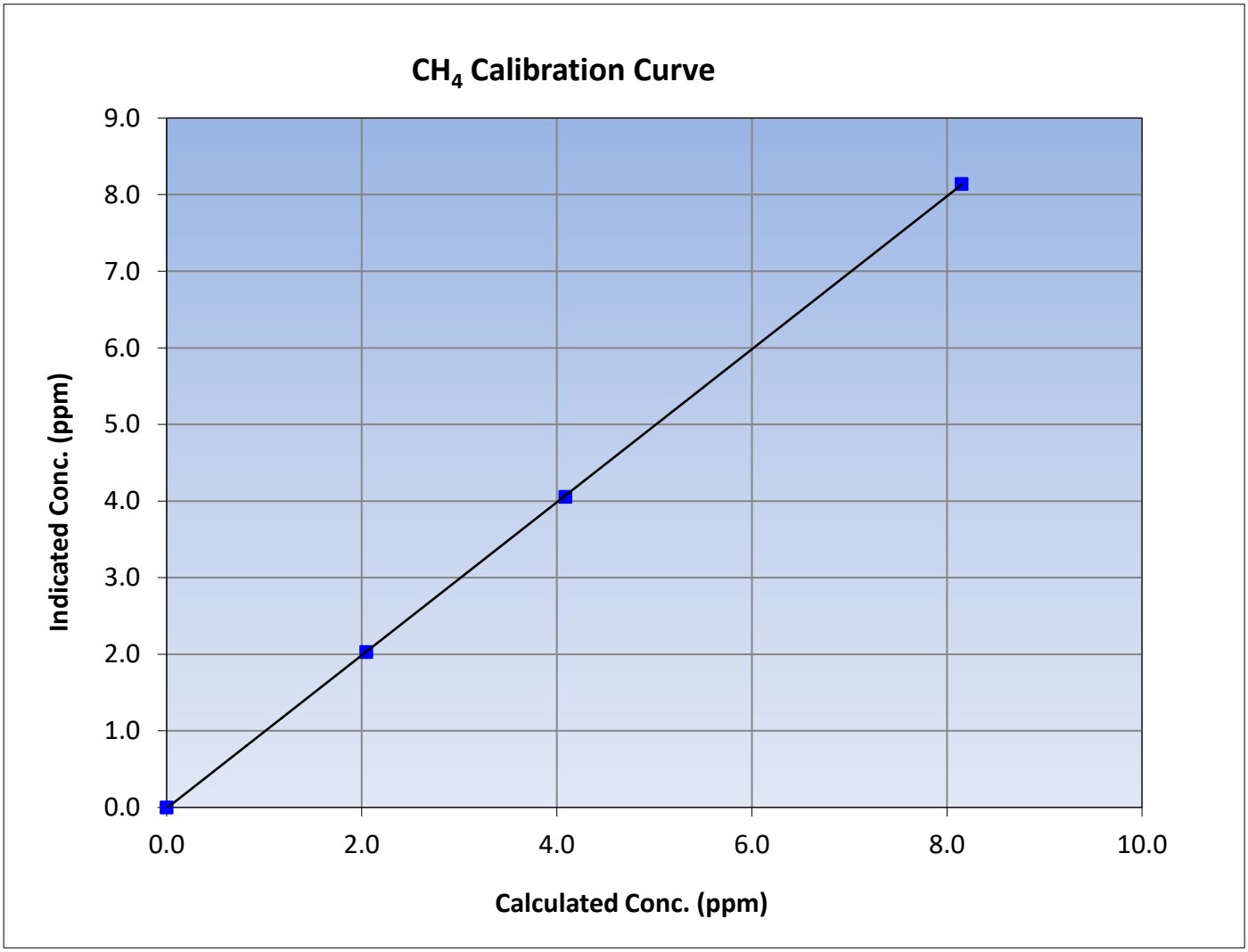
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 10:47 | End Time (MST): | 14:43 |
| 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 | 0.999987 | *≥0.995* |
| 8.15 | 8.14 | 1.0016 | | | |
| 4.09 | 4.06 | 1.0078 | Slope | 0.998771 | *0.90 - 1.10* |
| 2.05 | 2.03 | 1.0097 | | | |
| | | | Intercept | -0.011567 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

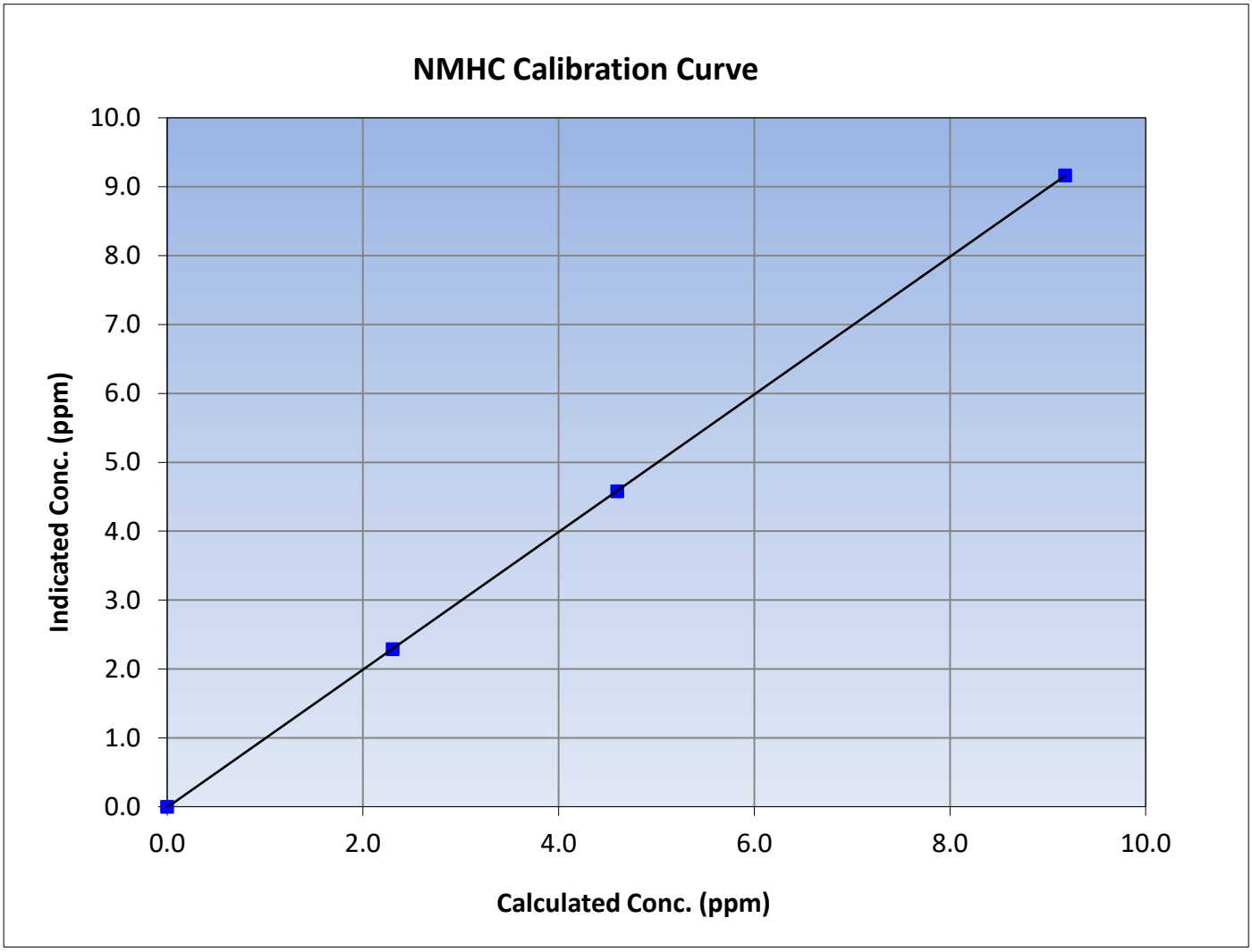
Version-06-2022

### Station Information

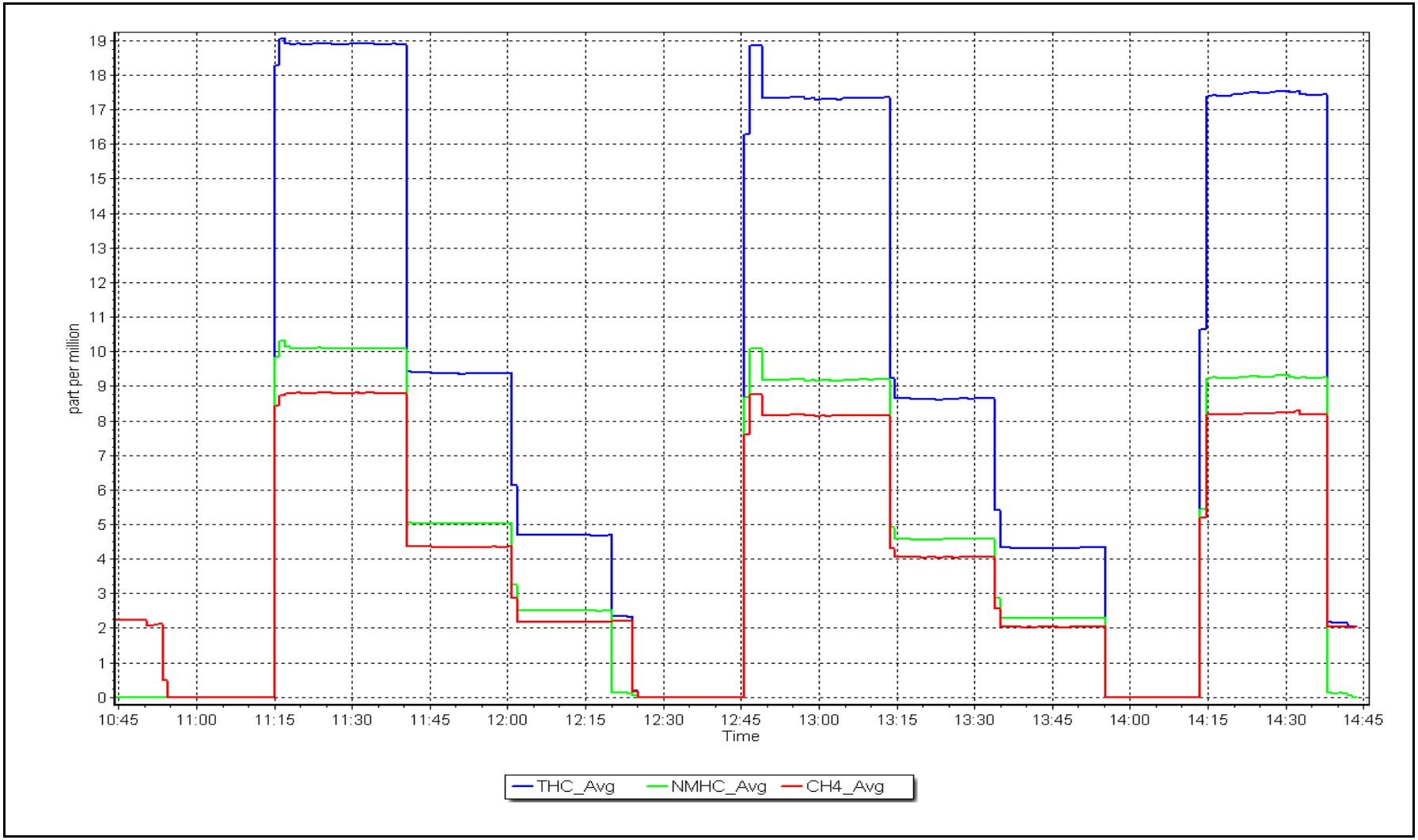
| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Lower Camp | Station Number: | AMS11 |
| Start Time (MST): | 10:47 | End Time (MST): | 14:43 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1505164381 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999995 | *≥0.995* |
| 9.18 | 9.16 | 1.0013 | | | |
| 4.60 | 4.58 | 1.0045 | Slope | 0.999149 | *0.90 - 1.10* |
| 2.31 | 2.29 | 1.0083 | | | |
| | | | Intercept | -0.009354 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 26, 2024 Location: Lower Camp



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS13
## FORT MCKAY SOUTH
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort McKay South | Station number: | AMS13 |
| Calibration Date: | March 12, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 10:23 | End time (MST): | 13:35 |
| 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: | 1.003642 | 1.002127 | Backgd or Offset: | 90.0 | 90.0 |
| Calibration intercept: | -2.718121 | -2.338170 | Coeff or Slope: | 0.711 | 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 | -0.1 | ---- |
| as found span | 4921 | 79.1 | 799.7 | 798.9 | 1.001 |
| 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 | 800.2 | 0.999 |
| second point | 4961 | 39.5 | 399.3 | 396.9 | 1.006 |
| third point | 4980 | 19.8 | 200.2 | 195.5 | 1.024 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4921 | 79.1 | 799.7 | 800.4 | 0.999 |
| | | | | Average Correction Factor | 1.010 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 799.00 | Previous response | 799.88 | *% 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. No adjustments made.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

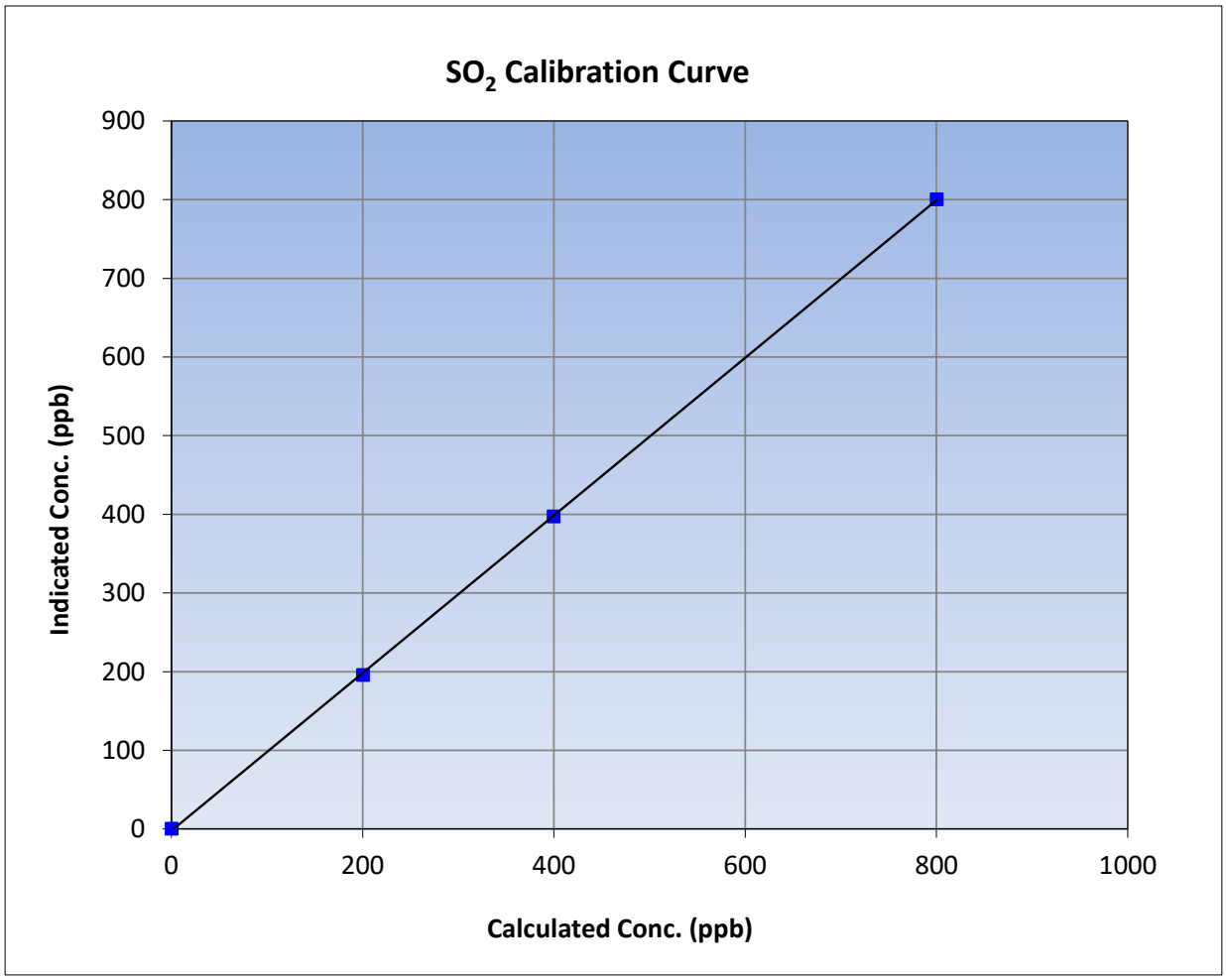
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:35 |
| Analyzer make: | API T100 | Analyzer serial #: | 599 |

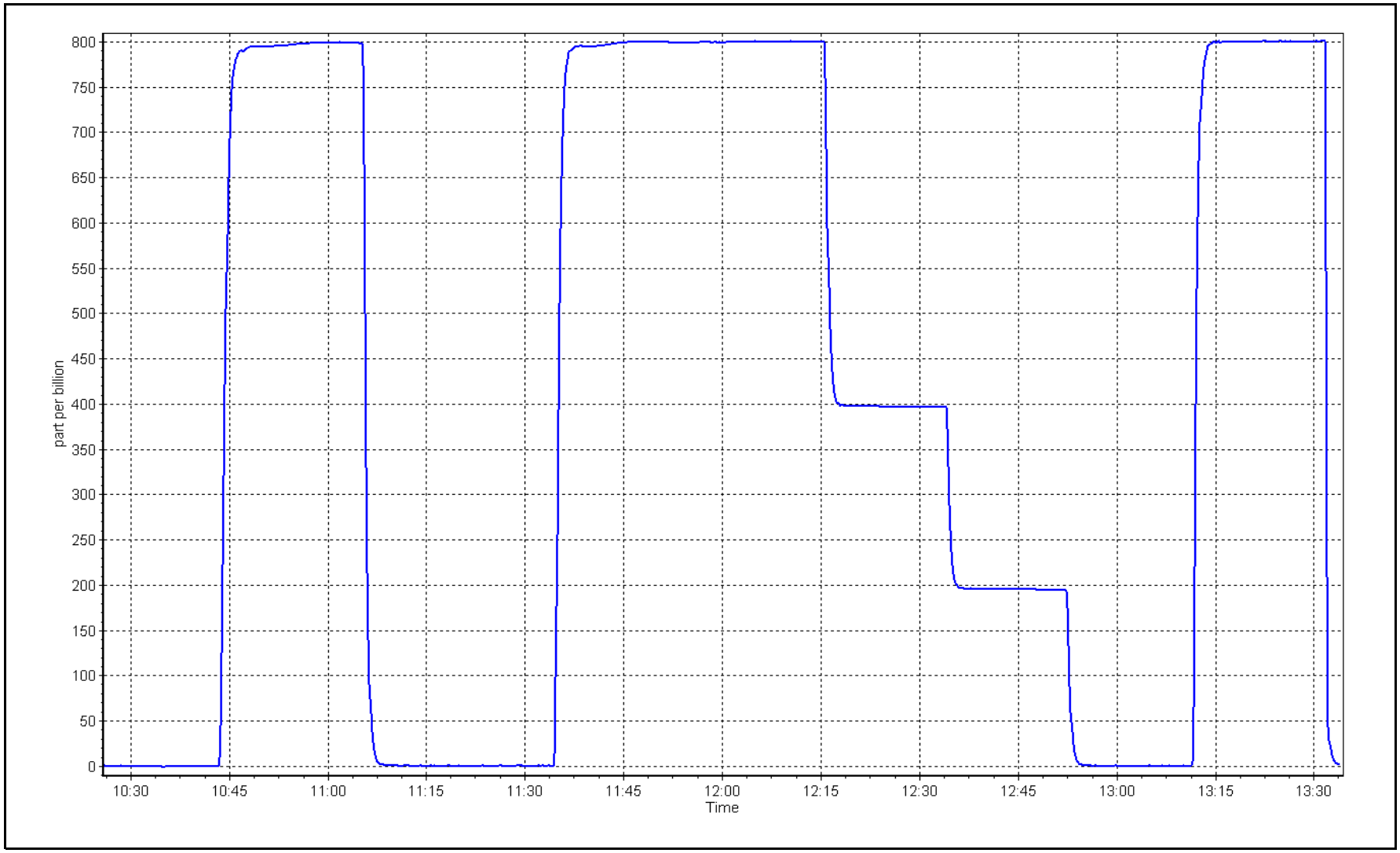
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 799.7 | 800.2 | 0.9994 |
| 399.3 | 396.9 | 1.0061 |
| 200.2 | 195.5 | 1.0240 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999954 | *≥0.995* |
| Slope | 1.002127 | *0.90 - 1.10* |
| Intercept | -2.338170 | *+/-30* |



**SO2 Calibration Plot** Date: March 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: | March 21, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 10:06 | 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: | 1.001638 | 1.007879 | Backgd or Offset: | 4.15 | 4.15 |
| Calibration intercept: | -0.302148 | -0.422268 | 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 | 81.1 | 0.989 |
| as found 2nd point | 4962 | 37.7 | 40.3 | 40.0 | 0.997 |
| as found 3rd point | 4981 | 18.9 | 20.2 | 19.5 | 1.014 |
| 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 | 80.9 | 0.997 |
| second point | 4962 | 37.7 | 40.3 | 40.1 | 1.004 |
| third point | 4981 | 18.9 | 20.2 | 19.8 | 1.019 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4925 | 75.5 | 80.6 | 80.1 | 1.007 |
| SO2 Scrubber Check | 4921 | 79.1 | 791.0 | 0.1 | ---- |
| Date of last scrubber change: | | 20-Mar-20 | | Ave Corr Factor | 1.007 |
| Date of last converter efficiency test: | | NA | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.5 | Prev response: | 80.46 | *% change: | 1.3% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.012557 | AF Intercept: | -0.662257 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999953 | | |

* = > +/-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

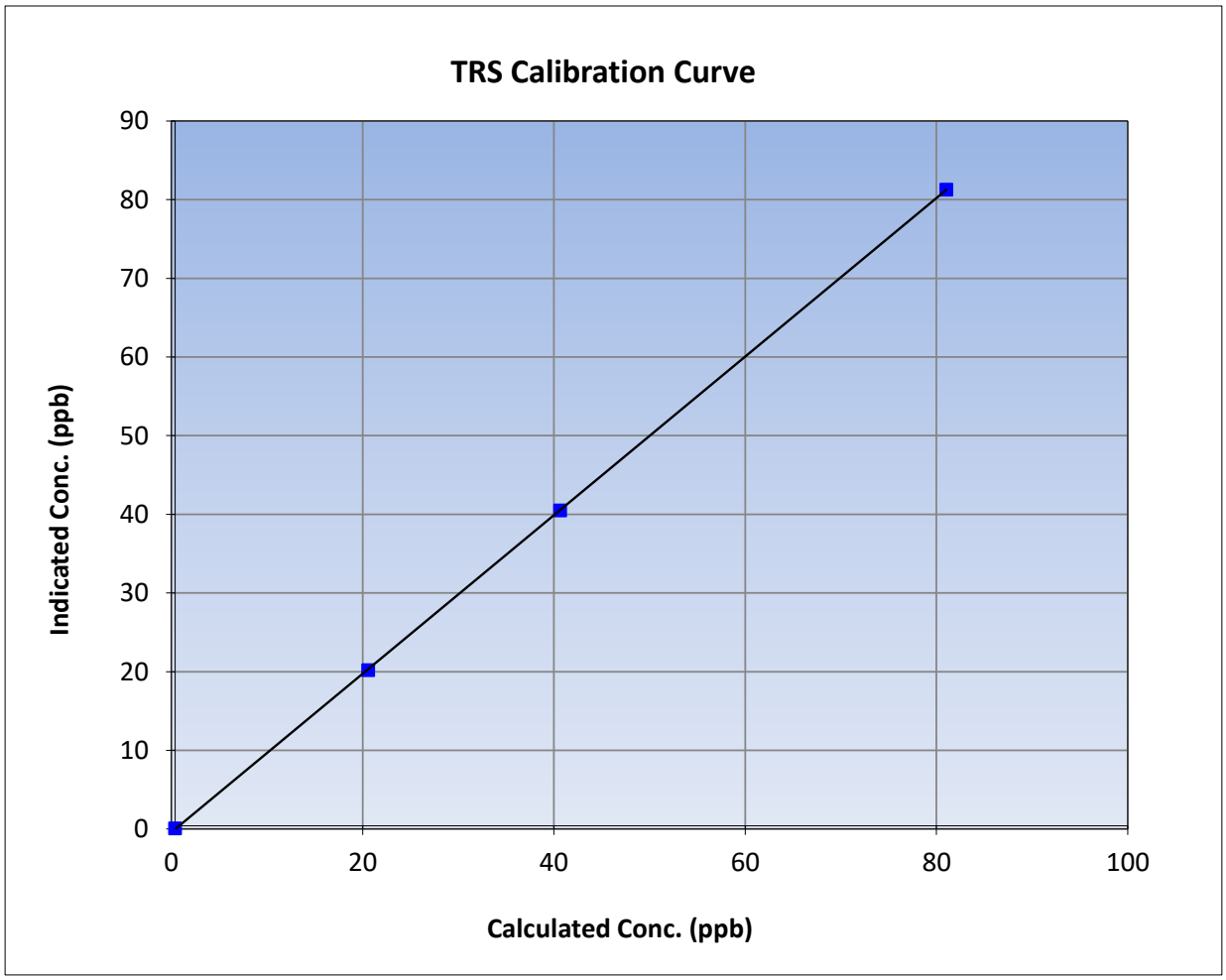
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:06 | End Time (MST): | 14:19 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1180540017 |

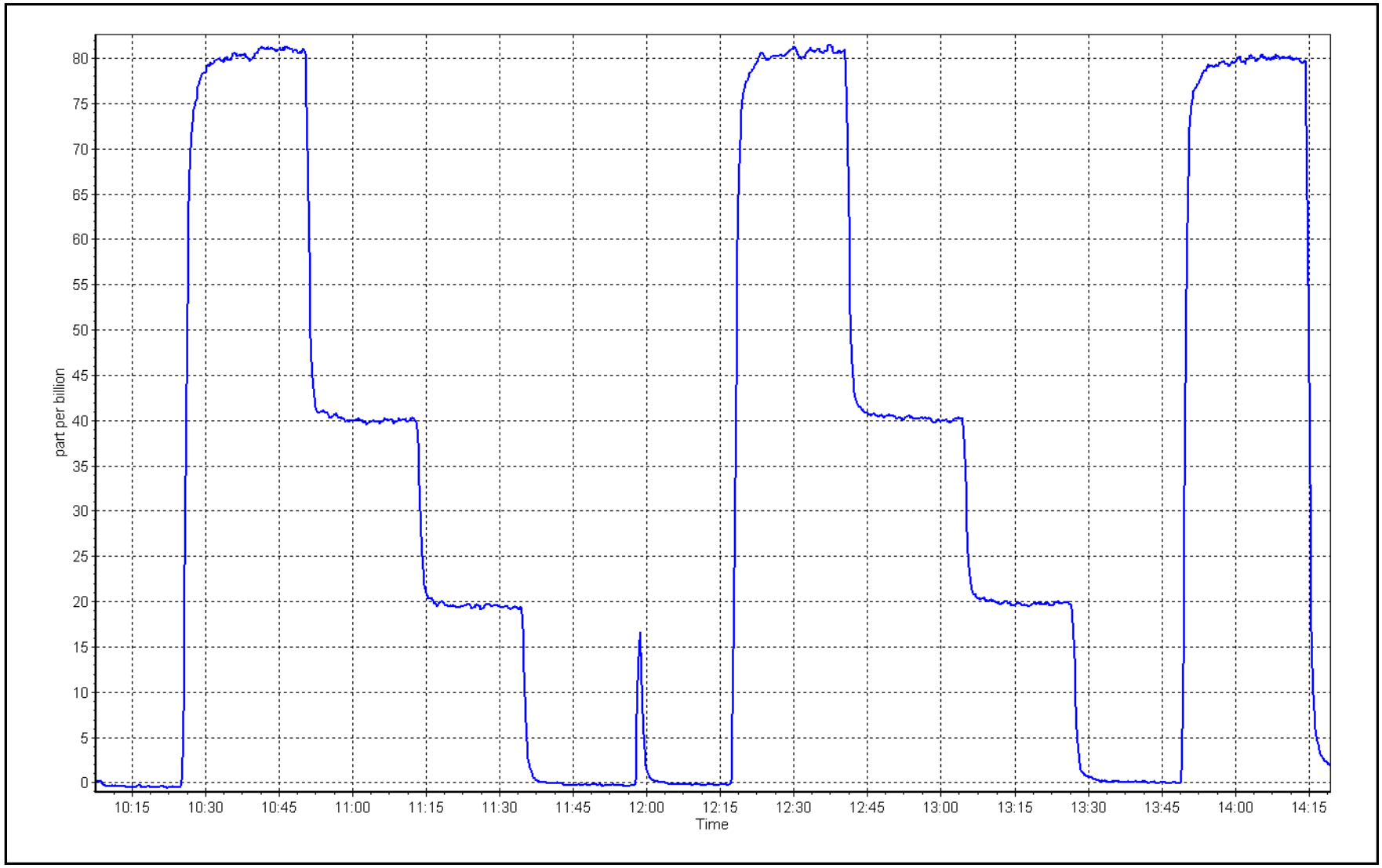
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.3 | ---- |
| 80.6 | 80.9 | 0.9966 |
| 40.3 | 40.1 | 1.0041 |
| 20.2 | 19.8 | 1.0195 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999990 | *≥0.995* |
| Slope | 1.007879 | *0.90 - 1.10* |
| Intercept | -0.422268 | *+/-3* |



**TRS Calibration Plot** Date: March 21, 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: | March 12, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 10:23 | End time (MST): | 13:35 |
| 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 | 2.95E-04 | NMHC SP Ratio: | 4.83E-05 | 5.07E-05 |
| CH4 Retention time: | 15.20 | 15.20 | NMHC Peak Area: | 1879773 | 179256 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | ON | 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 | 0.02 | ---- |
| as found span | 4921 | 79.1 | 17.05 | 16.83 | 1.013 |
| 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 | 17.02 | 1.001 |
| second point | 4961 | 39.5 | 8.51 | 8.42 | 1.011 |
| third point | 4980 | 19.8 | 4.27 | 4.11 | 1.039 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.1 | 17.05 | 17.07 | 0.999 |
| | | | | Average Correction Factor | 1.017 |
| Baseline Corr AF: | 16.81 | Prev response | 16.99 | *% 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 | 0.00 | 0.00 | ---- |
| as found span | 4921 | 79.1 | 9.08 | 8.80 | 1.031 |
| 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 | 9.12 | 0.996 |
| second point | 4961 | 39.5 | 4.53 | 4.52 | 1.004 |
| third point | 4980 | 19.8 | 2.27 | 2.19 | 1.040 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.1 | 9.08 | 9.13 | 0.994 |
| | | | | Average Correction Factor | 1.013 |
| Baseline Corr AF: | 8.80 | Prev response | 9.07 | *% change | -3.0% |
| 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 | 0.02 | ---- |
| as found span | 4921 | 79.1 | 7.97 | 8.03 | 0.993 |
| 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 | 7.91 | 1.007 |
| second point | 4961 | 39.5 | 3.98 | 3.90 | 1.020 |
| third point | 4980 | 19.8 | 1.99 | 1.92 | 1.039 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.1 | 7.97 | 7.94 | 1.004 |
| | | | | Average Correction Factor | 1.022 |
| Baseline Corr AF: | 8.01 | Prev response | 7.93 | *% change | 1.0% |
| 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: | 1.000652 | 1.001286 |
| THC Cal Offset: | -0.065578 | -0.078556 |
| CH4 Cal Slope: | 1.000073 | 0.994805 |
| CH4 Cal Offset: | -0.040797 | -0.034188 |
| NMHC Cal Slope: | 1.001197 | 1.007213 |
| NMHC Cal Offset: | -0.024180 | -0.045569 |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## THC Calibration Summary

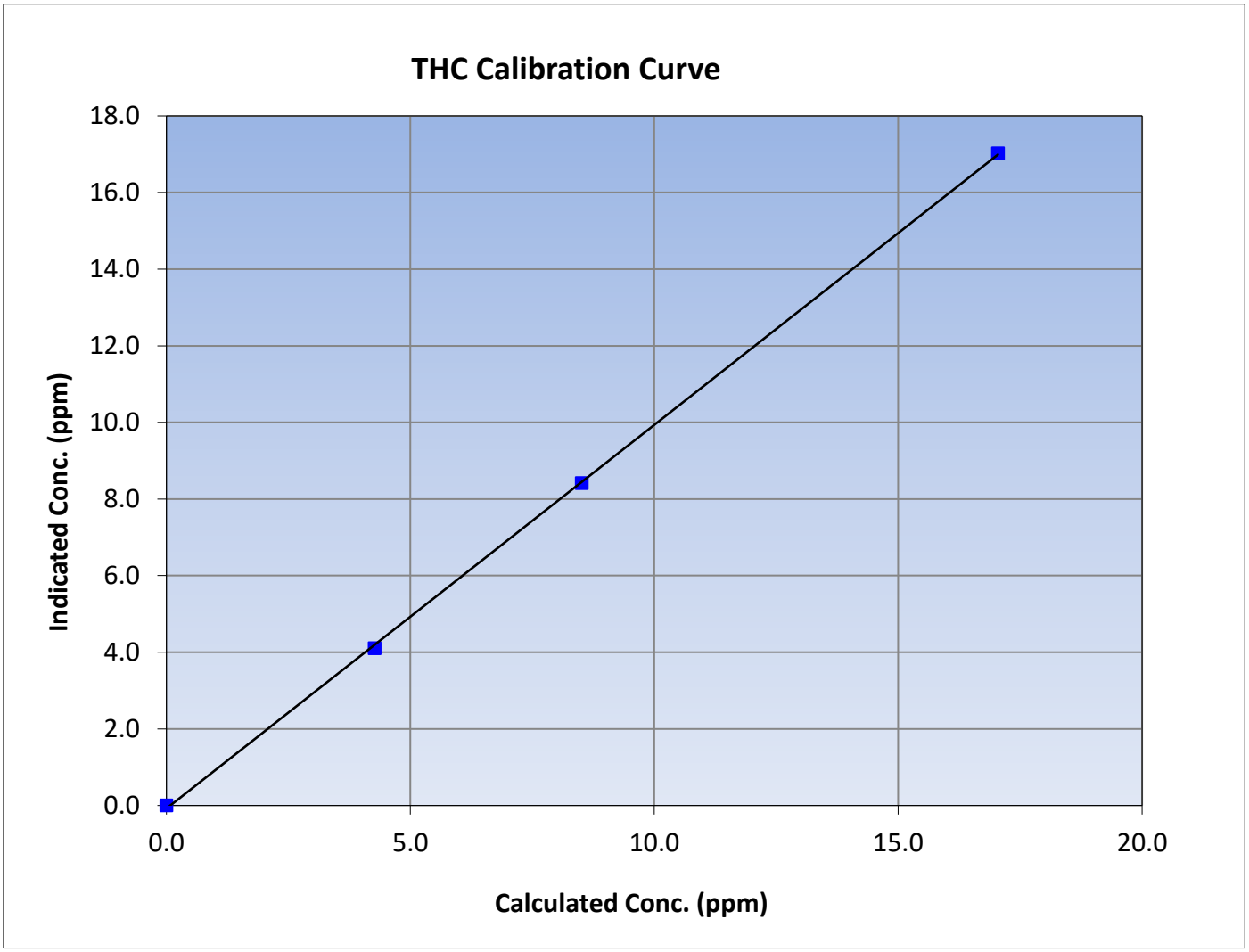
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:35 |
| 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 | 0.999901 | ≥0.995 |
| 17.05 | 17.02 | 1.0013 | | | |
| 8.51 | 8.42 | 1.0110 | Slope | 1.001286 | 0.90 - 1.10 |
| 4.27 | 4.11 | 1.0393 | | | |
| | | | Intercept | -0.078556 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

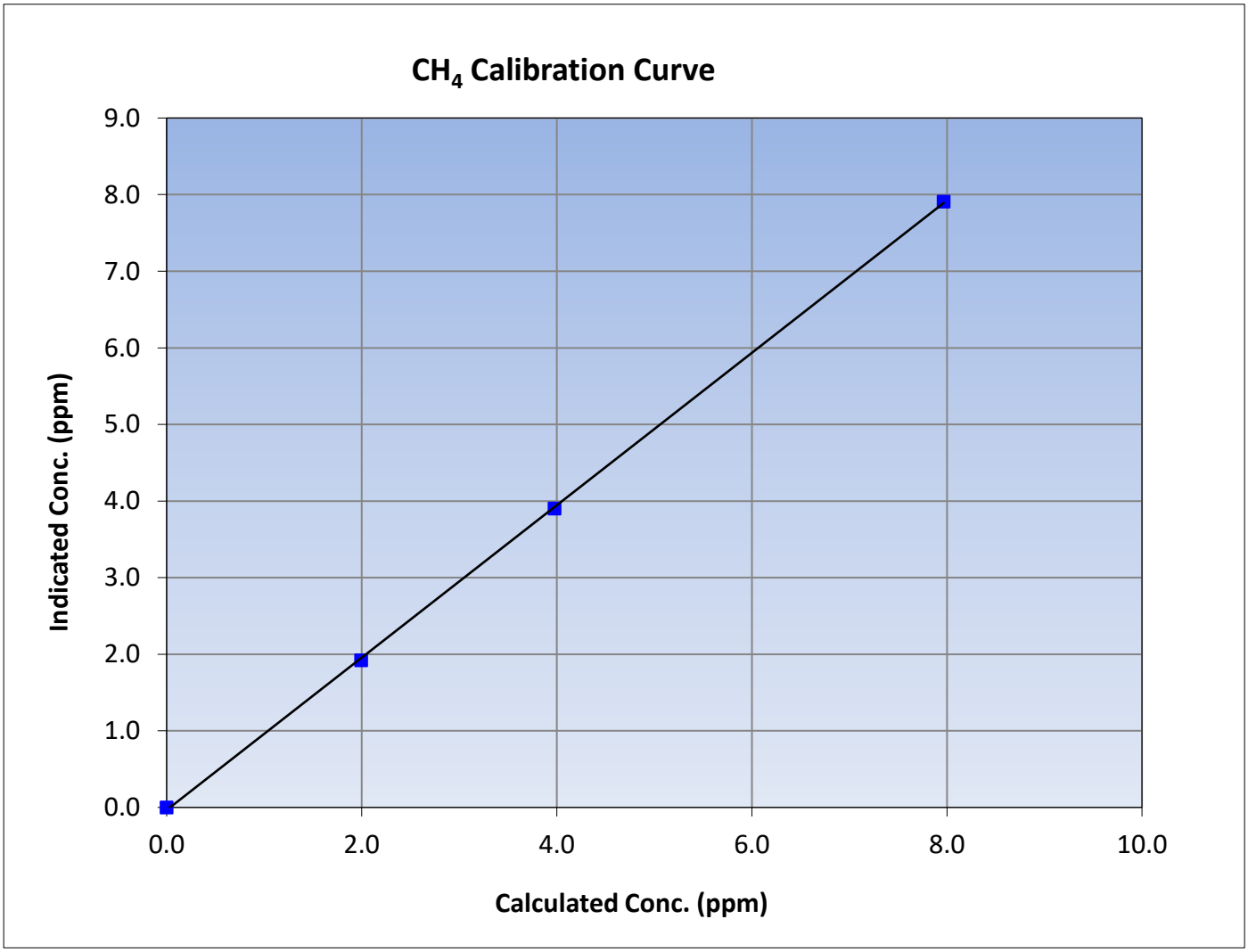
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:35 |
| 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 | 0.999914 | ≥0.995 |
| 7.97 | 7.91 | 1.0072 | | | |
| 3.98 | 3.90 | 1.0197 | Slope | 0.994805 | 0.90 - 1.10 |
| 1.99 | 1.92 | 1.0393 | | | |
| | | | Intercept | -0.034188 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

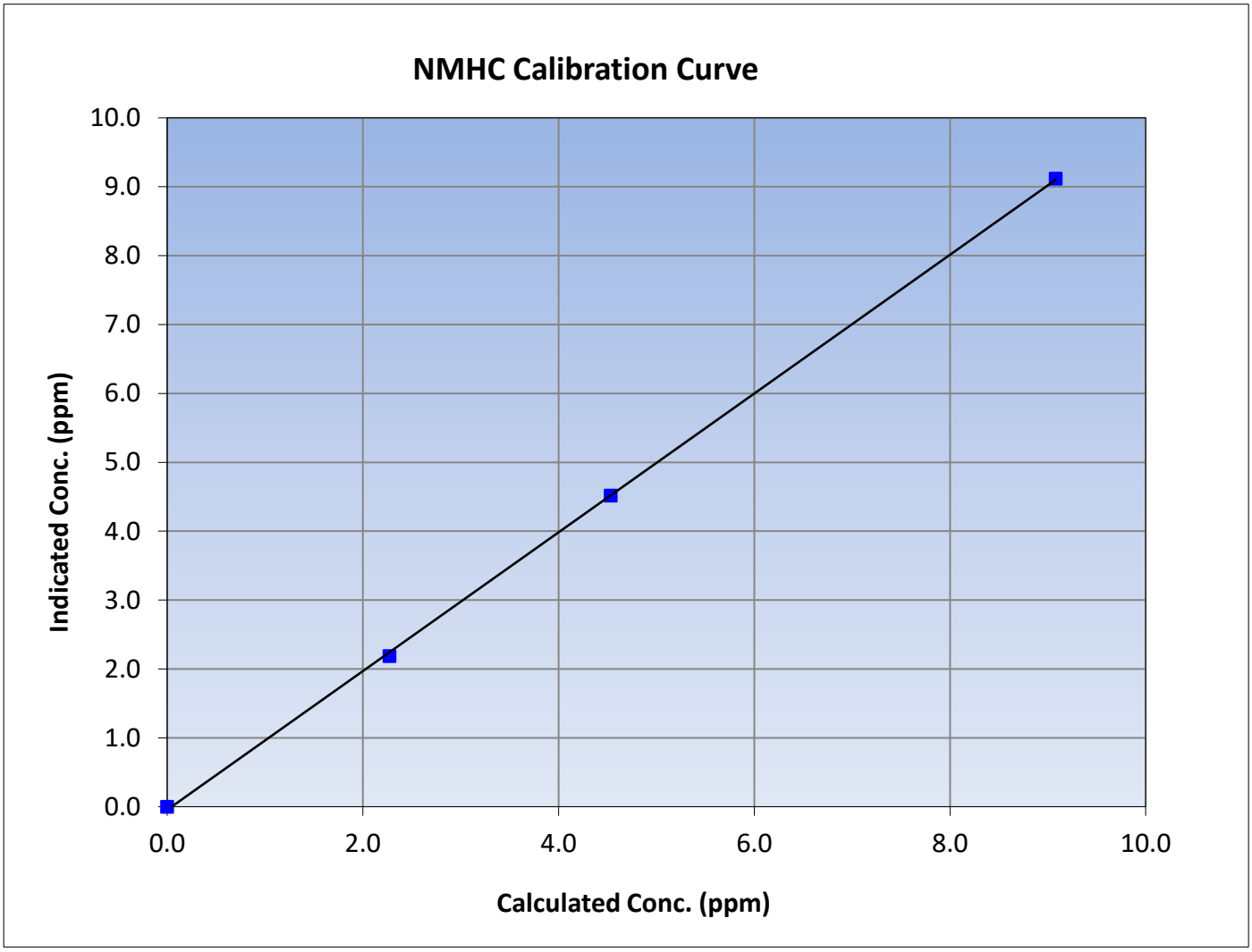
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:23 | End Time (MST): | 13:35 |
| 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 | 0.999875 | ≥0.995 |
| 9.08 | 9.12 | 0.9960 | | | |
| 4.53 | 4.52 | 1.0039 | Slope | 1.007213 | 0.90 - 1.10 |
| 2.27 | 2.19 | 1.0397 | | | |
| | | | Intercept | -0.045569 | +/-0.5 |



**NMHC Calibration Plot** Date: March 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: | March 27, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 8:42 | End time (MST): | 12:47 |
| 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: | 1.128 | 1.128 | NO bkgnd or offset: | 10.1 | 10.1 |
| NOX coeff or slope: | 0.999 | 0.999 | NOX bkgnd or offset: | 10.2 | 10.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 156.4 | 157.3 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.999462 | 0.994114 |
| $NO_X$ Cal Offset: | -1.952788 | -1.991485 |
| NO Cal Slope: | 1.002954 | 0.997692 |
| NO Cal Offset: | -2.771571 | -2.930061 |
| $NO_2$ Cal Slope: | 1.000409 | 0.999151 |
| $NO_2$ Cal Offset: | -0.685310 | -1.075362 |

# 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 | 4917 | 83.5 | 805.7 | 799.5 | 6.2 | 802.3 | 796.4 | 5.9 | 1.0042 | 1.0039 |
| 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 | 800.1 | 796.4 | 3.8 | 1.0070 | 1.0039 |
| second point | 4958 | 41.8 | 403.4 | 400.3 | 3.1 | 397.7 | 394.5 | 3.2 | 1.0143 | 1.0147 |
| third point | 4979 | 20.9 | 201.7 | 200.1 | 1.5 | 196.6 | 194.0 | 2.6 | 1.0259 | 1.0317 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ---- | ---- |
| as left span | 4917 | 83.5 | 805.7 | 383.6 | 422.1 | 802.2 | 378.3 | 423.9 | 1.0044 | 1.0141 |
| | | | | | | | | Average Correction Factor | 1.0157 | 1.0168 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 802.4 ppb | NO = 796.5 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -0.1% |
| Previous Response | $NO_X$ = 803.3 ppb | NO = 799.1 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) | 790.9 | 375.0 | 422.1 | 421.1 | 1.0023 | 99.8% |
| 2nd GPT point (200 ppb O3) | 790.9 | 583.6 | 213.5 | 212.0 | 1.0070 | 99.3% |
| 3rd GPT point (100 ppb O3) | 790.9 | 686.4 | 110.7 | 108.2 | 1.0229 | 97.8% |
| | | | | Average Correction Factor | 1.0107 | 98.9% |

Notes: Changed inlet filter after as founds. No adjustment made. Used 2nd NO reference point due to drift.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

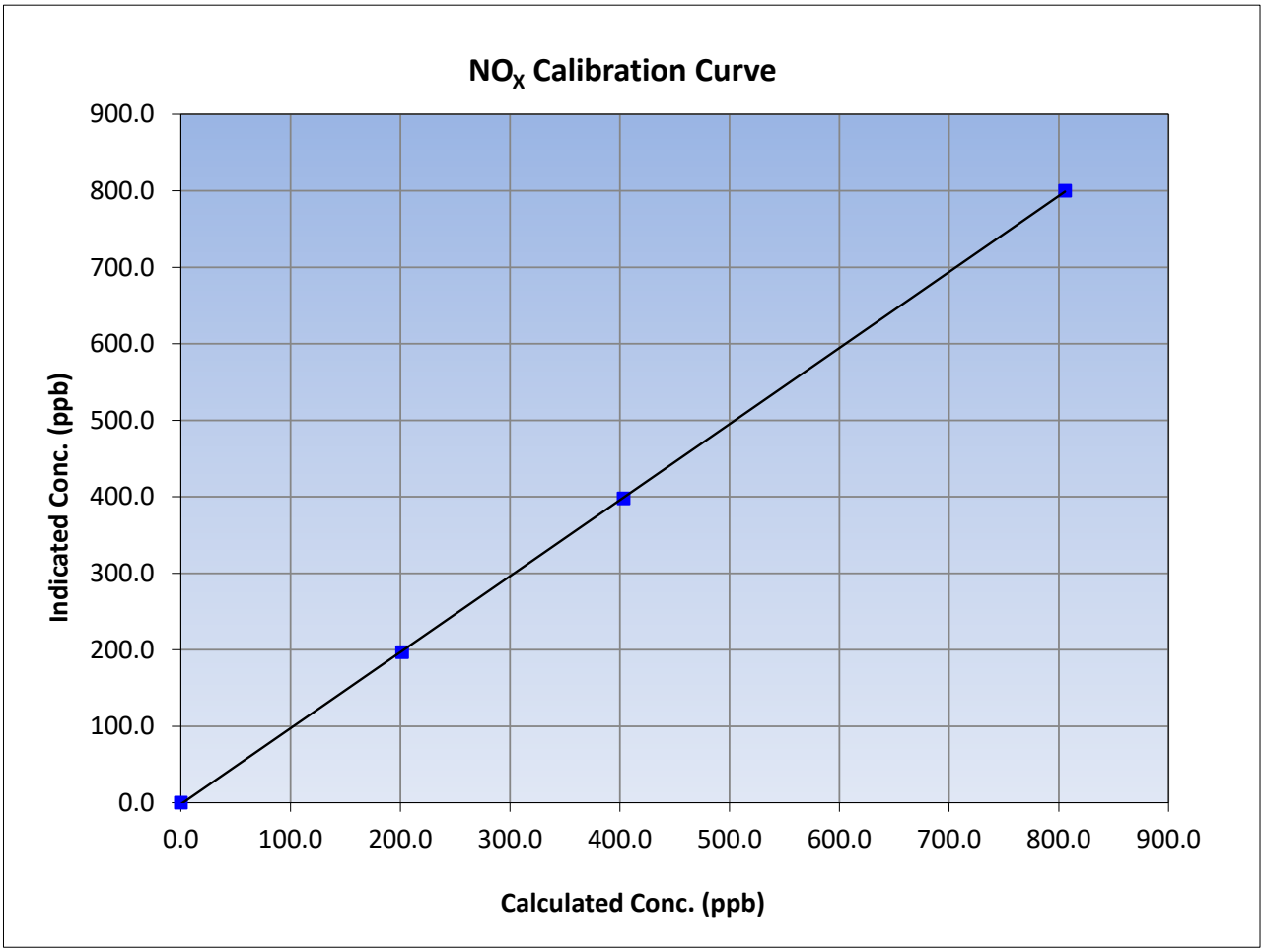
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS 13 |
| Start Time (MST): | 8:42 | End Time (MST): | 12:47 |
| 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 | 0.999968 | *≥0.995* |
| 805.7 | 800.1 | 1.0070 | | | |
| 403.4 | 397.7 | 1.0143 | Slope | 0.994114 | *0.90 - 1.10* |
| 201.7 | 196.6 | 1.0259 | | | |
| | | | Intercept | -1.991485 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

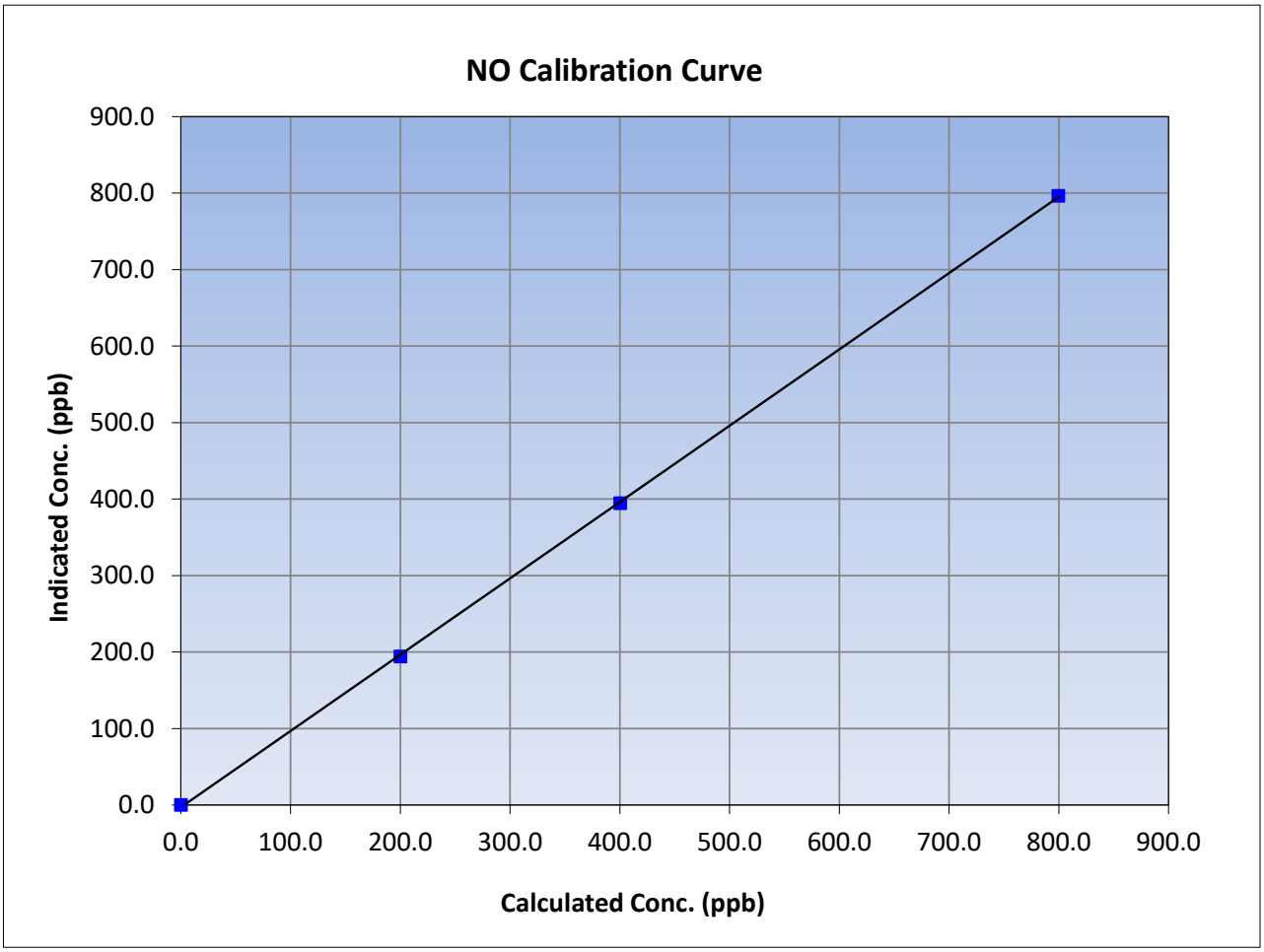
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS 13 |
| Start Time (MST): | 8:42 | End Time (MST): | 12:47 |
| 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 | 0.999933 | ≥0.995 |
| 799.5 | 796.4 | 1.0039 | | | |
| 400.3 | 394.5 | 1.0147 | Slope | 0.997692 | 0.90 - 1.10 |
| 200.1 | 194.0 | 1.0317 | | | |
| | | | Intercept | -2.930061 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

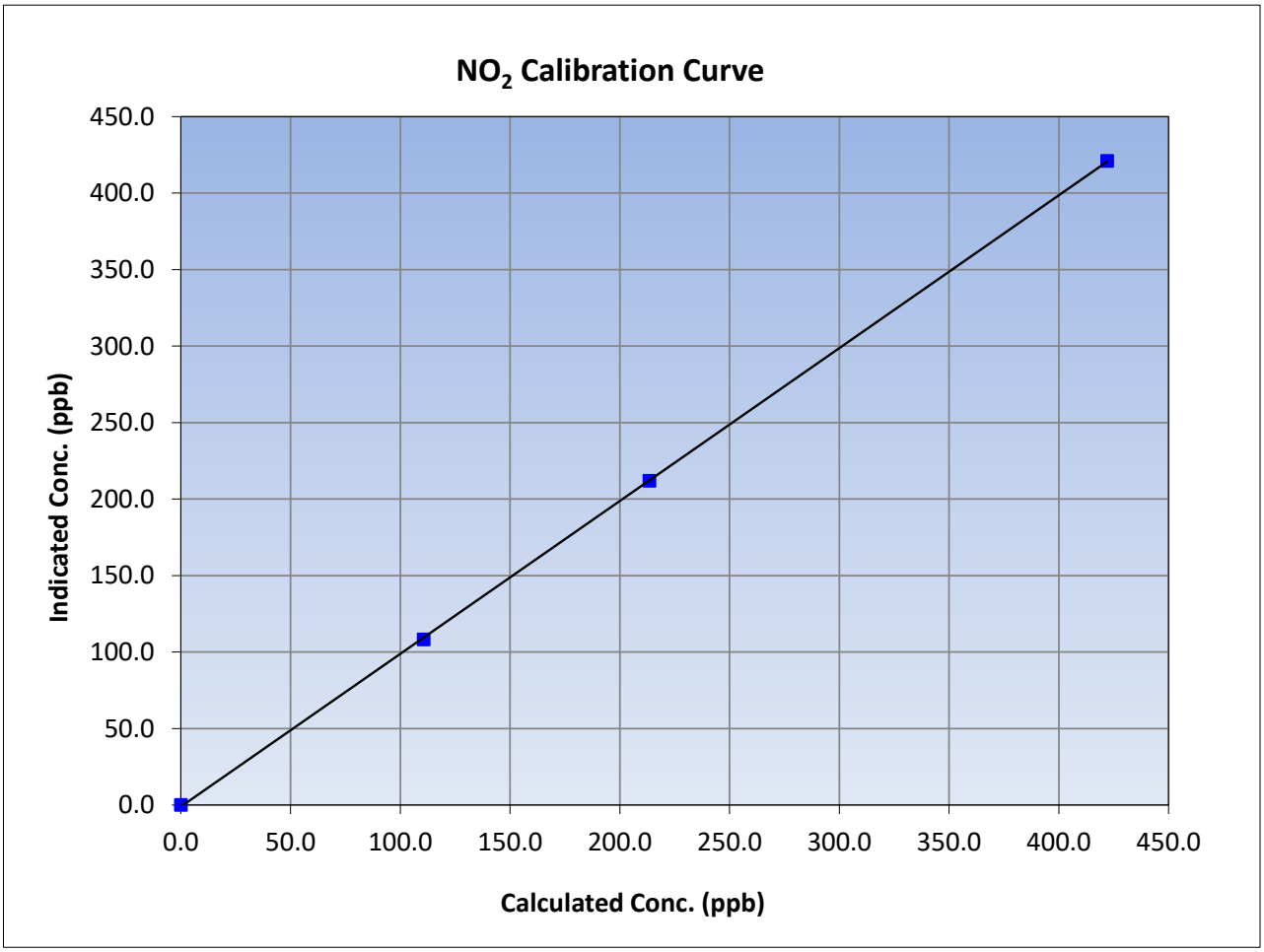
Version-04-2020

### Station Information

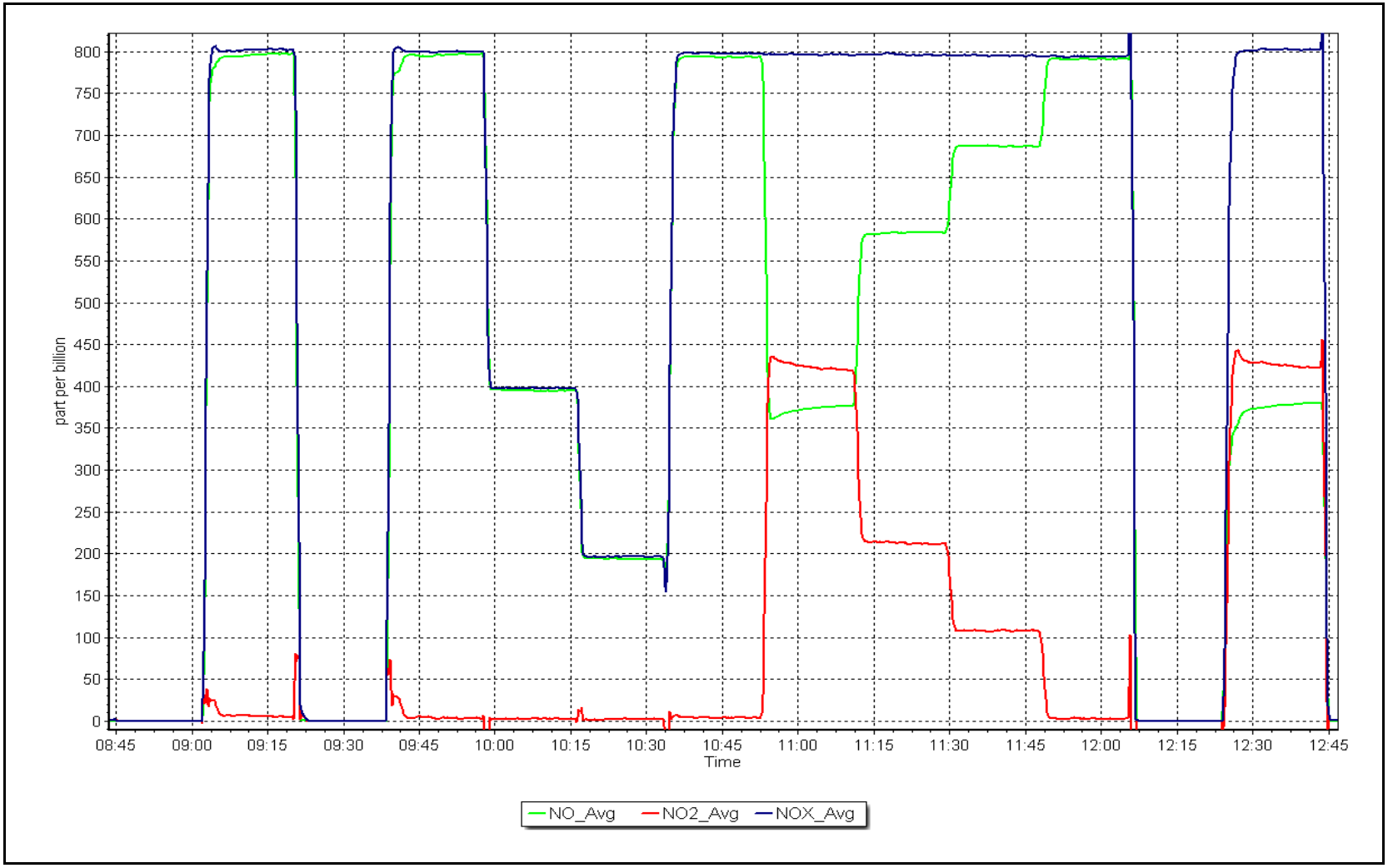
| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS 13 |
| Start Time (MST): | 8:42 | End Time (MST): | 12:47 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661329 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999968 | ≥0.995 |
| 422.1 | 421.1 | 1.0023 | | | |
| 213.5 | 212.0 | 1.0070 | Slope | 0.999151 | 0.90 - 1.10 |
| 110.7 | 108.2 | 1.0229 | | | |
| | | | Intercept | -1.075362 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 27, 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: | March 5, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 10:38 | End time (MST): | 14:11 |
| 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 | 0.999371 | Backgd or Offset: | 3.7 | 4.0 |
| Calibration intercept: | 0.740000 | 0.560000 | Coeff or Slope: | 0.970 | 0.984 |

### $O_3$ 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 | -0.5 | ---- |
| as found span | 5000 | 989.8 | 400.0 | 395.1 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| high point | 5000 | 989.8 | 400.0 | 399.7 | 1.001 |
| second point | 5000 | 849.9 | 200.0 | 201.4 | 0.993 |
| third point | 5000 | 745.1 | 100.0 | 101.0 | 0.990 |
| as left zero | 5000 | 0.0 | 0.0 | -0.5 | ---- |
| as left span | 5000 | 989.8 | 400.0 | 400.1 | 1.000 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 395.6 | Previous response | 401.1 | *% change | -1.4% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

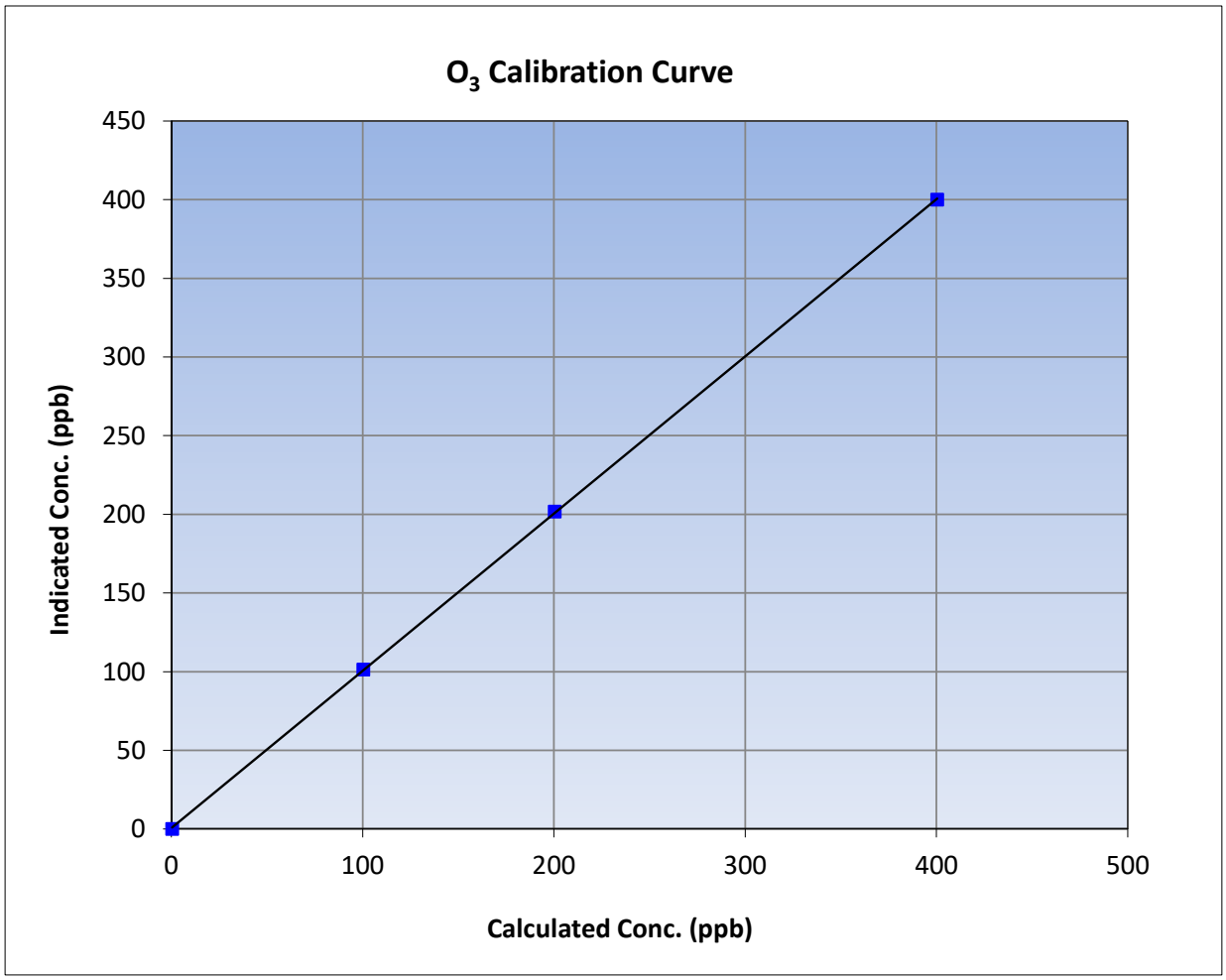
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Fort McKay South | Station Number: | AMS13 |
| Start Time (MST): | 10:38 | End Time (MST): | 14:11 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 3871 |

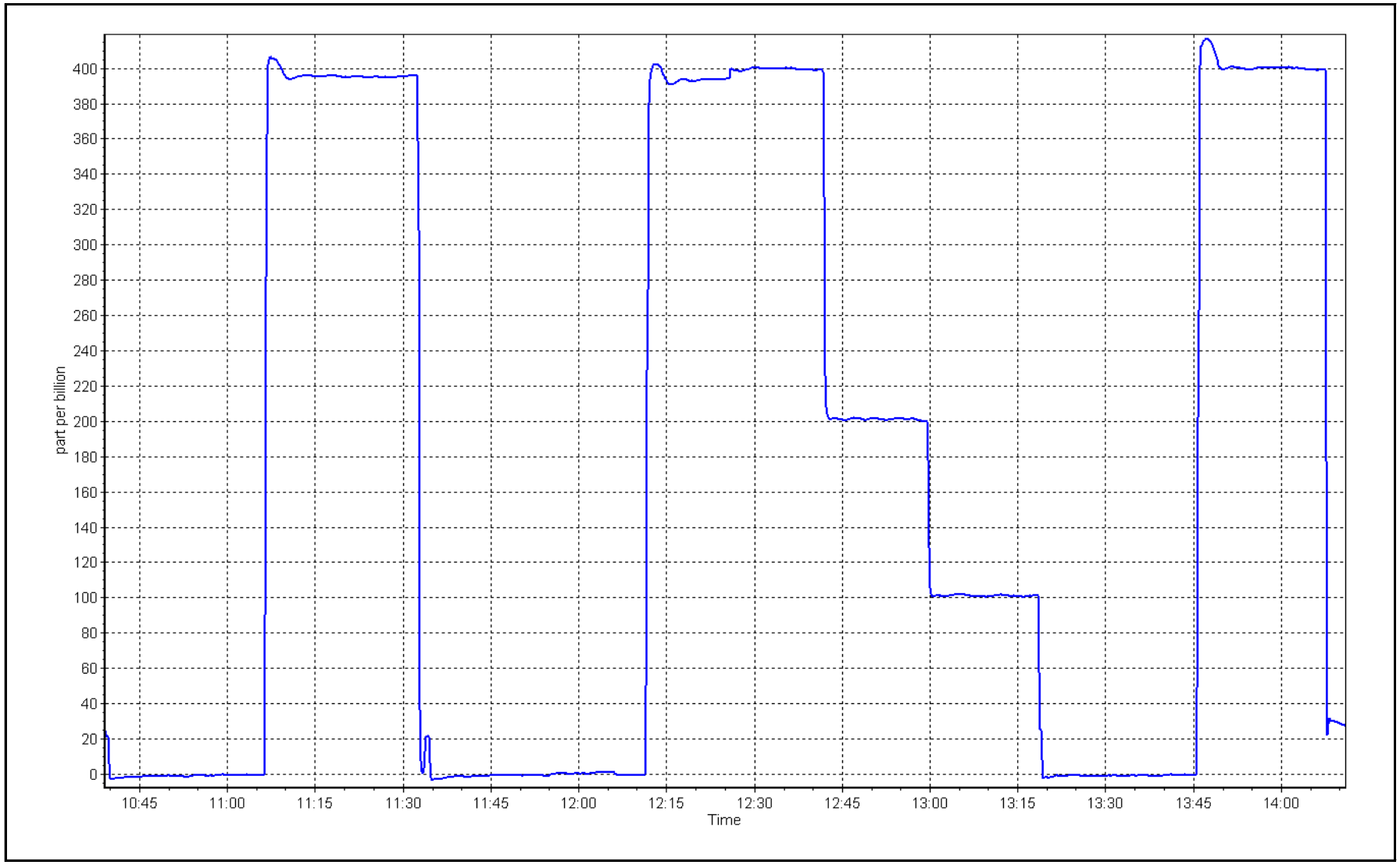
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.3 | ---- |
| 400.0 | 399.7 | 1.0008 |
| 200.0 | 201.4 | 0.9930 |
| 100.0 | 101.0 | 0.9901 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999974 | *≥0.995* |
| Slope | 0.999371 | *0.90 - 1.10* |
| Intercept | 0.560000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 5, 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: | March 27, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 8:48 | End time (MST): | 9:08 |
| 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) | -6.70 | -7.02 | -6.70 | ☐ | +/- 2 °C |
| P (mmHg) | 732.00 | 734.24 | 732.00 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.02 | 4.92 | 5.02 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 46.00 | ----- | 46.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 5.10 | PM w/ HEPA: | 0.00 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 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 adjustment made. Leak check passed.

Calibration by: Sean Bala

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS14
## ANZAC
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS 14 |
| Calibration Date: | March 7, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 14:37 |
| 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: | 0.994566 | 1.005467 | Backgd or Offset: | 25.6 | 26.4 |
| Calibration intercept: | -0.897563 | -1.163959 | Coeff or Slope: | 0.812 | 0.836 |

### $SO_2$ 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 | 4938 | 80.3 | 799.3 | 773.9 | 1.033 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 1.1 | ---- |
| high point | 4938 | 80.3 | 799.3 | 803.3 | 0.995 |
| second point | 4979 | 40.2 | 400.1 | 400.9 | 0.998 |
| third point | 4998 | 20.2 | 201.1 | 198.1 | 1.015 |
| as left zero | 5000 | 0.0 | 0.0 | 1.2 | ---- |
| as left span | 4938 | 80.3 | 799.3 | 796.8 | 1.003 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 773.20 | Previous response | 794.03 | *% change | -2.7% |
| 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. Adjusted span only.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

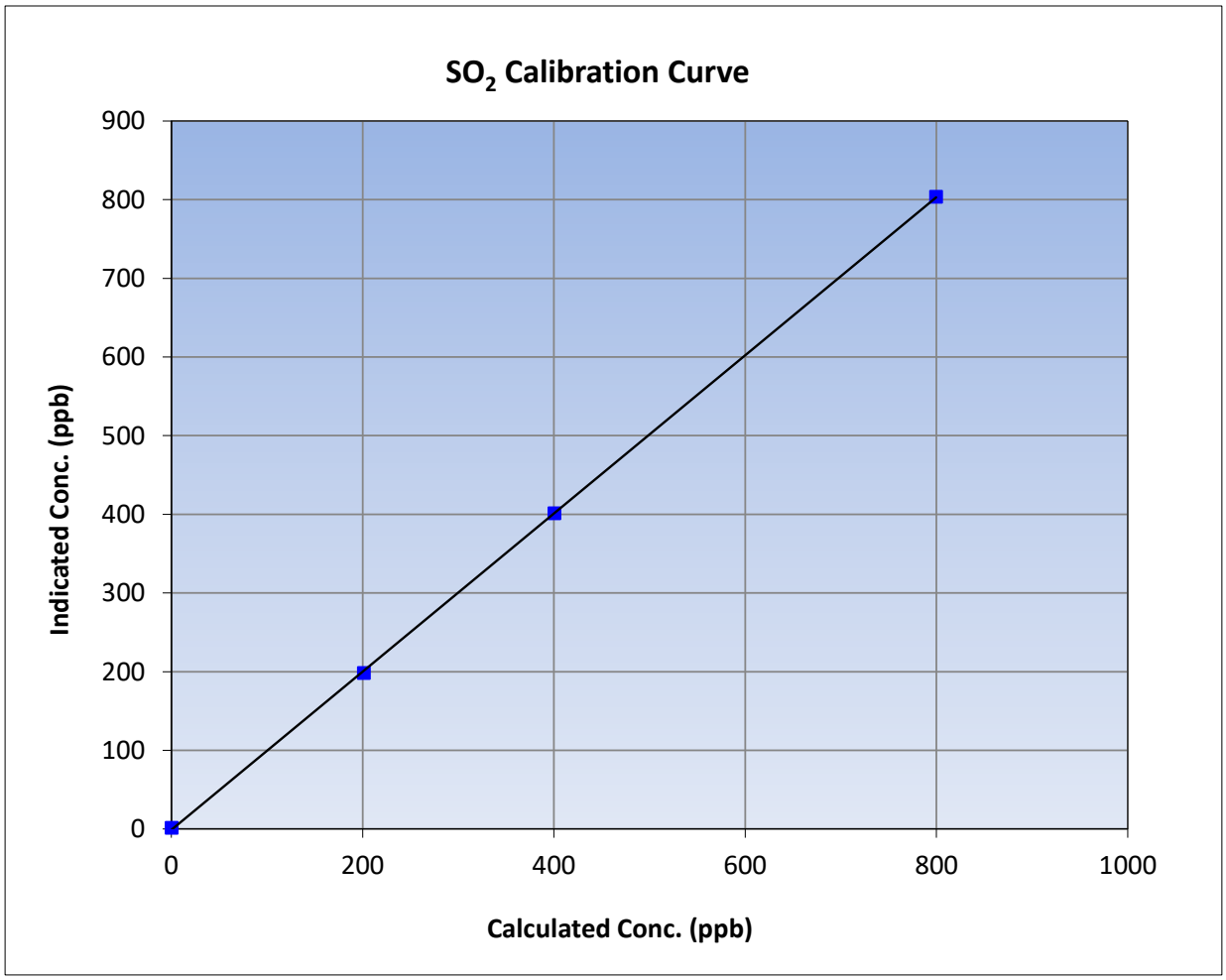
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Anzac | Station Number: | AMS 14 |
| Start Time (MST): | 11:15 | End Time (MST): | 14:37 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 0710321322 |

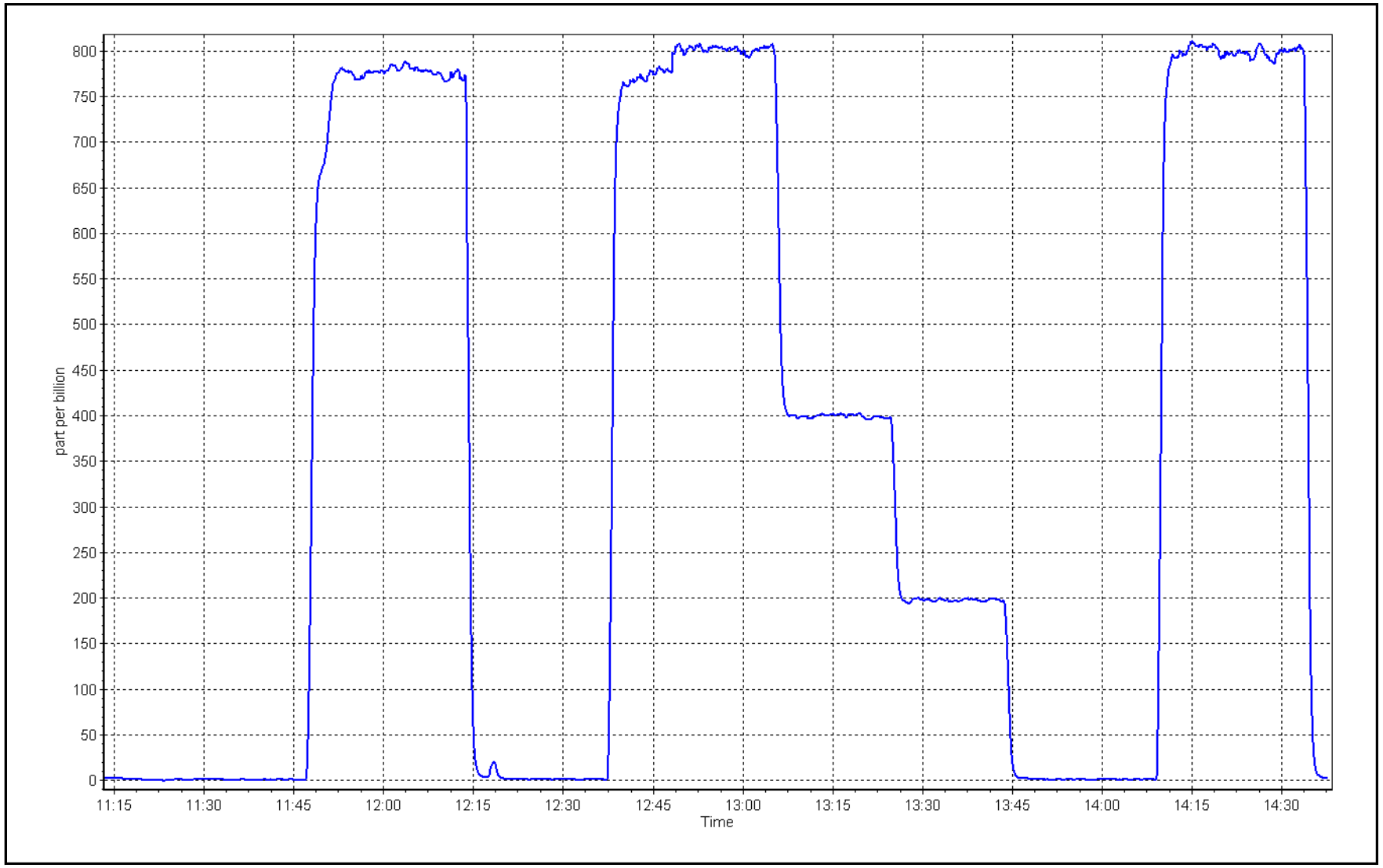
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 1.1 | ---- |
| 799.3 | 803.3 | 0.9950 |
| 400.1 | 400.9 | 0.9979 |
| 201.1 | 198.1 | 1.0150 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999960 | *≥0.995* |
| Slope | 1.005467 | *0.90 - 1.10* |
| Intercept | -1.163959 | *+/-30* |



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



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | March 27, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 9:47 | End time (MST): | 13:58 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.15 | ppm | Cal Gas Exp Date: | January 3, 2026 |
| Cal Gas Cylinder #: | CC510379 | | | |
| Removed Cal Gas Conc: | 5.15 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | API T700 | | Serial Number: | 3060 |
| ZAG Make/Model: | API 701H | | Serial Number: | 357 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i-TLE | | Analyzer serial #: | 1218153582 | |
| Converter make: | CD Nova CDN-101 | | Converter serial #: | 503 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.003735 | 1.000445 | Backgd or Offset: | 2.30 | 2.29 |
| Calibration intercept: | -0.085416 | -0.045344 | Coeff or Slope: | 0.984 | 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 | -0.1 | ---- |
| as found span | 4938 | 77.9 | 80.0 | 80.5 | 0.992 |
| as found 2nd point | 4973 | 38.9 | 40.0 | 40.3 | 0.989 |
| as found 3rd point | 4997 | 19.5 | 20.0 | 19.8 | 1.006 |
| 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 | 79.9 | 1.001 |
| second point | 4973 | 38.9 | 40.0 | 40.1 | 0.996 |
| third point | 4997 | 19.5 | 20.0 | 19.8 | 1.011 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4938 | 77.9 | 80.0 | 78.6 | 1.017 |
| SO2 Scrubber Check | 4936 | 80.3 | 800.4 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.003 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.6 | Prev response: | 80.20 | *% change: | 0.5% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.009059 | AF Intercept: | -0.185387 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999978 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

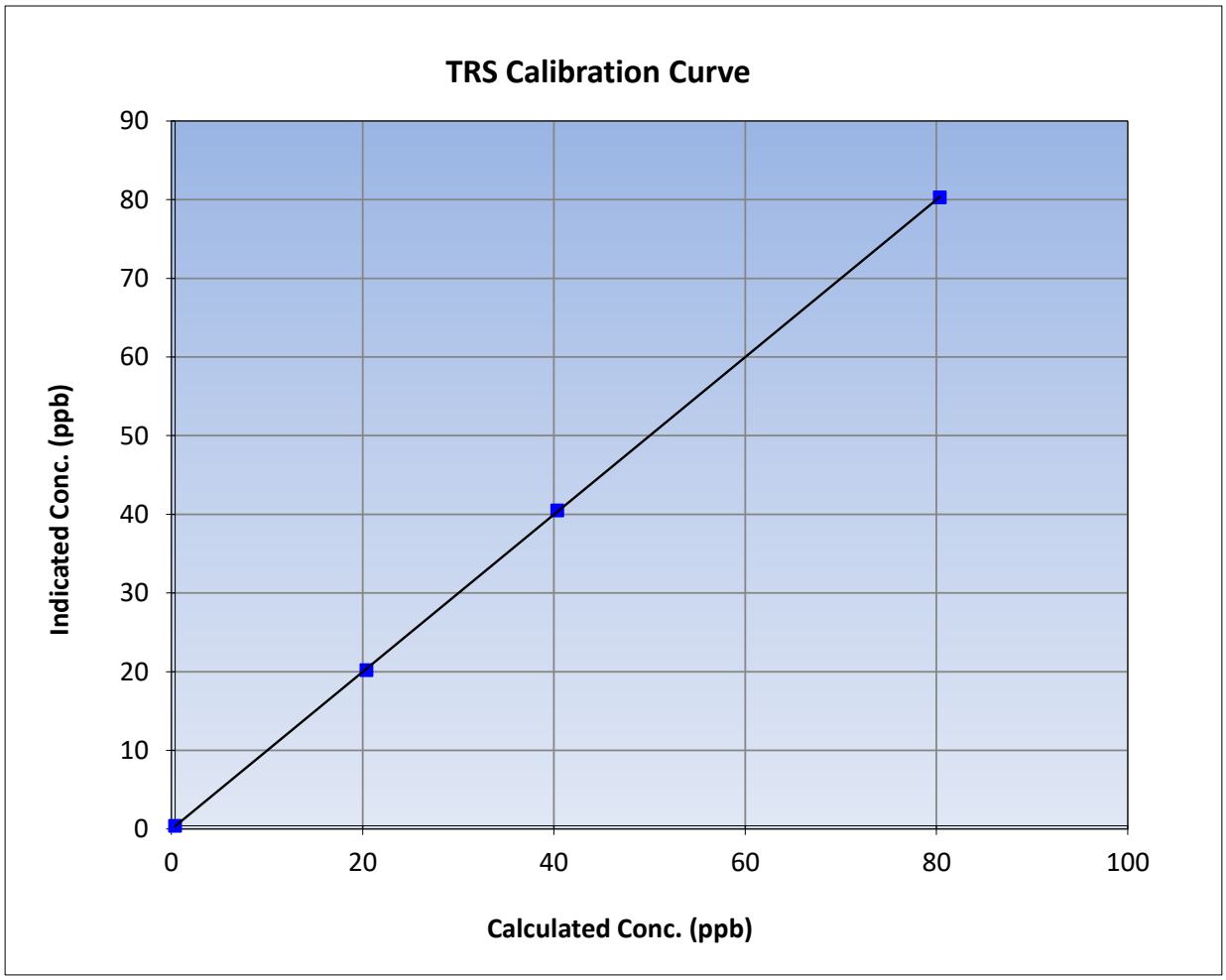
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 9:47 | End Time (MST): | 13:58 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1218153582 |

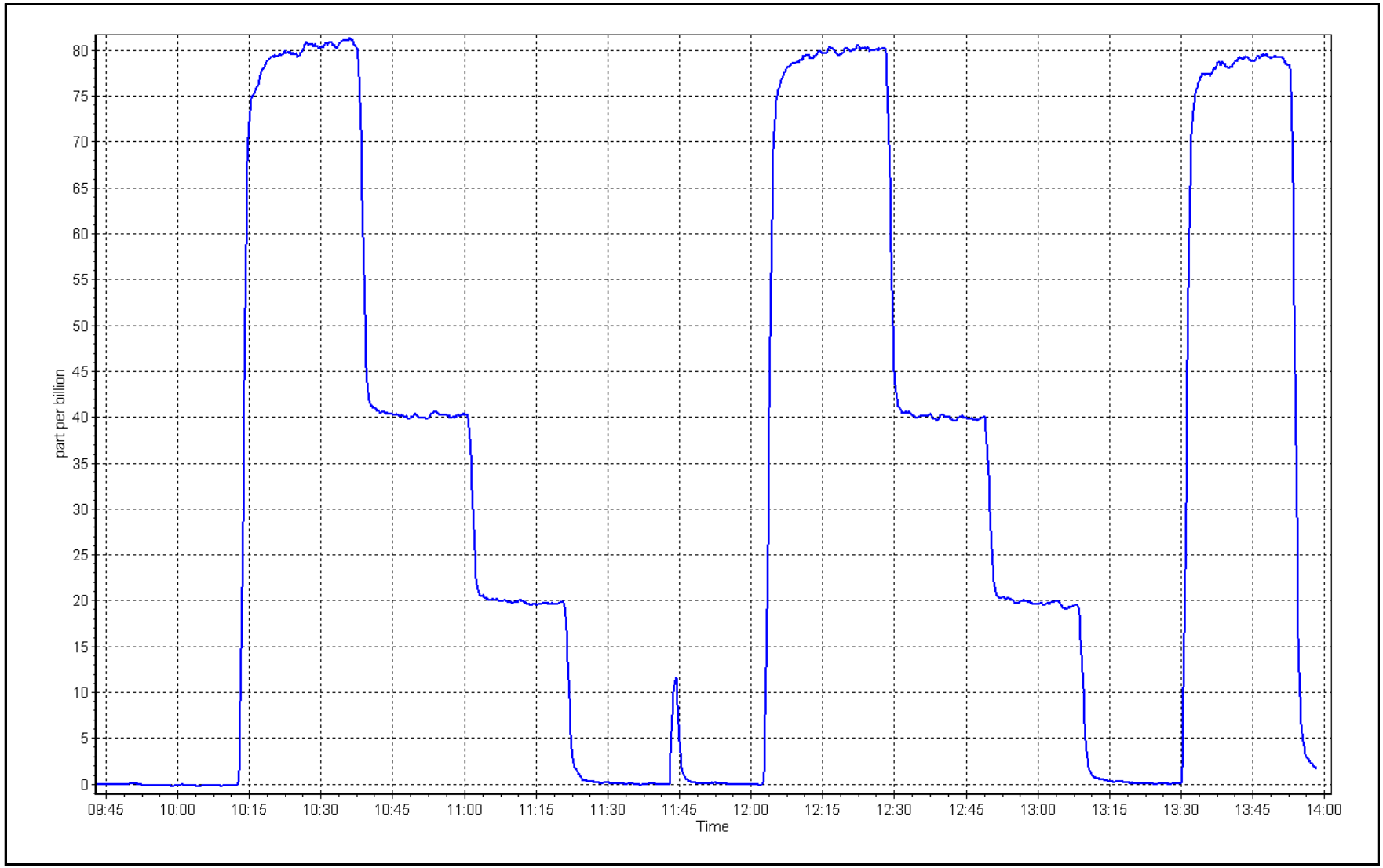
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 79.9 | 1.0006 |
| 40.0 | 40.1 | 0.9964 |
| 20.0 | 19.8 | 1.0107 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999982 | *≥0.995* |
| Slope | 1.000445 | *0.90 - 1.10* |
| Intercept | -0.045344 | *+/-3* |



**TRS Calibration Plot** Date: March 27, 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: | March 7, 2024 | Last Cal Date: | February 3, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 14:37 |
| 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: | 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 | 17.05 | 1.003 |
| 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 | 17.01 | 1.006 |
| second point | 4979 | 40.2 | 8.56 | 8.41 | 1.018 |
| third point | 4998 | 20.2 | 4.30 | 4.17 | 1.032 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4938 | 80.3 | 17.10 | 17.00 | 1.006 |
| | | | | Average Correction Factor | 1.019 |
| Baseline Corr AF: | 17.05 | Prev response | 17.09 | *% 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 | 4938 | 80.3 | 9.11 | 9.09 | 1.002 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4938 | 80.3 | 9.11 | 9.07 | 1.005 |
| second point | 4979 | 40.2 | 4.56 | 4.51 | 1.012 |
| third point | 4998 | 20.2 | 2.29 | 2.24 | 1.025 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4938 | 80.3 | 9.11 | 9.06 | 1.006 |
| | | | | Average Correction Factor | 1.014 |
| Baseline Corr AF: | 9.09 | Prev response | 9.12 | *% 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 | 4938 | 80.3 | 7.99 | 7.96 | 1.004 |
| 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 | 7.94 | 1.007 |
| second point | 4979 | 40.2 | 4.00 | 3.91 | 1.024 |
| third point | 4998 | 20.2 | 2.01 | 1.93 | 1.042 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4938 | 80.3 | 7.99 | 7.95 | 1.006 |
| | | | | Average Correction Factor | 1.024 |
| Baseline Corr AF: | 7.96 | Prev response | 7.97 | *% change | -0.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.002044 | 0.995891 |
| THC Cal Offset: | -0.050467 | -0.064367 |
| CH4 Cal Slope: | 1.002402 | 0.995346 |
| CH4 Cal Offset: | -0.039003 | -0.040562 |
| NMHC Cal Slope: | 1.001944 | 0.995954 |
| NMHC Cal Offset: | -0.011066 | -0.023403 |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

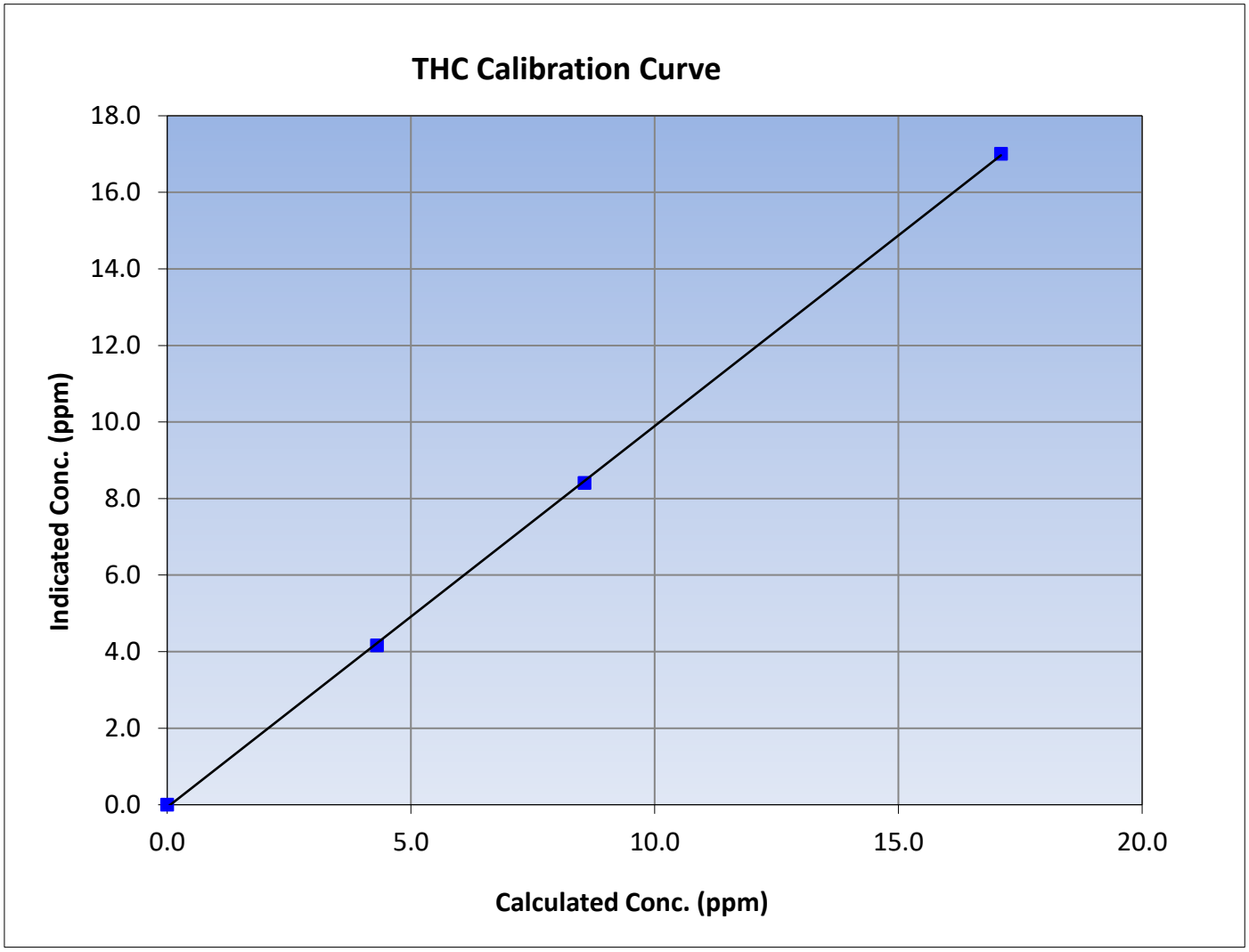
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 3, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:15 | End Time (MST): | 14:37 |
| 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 | 0.999932 | ≥0.995 |
| 17.10 | 17.01 | 1.0057 | | | |
| 8.56 | 8.41 | 1.0177 | Slope | 0.995891 | 0.90 - 1.10 |
| 4.30 | 4.17 | 1.0325 | | | |
| | | | Intercept | -0.064367 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

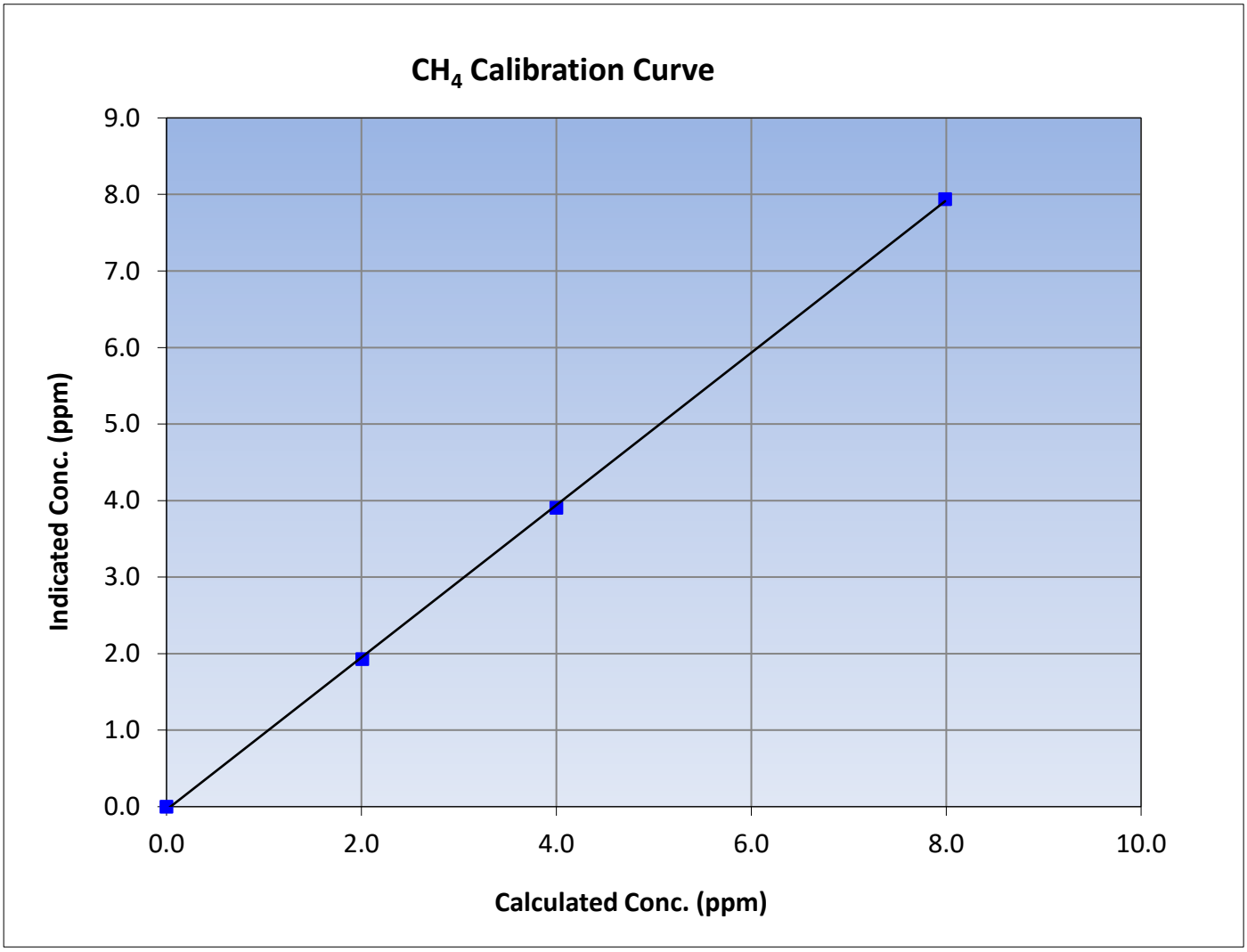
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 3, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:15 | End Time (MST): | 14:37 |
| 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 | 0.999871 | ≥0.995 |
| 7.99 | 7.94 | 1.0066 | | | |
| 4.00 | 3.91 | 1.0241 | Slope | 0.995346 | 0.90 - 1.10 |
| 2.01 | 1.93 | 1.0419 | | | |
| | | | Intercept | -0.040562 | +/-0.5 |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

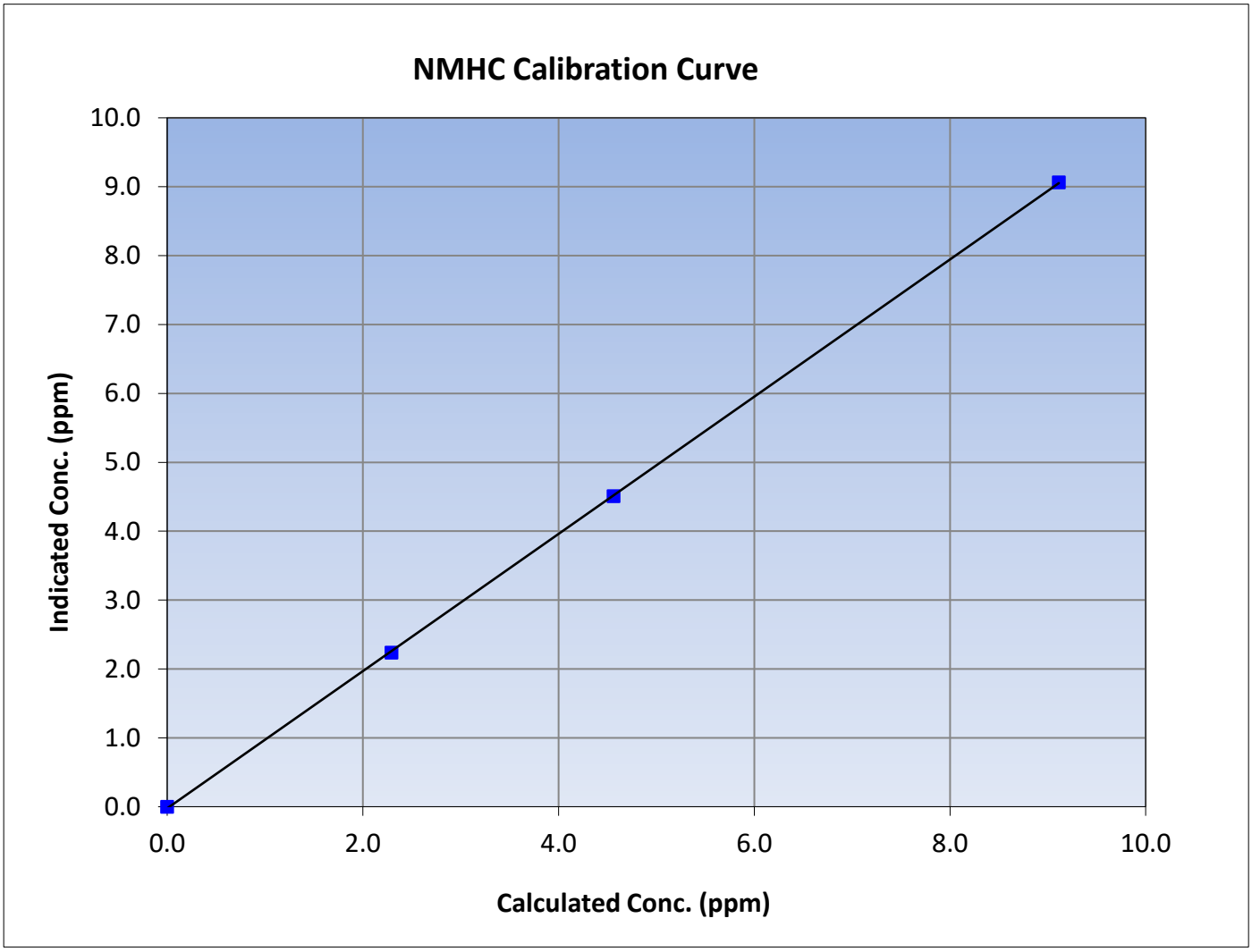
Version-06-2022

### Station Information

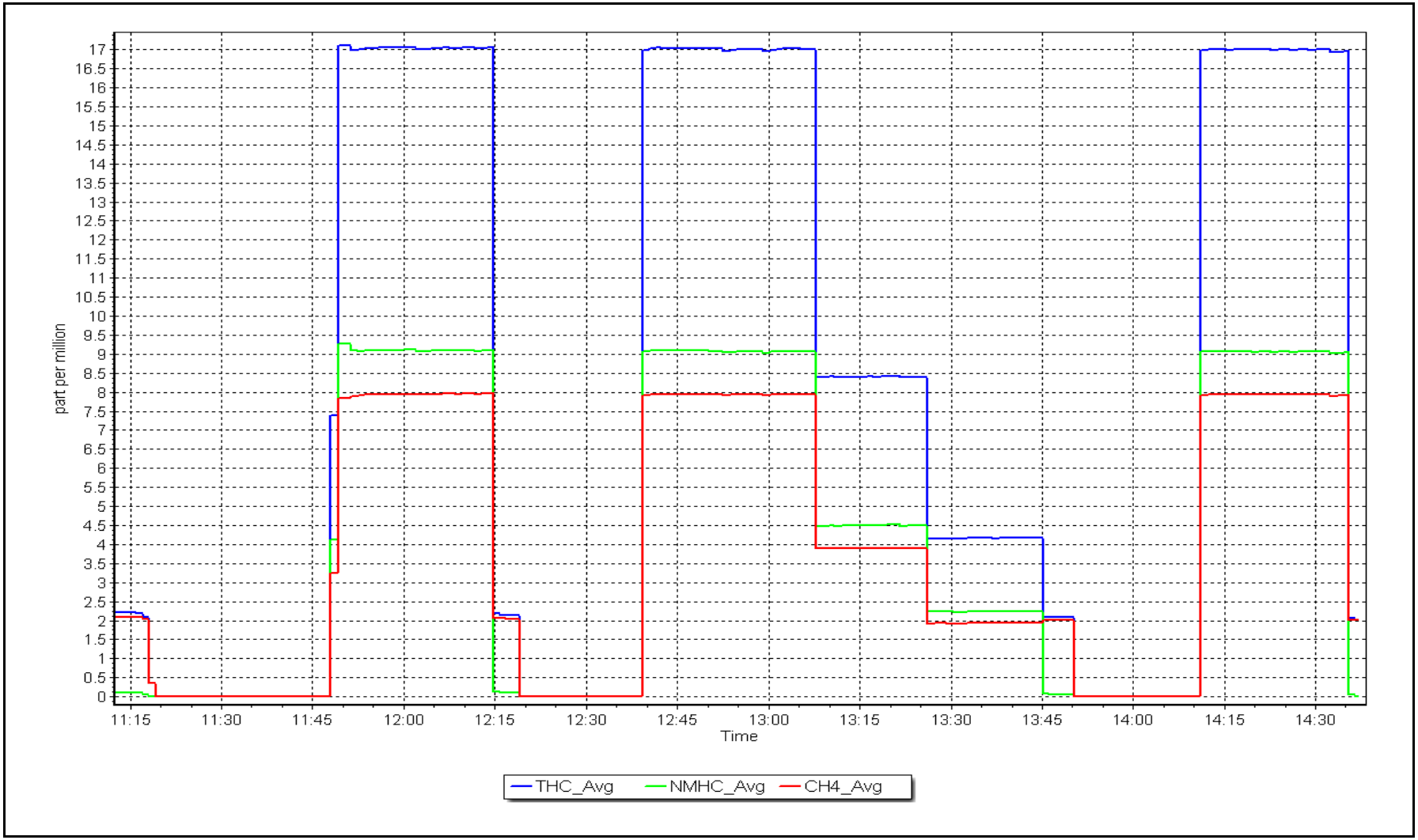
| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 3, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:15 | End Time (MST): | 14:37 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148494 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999969 | ≥0.995 |
| 9.11 | 9.07 | 1.0053 | | | |
| 4.56 | 4.51 | 1.0121 | Slope | 0.995954 | 0.90 - 1.10 |
| 2.29 | 2.24 | 1.0248 | | | |
| | | | Intercept | -0.023403 | +/-0.5 |



**NMHC Calibration Plot** Date: March 7, 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: | March 14, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 10:34 | End time (MST): | 15:25 |
| 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: | 160.0 | 160.0 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.001051 | 0.993607 |
| $NO_X$ Cal Offset: | -0.650468 | -0.629791 |
| NO Cal Slope: | 1.006866 | 0.999912 |
| NO Cal Offset: | -1.970746 | -2.109531 |
| $NO_2$ Cal Slope: | 0.997816 | 0.994068 |
| $NO_2$ Cal Offset: | -1.058817 | -1.527274 |

# 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 | 802.3 | 798.8 | 3.4 | 1.0032 | 1.0026 |
| 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 | 4934 | 66.3 | 804.8 | 800.9 | 4.0 | 799.2 | 799.5 | -0.2 | 1.0070 | 1.0017 |
| second point | 4985 | 33.2 | 401.6 | 399.6 | 2.0 | 398.6 | 397.0 | 1.7 | 1.0075 | 1.0066 |
| third point | 5004 | 16.7 | 201.9 | 200.9 | 1.0 | 199.0 | 196.4 | 2.6 | 1.0146 | 1.0229 |
| 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 | 416.8 | 388.1 | 800.0 | 414.3 | 385.8 | 1.0060 | 1.0059 |
| | | | | | | | | Average Correction Factor | 1.0097 | 1.0104 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = | 802.4 ppb | NO = | 799.0 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = -0.3% |
| Previous Response | $NO_X$ = | 805.0 ppb | NO = | 804.4 ppb | | *Percent Change | NO = -0.7% |
| 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) | 796.2 | 412.1 | 388.1 | 385.0 | 1.0080 | 99.2% |
| 2nd GPT point (200 ppb O3) | 796.2 | 608.4 | 191.8 | 188.5 | 1.0174 | 98.3% |
| 3rd GPT point (100 ppb O3) | 796.2 | 701.6 | 98.6 | 94.7 | 1.0409 | 96.1% |
| | | | | Average Correction Factor | 1.0221 | 97.9% |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

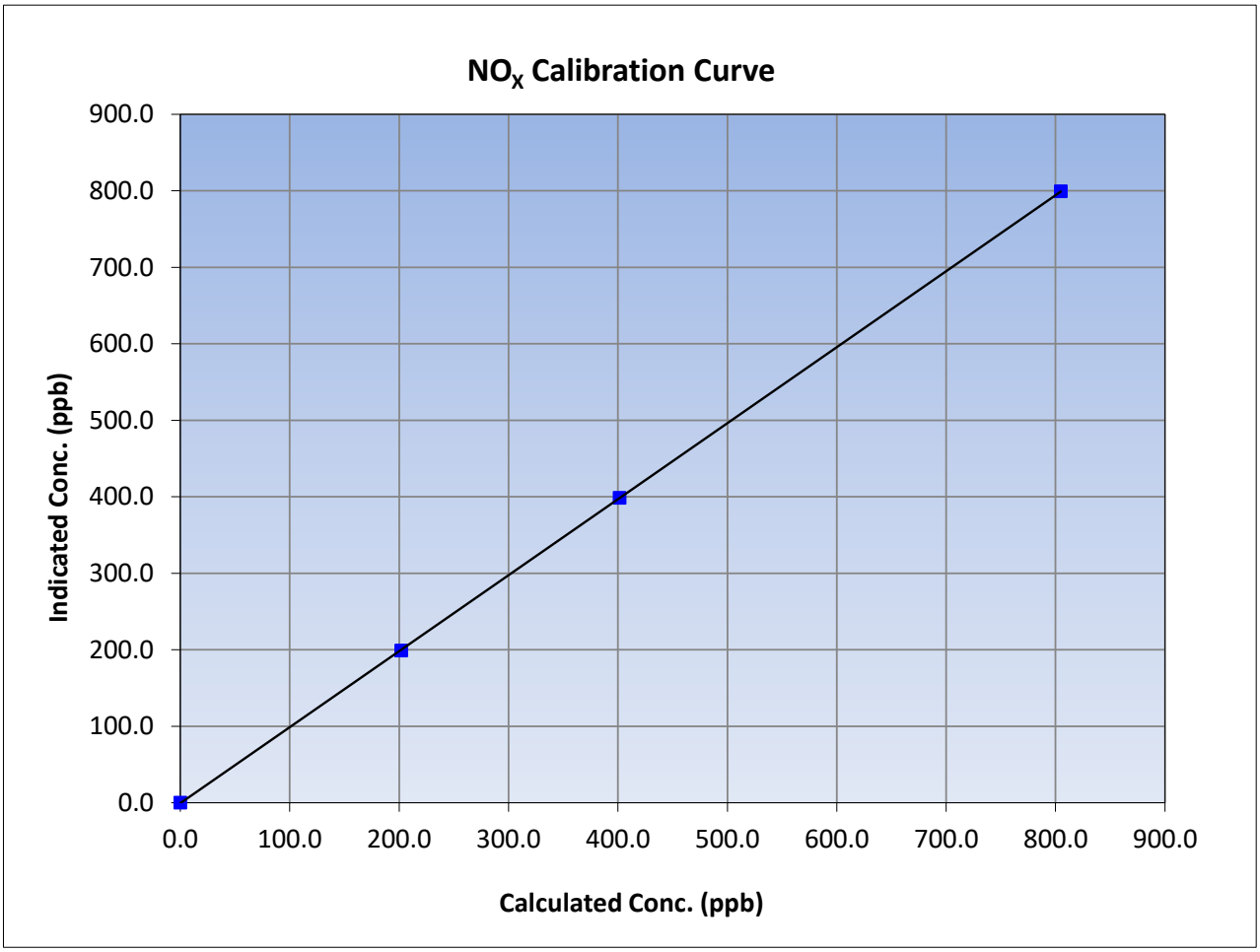
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 10:34 | End Time (MST): | 15:25 |
| 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 | 0.999996 | ≥0.995 |
| 804.8 | 799.2 | 1.0070 | | | |
| 401.6 | 398.6 | 1.0075 | Slope | 0.993607 | 0.90 - 1.10 |
| 201.9 | 199.0 | 1.0146 | | | |
| | | | Intercept | -0.629791 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

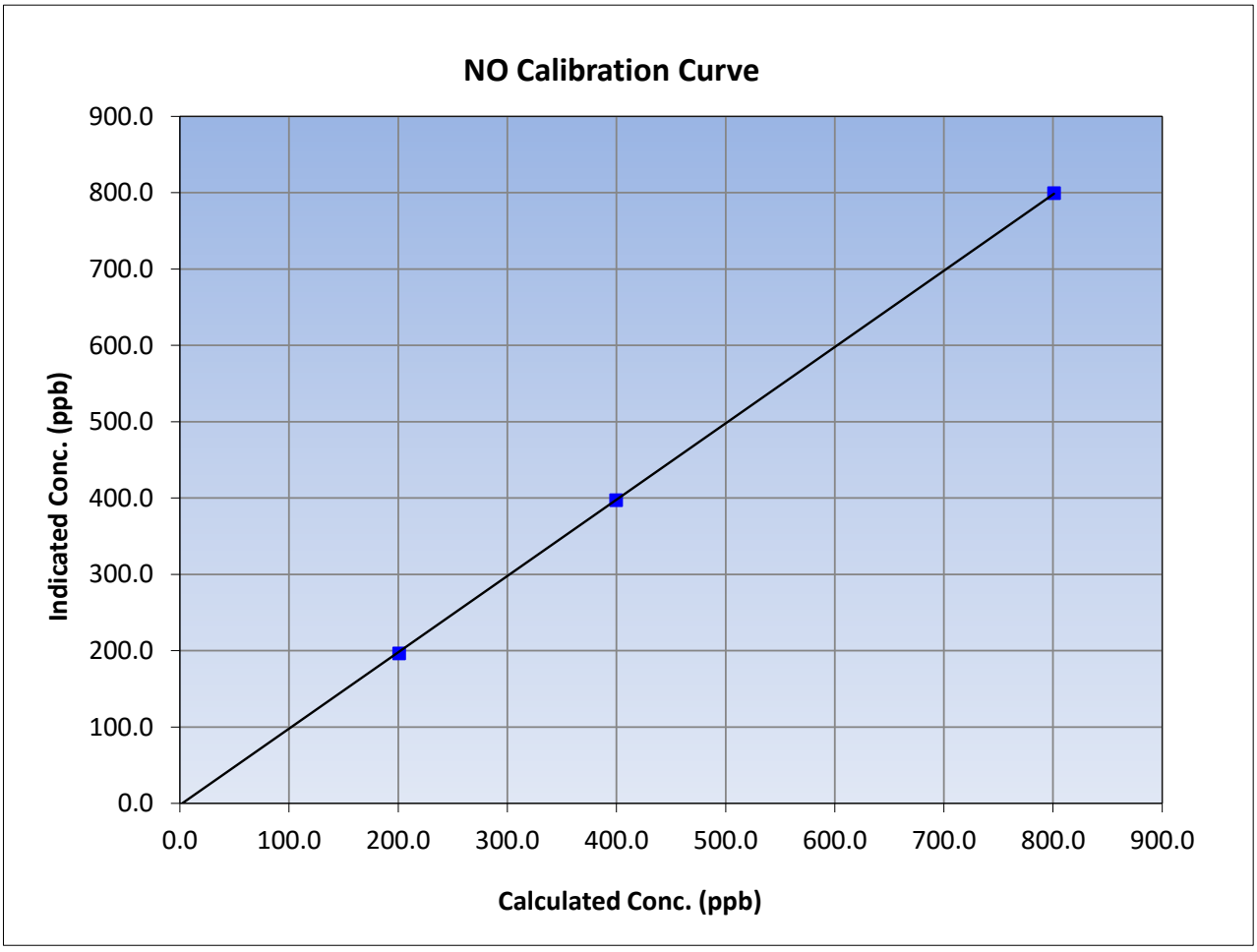
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 10:34 | End Time (MST): | 15:25 |
| 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 | 0.999970 | *≥0.995* |
| 800.9 | 799.5 | 1.0017 | | | |
| 399.6 | 397.0 | 1.0066 | Slope | 0.999912 | *0.90 - 1.10* |
| 200.9 | 196.4 | 1.0229 | | | |
| | | | Intercept | -2.109531 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

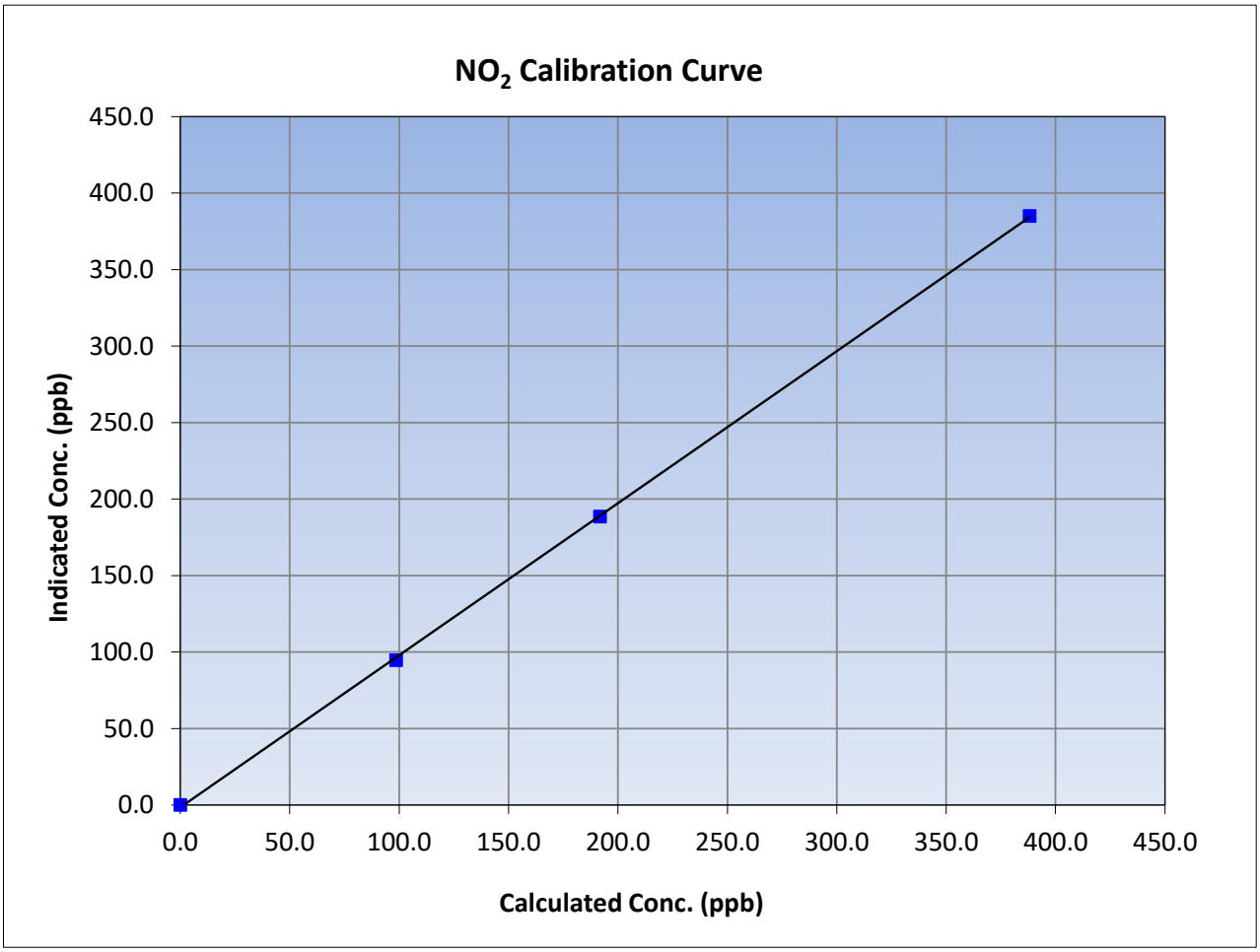
Version-04-2020

### Station Information

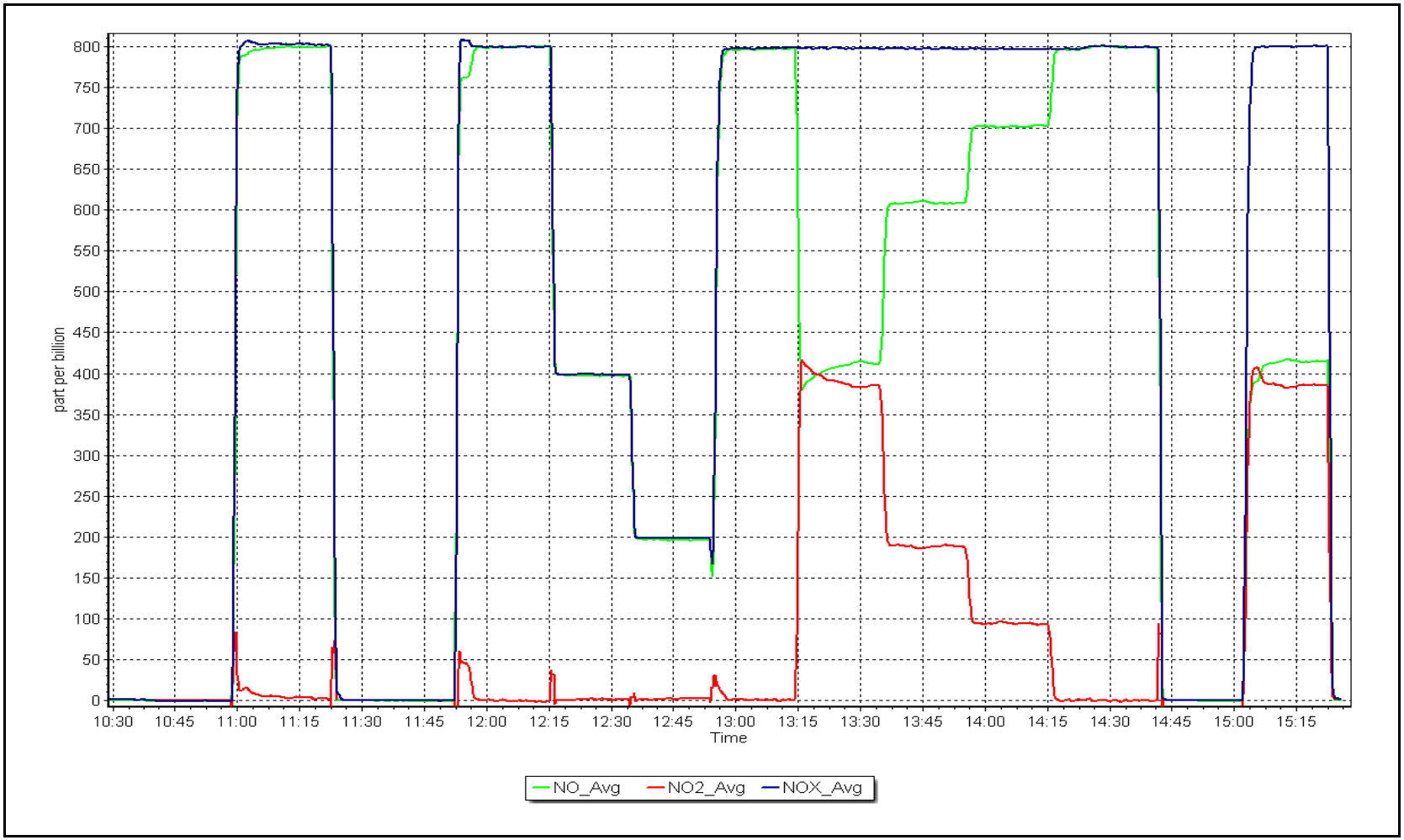
| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 10:34 | End Time (MST): | 15:25 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1426262592 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999917 | *≥0.995* |
| 388.1 | 385.0 | 1.0080 | | | |
| 191.8 | 188.5 | 1.0174 | Slope | 0.994068 | *0.90 - 1.10* |
| 98.6 | 94.7 | 1.0409 | | | |
| | | | Intercept | -1.527274 | *+/-20* |



**$NO_X$ Calibration Plot** Date: March 14, 2024 Location: Anzac



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station number: | AMS14 |
| Calibration Date: | March 6, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 11:54 | End time (MST): | 14:34 |
| 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: | 0.999057 | 1.004629 | Backgd or Offset: | 1.4 | 1.4 |
| Calibration intercept: | -0.260000 | 0.840000 | 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 | 0.7 | ---- |
| as found span | 5000 | 918.8 | 400.0 | 403.2 | 0.992 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| high point | 5000 | 918.8 | 400.0 | 402.4 | 0.994 |
| second point | 5000 | 803.8 | 200.0 | 202.5 | 0.988 |
| third point | 5000 | 709.8 | 100.0 | 101.0 | 0.990 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 5000 | 918.8 | 400.0 | 403.9 | 0.990 |
| | | | | Average Correction Factor | 0.991 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 402.5 | Previous response | 399.4 | *% change | 0.8% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

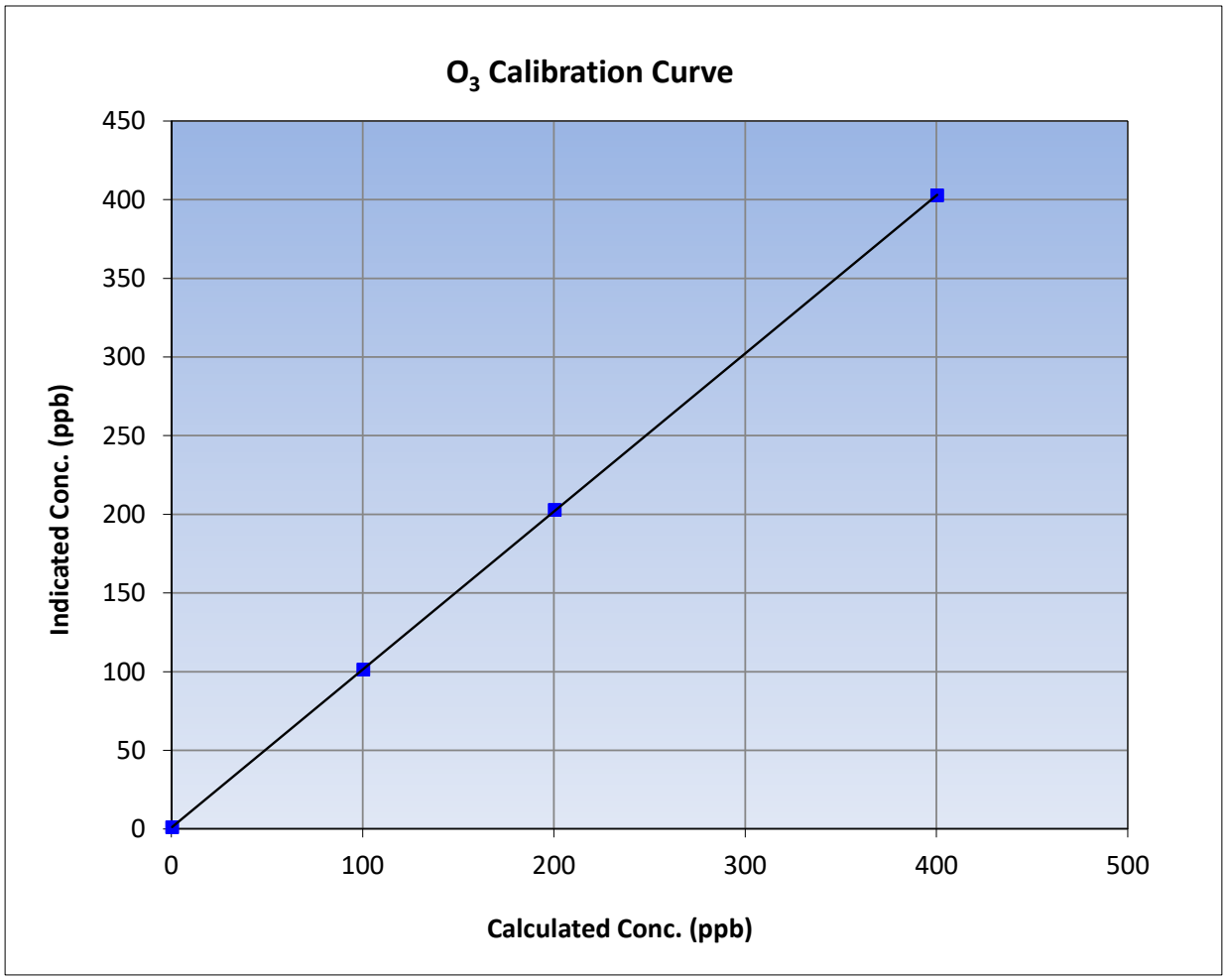
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Anzac | Station Number: | AMS14 |
| Start Time (MST): | 11:54 | End Time (MST): | 14:34 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1426262595 |

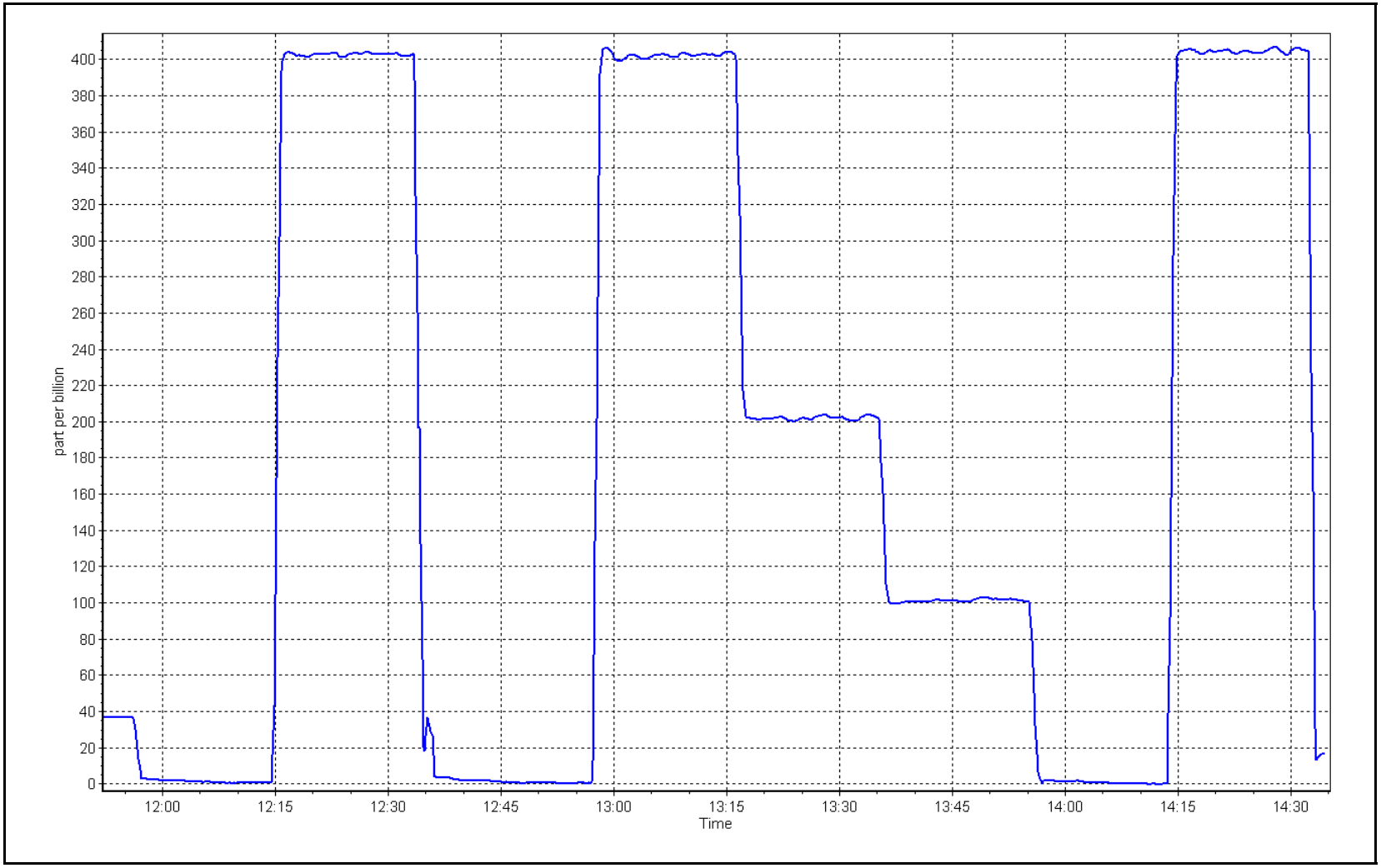
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.7 | ---- |
| 400.0 | 402.4 | 0.9940 |
| 200.0 | 202.5 | 0.9877 |
| 100.0 | 101.0 | 0.9901 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999992 | ≥0.995 |
| Slope | 1.004629 | 0.90 - 1.10 |
| Intercept | 0.840000 | +/- 5 |



**$O_3$ Calibration Plot** Date: March 6, 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: | March 27, 2024 | Last Cal Date: | February 26, 2024 |
| Start time (MST): | 12:49 | End time (MST): | 13:08 |
| 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) | -5.8 | -6.11 | -5.8 | ☐ | +/- 2 °C |
| P (mmHg) | 712.1 | 713.18 | 712.1 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.00 | 4.975 | 5.00 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 40 | ----- | 40 | ☐ | >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: — 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

## Wind Speed/Direction Calibration Report

Version-10-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Anzac | Station Number: | AMS 14 |
| Calibration Date: | March 11, 2024 | Prev Cal Date: | August 23, 2023 |
| Start Time (MST): | 10:00 | End Time (MST): | 13:16 |
| Tower Height (m): | 20.0 | Reason: | Routine |

### Wind Speed Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 010C-1 | Serial Number: | E5132 |
| WS Calibrator: | MetOne 053 | Serial Number: | CA05231 |

| Shaft RPM | Calculated Speed (K/hr) (Cv) | Indicated Speed (K/hr) (Iv) | % Error *Limit = +/- 1.5%* |
|---|---|---|---|
| 0 | 0.0 | 0.0 | --- |
| 200 | 20.2 | 20.2 | 0.2% |
| 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 ($r^2$) | | 1.000000 | *≥0.9995* |
| Calculated slope | | 0.999465 | *0.90 - 1.10* |
| Calculated intercept | | -0.013446 | *+/- 2* |

### Wind Direction Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 020C-1 | Serial Number: | Z1048 |
| As Found Declination (deg east of True North): | 14 | As Left Declination (deg east of True North): | 14 |
| Solar noon time (MST): | 13:34 | Calc Declination*: | 13.23 Degrees |
| Deadband calc: | -1.1 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 | 1.0 | --- |
| 90 | 89.9 | 0.0% |
| 180 | 180.0 | 0.0% |
| 270 | 270.6 | 0.2% |
| 356 | 359.1 | 0.9% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999972 | *≥0.9995* |
| Calculated slope | | 0.994477 | *0.90 - 1.10* |
| Calculated intercept | | 0.072574 | *+/- 4* |

Notes: Performed WS and WD calibration. Noticed that the screw at the bottom or the 180-degree notch at the top of the WD sensor was not precisely facing south; instead, it was off by 20 degrees towards the SW. Realigned the WD so that the screw/180-degree notch is now facing south.The WS bearings seem to be in good condition.

Calibration Performed By: Mohammed Kashif and Max Farrell

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS17
## WAPASU
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | March 6, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 11:10 | End time (MST): | 14:18 |
| 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: | 1.001438 | 1.003695 | Backgd or Offset: | 13.4 | 13.2 |
| Calibration intercept: | -1.359391 | -1.998962 | Coeff or Slope: | 1.111 | 1.098 |

### $SO_2$ 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 | 79.4 | 800.0 | 808.0 | 0.990 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| high point | 4921 | 79.4 | 800.0 | 802.5 | 0.997 |
| second point | 4960 | 39.7 | 400.0 | 396.9 | 1.008 |
| third point | 4980 | 19.8 | 199.5 | 197.2 | 1.012 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 79.4 | 800.1 | 801.8 | 0.998 |
| | | | | Average Correction Factor | 1.005 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 807.80 | Previous response | 799.76 | *% 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

## $SO_2$ Calibration Summary

Version-01-2020

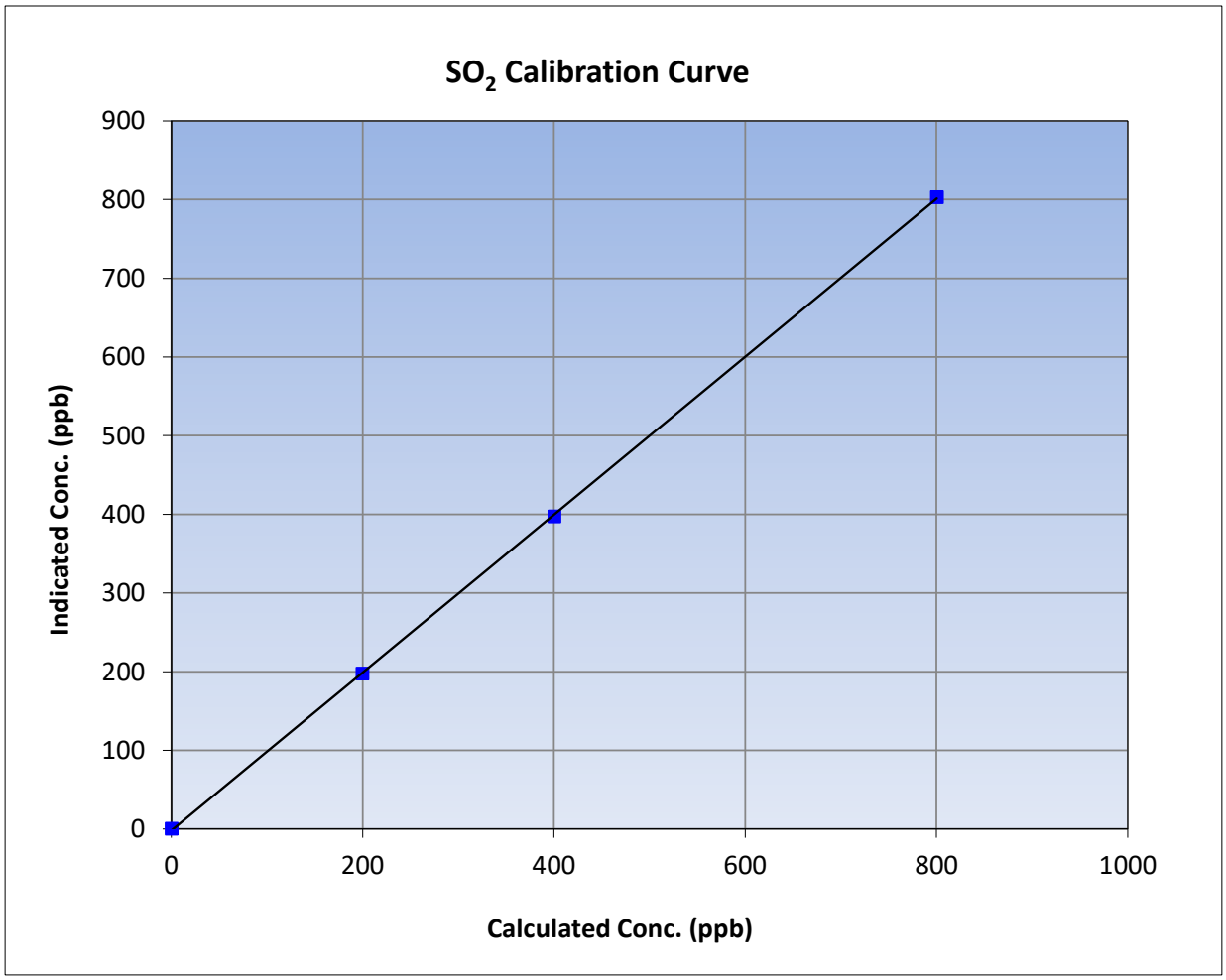
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 11:10 | End Time (MST): | 14:18 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1218153459 |

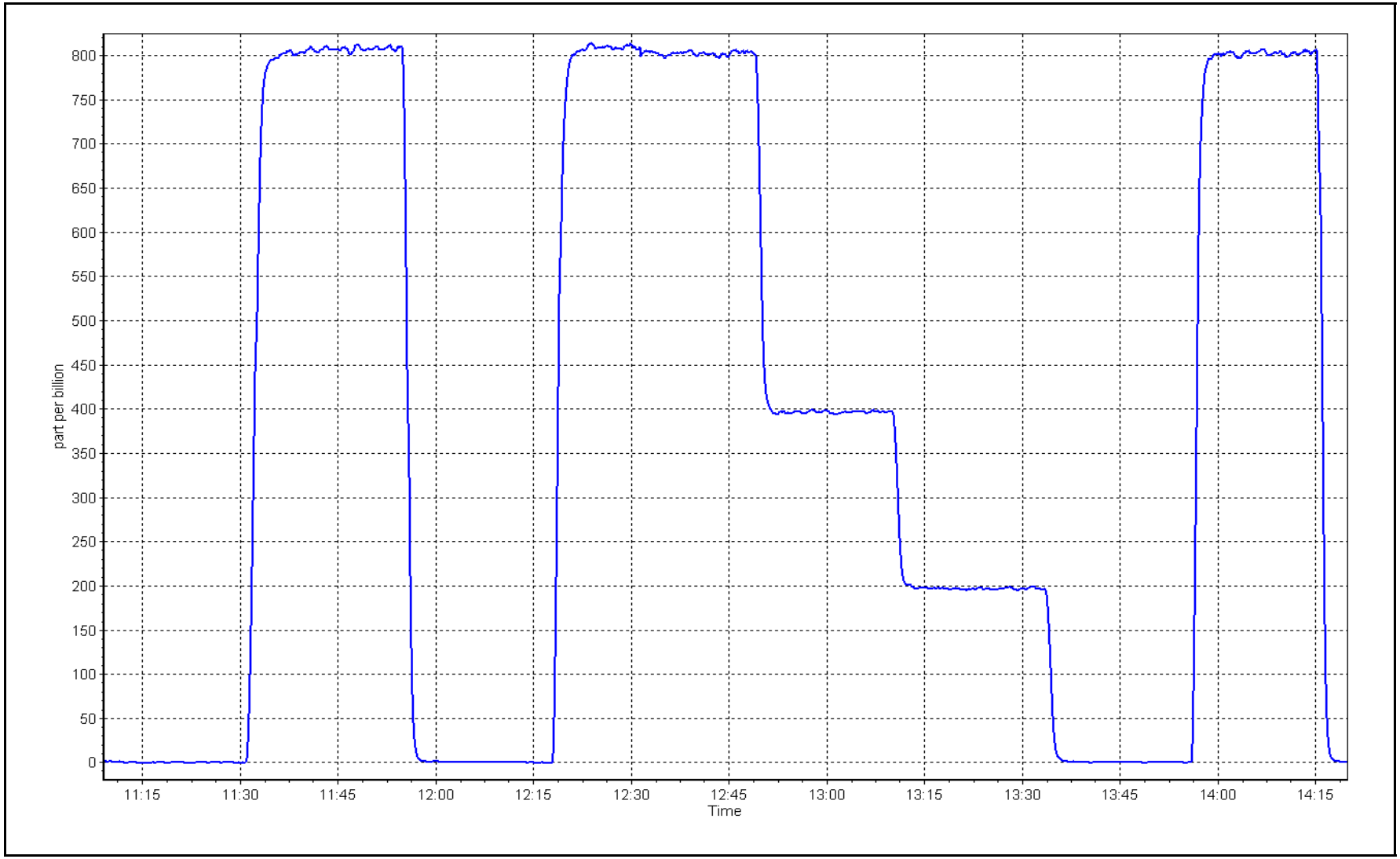
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.0 | 802.5 | 0.9968 |
| 400.0 | 396.9 | 1.0079 |
| 199.5 | 197.2 | 1.0117 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999958 | *≥0.995* |
| Slope | 1.003695 | *0.90 - 1.10* |
| Intercept | -1.998962 | *+/-30* |



**SO2 Calibration Plot** Date: March 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: | March 12, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 10:12 | End time (MST): | 15:15 |
| 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: | 1.010139 | 0.995282 | Backgd or Offset: | 12.2 | 11.7 |
| Calibration intercept: | 0.220812 | 0.340790 | Coeff or Slope: | 1.114 | 1.096 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as found span | 4921 | 78.8 | 80.0 | 82.5 | 0.973 |
| as found 2nd point | 4961 | 39.4 | 40.0 | 40.8 | 0.988 |
| as found 3rd point | 4980 | 19.7 | 20.0 | 20.2 | 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 | 0.6 | ---- |
| high point | 4921 | 78.8 | 80.0 | 80.1 | 0.999 |
| second point | 4961 | 39.4 | 40.0 | 40.0 | 1.000 |
| third point | 4980 | 19.7 | 20.0 | 20.0 | 1.000 |
| as left zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as left span | 4921 | 78.8 | 80.0 | 79.5 | 1.006 |
| SO2 Scrubber Check | 4921 | 79.4 | 800.0 | -0.2 | ---- |
| Date of last scrubber change: | | n/a | | Ave Corr Factor | 1.000 |
| Date of last converter efficiency test: | | n/a | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 82.2 | Prev response: | 81.03 | *% change: | 1.4% |
| Baseline Corr 2nd AF pt: | 40.5 | AF Slope: | 1.029425 | AF Intercept: | -0.079189 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999899 | | |

* = > +/-5% change initiates investigation

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

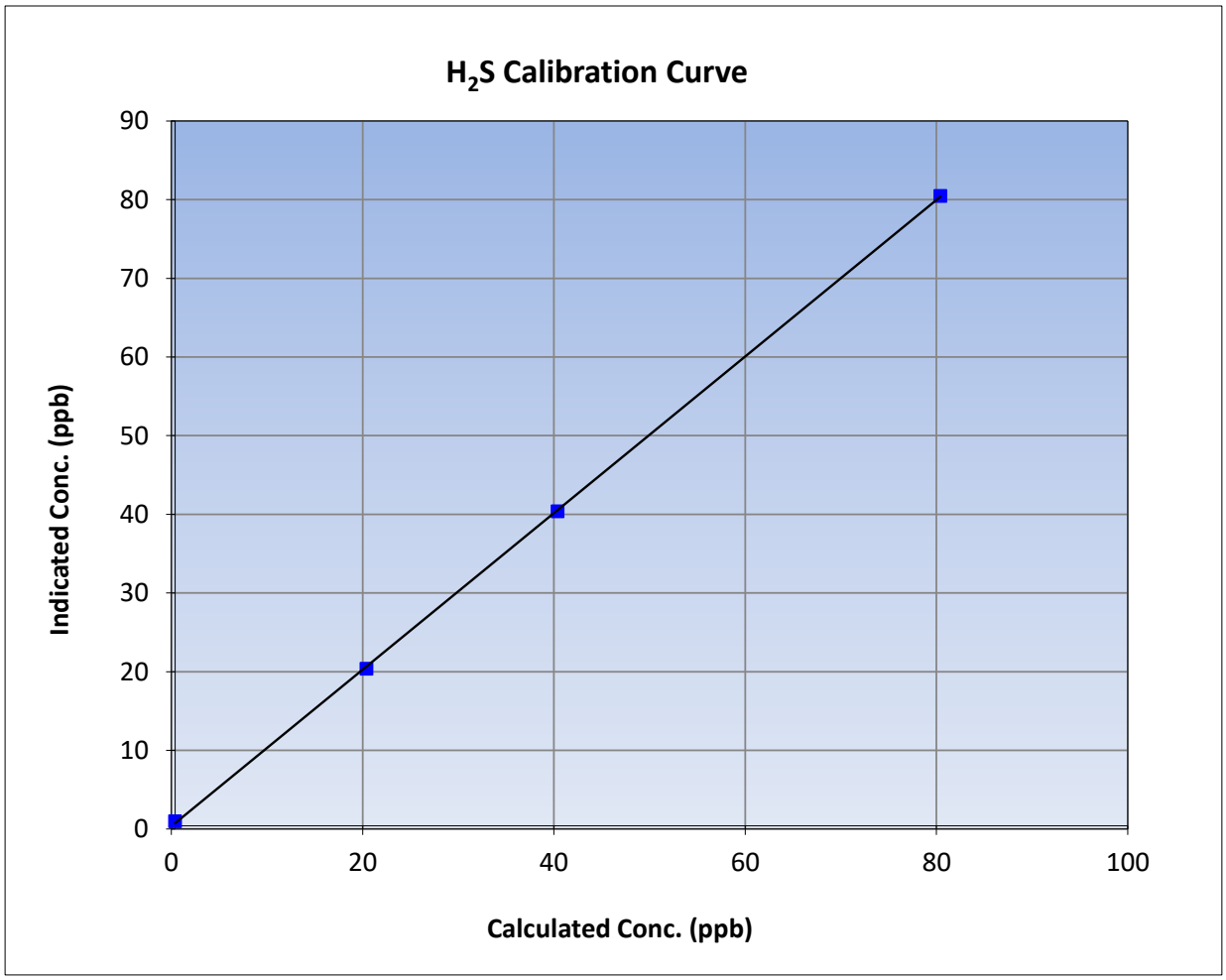
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | 2024-03-12 | Station Number: | Wapasu |
| Start Time (MST): | 10:12 | End Time (MST): | 15:15 |
| Analyzer make: | Thermo 450i | Analyzer serial #: | 1218153583 |

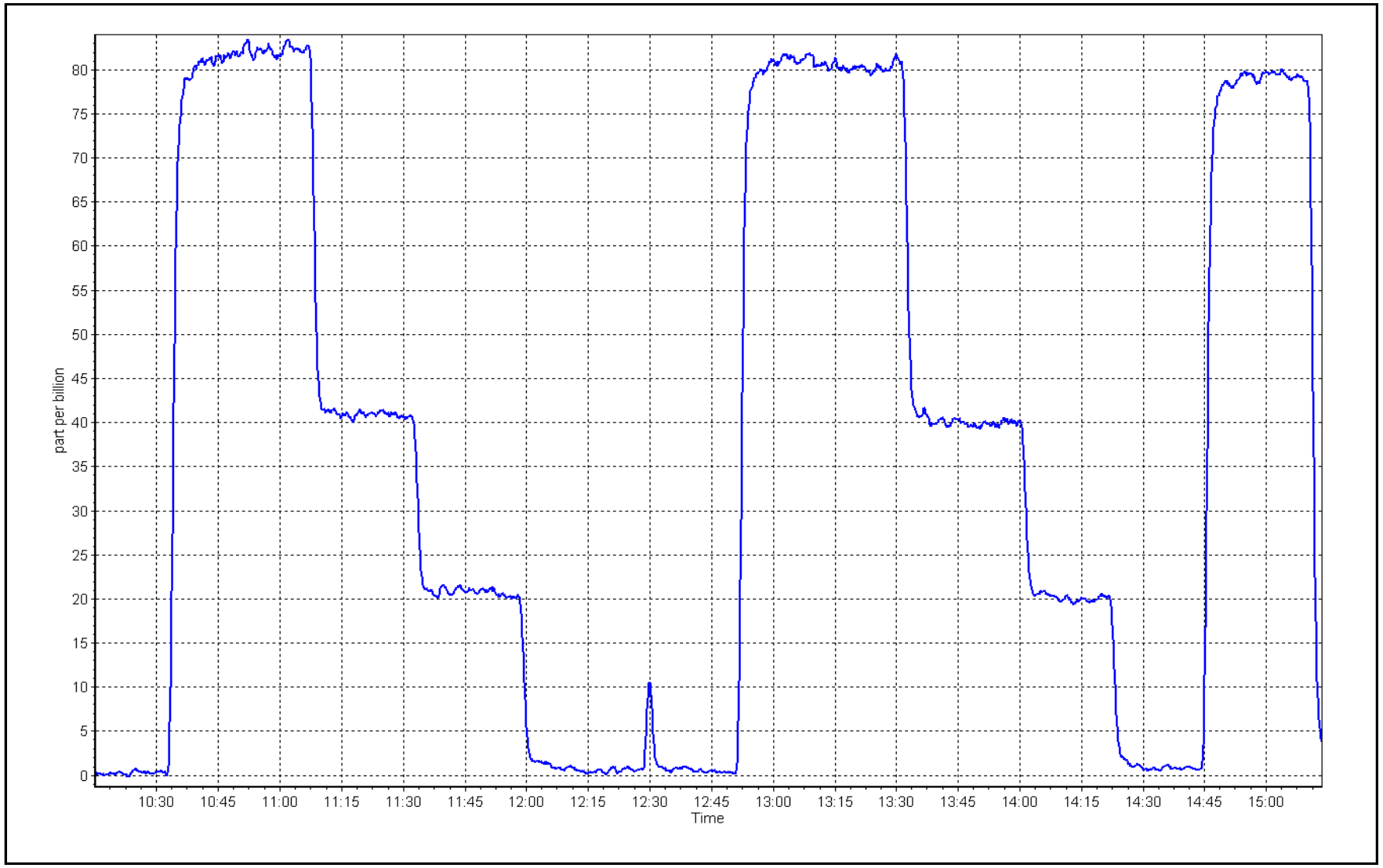
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 80.0 | 80.1 | 0.9988 |
| 40.0 | 40.0 | 0.9999 |
| 20.0 | 20.0 | 1.0000 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999951 | *≥0.995* |
| Slope | 0.995282 | *0.90 - 1.10* |
| Intercept | 0.340790 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 12, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | March 6, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 11:10 | End time (MST): | 14:18 |
| 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: | 0.992396 | 0.992946 | Background: | 3.020 | 3.020 |
| Calibration intercept: | 0.034435 | 0.028821 | 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 | 0.05 | ---- |
| as found span | 4921 | 79.4 | 17.09 | 17.07 | 1.001 |
| 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 | 17.04 | 1.003 |
| second point | 4960 | 39.7 | 8.55 | 8.45 | 1.011 |
| third point | 4980 | 19.8 | 4.26 | 4.23 | 1.008 |
| as left zero | 5000 | 0.0 | 0.00 | 0.04 | ---- |
| as left span | 4921 | 79.4 | 17.09 | 17.09 | 1.000 |
| | | | | Average Correction Factor | 1.007 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.02 | Previous response | 17.00 | *% 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

## THC Calibration Summary

Version-01-2020

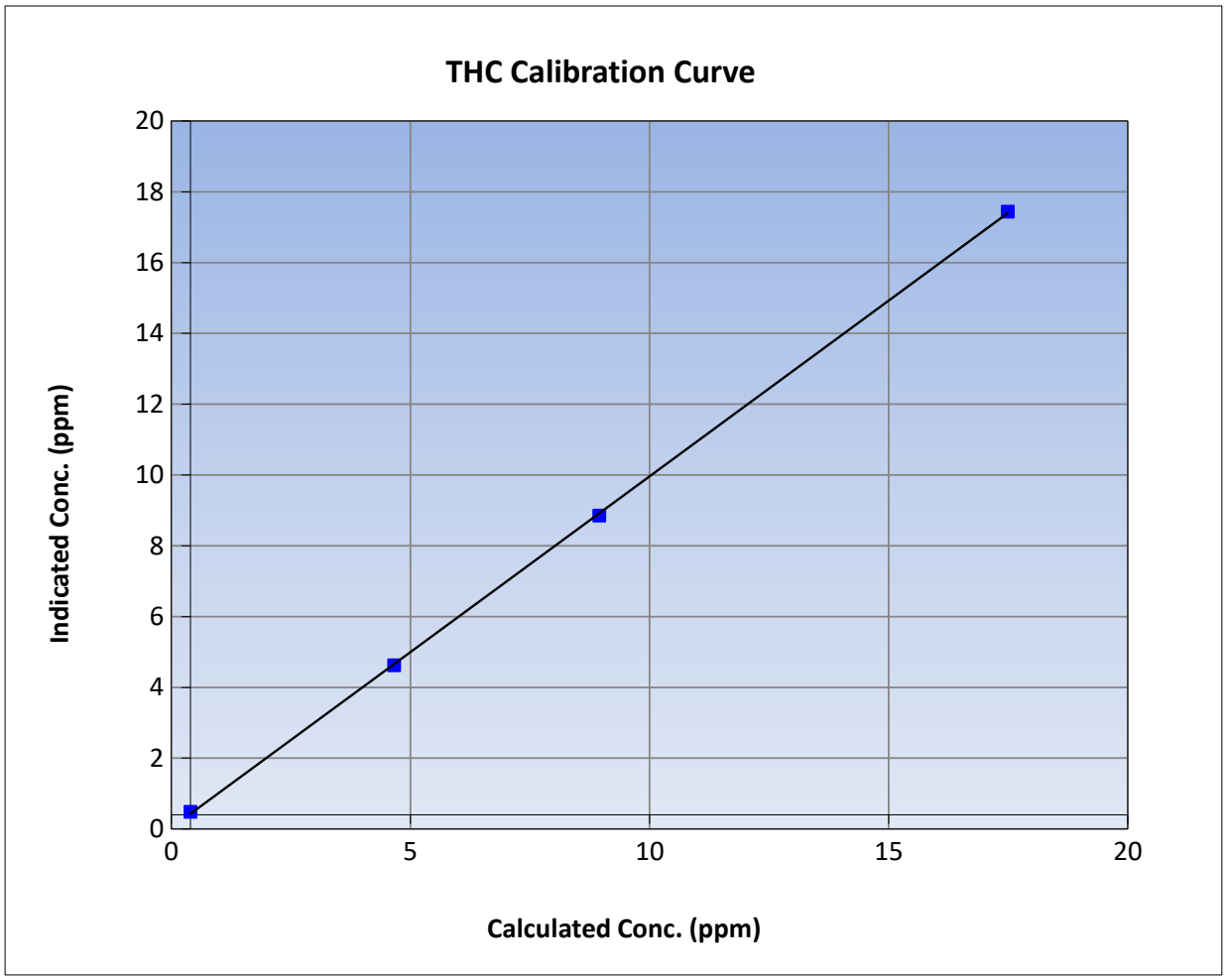
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 11:10 | End Time (MST): | 14:18 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1218153352 |

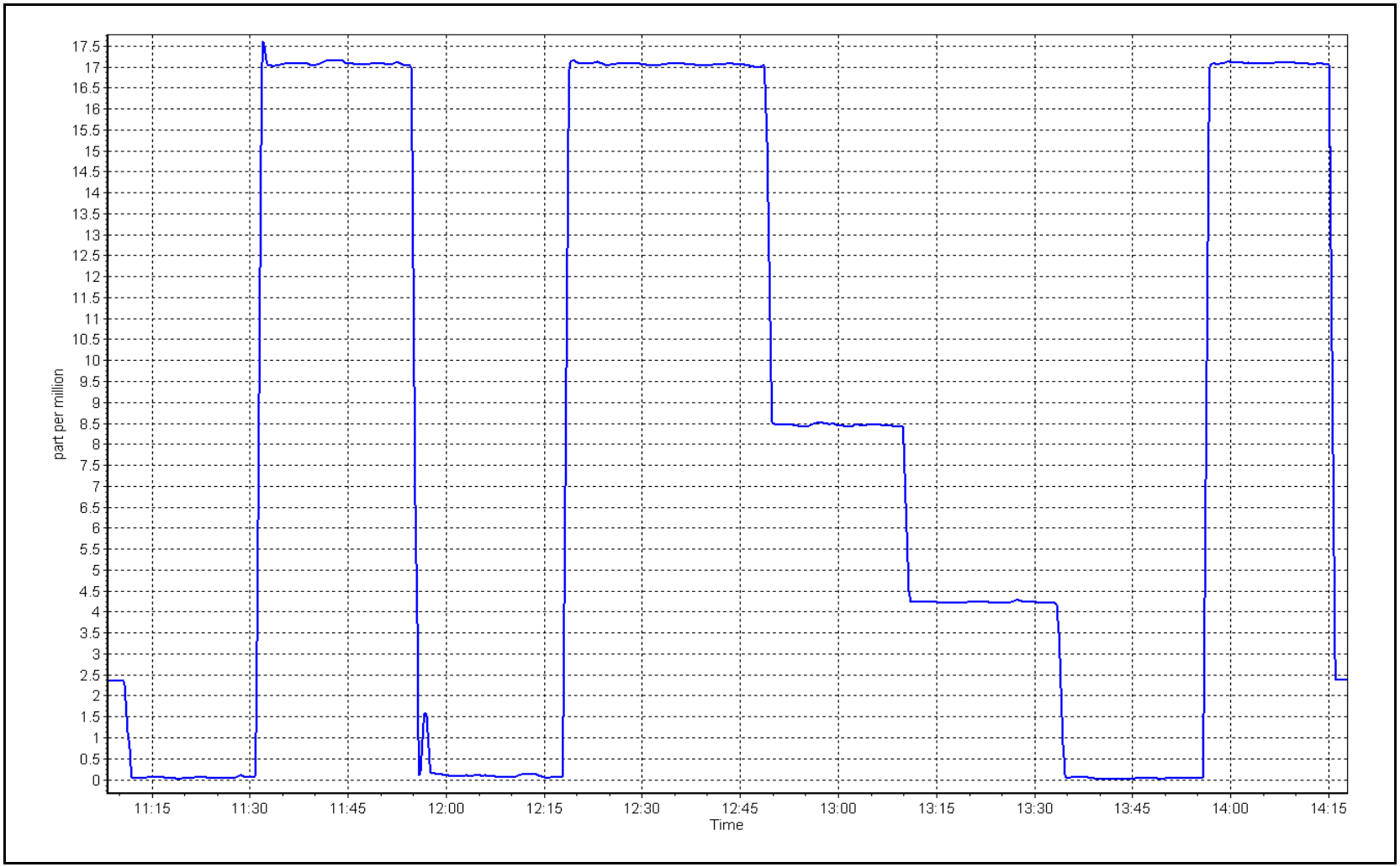
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | 0.09 | ---- |
| 17.09 | 17.04 | 1.0031 |
| 8.55 | 8.45 | 1.0109 |
| 4.26 | 4.23 | 1.0084 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999939 | *≥0.995* |
| Slope | 0.992946 | *0.90 - 1.10* |
| Intercept | 0.028821 | *+/-1.5* |



**THC Calibration Plot** Date: March 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: | March 26, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 6:47 | End time (MST): | 11:06 |
| 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: | 1.264 | 1.345 | NO bkgnd or offset: | 8.1 | 9.7 |
| NOX coeff or slope: | 0.986 | 0.994 | NOX bkgnd or offset: | 8.1 | 9.8 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 386.5 | 386.5 |

### Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998991 | 1.004319 |
| $NO_X$ Cal Offset: | -5.260000 | -4.540000 |
| NO Cal Slope: | 1.001959 | 1.001930 |
| NO Cal Offset: | -5.660000 | -5.200000 |
| $NO_2$ Cal Slope: | 0.995634 | 1.007870 |
| $NO_2$ Cal Offset: | -1.245592 | 1.467173 |

# 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 | -0.8 | -0.8 | 0.0 | ---- | ---- |
| as found span | 4917 | 83.2 | 817.2 | 799.9 | 17.3 | 774.3 | 761.2 | 13.1 | 1.0554 | 1.0508 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 | -0.2 | ---- | ---- |
| high point | 4917 | 83.2 | 817.2 | 799.9 | 17.3 | 819.3 | 799.7 | 19.6 | 0.9974 | 1.0002 |
| second point | 4958 | 41.6 | 408.6 | 399.9 | 8.7 | 400.8 | 390.3 | 10.5 | 1.0194 | 1.0247 |
| third point | 4979 | 20.8 | 204.3 | 200.0 | 4.3 | 198.2 | 191.7 | 6.6 | 1.0308 | 1.0431 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.3 | -0.1 | ---- | ---- |
| as left span | 4917 | 83.2 | 817.2 | 393.7 | 423.5 | 828.1 | 399.9 | 428.2 | 0.9868 | 0.9844 |
| | | | | | | | | Average Correction Factor | 1.0159 | 1.0227 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 775.1 ppb | NO = 762.0 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -4.6% |
| Previous Response | $NO_X$ = 811.1 ppb | NO = 795.8 ppb | | *Percent Change | NO = | -4.4% |
| 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) | 807.1 | 400.9 | 423.5 | 427.5 | 0.9907 | 100.9% |
| 2nd GPT point (200 ppb O3) | 807.1 | 601.6 | 222.8 | 226.5 | 0.9837 | 101.7% |
| 3rd GPT point (100 ppb O3) | 807.1 | 706.5 | 117.9 | 122.3 | 0.9641 | 103.7% |
| | | | | Average Correction Factor | 0.9795 | 102.1% |

Notes: Diagonstics similar to last month. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

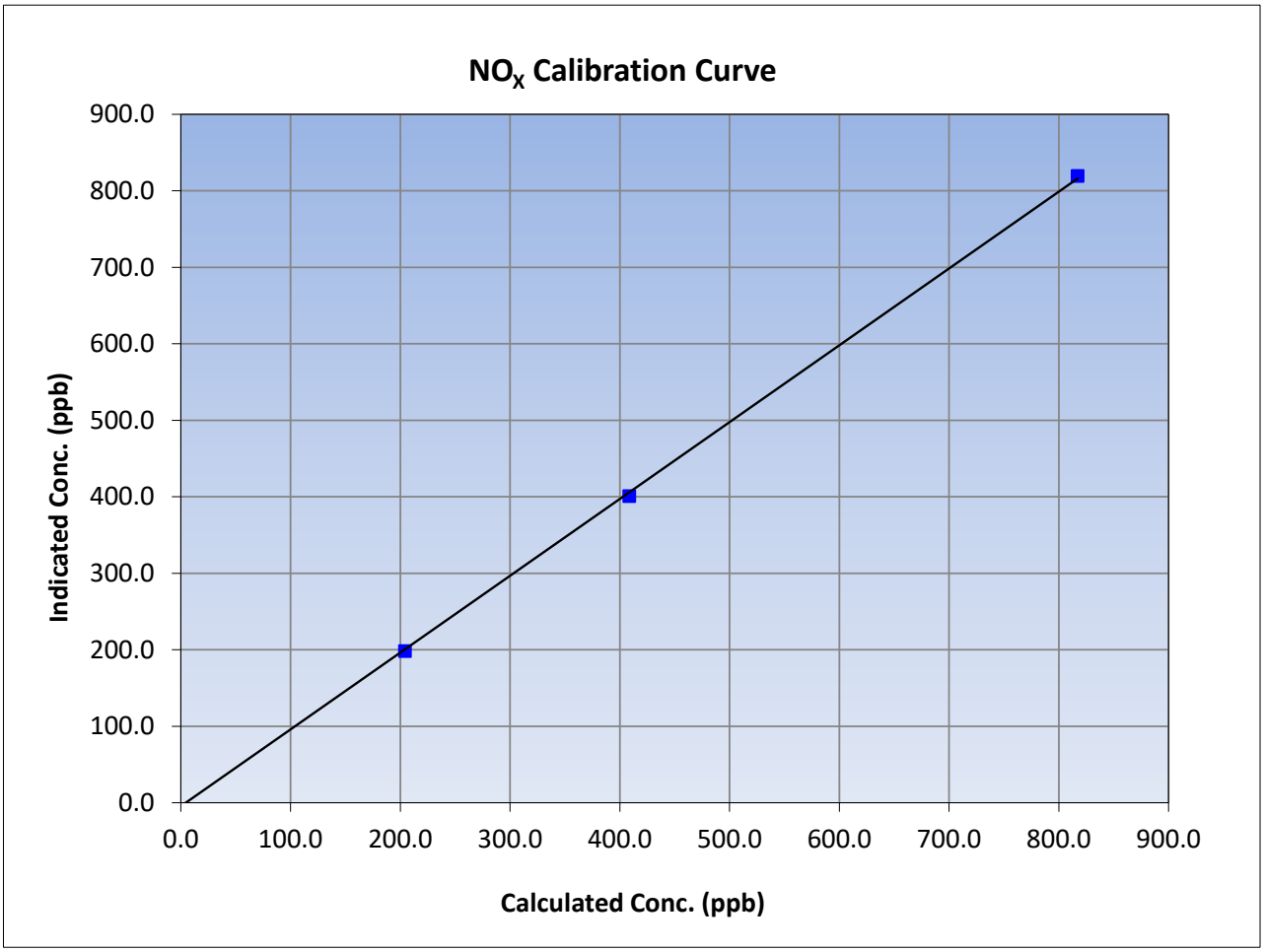
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 6:47 | End Time (MST): | 11:06 |
| 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 | -0.2 | ---- | Correlation Coefficient | 0.999838 | ≥0.995 |
| 817.2 | 819.3 | 0.9974 | | | |
| 408.6 | 400.8 | 1.0194 | Slope | 1.004319 | 0.90 - 1.10 |
| 204.3 | 198.2 | 1.0308 | | | |
| | | | Intercept | -4.540000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

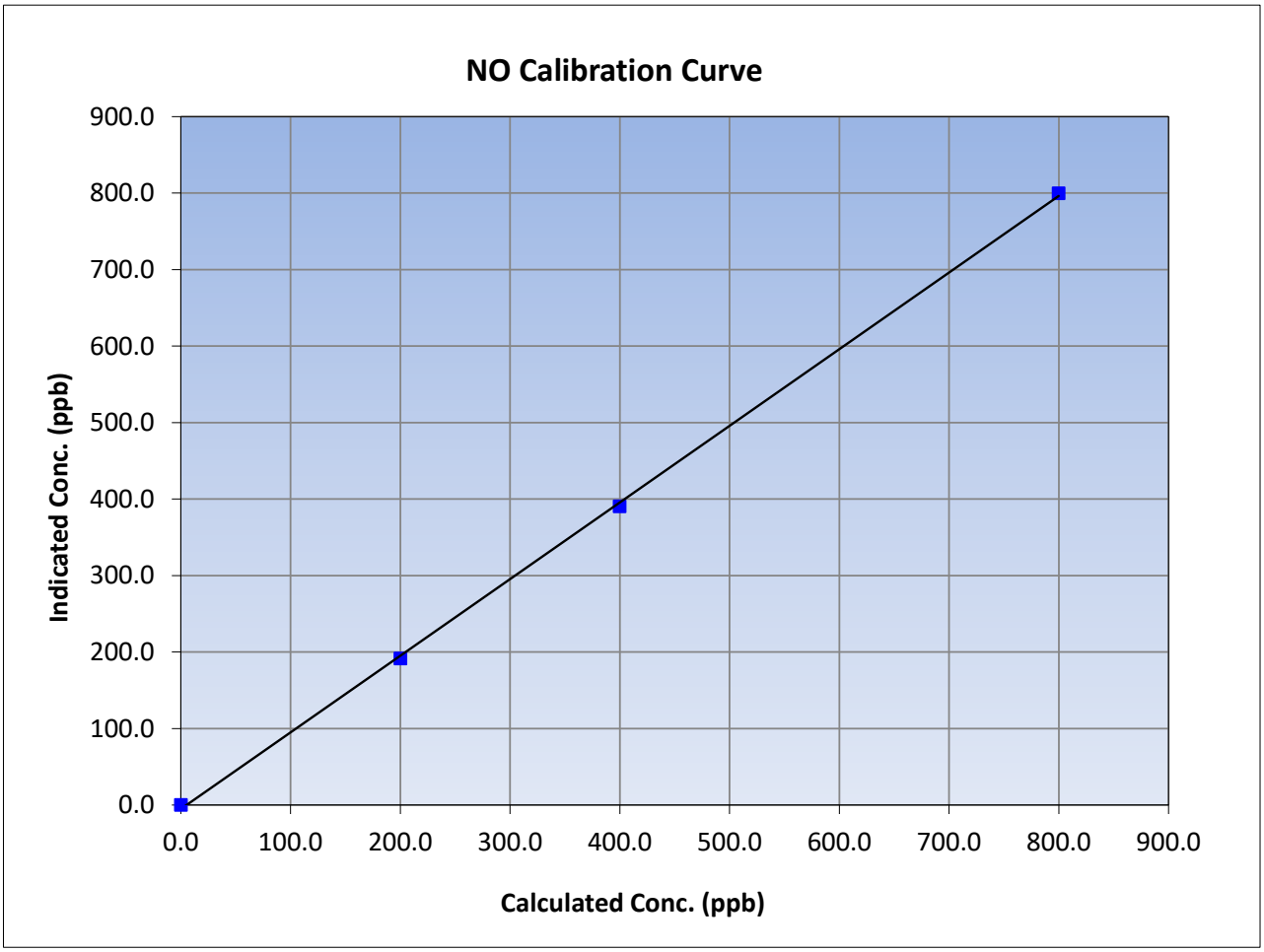
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 6:47 | End Time (MST): | 11:06 |
| 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 | 0.0 | ---- | Correlation Coefficient | 0.999777 | ≥0.995 |
| 799.9 | 799.7 | 1.0002 | | | |
| 399.9 | 390.3 | 1.0247 | Slope | 1.001930 | 0.90 - 1.10 |
| 200.0 | 191.7 | 1.0431 | | | |
| | | | Intercept | -5.200000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

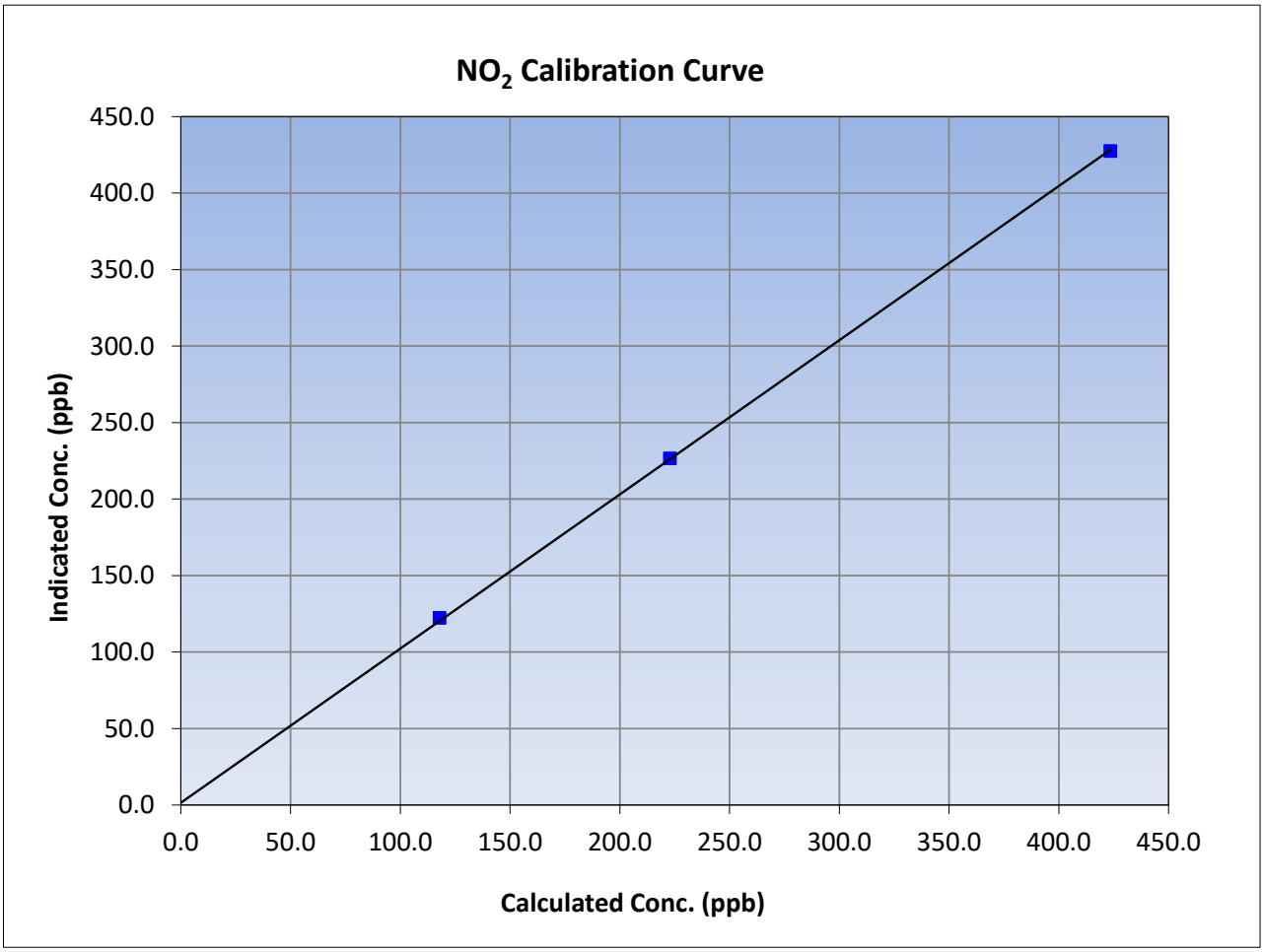
Version-04-2020

### Station Information

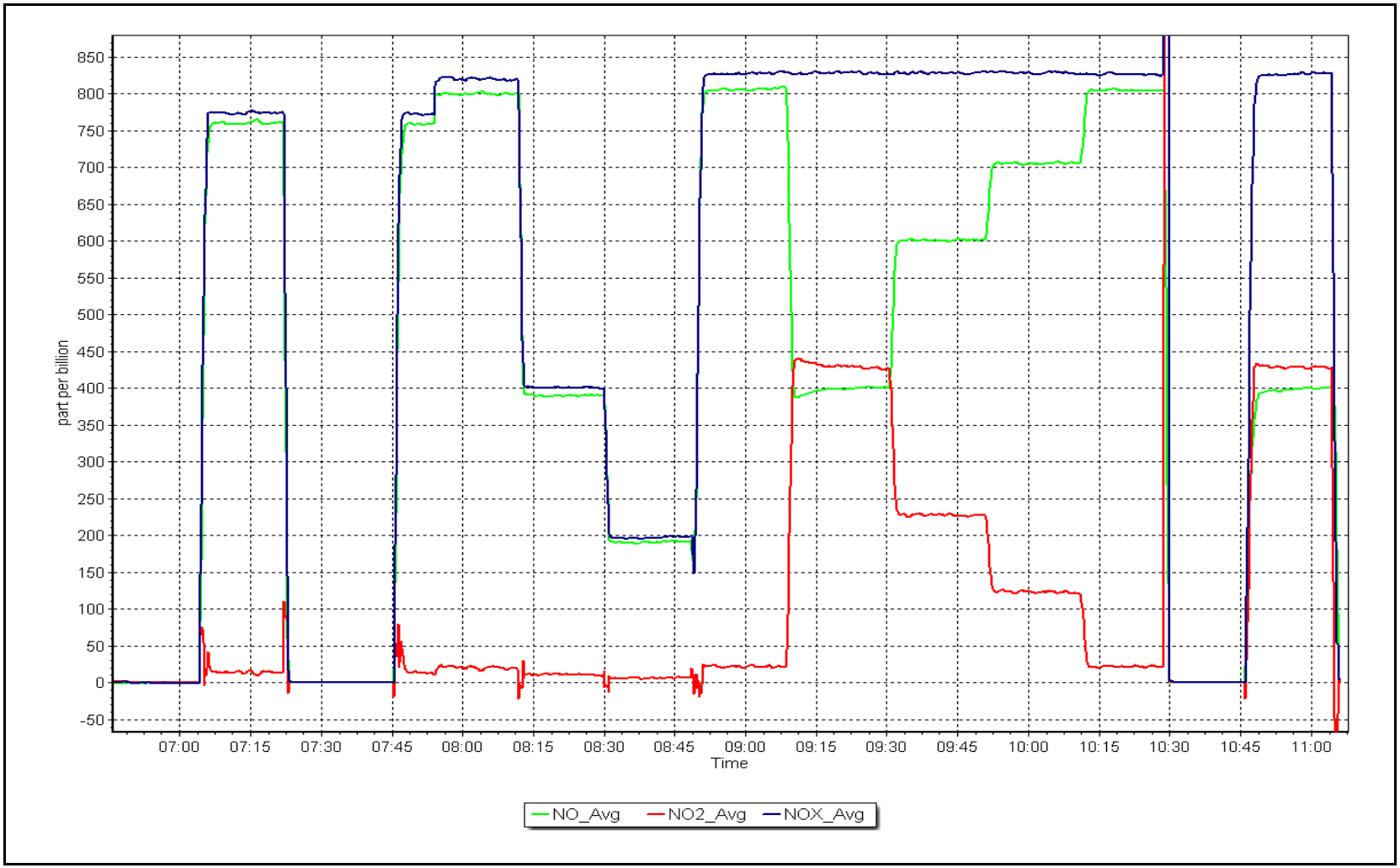
| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 6:47 | End Time (MST): | 11:06 |
| Analyzer make: | Thermo Scientific 42iQ | Analyzer serial #: | 12300522720 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999922 | *≥0.995* |
| 423.5 | 427.5 | 0.9907 | | | |
| 222.8 | 226.5 | 0.9837 | Slope | 1.007870 | *0.90 - 1.10* |
| 117.9 | 122.3 | 0.9641 | | | |
| | | | Intercept | 1.467173 | *+/-20* |



**$NO_X$ Calibration Plot** Date: March 26, 2024 Location: Wapasu



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Wapasu | Station number: | AMS17 |
| Calibration Date: | March 11, 2024 | Last Cal Date: | February 9, 2024 |
| Start time (MST): | 10:43 | End time (MST): | 14:02 |
| 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: | 1.006914 | 1.000657 | Backgd or Offset: | -1.8 | -1.8 |
| Calibration intercept: | -0.560000 | -0.340000 | Coeff or Slope: | 1.027 | 1.013 |

### $O_3$ 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 | 0.0 | ---- |
| as found span | 5000 | 1077.3 | 400.0 | 403.8 | 0.991 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 5000 | 1077.3 | 400.0 | 400.2 | 1.000 |
| second point | 5000 | 900.3 | 200.0 | 199.5 | 1.003 |
| third point | 5000 | 789.5 | 100.0 | 99.2 | 1.008 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 5000 | 1077.3 | 400.0 | 403.8 | 0.991 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 403.8 | Previous response | 402.2 | *% change | 0.4% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

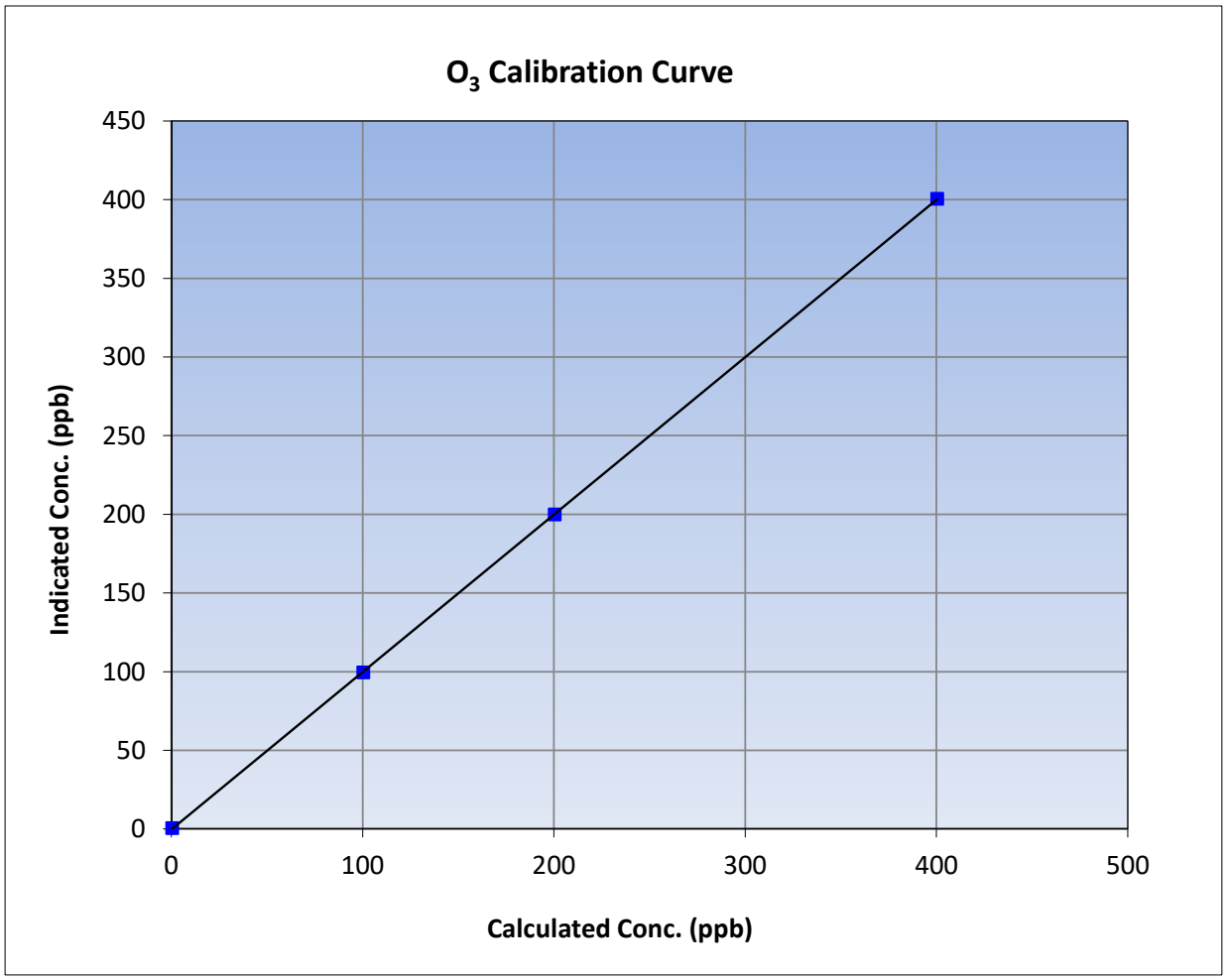
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 11, 2024 | Previous Calibration: | February 9, 2024 |
| Station Name: | Wapasu | Station Number: | AMS17 |
| Start Time (MST): | 10:43 | End Time (MST): | 14:02 |
| Analyzer make: | API T400 | Analyzer serial #: | 3870 |

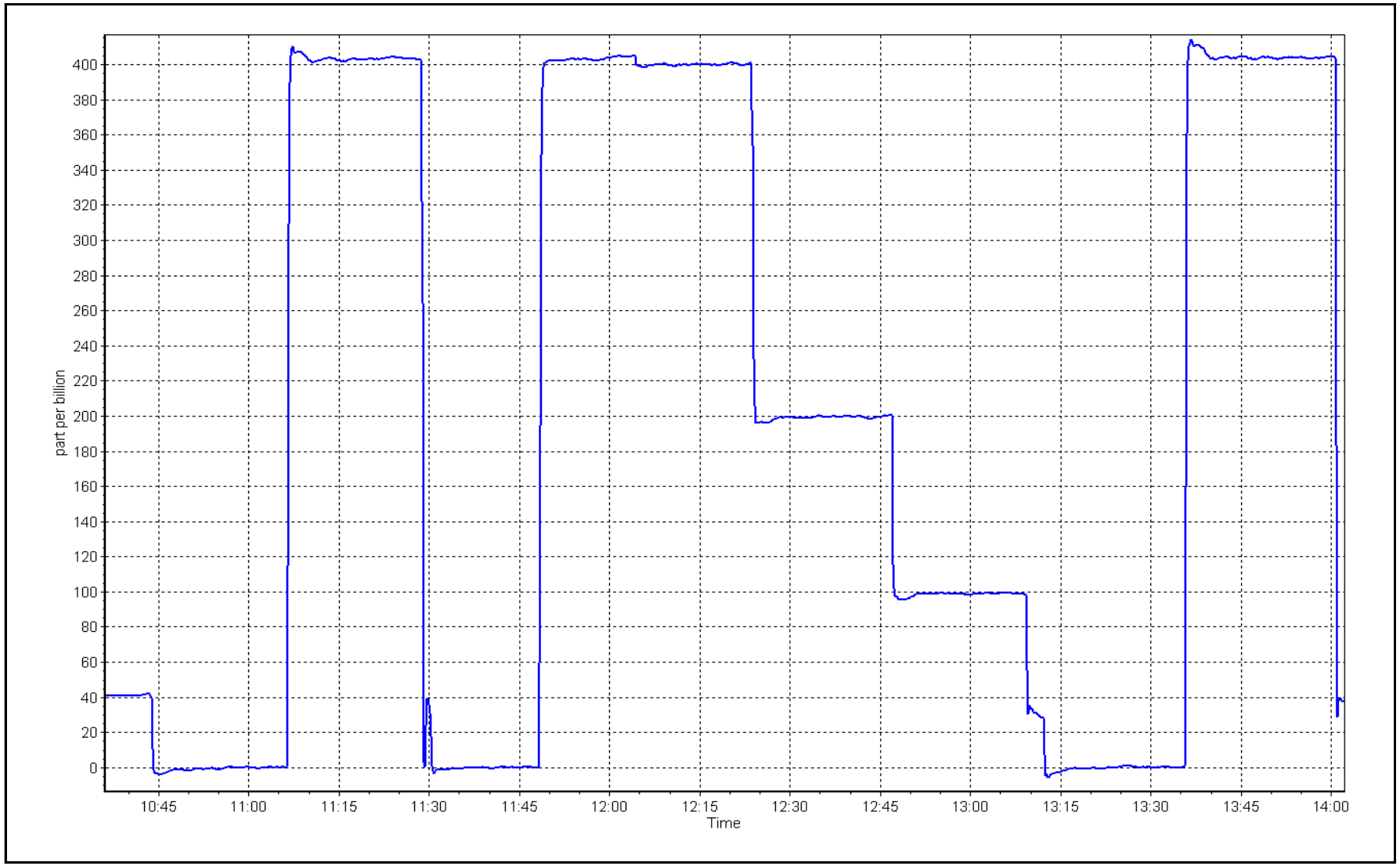
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 400.0 | 400.2 | 0.9995 |
| 200.0 | 199.5 | 1.0025 |
| 100.0 | 99.2 | 1.0081 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 1.000657 | *0.90 - 1.10* |
| Intercept | -0.340000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 11, 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: | March 26, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 6:49 | End time (MST): | 7:12 |
| Analyzer Make: | Teledyne API T640 | S/N: | 1183 |
| 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) | -5.6 | -5.4 | -5.6 | ☐ | +/- 2 °C |
| P (mmHg) | 710.5 | 713.4 | 710.5 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.00 | 4.97 | 5.00 | ☐ | +/- 0.25 LPM |
| PW% (pump) | | ----- | | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 6.5 | 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: — 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: No adjustments done. Leak Check Passed.

Calibration by: Melissa Lemay

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS18
## STONY MOUNTAIN
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | March 1, 2024 | Last Cal Date: | February 1, 2024 |
| Start time (MST): | 12:27 | End time (MST): | 16:39 |
| 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: | 1.002503 | 1.000733 | Backgd or Offset: | 22.9 | 22.9 |
| Calibration intercept: | -0.043083 | 0.276595 | Coeff or Slope: | 0.800 | 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 | 0.2 | ---- |
| as found span | 4919 | 81.0 | 800.3 | 797.4 | 1.004 |
| as found 2nd point | 4959 | 40.5 | 400.2 | 398.3 | 1.005 |
| as found 3rd point | 4979 | 20.2 | 199.6 | 197.4 | 1.011 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.6 | ---- |
| high point | 4919 | 81.0 | 800.3 | 801.1 | 0.999 |
| second point | 4959 | 40.5 | 400.2 | 401.2 | 0.997 |
| third point | 4979 | 20.2 | 199.6 | 199.3 | 1.002 |
| as left zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| as left span | 4919 | 81.0 | 800.3 | 804.2 | 0.995 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 797.20 | Previous response | 802.24 | *% change | -0.6% |
| Baseline Corr 2nd AF pt: | 398.10 | AF Slope: | 0.996778 | AF Intercept: | -0.564209 |
| Baseline Corr 3rd AF pt: | 197.20 | AF Correlation: | 0.999995 | | |

* = > +/-5% change initiates investigation

Notes: Inlet filter changed after as founds. No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

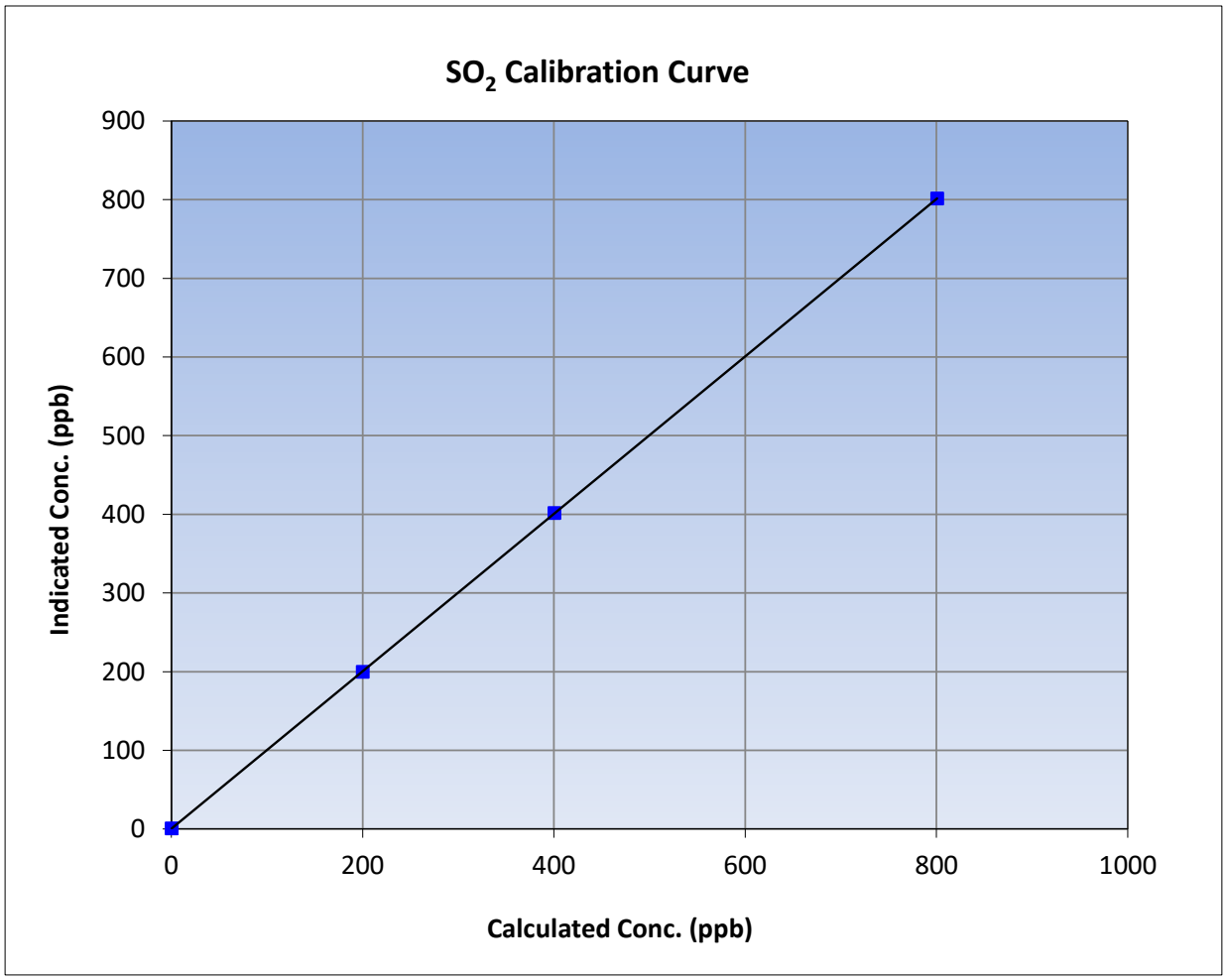
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 12:27 | End Time (MST): | 16:39 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | JC1501301453 |

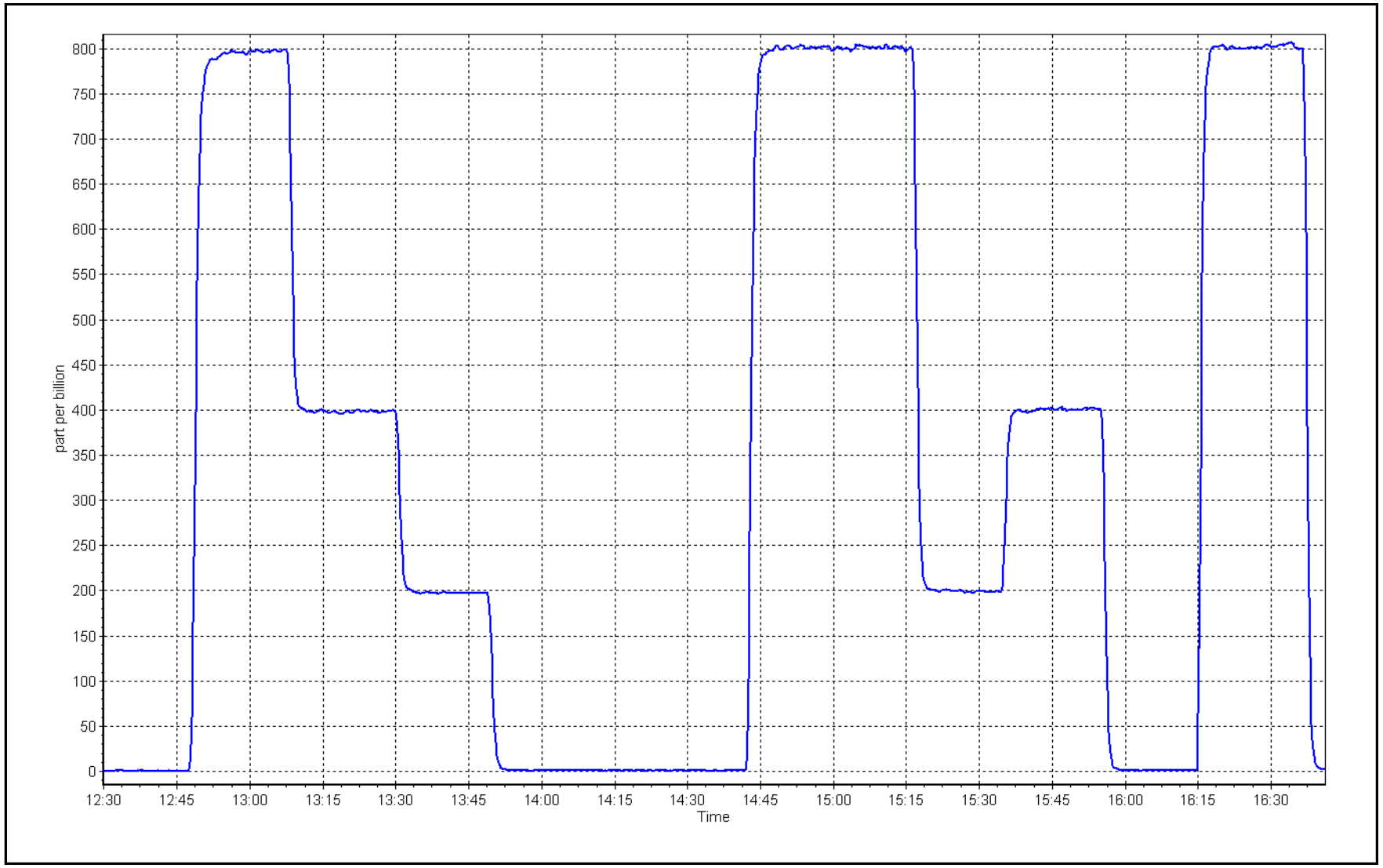
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.6 | ---- |
| 800.3 | 801.1 | 0.9990 |
| 400.2 | 401.2 | 0.9975 |
| 199.6 | 199.3 | 1.0015 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.000733 | *0.90 - 1.10* |
| Intercept | 0.276595 | *+/-30* |



**SO2 Calibration Plot** Date: March 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: | March 27, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 10:13 | End time (MST): | 14:50 |
| 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: | 0.995441 | 1.002157 | Backgd or Offset: | 2.66 | 2.66 |
| Calibration intercept: | 0.301088 | 0.240997 | 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 | 0.2 | ---- |
| as found span | 4927 | 73.0 | 80.0 | 82.0 | 0.978 |
| as found 2nd point | 4964 | 36.5 | 40.0 | 41.2 | 0.975 |
| as found 3rd point | 4983 | 18.3 | 20.0 | 20.4 | 0.992 |
| 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 | 80.4 | 0.995 |
| second point | 4964 | 36.5 | 40.0 | 40.4 | 0.990 |
| third point | 4983 | 18.3 | 20.0 | 20.2 | 0.992 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4927 | 73.0 | 80.0 | 79.9 | 1.001 |
| SO2 Scrubber Check | 4923 | 77.1 | 771.0 | 0.1 | ---- |
| Date of last scrubber change: | | 17-Dec-21 | | Ave Corr Factor | 0.992 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.8 | Prev response: | 79.93 | *% change: | 2.3% |
| Baseline Corr 2nd AF pt: | 41.0 | AF Slope: | 1.024019 | AF Intercept: | 0.100632 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999977 | | |

* = > +/-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

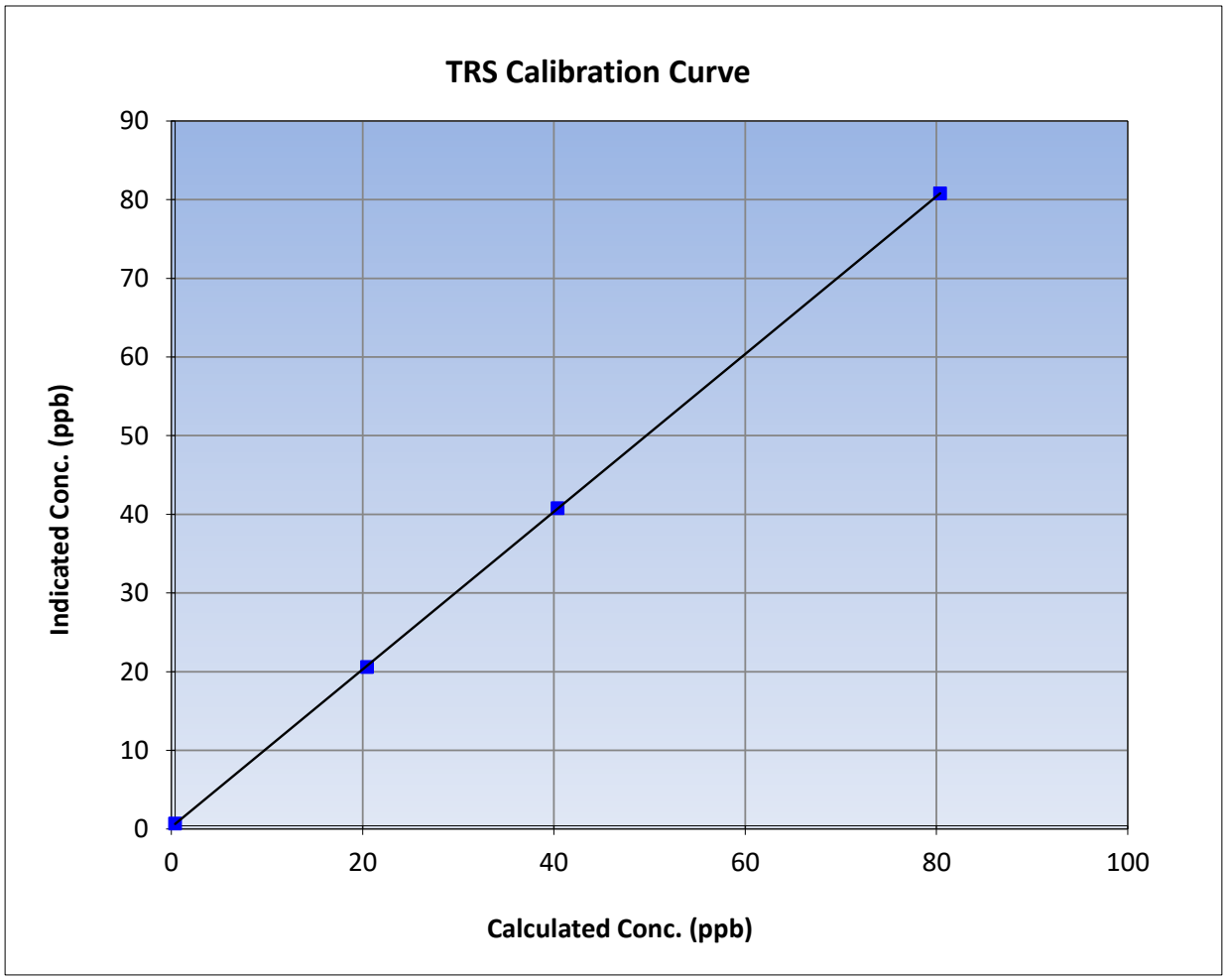
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS18 |
| Start Time (MST): | 10:13 | End Time (MST): | 14:50 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1218153359 |

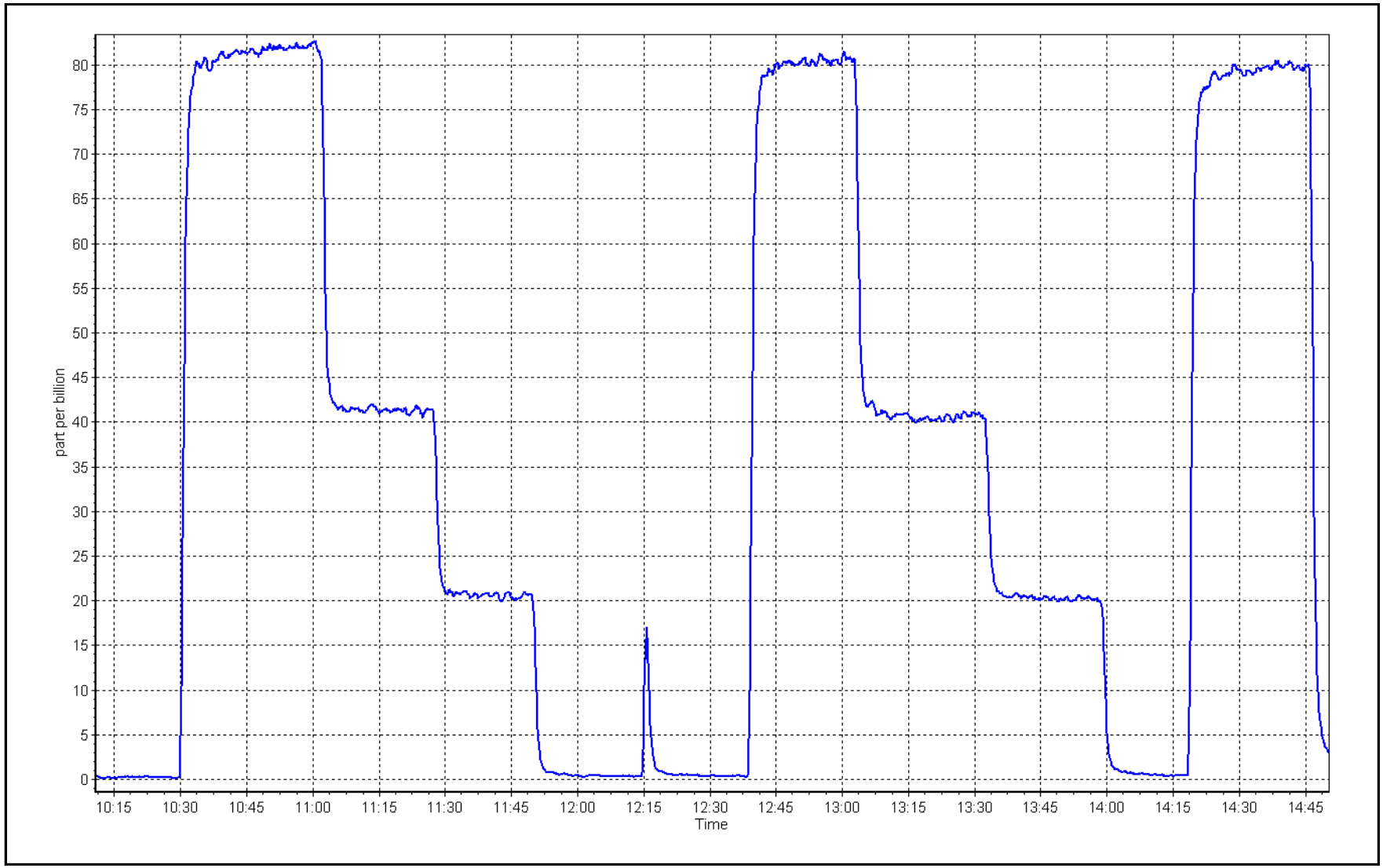
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 80.0 | 80.4 | 0.9949 |
| 40.0 | 40.4 | 0.9899 |
| 20.0 | 20.2 | 0.9925 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 1.002157 | *0.90 - 1.10* |
| Intercept | 0.240997 | *+/-3* |



**TRS Calibration Plot** Date: March 27, 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: | March 1, 2024 | Last Cal Date: | February 1, 2024 |
| Start time (MST): | 12:27 | End time (MST): | 16:39 |
| 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: | 2.88E-04 | 3.10E-04 | NMHC SP Ratio: | 5.97E-05 | 5.89E-05 |
| CH4 Retention time: | 15.8 | 16.2 | NMHC Peak Area: | 153566 | 156523 |
| 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 | 0.09 | ---- |
| as found span | 4919 | 81.0 | 17.28 | 16.25 | 1.064 |
| as found 2nd point | 4959 | 40.5 | 8.64 | 8.28 | 1.044 |
| as found 3rd point | 4979 | 20.2 | 4.31 | 4.15 | 1.038 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 17.28 | 17.35 | 0.996 |
| second point | 4959 | 40.5 | 8.64 | 8.73 | 0.990 |
| third point | 4979 | 20.2 | 4.31 | 4.37 | 0.986 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 81.0 | 17.28 | 17.51 | 0.987 |
| | | | | Average Correction Factor | 0.991 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.16 | Prev response | 17.18 | *% change | -6.3% |
| Baseline Corr 2nd AF: | 8.2 | AF Slope: | 0.935180 | AF Intercept: | 0.123368 |
| Baseline Corr 3rd AF: | 4.1 | AF Correlation: | 0.999947 | * = > +/-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 | 9.02 | 1.017 |
| as found 2nd point | 4959 | 40.5 | 4.58 | 4.50 | 1.018 |
| as found 3rd point | 4979 | 20.2 | 2.29 | 2.26 | 1.010 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 9.17 | 9.22 | 0.995 |
| second point | 4959 | 40.5 | 4.58 | 4.64 | 0.988 |
| third point | 4979 | 20.2 | 2.29 | 2.31 | 0.991 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 81.0 | 9.17 | 9.25 | 0.991 |
| | | | | Average Correction Factor | 0.991 |
| Baseline Corr AF: | 9.02 | Prev response | 9.09 | *% change | -0.9% |
| Baseline Corr 2nd AF: | 4.5 | AF Slope: | 0.982616 | AF Intercept: | 0.004996 |
| Baseline Corr 3rd AF: | 2.3 | AF Correlation: | 0.999995 | * = > +/-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 | 0.09 | ---- |
| as found span | 4919 | 81.0 | 8.11 | 7.23 | 1.122 |
| as found 2nd point | 4959 | 40.5 | 4.06 | 3.77 | 1.075 |
| as found 3rd point | 4979 | 20.2 | 2.02 | 1.89 | 1.071 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 8.11 | 8.14 | 0.997 |
| second point | 4959 | 40.5 | 4.06 | 4.10 | 0.991 |
| third point | 4979 | 20.2 | 2.02 | 2.06 | 0.981 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4919 | 81.0 | 8.11 | 8.26 | 0.982 |
| | | | | Average Correction Factor | 0.989 |
| Baseline Corr AF: | 7.15 | Prev response | 8.09 | *% change | -13.2% |
| Baseline Corr 2nd AF: | 3.69 | AF Slope: | 0.881432 | AF Intercept: | 0.118371 |
| Baseline Corr 3rd AF: | 1.80 | AF Correlation: | 0.999693 | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.993093 | 1.003678 |
| THC Cal Offset: | 0.015393 | 0.027639 |
| CH4 Cal Slope: | 0.997044 | 1.002169 |
| CH4 Cal Offset: | -0.003610 | 0.018204 |
| NMHC Cal Slope: | 0.989722 | 1.005151 |
| NMHC Cal Offset: | 0.019003 | 0.009635 |

Notes: Zero at 0.08 ppm. Span points had dips present and CH4 span was 12% low. Re-did zero chromatogram to adjust zero. Calibrated span to adjust RT.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## THC Calibration Summary

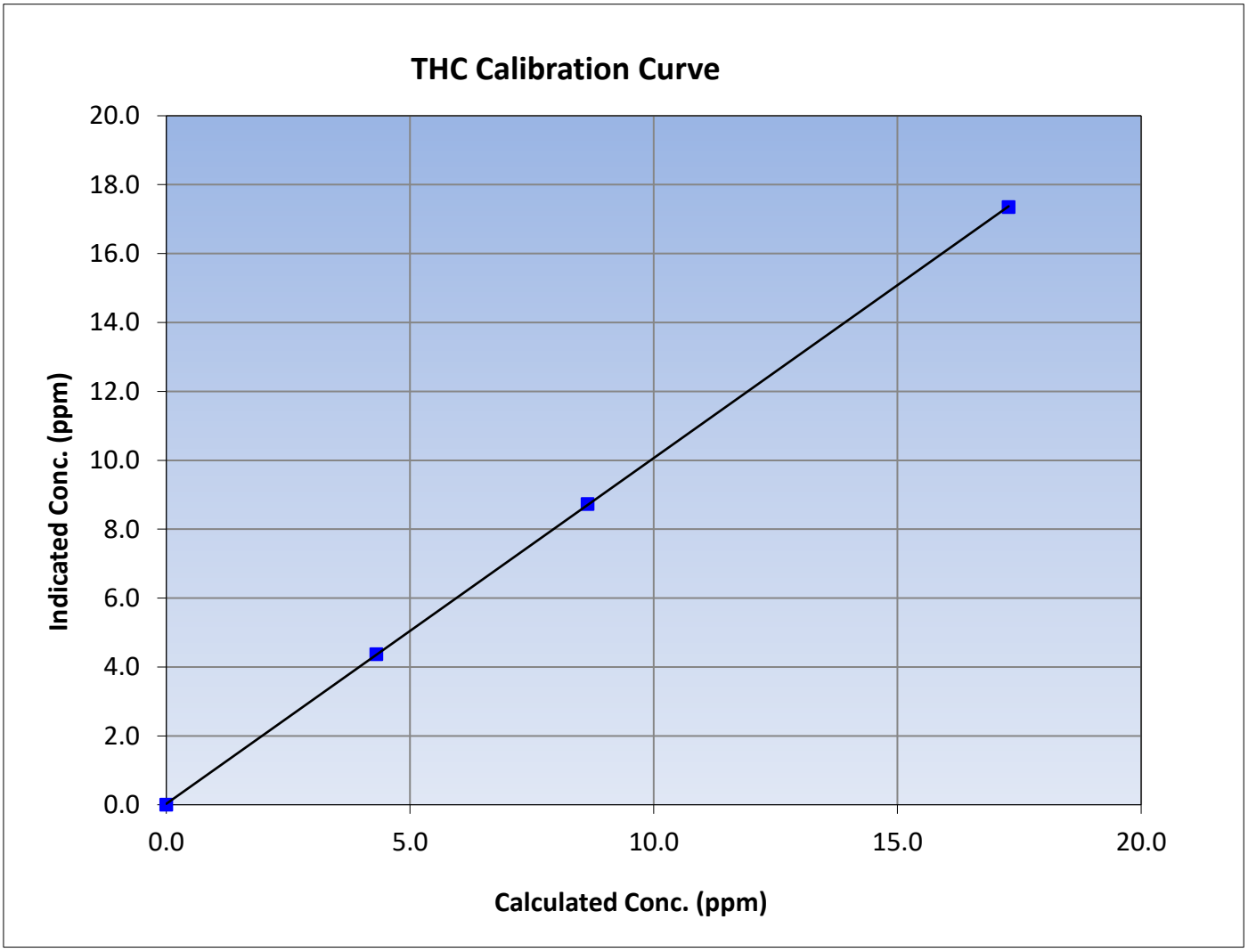
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 12:27 | End Time (MST): | 16:39 |
| 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 | 0.999986 | *≥0.995* |
| 17.28 | 17.35 | 0.9959 | | | |
| 8.64 | 8.73 | 0.9896 | Slope | 1.003678 | *0.90 - 1.10* |
| 4.31 | 4.37 | 0.9864 | | | |
| | | | Intercept | 0.027639 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

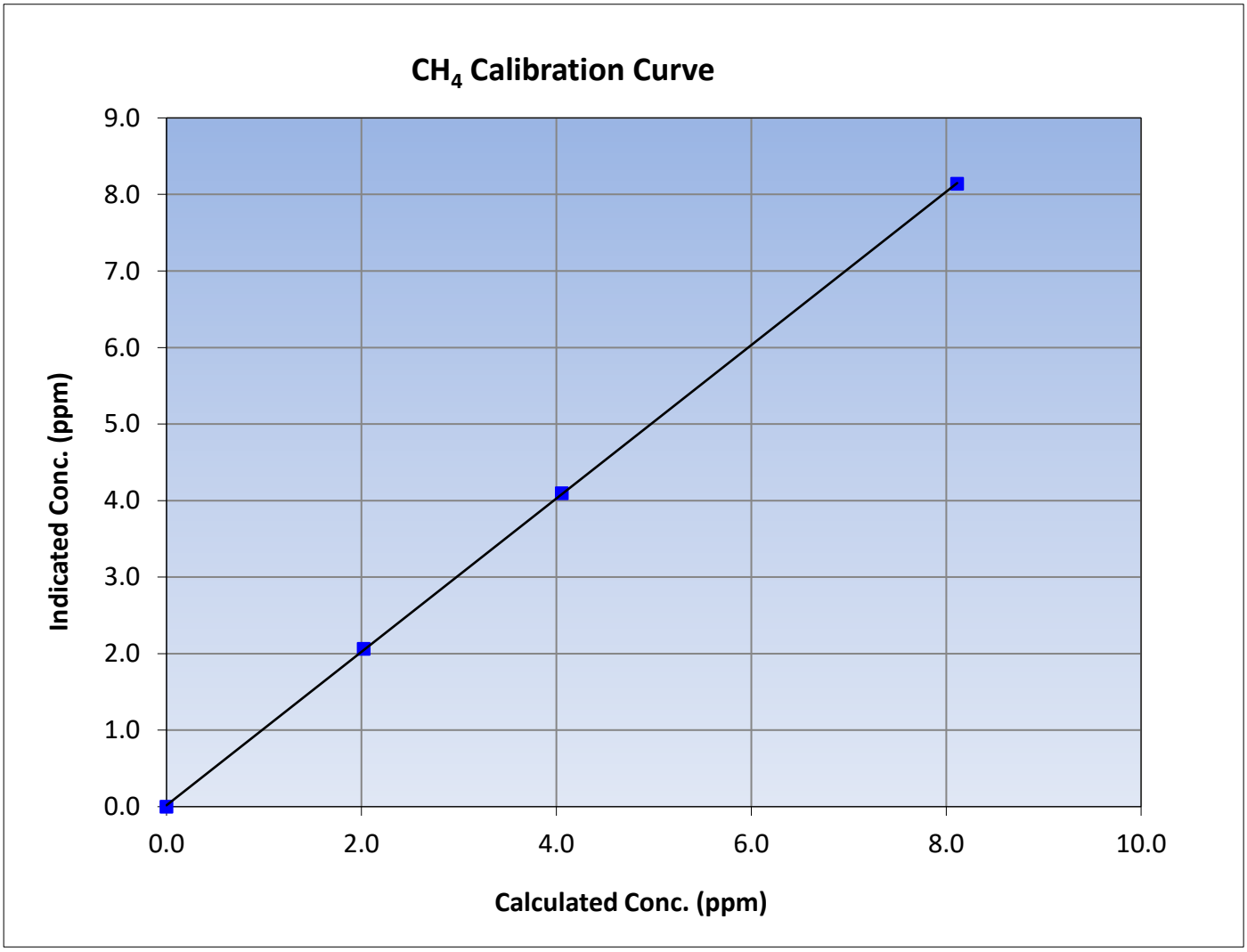
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 12:27 | End Time (MST): | 16:39 |
| 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 | 0.999977 | *≥0.995* |
| 8.11 | 8.14 | 0.9968 | | | |
| 4.06 | 4.10 | 0.9907 | Slope | 1.002169 | *0.90 - 1.10* |
| 2.02 | 2.06 | 0.9809 | | | |
| | | | Intercept | 0.018204 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

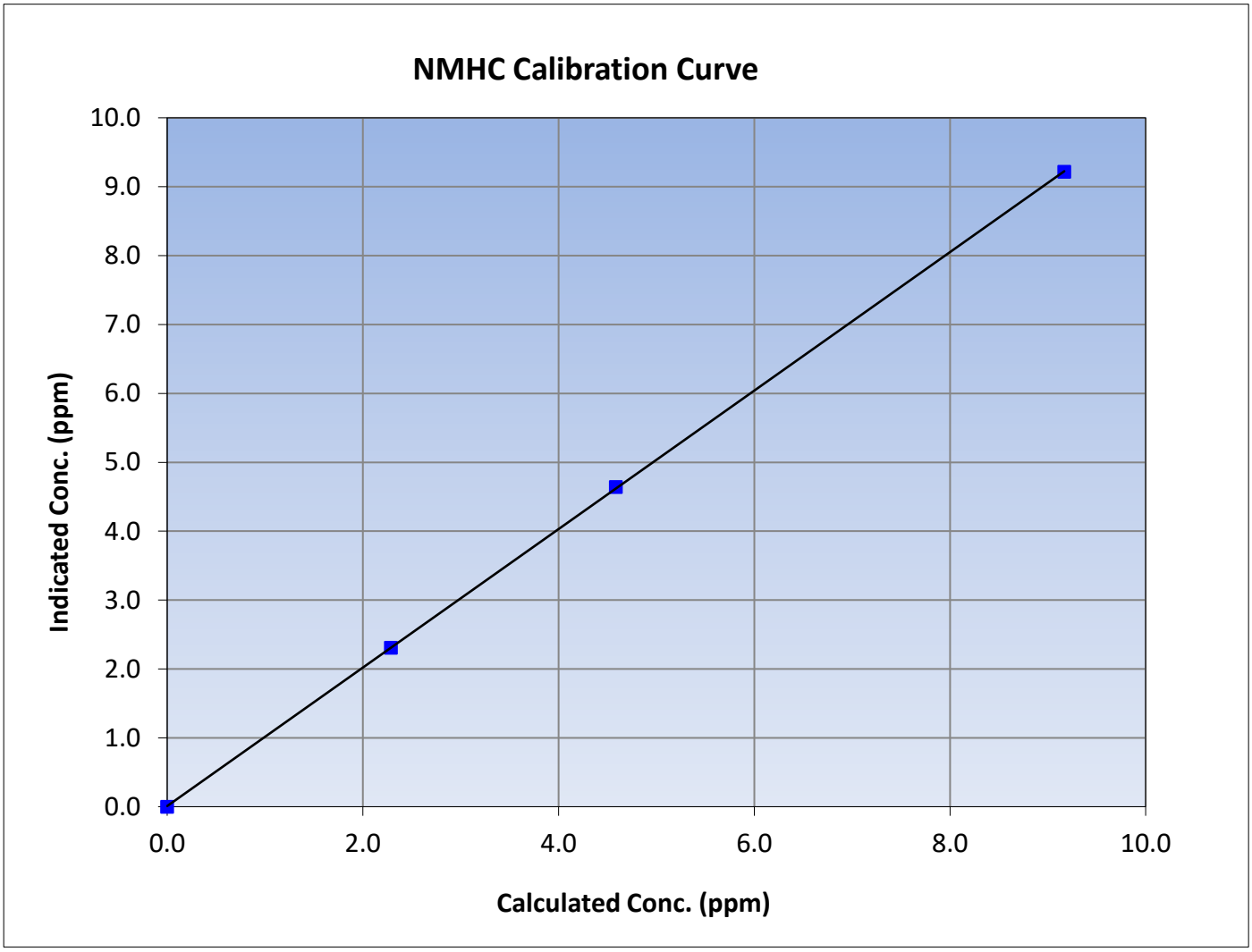
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 12:27 | End Time (MST): | 16:39 |
| 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 | 0.999986 | ≥0.995 |
| 9.17 | 9.22 | 0.9949 | | | |
| 4.58 | 4.64 | 0.9883 | Slope | 1.005151 | 0.90 - 1.10 |
| 2.29 | 2.31 | 0.9912 | | | |
| | | | Intercept | 0.009635 | +/-0.5 |



**NMHC Calibration Plot** Date: March 1, 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: | March 15, 2024 | Last Cal Date: | March 1, 2024 |
| Start time (MST): | 11:18 | End time (MST): | 13:23 |
| Reason: | Cylinder Change | | |

### 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: | 3.10E-04 | 3.10E-04 | NMHC SP Ratio: | 5.89E-05 | 5.89E-05 |
| CH4 Retention time: | 16.2 | 16.2 | NMHC Peak Area: | 156523 | 156523 |
| 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 | 0.04 | ---- |
| as found span | 4919 | 81.0 | 17.28 | 16.88 | 1.024 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.08 | ---- |
| high point | 4919 | 81.0 | 17.28 | 16.68 | 1.036 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.036 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.84 | 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 | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4919 | 81.0 | 9.17 | 9.05 | 1.013 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4919 | 81.0 | 9.17 | 8.94 | 1.025 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.025 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 9.05 | 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 | 5000 | 0.0 | 0.00 | 0.04 | ---- |
| as found span | 4919 | 81.0 | 8.11 | 7.83 | 1.036 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.08 | ---- |
| high point | 4919 | 81.0 | 8.11 | 7.74 | 1.049 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.049 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 7.79 | 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 | |

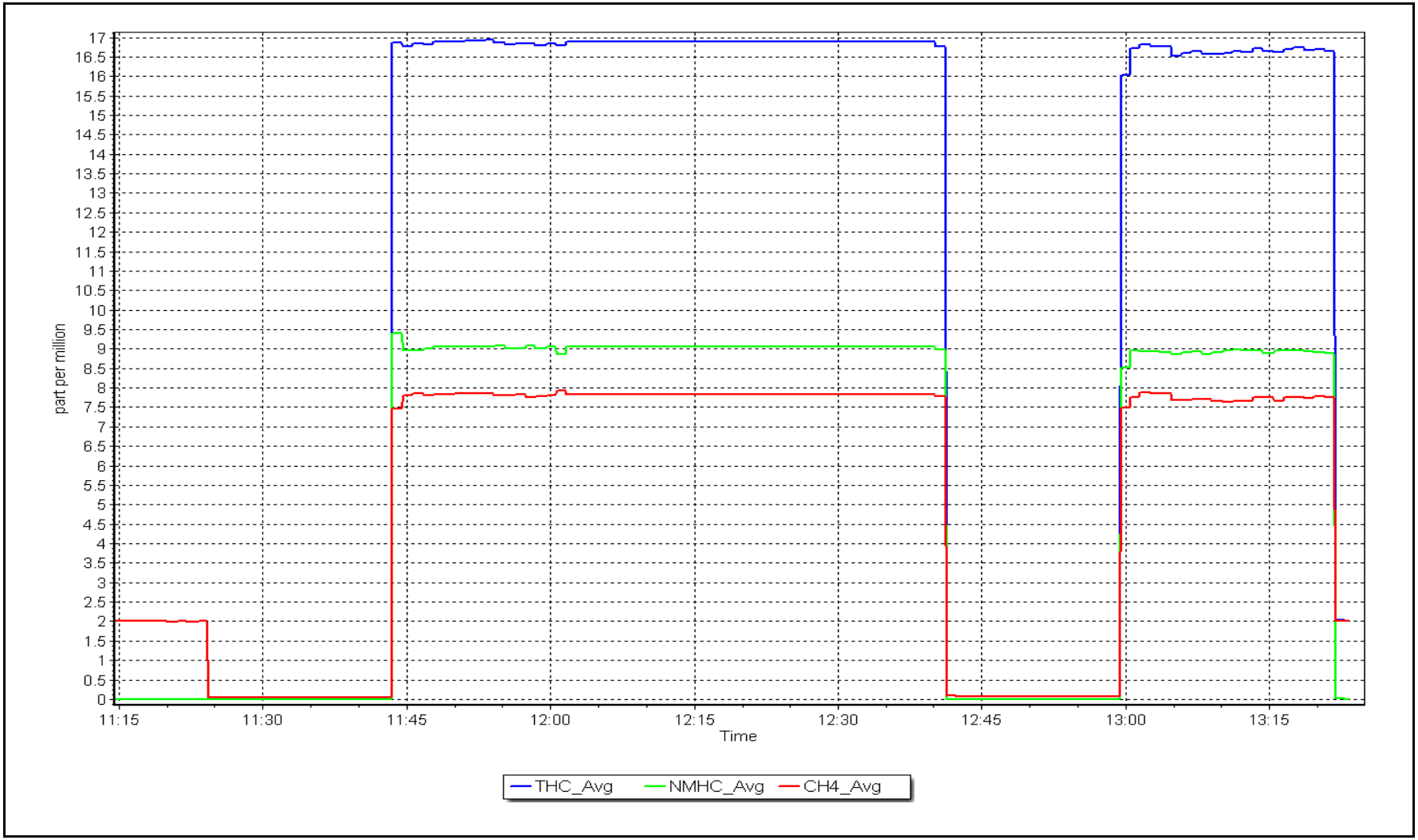
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | NA | NA |
| THC Cal Offset: | NA | NA |
| CH4 Cal Slope: | NA | NA |
| CH4 Cal Offset: | NA | NA |
| NMHC Cal Slope: | NA | NA |
| NMHC Cal Offset: | NA | NA |

Notes: H2 cylinder change

Calibration Performed By: Moahmmed Kashif

**NMHC Calibration Plot** Date: March 15, 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: | March 26, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 10:15 | End time (MST): | 15:06 |
| 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: | 1.104 | 1.119 | NO bkgnd or offset: | 3.1 | 3.1 |
| NOX coeff or slope: | 0.995 | 0.994 | NOX bkgnd or offset: | 3.1 | 3.2 |
| NO2 coeff or slope: | 0.999 | 0.999 | Reaction cell Press: | 253.2 | 254.7 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.001950 | 0.998146 |
| $NO_X$ Cal Offset: | -1.100000 | -0.500000 |
| NO Cal Slope: | 1.001421 | 0.998819 |
| NO Cal Offset: | -1.260000 | -0.600000 |
| $NO_2$ Cal Slope: | 1.009656 | 0.999802 |
| $NO_2$ Cal Offset: | 1.192503 | 0.793514 |

# 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 | 800.8 | 787.8 | 12.9 | 1.0129 | 1.0147 |
| 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 | 4916 | 84.0 | 811.1 | 799.3 | 11.8 | 809.1 | 797.8 | 11.3 | 1.0025 | 1.0019 |
| second point | 4958 | 42.0 | 405.6 | 399.7 | 5.9 | 404.8 | 399.2 | 5.5 | 1.0019 | 1.0012 |
| third point | 4979 | 21.0 | 202.8 | 199.8 | 2.9 | 200.9 | 197.8 | 3.2 | 1.0093 | 1.0103 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | ---- | ---- |
| as left span | 4916 | 84.0 | 811.1 | 370.3 | 440.8 | 824.0 | 371.2 | 452.4 | 0.9843 | 0.9977 |
| | | | | | | | | Average Correction Factor | 1.0046 | 1.0045 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 800.9 ppb | NO = 788.0 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | -1.3% |
| Previous Response | $NO_X$ = 811.6 ppb | NO = 799.2 ppb | | | *Percent Change | NO = | -1.4% |
| 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) | 796.8 | 367.8 | 440.8 | 440.9 | 0.9997 | 100.0% |
| 2nd GPT point (200 ppb O3) | 796.8 | 587.9 | 220.7 | 222.4 | 0.9922 | 100.8% |
| 3rd GPT point (100 ppb O3) | 796.8 | 693.5 | 115.1 | 116.1 | 0.9910 | 100.9% |
| | | | | Average Correction Factor | 0.9943 | 100.6% |

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

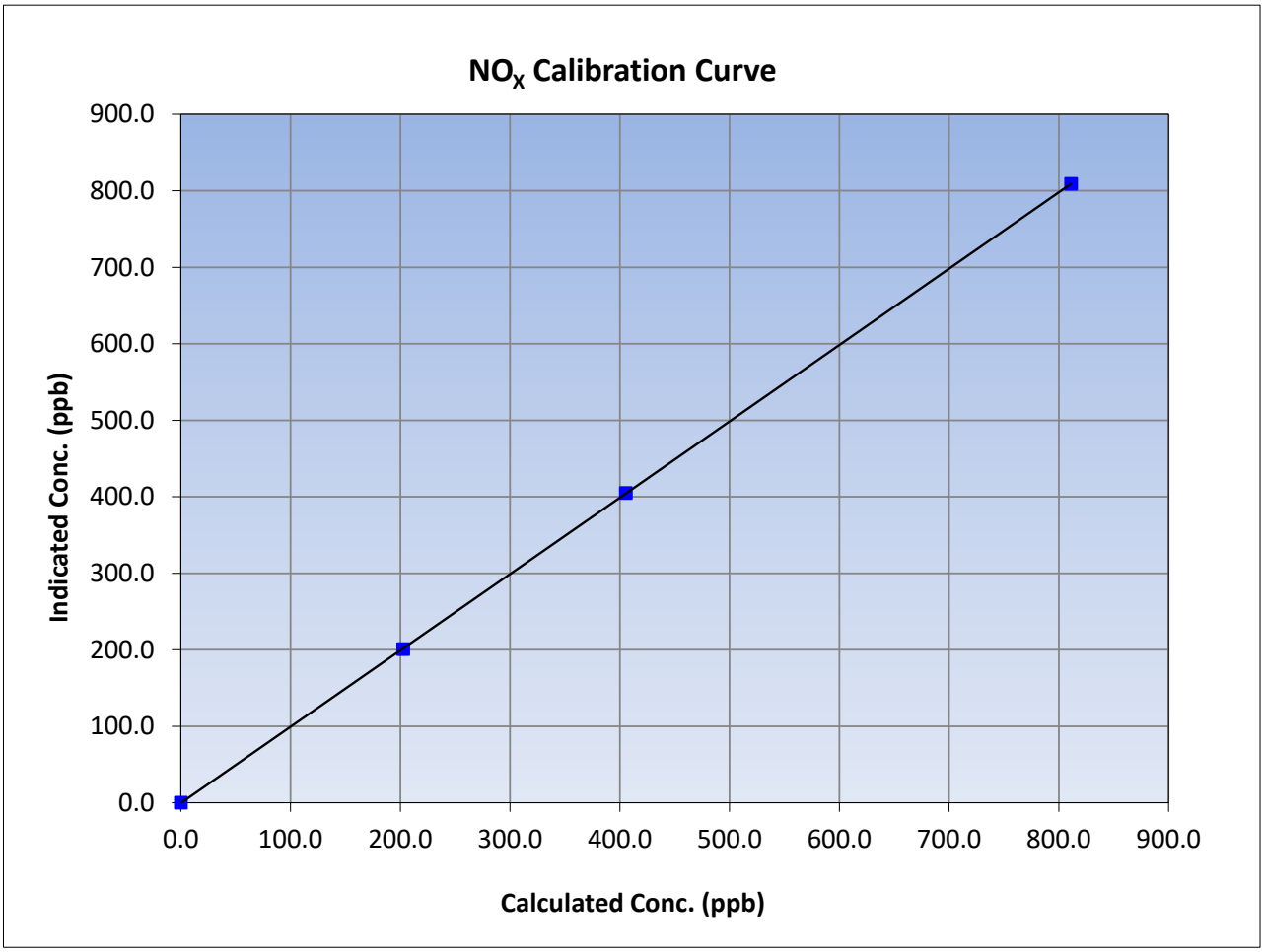
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 10:15 | End Time (MST): | 15:06 |
| 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 | 0.999996 | ≥0.995 |
| 811.1 | 809.1 | 1.0025 | | | |
| 405.6 | 404.8 | 1.0019 | Slope | 0.998146 | 0.90 - 1.10 |
| 202.8 | 200.9 | 1.0093 | | | |
| | | | Intercept | -0.500000 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

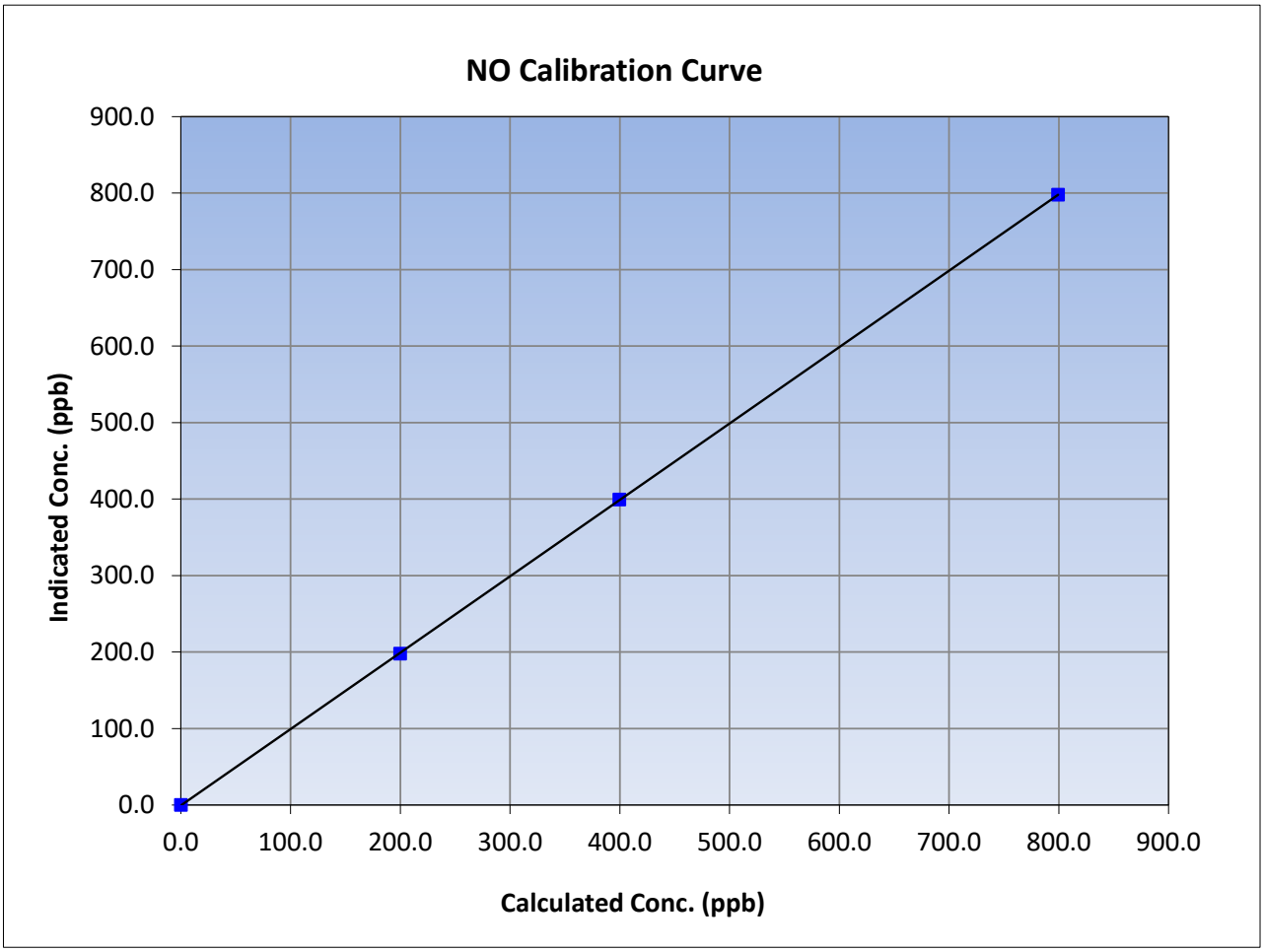
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 10:15 | End Time (MST): | 15:06 |
| 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 | 0.999994 | ≥0.995 |
| 799.3 | 797.8 | 1.0019 | | | |
| 399.7 | 399.2 | 1.0012 | Slope | 0.998819 | 0.90 - 1.10 |
| 199.8 | 197.8 | 1.0103 | | | |
| | | | Intercept | -0.600000 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

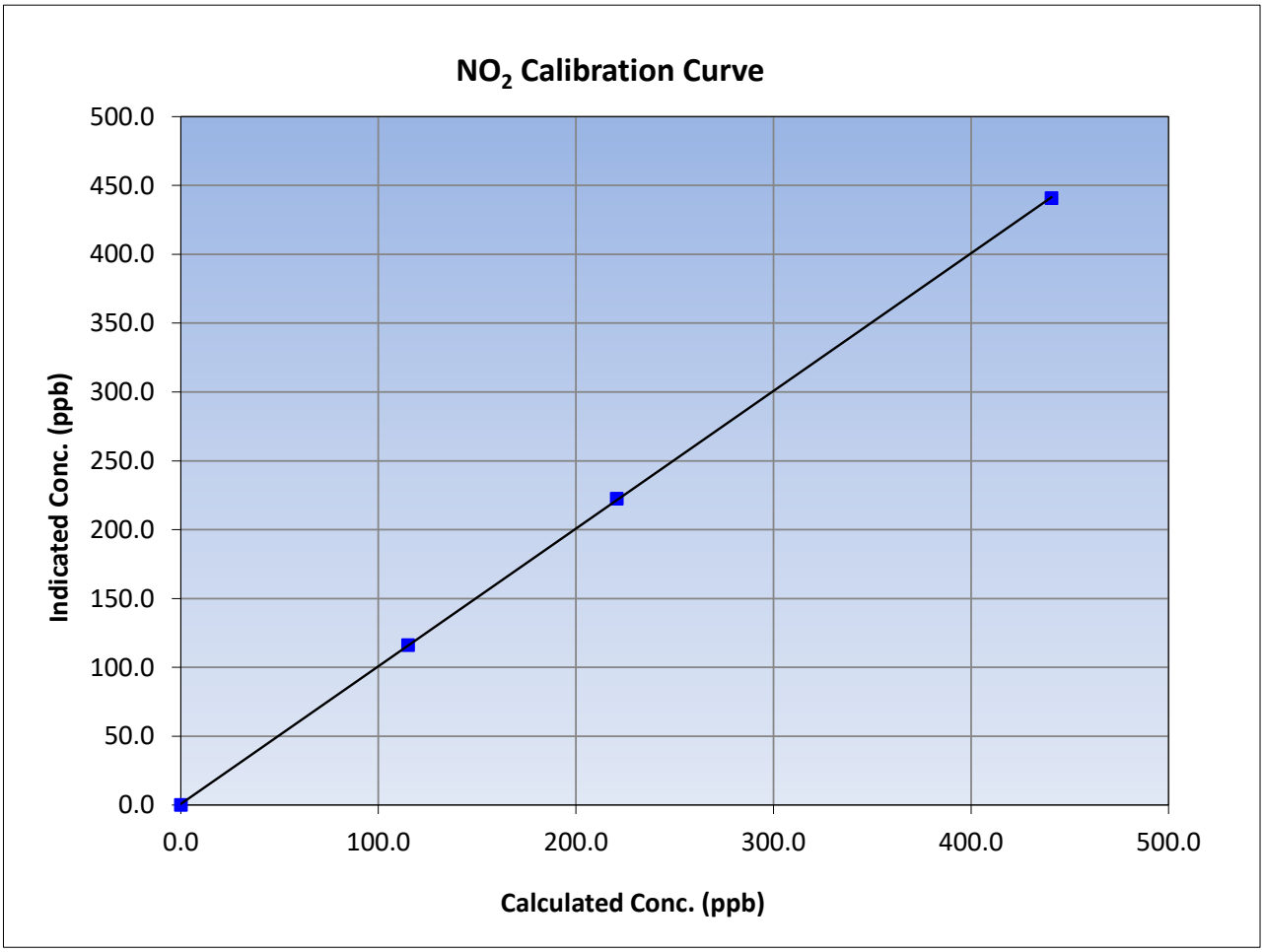
Version-04-2020

### Station Information

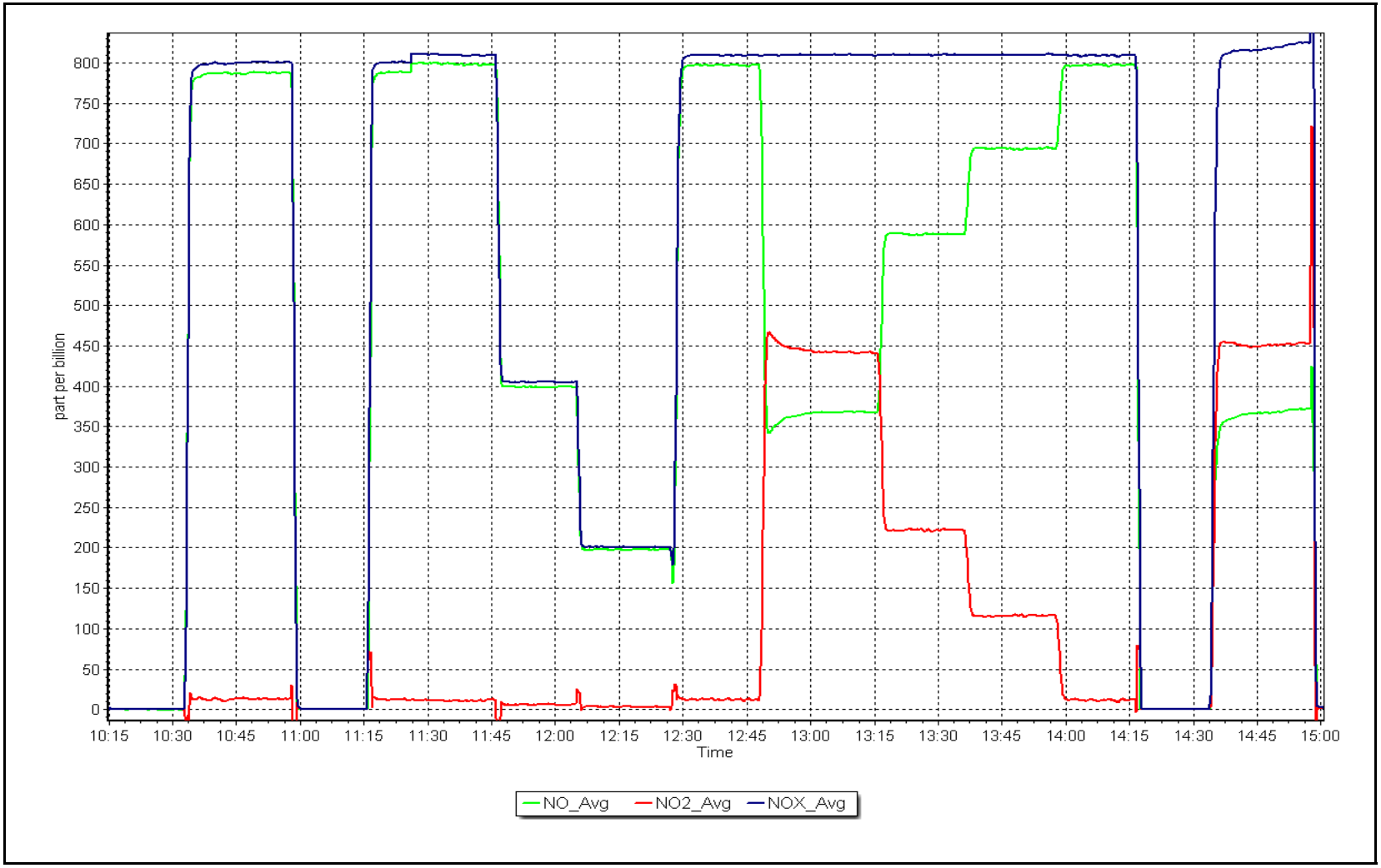
| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 10:15 | End Time (MST): | 15:06 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1336160088 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999982 | ≥0.995 |
| 440.8 | 440.9 | 0.9997 | | | |
| 220.7 | 222.4 | 0.9922 | Slope | 0.999802 | 0.90 - 1.10 |
| 115.1 | 116.1 | 0.9910 | | | |
| | | | Intercept | 0.793514 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 26, 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: | March 20, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 10:39 | End time (MST): | 13:44 |
| 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: | 1.002057 | 0.995743 | Backgd or Offset: | 0.3 | 0.3 |
| Calibration intercept: | 0.340000 | 0.220000 | Coeff or Slope: | 0.982 | 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 | 0.1 | ---- |
| as found span | 4804 | 1141.9 | 400.0 | 400.0 | 1.000 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | NA | 0.0 | 0.1 | ---- |
| high point | 4888 | 1138.1 | 400.0 | 398.3 | 1.004 |
| second point | 4888 | 884.5 | 200.0 | 199.9 | 1.001 |
| third point | 4888 | 741.4 | 100.0 | 99.6 | 1.004 |
| as left zero | 5000 | NA | 0.0 | 0.5 | ---- |
| as left span | 4812 | 1097.9 | 400.0 | 401.7 | 0.996 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 399.9 | Previous response | 401.2 | *% 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: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

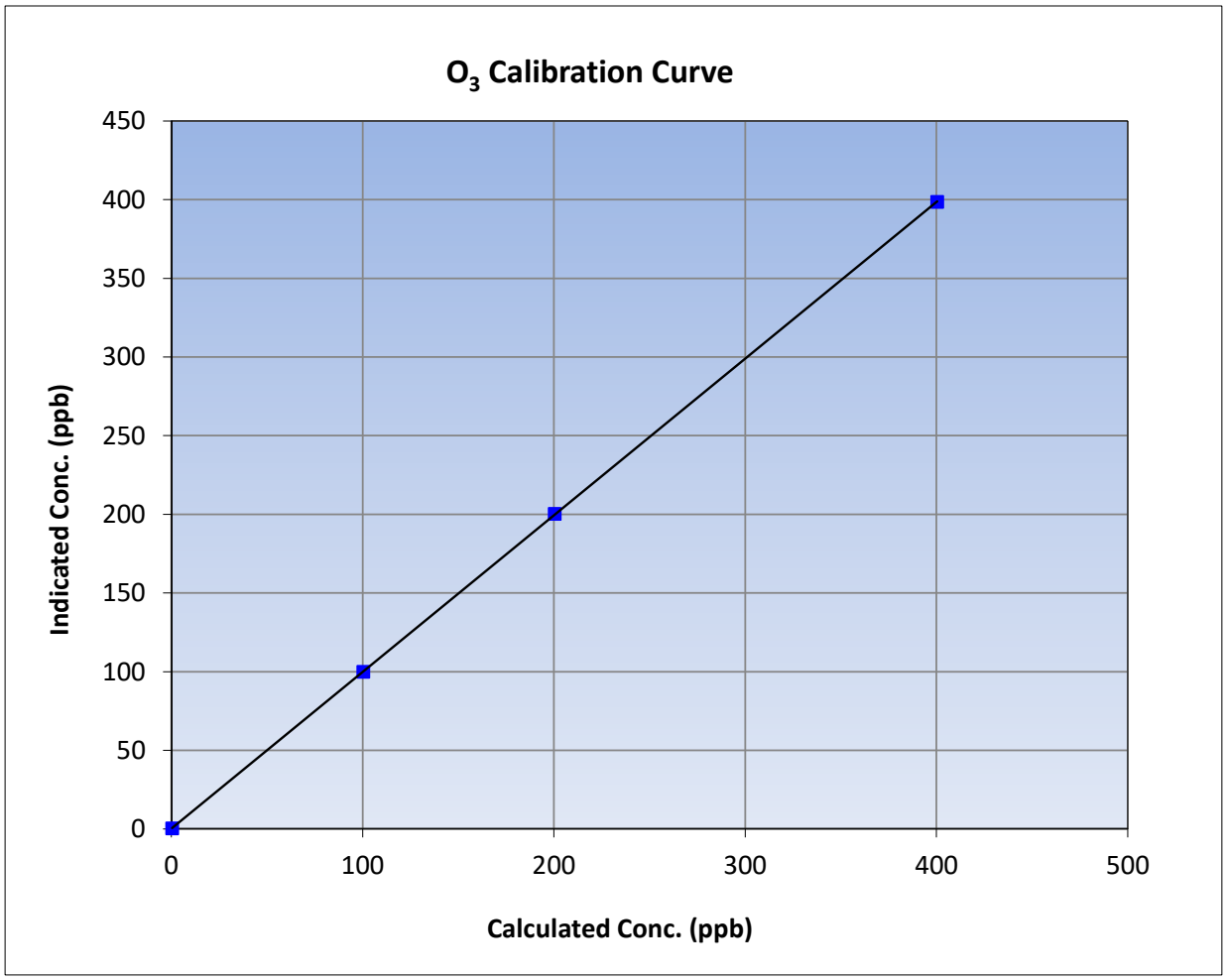
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS18 |
| Start Time (MST): | 10:39 | End Time (MST): | 13:44 |
| Analyzer make: | API T400 | Analyzer serial #: | 825 |

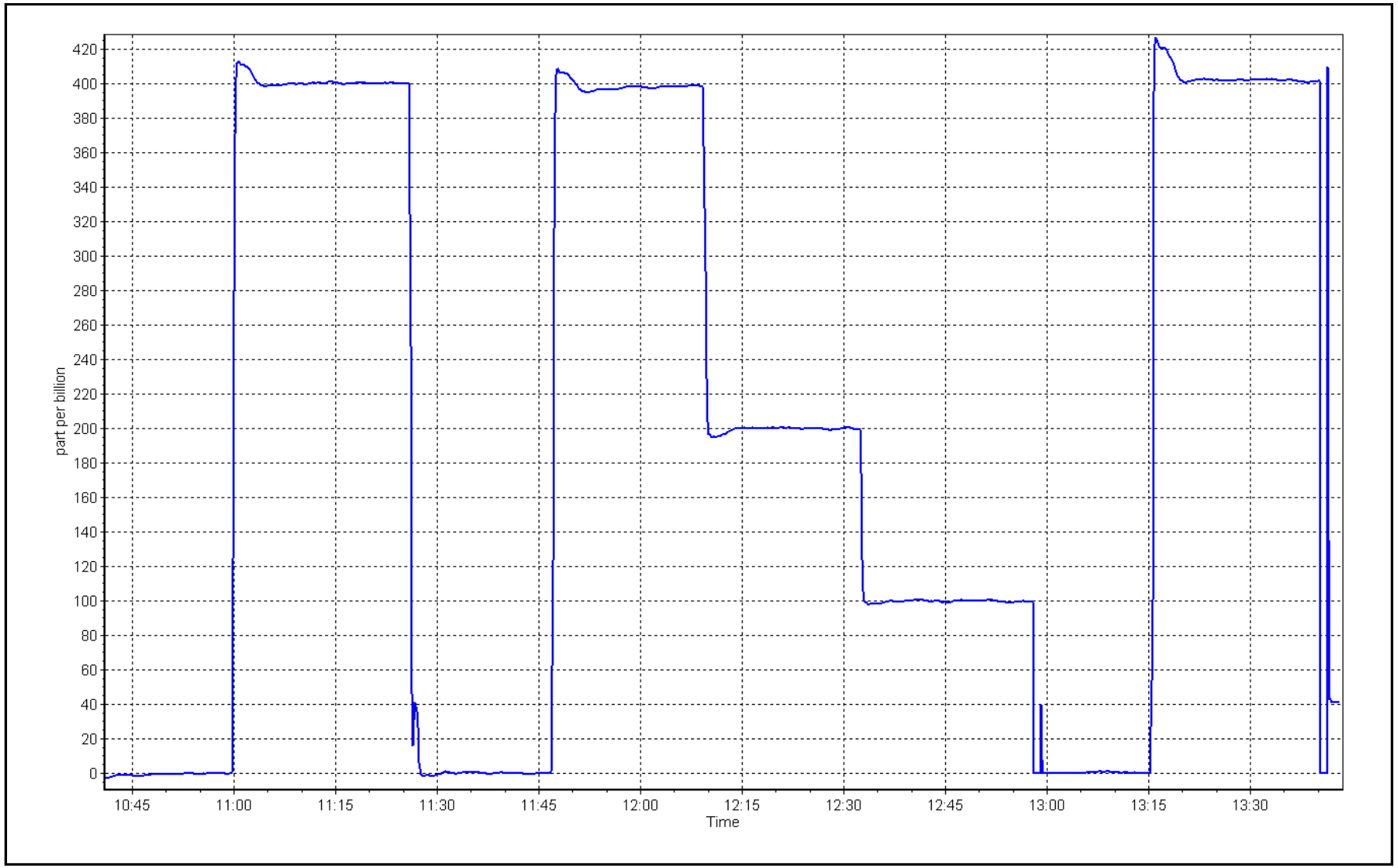
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 400.0 | 398.3 | 1.0043 |
| 200.0 | 199.9 | 1.0005 |
| 100.0 | 99.6 | 1.0040 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 0.995743 | *0.90 - 1.10* |
| Intercept | 0.220000 | *+/- 5* |



**$O_3$ Calibration Plot** Date: March 20, 2024 Location: Stony Mountain



# Wood Buffalo Environmental Association

## T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Stony Mountain | Station number: | AMS 18 |
| Calibration Date: | March 27, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 13:13 | End time (MST): | 14:30 |
| 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) | -6 | -5.7 | -6 | ☐ | +/- 2 °C |
| P (mmHg) | 696.3 | 696.19 | 696.3 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.94 | 5.03 | 4.94 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 39 | ----- | 39 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 4.1 | 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: October 10, 2024 — Lot No.: 100128-050-042

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

Date Optical Chamber Cleaned: February 21, 2024

Date Disposable Filter Changed: February 21, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: August 30, 2022

Date RH/T Sensor Cleaned: August 30, 2022

Notes: Flow, pressure and temp checked. Leak check passed.

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: | March 14, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 10:10 | End time (MST): | 13:21 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 3,080 | ppm | Cal Gas Exp Date: | November 4, 2028 |
| Cal Gas Cylinder #: | EB0065608 | | | |
| Removed Cal Gas Conc: | 3,080 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 2658 |
| ZAG Make/Model: | Teledyne API T701H | | Serial Number: | 355 |

### Analyzer Information

Analyzer make: API T300 — Analyzer serial #: 3504

Analyzer Range: 0 - 50 ppm

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| Calibration slope: | 0.989898 | 0.996462 | Backgd or Offset: | -0.010 | -0.010 |
| Calibration intercept: | 0.085783 | 0.037795 | Coeff or Slope: | 0.901 | 0.905 |

### 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 | 41.1 | 40.9 | 1.004 |
| 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 | 41.1 | 40.9 | 1.005 |
| second point | 4966 | 33.3 | 20.5 | 20.7 | 0.993 |
| third point | 4983 | 16.7 | 10.3 | 10.2 | 1.005 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4933 | 66.7 | 41.1 | 41.0 | 1.003 |
| | | | | Average Correction Factor | 1.001 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 40.82 | Prev response: | 40.76 | *% 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: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## CO Calibration Summary

Version-01-2020

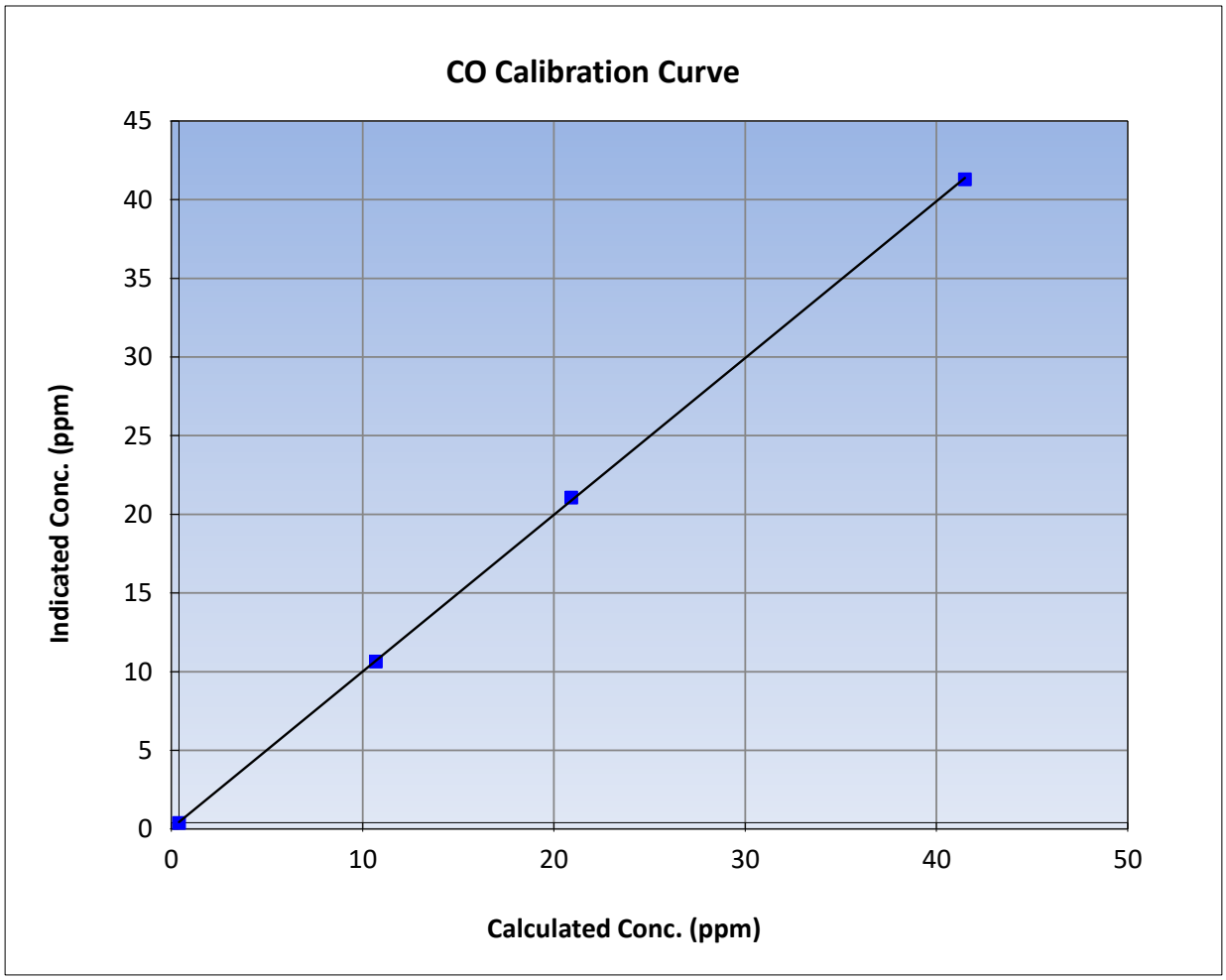
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Stony Mountain | Station Number: | AMS 18 |
| Start Time (MST): | 10:10 | End Time (MST): | 13:21 |
| Analyzer make: | API T300 | Analyzer serial #: | 3504 |

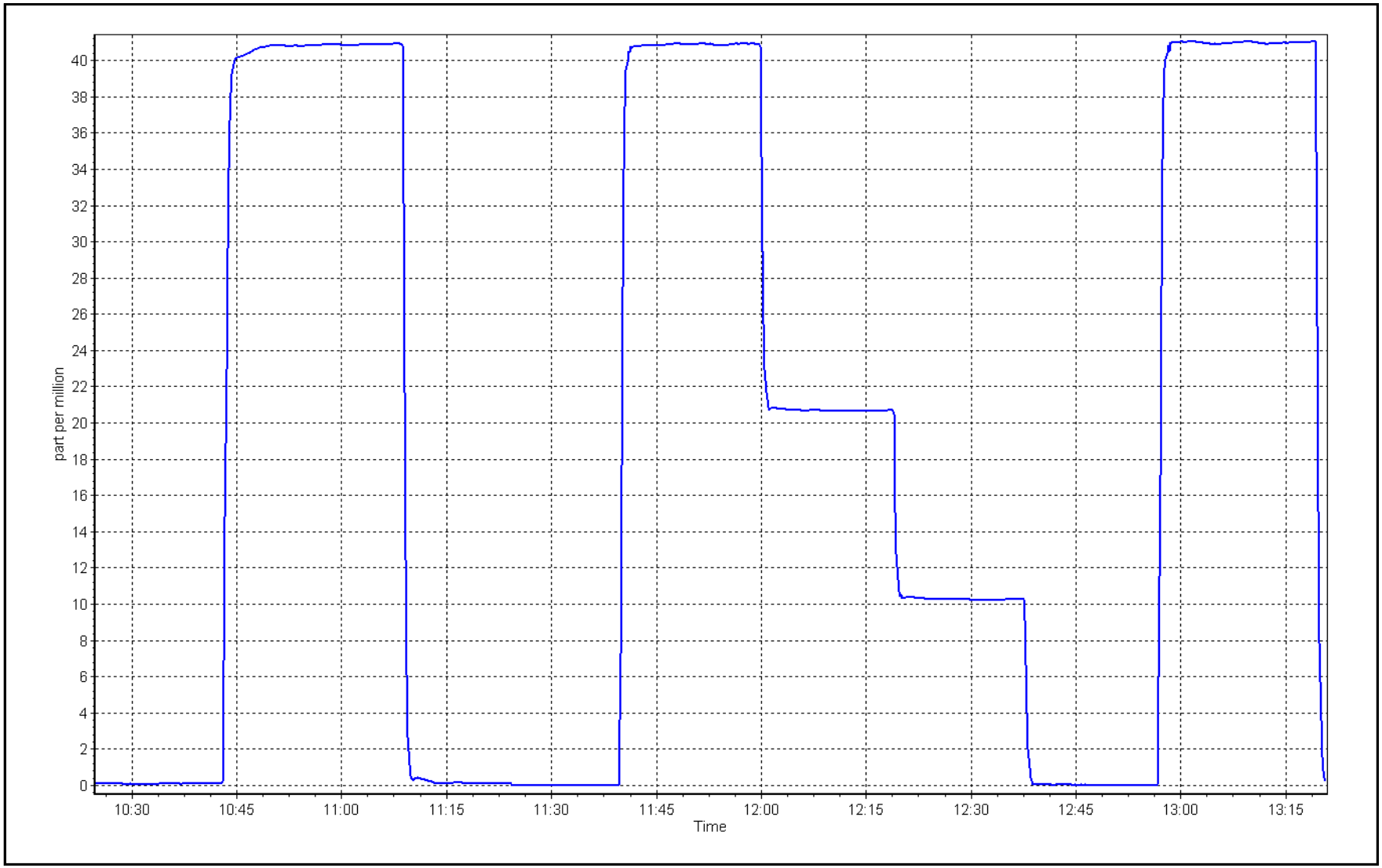
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 41.1 | 40.9 | 1.0046 |
| 20.5 | 20.7 | 0.9925 |
| 10.3 | 10.2 | 1.0047 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999947 | *≥0.995* |
| Slope | 0.996462 | *0.90 - 1.10* |
| Intercept | 0.037795 | *+/-1.5* |



**CO Calibration Plot** Date: March 14, 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: | March 21, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 10:40 | End time (MST): | 13:53 |
| 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: | 1.030319 | 1.000660 | Backgd or Offset: | -0.037 | -0.037 |
| Calibration intercept: | -5.680000 | -4.780000 | Coeff or Slope: | 0.945 | 0.939 |

### $CO_2$ 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 | -0.4 | ---- |
| as found span | 2920 | 80.0 | 1576.0 | 1613.0 | 0.977 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 3000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 2920 | 80.0 | 1576.0 | 1576.5 | 1.000 |
| second point | 2960 | 40.0 | 788.0 | 775.8 | 1.016 |
| third point | 2980 | 20.0 | 394.0 | 388.4 | 1.014 |
| as left zero | 3000 | 0.0 | 0.0 | -0.2 | ---- |
| as left span | 2930 | 80.0 | 1570.8 | 1576.3 | 0.996 |
| | | | | Average Correction Factor | 1.010 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 1613.40 | Prev response: | 1618.10 | *% 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: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## $CO_2$ Calibration Summary

Version-01-2020

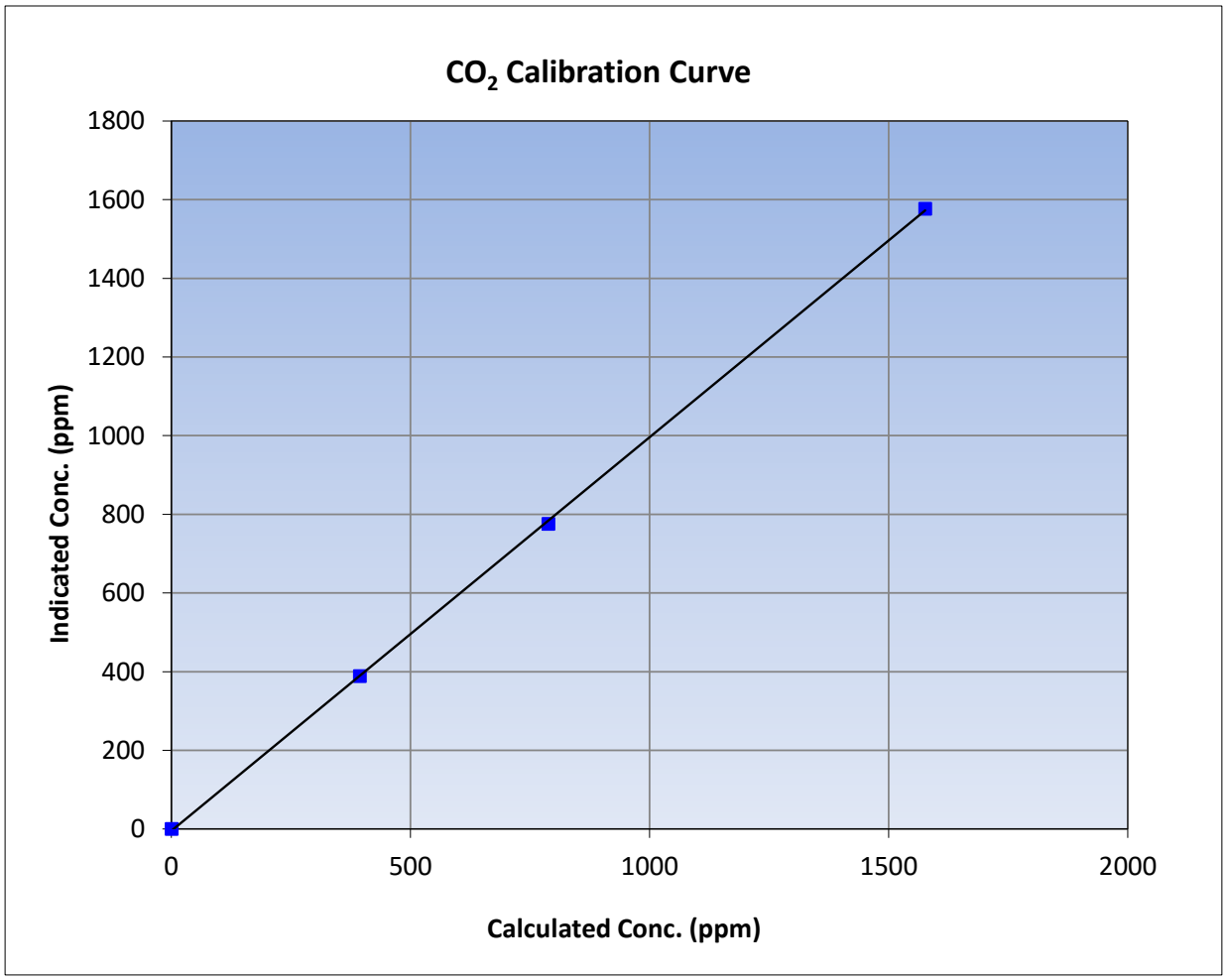
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date | March 21, 2024 | Previous Calibration | February 7, 2024 |
| Station Name | Stony Mountain | Station Number | AMS 18 |
| Start Time (MST) | 10:40 | End Time (MST) | 13:53 |
| Analyzer make | API T360 | Analyzer serial # | 489 |

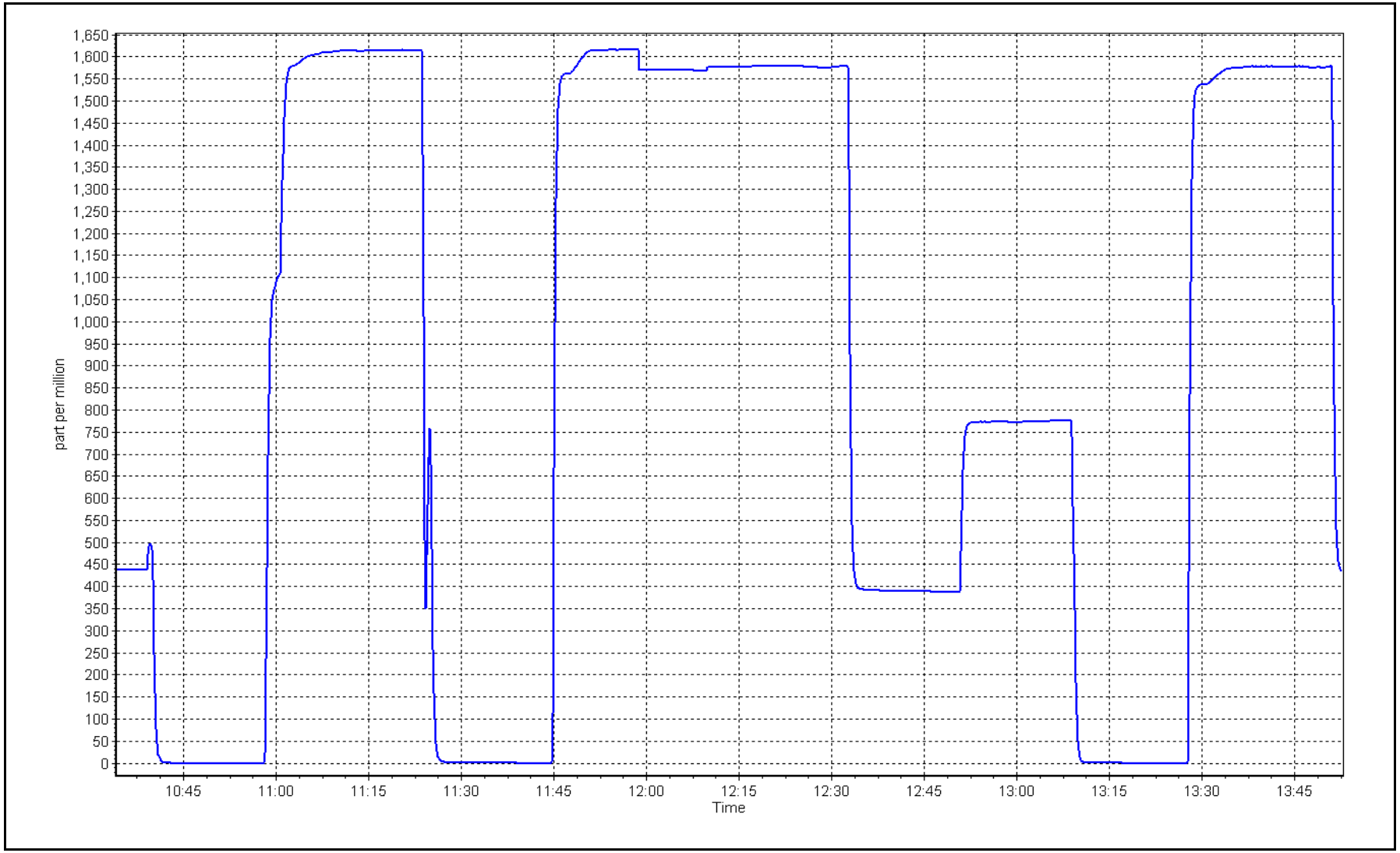
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 1576.0 | 1576.5 | 0.9997 |
| 788.0 | 775.8 | 1.0157 |
| 394.0 | 388.4 | 1.0144 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999923 | *≥0.995* |
| Slope | 1.000660 | *0.90 - 1.10* |
| Intercept | -4.780000 | *+/-10* |



**$CO_2$ Calibration Plot** Date: March 21, 2024 Location: Stony Mountain



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS19
## FIREBAG
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS 19 |
| Calibration Date: | March 12, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 10:17 | End time (MST): | 13:53 |
| 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: | 1.003793 | 0.997705 | Backgd or Offset: | 10.5 | 10.5 |
| Calibration intercept: | 0.237576 | 0.418240 | Coeff or Slope: | 0.984 | 0.991 |

### $SO_2$ 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 | 0.0 | ---- |
| as found span | 4919 | 81.1 | 799.5 | 794.4 | 1.006 |
| 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 | 797.8 | 1.002 |
| second point | 4959 | 40.6 | 400.3 | 400.2 | 1.000 |
| third point | 4980 | 20.3 | 200.1 | 200.2 | 1.000 |
| as left zero | 4999 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 81.1 | 799.5 | 799.5 | 1.000 |
| | | | | Average Correction Factor | 1.001 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 794.40 | Previous response | 802.74 | *% 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: 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

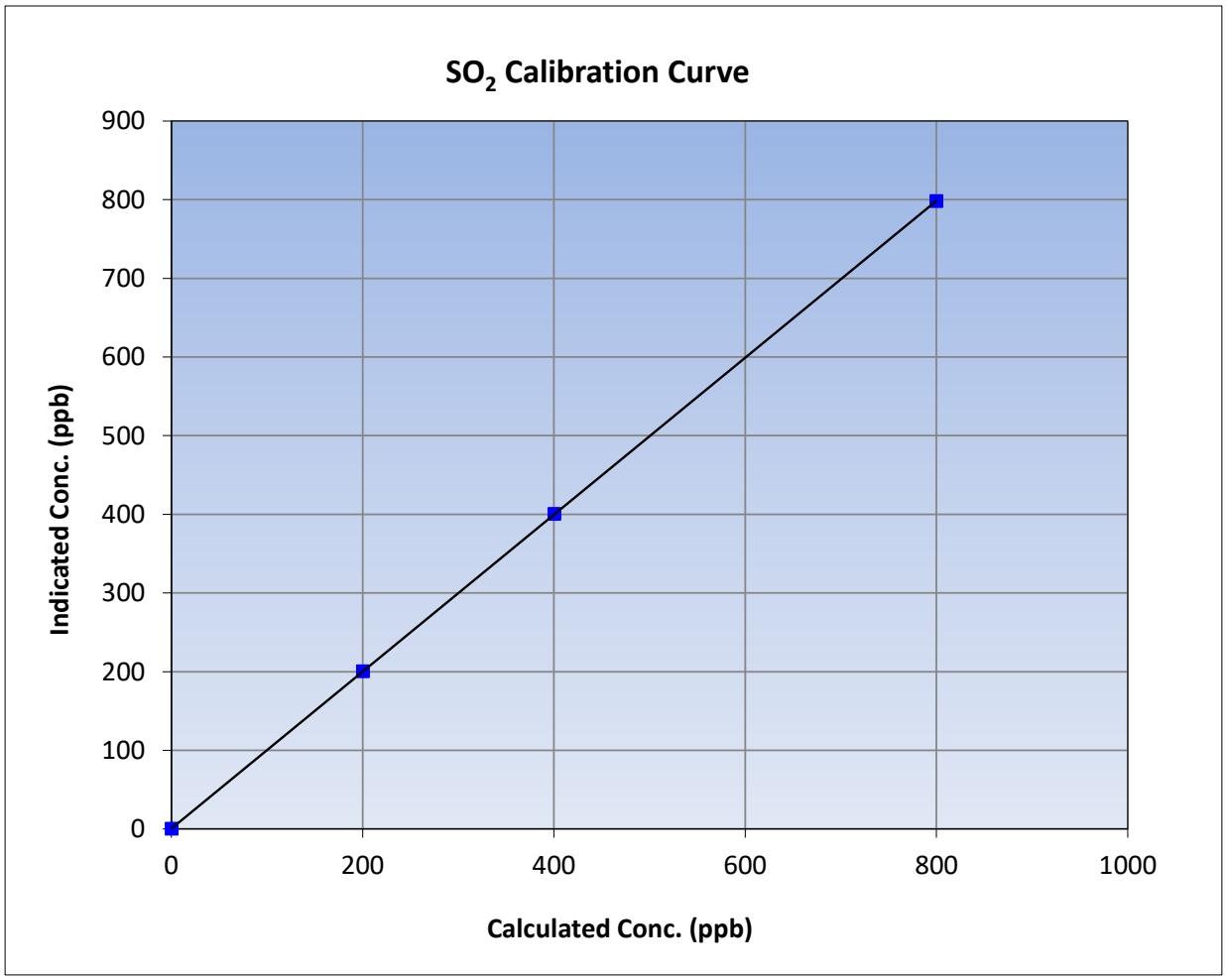
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 10:17 | End Time (MST): | 13:53 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1410661308 |

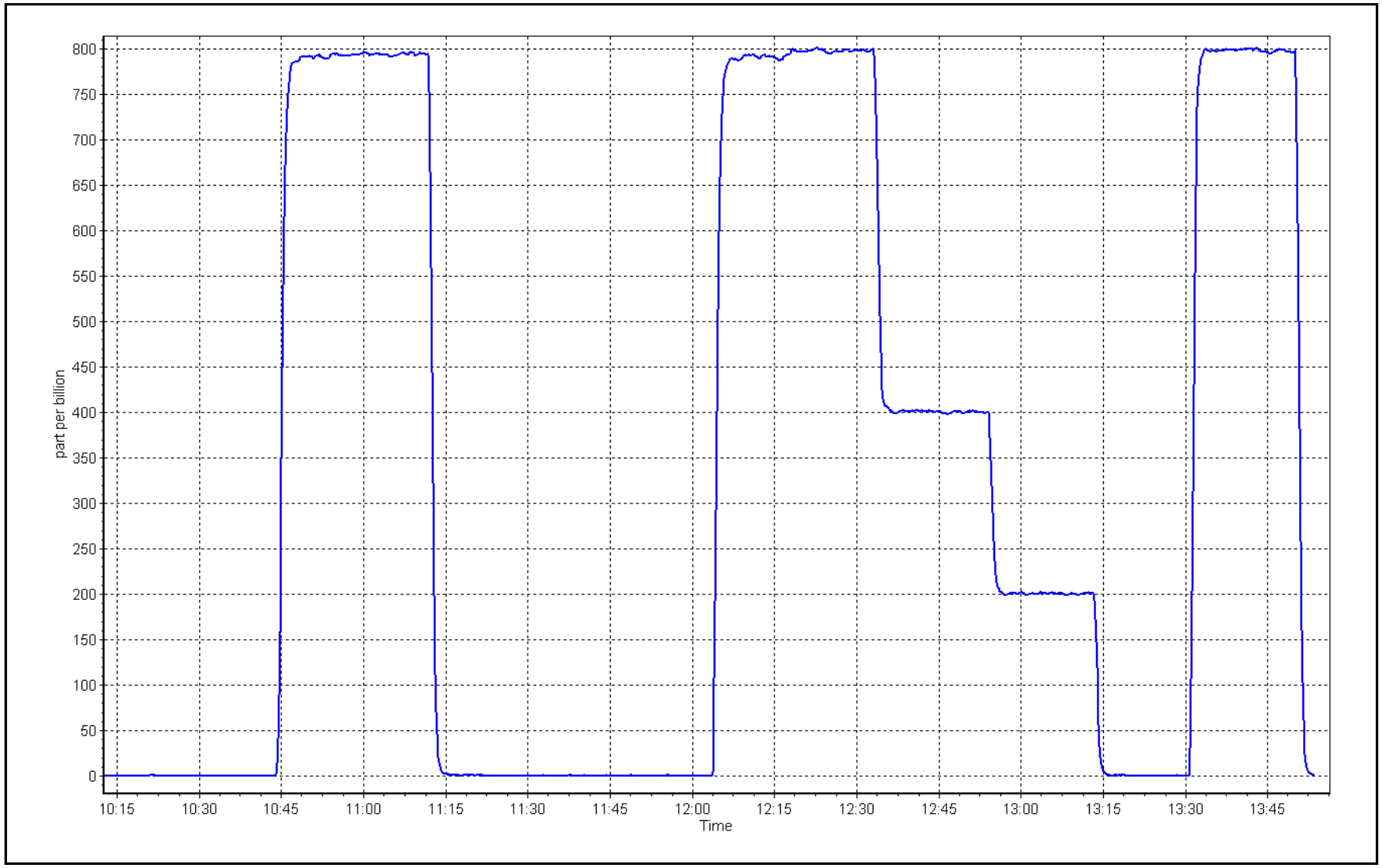
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 799.5 | 797.8 | 1.0021 |
| 400.3 | 400.2 | 1.0002 |
| 200.1 | 200.2 | 0.9995 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 0.997705 | *0.90 - 1.10* |
| Intercept | 0.418240 | *+/-30* |



**SO2 Calibration Plot** Date: March 12, 2024 Location: Firebag



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS19 |
| Calibration Date: | March 5, 2024 | Last Cal Date: | February 1, 2024 |
| Start time (MST): | 12:36 | End time (MST): | 18:10 |
| 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: | 1.000909 | 0.999337 | Backgd or Offset: | 2.77 | 3.22 |
| Calibration intercept: | -0.061541 | -0.081535 | Coeff or Slope: | 1.166 | 1.198 |

### $H_2S$ 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 | 78.2 | 80.0 | 77.8 | 1.033 |
| as found 2nd point | 4961 | 39.1 | 40.0 | 39.3 | 1.028 |
| as found 3rd point | 4980 | 19.6 | 20.0 | 19.8 | 1.033 |
| 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 | 78.2 | 80.0 | 79.8 | 1.002 |
| 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 | 0.0 | ---- |
| as left span | 4922 | 78.2 | 80.0 | 79.2 | 1.010 |
| SO2 Scrubber Check | 4922 | 78.3 | 800.2 | 0.0 | ---- |
| Date of last scrubber change: | | January 18, 2023 | | Ave Corr Factor | 1.003 |
| Date of last converter efficiency test: | | n/a | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 77.4 | Prev response: | 79.99 | *% change: | -3.3% |
| Baseline Corr 2nd AF pt: | 38.9 | AF Slope: | 0.968037 | AF Intercept: | 0.439136 |
| Baseline Corr 3rd AF pt: | 19.4 | AF Correlation: | 0.999991 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. Ran SOx scrubber check after cal zero. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

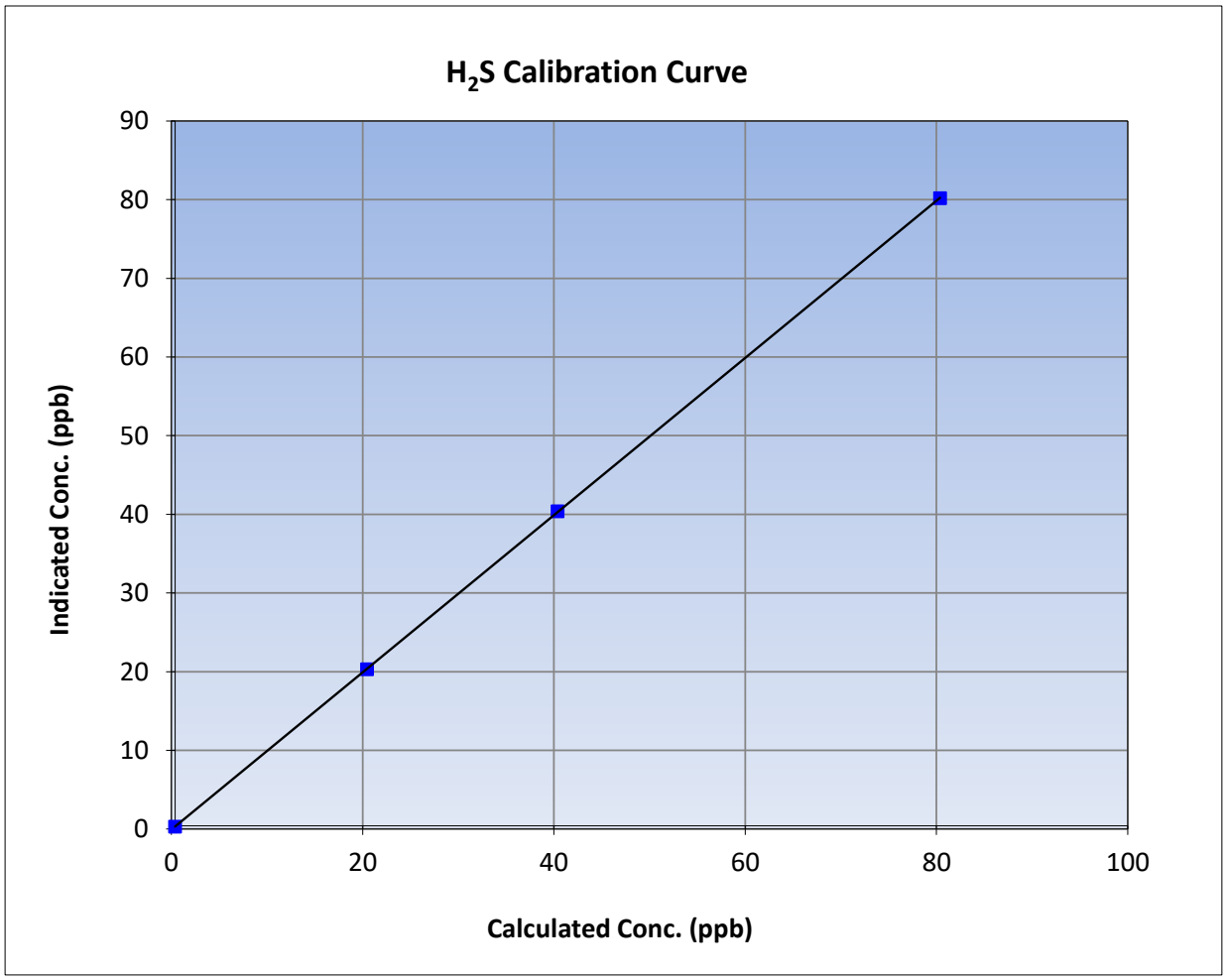
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Firebag | Station Number: | AMS19 |
| Start Time (MST): | 12:36 | End Time (MST): | 18:10 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1151680032 |

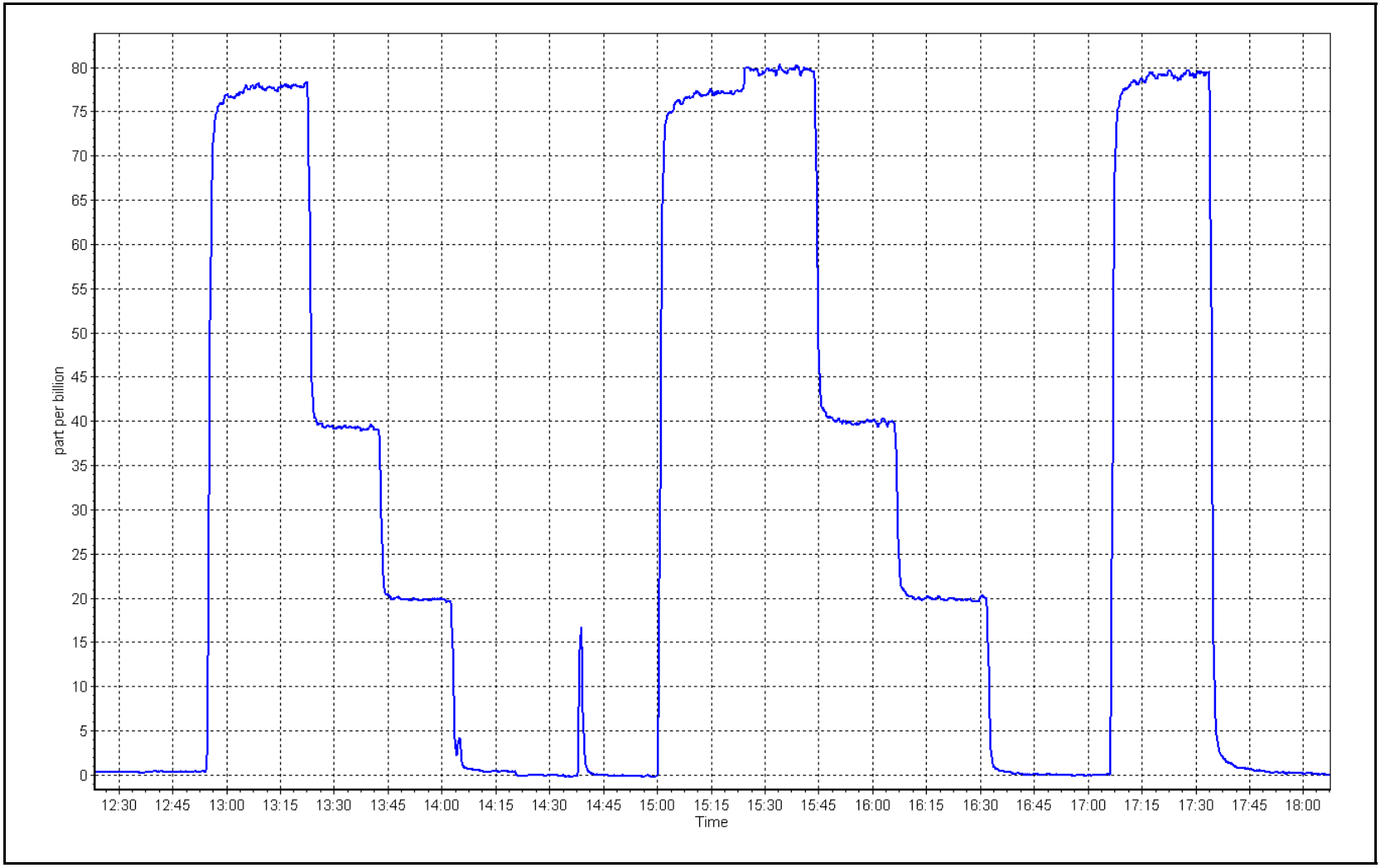
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.1 | ---- |
| 80.0 | 79.8 | 1.0023 |
| 40.0 | 40.0 | 0.9998 |
| 20.0 | 19.9 | 1.0075 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999995 | *≥0.995* |
| Slope | 0.999337 | *0.90 - 1.10* |
| Intercept | -0.081535 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 5, 2024 Location: Firebag



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS 19 |
| Calibration Date: | March 12, 2024 | Last Cal Date: | February 27, 2024 |
| Start time (MST): | 10:32 | End time (MST): | 13:53 |
| 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: | 1.002921 | 1.003849 | Background: | 2.03 | 2.15 |
| Calibration intercept: | -0.061568 | -0.040348 | Coefficient: | 3.764 | 3.788 |

### 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 | 0.04 | ---- |
| as found span | 4919 | 81.1 | 17.31 | 17.35 | 0.997 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 4999 | 0.0 | 0.00 | 0.02 | ---- |
| high point | 4919 | 81.1 | 17.31 | 17.37 | 0.996 |
| second point | 4959 | 40.6 | 8.66 | 8.60 | 1.007 |
| third point | 4980 | 20.3 | 4.33 | 4.27 | 1.015 |
| as left zero | 5000 | 0.0 | 0.00 | -0.04 | ---- |
| as left span | 4919 | 81.1 | 17.31 | 17.49 | 0.989 |
| | | | | Average Correction Factor | 1.006 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.31 | Previous response | 17.29 | *% 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. Changed out hydrogen cylinder. Adjusted zero.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

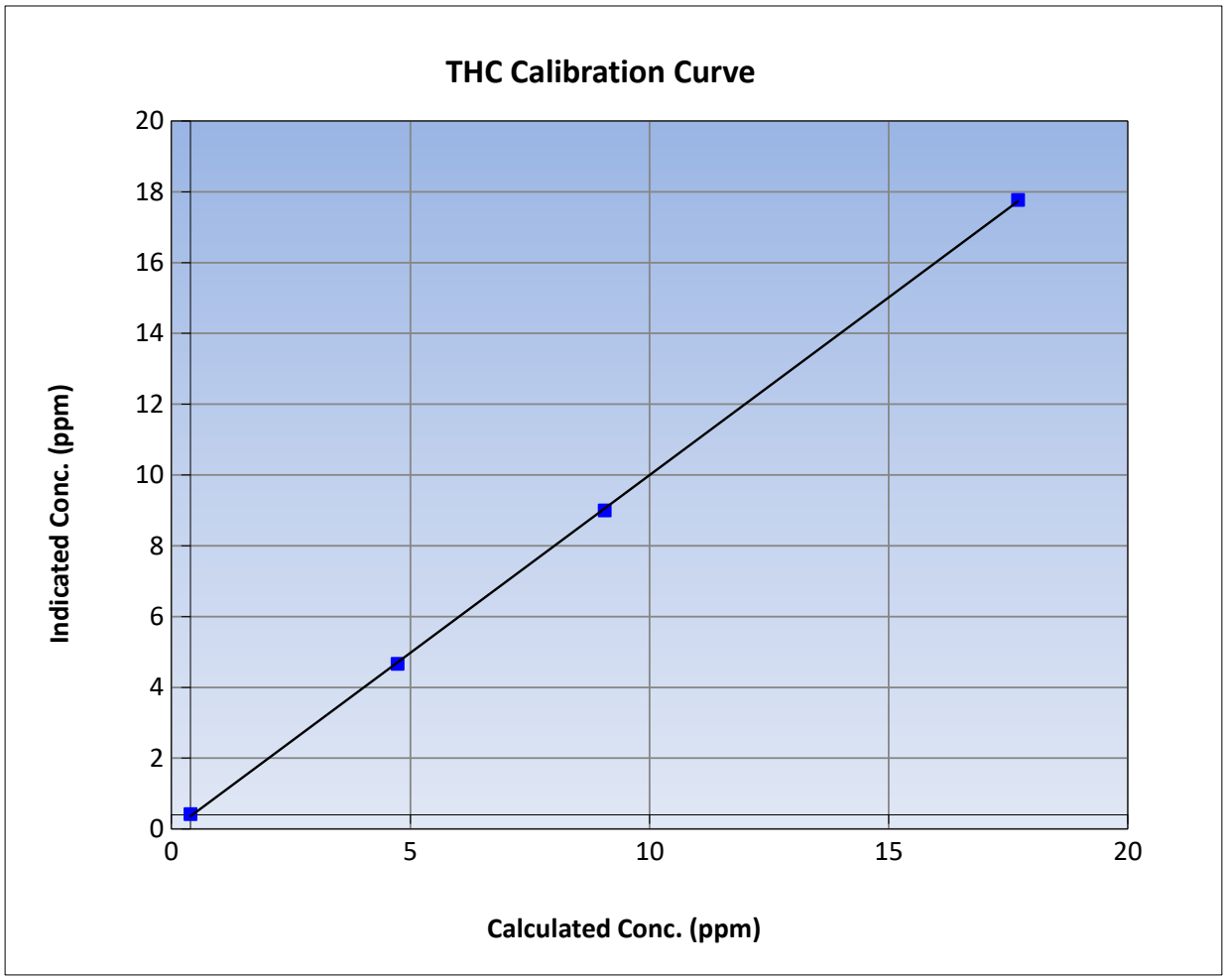
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 27, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 10:32 | End Time (MST): | 13:53 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1336160089 |

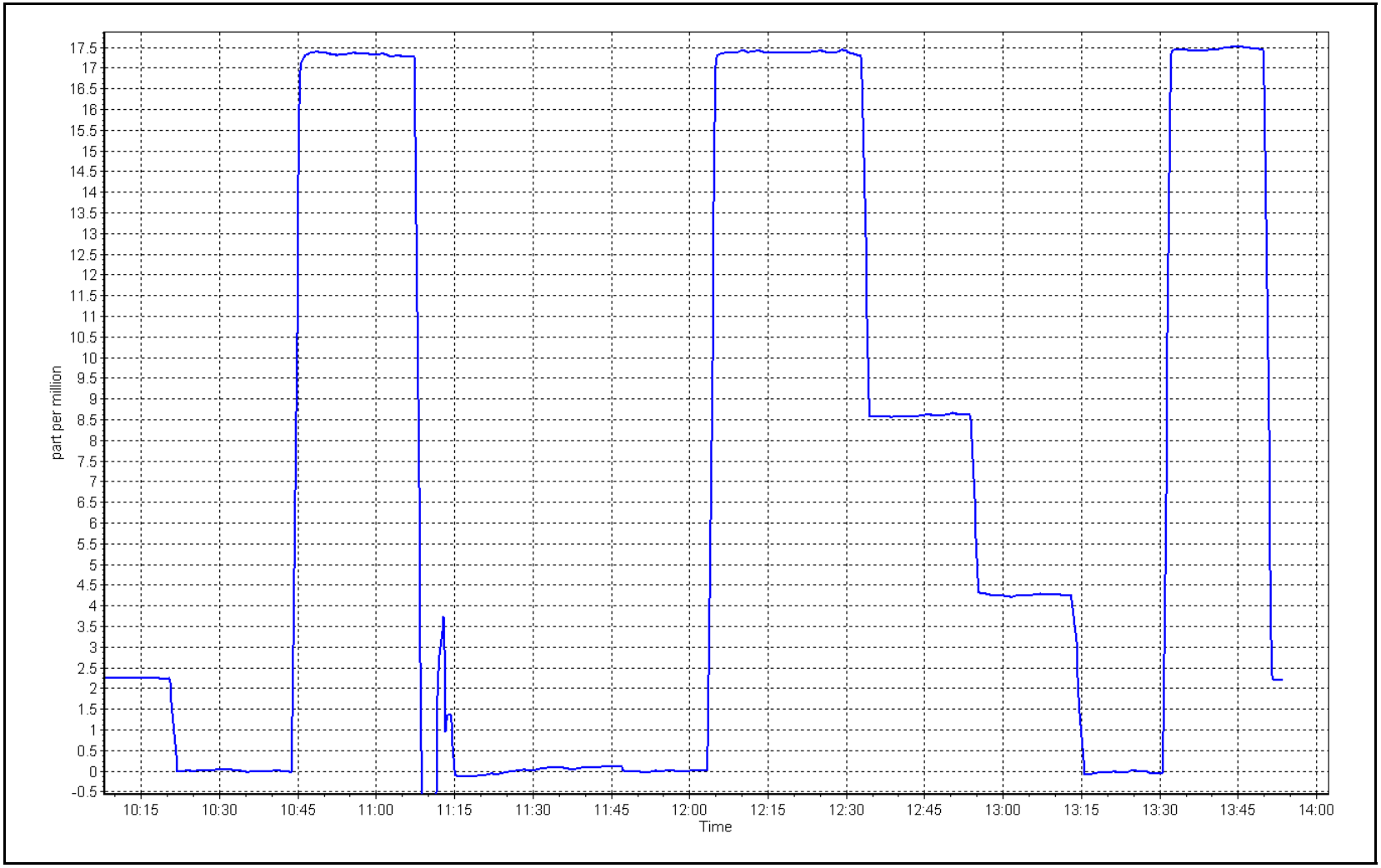
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | 0.02 | ---- |
| 17.31 | 17.37 | 0.9963 |
| 8.66 | 8.60 | 1.0075 |
| 4.33 | 4.27 | 1.0149 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999941 | *≥0.995* |
| Slope | 1.003849 | *0.90 - 1.10* |
| Intercept | -0.040348 | *+/-1.5* |



**THC Calibration Plot** Date: March 12, 2024 Location: Firebag



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Firebag | Station number: | AMS 19 |
| Calibration Date: | March 20, 2024 | Last Cal Date: | March 12, 2024 |
| Start time (MST): | 11:13 | End time (MST): | 13:43 |
| Reason: | Maintenance | | |

### 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 T701H | | Serial Number: | 201 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1336160089 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.003849 | | Background: | 2.15 | 2.15 |
| Calibration intercept: | -0.040348 | | Coefficient: | 3.788 | 3.788 |

### THC Calibration Data

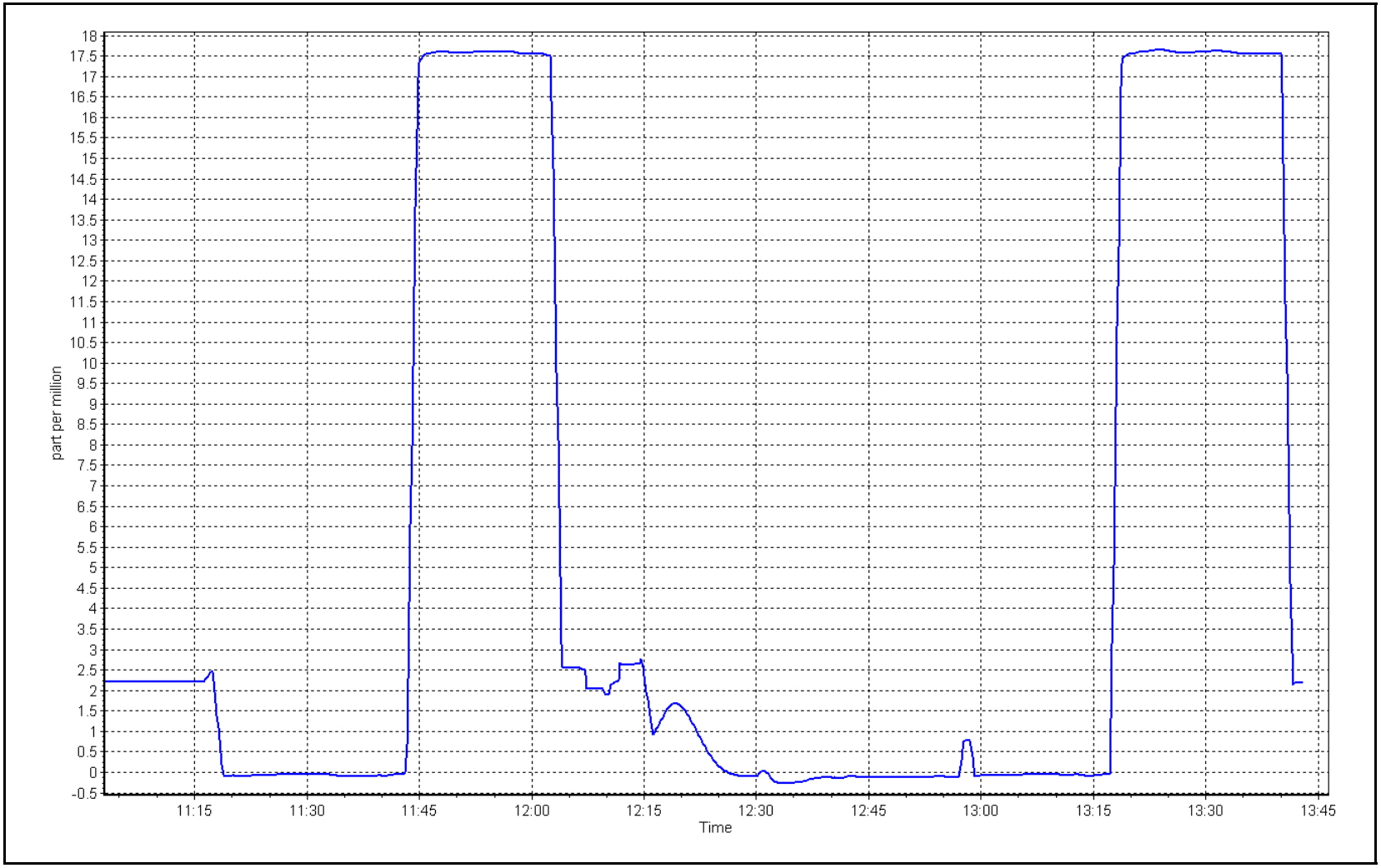
| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| as found zero | 4999 | 0.0 | 0.00 | -0.06 | ---- |
| as found span | 4919 | 81.1 | 17.31 | 17.55 | 0.986 |
| 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 | -0.07 | ---- |
| as left span | 4919 | 81.1 | 17.31 | 17.56 | 0.985 |
| | | | | Average Correction Factor | |
| Baseline Corr As found: | 17.61 | Previous response | 17.33 | *% 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: Swapped ZAG due to leak. Removed T701 SN: 1118, installed T701H SN: 201.

Calibration Performed By: Braiden Boutilier

**THC Calibration Plot** Date: March 20, 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: | March 21, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 9:41 | End time (MST): | 14:49 |
| 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: | 201 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 42i | | Analyzer serial #: | 1410661309 | |
| NOX Range (ppb): | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| NO coeff or slope: | 1.081 | 1.040 | NO bkgnd or offset: | 7.6 | 7.3 |
| NOX coeff or slope: | 0.996 | 0.995 | NOX bkgnd or offset: | 7.7 | 7.4 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 216.5 | 222.0 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.006289 | 0.993092 |
| $NO_X$ Cal Offset: | 0.400360 | -0.219382 |
| NO Cal Slope: | 1.006923 | 0.994756 |
| NO Cal Offset: | 0.340247 | -0.699633 |
| $NO_2$ Cal Slope: | 0.998051 | 1.011032 |
| $NO_2$ Cal Offset: | -0.640112 | -1.734028 |

# 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 | 0.0 | -0.3 | ---- | ---- |
| as found span | 4918 | 82.1 | 802.9 | 799.7 | 3.3 | 840.0 | 835.0 | 4.2 | 0.9559 | 0.9577 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 4999 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ---- | ---- |
| high point | 4918 | 82.1 | 802.9 | 799.7 | 3.3 | 797.6 | 795.3 | 2.3 | 1.0067 | 1.0055 |
| second point | 4959 | 41.1 | 402.0 | 400.3 | 1.6 | 397.9 | 396.6 | 1.3 | 1.0102 | 1.0094 |
| third point | 4980 | 20.5 | 200.5 | 199.7 | 0.8 | 199.3 | 197.6 | 1.7 | 1.0060 | 1.0105 |
| as left zero | 4999 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | -0.1 | ---- | ---- |
| as left span | 4918 | 82.1 | 802.9 | 395.7 | 407.3 | 785.5 | 373.4 | 412.1 | 1.0222 | 1.0596 |
| | | | | | | | | Average Correction Factor | 1.0076 | 1.0084 |

Corrected As found $NO_X$ = 840.3 ppb NO = 835.0 ppb

Previous Response $NO_X$ = 808.4 ppb NO = 805.5 ppb

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

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

* = > +/-5% change initiates investigation

*Percent Change $NO_X$ = 3.8%

*Percent Change NO = 3.5%

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) | 777.7 | 373.7 | 407.3 | 411.1 | 0.9907 | 100.9% |
| 2nd GPT point (200 ppb O3) | 777.7 | 576.1 | 204.9 | 204.0 | 1.0043 | 99.6% |
| 3rd GPT point (100 ppb O3) | 777.7 | 678.5 | 102.5 | 100.5 | 1.0197 | 98.1% |
| | | | | Average Correction Factor | 1.0049 | 99.5% |

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

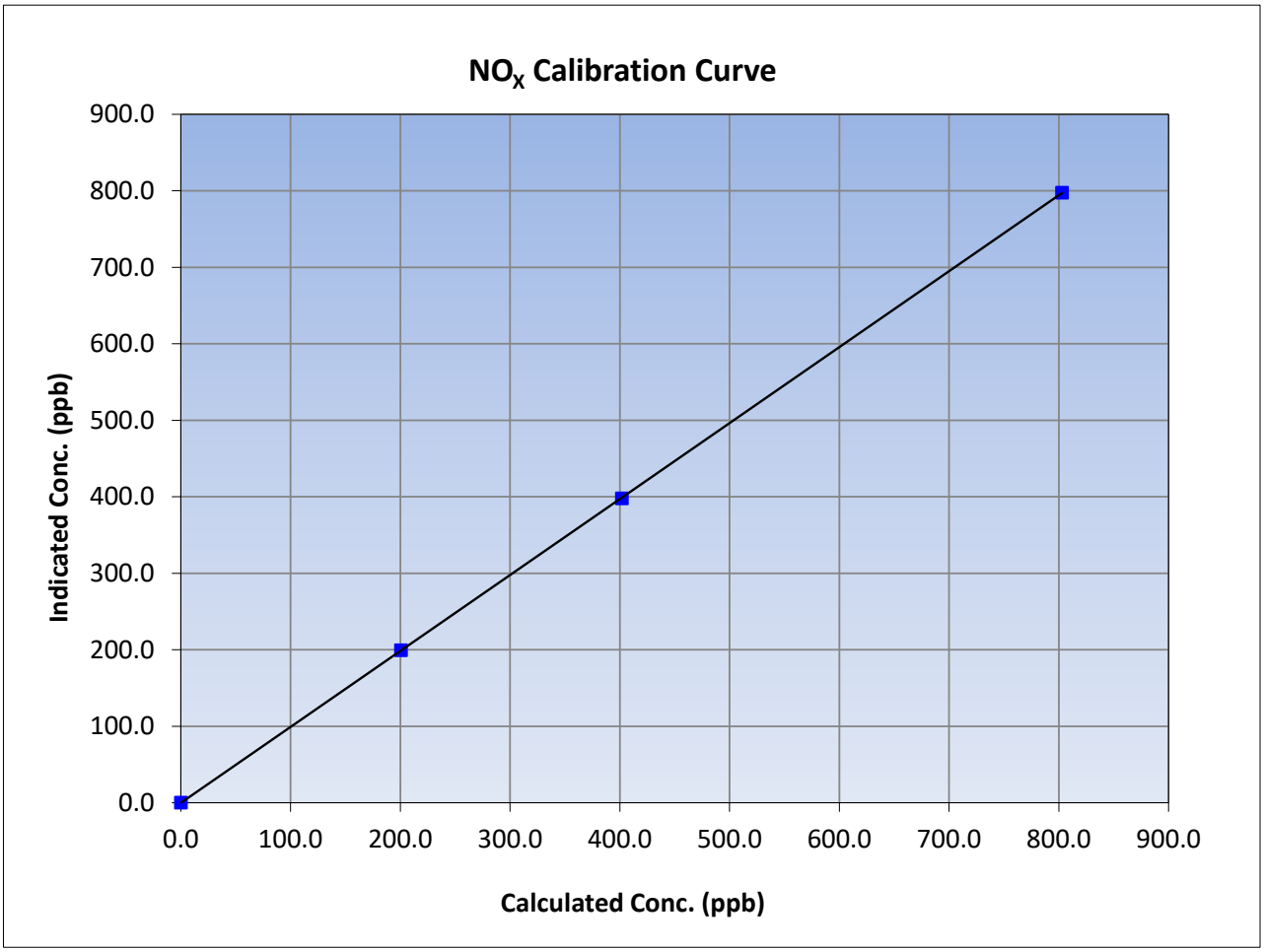
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 9:41 | End Time (MST): | 14:49 |
| 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 | 0.0 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 802.9 | 797.6 | 1.0067 | | | |
| 402.0 | 397.9 | 1.0102 | Slope | 0.993092 | 0.90 - 1.10 |
| 200.5 | 199.3 | 1.0060 | | | |
| | | | Intercept | -0.219382 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

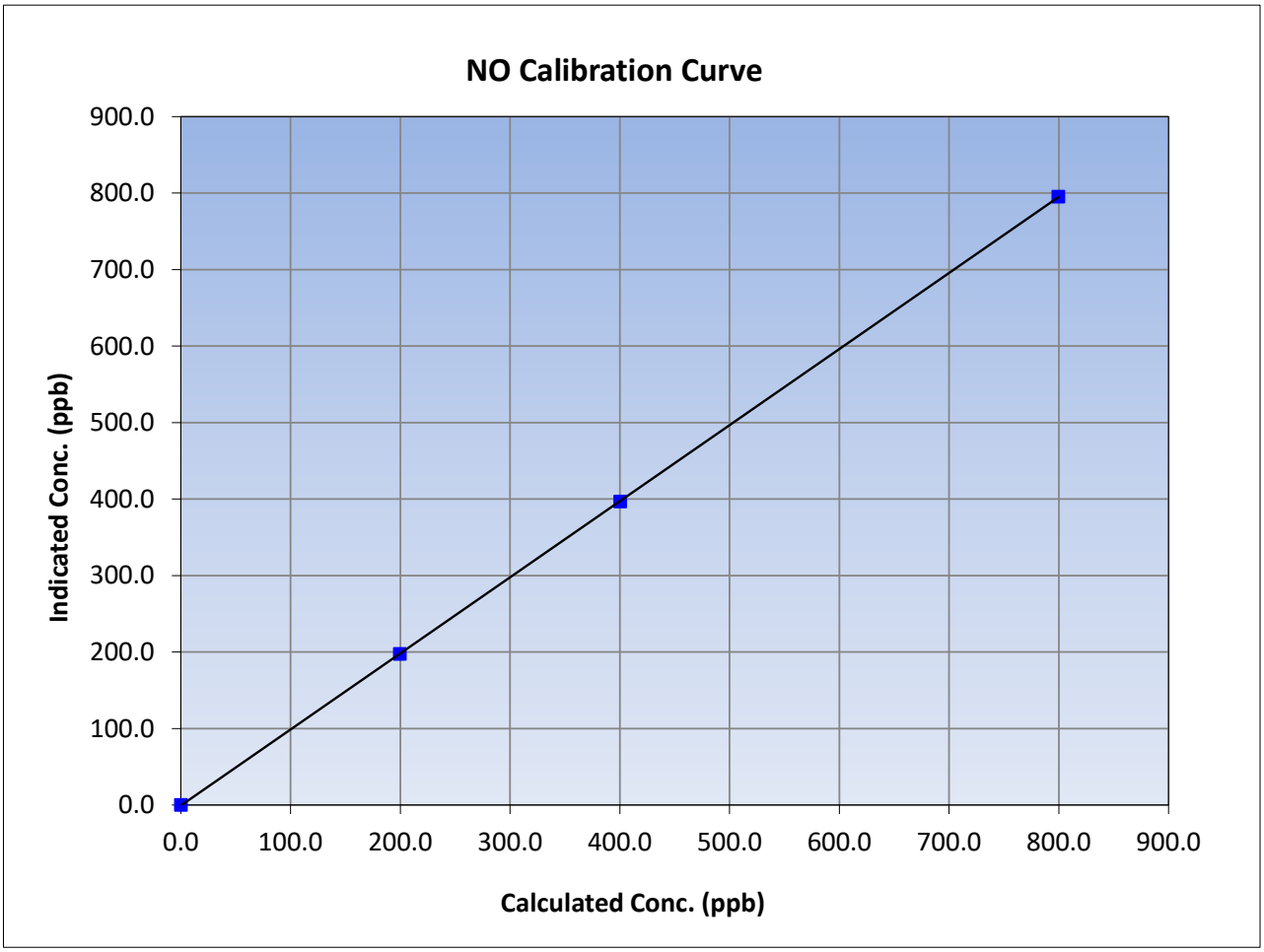
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 9:41 | End Time (MST): | 14:49 |
| 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 | 0.0 | ---- | Correlation Coefficient | 0.999995 | *≥0.995* |
| 799.7 | 795.3 | 1.0055 | | | |
| 400.3 | 396.6 | 1.0094 | Slope | 0.994756 | *0.90 - 1.10* |
| 199.7 | 197.6 | 1.0105 | | | |
| | | | Intercept | -0.699633 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

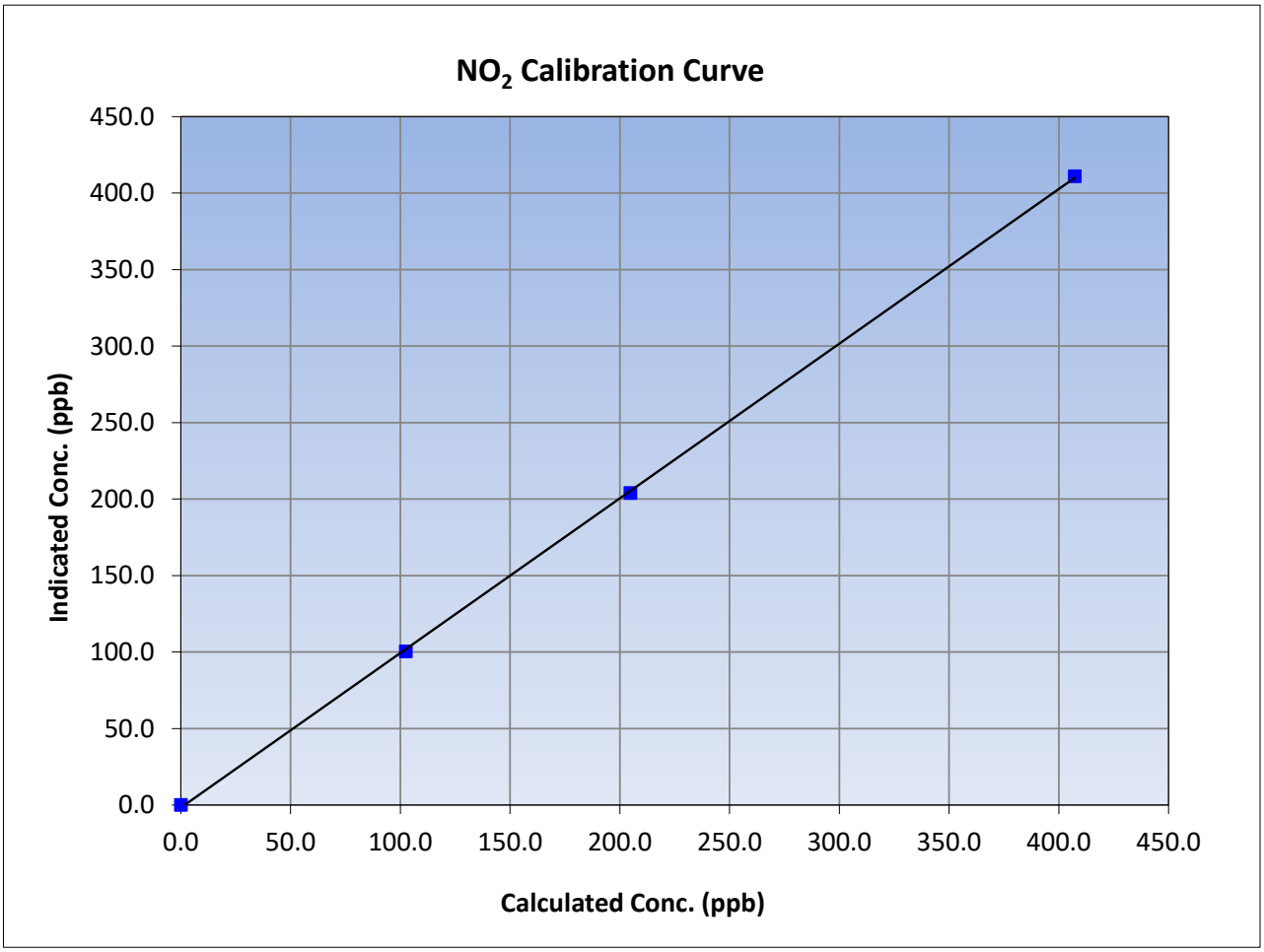
Version-04-2020

### Station Information

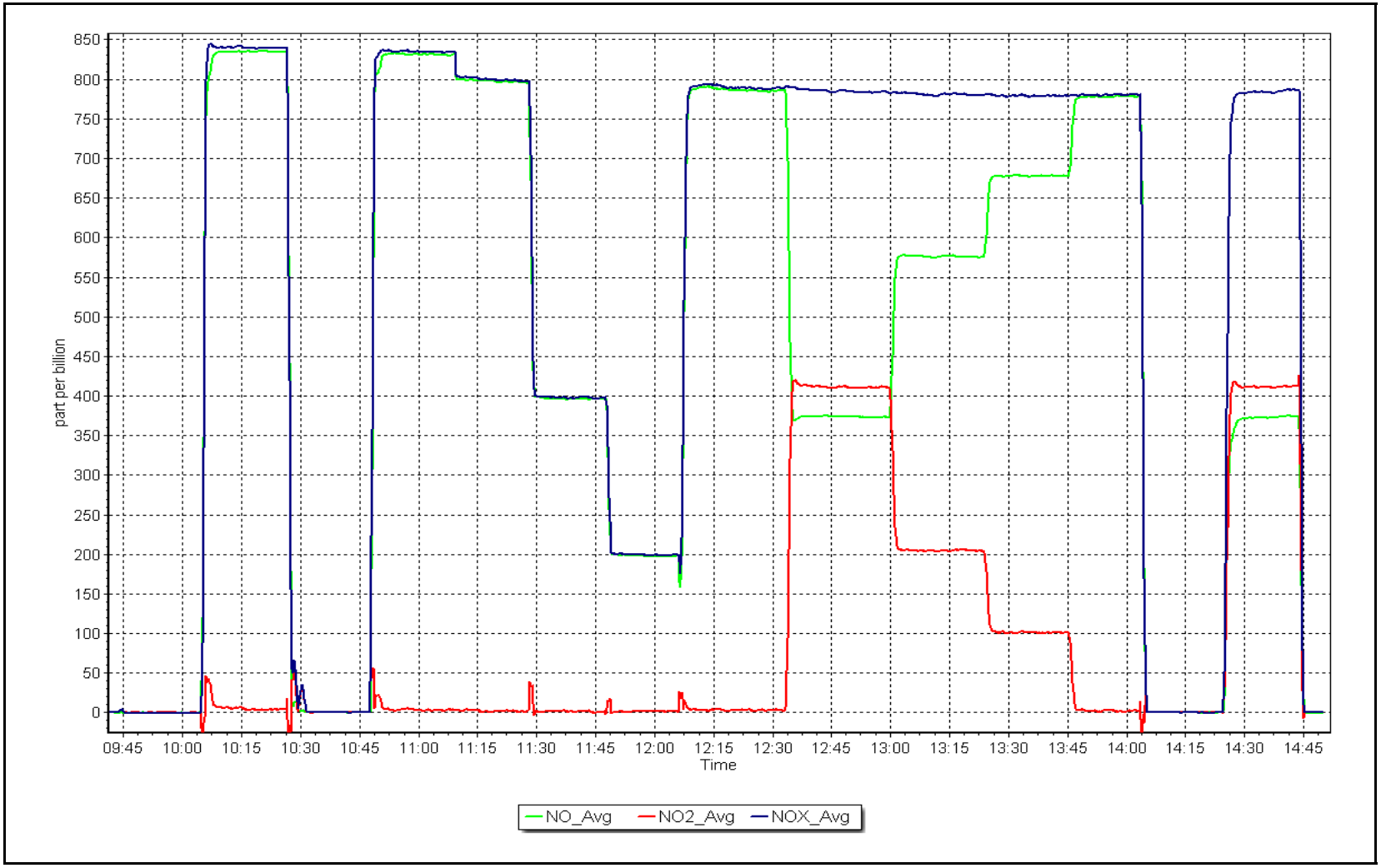
| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Firebag | Station Number: | AMS 19 |
| Start Time (MST): | 9:41 | End Time (MST): | 14:49 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1410661309 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999913 | ≥0.995 |
| 407.3 | 411.1 | 0.9907 | | | |
| 204.9 | 204.0 | 1.0043 | Slope | 1.011032 | 0.90 - 1.10 |
| 102.5 | 100.5 | 1.0197 | | | |
| | | | Intercept | -1.734028 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 21, 2024 Location: Firebag



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS20
## MACKAY RIVER
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | MacKay River | Station number: | AMS20 |
| Calibration Date: | March 7, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 8:24 | End time (MST): | 11:17 |
| 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: | 1.004391 | 1.004703 | Backgd or Offset: | 19.7 | 19.7 |
| Calibration intercept: | 2.870973 | 2.311780 | 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 | 0.6 | ---- |
| as found span | 4919 | 81.3 | 800.3 | 802.7 | 0.997 |
| 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 | 800.3 | 805.9 | 0.993 |
| second point | 4959 | 40.7 | 400.7 | 403.9 | 0.992 |
| third point | 4980 | 20.3 | 199.8 | 206.8 | 0.966 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4919 | 81.3 | 800.3 | 806.6 | 0.992 |
| | | | | Average Correction Factor | 0.984 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.10 | Previous response | 806.65 | *% 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: Zero adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

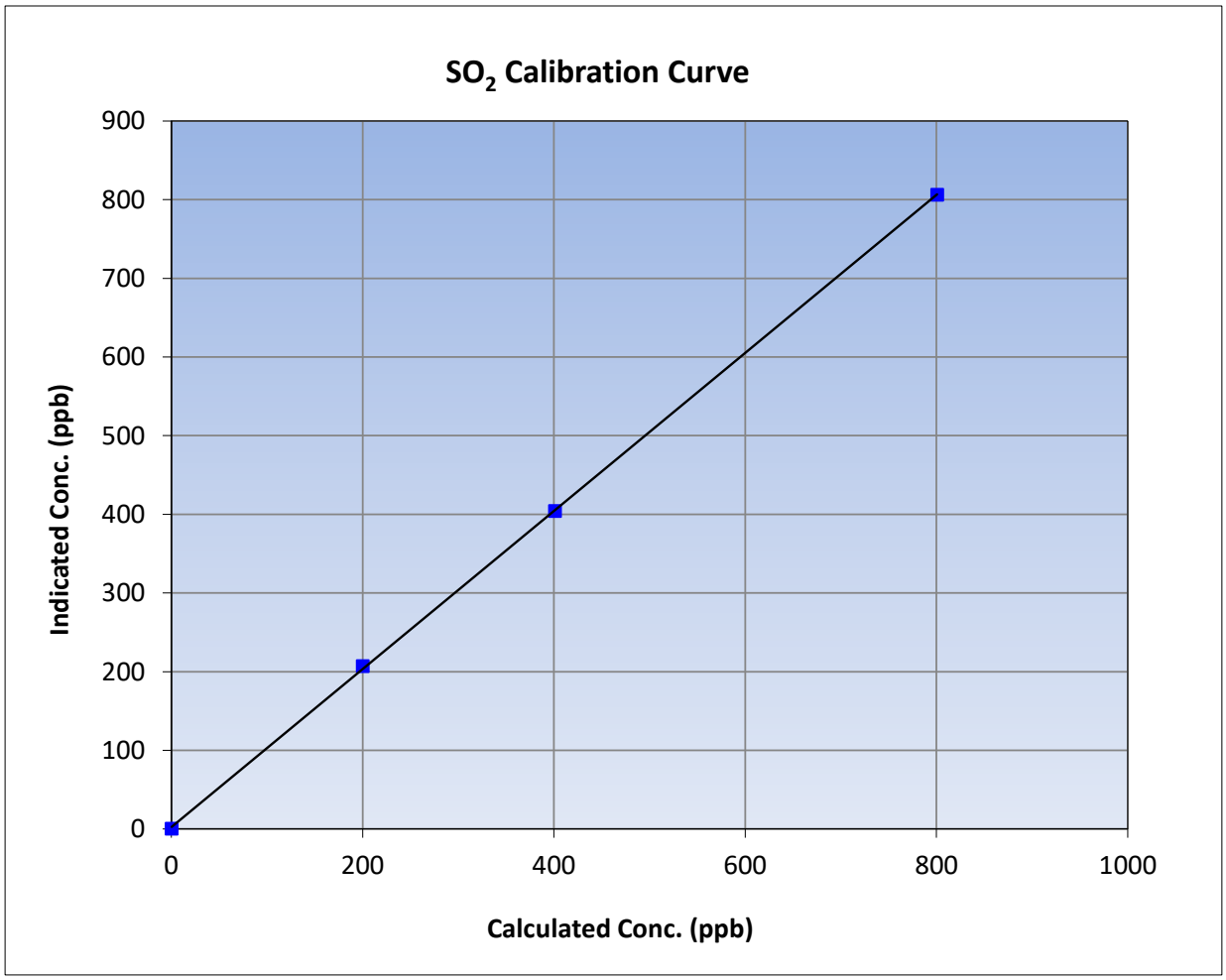
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 8:24 | End Time (MST): | 11:17 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1501301450 |

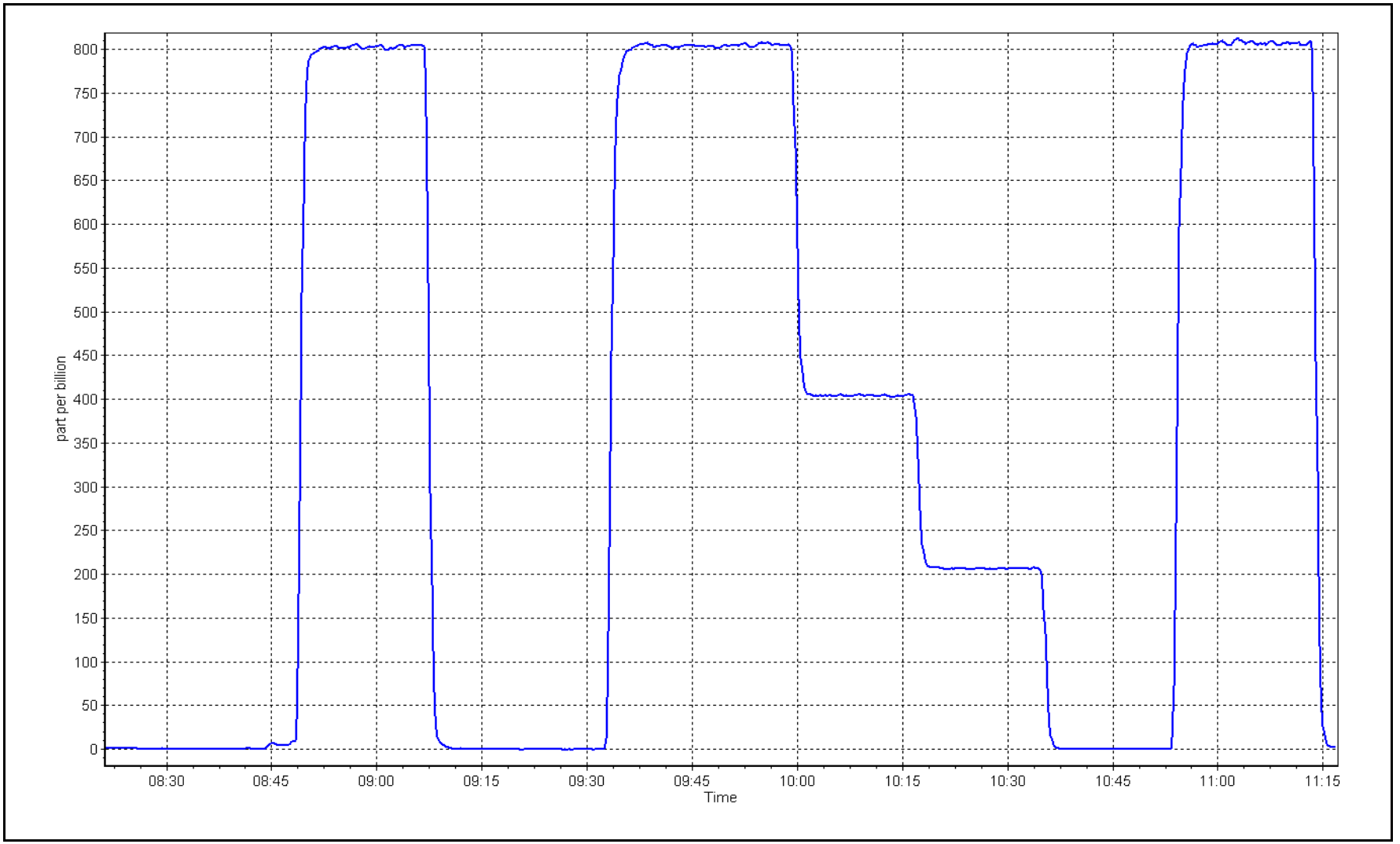
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 800.3 | 805.9 | 0.9930 |
| 400.7 | 403.9 | 0.9920 |
| 199.8 | 206.8 | 0.9663 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999942 | *≥0.995* |
| Slope | 1.004703 | *0.90 - 1.10* |
| Intercept | 2.311780 | *+/-30* |



**SO2 Calibration Plot** Date: March 7, 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: | March 5, 2024 | Last Cal Date: | February 1, 2024 |
| Start time (MST): | 8:10 | End time (MST): | 12:11 |
| 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: | 0.987249 | 0.975111 | Backgd or Offset: | 3.19 | 3.19 |
| Calibration intercept: | 0.499237 | 0.699032 | 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 | 78.7 | 1.019 |
| as found 2nd point | 4961 | 39.0 | 39.9 | 39.8 | 1.008 |
| as found 3rd point | 4980 | 19.5 | 20.0 | 20.4 | 0.989 |
| 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 | 0.4 | ---- |
| high point | 4922 | 78.1 | 80.0 | 78.6 | 1.018 |
| second point | 4961 | 39.0 | 40.0 | 39.8 | 1.004 |
| third point | 4980 | 19.5 | 20.0 | 20.5 | 0.975 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4922 | 78.1 | 80.0 | 78.4 | 1.021 |
| SO2 Scrubber Check | 4982 | 81.3 | 802.8 | -0.1 | ---- |
| Date of last scrubber change: | | May 25, 2023 | | Ave Corr Factor | 0.999 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 78.5 | Prev response: | 79.45 | *% change: | -1.2% |
| Baseline Corr 2nd AF pt: | 39.6 | AF Slope: | 0.979587 | AF Intercept: | 0.519121 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999924 | | |

* = > +/-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

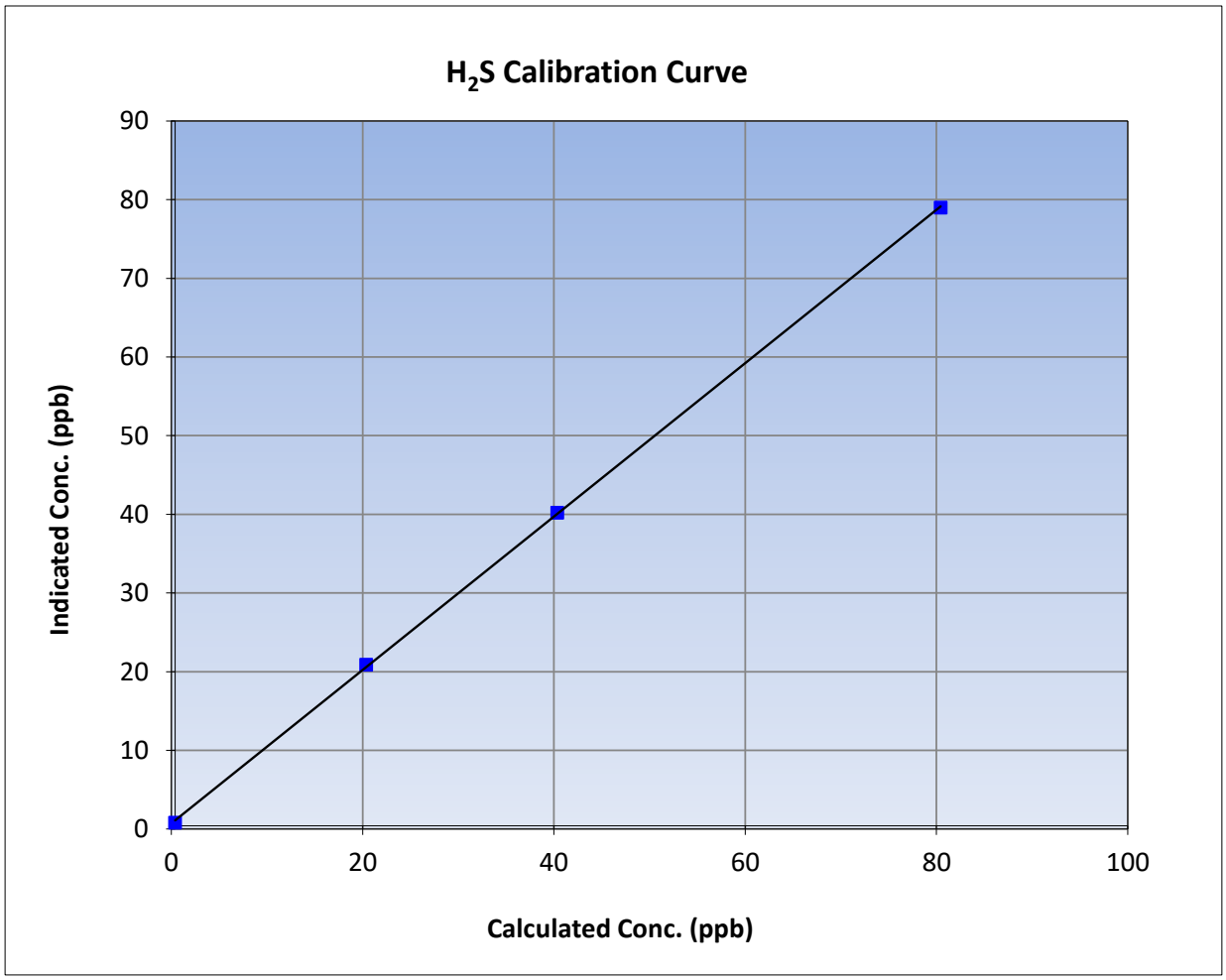
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 8:10 | End Time (MST): | 12:11 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1236656117 |

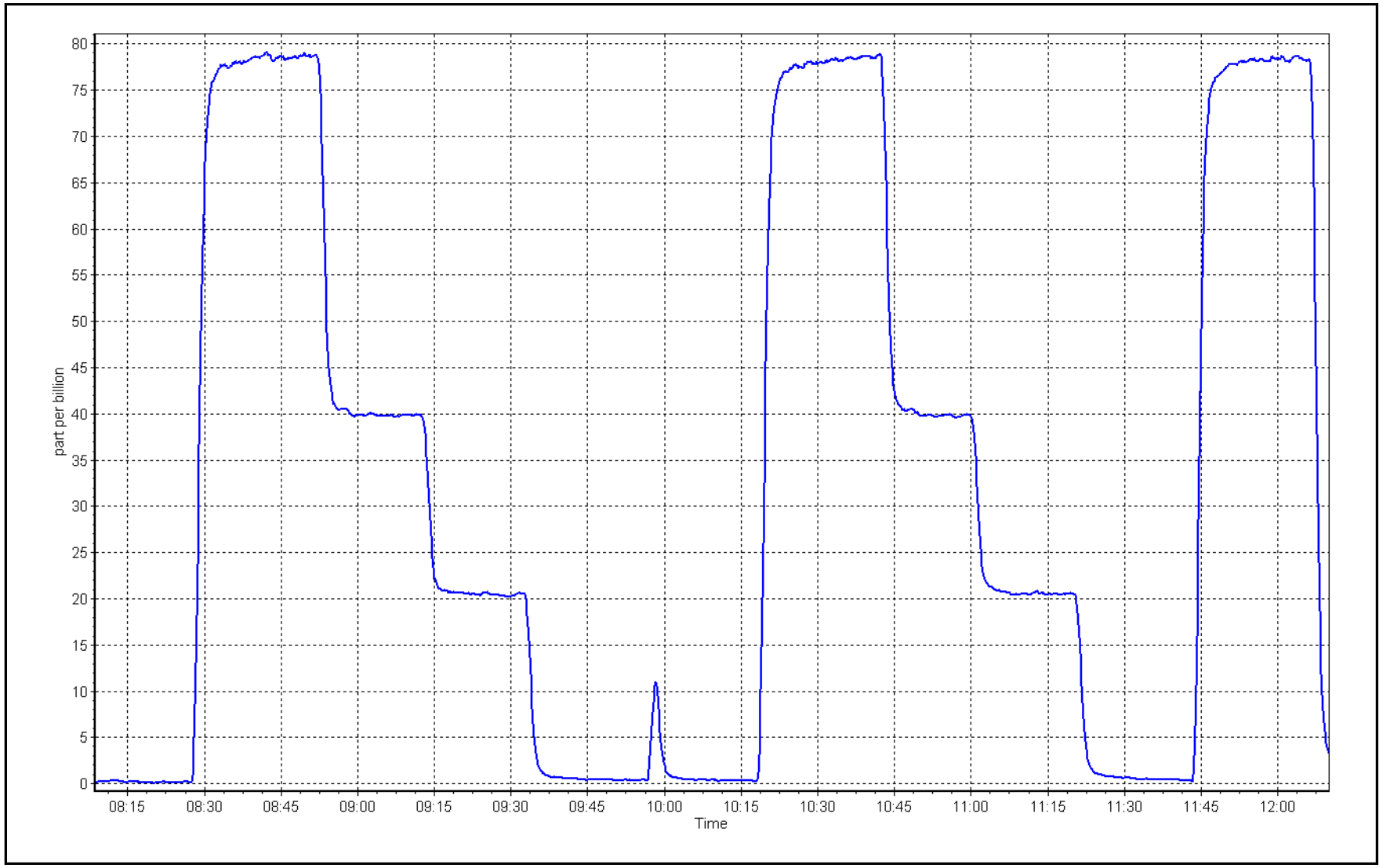
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 80.0 | 78.6 | 1.0183 |
| 40.0 | 39.8 | 1.0042 |
| 20.0 | 20.5 | 0.9749 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999933 | *≥0.995* |
| Slope | 0.975111 | *0.90 - 1.10* |
| Intercept | 0.699032 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 5, 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: | March 7, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 8:24 | End time (MST): | 11:16 |
| 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: | 0.999403 | 0.997159 | Background: | 3.480 | 3.610 |
| Calibration intercept: | 0.034183 | 0.028212 | Coefficient: | 5.950 | 6.010 |

### 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 | 17.34 | 17.37 | 0.998 |
| 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 | 17.34 | 17.31 | 1.002 |
| second point | 4959 | 40.7 | 8.68 | 8.68 | 1.000 |
| third point | 4980 | 20.3 | 4.33 | 4.41 | 0.982 |
| as left zero | 5000 | 0.0 | 0.00 | -0.02 | ---- |
| as left span | 4919 | 81.3 | 17.34 | 17.35 | 0.999 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.23 | Previous response | 17.36 | *% 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: No maintenance done. Zero and span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

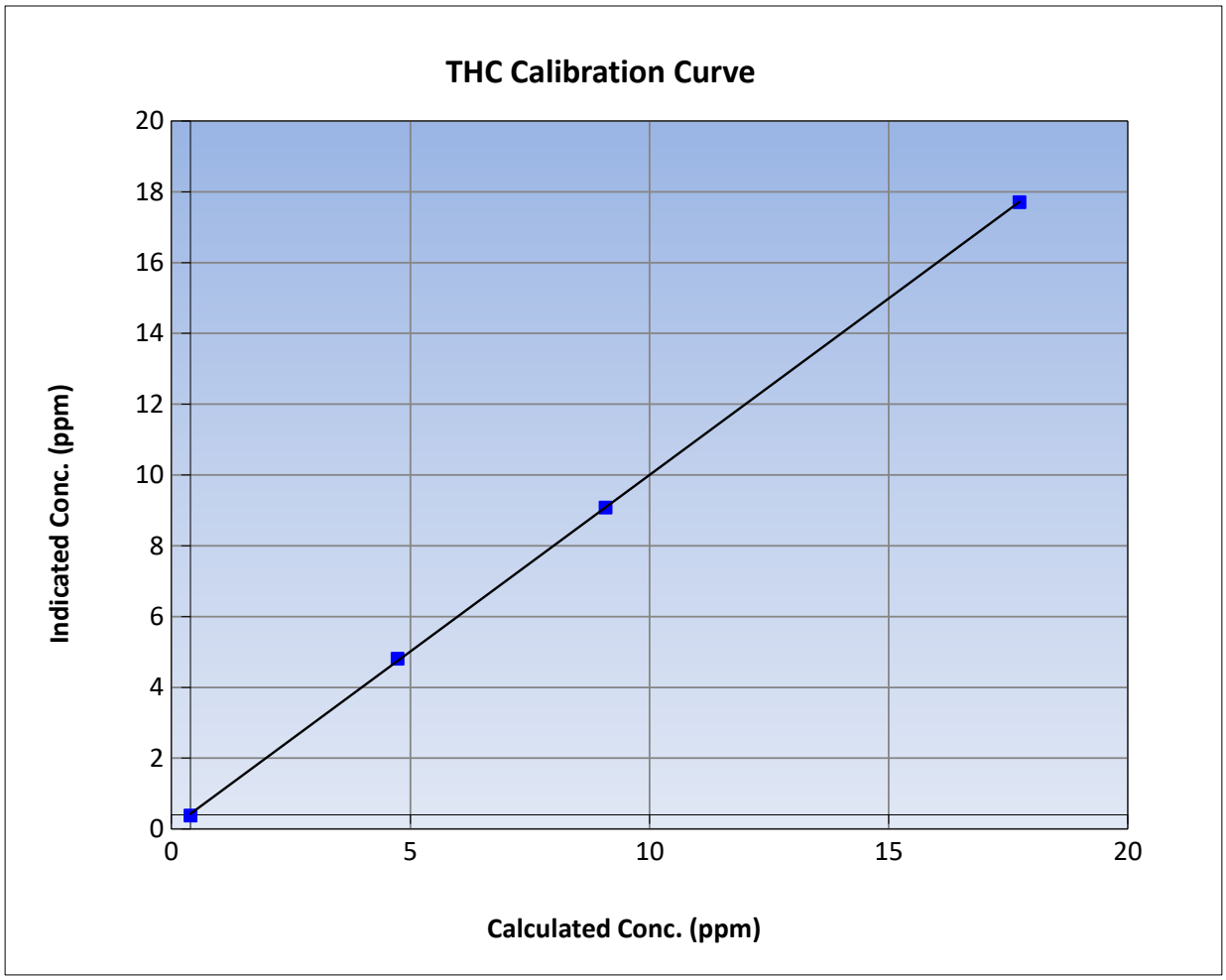
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 8:24 | End Time (MST): | 11:16 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1501663727 |

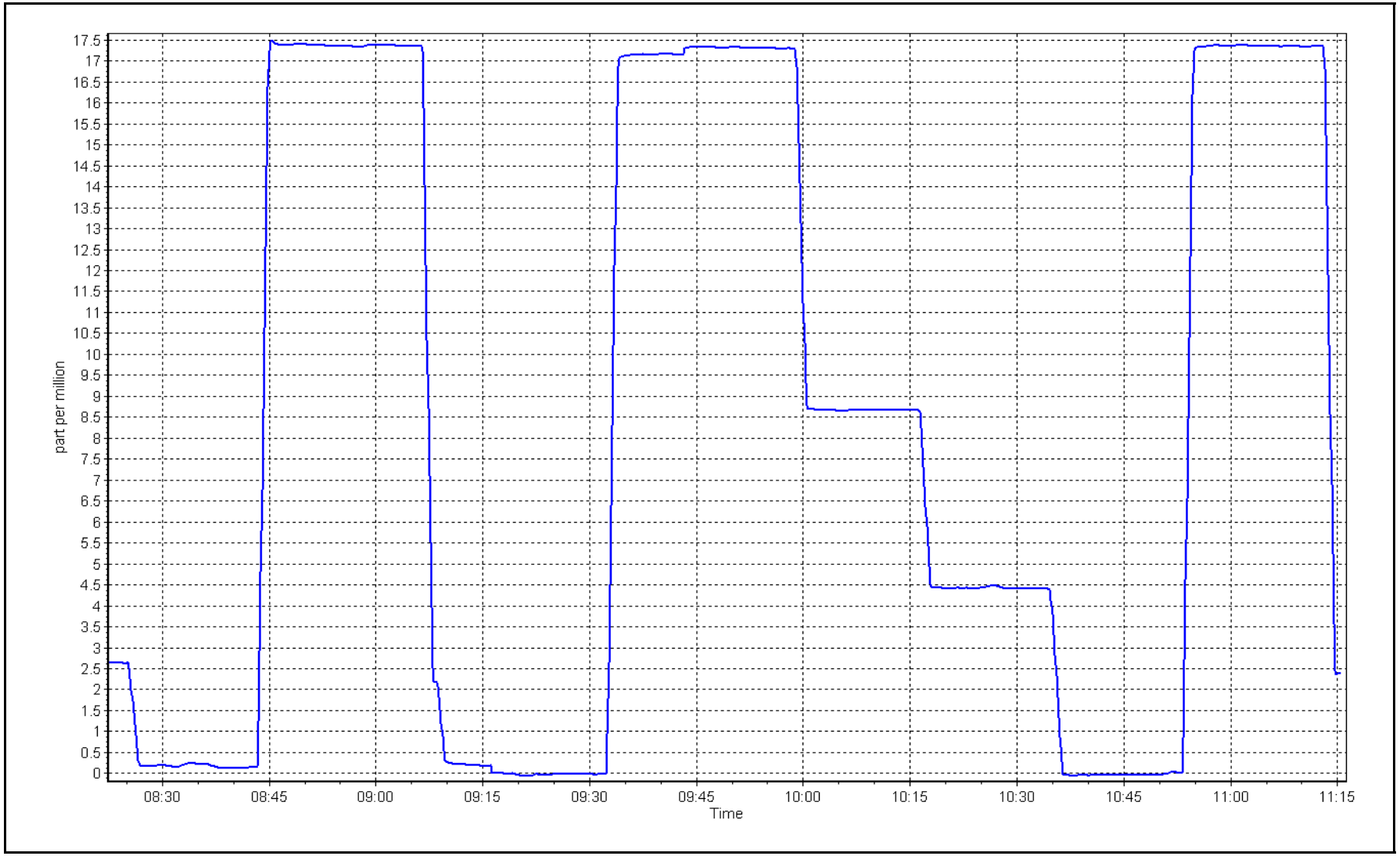
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.02 | ---- |
| 17.34 | 17.31 | 1.0019 |
| 8.68 | 8.68 | 1.0004 |
| 4.33 | 4.41 | 0.9820 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999962 | *≥0.995* |
| Slope | 0.997159 | *0.90 - 1.10* |
| Intercept | 0.028212 | *+/-1.5* |



**THC Calibration Plot** Date: March 7, 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: | March 6, 2024 | Last Cal Date: | February 8, 2024 |
| Start time (MST): | 7:55 | End time (MST): | 12:13 |
| 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: | 166.6 | 166.6 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.994581 | 1.001037 |
| $NO_X$ Cal Offset: | 3.602279 | 3.662215 |
| NO Cal Slope: | 0.995045 | 1.001142 |
| NO Cal Offset: | 2.502804 | 2.942582 |
| $NO_2$ Cal Slope: | 1.000946 | 0.998215 |
| $NO_2$ Cal Offset: | -1.281410 | -0.831656 |

# 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 | 0.0 | -0.2 | ---- | ---- |
| as found span | 4917 | 83.3 | 819.5 | 800.3 | 19.2 | 826.8 | 805.1 | 21.5 | 0.9911 | 0.9940 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | -0.1 | ---- | ---- |
| high point | 4917 | 83.3 | 819.5 | 800.3 | 19.2 | 822.3 | 802.9 | 19.4 | 0.9965 | 0.9968 |
| second point | 4958 | 41.7 | 410.3 | 400.7 | 9.6 | 415.6 | 405.0 | 10.6 | 0.9872 | 0.9893 |
| third point | 4979 | 20.8 | 204.6 | 199.9 | 4.8 | 212.7 | 206.2 | 6.6 | 0.9621 | 0.9692 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | -0.1 | ---- | ---- |
| as left span | 4917 | 83.3 | 819.5 | 442.5 | 377.0 | 818.4 | 441.3 | 377.0 | 1.0013 | 1.0027 |
| | | | | | | | | Average Correction Factor | 0.9819 | 0.9851 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 827.0 ppb | NO = 805.1 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.0% |
| Previous Response | $NO_X$ = 818.6 ppb | NO = 798.8 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) | 799.7 | 441.9 | 377.0 | 375.8 | 1.0031 | 99.7% |
| 2nd GPT point (200 ppb O3) | 799.7 | 613.5 | 205.4 | 204.1 | 1.0062 | 99.4% |
| 3rd GPT point (100 ppb O3) | 799.7 | 702.6 | 116.3 | 114.2 | 1.0180 | 98.2% |
| | | | | Average Correction Factor | 1.0091 | 99.1% |

Notes: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

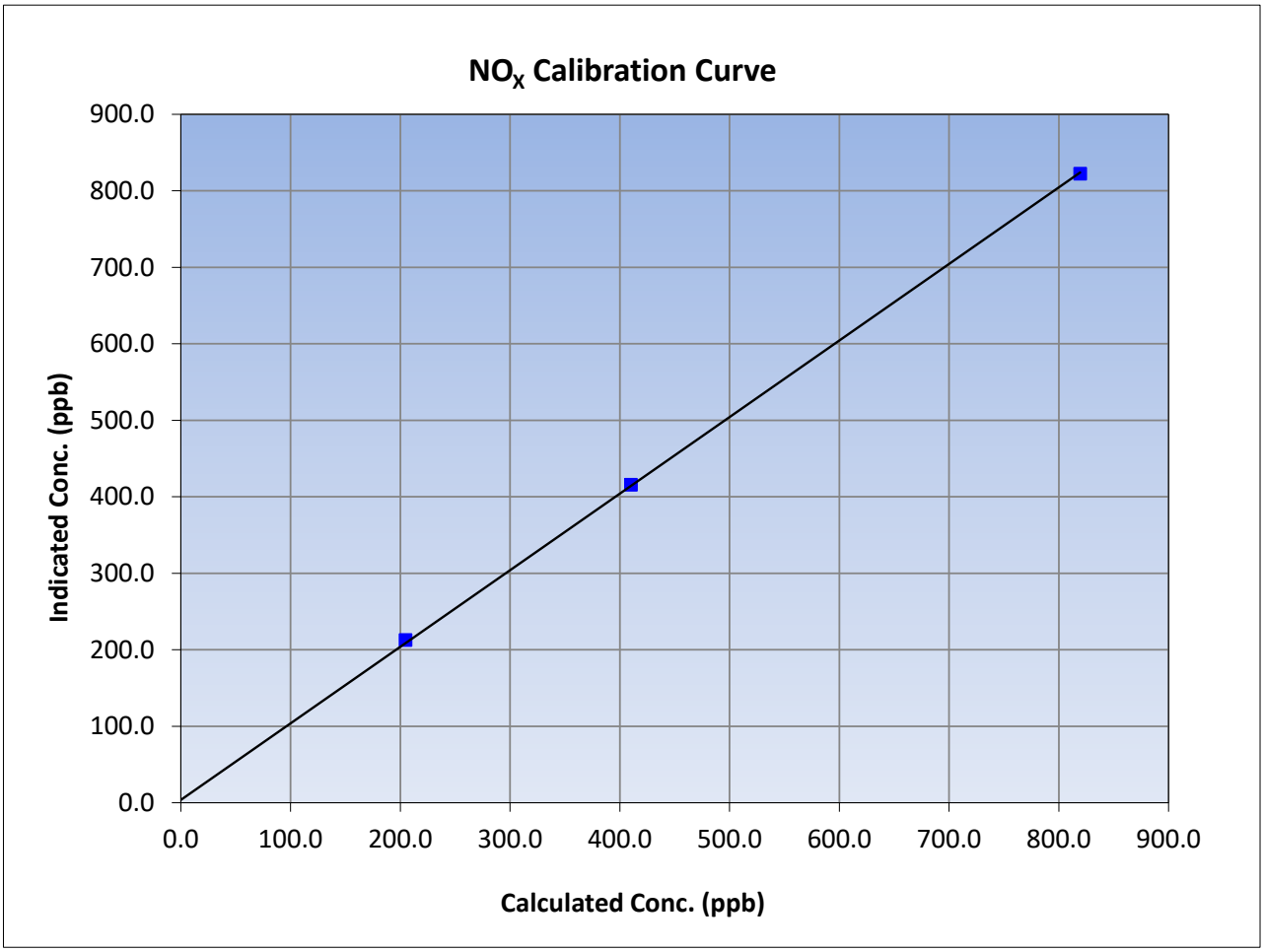
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 7:55 | End Time (MST): | 12:13 |
| 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 | -0.1 | ---- | Correlation Coefficient | 0.999902 | ≥0.995 |
| 819.5 | 822.3 | 0.9965 | | | |
| 410.3 | 415.6 | 0.9872 | Slope | 1.001037 | 0.90 - 1.10 |
| 204.6 | 212.7 | 0.9621 | | | |
| | | | Intercept | 3.662215 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

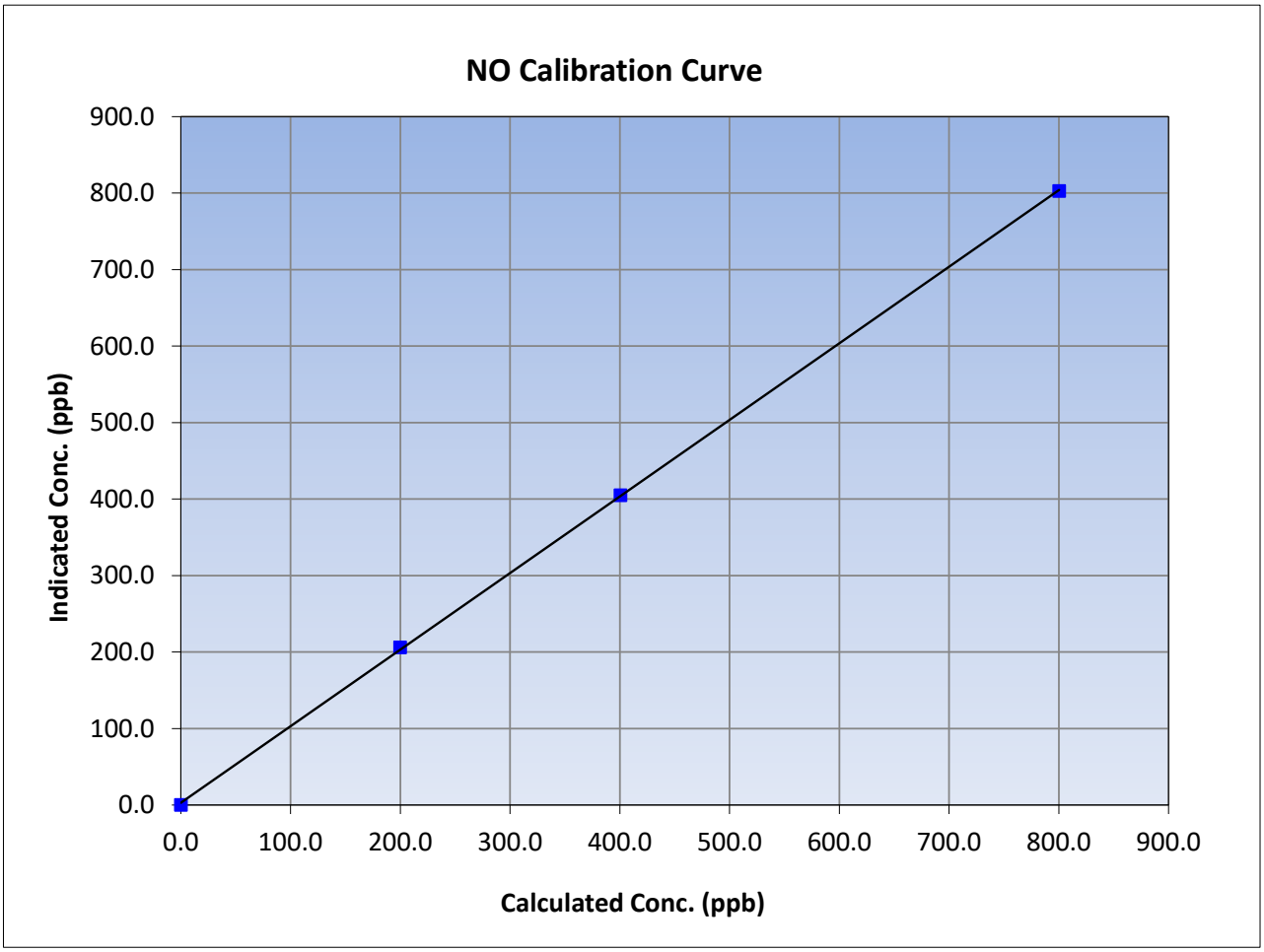
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 7:55 | End Time (MST): | 12:13 |
| 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 | 0.1 | ---- | Correlation Coefficient | 0.999941 | ≥0.995 |
| 800.3 | 802.9 | 0.9968 | | | |
| 400.7 | 405.0 | 0.9893 | Slope | 1.001142 | 0.90 - 1.10 |
| 199.9 | 206.2 | 0.9692 | | | |
| | | | Intercept | 2.942582 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

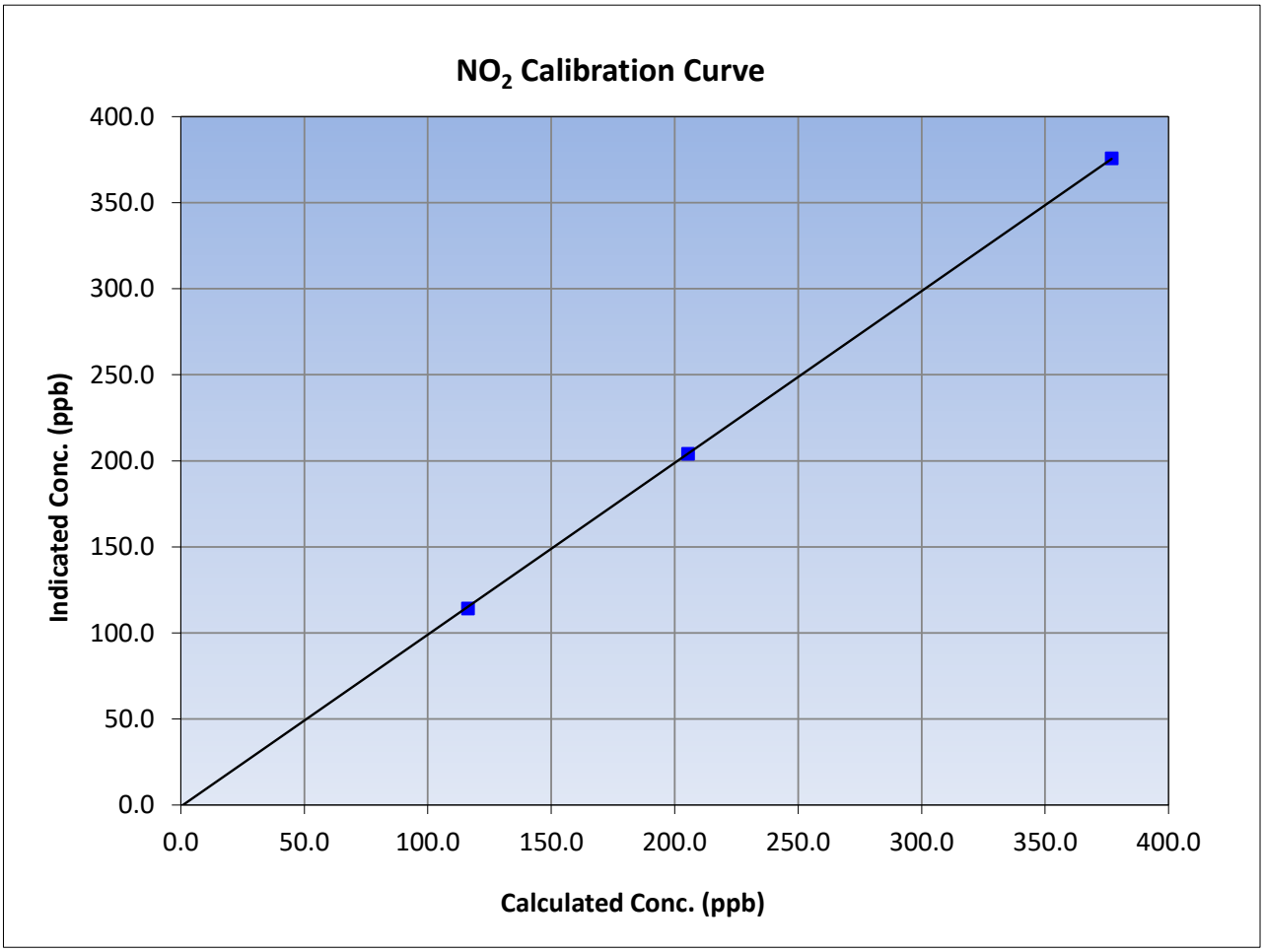
Version-04-2020

### Station Information

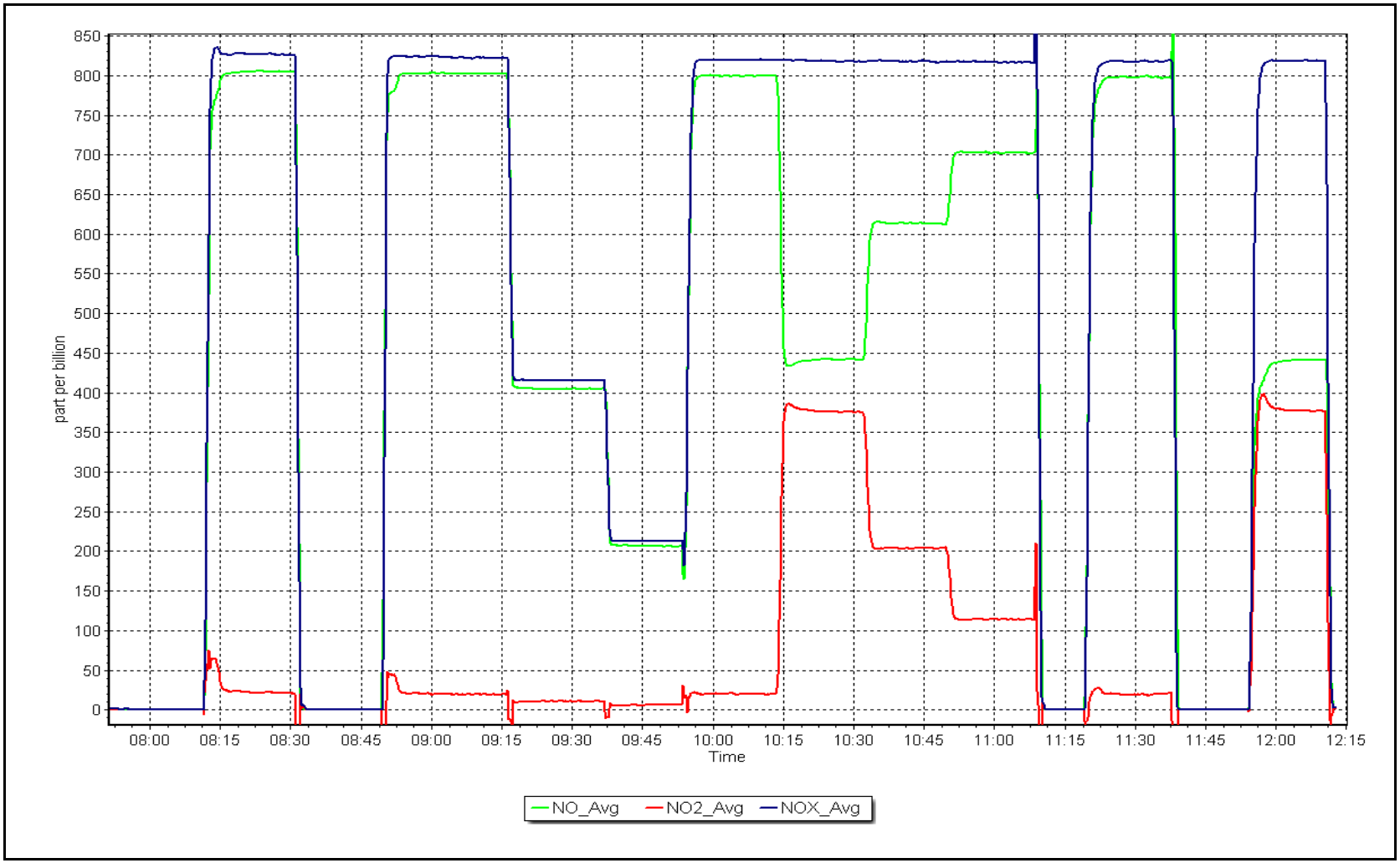
| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | MacKay River | Station Number: | AMS20 |
| Start Time (MST): | 7:55 | End Time (MST): | 12:13 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1505164379 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999978 | ≥0.995 |
| 377.0 | 375.8 | 1.0031 | | | |
| 205.4 | 204.1 | 1.0062 | Slope | 0.998215 | 0.90 - 1.10 |
| 116.3 | 114.2 | 1.0180 | | | |
| | | | Intercept | -0.831656 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 6, 2024 Location: MacKay River



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS21
## CONKLIN
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | March 18, 2024 | Last Cal Date: | February 8, 2024 |
| Start time (MST): | 8:41 | End time (MST): | 11:44 |
| 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: | 0.997719 | 0.997419 | Backgd or Offset: | 28.7 | 28.3 |
| Calibration intercept: | 1.675879 | 1.855817 | Coeff or Slope: | 0.914 | 0.901 |

### $SO_2$ 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 | 0.2 | ---- |
| as found span | 4920 | 80.2 | 800.8 | 809.8 | 0.989 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5005 | 0.0 | 0.0 | 0.5 | ---- |
| high point | 4920 | 80.2 | 800.8 | 800.0 | 1.001 |
| second point | 4960 | 40.1 | 400.4 | 401.8 | 0.997 |
| third point | 4980 | 20.0 | 200.1 | 202.9 | 0.986 |
| as left zero | 5005 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 80.2 | 800.8 | 801.0 | 1.000 |
| | | | | Average Correction Factor | 0.995 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 809.60 | Previous response | 800.69 | *% 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: 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

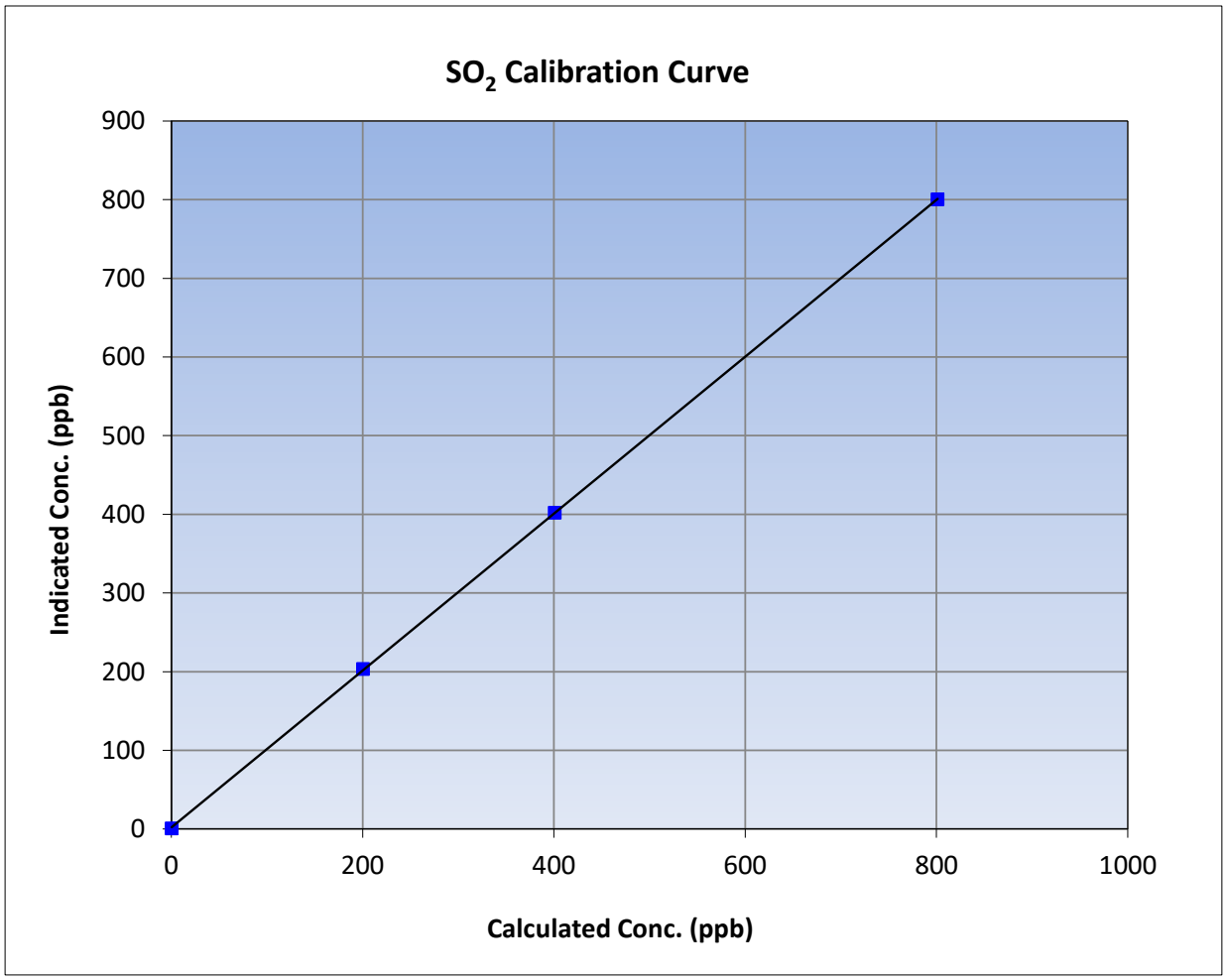
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:41 | End Time (MST): | 11:44 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1428701363 |

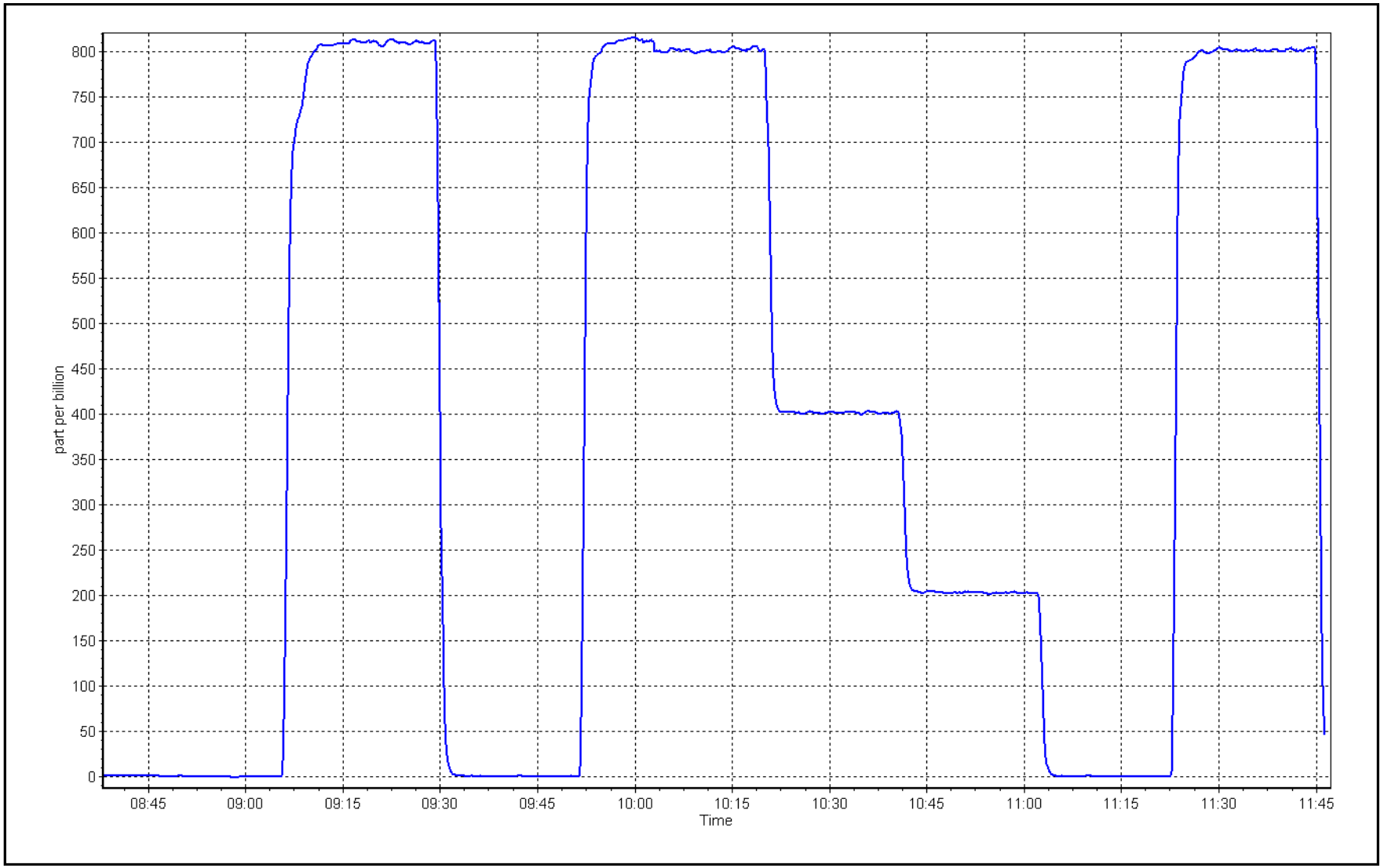
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.5 | ---- |
| 800.8 | 800.0 | 1.0011 |
| 400.4 | 401.8 | 0.9966 |
| 200.1 | 202.9 | 0.9863 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999987 | *≥0.995* |
| Slope | 0.997419 | *0.90 - 1.10* |
| Intercept | 1.855817 | *+/-30* |



**SO2 Calibration Plot** Date: March 18, 2024 Location: Conklin



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | March 21, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 9:23 | End time (MST): | 14:55 |
| 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: | 1.001571 | 1.000286 | Backgd or Offset: | 2.4 | 2.77 |
| Calibration intercept: | 0.420000 | 0.140000 | Coeff or Slope: | 0.980 | 0.998 |

### 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 | 4920 | 80.0 | 80.0 | 79.6 | 1.005 |
| as found 2nd point | 4960 | 40.0 | 40.0 | 40.0 | 1.000 |
| as found 3rd point | 4980 | 20.0 | 20.0 | 20.3 | 0.985 |
| 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 | 80.0 | 80.0 | 80.0 | 1.000 |
| second point | 4960 | 40.0 | 40.0 | 40.5 | 0.988 |
| third point | 4980 | 20.0 | 20.0 | 20.1 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4920 | 80.0 | 80.0 | 79.7 | 1.004 |
| SO2 Scrubber Check | 4920 | 80.2 | 802.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.994 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 79.6 | Prev response: | 80.55 | *% change: | -1.2% |
| Baseline Corr 2nd AF pt: | 40.0 | AF Slope: | 0.993571 | AF Intercept: | 0.200000 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999970 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after multiple as founds. SO2 scrubber check done after calibrator zero and it passed. Adjusted zero and span.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

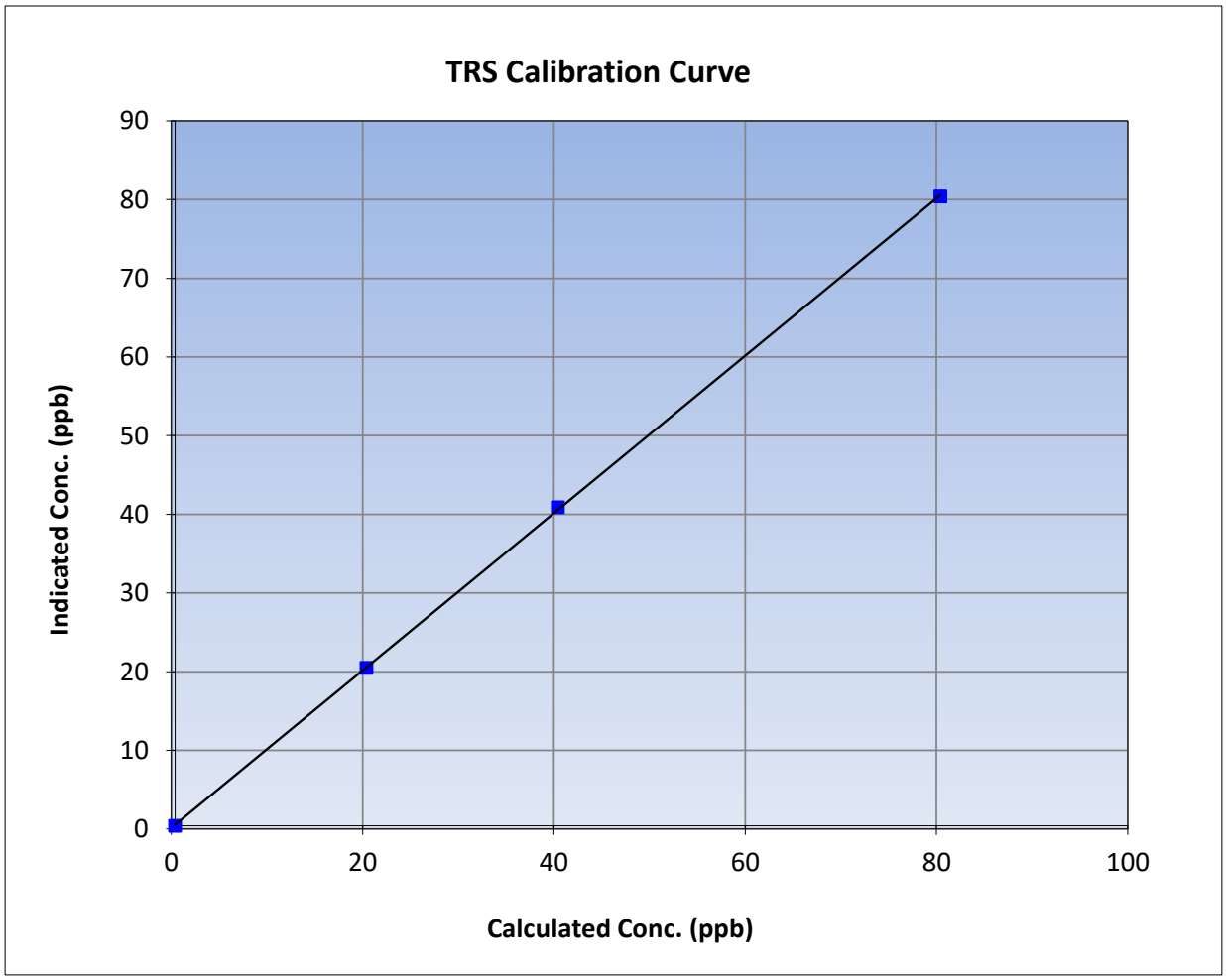
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 9:23 | End Time (MST): | 14:55 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1236656116 |

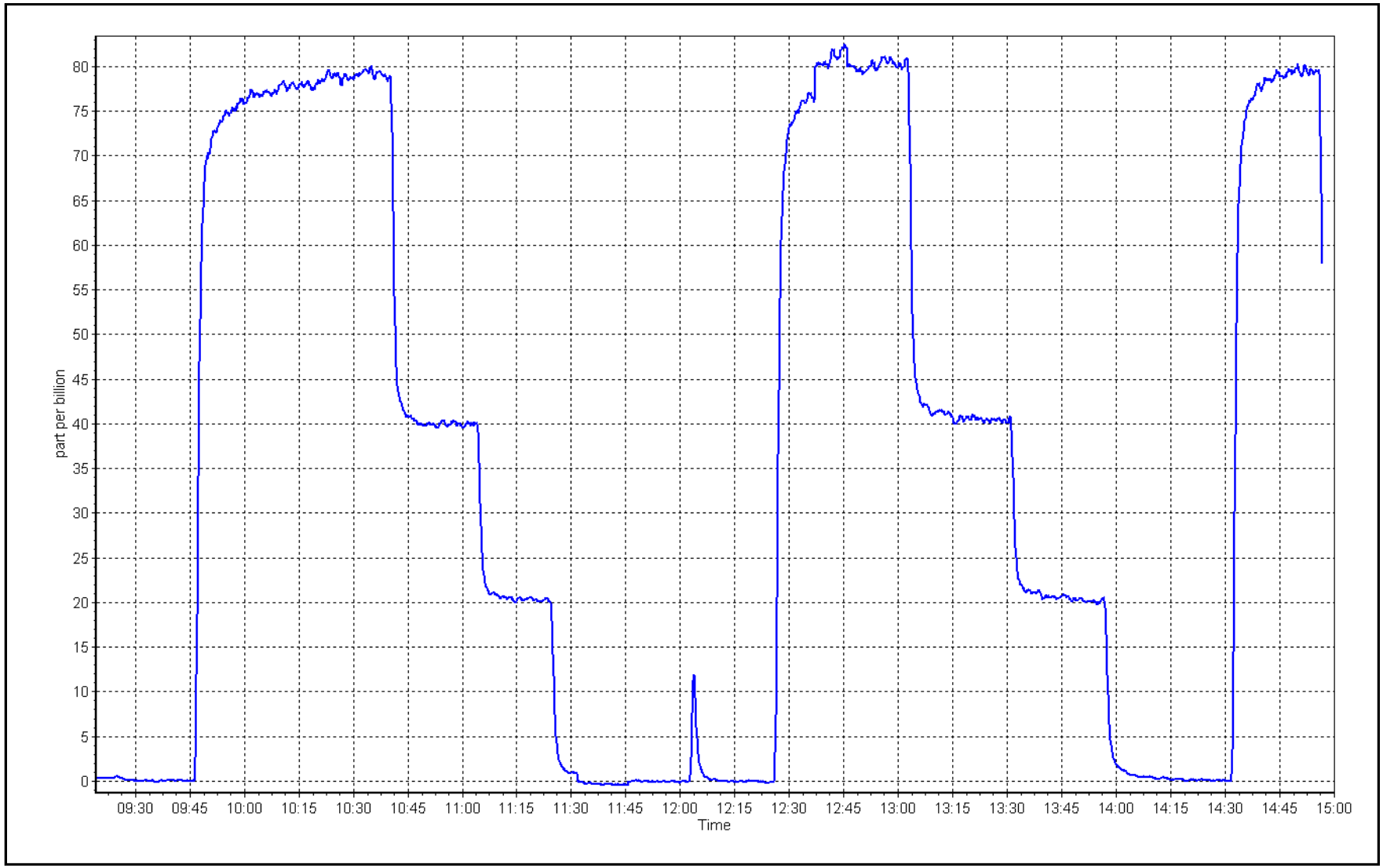
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.0 | 1.0000 |
| 40.0 | 40.5 | 0.9877 |
| 20.0 | 20.1 | 0.9950 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999952 | *≥0.995* |
| Slope | 1.000286 | *0.90 - 1.10* |
| Intercept | 0.140000 | *+/-3* |



**TRS Calibration Plot** Date: March 21, 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: | March 5, 2024 | Last Cal Date: | February 8, 2024 |
| Start time (MST): | 12:58 | End time (MST): | 17:51 |
| 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: | 3.71E-04 | 3.60E-04 | NMHC SP Ratio: | 7.57E-05 | 7.48E-05 |
| CH4 Retention time: | 17.4 | 17.4 | NMHC Peak Area: | 120807 | 122143 |
| 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 | 0.01 | ---- |
| as found span | 4920 | 80.2 | 17.13 | 16.77 | 1.021 |
| as found 2nd point | 4960 | 40.1 | 8.56 | 8.44 | 1.014 |
| as found 3rd point | 4980 | 20.0 | 4.28 | 4.26 | 1.004 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.01 | ---- |
| high point | 4920 | 80.2 | 17.13 | 17.11 | 1.001 |
| second point | 4960 | 40.1 | 8.56 | 8.63 | 0.992 |
| third point | 4980 | 20.0 | 4.28 | 4.39 | 0.976 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 17.13 | 17.09 | 1.002 |
| | | | | Average Correction Factor | 0.990 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.75 | Prev response | 17.16 | *% change | -2.4% |
| Baseline Corr 2nd AF: | 8.4 | AF Slope: | 0.977405 | AF Intercept: | 0.047951 |
| Baseline Corr 3rd AF: | 4.3 | AF Correlation: | 0.999977 | * = > +/-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 | 9.15 | 0.999 |
| as found 2nd point | 4960 | 40.1 | 4.57 | 4.61 | 0.991 |
| as found 3rd point | 4980 | 20.0 | 2.28 | 2.33 | 0.981 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 80.2 | 9.14 | 9.12 | 1.002 |
| second point | 4960 | 40.1 | 4.57 | 4.62 | 0.990 |
| third point | 4980 | 20.0 | 2.28 | 2.34 | 0.976 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 9.14 | 9.10 | 1.005 |
| | | | | Average Correction Factor | 0.989 |
| Baseline Corr AF: | 9.15 | Prev response | 9.18 | *% change | -0.3% |
| Baseline Corr 2nd AF: | 4.6 | AF Slope: | 0.999605 | AF Intercept: | 0.025410 |
| Baseline Corr 3rd AF: | 2.3 | AF Correlation: | 0.999963 | * = > +/-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 | 0.01 | ---- |
| as found span | 4920 | 80.2 | 7.99 | 7.62 | 1.048 |
| as found 2nd point | 4960 | 40.1 | 3.99 | 3.83 | 1.042 |
| as found 3rd point | 4980 | 20.0 | 2.00 | 1.93 | 1.032 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.01 | ---- |
| high point | 4920 | 80.2 | 7.99 | 7.99 | 0.999 |
| second point | 4960 | 40.1 | 3.99 | 4.01 | 0.996 |
| third point | 4980 | 20.0 | 2.00 | 2.05 | 0.976 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 7.99 | 8.00 | 0.999 |
| | | | | Average Correction Factor | 0.990 |
| Baseline Corr AF: | 7.61 | Prev response | 7.98 | *% change | -5.0% |
| Baseline Corr 2nd AF: | 3.82 | AF Slope: | 0.951755 | AF Intercept: | 0.023140 |
| Baseline Corr 3rd AF: | 1.92 | AF Correlation: | 0.999988 | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 1.000154 | 0.996984 |
| THC Cal Offset: | 0.033769 | 0.062768 |
| CH4 Cal Slope: | 0.997762 | 0.998048 |
| CH4 Cal Offset: | 0.015158 | 0.026159 |
| NMHC Cal Slope: | 1.002131 | 0.996179 |
| NMHC Cal Offset: | 0.018811 | 0.036609 |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

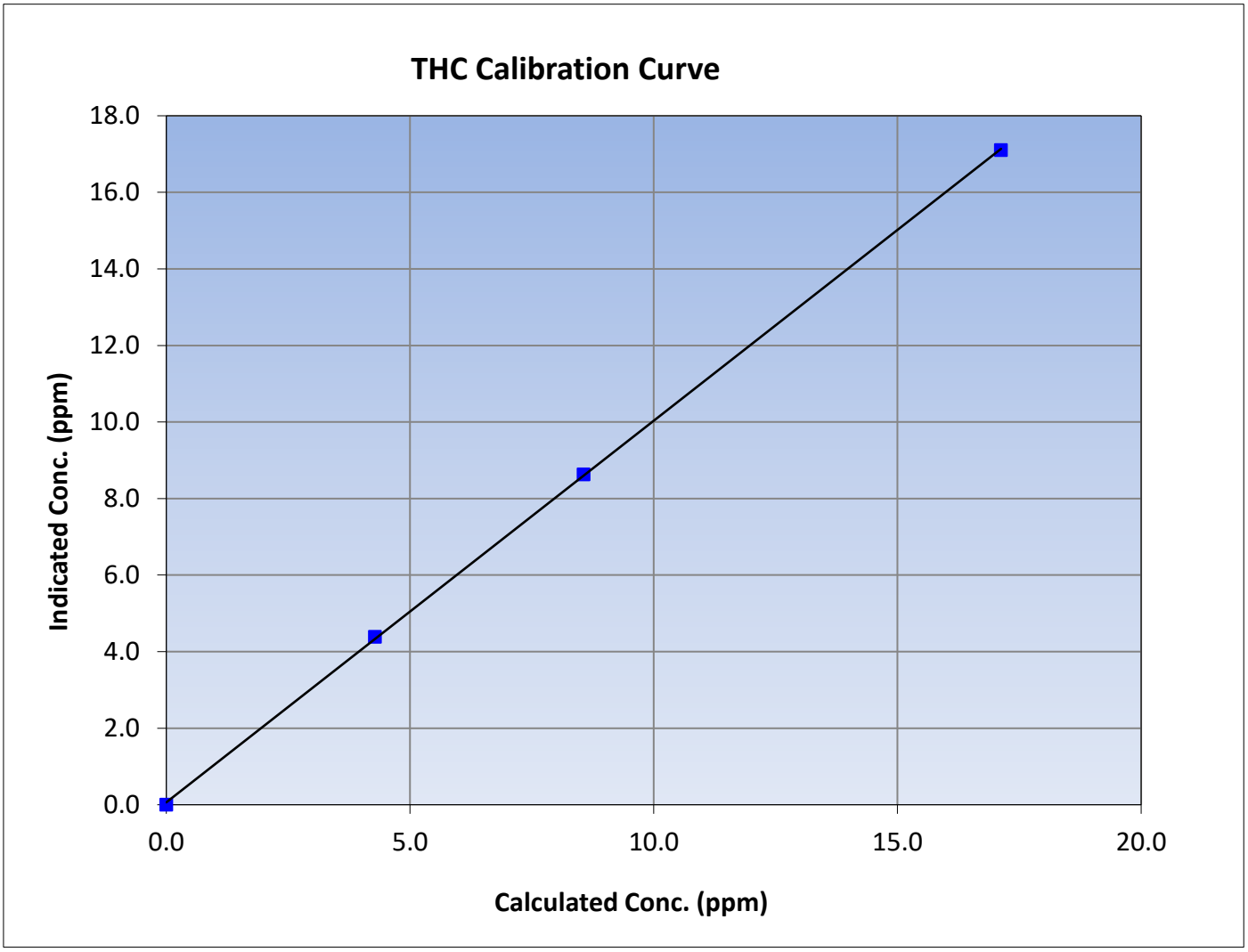
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 12:58 | End Time (MST): | 17:51 |
| 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 | 0.01 | ---- | Correlation Coefficient | 0.999949 | *≥0.995* |
| 17.13 | 17.11 | 1.0010 | | | |
| 8.56 | 8.63 | 0.9924 | Slope | 0.996984 | *0.90 - 1.10* |
| 4.28 | 4.39 | 0.9757 | | | |
| | | | Intercept | 0.062768 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

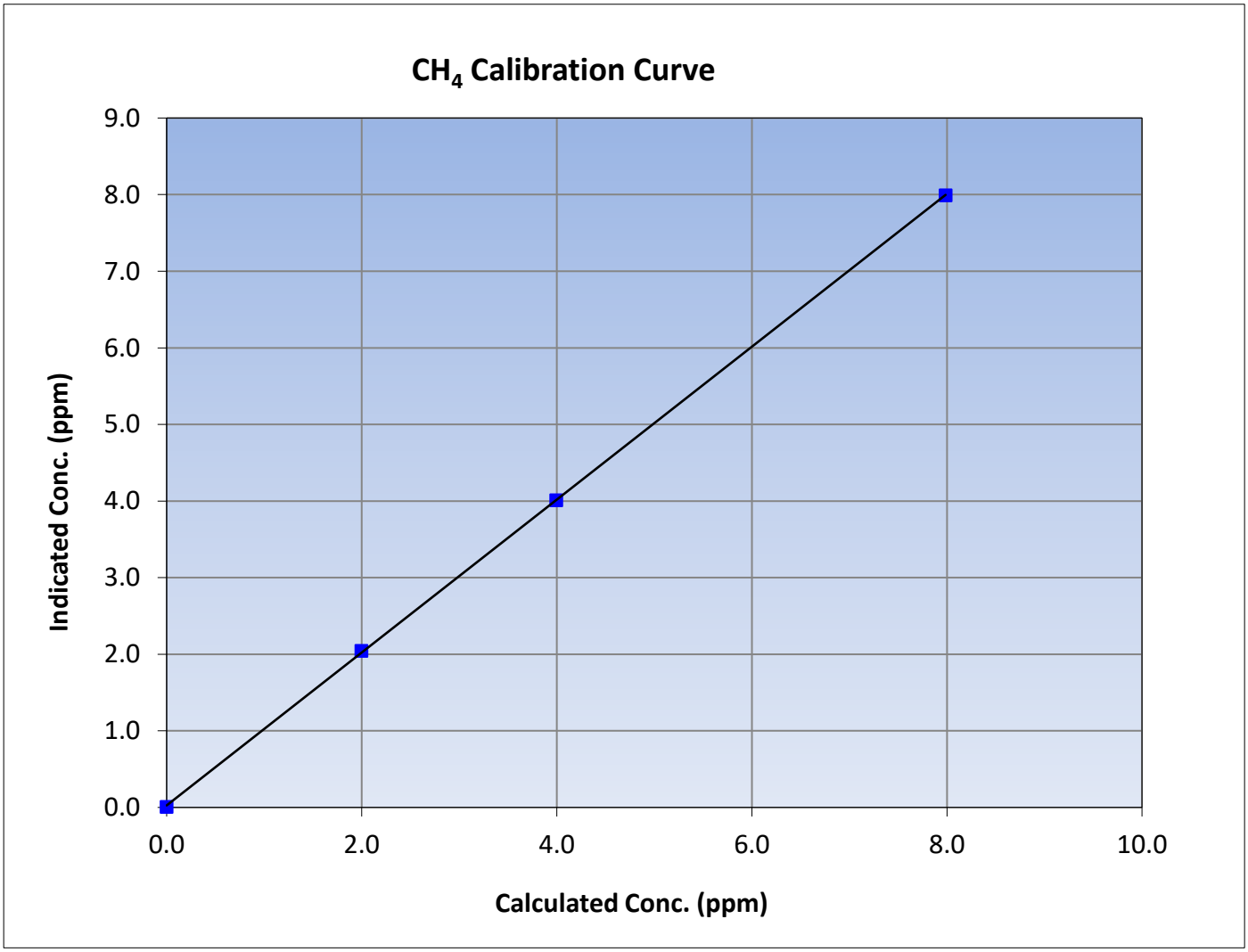
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 12:58 | End Time (MST): | 17:51 |
| 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 | 0.01 | ---- | Correlation Coefficient | 0.999966 | *≥0.995* |
| 7.99 | 7.99 | 0.9995 | | | |
| 3.99 | 4.01 | 0.9955 | Slope | 0.998048 | *0.90 - 1.10* |
| 2.00 | 2.05 | 0.9758 | | | |
| | | | Intercept | 0.026159 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

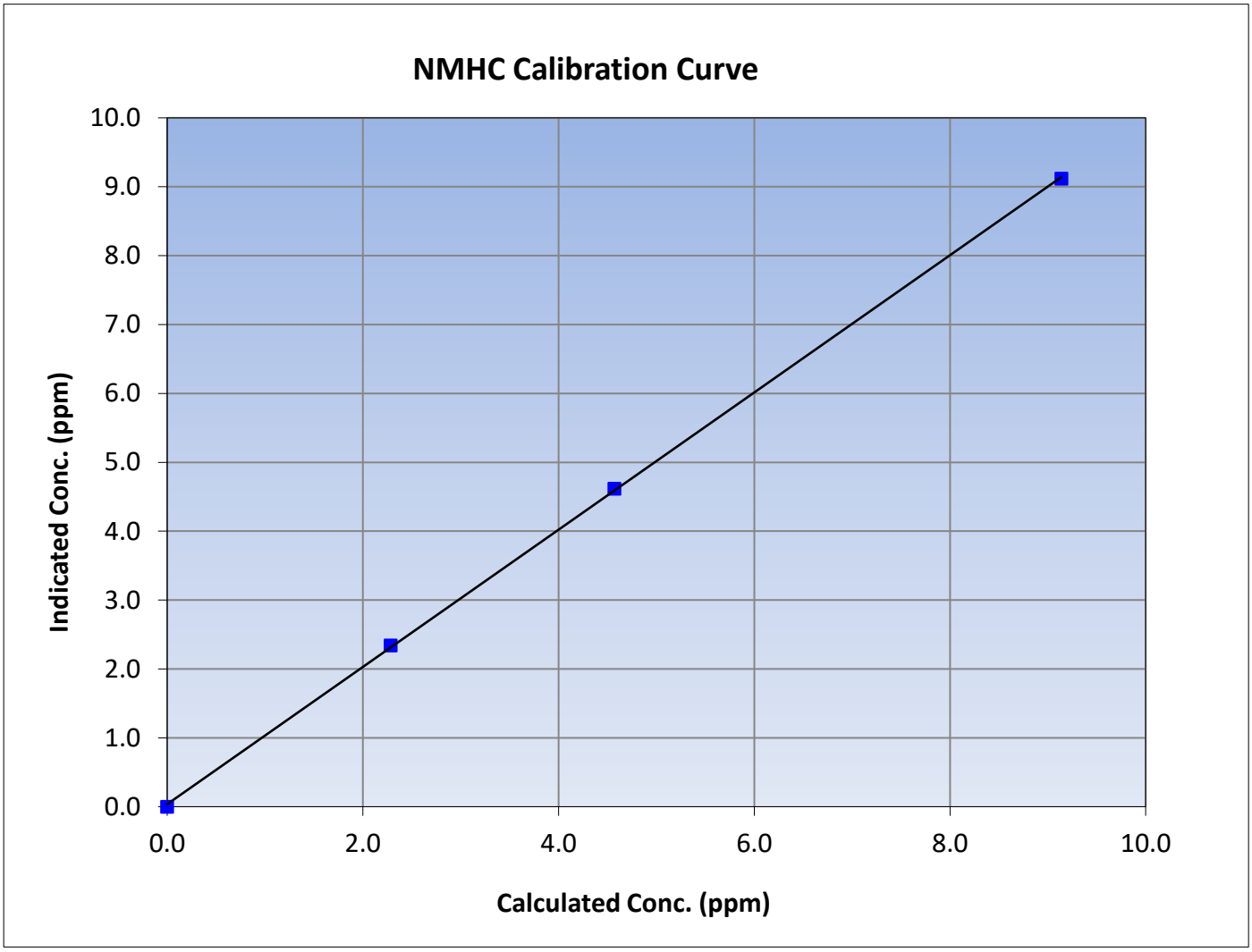
Version-06-2022

### Station Information

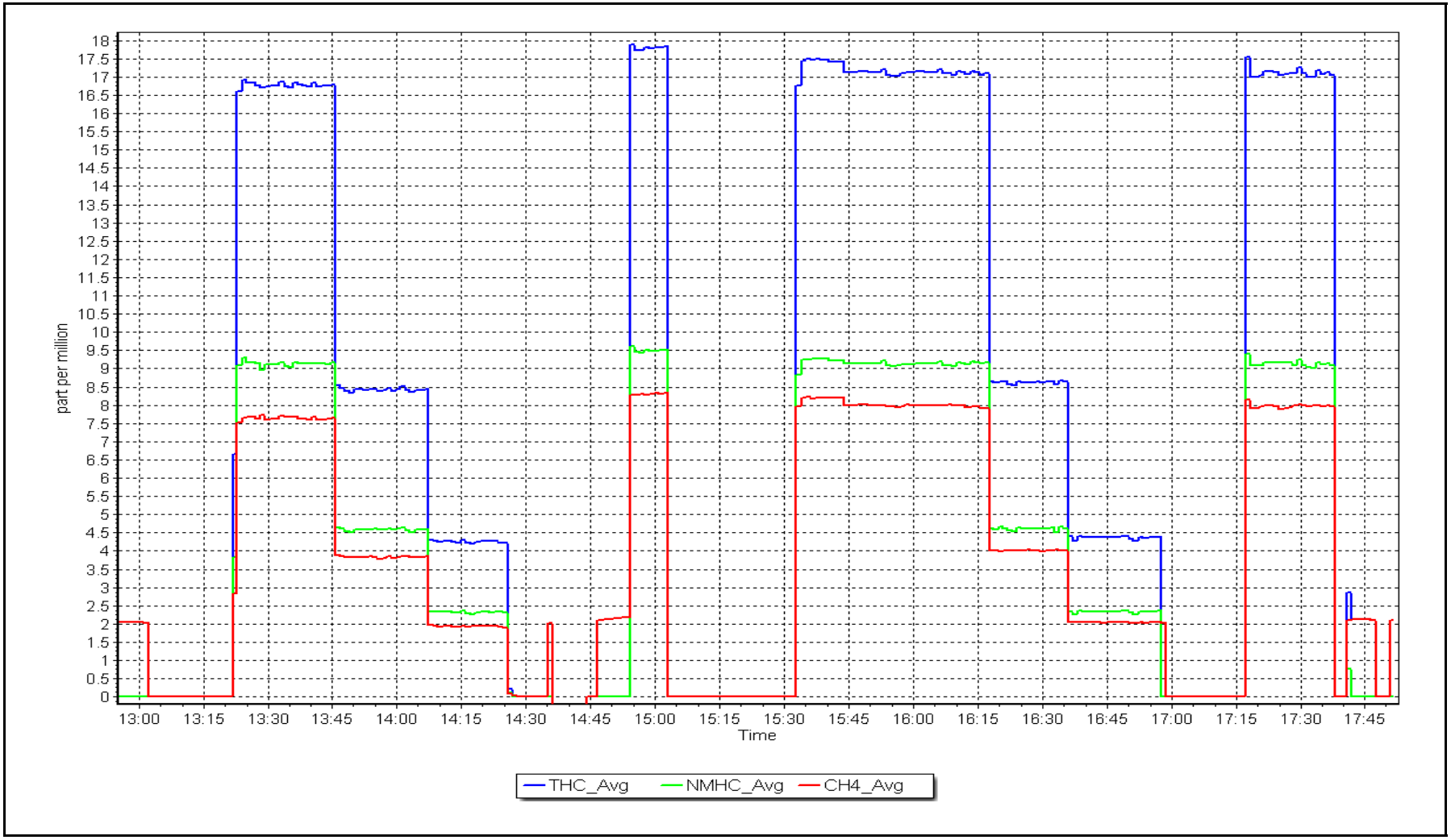
| | | | |
|---|---|---|---|
| Calibration Date: | March 5, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 12:58 | End Time (MST): | 17:51 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585649 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999922 | ≥0.995 |
| 9.14 | 9.12 | 1.0022 | | | |
| 4.57 | 4.62 | 0.9895 | Slope | 0.996179 | 0.90 - 1.10 |
| 2.28 | 2.34 | 0.9755 | | | |
| | | | Intercept | 0.036609 | +/-0.5 |



**NMHC Calibration Plot** Date: March 5, 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: | March 9, 2024 | Last Cal Date: | March 5, 2024 |
| Start time (MST): | 12:10 | End time (MST): | 13:54 |
| Reason: | Removal | | |

### 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: | 3.60E-04 | NA | NMHC SP Ratio: | 7.48E-05 | NA |
| CH4 Retention time: | 17.4 | NA | NMHC Peak Area: | 122143 | NA |
| 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 | 17.54 | 0.976 |
| as found 2nd point | 4960 | 40.1 | 8.56 | 8.79 | 0.974 |
| as found 3rd point | 4980 | 20.0 | 4.28 | 4.46 | 0.960 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.54 | Prev response | 17.14 | *% change | 2.3% |
| Baseline Corr 2nd AF: | 8.8 | AF Slope: | 1.022850 | AF Intercept: | 0.033987 |
| Baseline Corr 3rd AF: | 4.5 | AF Correlation: | 0.999979 | * = > +/-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 | 9.24 | 0.989 |
| as found 2nd point | 4960 | 40.1 | 4.57 | 4.65 | 0.984 |
| as found 3rd point | 4980 | 20.0 | 2.28 | 2.36 | 0.966 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 9.24 | Prev response | 9.14 | *% change | 1.1% |
| Baseline Corr 2nd AF: | 4.6 | AF Slope: | 1.009284 | AF Intercept: | 0.027215 |
| Baseline Corr 3rd AF: | 2.4 | AF Correlation: | 0.999959 | * = > +/-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 | 8.30 | 0.962 |
| as found 2nd point | 4960 | 40.1 | 3.99 | 4.14 | 0.964 |
| as found 3rd point | 4980 | 20.0 | 2.00 | 2.09 | 0.953 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 8.30 | Prev response | 8.00 | *% change | 3.7% |
| Baseline Corr 2nd AF: | 4.14 | AF Slope: | 1.038417 | AF Intercept: | 0.006372 |
| Baseline Corr 3rd AF: | 2.09 | AF Correlation: | 0.999991 | * = > +/-5% change initiates investigation | |

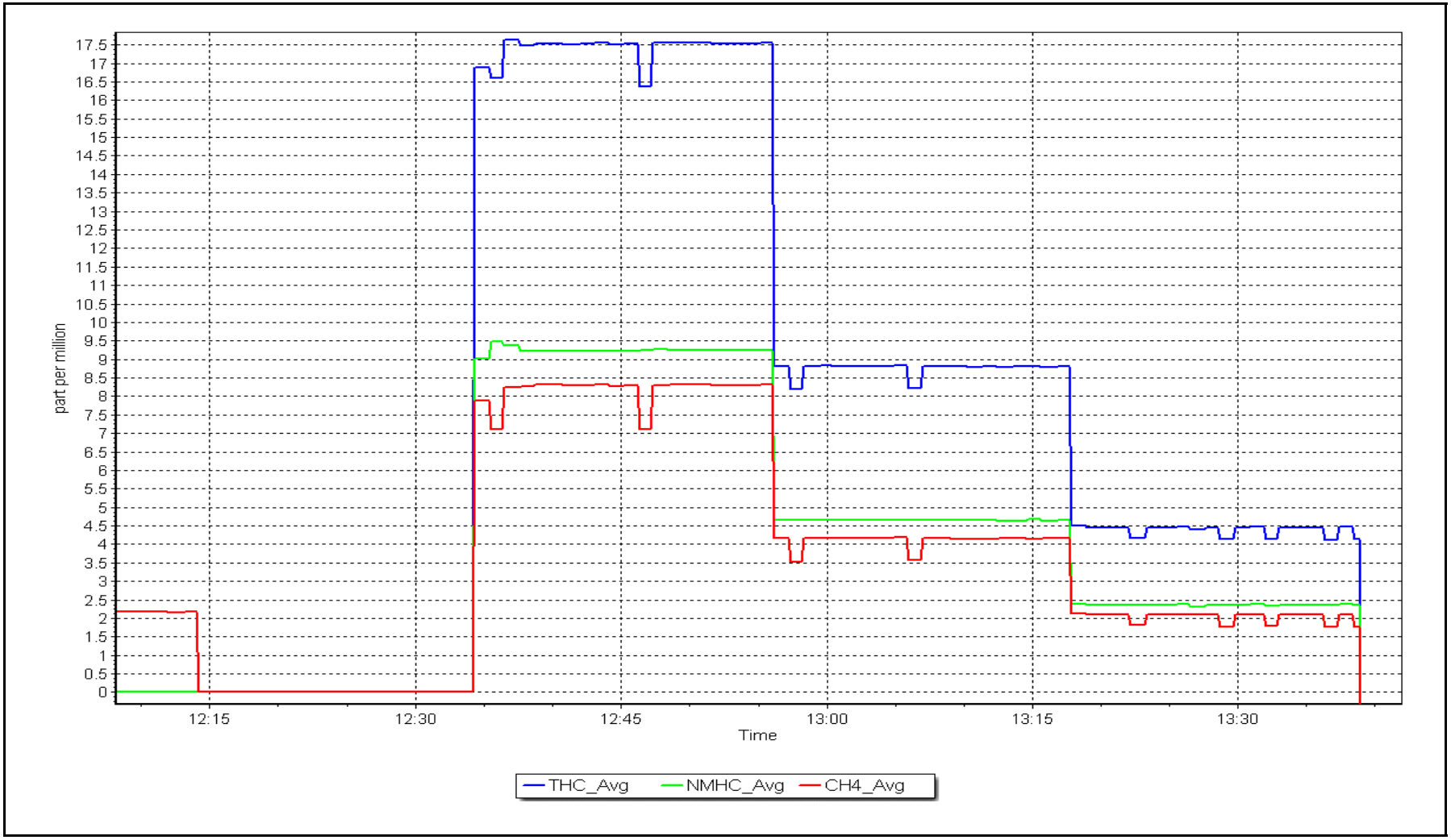
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.996984 | NA |
| THC Cal Offset: | 0.062768 | NA |
| CH4 Cal Slope: | 0.998048 | NA |
| CH4 Cal Offset: | 0.026159 | NA |
| NMHC Cal Slope: | 0.996179 | NA |
| NMHC Cal Offset: | 0.036609 | NA |

Notes: Removed due to dipping occurring after calibration and maintenance done on March 5. Installing analyzer SN: 1118148494.

Calibration Performed By: Braiden Boutilier

**NMHC Calibration Plot** Date: March 9, 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: | March 9, 2024 | Last Cal Date: | March 5, 2024 |
| Start time (MST): | 13:50 | End time (MST): | 18:25 |
| Reason: | Install | | |

### 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 #: | 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: | NA | 3.06E-04 | NMHC SP Ratio: | NA | 4.91E-05 |
| CH4 Retention time: | NA | 13.8 | NMHC Peak Area: | NA | 186157 |
| 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 | 80.2 | 17.13 | 17.07 | 1.003 |
| second point | 4960 | 40.1 | 8.56 | 8.63 | 0.992 |
| third point | 4980 | 20.0 | 4.28 | 4.38 | 0.978 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 17.13 | 17.09 | 1.002 |
| | | | | Average Correction Factor | 0.991 |

| | | | | | |
|---|---|---|---|---|---|
| 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 | 80.2 | 9.14 | 9.08 | 1.007 |
| second point | 4960 | 40.1 | 4.57 | 4.62 | 0.990 |
| third point | 4980 | 20.0 | 2.28 | 2.34 | 0.976 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 9.14 | 9.06 | 1.009 |
| | | | | Average Correction Factor | 0.991 |
| 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 | 80.2 | 7.99 | 7.99 | 0.999 |
| second point | 4960 | 40.1 | 3.99 | 4.02 | 0.994 |
| third point | 4980 | 20.0 | 2.00 | 2.04 | 0.980 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 7.99 | 8.03 | 0.995 |
| | | | | Average Correction Factor | 0.991 |
| 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 | 0.995216 |
| THC Cal Offset: | NA | 0.062766 |
| CH4 Cal Slope: | NA | 0.999651 |
| CH4 Cal Offset: | NA | 0.019559 |
| NMHC Cal Slope: | NA | 0.991840 |
| NMHC Cal Offset: | NA | 0.043208 |

Notes: Install calibration. Adjusted span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

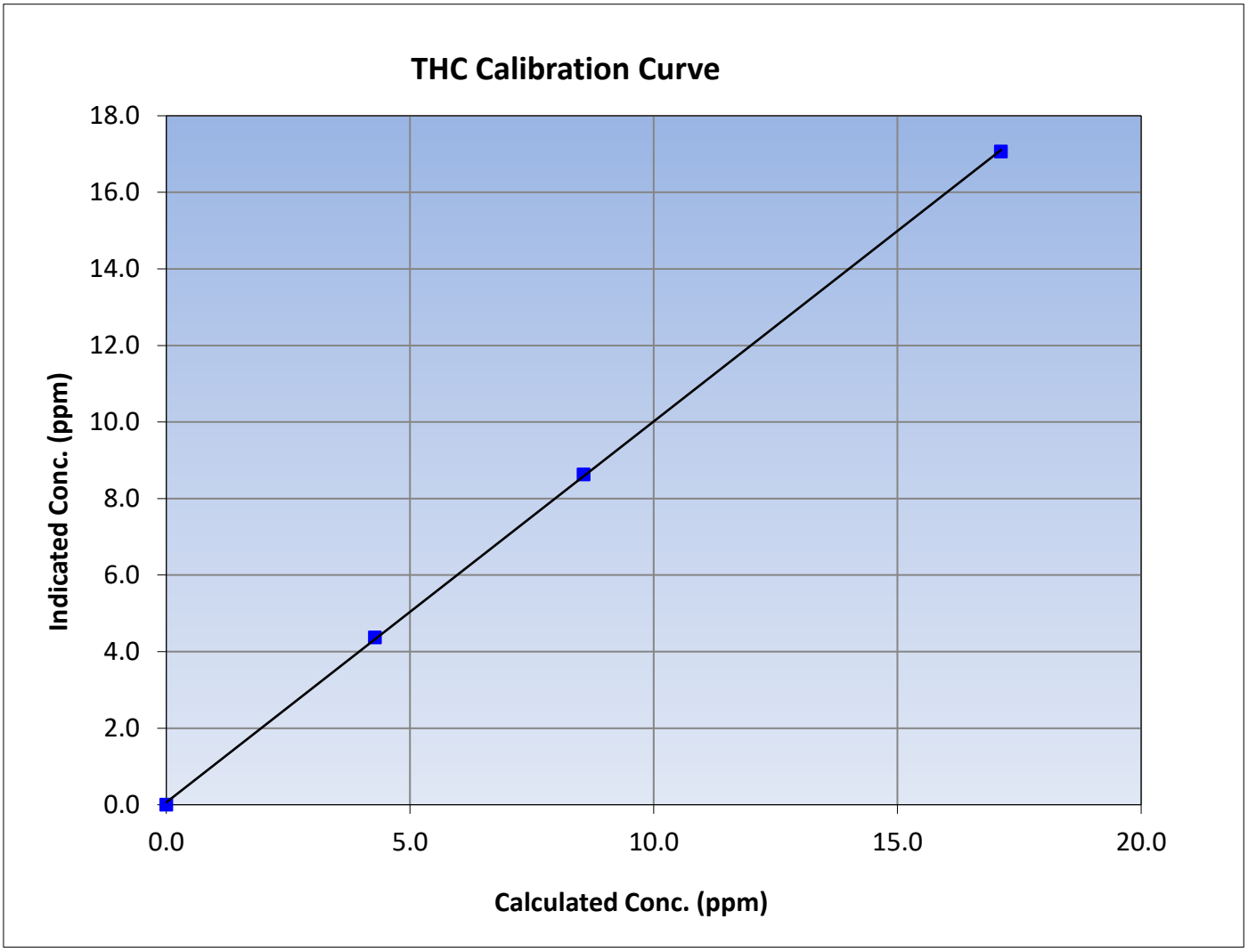
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 9, 2024 | Previous Calibration: | March 5, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 13:50 | End Time (MST): | 18:25 |
| 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 | 0.999936 | *≥0.995* |
| 17.13 | 17.07 | 1.0032 | | | |
| 8.56 | 8.63 | 0.9922 | Slope | 0.995216 | *0.90 - 1.10* |
| 4.28 | 4.38 | 0.9781 | | | |
| | | | Intercept | 0.062766 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

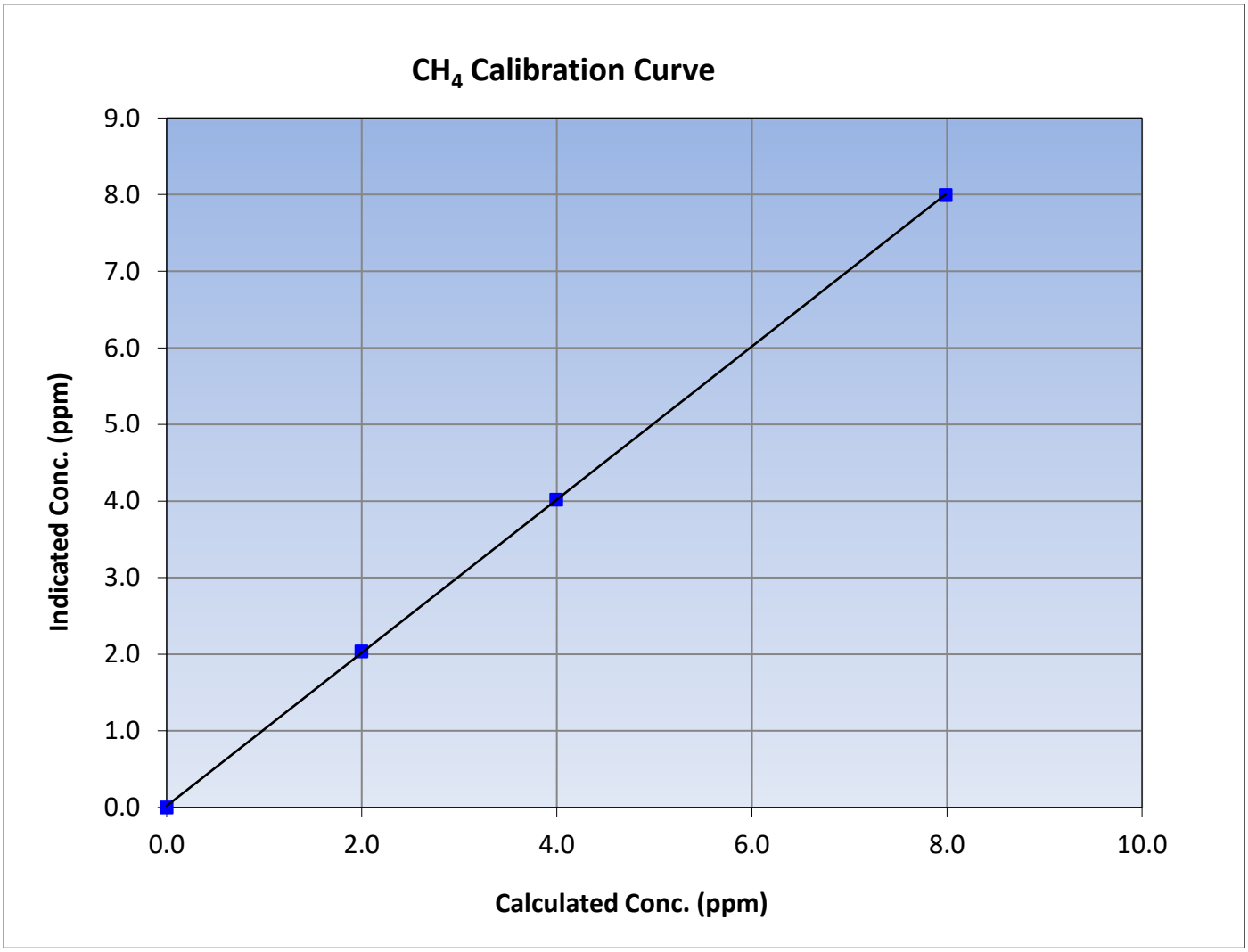
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 9, 2024 | Previous Calibration: | March 5, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 13:50 | End Time (MST): | 18:25 |
| 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 | 0.999972 | *≥0.995* |
| 7.99 | 7.99 | 0.9990 | | | |
| 3.99 | 4.02 | 0.9938 | Slope | 0.999651 | *0.90 - 1.10* |
| 2.00 | 2.04 | 0.9801 | | | |
| | | | Intercept | 0.019559 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

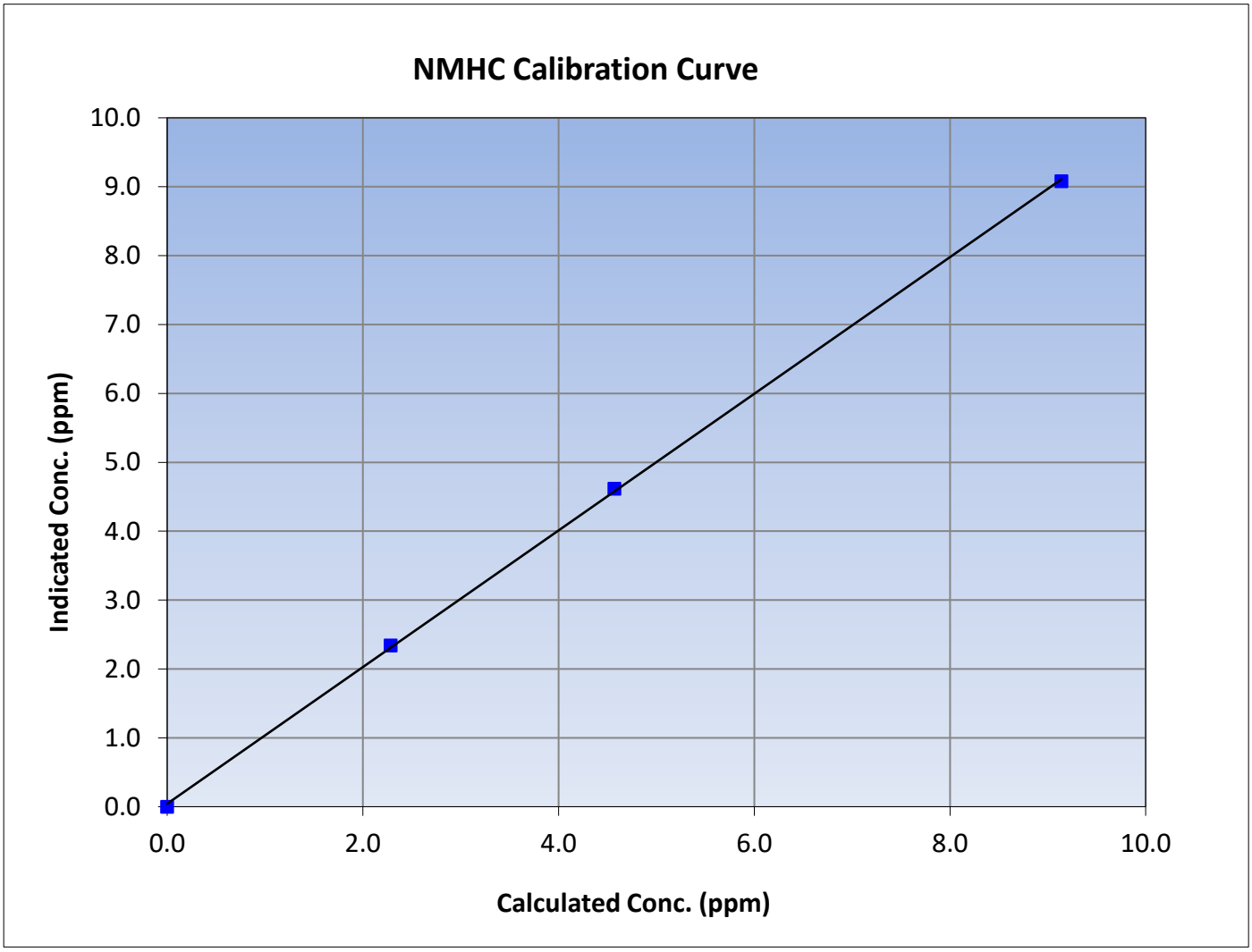
Version-06-2022

### Station Information

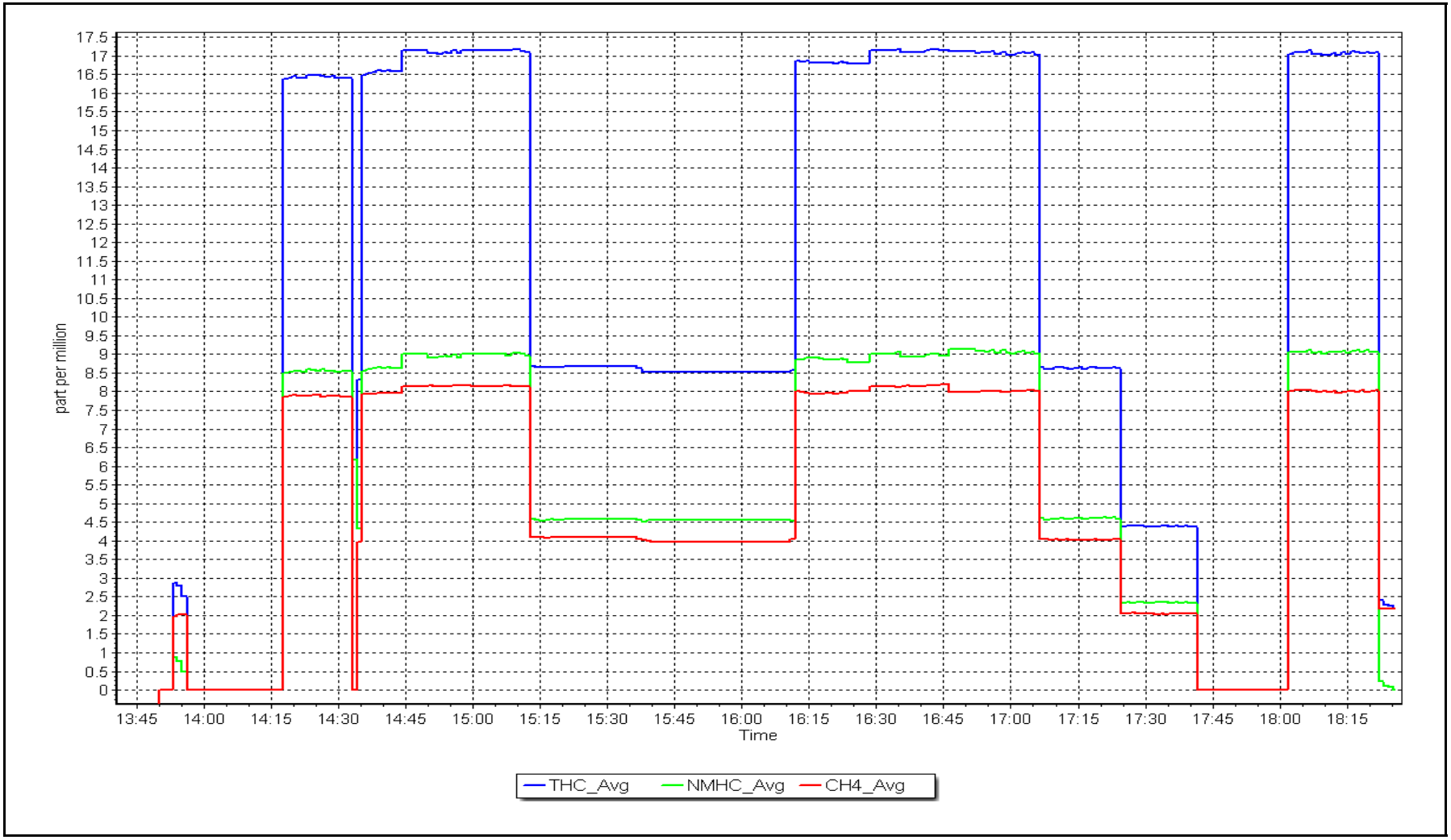
| | | | |
|---|---|---|---|
| Calibration Date: | March 9, 2024 | Previous Calibration: | March 5, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 13:50 | End Time (MST): | 18:25 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148494 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999884 | *≥0.995* |
| 9.14 | 9.08 | 1.0065 | | | |
| 4.57 | 4.62 | 0.9900 | Slope | 0.991840 | *0.90 - 1.10* |
| 2.28 | 2.34 | 0.9764 | | | |
| | | | Intercept | 0.043208 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 9, 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: | March 15, 2024 | Last Cal Date: | March 5, 2024 |
| Start time (MST): | 8:37 | End time (MST): | 10:44 |
| Reason: | Cylinder Change | | |

### 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 #: | 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: | NA | 3.06E-04 | NMHC SP Ratio: | NA | 4.91E-05 |
| CH4 Retention time: | NA | 13.8 | NMHC Peak Area: | NA | 186157 |
| 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 | 80.2 | 17.13 | 17.07 | 1.003 |
| 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 | 16.86 | 16.86 | 1.000 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.000 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.07 | 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 | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 9.14 | 9.24 | 0.989 |
| 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 | 9.16 | 0.998 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 0.998 |
| Baseline Corr AF: | 9.24 | 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 | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as found span | 4920 | 80.2 | 7.99 | 7.83 | 1.020 |
| 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 | 7.70 | 1.037 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.037 |
| Baseline Corr AF: | 7.83 | 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 | |

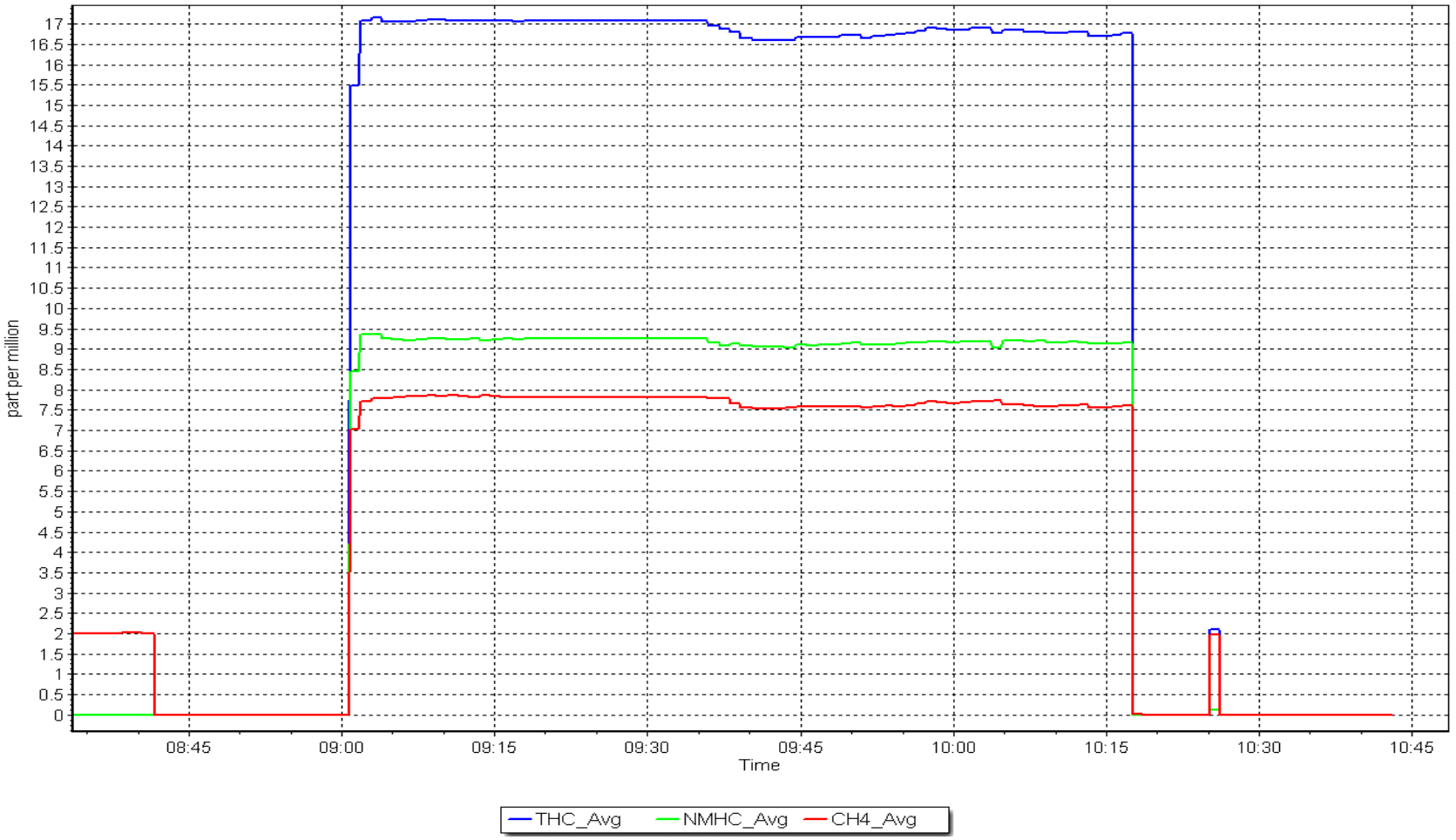
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | NA | 1.000264 |
| THC Cal Offset: | NA | 0.000000 |
| CH4 Cal Slope: | NA | 0.964313 |
| CH4 Cal Offset: | NA | 0.000000 |
| NMHC Cal Slope: | NA | 1.002054 |
| NMHC Cal Offset: | NA | 0.000000 |

Notes: H2 and N2 cylinder changed after as founds. Sample inlet filters changed before calibrator zero. No adjustment made.

Calibration Performed By: Jan Castro

**NMHC Calibration Plot** Date: March 15, 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: | March 18, 2024 | Last Cal Date: | March 9, 2024 |
| Start time (MST): | 8:41 | End time (MST): | 11:44 |
| Reason: | Maintenance | | |

### 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 #: | 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: | 3.06E-04 | 3.04E-04 | NMHC SP Ratio: | 4.91E-05 | 4.82E-05 |
| CH4 Retention time: | 13.8 | 13.8 | NMHC Peak Area: | 186157 | 189786 |
| 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 | 80.2 | 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 | 8.63 | 0.992 |
| third point | 4980 | 20.0 | 4.28 | 4.41 | 0.971 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 17.13 | 17.07 | 1.003 |
| | | | | Average Correction Factor | 0.987 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.45 | Prev response | 17.11 | *% change | 2.0% |
| 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-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 | 9.37 | 0.976 |
| 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 | 9.14 | 1.000 |
| second point | 4960 | 40.1 | 4.57 | 4.62 | 0.989 |
| third point | 4980 | 20.0 | 2.28 | 2.36 | 0.968 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 9.14 | 9.11 | 1.003 |
| | | | | Average Correction Factor | 0.986 |
| Baseline Corr AF: | 9.37 | Prev response | 9.11 | *% change | 2.8% |
| 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 | 80.2 | 7.99 | 8.08 | 0.988 |
| 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 | 8.01 | 0.997 |
| second point | 4960 | 40.1 | 3.99 | 4.01 | 0.996 |
| third point | 4980 | 20.0 | 2.00 | 2.05 | 0.976 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 7.99 | 7.96 | 1.003 |
| | | | | Average Correction Factor | 0.990 |
| Baseline Corr AF: | 8.08 | Prev response | 8.00 | *% change | 1.0% |
| 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: | 0.995216 | 0.999299 |
| THC Cal Offset: | 0.062766 | 0.059171 |
| CH4 Cal Slope: | 0.999651 | 1.000967 |
| CH4 Cal Offset: | 0.019559 | 0.018960 |
| NMHC Cal Slope: | 0.991840 | 0.997617 |
| NMHC Cal Offset: | 0.043208 | 0.040611 |

Notes: Maintenance calibration to address baseline dipping. Changed sample inlet filters after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## THC Calibration Summary

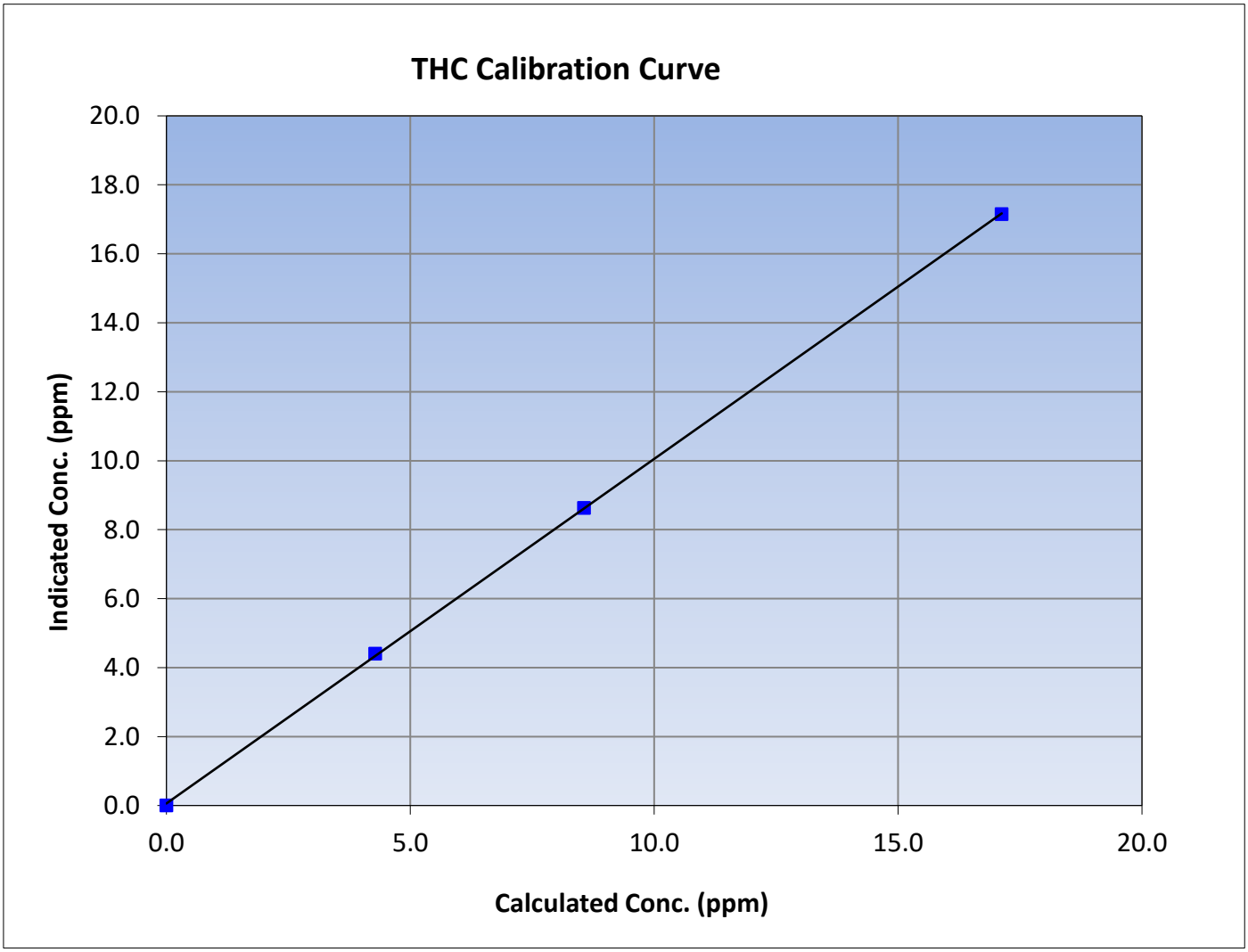
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | March 9, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:41 | End Time (MST): | 11:44 |
| 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 | 0.999943 | ≥0.995 |
| 17.13 | 17.15 | 0.9987 | | | |
| 8.56 | 8.63 | 0.9922 | Slope | 0.999299 | 0.90 - 1.10 |
| 4.28 | 4.41 | 0.9715 | | | |
| | | | Intercept | 0.059171 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

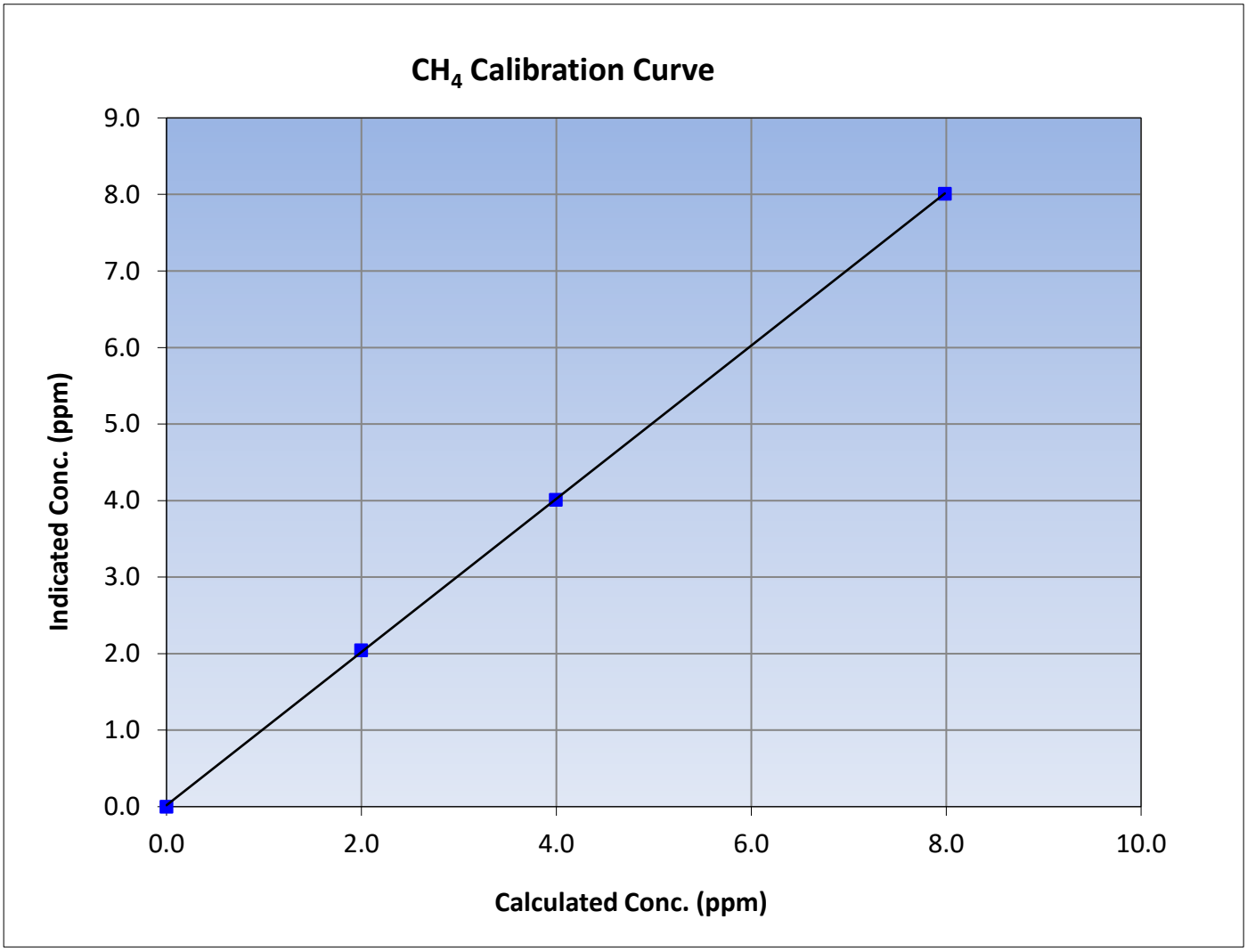
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | March 9, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:41 | End Time (MST): | 11:44 |
| 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 | 0.999965 | *≥0.995* |
| 7.99 | 8.01 | 0.9973 | | | |
| 3.99 | 4.01 | 0.9955 | Slope | 1.000967 | *0.90 - 1.10* |
| 2.00 | 2.05 | 0.9758 | | | |
| | | | Intercept | 0.018960 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

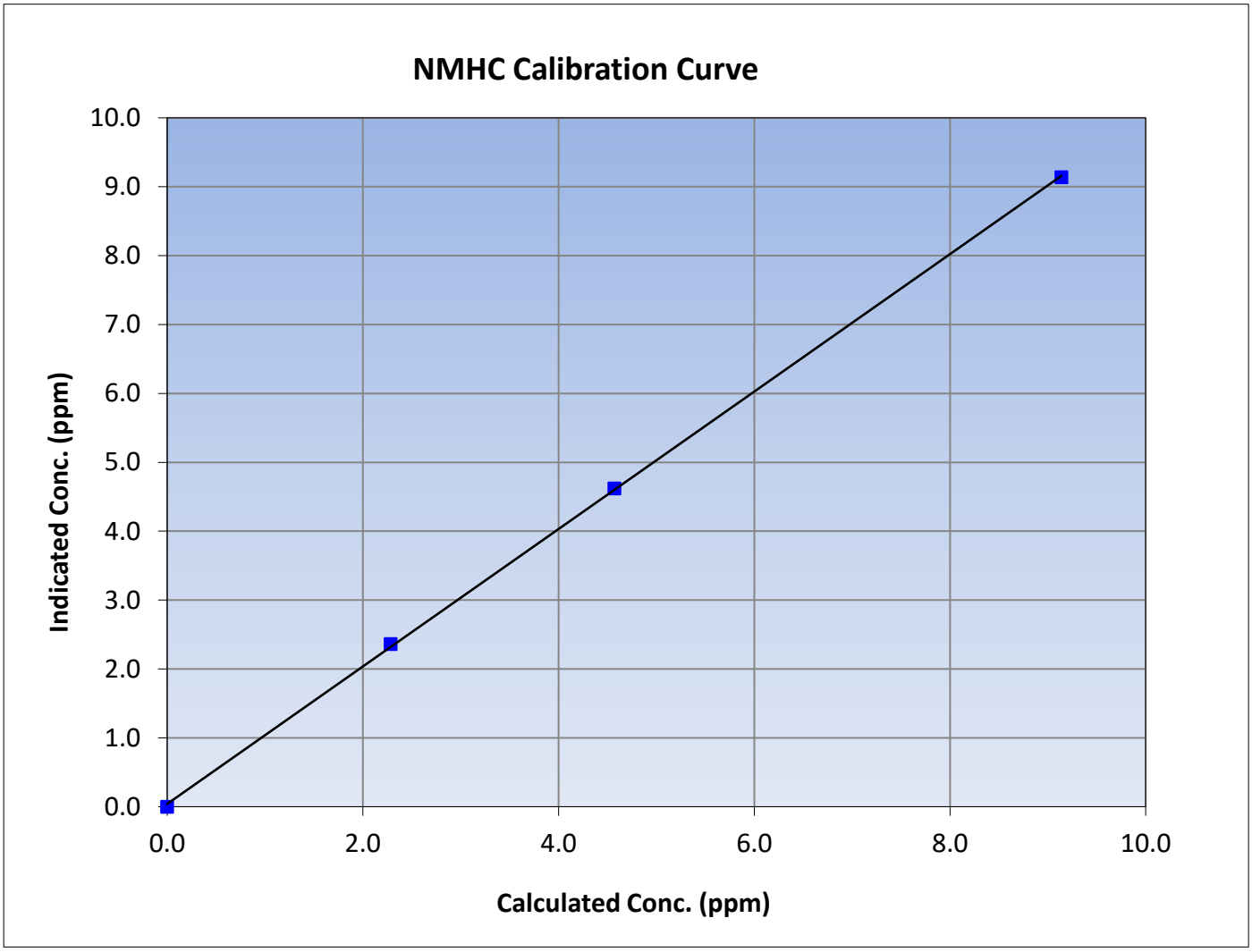
Version-06-2022

### Station Information

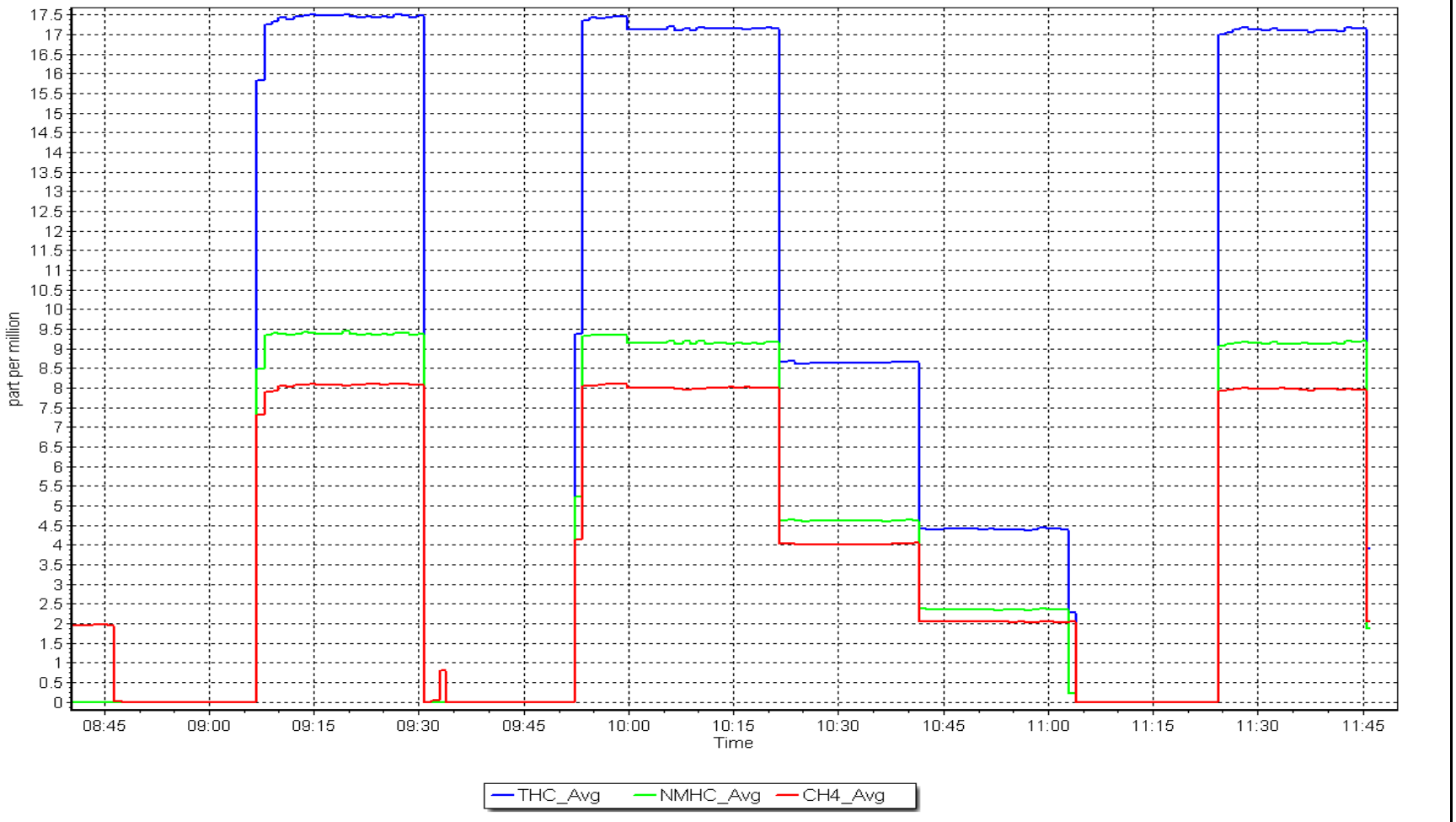
| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | March 9, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:41 | End Time (MST): | 11:44 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1118148494 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999909 | ≥0.995 |
| 9.14 | 9.14 | 1.0001 | | | |
| 4.57 | 4.62 | 0.9893 | Slope | 0.997617 | 0.90 - 1.10 |
| 2.28 | 2.36 | 0.9677 | | | |
| | | | Intercept | 0.040611 | +/-0.5 |



**NMHC Calibration Plot** Date: March 18, 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: | March 19, 2024 | Last Cal Date: | March 18, 2024 |
| Start time (MST): | 9:34 | End time (MST): | 11:37 |
| Reason: | Maintenance | Change ZAG | |

### 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 #: | 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: | 3.04E-04 | 3.04E-04 | NMHC SP Ratio: | 4.82E-05 | 4.82E-05 |
| CH4 Retention time: | 13.8 | 13.8 | NMHC Peak Area: | 189786 | 189786 |
| 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 | 80.2 | 17.13 | 16.74 | 1.023 |
| 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 | 16.74 | 1.023 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.023 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 16.74 | Prev response | 17.11 | *% change | -2.2% |
| 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 | 80.2 | 9.14 | 9.11 | 1.003 |
| 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 | 9.11 | 1.003 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.003 |
| Baseline Corr AF: | 9.11 | Prev response | 9.11 | *% 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 | 7.63 | 1.046 |
| 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 | 7.63 | 1.046 |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | 1.046 |
| Baseline Corr AF: | 7.63 | Prev response | 8.00 | *% change | -4.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

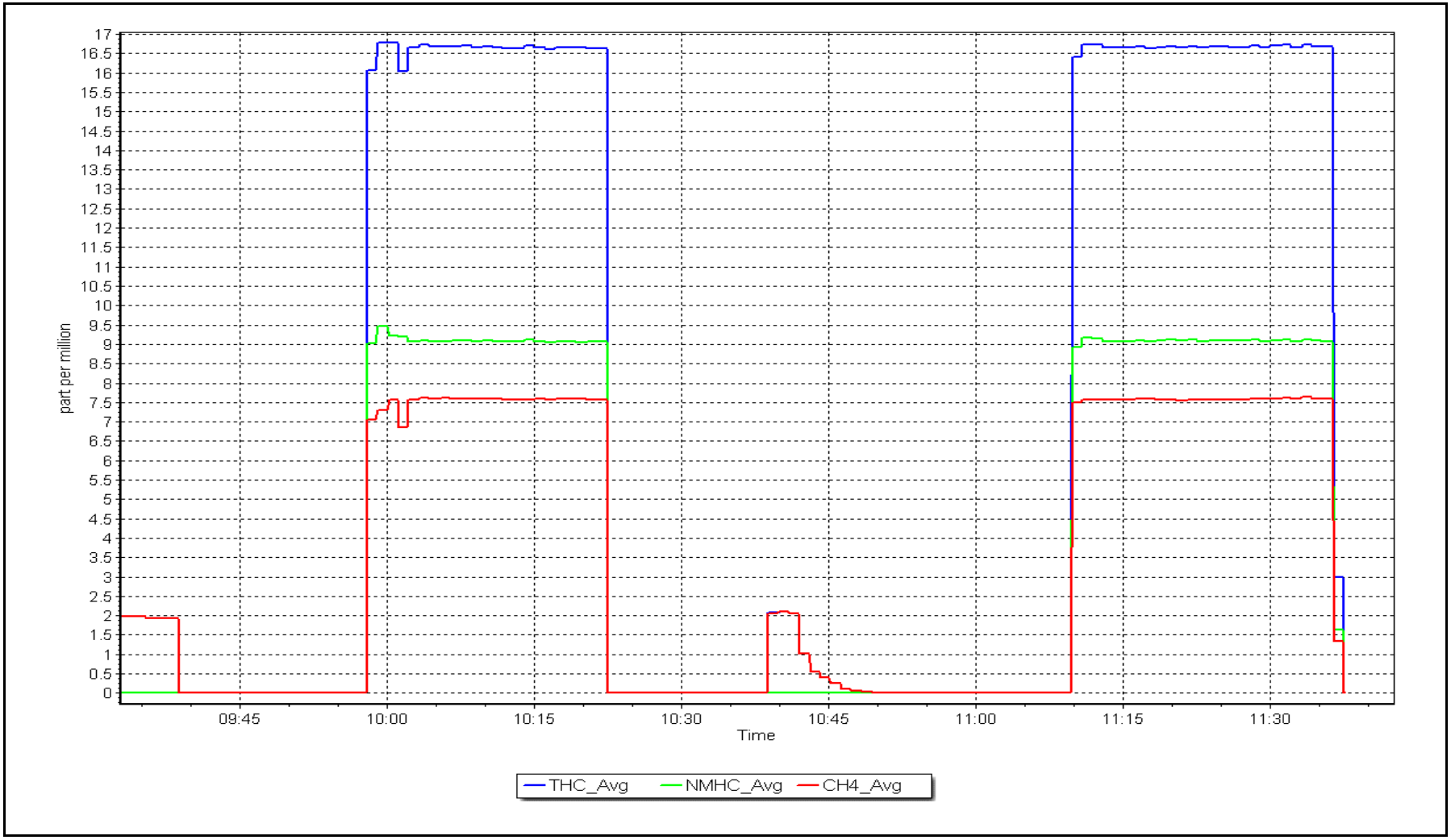
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.995216 | 0.977506 |
| THC Cal Offset: | 0.062766 | 0.000000 |
| CH4 Cal Slope: | 0.999651 | 0.955923 |
| CH4 Cal Offset: | 0.019559 | 0.000000 |
| NMHC Cal Slope: | 0.991840 | 0.996802 |
| NMHC Cal Offset: | 0.043208 | 0.000000 |

Notes: ZAG was replaced after as founds. No adjustment made.

Calibration Performed By: Jan Castro

**NMHC Calibration Plot** Date: March 19, 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: | March 20, 2024 | Last Cal Date: | March 18, 2024 |
| Start time (MST): | 9:23 | End time (MST): | 10:47 |
| Reason: | Removal | | |

### 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 #: | 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: | 3.04E-04 | NA | NMHC SP Ratio: | 4.82E-05 | NA |
| CH4 Retention time: | 13.8 | NA | NMHC Peak Area: | 189786 | NA |
| 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 | 80.2 | 17.13 | 17.09 | 1.002 |
| as found 2nd point | 4960 | 40.1 | 8.56 | 8.62 | 0.994 |
| as found 3rd point | 4980 | 20.0 | 4.27 | 4.40 | 0.971 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |
| | | | | Average Correction Factor | |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.09 | Prev response | 17.11 | *% change | -0.1% |
| Baseline Corr 2nd AF: | 8.6 | AF Slope: | 0.995642 | AF Intercept: | 0.069188 |
| Baseline Corr 3rd AF: | 4.4 | AF Correlation: | 0.999923 | * = > +/-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 | 9.04 | 1.011 |
| as found 2nd point | 4960 | 40.1 | 4.57 | 4.54 | 1.006 |
| as found 3rd point | 4980 | 20.0 | 2.28 | 2.33 | 0.978 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 9.04 | Prev response | 9.11 | *% change | -0.8% |
| Baseline Corr 2nd AF: | 4.5 | AF Slope: | 0.986540 | AF Intercept: | 0.035018 |
| Baseline Corr 3rd AF: | 2.3 | AF Correlation: | 0.999919 | * = > +/-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 | 8.04 | 0.993 |
| as found 2nd point | 4960 | 40.1 | 3.99 | 4.07 | 0.981 |
| as found 3rd point | 4980 | 20.0 | 1.99 | 2.07 | 0.963 |
| new cylinder response | | | | | |
| calibrator zero | | | | | |
| high point | | | | | |
| second point | | | | | |
| third point | | | | | |
| as left zero | | | | | |
| as left span | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 8.04 | Prev response | 8.00 | *% change | 0.5% |
| Baseline Corr 2nd AF: | 4.07 | AF Slope: | 1.004757 | AF Intercept: | 0.035968 |
| Baseline Corr 3rd AF: | 2.07 | AF Correlation: | 0.999907 | * = > +/-5% change initiates investigation | |

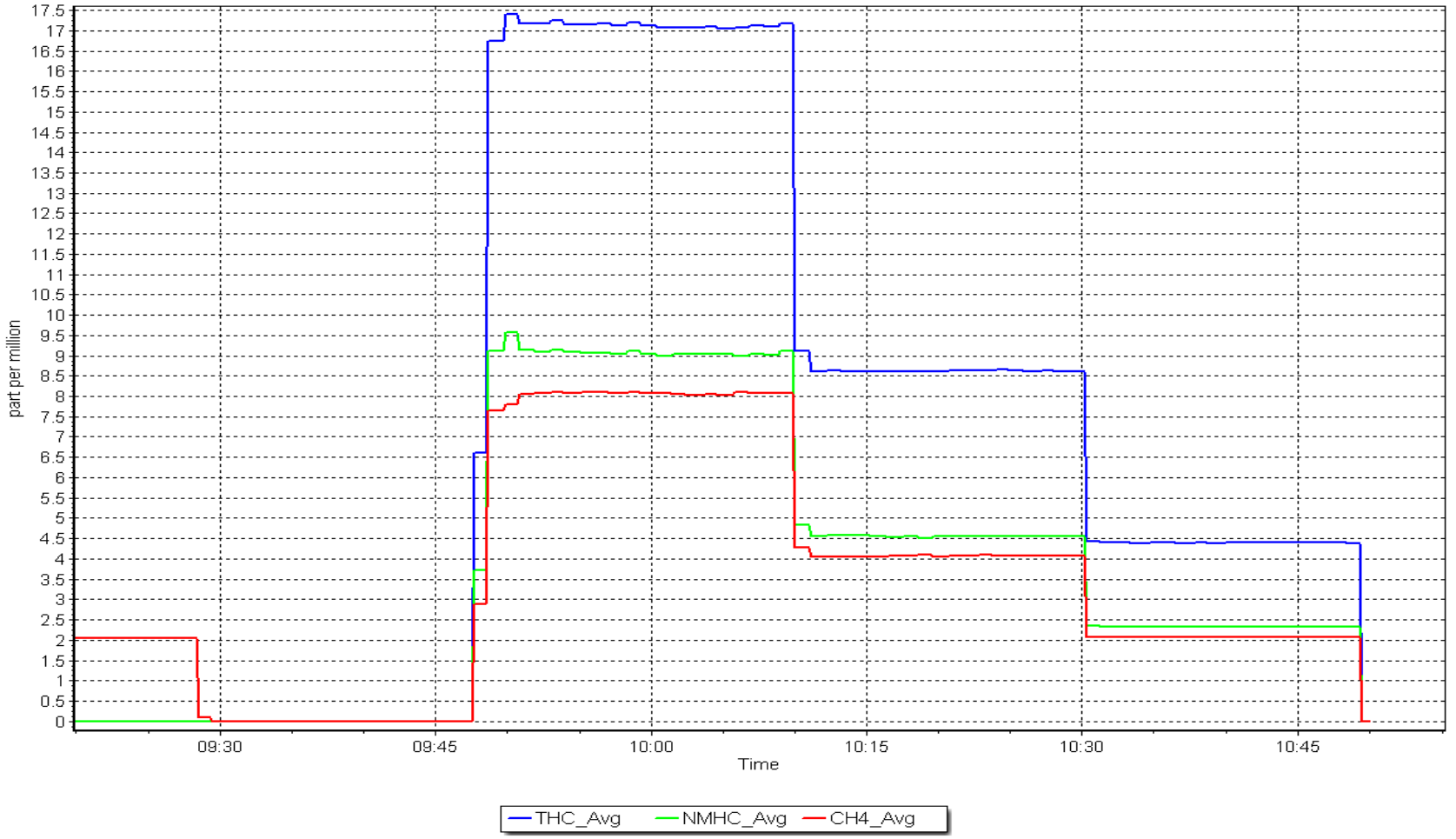
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.995216 | NA |
| THC Cal Offset: | 0.062766 | NA |
| CH4 Cal Slope: | 0.999651 | NA |
| CH4 Cal Offset: | 0.019559 | NA |
| NMHC Cal Slope: | 0.991840 | NA |
| NMHC Cal Offset: | 0.043208 | NA |

Notes: Baseline dipping during daily system checks. Removing instrument for further troubleshooting in the shop.

Calibration Performed By: Jan Castro

**NMHC Calibration Plot** Date: March 20, 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: | March 20, 2024 | Last Cal Date: | NA |
| Start time (MST): | 11:24 | End time (MST): | 13:35 |
| Reason: | Install | | |

### 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: | 953 | |

### Analyzer Information

| | | | |
|---|---|---|---|
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259520 |
| 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: | NA | 2.55E-04 | NMHC SP Ratio: | NA | 5.96E-05 |
| CH4 Retention time: | NA | 15.0 | NMHC Peak Area: | NA | 153262 |
| 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 | | | | | |
| 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 | 4920 | 80.2 | 17.13 | 17.04 | 1.005 |
| second point | 4960 | 40.1 | 8.56 | 8.59 | 0.997 |
| third point | 4980 | 20.0 | 4.28 | 4.36 | 0.982 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 17.13 | 17.00 | 1.008 |
| | | | | 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 | 80.2 | 9.14 | 9.11 | 1.003 |
| second point | 4960 | 40.1 | 4.57 | 4.59 | 0.995 |
| third point | 4980 | 20.0 | 2.28 | 2.33 | 0.980 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.2 | 9.14 | 9.11 | 1.003 |
| | | | | Average Correction Factor | 0.993 |
| 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 | 0.01 | ---- |
| high point | 4920 | 80.2 | 7.99 | 7.93 | 1.007 |
| second point | 4960 | 40.1 | 3.99 | 3.99 | 1.000 |
| 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 | 7.88 | 1.013 |
| | | | | Average Correction Factor | 0.997 |
| 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 | 0.993227 |
| THC Cal Offset: | NA | 0.057164 |
| CH4 Cal Slope: | NA | 0.991351 |
| CH4 Cal Offset: | NA | 0.026556 |
| NMHC Cal Slope: | NA | 0.995229 |
| NMHC Cal Offset: | NA | 0.029409 |

Notes: Install calibration. Adjusted zero and span. Use zero chromatogram

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## THC Calibration Summary

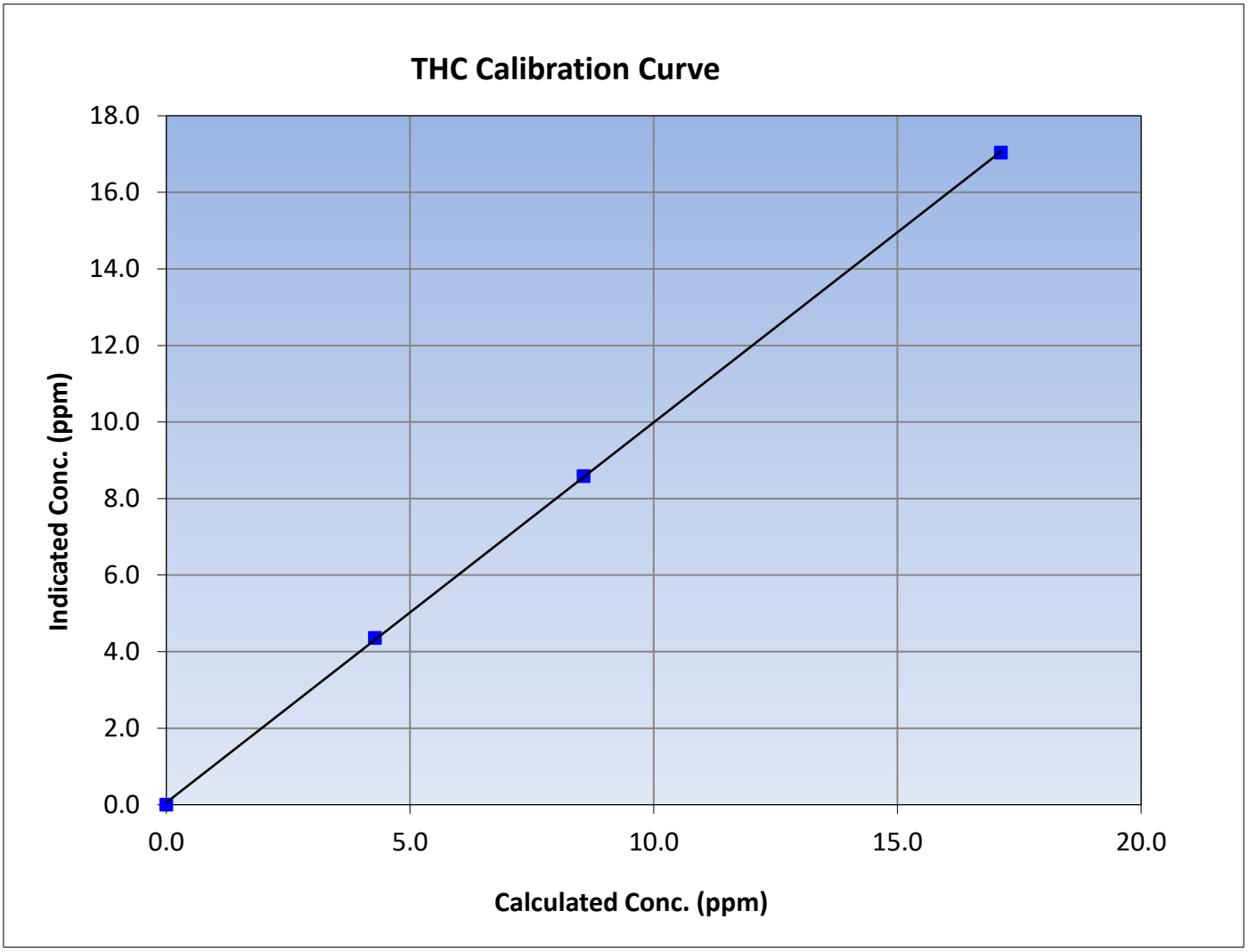
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | NA |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 11:24 | End Time (MST): | 13:35 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259520 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.01 | ---- | Correlation Coefficient | 0.999959 | ≥0.995 |
| 17.13 | 17.04 | 1.0050 | | | |
| 8.56 | 8.59 | 0.9968 | Slope | 0.993227 | 0.90 - 1.10 |
| 4.28 | 4.36 | 0.9822 | | | |
| | | | Intercept | 0.057164 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

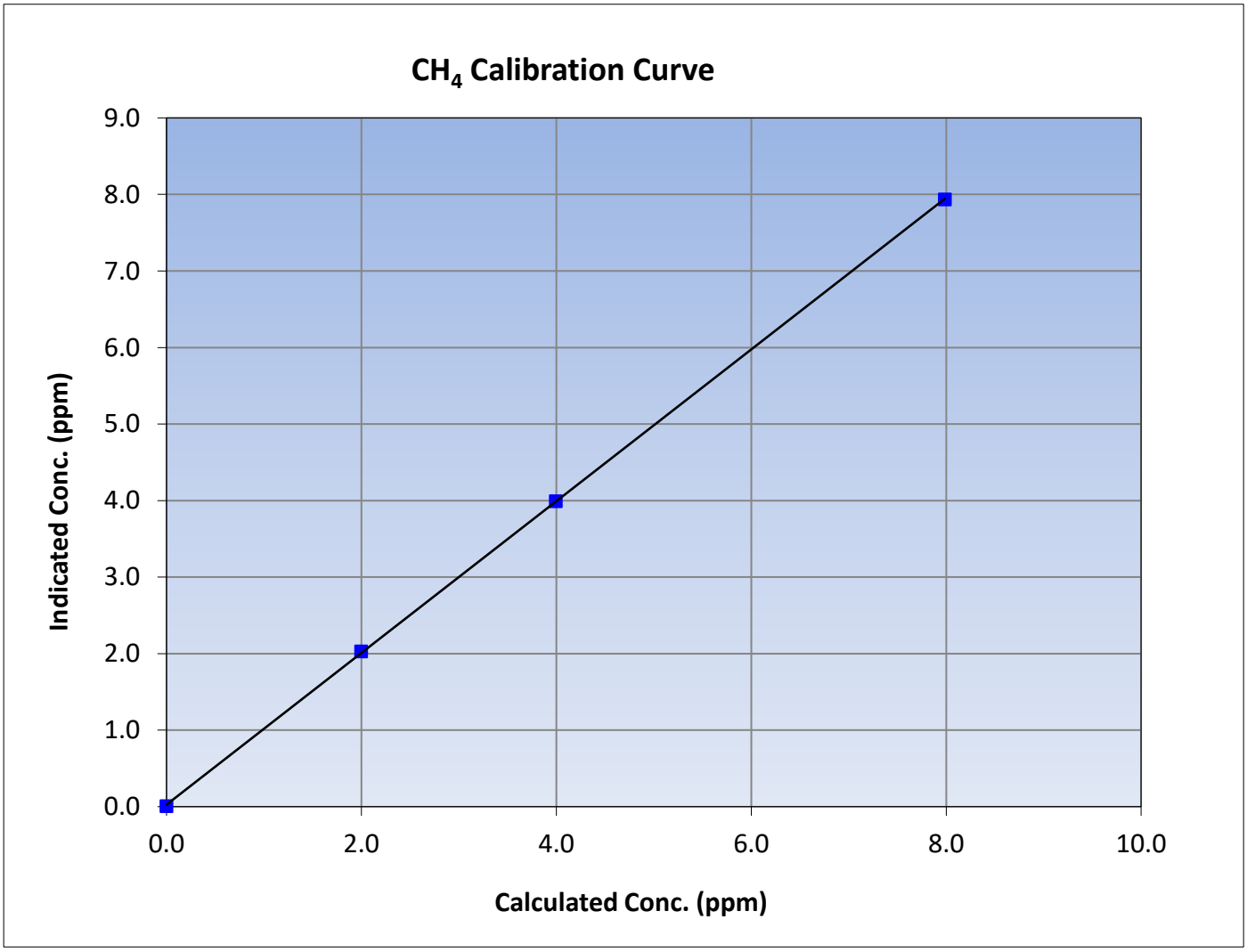
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | NA |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 11:24 | End Time (MST): | 13:35 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259520 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.01 | ---- | Correlation Coefficient | 0.999969 | *≥0.995* |
| 7.99 | 7.93 | 1.0066 | | | |
| 3.99 | 3.99 | 1.0000 | Slope | 0.991351 | *0.90 - 1.10* |
| 2.00 | 2.03 | 0.9845 | | | |
| | | | Intercept | 0.026556 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

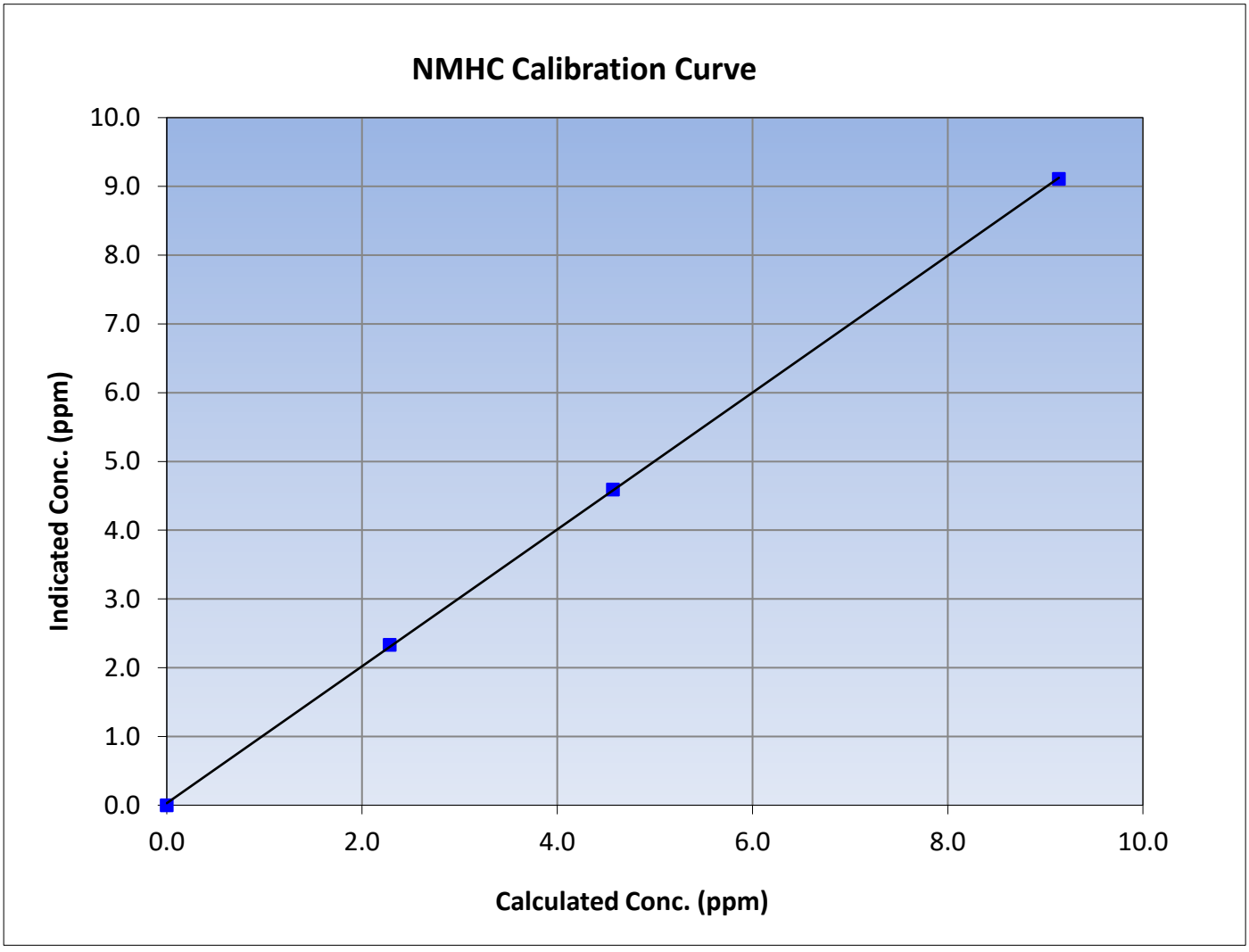
Version-06-2022

### Station Information

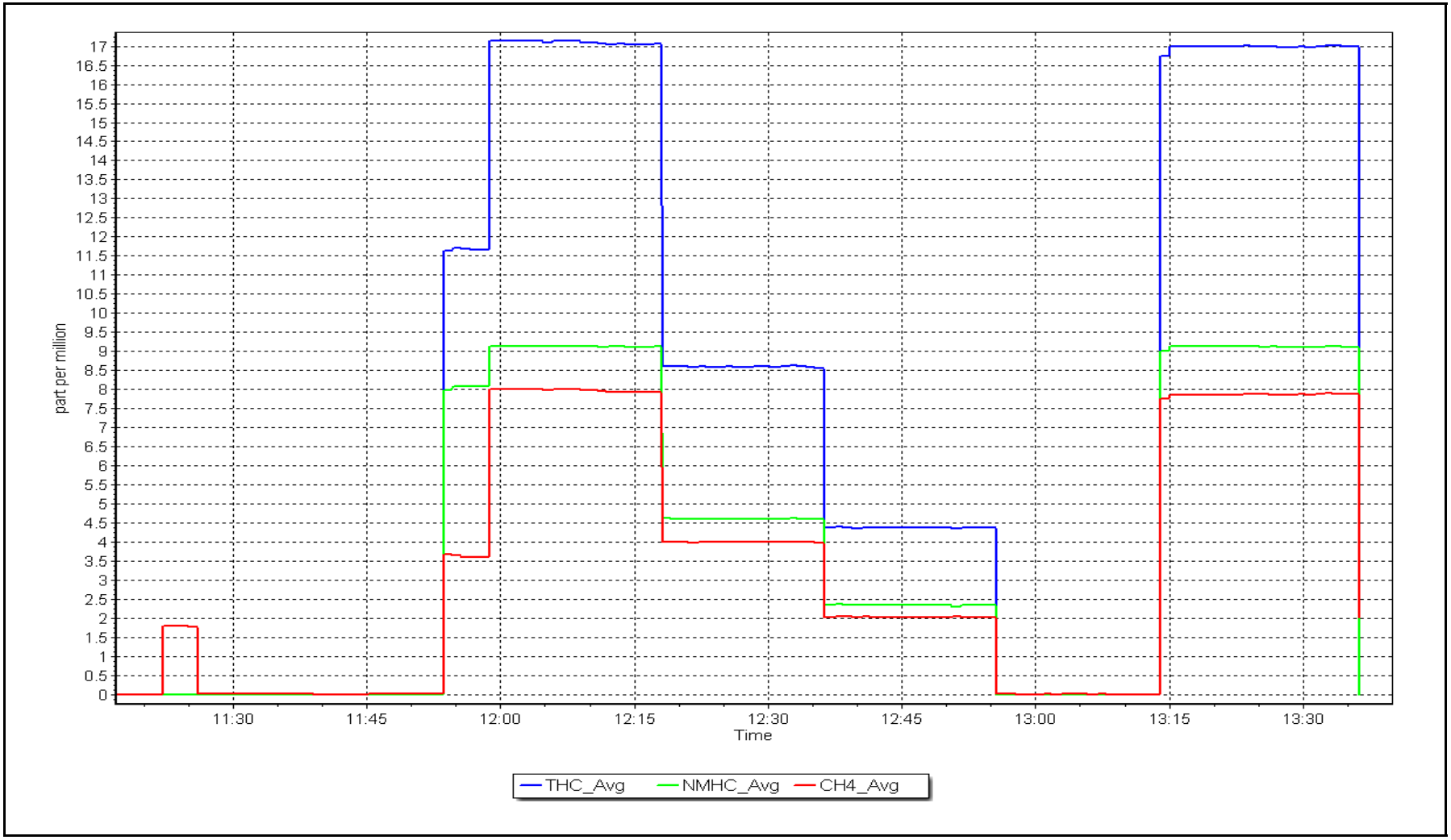
| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | NA |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 11:24 | End Time (MST): | 13:35 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1331259520 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999952 | ≥0.995 |
| 9.14 | 9.11 | 1.0032 | | | |
| 4.57 | 4.59 | 0.9949 | Slope | 0.995229 | 0.90 - 1.10 |
| 2.28 | 2.33 | 0.9797 | | | |
| | | | Intercept | 0.029409 | +/-0.5 |



**NMHC Calibration Plot** Date: March 20, 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: | March 26, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 8:56 | End time (MST): | 13:29 |
| 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: | 1.050 | 1.004 | NO bkgnd or offset: | 10.5 | 10.1 |
| NOX coeff or slope: | 0.993 | 0.993 | NOX bkgnd or offset: | 10.6 | 10.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 150.6 | 147.3 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.993108 | 0.994854 |
| $NO_X$ Cal Offset: | 2.428003 | 2.228020 |
| NO Cal Slope: | 0.994636 | 1.000020 |
| NO Cal Offset: | 1.768002 | 1.008029 |
| $NO_2$ Cal Slope: | 1.004592 | 0.996734 |
| $NO_2$ Cal Offset: | -0.278421 | -0.362609 |

# 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 | 4918 | 82.0 | 802.0 | 800.1 | 1.9 | 837.8 | 836.6 | 1.1 | 0.9572 | 0.9564 |
| 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 | 4918 | 82.0 | 802.0 | 800.3 | 1.6 | 799.0 | 801.0 | -1.7 | 1.0037 | 0.9992 |
| second point | 4959 | 41.0 | 401.0 | 400.2 | 0.8 | 402.2 | 401.2 | 1.0 | 0.9970 | 0.9974 |
| third point | 4980 | 20.5 | 200.5 | 200.1 | 0.4 | 203.8 | 202.4 | 1.4 | 0.9837 | 0.9884 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | ---- | ---- |
| as left span | 4918 | 82.0 | 802.0 | 385.6 | 416.3 | 796.6 | 382.9 | 413.7 | 1.0067 | 1.0071 |
| | | | | | | | | Average Correction Factor | 0.9948 | 0.9950 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 837.9 ppb | NO = 836.7 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | 4.7% |
| Previous Response | $NO_X$ = 798.9 ppb | NO = 797.6 ppb | | | *Percent Change | NO = | 4.7% |
| 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) | 797.7 | 383.0 | 416.3 | 415.1 | 1.0030 | 99.7% |
| 2nd GPT point (200 ppb O3) | 797.7 | 593.2 | 206.1 | 204.1 | 1.0100 | 99.0% |
| 3rd GPT point (100 ppb O3) | 797.7 | 696.4 | 102.9 | 102.3 | 1.0063 | 99.4% |
| | | | | Average Correction Factor | 1.0064 | 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

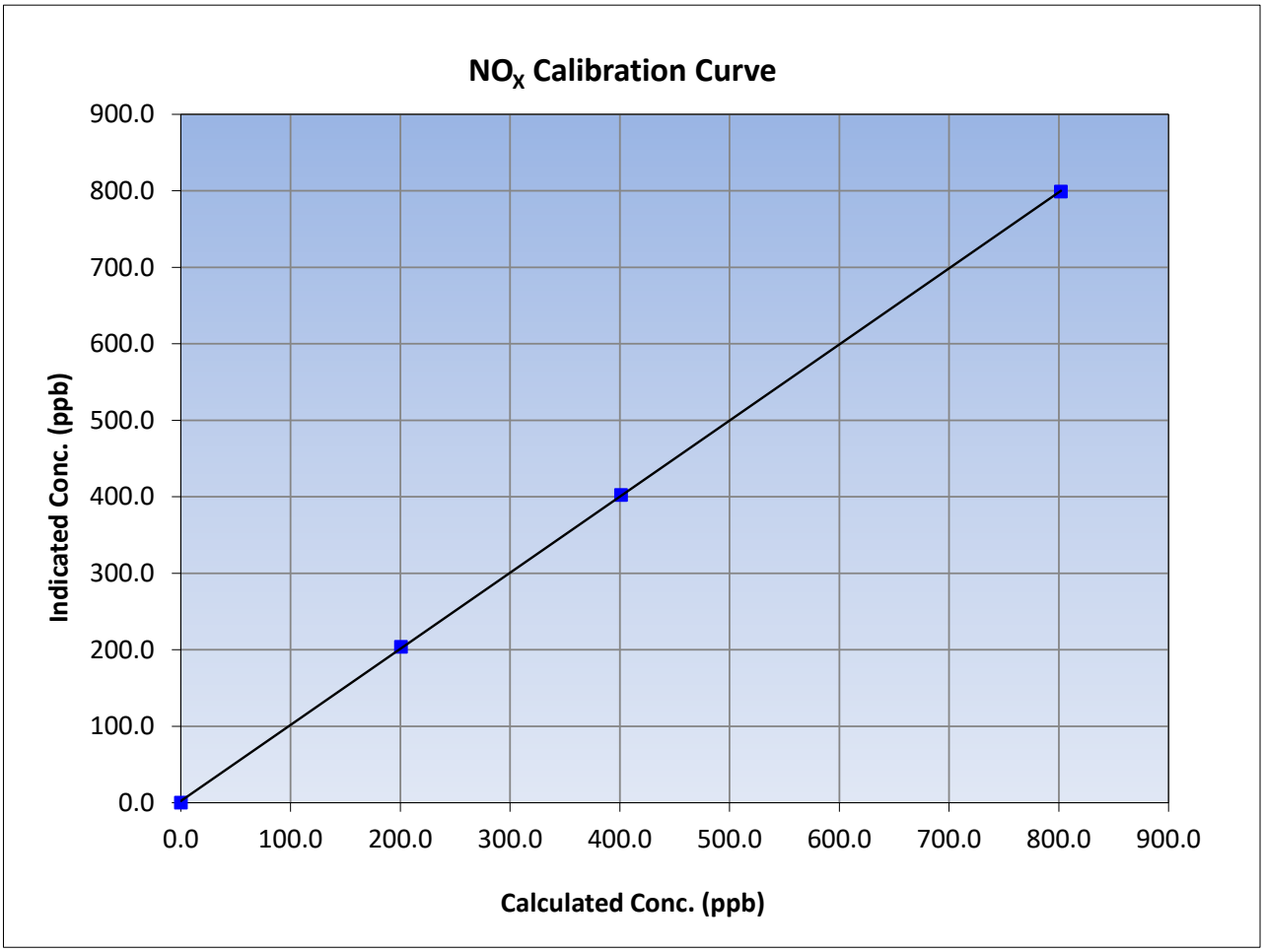
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:56 | End Time (MST): | 13:29 |
| 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 | 0.999967 | ≥0.995 |
| 802.0 | 799.0 | 1.0037 | | | |
| 401.0 | 402.2 | 0.9970 | Slope | 0.994854 | 0.90 - 1.10 |
| 200.5 | 203.8 | 0.9837 | | | |
| | | | Intercept | 2.228020 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

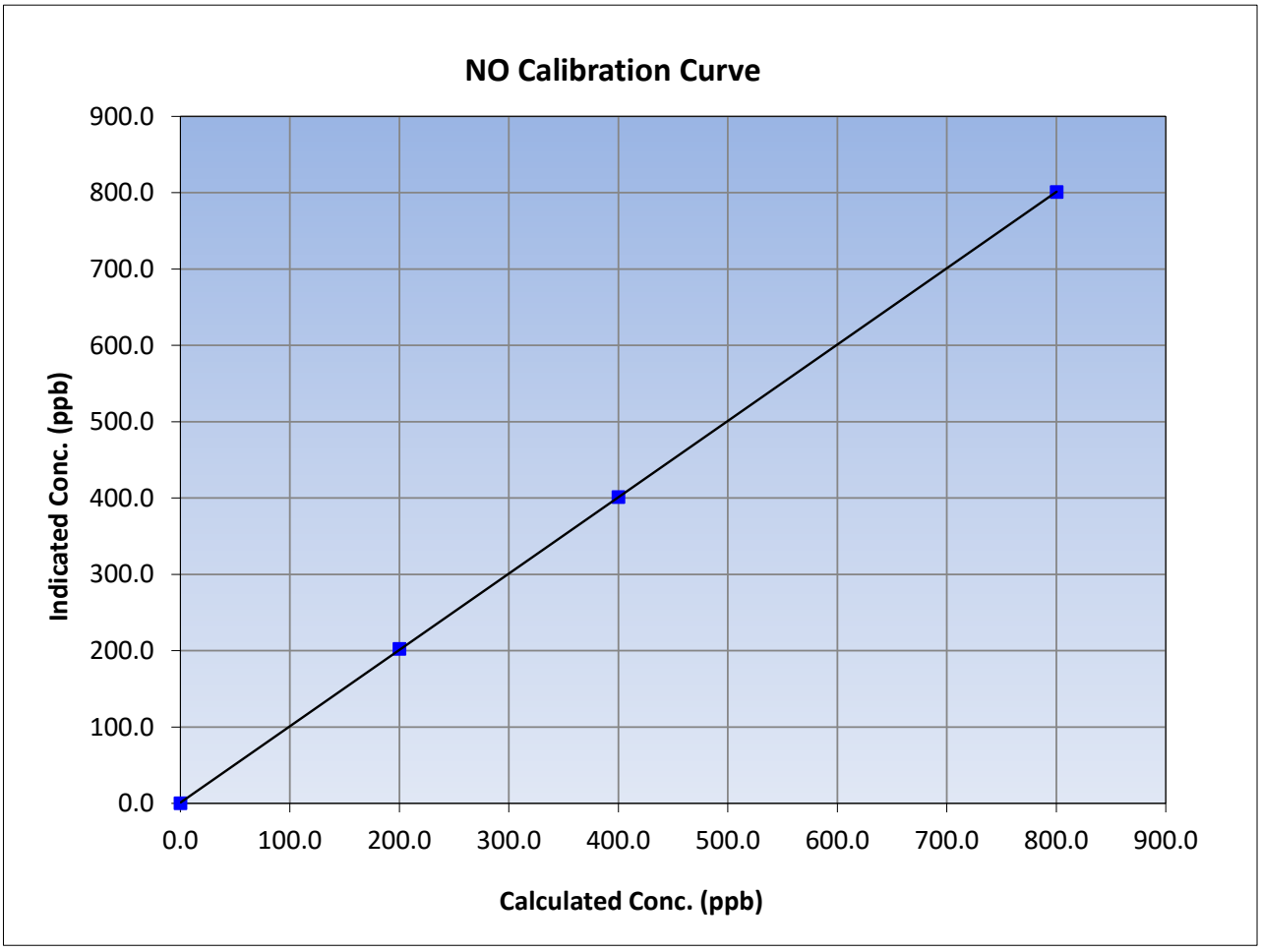
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:56 | End Time (MST): | 13:29 |
| 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 | 0.999992 | ≥0.995 |
| 800.3 | 801.0 | 0.9992 | | | |
| 400.2 | 401.2 | 0.9974 | Slope | 1.000020 | 0.90 - 1.10 |
| 200.1 | 202.4 | 0.9884 | | | |
| | | | Intercept | 1.008029 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

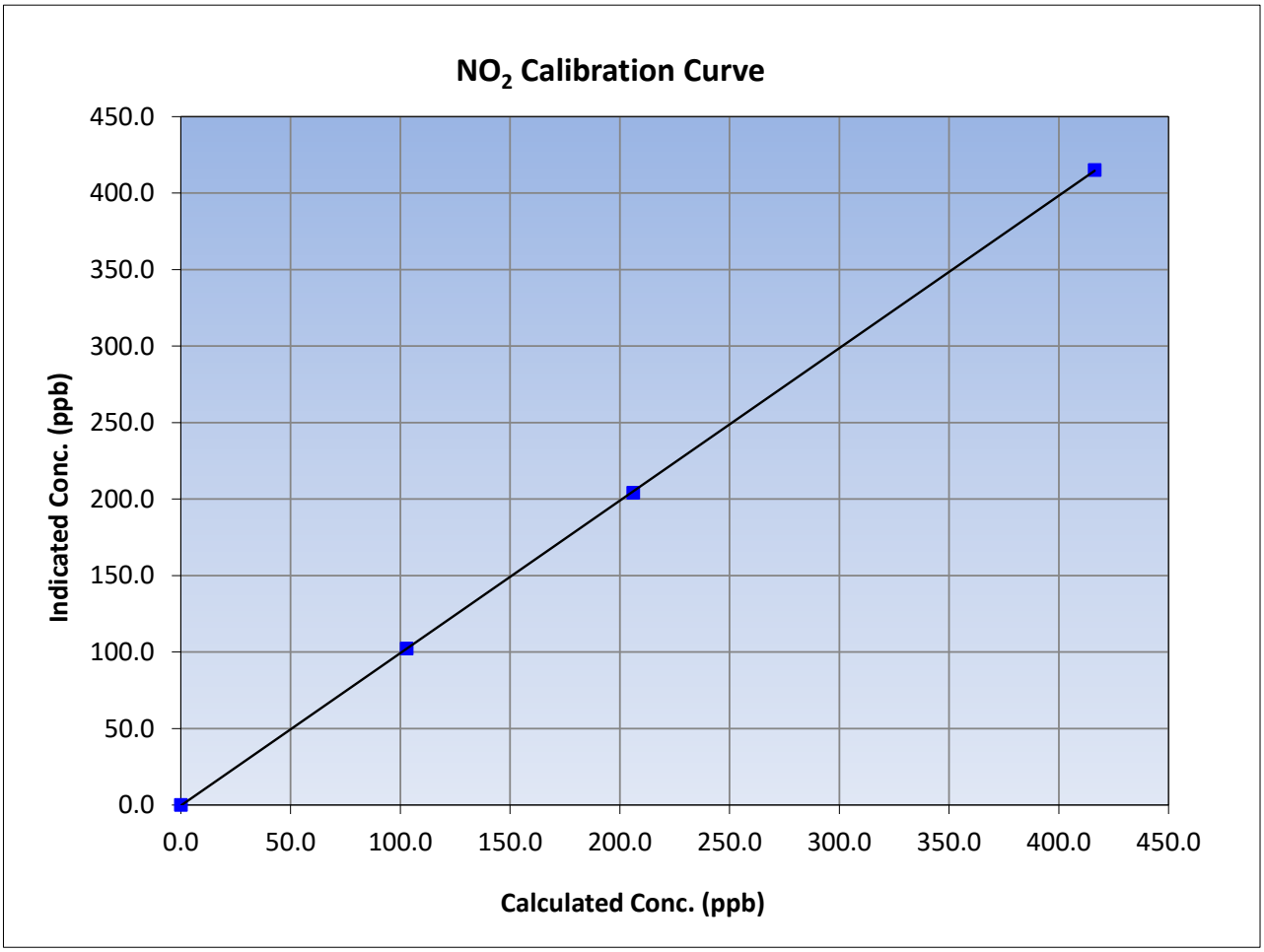
Version-04-2020

### Station Information

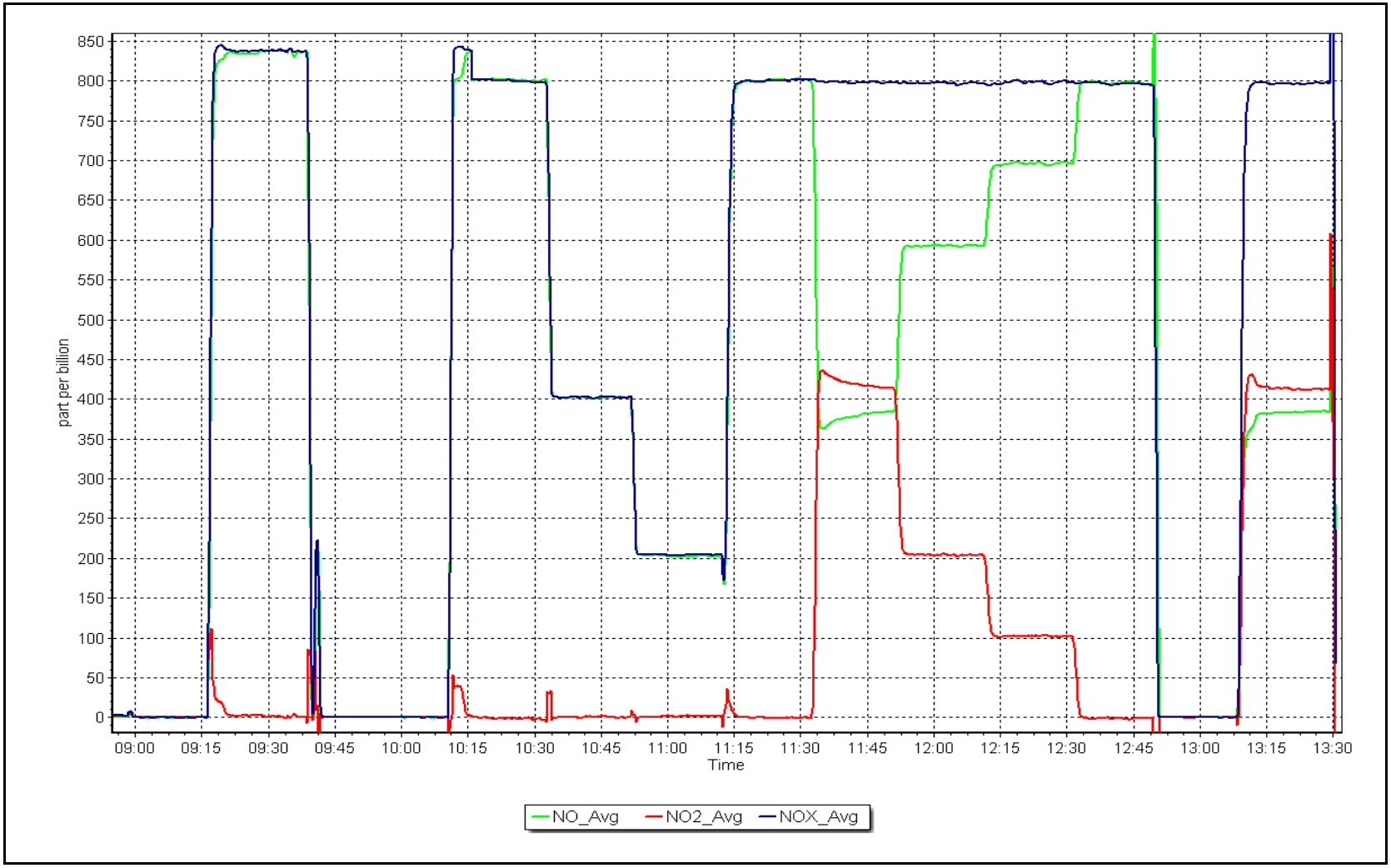
| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 8:56 | End Time (MST): | 13:29 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1501663731 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999985 | ≥0.995 |
| 416.3 | 415.1 | 1.0030 | | | |
| 206.1 | 204.1 | 1.0100 | Slope | 0.996734 | 0.90 - 1.10 |
| 102.9 | 102.3 | 1.0063 | | | |
| | | | Intercept | -0.362609 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 26, 2024 Location: Conklin



# Wood Buffalo Environmental Association

## $O_3$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Conklin | Station number: | AMS21 |
| Calibration Date: | March 15, 2024 | Last Cal Date: | February 1, 2024 |
| Start time (MST): | 10:47 | End time (MST): | 14:15 |
| 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: | 1.001543 | 0.999171 | Backgd or Offset: | -1.2 | -1.1 |
| Calibration intercept: | 0.180000 | 0.320000 | Coeff or Slope: | 0.998 | 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 | 800.0 | 0.0 | 0.2 | ---- |
| as found span | 5000 | 954.0 | 400.0 | 399.7 | 1.001 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 800.0 | 0.0 | 0.1 | ---- |
| high point | 5000 | 951.2 | 400.0 | 399.9 | 1.000 |
| second point | 5000 | 807.8 | 200.0 | 200.2 | 0.999 |
| third point | 5000 | 703.5 | 100.0 | 100.5 | 0.995 |
| as left zero | 5000 | 800.0 | 0.0 | 0.0 | ---- |
| as left span | 5000 | 951.6 | 400.0 | 401.0 | 0.998 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 399.5 | Previous response | 400.8 | *% change | -0.3% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

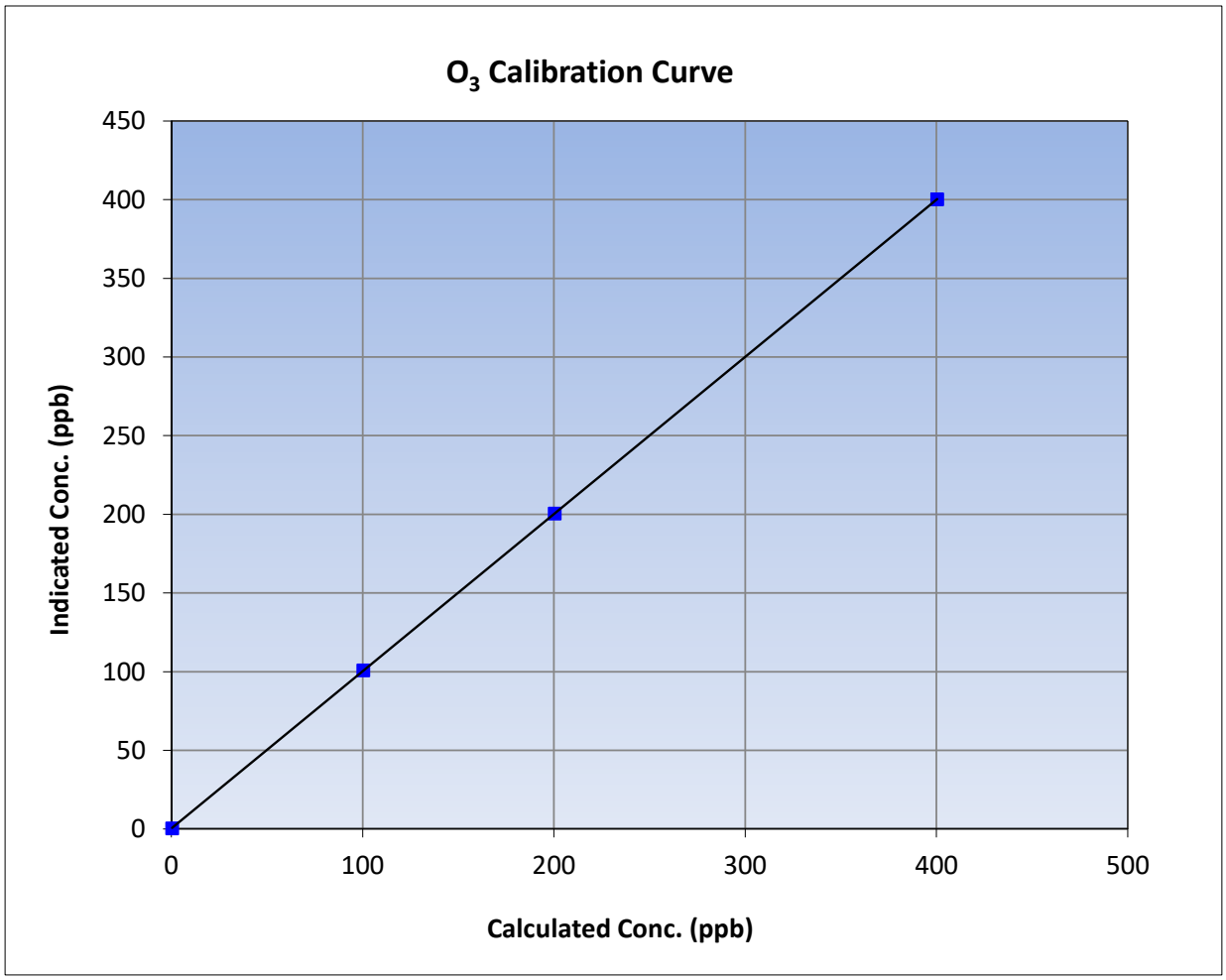
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | February 1, 2024 |
| Station Name: | Conklin | Station Number: | AMS21 |
| Start Time (MST): | 10:47 | End Time (MST): | 14:15 |
| Analyzer make: | Thermo 49i | Analyzer serial #: | 1501663734 |

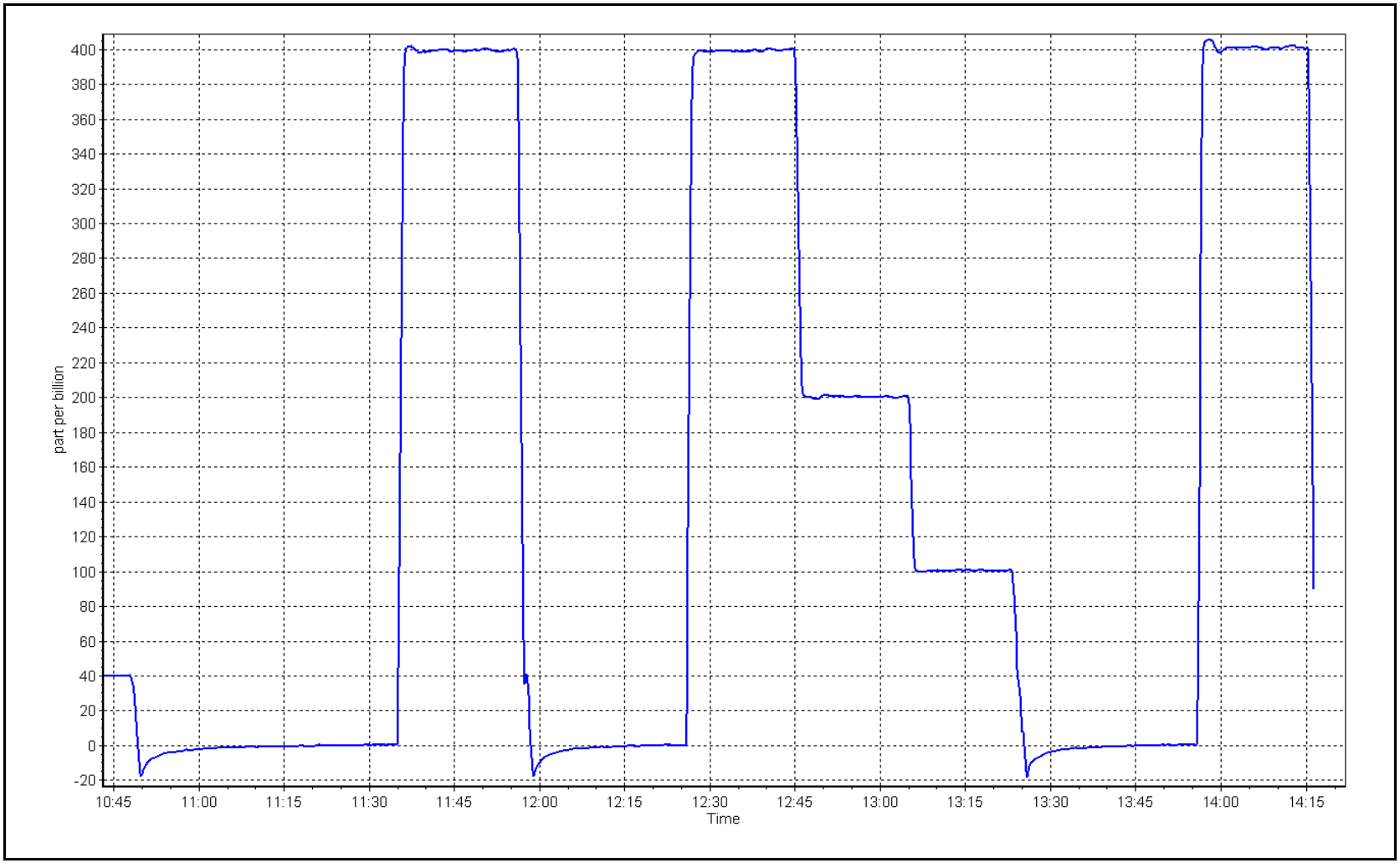
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 400.0 | 399.9 | 1.0003 |
| 200.0 | 200.2 | 0.9990 |
| 100.0 | 100.5 | 0.9950 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999999 | ≥0.995 |
| Slope | 0.999171 | 0.90 - 1.10 |
| Intercept | 0.320000 | +/- 5 |



**$O_3$ Calibration Plot** Date: March 15, 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: | March 18, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 11:24 | End time (MST): | 12:17 |
| Analyzer Make: | API T640 | S/N: | 326 |
| Particulate Fraction: | PM2.5 | | |
| Flow Meter Make/Model: | Alicat FP-25BT | S/N: | 388754 |
| Temp/RH standard: | Alicat FP-25BT | S/N: | 388754 |

### Monthly Calibration Test

| Parameter | As found | Measured | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| T (°C) | 7.80 | 7.26 | 7.80 | ☐ | +/- 2 °C |
| P (mmHg) | 708.90 | 710.90 | 708.90 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 5.05 | 5.01 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 39.00 | ----- | 39.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 4.30 | PM w/ HEPA: | 0.00 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: September 29, 2024 — Lot No.: 100128-050-040

| Parameter | As found | Post maintenance | As left | Adjusted | *(Limits)* |
|---|---|---|---|---|---|
| PMT Peak Test | 9.10 | 11.10 | 11.10 | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: March 18, 2024

Date Disposable Filter Changed: March 18, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0.00 <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
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | March 1, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 12:47 | End time (MST): | 16:54 |
| 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: | 1.000307 | 1.001522 | Backgd or Offset: | 24.0 | 23.8 |
| Calibration intercept: | 1.464248 | 0.764071 | 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 | 0.3 | ---- |
| as found span | 4920 | 79.8 | 799.8 | 799.3 | 1.001 |
| 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 | 801.4 | 0.998 |
| second point | 4960 | 39.9 | 399.9 | 402.0 | 0.995 |
| third point | 4980 | 20.0 | 200.4 | 201.5 | 0.995 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4920 | 79.8 | 799.8 | 801.9 | 0.997 |
| | | | | Average Correction Factor | 0.996 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 799.00 | Previous response | 801.50 | *% 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

## $SO_2$ Calibration Summary

Version-01-2020

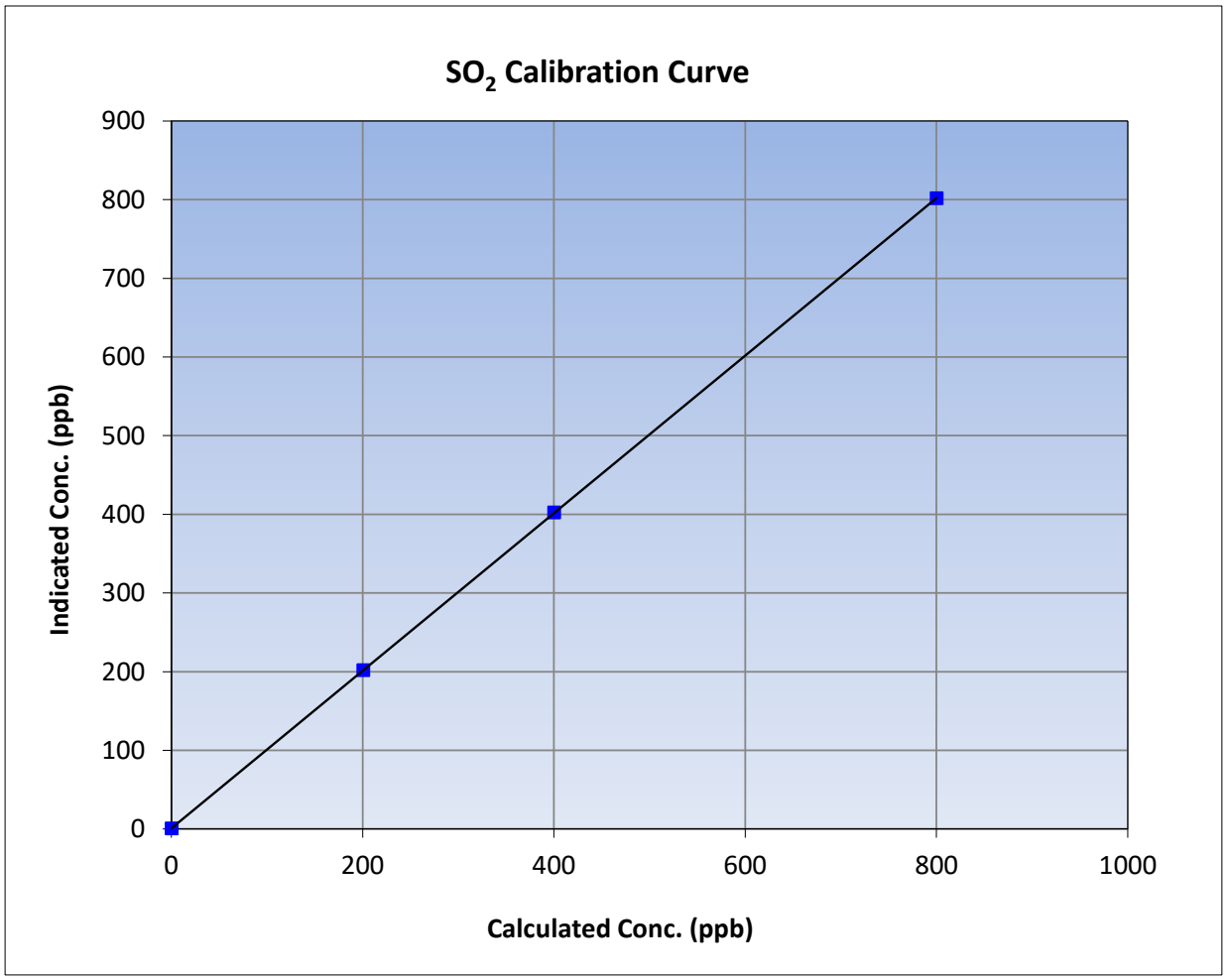
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 12:47 | End Time (MST): | 16:54 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1152430006 |

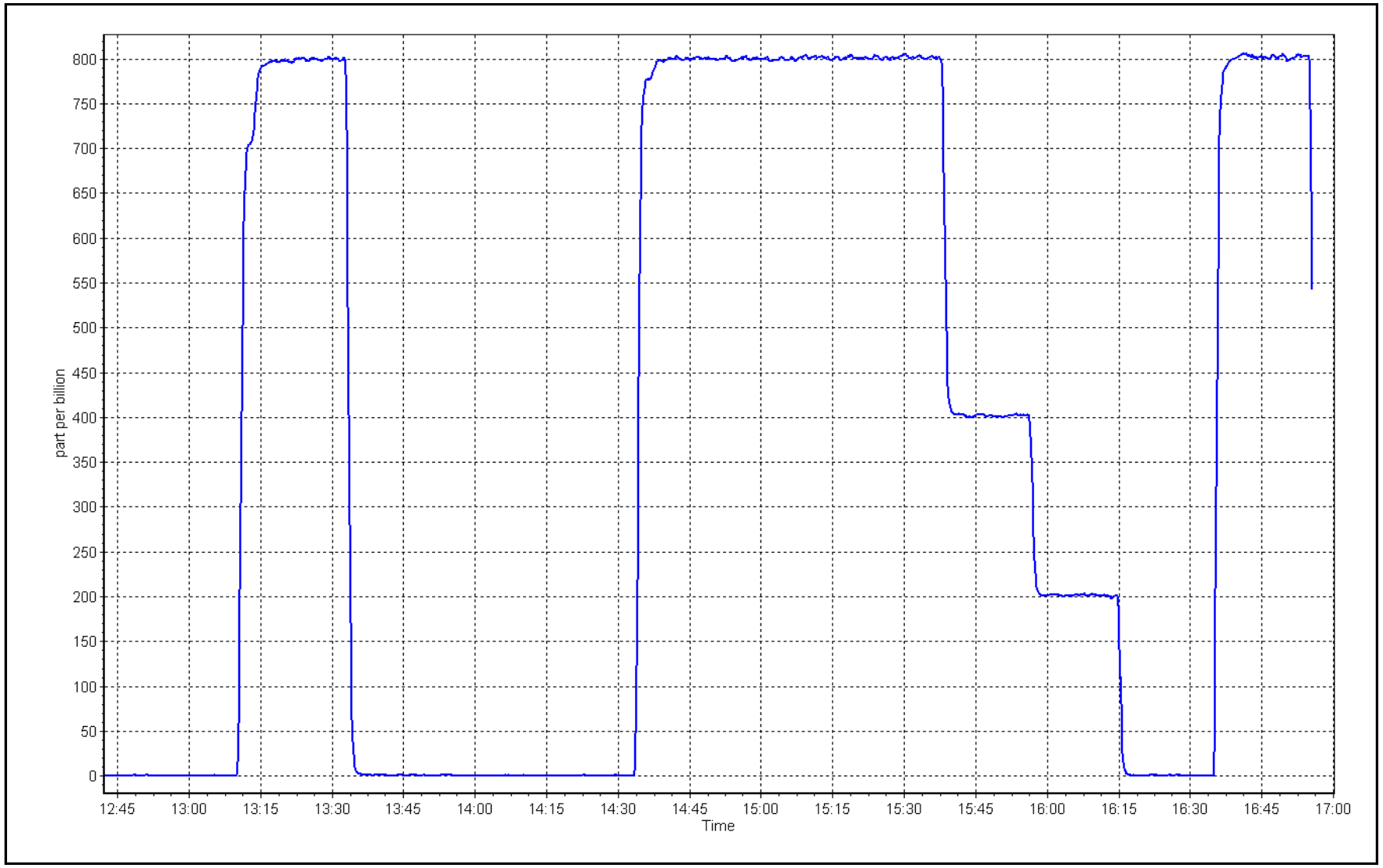
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 799.8 | 801.4 | 0.9980 |
| 399.9 | 402.0 | 0.9947 |
| 200.4 | 201.5 | 0.9947 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999998 | ≥0.995 |
| Slope | 1.001522 | 0.90 - 1.10 |
| Intercept | 0.764071 | +/-30 |



**SO2 Calibration Plot** Date: March 1, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS 22 |
| Calibration Date: | March 11, 2024 | Last Cal Date: | March 1, 2024 |
| Start time (MST): | 10:50 | End time (MST): | 13:16 |
| Reason: | Maintenance | | |

### 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: | 1.001522 | 0.999806 | Backgd or Offset: | 23.8 | 23.6 |
| Calibration intercept: | 0.764071 | 0.664437 | Coeff or Slope: | 1.035 | 1.022 |

### $SO_2$ 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 | 0.2 | ---- |
| high point | 4920 | 79.8 | 799.8 | 799.8 | 1.000 |
| second point | 4960 | 39.9 | 399.9 | 401.5 | 0.996 |
| third point | 4980 | 20.0 | 200.4 | 201.0 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| as left span | 4920 | 79.8 | 799.8 | 802.7 | 0.996 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| 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: No as founds completed because the pump was dead on arrival. Replaced the pump. Adjusted span only.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

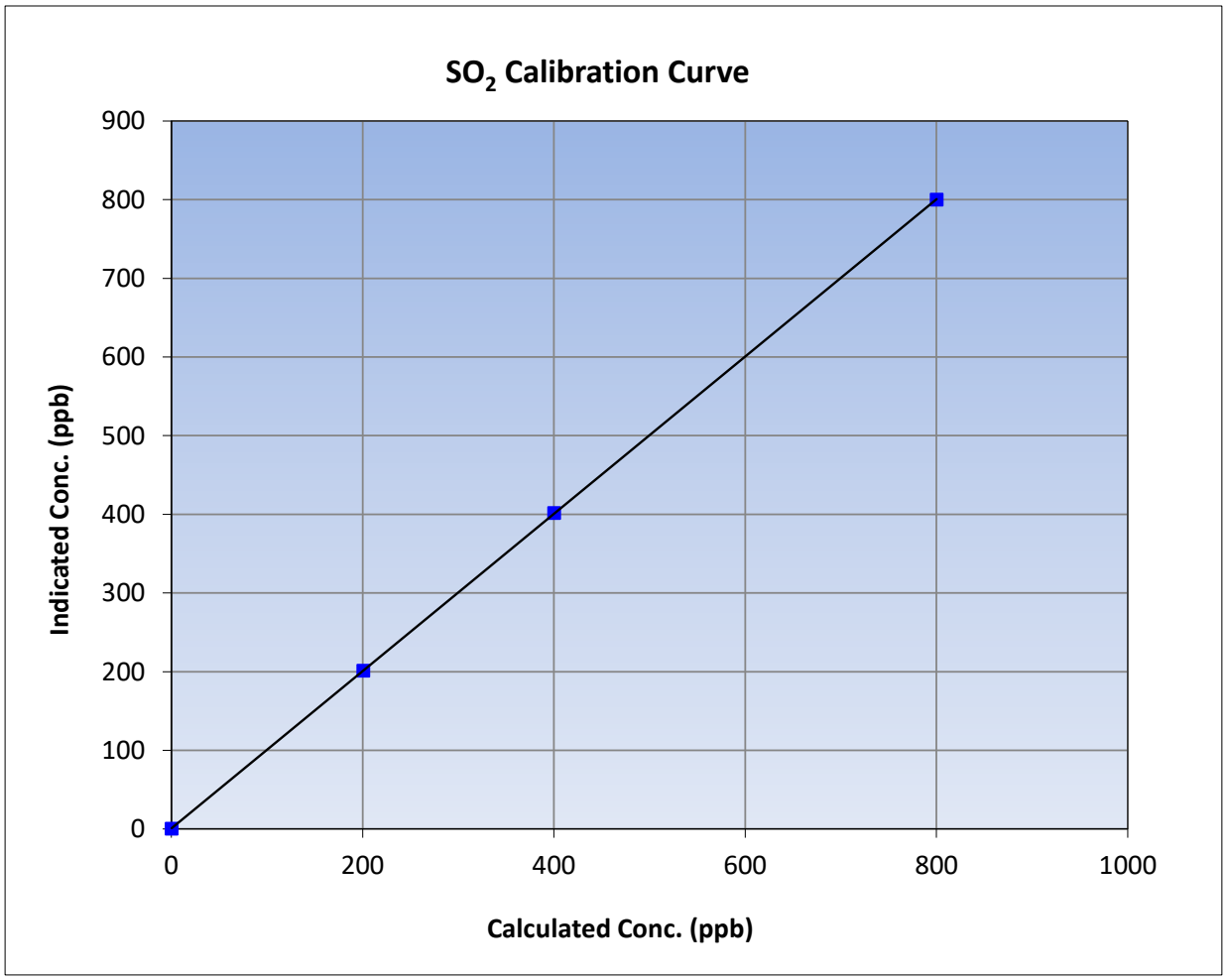
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 11, 2024 | Previous Calibration: | March 1, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:50 | End Time (MST): | 13:16 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1152430006 |

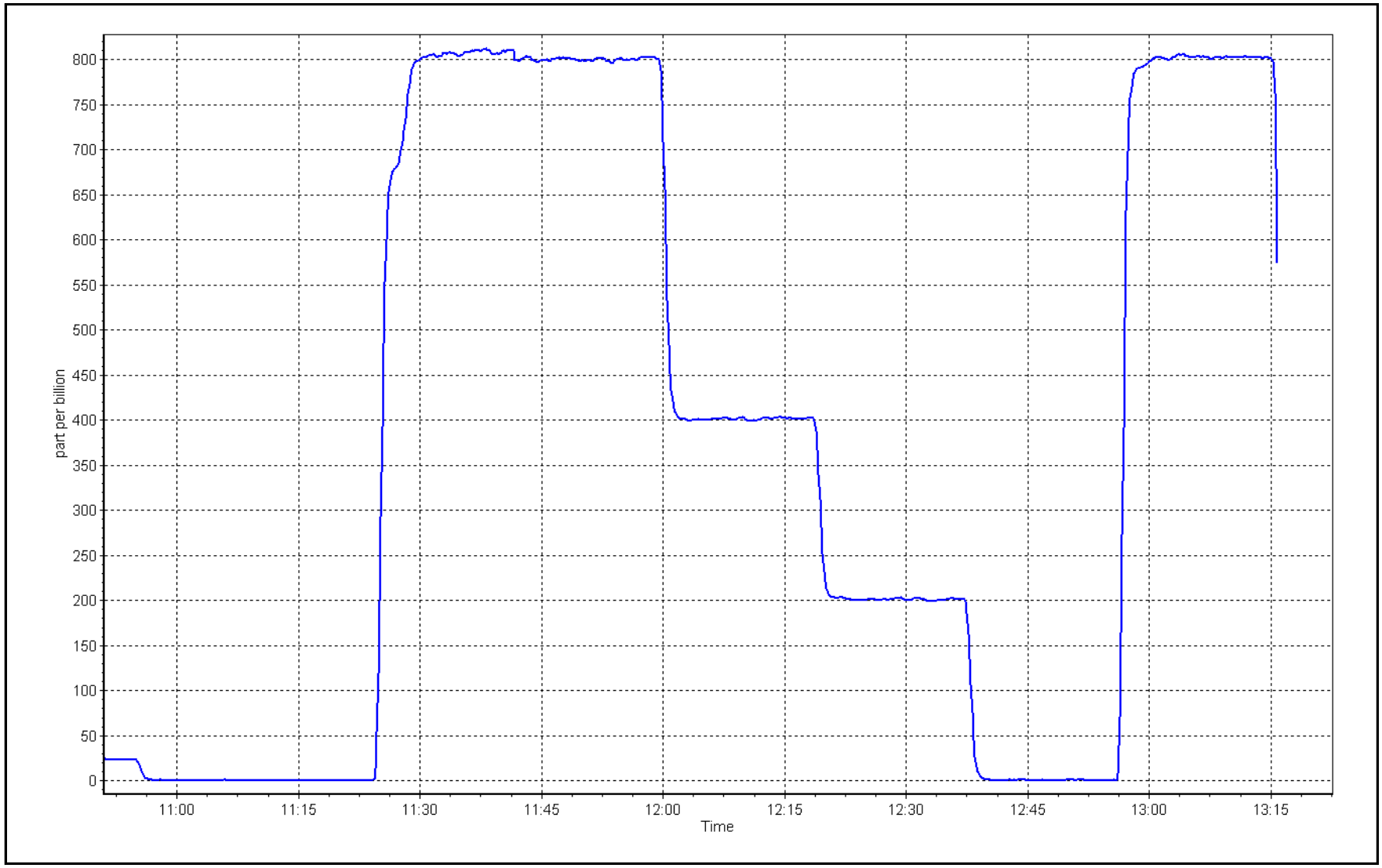
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 799.8 | 799.8 | 1.0000 |
| 399.9 | 401.5 | 0.9960 |
| 200.4 | 201.0 | 0.9972 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 0.999806 | *0.90 - 1.10* |
| Intercept | 0.664437 | *+/-30* |



**SO2 Calibration Plot** Date: March 11, 2024 Location: Janvier



# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Janvier | Station number: | AMS22 |
| Calibration Date: | March 26, 2024 | Last Cal Date: | February 22, 2024 |
| Start time (MST): | 10:52 | End time (MST): | 14:47 |
| 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: | 0.996235 | 0.989096 | Backgd or Offset: | 3.64 | 3.65 |
| Calibration intercept: | 0.440650 | 0.440430 | Coeff or Slope: | 1.188 | 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 | 0.2 | ---- |
| as found span | 4920 | 79.7 | 80.0 | 79.8 | 1.005 |
| as found 2nd point | 4960 | 39.8 | 40.0 | 40.3 | 0.997 |
| as found 3rd point | 4980 | 19.9 | 20.0 | 20.3 | 0.994 |
| 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 | 4920 | 79.7 | 80.0 | 79.5 | 1.007 |
| second point | 4960 | 39.8 | 40.0 | 40.1 | 0.997 |
| third point | 4980 | 19.9 | 20.0 | 20.3 | 0.984 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 79.7 | 80.0 | 79.5 | 1.007 |
| SO2 Scrubber Check | 4920 | 79.8 | 798.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 79.6 | Prev response: | 80.16 | *% change: | -0.7% |
| Baseline Corr 2nd AF pt: | 40.1 | AF Slope: | 0.994237 | AF Intercept: | 0.360568 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999974 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

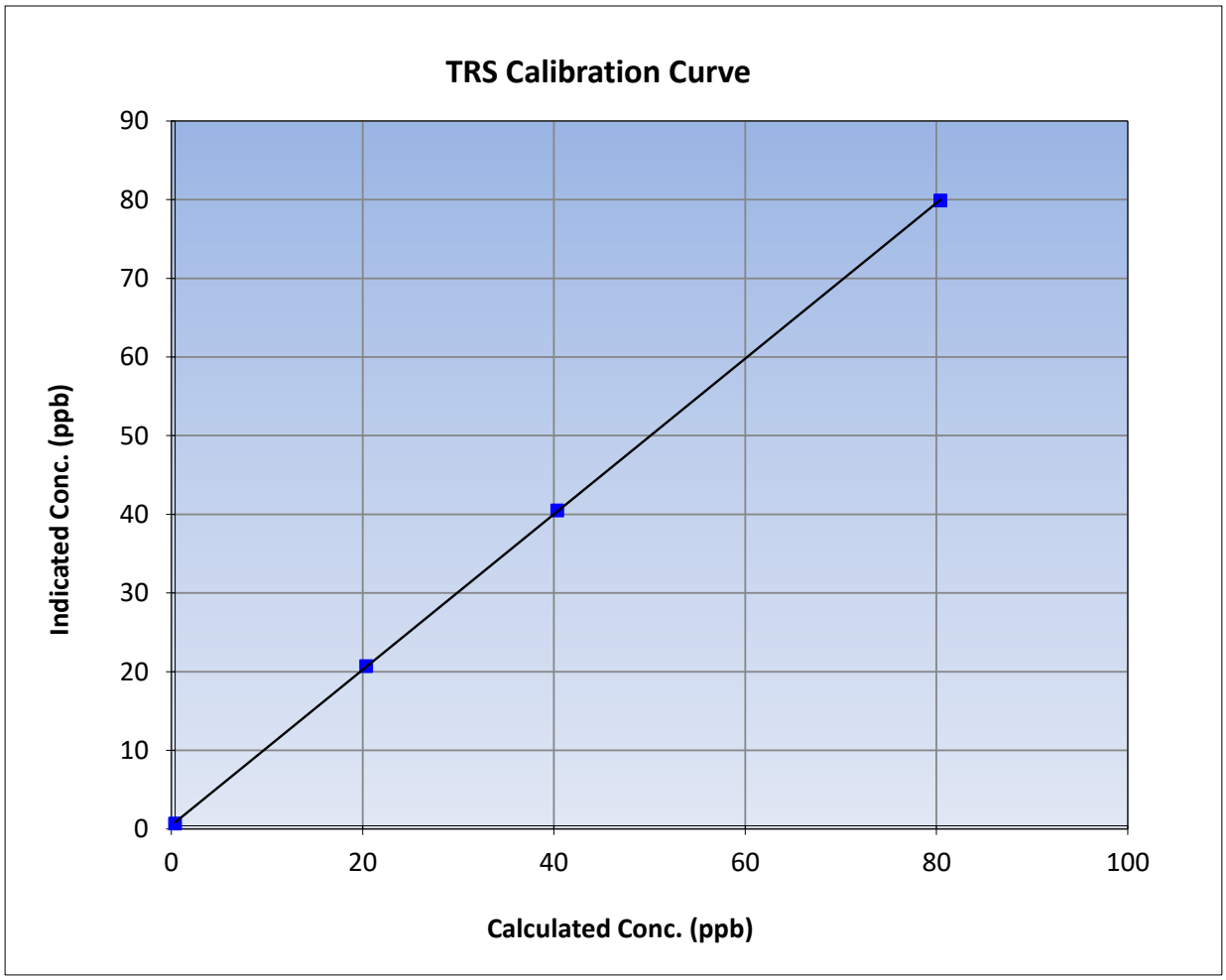
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Janvier | Station Number: | AMS22 |
| Start Time (MST): | 10:52 | End Time (MST): | 14:47 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1151680031 |

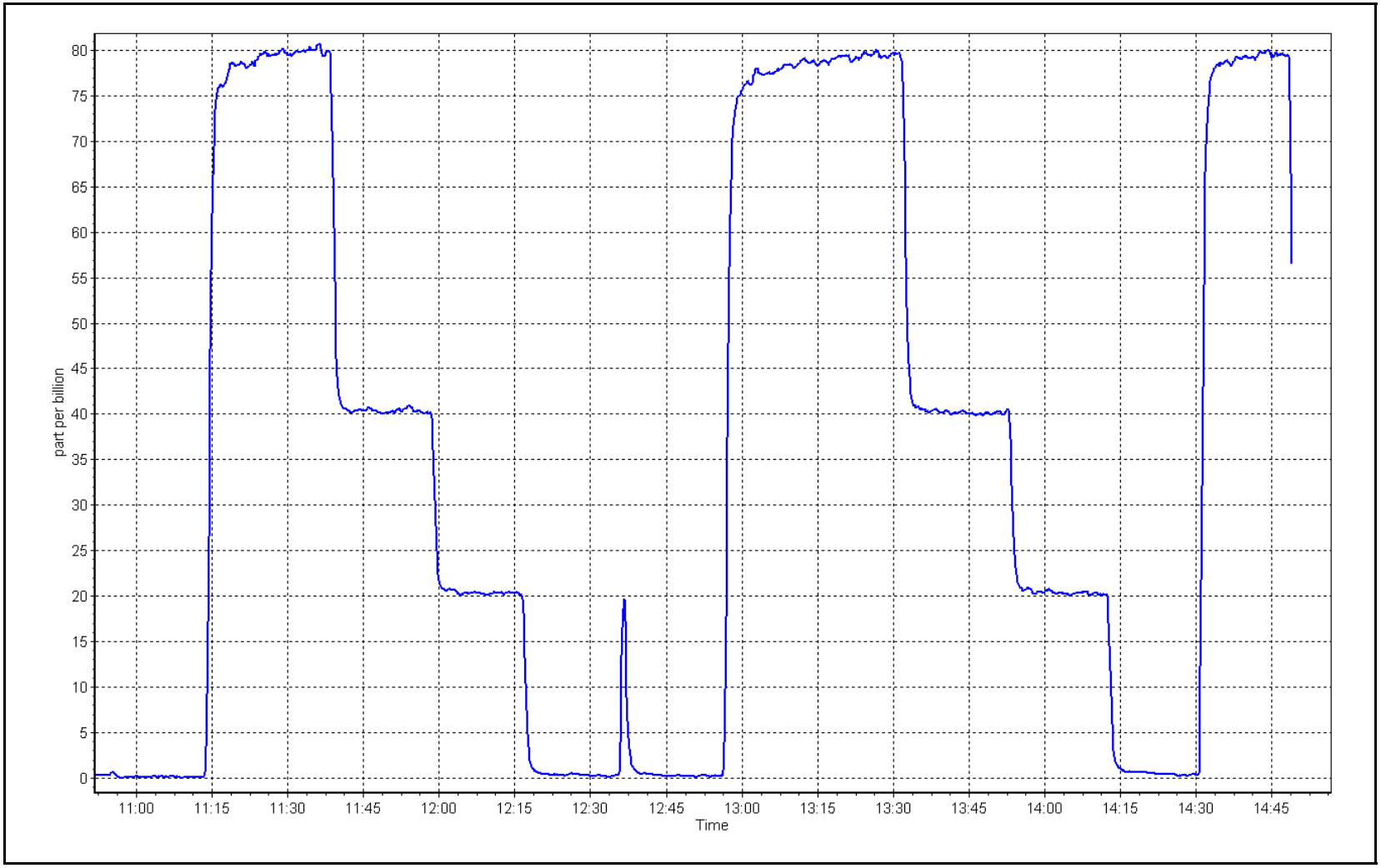
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 80.0 | 79.5 | 1.0066 |
| 40.0 | 40.1 | 0.9965 |
| 20.0 | 20.3 | 0.9842 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999984 | *≥0.995* |
| Slope | 0.989096 | *0.90 - 1.10* |
| Intercept | 0.440430 | *+/-3* |



**TRS Calibration Plot** Date: March 26, 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: | March 1, 2024 | Last Cal Date: | February 29, 2024 |
| Start time (MST): | 12:47 | End time (MST): | 16:54 |
| 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: | 2.890E-04 | 2.390E-04 | NMHC SP Ratio: | 5.52E-05 | 5.42E-05 |
| CH4 Retention time: | 13.1 | 11.7 | NMHC Peak Area: | 165825 | 168687 |
| 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 | 17.04 | 1.008 |
| 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 | 17.15 | 1.001 |
| second point | 4960 | 39.9 | 8.59 | 8.51 | 1.009 |
| third point | 4980 | 20.0 | 4.30 | 4.27 | 1.009 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 17.17 | 17.13 | 1.002 |
| | | | | Average Correction Factor | 1.006 |
| Baseline Corr AF: | 17.04 | Prev response | 17.17 | *% 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 | 4920 | 79.8 | 9.15 | 9.19 | 0.995 |
| 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 | 9.12 | 1.003 |
| second point | 4960 | 39.9 | 4.57 | 4.57 | 1.002 |
| third point | 4980 | 20.0 | 2.29 | 2.29 | 1.000 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.15 | 9.14 | 1.000 |
| | | | | Average Correction Factor | 1.002 |
| Baseline Corr AF: | 9.19 | 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 | 79.8 | 8.03 | 7.86 | 1.022 |
| 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 | 8.03 | 0.999 |
| second point | 4960 | 39.9 | 4.01 | 3.94 | 1.018 |
| third point | 4980 | 20.0 | 2.01 | 1.98 | 1.018 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 8.03 | 7.99 | 1.005 |
| | | | | Average Correction Factor | 1.012 |
| Baseline Corr AF: | 7.86 | Prev response | 8.02 | *% change | -2.1% |
| 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: | 0.999432 | 0.999011 |
| THC Cal Offset: | 0.007396 | -0.026194 |
| CH4 Cal Slope: | 0.999247 | 1.001182 |
| CH4 Cal Offset: | 0.002236 | -0.029561 |
| NMHC Cal Slope: | 0.999206 | 0.996756 |
| NMHC Cal Offset: | 0.005960 | 0.003768 |

Notes: Changed the inlet filter and H2 cylinder after as founds. Adjusted the carrier run pressure. Adjusted the window timings. Adjusted the span.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## THC Calibration Summary

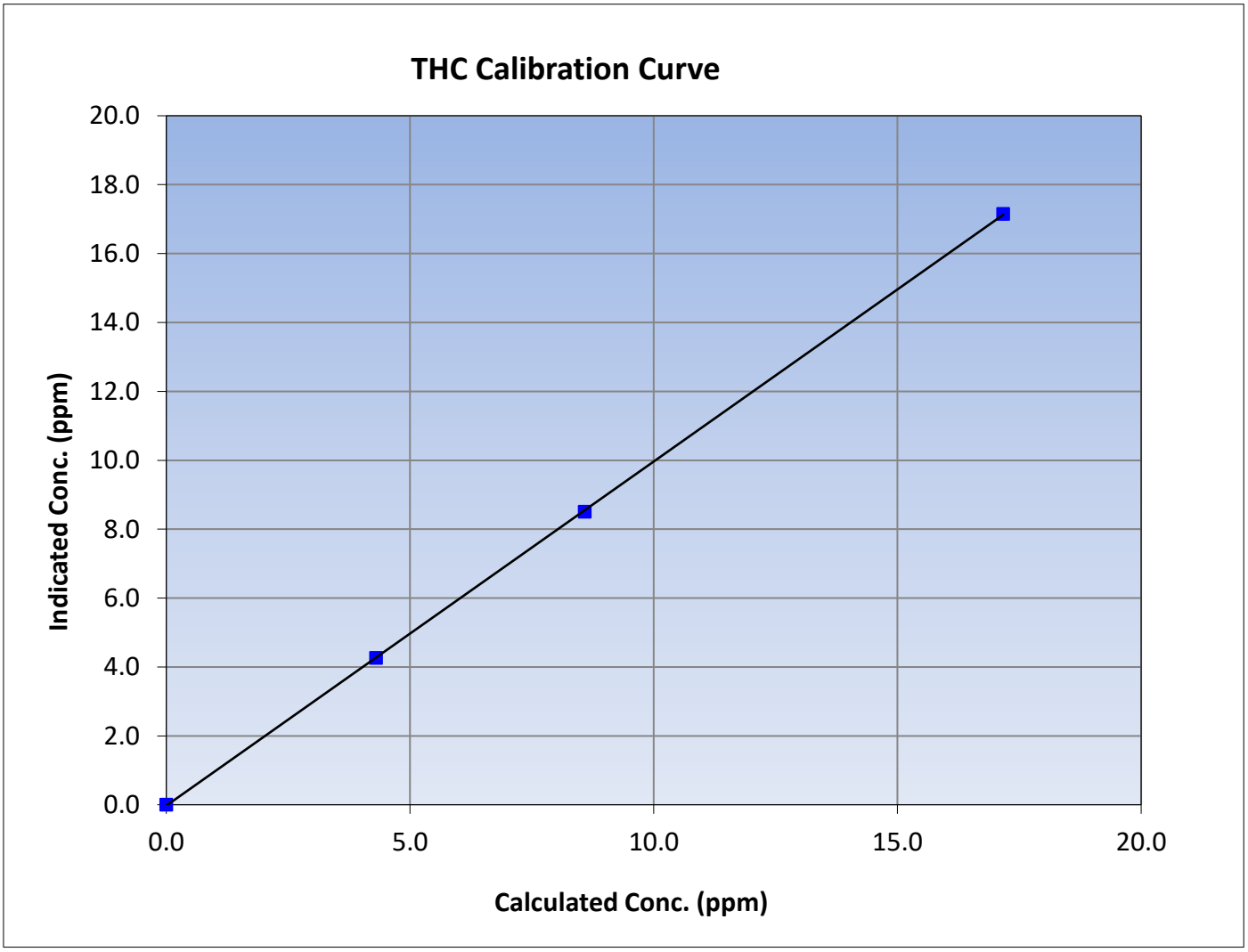
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 29, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 12:47 | End Time (MST): | 16:54 |
| 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 | 0.999981 | *≥0.995* |
| 17.17 | 17.15 | 1.0012 | | | |
| 8.59 | 8.51 | 1.0092 | Slope | 0.999011 | *0.90 - 1.10* |
| 4.30 | 4.27 | 1.0086 | | | |
| | | | Intercept | -0.026194 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

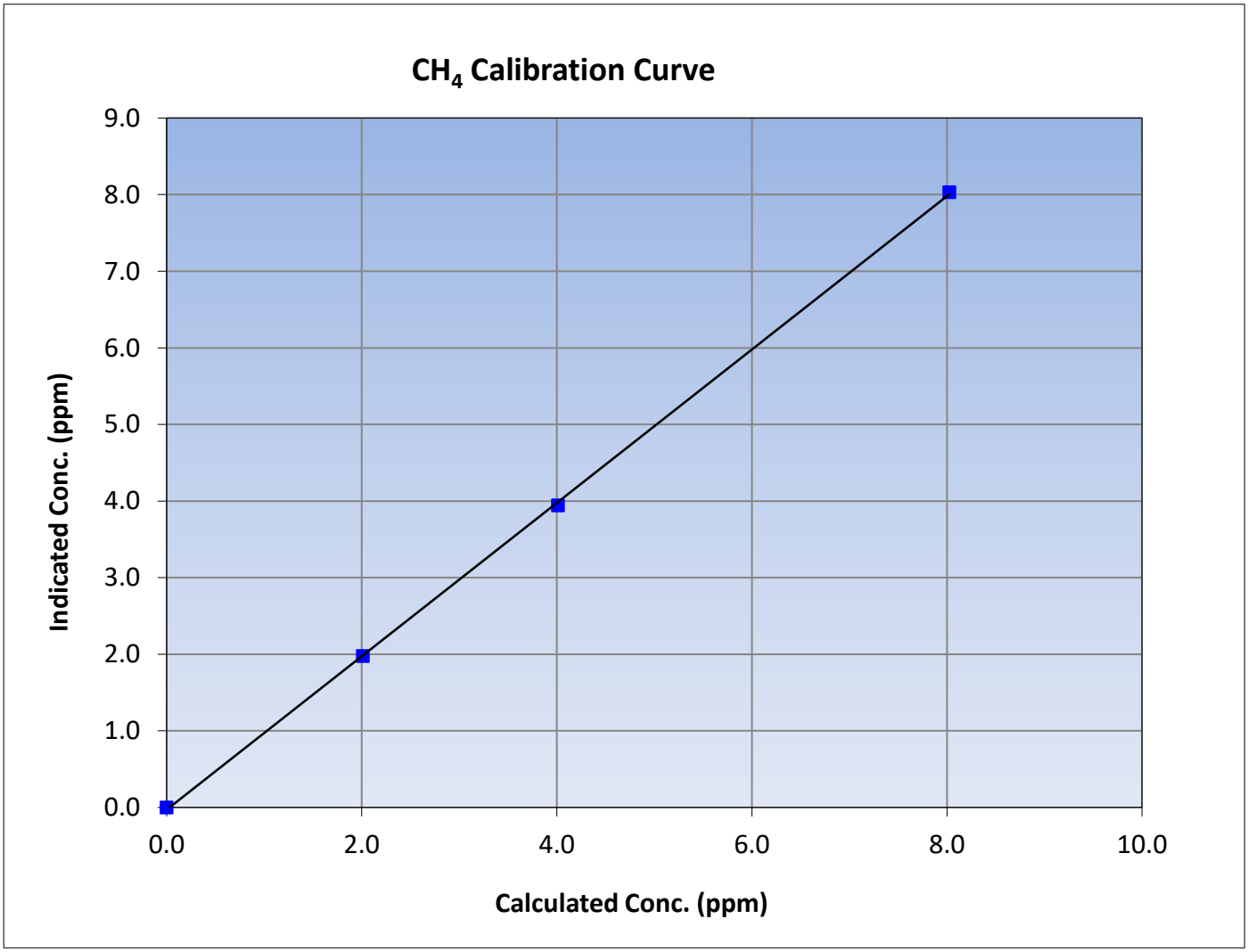
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 29, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 12:47 | End Time (MST): | 16:54 |
| 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 | 0.999896 | *≥0.995* |
| 8.03 | 8.03 | 0.9994 | | | |
| 4.01 | 3.94 | 1.0179 | Slope | 1.001182 | *0.90 - 1.10* |
| 2.01 | 1.98 | 1.0183 | | | |
| | | | Intercept | -0.029561 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

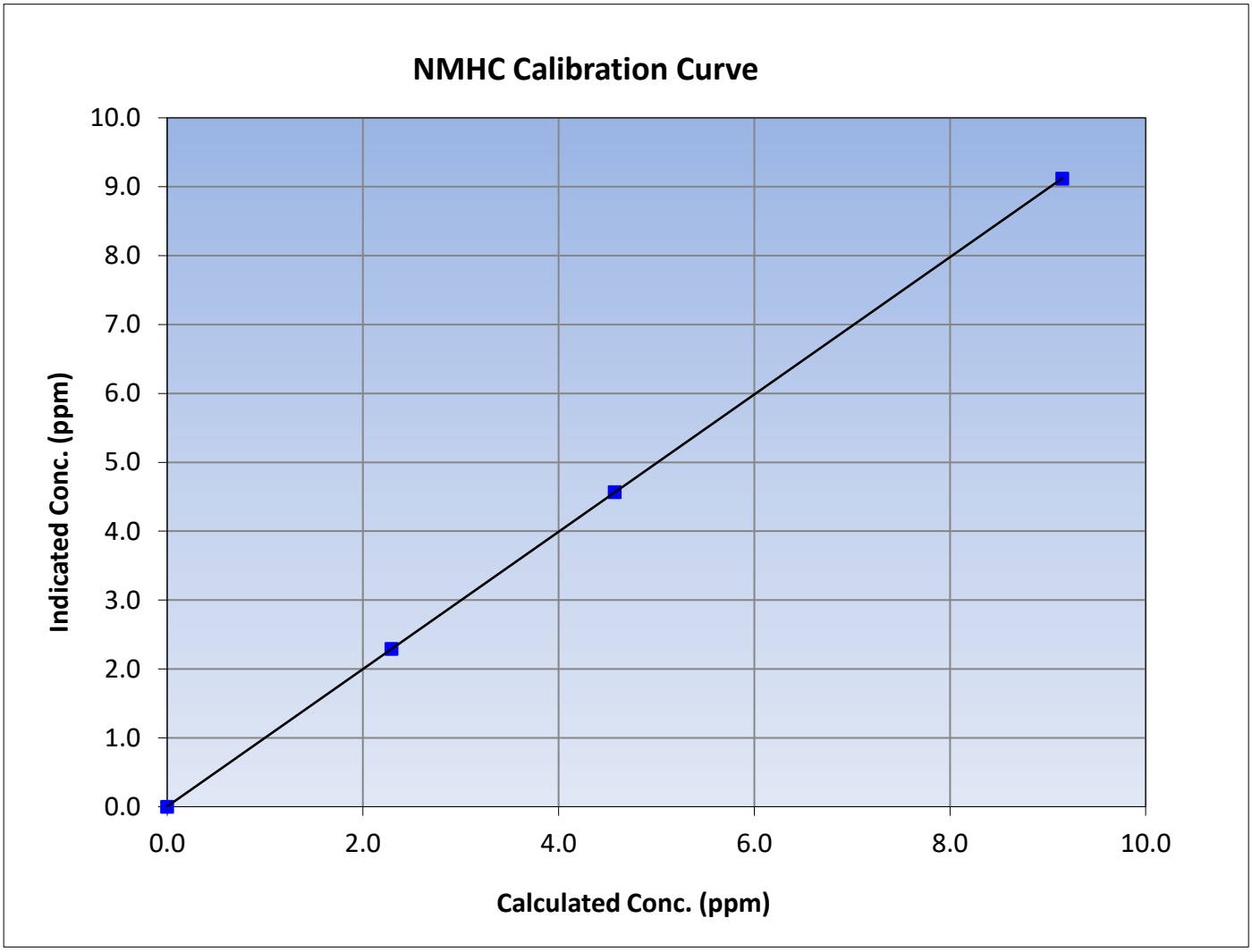
Version-06-2022

### Station Information

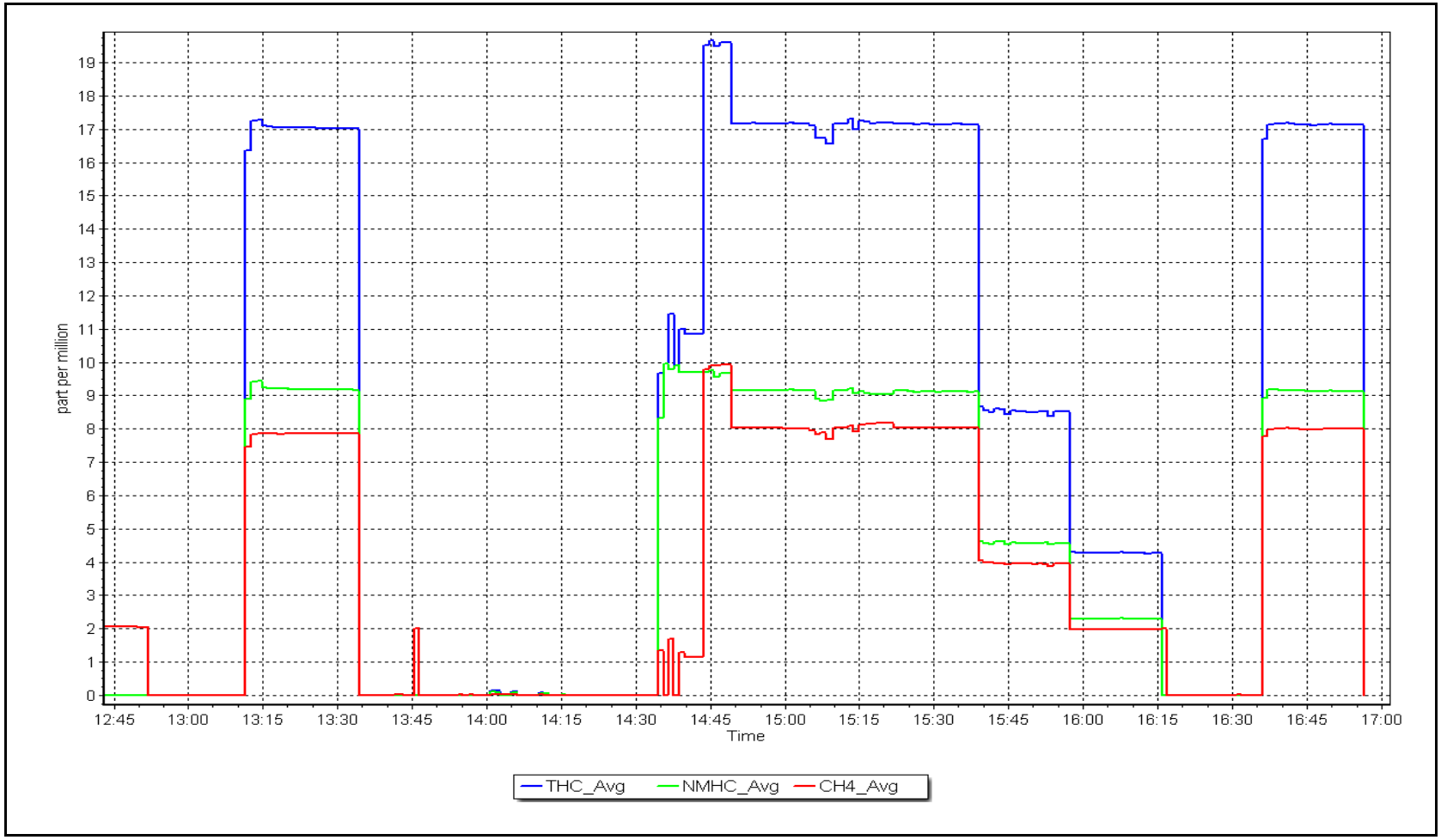
| | | | |
|---|---|---|---|
| Calibration Date: | March 1, 2024 | Previous Calibration: | February 29, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 12:47 | End Time (MST): | 16:54 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### 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 | 9.12 | 1.0031 | | | |
| 4.57 | 4.57 | 1.0018 | Slope | 0.996756 | *0.90 - 1.10* |
| 2.29 | 2.29 | 1.0002 | | | |
| | | | Intercept | 0.003768 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 1, 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: | March 22, 2024 | Last Cal Date: | March 1, 2024 |
| Start time (MST): | 11:21 | End time (MST): | 12:46 |
| Reason: | Cylinder Change | | |

### 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: | 2.390E-04 | 2.390E-04 | NMHC SP Ratio: | 5.42E-05 | 5.42E-05 |
| CH4 Retention time: | 11.7 | 11.7 | NMHC Peak Area: | 168687 | 168687 |
| 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 | 17.43 | 0.985 |
| 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 | 79.8 | 17.17 | 17.58 | 0.977 |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 17.43 | Prev response | 17.13 | *% change | 1.7% |
| 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 | 4920 | 79.8 | 9.15 | 9.13 | 1.002 |
| 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 | 79.8 | 9.15 | 9.23 | 0.991 |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 9.13 | Prev response | 9.12 | *% change | 0.1% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### 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 | 8.29 | 0.968 |
| 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 | 79.8 | 8.03 | 8.35 | 0.961 |
| | | | | Average Correction Factor | |
| Baseline Corr AF: | 8.29 | Prev response | 8.00 | *% change | 3.5% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

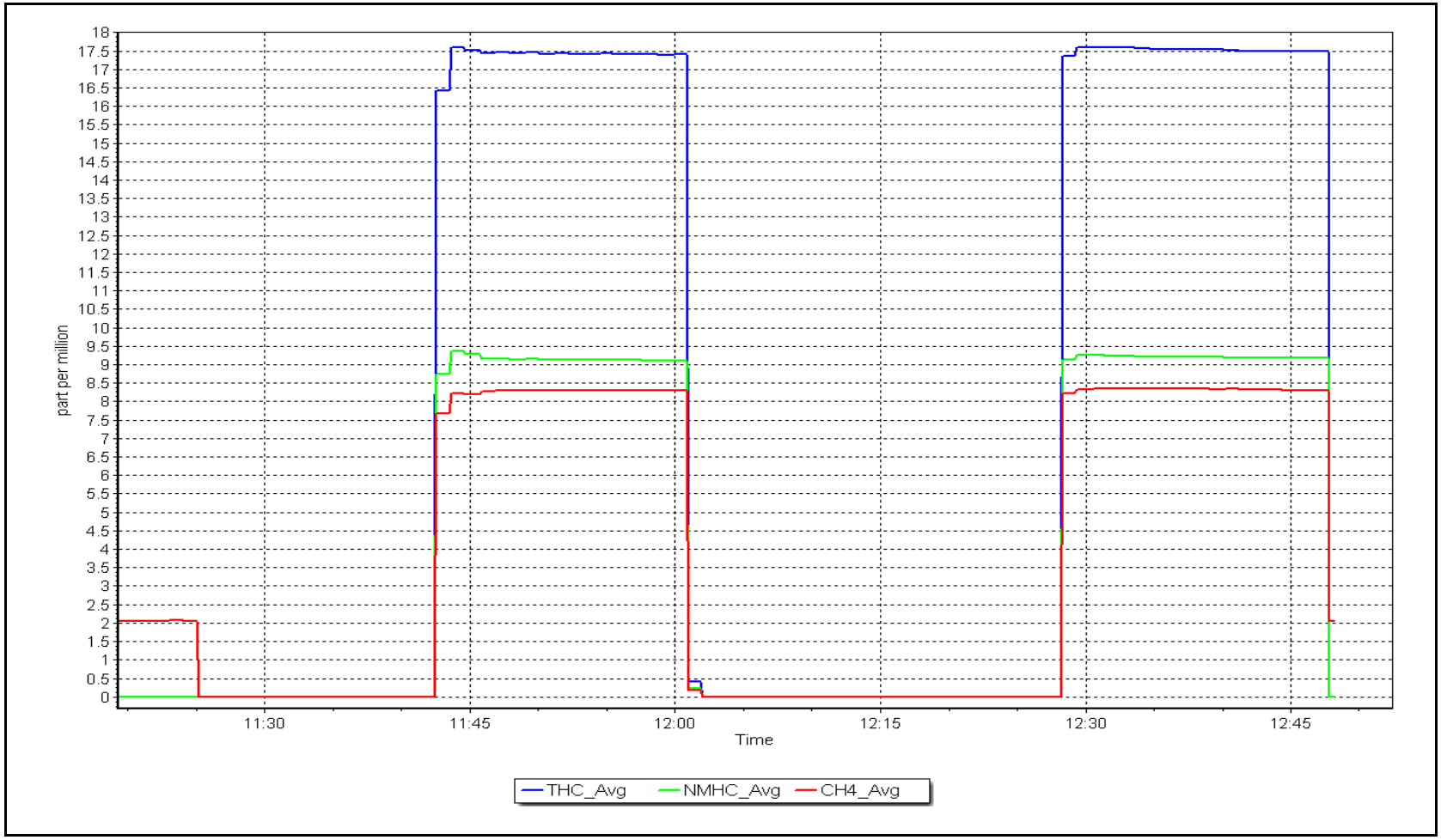
### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.999011 | |
| THC Cal Offset: | -0.026194 | |
| CH4 Cal Slope: | 1.001182 | |
| CH4 Cal Offset: | -0.029561 | |
| NMHC Cal Slope: | 0.996756 | |
| NMHC Cal Offset: | 0.003768 | |

Notes: Changed the N2 cylinder after as founds.

Calibration Performed By: Rene Chamberland

**NMHC Calibration Plot** Date: March 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: | March 25, 2024 | Last Cal Date: | March 1, 2024 |
| Start time (MST): | 10:19 | End time (MST): | 13:53 |
| 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: | 2.390E-04 | 2.360E-04 | NMHC SP Ratio: | 5.42E-05 | 5.52E-05 |
| CH4 Retention time: | 11.7 | 11.6 | NMHC Peak Area: | 168687 | 165650 |
| 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 | 17.27 | 0.994 |
| as found 2nd point | 4960 | 39.9 | 8.59 | 8.57 | 1.002 |
| as found 3rd point | 4980 | 20.0 | 4.30 | 4.28 | 1.006 |
| 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 | 8.54 | 1.006 |
| third point | 4980 | 20.0 | 4.30 | 4.27 | 1.008 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 17.17 | 17.20 | 0.998 |
| | | | | Average Correction Factor | 1.005 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.27 | Prev response | 17.13 | *% change | 0.8% |
| Baseline Corr 2nd AF: | 8.6 | AF Slope: | 1.006545 | AF Intercept: | -0.033818 |
| Baseline Corr 3rd AF: | 4.3 | AF Correlation: | 0.999979 | * = > +/-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 | 4960 | 39.9 | 4.57 | 4.50 | 1.016 |
| as found 3rd point | 4980 | 20.0 | 2.29 | 2.25 | 1.019 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 9.15 | 9.14 | 1.001 |
| second point | 4960 | 39.9 | 4.57 | 4.57 | 1.001 |
| third point | 4980 | 20.0 | 2.29 | 2.30 | 0.999 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 9.15 | 9.18 | 0.996 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 9.04 | Prev response | 9.12 | *% change | -0.9% |
| Baseline Corr 2nd AF: | 4.5 | AF Slope: | 0.989007 | AF Intercept: | -0.010210 |
| Baseline Corr 3rd AF: | 2.3 | AF Correlation: | 0.999993 | * = > +/-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 | 8.23 | 0.975 |
| as found 2nd point | 4960 | 39.9 | 4.01 | 4.07 | 0.986 |
| as found 3rd point | 4980 | 20.0 | 2.01 | 2.03 | 0.992 |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| high point | 4920 | 79.8 | 8.03 | 8.03 | 0.999 |
| second point | 4960 | 39.9 | 4.01 | 3.97 | 1.011 |
| third point | 4980 | 20.0 | 2.01 | 1.97 | 1.019 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 79.8 | 8.03 | 8.02 | 1.001 |
| | | | | Average Correction Factor | 1.010 |
| Baseline Corr AF: | 8.23 | Prev response | 8.00 | *% change | 2.7% |
| Baseline Corr 2nd AF: | 4.07 | AF Slope: | 1.026422 | AF Intercept: | -0.023208 |
| Baseline Corr 3rd AF: | 2.03 | AF Correlation: | 0.999956 | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.999011 | 1.000249 |
| THC Cal Offset: | -0.026194 | -0.023996 |
| CH4 Cal Slope: | 1.001182 | 1.001651 |
| CH4 Cal Offset: | -0.029561 | -0.024958 |
| NMHC Cal Slope: | 0.996756 | 0.999256 |
| NMHC Cal Offset: | 0.003768 | 0.000762 |

Notes: Changed the pump after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## THC Calibration Summary

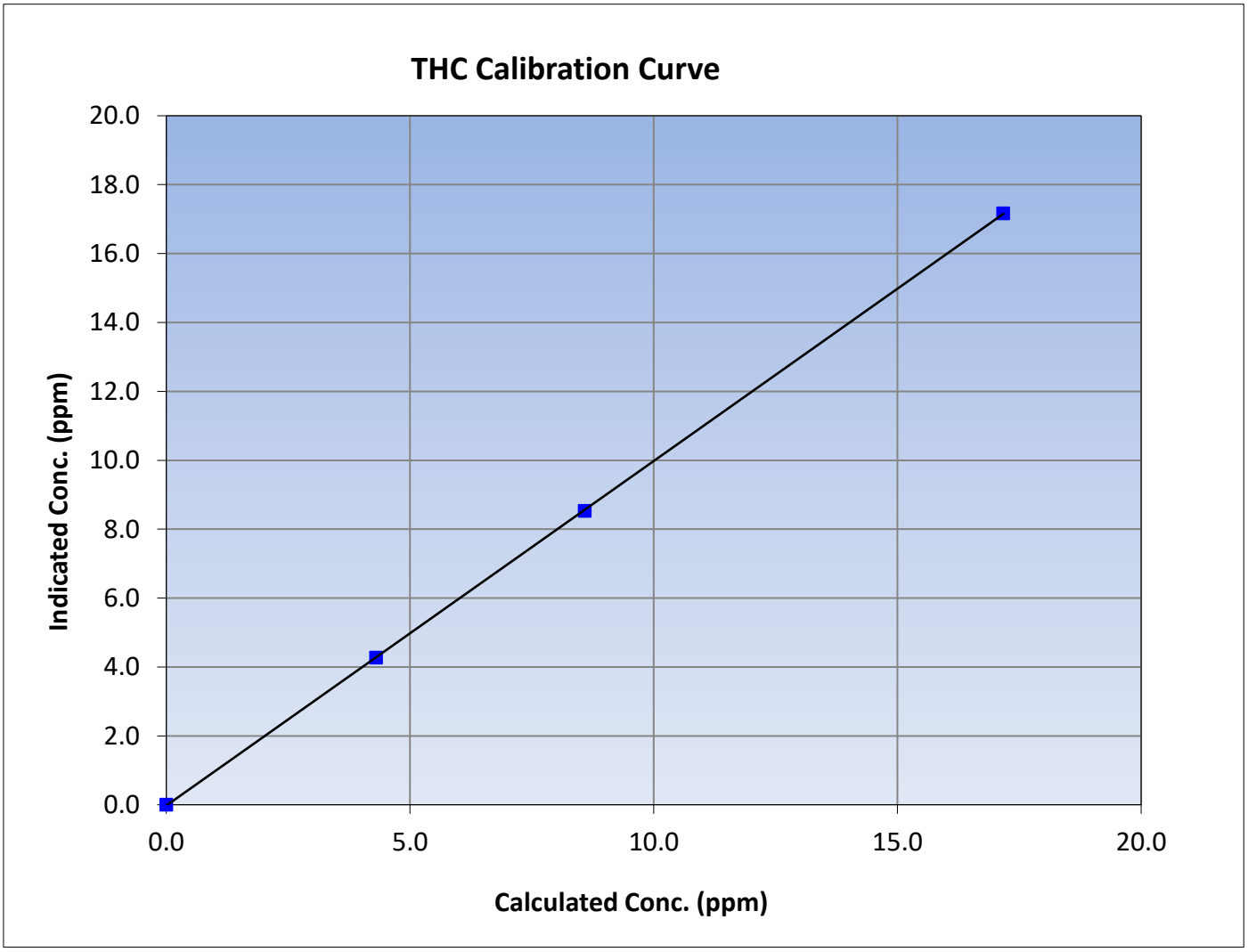
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | March 1, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:19 | End Time (MST): | 13:53 |
| 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 | 0.999988 | ≥0.995 |
| 17.17 | 17.17 | 1.0001 | | | |
| 8.59 | 8.54 | 1.0060 | Slope | 1.000249 | 0.90 - 1.10 |
| 4.30 | 4.27 | 1.0083 | | | |
| | | | Intercept | -0.023996 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

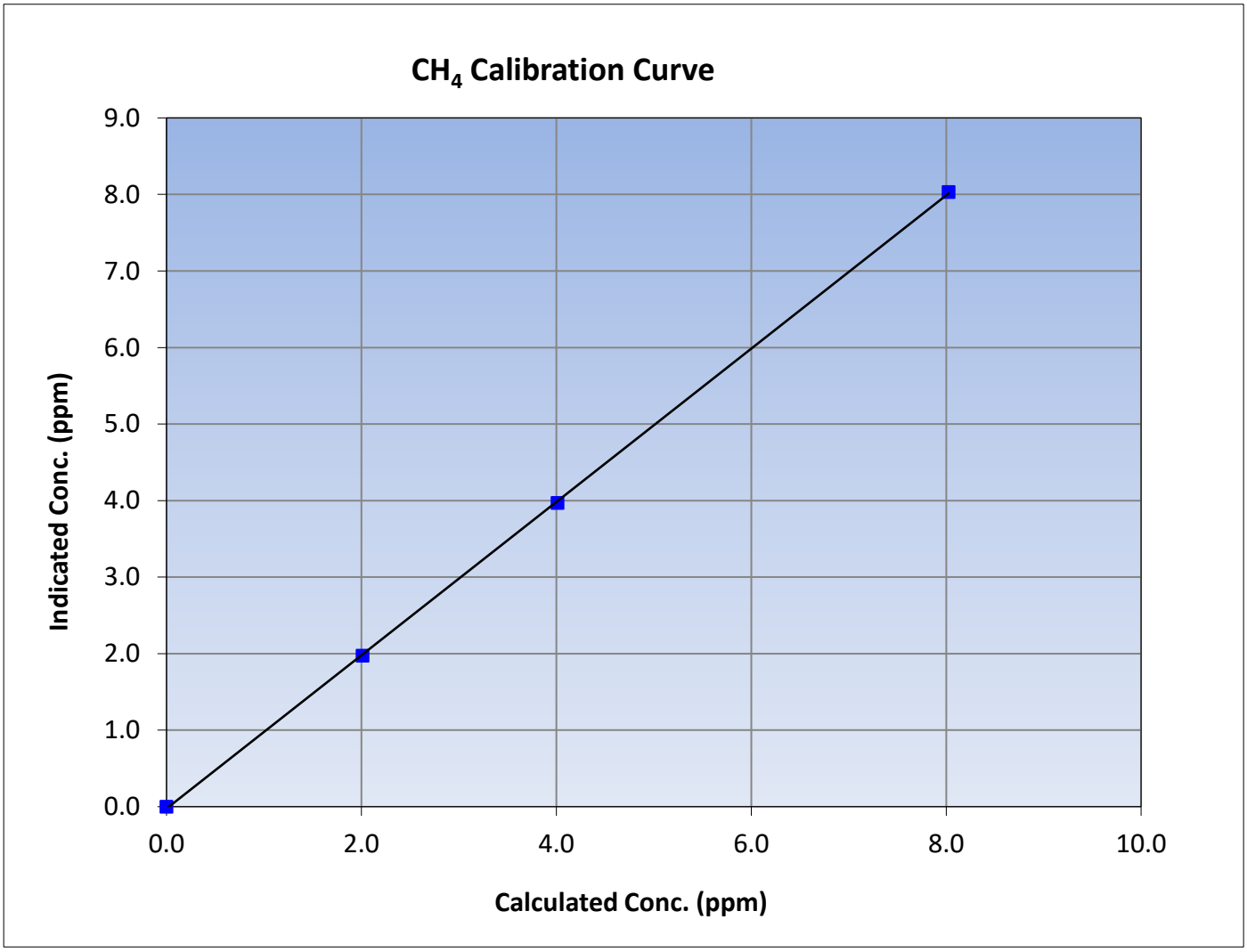
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | March 1, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:19 | End Time (MST): | 13:53 |
| 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 | 0.999949 | *≥0.995* |
| 8.03 | 8.03 | 0.9994 | | | |
| 4.01 | 3.97 | 1.0109 | Slope | 1.001651 | *0.90 - 1.10* |
| 2.01 | 1.97 | 1.0194 | | | |
| | | | Intercept | -0.024958 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

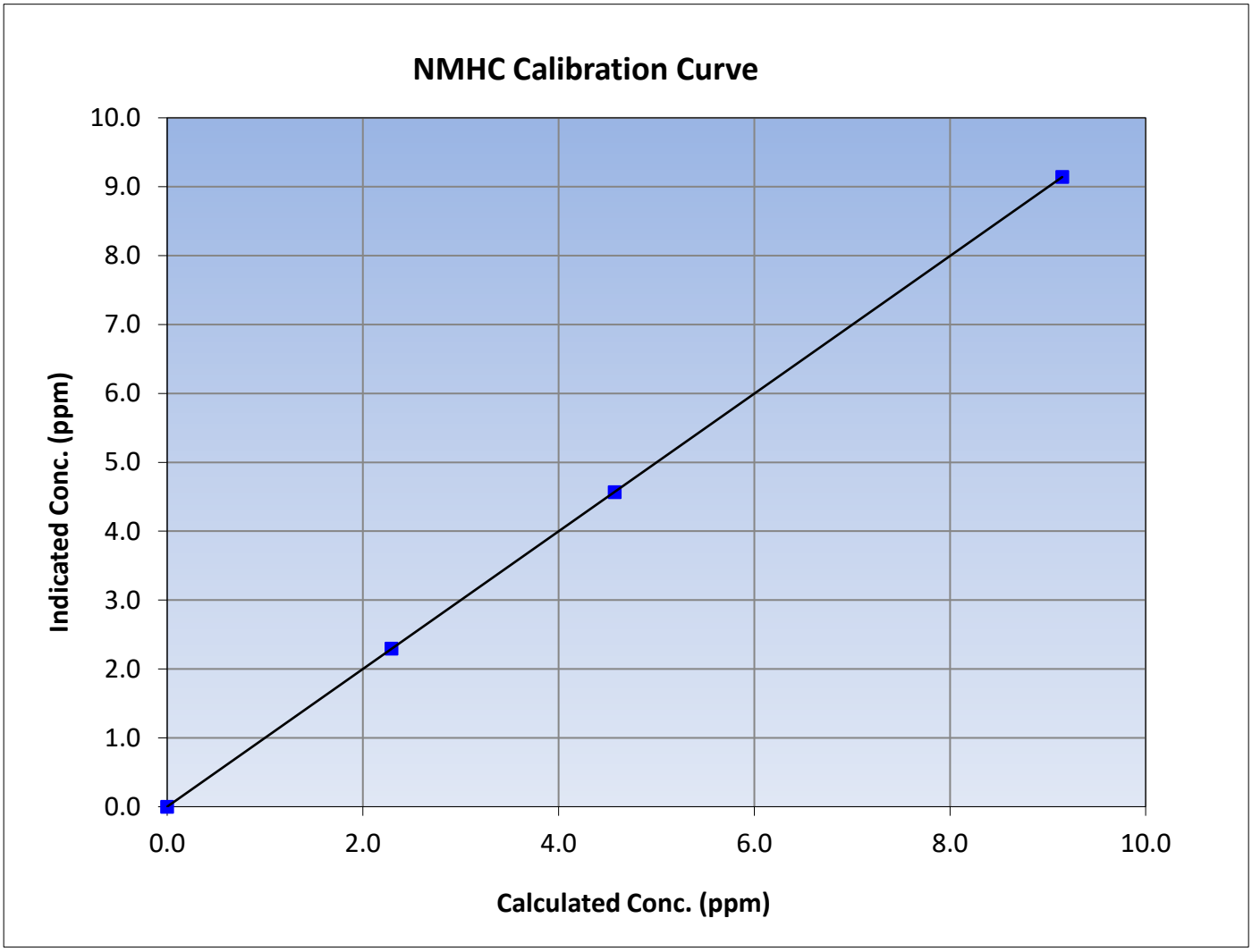
Version-06-2022

### Station Information

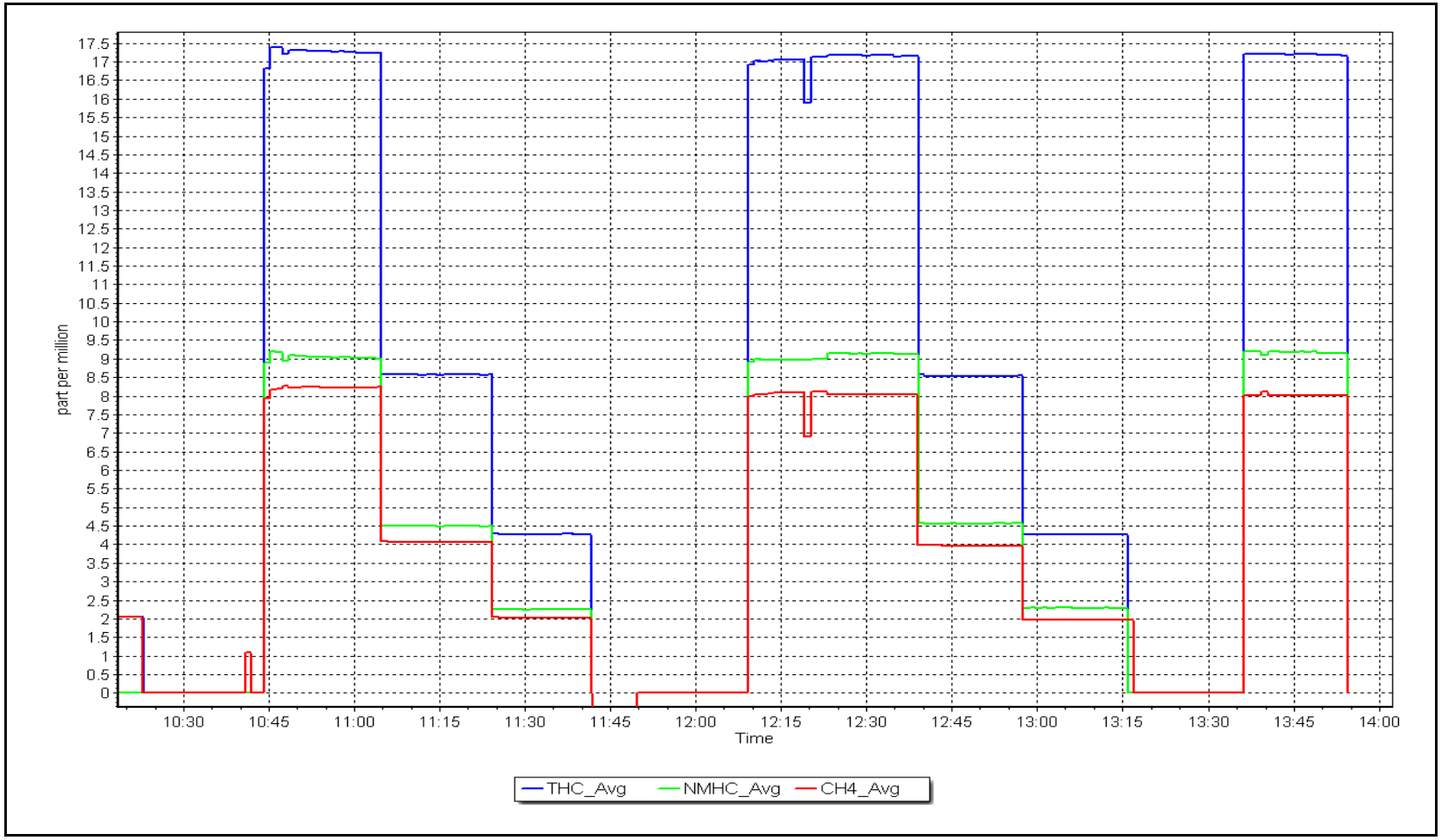
| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | March 1, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:19 | End Time (MST): | 13:53 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1317958219 |

### 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 | 9.14 | 1.0006 | | | |
| 4.57 | 4.57 | 1.0014 | Slope | 0.999256 | *0.90 - 1.10* |
| 2.29 | 2.30 | 0.9989 | | | |
| | | | Intercept | 0.000762 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 25, 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: | March 27, 2024 | Last Cal Date: | February 28, 2024 |
| Start time (MST): | 10:25 | End time (MST): | 14:26 |
| 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: | 0.840 | 0.853 | NO bkgnd or offset: | 0.0 | 0.0 |
| NOX coeff or slope: | 0.835 | 0.845 | NOX bkgnd or offset: | -0.2 | -0.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 6.3 | 6.4 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.000594 | 1.003829 |
| $NO_X$ Cal Offset: | 0.484102 | 0.024109 |
| NO Cal Slope: | 0.999460 | 1.005929 |
| NO Cal Offset: | -0.576026 | -0.915862 |
| $NO_2$ Cal Slope: | 1.004914 | 0.998553 |
| $NO_2$ Cal Offset: | 0.223696 | -0.654801 |

# 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 | 0.0 | 0.2 | ---- | ---- |
| as found span | 4918 | 82.0 | 802.0 | 800.3 | 1.6 | 791.5 | 782.9 | 8.6 | 1.0132 | 1.0223 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.1 | 0.2 | ---- | ---- |
| high point | 4918 | 82.0 | 802.0 | 800.3 | 1.6 | 805.3 | 804.4 | 0.9 | 0.9959 | 0.9949 |
| second point | 4960 | 41.0 | 400.9 | 400.1 | 0.8 | 402.0 | 401.8 | 0.3 | 0.9973 | 0.9957 |
| 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 | 0.5 | 0.1 | 0.4 | ---- | ---- |
| as left span | 4918 | 82.0 | 802.0 | 400.6 | 401.3 | 797.6 | 397.0 | 400.6 | 1.0055 | 1.0091 |
| | | | | | | | | Average Correction Factor | 0.9965 | 0.9990 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 791.3 ppb | NO = 782.9 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -1.5% |
| Previous Response | $NO_X$ = 802.9 ppb | NO = 799.3 ppb | | *Percent Change | NO = | -2.1% |
| 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) | 799.8 | 400.1 | 401.3 | 400.6 | 1.0018 | 99.8% |
| 2nd GPT point (200 ppb O3) | 799.8 | 606.7 | 194.7 | 193.1 | 1.0085 | 99.2% |
| 3rd GPT point (100 ppb O3) | 799.8 | 705.8 | 95.6 | 94.2 | 1.0153 | 98.5% |
| | | | | Average Correction Factor | 1.0085 | 99.2% |

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

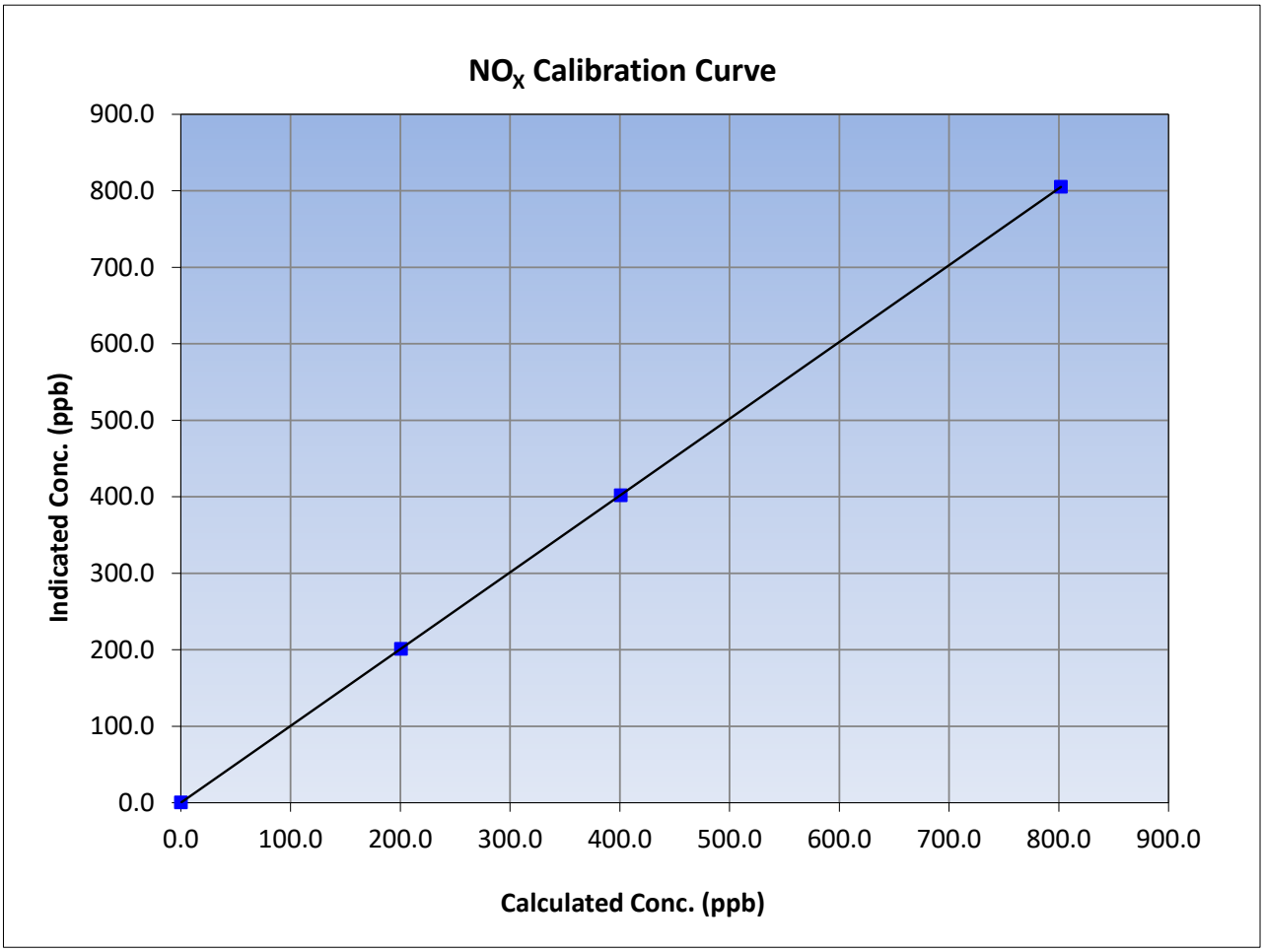
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 28, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:25 | End Time (MST): | 14:26 |
| 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 | 0.999999 | *≥0.995* |
| 802.0 | 805.3 | 0.9959 | | | |
| 400.9 | 402.0 | 0.9973 | Slope | 1.003829 | *0.90 - 1.10* |
| 200.5 | 201.2 | 0.9964 | | | |
| | | | Intercept | 0.024109 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

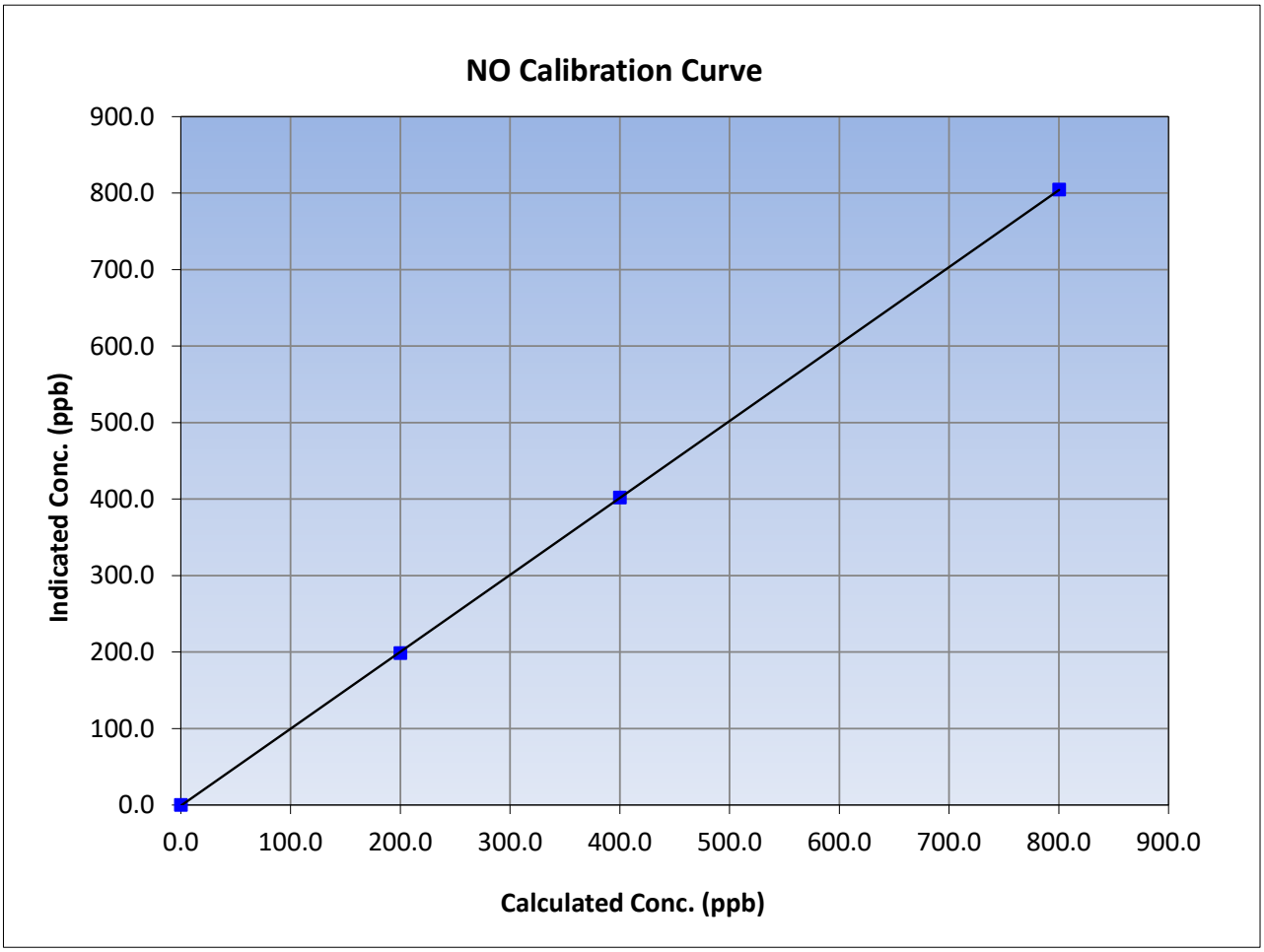
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 28, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:25 | End Time (MST): | 14:26 |
| 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 | 0.999990 | ≥0.995 |
| 800.3 | 804.4 | 0.9949 | | | |
| 400.1 | 401.8 | 0.9957 | Slope | 1.005929 | 0.90 - 1.10 |
| 200.1 | 198.8 | 1.0063 | | | |
| | | | Intercept | -0.915862 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

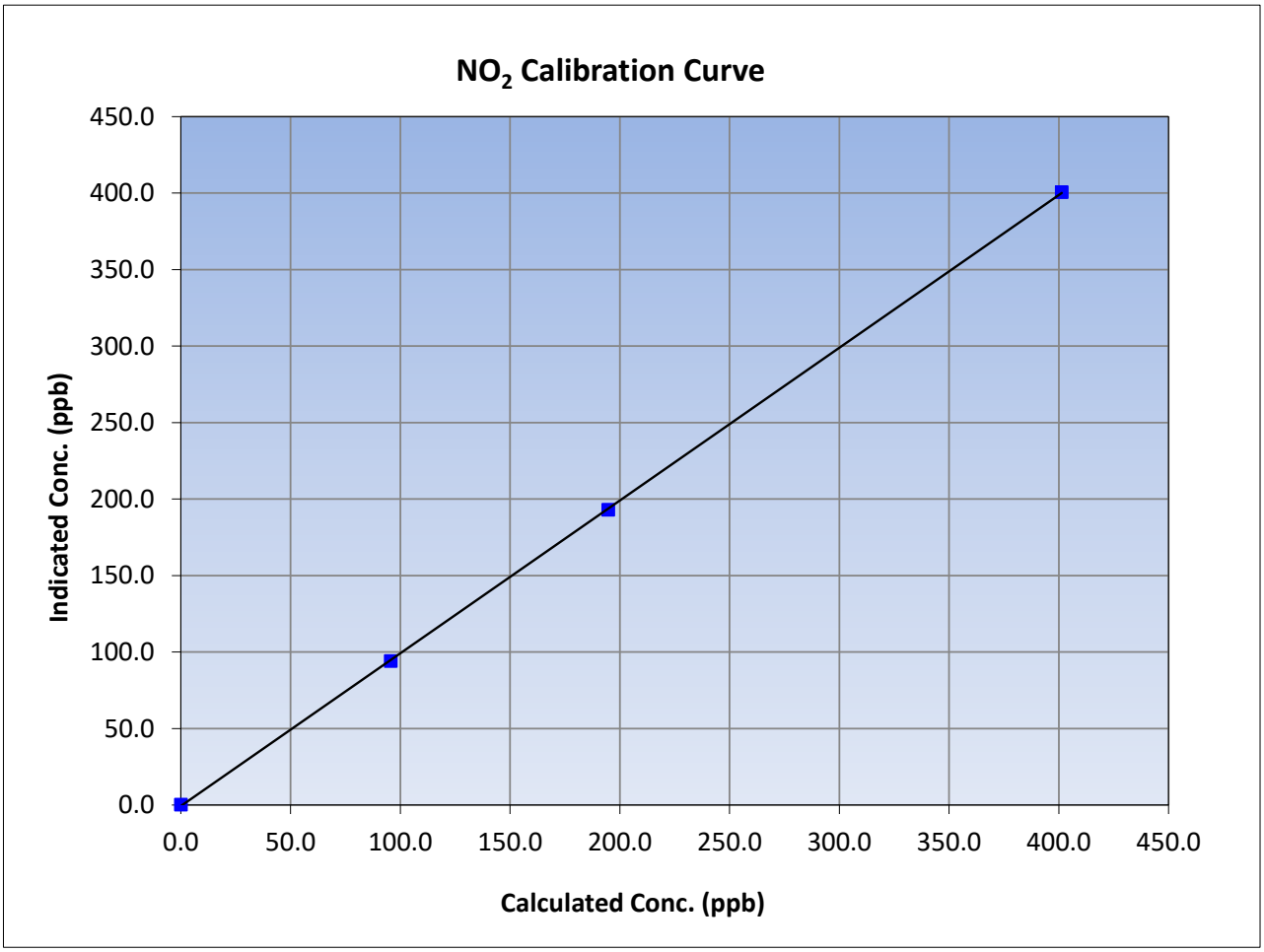
Version-04-2020

### Station Information

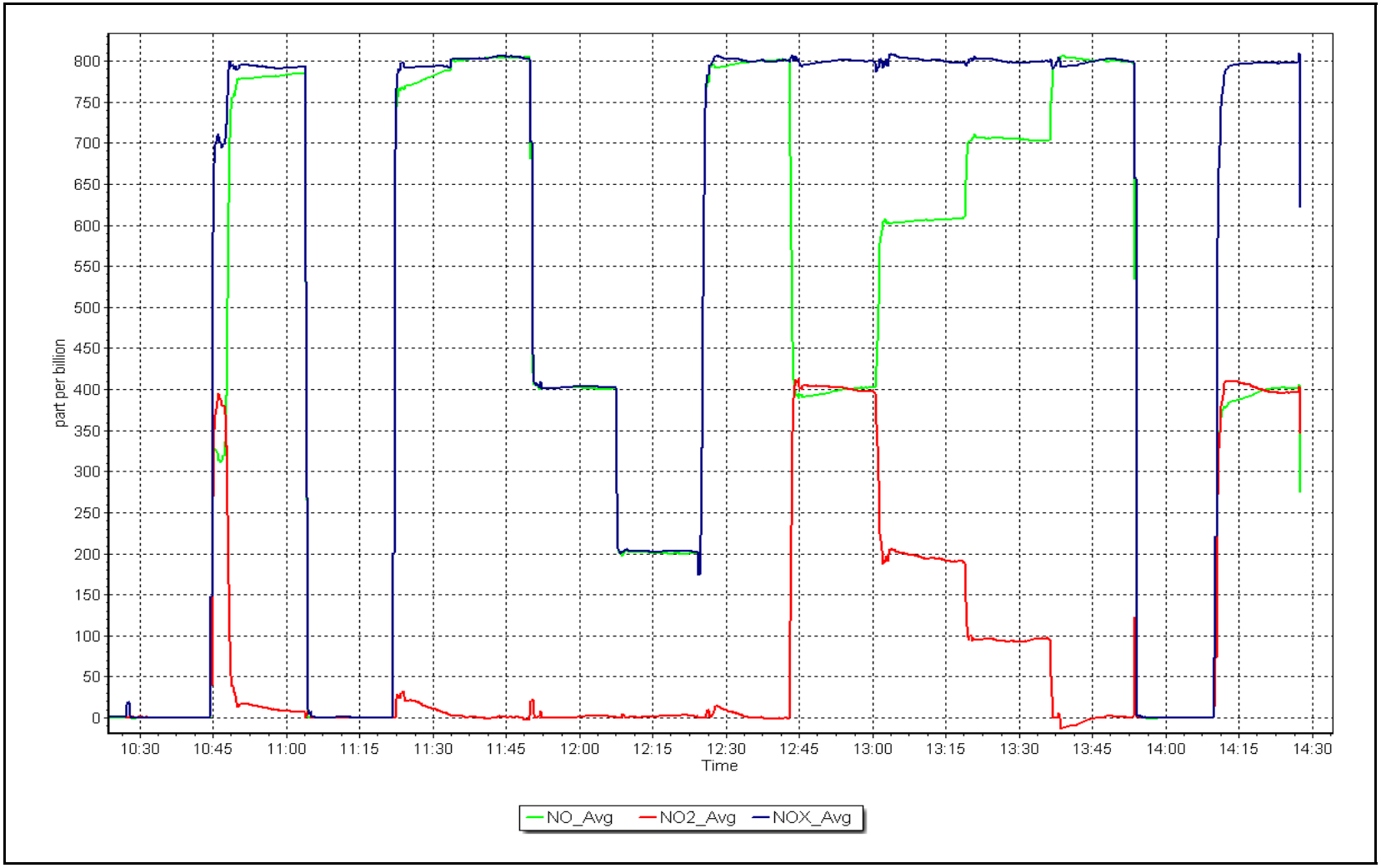
| | | | |
|---|---|---|---|
| Calibration Date: | March 27, 2024 | Previous Calibration: | February 28, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 10:25 | End Time (MST): | 14:26 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 833 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.2 | ---- | Correlation Coefficient | 0.999979 | ≥0.995 |
| 401.3 | 400.6 | 1.0018 | | | |
| 194.7 | 193.1 | 1.0085 | Slope | 0.998553 | 0.90 - 1.10 |
| 95.6 | 94.2 | 1.0153 | | | |
| | | | Intercept | -0.654801 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 27, 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: | March 22, 2024 | Last Cal Date: | February 20, 2024 |
| Start time (MST): | 12:45 | End time (MST): | 15:04 |
| 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: | 1.003229 | 1.003829 | Backgd or Offset: | 2.2 | 2.2 |
| Calibration intercept: | 0.560000 | 0.480000 | Coeff or Slope: | 1.027 | 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 | 0.1 | ---- |
| as found span | 4895 | 905.3 | 400.0 | 402.2 | 0.995 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| calibrator zero | 5000 | 800.0 | 0.0 | 0.2 | ---- |
| high point | 4895 | 905.3 | 400.0 | 401.8 | 0.996 |
| second point | 4895 | 756.7 | 200.0 | 201.6 | 0.992 |
| third point | 4895 | 656.1 | 100.0 | 101.0 | 0.990 |
| as left zero | 5000 | 800.0 | 0.0 | 1.0 | ---- |
| as left span | 4895 | 904.3 | 400.0 | 404.5 | 0.989 |
| | | | | Average Correction Factor | 0.993 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 402.1 | Previous response | 401.9 | *% change | 0.1% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Rene Chamberland

# Wood Buffalo Environmental Association

## $O_3$ Calibration Summary

Version-01-2020

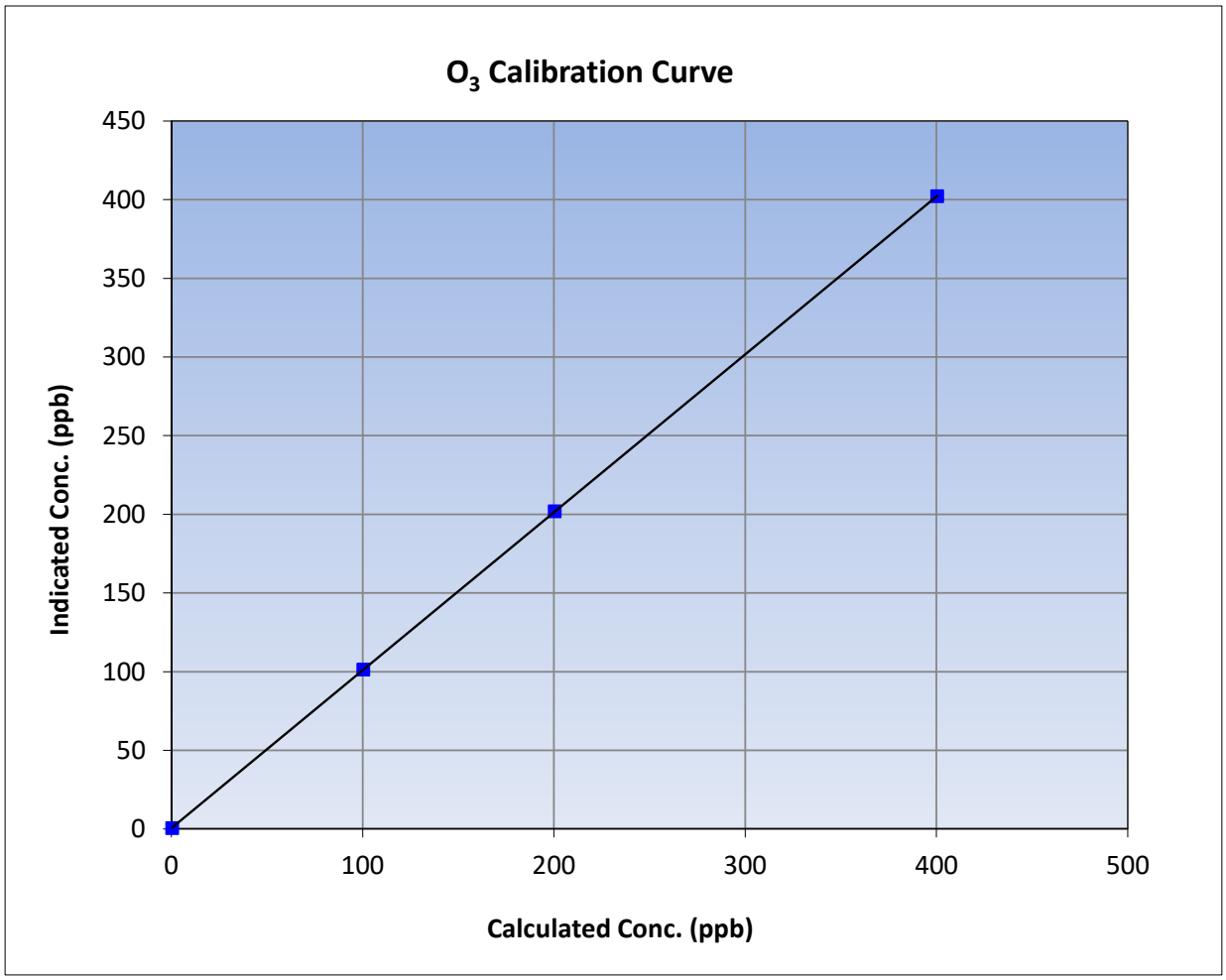
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 20, 2024 |
| Station Name: | Janvier | Station Number: | AMS 22 |
| Start Time (MST): | 12:45 | End Time (MST): | 15:04 |
| Analyzer make: | Teledyne API T400 | Analyzer serial #: | 7046 |

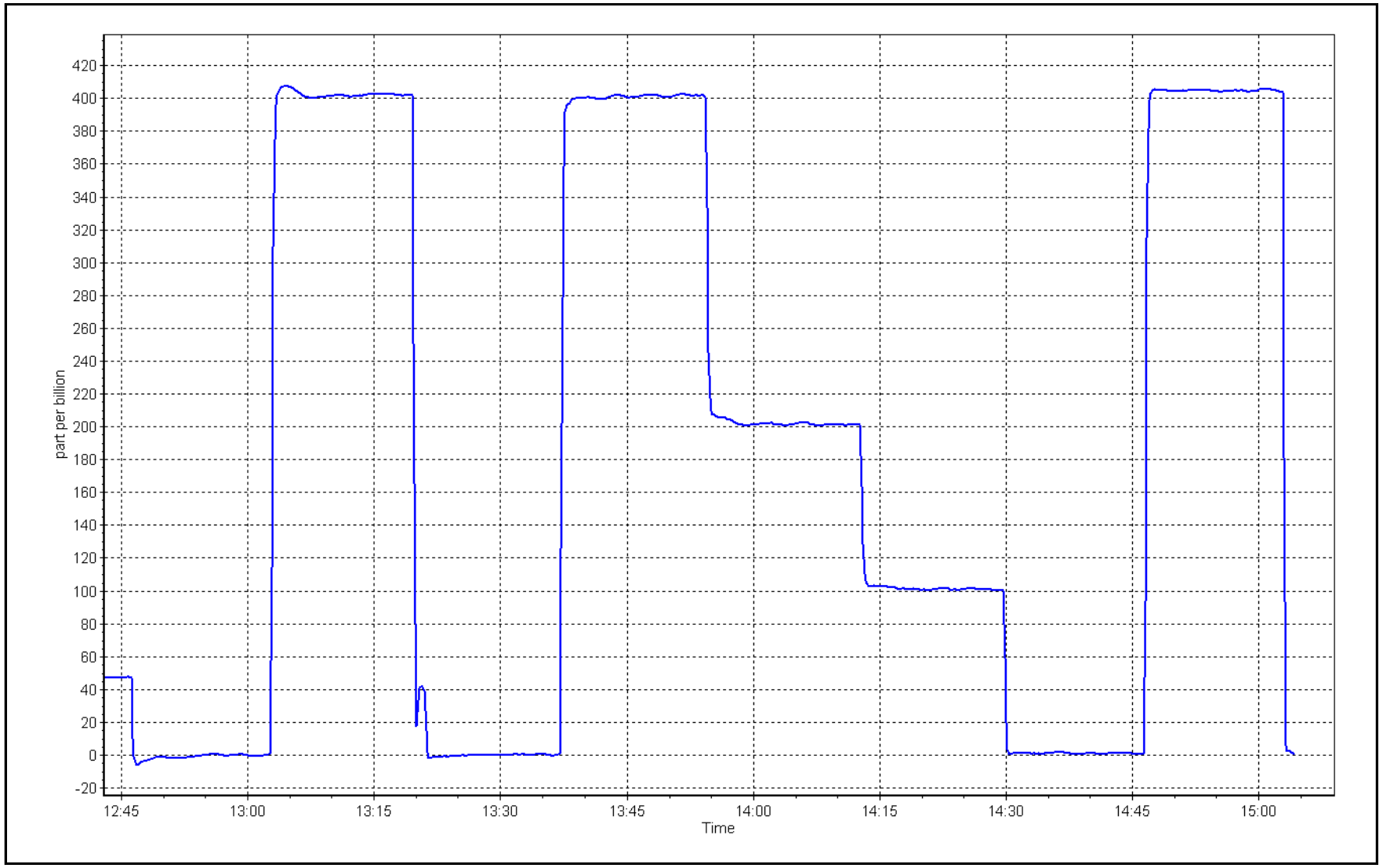
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 400.0 | 401.8 | 0.9955 |
| 200.0 | 201.6 | 0.9921 |
| 100.0 | 101.0 | 0.9901 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999997 | ≥0.995 |
| Slope | 1.003829 | 0.90 - 1.10 |
| Intercept | 0.480000 | +/- 5 |



**$O_3$ Calibration Plot** Date: March 22, 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: | March 26, 2024 | Last Cal Date: | February 28, 2024 |
| Start time (MST): | 11:09 | End time (MST): | 12:13 |
| 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) | -1.5 | -1.7 | -1.5 | ☐ | +/- 2 °C |
| P (mmHg) | 714.9 | 715.71 | 714.9 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 5.078 | 5.01 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 39 | ----- | 39 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 3.3 | PM w/ HEPA: | 0.0 | <0.2 ug/m3 |

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

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

### Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 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
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Fort Hills | Station number: | AMS23 |
| Calibration Date: | March 8, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 8:46 | End time (MST): | 11:34 |
| 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: | 1.000522 | 1.003512 | Backgd or Offset: | 18.5 | 18.5 |
| Calibration intercept: | -0.903438 | -0.524217 | 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 | -0.1 | ---- |
| as found span | 4920 | 80.3 | 799.1 | 802.5 | 0.996 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| high point | 4920 | 80.3 | 799.1 | 801.7 | 0.997 |
| second point | 4960 | 40.2 | 400.1 | 400.7 | 0.998 |
| third point | 4980 | 20.1 | 200.0 | 199.4 | 1.003 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4920 | 80.3 | 799.1 | 804.9 | 0.993 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 802.60 | Previous response | 798.61 | *% 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: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

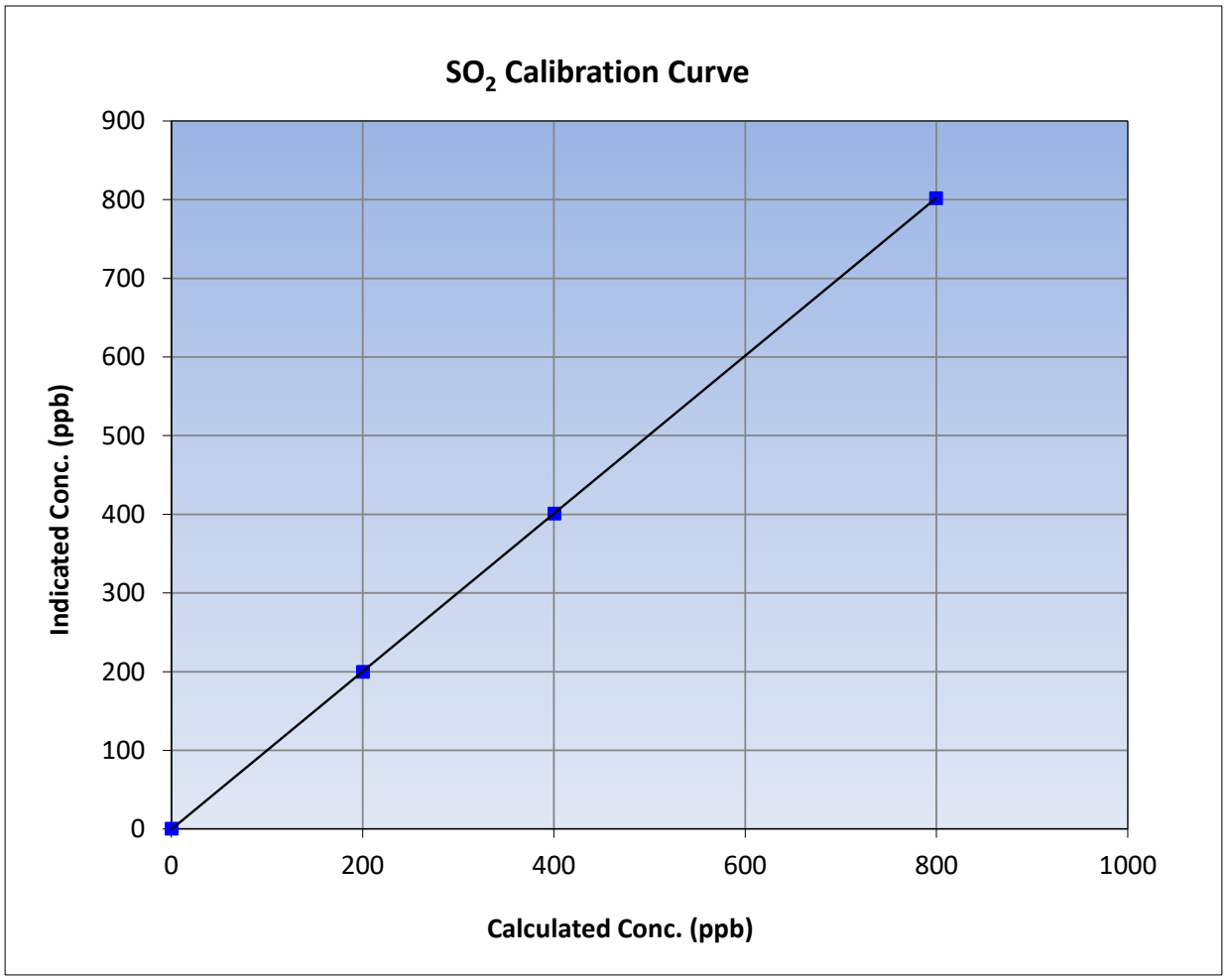
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 8:46 | End Time (MST): | 11:34 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1160290012 |

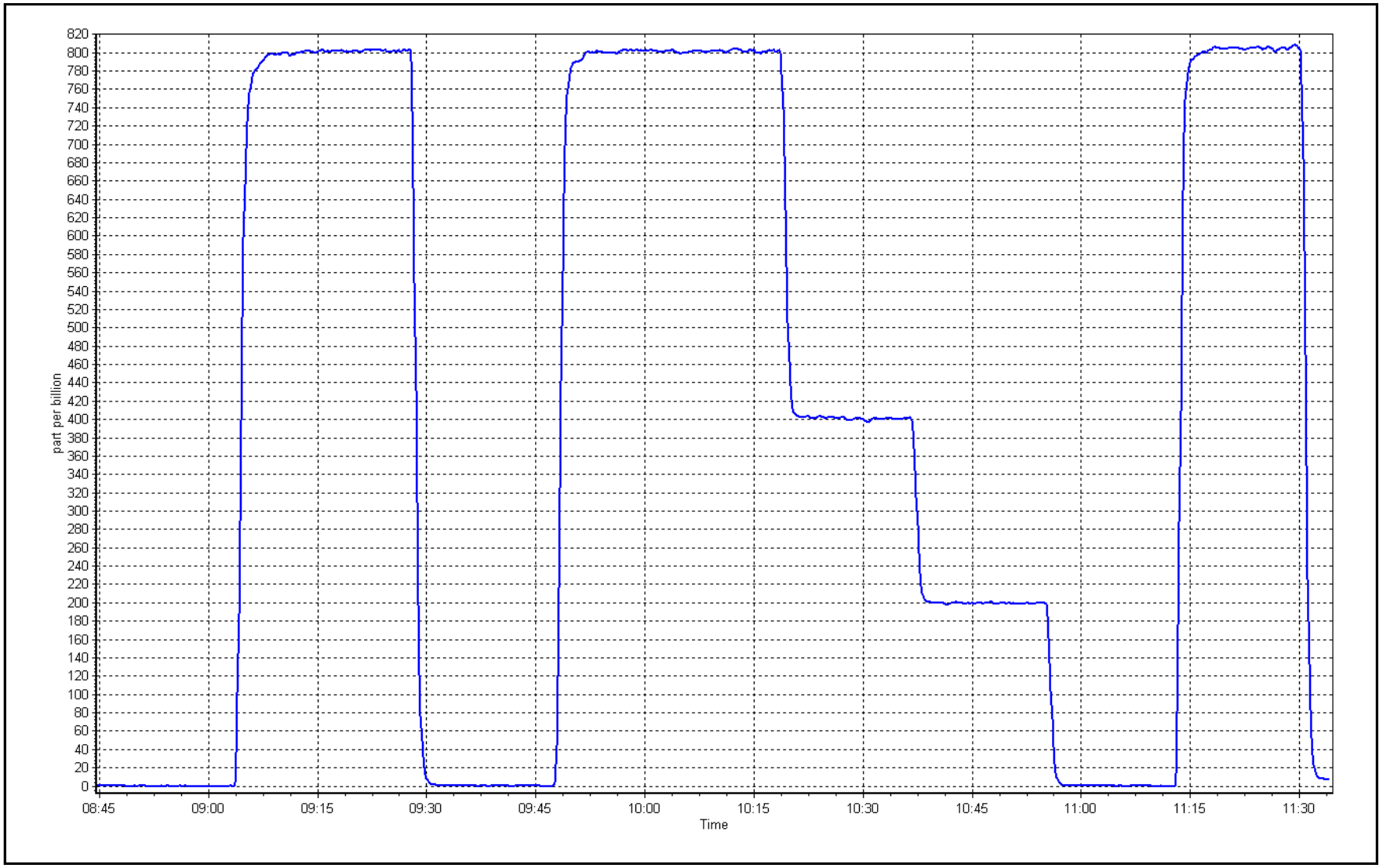
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 799.1 | 801.7 | 0.9968 |
| 400.1 | 400.7 | 0.9984 |
| 200.0 | 199.4 | 1.0032 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999996 | *≥0.995* |
| Slope | 1.003512 | *0.90 - 1.10* |
| Intercept | -0.524217 | *+/-30* |



**SO2 Calibration Plot** Date: March 8, 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: | March 13, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 7:00 | End time (MST): | 11:26 |
| 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: | 1.010172 | 0.991459 | Backgd or Offset: | 1.96 | 1.96 |
| Calibration intercept: | -0.218012 | -0.038309 | Coeff or Slope: | 1.160 | 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 | 77.9 | 1.027 |
| as found 2nd point | 4962 | 38.5 | 40.0 | 39.3 | 1.018 |
| as found 3rd point | 4981 | 19.2 | 19.9 | 19.7 | 1.013 |
| 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 | 77.0 | 80.0 | 79.3 | 1.009 |
| second point | 4962 | 38.5 | 40.0 | 39.6 | 1.010 |
| 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 | 80.9 | 0.989 |
| SO2 Scrubber Check | 4920 | 80.3 | 803.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.010 |
| Date of last converter efficiency test: | | March 13, 2024 | | 102.7% | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 77.9 | Prev response: | 80.60 | *% change: | -3.5% |
| Baseline Corr 2nd AF pt: | 39.3 | AF Slope: | 0.973033 | AF Intercept: | 0.181374 |
| Baseline Corr 3rd AF pt: | 19.7 | AF Correlation: | 0.999970 | | |

* = > +/-5% change initiates investigation

Notes: Converter efficiency test done after the third as found point at 102.7%. Pump changed out. SOx scrubber checked after the third point. No adjustments done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

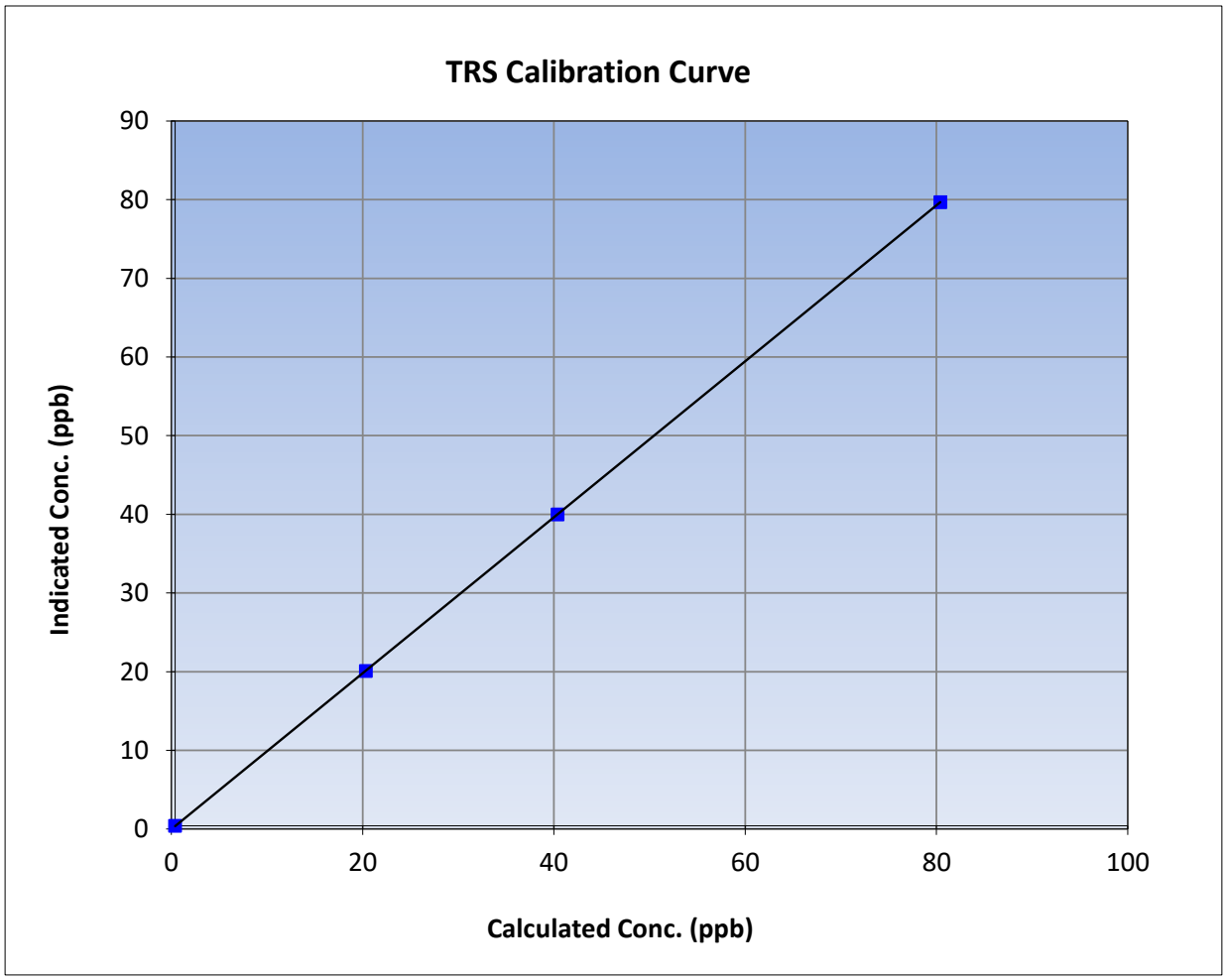
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 7:00 | End Time (MST): | 11:26 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1300156232 |

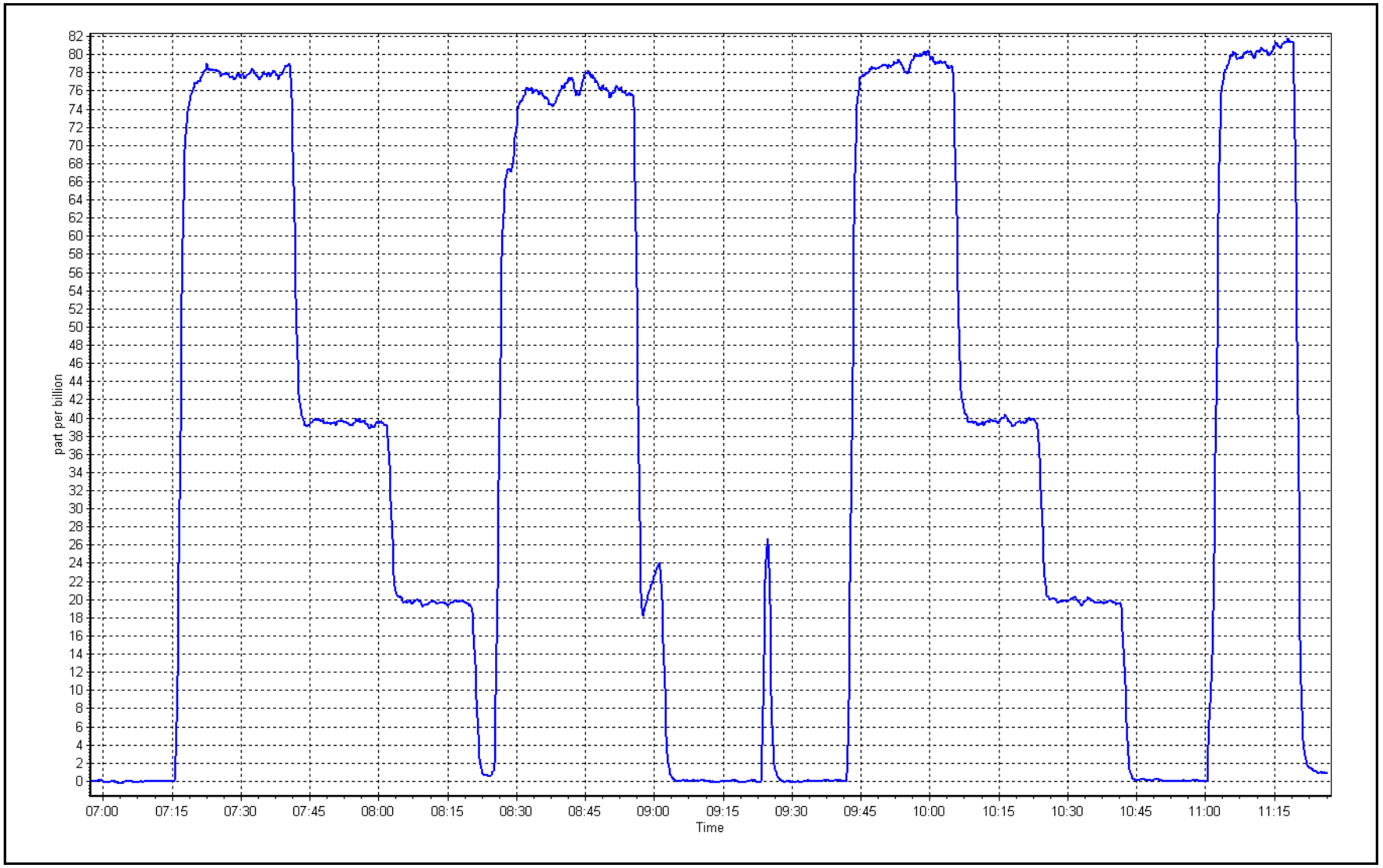
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 79.3 | 1.0089 |
| 40.0 | 39.6 | 1.0100 |
| 19.9 | 19.7 | 1.0126 |
| | | |

| Statistical Evaluation | | Limits |
|---|---|---|
| Correlation Coefficient | 0.999999 | ≥0.995 |
| Slope | 0.991459 | 0.90 - 1.10 |
| Intercept | -0.038309 | +/-3 |



**TRS Calibration Plot** Date: March 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: | March 8, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 8:46 | End time (MST): | 11:33 |
| 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 | 2.35E-04 | NMHC SP Ratio: | 4.93E-05 | 4.99E-05 |
| CH4 Retention time: | 13.0 | 13.2 | NMHC Peak Area: | 186451 | 183614 |
| 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 | 17.29 | 0.994 |
| 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 | 17.27 | 0.995 |
| second point | 4960 | 40.2 | 8.61 | 8.65 | 0.996 |
| third point | 4980 | 20.1 | 4.30 | 4.35 | 0.988 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 17.19 | 17.24 | 0.997 |
| | | | | Average Correction Factor | 0.993 |
| Baseline Corr AF: | 17.29 | Prev response | 17.21 | *% change | 0.5% |
| 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 | 9.23 | 0.993 |
| 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 | 9.16 | 1.000 |
| second point | 4960 | 40.2 | 4.59 | 4.63 | 0.991 |
| third point | 4980 | 20.1 | 2.29 | 2.36 | 0.970 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 9.16 | 9.14 | 1.002 |
| | | | | Average Correction Factor | 0.987 |
| Baseline Corr AF: | 9.23 | Prev response | 9.21 | *% change | 0.2% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 8.07 | 0.996 |
| 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 | 8.12 | 0.989 |
| second point | 4960 | 40.2 | 4.02 | 4.02 | 1.000 |
| third point | 4980 | 20.1 | 2.01 | 1.99 | 1.010 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4920 | 80.3 | 8.03 | 8.11 | 0.991 |
| | | | | Average Correction Factor | 1.000 |
| Baseline Corr AF: | 8.07 | Prev response | 8.00 | *% change | 0.8% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.999507 | 1.004093 |
| THC Cal Offset: | 0.025608 | 0.011596 |
| CH4 Cal Slope: | 0.997953 | 1.012136 |
| CH4 Cal Offset: | -0.014037 | -0.025657 |
| NMHC Cal Slope: | 1.000996 | 0.997614 |
| NMHC Cal Offset: | 0.041641 | 0.036452 |

Notes: Span adjusted. No maintenance done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## THC Calibration Summary

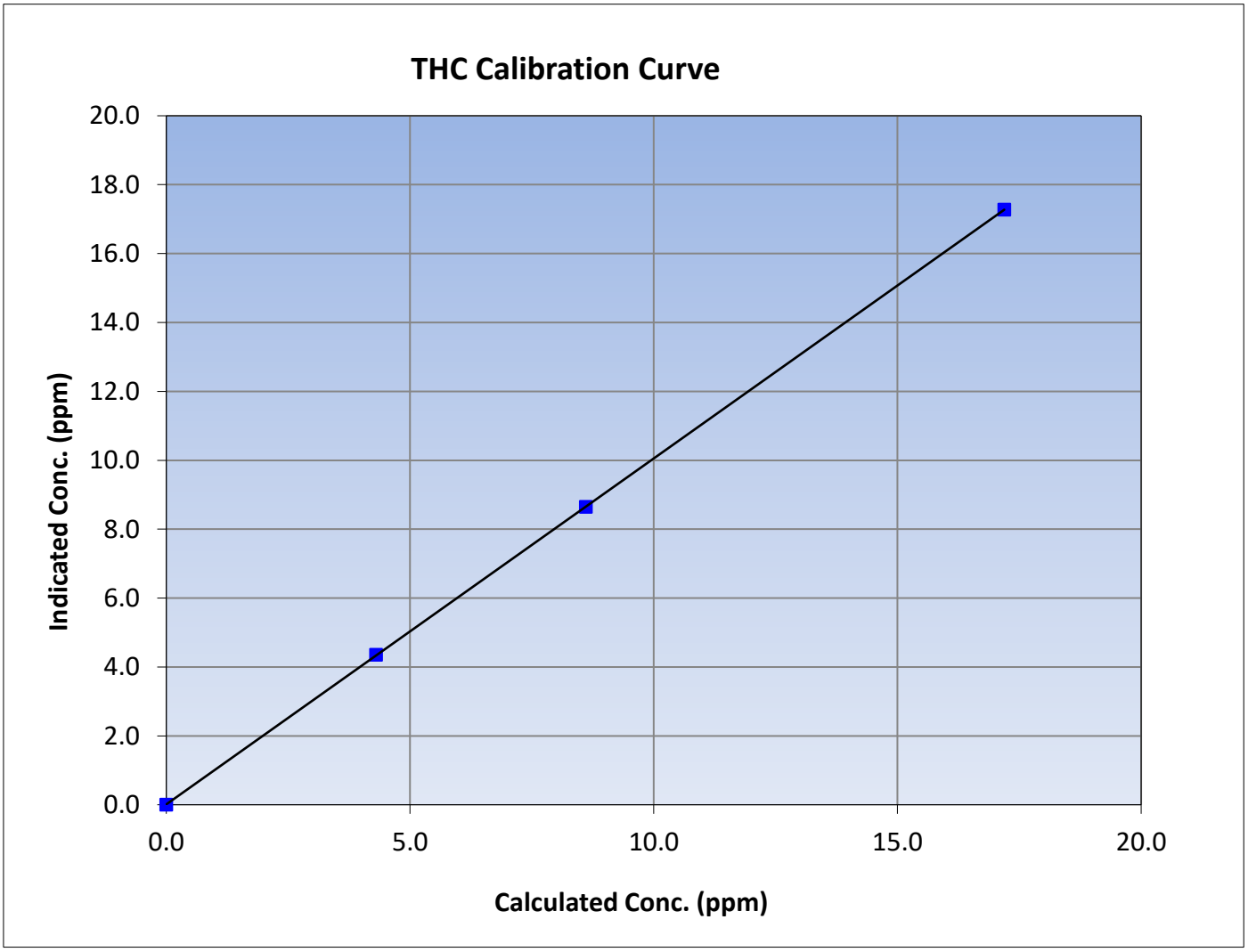
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 8:46 | End Time (MST): | 11:33 |
| 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 | 0.999996 | *≥0.995* |
| 17.19 | 17.27 | 0.9953 | | | |
| 8.61 | 8.65 | 0.9956 | Slope | 1.004093 | *0.90 - 1.10* |
| 4.30 | 4.35 | 0.9884 | | | |
| | | | Intercept | 0.011596 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

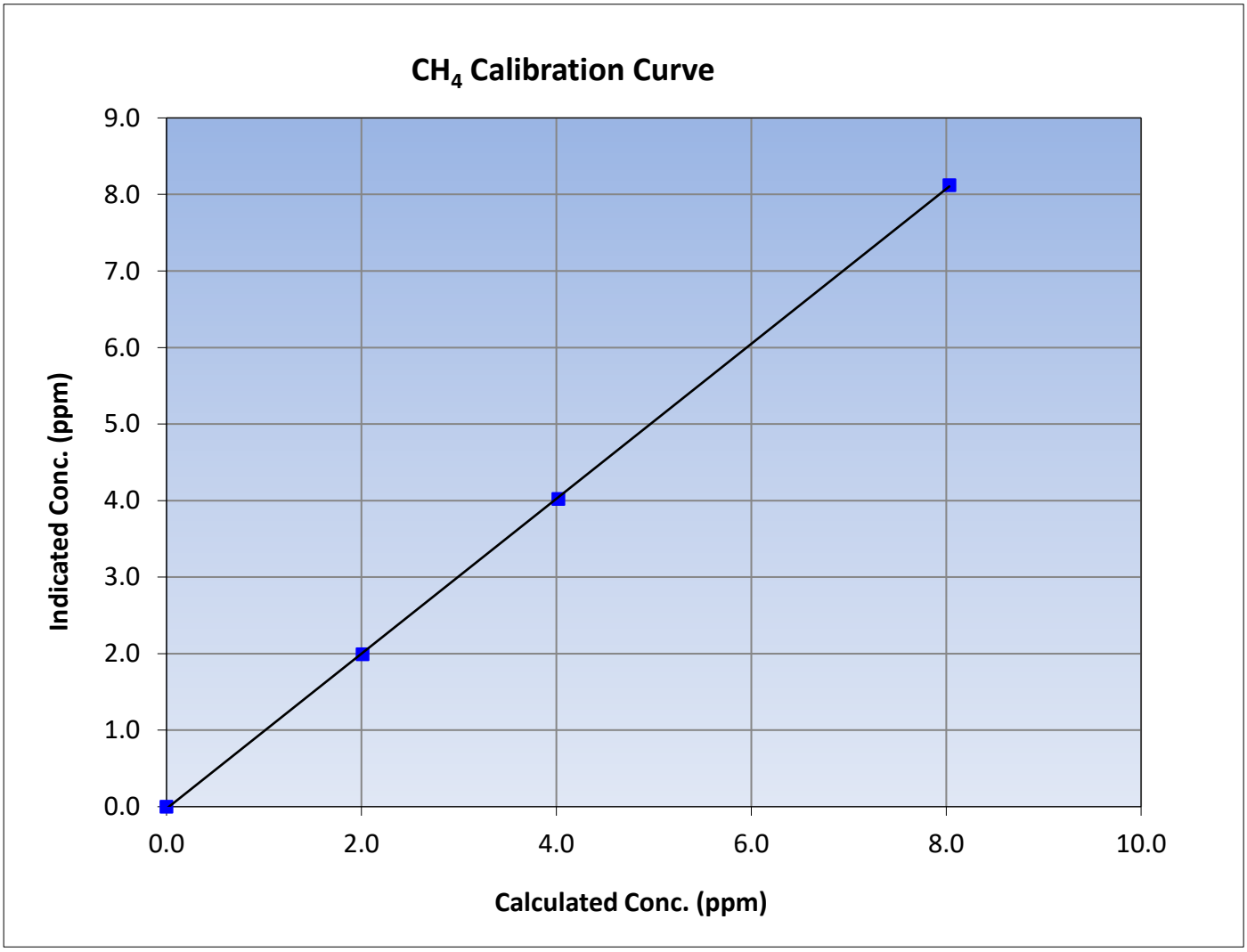
Version-06-2022

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 8:46 | End Time (MST): | 11:33 |
| 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 | 0.999949 | *≥0.995* |
| 8.03 | 8.12 | 0.9891 | | | |
| 4.02 | 4.02 | 1.0001 | Slope | 1.012136 | *0.90 - 1.10* |
| 2.01 | 1.99 | 1.0099 | | | |
| | | | Intercept | -0.025657 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

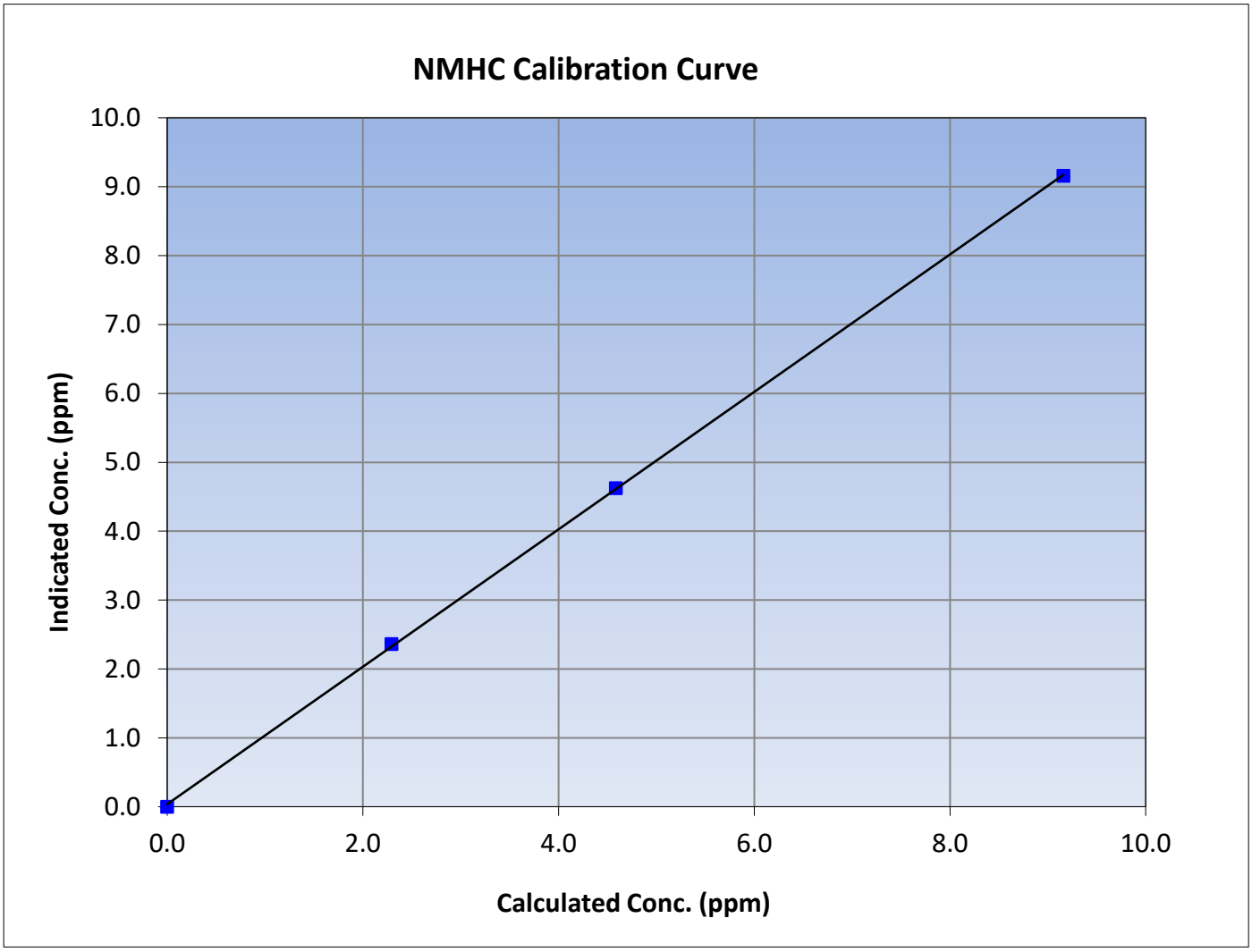
Version-06-2022

### Station Information

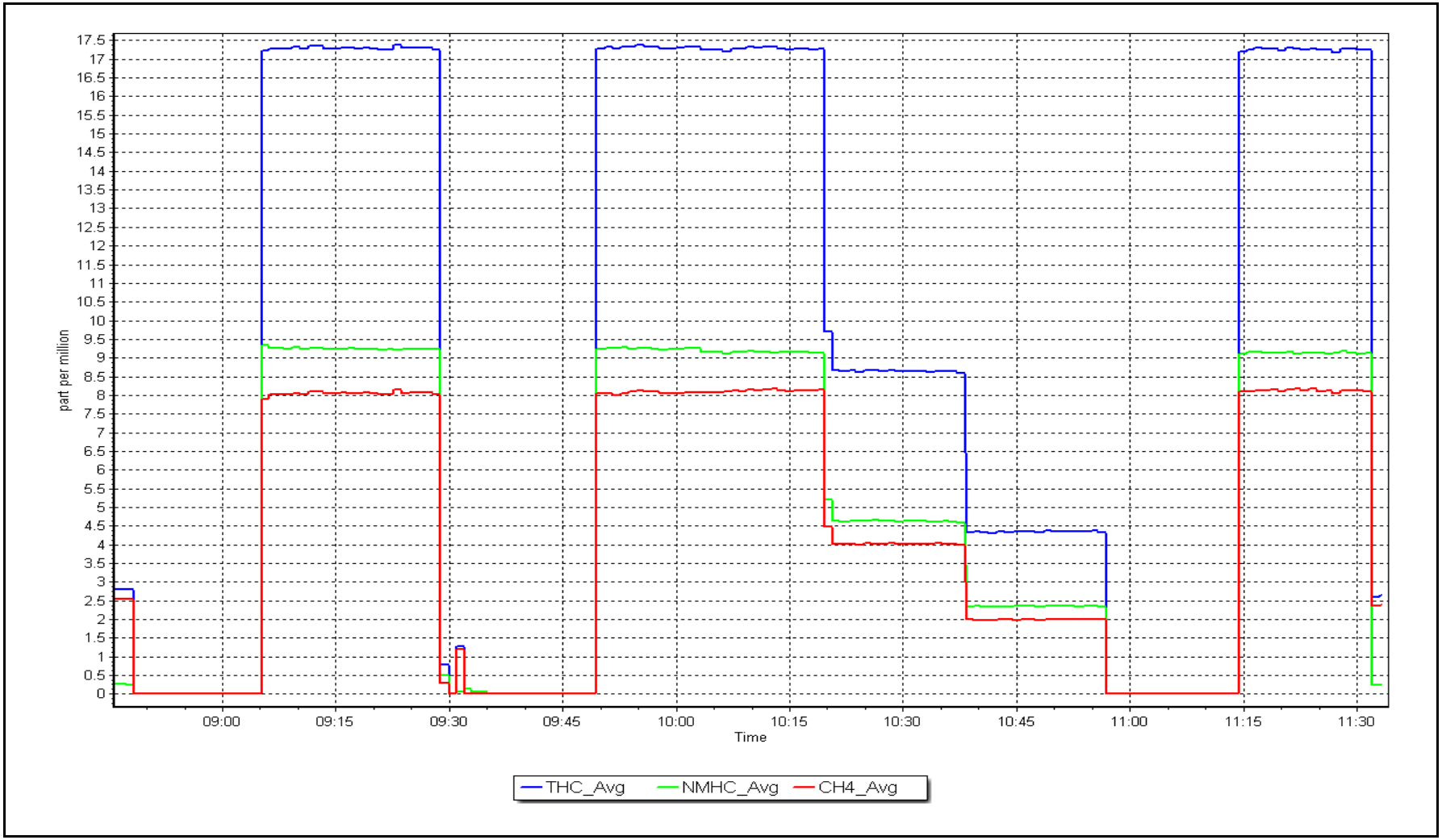
| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 8:46 | End Time (MST): | 11:33 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585648 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999927 | ≥0.995 |
| 9.16 | 9.16 | 1.0002 | | | |
| 4.59 | 4.63 | 0.9914 | Slope | 0.997614 | 0.90 - 1.10 |
| 2.29 | 2.36 | 0.9703 | | | |
| | | | Intercept | 0.036452 | +/-0.5 |



**NMHC Calibration Plot** Date: March 8, 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: | March 12, 2024 | Last Cal Date: | February 2, 2024 |
| Start time (MST): | 6:55 | End time (MST): | 11:35 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | CC358149 | | Cal Gas Expiry Date: | January 5, 2032 | |
| NOX Cal Gas Conc: | 60.3 | ppm | NO Cal Gas Conc: | 60.1 | ppm |
| Removed Cylinder #: | CC332703 | | Removed Gas Exp Date: | January 28, 2024 | |
| Removed Gas NOX Conc: | 49.7 | ppm | Removed Gas NO Conc: | 49.7 | ppm |
| NOX gas Diff: | 1.0% | | NO gas Diff: | 2.1% | |
| 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: | 1.102 | 1.132 | NO bkgnd or offset: | 3 | 3.1 |
| NOX coeff or slope: | 0.990 | 0.996 | NOX bkgnd or offset: | 3.2 | 3.3 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 170.3 | 170.3 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.002680 | 0.998626 |
| $NO_X$ Cal Offset: | 0.104366 | -0.173464 |
| NO Cal Slope: | 1.001767 | 0.998303 |
| NO Cal Offset: | -0.976340 | -1.451679 |
| $NO_2$ Cal Slope: | 1.002767 | 1.002264 |
| $NO_2$ Cal Offset: | 0.602578 | 0.618019 |

# 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 | 0.0 | -0.1 | ---- | ---- |
| as found span | 4920 | 80.5 | 800.2 | 800.2 | 0.0 | 767.0 | 762.9 | 4.1 | 1.043 | 1.049 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4934 | 66.3 | 799.5 | 796.9 | 2.7 | 774.1 | 775.2 | -1.1 | 1.0329 | 1.0280 |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | ---- | ---- |
| high point | 4934 | 66.3 | 799.5 | 796.9 | 2.7 | 798.4 | 794.9 | 3.5 | 1.001 | 1.002 |
| second point | 4967 | 33.2 | 400.4 | 399.0 | 1.3 | 399.6 | 396.1 | 3.5 | 1.002 | 1.007 |
| third point | 4983 | 16.6 | 200.2 | 199.5 | 0.7 | 199.3 | 196.1 | 3.3 | 1.005 | 1.018 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | -0.1 | ---- | ---- |
| as left span | 4934 | 66.3 | 799.5 | 479.3 | 320.3 | 801.0 | 477.0 | 324.1 | 0.998 | 1.005 |
| | | | | | | | | Average Correction Factor | 1.003 | 1.009 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 767.0 ppb | NO = 762.9 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -4.6% |
| Previous Response | $NO_X$ = 802.4 ppb | NO = 800.6 ppb | | *Percent Change | NO = | -4.9% |
| 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) | 792.8 | 475.2 | 320.3 | 321.1 | 0.997 | 100.3% |
| 2nd GPT point (200 ppb O3) | 792.8 | 636.4 | 159.1 | 160.9 | 0.989 | 101.2% |
| 3rd GPT point (100 ppb O3) | 792.8 | 712.7 | 82.8 | 83.8 | 0.987 | 101.3% |
| | | | | Average Correction Factor | 0.991 | 100.9% |

Notes: Calibration gas changed. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

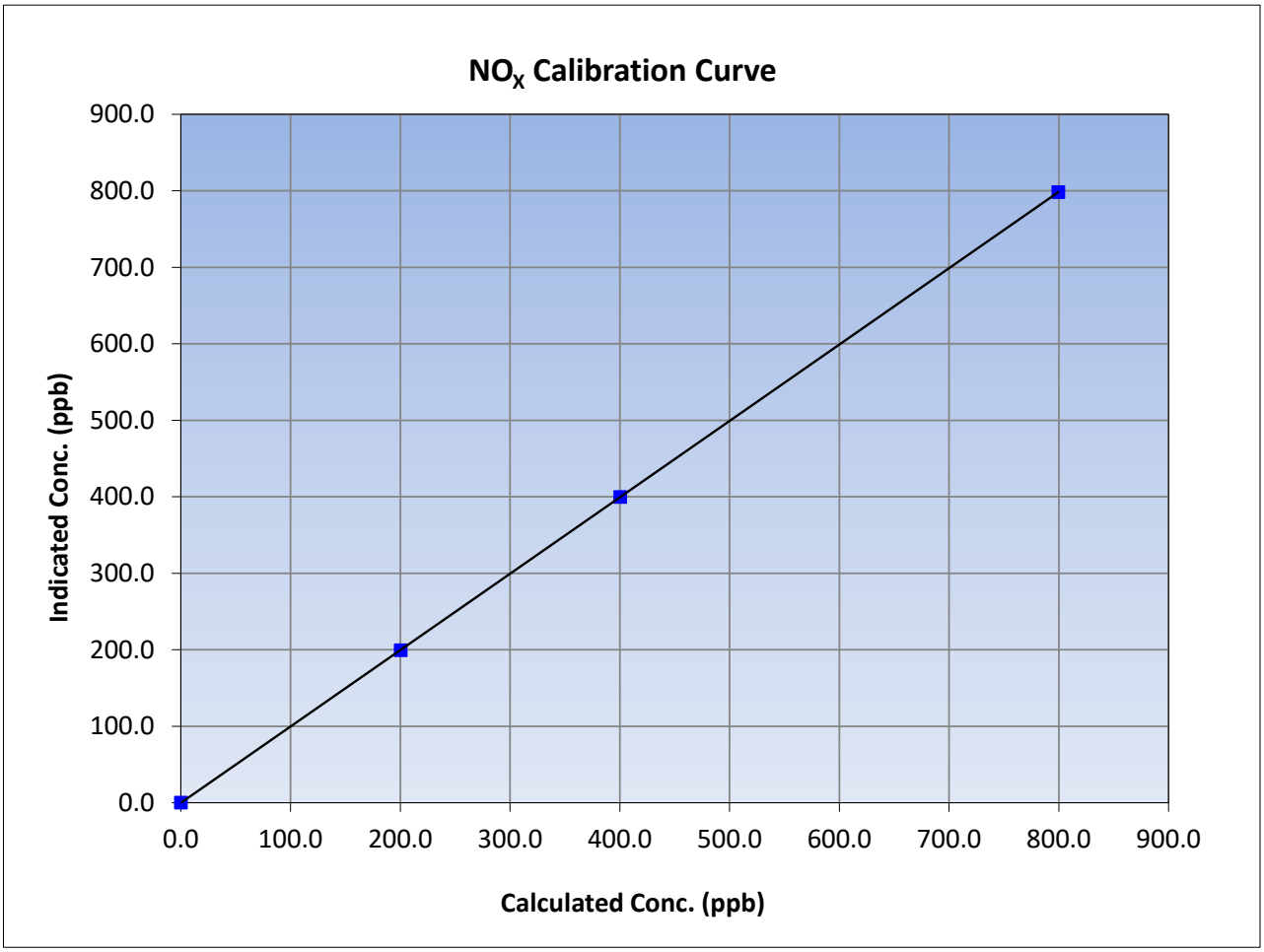
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 6:55 | End Time (MST): | 11:35 |
| 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 | 0.2 | ---- | Correlation Coefficient | 0.999999 | ≥0.995 |
| 799.5 | 798.4 | 1.0014 | | | |
| 400.4 | 399.6 | 1.0019 | Slope | 0.998626 | 0.90 - 1.10 |
| 200.2 | 199.3 | 1.0046 | | | |
| | | | Intercept | -0.173464 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

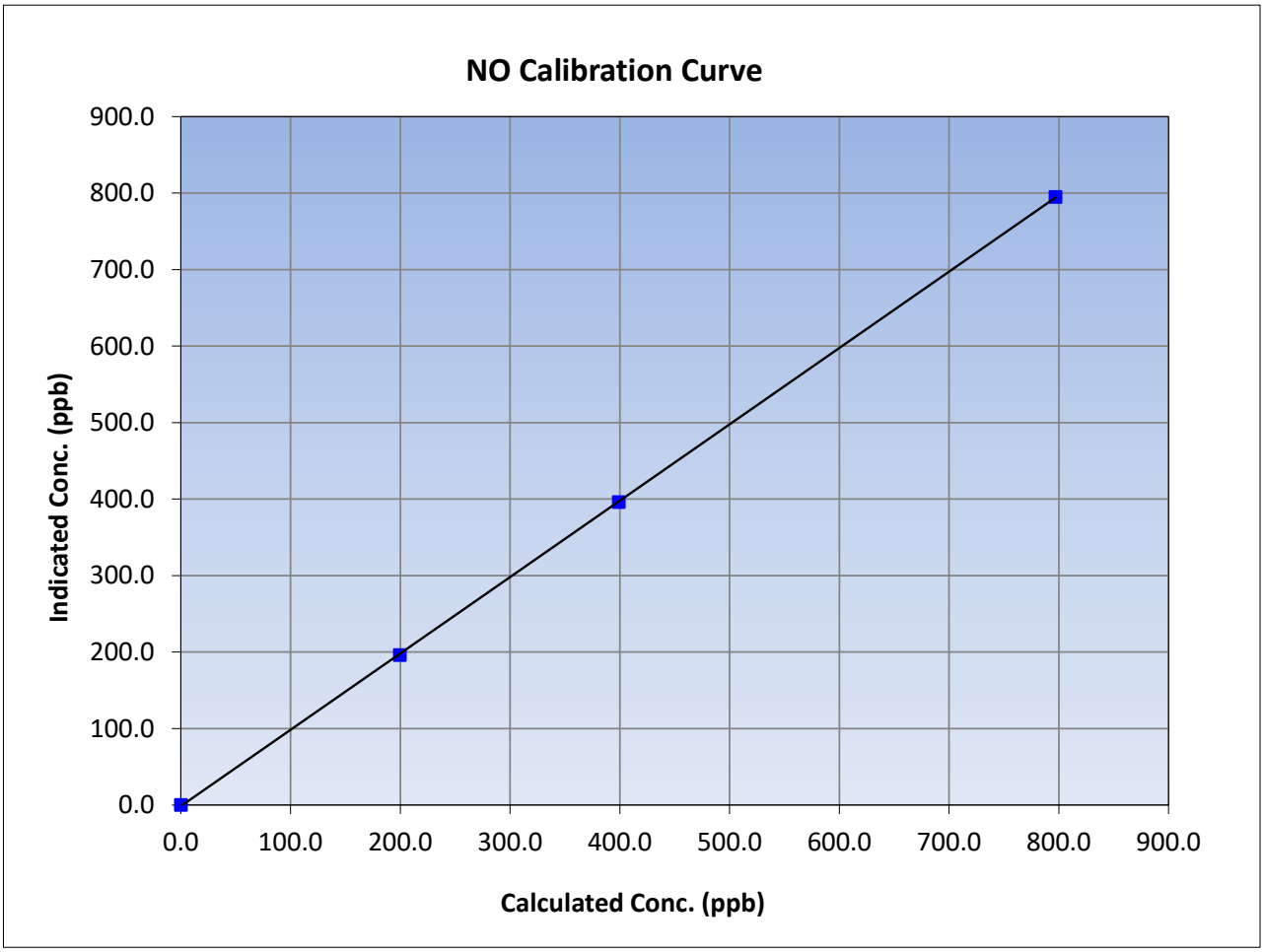
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 6:55 | End Time (MST): | 11:35 |
| 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 | 0.2 | ---- | Correlation Coefficient | 0.999980 | ≥0.995 |
| 796.9 | 794.9 | 1.0025 | | | |
| 399.0 | 396.1 | 1.0074 | Slope | 0.998303 | 0.90 - 1.10 |
| 199.5 | 196.1 | 1.0176 | | | |
| | | | Intercept | -1.451679 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

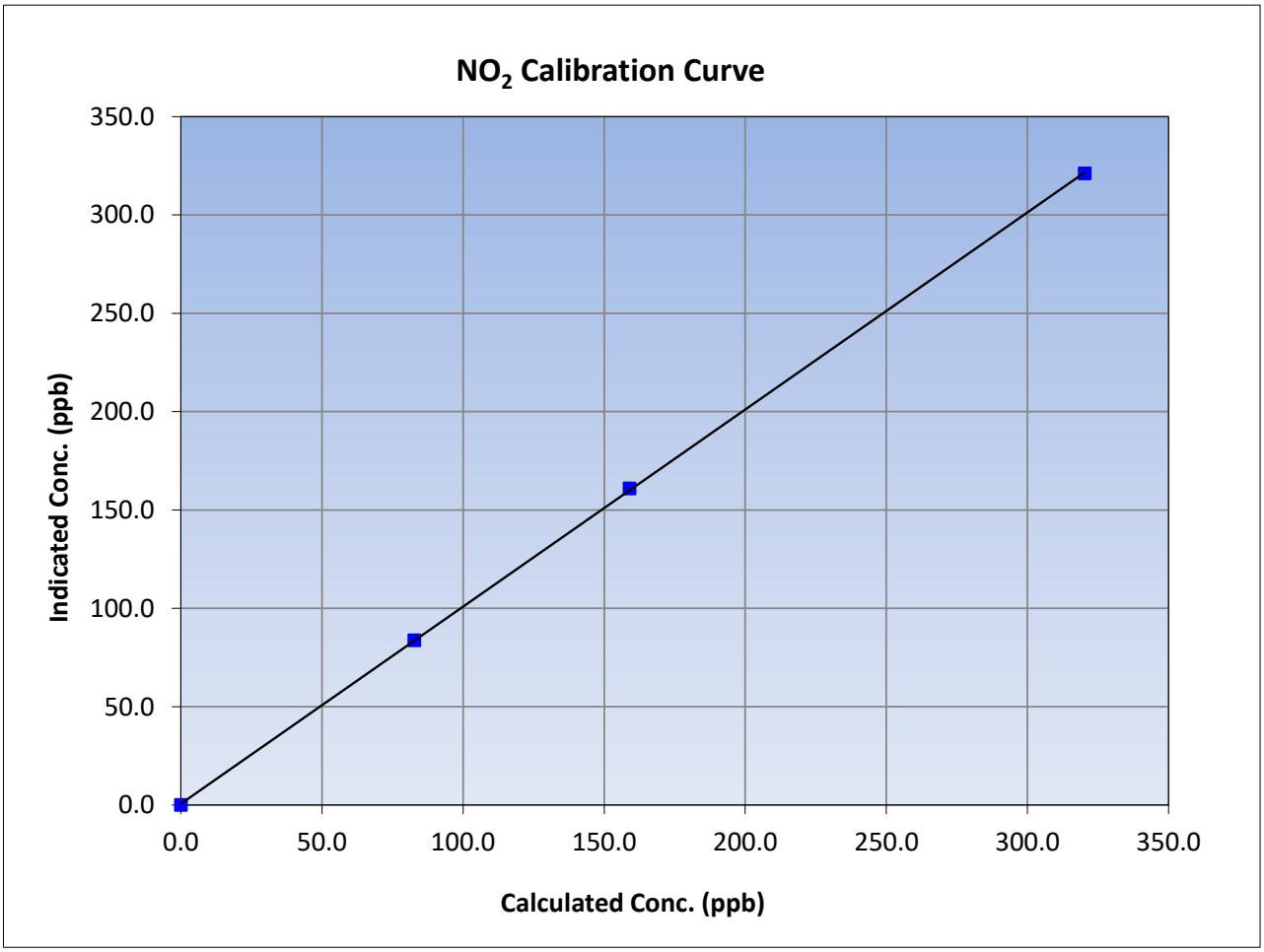
Version-04-2020

### Station Information

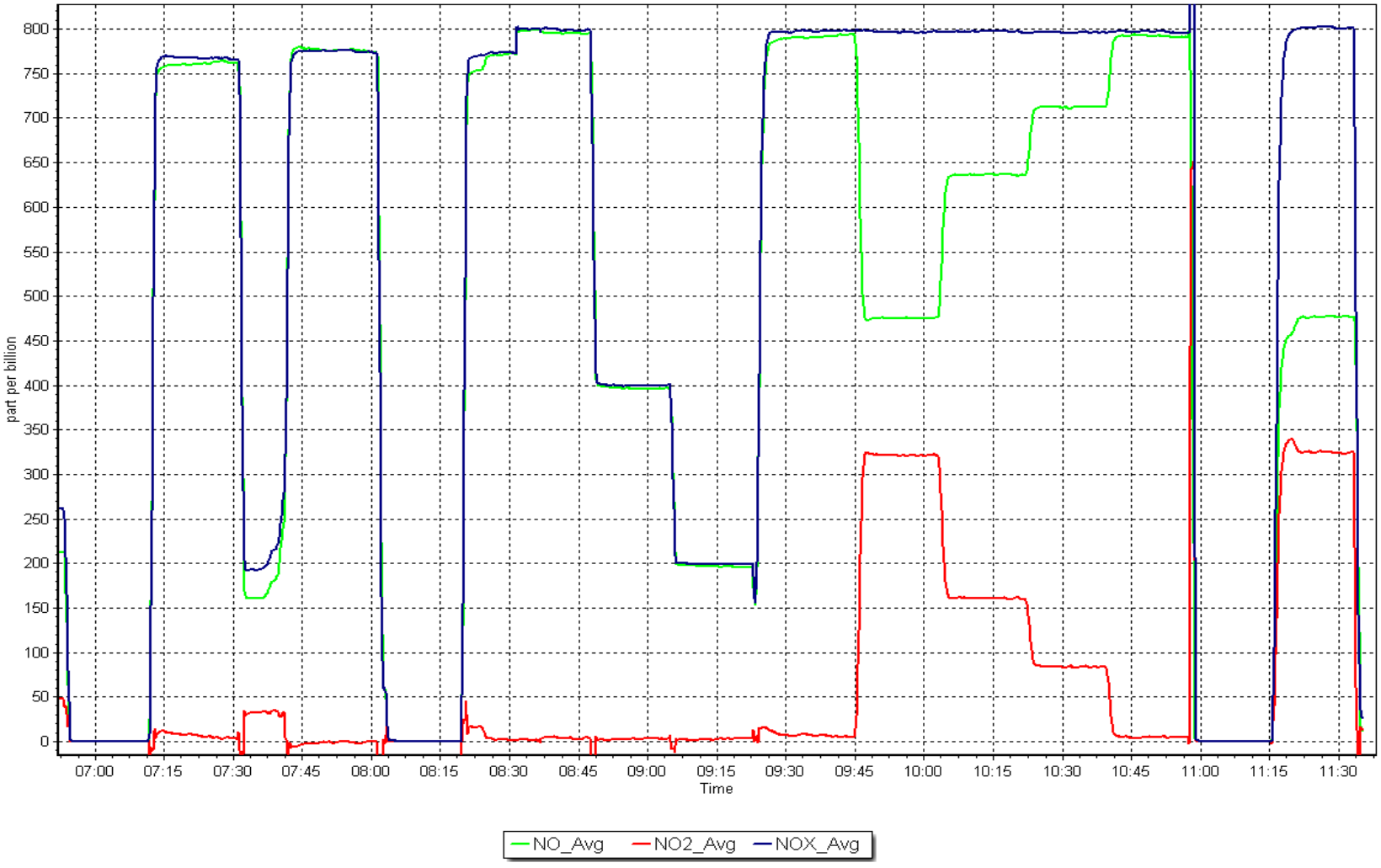
| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 2, 2024 |
| Station Name: | Fort Hills | Station Number: | AMS23 |
| Start Time (MST): | 6:55 | End Time (MST): | 11:35 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1152430007 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999974 | ≥0.995 |
| 320.3 | 321.1 | 0.9974 | | | |
| 159.1 | 160.9 | 0.9885 | Slope | 1.002264 | 0.90 - 1.10 |
| 82.8 | 83.8 | 0.9875 | | | |
| | | | Intercept | 0.618019 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 12, 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: | March 8, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 8:04 | End time (MST): | 8:39 |
| 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) | -11.3 | -11.5 | -11.3 | ☐ | +/- 2 °C |
| P (mmHg) | 735.6 | 735 | 735.6 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5 | 4.86 | 5 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 44 | ----- | 44 | ☐ | >80% |

Zero Verification — PM w/o HEPA: 6.8 — 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: 10-Jun-24 — Lot No.: 100128-050-042

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

Date Optical Chamber Cleaned: February 7, 2024

Date Disposable Filter Changed: February 7, 2024

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

### Annual Maintenance

Date Sample Tube Cleaned: October 17, 2023

Date RH/T Sensor Cleaned: October 17, 2023

Notes: No adjustments done. Leak check passed.

Calibration by: Melissa Lemay

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS25
## WASKŌW OHCI PIMÂTISIWIN
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Waskow ohci Pimatisiwin | Station number: | AMS25 |
| Calibration Date: | March 11, 2024 | Last Cal Date: | February 16, 2024 |
| Start time (MST): | 6:53 | End time (MST): | 11:11 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 49.7 | ppm | Cal Gas Exp Date: | March 10, 2031 |
| Cal Gas Cylinder #: | CC342445 | | | |
| Removed Cal Gas Conc: | 50.54 | ppm | Rem Gas Exp Date: | December 29, 2028 |
| Removed Gas Cyl #: | CC437219 | | Diff between cyl: | -0.5% |
| 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: | 1.004302 | 1.002469 | Backgd or Offset: | 10.8 | 11.2 |
| Calibration intercept: | 0.123899 | 0.048260 | Coeff or Slope: | 1.030 | 1.056 |

### $SO_2$ 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 | 4921 | 79.2 | 800.5 | 793.2 | 1.009 |
| as found 2nd point | 4960 | 39.6 | 400.3 | 396.6 | 1.009 |
| as found 3rd point | 4980 | 19.8 | 200.1 | 198.1 | 1.010 |
| new cylinder response | 4920 | 80.5 | 800.1 | 789.0 | 1.014 |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| high point | 4920 | 80.5 | 800.1 | 801.9 | 0.998 |
| second point | 4960 | 40.2 | 399.6 | 401.2 | 0.996 |
| third point | 4980 | 20.1 | 199.8 | 200.0 | 0.999 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4921 | 79.2 | 787.2 | 801.6 | 0.982 |
| | | | | Average Correction Factor | 0.998 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 793.30 | Previous response | 804.09 | *% change | -1.4% |
| Baseline Corr 2nd AF pt: | 396.70 | AF Slope: | 0.991040 | AF Intercept: | -0.155868 |
| Baseline Corr 3rd AF pt: | 198.20 | AF Correlation: | 1.000000 | | |

* = > +/-5% change initiates investigation

Notes: Calibration Gas Changed. Pump Changed. Span adjusted.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

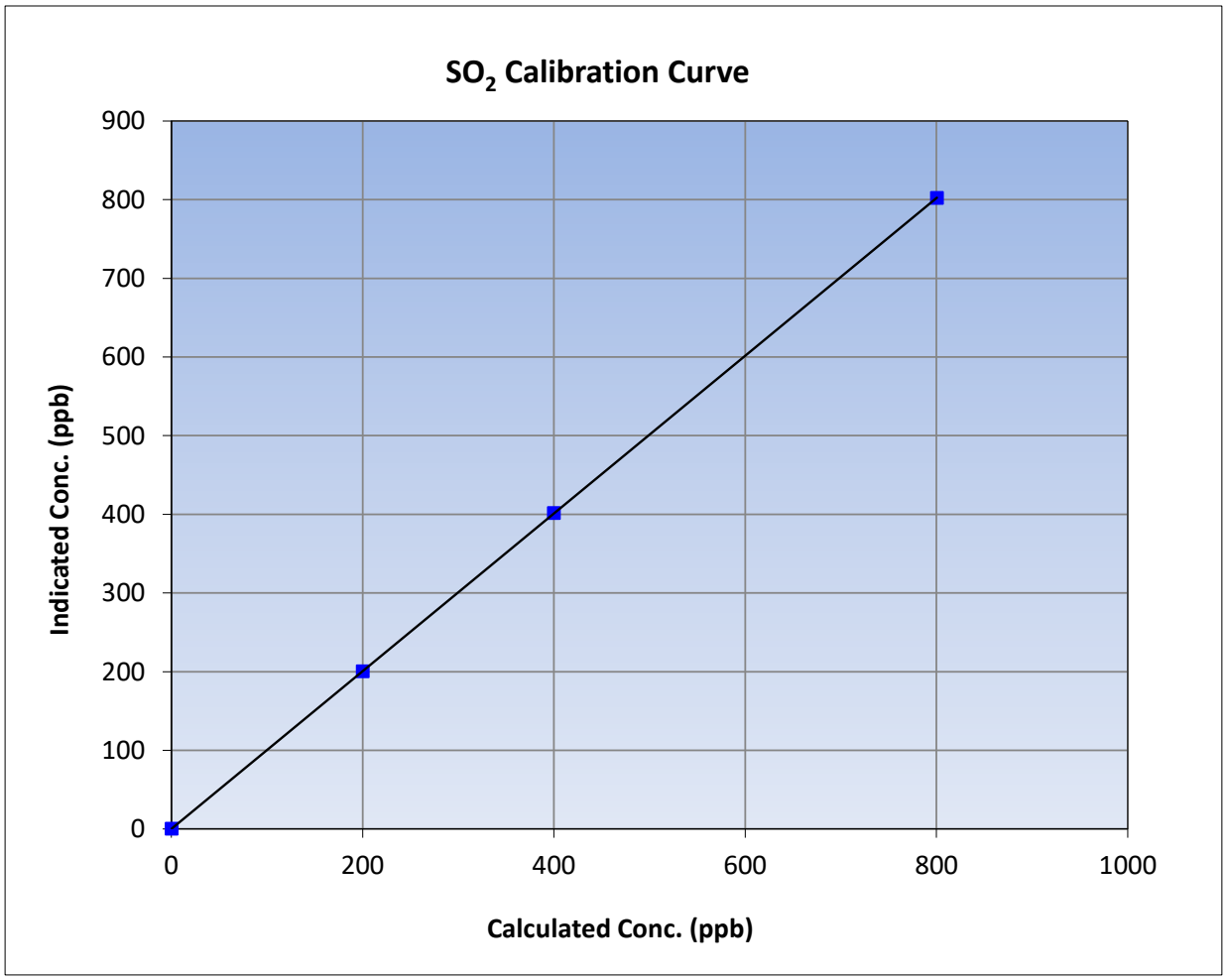
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 11, 2024 | Previous Calibration: | February 16, 2024 |
| Station Name: | Waskow ohci Pimatisiwin | Station Number: | AMS25 |
| Start Time (MST): | 6:53 | End Time (MST): | 11:11 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1118148497 |

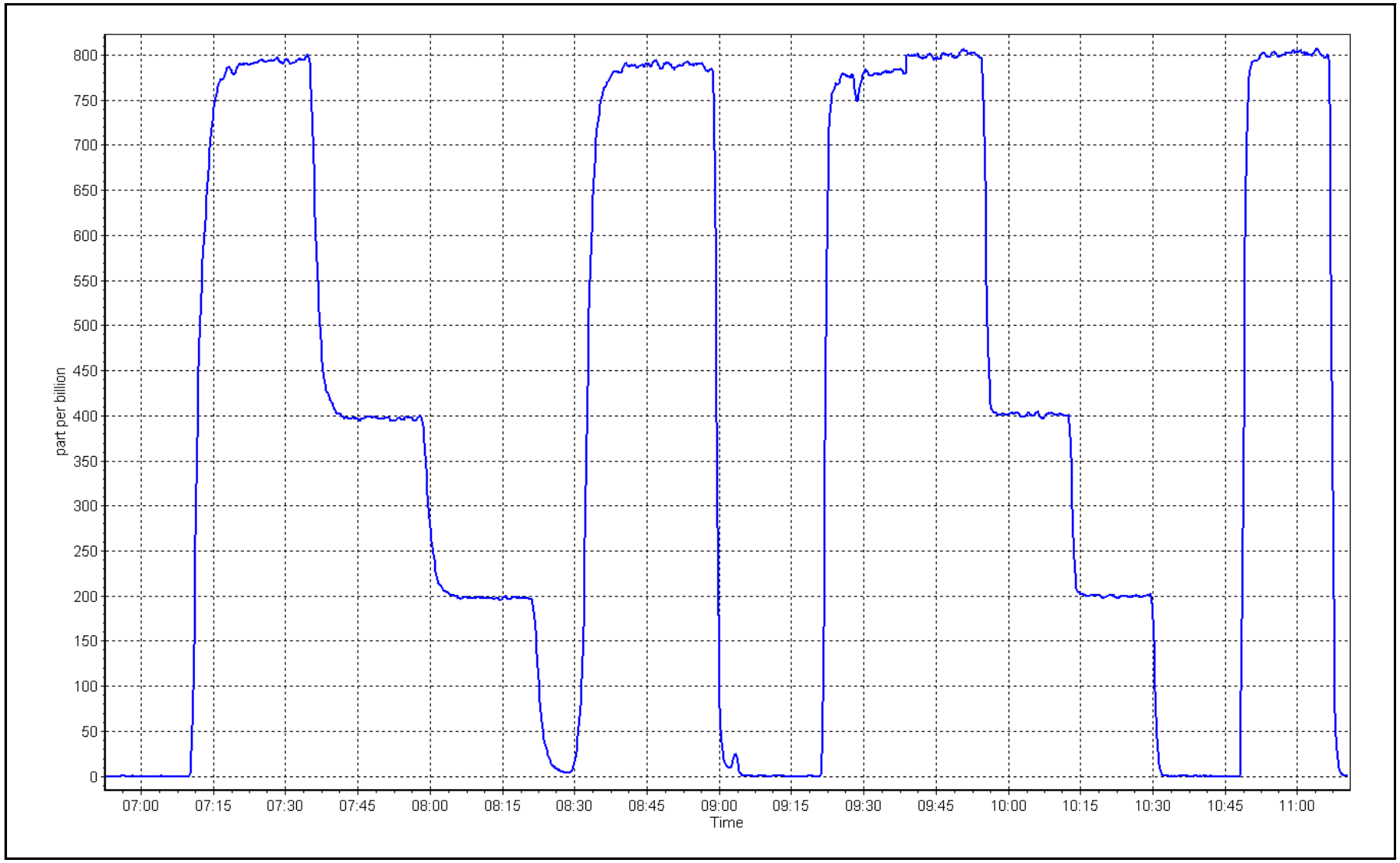
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 800.1 | 801.9 | 0.9977 |
| 399.6 | 401.2 | 0.9959 |
| 199.8 | 200.0 | 0.9990 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 1.002469 | *0.90 - 1.10* |
| Intercept | 0.048260 | *+/-30* |



**SO2 Calibration Plot** Date: March 11, 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: | March 18, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 6:20 | End time (MST): | 10:30 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 4.97 | ppm | Cal Gas Exp Date: | January 3, 2026 |
| Cal Gas Cylinder #: | CC517099 | | | |
| Removed Cal Gas Conc: | 4.97 | ppm | Rem Gas Exp Date: | 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: | 1.005840 | 1.008429 | Backgd or Offset: | 3.30 | 3.30 |
| Calibration intercept: | 0.060000 | 0.120000 | 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 | -0.1 | ---- |
| as found span | 4920 | 80.0 | 79.5 | 80.5 | 0.986 |
| as found 2nd point | 4960 | 40.0 | 39.7 | 40.3 | 0.983 |
| as found 3rd point | 4980 | 20.0 | 19.9 | 20.2 | 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 | 80.2 | 0.991 |
| second point | 4960 | 40.0 | 39.7 | 40.3 | 0.986 |
| third point | 4980 | 20.0 | 19.9 | 20.1 | 0.988 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4920 | 80.0 | 800.0 | 809.5 | 0.988 |
| SO2 Scrubber Check | 4921 | 79.2 | 800.0 | 0.0 | ---- |
| Date of last scrubber change: | | 20-Jun-23 | | Ave Corr Factor | 0.988 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.6 | Prev response: | 79.98 | *% change: | 0.8% |
| Baseline Corr 2nd AF pt: | 40.4 | AF Slope: | 1.013894 | AF Intercept: | -0.020000 |
| Baseline Corr 3rd AF pt: | 20.3 | AF Correlation: | 0.999995 | | |

* = > +/-5% change initiates investigation

Notes: SOx scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

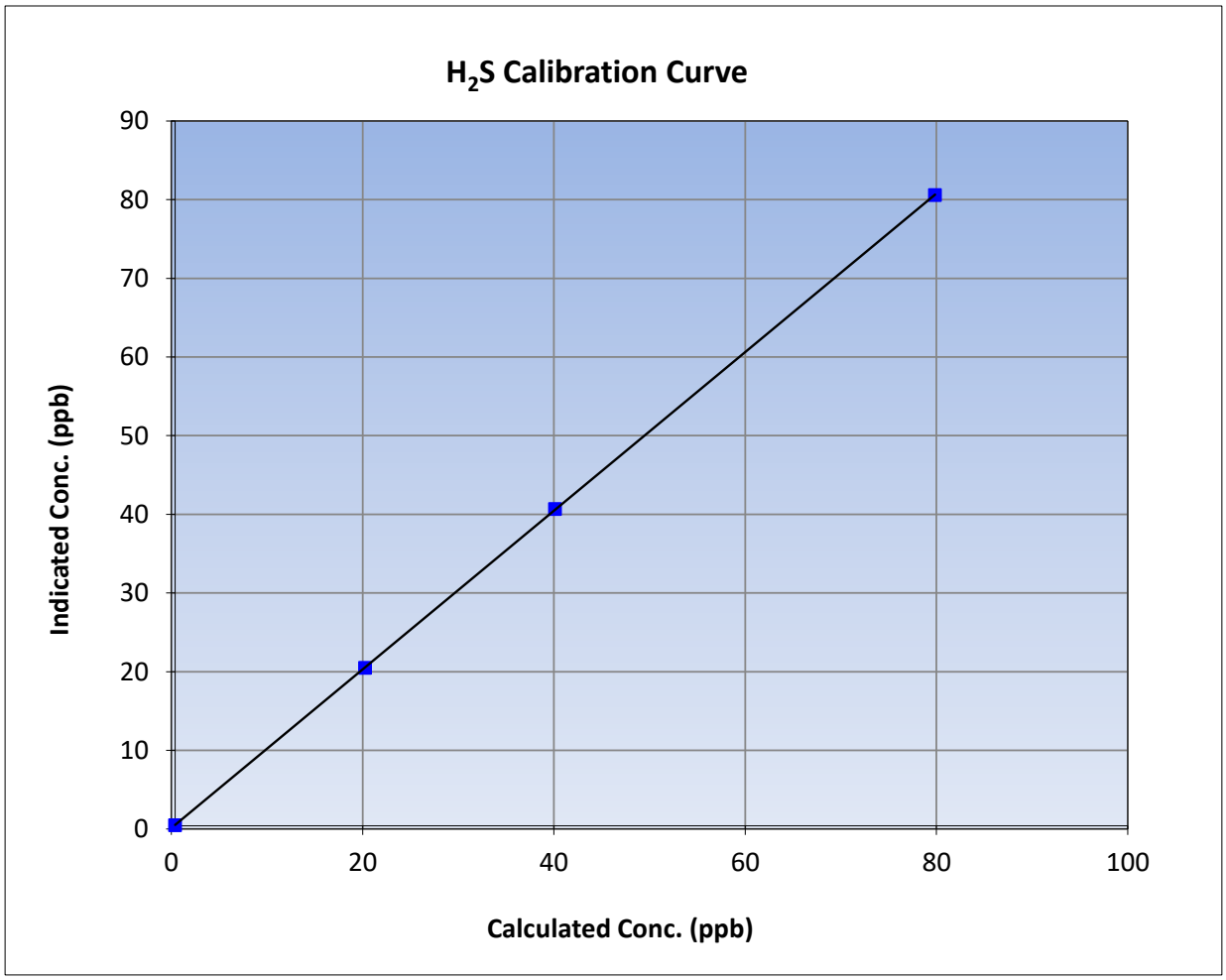
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Waskow ohci Pimatisiwin | Station Number: | AMS25 |
| Start Time (MST): | 6:20 | End Time (MST): | 10:30 |
| Analyzer make: | Thermo 43i-LTE | Analyzer serial #: | 1170050146 |

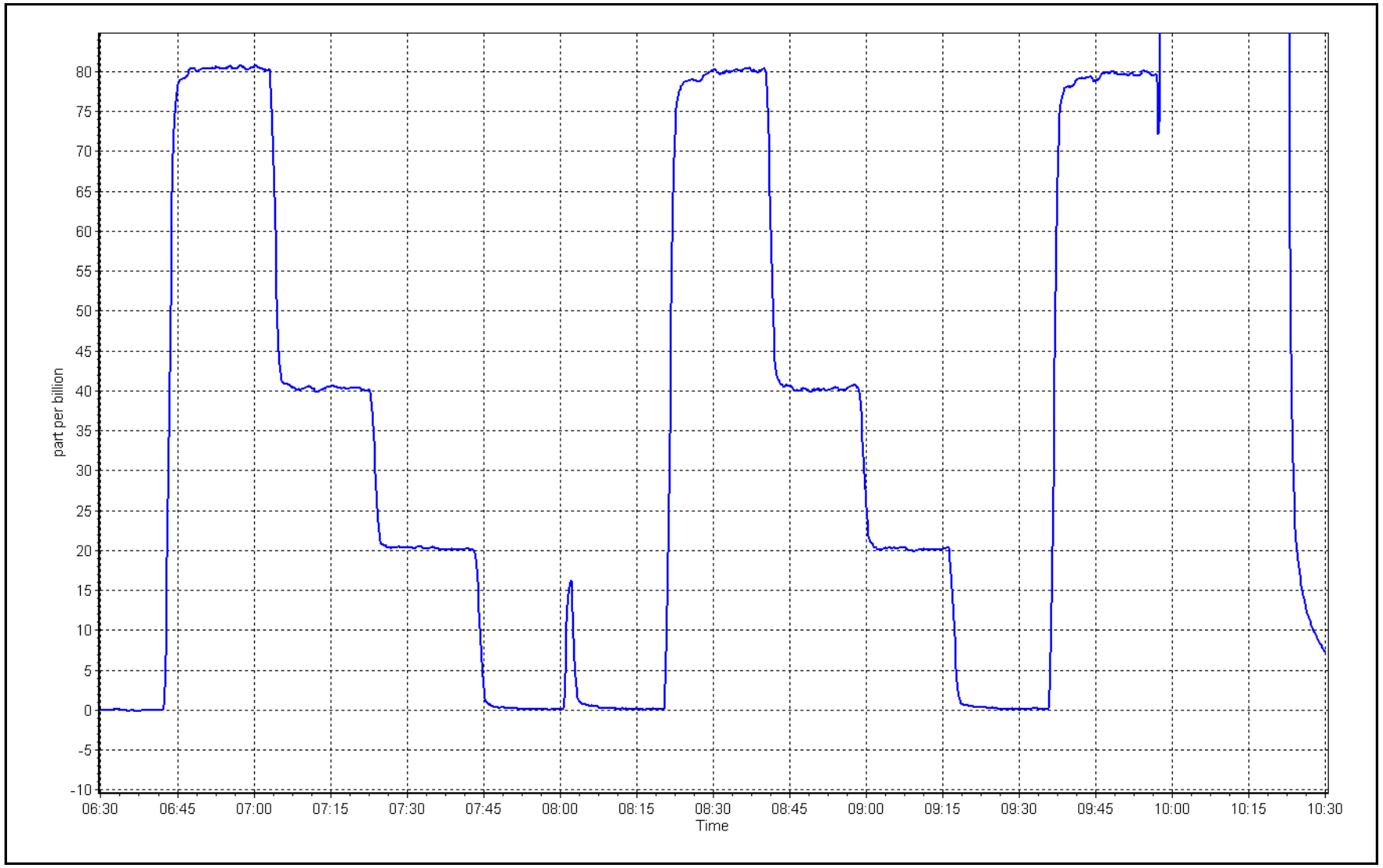
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 79.5 | 80.2 | 0.9907 |
| 39.7 | 40.3 | 0.9858 |
| 19.9 | 20.1 | 0.9883 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999995 | *≥0.995* |
| Slope | 1.008429 | *0.90 - 1.10* |
| Intercept | 0.120000 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 18, 2024 Location: Waskow ohci Pimatisiwin



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS26
## CHRISTINA LAKE
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Christina Lake | Station number: | AMS 26 |
| Calibration Date: | March 22, 2024 | Last Cal Date: | February 3, 2024 |
| Start time (MST): | 9:42 | End time (MST): | 12:28 |
| Reason: | Routine | | |

### 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: | 0.998578 | 0.997322 | Backgd or Offset: | 25.8 | 25.8 |
| Calibration intercept: | 0.236006 | 0.975976 | Coeff or Slope: | 0.944 | 0.956 |

### $SO_2$ 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 | 80.8 | 800.9 | 791.2 | 1.012 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.7 | ---- |
| high point | 4919 | 80.8 | 800.9 | 799.7 | 1.002 |
| second point | 4960 | 40.4 | 400.4 | 400.2 | 1.001 |
| third point | 4980 | 20.2 | 200.2 | 201.1 | 0.996 |
| as left zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as left span | 4919 | 80.8 | 800.9 | 799.6 | 1.002 |
| | | | | Average Correction Factor | 0.999 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 791.10 | Previous response | 800.02 | *% 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: Sample inlet filters changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

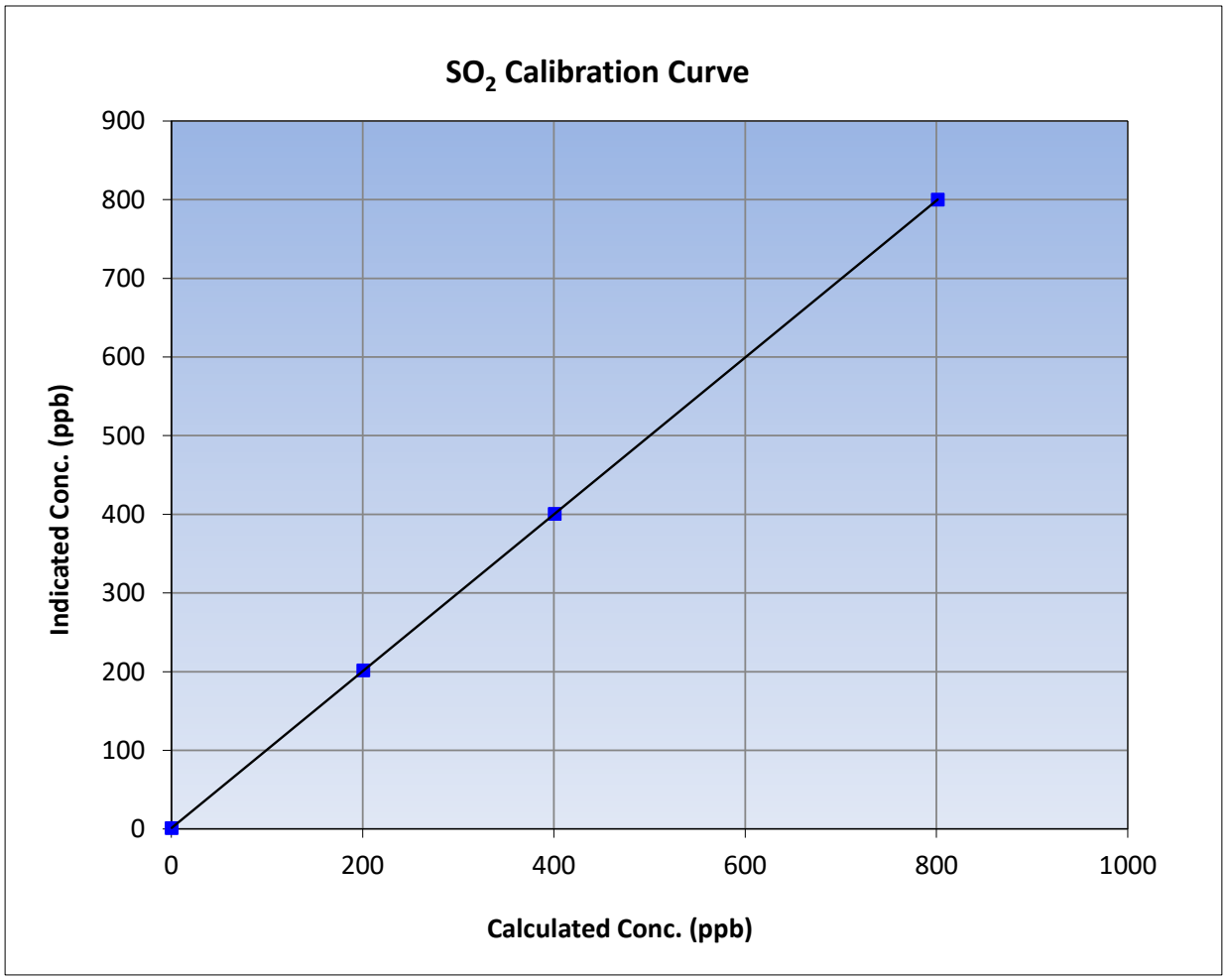
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 22, 2024 | Previous Calibration: | February 3, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS 26 |
| Start Time (MST): | 9:42 | End Time (MST): | 12:28 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1152430005 |

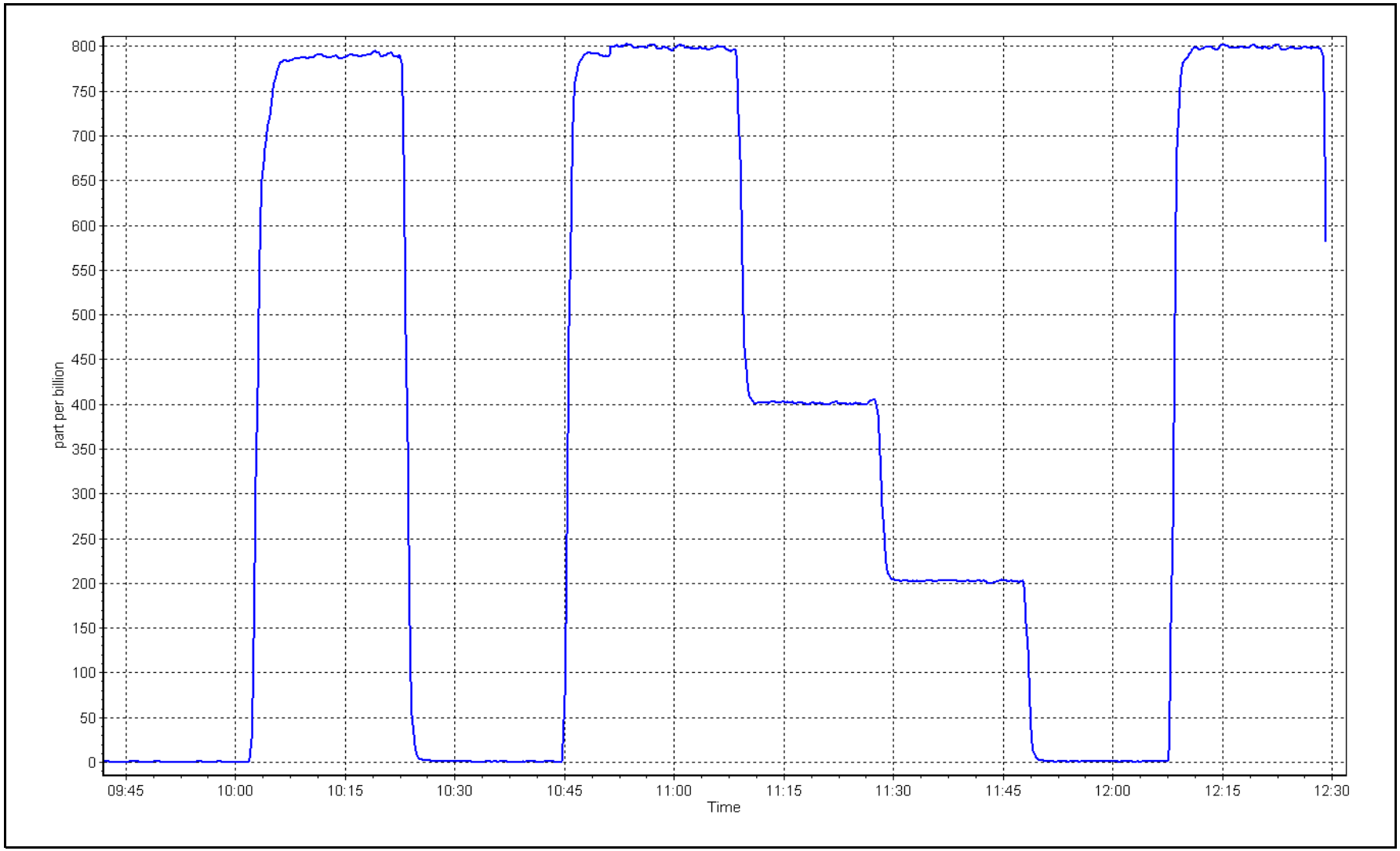
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.7 | ---- |
| 800.9 | 799.7 | 1.0015 |
| 400.4 | 400.2 | 1.0005 |
| 200.2 | 201.1 | 0.9956 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 0.997322 | *0.90 - 1.10* |
| Intercept | 0.975976 | *+/-30* |



**SO2 Calibration Plot** Date: March 22, 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: | March 12, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 9:49 | End time (MST): | 14:18 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.05 | ppm | Cal Gas Exp Date: | November 15, 2026 |
| Cal Gas Cylinder #: | DT0014831 | | | |
| Removed Cal Gas Conc: | 5.05 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | 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: | 1.008427 | 0.996996 | Backgd or Offset: | 35.0 | 34.5 |
| Calibration intercept: | 0.258384 | 0.358415 | Coeff or Slope: | 1.086 | 1.064 |

### $H_2S$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| as found zero | 5000 | 0.0 | 0.0 | 0.8 | ---- |
| as found span | 4921 | 79.2 | 80.0 | 81.8 | 0.988 |
| as found 2nd point | 4960 | 39.6 | 40.0 | 41.7 | 0.978 |
| as found 3rd point | 4980 | 19.8 | 20.0 | 21.4 | 0.971 |
| 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 | 0.4 | ---- |
| high point | 4921 | 79.2 | 80.0 | 80.2 | 0.997 |
| second point | 4960 | 39.6 | 40.0 | 40.0 | 1.000 |
| third point | 4980 | 19.8 | 20.0 | 20.4 | 0.980 |
| as left zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as left span | 4921 | 79.2 | 80.0 | 80.0 | 1.000 |
| SO2 Scrubber Check | 4919 | 80.8 | 808.0 | -0.1 | ---- |
| Date of last scrubber change: | | 27-Feb-19 | | Ave Corr Factor | 0.993 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.0 | Prev response: | 80.92 | *% change: | 0.1% |
| Baseline Corr 2nd AF pt: | 40.9 | AF Slope: | 1.011713 | AF Intercept: | 1.018369 |
| Baseline Corr 3rd AF pt: | 20.6 | AF Correlation: | 0.999962 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filters after multipoint as founds. SO2 scrubber check after calibrator zero done and passed. Adjusted zero and span.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

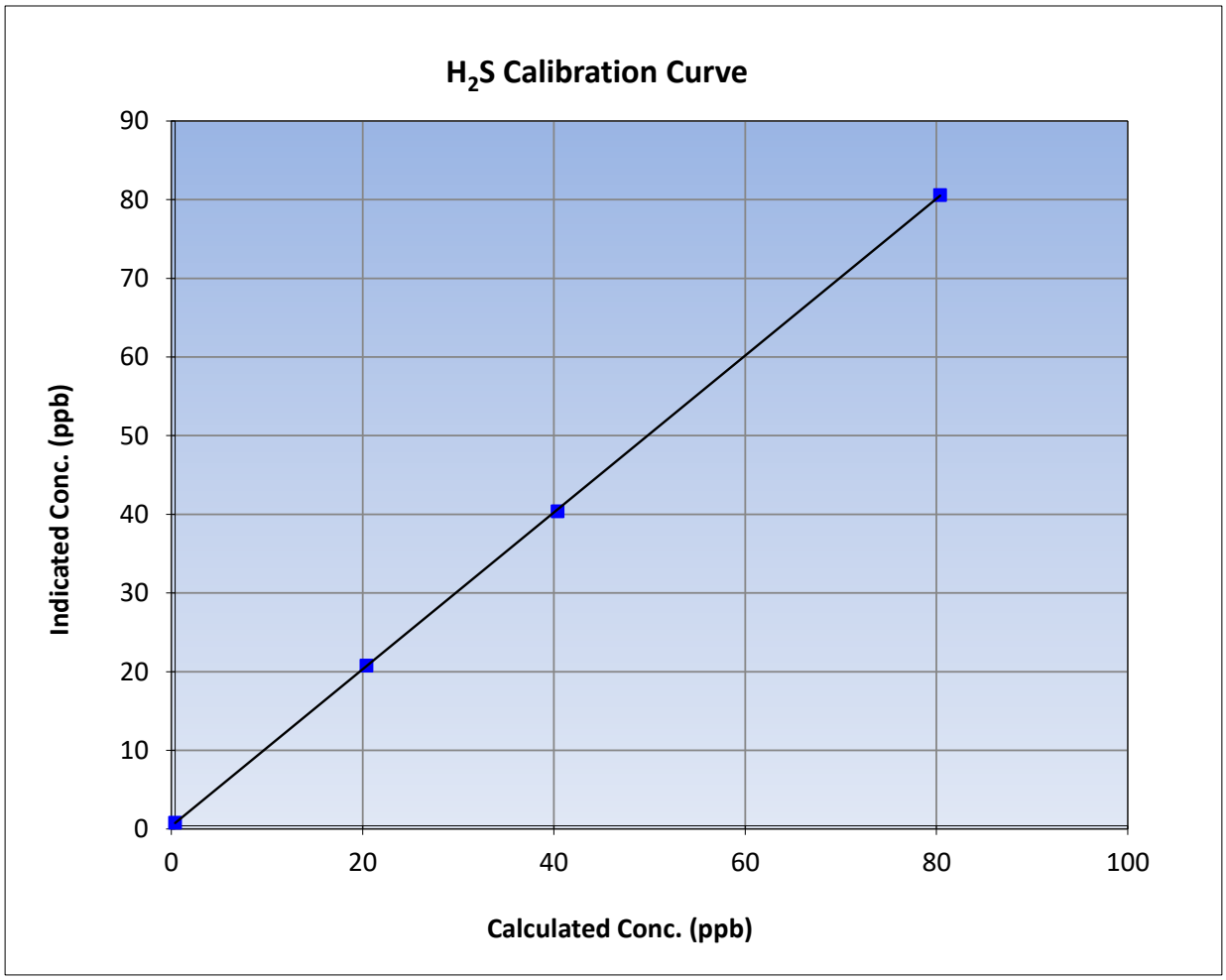
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 9:49 | End Time (MST): | 14:18 |
| Analyzer make: | Thermo 450i | Analyzer serial #: | 1180030032 |

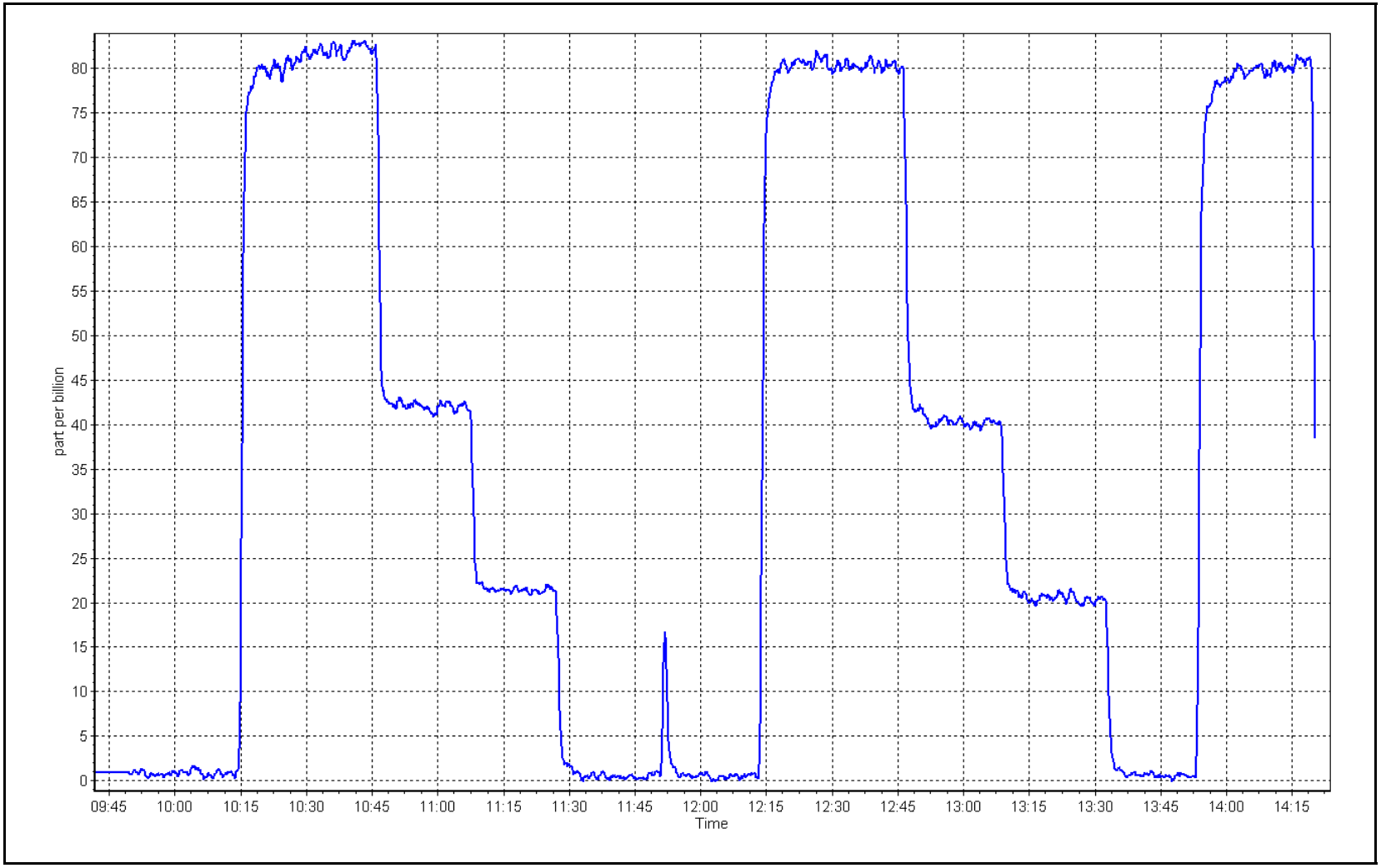
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 80.0 | 80.2 | 0.9974 |
| 40.0 | 40.0 | 1.0000 |
| 20.0 | 20.4 | 0.9803 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999978 | *≥0.995* |
| Slope | 0.996996 | *0.90 - 1.10* |
| Intercept | 0.358415 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 12, 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: | March 13, 2024 | Last Cal Date: | February 13, 2024 |
| Start time (MST): | 9:33 | End time (MST): | 13:54 |
| 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: | 1.325 | 1.318 | NO bkgnd or offset: | 2.5 | 2.5 |
| NOX coeff or slope: | 0.994 | 0.994 | NOX bkgnd or offset: | 3.3 | 3.3 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 162.5 | 162.8 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.999923 | 1.000066 |
| $NO_X$ Cal Offset: | 0.266541 | 0.766423 |
| NO Cal Slope: | 0.998413 | 0.999129 |
| NO Cal Offset: | 0.406737 | 0.606305 |
| $NO_2$ Cal Slope: | 1.003805 | 1.004655 |
| $NO_2$ Cal Offset: | 0.175464 | 0.153346 |

# 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 | 811.1 | 804.8 | 6.3 | 0.9899 | 0.9936 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.7 | 0.0 | -0.7 | ---- | ---- |
| high point | 4918 | 82.1 | 802.9 | 799.6 | 3.3 | 803.0 | 799.2 | 3.8 | 0.9999 | 1.0005 |
| second point | 4959 | 41.1 | 401.9 | 400.3 | 1.6 | 403.5 | 401.0 | 2.4 | 0.9962 | 0.9983 |
| third point | 4980 | 20.5 | 200.5 | 199.7 | 0.8 | 202.7 | 200.6 | 2.1 | 0.9890 | 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 | 421.0 | 381.9 | 800.4 | 423.2 | 377.1 | 1.0032 | 0.9949 |
| | | | | | | | | Average Correction Factor | 0.9950 | 0.9980 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 812.0 ppb | NO = 805.0 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 1.1% |
| Previous Response | $NO_X$ = 803.1 ppb | NO = 798.8 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) | 797.5 | 418.9 | 381.9 | 383.4 | 0.9960 | 100.4% |
| 2nd GPT point (200 ppb O3) | 797.5 | 606.8 | 194.0 | 195.4 | 0.9928 | 100.7% |
| 3rd GPT point (100 ppb O3) | 797.5 | 703.2 | 97.6 | 99.1 | 0.9847 | 101.6% |
| | | | | Average Correction Factor | 0.9912 | 100.9% |

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

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

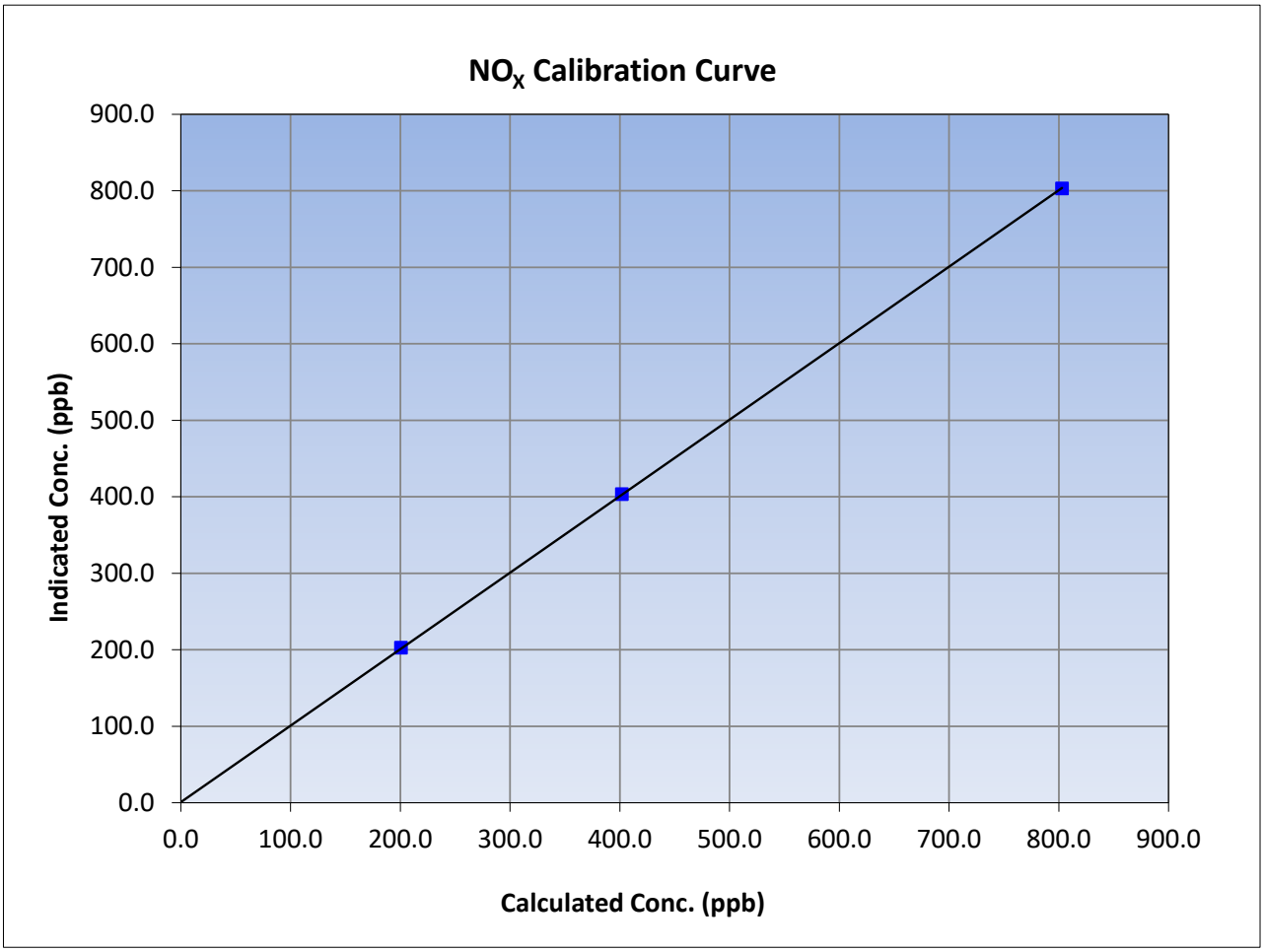
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 9:33 | End Time (MST): | 13:54 |
| 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 | 0.999985 | ≥0.995 |
| 802.9 | 803.0 | 0.9999 | | | |
| 401.9 | 403.5 | 0.9962 | Slope | 1.000066 | 0.90 - 1.10 |
| 200.5 | 202.7 | 0.9890 | | | |
| | | | Intercept | 0.766423 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

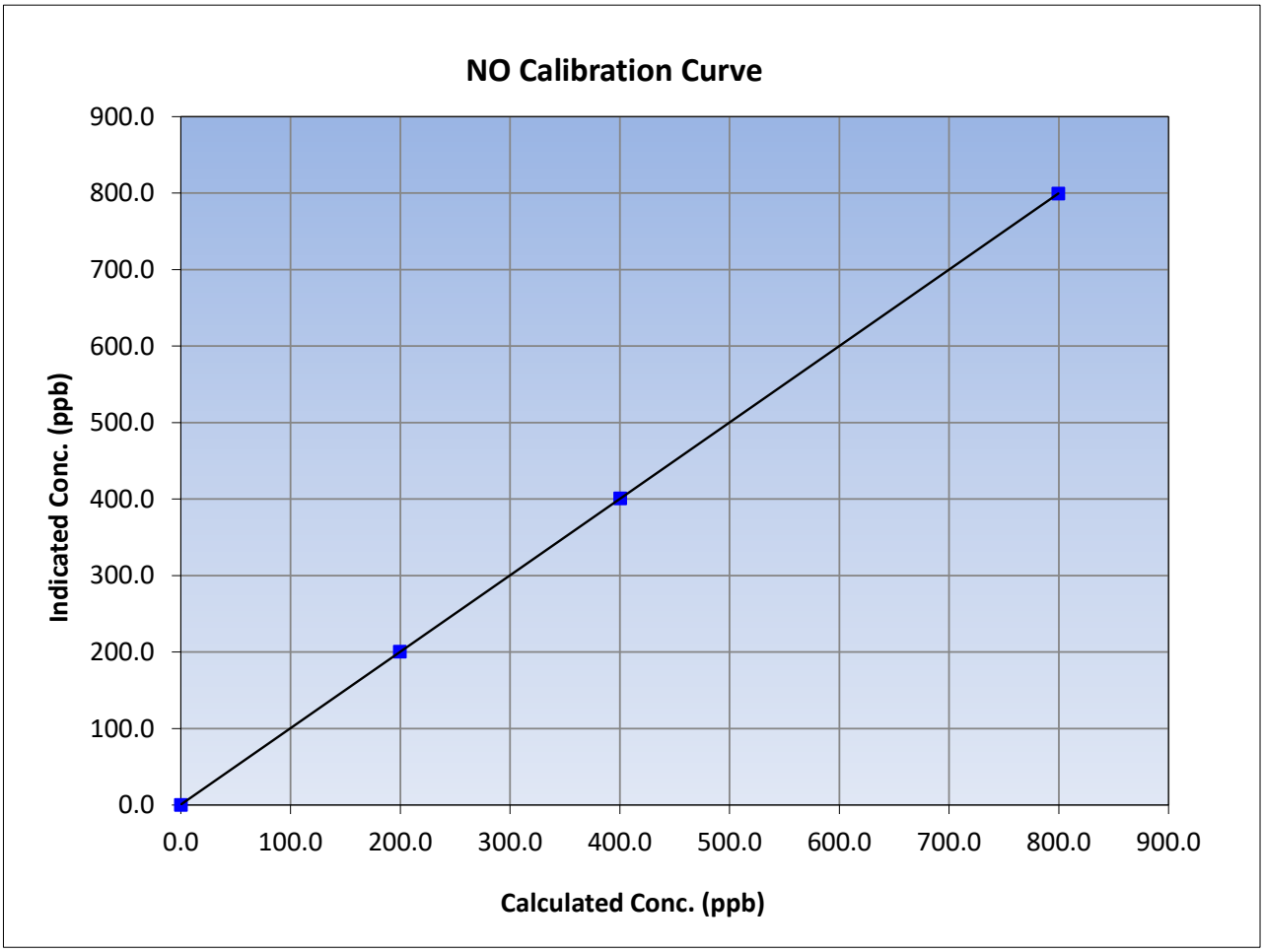
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 9:33 | End Time (MST): | 13:54 |
| 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 | 0.0 | ---- | Correlation Coefficient | 0.999997 | ≥0.995 |
| 799.6 | 799.2 | 1.0005 | | | |
| 400.3 | 401.0 | 0.9983 | Slope | 0.999129 | 0.90 - 1.10 |
| 199.7 | 200.6 | 0.9953 | | | |
| | | | Intercept | 0.606305 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

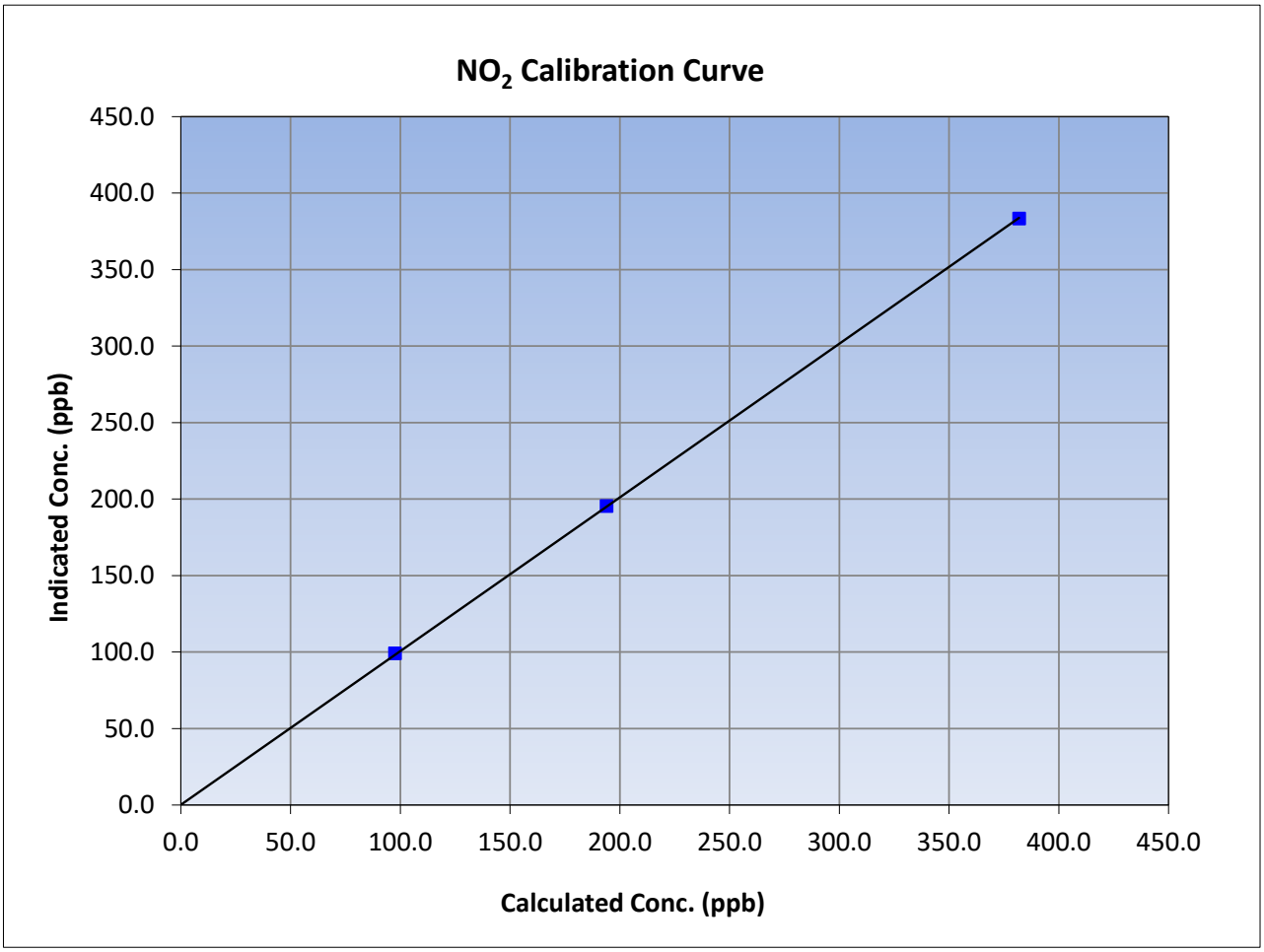
Version-04-2020

### Station Information

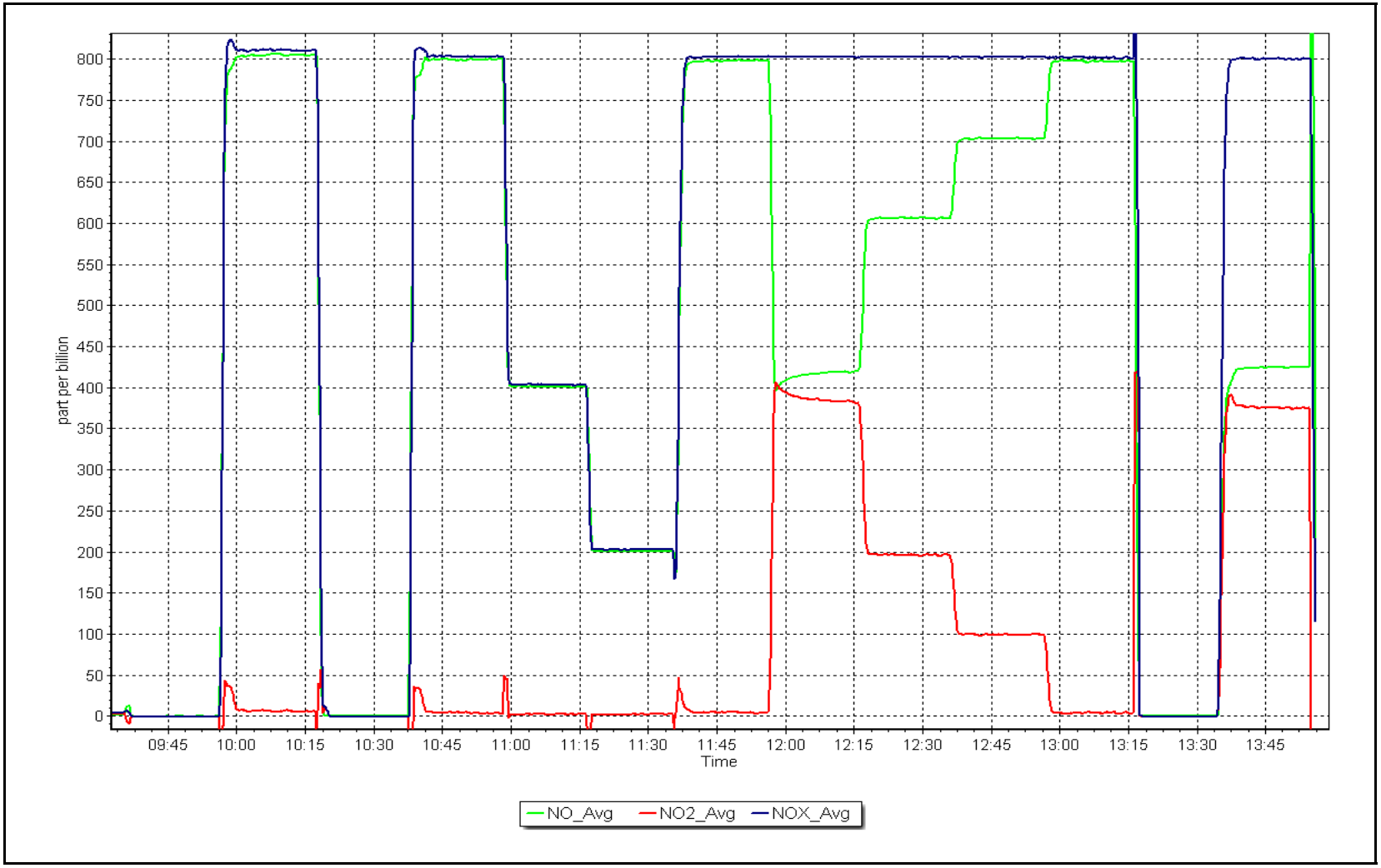
| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 13, 2024 |
| Station Name: | Christina Lake | Station Number: | AMS26 |
| Start Time (MST): | 9:33 | End Time (MST): | 13:54 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1173480006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.7 | ---- | Correlation Coefficient | 0.999977 | ≥0.995 |
| 381.9 | 383.4 | 0.9960 | | | |
| 194.0 | 195.4 | 0.9928 | Slope | 1.004655 | 0.90 - 1.10 |
| 97.6 | 99.1 | 0.9847 | | | |
| | | | Intercept | 0.153346 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 13, 2024 Location: Christina Lake



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS27
## JACKFISH 2/3
## MARCH 2024

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

April 30, 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: | March 8, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 11:47 | End time (MST): | 14:46 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 50.58 | ppm | Cal Gas Exp Date: | December 29, 2028 |
| Cal Gas Cylinder #: | SG9133974BAL | | | |
| Removed Cal Gas Conc: | 50.58 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator 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: | 1.006935 | 1.003248 | Backgd or Offset: | 8.4 | 8.7 |
| Calibration intercept: | -2.579017 | -1.638441 | Coeff or Slope: | 0.960 | 0.983 |

### $SO_2$ 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 | 79.1 | 800.2 | 783.5 | 1.021 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| high point | 4921 | 79.1 | 800.2 | 802.2 | 0.997 |
| second point | 4961 | 39.5 | 399.5 | 398.1 | 1.004 |
| third point | 4980 | 19.8 | 200.3 | 197.2 | 1.016 |
| as left zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as left span | 4921 | 79.1 | 800.2 | 807.8 | 0.991 |
| | | | | Average Correction Factor | 1.006 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 783.30 | Previous response | 803.13 | *% change | -2.5% |
| Baseline Corr 2nd AF pt: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | | | |

* = > +/-5% change initiates investigation

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

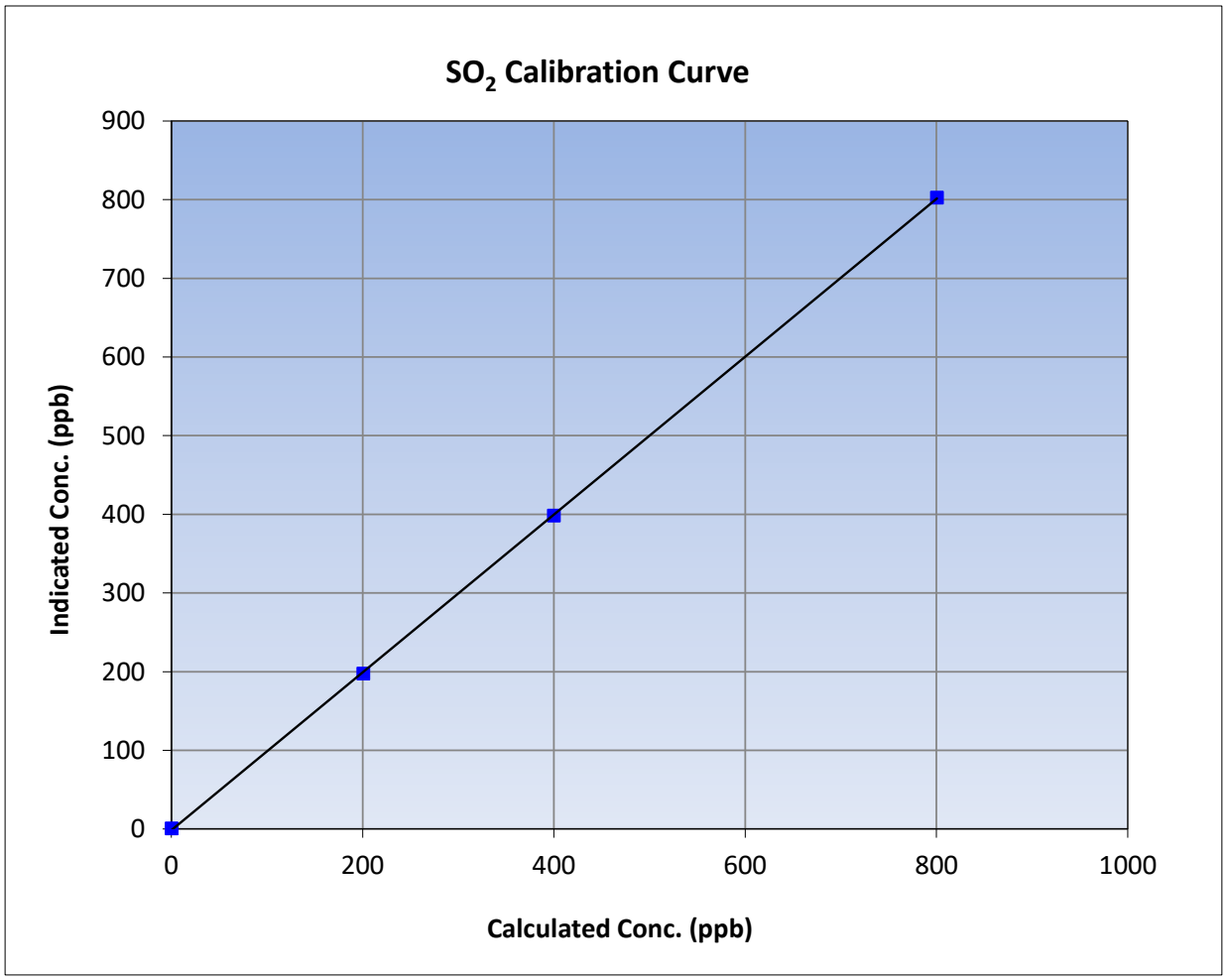
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS 27 |
| Start Time (MST): | 11:47 | End Time (MST): | 14:46 |
| Analyzer make: | Thermo 43iQ-TL | Analyzer serial #: | 12124313138 |

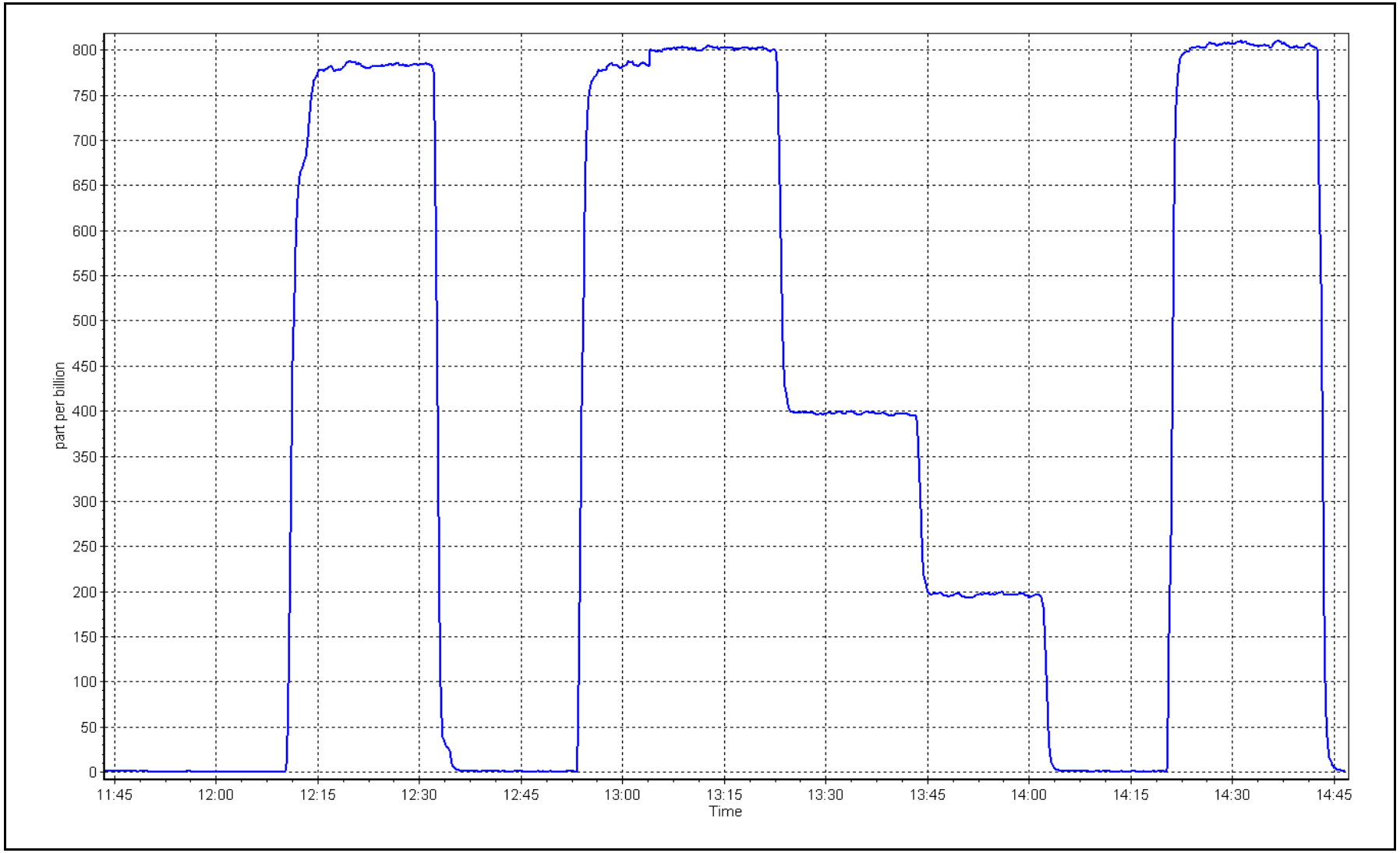
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.5 | ---- |
| 800.2 | 802.2 | 0.9975 |
| 399.5 | 398.1 | 1.0036 |
| 200.3 | 197.2 | 1.0157 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999968 | *≥0.995* |
| Slope | 1.003248 | *0.90 - 1.10* |
| Intercept | -1.638441 | *+/-30* |



**SO2 Calibration Plot** Date: March 8, 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: | March 12, 2024 | Last Cal Date: | February 22, 2024 |
| Start time (MST): | 8:57 | End time (MST): | 13:18 |
| 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: | 1.013890 | 1.014173 | Backgd or Offset: | 29.9 | 29.9 |
| Calibration intercept: | -0.217825 | -0.277753 | Coeff or Slope: | 0.965 | 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 | 0.3 | ---- |
| as found span | 4926 | 74.1 | 80.2 | 81.9 | 0.983 |
| as found 2nd point | 4963 | 37.0 | 40.0 | 40.6 | 0.993 |
| as found 3rd point | 4982 | 18.5 | 20.0 | 19.9 | 1.021 |
| 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 | 4926 | 74.1 | 80.2 | 81.2 | 0.987 |
| second point | 4963 | 37.0 | 40.0 | 40.2 | 0.996 |
| third point | 4982 | 18.5 | 20.0 | 19.6 | 1.021 |
| as left zero | 5000 | 0.0 | 0.0 | 0.2 | ---- |
| as left span | 4926 | 74.1 | 80.2 | 81.1 | 0.989 |
| SO2 Scrubber Check | 4921 | 79.1 | 791.0 | 0.1 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.001 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.6 | Prev response: | 81.07 | *% change: | 0.6% |
| Baseline Corr 2nd AF pt: | 40.3 | AF Slope: | 1.020445 | AF Intercept: | -0.097632 |
| Baseline Corr 3rd AF pt: | 19.6 | AF Correlation: | 0.999891 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

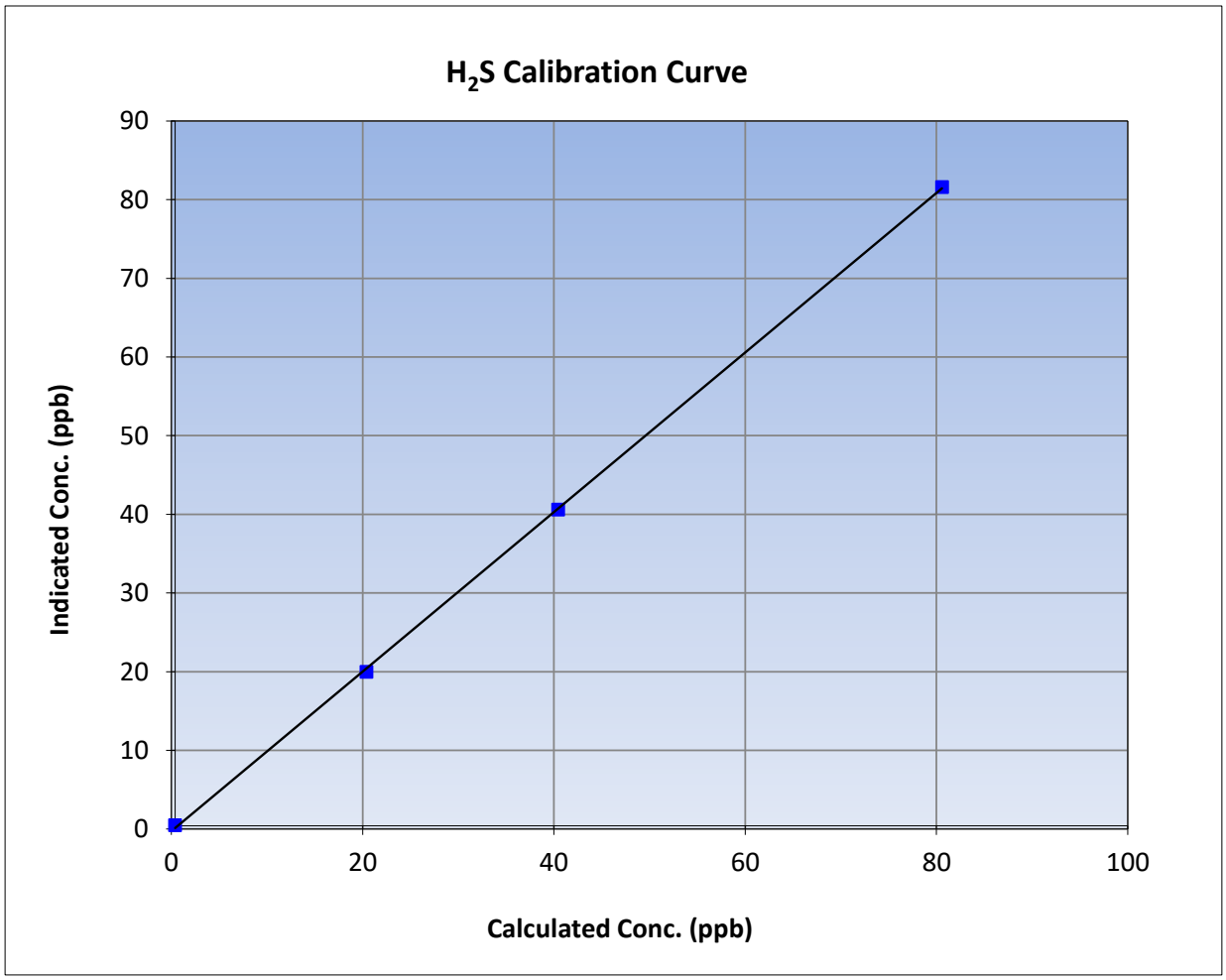
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 12, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 8:57 | End Time (MST): | 13:18 |
| Analyzer make: | API T101 | Analyzer serial #: | 621 |

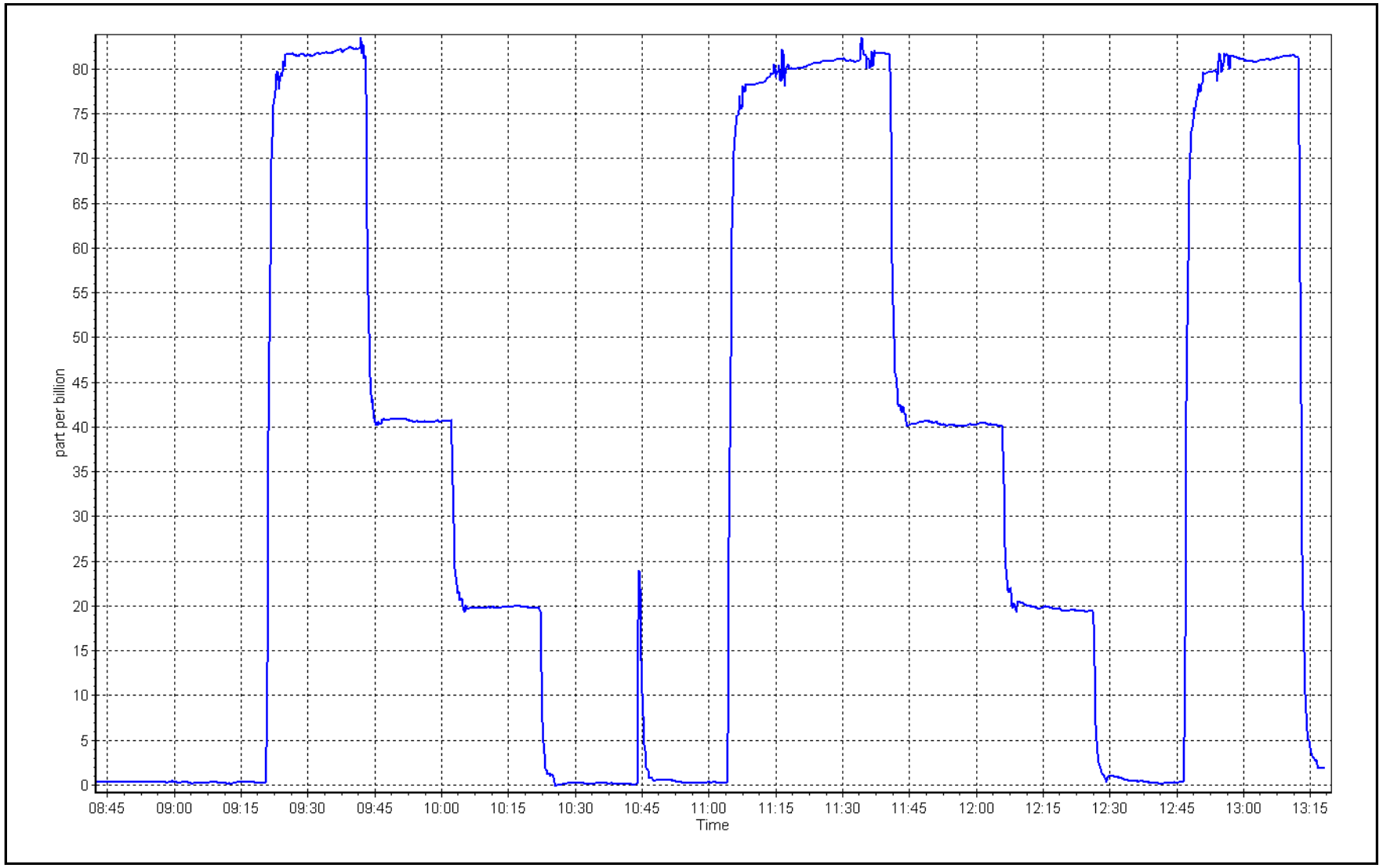
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.2 | 81.2 | 0.9874 |
| 40.0 | 40.2 | 0.9959 |
| 20.0 | 19.6 | 1.0212 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999900 | *≥0.995* |
| Slope | 1.014173 | *0.90 - 1.10* |
| Intercept | -0.277753 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 12, 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: | March 19, 2024 | Last Cal Date: | February 22, 2024 |
| Start time (MST): | 11:48 | End time (MST): | 18:16 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | CC757838 | | Cal Gas Expiry Date: | January 9, 2032 | |
| NOX Cal Gas Conc: | 60.30 | ppm | NO Cal Gas Conc: | 60.20 | ppm |
| Removed Cylinder #: | T2Y1P35 | | Removed Gas Exp Date: | December 11, 2023 | |
| Removed Gas NOX Conc: | 51.44 | ppm | Removed Gas NO Conc: | 50.40 | ppm |
| NOX gas Diff: | 0.4% | | NO gas Diff: | 0.9% | |
| 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: | 1.227 | 1.236 | NO bkgnd or offset: | 0.3 | 0.3 |
| NOX coeff or slope: | 1.207 | 1.217 | NOX bkgnd or offset: | 1.2 | 1.2 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 3.1 | 3.2 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.006157 | 0.998635 |
| $NO_X$ Cal Offset: | -3.917080 | -3.655643 |
| NO Cal Slope: | 1.005101 | 1.002024 |
| NO Cal Offset: | -3.480285 | -4.335475 |
| $NO_2$ Cal Slope: | 0.998557 | 0.991424 |
| $NO_2$ Cal Offset: | 0.165718 | -0.986298 |

# 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 | 4921 | 79.4 | 816.8 | 800.3 | 16.5 | 806.4 | 787.3 | 19.2 | 1.0129 | 1.0165 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | 4942 | 66.5 | 800.6 | 799.3 | 1.3 | 793.6 | 793.2 | 0.4 | 1.0089 | 1.0077 |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | -0.1 | ---- | ---- |
| high point | 4942 | 66.5 | 800.6 | 799.3 | 1.3 | 797.5 | 798.7 | -1.3 | 1.0039 | 1.0008 |
| second point | 4979 | 33.3 | 400.6 | 399.9 | 0.7 | 395.3 | 394.6 | 0.7 | 1.0134 | 1.0136 |
| third point | 4996 | 16.6 | 199.7 | 199.4 | 0.3 | 191.5 | 190.6 | 0.8 | 1.0428 | 1.0460 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 1.0 | 1.0 | ---- | ---- |
| as left span | 4942 | 66.5 | 800.6 | 417.2 | 390.6 | 796.2 | 412.8 | 383.4 | 1.0056 | 1.0107 |
| | | | | | | | | Average Correction Factor | 1.0200 | 1.0201 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 806.6 ppb | NO = 787.4 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -1.4% |
| Previous Response | $NO_X$ = 817.9 ppb | NO = 800.9 ppb | | *Percent Change | NO = | -1.7% |
| 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) | 798.7 | 409.4 | 390.6 | 386.3 | 1.0112 | 98.9% |
| 2nd GPT point (200 ppb O3) | 798.7 | 622.9 | 177.1 | 175.5 | 1.0093 | 99.1% |
| 3rd GPT point (100 ppb O3) | 798.7 | 710.4 | 89.6 | 86.1 | 1.0410 | 96.1% |
| | | | | Average Correction Factor | 1.0205 | 98.0% |

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

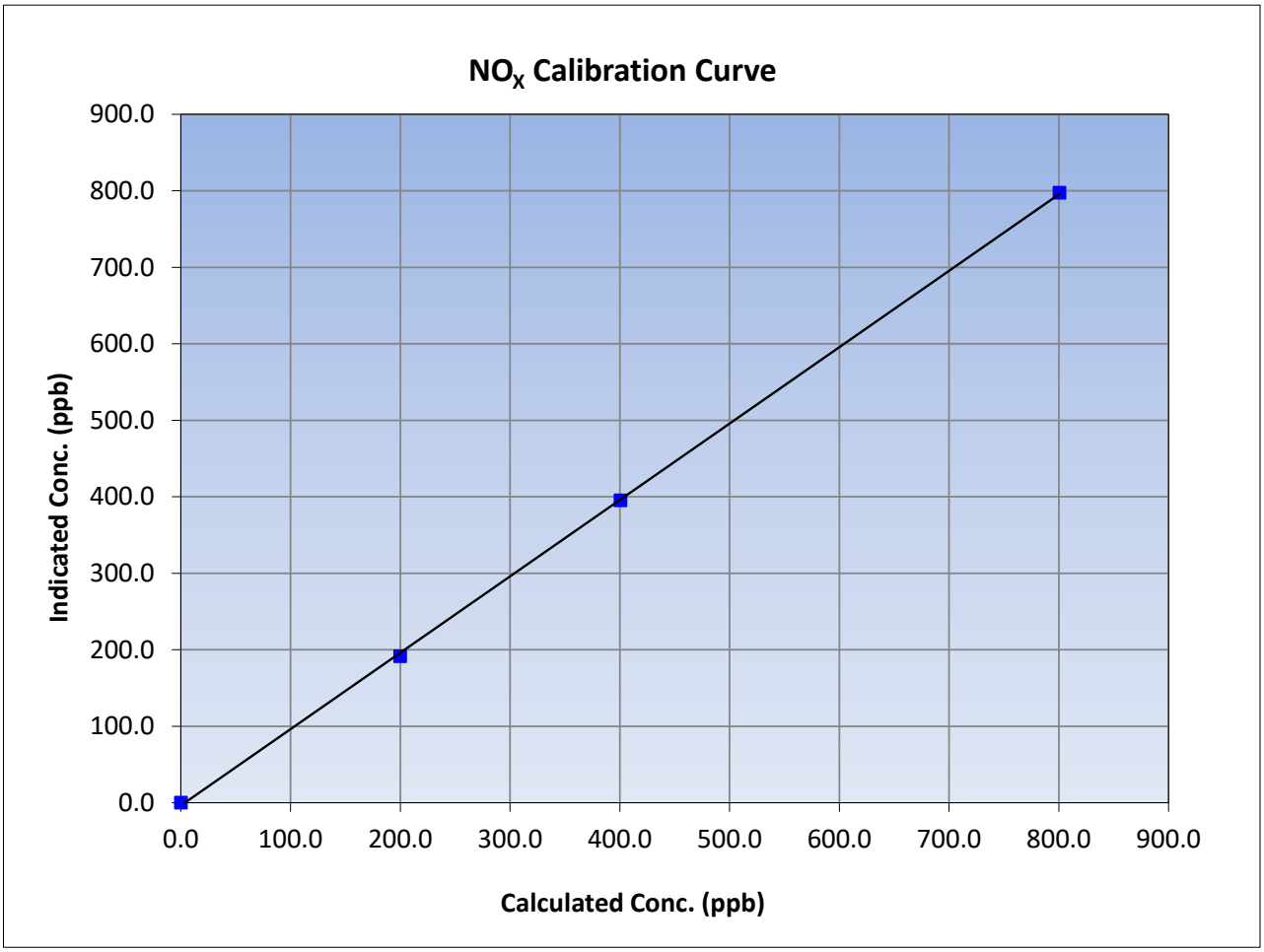
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 11:48 | End Time (MST): | 18:16 |
| 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 | 0.1 | ---- | Correlation Coefficient | 0.999897 | ≥0.995 |
| 800.6 | 797.5 | 1.0039 | | | |
| 400.6 | 395.3 | 1.0134 | Slope | 0.998635 | 0.90 - 1.10 |
| 199.7 | 191.5 | 1.0428 | | | |
| | | | Intercept | -3.655643 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

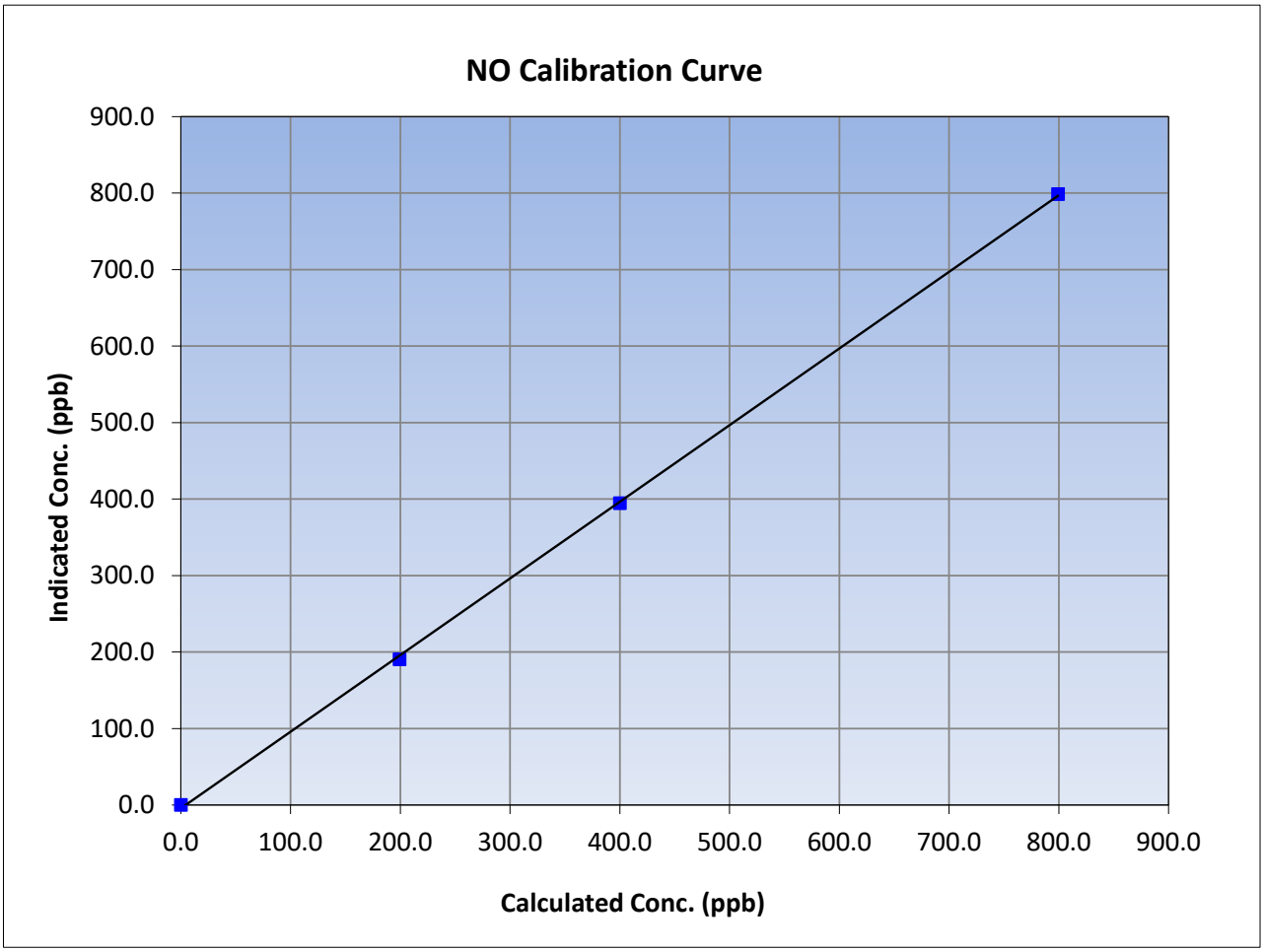
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 11:48 | End Time (MST): | 18:16 |
| 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 | 0.2 | ---- | Correlation Coefficient | 0.999853 | ≥0.995 |
| 799.3 | 798.7 | 1.0008 | | | |
| 399.9 | 394.6 | 1.0136 | Slope | 1.002024 | 0.90 - 1.10 |
| 199.4 | 190.6 | 1.0460 | | | |
| | | | Intercept | -4.335475 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

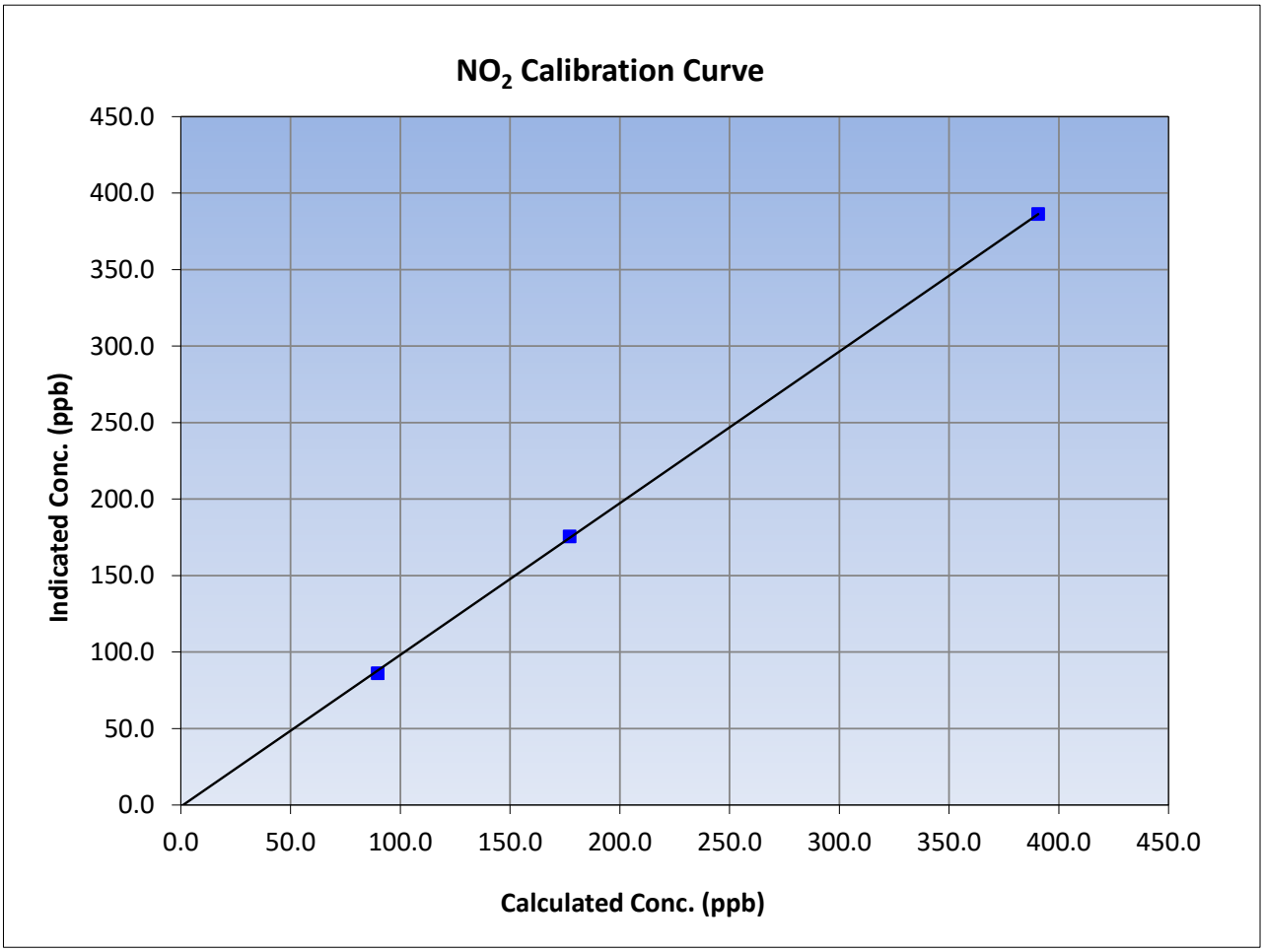
Version-04-2020

### Station Information

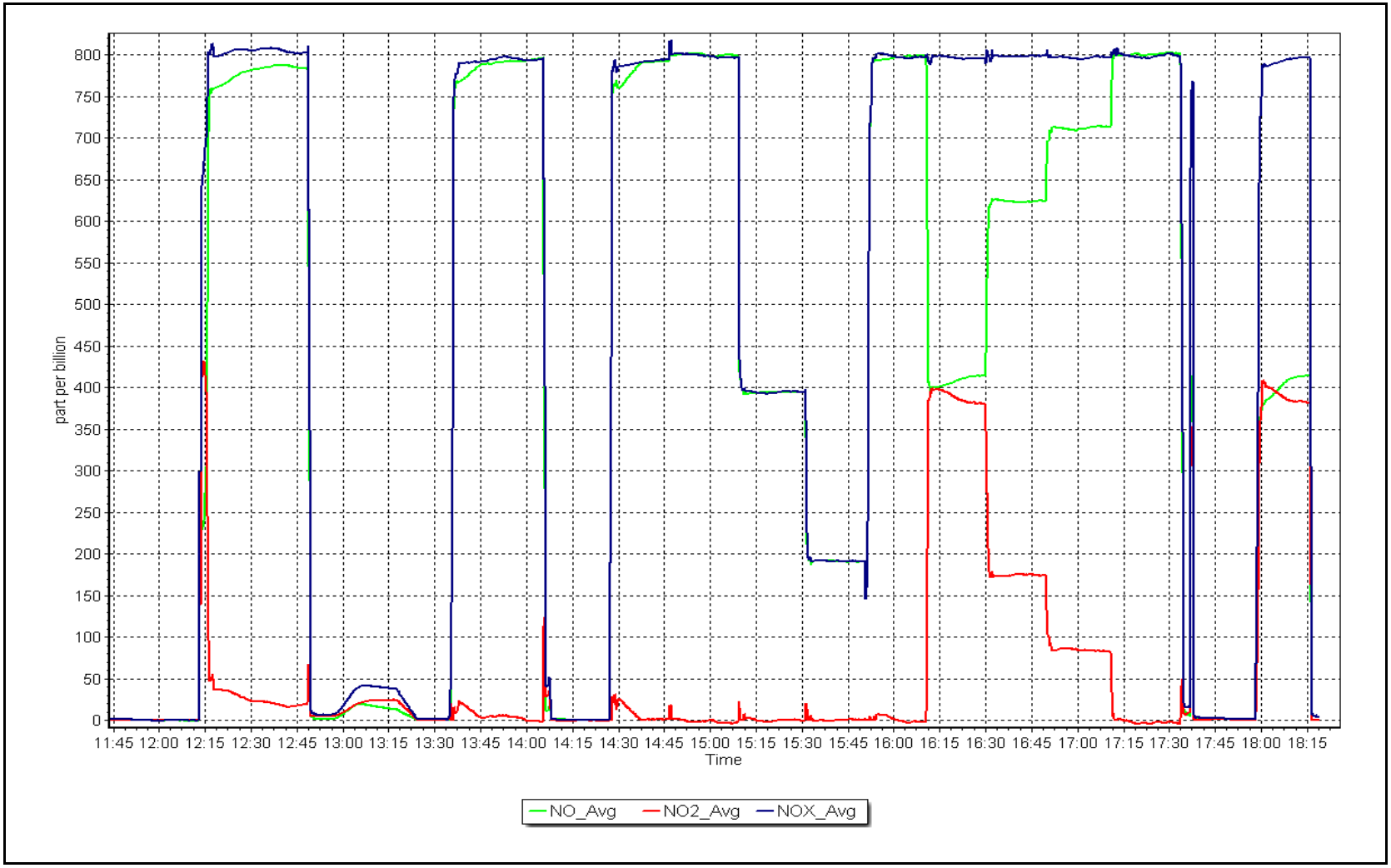
| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Jackfish 2/3 | Station Number: | AMS27 |
| Start Time (MST): | 11:48 | End Time (MST): | 18:16 |
| Analyzer make: | API T200 | Analyzer serial #: | 722 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.1 | ---- | Correlation Coefficient | 0.999943 | ≥0.995 |
| 390.6 | 386.3 | 1.0112 | | | |
| 177.1 | 175.5 | 1.0093 | Slope | 0.991424 | 0.90 - 1.10 |
| 89.6 | 86.1 | 1.0410 | | | |
| | | | Intercept | -0.986298 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 19, 2024 Location: Jackfish 2/3



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS29
## SURMONT 2
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station number: | AMS29 |
| Calibration Date: | March 8, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 10:55 | End time (MST): | 14:36 |
| 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: | 4698 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1170050150

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 0.998273 | 1.007141 | Backgd or Offset: | 12.9 | 12.9 |
| Calibration intercept: | -1.525570 | -1.805499 | Coeff or Slope: | 0.939 | 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 | -0.2 | ---- |
| as found span | 4919 | 81.3 | 800.1 | 803.0 | 0.996 |
| 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 | 800.1 | 805.0 | 0.994 |
| second point | 4959 | 40.7 | 400.6 | 400.5 | 1.000 |
| third point | 4979 | 20.3 | 199.8 | 197.8 | 1.010 |
| 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 | 1.001 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 803.20 | Previous response | 797.20 | *% 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. No adjustments made.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

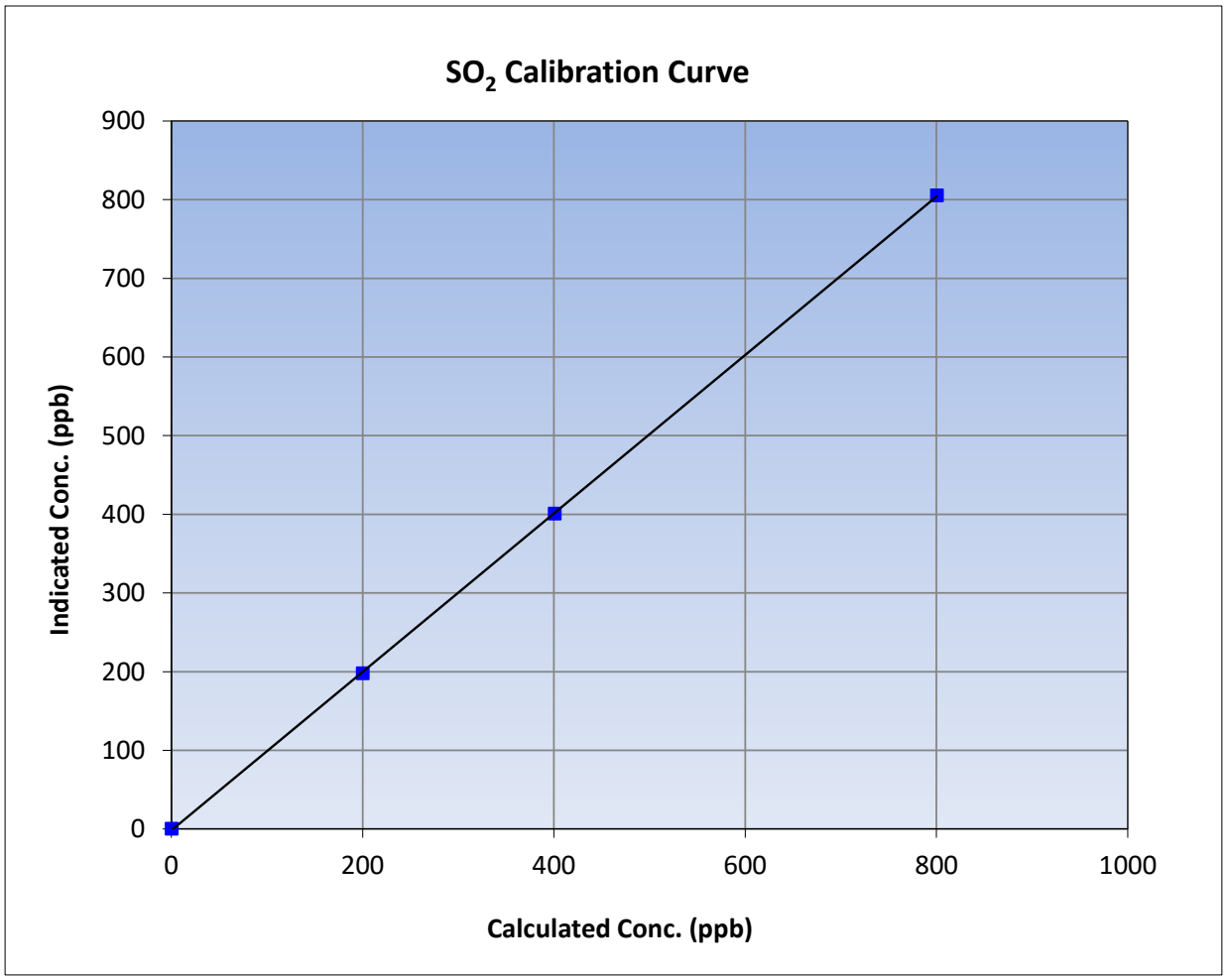
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 10:55 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1170050150 |

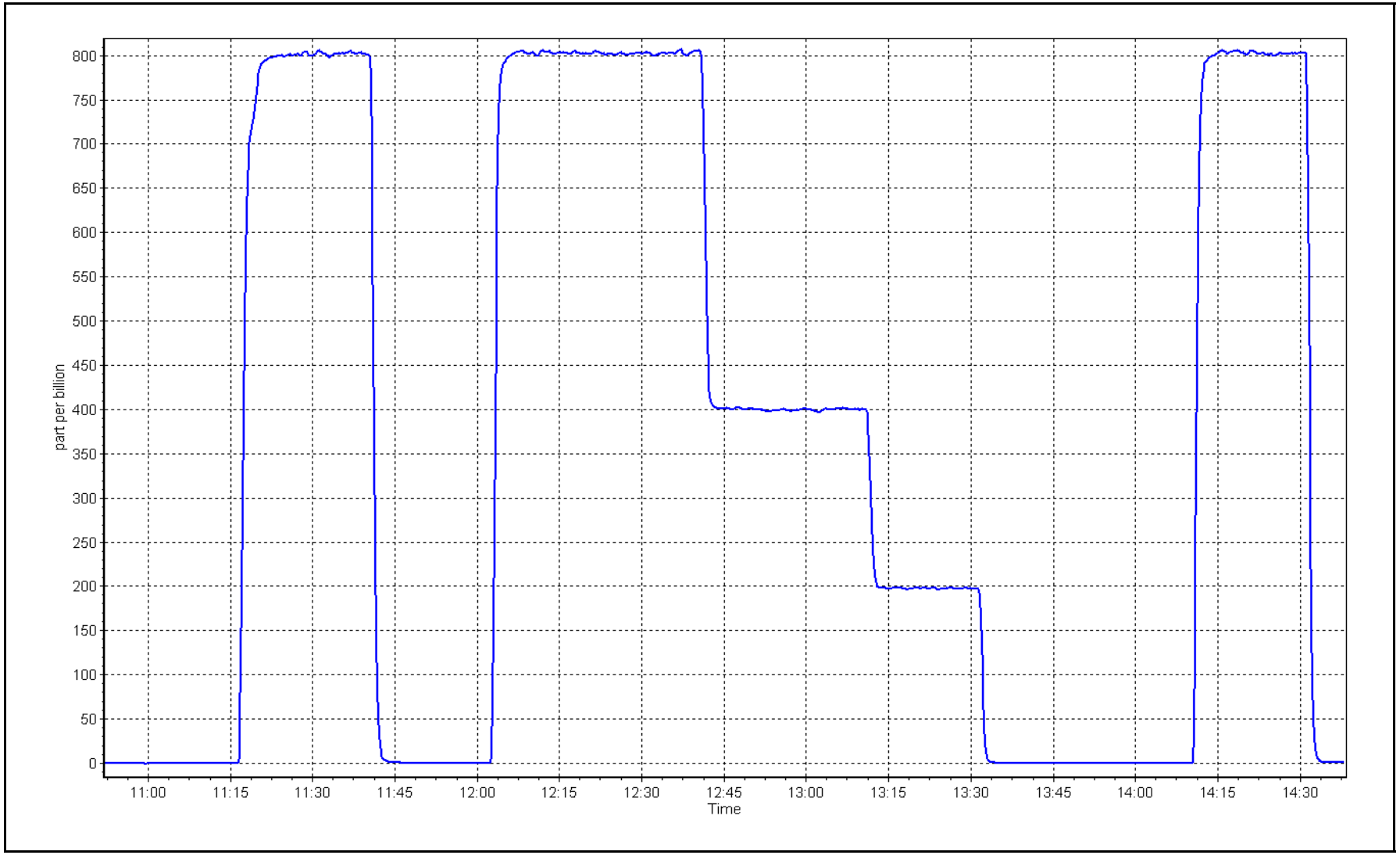
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 800.1 | 805.0 | 0.9939 |
| 400.6 | 400.5 | 1.0002 |
| 199.8 | 197.8 | 1.0102 |
| | | |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999977 | *≥0.995* |
| Slope | 1.007141 | *0.90 - 1.10* |
| Intercept | -1.805499 | *+/-30* |



**SO2 Calibration Plot** Date: March 8, 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: | March 7, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 11:11 | End time (MST): | 16:14 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.391 | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #: | CC508338 | | | |
| Removed Cal Gas Conc: | 5.391 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | CC508338 | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5472 |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4698 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43iQ-TLE | | Analyzer serial #: | 1200326170 | |
| Converter make: | Global | | Converter serial #: | 2022-220 | |
| Analyzer Range | 0 - 100 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.004326 | 0.997613 | Backgd or Offset: | 0.92 | 0.92 |
| Calibration intercept: | -0.142791 | 0.017447 | 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 | 80.7 | 0.990 |
| as found 2nd point | 4963 | 37.2 | 40.1 | 40.4 | 0.990 |
| as found 3rd point | 4982 | 18.6 | 20.1 | 19.8 | 1.008 |
| 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 | 4926 | 74.2 | 80.0 | 79.9 | 1.001 |
| second point | 4963 | 37.2 | 40.1 | 39.9 | 1.005 |
| third point | 4982 | 18.6 | 20.1 | 20.0 | 1.003 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4926 | 74.2 | 80.0 | 80.0 | 1.000 |
| SO2 Scrubber Check | 4919 | 81.3 | 813.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 1.003 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.8 | Prev response: | 80.21 | *% change: | 0.7% |
| Baseline Corr 2nd AF pt: | 40.5 | AF Slope: | 1.011474 | AF Intercept: | -0.243249 |
| Baseline Corr 3rd AF pt: | 19.9 | AF Correlation: | 0.999976 | | |

* = > +/-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

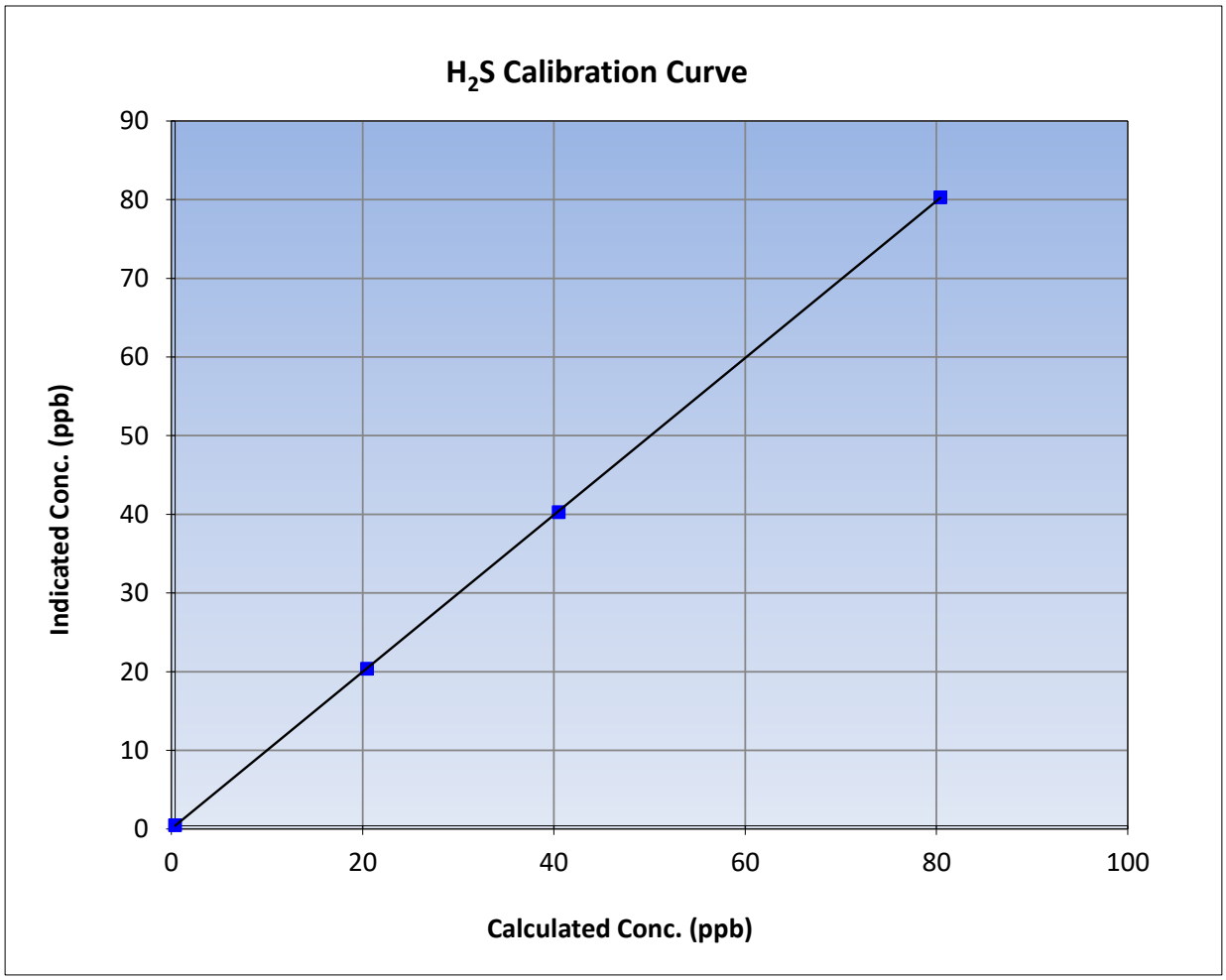
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 7, 2024 | Previous Calibration: | February 12, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:11 | End Time (MST): | 16:14 |
| Analyzer make: | Thermo 43iQ-TLE | Analyzer serial #: | 1200326170 |

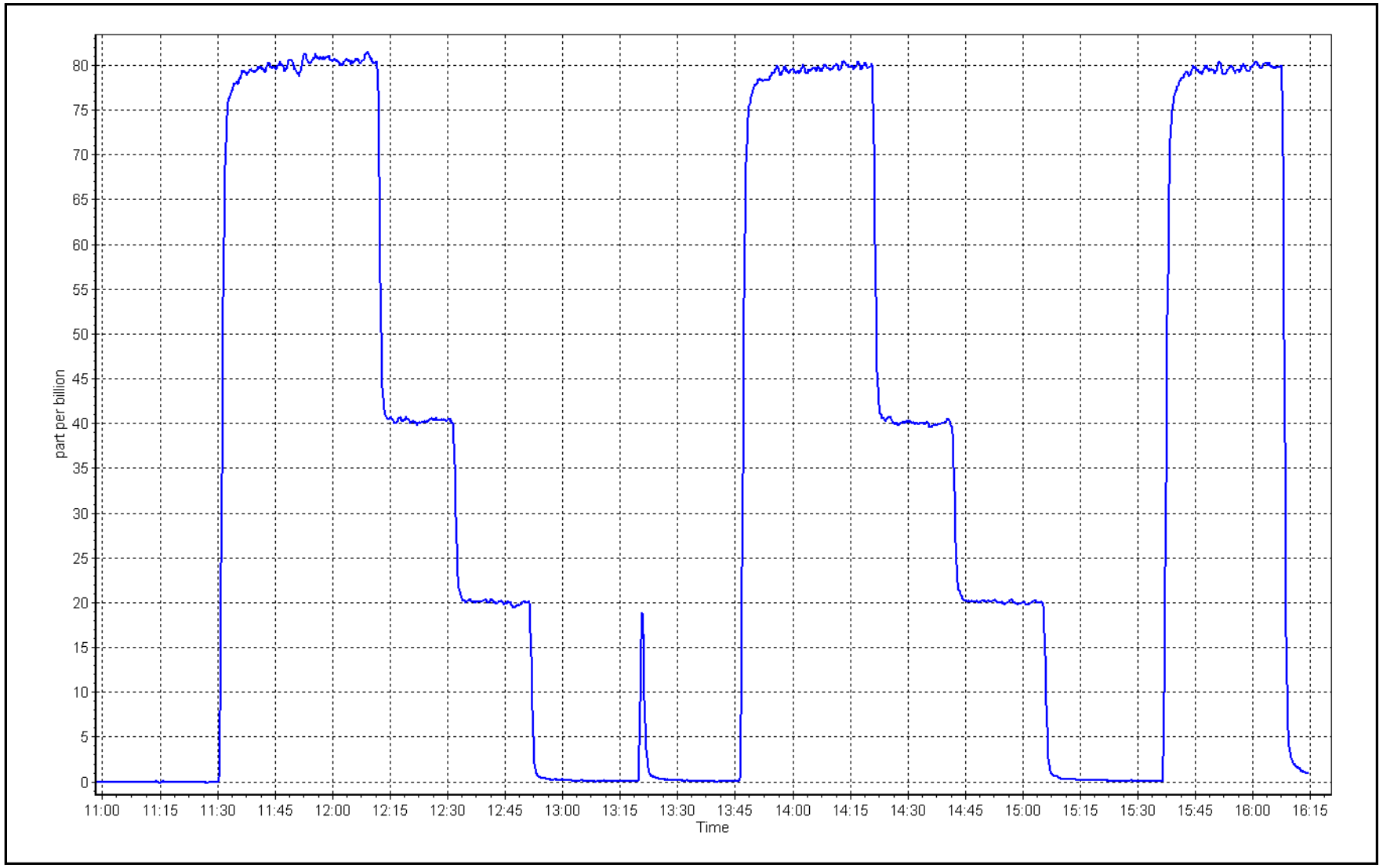
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 80.0 | 79.9 | 1.0013 |
| 40.1 | 39.9 | 1.0052 |
| 20.1 | 20.0 | 1.0027 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999992 | *≥0.995* |
| Slope | 0.997613 | *0.90 - 1.10* |
| Intercept | 0.017447 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 7, 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: | March 8, 2024 | Last Cal Date: | February 26, 2024 |
| Start time (MST): | 10:55 | End time (MST): | 14:36 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | | CC356008 | Cal Gas Expiry Date: | February 23, 2025 | |
| CH4 Cal Gas Conc. | 499.0 | ppm | CH4 Equiv Conc. | 1064.7 | ppm |
| C3H8 Cal Gas Conc. | 205.7 | ppm | | | |
| Removed Gas Cert: | | NA | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 499.0 | ppm | CH4 Equiv Conc. | 1064.7 | ppm |
| Removed C3H8 Conc. | 205.7 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 5472 | |
| ZAG Make/Model: | Teledyne API T701 | | Serial Number: | 4698 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i-LT | | Analyzer serial #: | 1170050149 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.995247 | 1.004976 | Background: | 3.62 | 3.64 |
| Calibration intercept: | -0.136283 | -0.063439 | Coefficient: | 4.021 | 4.046 |

### 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 | -0.09 | ---- |
| as found span | 4918 | 81.3 | 17.31 | 17.20 | 1.007 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | -0.02 | ---- |
| high point | 4918 | 81.3 | 17.31 | 17.36 | 0.997 |
| second point | 4959 | 40.6 | 8.65 | 8.60 | 1.005 |
| third point | 4979 | 20.3 | 4.32 | 4.24 | 1.020 |
| as left zero | 5000 | 0.0 | 0.00 | -0.07 | ---- |
| as left span | 4918 | 81.3 | 17.31 | 17.44 | 0.993 |
| | | | | Average Correction Factor | 1.008 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.29 | Previous response | 17.10 | *% 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: Changed sample inlet filter after as founds. Small span adjustment made.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

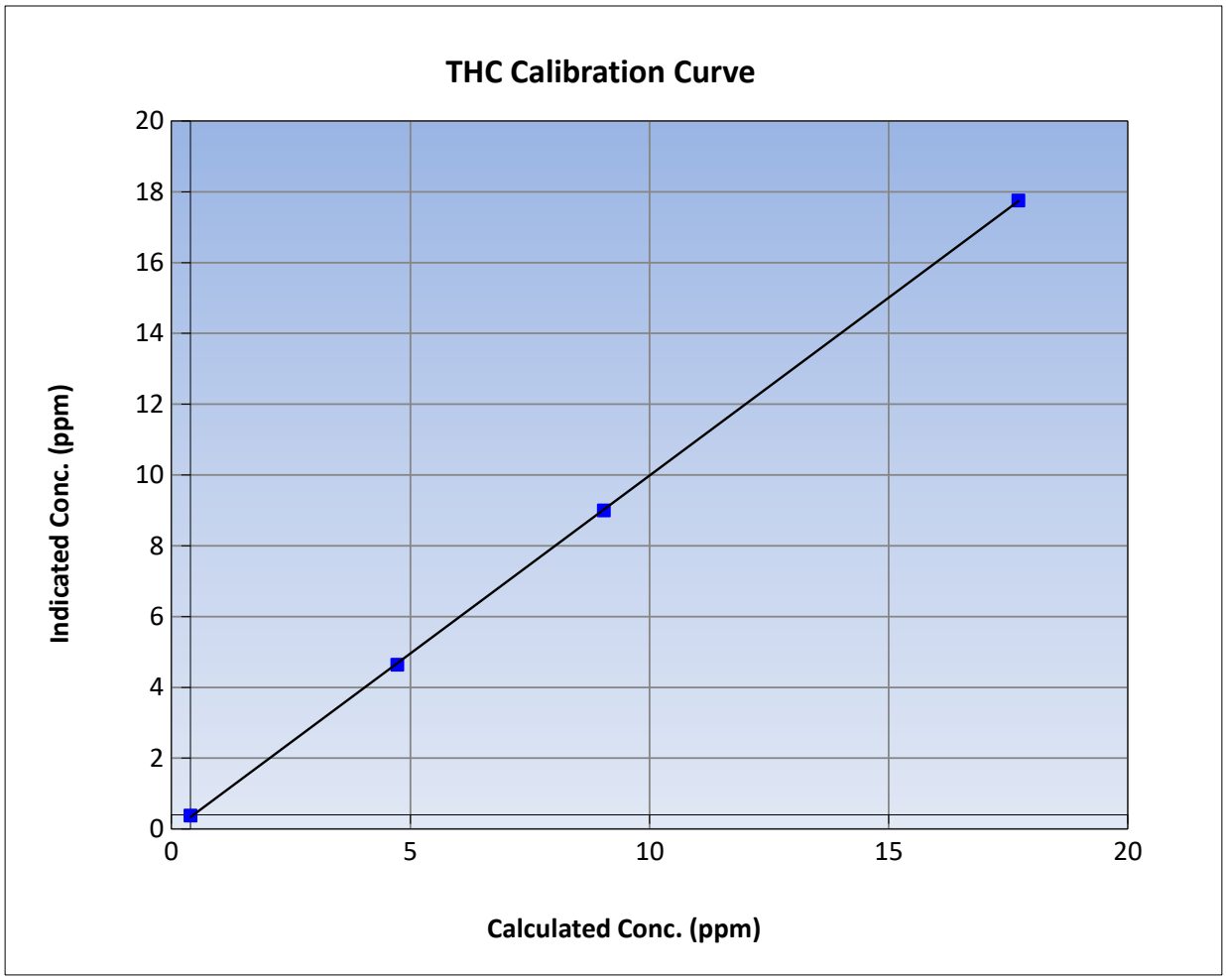
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 26, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 10:55 | End Time (MST): | 14:36 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1170050149 |

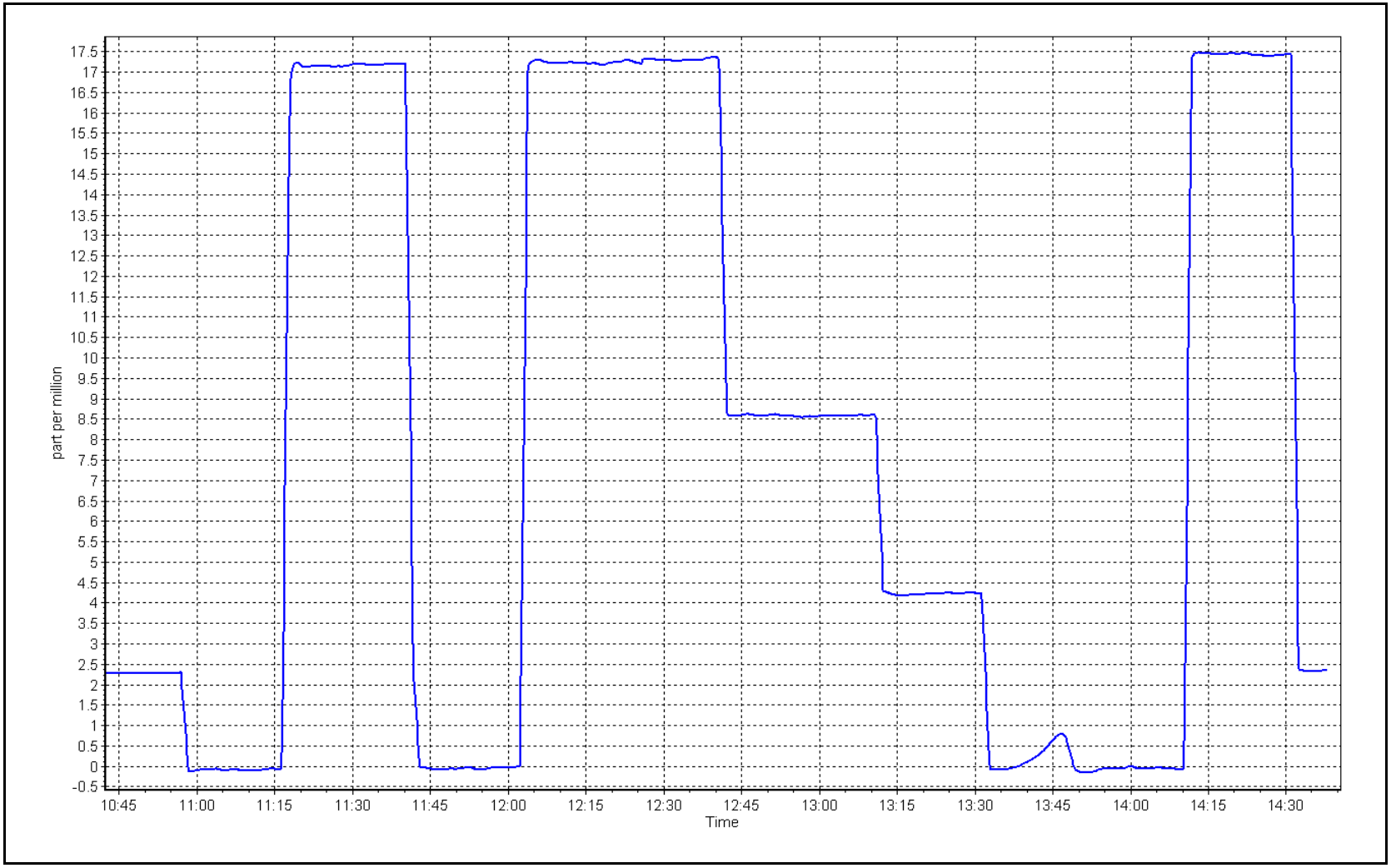
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.02 | ---- |
| 17.31 | 17.36 | 0.9974 |
| 8.65 | 8.60 | 1.0053 |
| 4.32 | 4.24 | 1.0199 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999970 | *≥0.995* |
| Slope | 1.004976 | *0.90 - 1.10* |
| Intercept | -0.063439 | *+/-1.5* |



**THC Calibration Plot** Date: March 8, 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: | March 6, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 11:05 | End time (MST): | 16:48 |
| Reason: | Routine | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| NO Gas Cylinder #: | | T12YYFE | Cal Gas Expiry Date: | October 30, 2024 | |
| NOX Cal Gas Conc: | 47.46 | ppm | NO Cal Gas Conc: | 47.46 | ppm |
| Removed Cylinder #: | | NA | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 47.46 | ppm | Removed Gas NO Conc: | 47.46 | ppm |
| NOX gas Diff: | | | NO gas Diff: | | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 5472 | |
| ZAG make/model: | Teledyne API T701 | | Serial Number: | 4698 | |

### 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 | 1.414 | 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: | 175.3 | 174.7 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.999594 | 1.000767 |
| $NO_X$ Cal Offset: | -1.052309 | -1.012410 |
| NO Cal Slope: | 0.998306 | 1.000380 |
| NO Cal Offset: | -1.451708 | -1.452150 |
| $NO_2$ Cal Slope: | 0.998502 | 0.998848 |
| $NO_2$ Cal Offset: | -0.096658 | 0.144949 |

# 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 | 0.0 | ---- | ---- |
| as found span | 4916 | 84.2 | 799.2 | 799.2 | 0.0 | 787.5 | 784.7 | 2.8 | 1.0149 | 1.0185 |
| 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 | 84.2 | 799.2 | 799.2 | 0.0 | 798.9 | 798.4 | 0.5 | 1.0004 | 1.0010 |
| second point | 4958 | 42.1 | 399.6 | 399.6 | 0.0 | 399.5 | 398.6 | 0.9 | 1.0003 | 1.0025 |
| third point | 4979 | 21.1 | 200.3 | 200.3 | 0.0 | 197.8 | 196.9 | 0.9 | 1.0125 | 1.0172 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.2 | 0.1 | ---- | ---- |
| as left span | 4916 | 84.2 | 799.2 | 409.5 | 389.7 | 793.8 | 403.3 | 390.5 | 1.0068 | 1.0154 |
| | | | | | | | | Average Correction Factor | 1.0044 | 1.0069 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 787.7 ppb | NO = 784.9 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | -1.3% |
| Previous Response | $NO_X$ = 797.8 ppb | NO = 796.4 ppb | | *Percent Change | NO = | -1.5% |
| 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) | 793.2 | 403.5 | 389.7 | 389.1 | 1.0015 | 99.8% |
| 2nd GPT point (200 ppb O3) | 793.2 | 602.6 | 190.6 | 191.3 | 0.9963 | 100.4% |
| 3rd GPT point (100 ppb O3) | 793.2 | 696.5 | 96.7 | 96.4 | 1.0031 | 99.7% |
| | | | | Average Correction Factor | 1.0003 | 100.0% |

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

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

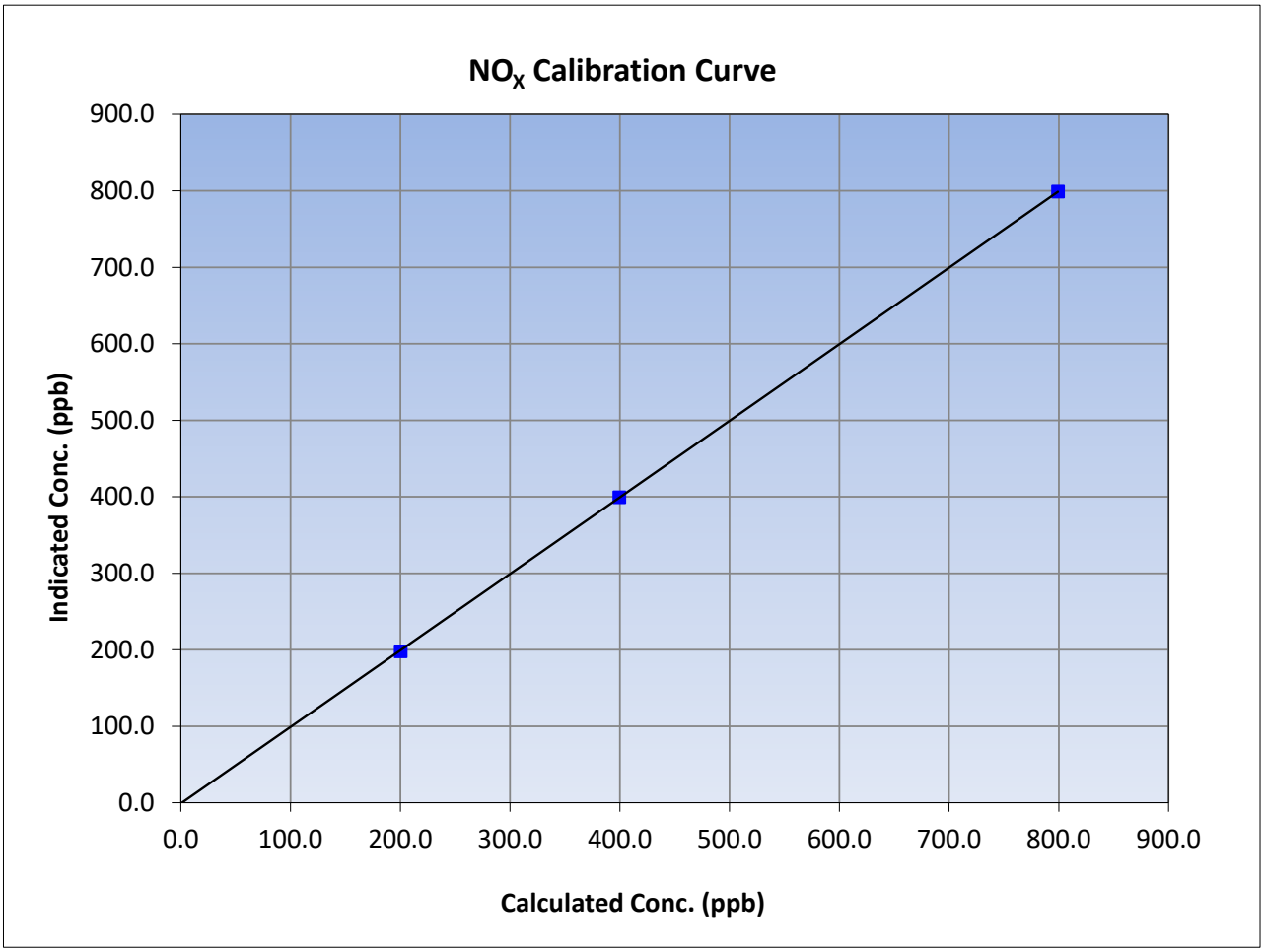
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:05 | End Time (MST): | 16:48 |
| 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 | 0.999989 | ≥0.995 |
| 799.2 | 798.9 | 1.0004 | | | |
| 399.6 | 399.5 | 1.0003 | Slope | 1.000767 | 0.90 - 1.10 |
| 200.3 | 197.8 | 1.0125 | | | |
| | | | Intercept | -1.012410 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

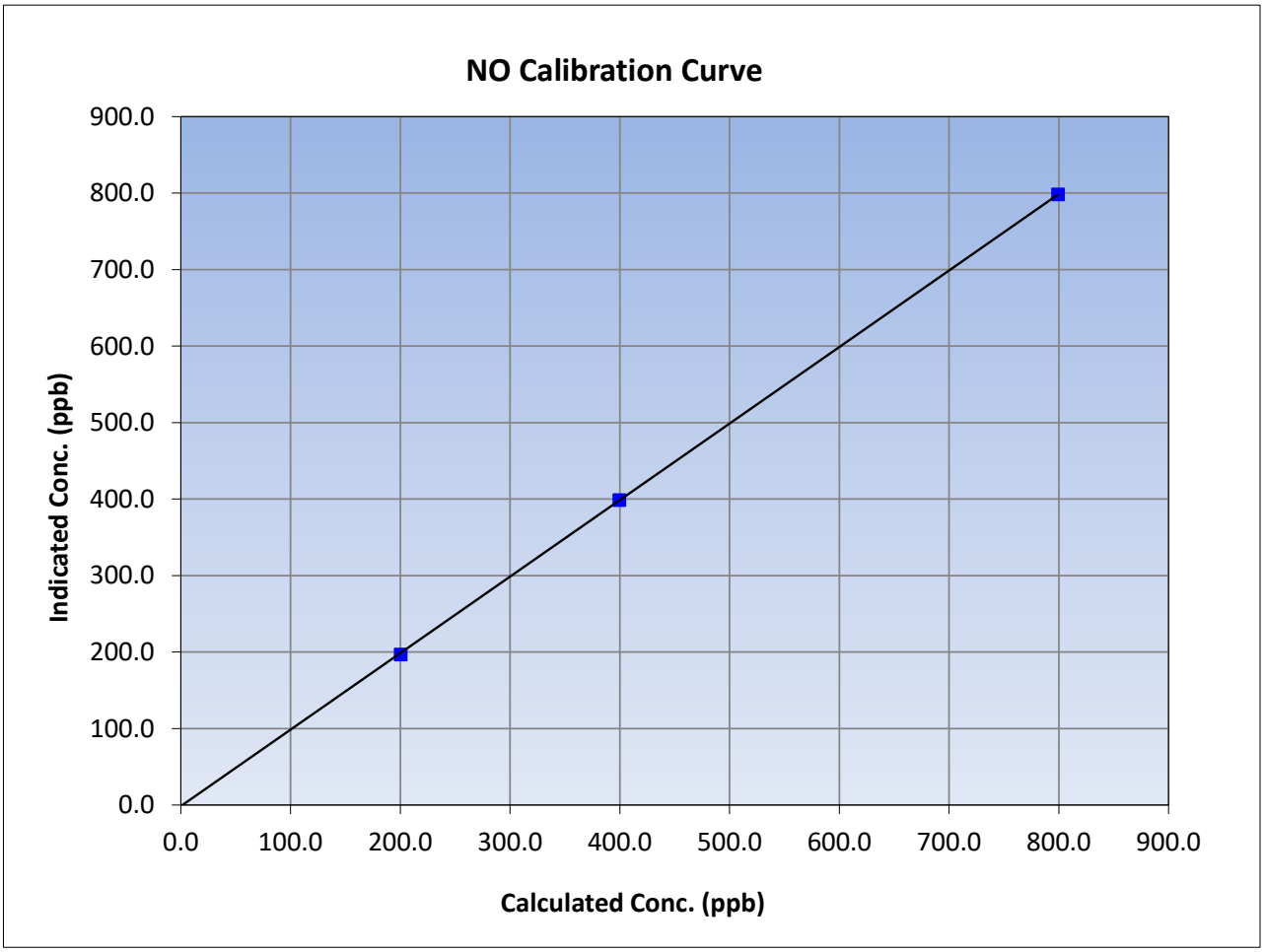
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:05 | End Time (MST): | 16:48 |
| 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 | 0.999983 | ≥0.995 |
| 799.2 | 798.4 | 1.0010 | | | |
| 399.6 | 398.6 | 1.0025 | Slope | 1.000380 | 0.90 - 1.10 |
| 200.3 | 196.9 | 1.0172 | | | |
| | | | Intercept | -1.452150 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

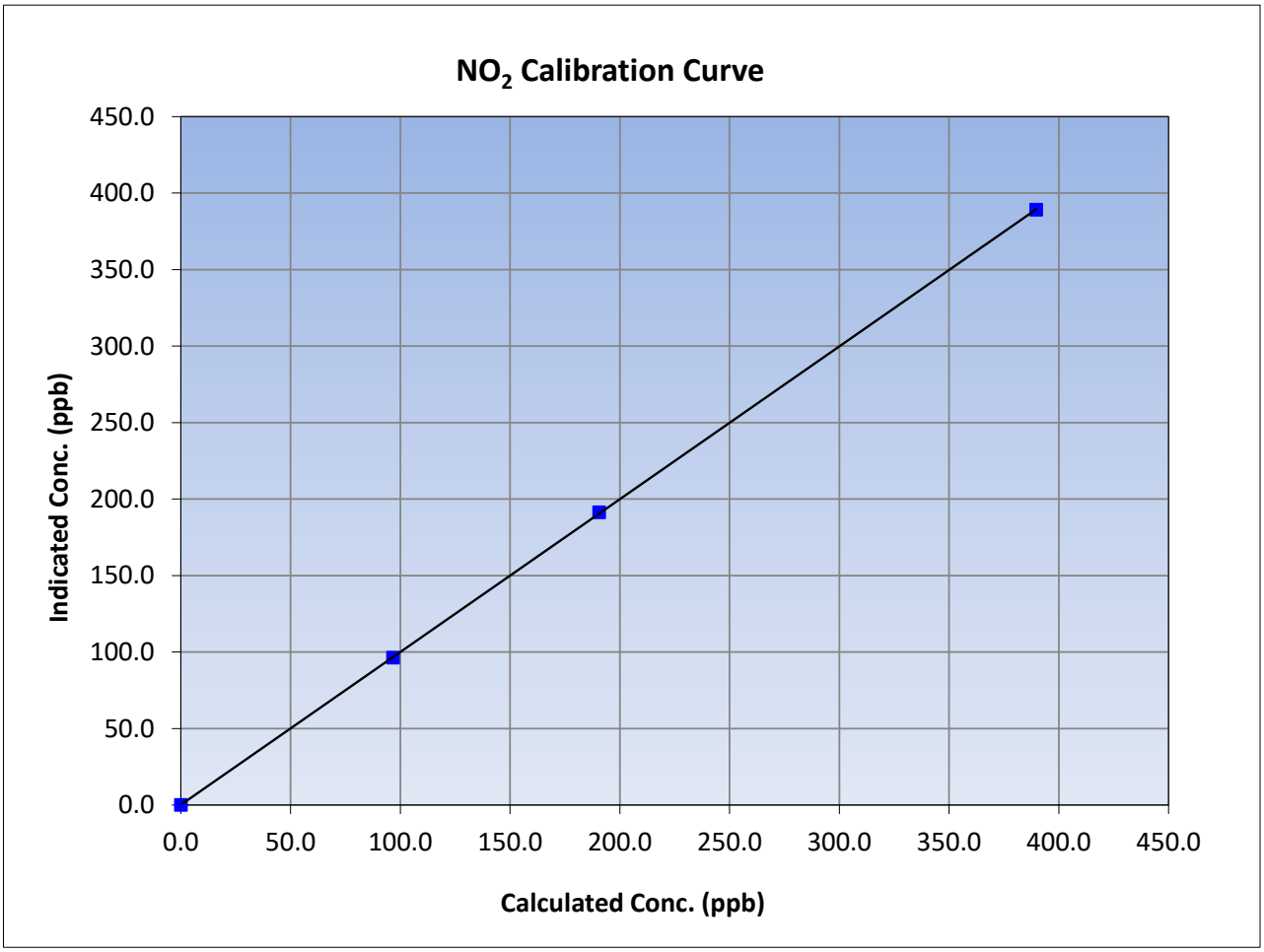
Version-04-2020

### Station Information

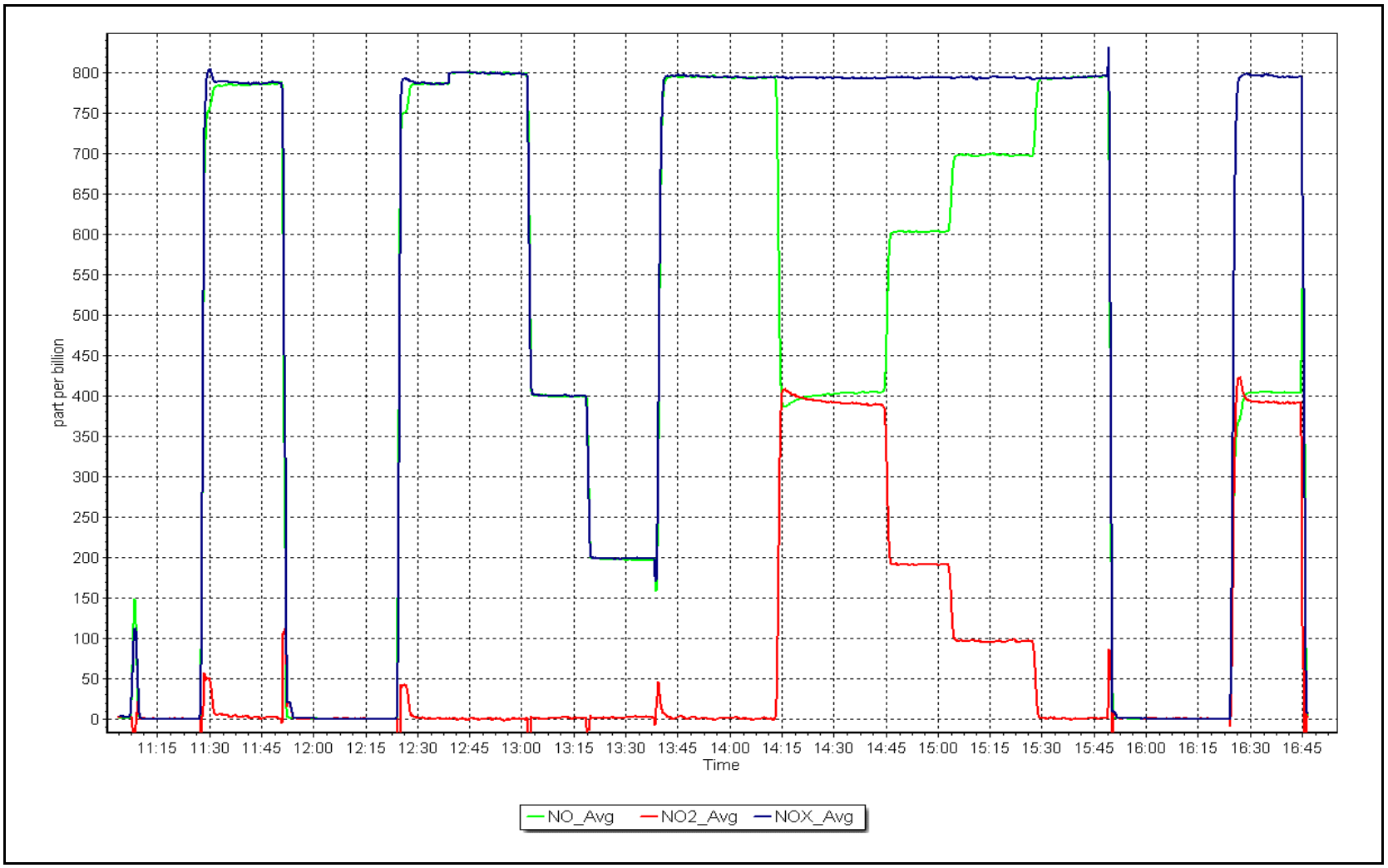
| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Surmont 2 | Station Number: | AMS29 |
| Start Time (MST): | 11:05 | End Time (MST): | 16:48 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1170050148 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999990 | ≥0.995 |
| 389.7 | 389.1 | 1.0015 | | | |
| 190.6 | 191.3 | 0.9963 | Slope | 0.998848 | 0.90 - 1.10 |
| 96.7 | 96.4 | 1.0031 | | | |
| | | | Intercept | 0.144949 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 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: | March 8, 2024 | Last Cal Date: | February 12, 2024 |
| Start time (MST): | 10:59 | End time (MST): | 11:20 |
| 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) | -0.9 | -0.43 | -0.9 | ☐ | +/- 2 °C |
| P (mmHg) | 710.0 | 711.07 | 710.0 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 4.99 | 5.128 | 4.99 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 36 | ----- | 36 | ☐ | >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 | | | | ☐ | +/- 0.5 |

Date Optical Chamber Cleaned: February 12, 2024

Date Disposable Filter Changed: February 12, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <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. Leak check passed.

Calibration by: Braiden Boutilier

# Wood Buffalo Environmental Association

## Wind Speed/Direction Calibration Report

Version-10-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Surmont 2 | Station Number: | AMS 29 |
| Calibration Date: | March 7, 2024 | Prev Cal Date: | June 8, 2023 |
| Start Time (MST): | 11:11 | End Time (MST): | 15:38 |
| Tower Height (m): | 10.0 | Reason: | Install |

### Wind Speed Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 010C-1 | Serial Number: | W15275 |
| WS Calibrator: | MetOne 053 | Serial Number: | 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 | -0.2% |
| 400 | 39.4 | 39.4 | 0.1% |
| 600 | 58.6 | 58.5 | 0.0% |
| 800 | 77.8 | 77.6 | -0.3% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999997 | *≥0.9995* |
| Calculated slope | | 1.001844 | *0.90 - 1.10* |
| Calculated intercept | | -0.029522 | *+/- 2* |

### Wind Direction Information

| | | | | |
|---|---|---|---|---|
| Sensor make/model: | Met One 020C-1 | Serial Number: | A2005 | |
| As Found Declination (deg east of True North): | 13° E | As Left Declination (deg east of True North): | 13° E | |
| Solar noon time (MST): | 12:34 | Calc Declination*: | 13.12° E | Degrees |
| Deadband calc: | NA 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 | | --- |
| 90 | | |
| 180 | | |
| 270 | | |
| 357 | | |

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

Notes: WS install. Verified tower alignment using solar noon and a compass.

Calibration Performed By: Braiden Boutilier

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS30
## ELLS RIVER
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | March 6, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 10:27 | End time (MST): | 13:30 |
| 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: | 1.000960 | 1.000331 | Backgd or Offset: | 9.5 | 9.5 |
| Calibration intercept: | -2.235937 | -2.815894 | 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 | -0.4 | ---- |
| as found span | 4921 | 79.2 | 800.4 | 799.6 | 1.001 |
| 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 | 799.3 | 1.001 |
| second point | 4960 | 39.6 | 400.2 | 396.0 | 1.011 |
| third point | 4980 | 19.8 | 200.1 | 194.5 | 1.029 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | ---- |
| as left span | 4921 | 79.2 | 800.4 | 799.7 | 1.001 |
| | | | | Average Correction Factor | 1.014 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 800.00 | Previous response | 798.90 | *% 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

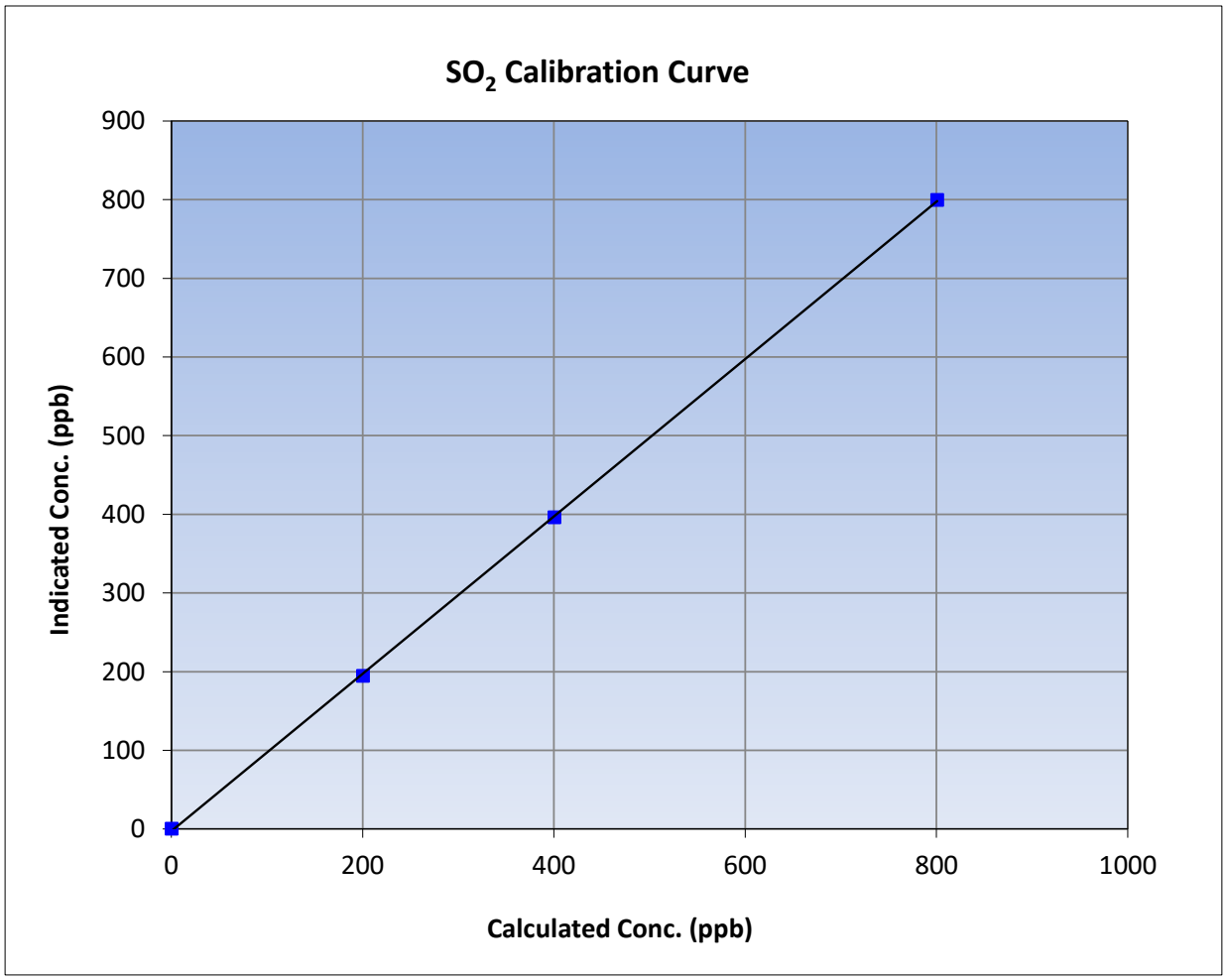
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:27 | End Time (MST): | 13:30 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1008841397 |

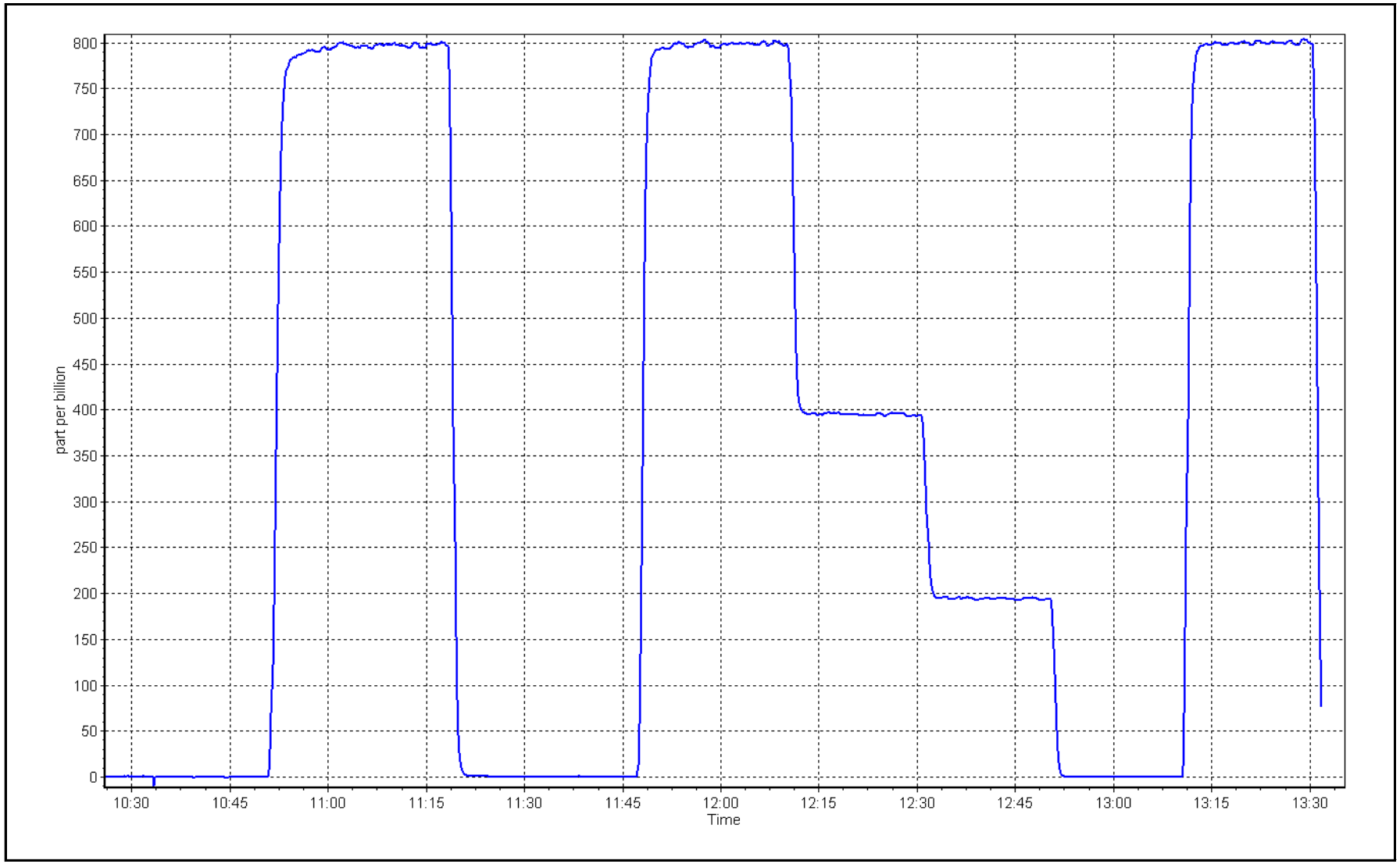
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.4 | 799.3 | 1.0013 |
| 400.2 | 396.0 | 1.0107 |
| 200.1 | 194.5 | 1.0288 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999939 | *≥0.995* |
| Slope | 1.000331 | *0.90 - 1.10* |
| Intercept | -2.815894 | *+/-30* |



**SO2 Calibration Plot** Date: March 6, 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: | March 11, 2024 | Last Cal Date: | February 6, 2024 |
| Start time (MST): | 9:11 | End time (MST): | 13:40 |
| 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: | 1.002473 | 1.002902 | Backgd or Offset: | 1.64 | 1.64 |
| Calibration intercept: | 0.159591 | -0.080433 | Coeff or Slope: | 1.060 | 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 | -0.1 | ---- |
| as found span | 4920 | 80.2 | 80.0 | 79.4 | 1.007 |
| as found 2nd point | 4960 | 40.1 | 40.0 | 39.7 | 1.006 |
| as found 3rd point | 4980 | 20.0 | 20.0 | 19.4 | 1.024 |
| 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 | 4920 | 80.2 | 80.0 | 80.2 | 0.998 |
| second point | 4960 | 40.1 | 40.0 | 40.0 | 1.000 |
| third point | 4980 | 20.0 | 20.0 | 20.0 | 0.998 |
| as left zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| as left span | 4920 | 80.2 | 80.0 | 80.0 | 1.000 |
| SO2 Scrubber Check | 4921 | 79.2 | 800.4 | 0.2 | ---- |
| Date of last scrubber change: | | N/A | | Ave Corr Factor | 0.999 |
| Date of last converter efficiency test: | | N/A | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 79.5 | Prev response: | 80.39 | *% change: | -1.1% |
| Baseline Corr 2nd AF pt: | 39.8 | AF Slope: | 0.994769 | AF Intercept: | -0.220738 |
| Baseline Corr 3rd AF pt: | 19.5 | AF Correlation: | 0.999976 | | |

* = > +/-5% change initiates investigation

Notes: Change inlet filters after multipoint as founds. SO2 scrubber check done after calibrator zero, passed. No adjustment made.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## TRS Calibration Summary

Version-11-2021

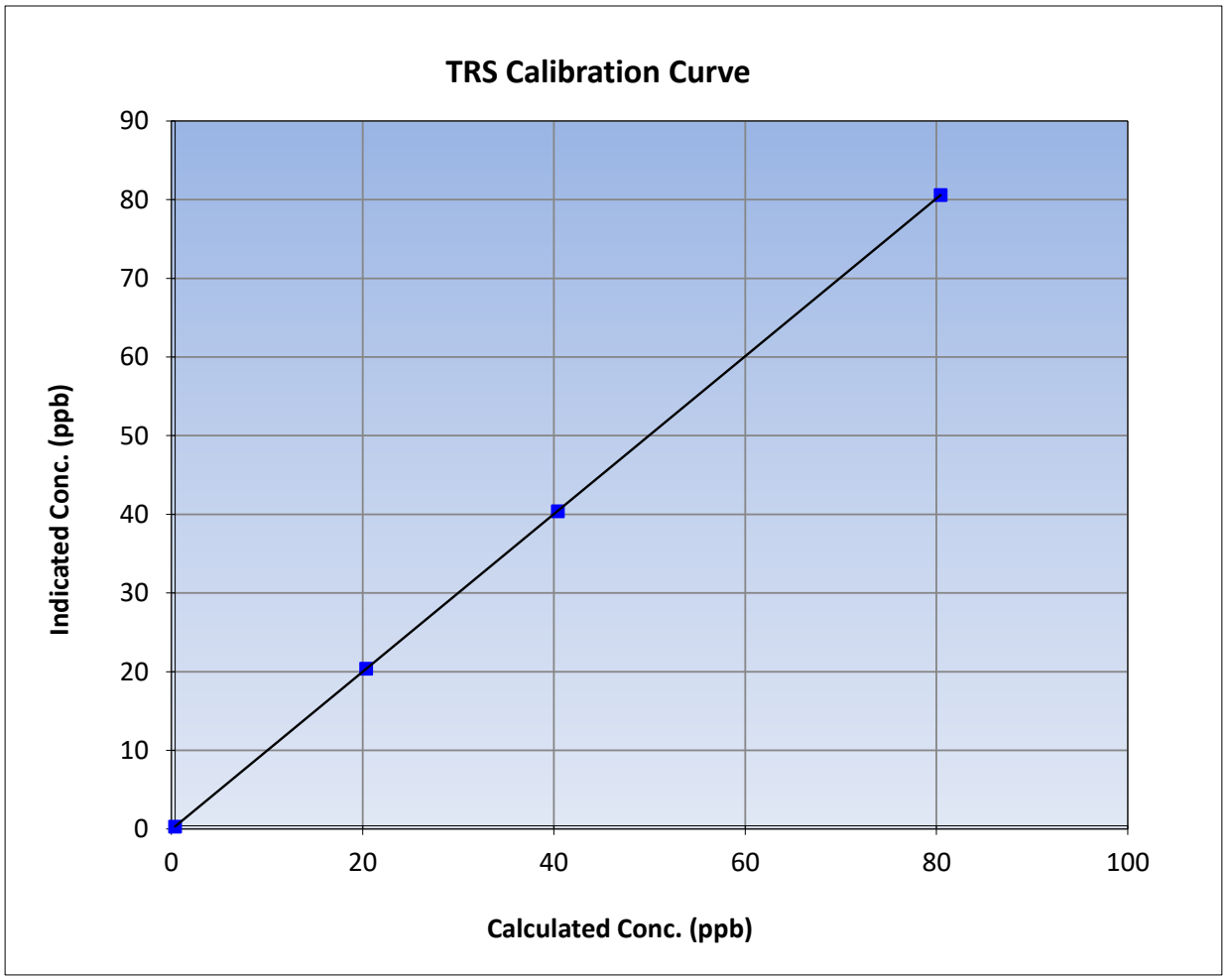
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 11, 2024 | Previous Calibration: | February 6, 2024 |
| Station Name: | Ells River | Station Number: | AMS30 |
| Start Time (MST): | 9:11 | End Time (MST): | 13:40 |
| Analyzer make: | Thermo 43i TLE | Analyzer serial #: | 1410661331 |

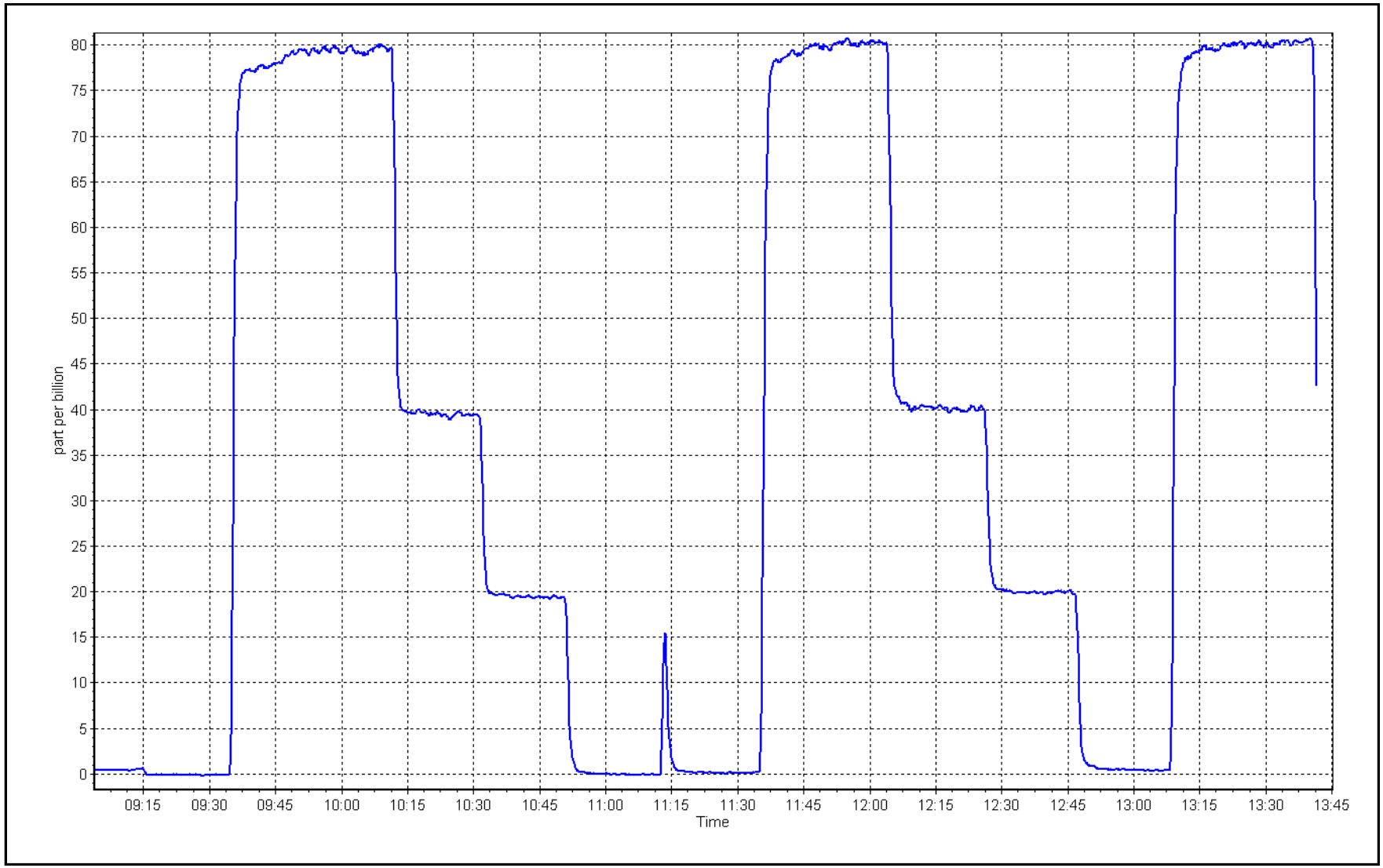
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.1 | ---- |
| 80.0 | 80.2 | 0.9980 |
| 40.0 | 40.0 | 1.0005 |
| 20.0 | 20.0 | 0.9980 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999998 | *≥0.995* |
| Slope | 1.002902 | *0.90 - 1.10* |
| Intercept | -0.080433 | *+/-3* |



**TRS Calibration Plot** Date: March 11, 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: | March 6, 2024 | Last Cal Date: | February 5, 2024 |
| Start time (MST): | 10:27 | End time (MST): | 13:30 |
| 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: | 2.53E-04 | 2.53E-04 | NMHC SP Ratio: | 6.42E-05 | 6.42E-05 |
| CH4 Retention time: | 14.2 | 14.2 | NMHC Peak Area: | 141799 | 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 | 16.97 | 1.003 |
| 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 | 16.98 | 1.003 |
| second point | 4960 | 39.6 | 8.51 | 8.46 | 1.006 |
| third point | 4980 | 19.8 | 4.26 | 4.14 | 1.030 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 17.03 | 17.02 | 1.000 |
| | | | | Average Correction Factor | 1.013 |
| Baseline Corr AF: | 16.97 | Prev response | 17.01 | *% 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-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 | 9.07 | 1.005 |
| 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 | 9.12 | 0.999 |
| second point | 4960 | 39.6 | 4.56 | 4.55 | 1.002 |
| third point | 4980 | 19.8 | 2.28 | 2.22 | 1.026 |
| as left zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 9.11 | 9.11 | 1.000 |
| | | | | Average Correction Factor | 1.009 |
| Baseline Corr AF: | 9.07 | Prev response | 9.14 | *% change | -0.7% |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | 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 | 7.90 | 1.002 |
| 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 | 7.86 | 1.007 |
| second point | 4960 | 39.6 | 3.96 | 3.91 | 1.013 |
| third point | 4980 | 19.8 | 1.98 | 1.91 | 1.034 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 7.91 | 7.91 | 1.000 |
| | | | | Average Correction Factor | 1.018 |
| Baseline Corr AF: | 7.90 | Prev response | 7.87 | *% 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: | 1.002141 | 0.999234 |
| THC Cal Offset: | -0.052740 | -0.050339 |
| CH4 Cal Slope: | 0.997247 | 0.994937 |
| CH4 Cal Offset: | -0.019157 | -0.025157 |
| NMHC Cal Slope: | 1.006266 | 1.002917 |
| NMHC Cal Offset: | -0.033582 | -0.025982 |

Notes: Inlet filter changed after As Founds, no adjustment made.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## THC Calibration Summary

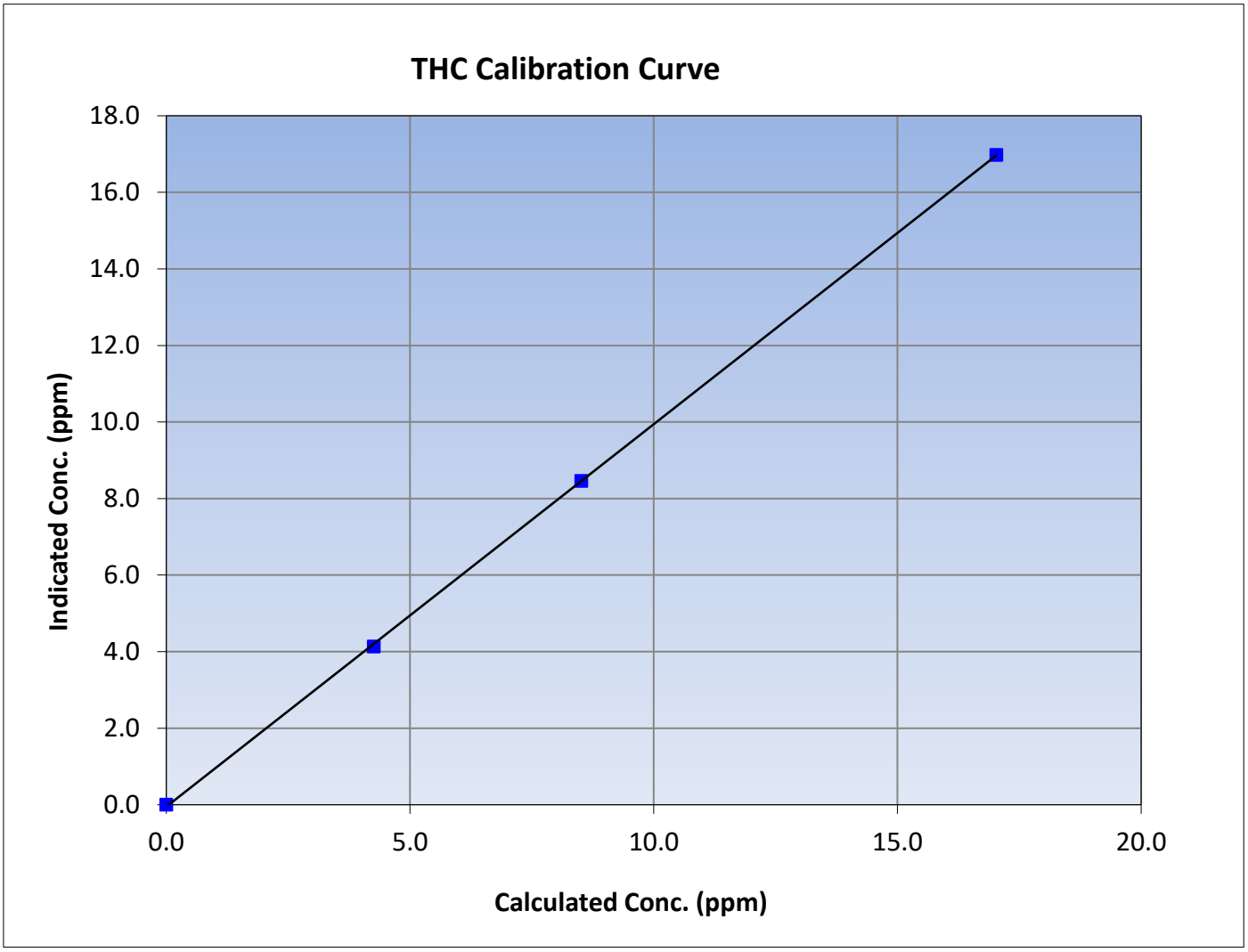
Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:27 | End Time (MST): | 13:30 |
| 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 | 0.999953 | ≥0.995 |
| 17.03 | 16.98 | 1.0028 | | | |
| 8.51 | 8.46 | 1.0065 | Slope | 0.999234 | 0.90 - 1.10 |
| 4.26 | 4.14 | 1.0295 | | | |
| | | | Intercept | -0.050339 | +/-0.5 |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

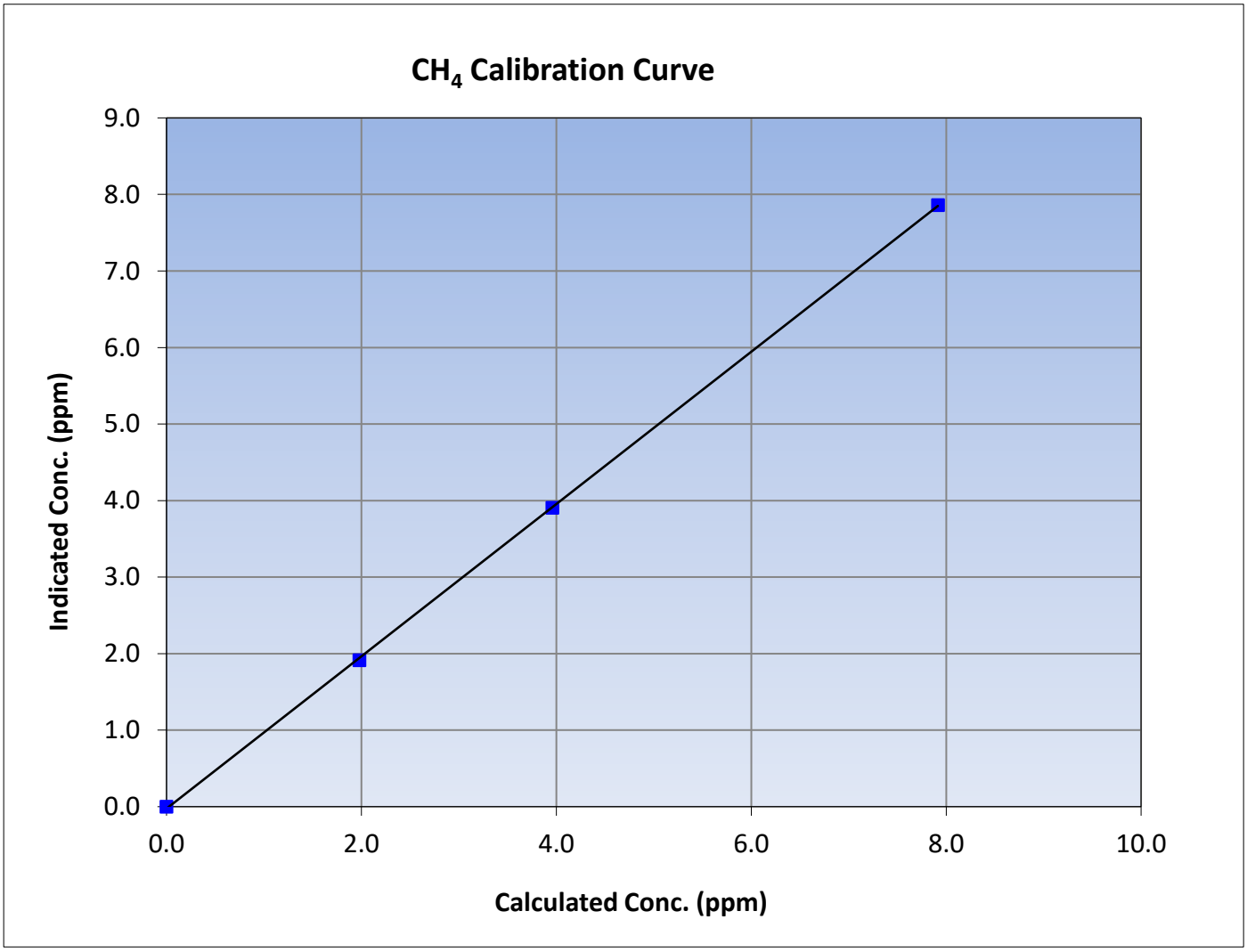
Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:27 | End Time (MST): | 13:30 |
| 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 | 0.999951 | *≥0.995* |
| 7.91 | 7.86 | 1.0070 | | | |
| 3.96 | 3.91 | 1.0130 | Slope | 0.994937 | *0.90 - 1.10* |
| 1.98 | 1.91 | 1.0339 | | | |
| | | | Intercept | -0.025157 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

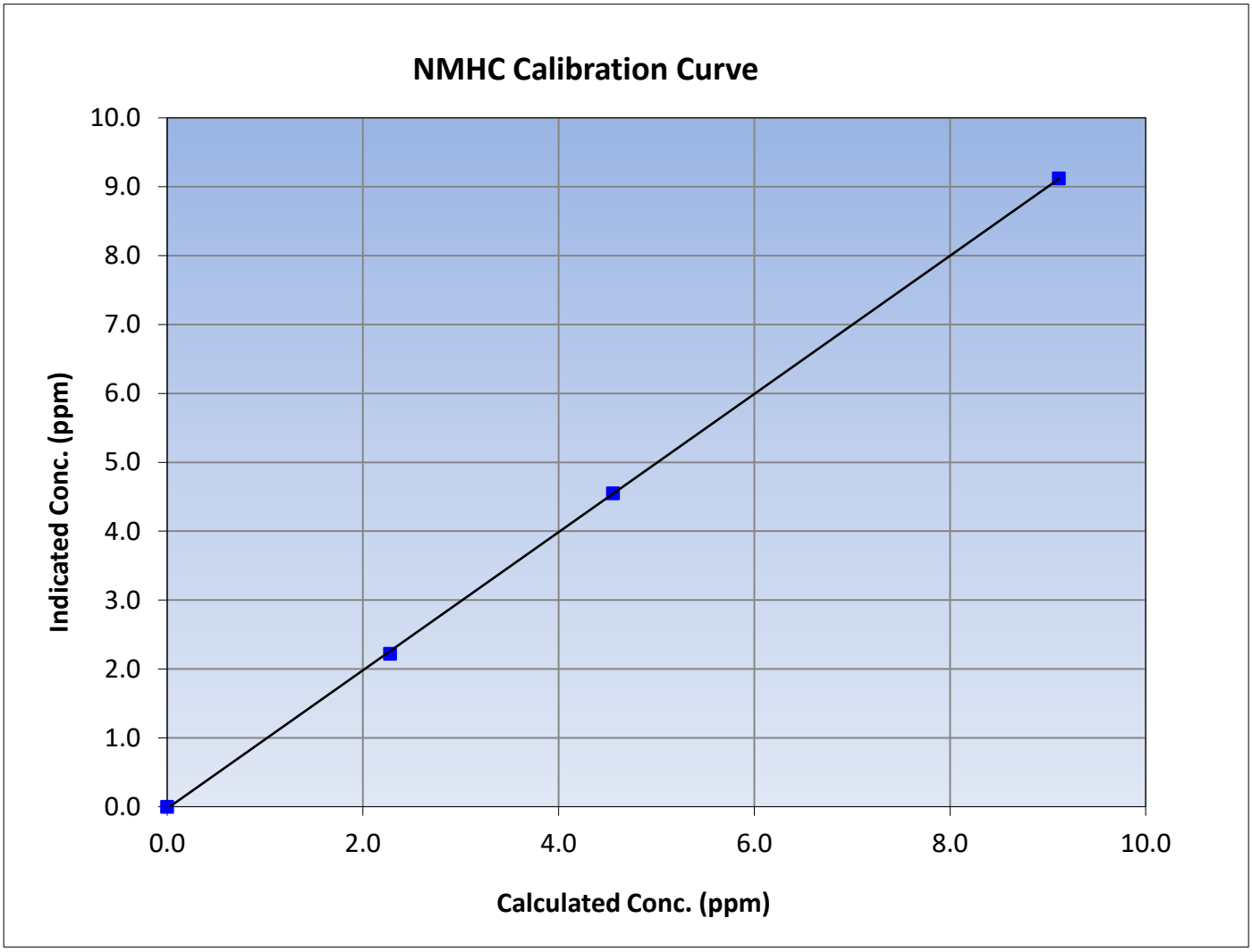
Version-01-2020

### Station Information

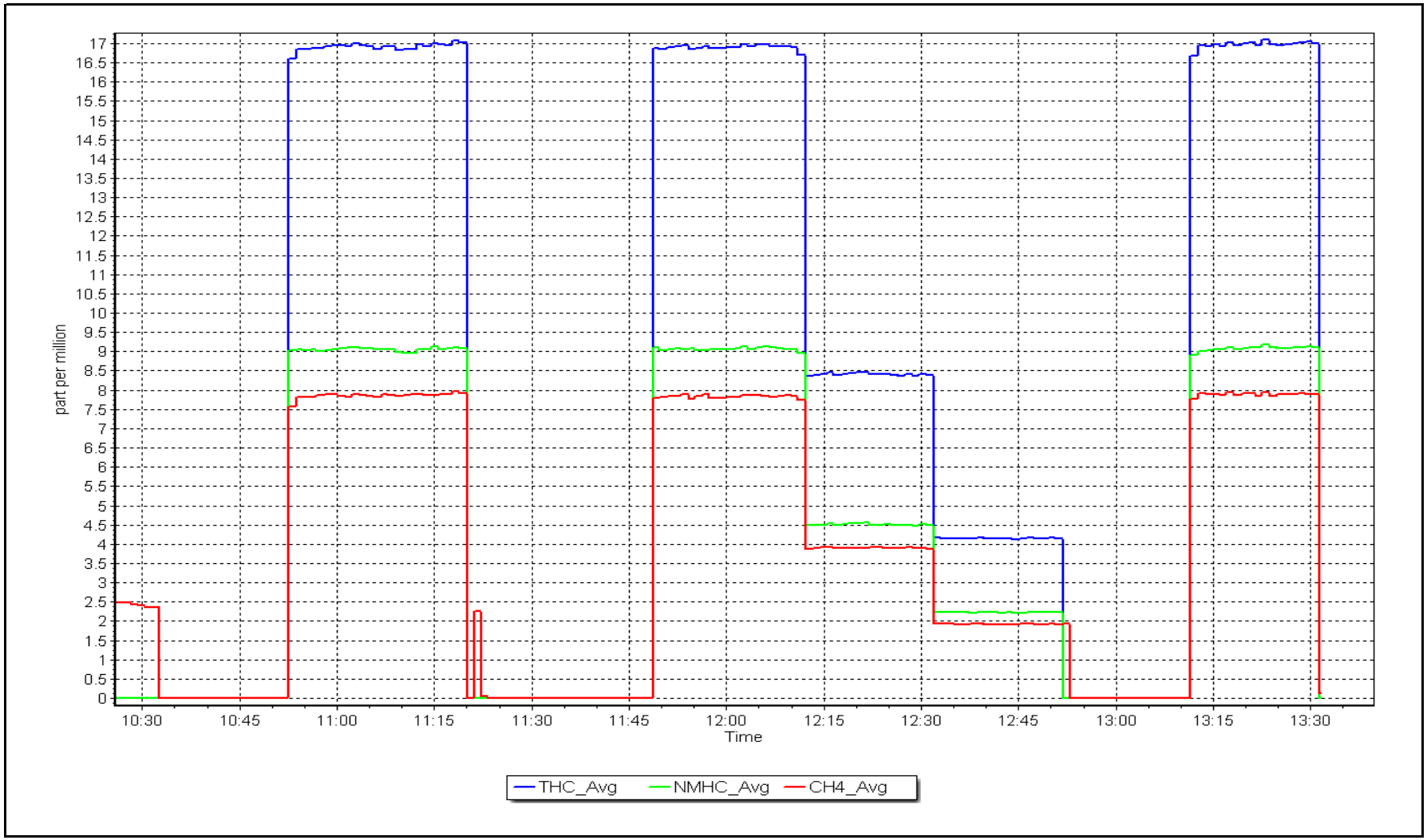
| | | | |
|---|---|---|---|
| Calibration Date: | March 6, 2024 | Previous Calibration: | February 5, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:27 | End Time (MST): | 13:30 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999952 | ≥0.995 |
| 9.11 | 9.12 | 0.9992 | | | |
| 4.56 | 4.55 | 1.0017 | Slope | 1.002917 | 0.90 - 1.10 |
| 2.28 | 2.22 | 1.0258 | | | |
| | | | Intercept | -0.025982 | +/-0.5 |



**NMHC Calibration Plot** Date: March 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: | March 23, 2024 | Last Cal Date: | March 6, 2024 |
| Start time (MST): | 10:46 | End time (MST): | 14:13 |
| Reason: | Maintenance | | |

### 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: | 2.53E-04 | 2.55E-04 | NMHC SP Ratio: | 6.42E-05 | 6.18E-05 |
| CH4 Retention time: | 14.2 | 14.6 | NMHC Peak Area: | 141799 | 147488 |

### 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 | 17.24 | 0.987 |
| 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 | 16.99 | 1.002 |
| second point | 4960 | 39.6 | 8.51 | 8.44 | 1.009 |
| third point | 4980 | 19.8 | 4.26 | 4.17 | 1.020 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 17.03 | 17.09 | 0.997 |
| | | | | Average Correction Factor | 1.011 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | 17.24 | Prev response | 16.96 | *% 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-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 | 9.40 | 0.970 |
| 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 | 9.09 | 1.003 |
| second point | 4960 | 39.6 | 4.56 | 4.53 | 1.006 |
| third point | 4980 | 19.8 | 2.28 | 2.24 | 1.016 |
| as left zero | 5000 | 0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 9.11 | 9.18 | 0.993 |
| | | | | Average Correction Factor | 1.008 |
| Baseline Corr AF: | 9.40 | Prev response | 9.11 | *% change | 3.0% |
| 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 | 4921 | 79.2 | 7.91 | 7.84 | 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 | 79.2 | 7.91 | 7.91 | 1.001 |
| second point | 4960 | 39.6 | 3.96 | 3.91 | 1.013 |
| third point | 4980 | 19.8 | 1.98 | 1.93 | 1.025 |
| as left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| as left span | 4921 | 79.2 | 7.91 | 7.91 | 1.001 |
| | | | | Average Correction Factor | 1.013 |
| Baseline Corr AF: | 7.84 | Prev response | 7.85 | *% 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: | 0.999234 | 0.999013 |
| THC Cal Offset: | -0.050339 | -0.041938 |
| CH4 Cal Slope: | 0.994937 | 1.000221 |
| CH4 Cal Offset: | -0.025157 | -0.027957 |
| NMHC Cal Slope: | 1.002917 | 0.997951 |
| NMHC Cal Offset: | -0.025982 | -0.014182 |

Notes: Dips in instrument response. Chromatograms indicating peak has shifted. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

## THC Calibration Summary

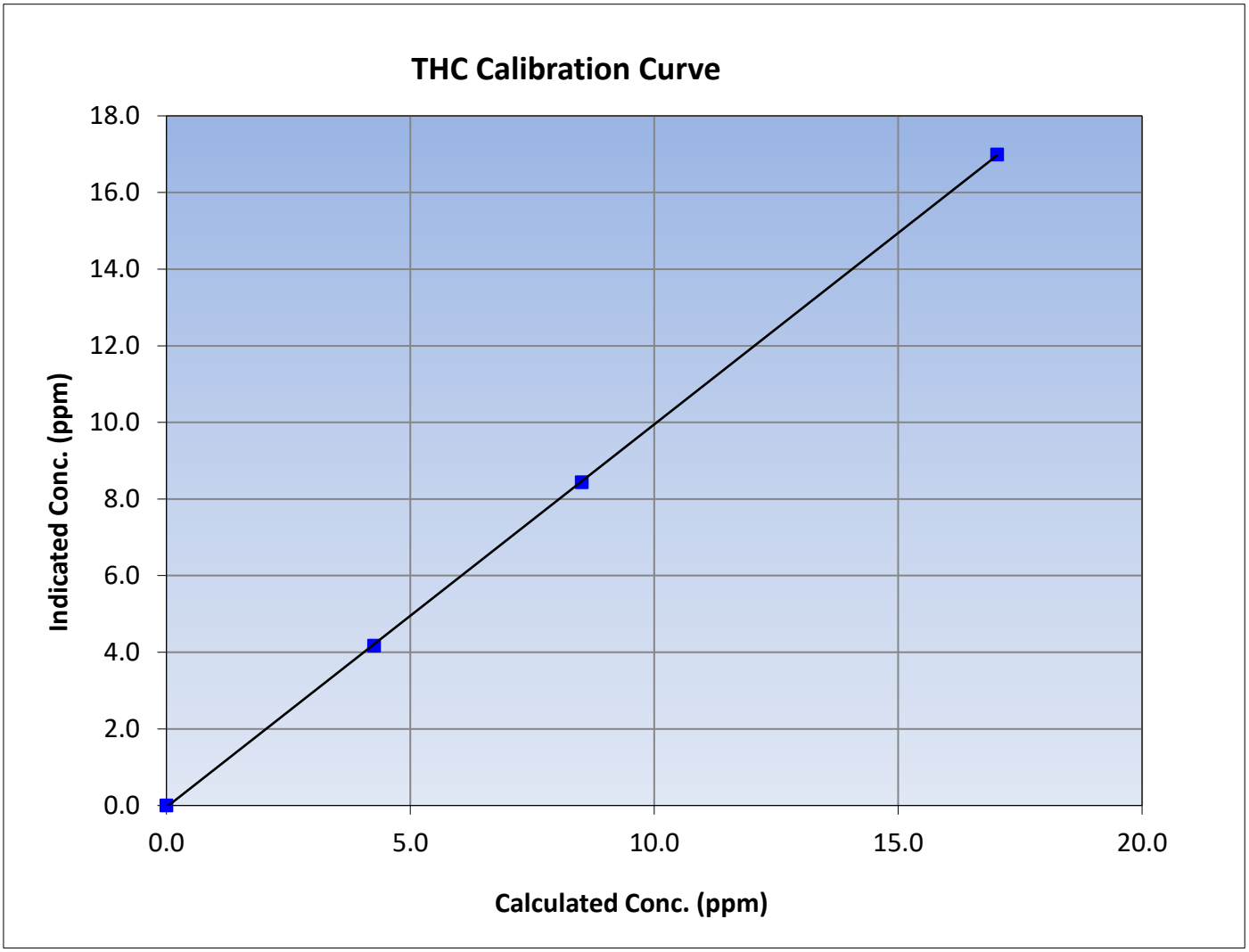
Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 23, 2024 | Previous Calibration: | March 6, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:46 | End Time (MST): | 14:13 |
| 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* |
| 17.03 | 16.99 | 1.0021 | | | |
| 8.51 | 8.44 | 1.0090 | Slope | 0.999013 | *0.90 - 1.10* |
| 4.26 | 4.17 | 1.0204 | | | |
| | | | Intercept | -0.041938 | *+/-0.5* |



# Wood Buffalo Environmental Association

## $CH_4$ Calibration Summary

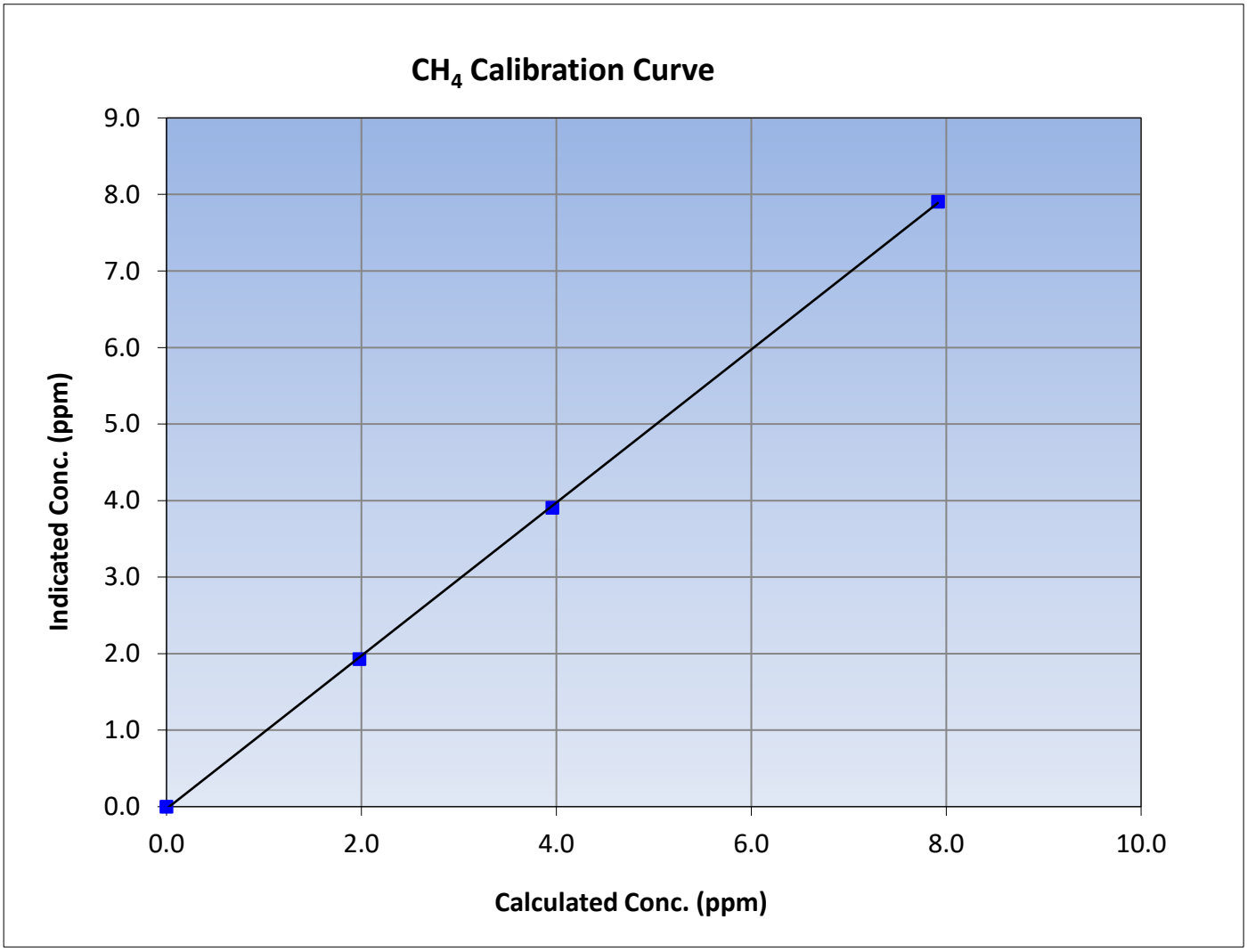
Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 23, 2024 | Previous Calibration: | March 6, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:46 | End Time (MST): | 14:13 |
| 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 | 0.999939 | *≥0.995* |
| 7.91 | 7.91 | 1.0011 | | | |
| 3.96 | 3.91 | 1.0130 | Slope | 1.000221 | *0.90 - 1.10* |
| 1.98 | 1.93 | 1.0253 | | | |
| | | | Intercept | -0.027957 | *+/-0.5* |



# Wood Buffalo Environmental Association

## NMHC Calibration Summary

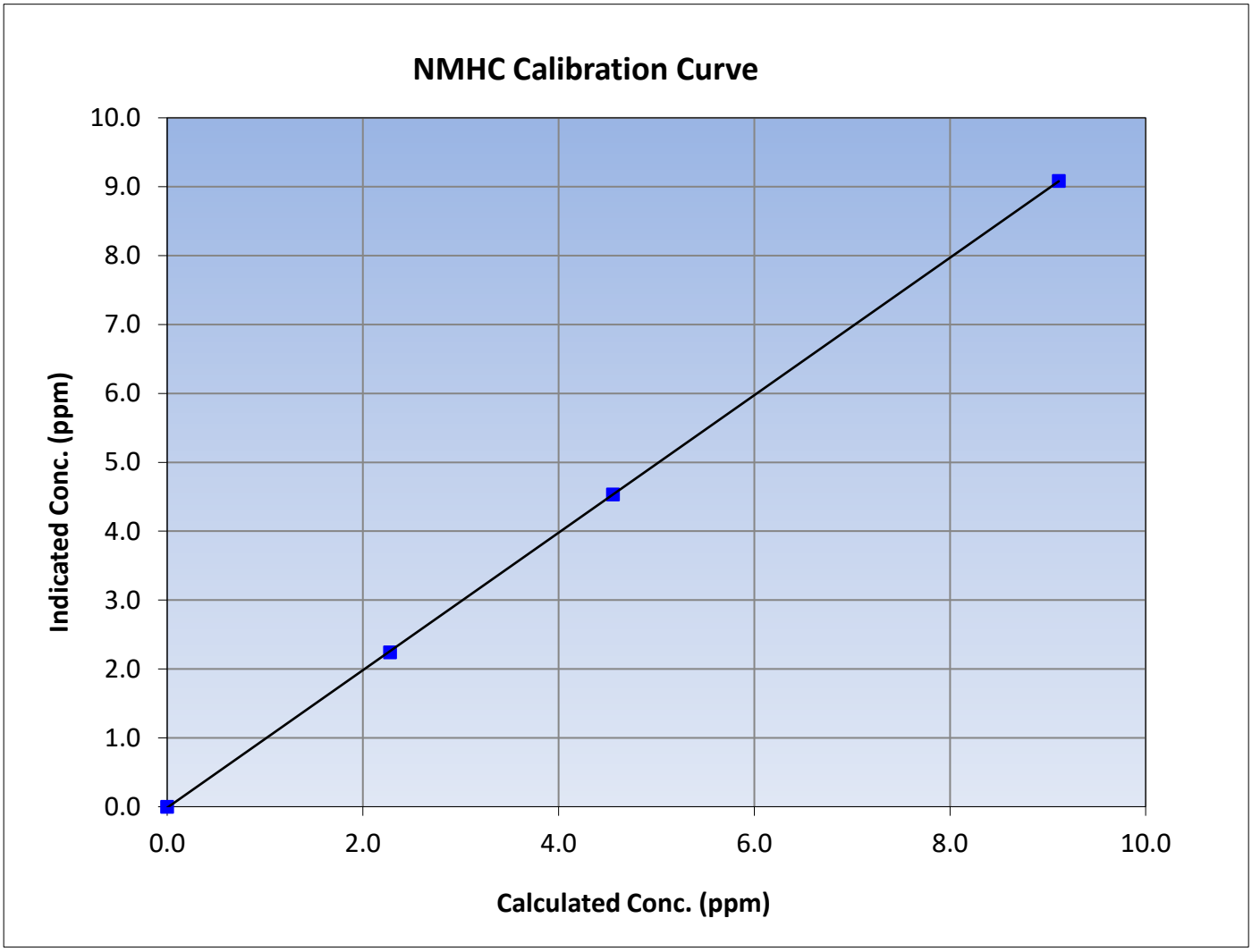
Version-01-2020

### Station Information

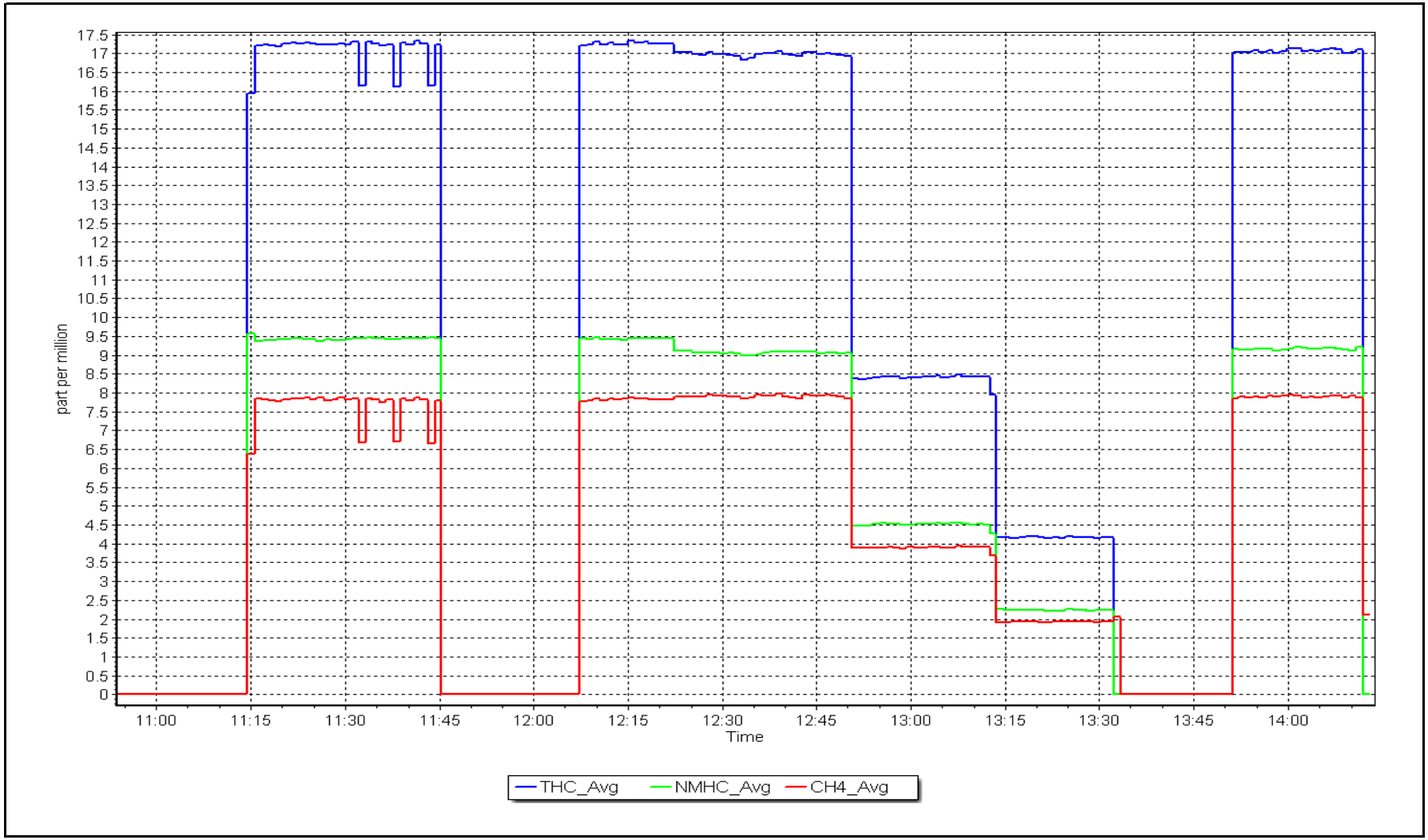
| | | | |
|---|---|---|---|
| Calibration Date: | March 23, 2024 | Previous Calibration: | March 6, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 10:46 | End Time (MST): | 14:13 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999988 | *≥0.995* |
| 9.11 | 9.09 | 1.0030 | | | |
| 4.56 | 4.53 | 1.0057 | Slope | 0.997951 | *0.90 - 1.10* |
| 2.28 | 2.24 | 1.0162 | | | |
| | | | Intercept | -0.014182 | *+/-0.5* |



**NMHC Calibration Plot** Date: March 23, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | March 25, 2024 | Last Cal Date: | March 23, 2024 |
| Start time (MST): | 10:45 | End time (MST): | N/A |
| Reason: | Removal | | |

### 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 | |
| Zero Air Gen model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1181490018 | |
| THC Range: | 0 - 20 ppm | | NMHC/CH4 Range: | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | 2.55E-04 | N/A | NMHC SP Ratio: | 6.42E-05 | N/A |
| CH4 Retention time: | 14.2 | N/A | NMHC Peak Area: | 141799 | N/A |
| Zero Chromatogram: | OFF | | Flat Baseline: | OFF | |

### THC As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As found High point | 4921 | 79.2 | 17.03 | 17.02 | 1.000 |
| As found Mid point | 4960 | 39.6 | 8.51 | 8.39 | 1.015 |
| As found Low point | 4980 | 19.8 | 4.26 | 4.15 | 1.025 |
| New cylinder response | | | | | |
| Baseline Corr AF: | 17.02 | Prev response | 16.97 | *% change | 0.3% |
| Baseline Corr 2nd AF: | 8.39 | AF Slope: | 1.000771 | AF Intercept: | -0.065537 |
| Baseline Corr 3rd AF: | 4.15 | AF Correlation: | 0.999921 | * = > +/-5% change initiates investigation | |

### THC Calibration Data

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

Average Correction Factor

Notes: Removal calibration, will complete maintenance at the WBEAC.

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### NMHC As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As found High point | 4921 | 79.2 | 9.11 | 9.02 | 1.010 |
| As found Mid point | 4960 | 39.6 | 4.56 | 4.46 | 1.022 |
| As found Low point | 4980 | 19.8 | 2.28 | 2.19 | 1.039 |
| New cylinder response | | | | | |
| Baseline Corr AF: | 9.02 | Prev response | 9.08 | 47116 | |
| Baseline Corr 2nd AF: | 4.46 | AF Slope: | 0.991705 | AF Intercept: | -0.035779 |
| Baseline Corr 3rd AF: | 2.19 | AF Correlation: | 0.999927 | * = > +/-5% change initiates investigation | |

### NMHC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | | | | | |
| High point | | | | | |
| Mid point | | | | | |
| Low point | | | | | |
| As left zero | | | | | |
| As left span | | | | | |

Average Correction Factor

### CH4 As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As found High point | 4921 | 79.2 | 7.91 | 8.00 | 0.990 |
| As found Mid point | 4960 | 39.6 | 3.96 | 3.93 | 1.007 |
| As found Low point | 4980 | 19.8 | 1.98 | 1.96 | 1.010 |
| New cylinder response | | | | | |
| Baseline Corr AF: | 8.00 | Prev response | 7.89 | *% change | 1.4% |
| Baseline Corr 2nd AF: | 3.93 | AF Slope: | 1.011209 | AF Intercept: | -0.029758 |
| Baseline Corr 3rd AF: | 1.96 | AF Correlation: | 0.999903 | * = > +/-5% change initiates investigation | |

### CH4 Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | | | | | |
| High point | | | | | |
| Mid point | | | | | |
| Low point | | | | | |
| As left zero | | | | | |
| As left span | | | | | |

Average Correction Factor

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.999013 | |
| THC Cal Offset: | -0.041938 | |
| CH4 Cal Slope: | 1.000221 | |
| CH4 Cal Offset: | -0.027957 | |
| NMHC Cal Slope: | 0.997951 | |
| NMHC Cal Offset: | -0.014182 | |

Calibration Performed By: Aswin Sasi Kumar

**NMHC Calibration Plot** Date: March 25, 2024 Location: Ells River

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | March 25, 2024 | Last Cal Date: | N/A |
| Start time (MST): | 12:28 | End time (MST): | 16:30 |
| Reason: | Install | | |

### 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 | |
| Zero Air Gen model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1193585649 | |
| THC Range: | 0 - 20 ppm | | NMHC/CH4 Range: | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | N/A | 3.64E-04 | NMHC SP Ratio: | N/A | 6.38E-05 |
| CH4 Retention time: | N/A | 17.0 | NMHC Peak Area: | N/A | 142822 |
| Zero Chromatogram: | OFF | OFF | Flat Baseline: | OFF | OFF |

### THC As Found Data

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

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

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4921 | 79.2 | 17.03 | 17.04 | 0.999 |
| Mid point | 4960 | 39.6 | 8.51 | 8.47 | 1.005 |
| Low point | 4980 | 19.8 | 4.26 | 4.17 | 1.021 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4921 | 79.2 | 17.03 | 17.72 | 0.961 |
| | | | | Average Correction Factor | 1.008 |

Notes: Install calibration. As left CH4 high.

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### NMHC As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | | | | | |
| As found High point | | | | | |
| As found Mid point | | | | | |
| As found Low point | | | | | |
| New cylinder response | | | | | |
| Baseline Corr AF: | NA | Prev response | NA | 47116 | |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### NMHC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4921 | 79.2 | 9.11 | 9.11 | 1.000 |
| Mid point | 4960 | 39.6 | 4.56 | 4.53 | 1.007 |
| Low point | 4980 | 19.8 | 2.28 | 2.23 | 1.020 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4921 | 79.2 | 9.11 | 9.19 | 0.992 |
| | | | | Average Correction Factor | 1.009 |

### CH4 As Found Data

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

### CH4 Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4921 | 79.2 | 7.91 | 7.93 | 0.999 |
| Mid point | 4960 | 39.6 | 3.96 | 3.95 | 1.003 |
| Low point | 4980 | 19.8 | 1.98 | 1.94 | 1.022 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4921 | 79.2 | 7.91 | 8.53 | 0.928 |
| | | | | Average Correction Factor | 1.008 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | 0.999013 | 1.001973 |
| THC Cal Offset: | -0.041938 | -0.044740 |
| CH4 Cal Slope: | 1.000221 | 1.003138 |
| CH4 Cal Offset: | -0.027957 | -0.021558 |
| NMHC Cal Slope: | 0.997951 | 1.001236 |
| NMHC Cal Offset: | -0.014182 | -0.023782 |

Calibration Performed By: Aswin Sasi Kumar

# Wood Buffalo Environmental Association

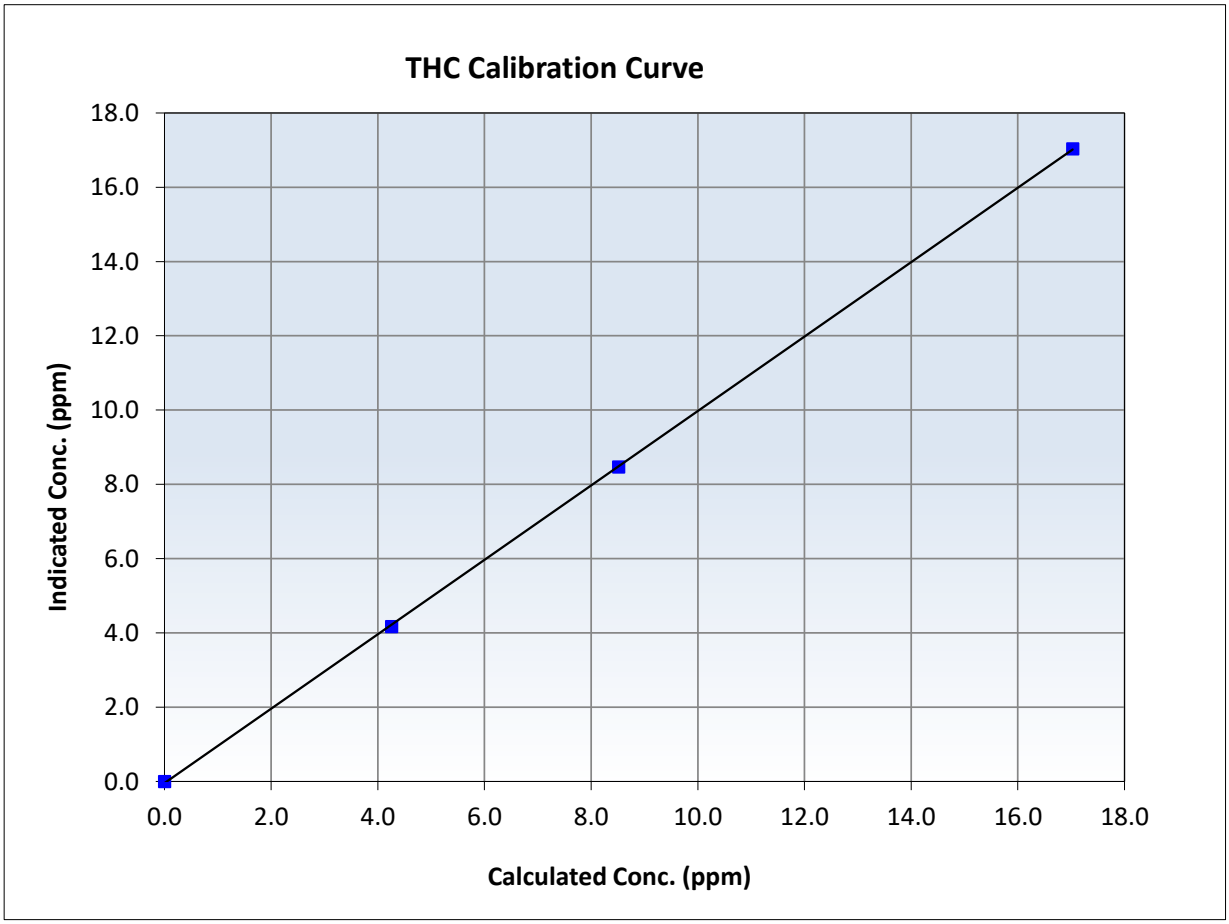
## THC Calibration Summary

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | N/A |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 12:28 | End Time (MST): | 16:30 |
| 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 | 0.999968 | ≥0.995 |
| 17.03 | 17.04 | 0.9995 | Slope | 1.001973 | 0.90 - 1.10 |
| 8.51 | 8.47 | 1.0050 | | | |
| 4.26 | 4.17 | 1.0207 | Intercept | -0.044740 | +/-0.5 |



# Wood Buffalo Environmental Association

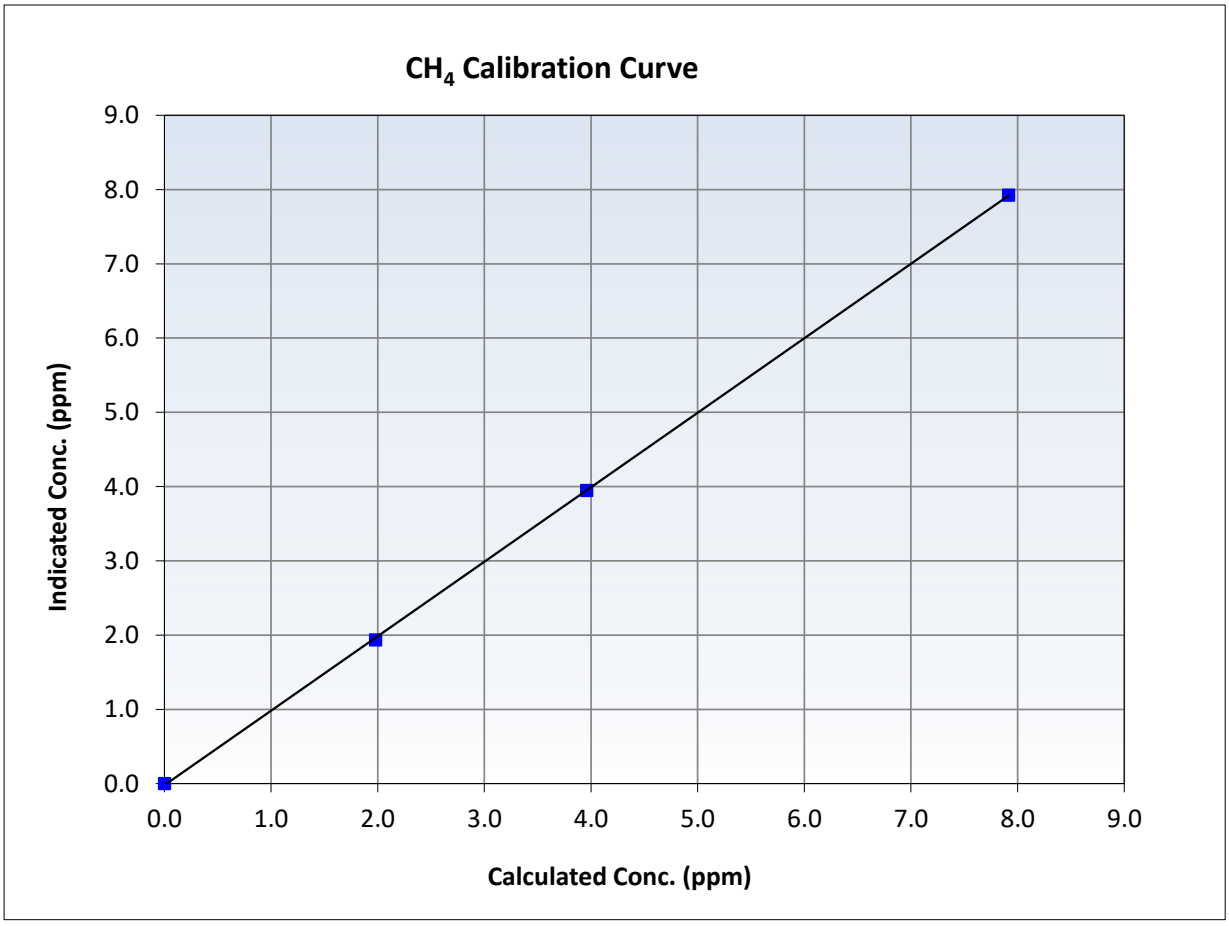
## $CH_4$ Calibration Summary

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | N/A |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 12:28 | End Time (MST): | 16:30 |
| 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 | 0.999963 | ≥0.995 |
| 7.91 | 7.93 | 0.9986 | Slope | 1.003138 | 0.90 - 1.10 |
| 3.96 | 3.95 | 1.0028 | | | |
| 1.98 | 1.94 | 1.0222 | Intercept | -0.021558 | +/-0.5 |



# Wood Buffalo Environmental Association

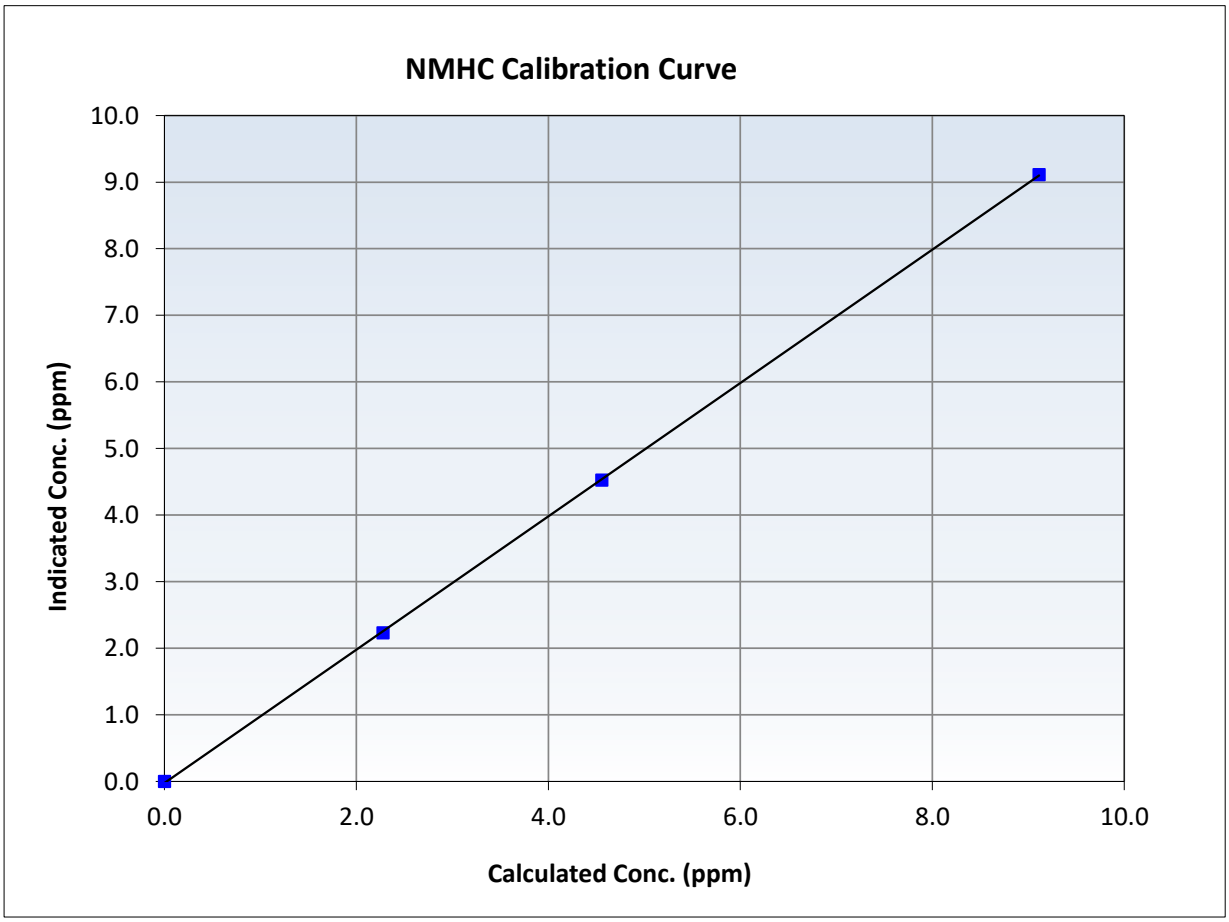
## NMHC Calibration Summary

### Station Information

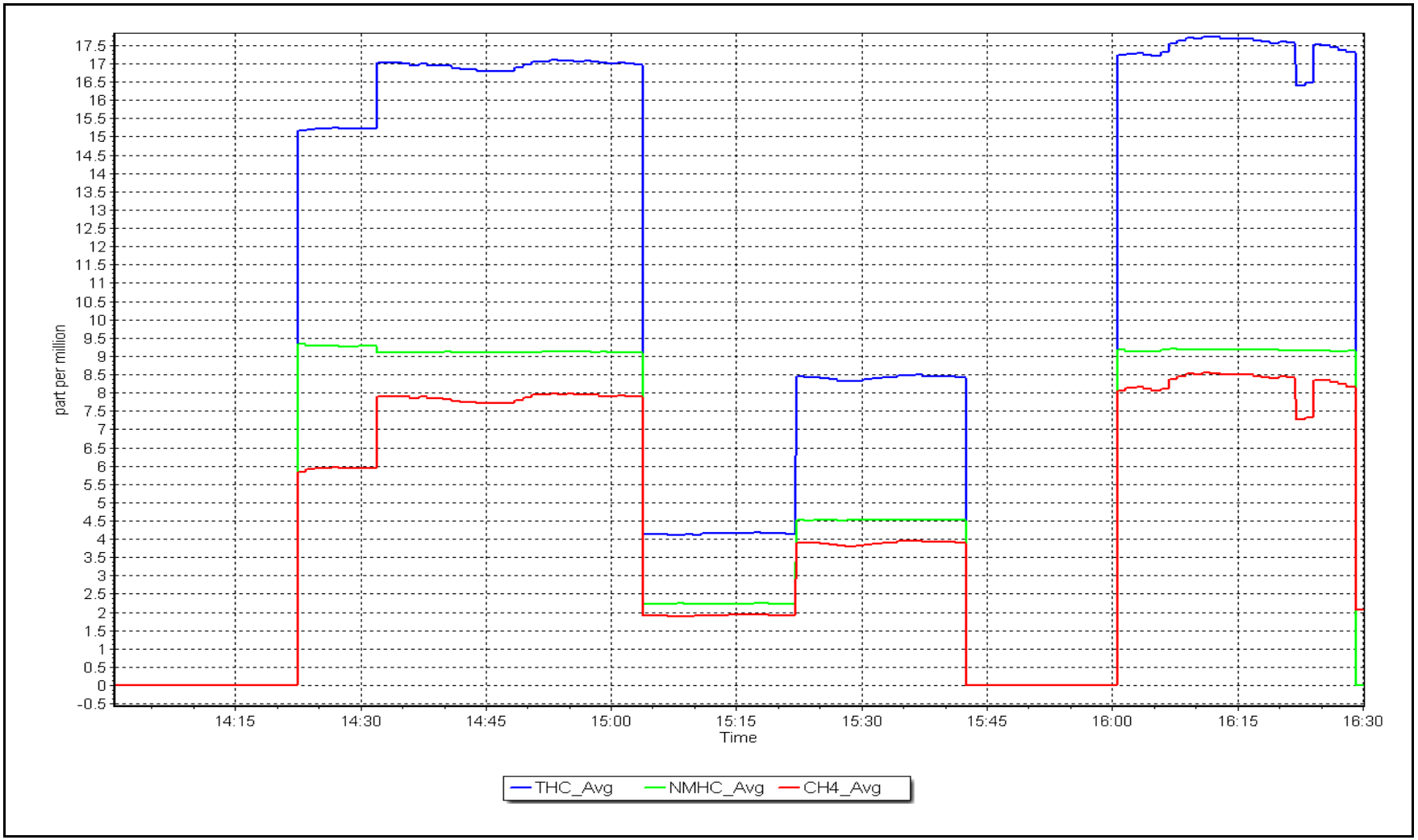
| | | | |
|---|---|---|---|
| Calibration Date: | March 25, 2024 | Previous Calibration: | N/A |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 12:28 | End Time (MST): | 16:30 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1193585649 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | *Limits* |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999969 | *≥0.995* |
| 9.11 | 9.11 | 1.0000 | Slope | 1.001236 | *0.90 - 1.10* |
| 4.56 | 4.53 | 1.0068 | Intercept | -0.023782 | *+/-0.5* |
| 2.28 | 2.23 | 1.0198 | | | |



**NMHC Calibration Plot** Date: March 25, 2024 Location: Ells River



# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Ells River | Station number: | AMS 30 |
| Calibration Date: | March 28, 2024 | Last Cal Date: | N/A |
| Start time (MST): | 13:43 | End time (MST): | 16:05 |
| Reason: | Install | | |

### 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 | |
| Zero Air Gen model: | API T701H | | Serial Number: | 358 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 55i | | Analyzer serial #: | 1152430011 | |
| THC Range: | 0 - 20 ppm | | NMHC/CH4 Range: | 0 - 10 ppm | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| CH4 SP Ratio: | N/A | 3.07E-04 | NMHC SP Ratio: | N/A | 6.43E-05 |
| CH4 Retention time: | N/A | 17.4 | NMHC Peak Area: | N/A | 141658 |
| Zero Chromatogram: | OFF | ON | Flat Baseline: | OFF | OFF |

### THC As Found Data

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

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

### THC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/(Ic-AFzero)) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4921 | 79.2 | 17.03 | 17.05 | 0.999 |
| Mid point | 4960 | 39.6 | 8.51 | 8.50 | 1.002 |
| Low point | 4980 | 19.8 | 4.26 | 4.22 | 1.010 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4921 | 79.2 | 17.03 | 17.14 | 0.994 |
| | | | | Average Correction Factor | 1.003 |

Notes: Install calibration. Adjusted zero and span. Use zero chromatogram.

# Wood Buffalo Environmental Association

## THC / $CH_4$ / NMHC Calibration Report

### NMHC As Found Data

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

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr AF: | NA | Prev response | NA | 47116 | |
| Baseline Corr 2nd AF: | NA | AF Slope: | | AF Intercept: | |
| Baseline Corr 3rd AF: | NA | AF Correlation: | | * = > +/-5% change initiates investigation | |

### NMHC Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4921 | 79.2 | 9.11 | 9.15 | 0.996 |
| Mid point | 4960 | 39.6 | 4.56 | 4.60 | 0.991 |
| Low point | 4980 | 19.8 | 2.28 | 2.29 | 0.996 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4921 | 79.2 | 9.11 | 9.28 | 0.982 |
| | | | | Average Correction Factor | 0.994 |

### CH4 As Found Data

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

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

### CH4 Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| High point | 4921 | 79.2 | 7.91 | 7.90 | 1.001 |
| Mid point | 4960 | 39.6 | 3.96 | 3.90 | 1.014 |
| Low point | 4980 | 19.8 | 1.98 | 1.93 | 1.027 |
| As left zero | 5000 | 0.0 | 0.00 | 0.00 | ---- |
| As left span | 4921 | 79.2 | 7.91 | 7.85 | 1.008 |
| | | | | Average Correction Factor | 1.014 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| THC Cal Slope: | NA | 1.002121 |
| THC Cal Offset: | NA | -0.024340 |
| CH4 Cal Slope: | NA | 1.000048 |
| CH4 Cal Offset: | NA | -0.029357 |
| NMHC Cal Slope: | NA | 1.003946 |
| NMHC Cal Offset: | NA | 0.005416 |

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

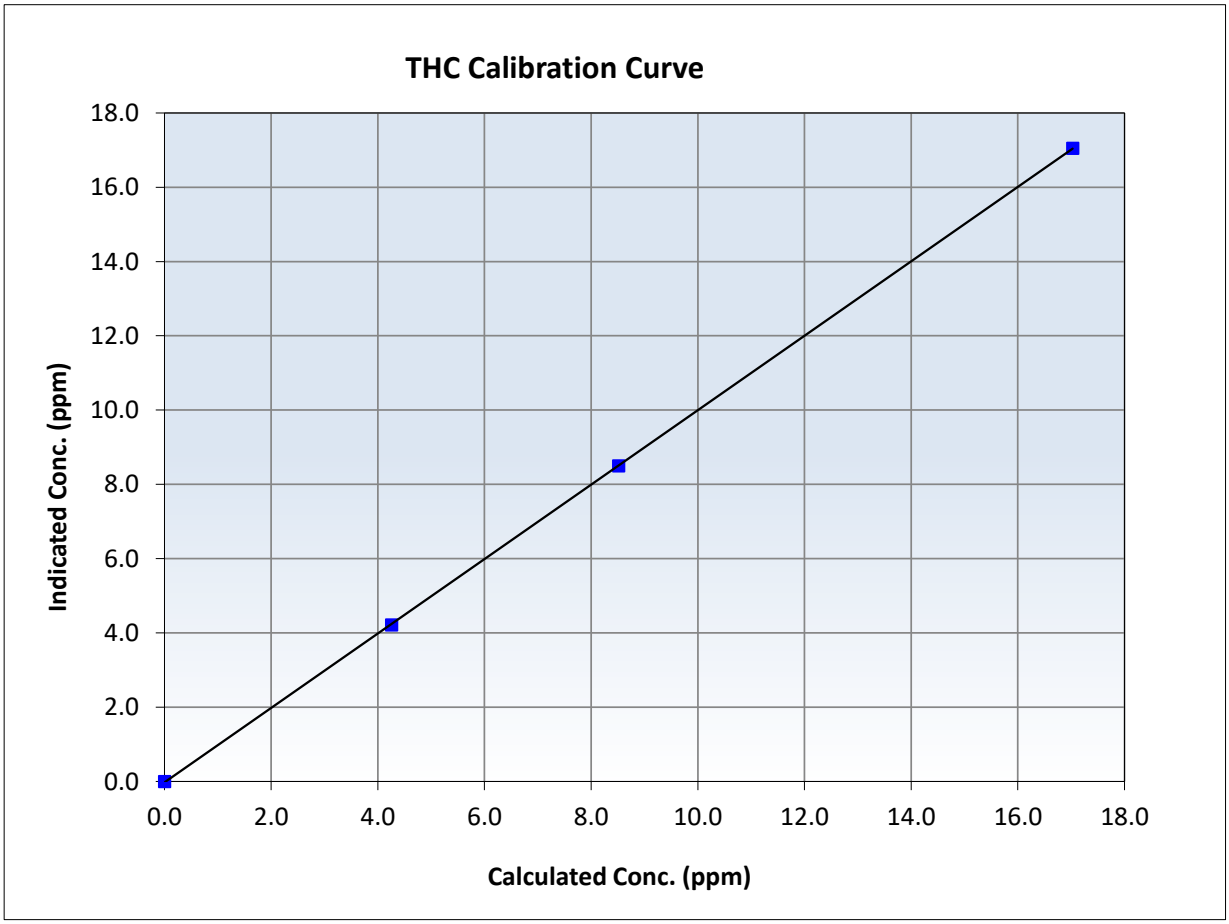
## THC Calibration Summary

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 28, 2024 | Previous Calibration: | N/A |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 13:43 | End Time (MST): | 16:05 |
| 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 | 0.999991 | ≥0.995 |
| 17.03 | 17.05 | 0.9987 | Slope | 1.002121 | 0.90 - 1.10 |
| 8.51 | 8.50 | 1.0017 | Intercept | -0.024340 | +/-0.5 |
| 4.26 | 4.22 | 1.0100 | | | |



# Wood Buffalo Environmental Association

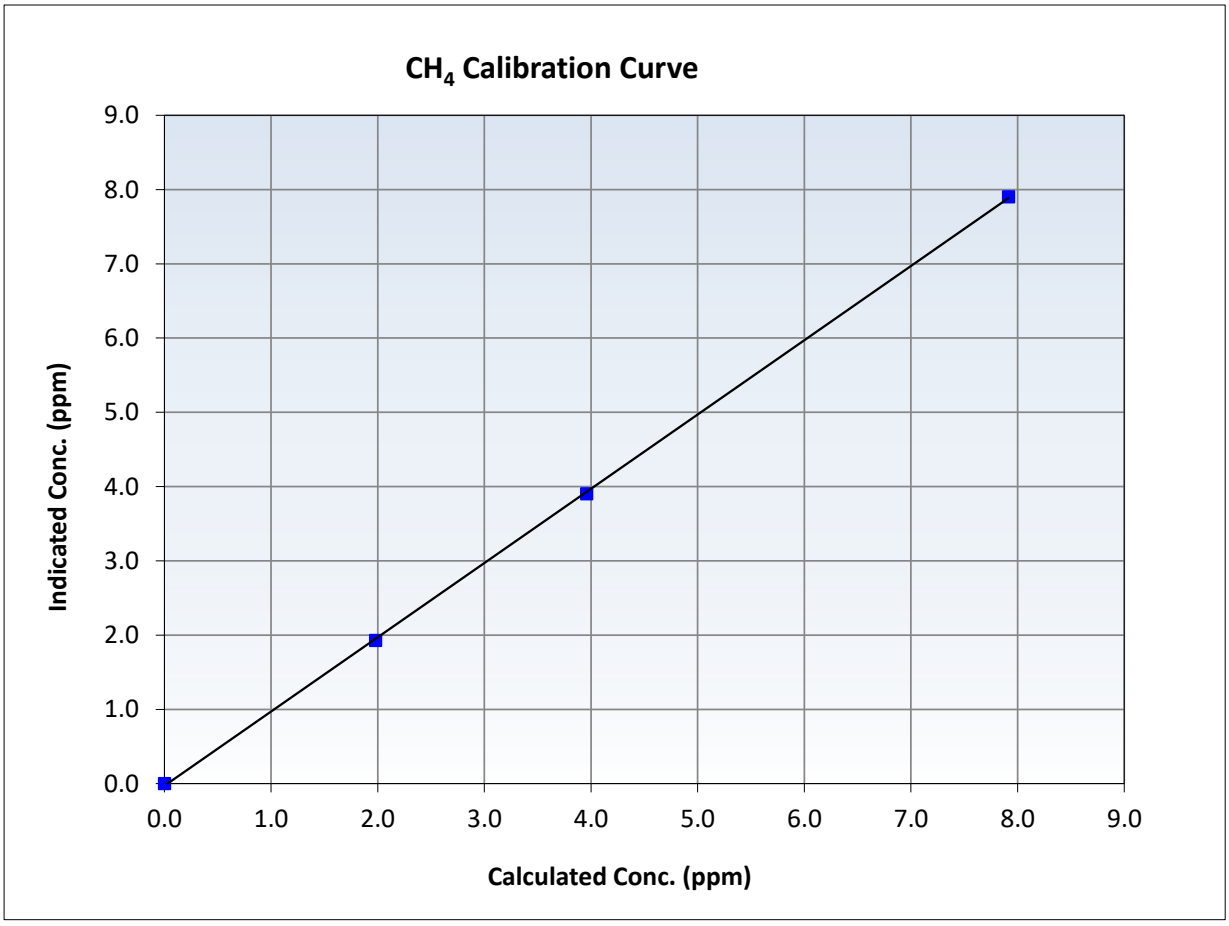
## $CH_4$ Calibration Summary

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 28, 2024 | Previous Calibration: | N/A |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 13:43 | End Time (MST): | 16:05 |
| 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 | 0.999932 | ≥0.995 |
| 7.91 | 7.90 | 1.0014 | Slope | 1.000048 | 0.90 - 1.10 |
| 3.96 | 3.90 | 1.0138 | | | |
| 1.98 | 1.93 | 1.0269 | Intercept | -0.029357 | +/-0.5 |



# Wood Buffalo Environmental Association

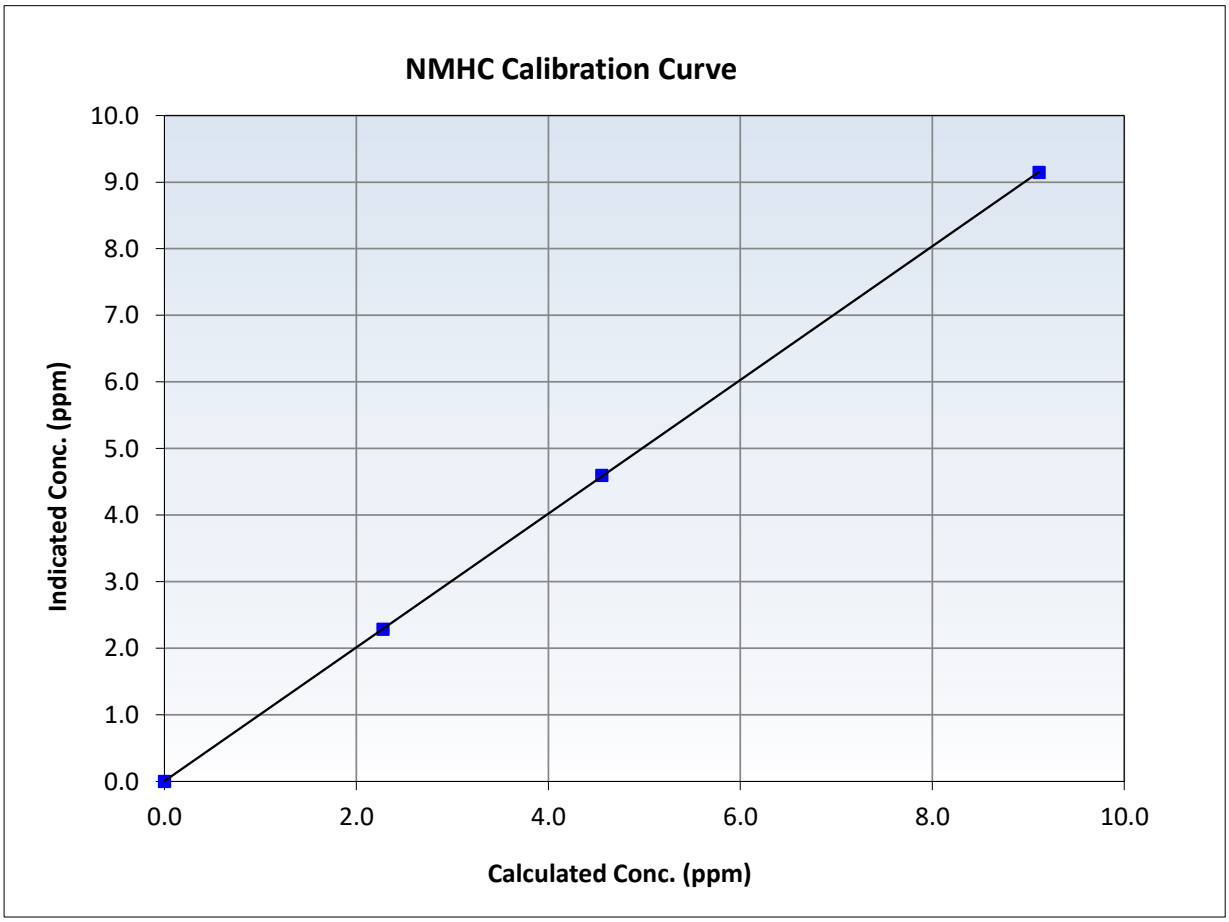
## NMHC Calibration Summary

### Station Information

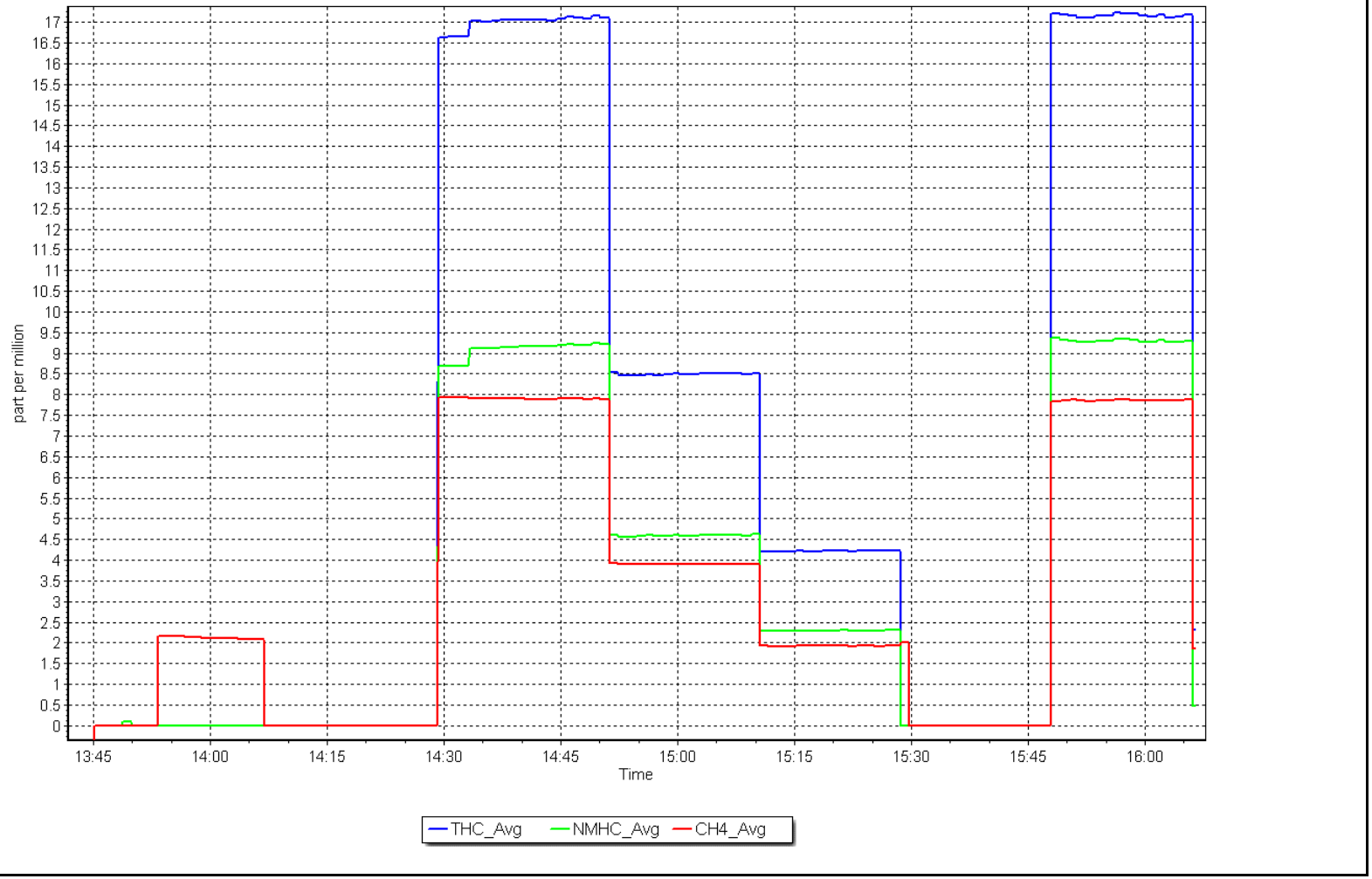
| | | | |
|---|---|---|---|
| Calibration Date: | March 28, 2024 | Previous Calibration: | N/A |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 13:43 | End Time (MST): | 16:05 |
| Analyzer make: | Thermo 55i | Analyzer serial #: | 1152430011 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.00 | 0.00 | ---- | Correlation Coefficient | 0.999991 | ≥0.995 |
| 9.11 | 9.15 | 0.9963 | Slope | 1.003946 | 0.90 - 1.10 |
| 4.56 | 4.60 | 0.9910 | Intercept | 0.005416 | +/-0.5 |
| 2.28 | 2.29 | 0.9958 | | | |



**NMHC Calibration Plot** Date: March 28, 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: | March 8, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 9:39 | End time (MST): | 14:08 |
| 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 #: | | NA | Removed Gas Exp Date: | NA | |
| Removed Gas NOX Conc: | 59.3 | ppm | Removed Gas NO Conc: | 59.1 | 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: | 1.182 | 1.182 | NO bkgnd or offset: | 14.0 | 13.9 |
| NOX coeff or slope: | 0.994 | 0.994 | NOX bkgnd or offset: | 13.9 | 13.8 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 188.7 | 192.4 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 0.998634 | 0.999616 |
| $NO_X$ Cal Offset: | -0.718485 | -0.638284 |
| NO Cal Slope: | 0.999588 | 1.002443 |
| NO Cal Offset: | -1.719843 | -1.418930 |
| $NO_2$ Cal Slope: | 1.005754 | 0.996723 |
| $NO_2$ Cal Offset: | 0.149457 | -0.460536 |

# 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 | 807.4 | 804.4 | 3.0 | 0.9945 | 0.9949 |
| 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 | 4932 | 67.7 | 803.0 | 800.3 | 2.7 | 802.2 | 801.4 | 1.0 | 1.0010 | 0.9986 |
| second point | 4966 | 33.8 | 400.9 | 399.5 | 1.4 | 400.3 | 398.7 | 1.6 | 1.0015 | 1.0021 |
| third point | 4983 | 16.9 | 200.4 | 199.8 | 0.7 | 198.6 | 197.2 | 1.4 | 1.0093 | 1.0130 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| as left span | 4932 | 67.7 | 803.0 | 423.2 | 379.8 | 805.0 | 425.8 | 379.7 | 0.9975 | 0.9938 |
| | | | | | | | | Average Correction Factor | 1.0039 | 1.0046 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 807.5 ppb | NO = 804.6 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.8% |
| Previous Response | $NO_X$ = 801.2 ppb | NO = 798.2 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) | 798.5 | 421.4 | 379.8 | 378.5 | 1.0035 | 99.7% |
| 2nd GPT point (200 ppb O3) | 798.5 | 613.5 | 187.7 | 186.0 | 1.0092 | 99.1% |
| 3rd GPT point (100 ppb O3) | 798.5 | 702.7 | 98.5 | 97.4 | 1.0114 | 98.9% |
| | | | | Average Correction Factor | 1.0080 | 99.2% |

Notes: Changed sample inlet filters after as founds. No adjustment made.

Calibration Performed By: Jan Castro

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

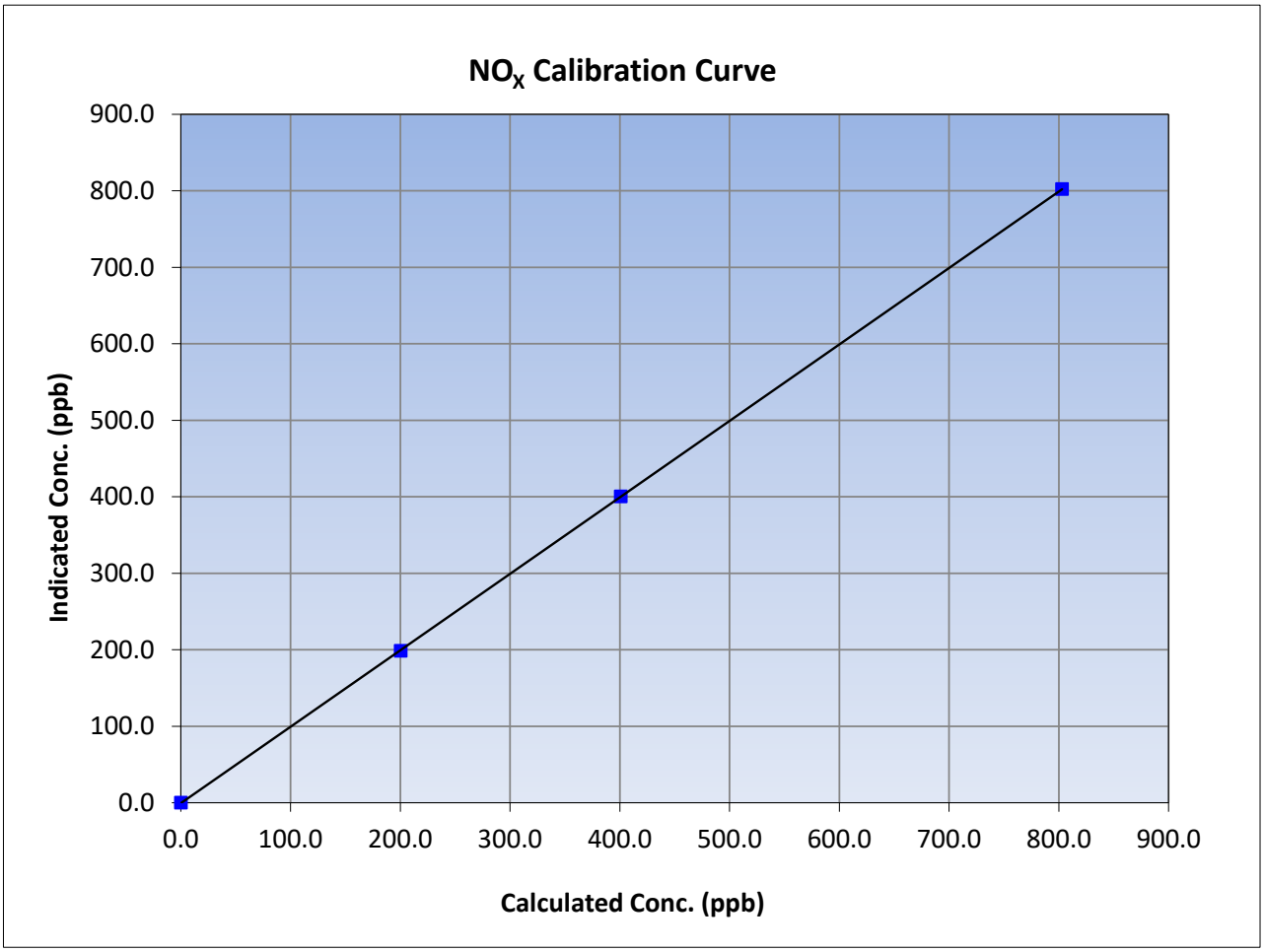
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 9:39 | End Time (MST): | 14:08 |
| 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 | 0.999995 | ≥0.995 |
| 803.0 | 802.2 | 1.0010 | | | |
| 400.9 | 400.3 | 1.0015 | Slope | 0.999616 | 0.90 - 1.10 |
| 200.4 | 198.6 | 1.0093 | | | |
| | | | Intercept | -0.638284 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

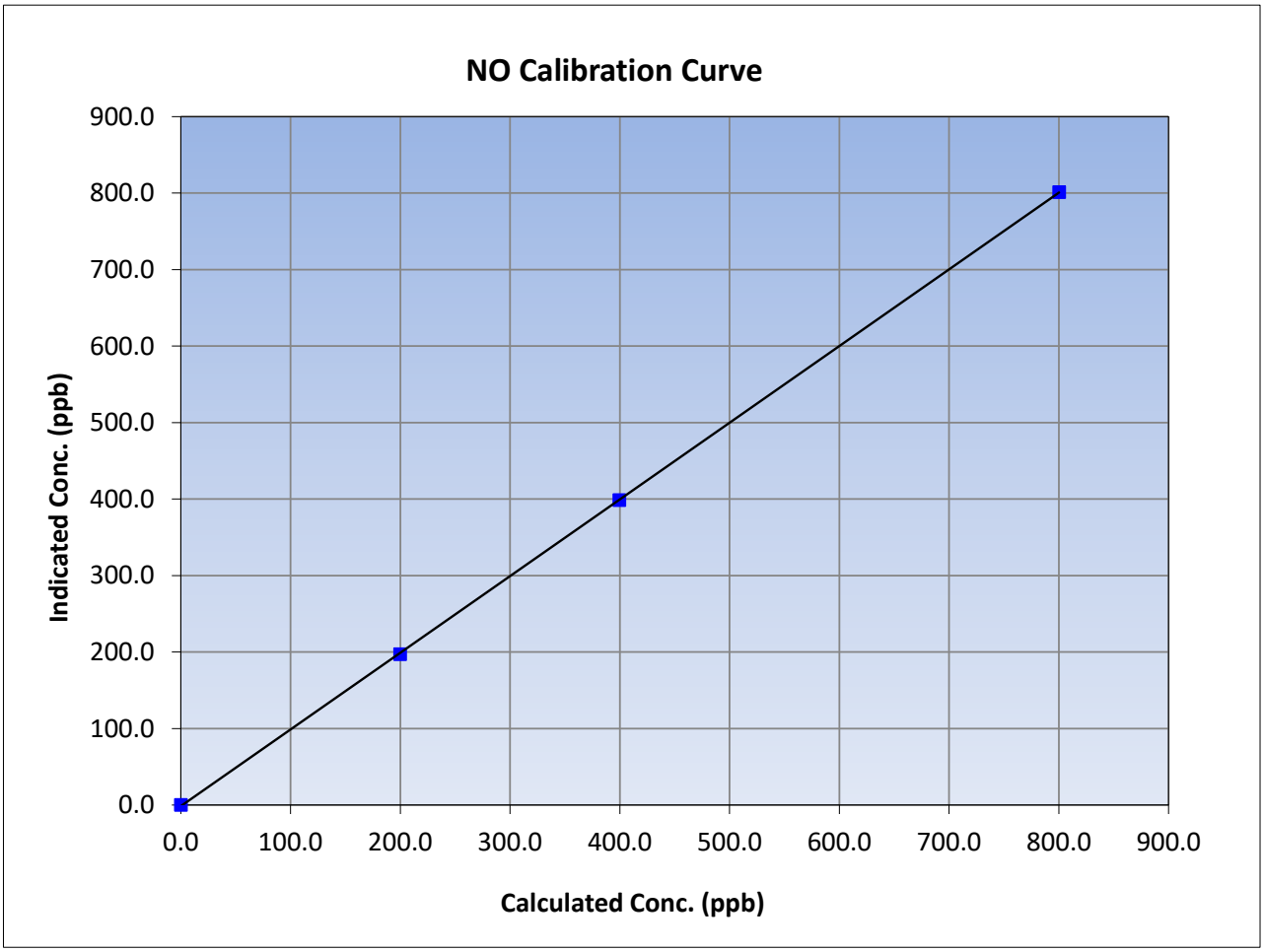
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 9:39 | End Time (MST): | 14:08 |
| 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 | 0.0 | ---- | Correlation Coefficient | 0.999985 | ≥0.995 |
| 800.3 | 801.4 | 0.9986 | | | |
| 399.5 | 398.7 | 1.0021 | Slope | 1.002443 | 0.90 - 1.10 |
| 199.8 | 197.2 | 1.0130 | | | |
| | | | Intercept | -1.418930 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

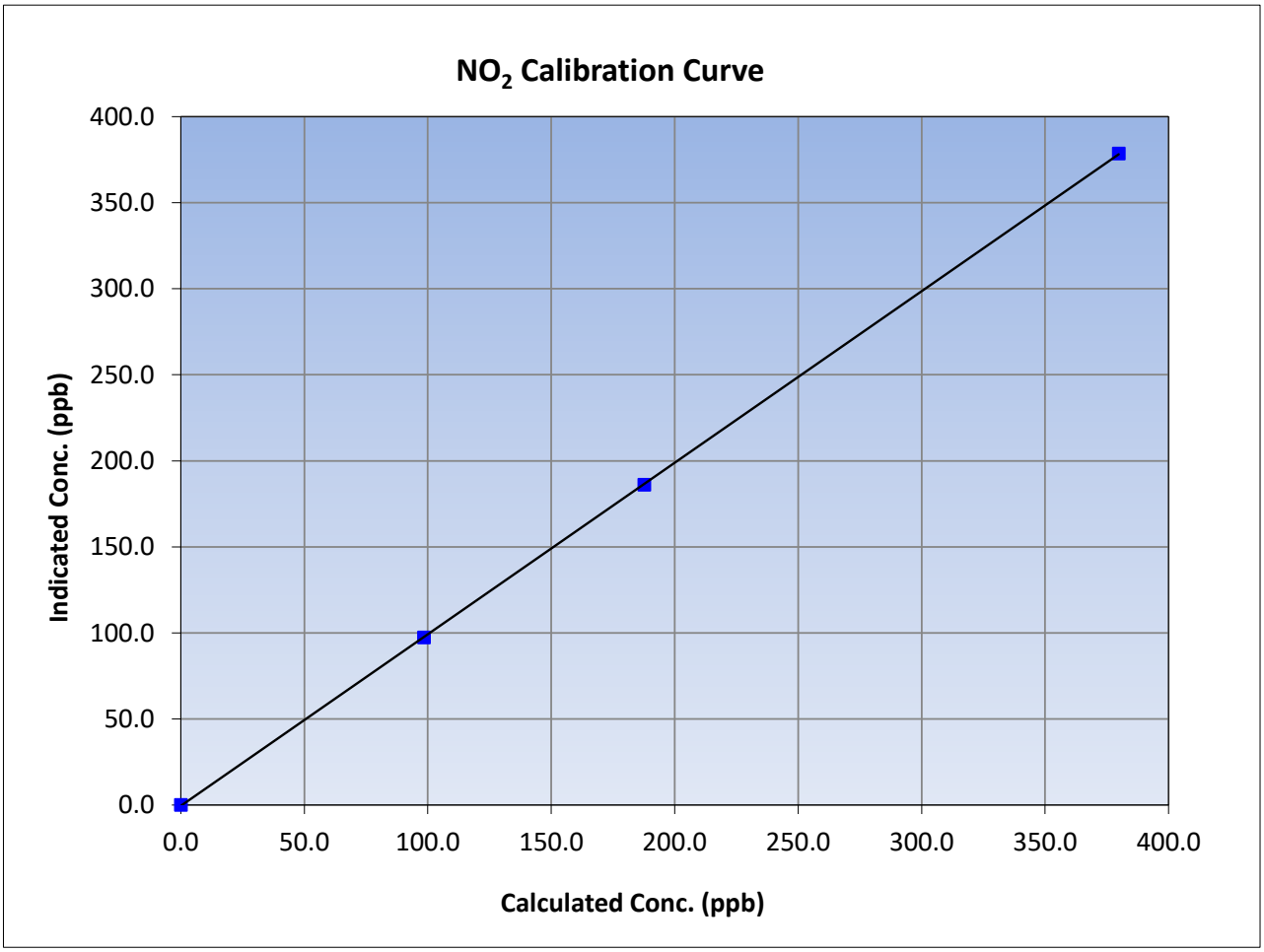
Version-04-2020

### Station Information

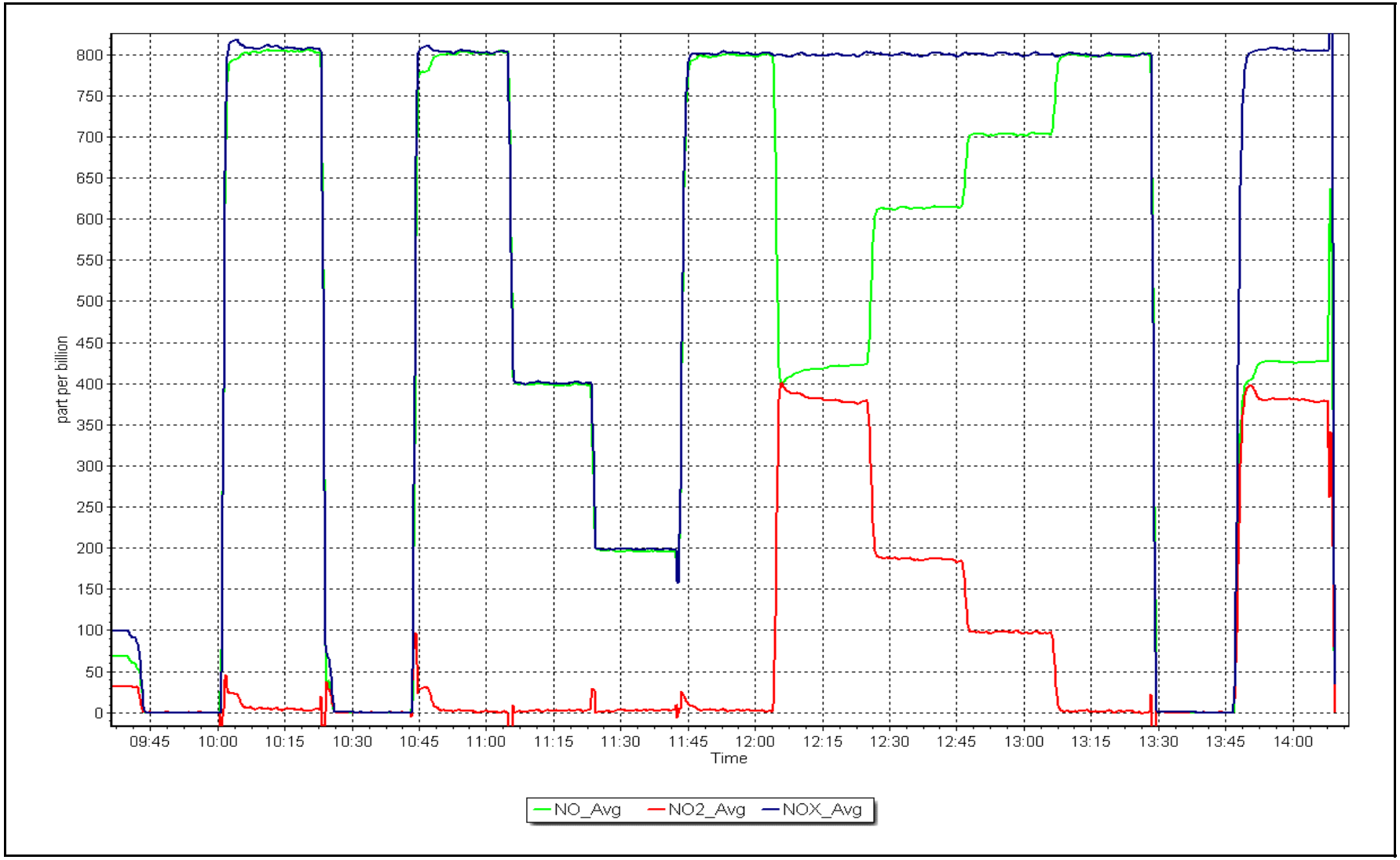
| | | | |
|---|---|---|---|
| Calibration Date: | March 8, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Ells River | Station Number: | AMS 30 |
| Start Time (MST): | 9:39 | End Time (MST): | 14:08 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 710321429 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.1 | ---- | Correlation Coefficient | 0.999987 | ≥0.995 |
| 379.8 | 378.5 | 1.0035 | | | |
| 187.7 | 186.0 | 1.0092 | Slope | 0.996723 | 0.90 - 1.10 |
| 98.5 | 97.4 | 1.0114 | | | |
| | | | Intercept | -0.460536 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 8, 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: | March 8, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 11:06 | End time (MST): | 11:18 |
| 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) | -2.90 | -3.02 | -2.90 | ☐ | +/- 2 °C |
| P (mmHg) | 731.40 | 733.13 | 731.40 | ☐ | +/- 10 mmHg |
| Flow (LPM) | 5.01 | 5.03 | 5.01 | ☐ | +/- 0.25 LPM |
| PW% (pump) | 52.00 | ----- | 52.00 | ☐ | >80% |
| Zero Verification | PM w/o HEPA: | 10.60 | 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: 10.90 — 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
## MARCH 2024

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

April 30, 2024

CALS_562

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station number: | AMS501 |
| Calibration Date: | March 15, 2024 | Last Cal Date: | February 8, 2024 |
| Start time (MST): | 8:35 | End time (MST): | 11:19 |
| 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: | 1.003086 | 1.007642 | Backgd or Offset: | 19.8 | 19.8 |
| Calibration intercept: | -1.136075 | -1.456115 | 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 | -0.1 | ---- |
| as found span | 4921 | 79.2 | 800.2 | 804.1 | 0.995 |
| 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 | 805.2 | 0.994 |
| second point | 4960 | 39.6 | 400.2 | 402.3 | 0.995 |
| third point | 4980 | 19.8 | 200.1 | 197.7 | 1.012 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4921 | 79.2 | 800.2 | 808.2 | 0.990 |
| | | | | Average Correction Factor | 1.000 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 804.20 | Previous response | 801.54 | *% 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 inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

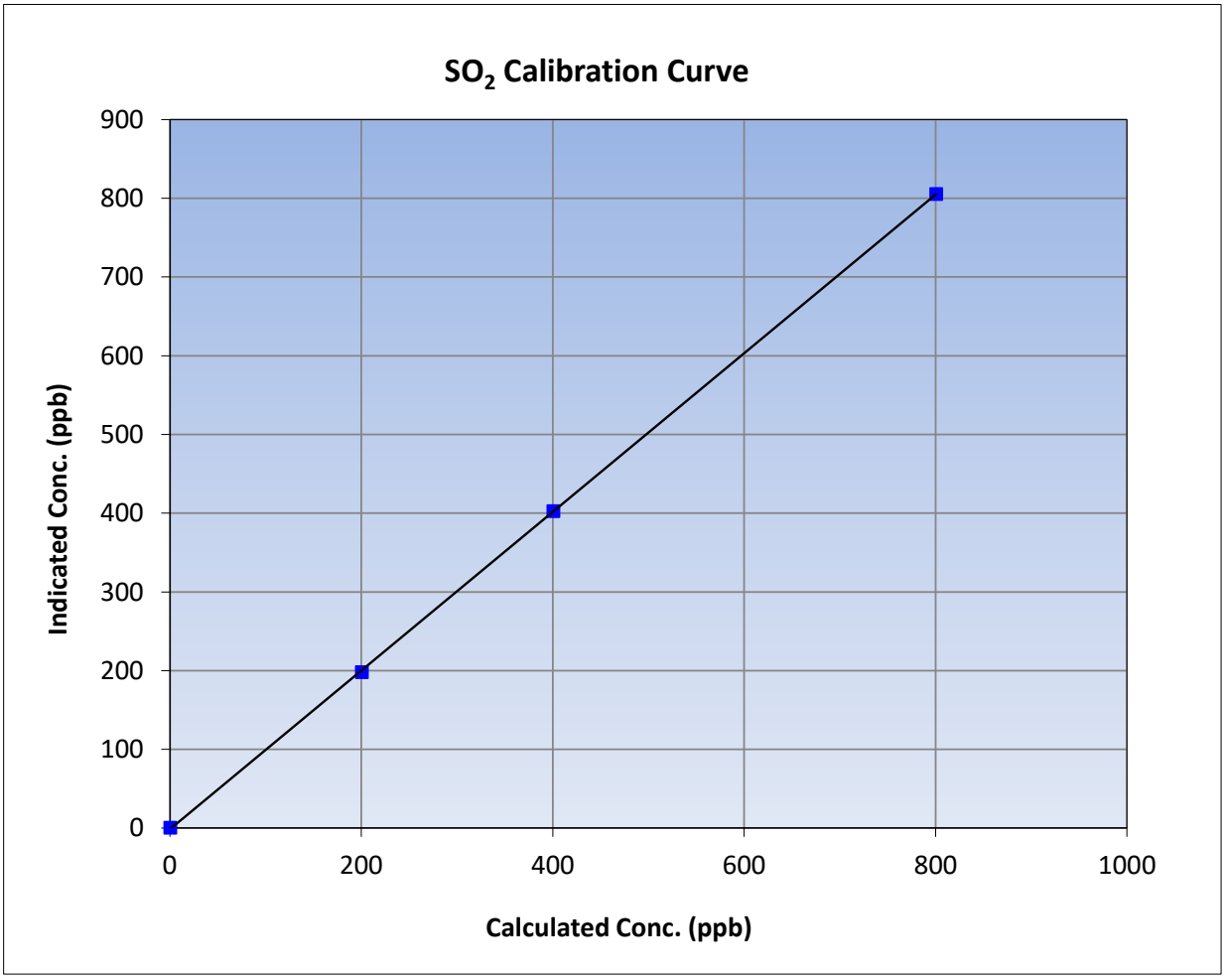
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 10:02 | End Time (MST): | 11:19 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1160290011 |

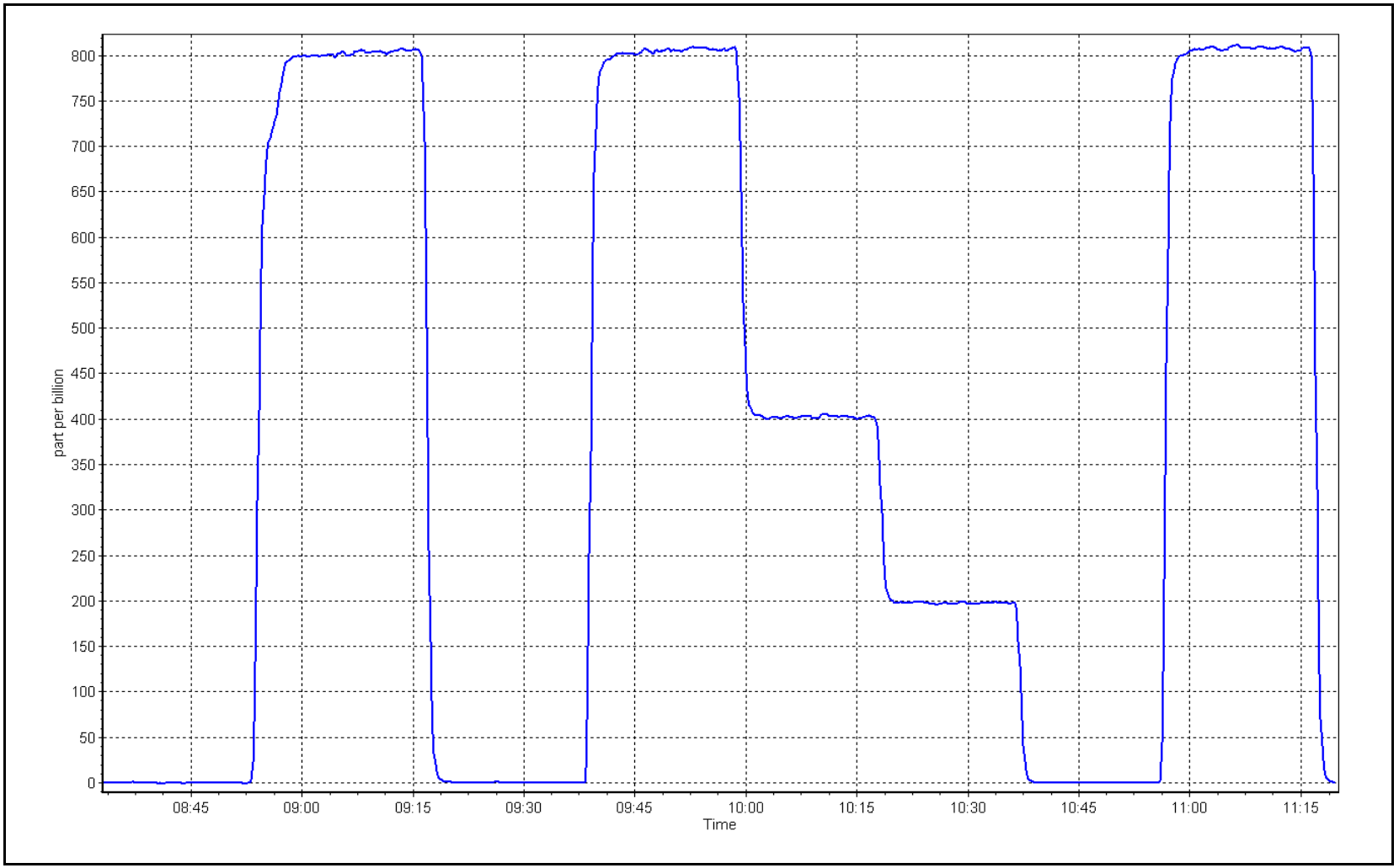
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.1 | ---- |
| 800.2 | 805.2 | 0.9938 |
| 400.2 | 402.3 | 0.9947 |
| 200.1 | 197.7 | 1.0120 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999975 | *≥0.995* |
| Slope | 1.007642 | *0.90 - 1.10* |
| Intercept | -1.456115 | *+/-30* |



**SO2 Calibration Plot** Date: March 15, 2024 Location: Leismer



# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station number: | AMS 501 |
| Calibration Date: | April 8, 2024 | Last Cal Date: | March 15, 2024 |
| Start time (MST): | 11:25 | End time (MST): | 12:55 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 50.52 | ppm | Cal Gas Exp Date: | December 29, 2028 |
| Cal Gas Cylinder #: | CC274266 | | | |
| Removed Cal Gas Conc: | 50.52 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 2659 |
| Zero Air Gen Model: | Teledyne API T701 | | Serial Number: | 4427 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 43i | | Serial Number: | 1160290011 | |
| Analyzer Range: | 0-1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.007642 | NA | Backgd or Offset: | 19.8 | 19.9 |
| Calibration intercept: | -1.456115 | NA | Coeff or Slope: | 0.981 | 0.981 |

### $SO_2$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| As found High point | 4921 | 79.2 | 800.2 | 804.0 | 0.995 |
| As found Mid point | 4960 | 39.6 | 400.2 | 400.7 | 0.998 |
| As found Low point | 4980 | 19.8 | 200.1 | 197.2 | 1.013 |
| New cylinder response | | | | | |
| Baseline Corr As found: | 804.3 | Previous response | 804.9 | *% change | -0.1% |
| Baseline Corr 2nd AF pt: | 401.0 | AF Slope: | 1.006485 | AF Intercept: | -1.976071 |
| Baseline Corr 3rd AF pt: | 197.5 | AF Correlation: | 0.999978 | * = > +/-5% change initiates investigation | |

### $SO_2$ Calibration Data

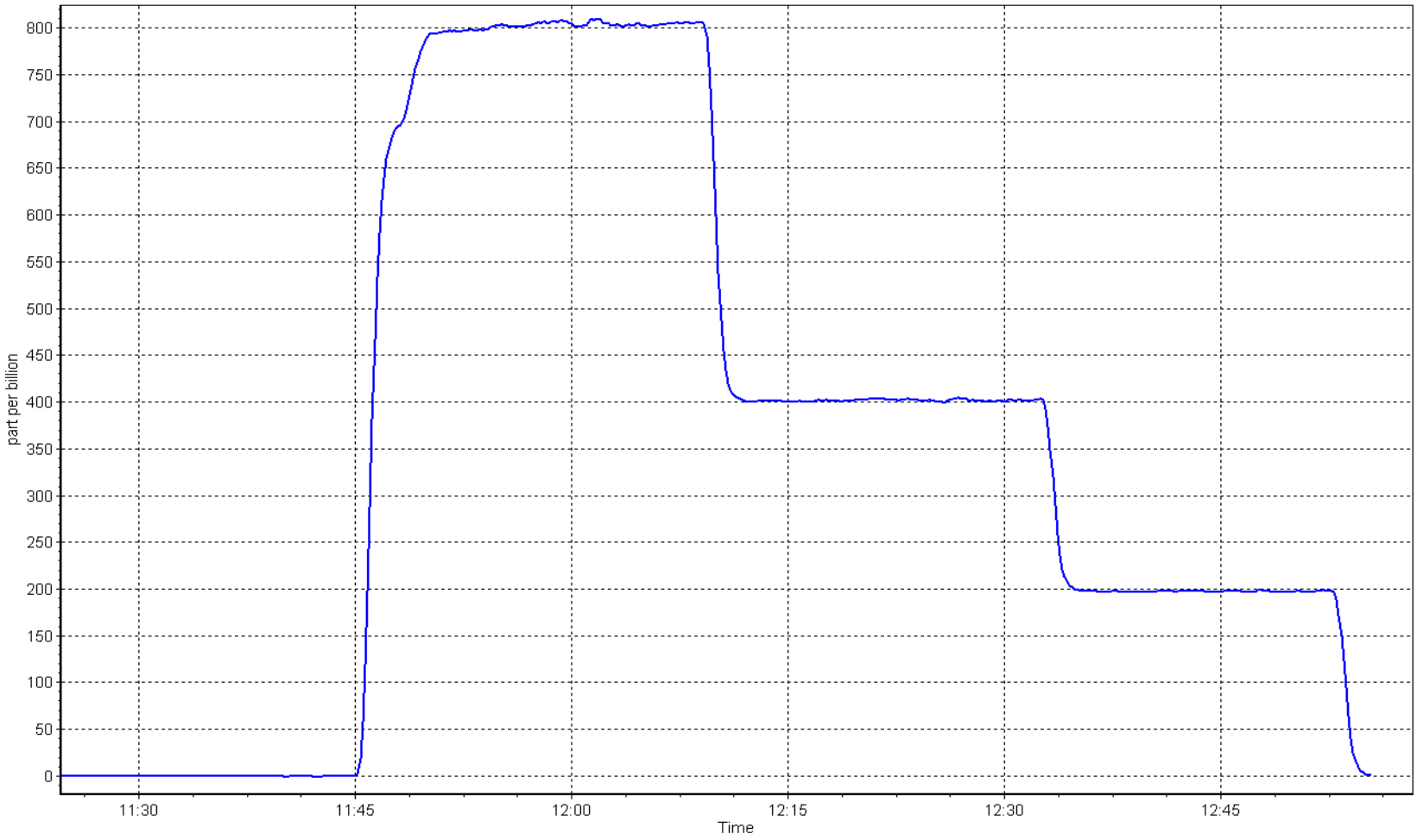
| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | | | | | |
| High point | | | | | |
| Mid point | | | | |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

Average Correction Factor:

Notes: As founds completed for station removal planned for April 10.

Calibration Performed By: Braiden Boutilier

**SO2 Calibration Plot** Date: April 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: | March 13, 2024 | Last Cal Date: | February 7, 2024 |
| Start time (MST): | 8:31 | End time (MST): | 12:28 |
| 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: | 1.011575 | 1.010290 | Backgd or Offset: | 3.57 | 3.57 |
| Calibration intercept: | -0.158186 | -0.138211 | 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 | 80.1 | 0.997 |
| as found 2nd point | 4961 | 38.9 | 40.0 | 40.2 | 0.992 |
| as found 3rd point | 4981 | 19.4 | 19.9 | 19.7 | 1.007 |
| 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 | 80.7 | 0.991 |
| 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 | 80.8 | 0.990 |
| SO2 Scrubber Check | 4921 | 79.2 | 792.0 | 0.0 | ---- |
| Date of last scrubber change: | | 24-Feb-23 | | Ave Corr Factor | 0.997 |
| Date of last converter efficiency test: | | December 1, 2022 | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.2 | Prev response: | 80.75 | *% change: | -0.7% |
| Baseline Corr 2nd AF pt: | 40.3 | AF Slope: | 1.003860 | AF Intercept: | -0.138334 |
| Baseline Corr 3rd AF pt: | 19.8 | AF Correlation: | 0.999979 | | |

* = > +/-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

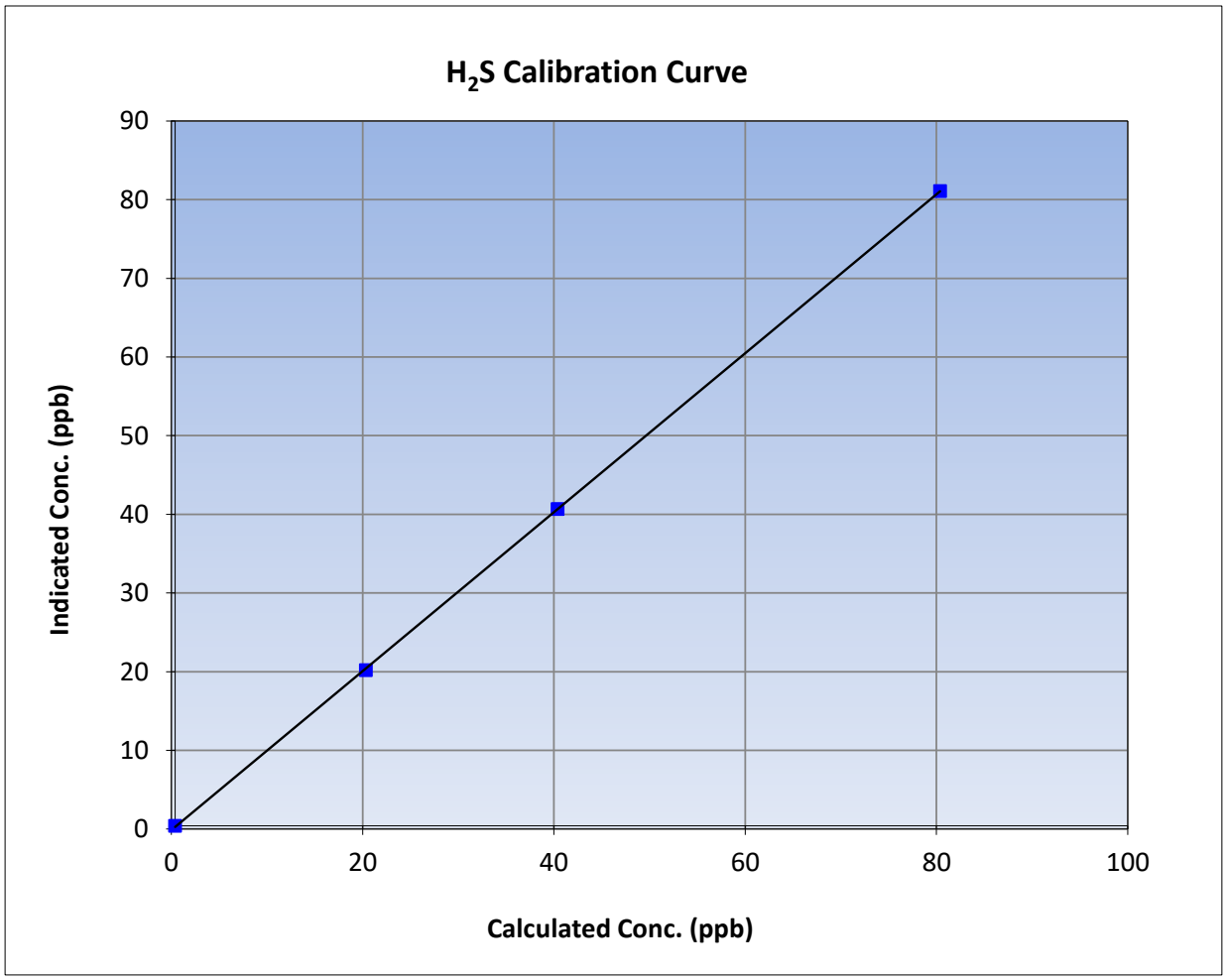
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 7, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 8:31 | End Time (MST): | 12:28 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1180540020 |

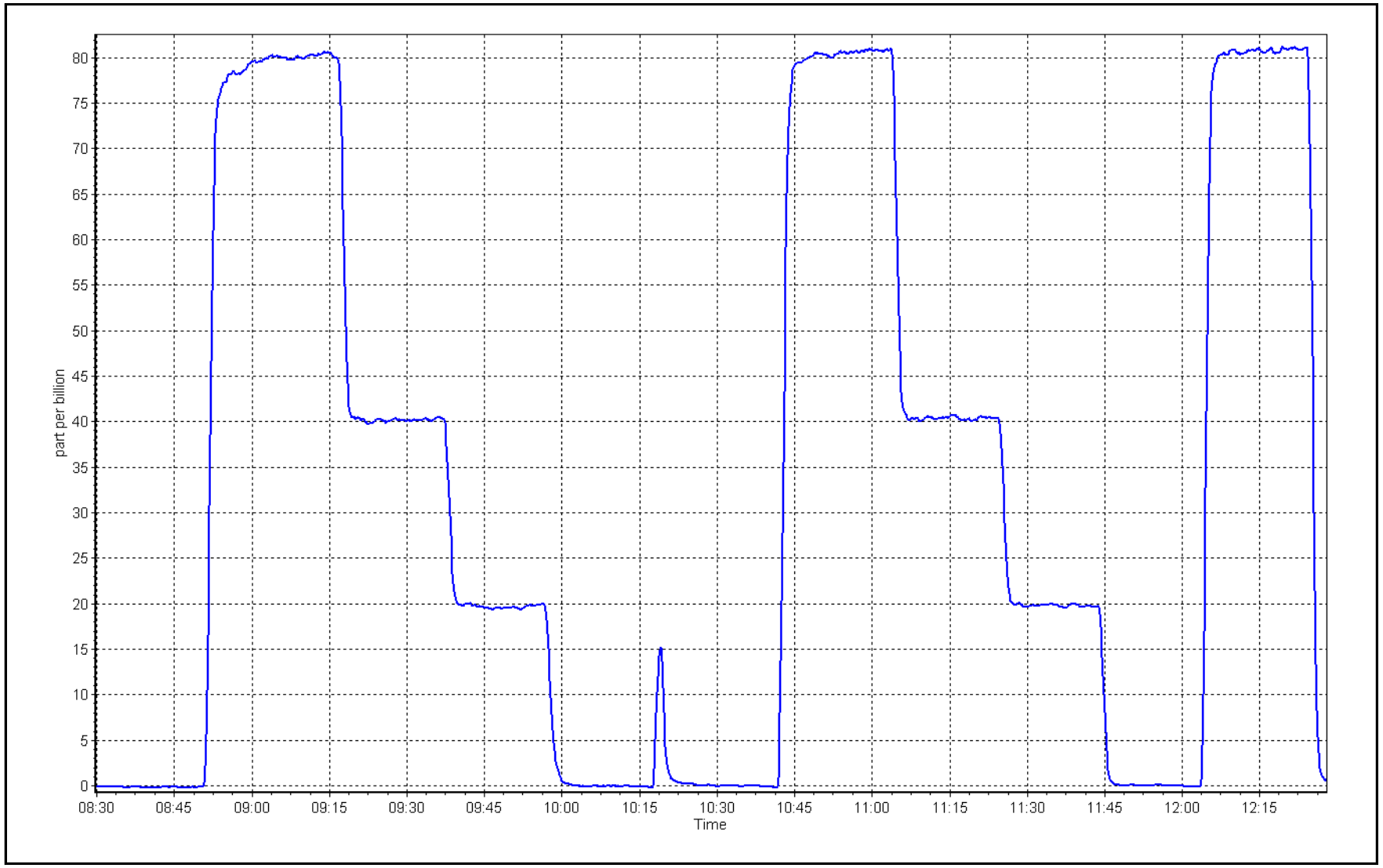
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 80.7 | 0.9911 |
| 40.0 | 40.3 | 0.9923 |
| 19.9 | 19.8 | 1.0072 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999982 | *≥0.995* |
| Slope | 1.010290 | *0.90 - 1.10* |
| Intercept | -0.138211 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 13, 2024 Location: Leismer



# Wood Buffalo Environmental Association

## H2S Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station number: | AMS 501 |
| Calibration Date: | April 8, 2024 | Last Cal Date: | March 13, 2024 |
| Start time (MST): | 12:53 | End time (MST): | 14:50 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.14 | ppm | Cal Gas Exp Date: | September 16, 2024 |
| Cal Gas Cylinder #: | CC511843 | | | |
| Removed Cal Gas Conc: | 5.14 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 2659 |
| ZAG Make/Model: | Teledyne API T701 | | 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 | | Converter Temp: | 325.0 degC |

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 1.010290 | NA | Backgd or Offset: | 3.57 | 3.61 |
| Calibration intercept: | -0.138211 | NA | Coeff or Slope: | 1.128 | 1.128 |

### H2S As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.0 | -0.2 | ---- |
| As found High point | 4922 | 77.8 | 80.0 | 80.4 | 0.992 |
| As found Mid point | 4961 | 38.9 | 40.0 | 40.4 | 0.985 |
| As found Low point | 4981 | 19.4 | 19.9 | 19.6 | 1.007 |
| New cylinder response | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.6 | Prev response: | 80.67 | *% change: | -0.1% |
| Baseline Corr 2nd AF pt: | 40.6 | AF Slope: | 1.009433 | AF Intercept: | -0.258261 |
| Baseline Corr 3rd AF pt: | 19.8 | AF Correlation: | 0.999953 | * = > +/-5% change initiates investigation | |

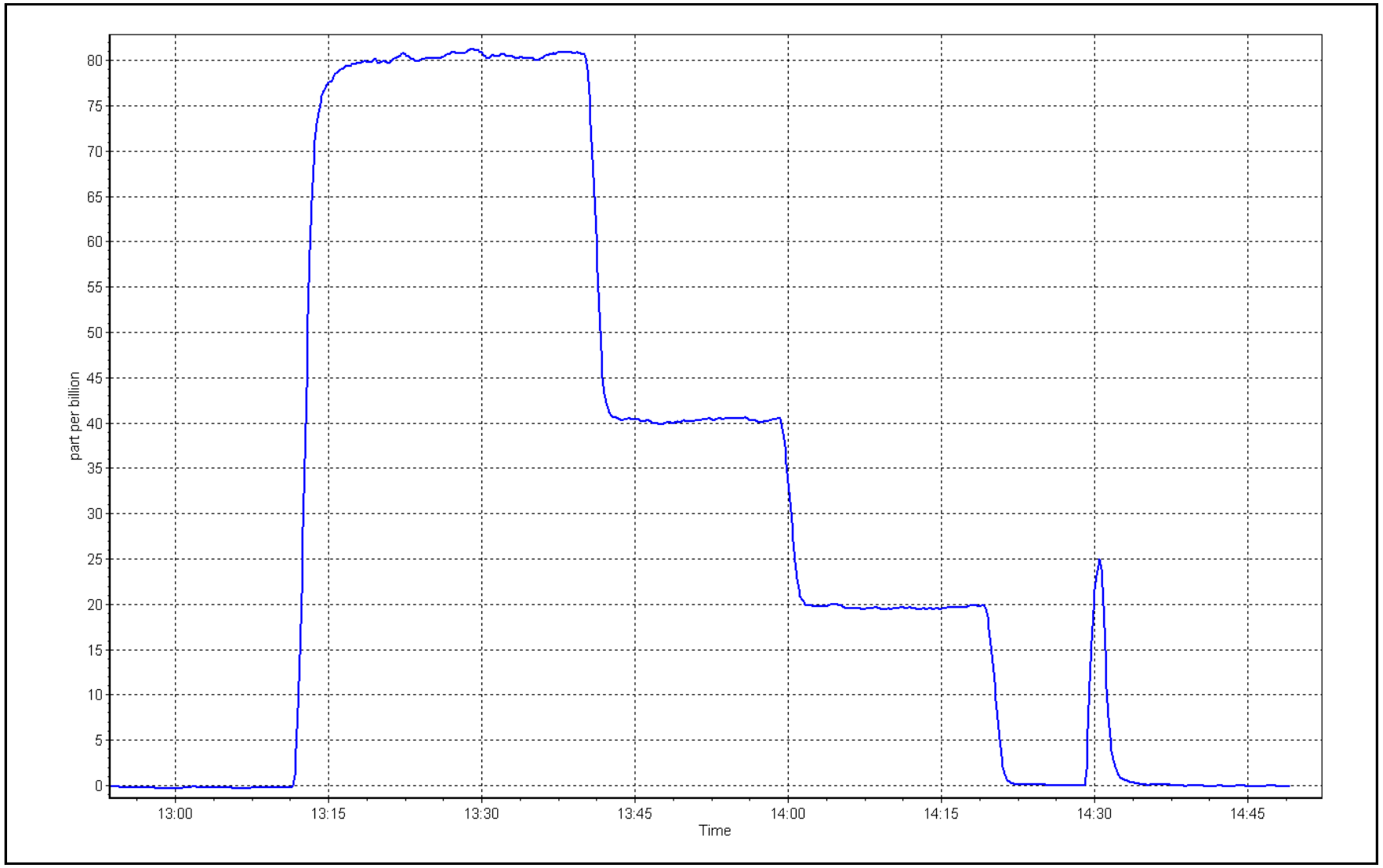
### H2S Calibration Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | | | | | |
| High point | | | | | |
| Mid point | | | | | |
| Low point | | | | | |
| As left zero | | | | | |
| As left span | | | | | |
| SO2 Scrubber Check | 4921 | 79.2 | 800.2 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | |
| Date of last converter efficiency test: | | | | | |

Notes: As founds completed for station removal planned for April 10. Scrubber check passed.

Calibration Performed By: Braiden Boutilier

**H2S Calibration Plot** Date: April 8, 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: | March 26, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 8:34 | End time (MST): | 12:55 |
| 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: | 166.5 | 166.5 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.006425 | 1.003601 |
| $NO_X$ Cal Offset: | -3.447999 | -2.208002 |
| NO Cal Slope: | 1.006912 | 1.004712 |
| NO Cal Offset: | -4.347977 | -3.327979 |
| $NO_2$ Cal Slope: | 0.999948 | 1.002364 |
| $NO_2$ Cal Offset: | 0.272718 | 0.612715 |

# 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 | 0.3 | ---- | ---- |
| as found span | 4916 | 84.4 | 801.1 | 799.9 | 1.2 | 812.4 | 809.5 | 2.8 | 0.9860 | 0.9881 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | ---- | ---- |
| high point | 4916 | 84.4 | 801.1 | 799.9 | 1.2 | 802.5 | 801.6 | 0.9 | 0.9982 | 0.9979 |
| second point | 4958 | 42.2 | 400.5 | 400.0 | 0.6 | 399.9 | 398.0 | 1.9 | 1.0016 | 1.0049 |
| third point | 4979 | 21.1 | 200.3 | 200.0 | 0.3 | 195.5 | 193.5 | 2.0 | 1.0244 | 1.0335 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | ---- | ---- |
| as left span | 4916 | 84.4 | 801.1 | 400.4 | 400.7 | 800.7 | 403.0 | 397.8 | 1.0005 | 0.9935 |
| | | | | | | | | Average Correction Factor | 1.0081 | 1.0121 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 812.3 ppb | NO = 809.7 ppb | * = > +/-5% change initiates investigation | | *Percent Change | $NO_X$ = | 1.2% |
| Previous Response | $NO_X$ = 802.8 ppb | NO = 801.1 ppb | | | *Percent Change | NO = | 1.1% |
| Baseline Corr 2nd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | $NO_X$ $r^2$: | Nx Sl: | Nx Int: | |
| Baseline Corr 3rd pt | $NO_X$ = NA ppb | NO = NA ppb | As found | NO $r^2$: | NO Sl: | NO Int: | |
| | | | As found | $NO_2$ $r^2$: | NO2 Sl: | $NO_2$ Int: | |

## 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) | 799.5 | 400.0 | 400.7 | 402.1 | 0.9965 | 100.4% |
| 2nd GPT point (200 ppb O3) | 799.5 | 614.0 | 186.7 | 187.8 | 0.9940 | 100.6% |
| 3rd GPT point (100 ppb O3) | 799.5 | 709.4 | 91.3 | 92.6 | 0.9858 | 101.4% |
| | | | | Average Correction Factor | 0.9921 | 100.8% |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

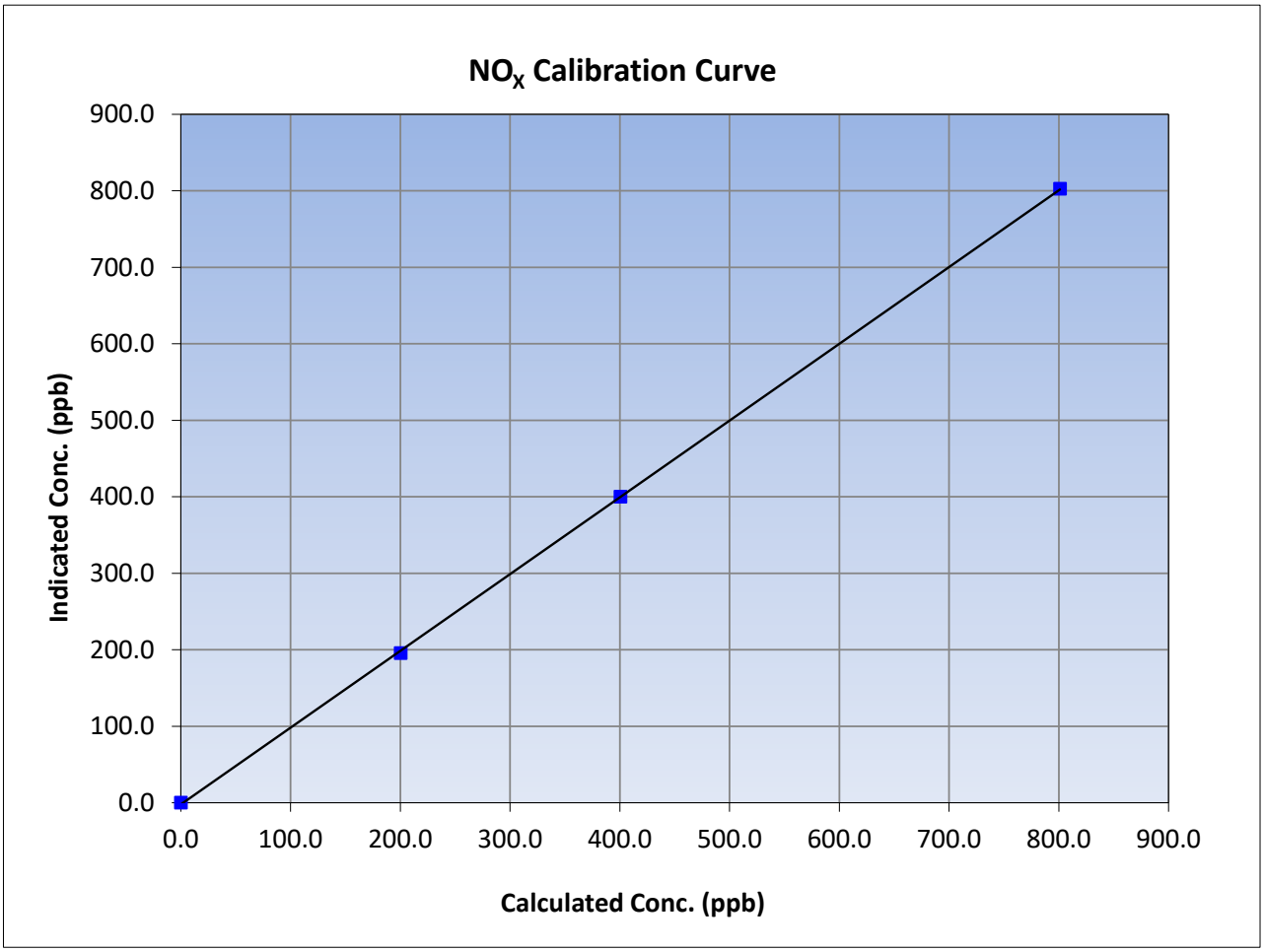
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 8:34 | End Time (MST): | 12:55 |
| 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 | 0.2 | ---- | Correlation Coefficient | 0.999951 | ≥0.995 |
| 801.1 | 802.5 | 0.9982 | | | |
| 400.5 | 399.9 | 1.0016 | Slope | 1.003601 | 0.90 - 1.10 |
| 200.3 | 195.5 | 1.0244 | | | |
| | | | Intercept | -2.208002 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

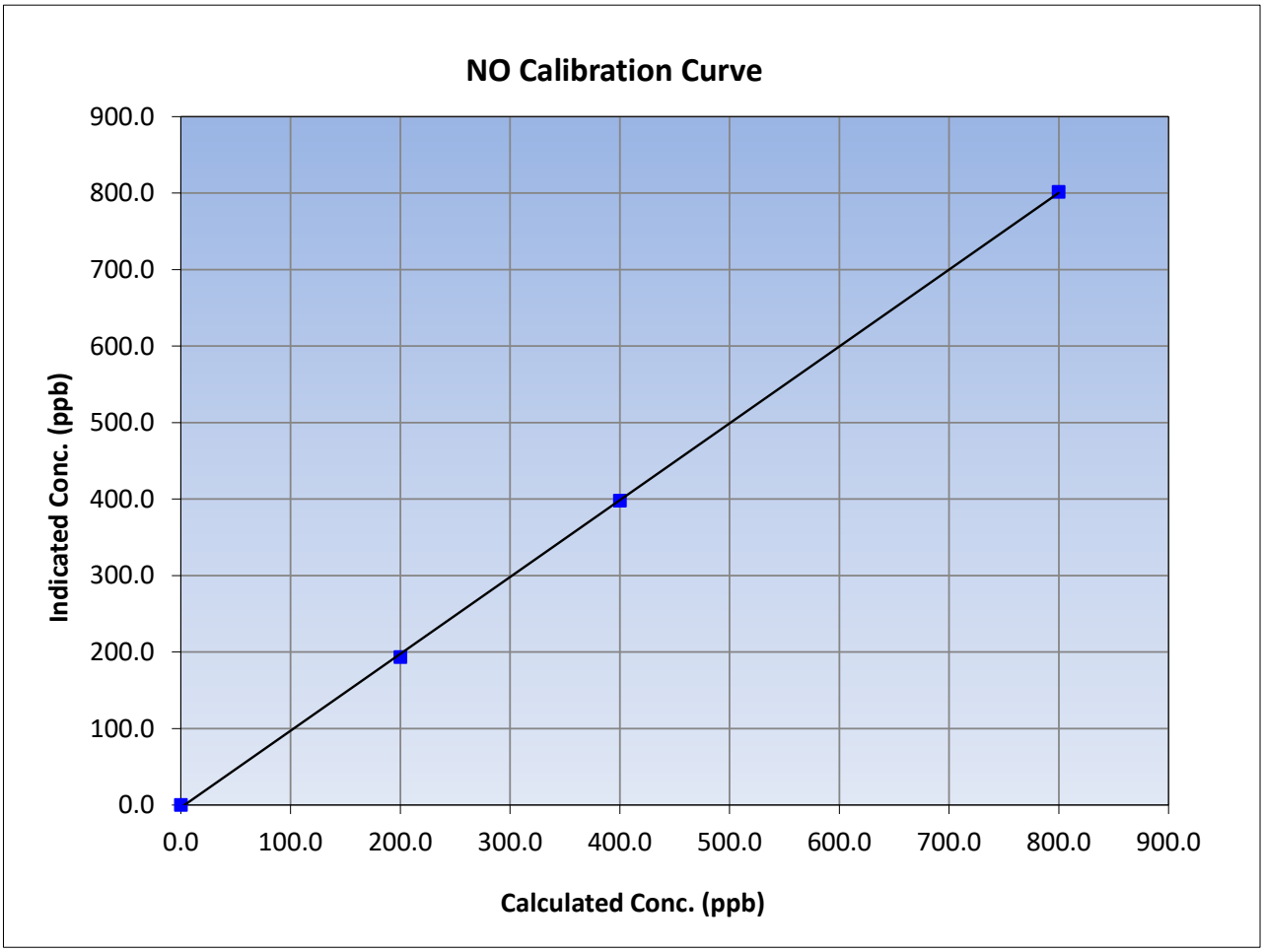
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 8:34 | End Time (MST): | 12:55 |
| 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 | 0.999916 | ≥0.995 |
| 799.9 | 801.6 | 0.9979 | | | |
| 400.0 | 398.0 | 1.0049 | Slope | 1.004712 | 0.90 - 1.10 |
| 200.0 | 193.5 | 1.0335 | | | |
| | | | Intercept | -3.327979 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

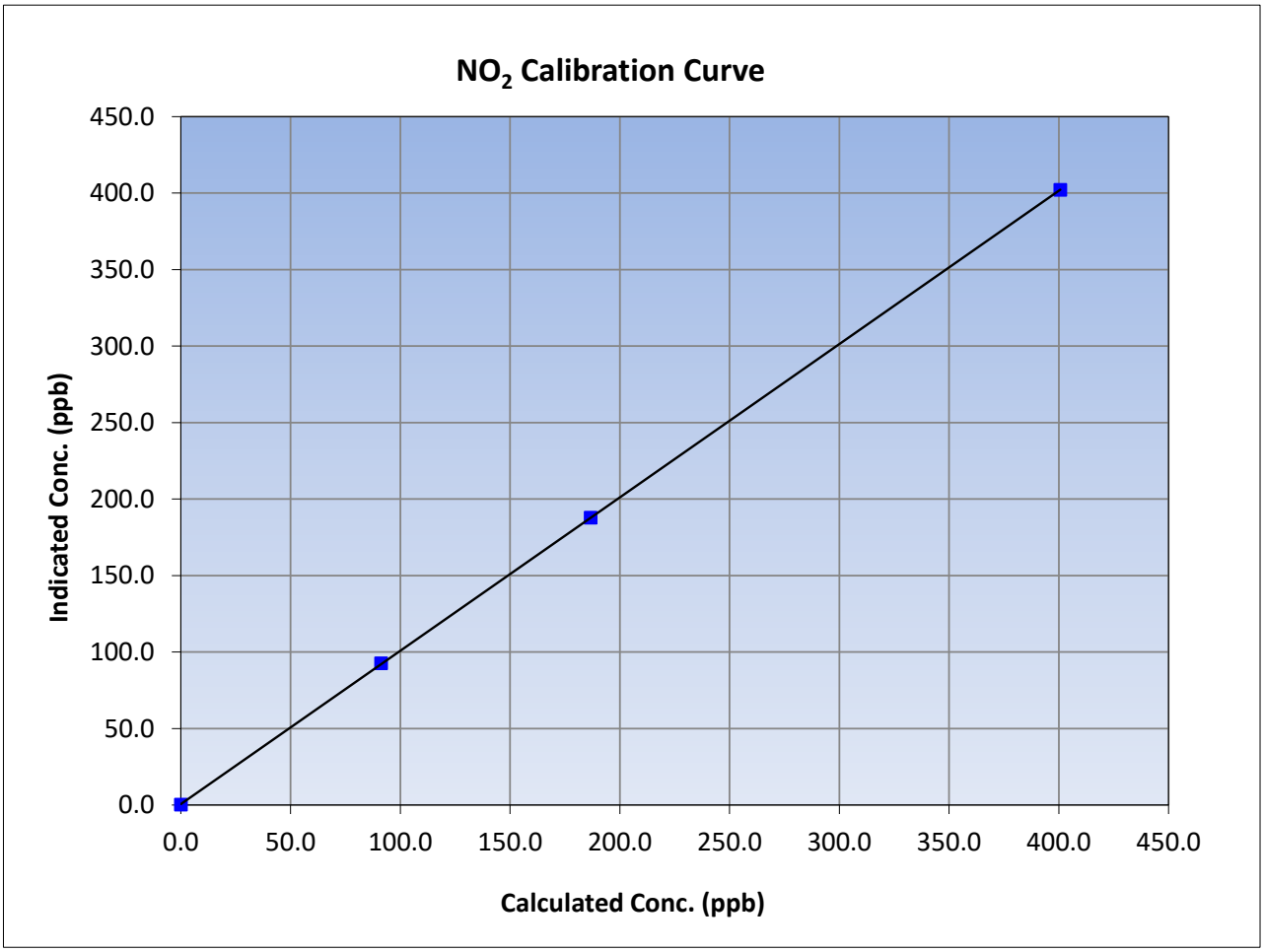
Version-04-2020

### Station Information

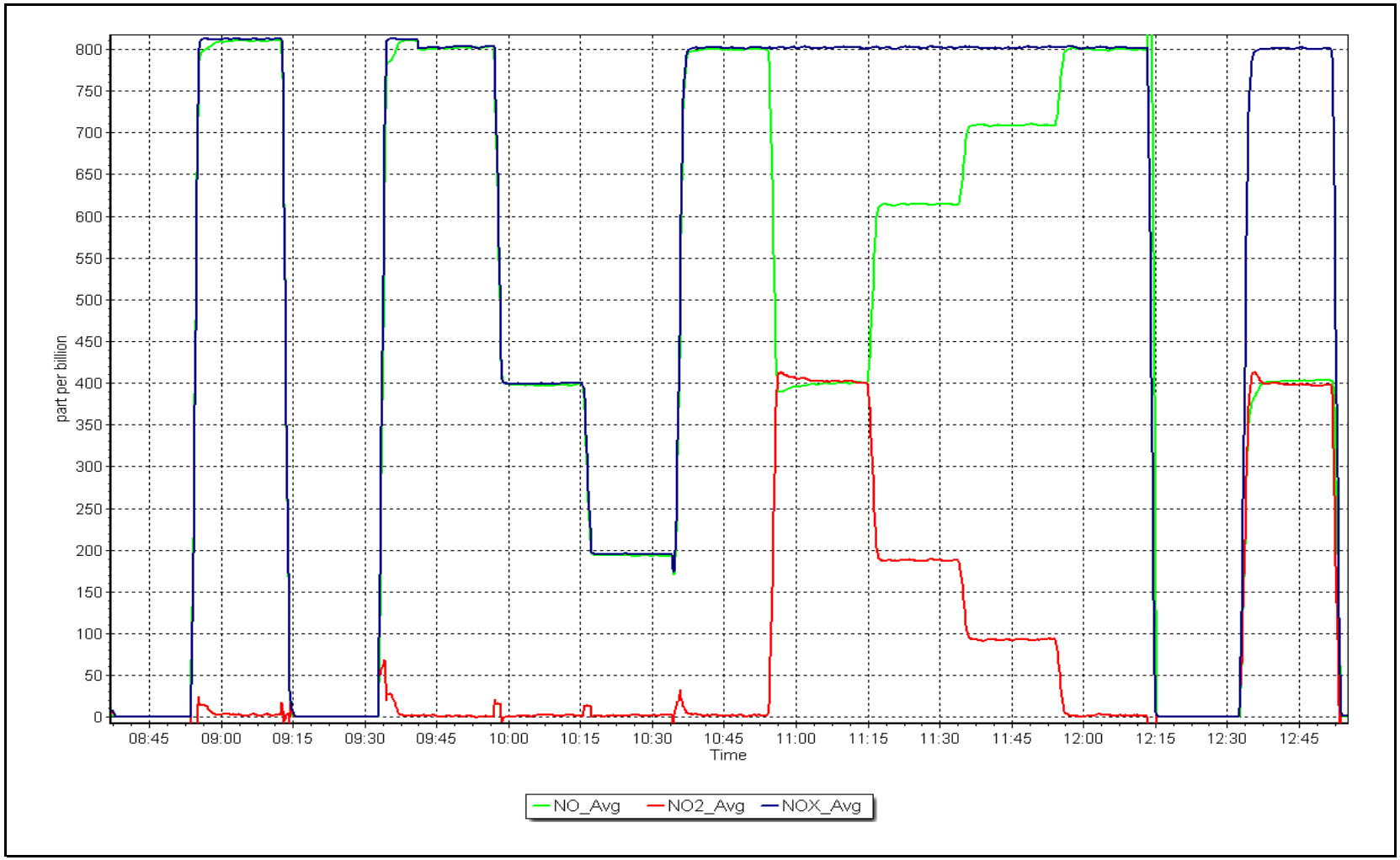
| | | | |
|---|---|---|---|
| Calibration Date: | March 26, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Leismer | Station Number: | AMS501 |
| Start Time (MST): | 8:34 | End Time (MST): | 12:55 |
| Analyzer make: | Thermo 42i | Analyzer serial #: | 1218153356 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.2 | ---- | Correlation Coefficient | 0.999995 | ≥0.995 |
| 400.7 | 402.1 | 0.9965 | | | |
| 186.7 | 187.8 | 0.9940 | Slope | 1.002364 | 0.90 - 1.10 |
| 91.3 | 92.6 | 0.9858 | | | |
| | | | Intercept | 0.612715 | +/-20 |



**$NO_x$ Calibration Plot** Date: March 26, 2024 Location: Leismer



# Wood Buffalo Environmental Association

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

### Station Information

| | |
|---|---|
| Station Name: | Leismer |
| Station number: | AMS 501 |
| Calibration Date: | April 9, 2024 |
| Last Cal Date: | March 26, 2024 |
| Start time (MST): | 10:47 |
| End time (MST): | 13:52 |
| Reason: | Removal |

### 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: | Teledyne API T700 | Serial Number: | 2659 |
| ZAG make/model: | Teledyne API T701 | Serial Number: | 4427 |

### As Found Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10* | Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10* |
|---|---|---|---|---|---|---|---|---|---|---|
| As found zero | 5000 | 0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.2 | 0.1 | ---- | ---- |
| AF High point | 4916 | 84.4 | 801.1 | 799.9 | 1.2 | 794.3 | 791.8 | 2.5 | 1.0084 | 1.0099 |
| AF Mid point | 4958 | 42.2 | 400.5 | 400.0 | 0.6 | 393.1 | 391.5 | 1.6 | 1.0187 | 1.0211 |
| AF Low point | 4979 | 21.1 | 200.3 | 200.0 | 0.3 | 192.3 | 189.5 | 2.7 | 1.0409 | 1.0542 |
| New cyl resp | | | | | | | | | | |

| | | |
|---|---|---|
| Previous Response | $NO_X$ = 801.7 ppb | NO = 800.3 ppb |
| Baseline Corr 1st pt | $NO_X$ = 794.4 ppb | NO = 792.0 ppb |
| Baseline Corr 2nd pt | $NO_X$ = 393.2 ppb | NO = 391.7 ppb |
| Baseline Corr 3rd pt | $NO_X$ = 192.4 ppb | NO = 189.7 ppb |

* = > +/-5% change initiates investigation

*Percent Change $NO_X$ = -0.9%

*Percent Change NO = -1.1%

As Found Statistics

| | | | |
|---|---|---|---|
| As found | $NO_X$ $r^2$: 0.999922 | Nx Sl: 0.993771 | Nx Int: -3.388 |
| As found | NO $r^2$: 0.999870 | NO Sl: 0.993095 | NO Int: -4.388 |
| As found | $NO_2$ $r^2$: 0.999917 | NO2 Sl: 0.997056 | $NO_2$ Int: 1.858 |

### As Found GPT Calibration Data

| O3 Setpoint (ppb) | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO2 concentration (ppb) (Cc) | Indicated NO2 concentration (ppb) (Ic) | Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10* | Converter Efficiency *Limit = 96-104%* |
|---|---|---|---|---|---|---|
| As Found GPT zero | ---- | ---- | 0.0 | 0.1 | ---- | ---- |
| As found high GPT point | 790.8 | 391.5 | 400.5 | 400.3 | 1.0005 | 100.0% |
| As found mid GPT point | 790.8 | 610.0 | 182.0 | 184.5 | 0.9863 | 101.4% |
| As found low GPT point | 790.8 | 702.7 | 89.3 | 92.3 | 0.9673 | 103.4% |

# Wood Buffalo Environmental Association

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

## Analyzer Information

Analyzer Make: Thermo 42i  Serial Number: 1170050148

NOX Range (ppb): 0 - 1000 ppb

*Instrument Settings*

| | Start | Finish | | Start | Finish |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.186 | 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: | 166.5 | 166.2 |

## Calibration Statistics

| | Start | Finish |
|---|---|---|
| $NO_X$ Cal Slope: | 1.003601 | NA |
| $NO_X$ Cal Offset: | -2.208002 | NA |
| NO Cal Slope: | 1.004712 | NA |
| NO Cal Offset: | -3.327979 | NA |
| $NO_2$ Cal Slope: | 1.002364 | NA |
| $NO_2$ Cal Offset: | 0.612715 | NA |

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| Cal zero | | | | | | | | | | |
| High point | | | | | | | | | | |
| Mid point | | | | | | | | | | |
| Low point | | | | | | | | | | |
| As left zero | | | | | | | | | | |
| As left span | | | | | | | | | | |
| | | | | | | | | Average Correction Factor | | |

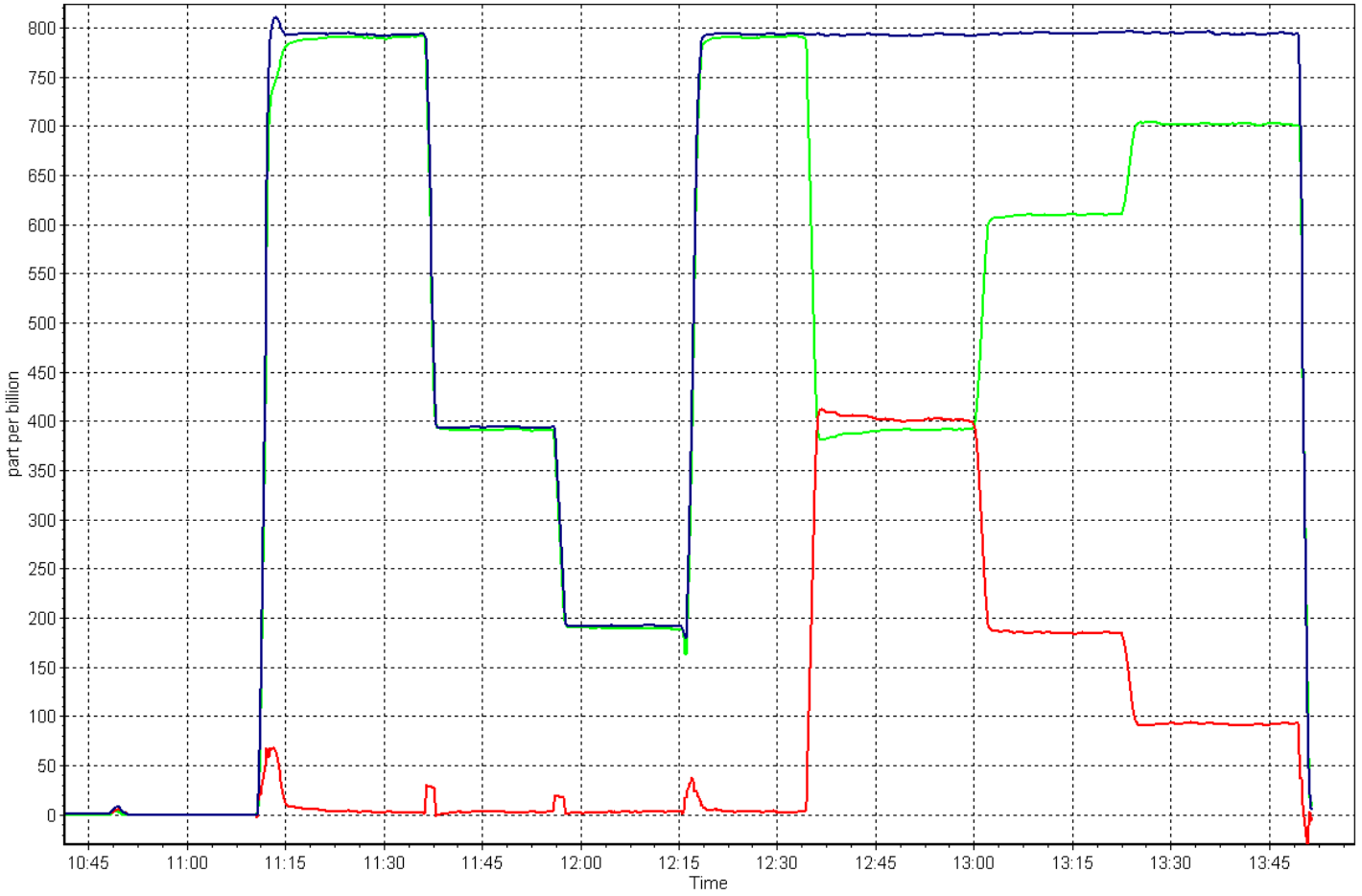
## GPT Calibration Data

| | O3 Setpoint (ppb) | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO2 concentration (ppb) (Cc) | Indicated NO2 concentration (ppb) (Ic) | NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05* | Converter Efficiency *Limit = 96-104%* |
|---|---|---|---|---|---|---|---|
| Cal zero | | | | | | | |
| High GPT point | | | | | | | |
| Mid GPT point | | | | | | | |
| Low GPT point | | | | | | | |
| | | | | | Average Correction Factor | | |

Notes: As founds completed for station removal planned for April 10.

Calibration Performed By: Braiden Boutilier

**$NO_X$ Calibration Plot** Date: April 9, 2024 Location: Leismer



# Wood Buffalo Environmental Association

## Wind Speed/Direction Calibration Report

Version-10-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Leismer | Station Number: | AMS 501 |
| Calibration Date: | April 9, 2024 | Prev Cal Date: | September 11, 2023 |
| Start Time (MST): | 12:37 | End Time (MST): | 13:30 |
| Tower Height (m): | 9.8 | Reason: | Removal |

### Wind Speed Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 010C-1 | Serial Number: | Y18362 |
| WS Calibrator: | MetOne 053 | 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 | -0.2% |
| 400 | 39.4 | 39.4 | 0.1% |
| 600 | 58.6 | 58.5 | 0.0% |
| 800 | 77.8 | 77.8 | 0.1% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999999 | *≥0.9995* |
| Calculated slope | | 0.998868 | *0.90 - 1.10* |
| Calculated intercept | | 0.028930 | *+/- 2* |

### Wind Direction Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 020C-1 | Serial Number: | R14654 |
| As Found Declination (deg east of True North): | 13.3 | As Left Declination (deg east of True North): | NA |
| Solar noon time (MST): | 12:37 | Calc Declination*: | 13.3 Degrees |
| Deadband calc: | -0.6 degrees (*Limit 4 deg*) | | * - calculated declination as per NOAA website |

| Physical Direction (Degrees) (Cv) | Indicated Direction (Degrees) (Iv) | % Error (based on 357° FS) *Limit = +/- 1.0%* |
|---|---|---|
| 0 | 2.4 | --- |
| 90 | 91.6 | 0.4% |
| 180 | 180.4 | 0.1% |
| 270 | 270.2 | 0.1% |
| 357 | 360.0 | 0.8% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999963 | *≥0.9995* |
| Calculated slope | | 1.000158 | *0.90 - 1.10* |
| Calculated intercept | | -1.552811 | *+/- 4* |

Notes: As founds done for the station removal planned for April 10.

Calibration Performed By: Braiden Boutilier

# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS505
## SAWBONES BAY
## MARCH 2024

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

April 30, 2024

CALS_583

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Sawbones Bay | Station number: | AMS505 |
| Calibration Date: | March 18, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 9:40 | End time (MST): | 12:37 |
| 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: | 1.004096 | 0.999393 | Backgd or Offset: | 20.1 | 20.5 |
| Calibration intercept: | -1.272603 | -1.051659 | Coeff or Slope: | 0.989 | 1.008 |

### $SO_2$ 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 | 4922 | 77.8 | 799.8 | 792.5 | 1.009 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| high point | 4922 | 77.8 | 799.8 | 798.6 | 1.002 |
| second point | 4961 | 38.9 | 399.9 | 399.0 | 1.002 |
| third point | 4981 | 19.5 | 200.4 | 197.2 | 1.016 |
| as left zero | 5000 | 0.0 | 0.0 | -0.3 | ---- |
| as left span | 4922 | 77.8 | 799.8 | 791.4 | 1.011 |
| | | | | Average Correction Factor | 1.007 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 792.40 | Previous response | 801.82 | *% 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: Changed inlet filter. Adjusted span only.

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

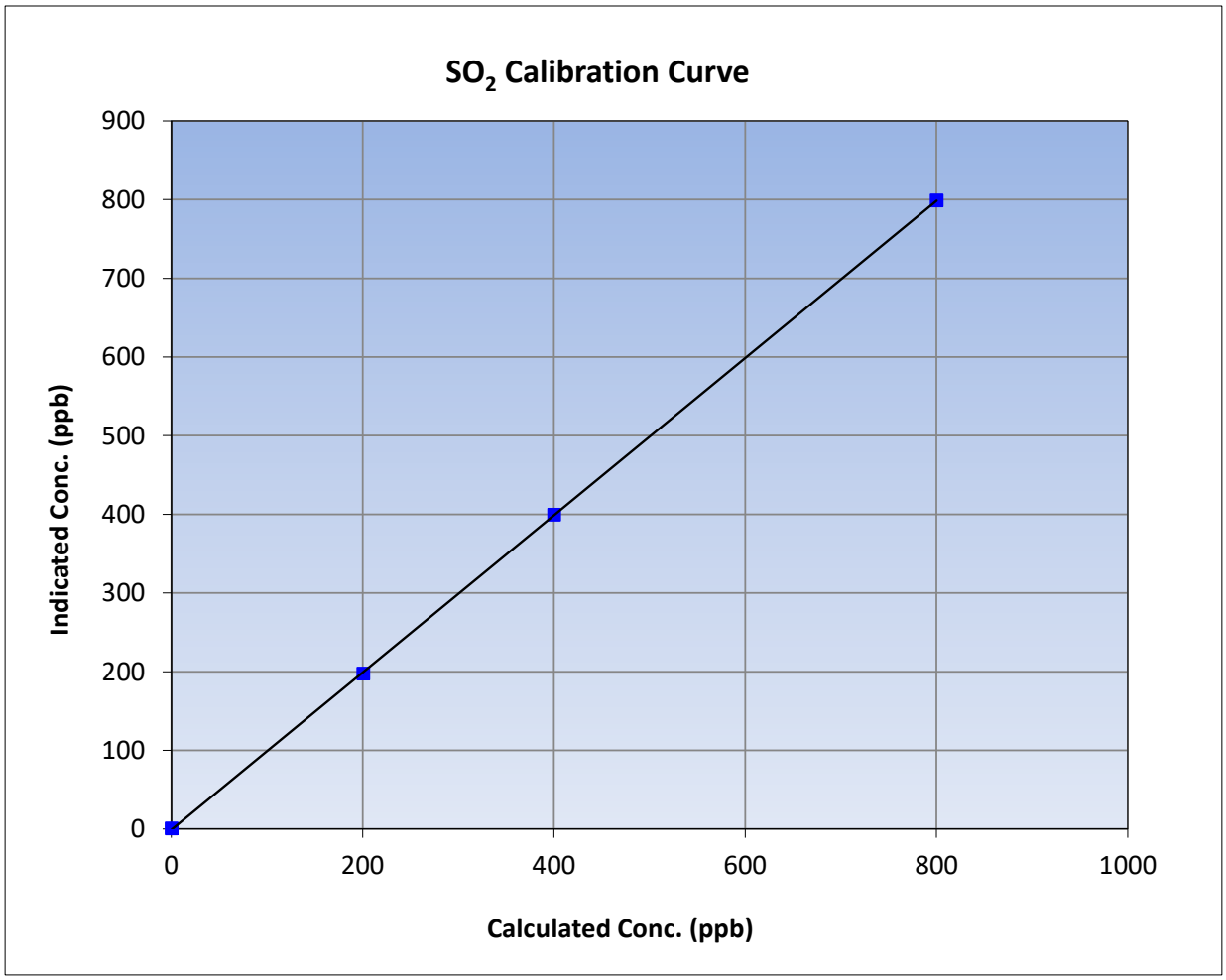
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 18, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 9:40 | End Time (MST): | 12:37 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 0710321323 |

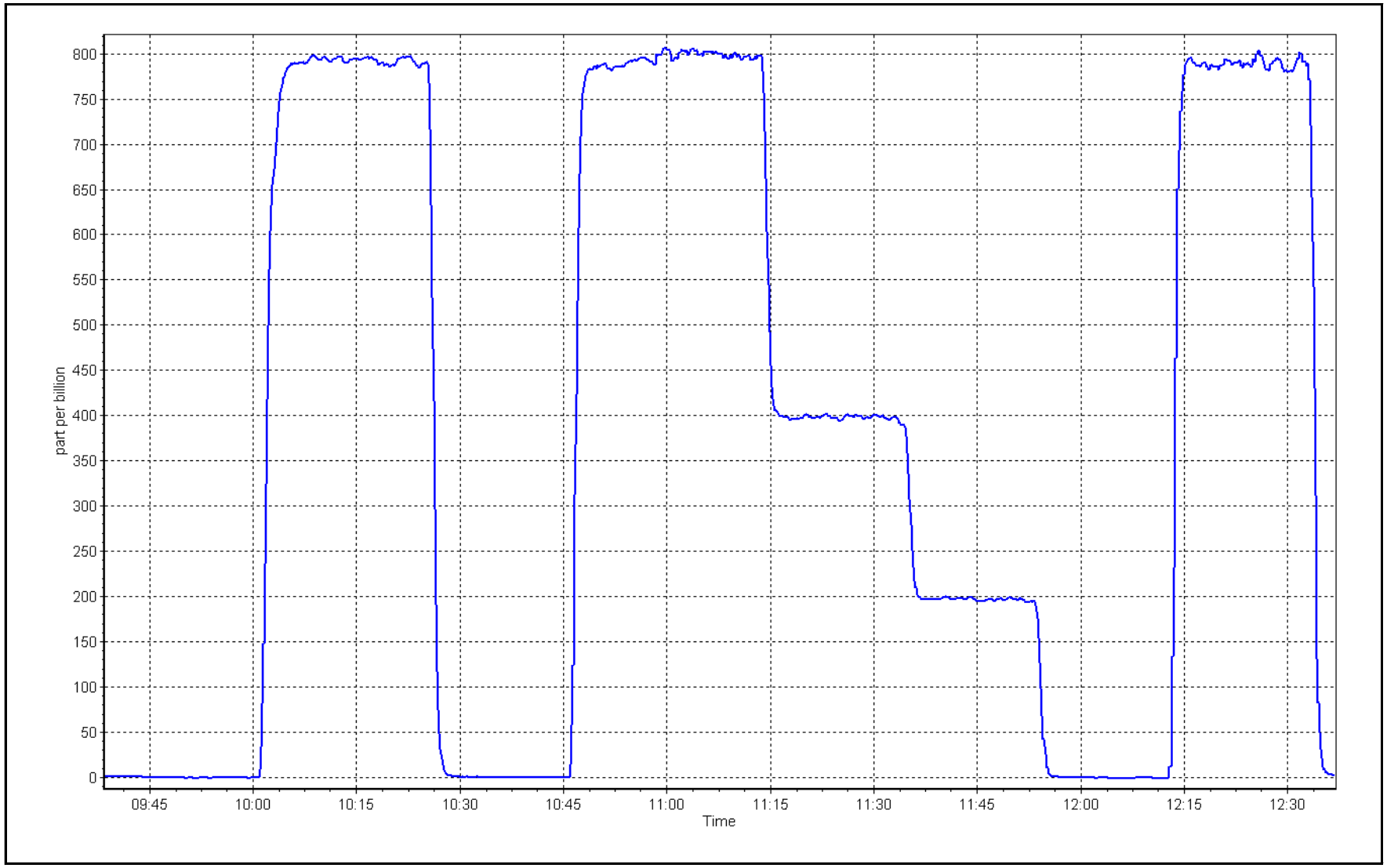
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.3 | ---- |
| 799.8 | 798.6 | 1.0015 |
| 399.9 | 399.0 | 1.0023 |
| 200.4 | 197.2 | 1.0164 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999982 | *≥0.995* |
| Slope | 0.999393 | *0.90 - 1.10* |
| Intercept | -1.051659 | *+/-30* |



**SO2 Calibration Plot** Date: March 18, 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: | March 19, 2024 | Last Cal Date: | February 22, 2024 |
| Start time (MST): | 8:37 | End time (MST): | 12:23 |
| 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: | 1.014500 | 1.015068 | Backgd or Offset: | 1.01 | 1.01 |
| Calibration intercept: | -0.077888 | 0.002254 | 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 | 81.7 | 0.978 |
| as found 2nd point | 4961 | 38.8 | 40.0 | 40.6 | 0.982 |
| as found 3rd point | 4981 | 19.4 | 20.0 | 20.1 | 0.989 |
| 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 | 40.7 | 0.982 |
| 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 | 81.2 | 0.986 |
| SO2 Scrubber Check | 4922 | 77.8 | 778.0 | 0.0 | ---- |
| Date of last scrubber change: | | | | Ave Corr Factor | 0.986 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.8 | Prev response: | 81.12 | *% change: | 0.8% |
| Baseline Corr 2nd AF pt: | 40.7 | AF Slope: | 1.022781 | AF Intercept: | -0.217686 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999991 | | |

* = > +/-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

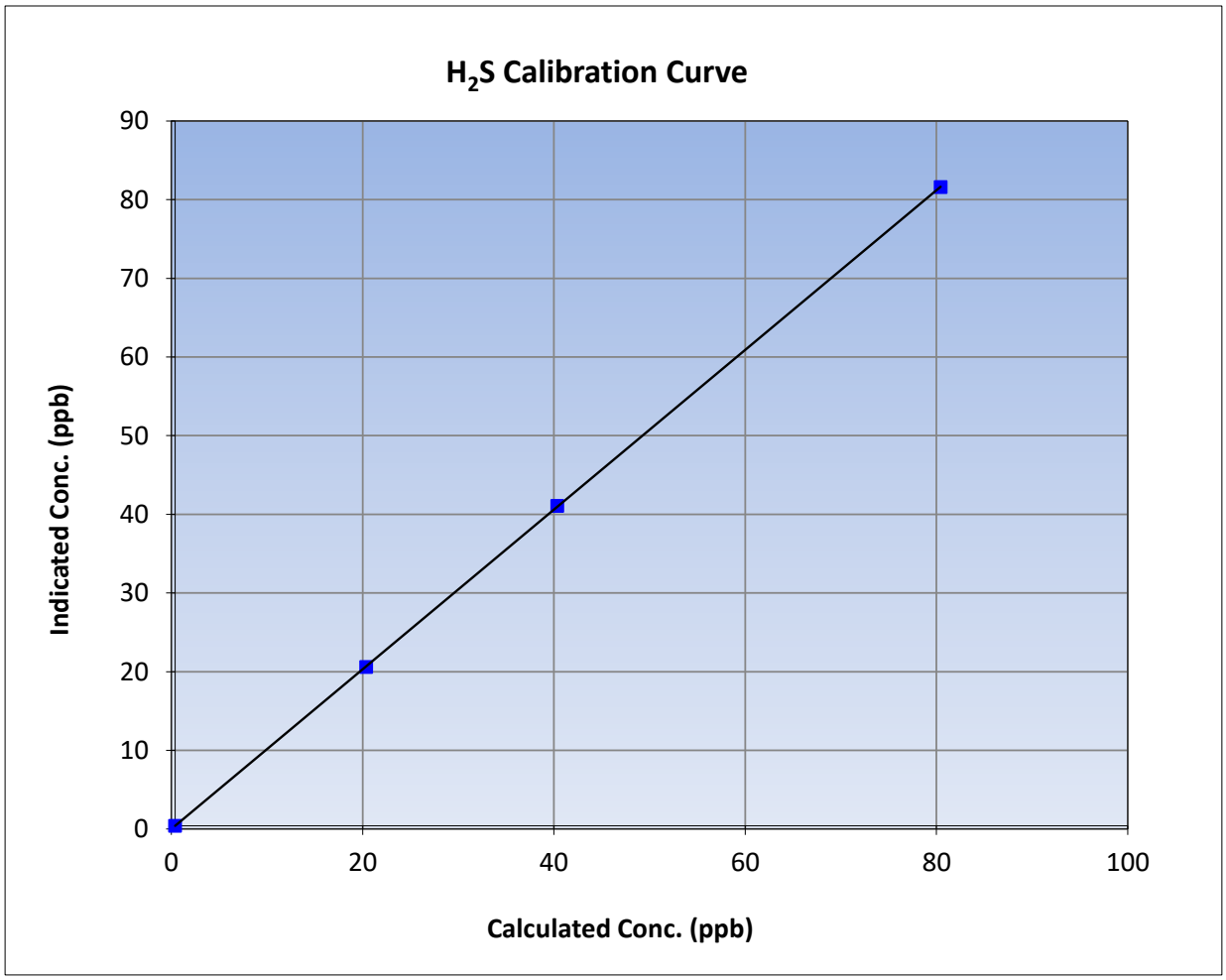
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 19, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 8:37 | End Time (MST): | 12:23 |
| Analyzer make: | Thermo 43iQ | Analyzer serial #: | 12113311965 |

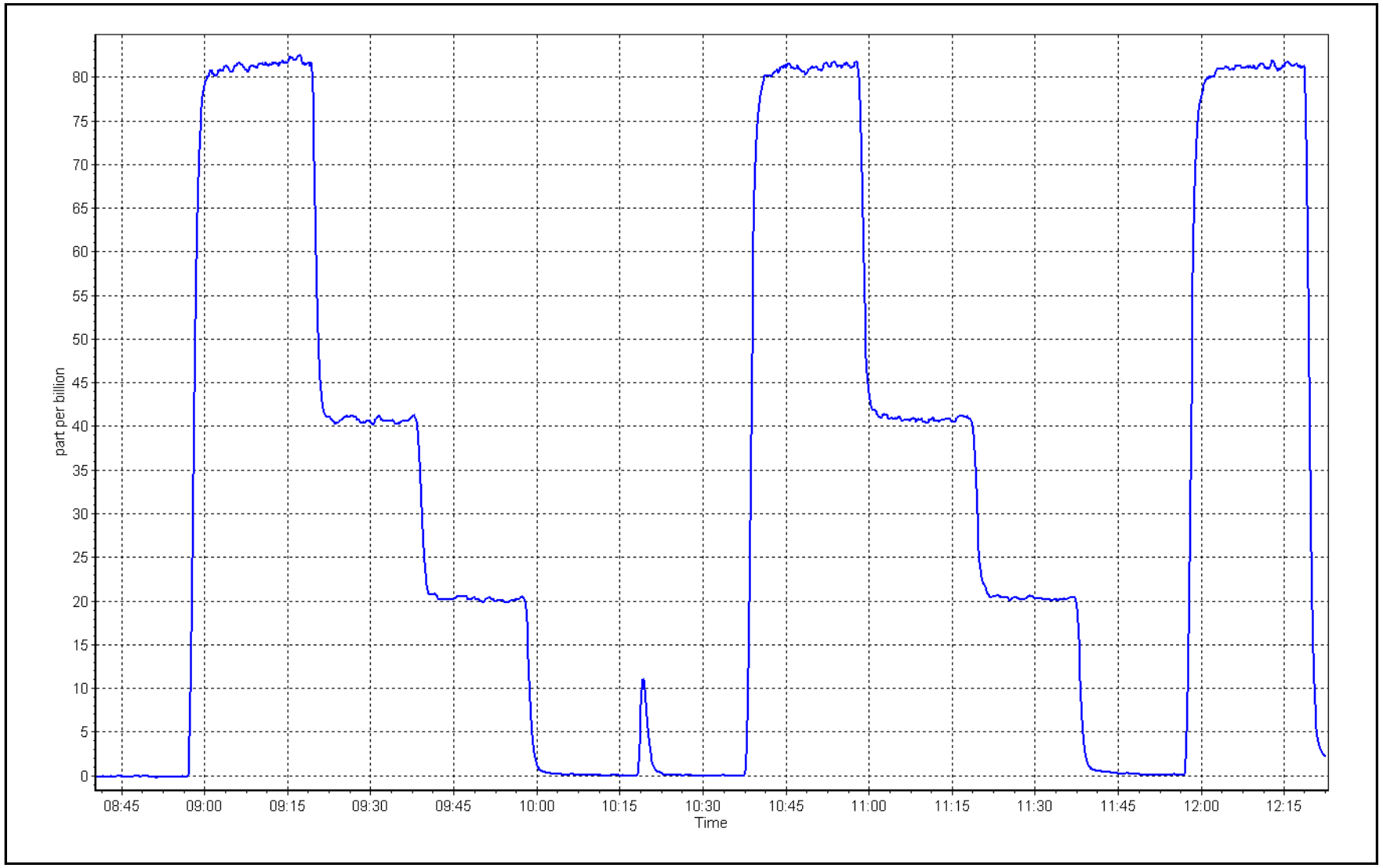
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 81.2 | 0.9857 |
| 40.0 | 40.7 | 0.9820 |
| 20.0 | 20.2 | 0.9891 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999993 | *≥0.995* |
| Slope | 1.015068 | *0.90 - 1.10* |
| Intercept | 0.002254 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 19, 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: | March 20, 2024 | Last Cal Date: | February 14, 2024 |
| Start time (MST): | 8:36 | End time (MST): | 12:47 |
| 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: | 1.054 | 1.045 | NO bkgnd or offset: | 0.4 | -1.1 |
| NOX coeff or slope: | 1.052 | 1.044 | NOX bkgnd or offset: | 1.3 | -0.1 |
| NO2 coeff or slope: | NA | NA | Reaction cell Press: | 8.0 | 8.0 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.001650 | 1.001550 |
| $NO_X$ Cal Offset: | -1.730586 | -1.470566 |
| NO Cal Slope: | 1.001864 | 1.000349 |
| NO Cal Offset: | -1.930254 | -1.350176 |
| $NO_2$ Cal Slope: | 1.000683 | 1.002397 |
| $NO_2$ Cal Offset: | -0.373004 | 0.386621 |

# 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 | 806.0 | 803.1 | 2.9 | 0.9920 | 0.9956 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -0.1 | -0.3 | ---- | ---- |
| high point | 4917 | 83.4 | 799.6 | 799.6 | 0.0 | 799.7 | 798.9 | 0.8 | 0.9998 | 1.0008 |
| second point | 4958 | 41.7 | 399.8 | 399.8 | 0.0 | 399.0 | 398.7 | 0.4 | 1.0021 | 1.0029 |
| third point | 4979 | 20.9 | 200.4 | 200.4 | 0.0 | 197.8 | 197.4 | 0.3 | 1.0131 | 1.0152 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.7 | -0.4 | ---- | ---- |
| as left span | 4916 | 83.4 | 799.7 | 338.3 | 461.4 | 795.3 | 336.6 | 458.6 | 1.0056 | 1.0052 |
| | | | | | | | | Average Correction Factor | 1.0050 | 1.0063 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 806.4 ppb | NO = 803.3 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = | 0.9% |
| Previous Response | $NO_X$ = 799.2 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) | 794.6 | 333.2 | 461.4 | 462.5 | 0.9976 | 100.2% |
| 2nd GPT point (200 ppb O3) | 794.6 | 546.9 | 247.7 | 248.9 | 0.9952 | 100.5% |
| 3rd GPT point (100 ppb O3) | 794.6 | 647.1 | 147.5 | 149.1 | 0.9893 | 101.1% |
| | | | | Average Correction Factor | 0.9940 | 100.6% |

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

Calibration Performed By: Sean Bala

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

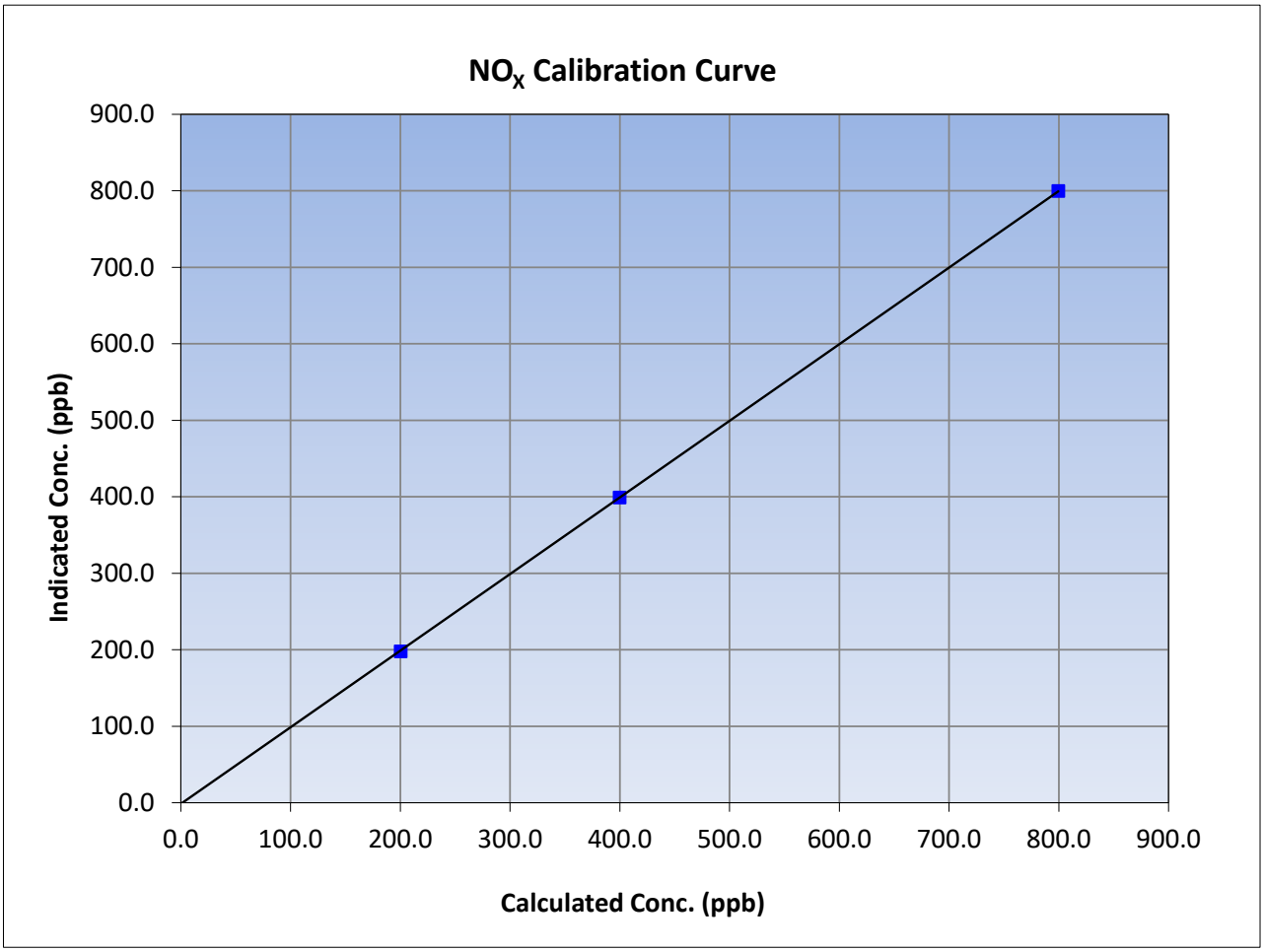
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 8:36 | End Time (MST): | 12:47 |
| 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 | 0.999991 | ≥0.995 |
| 799.6 | 799.7 | 0.9998 | | | |
| 399.8 | 399.0 | 1.0021 | Slope | 1.001550 | 0.90 - 1.10 |
| 200.4 | 197.8 | 1.0131 | | | |
| | | | Intercept | -1.470566 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

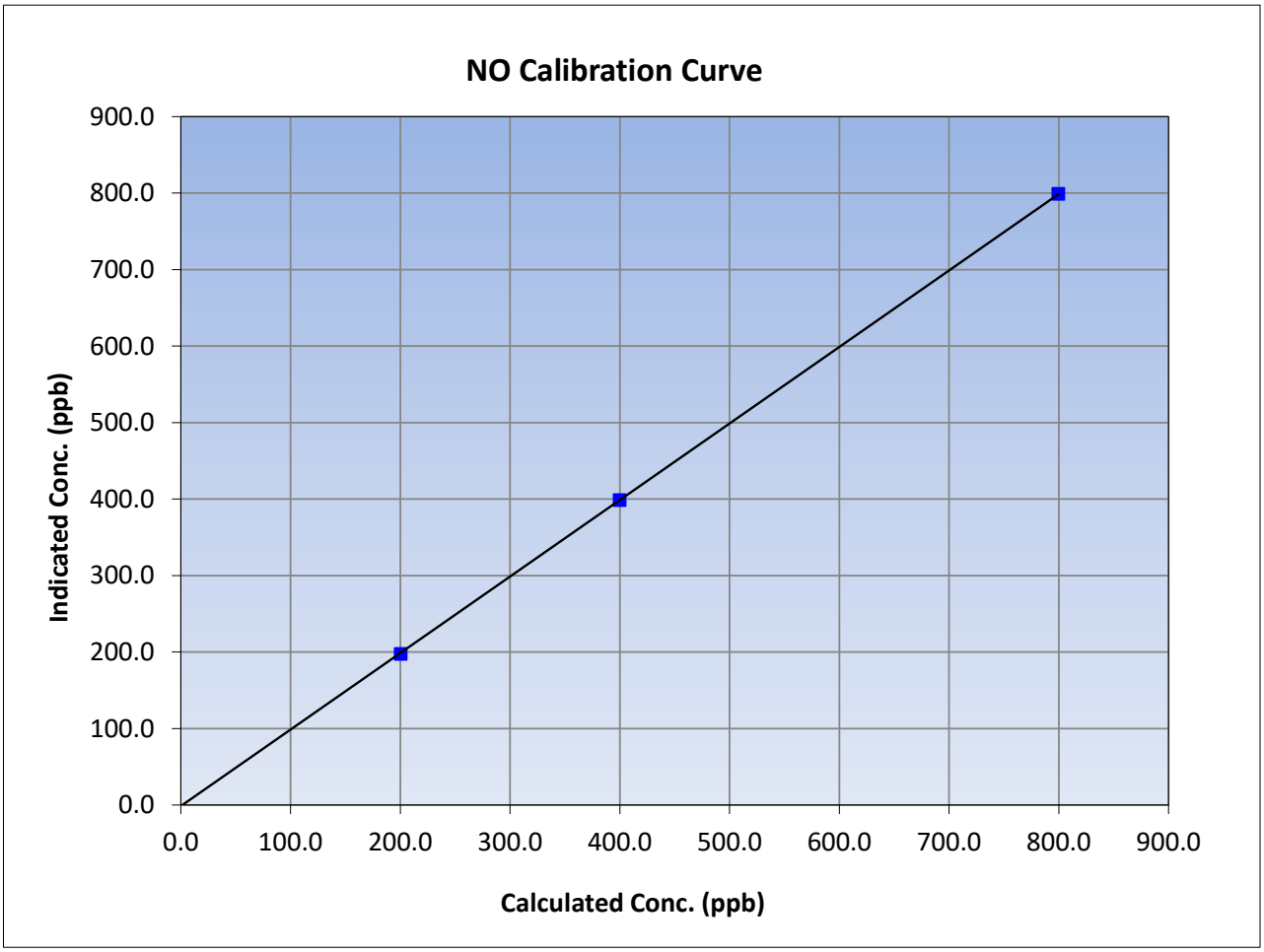
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 8:36 | End Time (MST): | 12:47 |
| 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 | 0.999987 | ≥0.995 |
| 799.6 | 798.9 | 1.0008 | | | |
| 399.8 | 398.7 | 1.0029 | Slope | 1.000349 | 0.90 - 1.10 |
| 200.4 | 197.4 | 1.0152 | | | |
| | | | Intercept | -1.350176 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

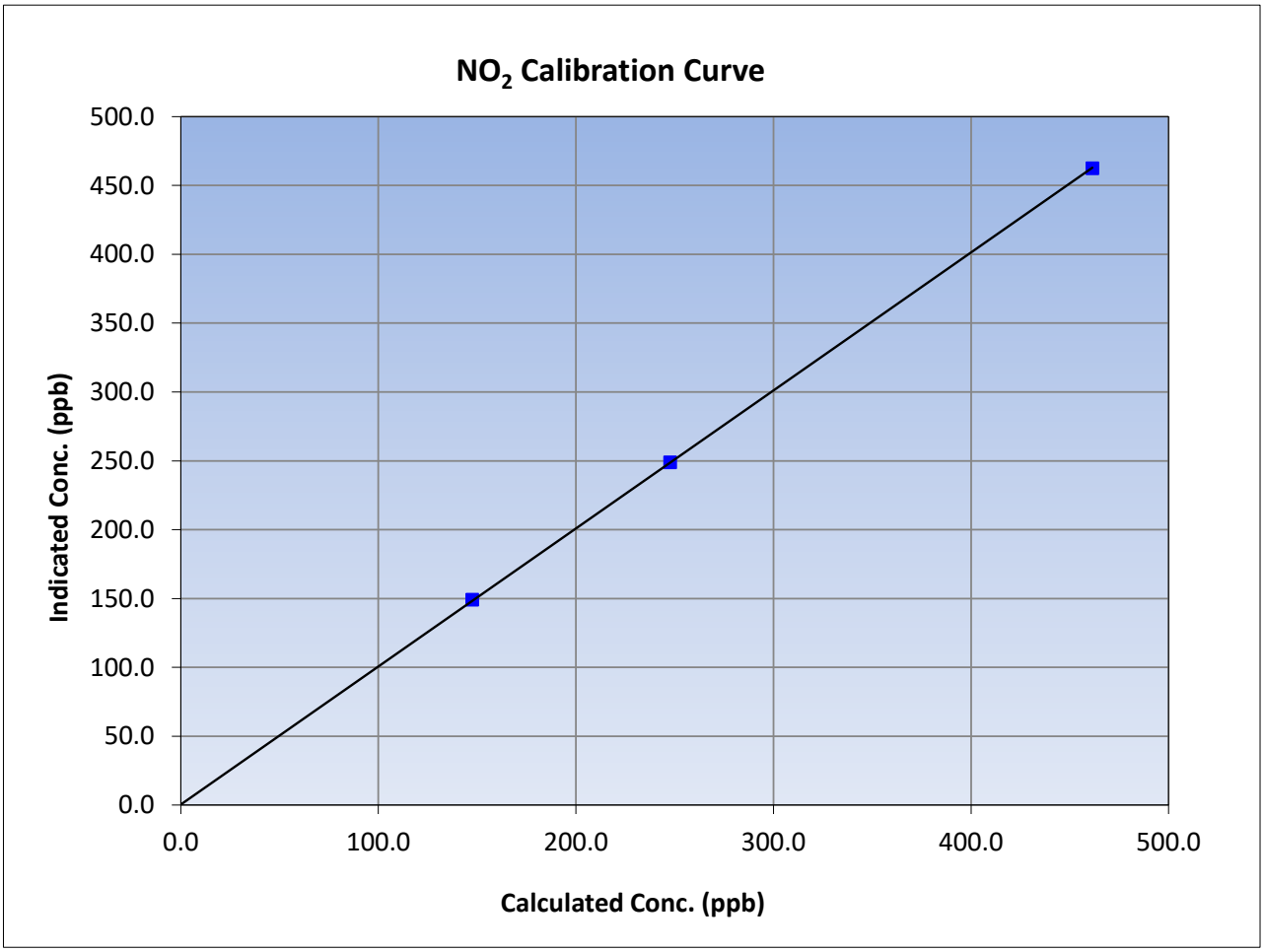
Version-04-2020

### Station Information

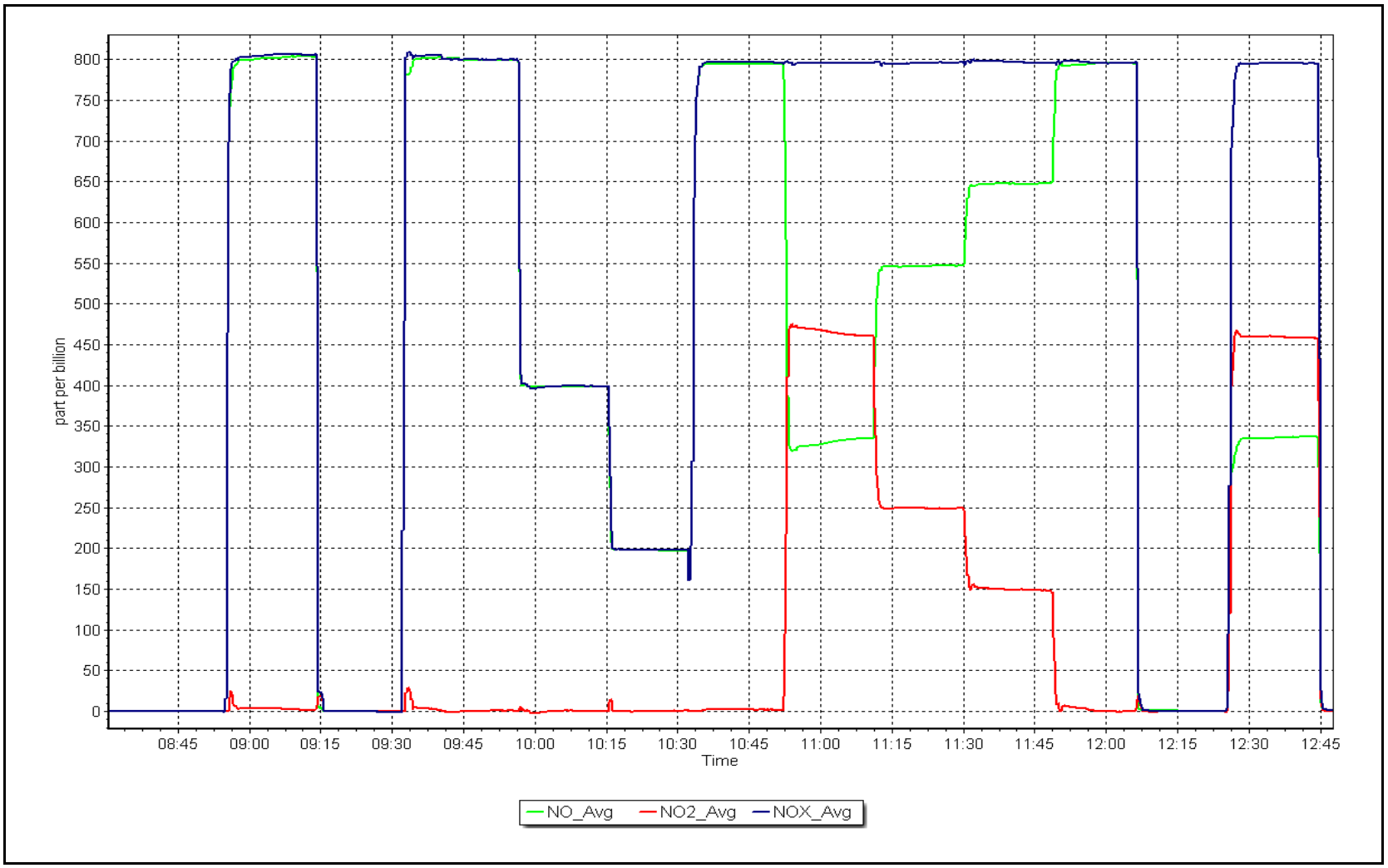
| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 14, 2024 |
| Station Name: | Sawbones Bay | Station Number: | AMS505 |
| Start Time (MST): | 8:36 | End Time (MST): | 12:47 |
| Analyzer make: | API T200 | Analyzer serial #: | 4260 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.3 | ---- | Correlation Coefficient | 0.999988 | ≥0.995 |
| 461.4 | 462.5 | 0.9976 | | | |
| 247.7 | 248.9 | 0.9952 | Slope | 1.002397 | 0.90 - 1.10 |
| 147.5 | 149.1 | 0.9893 | | | |
| | | | Intercept | 0.386621 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 20, 2024 Location: Sawbones Bay



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS507
## KIRBY SOUTH
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Kirby South | Station number: | AMS 507 |
| Calibration Date: | March 14, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 8:30 | End time (MST): | 12:29 |
| 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 T750 | | Serial Number: | 281 |
| ZAG Make/Model: | API T751H | | Serial Number: | 321 |

### Analyzer Information

Analyzer make: Thermo 43i — Analyzer serial #: 1173410001

Analyzer Range 0 - 1000 ppb

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 0.999677 | 0.995804 | Backgd or Offset: | 18.8 | 21.7 |
| Calibration intercept: | -1.668567 | 0.311657 | Coeff or Slope: | 0.889 | 0.906 |

### $SO_2$ 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 | 3.0 | ---- |
| as found span | 4919 | 81.3 | 799.6 | 780.0 | 1.025 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.4 | ---- |
| high point | 4919 | 81.3 | 799.6 | 797.2 | 1.003 |
| second point | 4959 | 40.7 | 400.3 | 397.2 | 1.008 |
| third point | 4980 | 20.3 | 199.7 | 200.2 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.5 | ---- |
| as left span | 4919 | 81.3 | 799.6 | 792.4 | 1.009 |
| | | | | Average Correction Factor | 1.003 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 777.00 | Previous response | 797.69 | *% change | -2.7% |
| 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

## $SO_2$ Calibration Summary

Version-01-2020

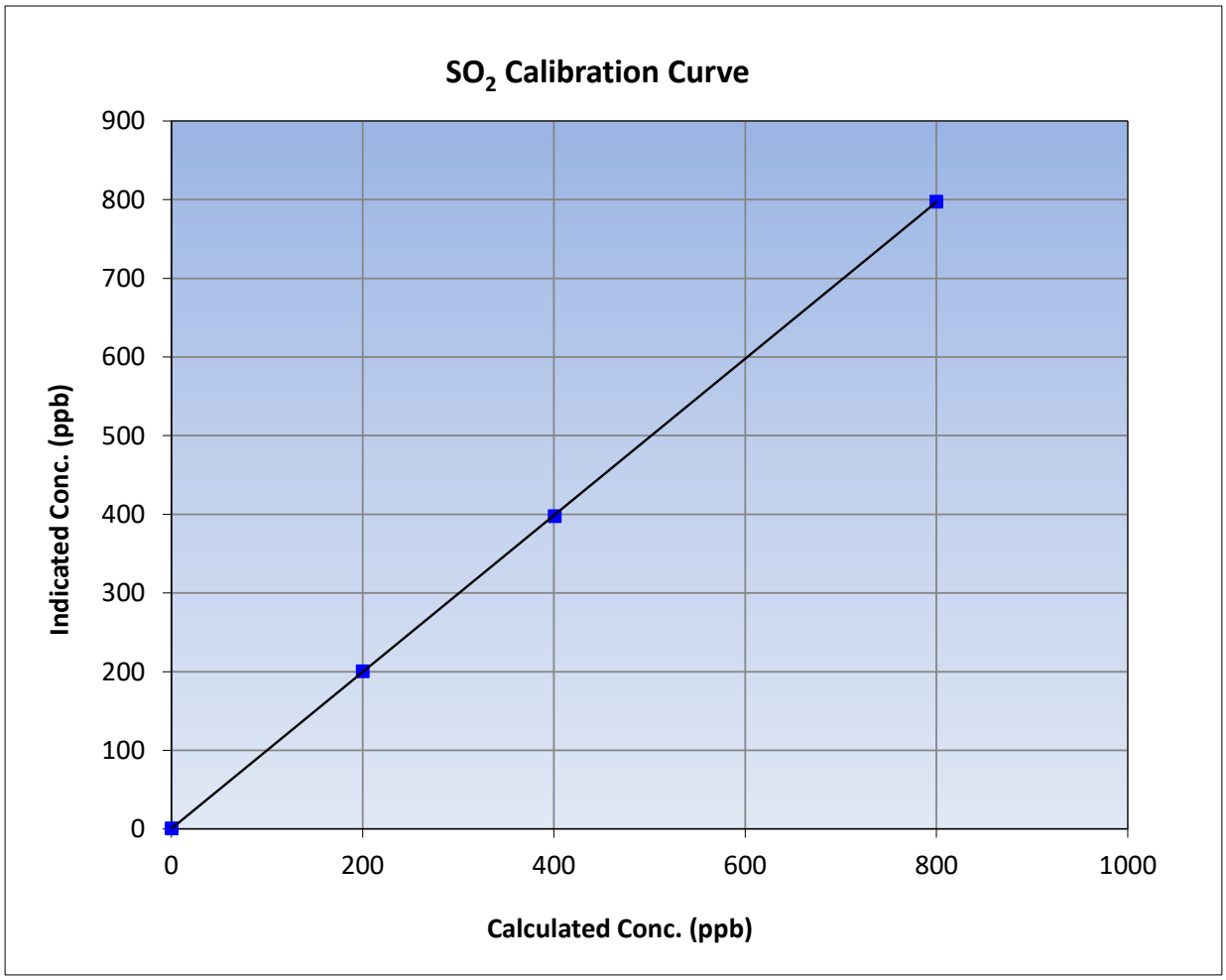
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Kirby South | Station Number: | AMS 507 |
| Start Time (MST): | 8:30 | End Time (MST): | 12:29 |
| Analyzer make: | Thermo 43i | Analyzer serial #: | 1173410001 |

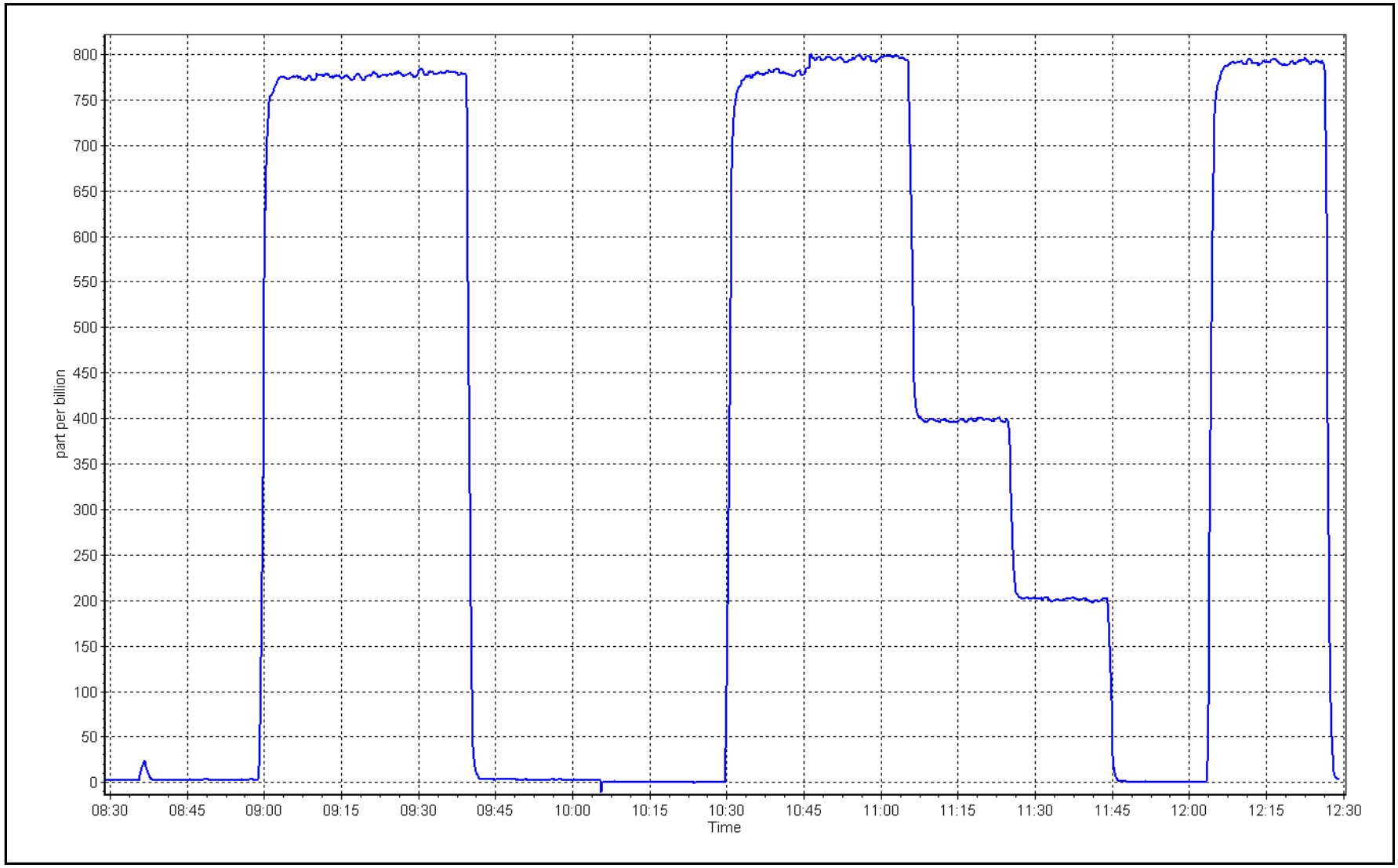
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.4 | ---- |
| 799.6 | 797.2 | 1.0030 |
| 400.3 | 397.2 | 1.0079 |
| 199.7 | 200.2 | 0.9973 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999986 | *≥0.995* |
| Slope | 0.995804 | *0.90 - 1.10* |
| Intercept | 0.311657 | *+/-30* |



**SO2 Calibration Plot** Date: March 14, 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: | March 13, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 11:15 | End time (MST): | 17:28 |
| 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: | 0.998813 | 0.996813 | Backgd or Offset: | 1.74 | 1.73 |
| Calibration intercept: | 0.219035 | 0.139039 | Coeff or Slope: | 1.052 | 1.041 |

### $H_2S$ 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 | 79.2 | 80.0 | 81.1 | 0.985 |
| as found 2nd point | 4960 | 39.6 | 40.0 | 40.6 | 0.983 |
| as found 3rd point | 4980 | 19.8 | 20.0 | 20.3 | 0.980 |
| 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 | 79.8 | 1.002 |
| second point | 4960 | 39.6 | 40.0 | 40.1 | 0.997 |
| third point | 4980 | 19.8 | 20.0 | 20.2 | 0.990 |
| as left zero | 5000 | 0.0 | 0.0 | 0.1 | ---- |
| as left span | 4921 | 79.2 | 80.0 | 79.7 | 1.004 |
| SO2 Scrubber Check | 4919 | 80.0 | 800.2 | 0.1 | ---- |
| Date of last scrubber change: | | 25-Jul-23 | | Ave Corr Factor | 0.997 |
| Date of last converter efficiency test: | | | | | efficiency |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 81.2 | Prev response: | 80.12 | *% change: | 1.3% |
| Baseline Corr 2nd AF pt: | 40.7 | AF Slope: | 1.014815 | AF Intercept: | -0.040976 |
| Baseline Corr 3rd AF pt: | 20.4 | AF Correlation: | 0.999997 | | |

* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. Ran SOx scrubber check after cal zero, passed. Adjusted span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

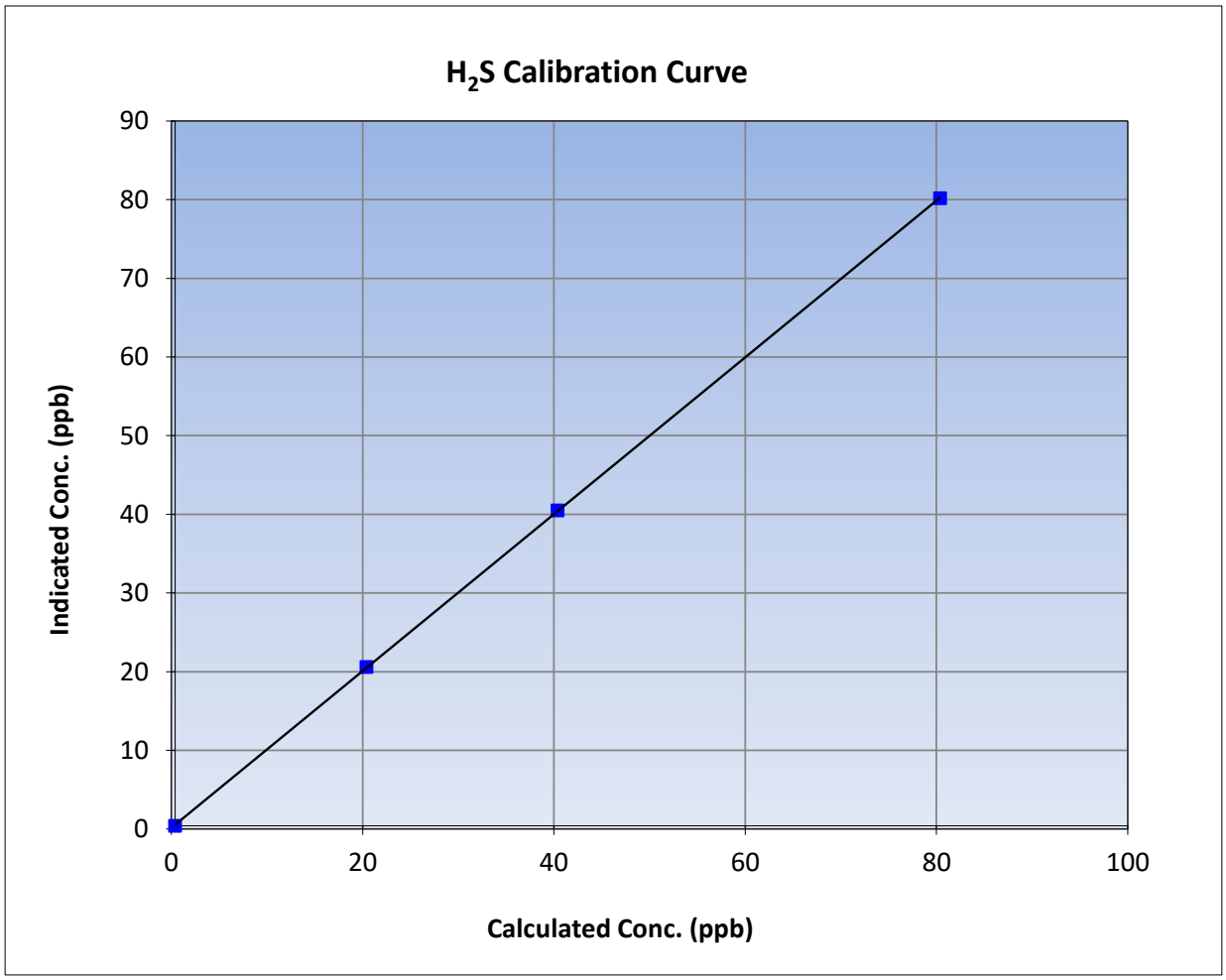
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 11:15 | End Time (MST): | 17:28 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1150840012 |

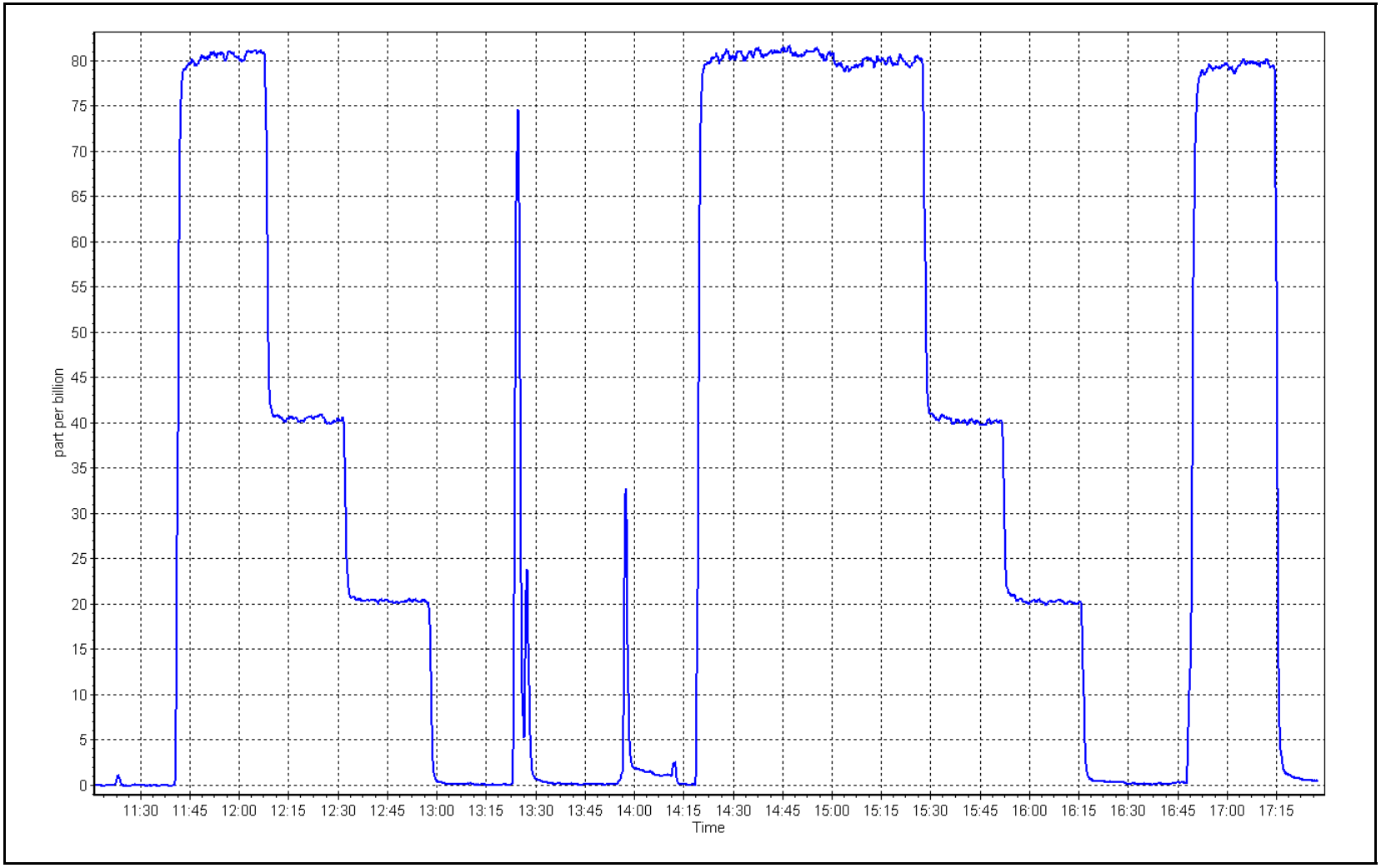
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.0 | ---- |
| 80.0 | 79.8 | 1.0024 |
| 40.0 | 40.1 | 0.9975 |
| 20.0 | 20.2 | 0.9900 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999986 | *≥0.995* |
| Slope | 0.996813 | *0.90 - 1.10* |
| Intercept | 0.139039 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 13, 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: | March 14, 2024 | Last Cal Date: | February 22, 2024 |
| Start time (MST): | 8:30 | End time (MST): | 12:29 |
| 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 T750 | | Serial Number: | 281 | |
| ZAG Make/Model: | API T751H | | Serial Number: | 321 | |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo 51i | | Analyzer serial #: | 1182340005 | |
| Analyzer Range: | 0 - 20 ppm | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 0.998323 | 0.997260 | Background: | 2.30 | 2.15 |
| Calibration intercept: | 0.032189 | 0.004217 | Coefficient: | 3.728 | 3.701 |

### 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 | -0.15 | ---- |
| as found span | 4919 | 81.3 | 17.26 | 17.23 | 1.002 |
| 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 | 17.22 | 1.002 |
| second point | 4959 | 40.7 | 8.64 | 8.60 | 1.005 |
| third point | 4980 | 20.3 | 4.31 | 4.35 | 0.991 |
| as left zero | 5000 | 0.0 | 0.00 | -0.06 | ---- |
| as left span | 4919 | 81.3 | 17.26 | 17.08 | 1.011 |
| | | | | Average Correction Factor | 1.000 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.38 | Previous response | 17.27 | *% 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.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

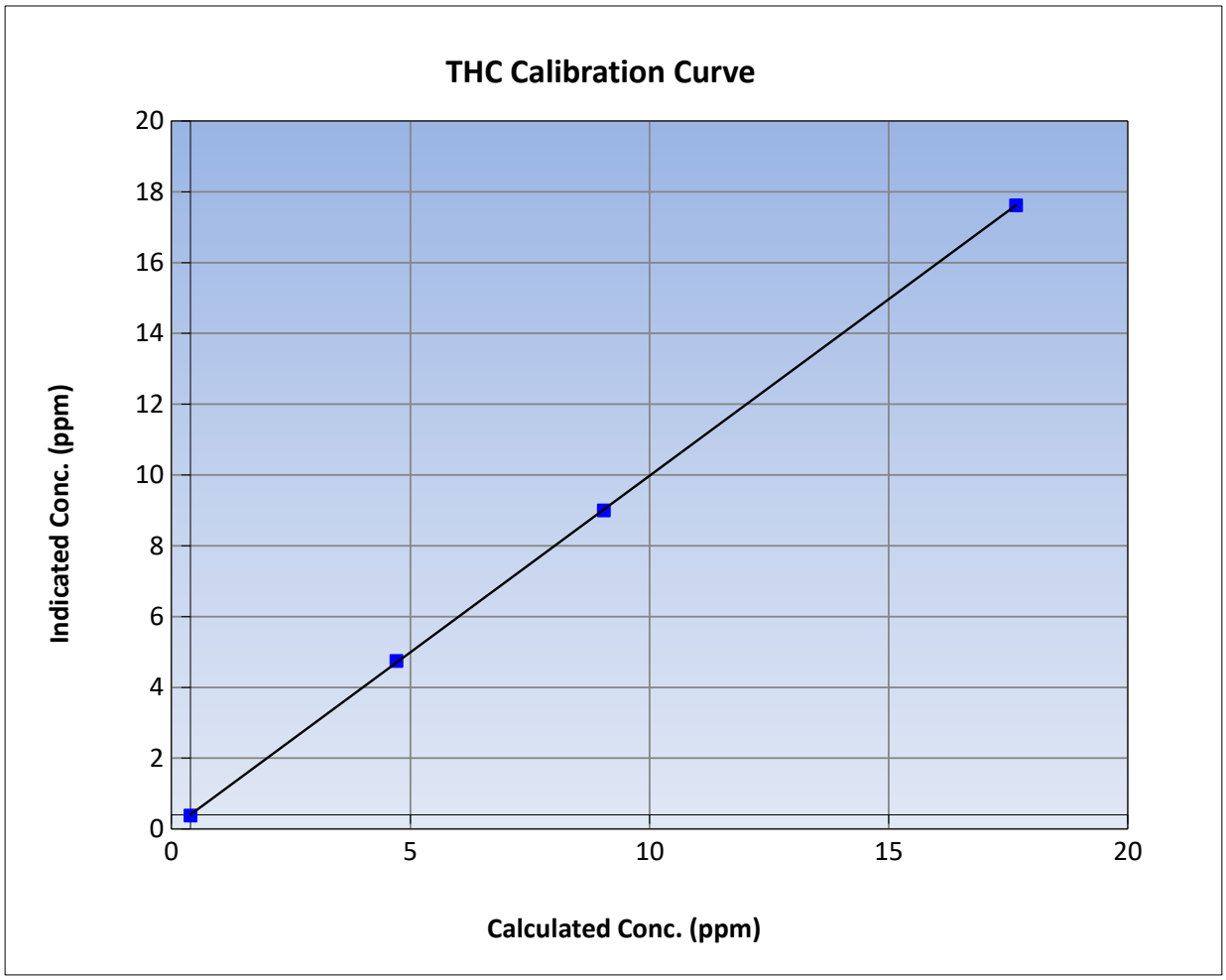
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 14, 2024 | Previous Calibration: | February 22, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 8:30 | End Time (MST): | 12:29 |
| Analyzer make: | Thermo 51i | Analyzer serial #: | 1182340005 |

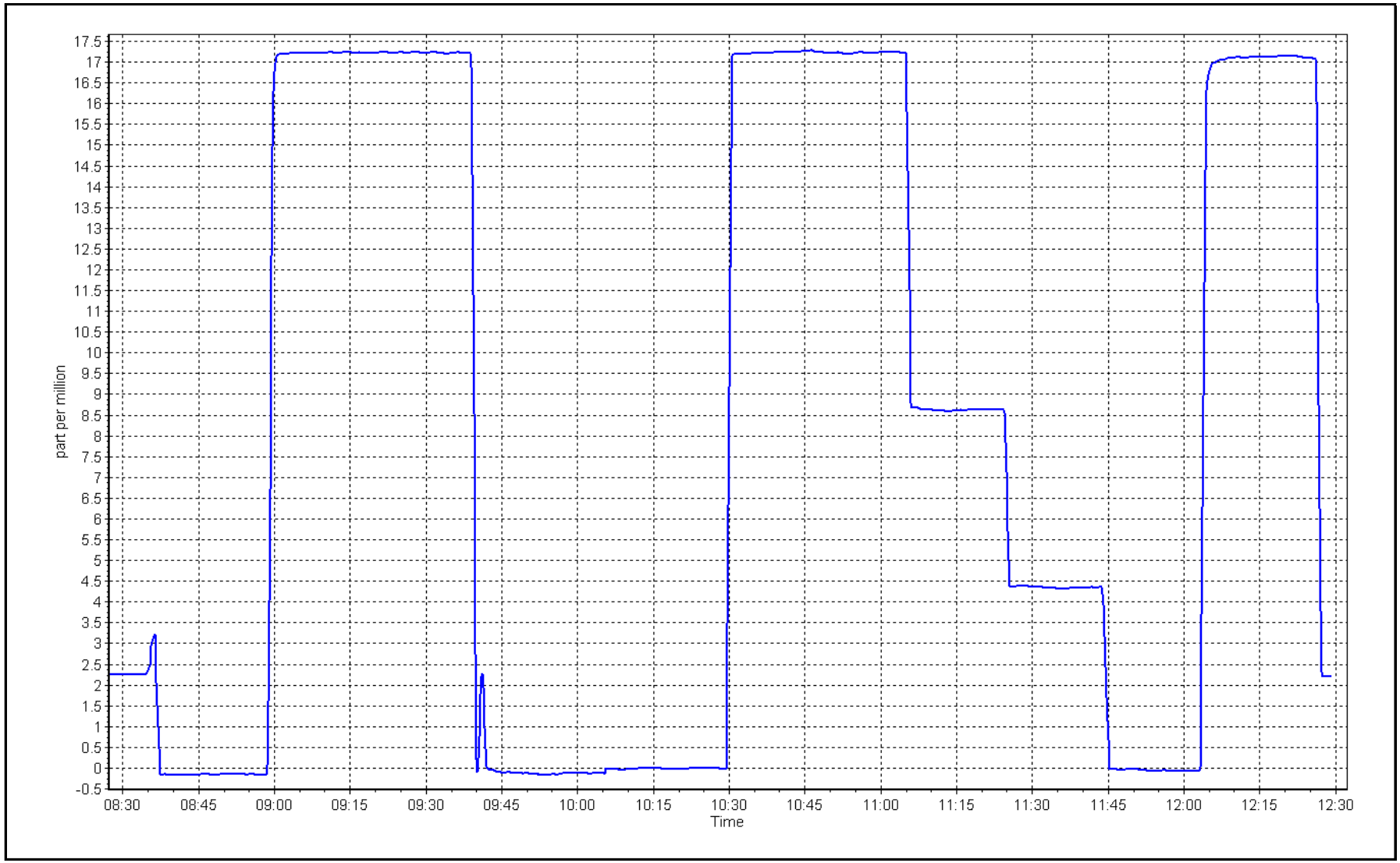
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | -0.02 | ---- |
| 17.26 | 17.22 | 1.0025 |
| 8.64 | 8.60 | 1.0050 |
| 4.31 | 4.35 | 0.9913 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999981 | *≥0.995* |
| Slope | 0.997260 | *0.90 - 1.10* |
| Intercept | 0.004217 | *+/-1.5* |



**THC Calibration Plot** Date: March 14, 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: | March 13, 2024 | Last Cal Date: | February 15, 2024 |
| Start time (MST): | 11:12 | End time (MST): | 13:20 |
| Reason: | Removal | | |

### 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: | 1.383 | 1.383 | NO bkgnd or offset: | 1.7 | 1.7 |
| NOX coeff or slope: | 0.998 | 0.998 | NOX bkgnd or offset: | 1.8 | 1.8 |
| NO2 coeff or slope: | 1.000 | 1.000 | Reaction cell Press: | 210.24 | 260.25 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.009303 | 0.999789 |
| $NO_X$ Cal Offset: | -4.671552 | -5.004402 |
| NO Cal Slope: | 1.014663 | 1.001150 |
| NO Cal Offset: | -5.612277 | -5.705997 |
| $NO_2$ Cal Slope: | 1.003572 | |
| $NO_2$ Cal Offset: | 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 | -0.5 | -0.5 | 0.0 | ---- | ---- |
| as found span | 4919 | 81.0 | 800.1 | 794.1 | 6.0 | 828.0 | 812.0 | 15.6 | 0.9663 | 0.9780 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -0.2 | -0.1 | ---- | ---- |
| high point | 4919 | 81.0 | 800.1 | 794.1 | 6.0 | 797.7 | 792.5 | 5.2 | 1.0030 | 1.0020 |
| second point | 4960 | 40.5 | 400.1 | 397.1 | 3.0 | 391.4 | 387.8 | 3.6 | 1.0221 | 1.0239 |
| third point | 4980 | 20.2 | 199.5 | 198.0 | 1.5 | 190.6 | 187.9 | 2.7 | 1.0469 | 1.0540 |
| as left zero | | | | | | | | | | |
| as left span | | | | | | | | | | |
| | | | | | | | | Average Correction Factor | 1.0240 | 1.0266 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 828.5 ppb | NO = 812.5 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = 3.1% | | |
| Previous Response | $NO_X$ = 802.9 ppb | NO = 800.2 ppb | | *Percent Change | NO = 1.5% | | |
| 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) | | | | | | |
| 2nd GPT point (200 ppb O3) | | | | | | |
| 3rd GPT point (100 ppb O3) | | | | | | |
| | | | | Average Correction Factor | | |

Notes: Analyzer does meet internal criteria. Maintenance planned for tomorrow.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

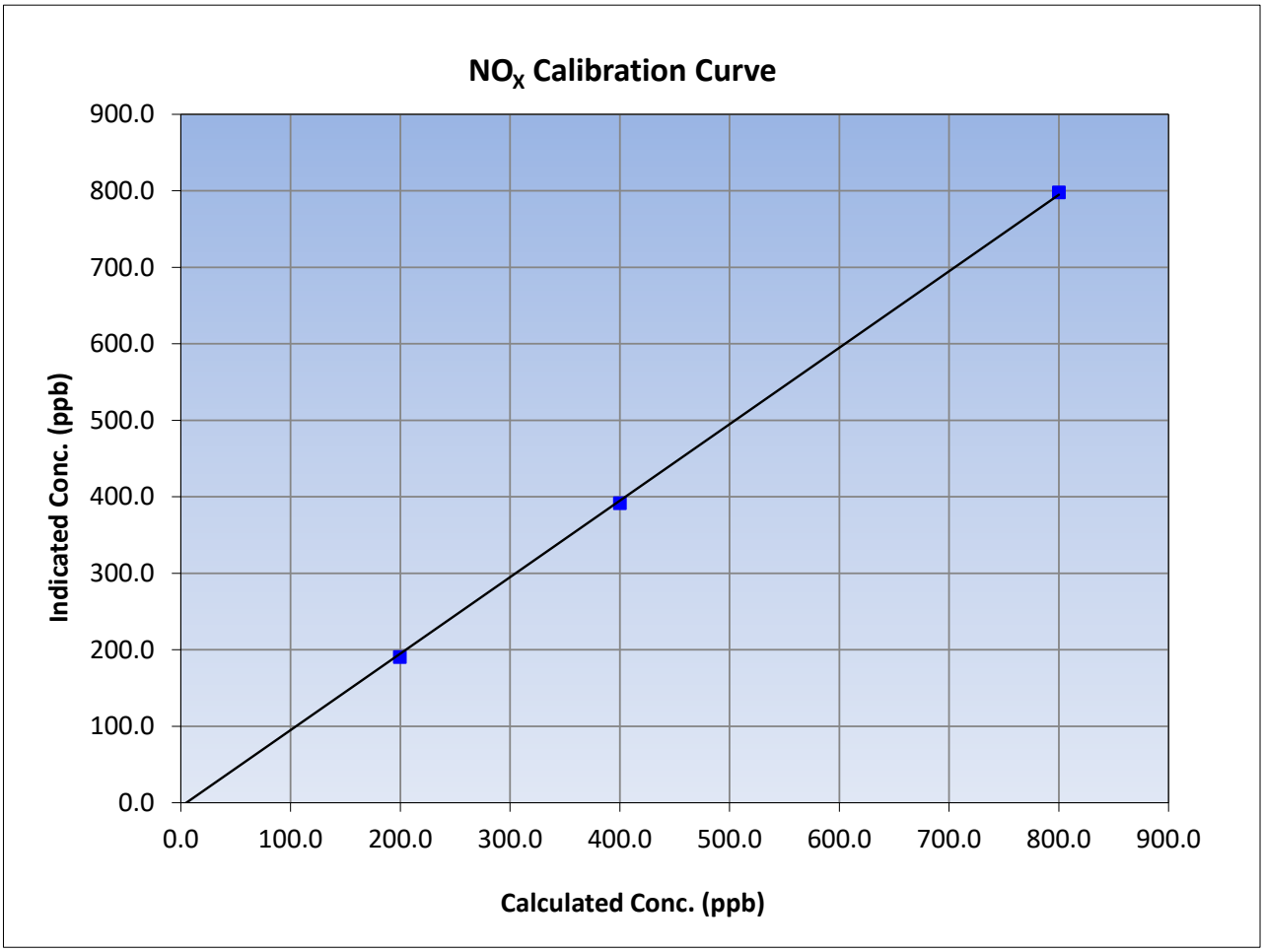
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 11:12 | End Time (MST): | 13:20 |
| 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 | -0.3 | ---- | Correlation Coefficient | 0.999836 | ≥0.995 |
| 800.1 | 797.7 | 1.0030 | | | |
| 400.1 | 391.4 | 1.0221 | Slope | 0.999789 | 0.90 - 1.10 |
| 199.5 | 190.6 | 1.0469 | | | |
| | | | Intercept | -5.004402 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

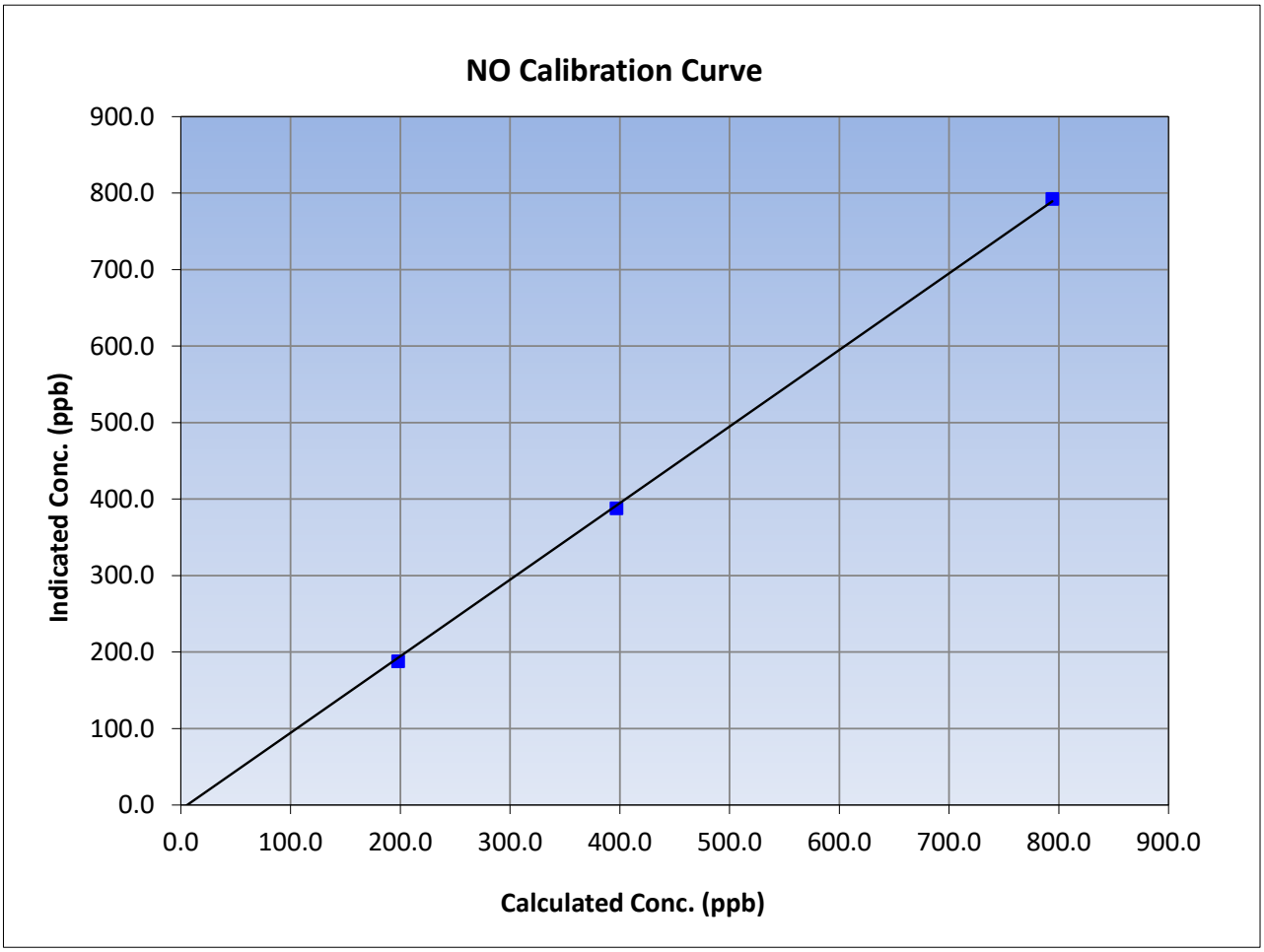
Version-04-2020

### Station Information

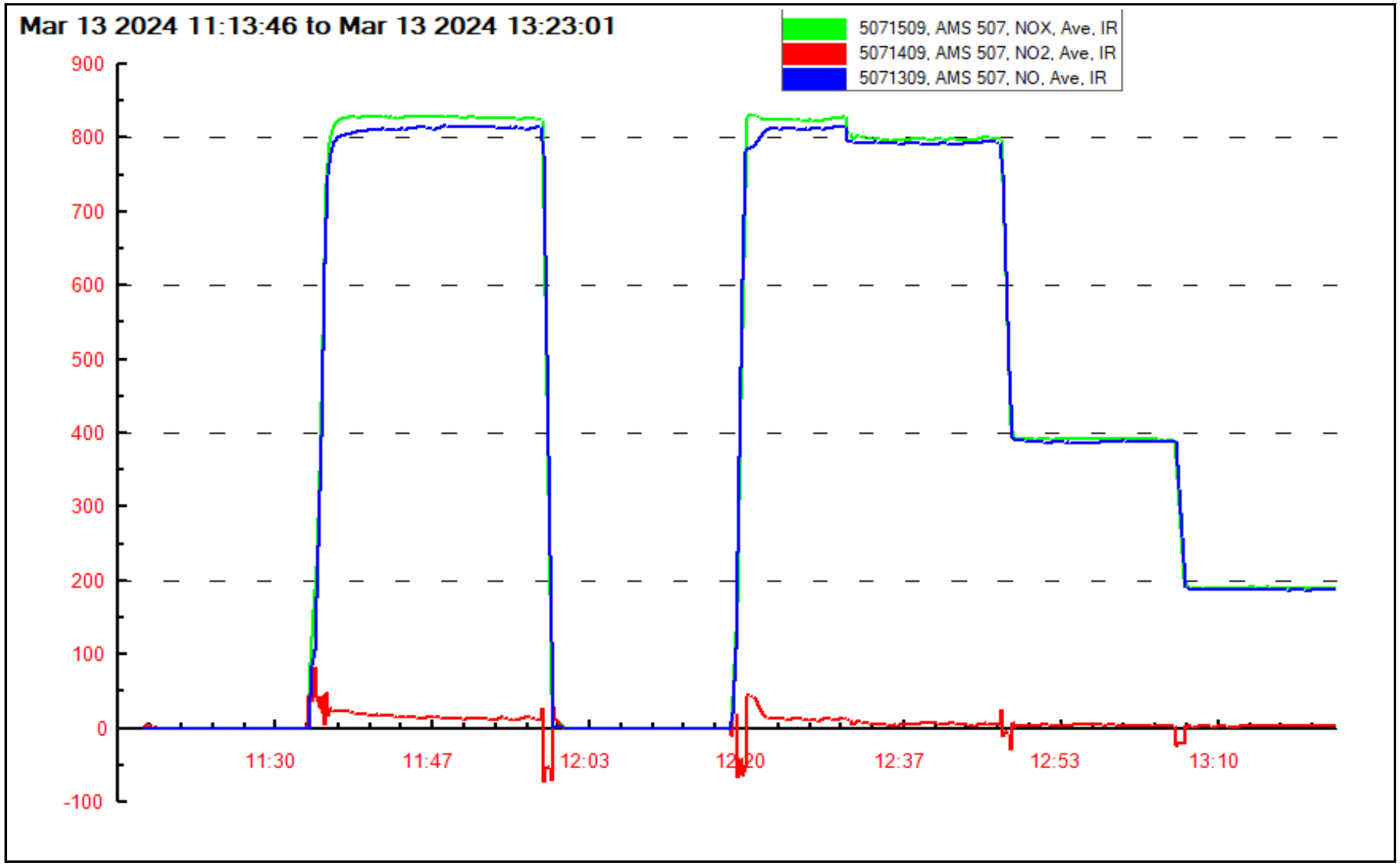
| | | | |
|---|---|---|---|
| Calibration Date: | March 13, 2024 | Previous Calibration: | February 15, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 11:12 | End Time (MST): | 13:20 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 1182340006 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999774 | ≥0.995 |
| 794.1 | 792.5 | 1.0020 | | | |
| 397.1 | 387.8 | 1.0239 | Slope | 1.001150 | 0.90 - 1.10 |
| 198.0 | 187.9 | 1.0540 | | | |
| | | | Intercept | -5.705997 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 13, 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: | March 15, 2024 | Last Cal Date: | March 13, 2024 |
| Start time (MST): | 10:30 | End time (MST): | 15:00 |
| Reason: | Install | | |

### 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 #: | 12400232071 |
| NOX Range (ppb): | 0 - 1000 ppb | | |

| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
|---|---|---|---|---|---|
| NO coeff or slope: | NA | 1.097 | NO bkgnd or offset: | NA | 1.8 |
| NOX coeff or slope: | NA | 0.996 | NOX bkgnd or offset: | NA | 2.5 |
| NO2 coeff or slope: | NA | 1.000 | Reaction cell Press: | NA | 196.86 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | NA | 1.000646 |
| $NO_X$ Cal Offset: | NA | -4.504120 |
| NO Cal Slope: | NA | 1.002372 |
| NO Cal Offset: | NA | -5.105630 |
| $NO_2$ Cal Slope: | NA | 0.996340 |
| $NO_2$ Cal Offset: | NA | 0.258912 |

# 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 | -0.2 | -0.2 | ---- | ---- |
| high point | 4919 | 81.0 | 800.1 | 794.1 | 6.0 | 798.4 | 793.6 | 4.8 | 1.0022 | 1.0007 |
| second point | 4960 | 40.5 | 400.1 | 397.1 | 3.0 | 393.1 | 389.7 | 3.4 | 1.0177 | 1.0189 |
| third point | 4980 | 20.2 | 199.5 | 198.0 | 1.5 | 191.5 | 189.0 | 2.5 | 1.0420 | 1.0478 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | -0.8 | -0.3 | -0.5 | ---- | ---- |
| as left span | 4919 | 81.0 | 800.1 | 407.5 | 392.6 | 802.0 | 407.9 | 393.7 | 0.9977 | 0.9991 |
| | | | | | | | | Average Correction Factor | 1.0206 | 1.0225 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 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) | 791.2 | 404.6 | 392.6 | 391.1 | 1.0038 | 99.6% |
| 2nd GPT point (200 ppb O3) | 791.2 | 617.0 | 180.2 | 180.4 | 0.9989 | 100.1% |
| 3rd GPT point (100 ppb O3) | 791.2 | 709.4 | 87.8 | 87.9 | 0.9988 | 100.1% |
| | | | | Average Correction Factor | 1.0005 | 100.0% |

Notes: Install calibration. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

# Wood Buffalo Environmental Association

## $NO_X$ Calibration Summary

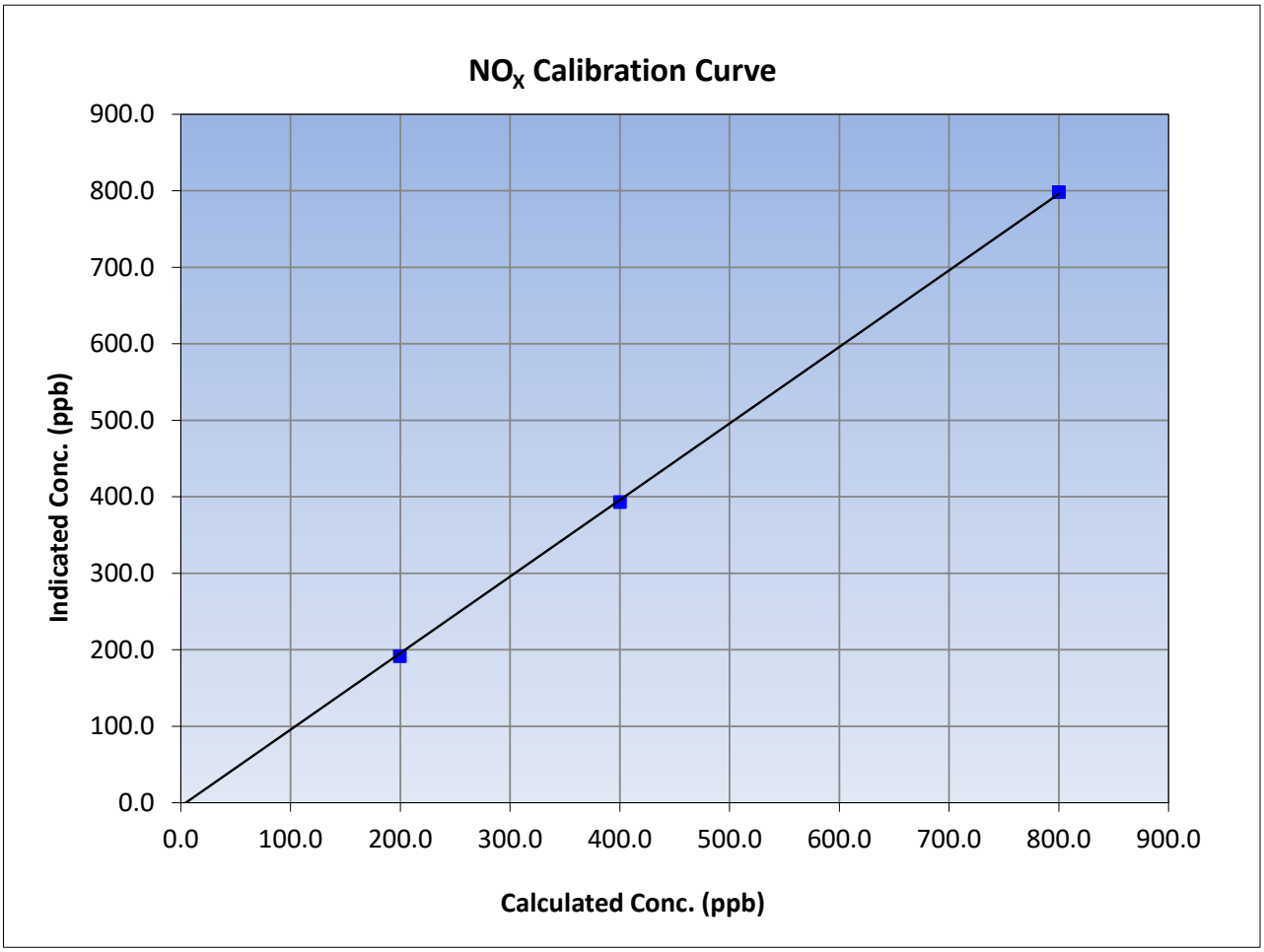
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | March 13, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 10:30 | End Time (MST): | 15:00 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 12400232071 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.4 | ---- | Correlation Coefficient | 0.999878 | ≥0.995 |
| 800.1 | 798.4 | 1.0022 | | | |
| 400.1 | 393.1 | 1.0177 | Slope | 1.000646 | 0.90 - 1.10 |
| 199.5 | 191.5 | 1.0420 | | | |
| | | | Intercept | -4.504120 | +/-20 |



# Wood Buffalo Environmental Association

## NO Calibration Summary

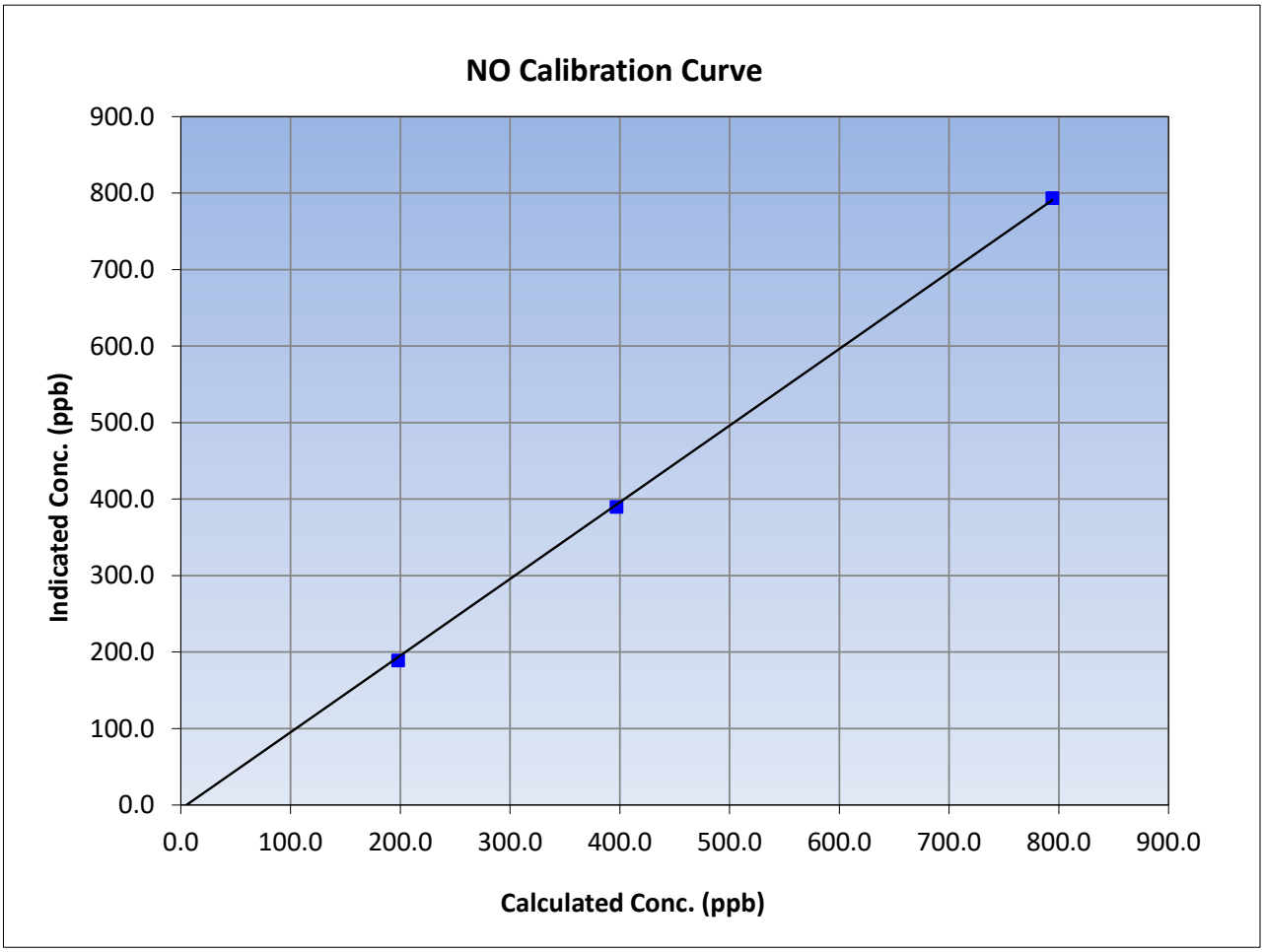
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | March 13, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 10:30 | End Time (MST): | 15:00 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 12400232071 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999824 | ≥0.995 |
| 794.1 | 793.6 | 1.0007 | | | |
| 397.1 | 389.7 | 1.0189 | Slope | 1.002372 | 0.90 - 1.10 |
| 198.0 | 189.0 | 1.0478 | | | |
| | | | Intercept | -5.105630 | +/-20 |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

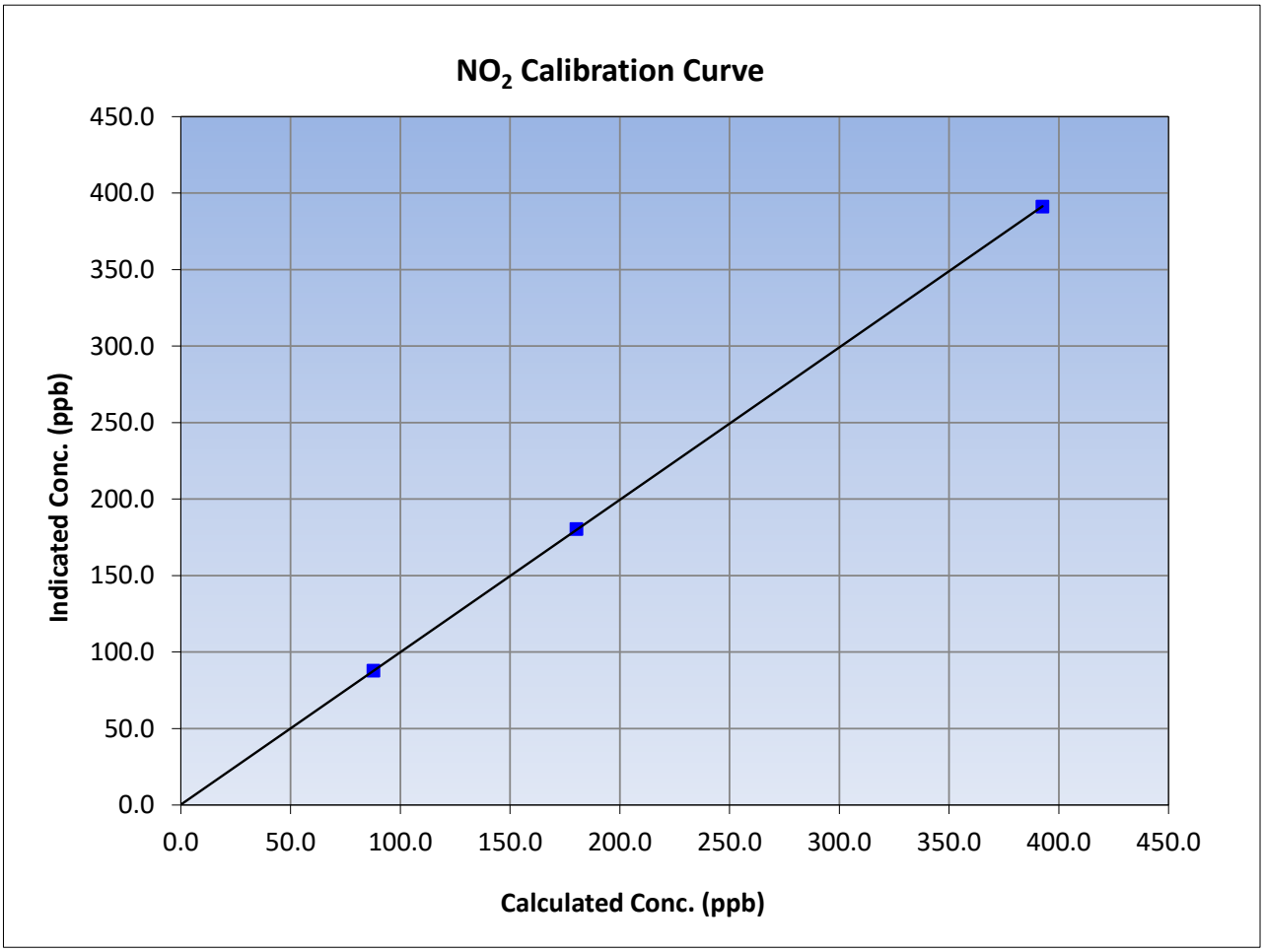
Version-04-2020

### Station Information

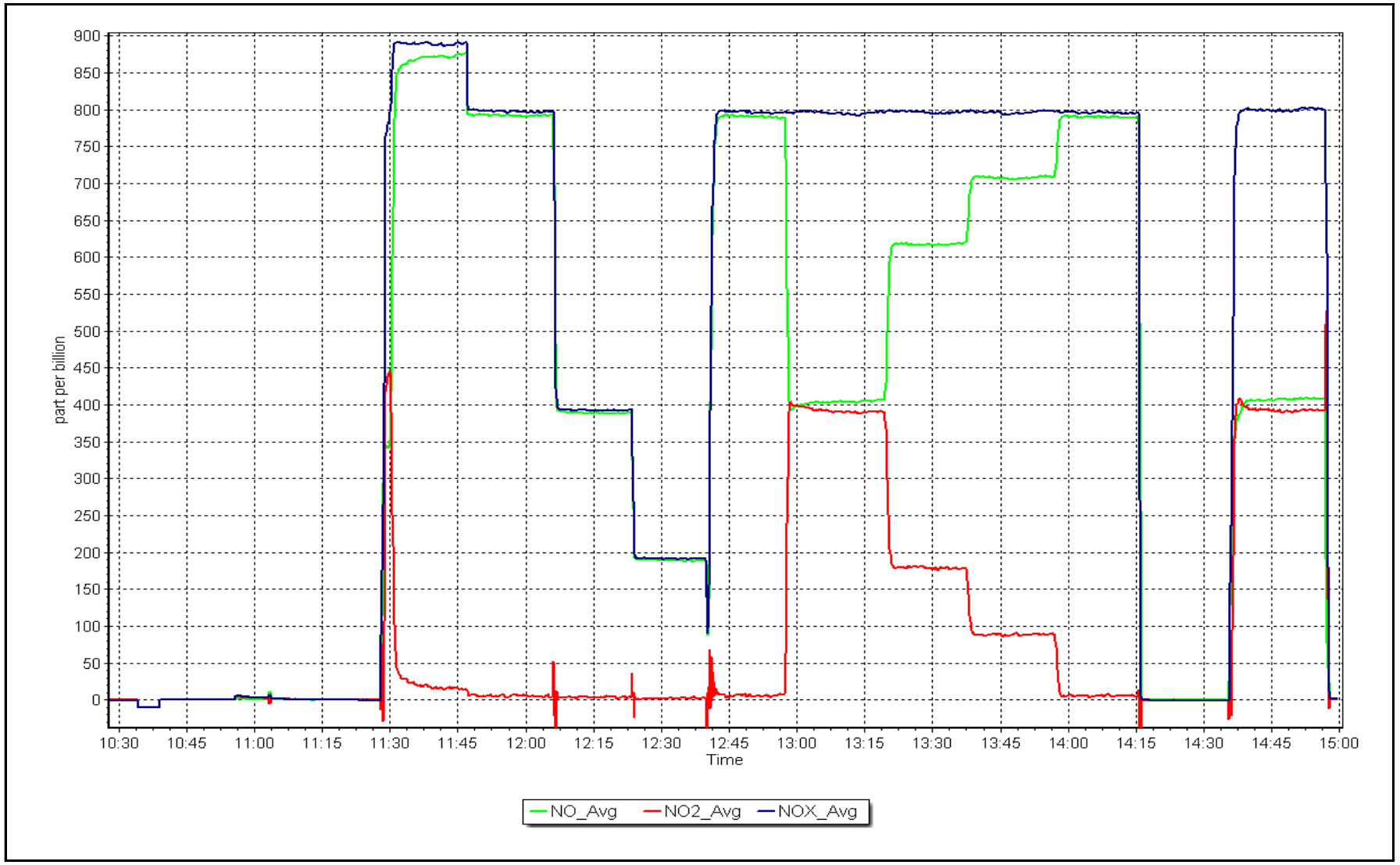
| | | | |
|---|---|---|---|
| Calibration Date: | March 15, 2024 | Previous Calibration: | March 13, 2024 |
| Station Name: | Kirby South | Station Number: | AMS507 |
| Start Time (MST): | 10:30 | End Time (MST): | 15:00 |
| Analyzer make: | Thermo 42iQ | Analyzer serial #: | 12400232071 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | -0.2 | ---- | Correlation Coefficient | 0.999992 | ≥0.995 |
| 392.6 | 391.1 | 1.0038 | | | |
| 180.2 | 180.4 | 0.9989 | Slope | 0.996340 | 0.90 - 1.10 |
| 87.8 | 87.9 | 0.9988 | | | |
| | | | Intercept | 0.258912 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 15, 2024 Location: Kirby South



# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

## AMS511
## BLACKGOLD
## MARCH 2024

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

April 30, 2024

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | March 21, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 8:12 | End time (MST): | 11:16 |
| 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: | 2445 |
| 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: | 1.003517 | 1.008482 | Backgd or Offset: | 36.0 | 38.0 |
| Calibration intercept: | 0.290852 | -0.070301 | Coeff or Slope: | 1.202 | 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 | 2.1 | ---- |
| as found span | 4926 | 79.9 | 799.0 | 806.7 | 0.990 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | -0.4 | ---- |
| high point | 4926 | 79.9 | 799.0 | 805.5 | 0.992 |
| second point | 4968 | 40.0 | 399.8 | 403.5 | 0.991 |
| third point | 4987 | 20.0 | 200.0 | 201.8 | 0.991 |
| as left zero | 5000 | 0.0 | 0.0 | -0.1 | ---- |
| as left span | 4926 | 80.0 | 800.0 | 806.8 | 0.992 |
| | | | | Average Correction Factor | 0.991 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 804.60 | Previous response | 802.12 | *% 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 sample inlet filter after as founds. Adjusted zero only.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $SO_2$ Calibration Summary

Version-01-2020

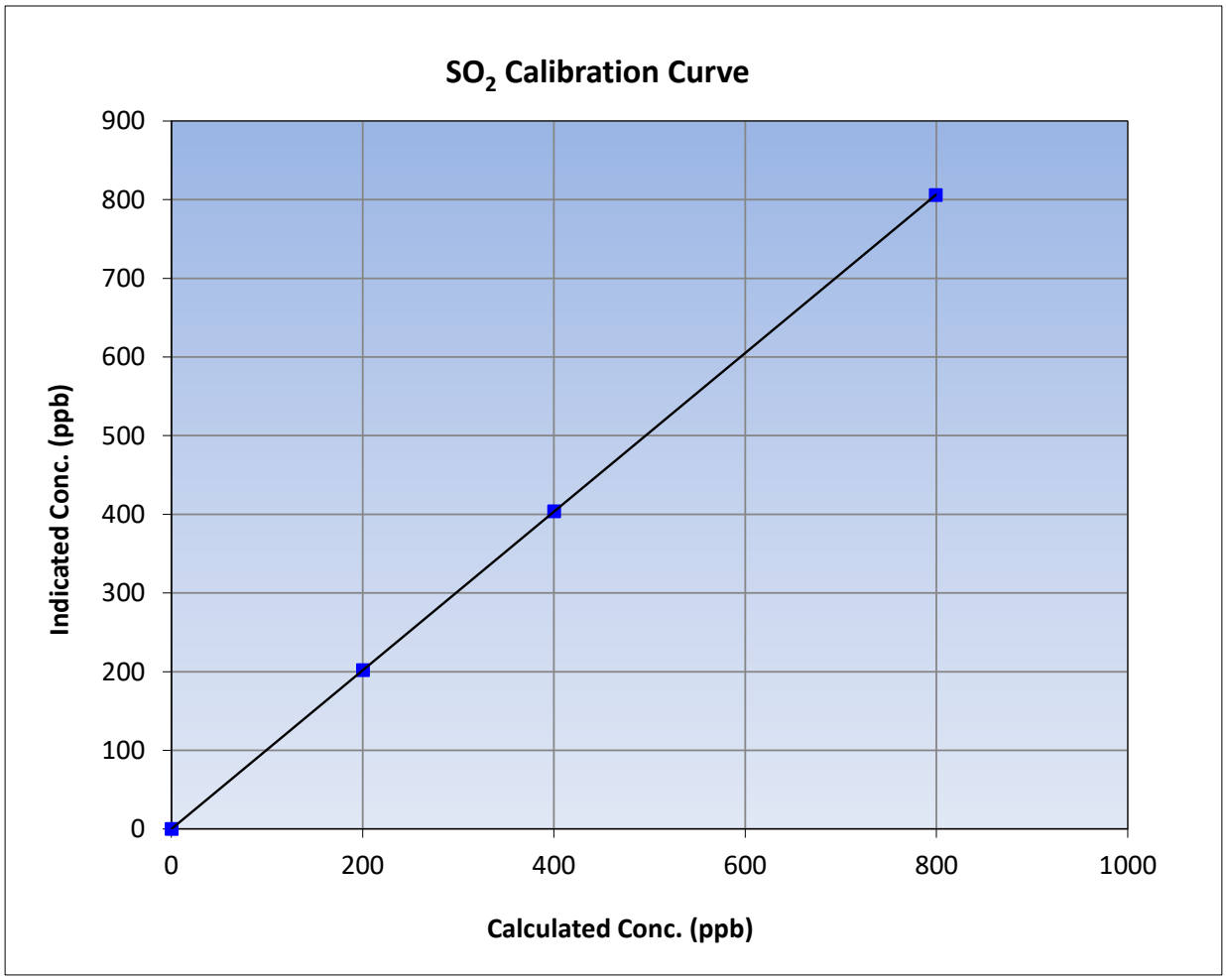
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:12 | End Time (MST): | 11:16 |
| Analyzer make: | Thermo scientific | Analyzer serial #: | 1160290014 |

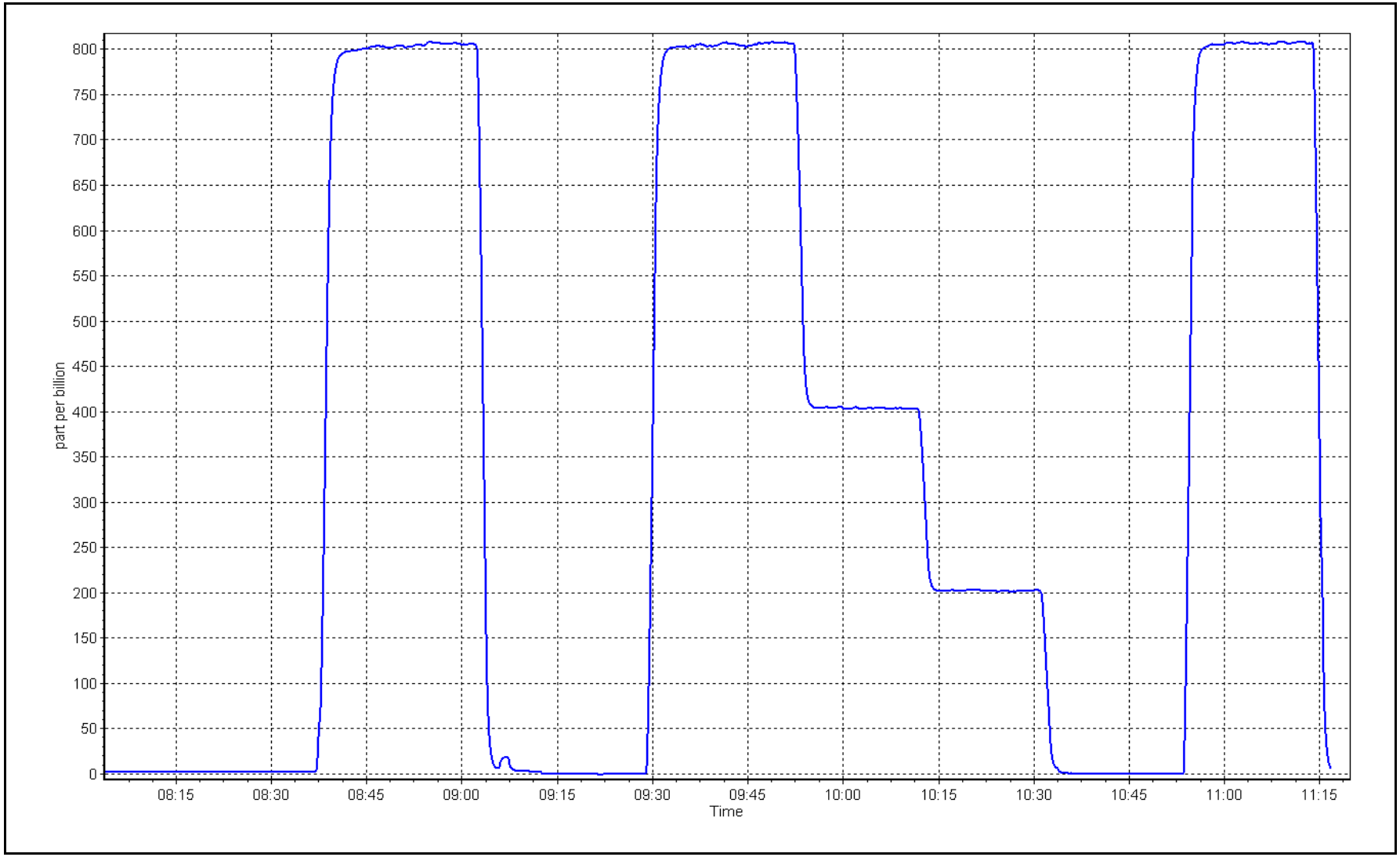
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | -0.4 | ---- |
| 799.0 | 805.5 | 0.9920 |
| 399.8 | 403.5 | 0.9909 |
| 200.0 | 201.8 | 0.9909 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999999 | *≥0.995* |
| Slope | 1.008482 | *0.90 - 1.10* |
| Intercept | -0.070301 | *+/-30* |



**SO2 Calibration Plot** Date: March 21, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## $SO_2$ Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS 511 |
| Calibration Date: | April 4, 2024 | Last Cal Date: | March 21, 2024 |
| Start time (MST): | 12:31 | End time (MST): | 13:59 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 50.06 | ppm | Cal Gas Exp Date: | January 5, 2029 |
| Cal Gas Cylinder #: | CC147416 | | | |
| Removed Cal Gas Conc: | 50.06 | ppm | Rem Gas Exp Date: | NA |
| Removed Gas Cyl #: | NA | | Diff between cyl: | |
| Calibrator Model: | Teledyne API T700 | | Serial Number: | 2445 |
| Zero Air Gen Model: | Teledyne API 701 | | Serial Number: | 138 |

### Analyzer Information

| | | | | | |
|---|---|---|---|---|---|
| Analyzer make: | Thermo scientific | | Serial Number: | 1160290014 | |
| Analyzer Range: | 0 - 1000 ppb | | | | |
| | ***Start*** | ***Finish*** | | ***Start*** | ***Finish*** |
| Calibration slope: | 1.008482 | NA | Backgd or Offset: | 38.0 | NA |
| Calibration intercept: | -0.070301 | NA | Coeff or Slope: | 1.202 | NA |

### $SO_2$ As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.0 | -1.5 | ---- |
| As found High point | 4926 | 79.9 | 799.0 | 812.7 | 0.981 |
| As found Mid point | 4968 | 40.0 | 399.8 | 406.1 | 0.981 |
| As found Low point | 4987 | 20.0 | 200.0 | 201.4 | 0.986 |
| New cylinder response | | | | | |
| Baseline Corr As found: | 814.2 | Previous response | 805.7 | *% change | 1.0% |
| Baseline Corr 2nd AF pt: | 407.6 | AF Slope: | 1.019395 | AF Intercept: | -1.811745 |
| Baseline Corr 3rd AF pt: | 202.9 | AF Correlation: | 0.999998 | * = > +/-5% change initiates investigation | |

### $SO_2$ Calibration Data

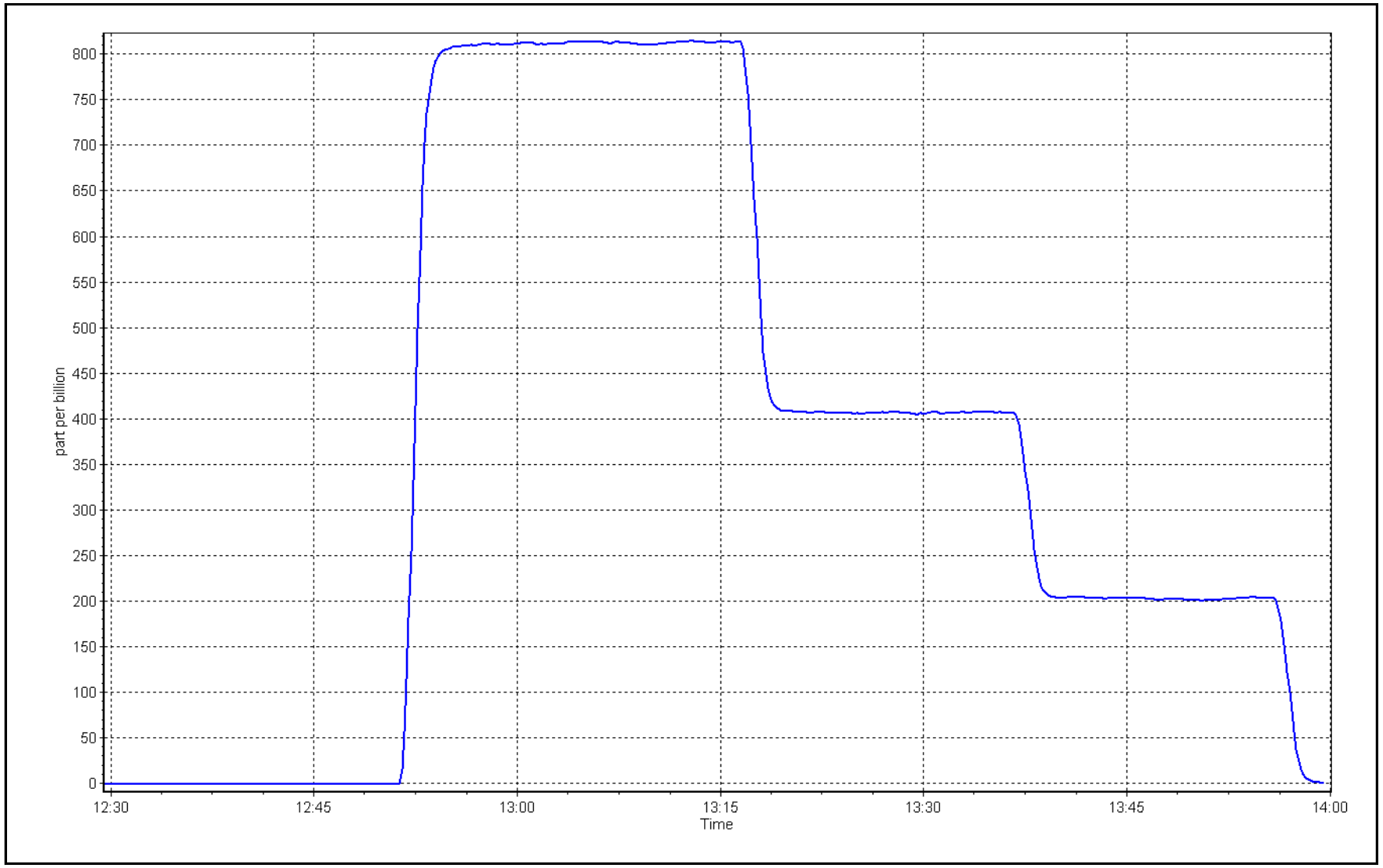
| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | | | | | |
| High point | | | | | |
| Mid point | | | | |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

Average Correction Factor:

Notes: Removal Calibration.

Calibration Performed By: Mohammed Kashif

**SO2 Calibration Plot** Date: April 4, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

Version-11-2021

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | March 28, 2024 | Last Cal Date: | February 8, 2024 |
| Start time (MST): | 8:14 | End time (MST): | 12:11 |
| 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: | 0.998919 | 0.999918 | Backgd or Offset: | 3.49 | 3.48 |
| Calibration intercept: | 0.140727 | 0.180786 | Coeff or Slope: | 1.189 | 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 | 0.1 | ---- |
| as found span | 4922 | 77.8 | 80.0 | 80.3 | 0.997 |
| as found 2nd point | 4961 | 38.9 | 40.0 | 40.2 | 0.997 |
| as found 3rd point | 4981 | 19.5 | 20.0 | 20.3 | 0.992 |
| 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 | 77.8 | 80.0 | 80.1 | 0.998 |
| second point | 4961 | 38.9 | 40.0 | 40.3 | 0.992 |
| third point | 4981 | 19.5 | 20.0 | 20.1 | 0.997 |
| as left zero | 5000 | 0.0 | 0.0 | 0.3 | ---- |
| as left span | 4922 | 77.9 | 80.0 | 80.1 | 0.999 |
| 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: | 80.2 | Prev response: | 80.02 | *% change: | 0.2% |
| Baseline Corr 2nd AF pt: | 40.1 | AF Slope: | 1.002494 | AF Intercept: | 0.140643 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999998 | | |

* = > +/-5% change initiates investigation

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

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## $H_2S$ Calibration Summary

Version-11-2021

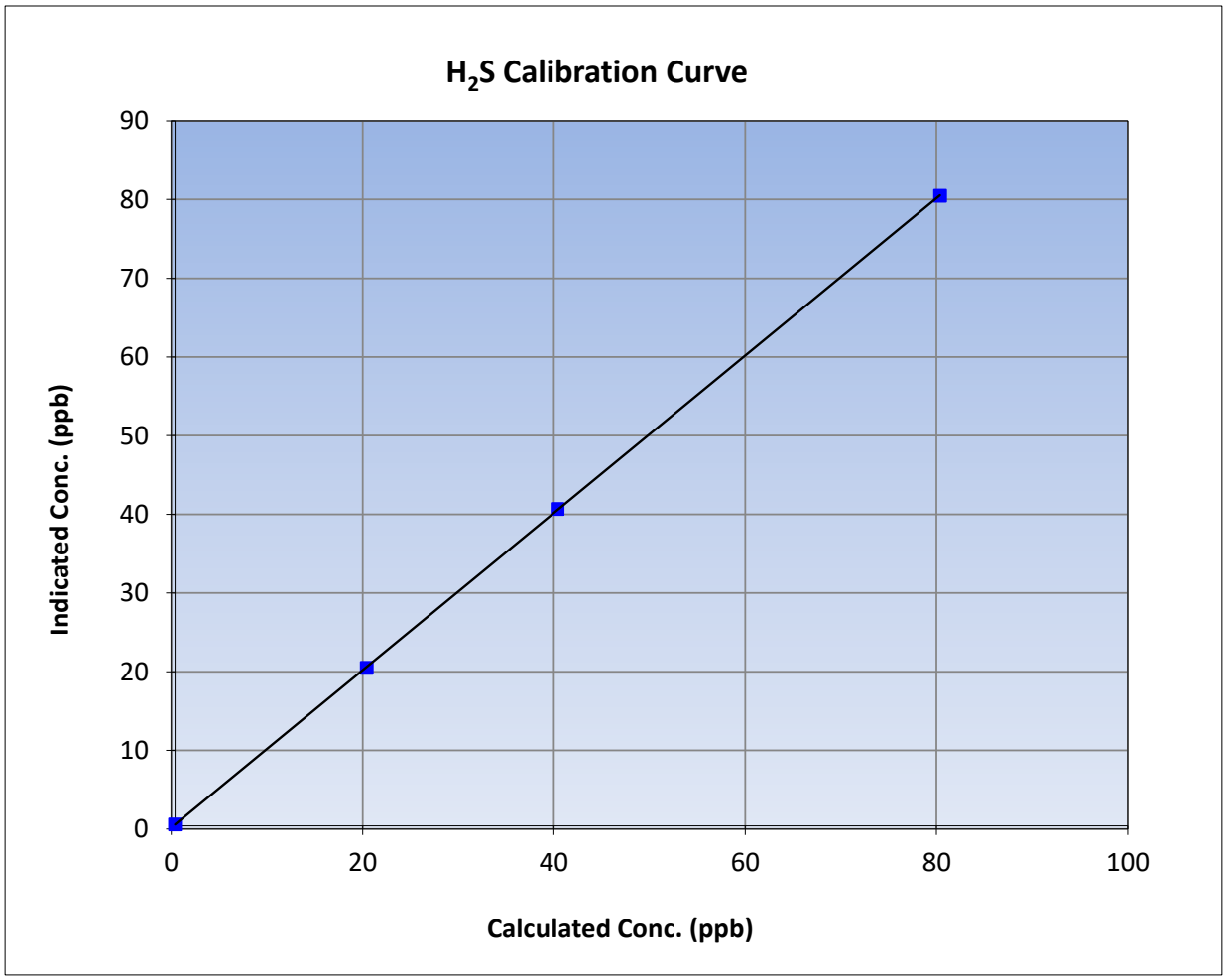
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 28, 2024 | Previous Calibration: | February 8, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:14 | End Time (MST): | 12:11 |
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1336160090 |

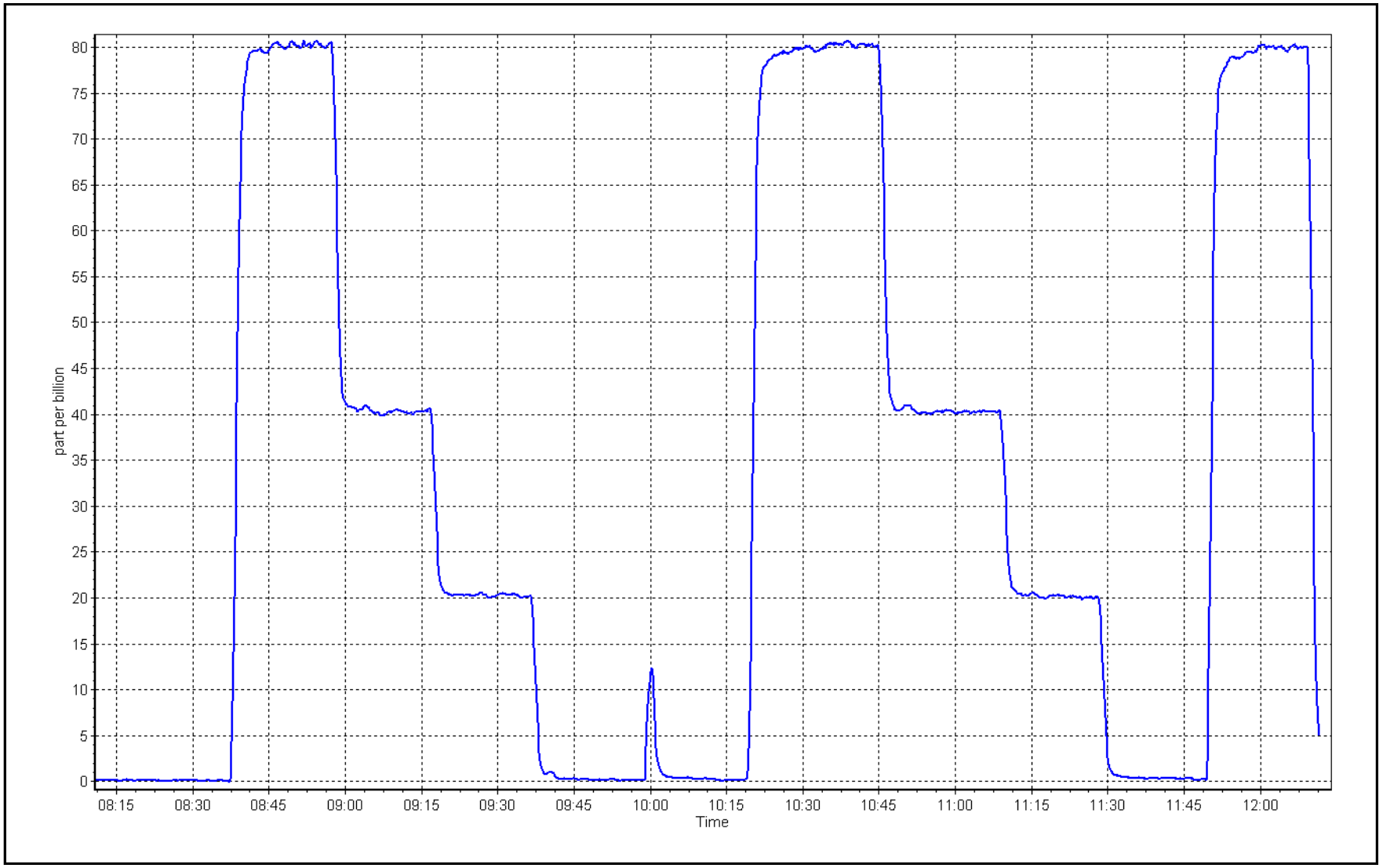
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.0 | 0.2 | ---- |
| 80.0 | 80.1 | 0.9983 |
| 40.0 | 40.3 | 0.9921 |
| 20.0 | 20.1 | 0.9970 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999990 | *≥0.995* |
| Slope | 0.999918 | *0.90 - 1.10* |
| Intercept | 0.180786 | *+/-3* |



**$H_2S$ Calibration Plot** Date: March 28, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## $H_2S$ Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS 511 |
| Calibration Date: | April 4, 2024 | Last Cal Date: | March 28, 2024 |
| Start time (MST): | 10:32 | End time (MST): | 12:31 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | |
|---|---|---|---|---|
| Cal Gas Concentration: | 5.14 | ppm | Cal Gas Exp Date: | January 3, 2026 |
| Cal Gas Cylinder #: | CC511397 | | | |
| 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: | 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 | | Converter Temp: | 325 degC |

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| Calibration slope: | 0.999918 | NA | Backgd or Offset: | 3.5 | NA |
| Calibration intercept: | 0.180786 | NA | Coeff or Slope: | 1.189 | 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 | 0.1 | ---- |
| As found High point | 4922 | 77.8 | 80.0 | 80.8 | 0.991 |
| As found Mid point | 4961 | 38.9 | 40.0 | 40.6 | 0.987 |
| As found Low point | 4981 | 19.5 | 20.0 | 20.3 | 0.992 |
| New cylinder response | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 80.7 | Prev response: | 80.14 | *% change: | 0.7% |
| Baseline Corr 2nd AF pt: | 40.5 | AF Slope: | 1.009496 | AF Intercept: | 0.120568 |
| Baseline Corr 3rd AF pt: | 20.2 | AF Correlation: | 0.999995 | * = > +/-5% change initiates investigation | |

### $H_2S$ Calibration Data

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

Date of last scrubber change:

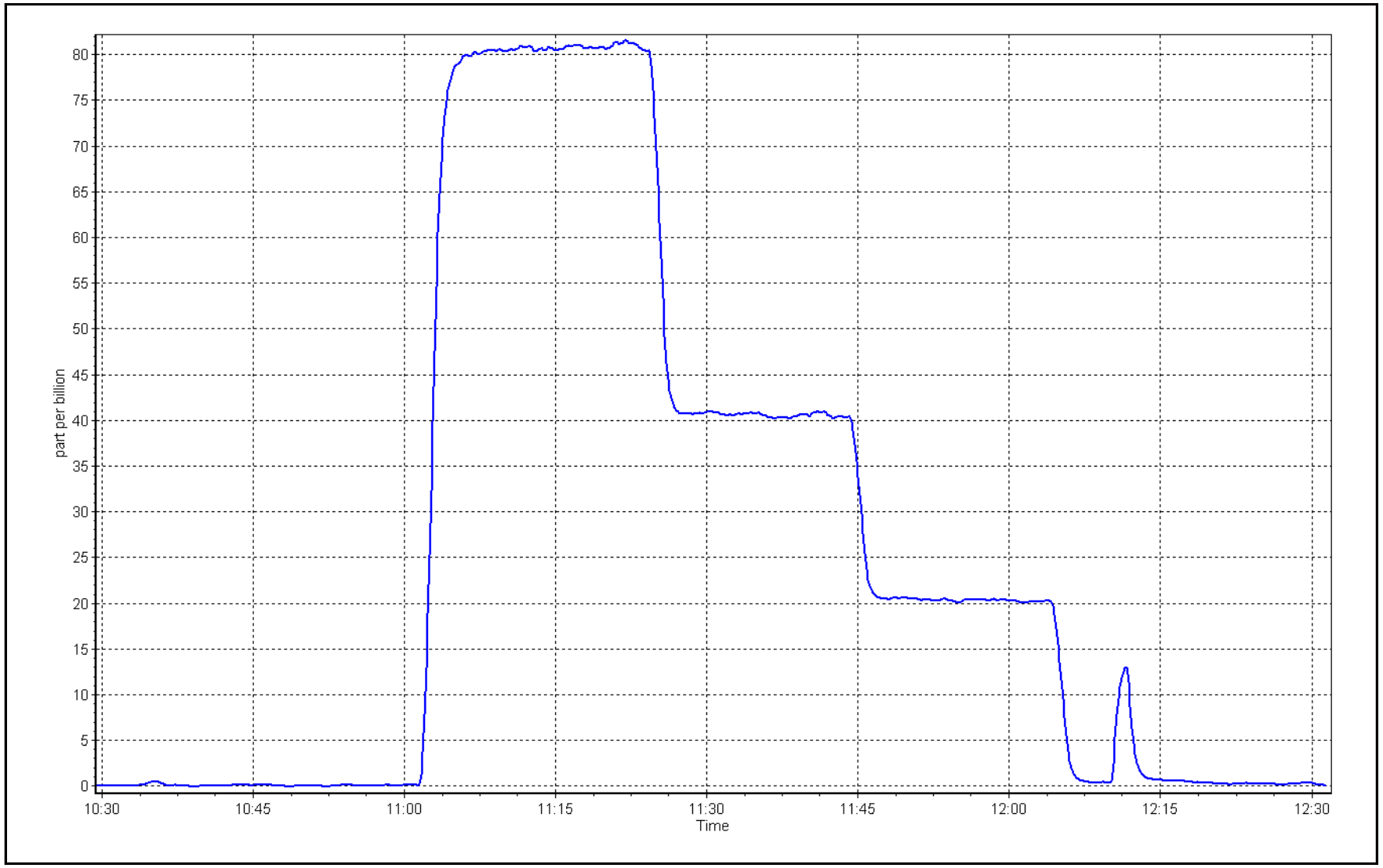
Ave Corr Factor

Date of last converter efficiency test:

Notes: Removal Calibartion. Ran SO2 scrubber check after as found span and it passed.

Calibration Performed By: Mohammed Kashif

**$H_2S$ Calibration Plot** Date: April 4, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS511 |
| Calibration Date: | March 21, 2024 | Last Cal Date: | February 21, 2024 |
| Start time (MST): | 8:12 | End time (MST): | 11:16 |
| 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: | 2445 | |
| 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: | 0.982206 | 1.001619 | Background: | 0.89 | 0.89 |
| Calibration intercept: | -0.016488 | -0.026162 | 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 | 0.07 | ---- |
| as found span | 4920 | 79.9 | 17.11 | 17.20 | 0.995 |
| as found 2nd point | | | | | |
| as found 3rd point | | | | | |
| new cylinder response | | | | | |
| calibrator zero | 5000 | 0.0 | 0.00 | 0.07 | ---- |
| high point | 4920 | 79.9 | 17.11 | 17.18 | 0.996 |
| second point | 4960 | 40.0 | 8.57 | 8.47 | 1.012 |
| third point | 4980 | 20.0 | 4.28 | 4.20 | 1.021 |
| as left zero | 5000 | 0.0 | 0.00 | 0.06 | ---- |
| as left span | 4926 | 80.0 | 17.11 | 17.23 | 0.993 |
| | | | | Average Correction Factor | 1.010 |

| | | | | | |
|---|---|---|---|---|---|
| Baseline Corr As found: | 17.13 | Previous response | 16.79 | *% change | 2.0% |
| 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 sample inlet filter after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif

# Wood Buffalo Environmental Association

## THC Calibration Summary

Version-01-2020

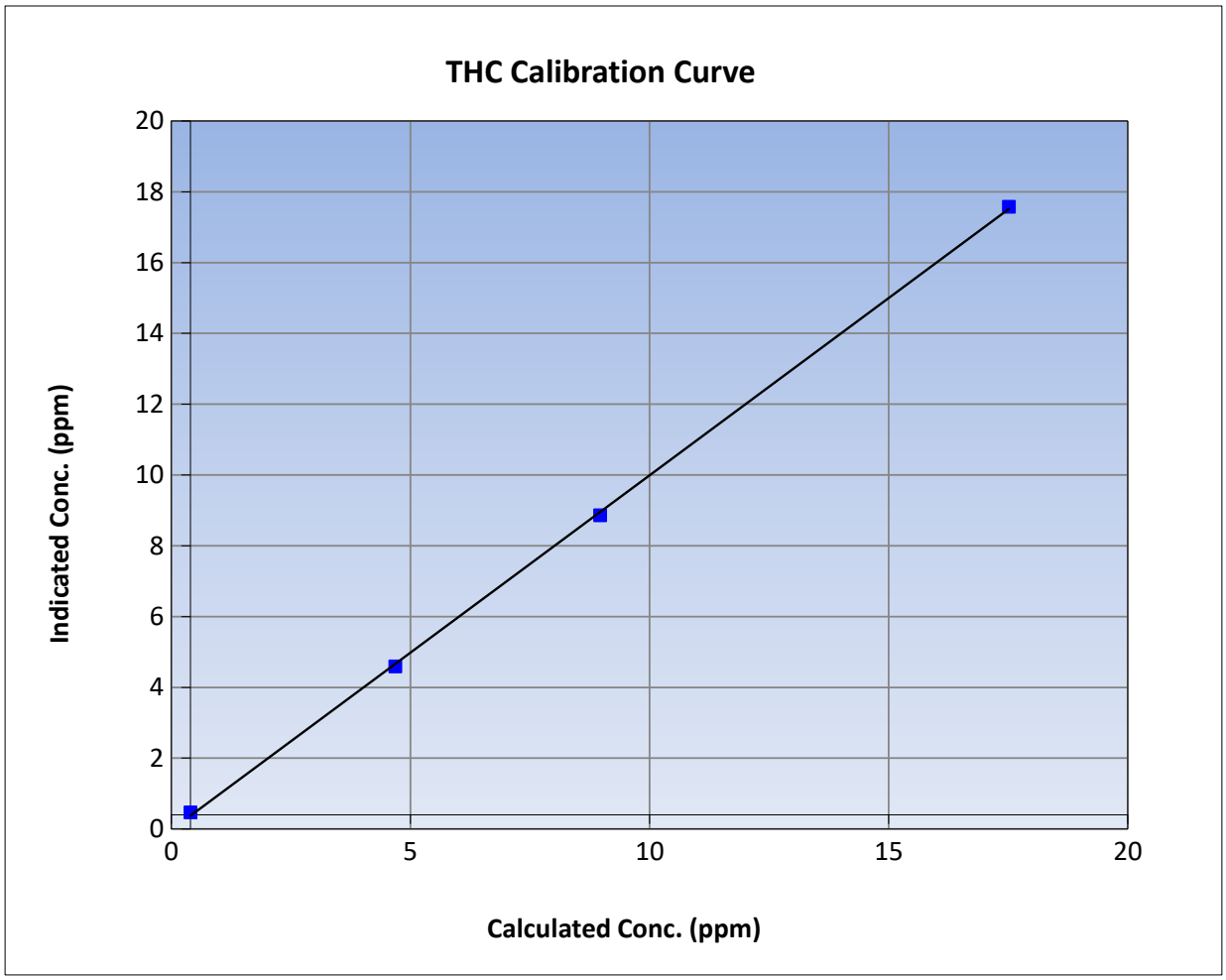
### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 21, 2024 | Previous Calibration: | February 21, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:12 | End Time (MST): | 11:16 |
| Analyzer make: | Thermo 51i-LT | Analyzer serial #: | 1317958295 |

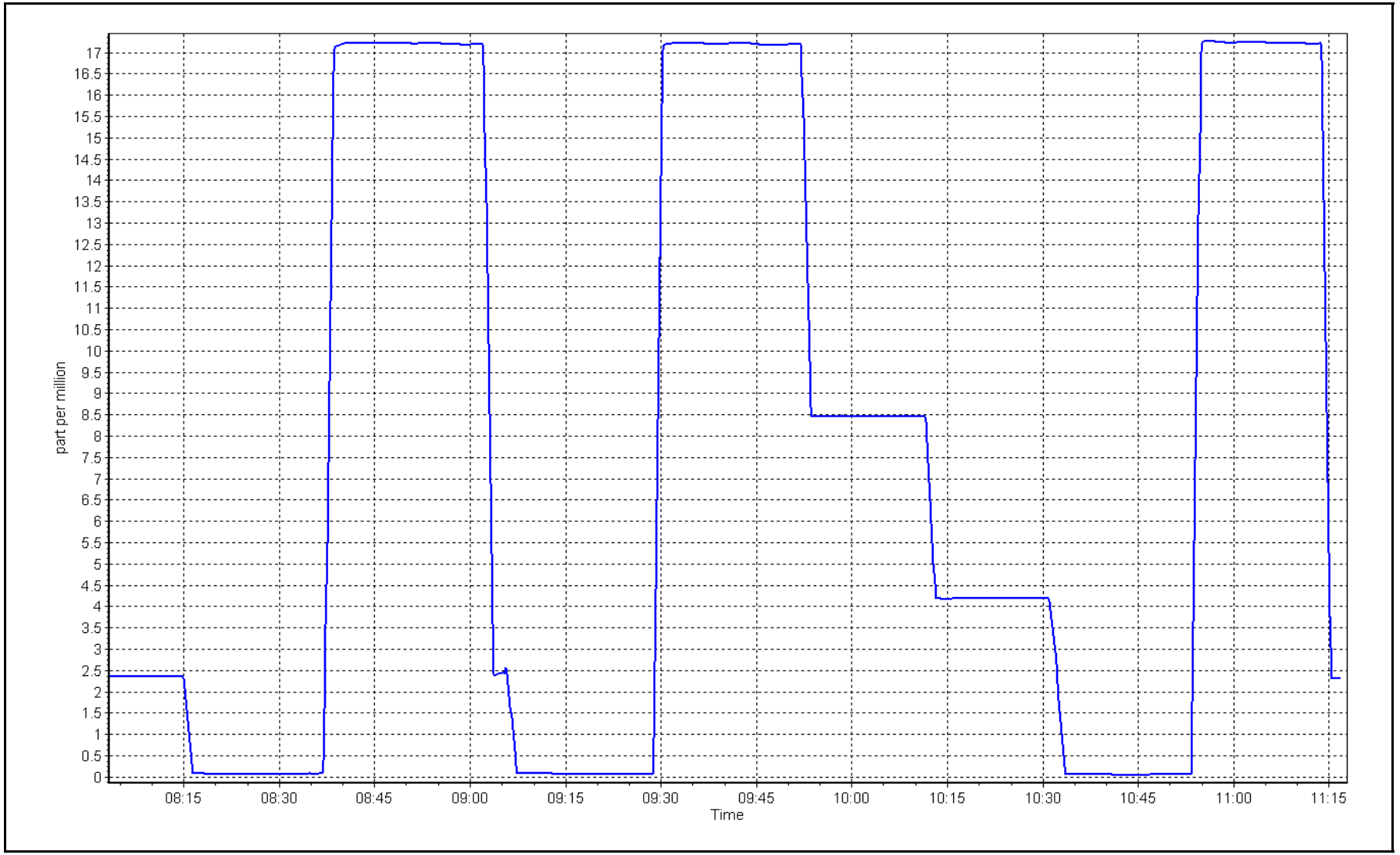
### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---|---|---|
| 0.00 | 0.07 | ---- |
| 17.11 | 17.18 | 0.9964 |
| 8.57 | 8.47 | 1.0118 |
| 4.28 | 4.20 | 1.0209 |
| | | |

| Statistical Evaluation | | *Limits* |
|---|---|---|
| Correlation Coefficient | 0.999843 | *≥0.995* |
| Slope | 1.001619 | *0.90 - 1.10* |
| Intercept | -0.026162 | *+/-1.5* |



**THC Calibration Plot** Date: March 21, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## THC Calibration Report

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Blackgold | Station number: | AMS 511 |
| Calibration Date: | April 4, 2024 | Last Cal Date: | March 21, 2024 |
| Start time (MST): | 12:31 | End time (MST): | 13:59 |
| Reason: | Removal | | |

### Calibration Standards

| | | | | | |
|---|---|---|---|---|---|
| Gas Cert Reference: | CC147416 | | Cal Gas Expiry Date: | January 5, 2029 | |
| CH4 Cal Gas Conc. | 498.9 | ppm | CH4 Equiv Conc. | 1070.9 | ppm |
| C3H8 Cal Gas Conc. | 208.0 | ppm | | | |
| Removed Gas Cert: | NA | | Removed Gas Expiry: | NA | |
| Removed CH4 Conc. | 498.9 | ppm | CH4 Equiv Conc. | 1070.9 | ppm |
| Removed C3H8 Conc. | 208.0 | ppm | Diff between cyl: | | |
| Calibrator Make/Model: | Teledyne API T700 | | Serial Number: | 2445 | |
| 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: | 1.001619 | NA | Background: | 0.890 | NA |
| Calibration intercept: | -0.026162 | NA | Coefficient: | 0.567 | NA |

### THC As Found Data

| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10* |
|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.00 | 0.08 | ---- |
| As found High point | 4920 | 79.9 | 17.11 | 17.17 | 1.001 |
| As found Mid point | 4960 | 40.0 | 8.57 | 8.43 | 1.025 |
| As found Low point | 4980 | 20.0 | 4.28 | 4.17 | 1.045 |
| New cylinder response | | | | | |
| Baseline Corr As found: | 17.10 | Previous response | 17.11 | *% change | -0.1% |
| Baseline Corr 2nd AF pt: | 8.36 | AF Slope: | 1.001424 | AF Intercept: | -0.037948 |
| Baseline Corr 3rd AF pt: | 4.10 | AF Correlation: | 0.999774 | * = > +/-5% change initiates investigation | |

### THC Calibration Data

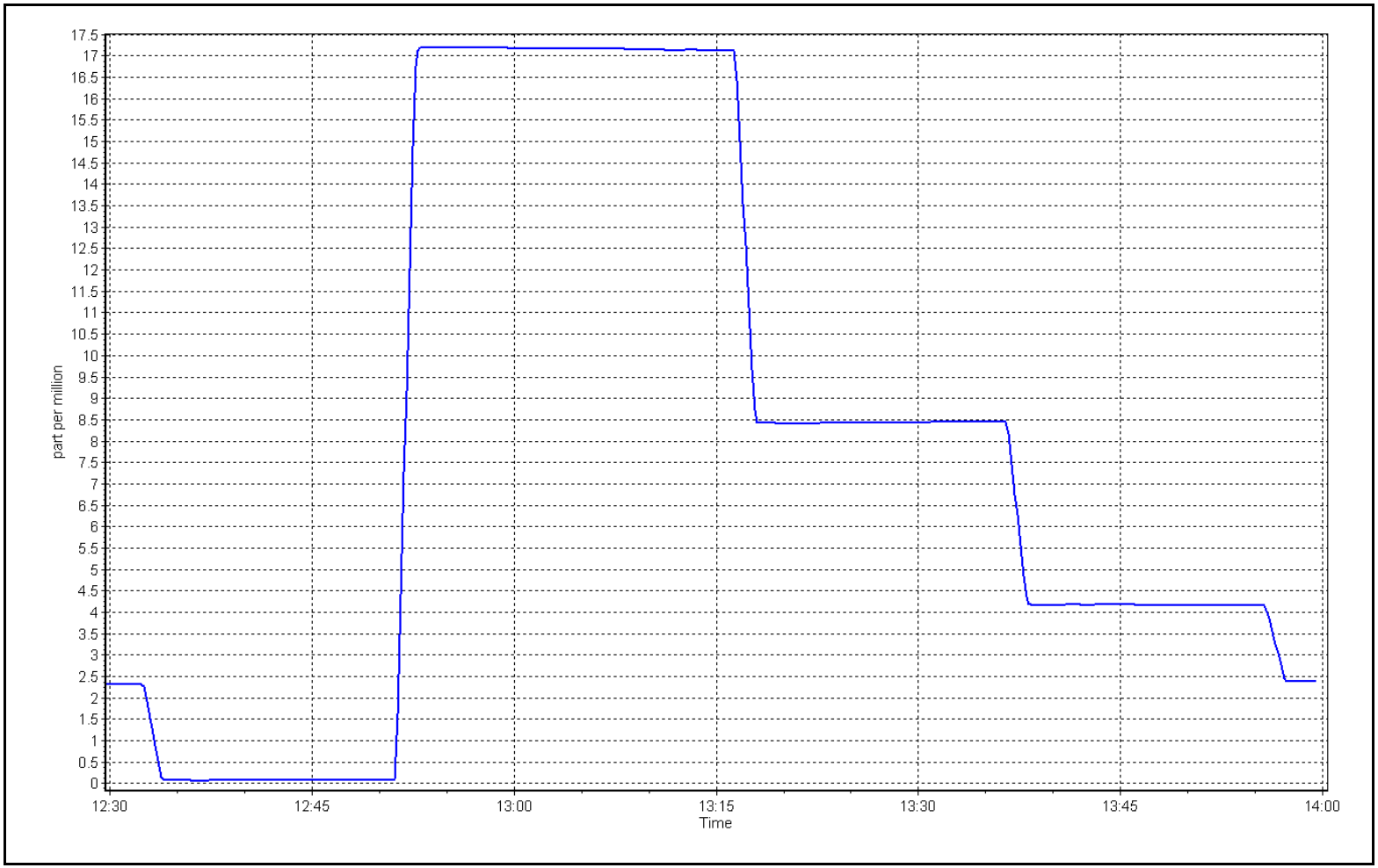
| Set Point | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|
| Calibrator zero | | | | | |
| High point | | | | | |
| Mid point | | | | | |
| Low point | | | | | |
| As left zero | | | | | |
| As left span | | | | | |

Average Correction Factor

Notes: Removal Calibration.

Calibration Performed By: Mohammed Kashif

**THC Calibration Plot** Date: April 4, 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: | March 20, 2024 | Last Cal Date: | February 23, 2024 |
| Start time (MST): | 8:47 | End time (MST): | 13:20 |
| 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: | 4.2 | 4.2 |

### Calibration Statistics

| | ***Start*** | ***Finish*** |
|---|---|---|
| $NO_X$ Cal Slope: | 1.016612 | 1.015442 |
| $NO_X$ Cal Offset: | 0.426960 | 0.386974 |
| NO Cal Slope: | 1.015955 | 1.015028 |
| NO Cal Offset: | -0.193015 | 0.006993 |
| $NO_2$ Cal Slope: | 1.002724 | 1.000776 |
| $NO_2$ Cal Offset: | 0.288096 | 0.123095 |

# 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 | 84.4 | 800.6 | 800.6 | 0.0 | 810.9 | 809.5 | 1.6 | 0.9872 | 0.9889 |
| as found 2nd | | | | | | | | | | |
| as found 3rd | | | | | | | | | | |
| new cyl resp | | | | | | | | | | |
| calibrator zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | ---- | ---- |
| high point | 4916 | 84.4 | 800.6 | 800.6 | 0.0 | 813.0 | 812.5 | 0.6 | 0.9847 | 0.9853 |
| second point | 4958 | 42.2 | 400.3 | 400.3 | 0.0 | 407.4 | 406.5 | 1.0 | 0.9826 | 0.9848 |
| third point | 4979 | 21.1 | 200.2 | 200.2 | 0.0 | 203.8 | 203.2 | 0.6 | 0.9821 | 0.9850 |
| as left zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | ---- | ---- |
| as left span | 4916 | 84.4 | 800.6 | 399.9 | 400.7 | 807.6 | 410.6 | 396.8 | 0.9913 | 0.9738 |
| | | | | | | | | Average Correction Factor | 0.9831 | 0.9850 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Corrected As found | $NO_X$ = 811.0 ppb | NO = 809.6 ppb | * = > +/-5% change initiates investigation | *Percent Change | $NO_X$ = -0.4% |
| Previous Response | $NO_X$ = 814.3 ppb | NO = 813.1 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) | 809.3 | 408.6 | 400.7 | 401.2 | 0.9988 | 100.1% |
| 2nd GPT point (200 ppb O3) | 809.3 | 638.7 | 170.6 | 170.5 | 1.0006 | 99.9% |
| 3rd GPT point (100 ppb O3) | 809.3 | 726.4 | 82.9 | 83.5 | 0.9928 | 100.7% |
| | | | | Average Correction Factor | 0.9974 | 100.3% |

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

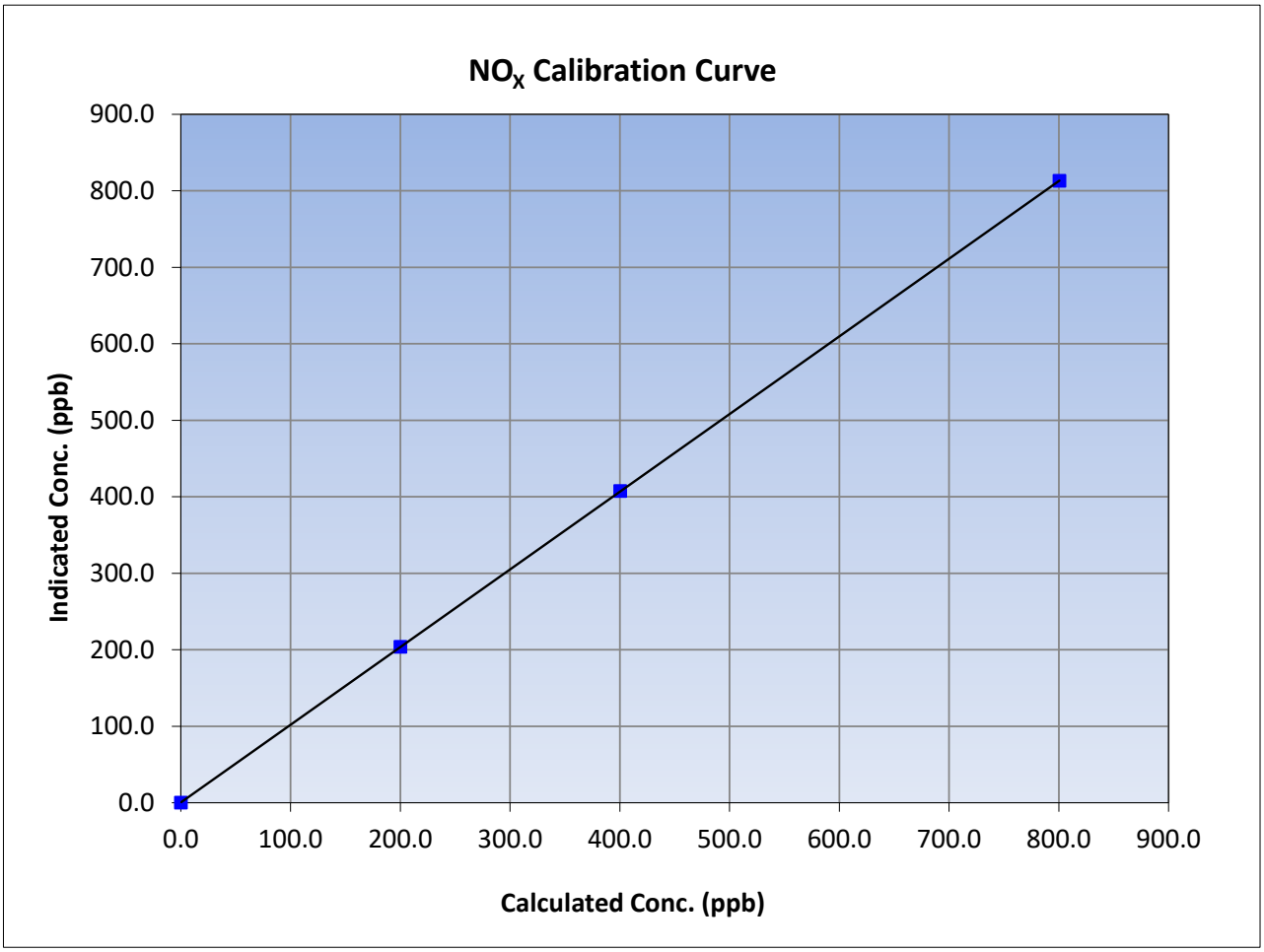
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:47 | End Time (MST): | 13:20 |
| 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 | 0.999998 | *≥0.995* |
| 800.6 | 813.0 | 0.9847 | | | |
| 400.3 | 407.4 | 0.9826 | Slope | 1.015442 | *0.90 - 1.10* |
| 200.2 | 203.8 | 0.9821 | | | |
| | | | Intercept | 0.386974 | *+/-20* |



# Wood Buffalo Environmental Association

## NO Calibration Summary

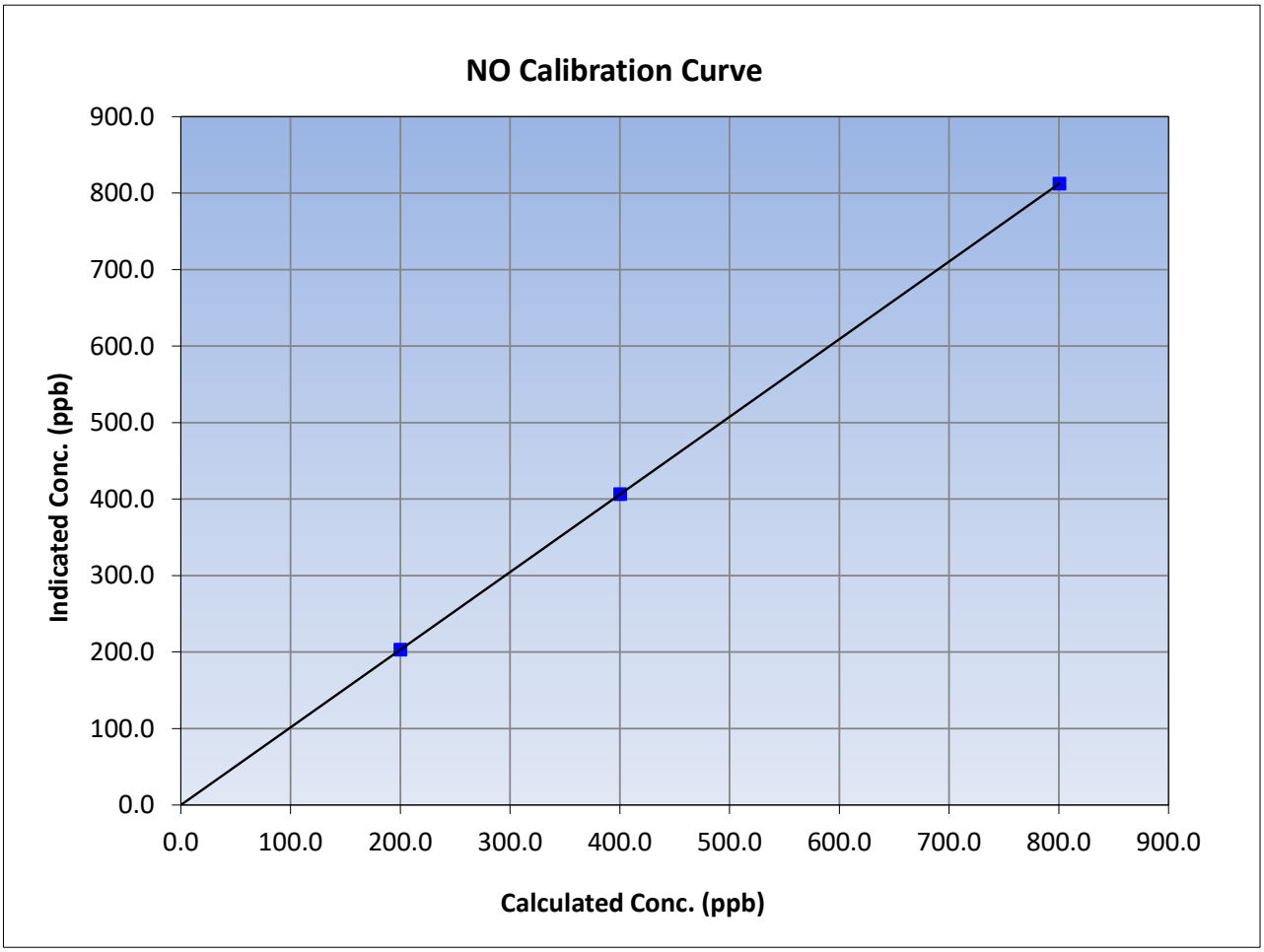
Version-04-2020

### Station Information

| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:47 | End Time (MST): | 13:20 |
| 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 | 812.5 | 0.9853 | | | |
| 400.3 | 406.5 | 0.9848 | Slope | 1.015028 | *0.90 - 1.10* |
| 200.2 | 203.2 | 0.9850 | | | |
| | | | Intercept | 0.006993 | *+/-20* |



# Wood Buffalo Environmental Association

## $NO_2$ Calibration Summary

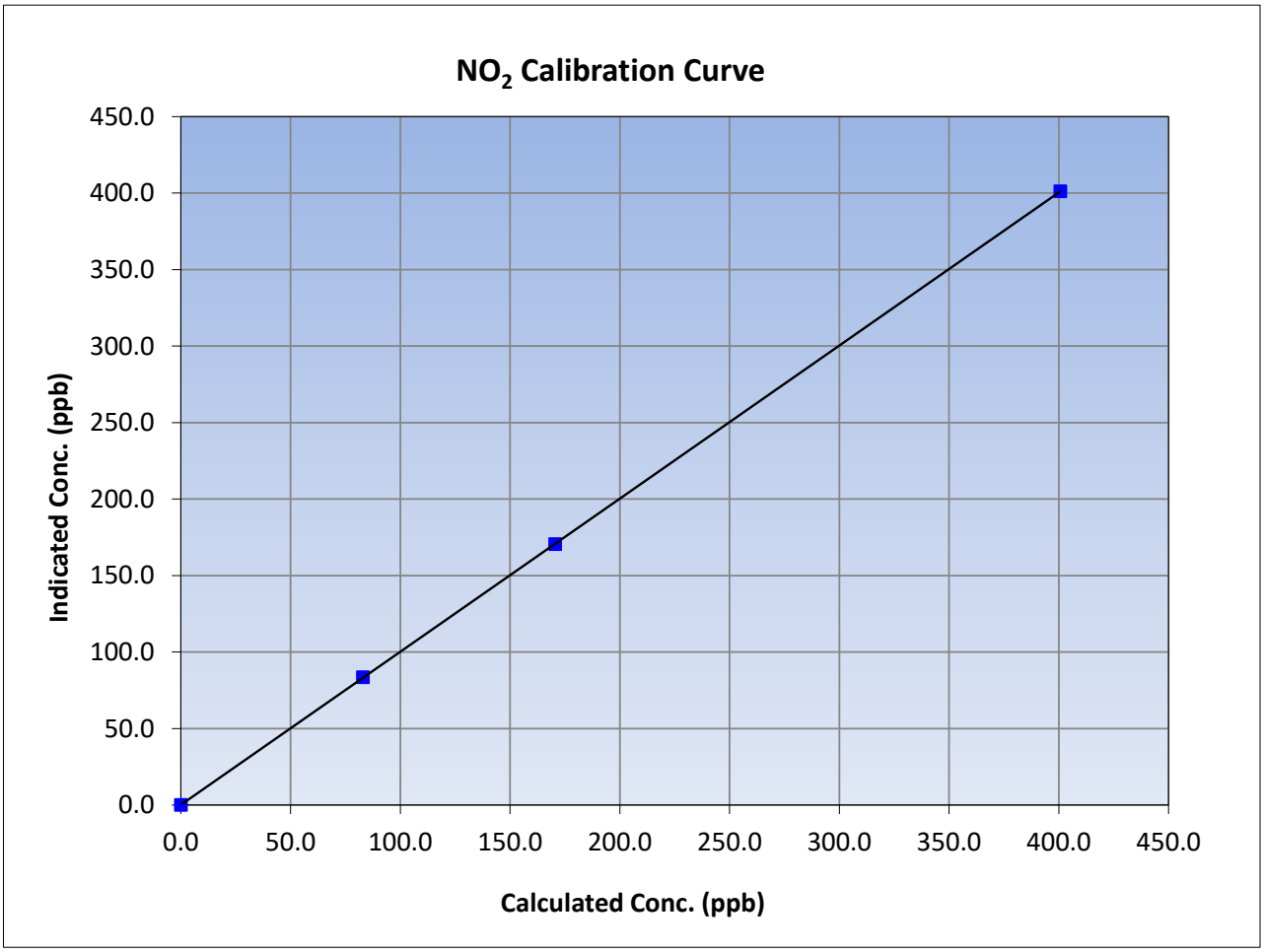
Version-04-2020

### Station Information

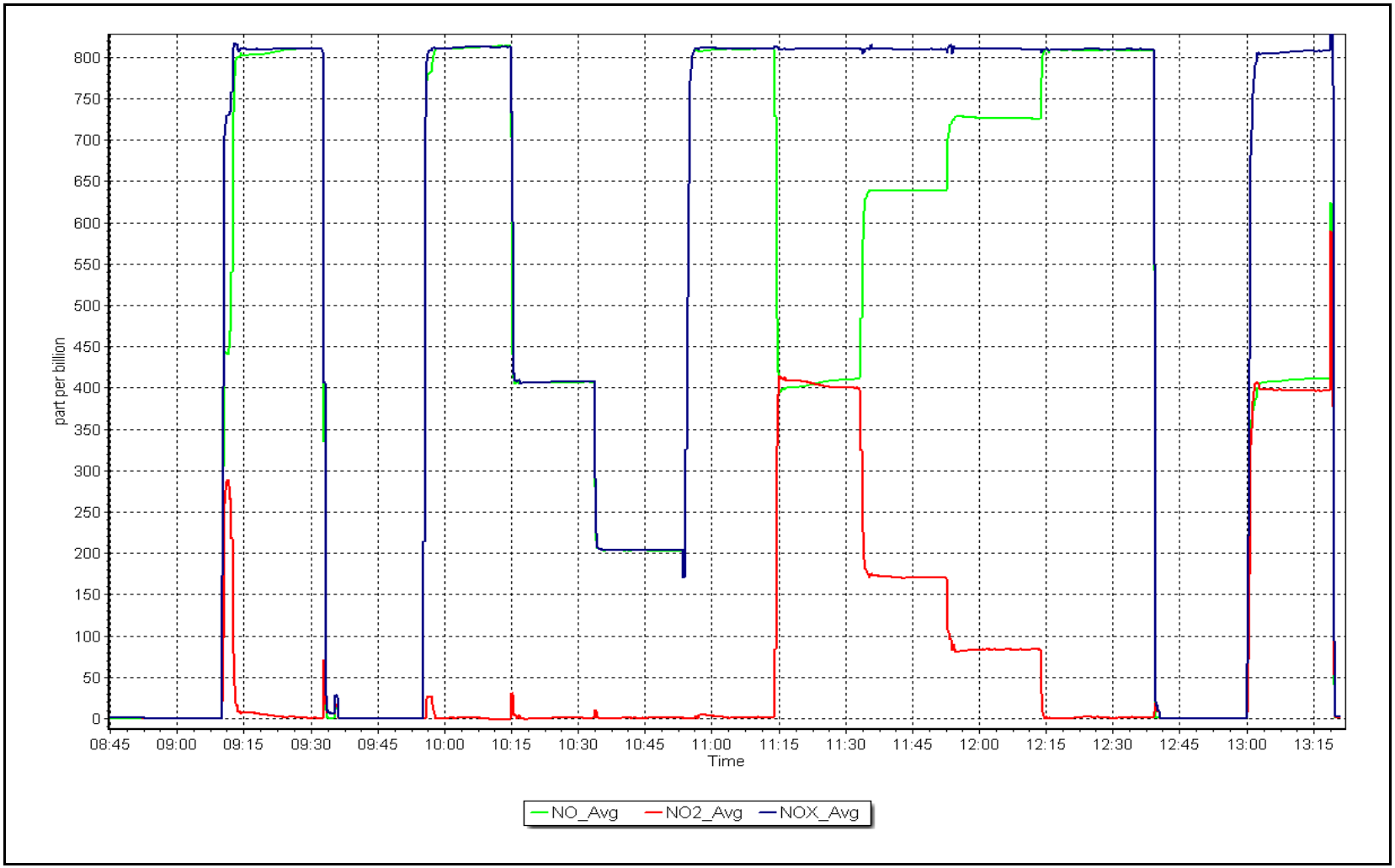
| | | | |
|---|---|---|---|
| Calibration Date: | March 20, 2024 | Previous Calibration: | February 23, 2024 |
| Station Name: | Blackgold | Station Number: | AMS511 |
| Start Time (MST): | 8:47 | End Time (MST): | 13:20 |
| Analyzer make: | Teledyne API T200 | Analyzer serial #: | 7029 |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation | | Limits |
|---|---|---|---|---|---|
| 0.0 | 0.0 | ---- | Correlation Coefficient | 0.999996 | ≥0.995 |
| 400.7 | 401.2 | 0.9988 | | | |
| 170.6 | 170.5 | 1.0006 | Slope | 1.000776 | 0.90 - 1.10 |
| 82.9 | 83.5 | 0.9928 | | | |
| | | | Intercept | 0.123095 | +/-20 |



**$NO_X$ Calibration Plot** Date: March 20, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

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

## Station Information

| | |
|---|---|
| Station Name: | Blackgold |
| Station number: | AMS 511 |
| Calibration Date: | April 5, 2024 |
| Last Cal Date: | March 20, 2024 |
| Start time (MST): | 10:55 |
| End time (MST): | 14:16 |
| Reason: | Removal |

## Calibration Standards

| | | | |
|---|---|---|---|
| NO Gas Cylinder #: | T0F8P52 | Cal Gas Expiry Date: | August 16, 2026 |
| NOX Cal Gas Conc: | 47.43 ppm | NO Cal Gas Conc: | 47.43 ppm |
| Removed Cylinder #: | NA | Removed Gas Exp Date: | NA |
| Removed Gas NOX Conc: | 47.43 ppm | Removed Gas NO Conc: | 47.43 ppm |
| NOX gas Diff: | | NO gas Diff: | |
| Calibrator Model: | Teledyne API T700 | Serial Number: | 2445 |
| ZAG make/model: | Teledyne API T701 | Serial Number: | 138 |

## As Found Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10* | Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10* |
|---|---|---|---|---|---|---|---|---|---|---|
| As found zero | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | ---- | ---- |
| AF High point | 4916 | 84.4 | 800.6 | 800.6 | 0.0 | 812.7 | 809.4 | 3.4 | 0.9851 | 0.9889 |
| AF Mid point | 4958 | 42.2 | 400.3 | 400.3 | 0.0 | 407.3 | 404.7 | 2.6 | 0.9828 | 0.9889 |
| AF Low point | 4979 | 21.1 | 200.2 | 200.2 | 0.0 | 203.2 | 201.7 | 1.5 | 0.9850 | 0.9918 |
| New cyl resp | | | | | | | | | | |

| | | |
|---|---|---|
| Previous Response | $NO_X$ = 813.3 ppb | NO = 812.6 ppb |
| Baseline Corr 1st pt | $NO_X$ = 812.7 ppb | NO = 809.5 ppb |
| Baseline Corr 2nd pt | $NO_X$ = 407.3 ppb | NO = 404.8 ppb |
| Baseline Corr 3rd pt | $NO_X$ = 203.2 ppb | NO = 201.8 ppb |

* = > +/-5% change initiates investigation

As Found Statistics

| | | | |
|---|---|---|---|
| As found | $NO_X$ $r^2$: 0.999998 | *Percent Change | $NO_X$ = -0.1% |
| As found | NO $r^2$: 0.999999 | *Percent Change | NO = -0.4% |
| As found | $NO_2$ $r^2$: 0.999985 | Nx Sl: 1.015299 | Nx Int: 0.187 |
| | | NO Sl: 1.011430 | NO Int: -0.333 |
| | | NO2 Sl: 1.000073 | $NO_2$ Int: 0.838 |

## As Found GPT Calibration Data

| O3 Setpoint (ppb) | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO2 concentration (ppb) (Cc) | Indicated NO2 concentration (ppb) (Ic) | Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10* | Converter Efficiency *Limit = 96-104%* |
|---|---|---|---|---|---|---|
| As Found GPT zero | ---- | ---- | 0.0 | 0.1 | ---- | ---- |
| As found high GPT point | 809.6 | 411.4 | 398.2 | 398.7 | 0.9987 | 100.1% |
| As found mid GPT point | 809.6 | 641.9 | 167.7 | 169.2 | 0.9911 | 100.9% |
| As found low GPT point | 809.6 | 727.8 | 81.8 | 83.1 | 0.9844 | 101.6% |

# Wood Buffalo Environmental Association

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

## Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 7029

NOX Range (ppb): 0 - 1000 ppb

### *Instrument Settings*

| | *Start* | *Finish* | | *Start* | *Finish* |
|---|---|---|---|---|---|
| NO coeff or slope: | 1.041 | NA | NO bkgnd or offset: | 0.2 | NA |
| NOX coeff or slope: | 1.038 | NA | NOX bkgnd or offset: | 0.4 | NA |
| NO2 coeff or slope: | 1.000 | NA | Reaction cell Press: | 4.2 | NA |

## Calibration Statistics

| | *Start* | *Finish* |
|---|---|---|
| $NO_X$ Cal Slope: | 1.015442 | |
| $NO_X$ Cal Offset: | 0.386974 | |
| NO Cal Slope: | 1.015028 | |
| NO Cal Offset: | 0.006993 | |
| $NO_2$ Cal Slope: | 1.000776 | |
| $NO_2$ Cal Offset: | 0.123095 | |

## Dilution Calibration Data

| Set Point | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NOx concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO2 concentration (ppb) (Cc) | Indicated NOx concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO2 concentration (ppb) (Ic) | NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05* | NO Correction factor (Cc/Ic) *Limit = 0.95-1.05* |
|---|---|---|---|---|---|---|---|---|---|---|
| Cal zero | | | | | | | | | | |
| High point | | | | | | | | | | |
| Mid point | | | | | | | | | | |
| Low point | | | | | | | | | | |
| As left zero | | | | | | | | | | |
| As left span | | | | | | | | | | |
| | | | | | | | | Average Correction Factor | | |

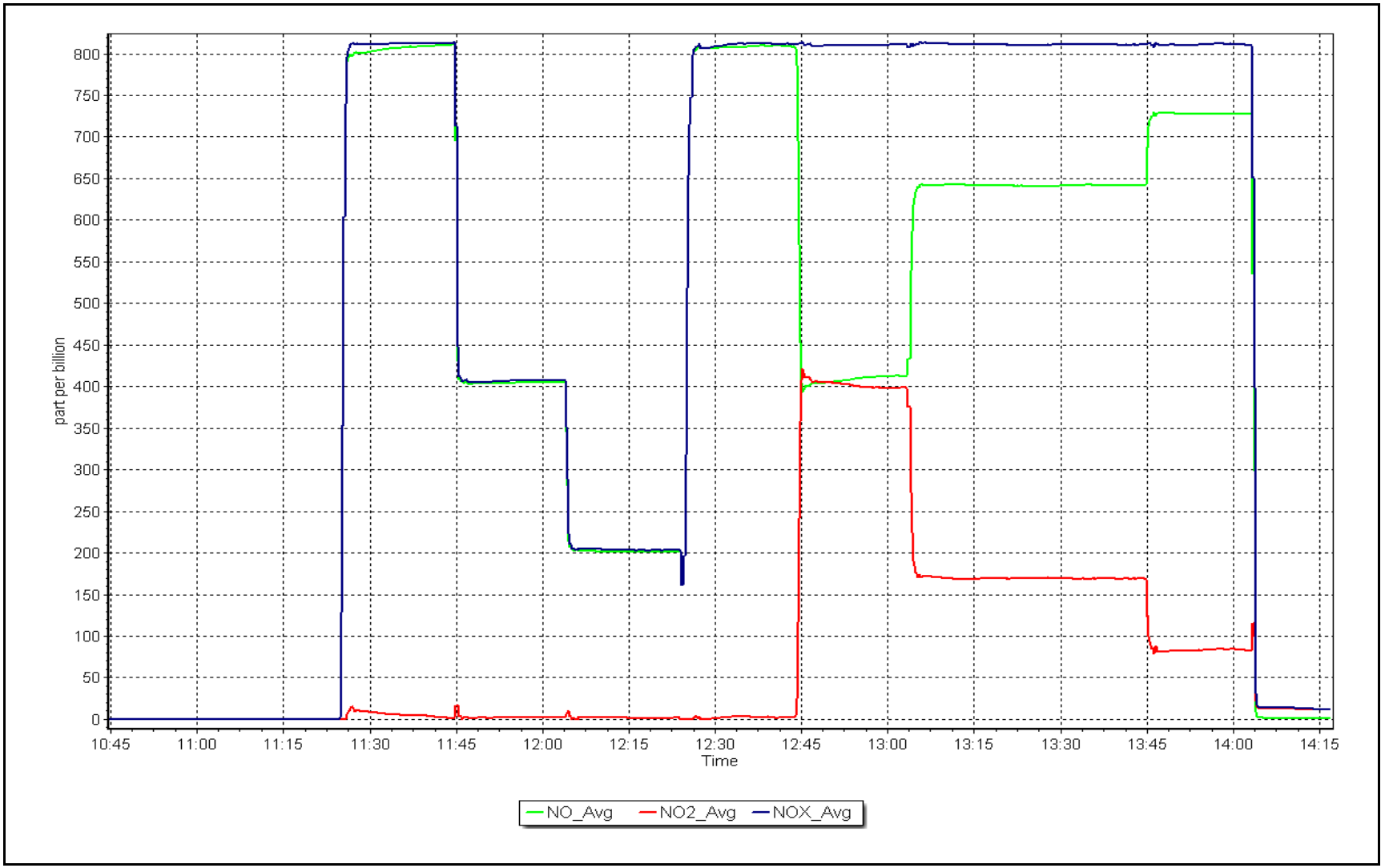
## GPT Calibration Data

| O3 Setpoint (ppb) | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO2 concentration (ppb) (Cc) | Indicated NO2 concentration (ppb) (Ic) | NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05* | Converter Efficiency *Limit = 96-104%* |
|---|---|---|---|---|---|---|
| Cal zero | | | | | | |
| High GPT point | | | | | | |
| Mid GPT point | | | | | | |
| Low GPT point | | | | | | |
| | | | | Average Correction Factor | | |

Notes: Removal Calibration.

Calibration Performed By: Mohammed Kashif

**$NO_X$ Calibration Plot** Date: April 5, 2024 Location: Blackgold



# Wood Buffalo Environmental Association

## Wind Speed/Direction Calibration Report

Version-10-2022

### Station Information

| | | | |
|---|---|---|---|
| Station Name: | Black gold | Station Number: | AMS 511 |
| Calibration Date: | April 8, 2024 | Prev Cal Date: | September 28, 2023 |
| Start Time (MST): | 11:15 | End Time (MST): | 11:33 |
| Tower Height (m): | 10.0 | Reason: | Removal |

### Wind Speed Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 010C-1 | Serial Number: | B10017 |
| WS Calibrator: | MetOne 053 | 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 | 58.7 | 0.2% |
| 800 | 77.8 | 77.8 | 0.1% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999999 | *≥0.9995* |
| Calculated slope | | 0.998137 | *0.90 - 1.10* |
| Calculated intercept | | 0.028665 | *+/- 2* |

### Wind Direction Information

| | | | |
|---|---|---|---|
| Sensor make/model: | Met One 020C-1 | Serial Number: | D13603 |
| As Found Declination (deg east of True North): | 14 | As Left Declination (deg east of True North): | NA |
| Solar noon time (MST): | 13:21 | Calc Declination*: | 13.8 Degrees |
| Deadband calc: | -2.7 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 | 0.1 | --- |
| 90 | 89.4 | -0.2% |
| 180 | 179.4 | -0.2% |
| 270 | 271.8 | 0.5% |
| 358 | 359.8 | 0.5% |

| | ***Start*** | ***Finish*** | *Limits* |
|---|---|---|---|
| Correl Coeff ($r^2$) | | 0.999984 | *≥0.9995* |
| Calculated slope | | 0.993497 | *0.90 - 1.10* |
| Calculated intercept | | 0.693651 | *+/- 4* |

Notes: Removal calibration.

Calibration Performed By: Mohammed Kashif and Devin Russel

End of Report